AGENDA

ENFIELD INLAND WETLANDS AND WATERCOURSES AGENCY

TUESDAY, JUNE 16, 2020 – 7:00PM

REGULAR MEETING

PLEASE JOIN THE MEETING VIRTUALLY WITH THE FOLLOWING LINK

LOGIN INFORMATION TO JOIN THE MEETING:

Join OfficeSuite Meeting
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Dial by your location
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+1 646 741 5293 US (New York)
+1 973 854 6173 US
Meeting ID: 111 811 6982

MEETING MAY ALSO BE SEEN VIA YOUTUBE AT:

https://youtu.be/tEBofqns1ZA

APPLICATION MATERIALS MAY BE FOUND AT:

http://www.enfield-ct.gov/650/Inland-Wetlands-Watercourses-Agency

REGULAR MEETING

1. **Call to Order**
2. **Pledge of Allegiance**
3. **Roll Call**
4. **Executive Session (Public will not be able to participate)**
5. **Correspondence**
6. **Agents Correspondence** (Site Visit Updates – if any)
7. **Approval of Minutes:** May 5, 2020
8. **Old Business**
9. **New Business –Wetland(s) Permits -**
    a. **IW # 605 – 118 Hazard Avenue –** Application for a permit to conduct a regulated activity that will fill +/- 4,877 sq. ft. of existing wetlands and land in the 100-foot Upland Review Area to construct a two-story 29,000 sq. ft. assisted living facility with associated improvements on the property known as 118 Hazard Avenue; Map 065/Lot 0059; Zone R44; Ward Manor, LLC, owner; Kaplan Development Group, LLC; applicant. (DoR: 06/16/2020).

b**. IW # 607 – 113 North Maple Street –** Application for a permit to conduct a regulated activity in the 100-foot Upland Review Area to construct a proposed distribution facility and associated improvements on the property known as 113 North Maple Street; Map 082/Lot 1, 2, 3, and 4; Industrial Land Zone I-1; WE 113 NORTH MAPLE STREET LLC, owner and applicant. (DoR: 06/16/2020).

Determination of Permit Need –

a. **DPN # 2020-05-22 – 10 Hazard Avenue also known as 50 Hazard Avenue –** Determination of Permit Need for the proposed +/- 6,300 sq. ft. expansion of a portion of the main retail strip at Brookside Plaza within the Upland Review Area. Map 056/Lot 0022; Commercial Use Zone BR; Equity One (Northeast Portfolio) c/o Michael Lai, Owner; Regency Centers c/o Michael Lai represented by Nate Krischner-Lagan.

10. **Statewide Inland Wetlands & Watercourses Activity Reporting Form**
11. **Enforcement Report(s)**
12. **Report of Development Services/Planning Staff**
13. **New Applications to be Received**
14. **Agent Approvals**
15. **Adjournment**

Note: Next Regular Meeting will be virtual on **Tuesday, July 7, 2020** at 7:00 p.m.. Instructions to join that meeting will be posted on the agenda and the IWWA webpage at http://www.enfield-ct.gov/650/Inland-Wetlands-Watercourses-Agency

By: Donna Corbin-Sobinski, Chairman - Files are available for review on the Town of Enfield Inland Wetlands and Watercourses Agency Website.
http://www.enfield-ct.gov/650/Inland-Wetlands-Watercourses-Agency.

DoR – Date of Receipt
CDD- Commission Decision Date

ENFIELD INLAND WETLANDS AND WATERCOURSES AGENCY
TUESDAY, May 5, 2020 – 7:00PM
REGULAR MEETING
DRAFT MINUTES FOR COMMISSION CONSIDERATION
Virtual Meeting

Call to Order
Chairman Donna Corbin-Sobinski called the meeting to order at 7:01 P.M.

Roll Call
Commissioner Zorda took the roll and present were Chairman Donna Corbin-Sobinski, Commissioners Kevin Zorda, Carrie Howe and Alternate Commissioners Robert Hendrickson, Marie Pyznar and Marcy Taliceo. Absent were Commissioners Robert Chagnon, Virginia Higley and Jane Smith.

Also present were Laurie Whitten, Director of Development Services and Elizabeth Bouley, Recording Secretary.

Chairman Corbin-Sobinski seated Alternate Commissioners Hendrickson, Pyznar and Taliceo.

Executive Session (Public will not be able to participate)

Motion: Commissioner Zorda made a motion, seconded by Commissioner Pyznar, to move the meeting to Executive Session.

The motion passed with a 6-0-0 vote.

Votes: 6-0-0

Attorney James Tallberg stated for the record that he will be included in the Executive Session along with Attorney Maria Elsden and Zoning Enforcement Officer Ricardo Rachele in order to discuss a pending Cease & Desist order at 57 Kimberly Drive.

The Commission returned from Executive Session and Commissioner Zorda took the roll again. Present were Chairman Donna Corbin-Sobinski, Commissioners Kevin Zorda, Jane Smith and Alternate Commissioners Robert Hendrickson, Marie Pyznar and Marcy Taliceo. Absent were Commissioners Carrie Howe, Robert Chagnon and Virginia Higley.

Chairman Corbin-Sobinski stated that Alternate Commissioners Hendrickson, Pyznar and Taliceo were still seated.

Chairman Corbin-Sobinski stated that no votes were taken and no decisions made during Executive Session.

Approval of Minutes: April 21, 2020 Regular Meeting

Motion: Commissioner Pyznar made a motion, seconded by Commissioner Hendrickson, to approve the minutes for the April 21, 2020 Regular Meeting.

The motion passed with a 6-0-0 roll call vote.

Votes: 6-0-0

Motion: Commissioner Zorda made a motion, seconded by Commissioner Taliceo, to move the Public Hearing for IW# 604 to this point in the meeting.

The motion passed with a 6-0-0 roll call vote.

Votes: 6-0-0

Continued Public Hearing IW# 604 – 118 Hazard Avenue – Wetlands Permit application for the re-delineation of wetlands on property known as 118 Hazard Avenue; Map65/Lot 59; Business Professional/Residential 44 Zones; Ward Manor, LCC; Kaplan Development Group,LLC applicant. (DoR: 3/17/2020; MOPH: 5/21/2020)

Chairman Corbin-Sobinski stated that this is a continuation from their last meeting, and that a third-party soil scientist from North Central Conservation District had gone out to look at the property. Ms. Whitten stated that the soil scientist, Barbara Kelly, investigated the area alone and provided a report which had been emailed to the Commission.

Soil Scientist Eric Davison went over the suggested areas of adjustment of the line. He stated that after revisiting the site, his original delineation is still correct. He went over the area where they added additional flags in order to better define the line, stating that Ms. Kelly's findings ultimately agreed with his.

Mr. Davison stated that he spoke to the engineer today and he intends to go out to the site and survey at flags 137A and 140A in order to add them to the survey map.

Commissioner Zorda asked if anything needs to be amended, to which Ms. Whitten replied that a condition of approval can be made saying that modifications must be done according to the memo should that be the Commission's decision.

George Logan, Rema Ecological Services, addressed the Commission as a representative for Sigrun Gadwa of Carya Ecological Services, LLC. Mr. Logan provided the Commission with his comments regarding the findings of Mr. Davison and Ms. Kelly. He went over the various issues that are in conflict with his findings. Mr. Logan concluded that, with the exception of inflammatory language, this is more or less how this process should work, with professionals working together to come to conclusions.

Mr. Davison stated that this is a field science rather than a laboratory science, and when the discrepancies are roughly six feet that is not cause to move another professional's flag. He stated that there were no redoximorphic features mentioned in any of the reports and concluded that the third-party findings agreed with his own.

Joan Nichols, Executive Director of the Connecticut Farm Bureau Association, stated that she was contacted by Richard Chmura, who is currently renting the abutting property. She stated that they are concerned with this development on an active working farm.

Chairman Corbin-Sobinski stated that this is a Public Hearing regarding the re-delineation of the soils. Ms. Whitten stated that there will be an IWWA meeting regarding the site plan.

Chairman Corbin-Sobinski asked if anyone else would like to speak; no one came forward.

Motion: Commissioner Pyznar made a motion, seconded by Commissioner Zorda, to close the Public Hearing.

The motion passed with a 6-0-0 vote.

Votes: 6-0-0

Motion: Commissioner Zorda made a motion, seconded by Commissioner Smith, to approve IW# 604 with the amended addition of the two flags: 137A and 140A.

The motion passed with a 6-0-0 roll call vote.

Votes: 6-0-0

Old Business

a. **Review of Bylaws**

Motion: Commissioner Zorda made a motion, seconded by Commissioner Smith, to un-table the Review of Bylaws.

The motion passed with a 6-0-0 vote.

Votes: 6-0-0

Ms. Whitten stated that there were numerous modifications based upon the Town Attorney's recommendations. She stated that a lot of it is statutory and wording.

Ms. Whitten asked if the bylaws had been approved yet, to which Chairman Corbin-Sobinski replied that they had not and are still waiting to approve them. Ms. Whitten stated that they need to go before the Town Council to change fees.

Chairman Corbin-Sobinski asked if the bylaws can be approved as they are, to which Ms. Whitten replied that they can.

Motion: Commissioner Zorda made motion, seconded by Commissioner Hendrickson, to approve the bylaws as amended up to this point.

The motion passed with a 6-0-0 roll call vote.

Votes: 6-0-0

Enforcement Report(s)

a. **IW # 589- 57 Kimberly Avenue-** Cease & Desist Order of the Inland Wetland & Watercourses Regulations regarding the violation of Section 6.1, 6.2, and 6.3- Regulated Activities to be Licensed for the dumping of earth material(s) into the escarpment area; Dean A + Tracy A Clark, Owner; Map 070/ Lot 0011; Residential 88 (R-88) zone. ***C&D issued March 6, 2018.***

Motion: Commissioner Zorda made motion, seconded by Commissioner Smith, that based upon the advice of the Town Attorney in Executive Session, the Cease & Desist order be hereby withdrawn without prejudice as to any of the rights or remedies of the IWWA.

The motion passed with a 6-0-0 vote.

Votes: 6-0-0

Ms. Whitten stated that there are no updates at this time for 117 North Street, 348 Hazard or AAA at 55 Hazard Avenue. She stated that she will get an update from ZEO Rachele on these issues for the next meeting.

Commissioner Zorda stated that the solar farm is being installed over at Powder Hollow and the last they heard is that it was going to litigation. Ms. Whitten stated that they have started clearing and are still working on getting their building permit. Commissioner Zorda stated that it has been cleaned up very well.

Report of Development Services/Planning Staff

Ms. Whitten stated Staff is all still in lockdown and they are working on means to protect Staff at the Town Hall.

Adjournment

Motion: Commissioner Zorda made a motion, seconded by Commissioner Pyznar, to adjourn.

The motion passed with a 6-0-0 vote.

Votes: 6-0-0

Prepared by: Elizabeth Bouley, Recording Secretary

Respectfully Submitted,

_____

Virginia Higley, Secretary

TOWN OF ENFIELD

Memorandum

To: Inland Wetlands & Watercourses Agency

From: Laurie P. Whitten, CZEO, AICP, Dir. Development Services –
Acting Inland Wetlands Agent

Date: June 9, 2020

Re: IW #605 – Application of Kaplan Development Group requesting a permit to construct a 29,000 sq. ft. Assisted Living Facility and associated improvements within and adjacent to wetlands at 118 Hazard Avenue. Map 65/Lot 59 in the BP/R-44 zones

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PROPOSAL:

The subject parcel is a 19.44 +/- acre lot with road frontage on Hazard Avenue and Middle Road. It is divided into two portions based on use. The southern half, accessed from Middle road is cleared and currently farmed. There is no proposed activity nor wetlands evaluation in this area. The northern half had previously been row farmed but is currently heavily wooded with a Red Maple swamp. The wetlands appear to lie only within the central area of this portion, and water drains generally towards Hazard Avenue.

The wetlands have been described as having principal levels of functionality with groundwater recharge/discharge, flood flow alteration, sediment/toxicant/pathogen retention & nutrient removal/alteration. The viability of a potential vernal pool is still to be reported.

Recently, a wetlands re-delineation was approved. Based on that re-delineation there are 123,072.27 sq. ft. of wetlands on the site, with a proposed direct impact of 4,991.73 sq. ft. and approximately 2.59 ac. of activity in the Upland Review Area.

The proposed development is for a 54,000 sq. ft. two story Assisted Living Facility with a 29,000 sq. ft. footprint, and associated development inclusive of drive aisles, walkways, stormwater management features, utilities and landscaping.

DRAINAGE:

Stormwater will be collected via overland flow into deep-sump hooded catchbasins. All stormwater will be directed into a) one of the 4 above ground infiltration basins which will help to treat roof runoff, b) one of 4 underground stormtech detention units which is designed to

treat the first inch of runoff. The design is pursuant to meeting or exceeding the 2004 Stormwater Quality Manual requirements, or c) via underground pipes leading to rip rap aprons leading back to the wetlands area.

The proposed stormwater management system will decrease the peak rates of runoff from pre-development flows for the 1,2,10, 25, and 100 year storms.

WETLANDS:

The proposal has construction within much of the 100'upland review area, mostly with drive aisles abutting the existing wetlands as close as 10-15'. The southwest corner of the building and drive aisle will encroach into and fill the wetlands, with approximately 4,877 sq. ft. of direct impact. The entire Wetlands area #2 of 134 sq. ft. is also proposed to be filled in.

A single low quality Vernal Pool was identified in wetland area #3. The vernal pool lies within the wetlands. Evaluation of the pool found 2 wood frog egg masses. Overall however, based on the 100' Vernal Pool Envelope (VPE) and the100'-750' Critical Terrestrial Habitat (CTH), the pool has been classified as a Tier 3 pool, which is of the lowest value. "*This is due to the presence of only a single indicator species, a low number of egg masses, and the highly degraded condition of the terrestrial habitat within the VPE and CTH management zones."* (See p. 8 of Wetland Functions & Values Assessment and Vernal Pool Survey results)

EROSION & SEDIMENTATION CONTROLS:

Short term impacts to the remaining wetlands will be from sediment discharges from construction activities. The applicant is proposing to minimize such impact by:

1. A 3rd party inspector to inspect the erosion and sedimentation controls weekly or more (such as after storm events
2. Use coir fiber logs, straw waddles or similar alternate measure in place of silt fencing; and
3. To preserve trees as much as possible when installing sedimentation and erosion controls, which the measures in #2 above will allow.

MITIGATION:

During the application for the wetlands delineation, the applicant and their consultant heard some of the concerns that had been expressed. In response they are proposing:

1. An Agricultural Conservation Easement over the currently farmed area. The only uses to be allowed will be agricultural in nature.
2. Creation of 10,010 sq. ft. of new wetlands adjacent to the southeast side of wetland are #4. This is at a ratio of 2:1.

3. A very detailed wetland creation area construction sequence has been proposed inclusive of ground water monitoring, wetland creation plantings, and monitoring and assessment.

Staff Comments:

1. The 100 foot Upland Review Buffer should be depicted on the plans.
2. As the proposal includes filling of wetlands, the applicant should be prepared to discuss the prudent and feasible alternatives that were considered.
3. The wetlands delineation did not seem to include the farm field. Was a study performed along the east property line area where the emergency access road is proposed?
4. The applicant should explain how the overall wetlands hydrologic regime will be preserved, in particular the area of mitigation in wetlands area #4.
5. Staff should be informed prior to when clearing will occur and meet in the field to discuss final plans for sedimentation and erosion controls.

Application IW# 605, Referenced Plans:

Proposed Site Plan Documents for KAPLAN Development Group, LLC, proposed All American Assisted Living Facility 118 Hazard Ave, Enfield CT , Map 65, Town of Enfield, Hartford County, CT,; prepared by BOHLER 16 Old Forge Rd, Ste A Rocky Hill, CT 06067 860/333-8900 www.BohlerEngineering.com dated 1/20/20 revised 3/10/20

1/17 "Proposed All-American Assisted Living Facility, 118 Hazard Avenue, Enfield, Connecticut 06082"; Cover Sheet with Site Location Map, Aerial Area Plan and Drawing Sheet Index; Sheet: C-101; Scale: As Noted; Prepared by Bohler Engineering, 16 Old Forge Road, Suite A, Rocky Hill, CT 06067. Prepared for Kaplan Development Group, LLC, 100 Jericho Quadrangle, Suite 142, Jericho, NY 11753. Dated December 6, 2019. Revised to March 10, 2020.
2/17 "General Notes Sheet" – Sheet C-102; Scale: None
3/17 "Demolition Plan" – Sheet C-201; Scale: 1" = 30'
4/17 "Site Layout Plan" – Sheet C-301; Scale: 1" = 30'
5/17 "Grading and Drainage Plan" – Sheet C-401; Scale: 1" = 30'
6/17 "Soil Erosion and Sediment Control Plan" – Sheet C-402; Scale: 1" = 30'
7/17 "Soil Erosion and Sediment Control Notes and Details" – Sheet C-403; Scale: None
8/17 "Utility Plan" – Sheet C-501; Scale: 1" = 30'
9/17 "Landscape Plan" – Sheet C-601; Scale: 1" = 30'
10/17 "Landscape Notes and Details" – Sheet C-602; Scale: None
11/17 "Lighting Plan" – Sheet C-701; Scale: 1" = 30'
12/17 "Detail Sheet" – Sheet C-901; Scale: None
13/17 "Detail Sheet" – Sheet C-902; Scale: None
14/17 "Detail Sheet" – Sheet C-903; Scale: None
15/17 "Detail Sheet" – Sheet C-904; Scale: None

16/17 "Detail Sheet" – Sheet C-905; Scale: None
17/17 "Detail Sheet" – Sheet C-906; Scale: None

Boundary and Topographic Survey

1/5 "Proposed All-American Assisted Living Facility, 118 Hazard Avenue, Enfield, Connecticut 06082"; Boundary and Topographic Survey with Location Map, Legend, Notes, Abutters Information and Map References; Scale: 1" = 60'; Prepared by Bohler Engineering, 16 Old Forge Road, Suite A, Rocky Hill, CT 06067. Prepared for Kaplan Development Group, LLC, 100 Jericho Quadrangle, Suite 142, Jericho, NY 11753. Dated September 5, 2019.

2/5 "Boundary and Topographic Survey" – Scale: 1" = 30'
3/5 "Boundary and Topographic Survey" – Scale: 1" = 30'
4/5 "Boundary and Topographic Survey" – Scale: 1" = 30'
5/5 "Boundary and Topographic Survey" – Scale: 1" = 30'

Inland Wetlands and Watercourse Permit
Standard Conditions of Approval

Site Specific Conditions Prior to Recording the Permit on the Land Records

Prior to the Start of Construction:

1. Prior to the start of construction or, if applicable, the issuance of a building permit(s) the full-size plans as approved by the Agency (and the Planning and Zoning Commission) shall be submitted to the Inland Wetlands Agent;
2. The permittee/contractor shall schedule a pre-construction meeting (if required) with the Inland Wetlands Agent to be held no sooner than two (2) weeks before the regulated activities are to begin. The permittee shall, at that time, review with the Inland Wetlands Agent, the procedures to be taken to protect the regulated areas prior to and during construction;
3. The applicant must submit a Sediment & Erosion Control Bond in an amount to be determined by the Director of Planning and the Town Engineer. This bond can be returned to the applicant upon completion and inspection of all work to be done on the property;
4. The Inland Wetlands and Watercourses Agency or its designated Agent must be notified in writing within three (3) business days of the proposed commencement of permitted activities, and upon completion of said activities; a "business day" is a day when the Town Hall is open for business.
5. Prior to the start of construction, adequate erosion and sedimentation control measures shall be implemented, and shall be maintained throughout the entire construction phase and shall

meet or exceed the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as revised, until the site has become stabilized with permanent vegetative cover.

6. The Permittee shall submit a plan noting plant type, caliper size, and number of plants to be placed in affected area.
7. The Standard Town Notes must be added to the final plans submitted to the Planning Office.

General Conditions:

8. This approval shall be valid for five (5) years from the date of approval unless otherwise revoked or specifically extended;
9. All work and all regulated activities conducted pursuant to this permit shall be consistent with these terms and conditions hereof. Any structures, excavation, fill, obstruction, encroachments or regulated activities not specifically identified and authorized herein shall constitute a violation of this permit and may result in its modification, suspension, or revocation. Upon initiation of the activities authorized herein, the permittee thereby accepts and agrees to comply with the terms and conditions hereof;
10. This approval is not transferable without the written consent of the Enfield Inland Wetlands and Watercourses Agency or its designated Agent;
11. In issuing this approval, the Agency has relied on information provided by the applicant and, if such information subsequently proves to be false, deceptive, incomplete and/or inaccurate this permit shall be modified, suspended or revoked;
12. This approval shall be made a part of all construction contracts and sub-contracts pertaining to the proposed regulated activities and shall supersede all other contract requirements;
13. The permittee shall permit the Agency, its authorized representative(s) or designee(s) to make periodic inspections at any time deemed necessary in order to assure that the activity being performed under authority of this permit is in accordance with the terms and conditions prescribed herein;
14. No equipment or material including without limitation, fill, construction materials, or debris, shall be deposited, placed, or stored in any wetland or watercourse on or off site unless specifically authorized by this permit;
15. This approval is subject to and does not derogate any present or future property rights or other rights or powers of the Town of Enfield, and conveys no property rights or in real estate of material nor any exclusive privileges, and is further subject to any and all public and private rights and to any activity affected hereby;
16. The construction site shall be left in a stable condition at the close of each day. An adequate stockpile of erosion control materials shall be on site at all times for emergency or routine replacement and shall include materials to repair silt fences, hay bales, mulch, stone-riprap filter dikes or any other devices planned for use during construction. Additional erosion/stormwater control measures are to be installed as directed by the Inland Wetland Agency, its authorized representative(s) or designee(s) if field conditions necessitate.

17. The permittee shall immediately inform the Planning office of any problems involving wetlands or watercourses which have developed in the course of, or which are caused by, the authorized work;
18. All temporary barriers, including erosion and sedimentation controls are to be removed when the site is stabilized in suitable weather conditions. The site is considered stabilized when there is equal to or greater than 70% vegetative cover;
19. With the exception of the addition of the items stated in these conditions, this application is approved in accordance with the plans referenced above. Any changes that would potentially cause greater impact to wetlands or watercourses, such as enlargement of the area of disturbance or reorientation of building footprints, from the plans shall require the permittee to come before the Enfield Inland Wetlands and Watercourses Agency for a Determination of Permit Modification.
20. The Inland Wetlands and Watercourses Permit number shall be located on all future plans to any Town or State Agency.
21. The Wetland Permittee shall complete the permit prerequisites and file the permit on the Land Records within 365 days.

The Inland Wetlands and Watercourses permit, when issued, does not abrogate the applicant's responsibility to obtain permits that may be necessary from other agencies at the local, state or federal level prior to commencing the project.

TOWN OF ENFIELD

Inland Wetlands & Watercourses Agency

Planning Division • 820 Enfield Street Enfield, CT 06082
Telephone: 860-253-6355 Website: www.enfield-ct.gov

Permit Application for Inland Wetlands & Watercourses Activity

Application For: ☒ Permit ☐ Extension ☐ Agent Approval ☐ Other_____
☐ Modification (Existing Permit/ Application #'s): _____

Staff Use Only			
IW #:	605	**View Permit #:**	TC-20-4
IWWA Regulation Section:			

PLEASE REVIEW LAND USE APPLICATION GUIDE FOR INSTRUCTIONS

Property Address: 118 Hazard Avenue **Map #:** 65 **Lot #:** 59

Zone(s): B-P Zone, R-44 Zone **Size of Parcel:** 19.435 Acres **Account #:** _____

Current Use: Vacant Land

Project Name: Kaplan Development - Adult Assisted Living Facility

Summary Description: The proposed project includes the construction of a new two-story 29,000 SF footprint freestanding "All American Assisted Living" facility along with new paved parking areas, landscaping, storm water management components and associative utilities. Per the request of the Town of Enfield, an emergency access road will be constructed with a drive entrance/exit located along Middle Road. This emergency access road will have an associated water quality infiltration trench and swale.

Applicant's Name: Kaplan Development Group, LLC

Applicant's Address: 100 Jericho Quadrangle, STE 142, Jericho, NY 11753

Contact #: 516-496-1505 **Email:** bwells@kagdev.com

Applicant's Representative: Ben Wells

Representative Address: _____

Contact #: _____ **Email:** _____

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Does Applicant own the Property? ☐ Yes (Attach Copy of DEED)
☒ No (Provide Information Below)

TOWN OF ENFIELD

Owner's Name: Ward Manor, LLC

Owner's Contact #:

Owner's Address: 82 Potter School Road, Willington, CT 06279

Owner's Email:

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Project Information:

Septic: ☐ Yes ☒ No

Public Sewer: ☒ Yes ☐ No

Well Water: ☐ Yes ☒ No

Public Water: ☒ Yes ☐ No

Outdoor Storage: ☐ Yes ☒ No

Design District: ☐ Yes ☒ No

Do wetlands and watercourses affect this application? ☒ Yes ☐ No

Is the property within a Level A or Level B Aquifer Protection Area? ☒ Yes ☐ No

Does this application include any regulated activity in a floodplain ☒ Yes ☐ No

(If yes, you will need to also submit a Flood Hazard Development Permit application to the Planning & Zoning Commission)

What is the total lot acreage? 19.435 Acres

What is the length of the property frontage? (List by Street) Hazard Avenue: 689.37'
Middle Road: 674.69'

Name the abutting street(s): Hazard Avenue, Middle Road

What are the existing land uses and zoning districts for abutting properties or across the street(s)?

North B-P: Business Professional

East B-G: Business General, B-P: Business Professional, R-44: One Family Residence

South R-33: One Family Residence

West B-P: Business Professional, R-44: One Family Residence

TOWN OF ENFIELD

Environmental History:

Is any portion of the property located within 500 feet of an adjoining municipality? ☐ Yes ☒ No

Name Municipalities: _____

Area of wetlands located on the property: 122,918.6 Square Feet

Area of wetlands to be impacted: 4,877.68 Square Feet

Watercourses located on the property: ☐ Yes ☒ No

Name and type of watercourses: _____

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Are proposed activities located within the 100-Year floodplain? ☐ Yes ☒ No

Are proposed activities located within a floodway? ☐ Yes ☒ No

Are there slopes with grades in excess of 15% located on the property? ☒ Yes ☐ No

Is any portion of the project located within a public water supply aquifer or watershed area? ☒ Yes ☐ No

Phase I: Land Records reviewed for environmental hazards? ☐ Yes ☒ No

Phase II: Environmental Hazards Identified? ☐ Yes ☒ No

If yes, please list the environmental conditions found: _____

TOWN OF ENFIELD

Phase 3: Is there a remediation plan? ☐ Yes ☒ No

If yes, please describe the remediation plan: _____

Are there environmental restrictions on the property? ☐ Yes ☒ No

If yes, please list environmental restrictions: _____

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☐ **COMPLETE & SUBMIT:**

INLAND WETLANDS & WATERCOURSES APPLICATION CHECKLIST

☐ **COMPLETE & SUBMIT:**

STATE OF CONNECTICUT INLAND & WETLANDS WATERCOURSE ACTIVITY REPORTING FORM

TOWN OF ENFIELD

The applicant understands that this application is to be considered complete only when all information and documents required by the Agency have been submitted. The undersigned warrants the truth of all statements contained herein and in all supporting documents according to the best of his/her knowledge and belief. Permission is granted to the Town of Enfield, Inland Wetlands & Watercourses Agency, and its agent(s) to walk the land, at reasonable times, and perform those tests necessary to properly review the application, both before and after a final decision has been issued.

☒ **I have reviewed and acknowledge the Land Use Application Guide for further instructions on how to complete my application.**

Applicant Signature: _____ **Date:** 2/25/20

Print Name: Ben Wells

Owner's Signature: _____ **Date:** _____

Print Name: _____

Subscribed and sworn to before me 25th **day of** FEBRUARY, 2020.

_____ 3/5/23

Notary Public **My Commission Expires:**

LINDA LUCKMAN
Notary Public, State of New York
No.01LU6162202
Qualified in Nassau County
Commission Expires 03/05/2023

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For Office Use	
Application #: _____	**Date Submitted:** _____
DEP Form Submitted Date: _____	

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Enfield Inland Wetlands and Watercourses Agency Application Checklist

	Documents Required
☑	All plans including revised plans must be submitted to the Department **25 days prior** to a Board or Commission meeting. Plans will be reviewed, circulated, and commented by appropriate Departments.
☑	An original of the completed application form and site plan and fourteen (14) full size copies of the set of site plans and any report.
☑	**Fourteen (14) copies** of 24 X 36 plans are to be submitted in complete sets- stapled and map folded. Part II of the DEEP Reporting Form completed.
☑	**Four (4) copies** of all reports required are to be submitted. i.e. Drainage, stormwater, soils, etc.
☑	Application Fee
☑	If any portion of the project is located within a public water supply aquifer or watershed areas Public Act No. 06-53 of the CT G.S. requires the following: 1. Written notice including Project Notification Form (PNF) to the involved Water Company within seven (7) days of submittal of any application, petition, request, or plan to the Town of Enfield. 2. Notice to the Water Company by the applicant is to be by certified mail, return receipt requested. The PNF and Level A Aquifer Protection Area mapping can be obtained from the Town of Enfield Planning Department as well as online.
☑	Pre and post development storm water drainage calculation, with drainage area map. → Report
☑	Report on soil types and characteristics from Professional Soil Scientist who delineated wetlands. Report shall include a minimum of one (1) field soil profile for each wetland soil type within project area. Profile shall be presented in data sheet format. As needed as mapped.
	The applicant must certify whether any portion of the property is within 500 feet of an adjoining municipality, whether streets from an adjoining municipality will be used for entering or exiting the site, whether sewer or water drainage will flow through or impact and adjoin municipality or whether water run-off will impact streets or adjoining municipal or private property within an adjoining municipality. If the project falls within any of the above mentioned definition, then a letter must be sent by certified mail to the adjoining municipality. ▪ If the project falls within any of the above mentioned definitions, then a letter must be sent by certified mail to the adjoining municipalities Inland Wetland Agency along with a copy of the application and site plan being submitted to this Agency. Evidence of submission shall be submitted to the Enfield IWWA.
☑	For proposed wetland impacts, a wetland assessment report from a soil scientist or other qualified individual. → Wetland Report

TOWN OF ENFIELD

	Site Plan Requirements
☑	Signed and Sealed by appropriate design professional (Surveyor, Engineer, Architect, and Landscape Architect) registered in the State of Connecticut.
☑	Property boundaries, north arrow, name of project, date and type of drawing, subsequent dates of revision with description, names and addresses of engineers and surveyors (when appropriate), location map, property owner(s) and adjacent property owners.
☑	Existing and proposed topography, structures, utilities, roadways and buildings. Plan/profile sheet shall be included for roads and all off road pipelines.
☑	Soil types as mapped by the National Resource Conservation Service.
☑	Wetlands located on adjacent properties, within approximately 100-feet of subject property.
☑	Alternatives considered and rejected to be either shown on a site plan or explained in narrative form.
☑	Soil and Erosion Control Measures including narrative, per 2002 CT E&S Control Guidelines at a minimum.
☑	Wetlands boundaries delineated by a Professional Soil Scientist whose signatures are required on the site plan.
☑	Limit of Upland Review Areas.
☑	Cuts and fill volumes indicating source and type of fill, destination of removed fill, expect for single-family homes or similar.
☑	Limits of woody vegetation clearing.
☑	Well locations and setbacks from septic system and drainage swales.
☑	Septic system locations including reserve areas, existing and proposed grading, spot grades and setbacks from wetland areas.
☑	Storm water drainage systems.
☑	All existing and proposed pipe sizes, length and inverts.
☑	Test pit and soil profile locations.
☑	Acreage of wetlands/watercourses on the site and the acreages presented separately of wetland, watercourses or upland review areas to be altered.
☑	Boundaries of 100-year floodplain or floodway as determined by FEMA.

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TOWN OF ENFIELD

	Detail Sheet
☑	Erosion and sediment control details along with a sequence plan.
☑	Test pit logs. — Report
☑	Details of all proposed site improvements (i.e. drainage structures, pipes, footing drains, curtain drains, dewatering, cross section of septic system or sewer connection, cross section of detention, retention, or sediment basins, etc.).
☑	Construction sequence specifications.
	Public Hearing (If Required)
☑	Notice to immediate abutters by certified mail not less that twenty-one **(21) days prior** to the start of the public hearing.
☑	A copy of the abutter's letter and proof of mailing notification is to be provided to the Planning Office **5 days prior** to the scheduled public hearing. (If applicable).
☑	Deadline to post public hearing sign(s) is **10 days prior** to the scheduled meeting at which the application will be discussed.
	▪ THE ENFIELD IWWA AND/OR THE PLANNING OFFICE MAY REQUEST ADDITIONAL INFORMATION DURING THE PERMIT PROCESS AS NECESSARY.
	Additional Information
	▪ The Planning Department requires an electronic submission of all documents received in CD Format or on a USB drive.
	▪ When multiple Commissions are involved the applicant must meet all conditions of approvals including final plan(s) revisions to obtain the appropriate signature of approval prior to applying to any other Land Use Commission.

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BOHLER

16 Old Forge Road, Suite A
Rocky Hill, CT 06067
860.333.8900

LETTER OF TRANSMITTAL

DATE: 04/02/2020

SENDING VIA: Hand Delivery

TO: Planning Division
Enfield Town Hall
820 Enfield Street
Enfield, CT 06082

RE: IWWA Permit Application
All-American Assisted Living
118 Hazard Avenue
Enfield, CT 06082

JOB #: CT191016

Item #	# of Copies	Date	Description
1	1	02/25/20	IWWA Permit Application
2	1	N/A	DEEP Statewide Activity Reporting Form
3	4	02/28/20	Wetland Delineation and Functional Evaluation
4	4	03/10/20	Drainage Report
5	14	03/10/20	(24" x 36") Proposed Site Plan Documents
6	1	02/20/20	Application Fee Check ($335.00) (CR03172020)
7	1	N/A	USB Drive

These are transmitted: ☐ For approval ☐ For your use ☐ As requested ☒ For review and comment

RECEIVED
ENFIELD PLANNING DEPT.
2020 APR -2 PM 12:40

Comments:

Attached please find the above-mentioned items for your use. Should you have any questions or require any additional information, please do not hesitate in contacting me 860-333-8900.

COPY TO:

FROM: Jeffrey Bord, P.E. (jbord@bohlereng.com)

If enclosures are not as noted, kindly notify us at once.

IW#605

BOHLER

Transmittal

16 Old Forge Road, Suite A, Rocky Hill, CT 06067

PROJECT:	CT191016 CT191016 - Senior Housing Development LLC - Enfield Town	DATE:	6/5/2020
SUBJECT:	118 Hazard Ave IWWA Permit Application	TRANSMITTAL ID:	00006
PURPOSE:	As requested for the purpose noted herein	VIA:	Info Exchange

FROM

NAME	COMPANY	EMAIL	PHONE
Jeffrey Bord 16 Old Forge Road, Suite A Rocky Hill CT 06067 United States	Bohler Engineering	jbord@bohlereng.com	860-333-8900

TO

NAME	COMPANY	EMAIL	PHONE
lwhitten@enfield.org		lwhitten@enfield.org	

REMARKS:

Hi Laurie,

I hope you are well and having an excellent Friday. Per our discussions, please follow the attached link to download the updated wetland report, plan set, drainage report and for the 118 Hazard Ave. They have been revised to include the conditions of approval from the IWC wetland delineation hearing, and to incorporate the Soil Scientists recent findings. Please substitute these documents in place of the previous submission.

We understand there is an online permit center in place now, but we did not want to submit an entirely new application. Please advise if you would like us to move forward with the online permitting instead. Thank you again for all your help with the project and permitting process as well as adapting so well to the work from home scenario.

If you have any questions or comments please do not hesitate to reach out, we will be happy to help. We are looking forward to continue working with you now and on any future projects, and we will see you on the 16th.

Have a great weekend!

Jeff

Transmittal

DATE: 6/5/2020
TRANSMITTAL ID: 00006

DESCRIPTION OF CONTENTS

QTY	DATED	TITLE	NOTES
1	6/5/2020	CT191016ss0 Drainage Report.pdf	
1	6/5/2020	CT191016ss3_06.04.2020.pdf	
1	6/5/2020	Wetland Functions_Values Report, Hazard Ave, Enfield - 6-5-20.pdf	

COPIES:

Ben Jednak (Bohler Engineering)

Connecticut Department of
ENERGY & ENVIRONMENTAL PROTECTION

GIS CODE #: ___ ___ ___ ___ ___ ___ ___ ___ ___
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Statewide Inland Wetlands & Watercourses Activity Reporting Form

Please complete and mail this form in accordance with the instructions on pages 2 and 3 to:
DEEP Land & Water Resources Division, Inland Wetlands Management Program, 79 Elm Street, 3rd Floor, Hartford, CT 06106
Incomplete or incomprehensible forms will be mailed back to the inland wetlands agency.

PART I: Must Be Completed By The Inland Wetlands Agency

1. DATE ACTION WAS TAKEN: year: _____ month: _____
2. ACTION TAKEN (see instructions, only use one code): _____
3. WAS A PUBLIC HEARING HELD (check one)? yes ☐ no ☐
4. NAME OF AGENCY OFFICIAL VERIFYING AND COMPLETING THIS FORM:
   (print name) _____ (signature) _____

PART II: To Be Completed By The Inland Wetlands Agency Or The Applicant

5. TOWN IN WHICH THE ACTION IS OCCURRING (print name): Enfield
   does this project cross municipal boundaries (check one)? yes ☐ no ☒
   if yes, list the other town(s) in which the action is occurring (print name(s)): _____, _____
6. LOCATION (see instructions for information): USGS quad name: Broad Brook, CT or number: 23
   subregional drainage basin number: 4003
7. NAME OF APPLICANT, VIOLATOR OR PETITIONER (print name): Kaplan Development Group, LLC
8. NAME & ADDRESS / LOCATION OF PROJECT SITE (print information): 118 Hazard Avenue Enfield, CT 06082
   briefly describe the action/project/activity (check and print information): temporary ☐ permanent ☒ description: Construction of new two-story 29,000 SF footprint building with paved parking area and associative amenities.
9. ACTIVITY *PURPOSE* CODE (see instructions, only use one code): D
10. ACTIVITY *TYPE* CODE(S) (see instructions for codes): 1, 9, 10, 12
11. WETLAND / WATERCOURSE AREA ALTERED (must provide acres or linear feet):
    wetlands: 0.111976 acres open water body: _____ acres stream: _____ linear feet
12. UPLAND AREA ALTERED (must provide acres): 2.588 acres
13. AREA OF WETLANDS / WATERCOURSES RESTORED, ENHANCED OR CREATED (must provide acres): 0 acres

DATE RECEIVED:

PART III: To Be Completed By The DEEP

DATE RETURNED TO DEEP:

FORM COMPLETED: YES NO

FORM CORRECTED / COMPLETED: YES NO

Connecticut Department of
ENERGY &
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PROTECTION

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STATEWIDE INLAND WETLANDS & WATERCOURSES ACTIVITY REPORTING FORM

Pursuant to section 22a-39(m) of the General Statutes of Connecticut and section 22a-39-14 of the Regulations of Connecticut State Agencies, inland wetlands agencies must complete the Statewide Inland Wetlands & Watercourses Activity Reporting Form for **each** action taken by such agency.

This form may be made part of a municipality's inland wetlands application package. If the municipality chooses to do this, it is recommended that a copy of the Town and Quadrangle Index of Connecticut and a copy of the municipality's subregional drainage basin map be included in the package.

Please remember, the inland wetlands agency is responsible for ensuring that the information provided is **accurate** and that it reflects the **final** action of the agency. Incomplete or incomprehensible forms will be mailed back to the agency. Instructions for completing the form are located on the following pages.

The inland wetlands agency shall mail completed forms for actions taken during a calendar month no later than the 15th day of the following month to the Department of Energy and Environmental Protection (DEEP). Do **not** mail this cover page or the instruction pages. Please mail **only** the **completed** reporting form to:

DEEP Land & Water Resources Division
Inland Wetlands Management Program
79 Elm Street, 3rd Floor
Hartford, CT 06106

Questions may be directed to the DEEP's Inland Wetlands Management Program at (860) 424-3019.

INSTRUCTIONS FOR COMPLETING

THE STATEWIDE INLAND WETLANDS & WATERCOURSES ACTIVITY REPORTING FORM

Use a separate form to report EACH action taken by the Agency. Complete the form as described below.
Do NOT submit a reporting form for withdrawn actions.

PART I: Must Be Completed By The Inland Wetlands Agency

1. Choose the year and month the Inland Wetlands Agency took the action being reported. If multiple actions were taken regarding the same project or activity then multiple forms need to be completed.

2. Choose ONE code letter to describe the final action or decision taken by the Inland Wetlands Agency. Do NOT submit a reporting form for withdrawn actions. Do NOT enter multiple code letters (for example: if an enforcement notice was given and subsequent permit issued - two forms for the two separate actions are to be completed).

- **A** = A Permit Granted by the Inland Wetlands Agency (not including map amendments, see code D below)
- **B** = Any Permit Denied by the Inland Wetlands Agency
- **C** = A Permit Renewed or Amended by the Inland Wetlands Agency
- **D** = A Map Amendment to the Official Town Wetlands Map - or -
  An Approved/Permitted Wetland or Watercourse Boundary Amendment to a Project Site Map
- **E** = An Enforcement Action: Permit Revocation, Citation, Notice of Violation, Order, Court Injunction, or Court Fines
- **F** = A Jurisdictional Ruling by the Inland Wetlands Agency (i.e.: activities "permitted as of right" or activities considered non-regulated)
- **G** = An Agent Approval pursuant to CGS 22a-42a(c)(2)
- **H** = An Appeal of Agent Approval Pursuant to 22a-42a(c)(2)

3. Check "yes" if a public hearing was held in regards to the action taken; otherwise check "no".

4. Enter the name of the Inland Wetlands Agency official verifying that the information provided on this form is accurate and that it reflects the FINAL action of the agency.

PART II: To Be Completed By The Inland Wetlands Agency Or The Applicant - If Part II is completed by the applicant, the applicant MUST return the form to the Inland Wetlands Agency. The Inland Wetlands Agency MUST ensure that the information provided is accurate and that it reflects the FINAL action of the Agency.

5. Enter the name of the municipality for which the Inland Wetlands Agency has jurisdiction and in which the action/project/activity is occurring.

Check "yes" if the action/project/activity crosses municipal boundaries and enter the name(s) of the other municipality(ies) where indicated. Check "no" if it does not cross municipal boundaries.

6. Enter the USGS Quad Map name or number (1 through 115) as found on the Connecticut Town and Quadrangle Index Map (the directory to all USGS Quad Maps) that contains the location of the action/project/activity. Click on the following website for USGS Quad Map information:
http://ct.gov/deep/lib/deep/gis/resources/Index_NamedQuadTown.pdf

ALSO enter the four-digit identification number of the corresponding Subregional Drainage Basin in which the action/project/activity is located. If the action/project/activity is located in more than one subregional drainage basin, enter the number of the basin in which the majority of the action/project/activity is located. Town subregional drainage basin maps can be found at UConn – CLEAR's website: http://clear.uconn.edu/data/map_set/index.htm

7. Enter the name of the individual applying for, petitioning, or receiving the action.

8. Enter the name and address or location of the action/project/activity. Check if the action/project/activity is TEMPORARY or PERMANENT in nature. Also provide a brief DESCRIPTION of the action/project/activity. It is always best to provide as much information as possible (i.e., don't just state "forestry", provide details such as "20 acre forestry harvest, permit required for stream crossing".)

9. Carefully review the list below and enter ONLY ONE code letter which best characterizes the action/project/activity. All state agency projects must code "N".

A = Residential Improvement by Homeowner
B = New Residential Development for Single Family Units
C = New Residential Development for Multi-Family / Condos
D = Commercial / Industrial Uses
E = Municipal Project
F = Utility Company Project
G = Agriculture, Forestry or Conservation
H = Wetland Restoration, Enhancement, Creation
I = Storm Water / Flood Control
J = Erosion / Sedimentation Control
K = Recreation / Boating / Navigation
L = Routine Maintenance
M = Map Amendment
N = State Agency Project
P = Other (this code includes the approval of concept plans with no-on-the-ground work)

10. Enter between one and four code numbers to best characterize the project or activity being reported. Enter "NA" if this form is being completed for the action of map amendment. You MUST provide code 12 if the activity is located in an established upland review area. You MUST provide code 14 if the activity is located beyond the established upland review area or no established upland review area exists.

1 = Filling
2 = Excavation
3 = Land Clearing / Grubbing (no other activity)
4 = Stream Channelization
5 = Stream Stabilization (includes lakeshore stabilization)
6 = Stream Clearance (removal of debris only)
7 = Culverting (not for roadways)
8 = Underground Utilities Only (no other activities)
9 = Roadway / Driveway Construction
10 = Drainage Improvements
11 = Pond, Lake Dredging / Dam Construction
12 = Activity in an Established Upland Review Area
14 = Activity in Upland

Examples: Jurisdictional ruling allowing construction of a parking lot in an upland where the municipality does not have an established upland review area must use code 14, other possible codes are 2 and 10. Permitted construction of a free standing garage (residential improvement by homeowner) partially in an established upland review area with the remainder in the upland must use code 12 and 14, other possible codes are 1 and 2.

11. Leave blank for TEMPORARY alterations but please indicate action/project/activity is temporary under question #8 on the form. For PERMANENT alterations, enter in acres the area of wetland soils or watercourses altered. Include areas that are permanently altered, or are proposed to be, for all agency permits, denials, amendments, renewals, jurisdictional rulings, and enforcement actions. For those activities that involve filling or dredging of lakes, ponds or similar open water bodies enter the acres filled or dredged under "open water body". For those activities that involve directly altering a linear reach of a brook, river, lakeshore or similar linear watercourse, enter the total linear feet altered under "stream". Remember that these figures represent only the acreage altered not the total acreage of wetlands or watercourses on the site. You MUST provide all information in ACRES (or linear feet as indicated) including those areas less than one acre. To convert from square feet to acres, divide square feet by the number 43,560. If this report is being completed for an agency jurisdictional ruling and detailed information is not available, provide an estimate. Enter zero if there is no alteration.

12. Enter in acres the area of upland altered as a result of an ACTIVITY REGULATED BY the inland wetlands agency, or as a result of an AGENT APPROVAL pursuant to CGS section 22a-42a(c)(2). Leave blank for TEMPORARY alterations but please indicate action/project/activity is temporary under question #8 on the form. Include areas that are permanently altered, or proposed to be permanently altered, for all agent approvals, agency permits, denials, amendments, renewals, jurisdictional rulings, and enforcement actions. You MUST provide all information in ACRES including those areas less than one acre. See directions above (#11) for conversion factor. If this report is being completed for an agent approval or an agency jurisdictional ruling and detailed information is not available, provide an estimate. Enter zero if there is no alteration.

13. Enter the acres that are, or are proposed to be, restored, enhanced or created for all agency permits, denials, amendments, renewals, jurisdictional rulings and enforcement actions. NOTE restored or enhanced applies to previously existing wetlands or watercourses. Created applies to a non-wetland or non-watercourse area which is converted into wetlands or watercourses (question #10 must provide 12 and/or 14 as an answer, and question #12 must also be answered). You MUST provide all information in ACRES including those areas less than one acre. See directions above (#11) for conversion factor. Enter zero if there is no restoration, enhancement or creation.

PART III: To Be Completed By The DEEP - Please leave this area blank. Incomplete or incomprehensible forms will be mailed back to the inland wetlands agency.

Connecticut Department of
ENERGY & ENVIRONMENTAL PROTECTION

GIS CODE #: ___ ___ ___ ___ ___ ___ ___ ___ ___
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Statewide Inland Wetlands & Watercourses Activity Reporting Form

Please complete and mail this form in accordance with the instructions on pages 2 and 3 to:
DEEP Land & Water Resources Division, Inland Wetlands Management Program, 79 Elm Street, 3rd Floor, Hartford, CT 06106
Incomplete or incomprehensible forms will be mailed back to the inland wetlands agency.

PART I: Must Be Completed By The Inland Wetlands Agency

1. DATE ACTION WAS TAKEN: year: _____ month: _____
2. ACTION TAKEN (see instructions, only use one code): _____
3. WAS A PUBLIC HEARING HELD (check one)? yes ☐ no ☐
4. NAME OF AGENCY OFFICIAL VERIFYING AND COMPLETING THIS FORM:

   (print name) _____ (signature) _____

PART II: To Be Completed By The Inland Wetlands Agency Or The Applicant

5. TOWN IN WHICH THE ACTION IS OCCURRING (print name): Enfield

   does this project cross municipal boundaries (check one)? yes ☐ no ☒

   if yes, list the other town(s) in which the action is occurring (print name(s)): _____, _____
6. LOCATION (see instructions for information): USGS quad name: Broad Brook, CT or number: 23

   subregional drainage basin number: 4003
7. NAME OF APPLICANT, VIOLATOR OR PETITIONER (print name): Kaplan Development Group, LLC
8. NAME & ADDRESS / LOCATION OF PROJECT SITE (print information): 118 Hazard Avenue Enfield, CT 06082

   briefly describe the action/project/activity (check and print information): temporary ☐ permanent ☒ description: Construction of new two-story 29,000 SF footprint building with paved parking area and associative amenities.
9. ACTIVITY *PURPOSE* CODE (see instructions, only use one code): D
10. ACTIVITY *TYPE* CODE(S) (see instructions for codes): 1, 9, 10, 12
11. WETLAND / WATERCOURSE AREA ALTERED (must provide acres or linear feet):

    wetlands: 0.114594 acres open water body: _____ acres stream: _____ linear feet
12. UPLAND AREA ALTERED (must provide acres): 2.619135 acres
13. AREA OF WETLANDS / WATERCOURSES RESTORED, ENHANCED OR CREATED (must provide acres): 0.229798 acres

DATE RECEIVED:

PART III: To Be Completed By The DEEP

DATE RETURNED TO DEEP:

FORM COMPLETED: YES NO

FORM CORRECTED / COMPLETED: YES NO

DRAINAGE REPORT

For

KAPLAN
DEVELOPMENT GROUP. LLC

PROPOSED

"All American Assisted Living" Facility

118 Hazard Avenue
Enfield, Connecticut
Hartford County

Prepared by:

BOHLER ENGINEERING
16 Old Forge Road
Rocky Hill, CT 06067
(860) 333-8900 TEL.

Jeff G. Bord
Connecticut P.E. Lic. #30414

BOHLER

June 4th, 2020
#CT191016

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- USGS MAP
- FEMA FIRMETTE

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- NCRS CUSTOM SOIL RESOURCE REPORT

APPENDIX C: EXISTING CONDITIONS HYDROLOGIC ANALYSIS
- EXISTING CONDITIONS DRAINAGE MAP
- EXISTING CONDITIONS HYDROCAD COMPUTATIONS

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- NOAA RAINFALL DATA
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- INSPECTION AND MAINTENANCE LOG FORM
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- ILLICIT DISCHARGE STATEMENT
- MANUFACTURER'S INSPECTION AND MAINTENANCE MANUALS

I. EXECUTIVE SUMMARY

This report examines the changes in drainage that can be expected as the result of the development of a proposed assisted living facility located on the southerly side of Hazard Avenue in the Town of Enfield, Connecticut. The site, which contains approximately ±19.43 acres of land, contains existing wetlands and wooded areas. The proposed project will disturb approximately ±3.60 acres.

The proposed project includes the construction of a new two-story 29,000 SF footprint freestanding "All American Assisted Living" facility along with new paved parking areas, landscaping, storm water management components and associated utilities. This report addresses a comparative analysis of the pre- and post-development site runoff conditions. Additionally, this report provides calculations documenting the design of the proposed stormwater conveyance/management system as illustrated within the accompanying Site Development Plans prepared by Bohler Engineering. The best management practices (BMPs) incorporated into the proposed stormwater management system have been designed to meet the requirements as set forth in the 2004 Connecticut Stormwater Quality Manual. This correlates to a total required water quality storage volume of 7,058 cubic feet, where we will be providing 11,183 cubic feet of water quality storage volume. The project will also provide erosion and sedimentation controls during the demolition and construction periods, as well as long term stabilization of the site.

On-Site Soil Information

The majority of the soils at the site are mapped as Walpole sandy loam which is classified by the Natural Resource Conservation Service (NRCS) as Hydrologic Soil Group (HSG) "B/D". There is also a portion in the middle of the site that is mapped as Windsor loamy sand which is classified by the NRCS as HSG "A". The remaining soils at the site are Udorthents-Urban land complex and Ninigret fine sandy loam, which are classified by the NRCS as HSG "B" and "C" respectively. Refer to **Appendix B** for additional information.

Design Point Descriptions

For the purposes of this analysis the pre- and post-development drainage conditions were analyzed at three (3) "design points" where stormwater runoff currently drains to under existing conditions. Refer to **Appendix C** for Existing Drainage Map

Design Point #1 (DP-1) is the 24" RCP within the Hazard Avenue right-of-way. Under existing conditions, this design point receives storm water flows from approximately 0.50 acres of land designated as watershed "ED-1". This watershed is entirely made up of wooded and grass areas. This area has a calculated curve number of 63 and a calculated time of concentration of 12.0 minutes.

Design Point #2 (DP-2) is the area of wetlands on the western portion of the site. Under existing conditions, this design point receives storm water flows from 1.68 acres of land designated as watersheds "ED-2a" and "ED-2b". These watersheds are entirely made up of wooded and grass areas as well as portions of the existing wetlands. Watershed "ED-2a" and "ED-2b" have a calculated curve number of 62 and 65, respectively as well as calculated time of concentrations of 11.5 minutes and 11.4 minutes, respectively.

Design Point #3 (DP-3) is the area of wetlands off-site to the east. Under existing conditions, this design point receives storm water flows from 1.42 acres of land designated as watershed "ED-3". This watershed is entirely made up of wooded and grass areas. This area has a calculated curve number of 55 and a calculated time of concentration of 14.5 minutes.

A summary of the existing and proposed conditions peak runoff rates and volumes for the 1-, 2-, 10-, 25-, and 100-year storms can be found in **Table 1.1** below. In addition, the project has been designed to meet or exceed the 2004 Connecticut Stormwater Quality Manual as detailed herein.

Table 1.1: Design Point Peak Runoff Rate Summary

Point of Analysis	1-Year Storm			2-Year Storm			10-Year Storm			25-Year Storm			100-Year Storm		
	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ
DP1	0.03	0.00	**-0.03**	0.07	0.00	**-0.07**	0.36	0.22	**-0.14**	0.59	0.30	**-0.29**	1.00	1.00	**0**
DP2	0.40	0.34	**-0.06**	0.62	0.42	**-0.20**	2.40	2.39	**-0.01**	3.76	3.54	**-0.22**	6.05	6.00	**-0.05**
DP3	0.03	0.03	**0**	0.18	0.07	**-0.11**	1.34	1.04	**-0.30**	2.41	2.38	**-0.03**	4.29	4.02	**-0.27**

**Flows are represented in cubic feet per second (cfs)*

II. EXISTING SITE CONDITIONS

Existing Site Description and Collection/Conveyance

The site consists of approximately 19.44 acres, of which approximately 3.60 acres are being developed. The site is located along the southerly side of Hazard Avenue in the Town of Enfield, Connecticut. Located in the B-P (Business Professional) Zone and Flood Zone X which correlates to a 0.2% annual chance of flood hazard. The site is entirely made up of existing wooded and wetland areas, with slopes varying from 1%-50% with on-site elevations ranging from 136 at the northwesterly corner of the site to 127 at the southern edge of the site. The surrounding area has an existing shopping center and restaurant along the frontage of Hazard Avenue. Refer to **Appendix A** for additional information.

The northeastern portion of the site drains from southwest to the northern edge of the site where it is collected by a 24" RCP within the Hazard Avenue municipal drainage system. The northwestern portion of the site drains from east to west into the existing areas of wetlands. The southwestern portion of the site also drains from east to west into the existing areas of wetlands. The remaining easterly portion of the site drains from west to east off-site into the adjacent property where there is also an area of existing wetlands.

Existing Watersheds and Design Point Information

The site was subdivided into four (4) separate sub catchments for the existing conditions as described below to analyze existing and proposed flow rates at each design point. The minimum time of concentration for all proposed areas is calculated as 6 minutes (0.1 hr).

Subcatchment ED-1 in total is 0.33 acres with existing wooded and grass areas. This area flows overland from southwest to north across the site where it is collected by an existing 24" RCP in the Hazard Avenue right-of-way. The stormwater runoff from this Subcatchment is not treated or attenuated. This subcatchment has a calculated curve number of 60 and a calculated time of concentration of 12.0 minutes

Subcatchment ED-2a in total is 0.79 acres with existing wooded, grass, and wetland areas. This area flows overland from east to west across the site where it drains into the existing wetland area at the western portion of the site. The stormwater runoff from this subcatchment is not treated or

attenuated. This subcatchment has a calculated curve number of 62 and a calculated time of concentration of 11.6 minutes.

Subcatchment ED-2b in total is 0.89 acres with existing wooded, grass, and wetland areas. This area flows from east to west across the site where it drains into the existing wetland area at the western portion of the site. The stormwater runoff from this subcatchment is not treated or attenuated. This subcatchment has a calculated curve number of 65 and a calculated time of concentration of 11.4 minutes.

Subcatchment ED-3 in total is 1.59 acres with existing wooded and grass areas. This area flows from west to east across the site where it drains off-site into the existing wetland area off the subject property. The stormwater runoff from this subcatchment is not treated or attenuated. This subcatchment has a calculated curve number of 56 and a calculated time of concentration of 14.5 minutes.

Refer to **Table 2.1,** for the calculated existing conditions peak rates of runoff and volumes. For additional hydrologic information, refer to **Appendix D** and the Drainage Area Maps in the appendices of this report for a graphical representation of the existing drainage areas.

Table 2.1: Existing Conditions Peak Runoff Rates*

Point of Analysis	1-Year Storm	2-Year Storm	10-Year Storm	25-Year Storm	100-Year Storm
DP1	0.03	0.07	0.36	0.59	1.00
DP2	0.40	0.62	2.40	3.76	6.05
DP3	0.03	0.07	1.04	2.38	4.02

**Flows are represented in cubic feet per second (cfs)*

III. PROPOSED SITE CONDITIONS

Proposed Development Description

The proposed project includes the construction of a new two-story 29,000 SF footprint freestanding "All American Assisted Living" facility along with new paved parking areas, landscaping, storm water management components and associated utilities. The site, including the proposed parking areas, has been designed to drain to deep-sump hooded catch basins. The catch basins will capture and convey stormwater runoff, via an underground pipe system, to one of four (4) subsurface infiltration basins with isolator rows to handle and treat the first inch of runoff pursuant to the 2004 Stormwater Quality Manual. Additionally, three (3) above ground infiltration basins have been proposed to provide treatment for part of the rooftop runoff and remaining impervious runoff.

The project has been designed to maintain existing drainage patterns to the maximum extent practical, utilizing the same design points described in **Section I** above.

Proposed Development Collection and Conveyance

Deep sump hooded catch basins are proposed to collect and route runoff from the paved parking areas to the proposed subsurface basins. Pipes have been designed for the 10-year storm using the Rational Method. Outlet protection sizing calculations are included in **Appendix E**.

The best management practices (BMPs) incorporated into the proposed stormwater management system have been designed to meet or exceed the requirements as set forth in the 2004 Connecticut Stormwater Quality manual. Refer to **Appendix E** for calculations. In addition, a Stormwater Operation and Maintenance (O&M) Plan, attached in **Appendix F**, has been developed which includes scheduled maintenance and periodic inspections of stormwater management structures.

Proposed Watersheds and Design Point Information

The project has been designed to maintain existing drainage watersheds to the greatest extent possible, with the same design points described in **Section II** above. The site was subdivided into ten (10) separate sub catchments for the proposed conditions as described below. The minimum time of concentration for all proposed areas is calculated as 6 minutes (0.1 hr).

Subcatchment PD-1 consists of 0.67 acres of pavement, landscaping and roofing. This area drains to proposed catch basins and is routed to an above ground infiltration basin for water quality treatment. The roof runoff from this area is routed through a SC-740 StormTech. This SC-740 StormTech contains isolator rows for the purpose of water quality treatment prior to discharging into an above ground infiltration basin. From which, it will flow into a 24" RCP headwall, as it does in existing conditions. A 6-minute time of concentration was assumed based on surface cover types and slopes.

Subcatchment PD-2a consists of 0.60 acres of pavement, and landscaping. This area drains to proposed catch basins and is routed through a SC-740 StormTech infiltration basin. This SC-740 infiltration basin contains isolator rows for the purpose of water quality treatment prior to discharging. A 6-minute time of concentration was assumed based on surface cover types and slopes.

Subcatchment PD-2b consists of 0.22 acres of landscaping and woodlands to remain. This area flows overland from east to west, as it does in existing conditions, to existing areas of wetlands to remain. A 6-minute of time of concentration was assumed based on surface cover types and slopes.

Subcatchment PD-2c consists of 0.36 acres of landscaping and pavement. This area drains to proposed catch basins and is routed through a SC-160LP StormTech infiltration basin prior to discharging. A 6-minute time of concentration was assumed based on surface cover types and slopes.

Subcatchment PD-2d consists of 0.03 acres of landscaping and woodlands to remain. This area flows overland from east to west, as it does in existing conditions, to existing areas of wetlands to remain. A 6-minute time of concentration was assumed based on surface cover types and slopes.

Subcatchment PD-2e consists of 0.36 acres of pavement, and landscaping. This area drains to a proposed catch basin and is routed through a SC-310 StormTech infiltration basin. This SC-310 StormTech contains isolator rows for the purpose of water quality treatment prior to discharging. A 6-minute time of concentration was assumed based on surface cover types and slopes.

Subcatchment PD-2f consists of 0.34 acres of landscaping and woodlands to remain. This area drains from east to west, as it does in existing conditions, to existing areas of wetlands to remain. A 12.8 minute time of concentration was calculated based on surface cover types and slopes.

Subcatchment PD-3a consists of 0.23 acres of entirely area consisting of pavement and landscaping. This area drains to proposed above ground infiltration basins prior to discharging. A 6-minute time of concentration was assumed based on surface cover types and slopes.

Subcatchment PD-3b consists of 0.46 acres of entirely area consisting of pavement, landscaping and roofing. This area drains to a proposed above ground infiltration basin prior to discharging. A 6-minute time of concentration was assumed based on surface cover types and slopes.

Subcatchment PD-3c consists of 0.33 acres of entirely area consisting of landscaping and woodlands to remain. This area drains from west to east, as it does in existing conditions, to existing areas of wetlands to remain. A 12.4-minute time of concentration was calculated based on surface cover types and slopes.

Refer to **Table 3.1** for the calculated proposed conditions peak rates of runoff. For additional hydrologic information, refer to **Appendix D** and the Drainage Area Maps in the appendices of this report for a graphical representation of the proposed drainage areas.

Table 3.1: Proposed Conditions Peak Runoff Rates*

Point of Analysis	1-Year Storm	2-Year Storm	10-Year Storm	25-Year Storm	100-Year Storm
DP1	0	0	0.22	0.30	1.00
DP2	0.34	0.42	2.39	3.54	6.00
DP3	0.03	0.07	0.74	2.22	4.13

**Flows are represented in cubic feet per second (cfs)*

IV. METHODOLOGY

Peak Flow Calculations

Methodology utilized to design the proposed stormwater management system includes compliance with the guidelines set forth in the 2004 Connecticut Stormwater Quality Manual. The pre- and post-development runoff rates being discharged from the site were computed using the HydroCAD

computer program. The drainage area and outlet information were entered into the program, which routes storm flows based on NRCS TR-20 and TR-55 methods. The other components of the model were determined following standard NRCS procedures for Curve Numbers (CNs) and times of concentrations documented in the appendices of this report. The rainfall data utilized and listed below in **Table 4.1** below for stormwater calculations was obtained from NOAA. Refer to **Appendix E** for more information.

Table 4.1: NOAA Rainfall Intensities

Frequency	1 year	2 year	10 year	25 year	100 year
Rainfall* (inches)	2.55	3.18	5.07	6.26	8.08

*Values derived from NOAA ATLAS on 10/24/2019

The proposed stormwater management as designed will provide a decrease in peak rates of runoff from the proposed facility for the 1-, 2-, 10-, 25- and 100-year design storm events. Additionally, the proposed project meets, or exceeds, the CTDEEP standards. Compliance with these standards is described further below.

V. SUMMARY

In summary, the proposed stormwater management system illustrated on the drawings prepared by Bohler Engineering results in a reduction in peak rates of runoff from the subject site when compared to pre-development conditions for the1-, 2-, 10-, 25- and 100-year storm frequencies. In addition, the proposed best management practices will result in an effective removal of total suspended solids from the post-development runoff. The pre-development versus post-development stormwater discharge comparisons are contained in **Table 5.1**:

Table 5.1: Design Point Peak Runoff Rate Summary

Point of Analysis	1-Year Storm			2-Year Storm			10-Year Storm			25-Year Storm			100-Year Storm		
	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ
DP1	0.03	0.00	**-0.03**	0.07	0.00	**-0.07**	0.36	0.22	**-0.14**	0.59	0.30	**-0.29**	1.00	1.00	**0**
DP2	0.40	0.34	**-0.06**	0.62	0.42	**-0.20**	2.40	2.39	**-0.01**	3.76	3.54	**-0.22**	6.05	6.00	**-0.05**
DP3	0.03	0.03	**0**	0.18	0.07	**-0.11**	1.34	1.04	**-0.30**	2.41	2.38	**-0.03**	4.29	4.02	**-0.27**

**Flows are represented in cubic feet per second (cfs)*

As outlined in the table above, the proposed stormwater management system as designed will provide a decrease in peak rates of runoff from the proposed facility for the 1-, 2-, 10-, 25- and 100-year storm events. Additionally, the project meets, or exceeds the CTDEEP Stormwater Management Standards as described further herein.

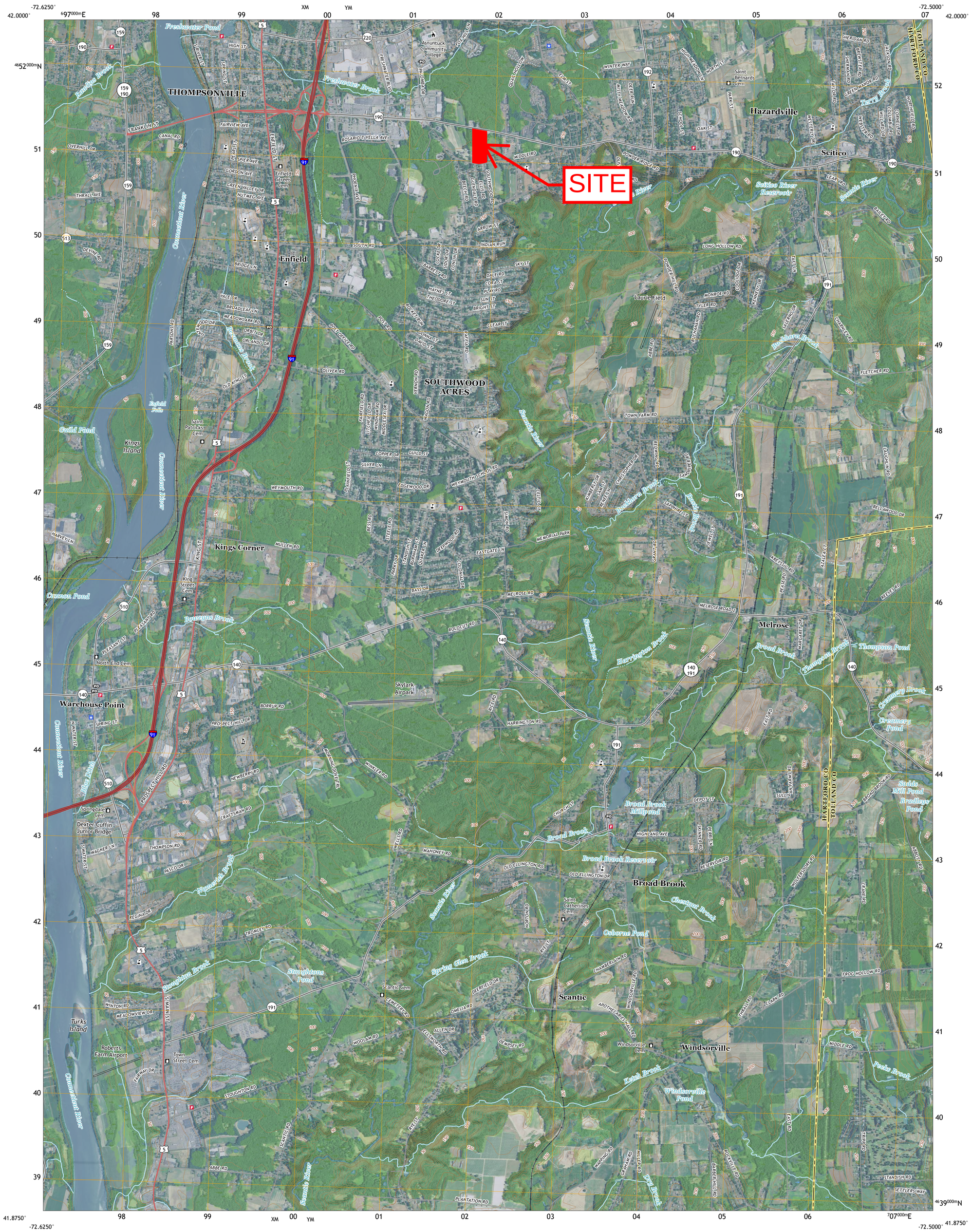
APPENDIX A: PROJECT LOCATION MAPS

- *USGS MAP*
- *FEMA FIRMETTE*

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map
US Topo

BROAD BROOK QUADRANGLE
CONNECTICUT
7.5-MINUTE SERIES



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 18T

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery....NAIP, July 2016 - September 2016
Roads.... U.S. Census Bureau, 2016
Names....GNIS, 1979 - 2017
Hydrography....National Hydrography Dataset, 2004
Contours....National Elevation Dataset, 2012
Boundaries....Multiple sources; see metadata file 2016 - 2017

Wetlands....FWS National Wetlands Inventory 2010

MN
GN
13°55′
247 MILS
1°38′
29 MILS
UTM GRID AND 2017 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000 - m Square ID
'00
XM
YM
Grid Zone Designation
18T

SCALE 1:24 000

KILOMETERS 1 0.5 0 1 2
METERS 1000 500 0 1000 2000
MILES 1 0.5 0 1
FEET 1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the
National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.18

CONNECTICUT
QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

ADJOINING QUADRANGLES
1 West Springfield
2 Springfield South
3 Hampden
4 Windsor Locks
5 Ellington
6 Hartford North
7 Manchester
8 Rockville

ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

BROAD BROOK, CT
2018

7643016360098
NSN. 7643016360098
NGA REF NO. USGSX24K5534

National Flood Hazard Layer FIRMette

FEMA

0 250 500 1,000 1,500 2,000 Feet 1:6,000

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

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

N

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

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/7/2019 at 10:53:09 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

APPENDIX B: SOIL AND WETLAND INFORMATION

- *NCRS CUSTOM SOIL RESOURCE REPORT*

United States Department of Agriculture

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for State of Connecticut

October 24, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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36A—Windsor loamy sand, 0 to 3 percent slopes.....11
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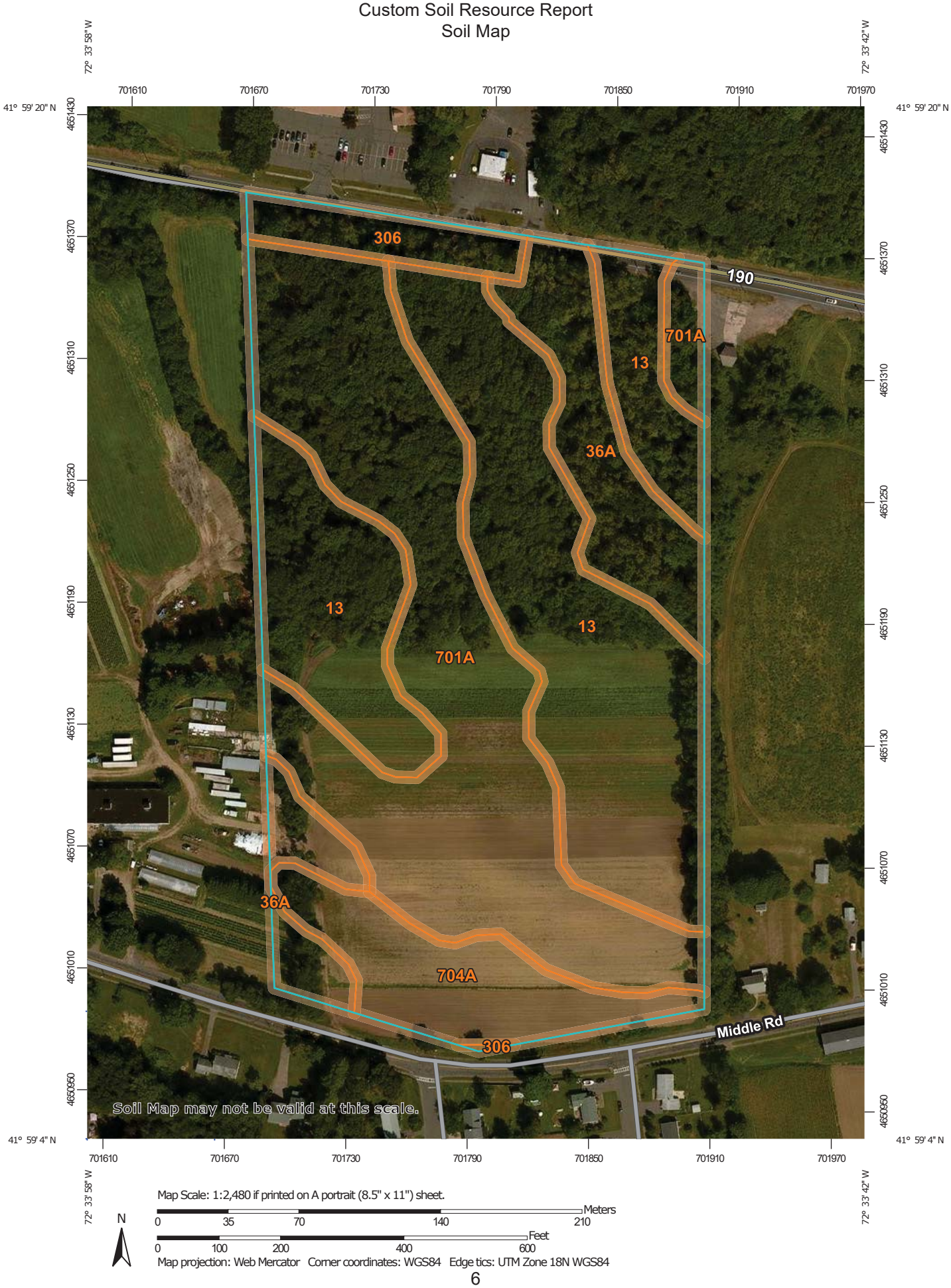
704A—Enfield silt loam, 0 to 3 percent slopes.....15

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

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

Special Point Features

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

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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

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

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

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

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

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

Soil Survey Area: State of Connecticut
Survey Area Data: Version 19, Sep 13, 2019

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

Date(s) aerial images were photographed: Aug 25, 2013—Sep 9, 2013

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
13	Walpole sandy loam, 0 to 3 percent slopes	8.4	39.5%
36A	Windsor loamy sand, 0 to 3 percent slopes	2.6	12.2%
306	Udorthents-Urban land complex	0.8	3.7%
701A	Ninigret fine sandy loam, 0 to 3 percent slopes	7.6	35.8%
704A	Enfield silt loam, 0 to 3 percent slopes	1.9	8.8%
Totals for Area of Interest		**21.3**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

State of Connecticut

13—Walpole sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2svkl
Elevation: 0 to 1,020 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Walpole and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Walpole

Setting

Landform: Outwash plains, depressions, deltas, outwash terraces, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy glaciofluvial deposits derived from igneous, metamorphic and sedimentary rock

Typical profile

Oe - 0 to 1 inches: mucky peat
A - 1 to 7 inches: sandy loam
Bg - 7 to 21 inches: sandy loam
BC - 21 to 25 inches: gravelly sandy loam
C - 25 to 65 inches: very gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 4 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Minor Components

Sudbury

Percent of map unit: 10 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Scarboro

Percent of map unit: 10 percent
Landform: Outwash terraces, outwash plains, deltas
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

36A—Windsor loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2svkg
Elevation: 0 to 990 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Windsor, loamy sand, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor, Loamy Sand

Setting

Landform: Deltas, outwash terraces, dunes, outwash plains
Landform position (three-dimensional): Riser, tread
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

Typical profile

O - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: loamy sand
Bw - 3 to 25 inches: loamy sand

C - 25 to 65 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Deerfield, loamy sand

Percent of map unit: 10 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Hinckley, loamy sand

Percent of map unit: 5 percent
Landform: Kames, outwash plains, deltas, eskers
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

306—Udorthents-Urban land complex

Map Unit Setting

National map unit symbol: 9lmg
Elevation: 0 to 2,000 feet
Mean annual precipitation: 43 to 56 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 120 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 50 percent
Urban land: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Drift

Typical profile

A - 0 to 5 inches: loam
C1 - 5 to 21 inches: gravelly loam
C2 - 21 to 80 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 1.98 in/hr)
Depth to water table: About 54 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Urban Land

Typical profile

H - 0 to 6 inches: material

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: Unranked

Minor Components

Unnamed, undisturbed soils

Percent of map unit: 8 percent
Hydric soil rating: No

Udorthents, wet substratum

Percent of map unit: 5 percent
Down-slope shape: Convex
Across-slope shape: Linear

Hydric soil rating: No

Rock outcrop

Percent of map unit: 2 percent
Hydric soil rating: No

701A—Ninigret fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2y07d
Elevation: 0 to 1,260 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Ninigret and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ninigret

Setting

Landform: Outwash plains, kame terraces, outwash terraces, kames, moraines
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Convex, linear
Across-slope shape: Convex, concave
Parent material: Coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from gneiss, granite, schist, and/or phyllite

Typical profile

Ap - 0 to 8 inches: fine sandy loam
Bw1 - 8 to 16 inches: fine sandy loam
Bw2 - 16 to 26 inches: fine sandy loam
2C - 26 to 65 inches: stratified loamy sand to loamy fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 18 to 38 inches to strongly contrasting textural stratification
Natural drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 17 to 39 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Merrimac

Percent of map unit: 5 percent
Landform: Eskers, outwash terraces, kames, moraines, outwash plains
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Side slope, crest, tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Agawam

Percent of map unit: 5 percent
Landform: Moraines, outwash plains, kame terraces, outwash terraces, kames
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Side slope, crest, tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Tisbury

Percent of map unit: 3 percent
Landform: Outwash terraces, outwash plains, deltas, valley trains
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

Raypol

Percent of map unit: 2 percent
Landform: Drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

704A—Enfield silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2y07p
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Enfield and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Enfield

Setting

Landform: Outwash terraces, outwash plains
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-silty eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite, schist, and/or gneiss

Typical profile

Ap - 0 to 7 inches: silt loam
Bw1 - 7 to 15 inches: silt loam
Bw2 - 15 to 25 inches: silt loam
2C - 25 to 60 inches: stratified very gravelly coarse sand to loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 16 to 39 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Haven

Percent of map unit: 5 percent
Landform: Outwash terraces, outwash plains
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Tisbury

Percent of map unit: 5 percent
Landform: Outwash terraces, outwash plains, deltas, valley trains
Landform position (three-dimensional): Tread
Down-slope shape: Concave

Across-slope shape: Concave
Hydric soil rating: No

Agawam

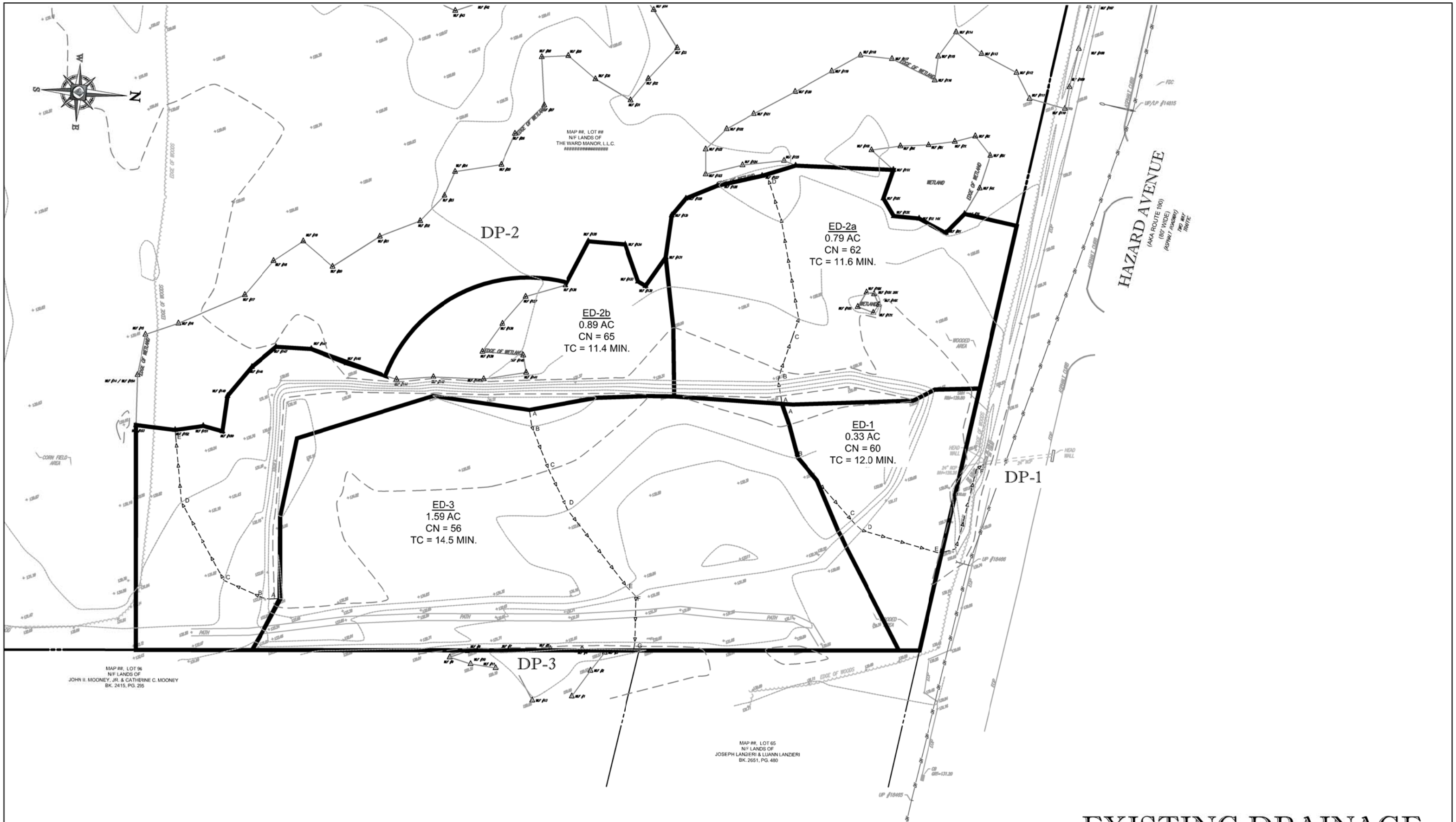
Percent of map unit: 3 percent
Landform: Kame terraces, outwash terraces, kames, moraines, outwash plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Side slope, crest, tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Raypol

Percent of map unit: 2 percent
Landform: Drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

APPENDIX C: EXISTING CONDITIONS HYDROLOGIC ANALYSIS

- *EXISTING CONDITIONS DRAINAGE MAP*
- *EXISTING CONDITIONS HYDROCAD COMPUTATIONS*

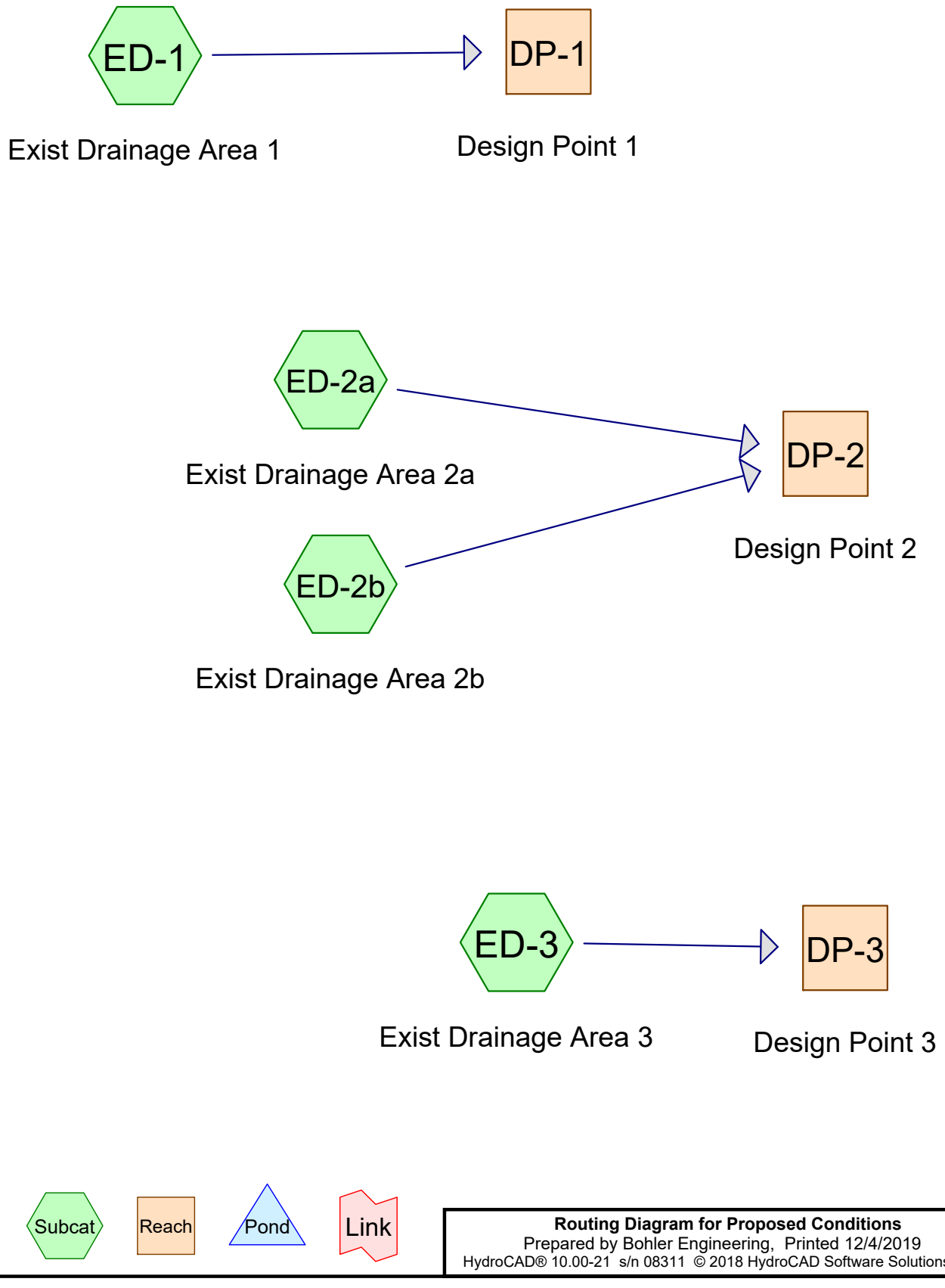


EXISTING DRAINAGE TRIBUTARY MAP

PREPARED BY

BOHLER

NOT TO SCALE



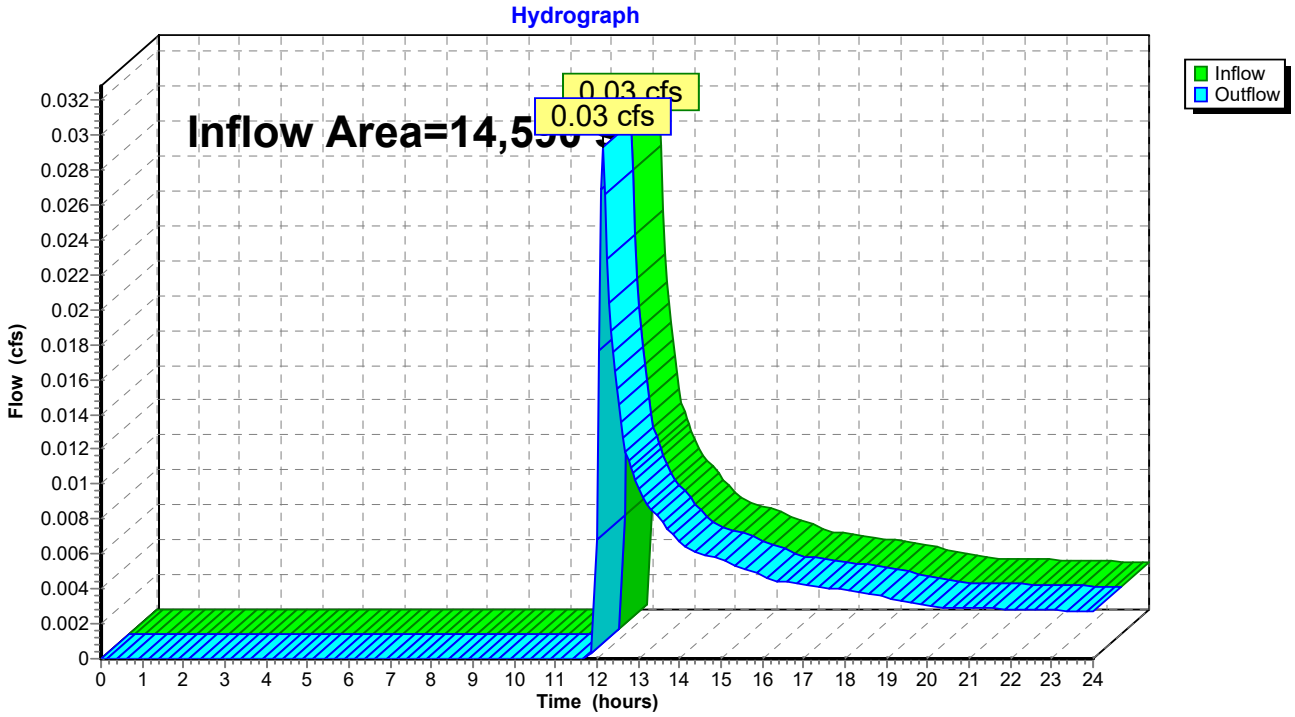
Routing Diagram for Proposed Conditions
Prepared by Bohler Engineering, Printed 12/4/2019
HydroCAD® 10.00-21 s/n 08311 © 2018 HydroCAD Software Solutions LLC

Summary for Reach DP-1: Design Point 1

Inflow Area = 14,590 sf, 0.00% Impervious, Inflow Depth > 0.19" for 1-YR event
Inflow = 0.03 cfs @ 12.15 hrs, Volume= 226 cf
Outflow = 0.03 cfs @ 12.15 hrs, Volume= 226 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: Design Point 1

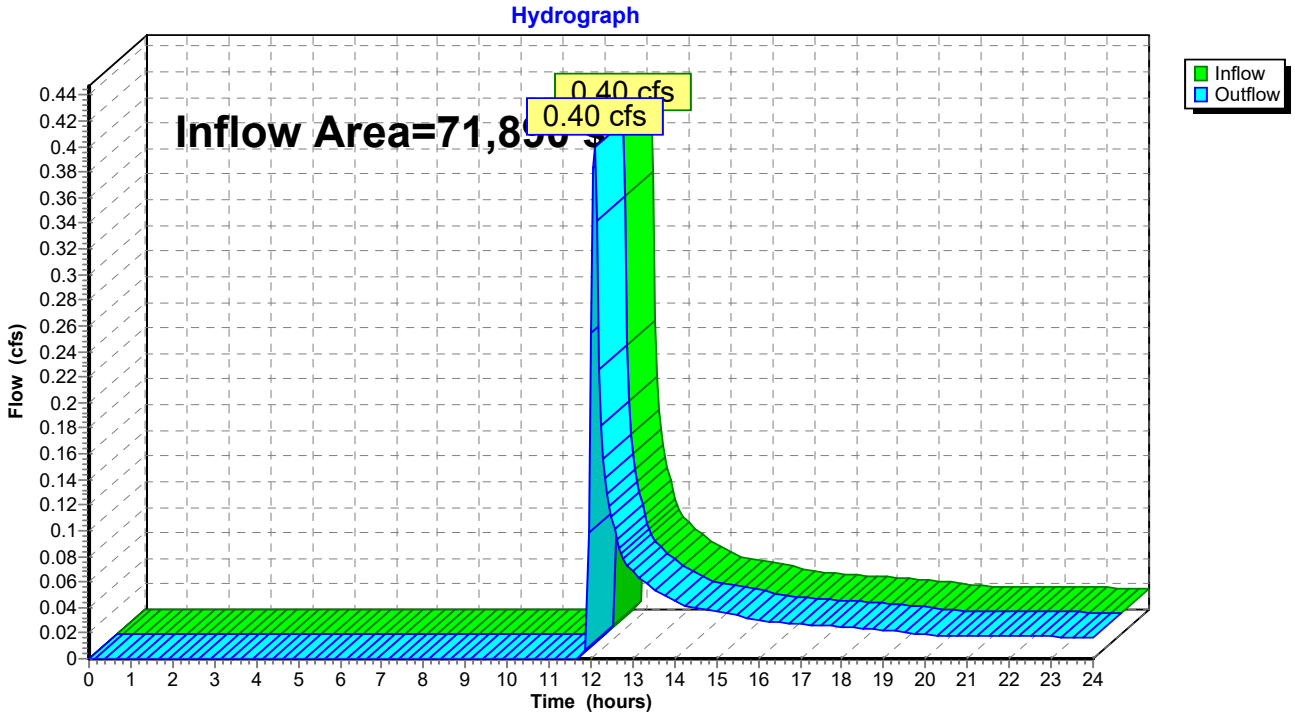


Summary for Reach DP-2: Design Point 2

Inflow Area = 71,890 sf, 0.00% Impervious, Inflow Depth > 0.28" for 1-YR event
Inflow = 0.40 cfs @ 12.07 hrs, Volume= 1,662 cf
Outflow = 0.40 cfs @ 12.07 hrs, Volume= 1,662 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-2: Design Point 2

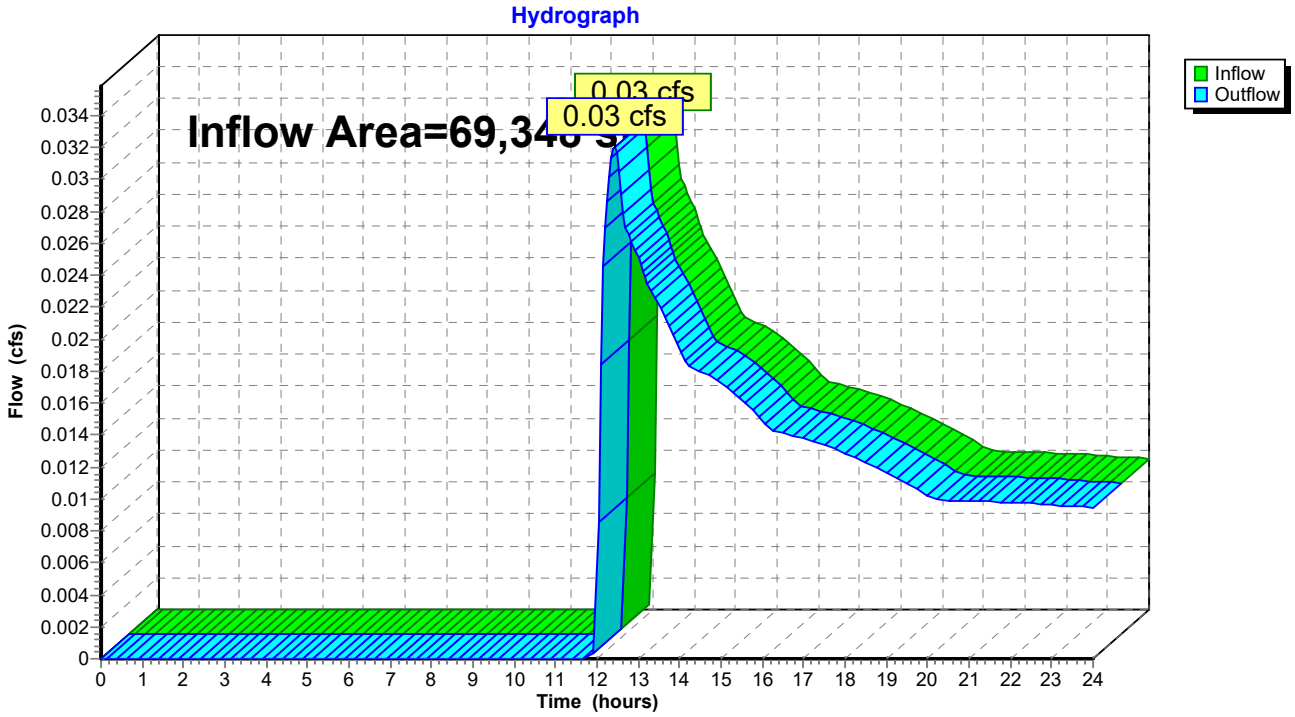


Summary for Reach DP-3: Design Point 3

Inflow Area = 69,348 sf, 0.00% Impervious, Inflow Depth > 0.11" for 1-YR event
Inflow = 0.03 cfs @ 12.43 hrs, Volume= 621 cf
Outflow = 0.03 cfs @ 12.43 hrs, Volume= 621 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-3: Design Point 3

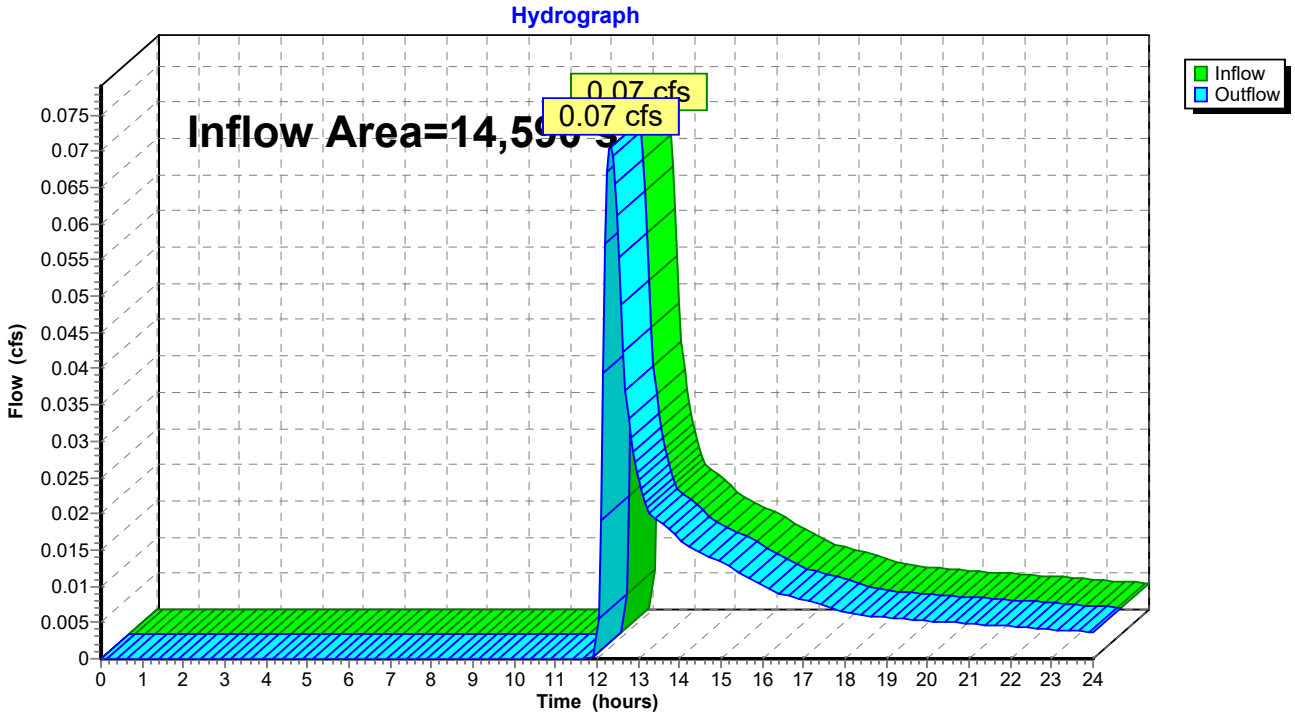


Summary for Reach DP-1: Design Point 1

Inflow Area = 14,590 sf, 0.00% Impervious, Inflow Depth > 0.40" for 2-YR event
Inflow = 0.07 cfs @ 12.32 hrs, Volume= 484 cf
Outflow = 0.07 cfs @ 12.32 hrs, Volume= 484 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: Design Point 1

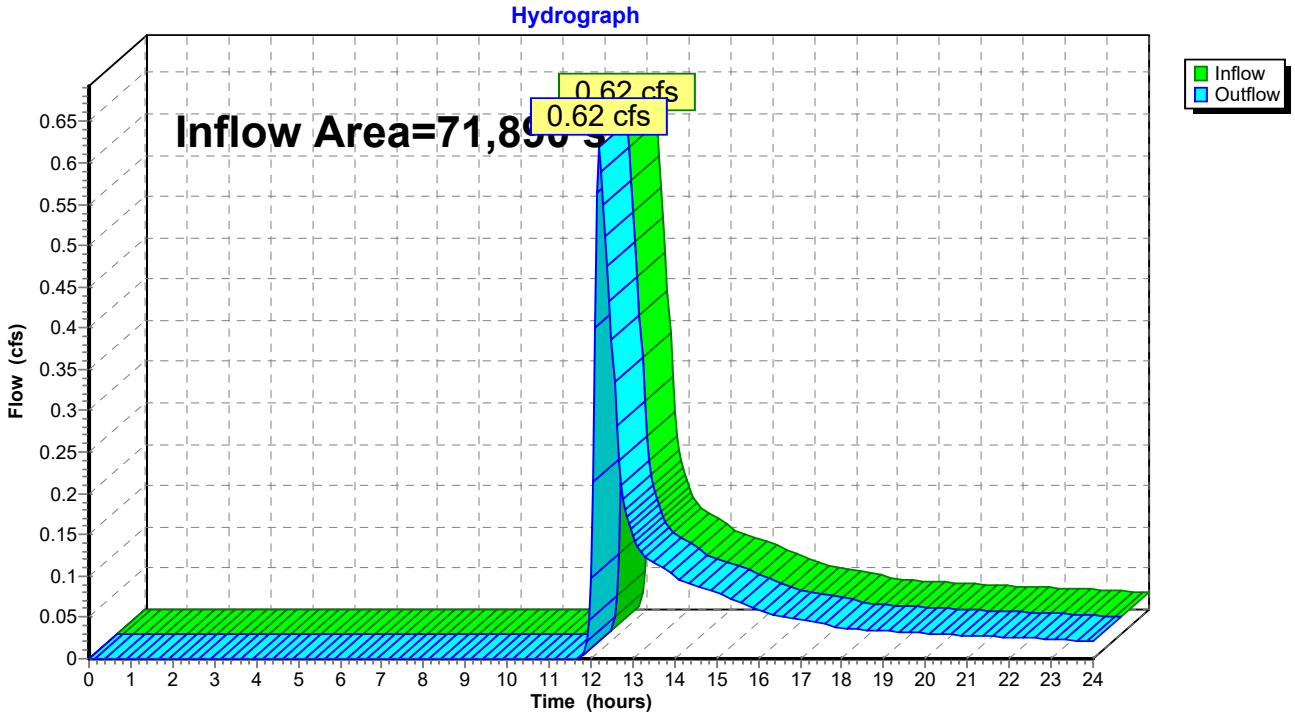


Summary for Reach DP-2: Design Point 2

Inflow Area = 71,890 sf, 0.00% Impervious, Inflow Depth > 0.53" for 2-YR event
Inflow = 0.62 cfs @ 12.21 hrs, Volume= 3,201 cf
Outflow = 0.62 cfs @ 12.21 hrs, Volume= 3,201 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-2: Design Point 2

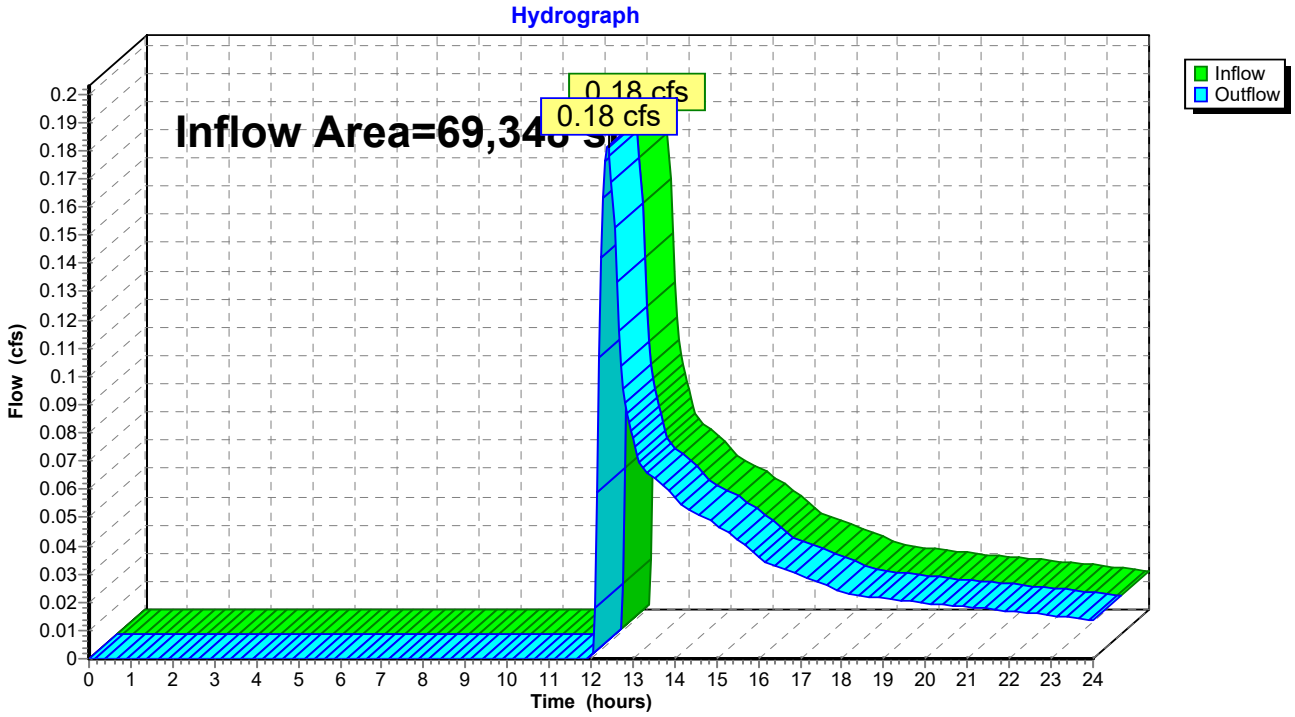


Summary for Reach DP-3: Design Point 3

Inflow Area = 69,348 sf, 0.00% Impervious, Inflow Depth > 0.27" for 2-YR event
Inflow = 0.18 cfs @ 12.41 hrs, Volume= 1,572 cf
Outflow = 0.18 cfs @ 12.41 hrs, Volume= 1,572 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-3: Design Point 3

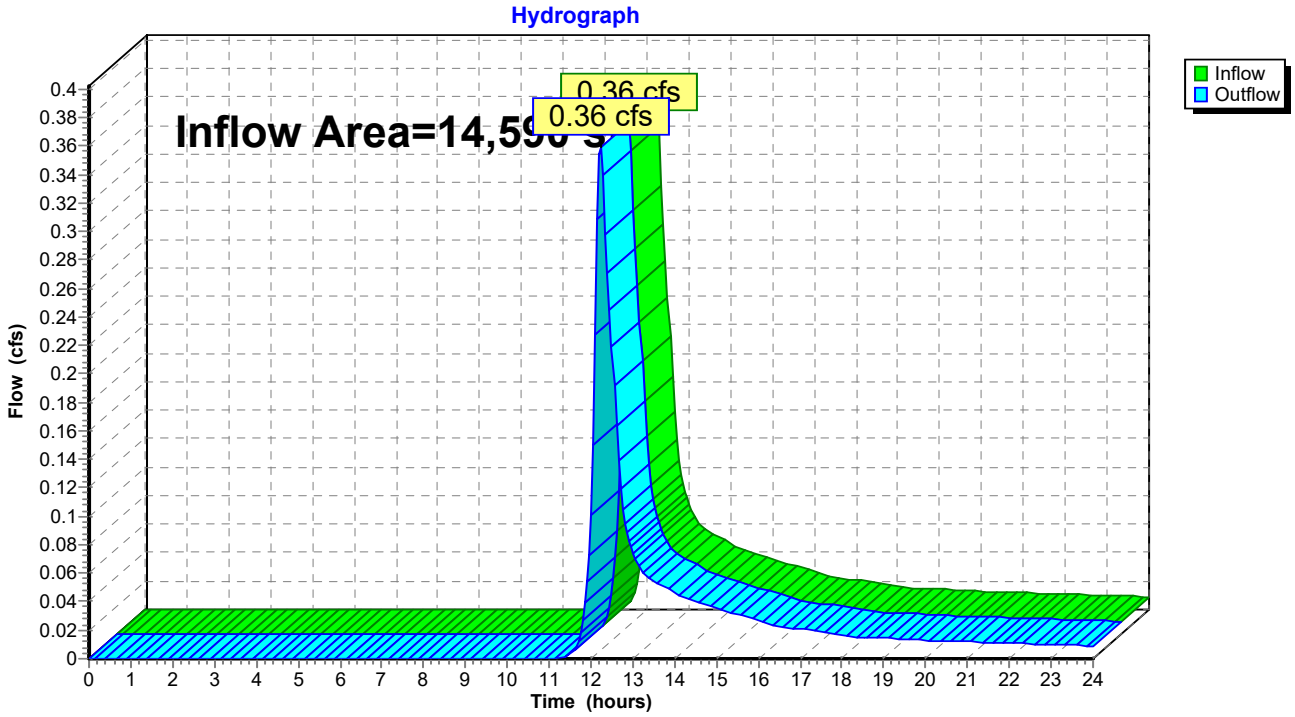


Summary for Reach DP-1: Design Point 1

Inflow Area = 14,590 sf, 0.00% Impervious, Inflow Depth > 1.34" for 10-YR event
Inflow = 0.36 cfs @ 12.22 hrs, Volume= 1,626 cf
Outflow = 0.36 cfs @ 12.22 hrs, Volume= 1,626 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: Design Point 1

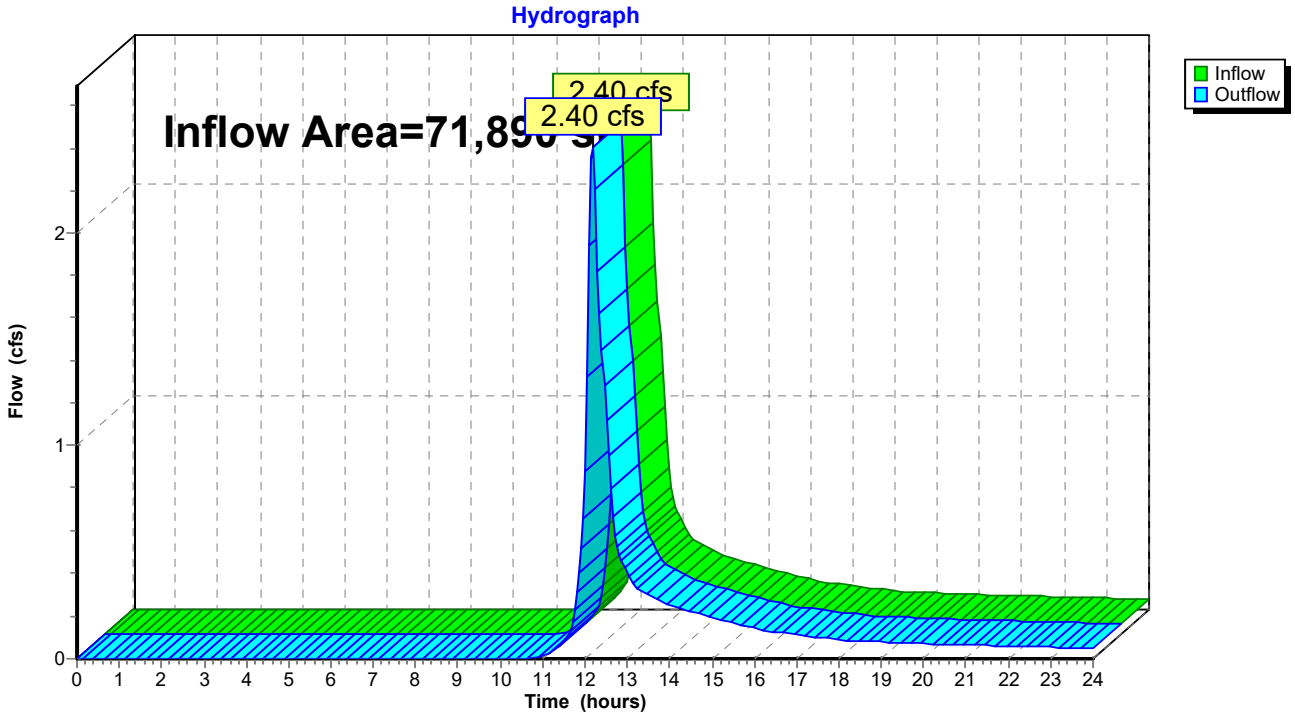


Summary for Reach DP-2: Design Point 2

Inflow Area = 71,890 sf, 0.00% Impervious, Inflow Depth > 1.60" for 10-YR event
Inflow = 2.40 cfs @ 12.17 hrs, Volume= 9,557 cf
Outflow = 2.40 cfs @ 12.17 hrs, Volume= 9,557 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-2: Design Point 2

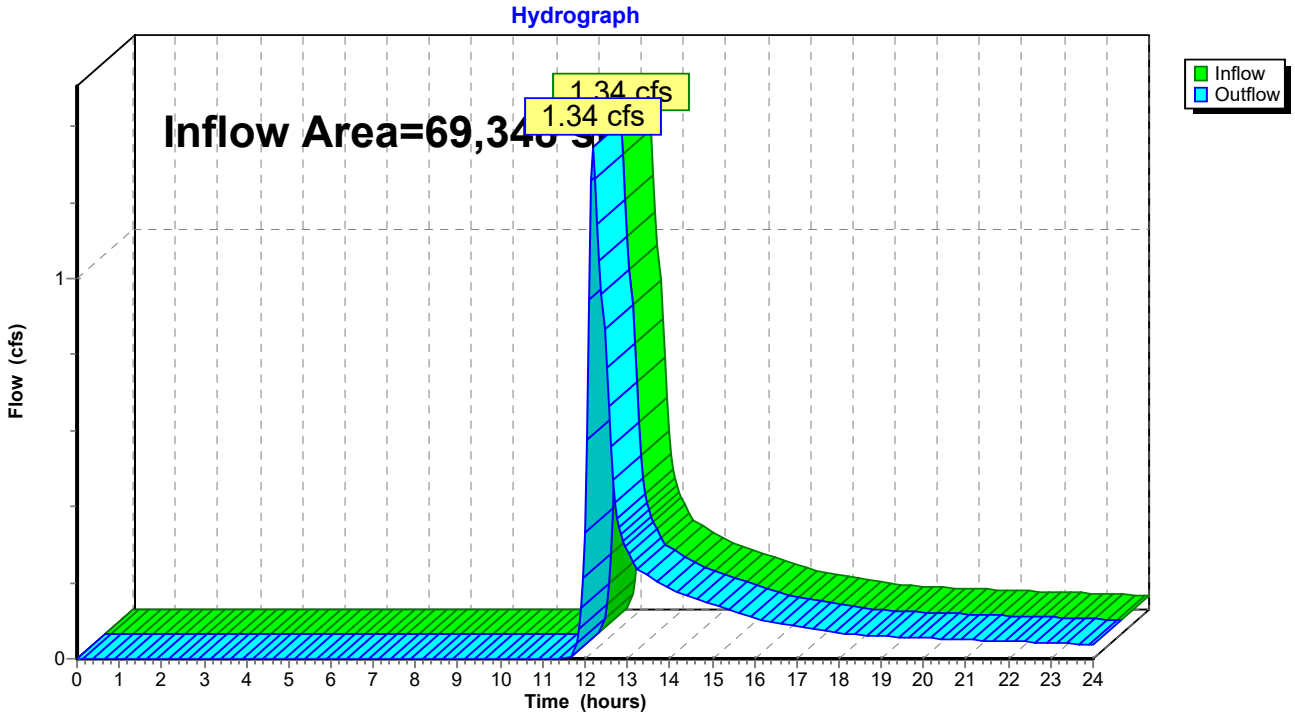


Summary for Reach DP-3: Design Point 3

Inflow Area = 69,348 sf, 0.00% Impervious, Inflow Depth > 1.07" for 10-YR event
Inflow = 1.34 cfs @ 12.20 hrs, Volume= 6,208 cf
Outflow = 1.34 cfs @ 12.20 hrs, Volume= 6,208 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-3: Design Point 3

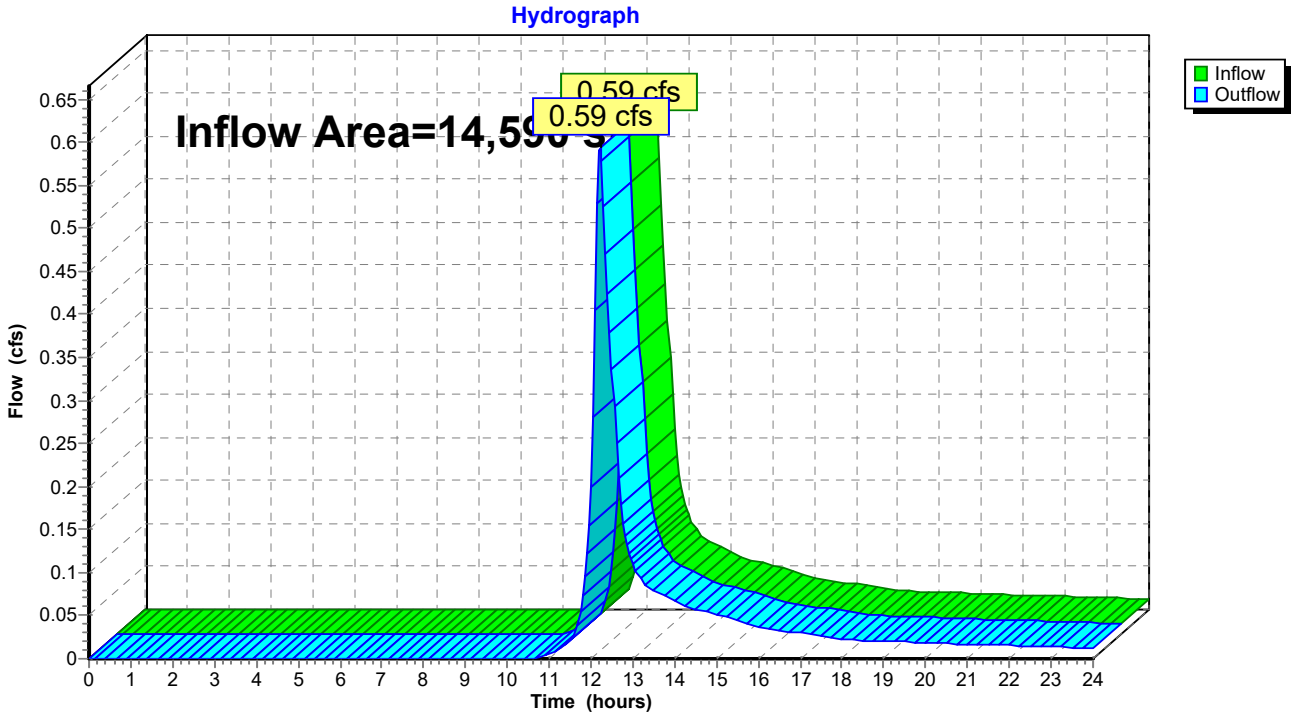


Summary for Reach DP-1: Design Point 1

Inflow Area = 14,590 sf, 0.00% Impervious, Inflow Depth > 2.09" for 25-YR event
Inflow = 0.59 cfs @ 12.22 hrs, Volume= 2,537 cf
Outflow = 0.59 cfs @ 12.22 hrs, Volume= 2,537 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: Design Point 1

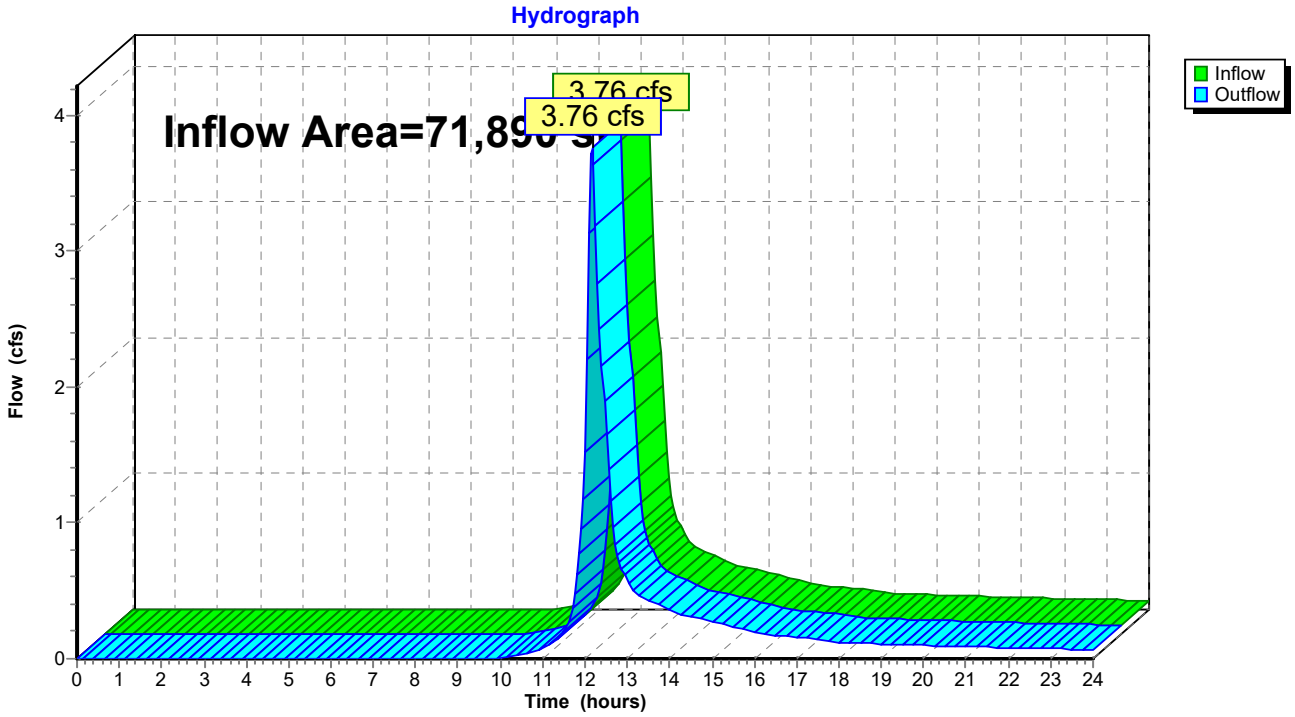


Summary for Reach DP-2: Design Point 2

Inflow Area = 71,890 sf, 0.00% Impervious, Inflow Depth > 2.41" for 25-YR event
Inflow = 3.76 cfs @ 12.17 hrs, Volume= 14,443 cf
Outflow = 3.76 cfs @ 12.17 hrs, Volume= 14,443 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-2: Design Point 2

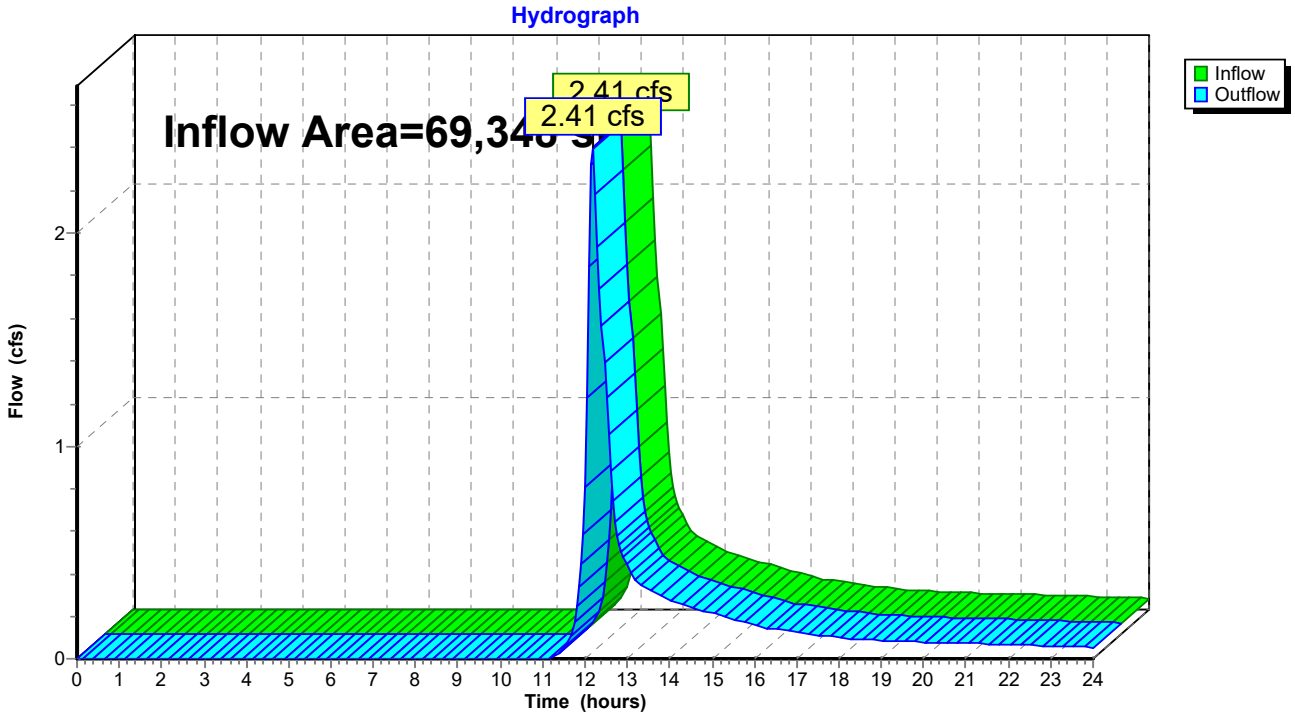


Summary for Reach DP-3: Design Point 3

Inflow Area = 69,348 sf, 0.00% Impervious, Inflow Depth > 1.75" for 25-YR event
Inflow = 2.41 cfs @ 12.19 hrs, Volume= 10,096 cf
Outflow = 2.41 cfs @ 12.19 hrs, Volume= 10,096 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-3: Design Point 3

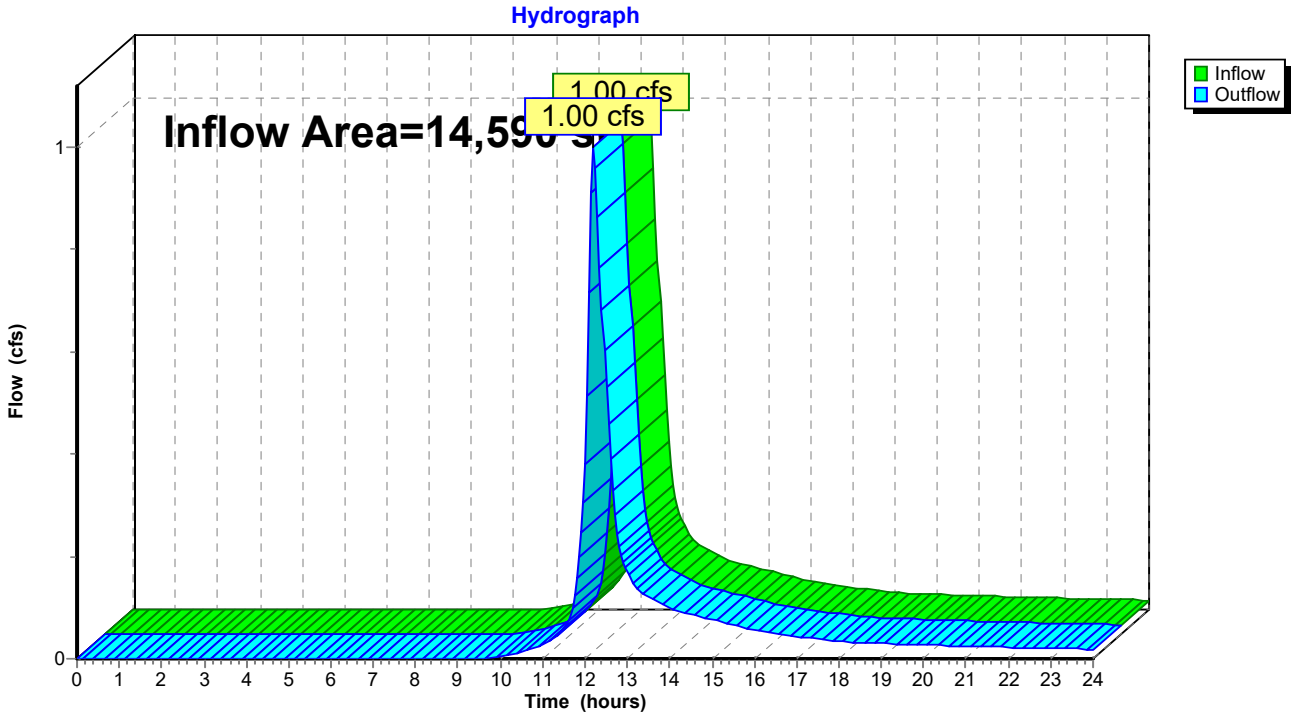


Summary for Reach DP-1: Design Point 1

Inflow Area = 14,590 sf, 0.00% Impervious, Inflow Depth > 3.38" for 100-YR event
Inflow = 1.00 cfs @ 12.21 hrs, Volume= 4,113 cf
Outflow = 1.00 cfs @ 12.21 hrs, Volume= 4,113 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: Design Point 1

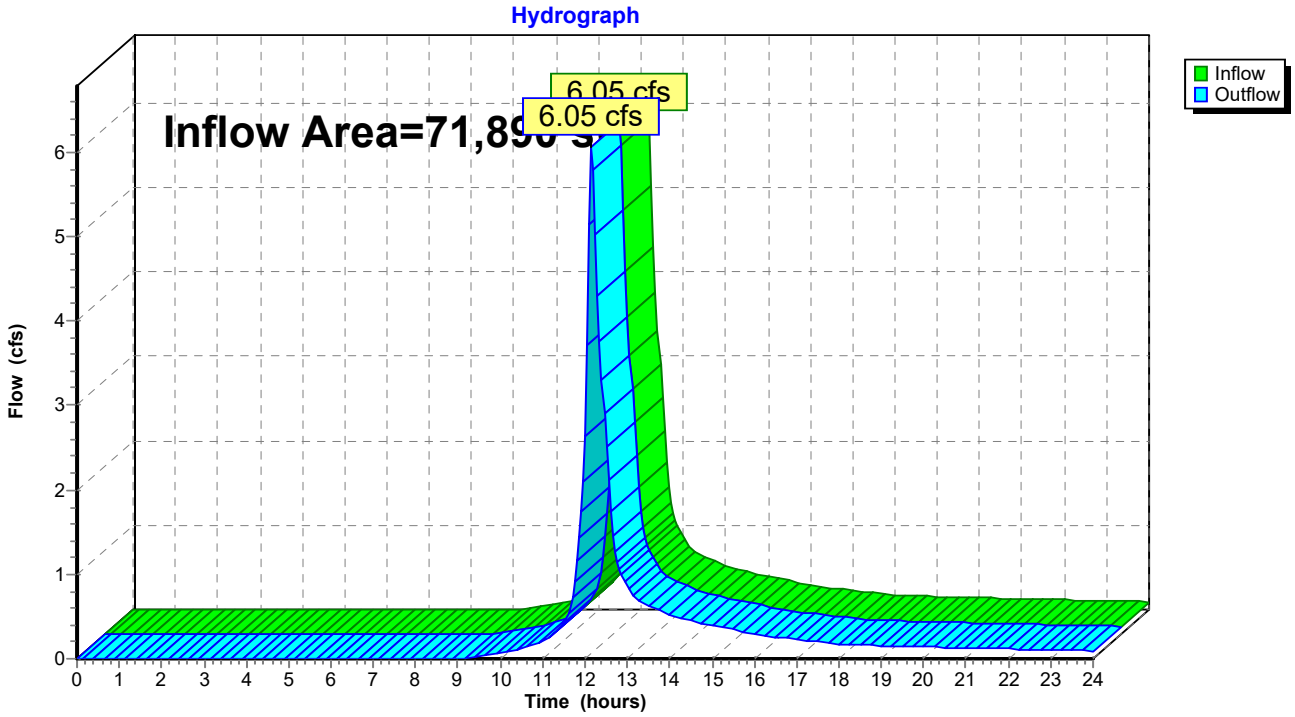


Summary for Reach DP-2: Design Point 2

Inflow Area = 71,890 sf, 0.00% Impervious, Inflow Depth > 3.79" for 100-YR event
Inflow = 6.05 cfs @ 12.16 hrs, Volume= 22,727 cf
Outflow = 6.05 cfs @ 12.16 hrs, Volume= 22,727 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-2: Design Point 2

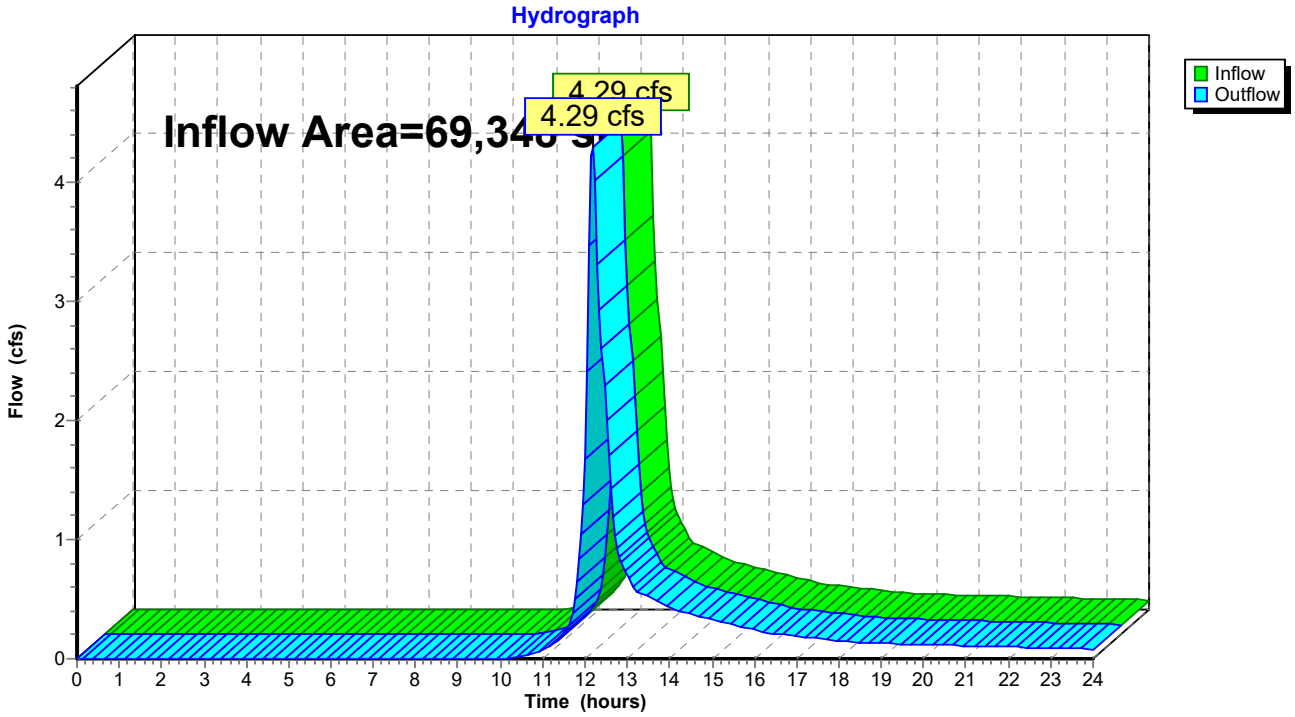


Summary for Reach DP-3: Design Point 3

Inflow Area = 69,348 sf, 0.00% Impervious, Inflow Depth > 2.94" for 100-YR event
Inflow = 4.29 cfs @ 12.18 hrs, Volume= 16,996 cf
Outflow = 4.29 cfs @ 12.18 hrs, Volume= 16,996 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-3: Design Point 3



APPENDIX D: PROPOSED CONDITIONS HYDROLOGIC ANALYSIS

- *PROPOSED CONDITIONS DRAINAGE MAP*
- *PROPOSED CONDITIONS HYDROCAD CALCULATIONS*

N/F LANDS OF
THE WARD MANOR, L.L.C.
##################

PD-2d
0.03 AC
CN = 74
TC = 6 MIN.

PD-2b
0.22 AC
CN = 70
TC = 6 MIN.

DP-2

PD-2c
0.36 AC
CN = 86
TC = 6 MIN.

PD-2a
0.60 AC
CN = 94
TC = 6 MIN.

PROPOSED
2 STORY ASSISTED
LIVING FACILITY
58 UNITS
54,000sf +/-

PD-1
0.67 AC
CN = 86
TC = 6 MIN.

PD-3b
0.46 AC
CN = 93
TC = 6 MIN.

PD-2e
0.36 AC
CN = 95
TC = 6 MIN.

PD-3a
0.23 AC
CN = 66
TC = 6 MIN.

PD-2f
0.34 AC
CN = 70
TC = 12.8 MIN.

DP-1

HAZARD A

DP-3

PD-3c
0.33 AC
CN = 60
TC = 12.4 MIN.

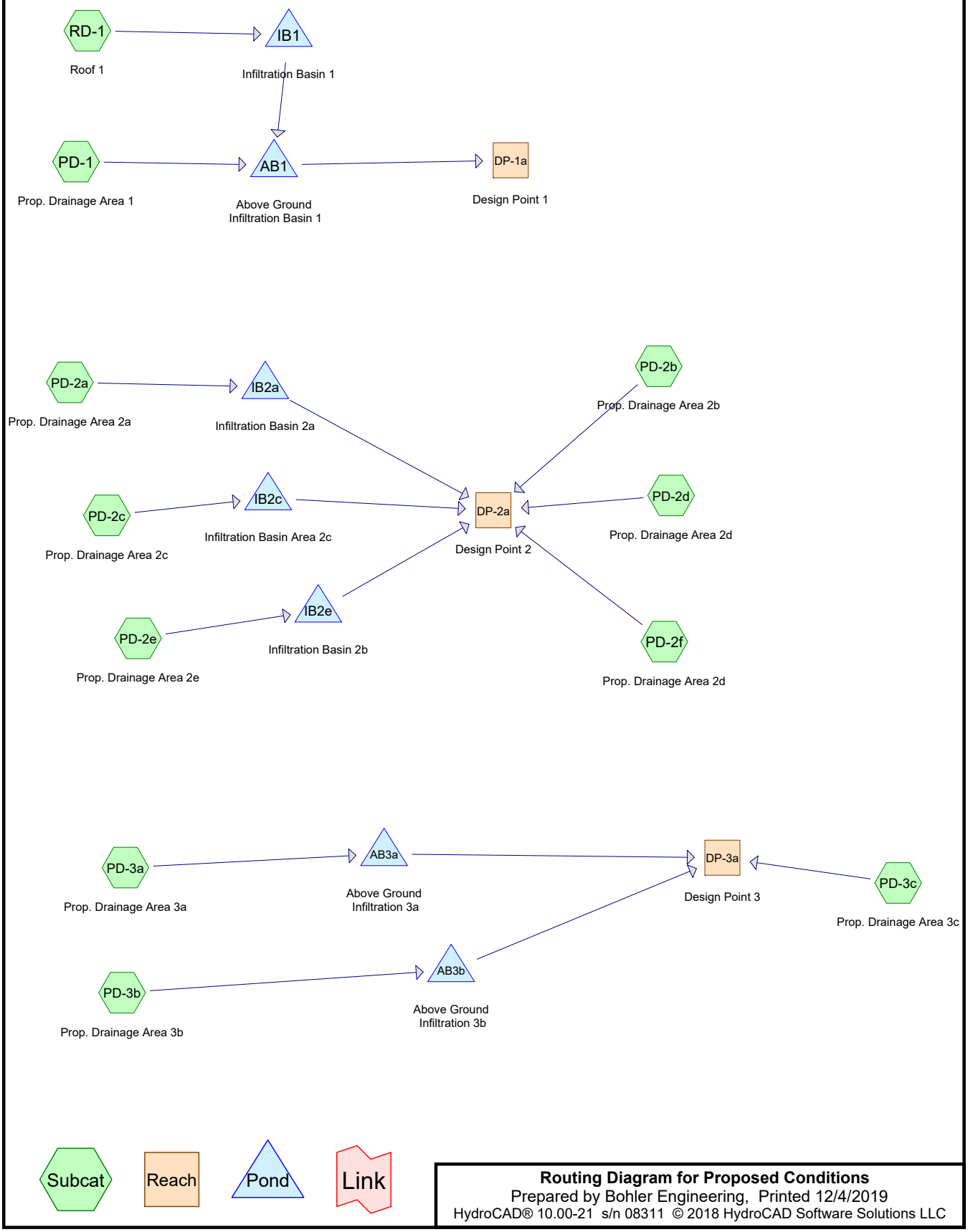
PROPOSED DRAINAGE TRIBUTARY MAP

PREPARED BY

BOHLER

NOT TO SCALE

MAP ##, LOT 65
N/F LANDS OF



Routing Diagram for Proposed Conditions
Prepared by Bohler Engineering, Printed 12/4/2019
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Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
13,721	49	50-75% Grass cover, Fair, HSG A, 36A (PD-1, PD-2a, PD-2c, PD-2e, PD-3a)
14,113	77	50-75% Grass cover, Fair, HSG B/D, 13 (PD-1, PD-2a, PD-2c, PD-3a, PD-3b)
738	77	50-75% Grass cover, Fair, HSG C (PD-3c)
828	79	50-75% Grass cover, Fair, HSG C, 701A (PD-3b)
48,700	98	Paved parking (PD-1, PD-2a, PD-2e, PD-3a, PD-3b)
10,149	98	Paved parking, HSG D (PD-2c)
14,505	98	Roofing (PD-3b)
14,505	98	Unconnected roofs (RD-1)
2,091	43	Woods/grass comb., Fair, HSG A (PD-2f)
6,858	43	Woods/grass comb., Fair, HSG A, 36A (PD-2e, PD-3c)
784	43	Woods/grass comb., Fair, HSG A. 36A (PD-2b)
1,045	65	Woods/grass comb., Fair, HSG B (PD-2b)
21,824	74	Woods/grass comb., Fair, HSG B/D, 13 (PD-2b, PD-2d, PD-2f)
5,545	74	Woods/grass comb., Fair, HSG C (PD-3c)
1,501	76	Woods/grass comb., Fair, HSG C (PD-3c)
156,909	**84**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
23,455	HSG A	PD-1, PD-2a, PD-2b, PD-2c, PD-2e, PD-2f, PD-3a, PD-3c
36,982	HSG B	PD-1, PD-2a, PD-2b, PD-2c, PD-2d, PD-2f, PD-3a, PD-3b
8,612	HSG C	PD-3b, PD-3c
10,149	HSG D	PD-2c
77,711	Other	PD-1, PD-2a, PD-2e, PD-3a, PD-3b, RD-1
156,909		**TOTAL AREA**

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	AB1	127.57	127.50	13.0	0.0054	0.025	8.0	0.0	0.0
2	IB1	130.24	130.00	10.0	0.0240	0.012	12.0	0.0	0.0
3	IB2a	128.60	128.00	55.0	0.0109	0.012	15.0	0.0	0.0
4	IB2c	129.20	129.00	14.0	0.0143	0.012	8.0	0.0	0.0
5	IB2e	130.85	130.50	69.0	0.0051	0.012	15.0	0.0	0.0

Summary for Subcatchment PD-1: Prop. Drainage Area 1

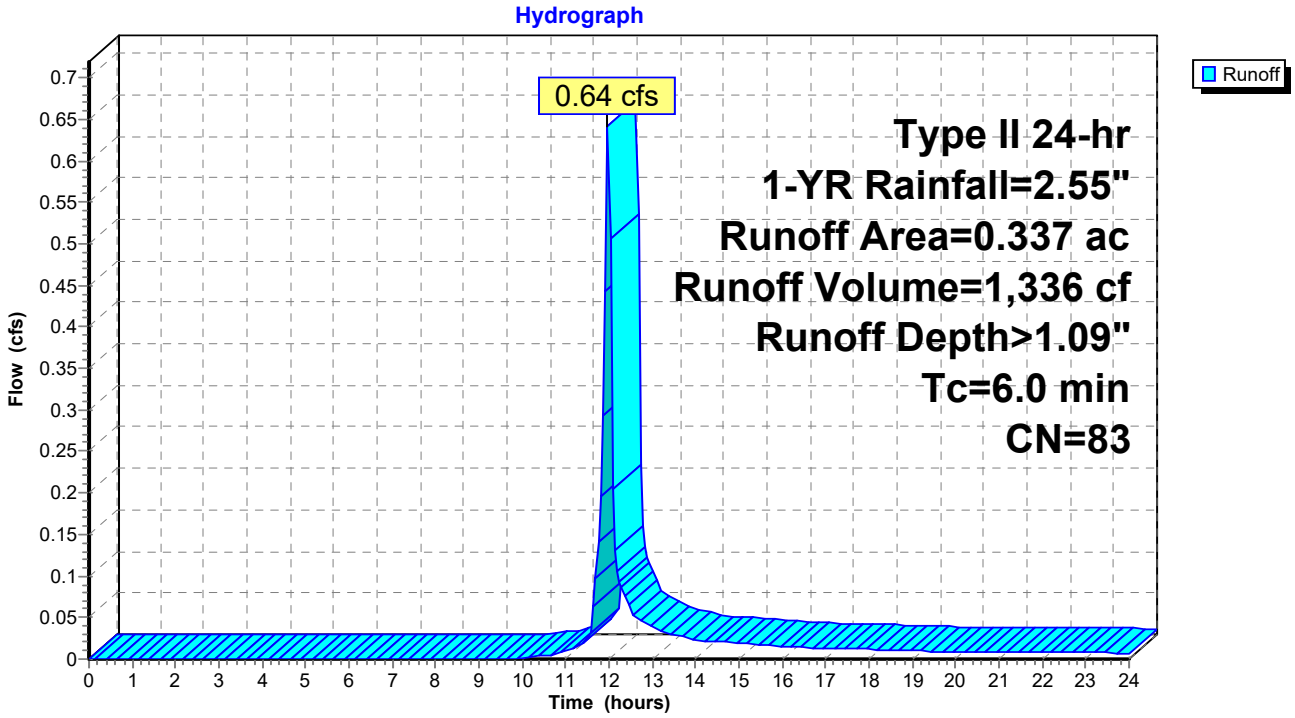
Runoff = 0.64 cfs @ 11.98 hrs, Volume= 1,336 cf, Depth> 1.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.55"

	Area (ac)	CN	Description
*	0.074	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.070	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.193	98	Paved parking
	0.337	83	Weighted Average
	0.144		42.73% Pervious Area
	0.193		57.27% Impervious Area

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

Subcatchment PD-1: Prop. Drainage Area 1



Summary for Subcatchment PD-2a: Prop. Drainage Area 2a

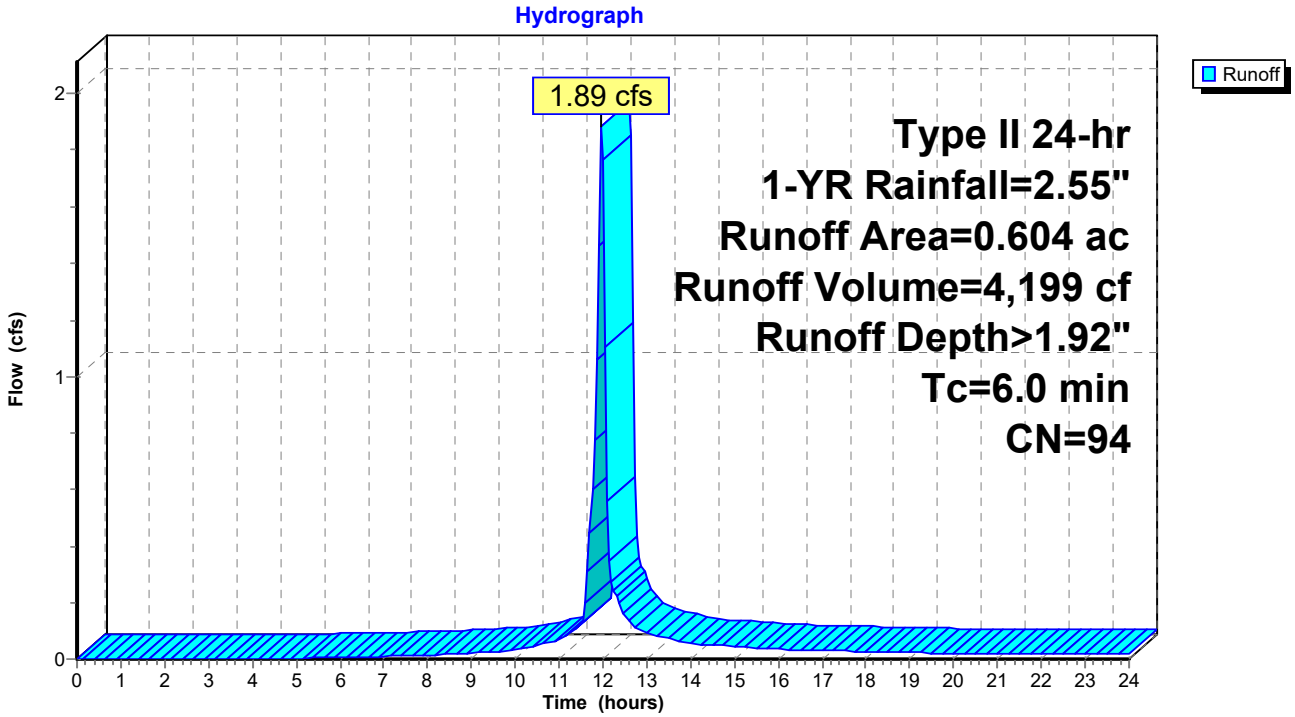
Runoff = 1.89 cfs @ 11.96 hrs, Volume= 4,199 cf, Depth> 1.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.55"

	Area (ac)	CN	Description
*	0.038	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.029	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.537	98	Paved parking
	0.604	94	Weighted Average
	0.067		11.09% Pervious Area
	0.537		88.91% Impervious Area

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

Subcatchment PD-2a: Prop. Drainage Area 2a



Summary for Subcatchment PD-2b: Prop. Drainage Area 2b

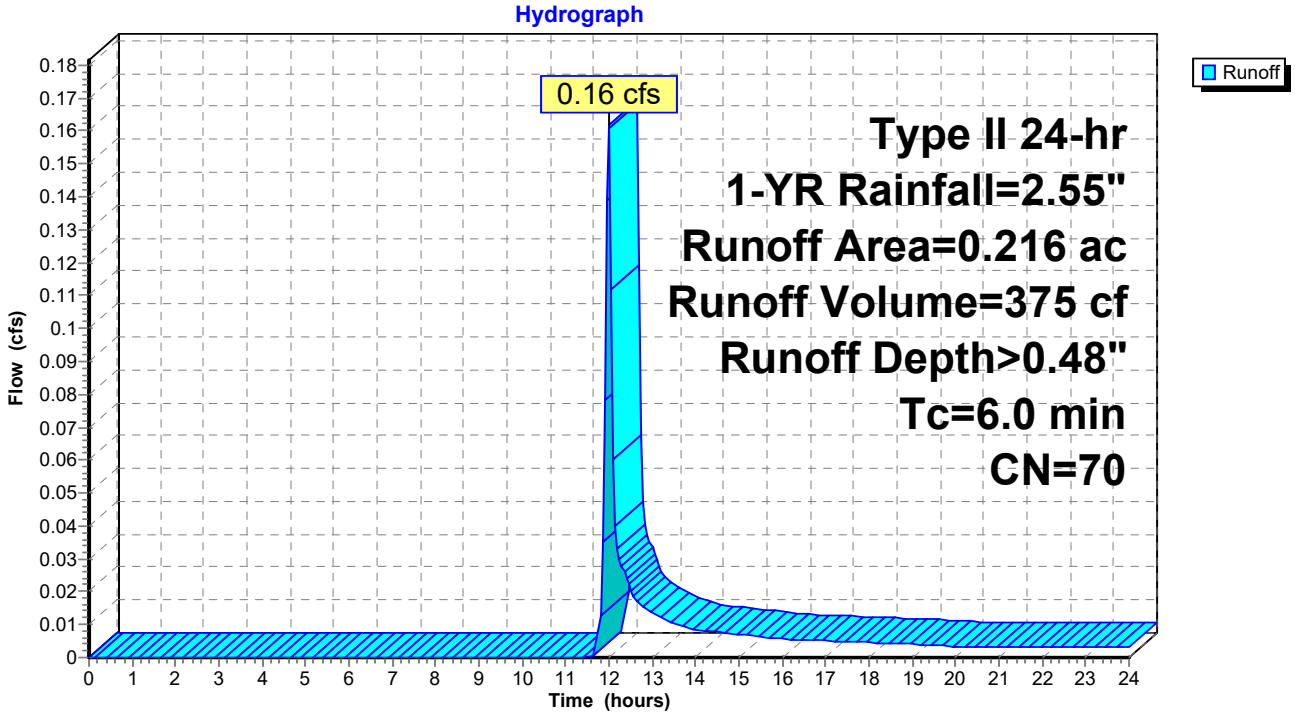
Runoff = 0.16 cfs @ 11.99 hrs, Volume= 375 cf, Depth> 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.55"

	Area (ac)	CN	Description
*	0.174	74	Woods/grass comb., Fair, HSG B/D, 13
*	0.018	43	Woods/grass comb., Fair, HSG A. 36A
	0.024	65	Woods/grass comb., Fair, HSG B
	0.216	70	Weighted Average
	0.216		100.00% Pervious Area

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

Subcatchment PD-2b: Prop. Drainage Area 2b



Summary for Subcatchment PD-2c: Prop. Drainage Area 2c

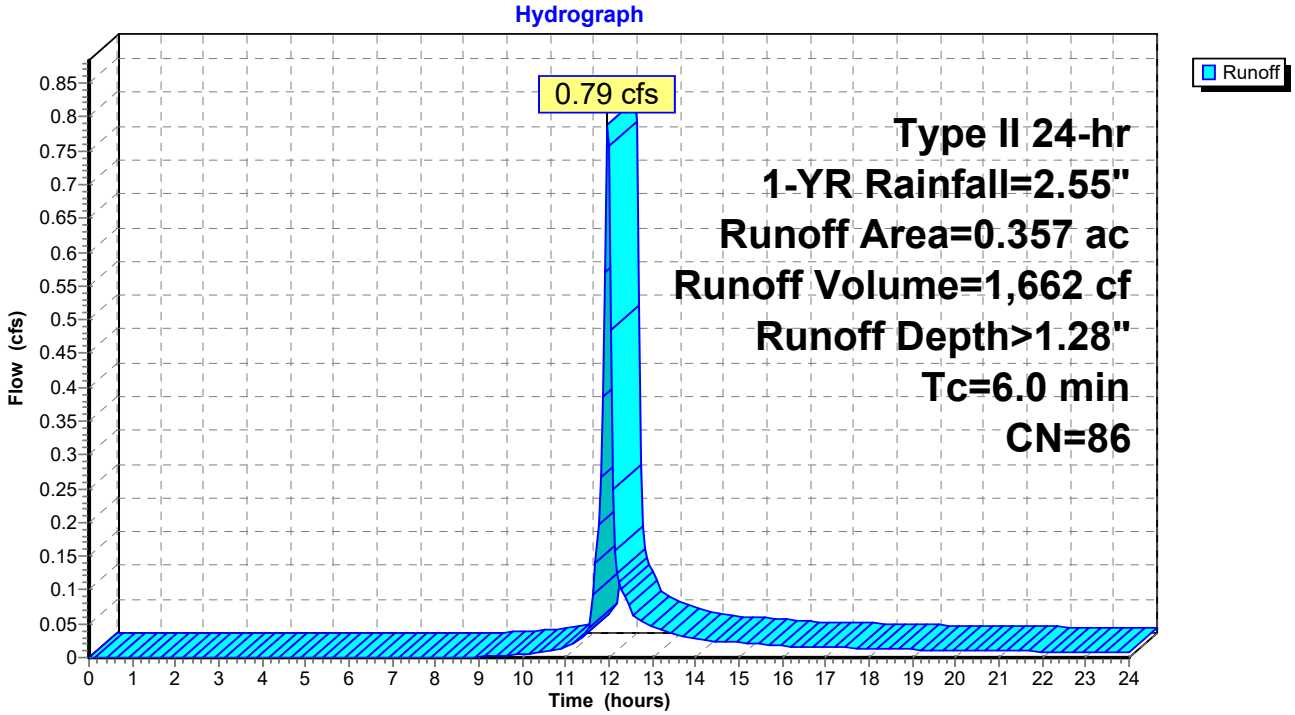
Runoff = 0.79 cfs @ 11.97 hrs, Volume= 1,662 cf, Depth> 1.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.55"

	Area (ac)	CN	Description
*	0.061	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.042	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.021	49	50-75% Grass cover, Fair, HSG A, 36A
	0.233	98	Paved parking, HSG D
	0.357	86	Weighted Average
	0.124		34.73% Pervious Area
	0.233		65.27% Impervious Area

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

Subcatchment PD-2c: Prop. Drainage Area 2c



Summary for Subcatchment PD-2d: Prop. Drainage Area 2d

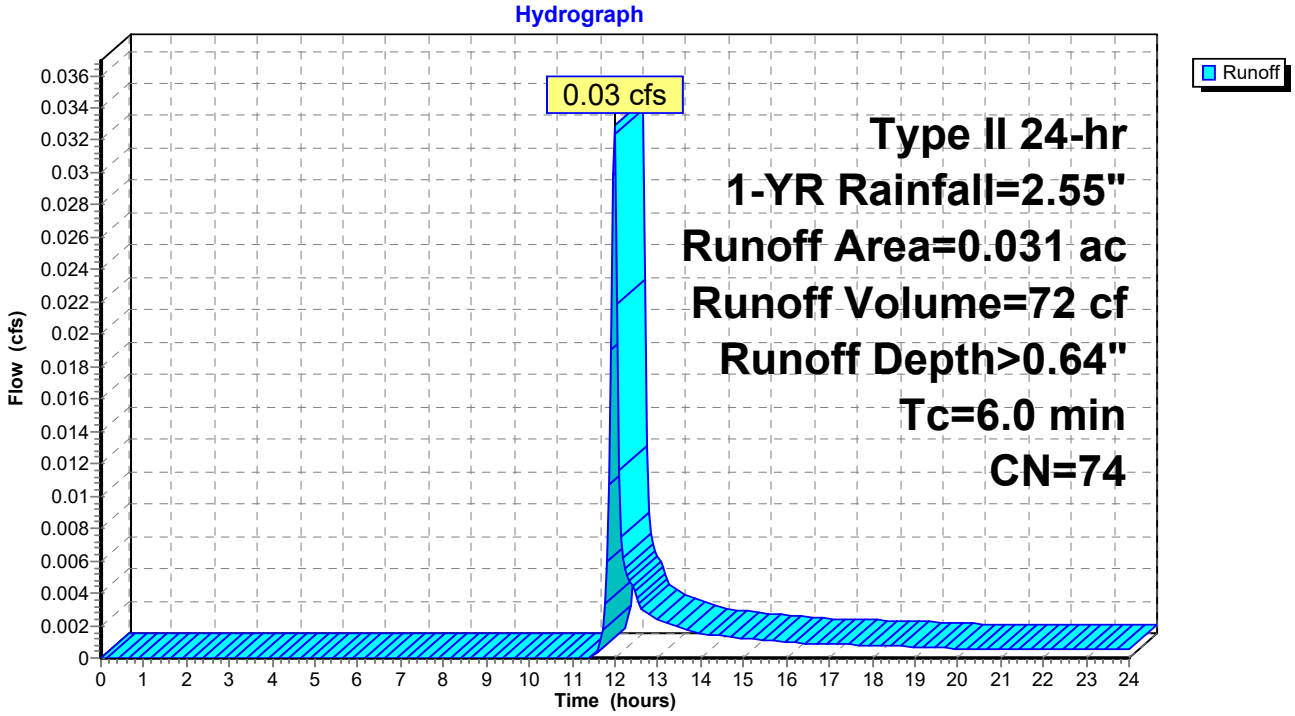
Runoff = 0.03 cfs @ 11.98 hrs, Volume= 72 cf, Depth> 0.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.55"

	Area (ac)	CN	Description
*	0.031	74	Woods/grass comb., Fair, HSG B/D, 13
	0.031		100.00% Pervious Area

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

Subcatchment PD-2d: Prop. Drainage Area 2d



Summary for Subcatchment PD-2e: Prop. Drainage Area 2e

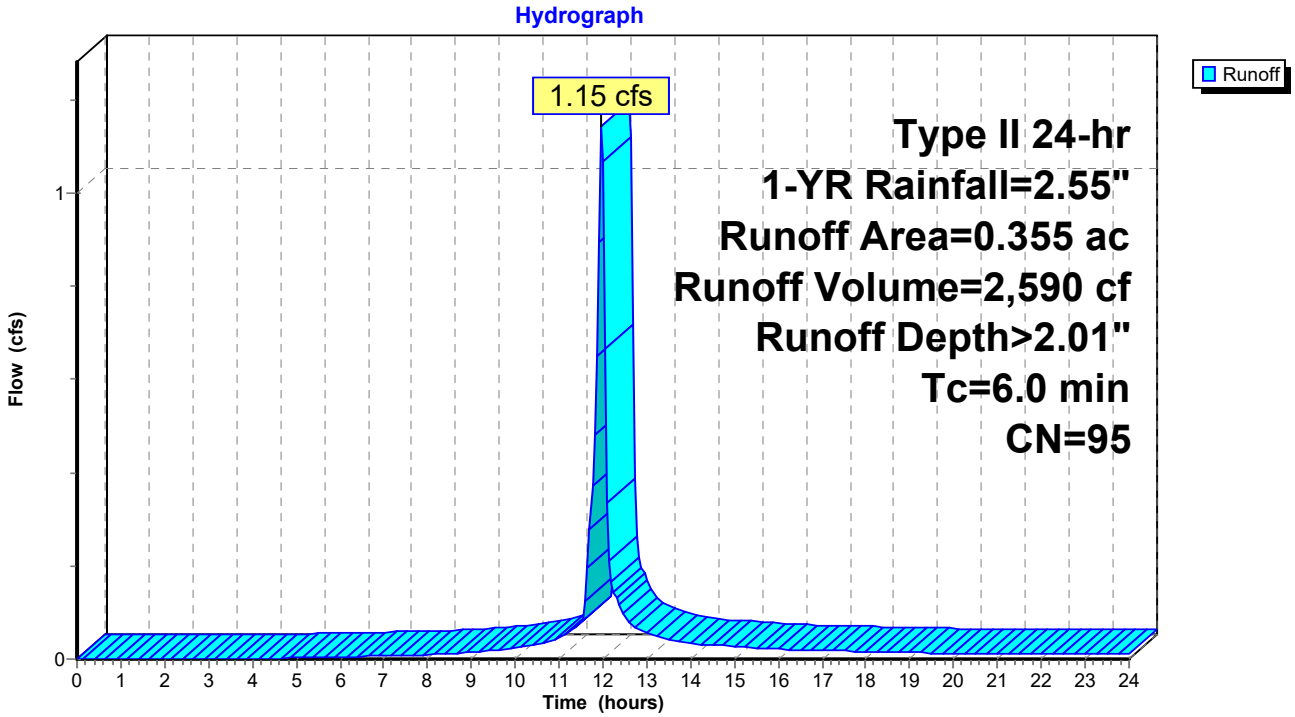
Runoff = 1.15 cfs @ 11.96 hrs, Volume= 2,590 cf, Depth> 2.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.55"

	Area (ac)	CN	Description
*	0.004	43	Woods/grass comb., Fair, HSG A, 36A
*	0.020	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.331	98	Paved parking
	0.355	95	Weighted Average
	0.024		6.76% Pervious Area
	0.331		93.24% Impervious Area

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

Subcatchment PD-2e: Prop. Drainage Area 2e



Summary for Subcatchment PD-2f: Prop. Drainage Area 2d

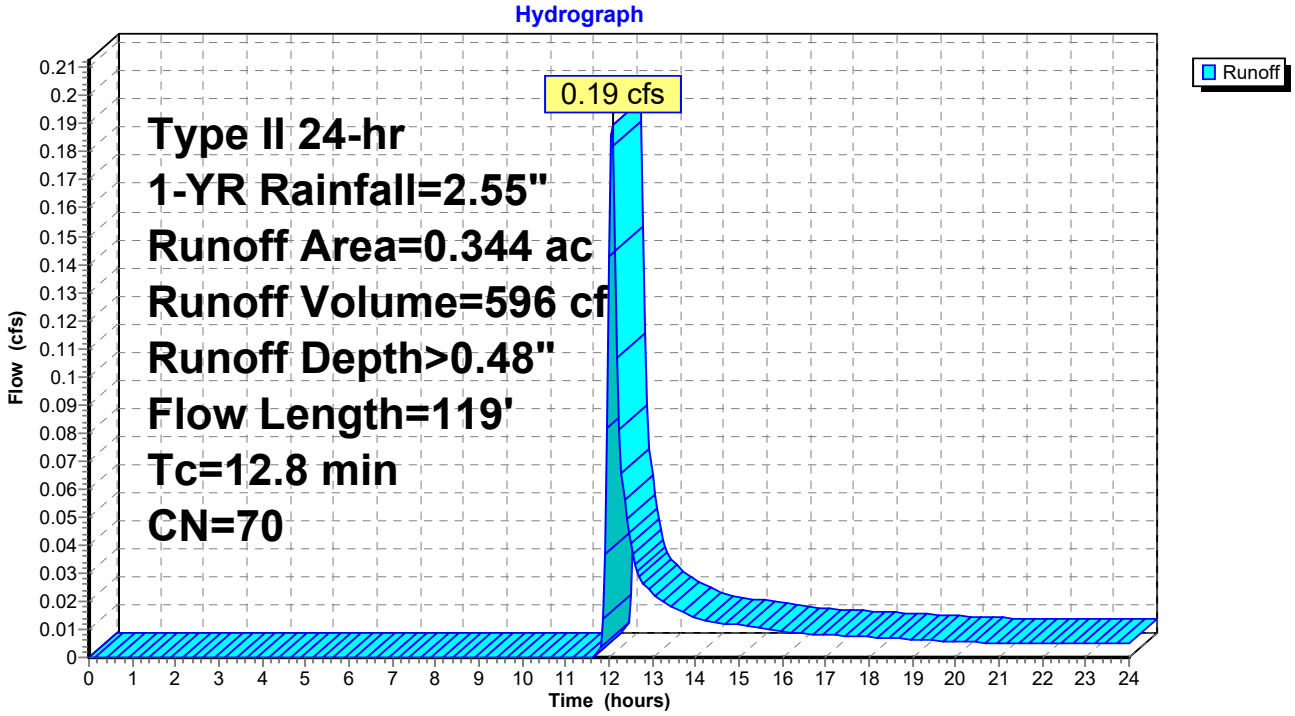
Runoff = 0.19 cfs @ 12.07 hrs, Volume= 596 cf, Depth> 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.55"

	Area (ac)	CN	Description
*	0.296	74	Woods/grass comb., Fair, HSG B/D, 13
	0.048	43	Woods/grass comb., Fair, HSG A
	0.344	70	Weighted Average
	0.344		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	23	0.1600	0.13		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.18"
8.4	36	0.0270	0.07		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.18"
1.5	60	0.0167	0.65		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
12.8	119	Total			

Subcatchment PD-2f: Prop. Drainage Area 2d



Summary for Subcatchment PD-3a: Prop. Drainage Area 3a

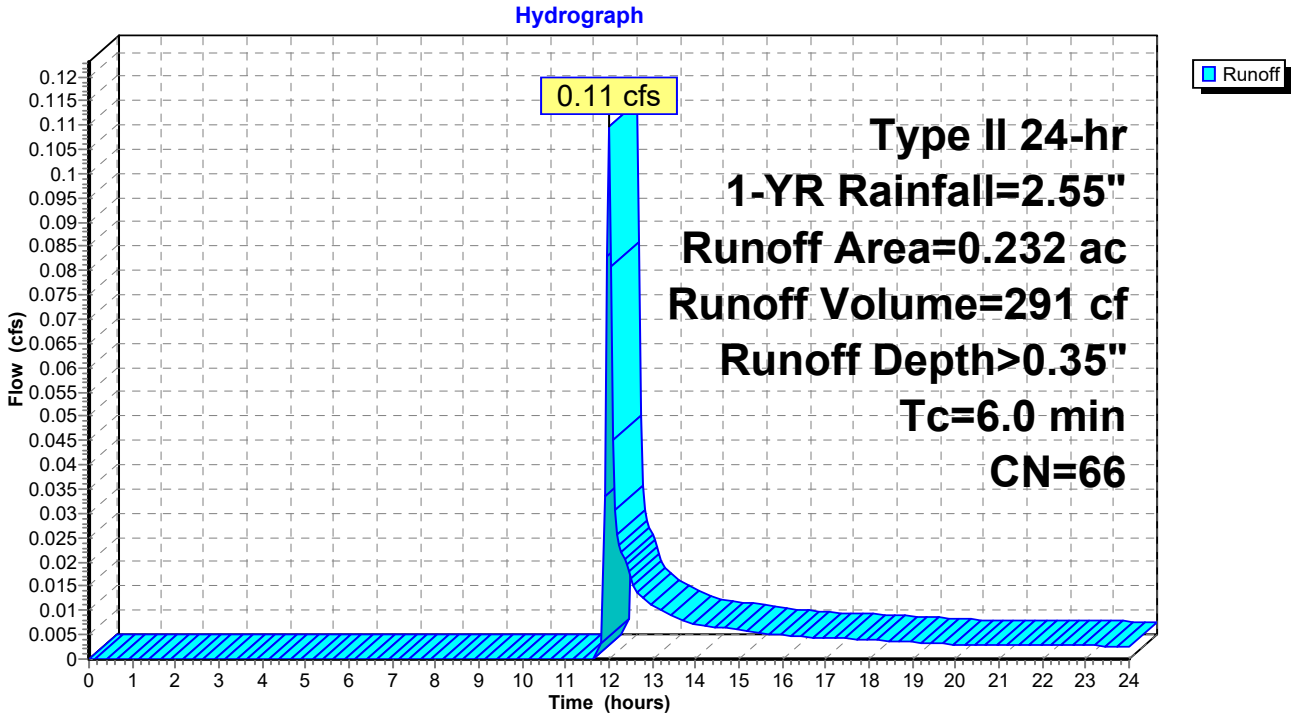
Runoff = 0.11 cfs @ 12.00 hrs, Volume= 291 cf, Depth> 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.55"

	Area (ac)	CN	Description
*	0.120	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.071	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.041	98	Paved parking
	0.232	66	Weighted Average
	0.191		82.33% Pervious Area
	0.041		17.67% Impervious Area

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

Subcatchment PD-3a: Prop. Drainage Area 3a



Summary for Subcatchment PD-3b: Prop. Drainage Area 3b

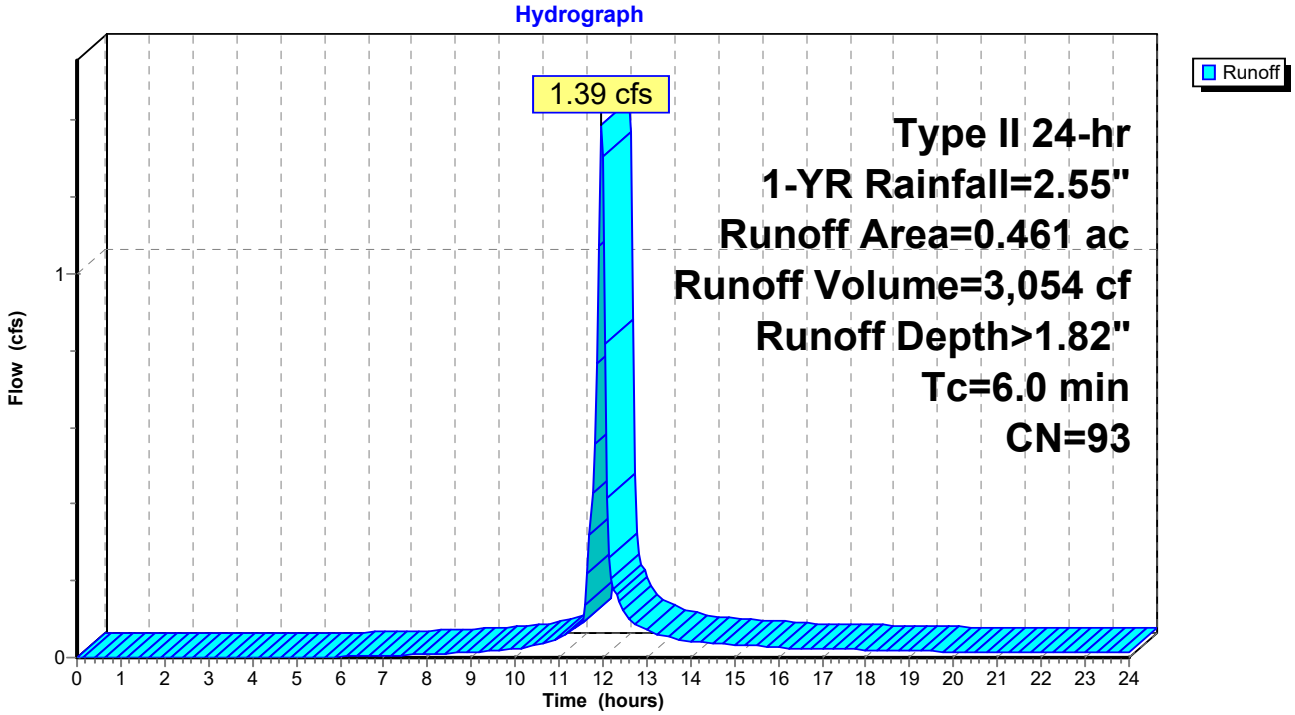
Runoff = 1.39 cfs @ 11.97 hrs, Volume= 3,054 cf, Depth> 1.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.55"

	Area (ac)	CN	Description
*	0.093	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.019	79	50-75% Grass cover, Fair, HSG C, 701A
*	0.016	98	Paved parking
*	0.333	98	Roofing
	0.461	93	Weighted Average
	0.112		24.30% Pervious Area
	0.349		75.70% Impervious Area

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

Subcatchment PD-3b: Prop. Drainage Area 3b



Summary for Subcatchment PD-3c: Prop. Drainage Area 3c

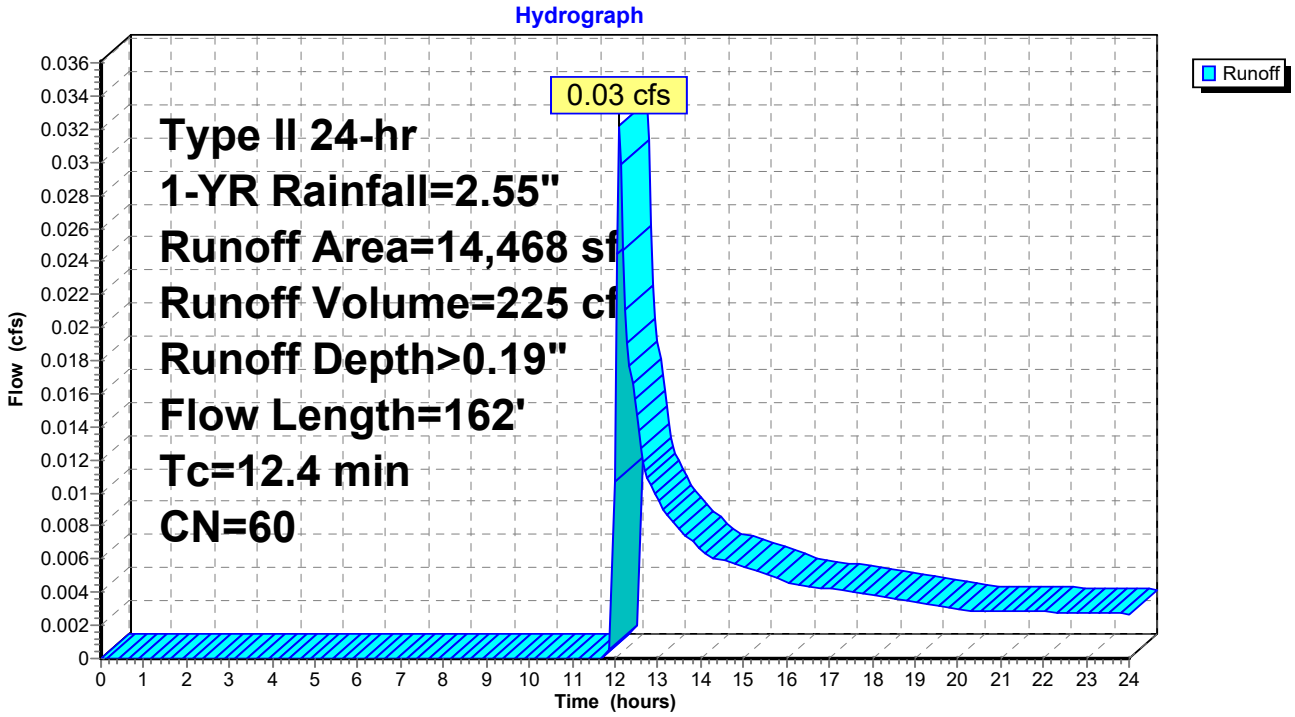
Runoff = 0.03 cfs @ 12.11 hrs, Volume= 225 cf, Depth> 0.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.55"

	Area (sf)	CN	Description
*	6,684	43	Woods/grass comb., Fair, HSG A, 36A
*	5,545	74	Woods/grass comb., Fair, HSG C
	1,501	76	Woods/grass comb., Fair, HSG C
*	738	77	50-75% Grass cover, Fair, HSG C
	14,468	60	Weighted Average
	14,468		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	8	0.0625	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.18"
3.4	17	0.0580	0.08		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.18"
3.2	16	0.0625	0.08		**Sheet Flow, C-D** Woods: Light underbrush n= 0.400 P2= 3.18"
1.5	9	0.1250	0.10		**Sheet Flow, D-E** Woods: Light underbrush n= 0.400 P2= 3.18"
2.5	112	0.0220	0.74		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
12.4	162	Total			

Subcatchment PD-3c: Prop. Drainage Area 3c



Summary for Subcatchment RD-1: Roof 1

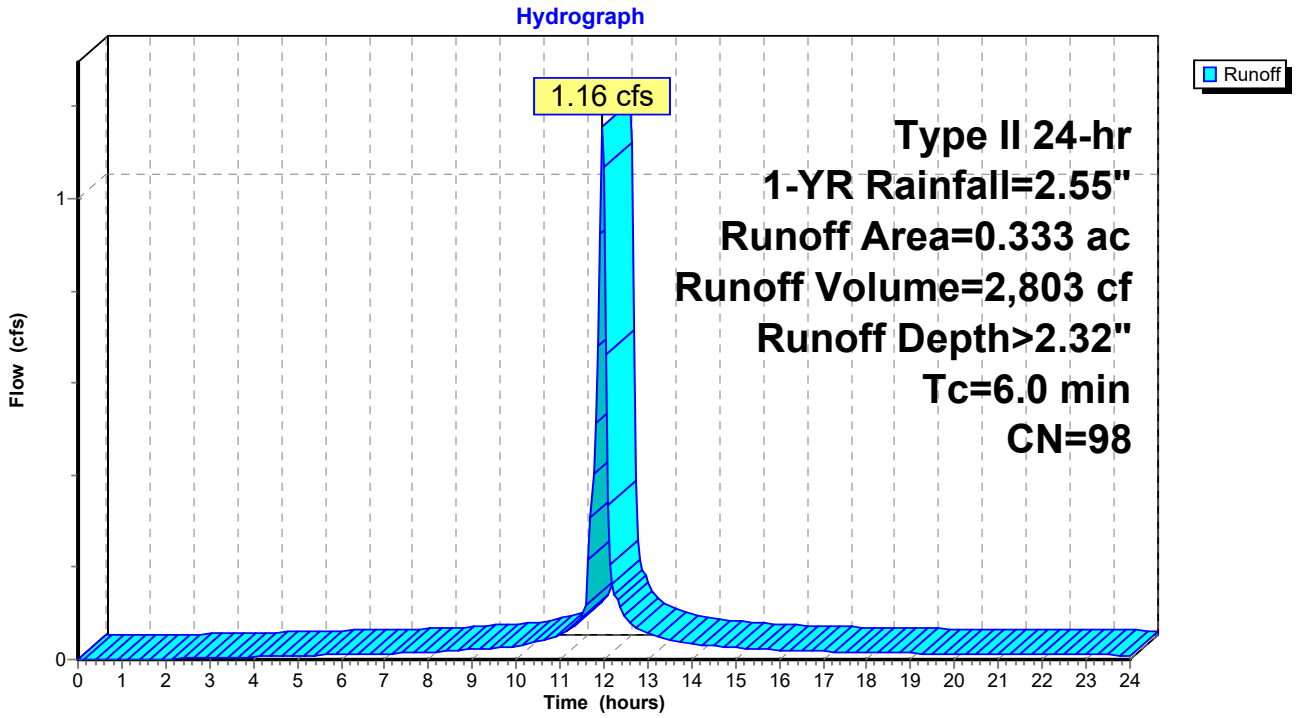
Runoff = 1.16 cfs @ 11.96 hrs, Volume= 2,803 cf, Depth> 2.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.55"

	Area (ac)	CN	Description
*	0.333	98	Unconnected roofs
	0.333		100.00% Impervious Area
	0.333		100.00% Unconnected

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

Subcatchment RD-1: Roof 1

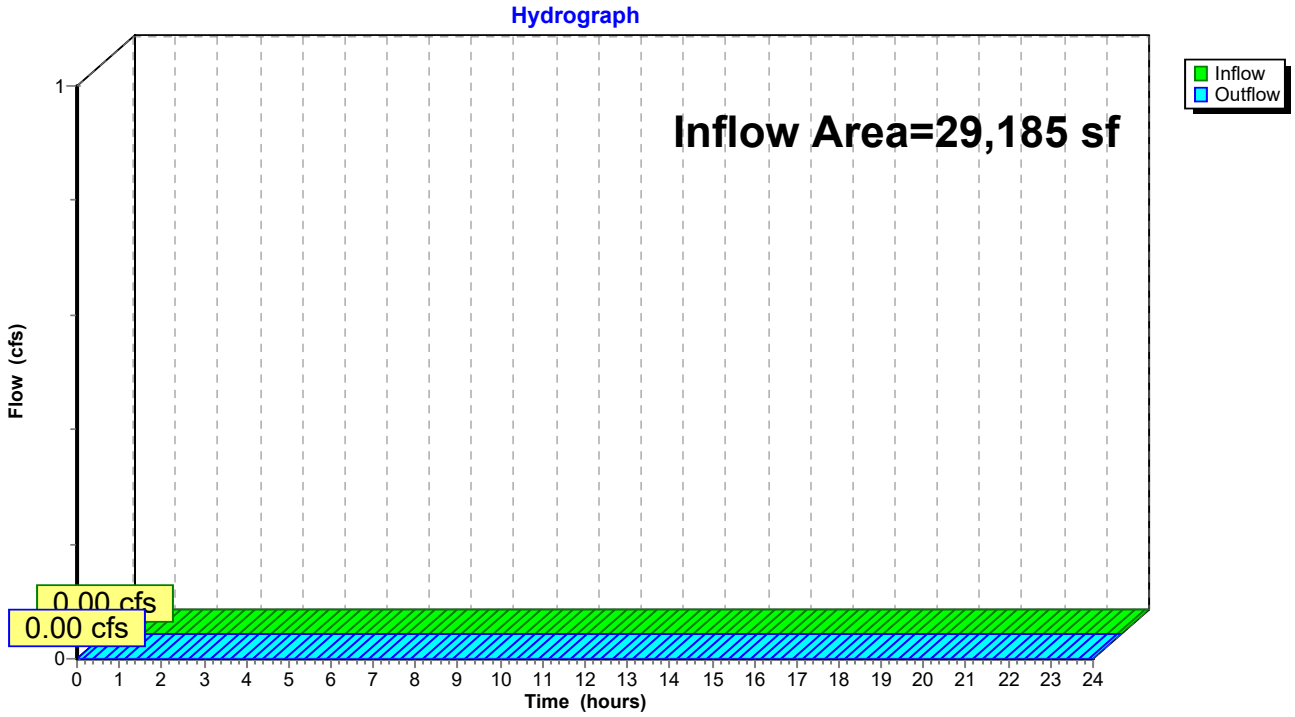


Summary for Reach DP-1a: Design Point 1

Inflow Area = 29,185 sf, 78.51% Impervious, Inflow Depth = 0.00" for 1-YR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 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-1a: Design Point 1

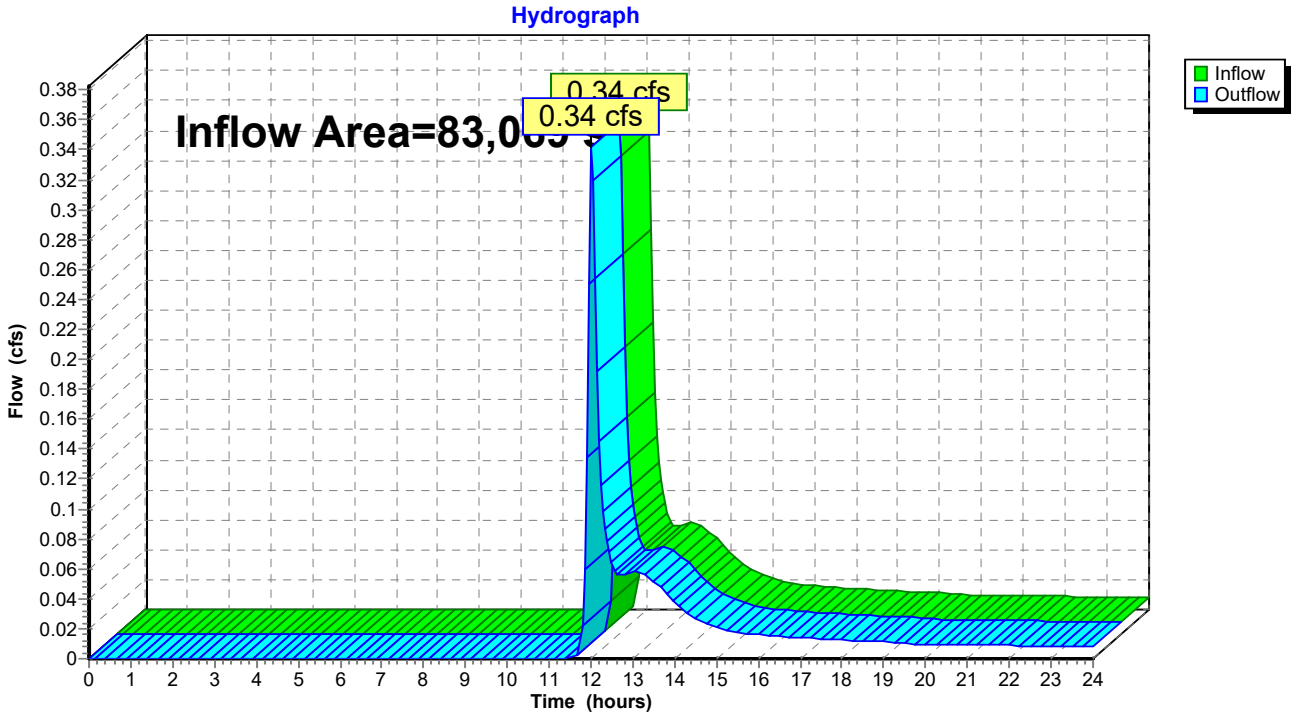


Summary for Reach DP-2a: Design Point 2

Inflow Area = 83,069 sf, 57.73% Impervious, Inflow Depth > 0.17" for 1-YR event
Inflow = 0.34 cfs @ 12.02 hrs, Volume= 1,154 cf
Outflow = 0.34 cfs @ 12.02 hrs, Volume= 1,154 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-2a: Design Point 2

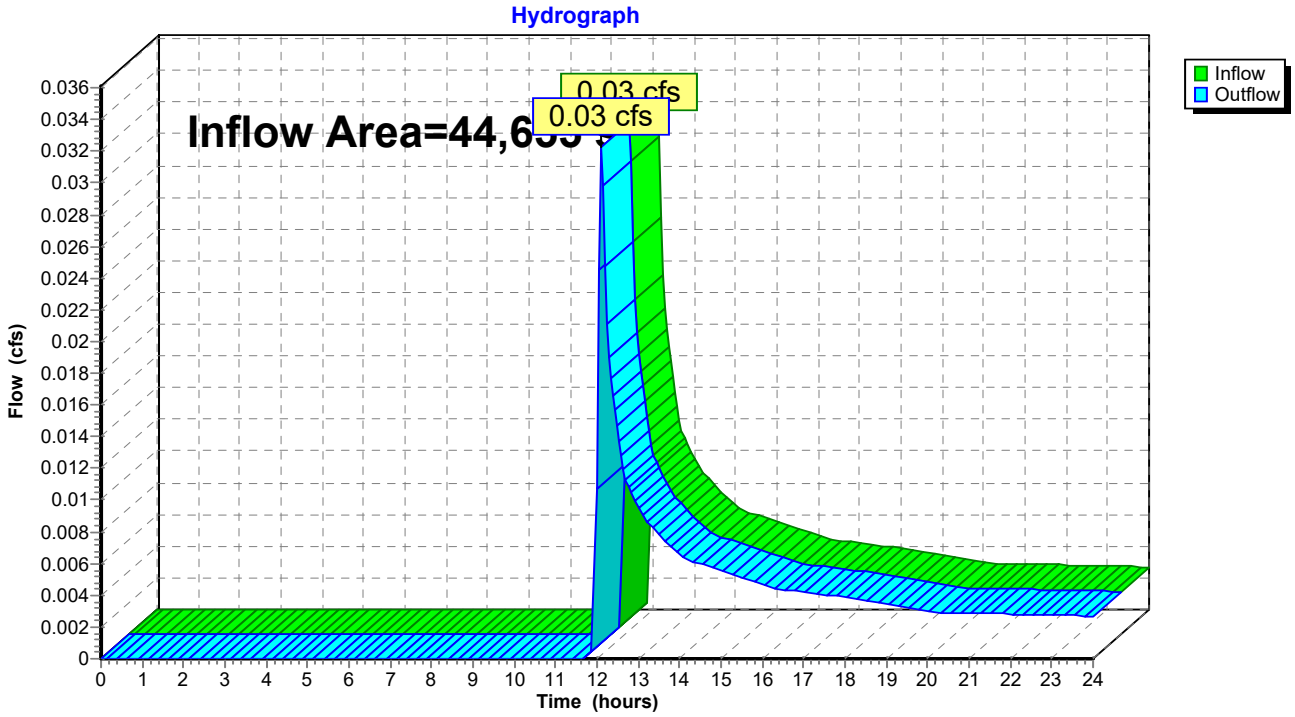


Summary for Reach DP-3a: Design Point 3

Inflow Area = 44,655 sf, 38.04% Impervious, Inflow Depth > 0.06" for 1-YR event
Inflow = 0.03 cfs @ 12.11 hrs, Volume= 225 cf
Outflow = 0.03 cfs @ 12.11 hrs, Volume= 225 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-3a: Design Point 3



Summary for Pond AB1: Above Ground Infiltration Basin 1

Inflow Area =	29,185 sf, 78.51% Impervious, Inflow Depth > 0.55" for 1-YR event				
Inflow =	0.64 cfs @	11.98 hrs,	Volume=	1,336 cf	
Outflow =	0.06 cfs @	12.50 hrs,	Volume=	1,335 cf,	Atten= 90%, Lag= 31.5 min
Discarded =	0.06 cfs @	12.50 hrs,	Volume=	1,335 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= 127.83' @ 12.50 hrs Surf.Area= 1,100 sf Storage= 517 cf

Plug-Flow detention time= 74.4 min calculated for 1,332 cf (100% of inflow)
Center-of-Mass det. time= 73.6 min (913.7 - 840.1)

Volume	Invert	Avail.Storage	Storage Description
#1	127.00'	4,542 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 4,798 cf Overall - 256 cf Embedded = 4,542 cf
#2	127.00'	102 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) Inside #1 256 cf Overall x 40.0% Voids
		4,644 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
127.00	512	0	0
128.00	1,218	865	865
129.00	1,949	1,584	2,449
130.00	2,749	2,349	4,798

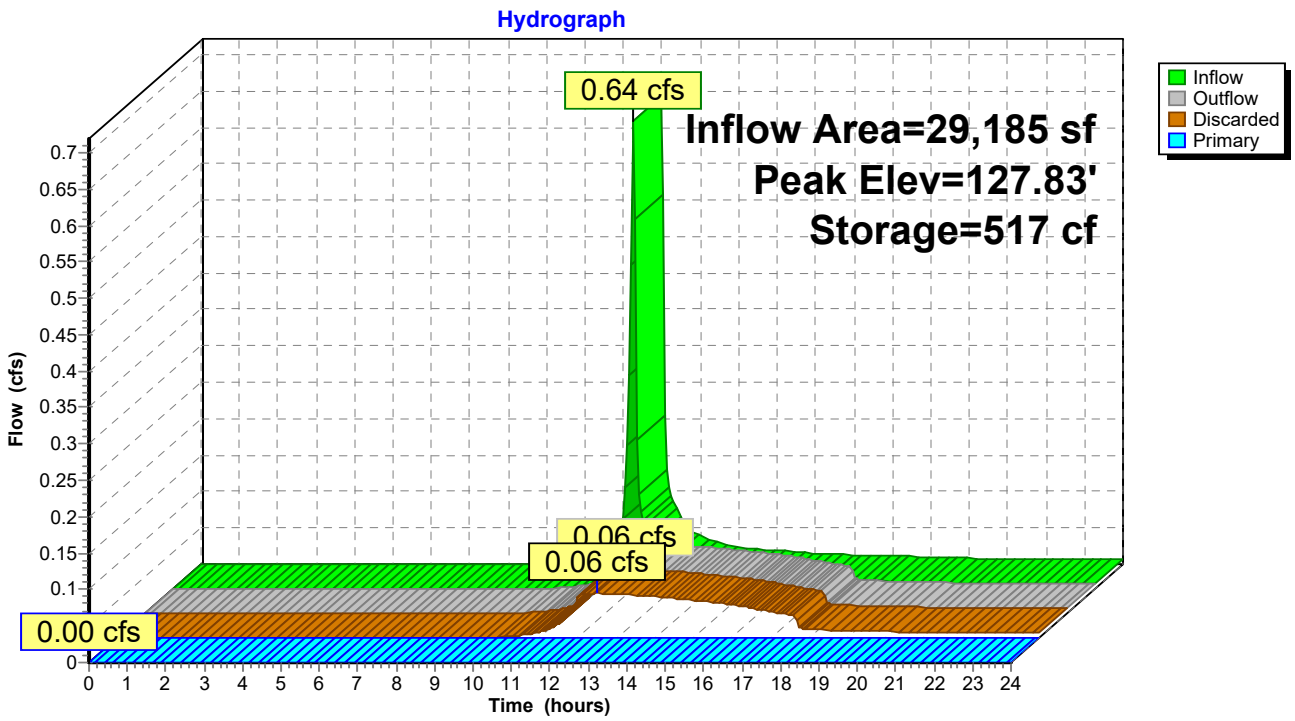
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
127.00	512	0	0
127.50	512	256	256

Device	Routing	Invert	Outlet Devices
#1	Primary	127.57'	**8.0" Round Culvert Barrel** L= 13.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 127.57' / 127.50' S= 0.0054 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.35 sf
#2	Device 1	129.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	127.00'	**2.410 in/hr Exfiltration over Surface area**
#4	Device 1	128.00'	**5.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.06 cfs @ 12.50 hrs HW=127.83' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=127.00' (Free Discharge)
└─**1=Culvert Barrel** (Controls 0.00 cfs)
  ├─**2=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Pond AB1: Above Ground Infiltration Basin 1



Stage-Area-Storage for Pond AB1: Above Ground Infiltration Basin 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
127.00	512	0
127.05	547	11
127.10	583	24
127.15	618	39
127.20	653	55
127.25	689	73
127.30	724	93
127.35	759	115
127.40	794	138
127.45	830	164
127.50	865	191
127.55	900	235
127.60	936	281
127.65	971	328
127.70	1,006	378
127.75	1,042	429
127.80	1,077	482
127.85	1,112	537
127.90	1,147	593
127.95	1,183	651
128.00	1,218	711
128.05	1,255	773
128.10	1,291	837
128.15	1,328	902
128.20	1,364	970
128.25	1,401	1,039
128.30	1,437	1,110
128.35	1,474	1,182
128.40	1,510	1,257
128.45	1,547	1,334
128.50	1,584	1,412
128.55	1,620	1,492
128.60	1,657	1,574
128.65	1,693	1,658
128.70	1,730	1,743
128.75	1,766	1,830
128.80	1,803	1,920
128.85	1,839	2,011
128.90	1,876	2,104
128.95	1,912	2,198
129.00	1,949	2,295
129.05	1,989	2,393
129.10	2,029	2,494
129.15	2,069	2,596
129.20	2,109	2,701
129.25	2,149	2,807
129.30	2,189	2,916
129.35	2,229	3,026
129.40	2,269	3,139
129.45	2,309	3,253
129.50	2,349	3,369
129.55	2,389	3,488
129.60	2,429	3,608
129.65	2,469	3,731
129.70	2,509	3,855
129.75	2,549	3,982
129.80	2,589	4,110
129.85	2,629	4,241
129.90	2,669	4,373
129.95	2,709	4,507
130.00	**2,749**	**4,644**

Summary for Pond AB3a: Above Ground Infiltration 3a

Inflow Area =	10,106 sf, 17.67% Impervious, Inflow Depth > 0.35" for 1-YR event				
Inflow =	0.11 cfs @	12.00 hrs, Volume=	291 cf		
Outflow =	0.05 cfs @	12.10 hrs, Volume=	290 cf, Atten= 53%, Lag= 5.9 min		
Discarded =	0.05 cfs @	12.10 hrs, Volume=	290 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= 132.03' @ 12.10 hrs Surf.Area= 929 sf Storage= 30 cf

Plug-Flow detention time= 6.3 min calculated for 290 cf (100% of inflow)
Center-of-Mass det. time= 4.6 min (918.3 - 913.7)

Volume	Invert	Avail.Storage	Storage Description
#1	132.00'	3,206 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

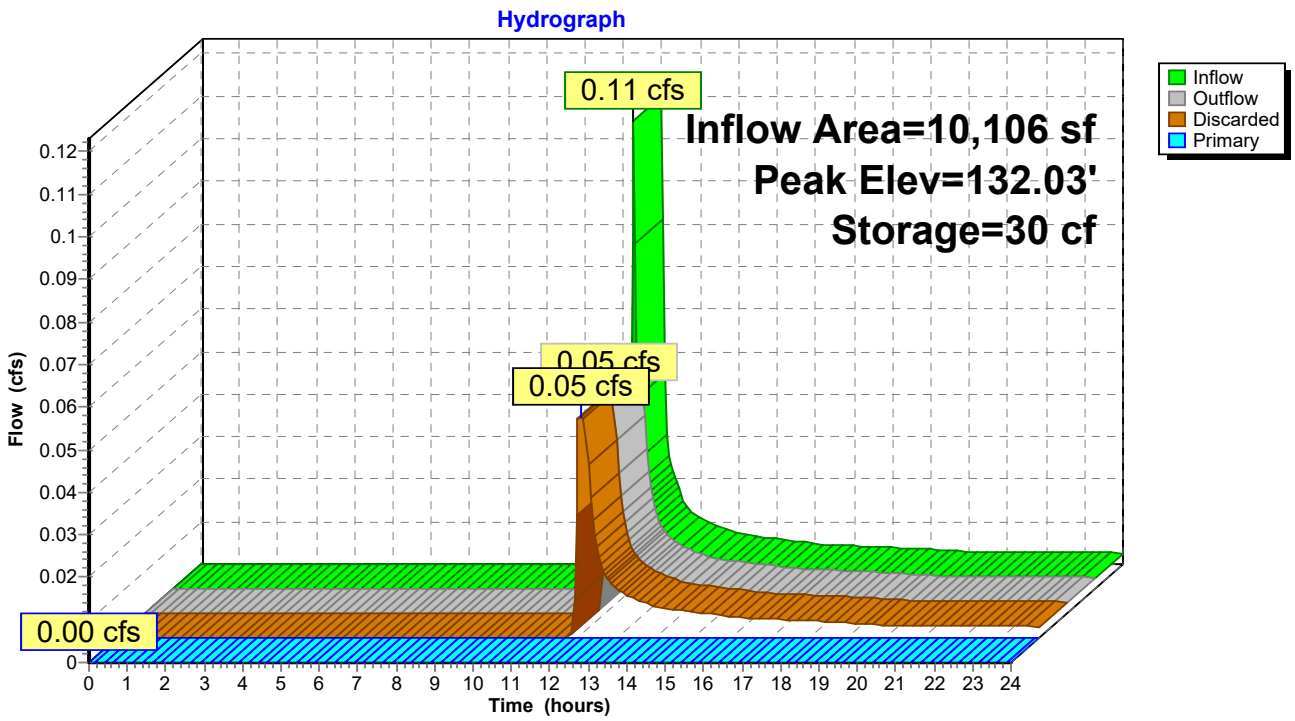
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
132.00	906	0	0
133.00	1,593	1,250	1,250
134.00	2,319	1,956	3,206

Device	Routing	Invert	Outlet Devices
#1	Discarded	132.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	133.00'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.05 cfs @ 12.10 hrs HW=132.03' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=132.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond AB3a: Above Ground Infiltration 3a



Stage-Area-Storage for Pond AB3a: Above Ground Infiltration 3a

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
132.00	906	0
132.02	920	18
132.04	933	37
132.06	947	56
132.08	961	75
132.10	975	94
132.12	988	114
132.14	1,002	134
132.16	1,016	154
132.18	1,030	174
132.20	1,043	195
132.22	1,057	216
132.24	1,071	237
132.26	1,085	259
132.28	1,098	281
132.30	1,112	303
132.32	1,126	325
132.34	1,140	348
132.36	1,153	371
132.38	1,167	394
132.40	1,181	417
132.42	1,195	441
132.44	1,208	465
132.46	1,222	489
132.48	1,236	514
132.50	1,250	539
132.52	1,263	564
132.54	1,277	589
132.56	1,291	615
132.58	1,304	641
132.60	1,318	667
132.62	1,332	694
132.64	1,346	721
132.66	1,359	748
132.68	1,373	775
132.70	1,387	803
132.72	1,401	830
132.74	1,414	859
132.76	1,428	887
132.78	1,442	916
132.80	1,456	945
132.82	1,469	974
132.84	1,483	1,003
132.86	1,497	1,033
132.88	1,511	1,063
132.90	1,524	1,094
132.92	1,538	1,124
132.94	1,552	1,155
132.96	1,566	1,186
132.98	1,579	1,218
133.00	1,593	1,250
133.02	1,608	1,282
133.04	1,622	1,314
133.06	1,637	1,346
133.08	1,651	1,379
133.10	1,666	1,412
133.12	1,680	1,446
133.14	1,695	1,480
133.16	1,709	1,514
133.18	1,724	1,548
133.20	1,738	1,583
133.22	1,753	1,618
133.24	1,767	1,653
133.26	1,782	1,688
133.28	1,796	1,724
133.30	1,811	1,760
133.32	1,825	1,796
133.34	1,840	1,833
133.36	1,854	1,870
133.38	1,869	1,907
133.40	1,883	1,945
133.42	1,898	1,983
133.44	1,912	2,021
133.46	1,927	2,059
133.48	1,941	2,098
133.50	1,956	2,137
133.52	1,971	2,176
133.54	1,985	2,216
133.56	2,000	2,255
133.58	2,014	2,296
133.60	2,029	2,336
133.62	2,043	2,377
133.64	2,058	2,418
133.66	2,072	2,459
133.68	2,087	2,501
133.70	2,101	2,542
133.72	2,116	2,585
133.74	2,130	2,627
133.76	2,145	2,670
133.78	2,159	2,713
133.80	2,174	2,756
133.82	2,188	2,800
133.84	2,203	2,844
133.86	2,217	2,888
133.88	2,232	2,932
133.90	2,246	2,977
133.92	2,261	3,022
133.94	2,275	3,068
133.96	2,290	3,113
133.98	2,304	3,159
134.00	**2,319**	**3,206**

Summary for Pond AB3b: Above Ground Infiltration 3b

Inflow Area =	20,081 sf, 75.70% Impervious, Inflow Depth > 1.82" for 1-YR event				
Inflow =	1.39 cfs @	11.97 hrs,	Volume=	3,054 cf	
Outflow =	0.03 cfs @	14.99 hrs,	Volume=	1,556 cf,	Atten= 98%, Lag= 181.4 min
Discarded =	0.03 cfs @	14.99 hrs,	Volume=	1,556 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= 132.40' @ 14.99 hrs Surf.Area= 1,429 sf Storage= 1,936 cf

Plug-Flow detention time= 334.2 min calculated for 1,556 cf (51% of inflow)
Center-of-Mass det. time= 222.5 min (1,019.5 - 797.0)

Volume	Invert	Avail.Storage	Storage Description
#1	130.00'	5,050 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

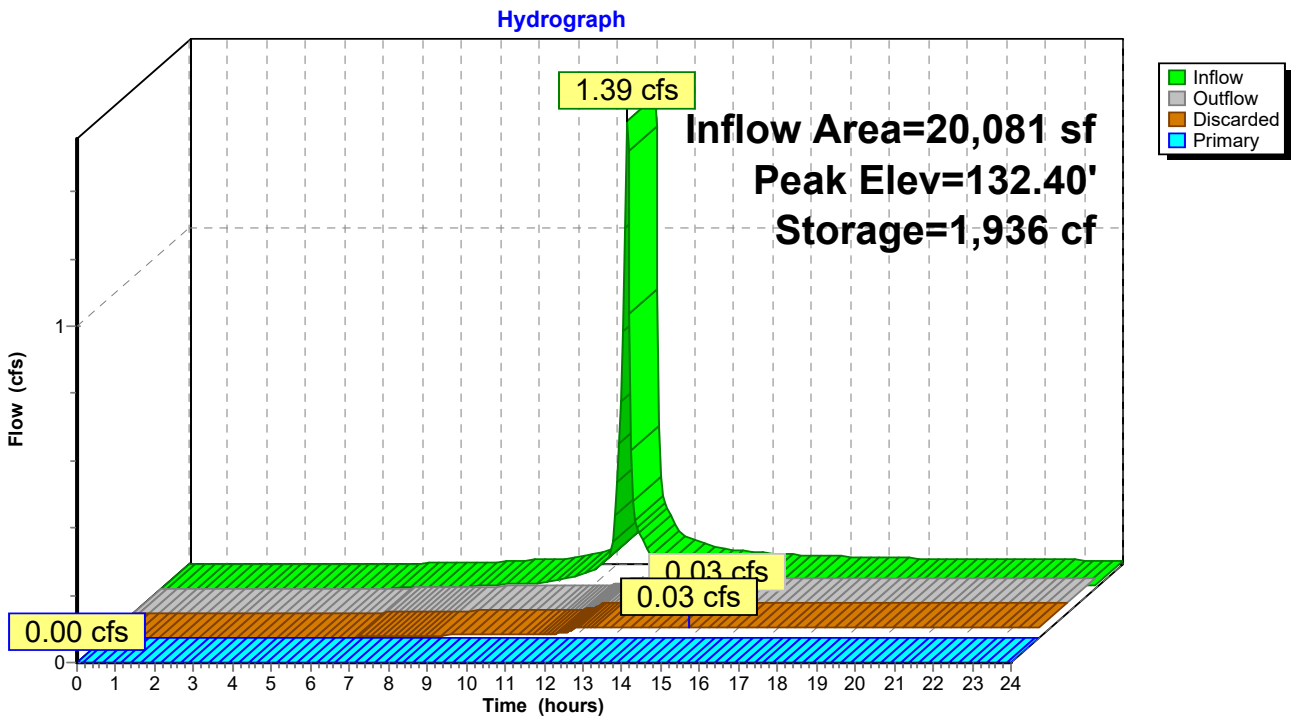
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
130.00	307	0	0
131.00	671	489	489
132.00	1,175	923	1,412
133.00	1,806	1,491	2,903
134.00	2,488	2,147	5,050

Device	Routing	Invert	Outlet Devices
#1	Primary	133.15'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Discarded	130.00'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 14.99 hrs HW=132.40' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=130.00' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond AB3b: Above Ground Infiltration 3b



Stage-Area-Storage for Pond AB3b: Above Ground Infiltration 3b

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.00	307	0
130.05	325	16
130.10	343	33
130.15	362	50
130.20	380	69
130.25	398	88
130.30	416	108
130.35	434	130
130.40	453	152
130.45	471	175
130.50	489	199
130.55	507	224
130.60	525	250
130.65	544	276
130.70	562	304
130.75	580	333
130.80	598	362
130.85	616	392
130.90	635	424
130.95	653	456
131.00	671	489
131.05	696	523
131.10	721	559
131.15	747	595
131.20	772	633
131.25	797	673
131.30	822	713
131.35	847	755
131.40	873	798
131.45	898	842
131.50	923	888
131.55	948	934
131.60	973	982
131.65	999	1,032
131.70	1,024	1,082
131.75	1,049	1,134
131.80	1,074	1,187
131.85	1,099	1,241
131.90	1,125	1,297
131.95	1,150	1,354
132.00	1,175	1,412
132.05	1,207	1,472
132.10	1,238	1,533
132.15	1,270	1,595
132.20	1,301	1,660
132.25	1,333	1,725
132.30	1,364	1,793
132.35	1,396	1,862
132.40	1,427	1,932
132.45	1,459	2,005
132.50	1,491	2,078
132.55	1,522	2,154
132.60	1,554	2,231
132.65	1,585	2,309
132.70	1,617	2,389
132.75	1,648	2,471
132.80	1,680	2,554
132.85	1,711	2,639
132.90	1,743	2,725
132.95	1,774	2,813
133.00	1,806	2,903
133.05	1,840	2,994
133.10	1,874	3,087
133.15	1,908	3,181
133.20	1,942	3,277
133.25	1,977	3,375
133.30	2,011	3,475
133.35	2,045	3,576
133.40	2,079	3,679
133.45	2,113	3,784
133.50	2,147	3,891
133.55	2,181	3,999
133.60	2,215	4,109
133.65	2,249	4,220
133.70	2,283	4,334
133.75	2,318	4,449
133.80	2,352	4,566
133.85	2,386	4,684
133.90	2,420	4,804
133.95	2,454	4,926
134.00	**2,488**	**5,050**

Summary for Pond IB1: Infiltration Basin 1

Inflow Area = 14,505 sf,100.00% Impervious, Inflow Depth > 2.32" for 1-YR event
Inflow = 1.16 cfs @ 11.96 hrs, Volume= 2,803 cf
Outflow = 0.11 cfs @ 11.65 hrs, Volume= 2,800 cf, Atten= 91%, Lag= 0.0 min
Discarded = 0.11 cfs @ 11.65 hrs, Volume= 2,800 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= 129.91' @ 12.43 hrs Surf.Area= 1,889 sf Storage= 1,012 cf

Plug-Flow detention time= 62.2 min calculated for 2,794 cf (100% of inflow)
Center-of-Mass det. time= 61.5 min (818.6 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	129.00'	1,726 cf	**25.25'W x 74.82'L x 3.50'H Field A** 6,612 cf Overall - 2,297 cf Embedded = 4,315 cf x 40.0% Voids
#2A	129.50'	2,297 cf	**ADS_StormTech SC-740 +Cap** x 50 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 5 Rows of 10 Chambers
		4,023 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	130.24'	**12.0" Round Culvert** L= 10.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 130.24' / 130.00' S= 0.0240 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#2	Discarded	129.00'	**2.410 in/hr Exfiltration over Surface area**
#3	Device 1	130.40'	**3.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	132.05'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.11 cfs @ 11.65 hrs HW=129.05' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=129.00' (Free Discharge)
└─**1=Culvert** (Controls 0.00 cfs)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB1: Infiltration Basin 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

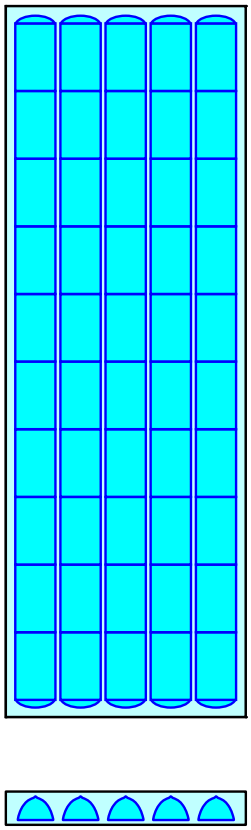
10 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 72.82' Row Length +12.0" End Stone x 2 = 74.82' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

50 Chambers x 45.9 cf = 2,297.0 cf Chamber Storage

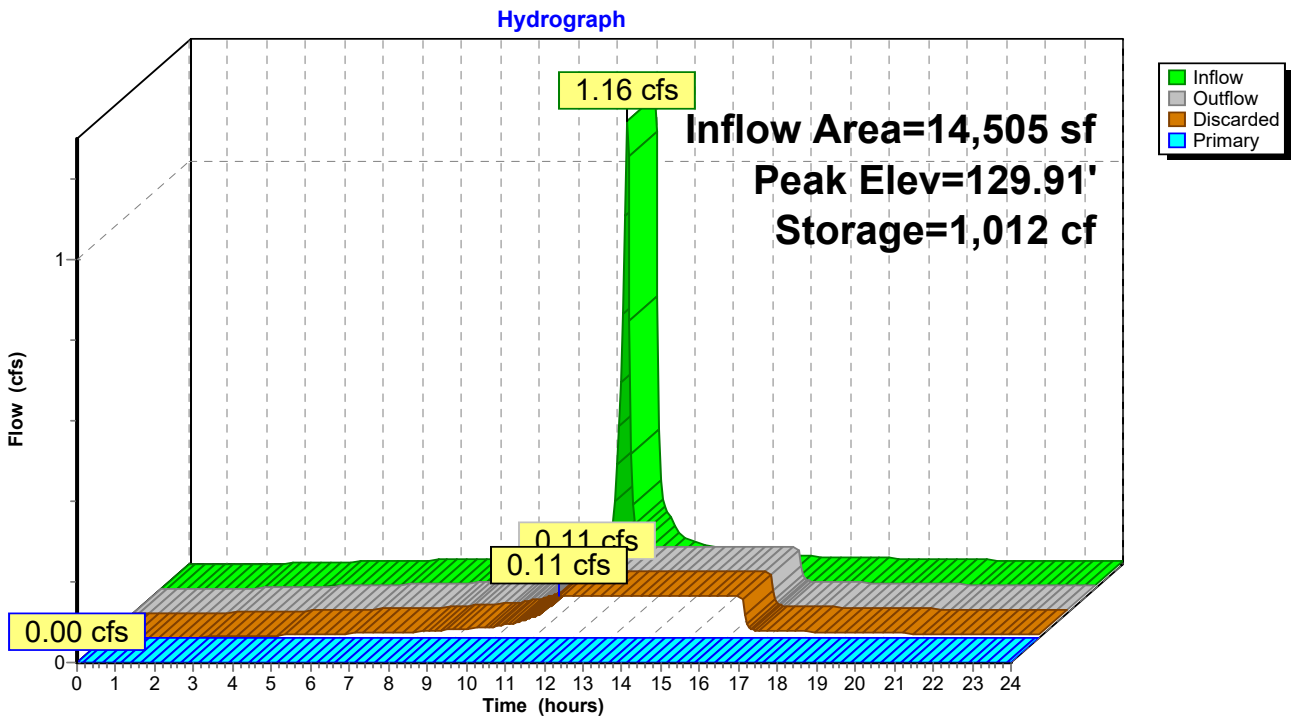
6,611.9 cf Field - 2,297.0 cf Chambers = 4,314.9 cf Stone x 40.0% Voids = 1,726.0 cf Stone Storage

Chamber Storage + Stone Storage = 4,023.0 cf = 0.092 af
Overall Storage Efficiency = 60.8%
Overall System Size = 74.82' x 25.25' x 3.50'

50 Chambers
244.9 cy Field
159.8 cy Stone



Pond IB1: Infiltration Basin 1



Stage-Area-Storage for Pond IB1: Infiltration Basin 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
129.00	**1,889**	0
129.05	1,889	38
129.10	1,889	76
129.15	1,889	113
129.20	1,889	151
129.25	1,889	189
129.30	1,889	227
129.35	1,889	264
129.40	1,889	302
129.45	1,889	340
129.50	1,889	378
129.55	1,889	455
129.60	1,889	533
129.65	1,889	610
129.70	1,889	687
129.75	1,889	764
129.80	1,889	841
129.85	1,889	917
129.90	1,889	993
129.95	1,889	1,069
130.00	1,889	1,145
130.05	1,889	1,220
130.10	1,889	1,295
130.15	1,889	1,369
130.20	1,889	1,444
130.25	1,889	1,517
130.30	1,889	1,591
130.35	1,889	1,664
130.40	1,889	1,736
130.45	1,889	1,809
130.50	1,889	1,880
130.55	1,889	1,952
130.60	1,889	2,022
130.65	1,889	2,093
130.70	1,889	2,162
130.75	1,889	2,232
130.80	1,889	2,300
130.85	1,889	2,368
130.90	1,889	2,435
130.95	1,889	2,502
131.00	1,889	2,568
131.05	1,889	2,634
131.10	1,889	2,698
131.15	1,889	2,762
131.20	1,889	2,825
131.25	1,889	2,887
131.30	1,889	2,948
131.35	1,889	3,008
131.40	1,889	3,067
131.45	1,889	3,124
131.50	1,889	3,181
131.55	1,889	3,236
131.60	1,889	3,290
131.65	1,889	3,342
131.70	1,889	3,392
131.75	1,889	3,439
131.80	1,889	3,484
131.85	1,889	3,526
131.90	1,889	3,567
131.95	1,889	3,607
132.00	1,889	3,645
132.05	1,889	3,683
132.10	1,889	3,721
132.15	1,889	3,758
132.20	1,889	3,796
132.25	1,889	3,834
132.30	1,889	3,872
132.35	1,889	3,910
132.40	1,889	3,947
132.45	1,889	3,985
132.50	1,889	**4,023**

Summary for Pond IB2a: Infiltration Basin 2a

Inflow Area =	26,310 sf, 88.91% Impervious, Inflow Depth > 1.92" for 1-YR event				
Inflow =	1.89 cfs @	11.96 hrs, Volume=	4,199 cf		
Outflow =	0.08 cfs @	13.27 hrs, Volume=	3,210 cf, Atten= 96%, Lag= 78.4 min		
Discarded =	0.06 cfs @	10.95 hrs, Volume=	3,098 cf		
Primary =	0.02 cfs @	13.27 hrs, Volume=	112 cf		

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 128.84' @ 13.27 hrs Surf.Area= 2,458 sf Storage= 2,161 cf

Plug-Flow detention time= 279.5 min calculated for 3,204 cf (76% of inflow)
Center-of-Mass det. time= 193.4 min (984.5 - 791.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	127.50'	2,392 cf	**30.00'W x 81.94'L x 3.67'H Field A** 9,013 cf Overall - 3,032 cf Embedded = 5,981 cf x 40.0% Voids
#2A	128.00'	3,032 cf	**ADS_StormTech SC-740 +Cap** x 66 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 6 Rows of 11 Chambers
		5,424 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	128.60'	**15.0" Round Culvert** L= 55.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 128.60' / 128.00' S= 0.0109 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Discarded	127.50'	**1.020 in/hr Exfiltration over Surface area**
#3	Device 1	128.80'	**10.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	130.10'	**10.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	130.99'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.06 cfs @ 10.95 hrs HW=127.54' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.02 cfs @ 13.27 hrs HW=128.84' (Free Discharge)
└─**1=Culvert** (Passes 0.02 cfs of 0.31 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.02 cfs @ 0.65 fps)
  ├─**4=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB2a: Infiltration Basin 2a - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

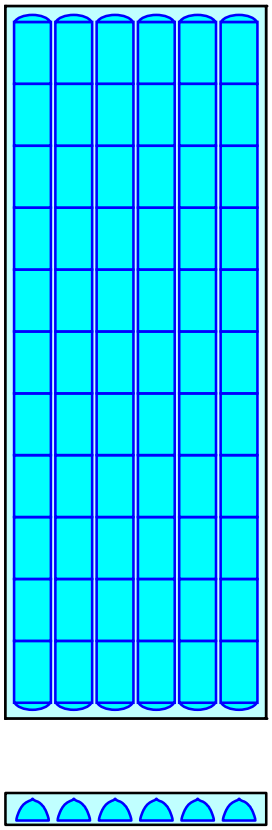
11 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 79.94' Row Length +12.0" End Stone x 2 = 81.94' Base Length
6 Rows x 51.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.00' Base Width
6.0" Base + 30.0" Chamber Height + 8.0" Cover = 3.67' Field Height

66 Chambers x 45.9 cf = 3,032.0 cf Chamber Storage

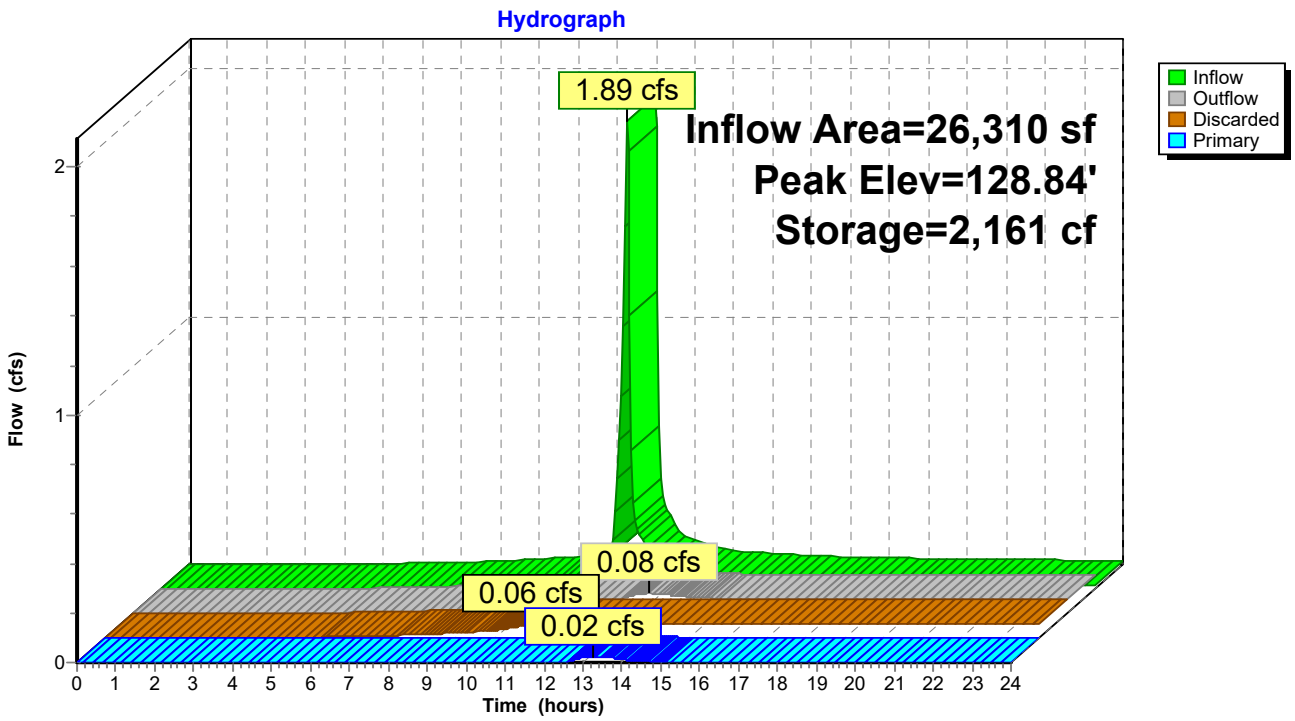
9,013.0 cf Field - 3,032.0 cf Chambers = 5,981.0 cf Stone x 40.0% Voids = 2,392.4 cf Stone Storage

Chamber Storage + Stone Storage = 5,424.4 cf = 0.125 af
Overall Storage Efficiency = 60.2%
Overall System Size = 81.94' x 30.00' x 3.67'

66 Chambers
333.8 cy Field
221.5 cy Stone



Pond IB2a: Infiltration Basin 2a



Stage-Area-Storage for Pond IB2a: Infiltration Basin 2a

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
127.50	**2,458**	0
127.55	2,458	49
127.60	2,458	98
127.65	2,458	147
127.70	2,458	197
127.75	2,458	246
127.80	2,458	295
127.85	2,458	344
127.90	2,458	393
127.95	2,458	442
128.00	2,458	492
128.05	2,458	593
128.10	2,458	695
128.15	2,458	796
128.20	2,458	897
128.25	2,458	998
128.30	2,458	1,099
128.35	2,458	1,199
128.40	2,458	1,298
128.45	2,458	1,398
128.50	2,458	1,497
128.55	2,458	1,595
128.60	2,458	1,694
128.65	2,458	1,791
128.70	2,458	1,888
128.75	2,458	1,985
128.80	2,458	2,081
128.85	2,458	2,177
128.90	2,458	2,272
128.95	2,458	2,367
129.00	2,458	2,461
129.05	2,458	2,554
129.10	2,458	2,647
129.15	2,458	2,739
129.20	2,458	2,830
129.25	2,458	2,921
129.30	2,458	3,011
129.35	2,458	3,100
129.40	2,458	3,188
129.45	2,458	3,275
129.50	2,458	3,362
129.55	2,458	3,447
129.60	2,458	3,532
129.65	2,458	3,615
129.70	2,458	3,698
129.75	2,458	3,779
129.80	2,458	3,858
129.85	2,458	3,937
129.90	2,458	4,014
129.95	2,458	4,089
130.00	2,458	4,164
130.05	2,458	4,236
130.10	2,458	4,306
130.15	2,458	4,374
130.20	2,458	4,439
130.25	2,458	4,501
130.30	2,458	4,559
130.35	2,458	4,614
130.40	2,458	4,667
130.45	2,458	4,719
130.50	2,458	4,769
130.55	2,458	4,818
130.60	2,458	4,867
130.65	2,458	4,916
130.70	2,458	4,966
130.75	2,458	5,015
130.80	2,458	5,064
130.85	2,458	5,113
130.90	2,458	5,162
130.95	2,458	5,211
131.00	2,458	5,261
131.05	2,458	5,310
131.10	2,458	5,359
131.15	2,458	**5,408**

Summary for Pond IB2c: Infiltration Basin Area 2c

Inflow Area =	15,551 sf, 65.27% Impervious, Inflow Depth > 1.28" for 1-YR event				
Inflow =	0.79 cfs @	11.97 hrs, Volume=	1,662 cf		
Outflow =	0.06 cfs @	11.70 hrs, Volume=	1,660 cf,	Atten= 93%,	Lag= 0.0 min
Discarded =	0.06 cfs @	11.70 hrs, Volume=	1,660 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= 130.62' @ 12.69 hrs Surf.Area= 2,373 sf Storage= 690 cf

Plug-Flow detention time= 102.2 min calculated for 1,660 cf (100% of inflow)
Center-of-Mass det. time= 101.1 min (930.0 - 828.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	130.00'	1,505 cf	**27.00'W x 87.91'L x 2.00'H Field A** 4,747 cf Overall - 985 cf Embedded = 3,762 cf x 40.0% Voids
#2A	130.50'	985 cf	**ADS_StormTech SC-160LP +Cap** x 144 Inside #1 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 12 Rows of 12 Chambers
		2,489 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	130.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	129.20'	**8.0" Round Culvert** L= 14.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 129.20' / 129.00' S= 0.0143 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.35 sf
#3	Device 2	130.70'	**11.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 2	131.40'	**2.0" Vert. Orifice/Grate** C= 0.600
#5	Device 2	131.88'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.06 cfs @ 11.70 hrs HW=130.03' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=130.00' (Free Discharge)
└─**2=Culvert** (Passes 0.00 cfs of 1.32 cfs potential flow)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  ├─**4=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB2c: Infiltration Basin Area 2c - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-160LP +Cap (ADS StormTech® SC-160LP with cap length)
Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf
Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap

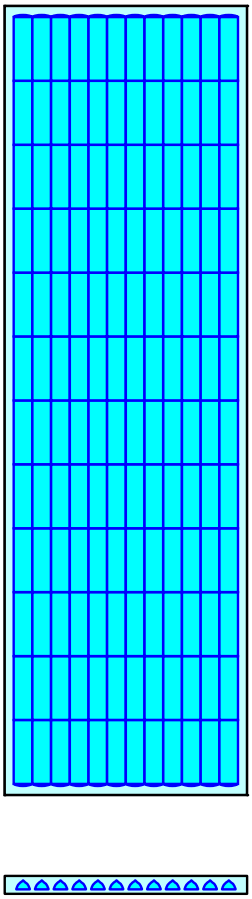
12 Chambers/Row x 7.12' Long +0.23' Cap Length x 2 = 85.91' Row Length +12.0" End Stone x 2 = 87.91' Base Length
12 Rows x 25.0" Wide + 12.0" Side Stone x 2 = 27.00' Base Width
6.0" Base + 12.0" Chamber Height + 6.0" Cover = 2.00' Field Height

144 Chambers x 6.8 cf = 984.5 cf Chamber Storage

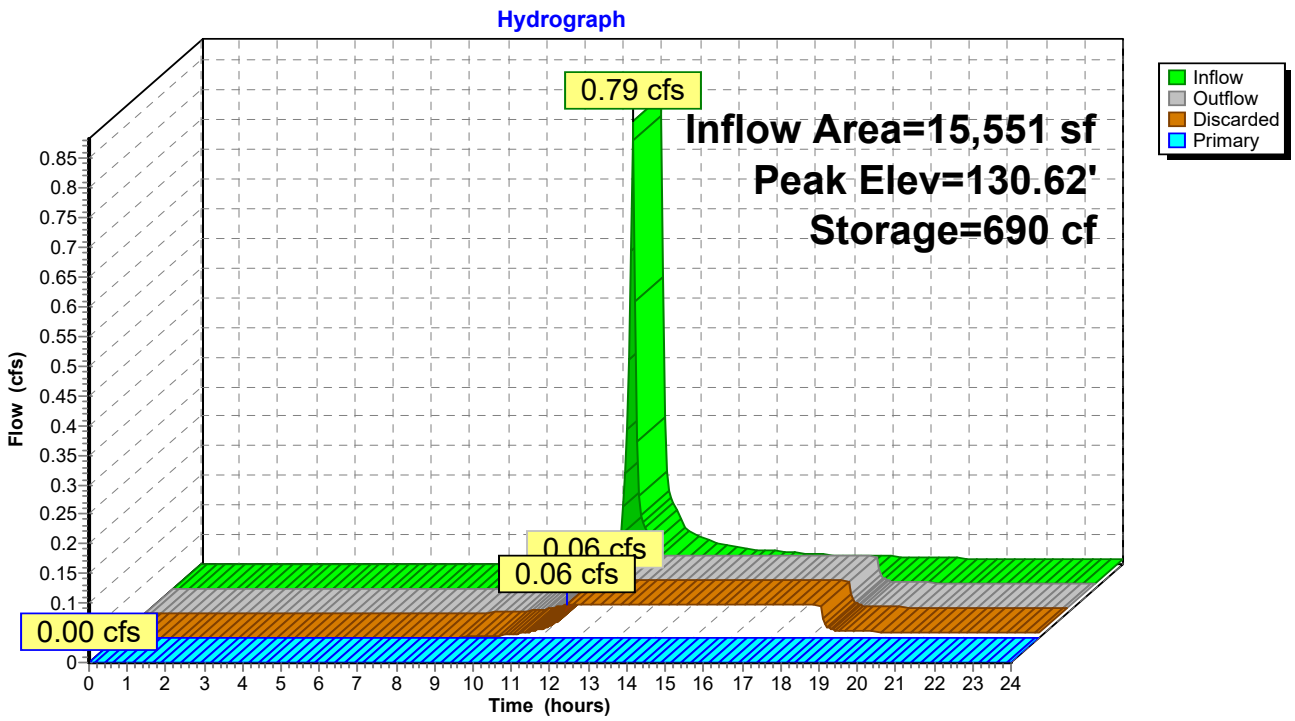
4,747.0 cf Field - 984.5 cf Chambers = 3,762.4 cf Stone x 40.0% Voids = 1,505.0 cf Stone Storage

Chamber Storage + Stone Storage = 2,489.5 cf = 0.057 af
Overall Storage Efficiency = 52.4%
Overall System Size = 87.91' x 27.00' x 2.00'

144 Chambers
175.8 cy Field
139.3 cy Stone



Pond IB2c: Infiltration Basin Area 2c



Stage-Area-Storage for Pond IB2c: Infiltration Basin Area 2c

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.00	**2,373**	0
130.02	2,373	19
130.04	2,373	38
130.06	2,373	57
130.08	2,373	76
130.10	2,373	95
130.12	2,373	114
130.14	2,373	133
130.16	2,373	152
130.18	2,373	171
130.20	2,373	190
130.22	2,373	209
130.24	2,373	228
130.26	2,373	247
130.28	2,373	266
130.30	2,373	285
130.32	2,373	304
130.34	2,373	323
130.36	2,373	342
130.38	2,373	361
130.40	2,373	380
130.42	2,373	399
130.44	2,373	418
130.46	2,373	437
130.48	2,373	456
130.50	2,373	475
130.52	2,373	512
130.54	2,373	549
130.56	2,373	587
130.58	2,373	624
130.60	2,373	661
130.62	2,373	698
130.64	2,373	735
130.66	2,373	772
130.68	2,373	808
130.70	2,373	844
130.72	2,373	880
130.74	2,373	916
130.76	2,373	952
130.78	2,373	987
130.80	2,373	1,022
130.82	2,373	1,057
130.84	2,373	1,092
130.86	2,373	1,127
130.88	2,373	1,161
130.90	2,373	1,195
130.92	2,373	1,229
130.94	2,373	1,263
130.96	2,373	1,296
130.98	2,373	1,329
131.00	2,373	1,361
131.02	2,373	1,394
131.04	2,373	1,426
131.06	2,373	1,457
131.08	2,373	1,489
131.10	2,373	1,519
131.12	2,373	1,550
131.14	2,373	1,580
131.16	2,373	1,609
131.18	2,373	1,638
131.20	2,373	1,667
131.22	2,373	1,695
131.24	2,373	1,722
131.26	2,373	1,749
131.28	2,373	1,774
131.30	2,373	1,799
131.32	2,373	1,824
131.34	2,373	1,847
131.36	2,373	1,870
131.38	2,373	1,892
131.40	2,373	1,914
131.42	2,373	1,935
131.44	2,373	1,955
131.46	2,373	1,976
131.48	2,373	1,995
131.50	2,373	2,015
131.52	2,373	2,034
131.54	2,373	2,053
131.56	2,373	2,072
131.58	2,373	2,091
131.60	2,373	2,110
131.62	2,373	2,129
131.64	2,373	2,148
131.66	2,373	2,167
131.68	2,373	2,186
131.70	2,373	2,205
131.72	2,373	2,224
131.74	2,373	2,243
131.76	2,373	2,262
131.78	2,373	2,281
131.80	2,373	2,300
131.82	2,373	2,319
131.84	2,373	2,338
131.86	2,373	2,357
131.88	2,373	2,376
131.90	2,373	2,395
131.92	2,373	2,414
131.94	2,373	2,433
131.96	2,373	2,452
131.98	2,373	2,471
132.00	2,373	**2,489**

Summary for Pond IB2e: Infiltration Basin 2b

Inflow Area =	15,464 sf, 93.24% Impervious, Inflow Depth > 2.01" for 1-YR event				
Inflow =	1.15 cfs @	11.96 hrs,	Volume=	2,590 cf	
Outflow =	0.14 cfs @	11.70 hrs,	Volume=	2,588 cf,	Atten= 87%, Lag= 0.0 min
Discarded =	0.14 cfs @	11.70 hrs,	Volume=	2,588 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= 131.17' @ 12.26 hrs Surf.Area= 2,592 sf Storage= 871 cf

Plug-Flow detention time= 37.8 min calculated for 2,583 cf (100% of inflow)
Center-of-Mass det. time= 37.3 min (821.6 - 784.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	130.50'	2,002 cf	**34.83'W x 74.40'L x 2.50'H Field A** 6,479 cf Overall - 1,474 cf Embedded = 5,005 cf x 40.0% Voids
#2A	131.00'	1,474 cf	**ADS_StormTech SC-310 +Cap** x 100 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 10 Rows of 10 Chambers
		3,476 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	130.85'	**15.0" Round Culvert Barrel** L= 69.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 130.85' / 130.50' S= 0.0051 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Discarded	130.50'	**2.410 in/hr Exfiltration over Surface area**
#3	Device 1	131.40'	**3.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	132.63'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.14 cfs @ 11.70 hrs HW=130.54' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=130.50' (Free Discharge)
└─**1=Culvert Barrel** (Controls 0.00 cfs)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB2e: Infiltration Basin 2b - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-310 +Cap (ADS StormTech® SC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

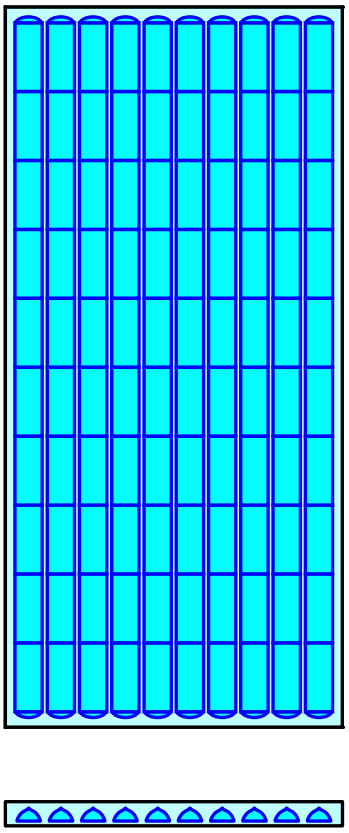
10 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 72.40' Row Length +12.0" End Stone x 2 = 74.40' Base Length
10 Rows x 34.0" Wide + 6.0" Spacing x 9 + 12.0" Side Stone x 2 = 34.83' Base Width
6.0" Base + 16.0" Chamber Height + 8.0" Cover = 2.50' Field Height

100 Chambers x 14.7 cf = 1,474.2 cf Chamber Storage

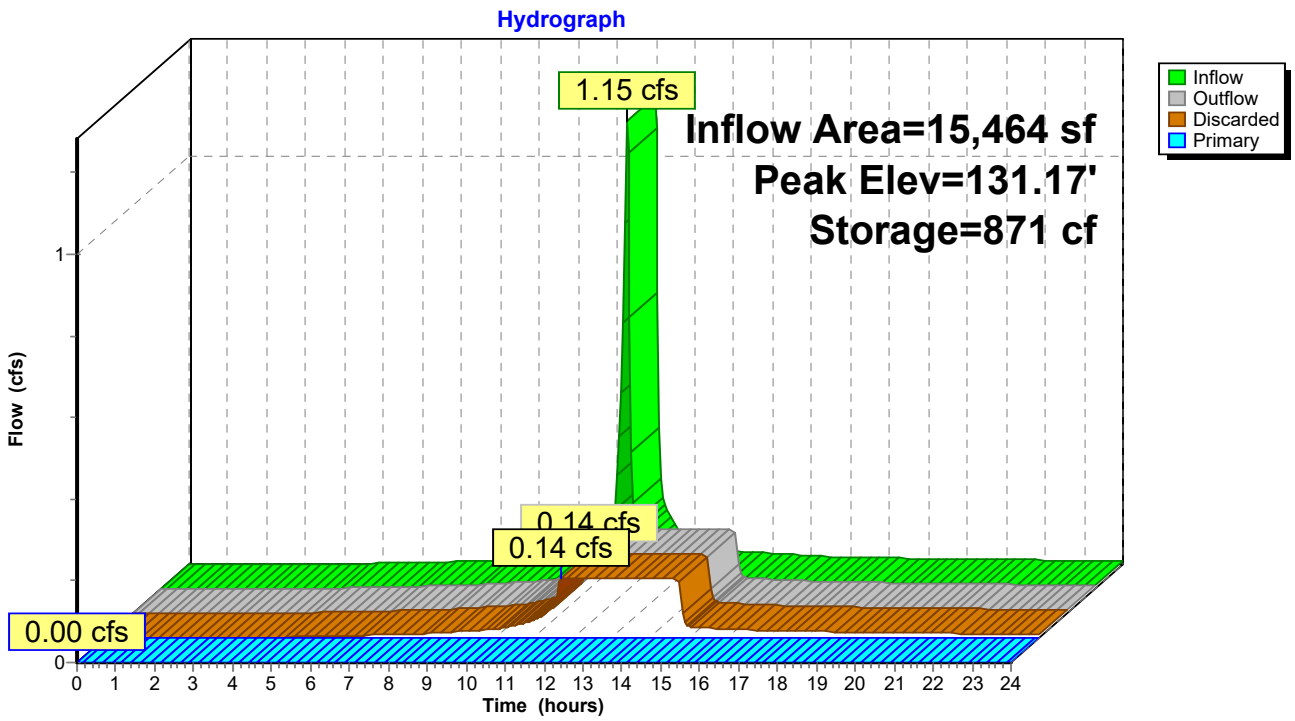
6,479.0 cf Field - 1,474.2 cf Chambers = 5,004.8 cf Stone x 40.0% Voids = 2,001.9 cf Stone Storage

Chamber Storage + Stone Storage = 3,476.1 cf = 0.080 af
Overall Storage Efficiency = 53.7%
Overall System Size = 74.40' x 34.83' x 2.50'

100 Chambers
240.0 cy Field
185.4 cy Stone



Pond IB2e: Infiltration Basin 2b



Stage-Area-Storage for Pond IB2e: Infiltration Basin 2b

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.50	**2,592**	0
130.55	2,592	52
130.60	2,592	104
130.65	2,592	155
130.70	2,592	207
130.75	2,592	259
130.80	2,592	311
130.85	2,592	363
130.90	2,592	415
130.95	2,592	466
131.00	2,592	518
131.05	2,592	622
131.10	2,592	724
131.15	2,592	827
131.20	2,592	928
131.25	2,592	1,029
131.30	2,592	1,129
131.35	2,592	1,227
131.40	2,592	1,325
131.45	2,592	1,422
131.50	2,592	1,517
131.55	2,592	1,611
131.60	2,592	1,703
131.65	2,592	1,794
131.70	2,592	1,884
131.75	2,592	1,972
131.80	2,592	2,057
131.85	2,592	2,141
131.90	2,592	2,222
131.95	2,592	2,301
132.00	2,592	2,377
132.05	2,592	2,449
132.10	2,592	2,516
132.15	2,592	2,579
132.20	2,592	2,638
132.25	2,592	2,695
132.30	2,592	2,750
132.35	2,592	2,802
132.40	2,592	2,854
132.45	2,592	2,906
132.50	2,592	2,958
132.55	2,592	3,010
132.60	2,592	3,061
132.65	2,592	3,113
132.70	2,592	3,165
132.75	2,592	3,217
132.80	2,592	3,269
132.85	2,592	3,321
132.90	2,592	3,372
132.95	2,592	3,424
133.00	2,592	**3,476**

Summary for Subcatchment PD-1: Prop. Drainage Area 1

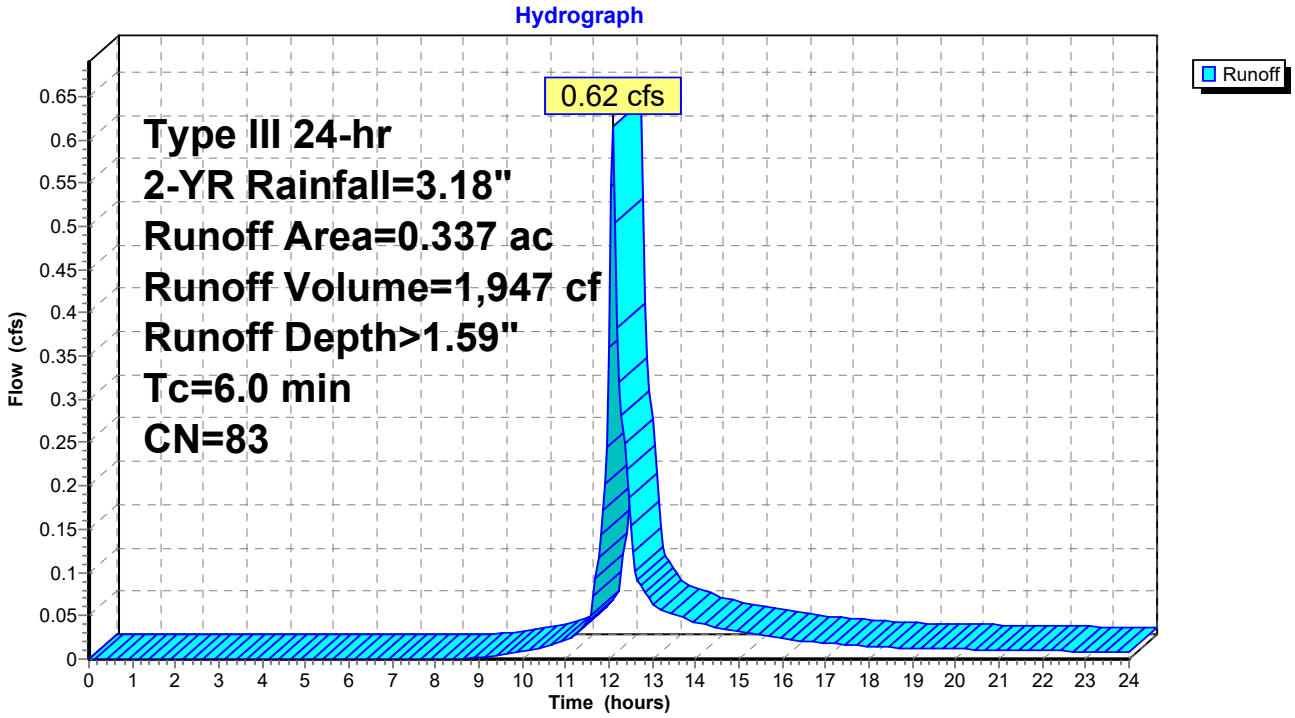
Runoff = 0.62 cfs @ 12.09 hrs, Volume= 1,947 cf, Depth> 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.18"

	Area (ac)	CN	Description
*	0.074	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.070	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.193	98	Paved parking
	0.337	83	Weighted Average
	0.144		42.73% Pervious Area
	0.193		57.27% Impervious Area

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

Subcatchment PD-1: Prop. Drainage Area 1



Summary for Subcatchment PD-2a: Prop. Drainage Area 2a

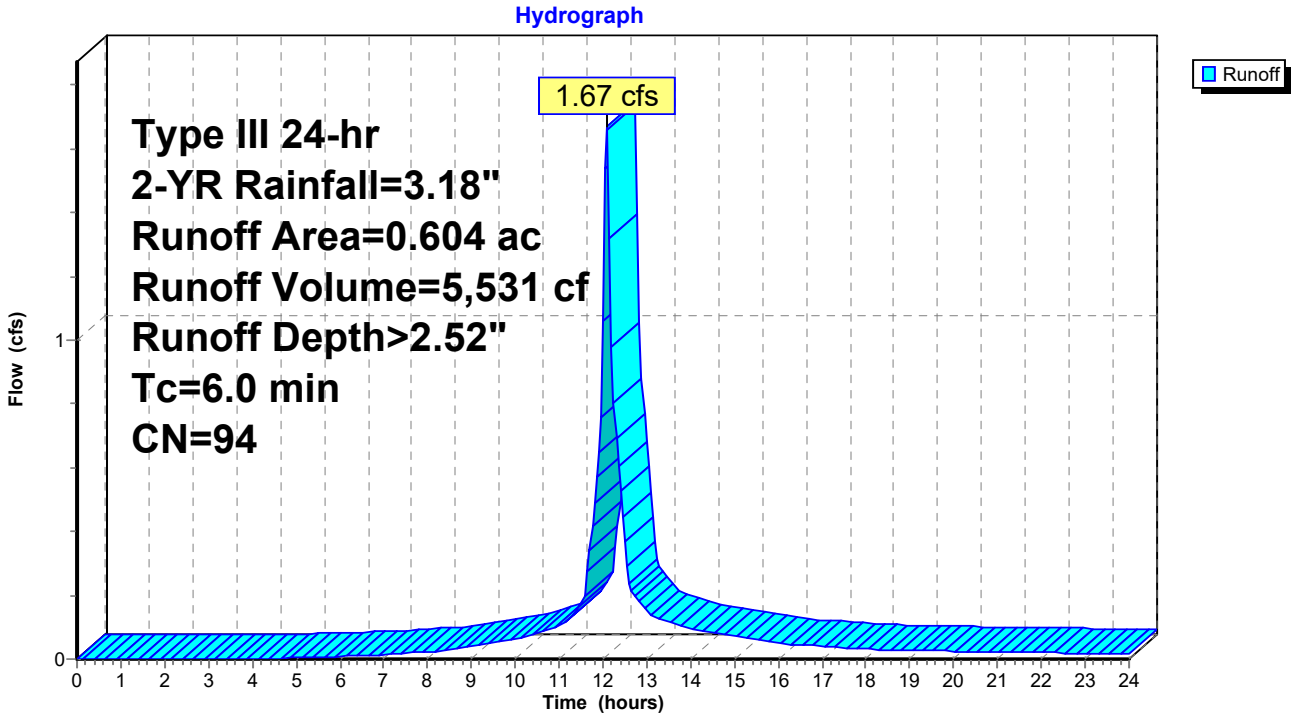
Runoff = 1.67 cfs @ 12.09 hrs, Volume= 5,531 cf, Depth> 2.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.18"

	Area (ac)	CN	Description
*	0.038	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.029	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.537	98	Paved parking
	0.604	94	Weighted Average
	0.067		11.09% Pervious Area
	0.537		88.91% Impervious Area

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

Subcatchment PD-2a: Prop. Drainage Area 2a



Summary for Subcatchment PD-2b: Prop. Drainage Area 2b

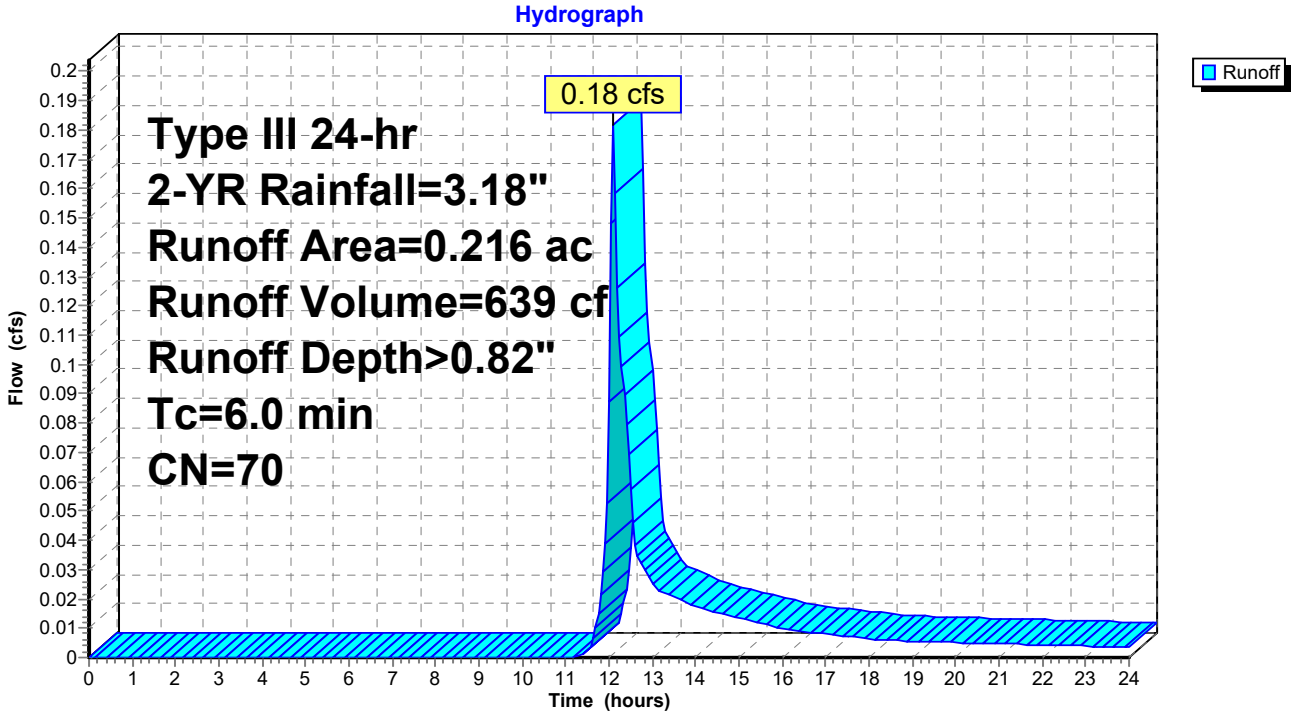
Runoff = 0.18 cfs @ 12.10 hrs, Volume= 639 cf, Depth> 0.82"

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-YR Rainfall=3.18"

	Area (ac)	CN	Description
*	0.174	74	Woods/grass comb., Fair, HSG B/D, 13
*	0.018	43	Woods/grass comb., Fair, HSG A. 36A
	0.024	65	Woods/grass comb., Fair, HSG B
	0.216	70	Weighted Average
	0.216		100.00% Pervious Area

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

Subcatchment PD-2b: Prop. Drainage Area 2b



Summary for Subcatchment PD-2c: Prop. Drainage Area 2c

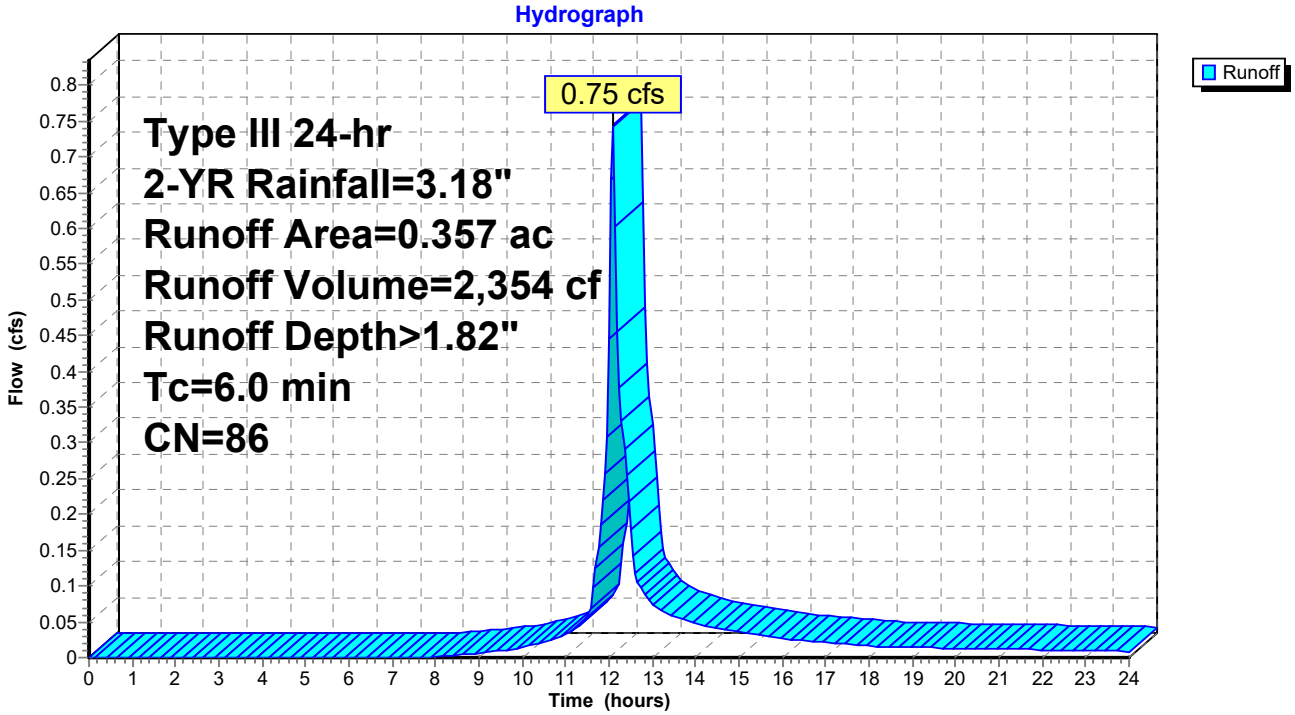
Runoff = 0.75 cfs @ 12.09 hrs, Volume= 2,354 cf, Depth> 1.82"

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-YR Rainfall=3.18"

	Area (ac)	CN	Description
*	0.061	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.042	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.021	49	50-75% Grass cover, Fair, HSG A, 36A
	0.233	98	Paved parking, HSG D
	0.357	86	Weighted Average
	0.124		34.73% Pervious Area
	0.233		65.27% Impervious Area

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

Subcatchment PD-2c: Prop. Drainage Area 2c



Summary for Subcatchment PD-2d: Prop. Drainage Area 2d

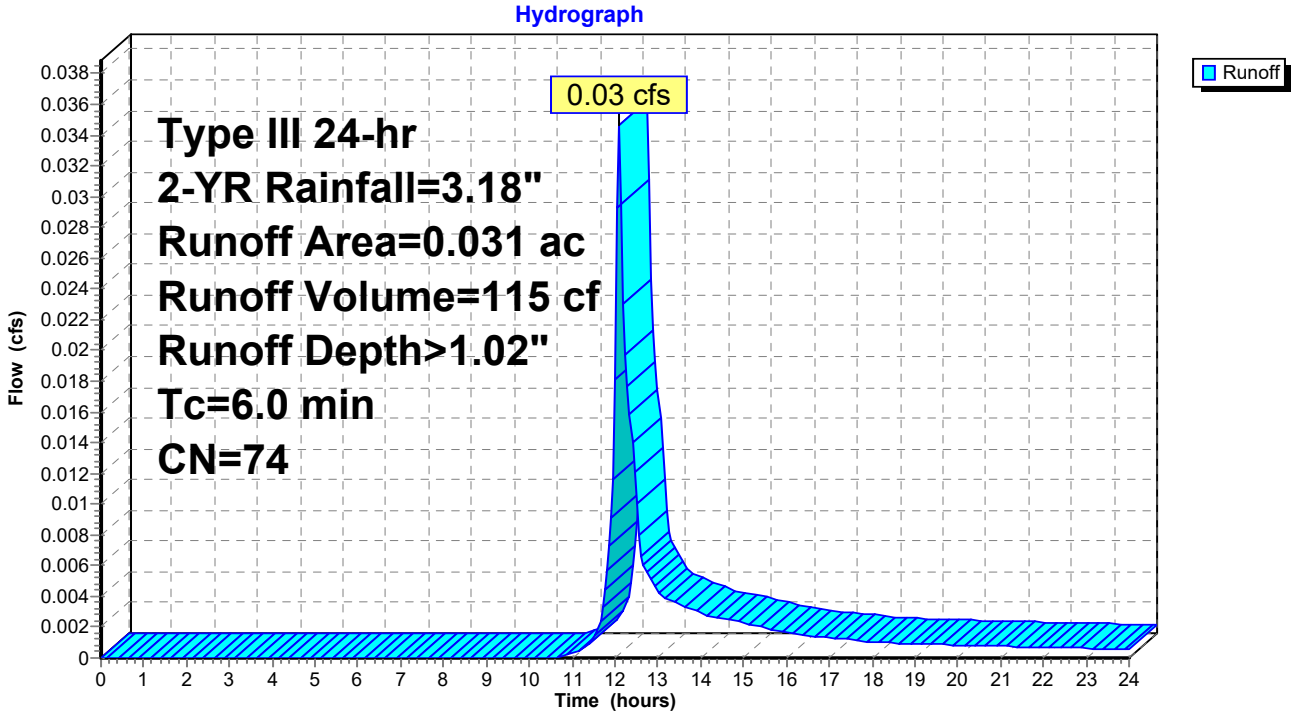
Runoff = 0.03 cfs @ 12.10 hrs, Volume= 115 cf, Depth> 1.02"

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-YR Rainfall=3.18"

	Area (ac)	CN	Description
*	0.031	74	Woods/grass comb., Fair, HSG B/D, 13
	0.031		100.00% Pervious Area

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

Subcatchment PD-2d: Prop. Drainage Area 2d



Summary for Subcatchment PD-2e: Prop. Drainage Area 2e

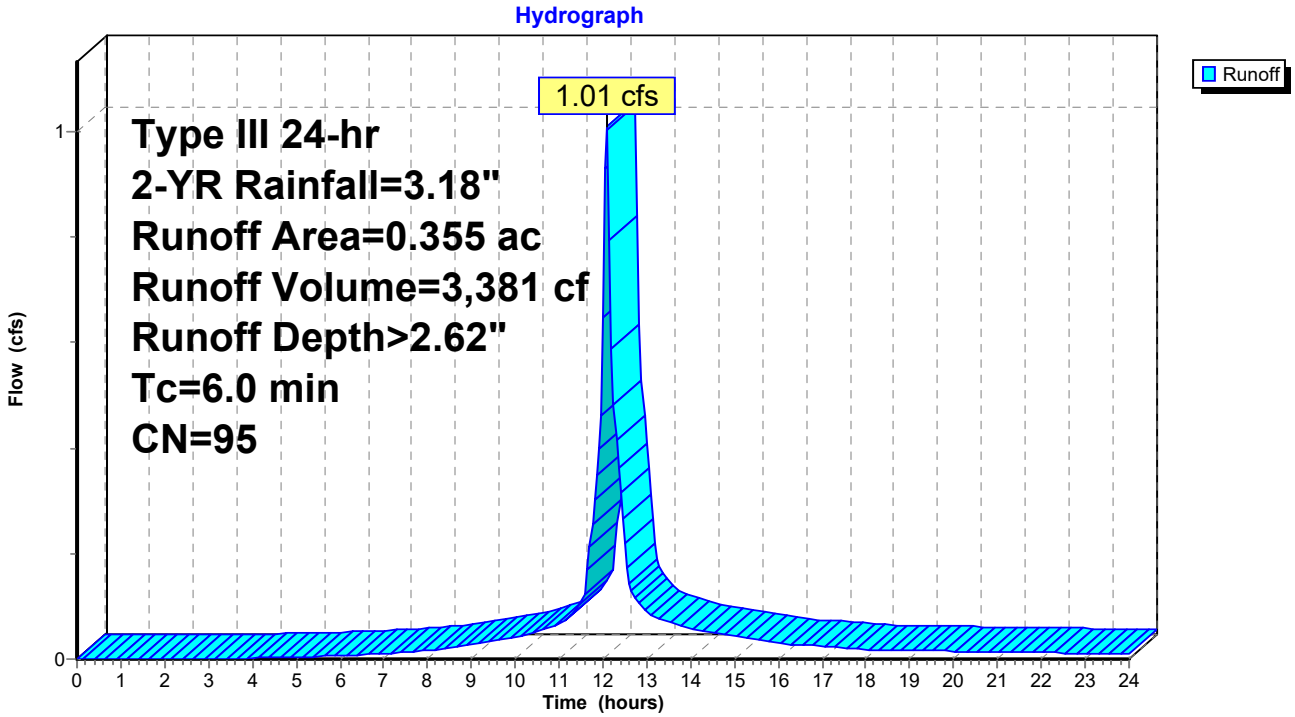
Runoff = 1.01 cfs @ 12.09 hrs, Volume= 3,381 cf, Depth> 2.62"

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-YR Rainfall=3.18"

	Area (ac)	CN	Description
*	0.004	43	Woods/grass comb., Fair, HSG A, 36A
*	0.020	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.331	98	Paved parking
	0.355	95	Weighted Average
	0.024		6.76% Pervious Area
	0.331		93.24% Impervious Area

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

Subcatchment PD-2e: Prop. Drainage Area 2e



Summary for Subcatchment PD-2f: Prop. Drainage Area 2d

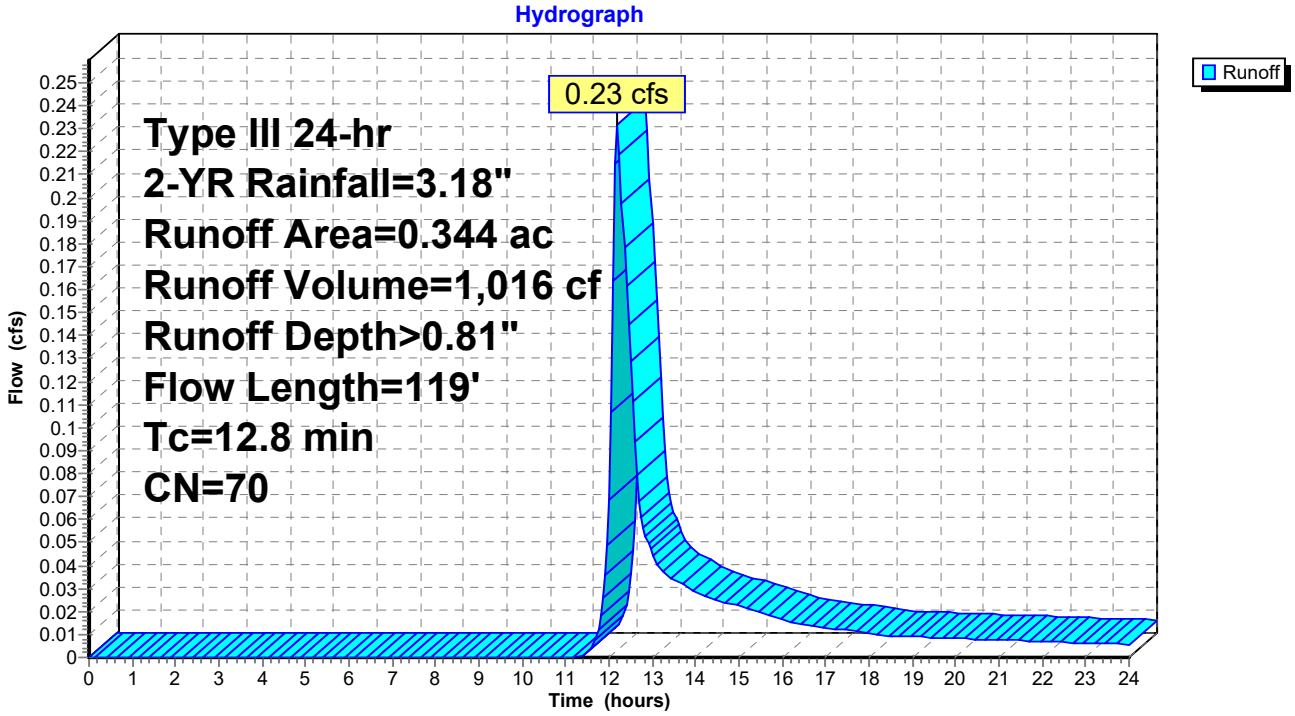
Runoff = 0.23 cfs @ 12.20 hrs, Volume= 1,016 cf, Depth> 0.81"

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-YR Rainfall=3.18"

	Area (ac)	CN	Description
*	0.296	74	Woods/grass comb., Fair, HSG B/D, 13
	0.048	43	Woods/grass comb., Fair, HSG A
	0.344	70	Weighted Average
	0.344		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	23	0.1600	0.13		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.18"
8.4	36	0.0270	0.07		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.18"
1.5	60	0.0167	0.65		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
12.8	119	Total			

Subcatchment PD-2f: Prop. Drainage Area 2d



Summary for Subcatchment PD-3a: Prop. Drainage Area 3a

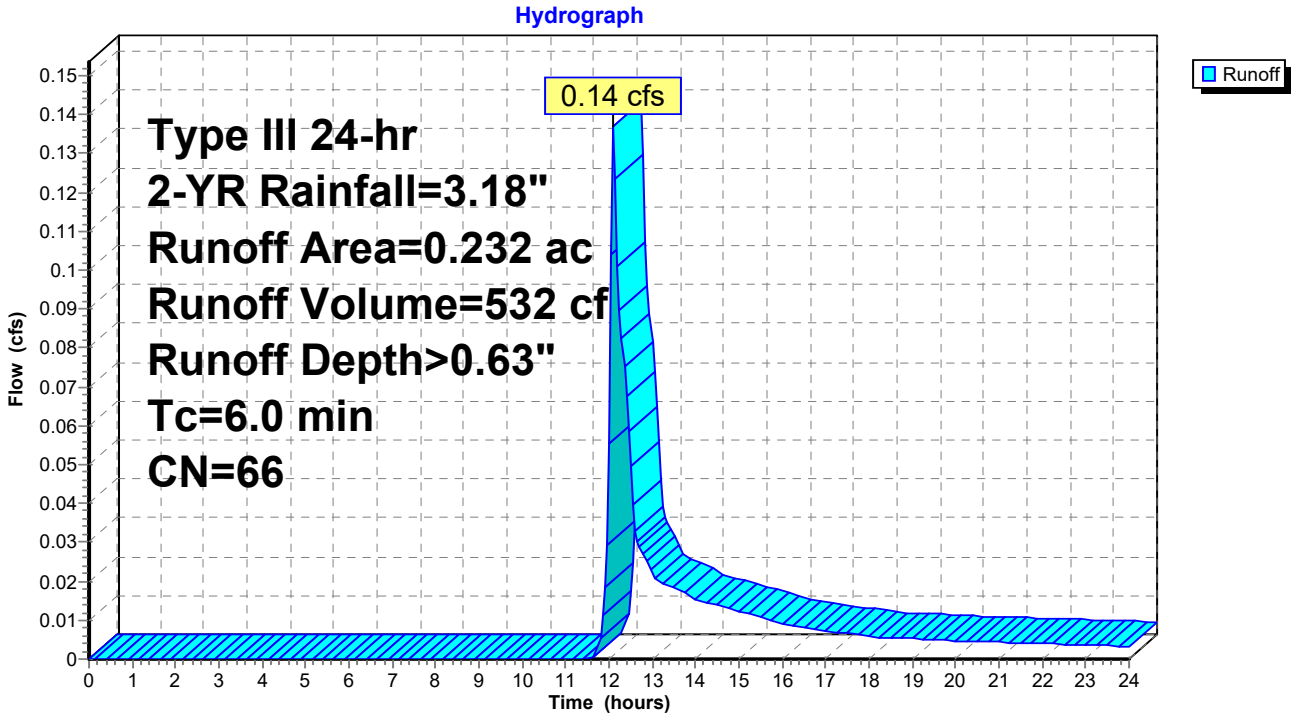
Runoff = 0.14 cfs @ 12.11 hrs, Volume= 532 cf, Depth> 0.63"

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-YR Rainfall=3.18"

	Area (ac)	CN	Description
*	0.120	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.071	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.041	98	Paved parking
	0.232	66	Weighted Average
	0.191		82.33% Pervious Area
	0.041		17.67% Impervious Area

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

Subcatchment PD-3a: Prop. Drainage Area 3a



Summary for Subcatchment PD-3b: Prop. Drainage Area 3b

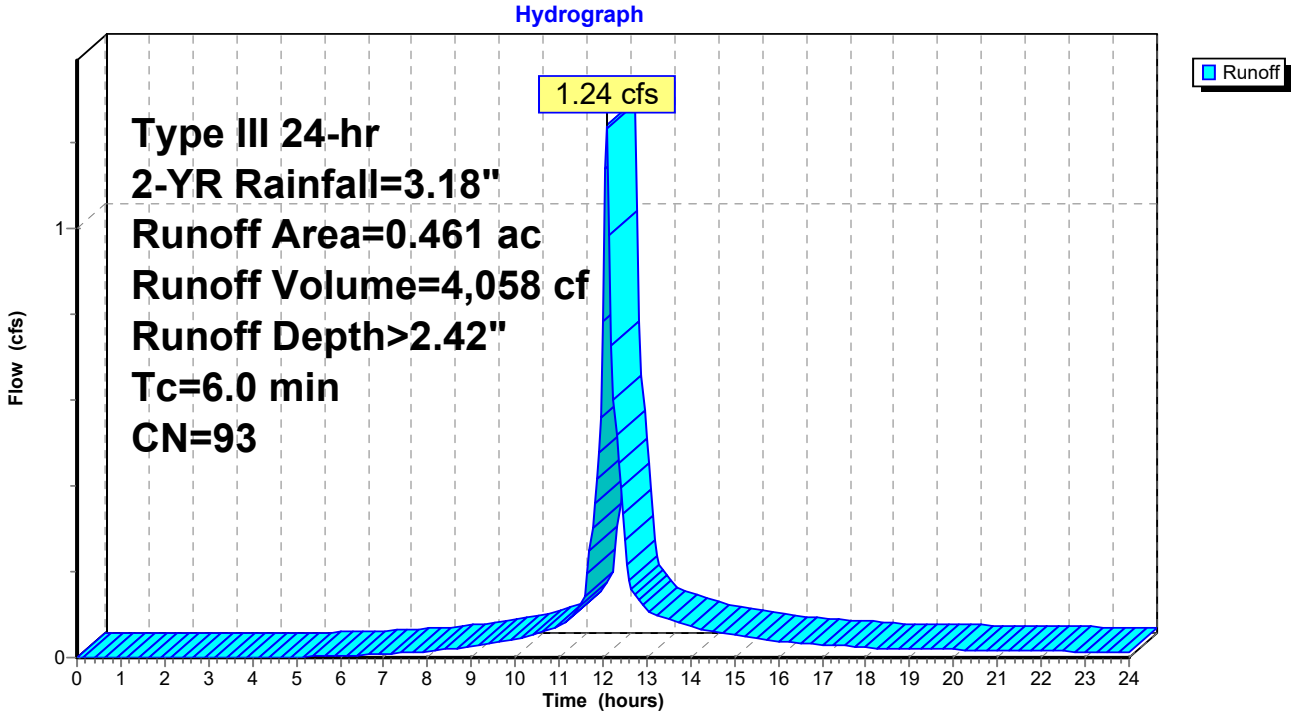
Runoff = 1.24 cfs @ 12.09 hrs, Volume= 4,058 cf, Depth> 2.42"

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-YR Rainfall=3.18"

	Area (ac)	CN	Description
*	0.093	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.019	79	50-75% Grass cover, Fair, HSG C, 701A
*	0.016	98	Paved parking
*	0.333	98	Roofing
	0.461	93	Weighted Average
	0.112		24.30% Pervious Area
	0.349		75.70% Impervious Area

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

Subcatchment PD-3b: Prop. Drainage Area 3b



Summary for Subcatchment PD-3c: Prop. Drainage Area 3c

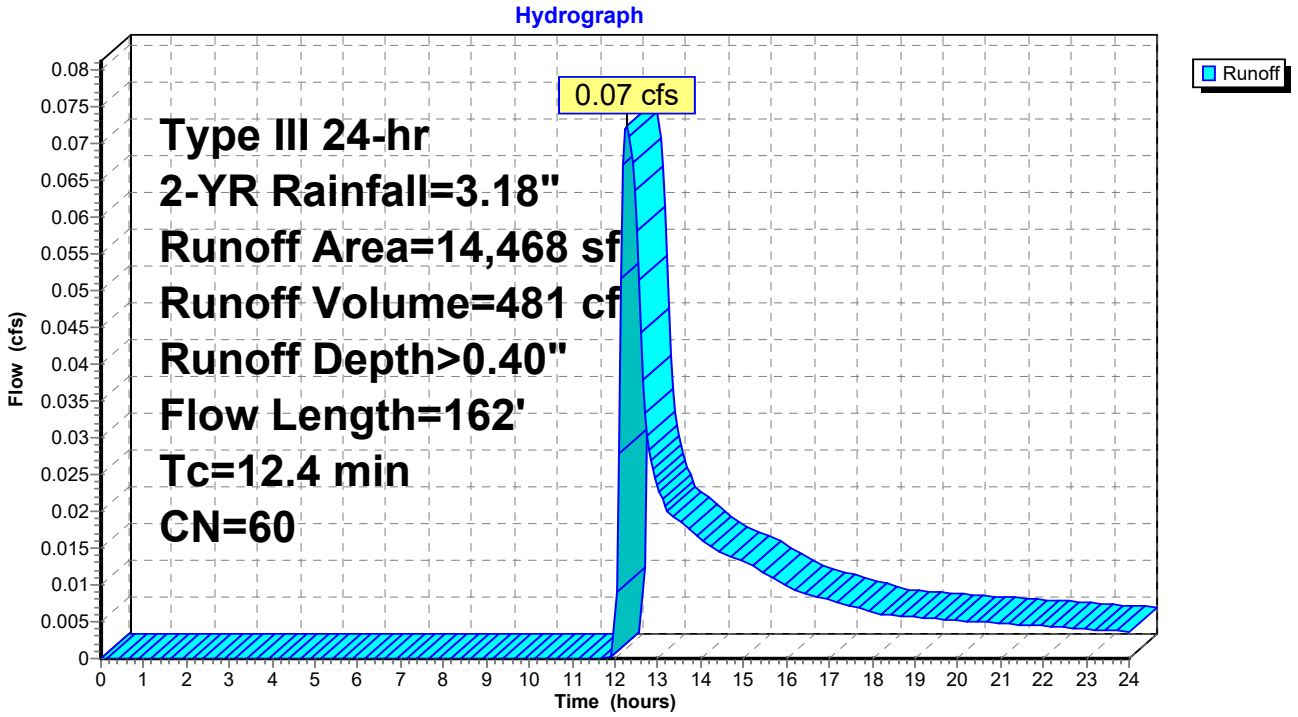
Runoff = 0.07 cfs @ 12.27 hrs, Volume= 481 cf, Depth> 0.40"

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-YR Rainfall=3.18"

	Area (sf)	CN	Description
*	6,684	43	Woods/grass comb., Fair, HSG A, 36A
*	5,545	74	Woods/grass comb., Fair, HSG C
	1,501	76	Woods/grass comb., Fair, HSG C
*	738	77	50-75% Grass cover, Fair, HSG C
	14,468	60	Weighted Average
	14,468		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	8	0.0625	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.18"
3.4	17	0.0580	0.08		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.18"
3.2	16	0.0625	0.08		**Sheet Flow, C-D** Woods: Light underbrush n= 0.400 P2= 3.18"
1.5	9	0.1250	0.10		**Sheet Flow, D-E** Woods: Light underbrush n= 0.400 P2= 3.18"
2.5	112	0.0220	0.74		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
12.4	162	Total			

Subcatchment PD-3c: Prop. Drainage Area 3c



Summary for Subcatchment RD-1: Roof 1

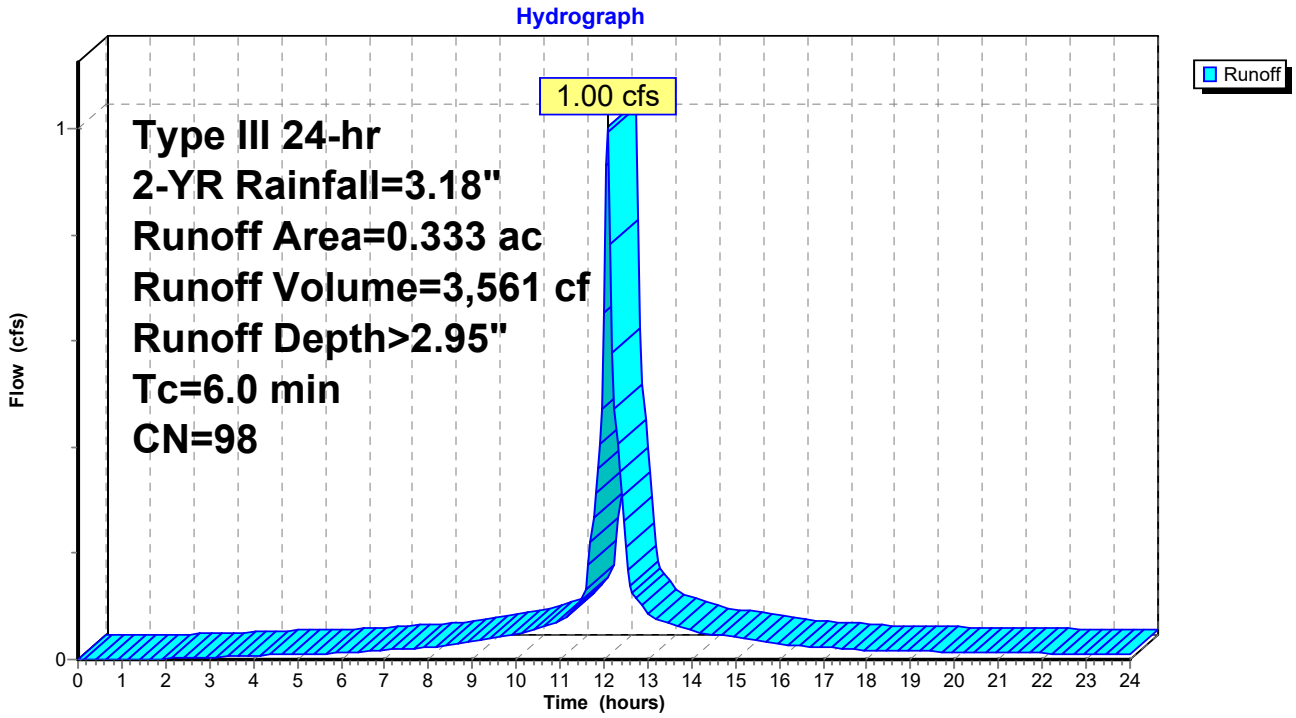
Runoff = 1.00 cfs @ 12.09 hrs, Volume= 3,561 cf, Depth> 2.95"

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-YR Rainfall=3.18"

	Area (ac)	CN	Description
*	0.333	98	Unconnected roofs
	0.333		100.00% Impervious Area
	0.333		100.00% Unconnected

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

Subcatchment RD-1: Roof 1

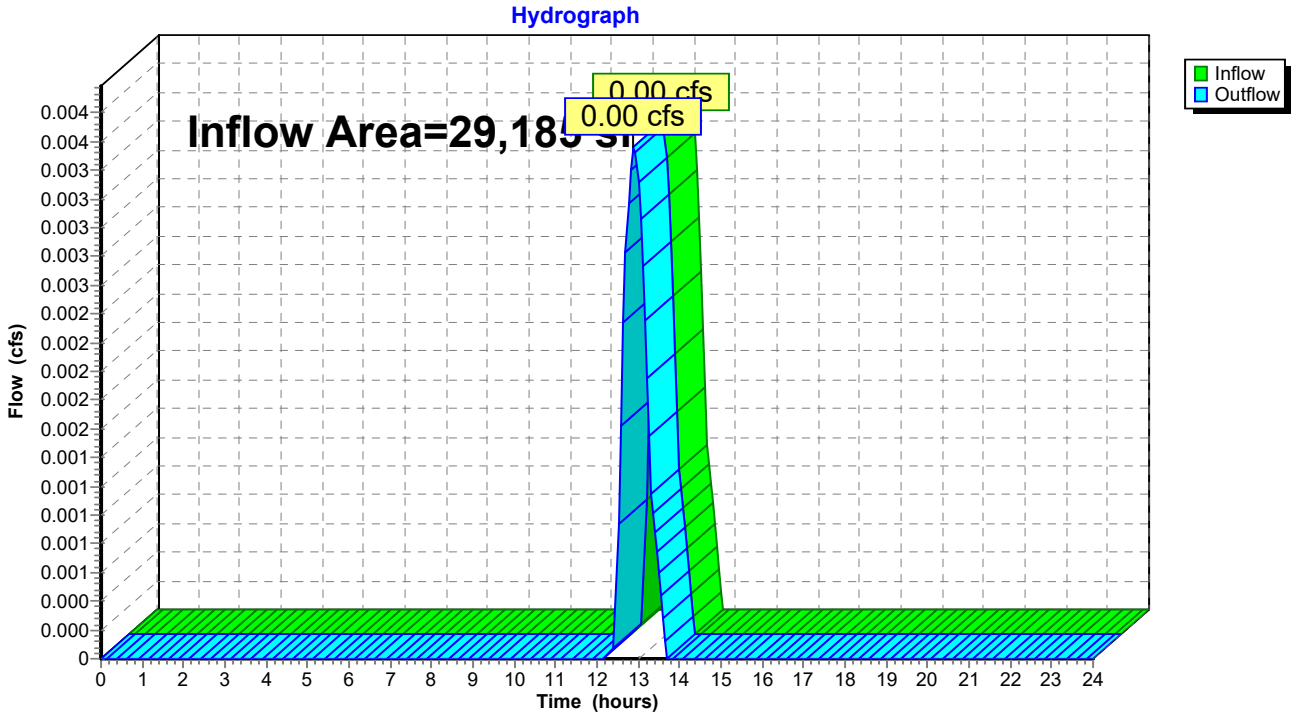


Summary for Reach DP-1a: Design Point 1

Inflow Area = 29,185 sf, 78.51% Impervious, Inflow Depth = 0.00" for 2-YR event
Inflow = 0.00 cfs @ 12.89 hrs, Volume= 8 cf
Outflow = 0.00 cfs @ 12.89 hrs, Volume= 8 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-1a: Design Point 1

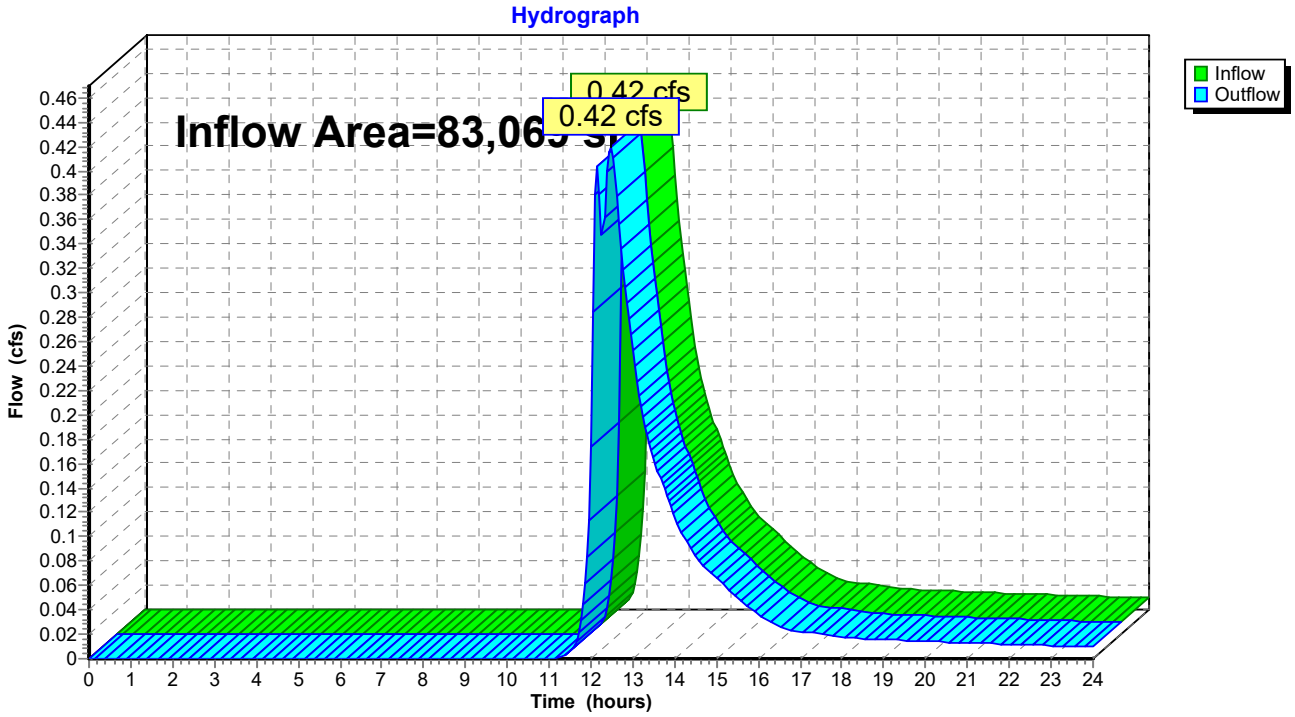


Summary for Reach DP-2a: Design Point 2

Inflow Area = 83,069 sf, 57.73% Impervious, Inflow Depth > 0.42" for 2-YR event
Inflow = 0.42 cfs @ 12.48 hrs, Volume= 2,893 cf
Outflow = 0.42 cfs @ 12.48 hrs, Volume= 2,893 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-2a: Design Point 2

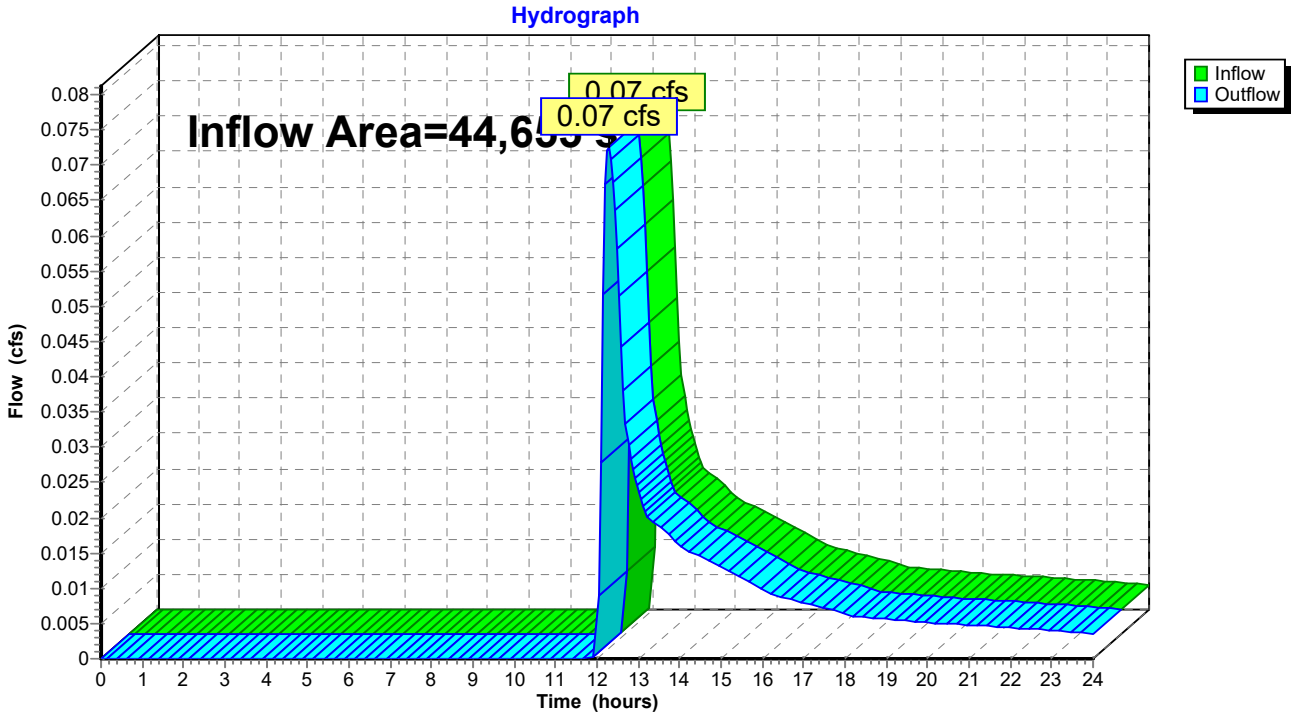


Summary for Reach DP-3a: Design Point 3

Inflow Area = 44,655 sf, 38.04% Impervious, Inflow Depth > 0.13" for 2-YR event
Inflow = 0.07 cfs @ 12.27 hrs, Volume= 481 cf
Outflow = 0.07 cfs @ 12.27 hrs, Volume= 481 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-3a: Design Point 3



Summary for Pond AB1: Above Ground Infiltration Basin 1

Inflow Area =	29,185 sf, 78.51% Impervious, Inflow Depth > 0.80" for 2-YR event				
Inflow =	0.62 cfs @	12.09 hrs,	Volume=	1,947 cf	
Outflow =	0.07 cfs @	12.89 hrs,	Volume=	1,945 cf,	Atten= 88%, Lag= 47.6 min
Discarded =	0.07 cfs @	12.89 hrs,	Volume=	1,937 cf	
Primary =	0.00 cfs @	12.89 hrs,	Volume=	8 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 128.03' @ 12.89 hrs Surf.Area= 1,242 sf Storage= 751 cf

Plug-Flow detention time= 105.7 min calculated for 1,941 cf (100% of inflow)
Center-of-Mass det. time= 104.9 min (937.6 - 832.7)

Volume	Invert	Avail.Storage	Storage Description
#1	127.00'	4,542 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 4,798 cf Overall - 256 cf Embedded = 4,542 cf
#2	127.00'	102 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) Inside #1 256 cf Overall x 40.0% Voids
		4,644 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
127.00	512	0	0
128.00	1,218	865	865
129.00	1,949	1,584	2,449
130.00	2,749	2,349	4,798

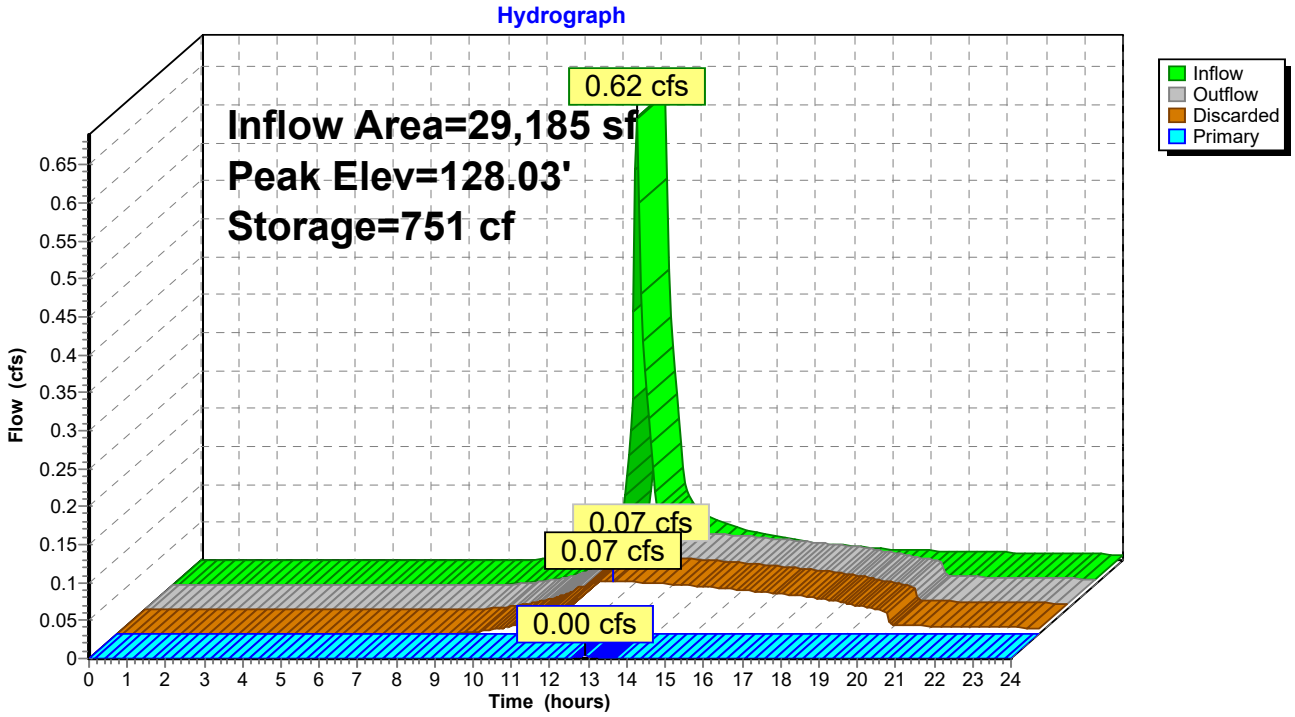
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
127.00	512	0	0
127.50	512	256	256

Device	Routing	Invert	Outlet Devices
#1	Primary	127.57'	**8.0" Round Culvert Barrel** L= 13.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 127.57' / 127.50' S= 0.0054 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.35 sf
#2	Device 1	129.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	127.00'	**2.410 in/hr Exfiltration over Surface area**
#4	Device 1	128.00'	**5.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.07 cfs @ 12.89 hrs HW=128.03' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 12.89 hrs HW=128.03' (Free Discharge)
└─**1=Culvert Barrel** (Passes 0.00 cfs of 0.33 cfs potential flow)
  ├─**2=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Orifice Controls 0.00 cfs @ 0.61 fps)

Pond AB1: Above Ground Infiltration Basin 1



Stage-Area-Storage for Pond AB1: Above Ground Infiltration Basin 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
127.00	512	0
127.05	547	11
127.10	583	24
127.15	618	39
127.20	653	55
127.25	689	73
127.30	724	93
127.35	759	115
127.40	794	138
127.45	830	164
127.50	865	191
127.55	900	235
127.60	936	281
127.65	971	328
127.70	1,006	378
127.75	1,042	429
127.80	1,077	482
127.85	1,112	537
127.90	1,147	593
127.95	1,183	651
128.00	1,218	711
128.05	1,255	773
128.10	1,291	837
128.15	1,328	902
128.20	1,364	970
128.25	1,401	1,039
128.30	1,437	1,110
128.35	1,474	1,182
128.40	1,510	1,257
128.45	1,547	1,334
128.50	1,584	1,412
128.55	1,620	1,492
128.60	1,657	1,574
128.65	1,693	1,658
128.70	1,730	1,743
128.75	1,766	1,830
128.80	1,803	1,920
128.85	1,839	2,011
128.90	1,876	2,104
128.95	1,912	2,198
129.00	1,949	2,295
129.05	1,989	2,393
129.10	2,029	2,494
129.15	2,069	2,596
129.20	2,109	2,701
129.25	2,149	2,807
129.30	2,189	2,916
129.35	2,229	3,026
129.40	2,269	3,139
129.45	2,309	3,253
129.50	2,349	3,369
129.55	2,389	3,488
129.60	2,429	3,608
129.65	2,469	3,731
129.70	2,509	3,855
129.75	2,549	3,982
129.80	2,589	4,110
129.85	2,629	4,241
129.90	2,669	4,373
129.95	2,709	4,507
130.00	**2,749**	**4,644**

Summary for Pond AB3a: Above Ground Infiltration 3a

Inflow Area =	10,106 sf, 17.67% Impervious, Inflow Depth > 0.63" for 2-YR event				
Inflow =	0.14 cfs @	12.11 hrs,	Volume=	532 cf	
Outflow =	0.05 cfs @	12.48 hrs,	Volume=	531 cf,	Atten= 61%, Lag= 22.0 min
Discarded =	0.05 cfs @	12.48 hrs,	Volume=	531 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= 132.08' @ 12.48 hrs Surf.Area= 963 sf Storage= 77 cf

Plug-Flow detention time= 10.4 min calculated for 530 cf (100% of inflow)
Center-of-Mass det. time= 9.2 min (900.1 - 890.9)

Volume	Invert	Avail.Storage	Storage Description
#1	132.00'	3,206 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

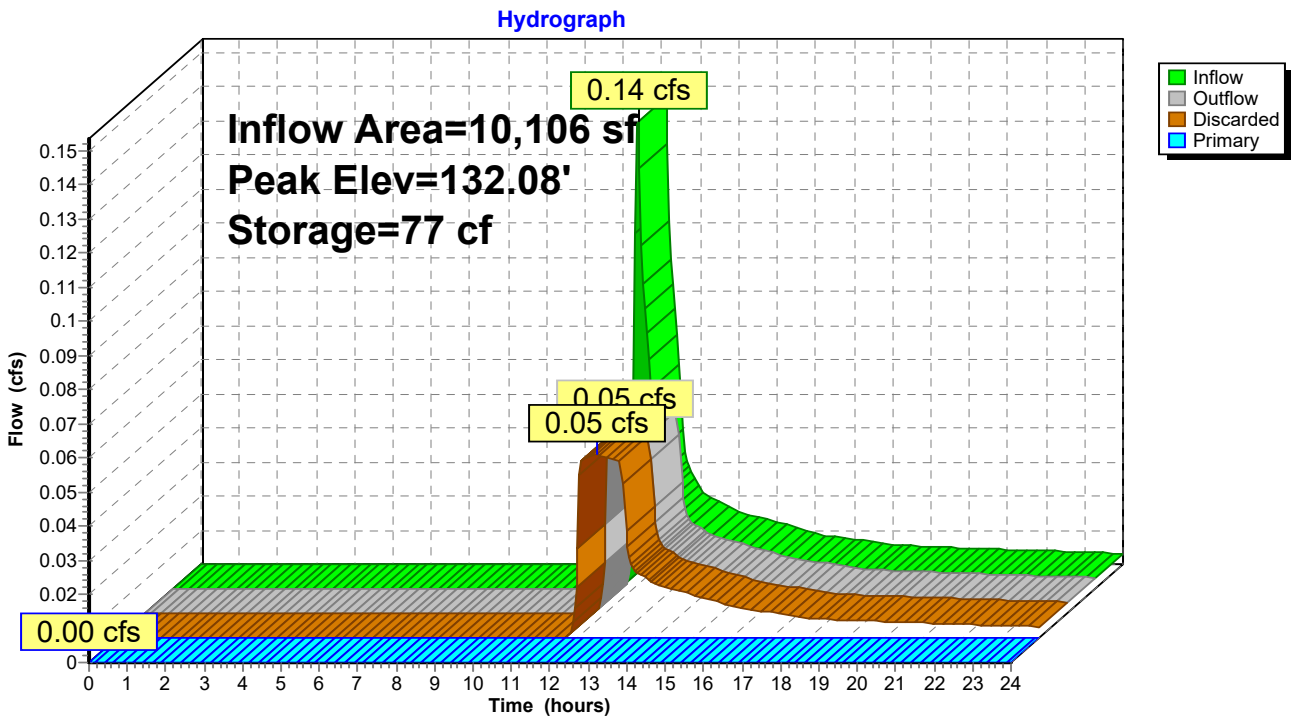
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
132.00	906	0	0
133.00	1,593	1,250	1,250
134.00	2,319	1,956	3,206

Device	Routing	Invert	Outlet Devices
#1	Discarded	132.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	133.00'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.05 cfs @ 12.48 hrs HW=132.08' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=132.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond AB3a: Above Ground Infiltration 3a



Stage-Area-Storage for Pond AB3a: Above Ground Infiltration 3a

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
132.00	906	0
132.02	920	18
132.04	933	37
132.06	947	56
132.08	961	75
132.10	975	94
132.12	988	114
132.14	1,002	134
132.16	1,016	154
132.18	1,030	174
132.20	1,043	195
132.22	1,057	216
132.24	1,071	237
132.26	1,085	259
132.28	1,098	281
132.30	1,112	303
132.32	1,126	325
132.34	1,140	348
132.36	1,153	371
132.38	1,167	394
132.40	1,181	417
132.42	1,195	441
132.44	1,208	465
132.46	1,222	489
132.48	1,236	514
132.50	1,250	539
132.52	1,263	564
132.54	1,277	589
132.56	1,291	615
132.58	1,304	641
132.60	1,318	667
132.62	1,332	694
132.64	1,346	721
132.66	1,359	748
132.68	1,373	775
132.70	1,387	803
132.72	1,401	830
132.74	1,414	859
132.76	1,428	887
132.78	1,442	916
132.80	1,456	945
132.82	1,469	974
132.84	1,483	1,003
132.86	1,497	1,033
132.88	1,511	1,063
132.90	1,524	1,094
132.92	1,538	1,124
132.94	1,552	1,155
132.96	1,566	1,186
132.98	1,579	1,218
133.00	1,593	1,250
133.02	1,608	1,282
133.04	1,622	1,314
133.06	1,637	1,346
133.08	1,651	1,379
133.10	1,666	1,412
133.12	1,680	1,446
133.14	1,695	1,480
133.16	1,709	1,514
133.18	1,724	1,548
133.20	1,738	1,583
133.22	1,753	1,618
133.24	1,767	1,653
133.26	1,782	1,688
133.28	1,796	1,724
133.30	1,811	1,760
133.32	1,825	1,796
133.34	1,840	1,833
133.36	1,854	1,870
133.38	1,869	1,907
133.40	1,883	1,945
133.42	1,898	1,983
133.44	1,912	2,021
133.46	1,927	2,059
133.48	1,941	2,098
133.50	1,956	2,137
133.52	1,971	2,176
133.54	1,985	2,216
133.56	2,000	2,255
133.58	2,014	2,296
133.60	2,029	2,336
133.62	2,043	2,377
133.64	2,058	2,418
133.66	2,072	2,459
133.68	2,087	2,501
133.70	2,101	2,542
133.72	2,116	2,585
133.74	2,130	2,627
133.76	2,145	2,670
133.78	2,159	2,713
133.80	2,174	2,756
133.82	2,188	2,800
133.84	2,203	2,844
133.86	2,217	2,888
133.88	2,232	2,932
133.90	2,246	2,977
133.92	2,261	3,022
133.94	2,275	3,068
133.96	2,290	3,113
133.98	2,304	3,159
134.00	**2,319**	**3,206**

Summary for Pond AB3b: Above Ground Infiltration 3b

Inflow Area =	20,081 sf, 75.70% Impervious, Inflow Depth > 2.42" for 2-YR event				
Inflow =	1.24 cfs @	12.09 hrs,	Volume=	4,058 cf	
Outflow =	0.04 cfs @	15.82 hrs,	Volume=	1,898 cf,	Atten= 97%, Lag= 224.2 min
Discarded =	0.04 cfs @	15.82 hrs,	Volume=	1,898 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= 132.88' @ 15.82 hrs Surf.Area= 1,731 sf Storage= 2,694 cf

Plug-Flow detention time= 344.9 min calculated for 1,898 cf (47% of inflow)
Center-of-Mass det. time= 228.6 min (1,021.0 - 792.4)

Volume	Invert	Avail.Storage	Storage Description
#1	130.00'	5,050 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

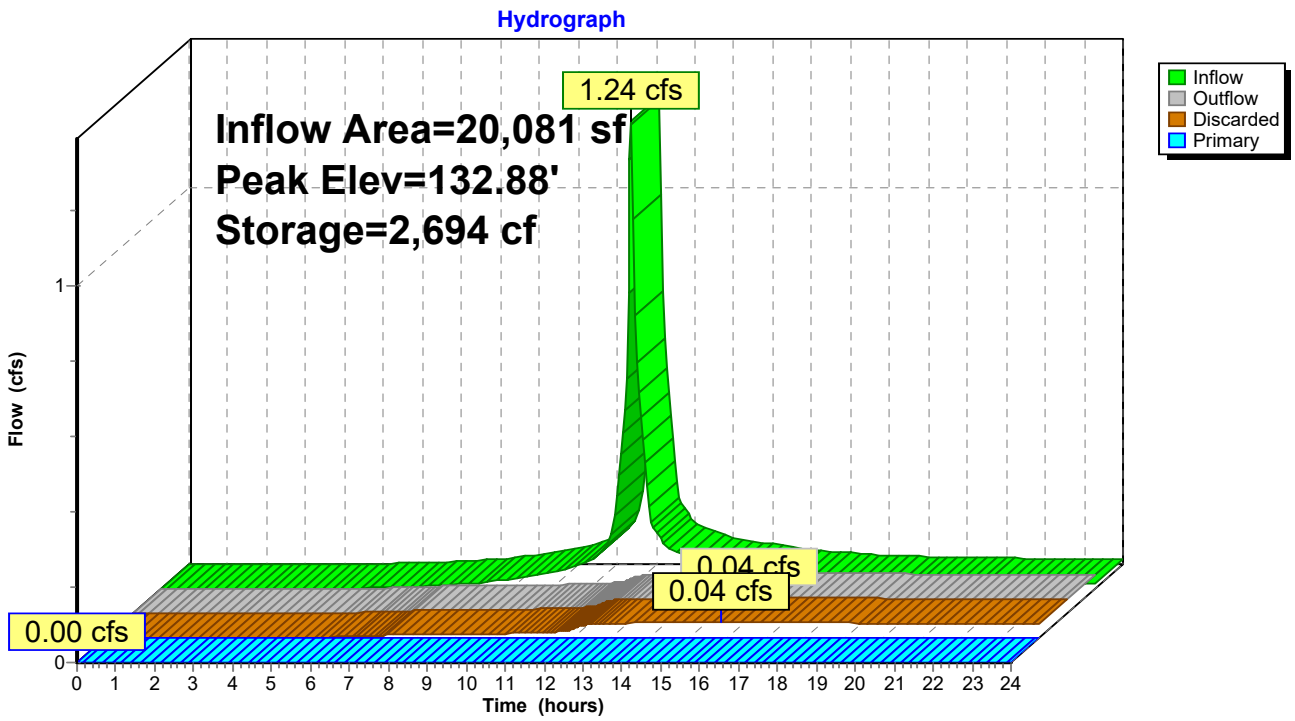
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
130.00	307	0	0
131.00	671	489	489
132.00	1,175	923	1,412
133.00	1,806	1,491	2,903
134.00	2,488	2,147	5,050

Device	Routing	Invert	Outlet Devices
#1	Primary	133.15'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Discarded	130.00'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.04 cfs @ 15.82 hrs HW=132.88' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=130.00' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond AB3b: Above Ground Infiltration 3b



Stage-Area-Storage for Pond AB3b: Above Ground Infiltration 3b

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.00	307	0
130.05	325	16
130.10	343	33
130.15	362	50
130.20	380	69
130.25	398	88
130.30	416	108
130.35	434	130
130.40	453	152
130.45	471	175
130.50	489	199
130.55	507	224
130.60	525	250
130.65	544	276
130.70	562	304
130.75	580	333
130.80	598	362
130.85	616	392
130.90	635	424
130.95	653	456
131.00	671	489
131.05	696	523
131.10	721	559
131.15	747	595
131.20	772	633
131.25	797	673
131.30	822	713
131.35	847	755
131.40	873	798
131.45	898	842
131.50	923	888
131.55	948	934
131.60	973	982
131.65	999	1,032
131.70	1,024	1,082
131.75	1,049	1,134
131.80	1,074	1,187
131.85	1,099	1,241
131.90	1,125	1,297
131.95	1,150	1,354
132.00	1,175	1,412
132.05	1,207	1,472
132.10	1,238	1,533
132.15	1,270	1,595
132.20	1,301	1,660
132.25	1,333	1,725
132.30	1,364	1,793
132.35	1,396	1,862
132.40	1,427	1,932
132.45	1,459	2,005
132.50	1,491	2,078
132.55	1,522	2,154
132.60	1,554	2,231
132.65	1,585	2,309
132.70	1,617	2,389
132.75	1,648	2,471
132.80	1,680	2,554
132.85	1,711	2,639
132.90	1,743	2,725
132.95	1,774	2,813
133.00	1,806	2,903
133.05	1,840	2,994
133.10	1,874	3,087
133.15	1,908	3,181
133.20	1,942	3,277
133.25	1,977	3,375
133.30	2,011	3,475
133.35	2,045	3,576
133.40	2,079	3,679
133.45	2,113	3,784
133.50	2,147	3,891
133.55	2,181	3,999
133.60	2,215	4,109
133.65	2,249	4,220
133.70	2,283	4,334
133.75	2,318	4,449
133.80	2,352	4,566
133.85	2,386	4,684
133.90	2,420	4,804
133.95	2,454	4,926
134.00	**2,488**	**5,050**

Summary for Pond IB1: Infiltration Basin 1

Inflow Area = 14,505 sf,100.00% Impervious, Inflow Depth > 2.95" for 2-YR event
Inflow = 1.00 cfs @ 12.09 hrs, Volume= 3,561 cf
Outflow = 0.11 cfs @ 11.50 hrs, Volume= 3,558 cf, Atten= 89%, Lag= 0.0 min
Discarded = 0.11 cfs @ 11.50 hrs, Volume= 3,558 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= 130.03' @ 12.81 hrs Surf.Area= 1,889 sf Storage= 1,188 cf

Plug-Flow detention time= 76.3 min calculated for 3,558 cf (100% of inflow)
Center-of-Mass det. time= 75.8 min (831.9 - 756.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	129.00'	1,726 cf	**25.25'W x 74.82'L x 3.50'H Field A** 6,612 cf Overall - 2,297 cf Embedded = 4,315 cf x 40.0% Voids
#2A	129.50'	2,297 cf	**ADS_StormTech SC-740 +Cap** x 50 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 5 Rows of 10 Chambers
		4,023 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	130.24'	**12.0" Round Culvert** L= 10.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 130.24' / 130.00' S= 0.0240 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#2	Discarded	129.00'	**2.410 in/hr Exfiltration over Surface area**
#3	Device 1	130.40'	**3.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	132.05'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.11 cfs @ 11.50 hrs HW=129.04' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=129.00' (Free Discharge)
└─**1=Culvert** (Controls 0.00 cfs)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB1: Infiltration Basin 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

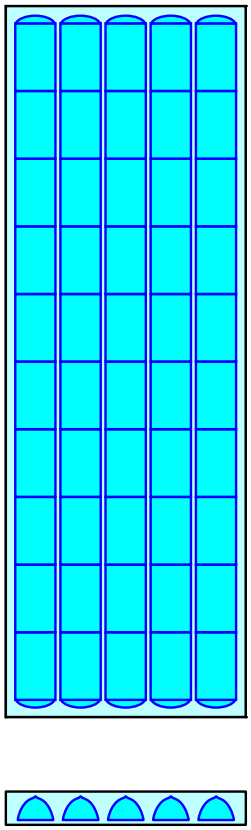
10 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 72.82' Row Length +12.0" End Stone x 2 = 74.82' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

50 Chambers x 45.9 cf = 2,297.0 cf Chamber Storage

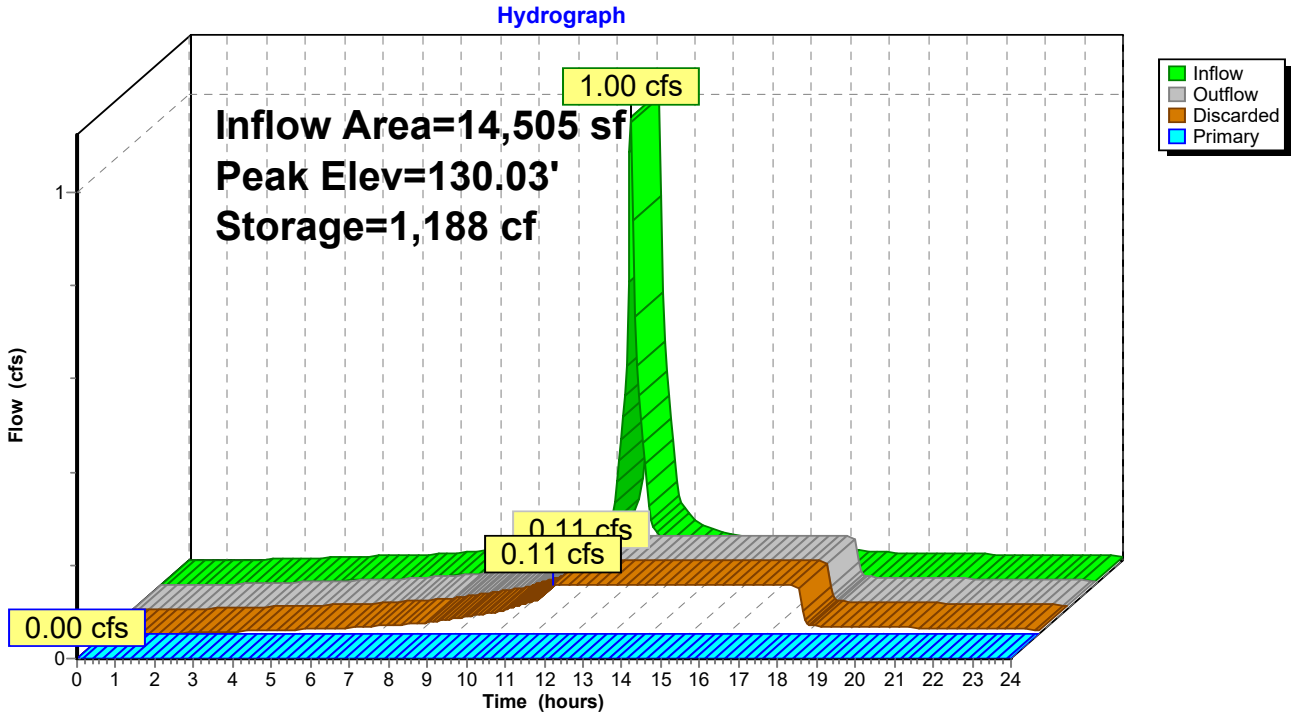
6,611.9 cf Field - 2,297.0 cf Chambers = 4,314.9 cf Stone x 40.0% Voids = 1,726.0 cf Stone Storage

Chamber Storage + Stone Storage = 4,023.0 cf = 0.092 af
Overall Storage Efficiency = 60.8%
Overall System Size = 74.82' x 25.25' x 3.50'

50 Chambers
244.9 cy Field
159.8 cy Stone



Pond IB1: Infiltration Basin 1



Stage-Area-Storage for Pond IB1: Infiltration Basin 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
129.00	**1,889**	0
129.05	1,889	38
129.10	1,889	76
129.15	1,889	113
129.20	1,889	151
129.25	1,889	189
129.30	1,889	227
129.35	1,889	264
129.40	1,889	302
129.45	1,889	340
129.50	1,889	378
129.55	1,889	455
129.60	1,889	533
129.65	1,889	610
129.70	1,889	687
129.75	1,889	764
129.80	1,889	841
129.85	1,889	917
129.90	1,889	993
129.95	1,889	1,069
130.00	1,889	1,145
130.05	1,889	1,220
130.10	1,889	1,295
130.15	1,889	1,369
130.20	1,889	1,444
130.25	1,889	1,517
130.30	1,889	1,591
130.35	1,889	1,664
130.40	1,889	1,736
130.45	1,889	1,809
130.50	1,889	1,880
130.55	1,889	1,952
130.60	1,889	2,022
130.65	1,889	2,093
130.70	1,889	2,162
130.75	1,889	2,232
130.80	1,889	2,300
130.85	1,889	2,368
130.90	1,889	2,435
130.95	1,889	2,502
131.00	1,889	2,568
131.05	1,889	2,634
131.10	1,889	2,698
131.15	1,889	2,762
131.20	1,889	2,825
131.25	1,889	2,887
131.30	1,889	2,948
131.35	1,889	3,008
131.40	1,889	3,067
131.45	1,889	3,124
131.50	1,889	3,181
131.55	1,889	3,236
131.60	1,889	3,290
131.65	1,889	3,342
131.70	1,889	3,392
131.75	1,889	3,439
131.80	1,889	3,484
131.85	1,889	3,526
131.90	1,889	3,567
131.95	1,889	3,607
132.00	1,889	3,645
132.05	1,889	3,683
132.10	1,889	3,721
132.15	1,889	3,758
132.20	1,889	3,796
132.25	1,889	3,834
132.30	1,889	3,872
132.35	1,889	3,910
132.40	1,889	3,947
132.45	1,889	3,985
132.50	1,889	**4,023**

Summary for Pond IB2a: Infiltration Basin 2a

Inflow Area =	26,310 sf, 88.91% Impervious, Inflow Depth > 2.52" for 2-YR event				
Inflow =	1.67 cfs @	12.09 hrs,	Volume=	5,531 cf	
Outflow =	0.28 cfs @	12.57 hrs,	Volume=	4,316 cf,	Atten= 83%, Lag= 28.7 min
Discarded =	0.06 cfs @	10.05 hrs,	Volume=	3,316 cf	
Primary =	0.22 cfs @	12.57 hrs,	Volume=	1,000 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 128.99' @ 12.57 hrs Surf.Area= 2,458 sf Storage= 2,438 cf

Plug-Flow detention time= 216.5 min calculated for 4,316 cf (78% of inflow)
Center-of-Mass det. time= 137.6 min (924.5 - 786.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	127.50'	2,392 cf	**30.00'W x 81.94'L x 3.67'H Field A** 9,013 cf Overall - 3,032 cf Embedded = 5,981 cf x 40.0% Voids
#2A	128.00'	3,032 cf	**ADS_StormTech SC-740 +Cap** x 66 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 6 Rows of 11 Chambers
		5,424 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	128.60'	**15.0" Round Culvert** L= 55.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 128.60' / 128.00' S= 0.0109 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Discarded	127.50'	**1.020 in/hr Exfiltration over Surface area**
#3	Device 1	128.80'	**10.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	130.10'	**10.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	130.99'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.06 cfs @ 10.05 hrs HW=127.54' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.22 cfs @ 12.57 hrs HW=128.99' (Free Discharge)
└─**1=Culvert** (Passes 0.22 cfs of 0.77 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.22 cfs @ 1.39 fps)
  ├─**4=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB2a: Infiltration Basin 2a - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

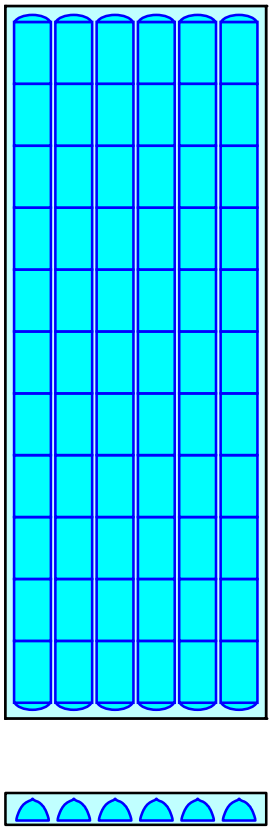
11 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 79.94' Row Length +12.0" End Stone x 2 = 81.94' Base Length
6 Rows x 51.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.00' Base Width
6.0" Base + 30.0" Chamber Height + 8.0" Cover = 3.67' Field Height

66 Chambers x 45.9 cf = 3,032.0 cf Chamber Storage

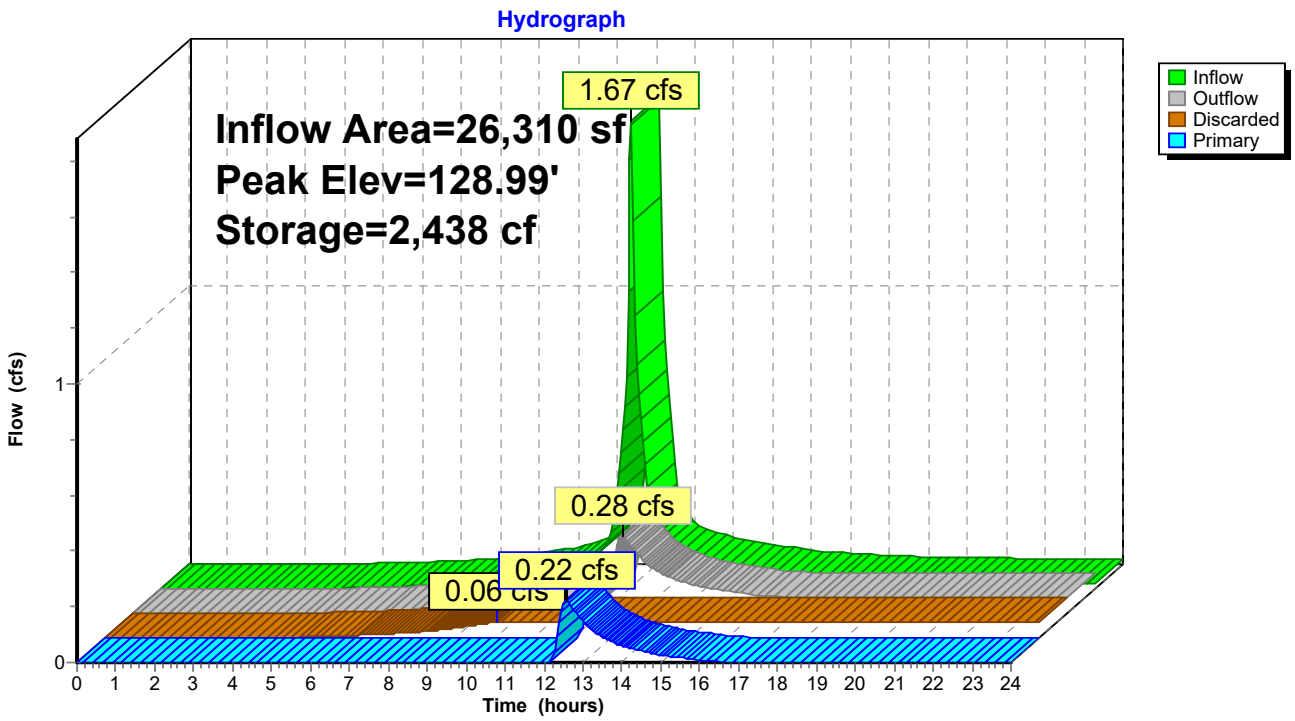
9,013.0 cf Field - 3,032.0 cf Chambers = 5,981.0 cf Stone x 40.0% Voids = 2,392.4 cf Stone Storage

Chamber Storage + Stone Storage = 5,424.4 cf = 0.125 af
Overall Storage Efficiency = 60.2%
Overall System Size = 81.94' x 30.00' x 3.67'

66 Chambers
333.8 cy Field
221.5 cy Stone



Pond IB2a: Infiltration Basin 2a



Stage-Area-Storage for Pond IB2a: Infiltration Basin 2a

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
127.50	**2,458**	0
127.55	2,458	49
127.60	2,458	98
127.65	2,458	147
127.70	2,458	197
127.75	2,458	246
127.80	2,458	295
127.85	2,458	344
127.90	2,458	393
127.95	2,458	442
128.00	2,458	492
128.05	2,458	593
128.10	2,458	695
128.15	2,458	796
128.20	2,458	897
128.25	2,458	998
128.30	2,458	1,099
128.35	2,458	1,199
128.40	2,458	1,298
128.45	2,458	1,398
128.50	2,458	1,497
128.55	2,458	1,595
128.60	2,458	1,694
128.65	2,458	1,791
128.70	2,458	1,888
128.75	2,458	1,985
128.80	2,458	2,081
128.85	2,458	2,177
128.90	2,458	2,272
128.95	2,458	2,367
129.00	2,458	2,461
129.05	2,458	2,554
129.10	2,458	2,647
129.15	2,458	2,739
129.20	2,458	2,830
129.25	2,458	2,921
129.30	2,458	3,011
129.35	2,458	3,100
129.40	2,458	3,188
129.45	2,458	3,275
129.50	2,458	3,362
129.55	2,458	3,447
129.60	2,458	3,532
129.65	2,458	3,615
129.70	2,458	3,698
129.75	2,458	3,779
129.80	2,458	3,858
129.85	2,458	3,937
129.90	2,458	4,014
129.95	2,458	4,089
130.00	2,458	4,164
130.05	2,458	4,236
130.10	2,458	4,306
130.15	2,458	4,374
130.20	2,458	4,439
130.25	2,458	4,501
130.30	2,458	4,559
130.35	2,458	4,614
130.40	2,458	4,667
130.45	2,458	4,719
130.50	2,458	4,769
130.55	2,458	4,818
130.60	2,458	4,867
130.65	2,458	4,916
130.70	2,458	4,966
130.75	2,458	5,015
130.80	2,458	5,064
130.85	2,458	5,113
130.90	2,458	5,162
130.95	2,458	5,211
131.00	2,458	5,261
131.05	2,458	5,310
131.10	2,458	5,359
131.15	2,458	**5,408**

Summary for Pond IB2c: Infiltration Basin Area 2c

Inflow Area =	15,551 sf, 65.27% Impervious, Inflow Depth > 1.82" for 2-YR event				
Inflow =	0.75 cfs @	12.09 hrs,	Volume=	2,354 cf	
Outflow =	0.09 cfs @	12.85 hrs,	Volume=	2,351 cf,	Atten= 88%, Lag= 45.6 min
Discarded =	0.06 cfs @	11.60 hrs,	Volume=	2,228 cf	
Primary =	0.03 cfs @	12.85 hrs,	Volume=	122 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 130.75' @ 12.85 hrs Surf.Area= 2,373 sf Storage= 930 cf

Plug-Flow detention time= 136.6 min calculated for 2,351 cf (100% of inflow)
Center-of-Mass det. time= 135.8 min (958.1 - 822.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	130.00'	1,505 cf	**27.00'W x 87.91'L x 2.00'H Field A** 4,747 cf Overall - 985 cf Embedded = 3,762 cf x 40.0% Voids
#2A	130.50'	985 cf	**ADS_StormTech SC-160LP +Cap** x 144 Inside #1 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 12 Rows of 12 Chambers
		2,489 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	130.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	129.20'	**8.0" Round Culvert** L= 14.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 129.20' / 129.00' S= 0.0143 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.35 sf
#3	Device 2	130.70'	**11.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 2	131.40'	**2.0" Vert. Orifice/Grate** C= 0.600
#5	Device 2	131.88'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.06 cfs @ 11.60 hrs HW=130.02' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.03 cfs @ 12.85 hrs HW=130.75' (Free Discharge)
└─**2=Culvert** (Passes 0.03 cfs of 2.21 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.03 cfs @ 0.70 fps)
  ├─**4=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB2c: Infiltration Basin Area 2c - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-160LP +Cap (ADS StormTech® SC-160LP with cap length)
Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf
Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap

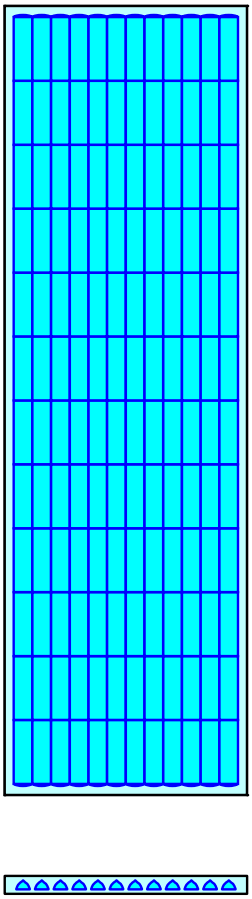
12 Chambers/Row x 7.12' Long +0.23' Cap Length x 2 = 85.91' Row Length +12.0" End Stone x 2 = 87.91' Base Length
12 Rows x 25.0" Wide + 12.0" Side Stone x 2 = 27.00' Base Width
6.0" Base + 12.0" Chamber Height + 6.0" Cover = 2.00' Field Height

144 Chambers x 6.8 cf = 984.5 cf Chamber Storage

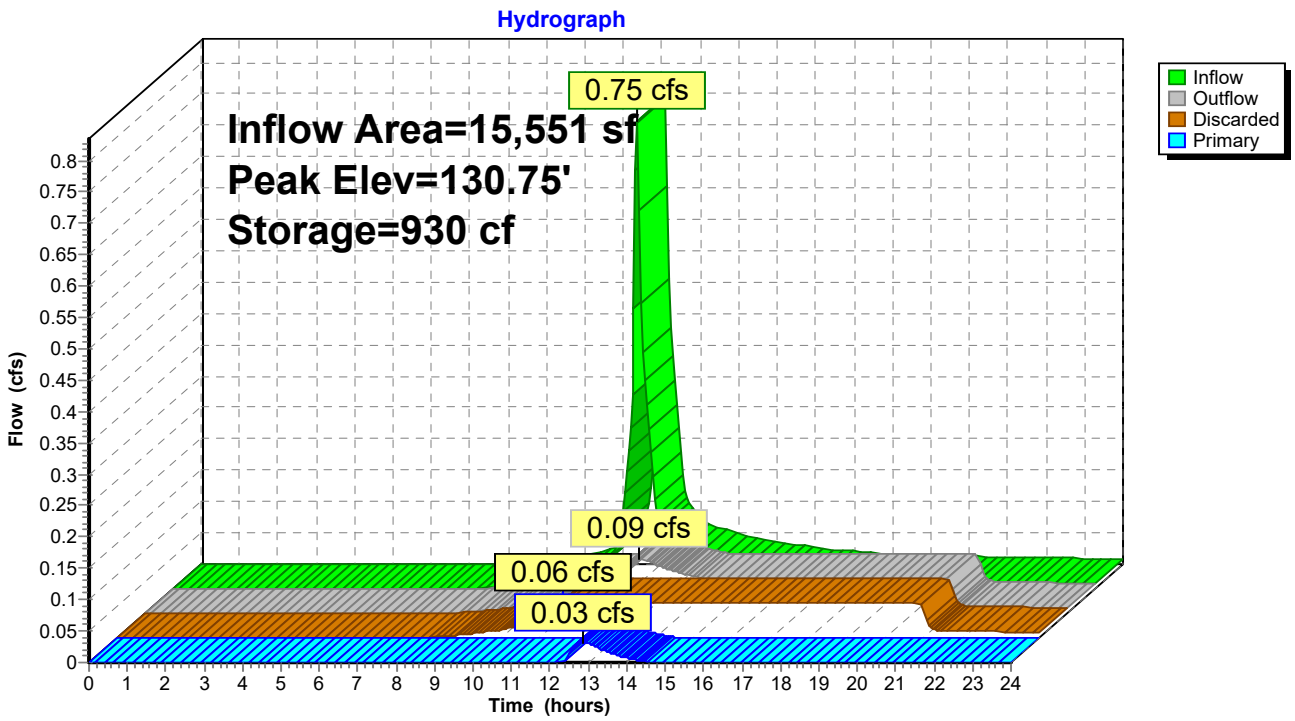
4,747.0 cf Field - 984.5 cf Chambers = 3,762.4 cf Stone x 40.0% Voids = 1,505.0 cf Stone Storage

Chamber Storage + Stone Storage = 2,489.5 cf = 0.057 af
Overall Storage Efficiency = 52.4%
Overall System Size = 87.91' x 27.00' x 2.00'

144 Chambers
175.8 cy Field
139.3 cy Stone



Pond IB2c: Infiltration Basin Area 2c



Stage-Area-Storage for Pond IB2c: Infiltration Basin Area 2c

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.00	**2,373**	0	131.06	2,373	1,457
130.02	2,373	19	131.08	2,373	1,489
130.04	2,373	38	131.10	2,373	1,519
130.06	2,373	57	131.12	2,373	1,550
130.08	2,373	76	131.14	2,373	1,580
130.10	2,373	95	131.16	2,373	1,609
130.12	2,373	114	131.18	2,373	1,638
130.14	2,373	133	131.20	2,373	1,667
130.16	2,373	152	131.22	2,373	1,695
130.18	2,373	171	131.24	2,373	1,722
130.20	2,373	190	131.26	2,373	1,749
130.22	2,373	209	131.28	2,373	1,774
130.24	2,373	228	131.30	2,373	1,799
130.26	2,373	247	131.32	2,373	1,824
130.28	2,373	266	131.34	2,373	1,847
130.30	2,373	285	131.36	2,373	1,870
130.32	2,373	304	131.38	2,373	1,892
130.34	2,373	323	131.40	2,373	1,914
130.36	2,373	342	131.42	2,373	1,935
130.38	2,373	361	131.44	2,373	1,955
130.40	2,373	380	131.46	2,373	1,976
130.42	2,373	399	131.48	2,373	1,995
130.44	2,373	418	131.50	2,373	2,015
130.46	2,373	437	131.52	2,373	2,034
130.48	2,373	456	131.54	2,373	2,053
130.50	2,373	475	131.56	2,373	2,072
130.52	2,373	512	131.58	2,373	2,091
130.54	2,373	549	131.60	2,373	2,110
130.56	2,373	587	131.62	2,373	2,129
130.58	2,373	624	131.64	2,373	2,148
130.60	2,373	661	131.66	2,373	2,167
130.62	2,373	698	131.68	2,373	2,186
130.64	2,373	735	131.70	2,373	2,205
130.66	2,373	772	131.72	2,373	2,224
130.68	2,373	808	131.74	2,373	2,243
130.70	2,373	844	131.76	2,373	2,262
130.72	2,373	880	131.78	2,373	2,281
130.74	2,373	916	131.80	2,373	2,300
130.76	2,373	952	131.82	2,373	2,319
130.78	2,373	987	131.84	2,373	2,338
130.80	2,373	1,022	131.86	2,373	2,357
130.82	2,373	1,057	131.88	2,373	2,376
130.84	2,373	1,092	131.90	2,373	2,395
130.86	2,373	1,127	131.92	2,373	2,414
130.88	2,373	1,161	131.94	2,373	2,433
130.90	2,373	1,195	131.96	2,373	2,452
130.92	2,373	1,229	131.98	2,373	2,471
130.94	2,373	1,263	132.00	2,373	**2,489**
130.96	2,373	1,296			
130.98	2,373	1,329			
131.00	2,373	1,361			
131.02	2,373	1,394			
131.04	2,373	1,426			

Summary for Pond IB2e: Infiltration Basin 2b

Inflow Area =	15,464 sf, 93.24% Impervious, Inflow Depth > 2.62" for 2-YR event				
Inflow =	1.01 cfs @	12.09 hrs,	Volume=	3,381 cf	
Outflow =	0.14 cfs @	11.70 hrs,	Volume=	3,379 cf,	Atten= 86%, Lag= 0.0 min
Discarded =	0.14 cfs @	11.70 hrs,	Volume=	3,379 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= 131.25' @ 12.60 hrs Surf.Area= 2,592 sf Storage= 1,029 cf

Plug-Flow detention time= 45.5 min calculated for 3,379 cf (100% of inflow)
Center-of-Mass det. time= 45.1 min (825.8 - 780.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	130.50'	2,002 cf	**34.83'W x 74.40'L x 2.50'H Field A** 6,479 cf Overall - 1,474 cf Embedded = 5,005 cf x 40.0% Voids
#2A	131.00'	1,474 cf	**ADS_StormTech SC-310 +Cap** x 100 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 10 Rows of 10 Chambers
		3,476 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	130.85'	**15.0" Round Culvert Barrel** L= 69.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 130.85' / 130.50' S= 0.0051 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Discarded	130.50'	**2.410 in/hr Exfiltration over Surface area**
#3	Device 1	131.40'	**3.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	132.63'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.14 cfs @ 11.70 hrs HW=130.53' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=130.50' (Free Discharge)
└─**1=Culvert Barrel** (Controls 0.00 cfs)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB2e: Infiltration Basin 2b - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-310 +Cap (ADS StormTech® SC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

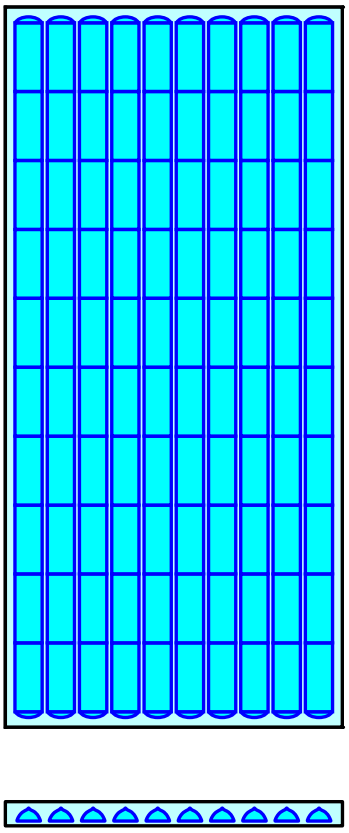
10 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 72.40' Row Length +12.0" End Stone x 2 = 74.40' Base Length
10 Rows x 34.0" Wide + 6.0" Spacing x 9 + 12.0" Side Stone x 2 = 34.83' Base Width
6.0" Base + 16.0" Chamber Height + 8.0" Cover = 2.50' Field Height

100 Chambers x 14.7 cf = 1,474.2 cf Chamber Storage

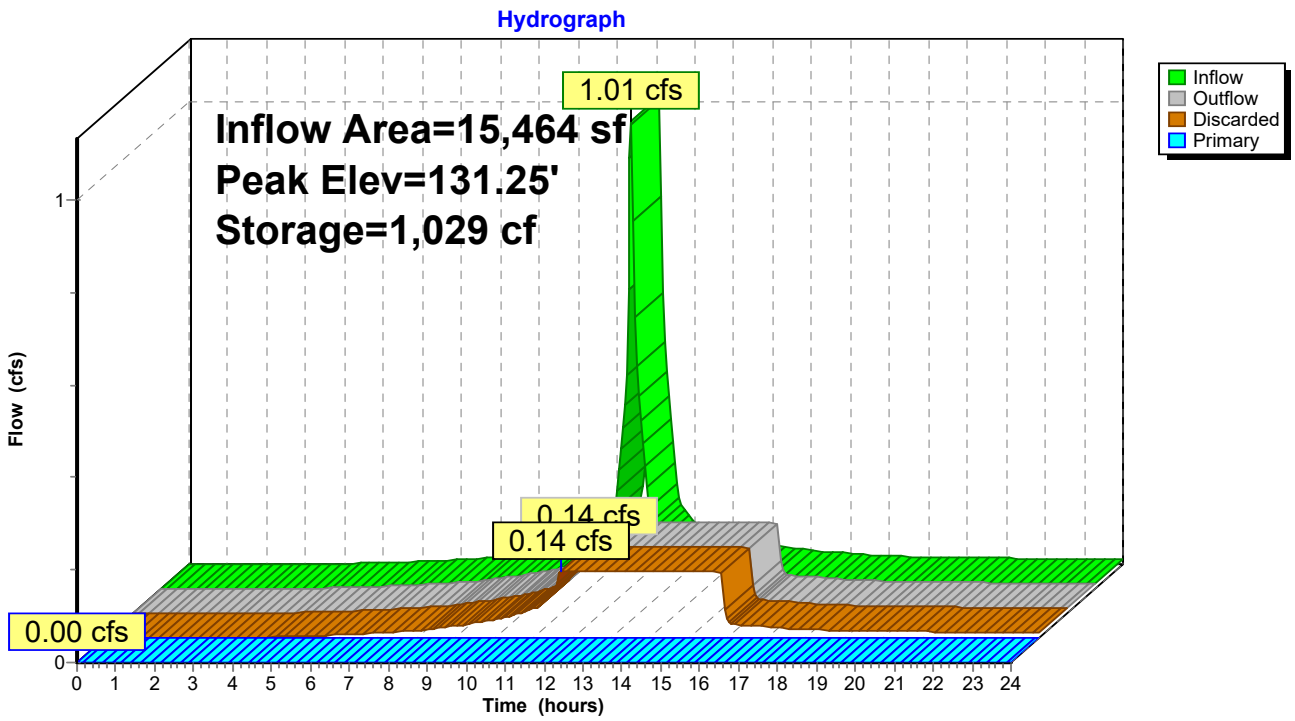
6,479.0 cf Field - 1,474.2 cf Chambers = 5,004.8 cf Stone x 40.0% Voids = 2,001.9 cf Stone Storage

Chamber Storage + Stone Storage = 3,476.1 cf = 0.080 af
Overall Storage Efficiency = 53.7%
Overall System Size = 74.40' x 34.83' x 2.50'

100 Chambers
240.0 cy Field
185.4 cy Stone



Pond IB2e: Infiltration Basin 2b



Stage-Area-Storage for Pond IB2e: Infiltration Basin 2b

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.50	**2,592**	0
130.55	2,592	52
130.60	2,592	104
130.65	2,592	155
130.70	2,592	207
130.75	2,592	259
130.80	2,592	311
130.85	2,592	363
130.90	2,592	415
130.95	2,592	466
131.00	2,592	518
131.05	2,592	622
131.10	2,592	724
131.15	2,592	827
131.20	2,592	928
131.25	2,592	1,029
131.30	2,592	1,129
131.35	2,592	1,227
131.40	2,592	1,325
131.45	2,592	1,422
131.50	2,592	1,517
131.55	2,592	1,611
131.60	2,592	1,703
131.65	2,592	1,794
131.70	2,592	1,884
131.75	2,592	1,972
131.80	2,592	2,057
131.85	2,592	2,141
131.90	2,592	2,222
131.95	2,592	2,301
132.00	2,592	2,377
132.05	2,592	2,449
132.10	2,592	2,516
132.15	2,592	2,579
132.20	2,592	2,638
132.25	2,592	2,695
132.30	2,592	2,750
132.35	2,592	2,802
132.40	2,592	2,854
132.45	2,592	2,906
132.50	2,592	2,958
132.55	2,592	3,010
132.60	2,592	3,061
132.65	2,592	3,113
132.70	2,592	3,165
132.75	2,592	3,217
132.80	2,592	3,269
132.85	2,592	3,321
132.90	2,592	3,372
132.95	2,592	3,424
133.00	2,592	**3,476**

Summary for Subcatchment PD-1: Prop. Drainage Area 1

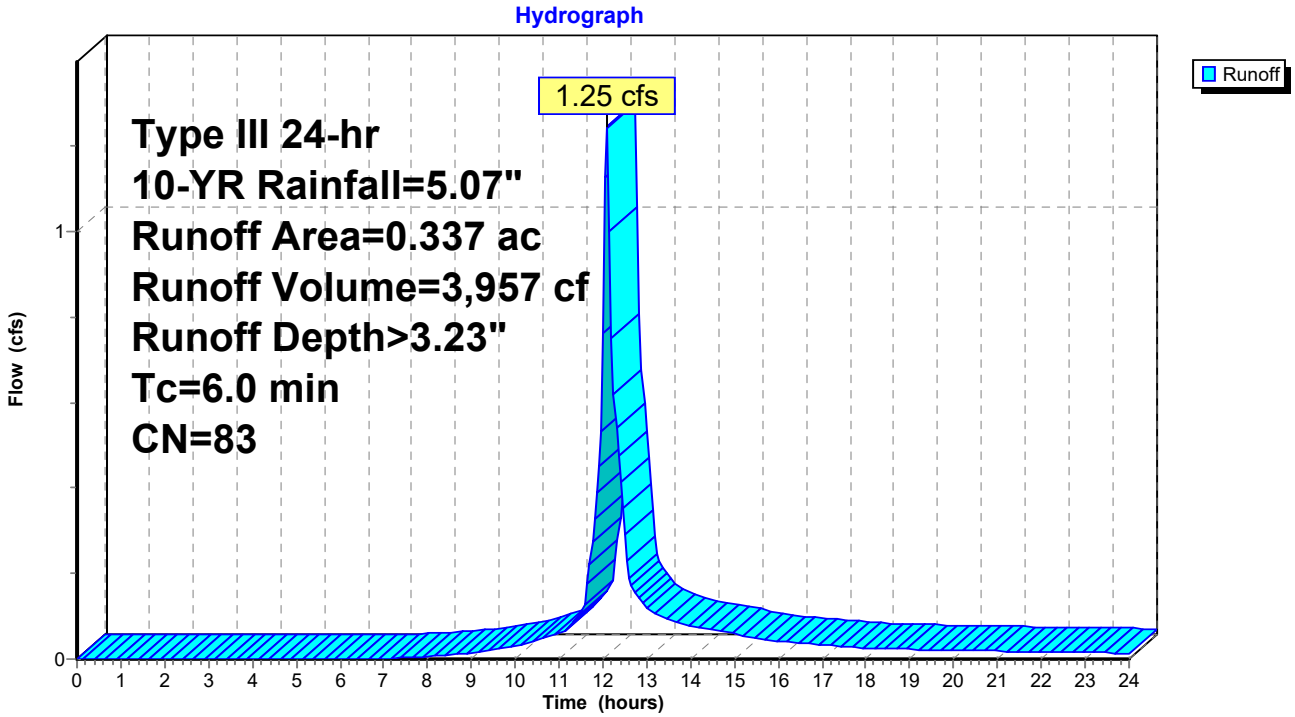
Runoff = 1.25 cfs @ 12.09 hrs, Volume= 3,957 cf, Depth> 3.23"

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-YR Rainfall=5.07"

	Area (ac)	CN	Description
*	0.074	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.070	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.193	98	Paved parking
	0.337	83	Weighted Average
	0.144		42.73% Pervious Area
	0.193		57.27% Impervious Area

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

Subcatchment PD-1: Prop. Drainage Area 1



Summary for Subcatchment PD-2a: Prop. Drainage Area 2a

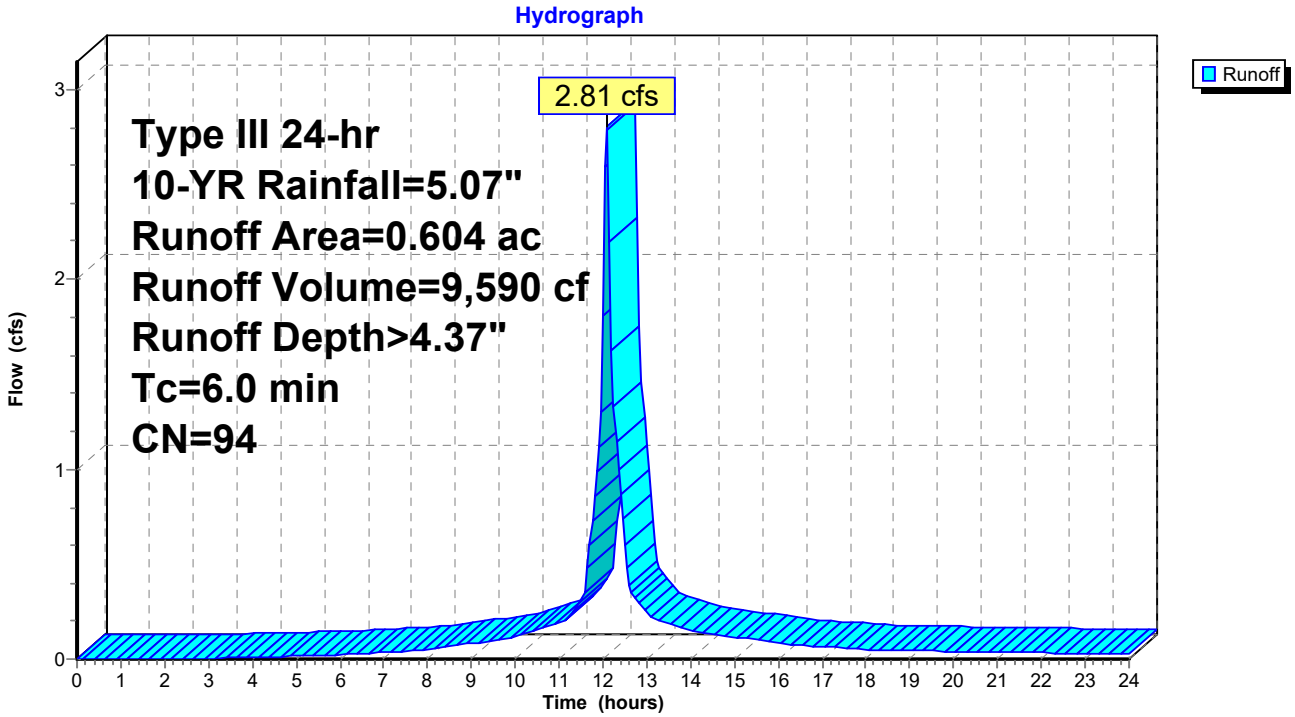
Runoff = 2.81 cfs @ 12.09 hrs, Volume= 9,590 cf, Depth> 4.37"

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-YR Rainfall=5.07"

	Area (ac)	CN	Description
*	0.038	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.029	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.537	98	Paved parking
	0.604	94	Weighted Average
	0.067		11.09% Pervious Area
	0.537		88.91% Impervious Area

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

Subcatchment PD-2a: Prop. Drainage Area 2a



Summary for Subcatchment PD-2b: Prop. Drainage Area 2b

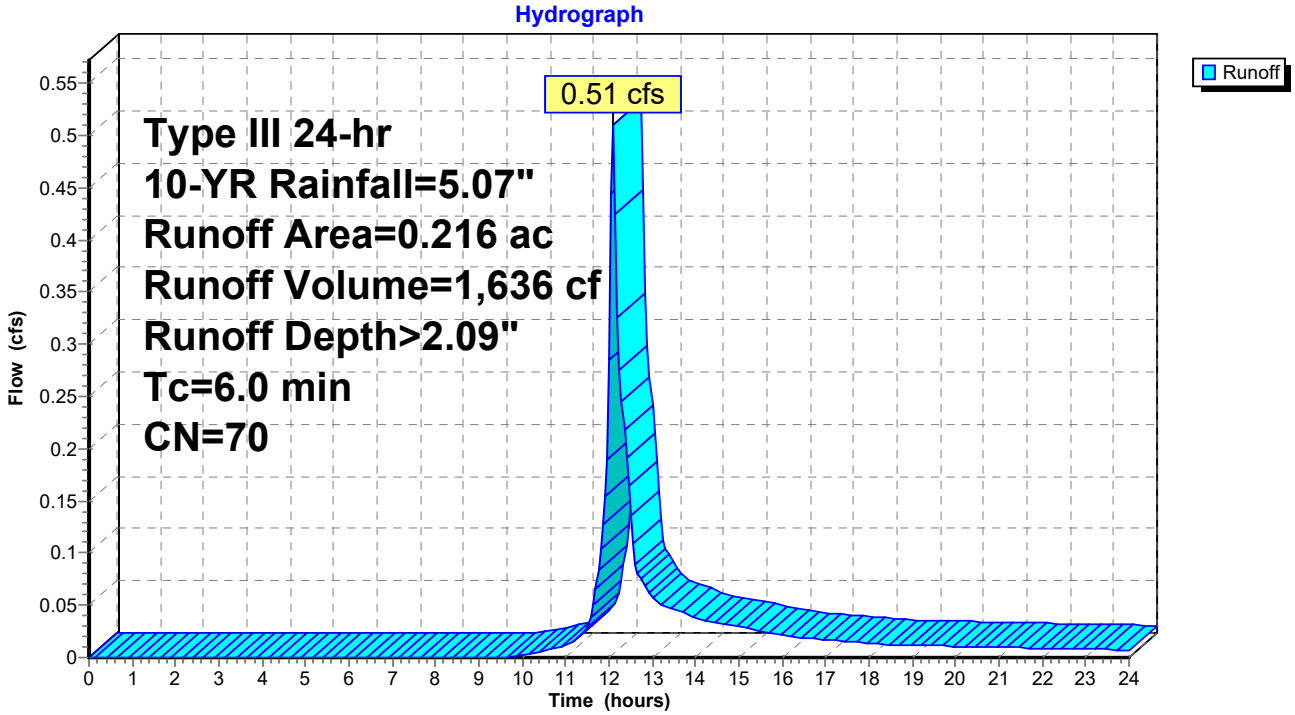
Runoff = 0.51 cfs @ 12.10 hrs, Volume= 1,636 cf, Depth> 2.09"

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-YR Rainfall=5.07"

	Area (ac)	CN	Description
*	0.174	74	Woods/grass comb., Fair, HSG B/D, 13
*	0.018	43	Woods/grass comb., Fair, HSG A. 36A
	0.024	65	Woods/grass comb., Fair, HSG B
	0.216	70	Weighted Average
	0.216		100.00% Pervious Area

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

Subcatchment PD-2b: Prop. Drainage Area 2b



Summary for Subcatchment PD-2c: Prop. Drainage Area 2c

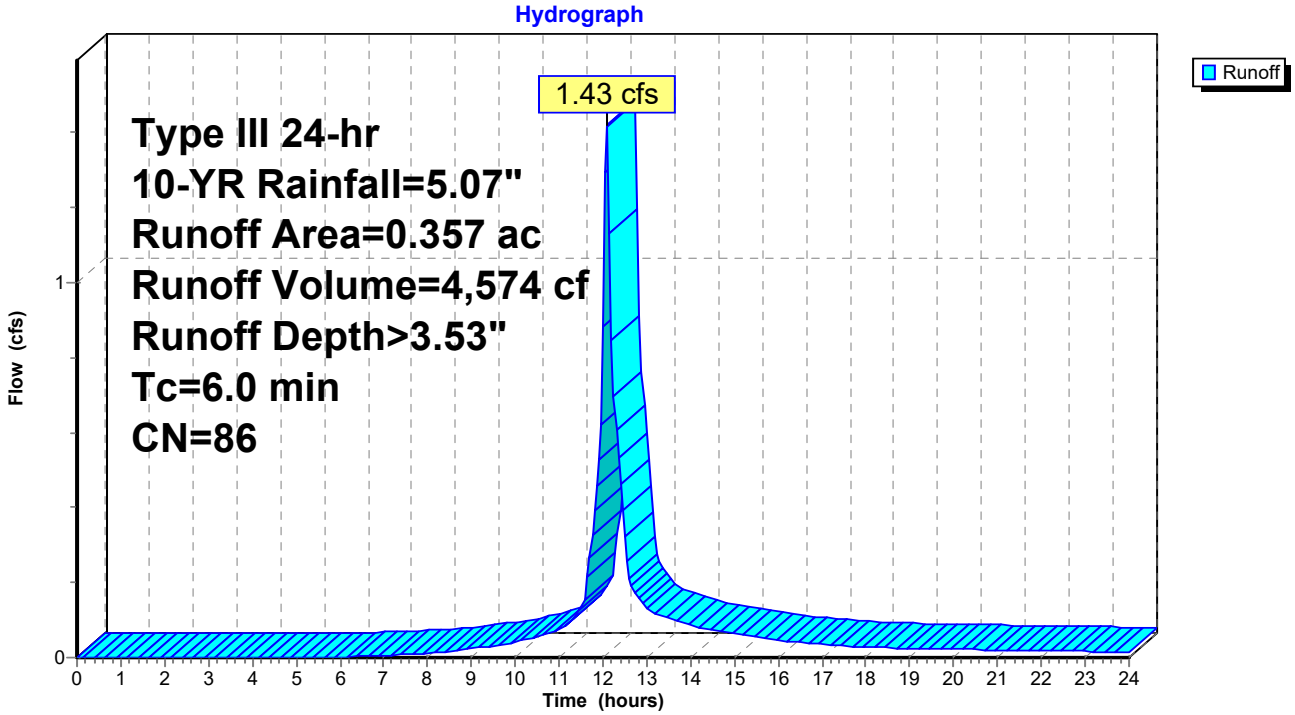
Runoff = 1.43 cfs @ 12.09 hrs, Volume= 4,574 cf, Depth> 3.53"

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-YR Rainfall=5.07"

	Area (ac)	CN	Description
*	0.061	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.042	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.021	49	50-75% Grass cover, Fair, HSG A, 36A
	0.233	98	Paved parking, HSG D
	0.357	86	Weighted Average
	0.124		34.73% Pervious Area
	0.233		65.27% Impervious Area

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

Subcatchment PD-2c: Prop. Drainage Area 2c



Summary for Subcatchment PD-2d: Prop. Drainage Area 2d

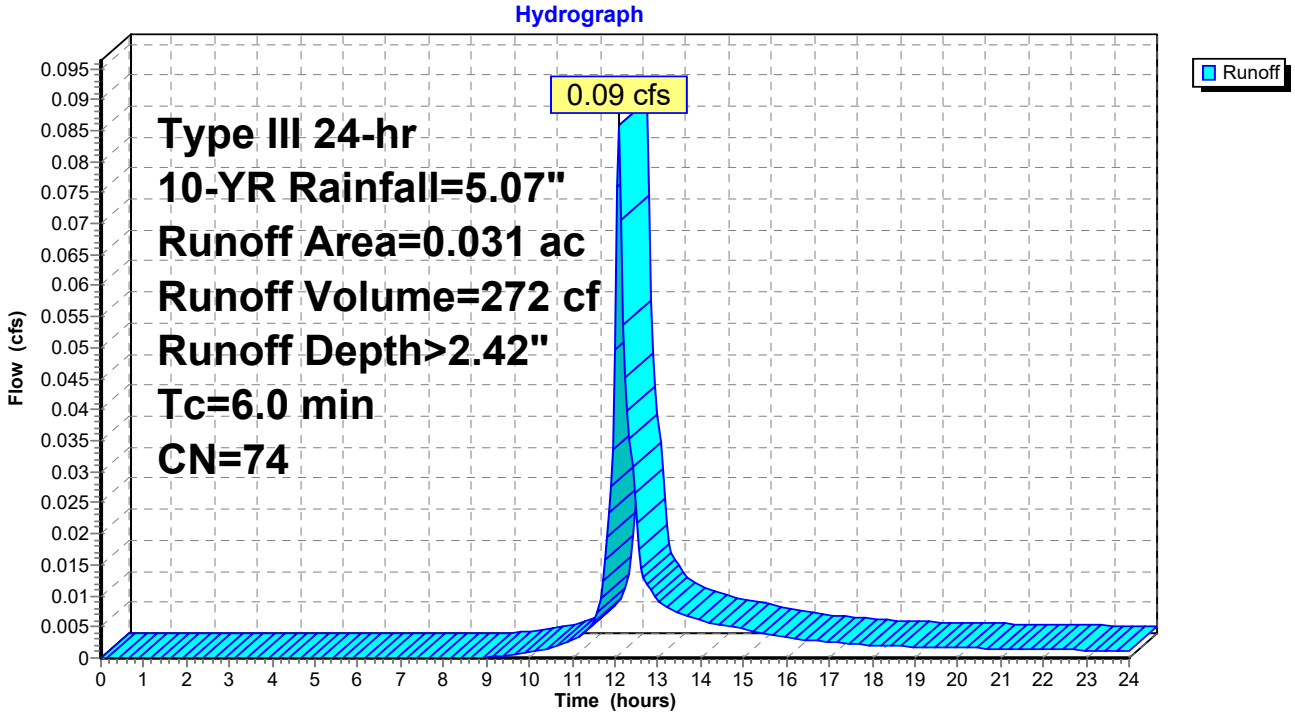
Runoff = 0.09 cfs @ 12.09 hrs, Volume= 272 cf, Depth> 2.42"

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-YR Rainfall=5.07"

	Area (ac)	CN	Description
*	0.031	74	Woods/grass comb., Fair, HSG B/D, 13
	0.031		100.00% Pervious Area

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

Subcatchment PD-2d: Prop. Drainage Area 2d



Summary for Subcatchment PD-2e: Prop. Drainage Area 2e

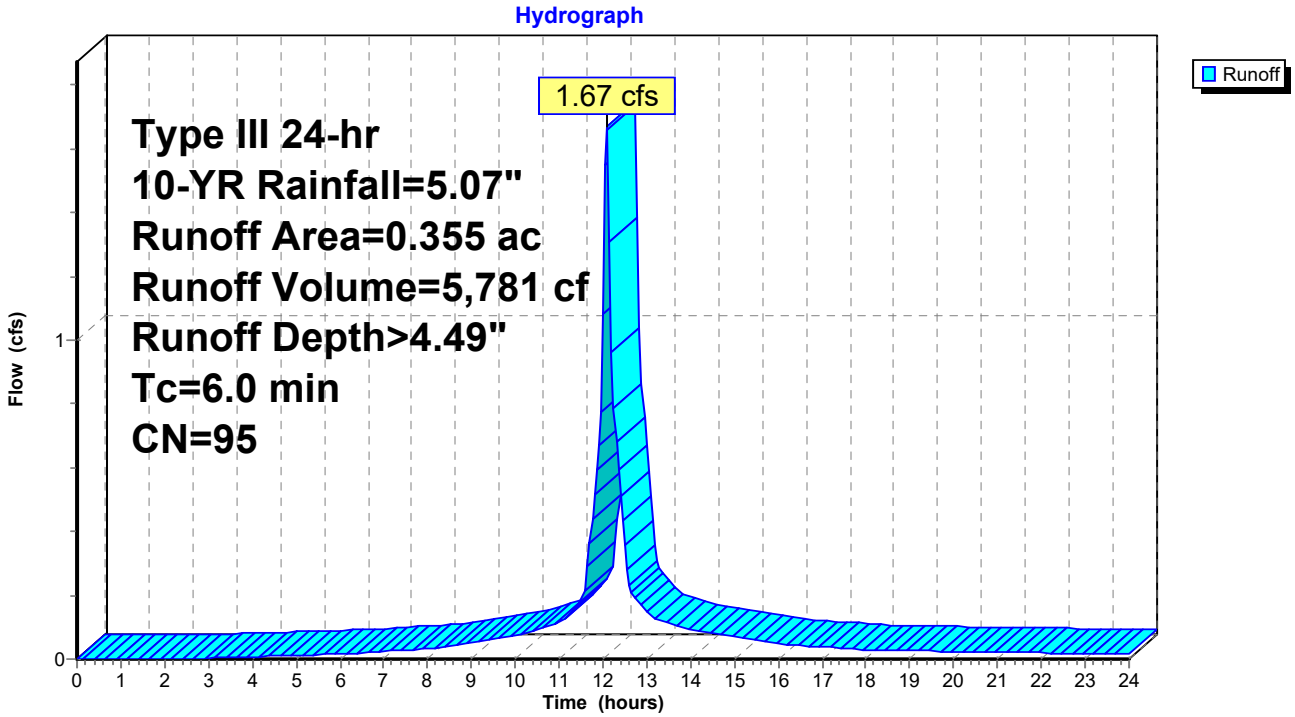
Runoff = 1.67 cfs @ 12.09 hrs, Volume= 5,781 cf, Depth> 4.49"

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 10-YR Rainfall=5.07"

	Area (ac)	CN	Description
*	0.004	43	Woods/grass comb., Fair, HSG A, 36A
*	0.020	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.331	98	Paved parking
	0.355	95	Weighted Average
	0.024		6.76% Pervious Area
	0.331		93.24% Impervious Area

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

Subcatchment PD-2e: Prop. Drainage Area 2e



Summary for Subcatchment PD-2f: Prop. Drainage Area 2d

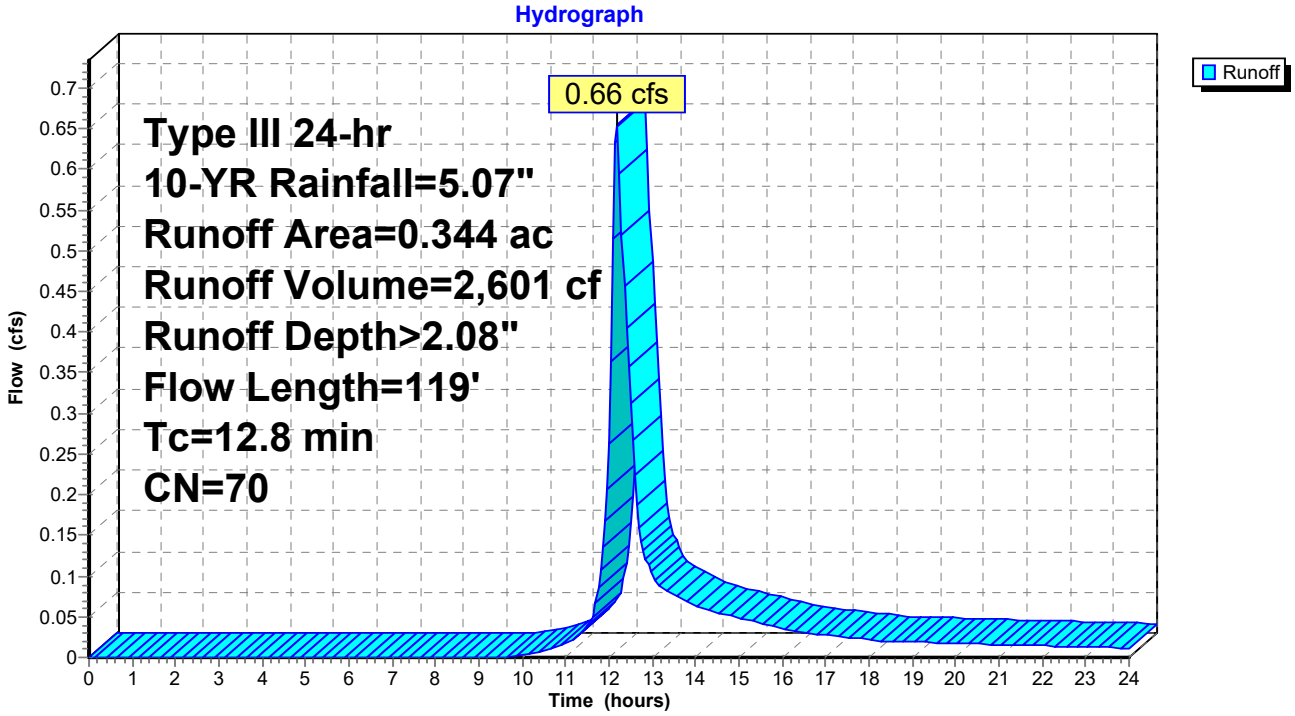
Runoff = 0.66 cfs @ 12.19 hrs, Volume= 2,601 cf, Depth> 2.08"

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-YR Rainfall=5.07"

	Area (ac)	CN	Description
*	0.296	74	Woods/grass comb., Fair, HSG B/D, 13
	0.048	43	Woods/grass comb., Fair, HSG A
	0.344	70	Weighted Average
	0.344		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	23	0.1600	0.13		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.18"
8.4	36	0.0270	0.07		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.18"
1.5	60	0.0167	0.65		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
12.8	119	Total			

Subcatchment PD-2f: Prop. Drainage Area 2d



Summary for Subcatchment PD-3a: Prop. Drainage Area 3a

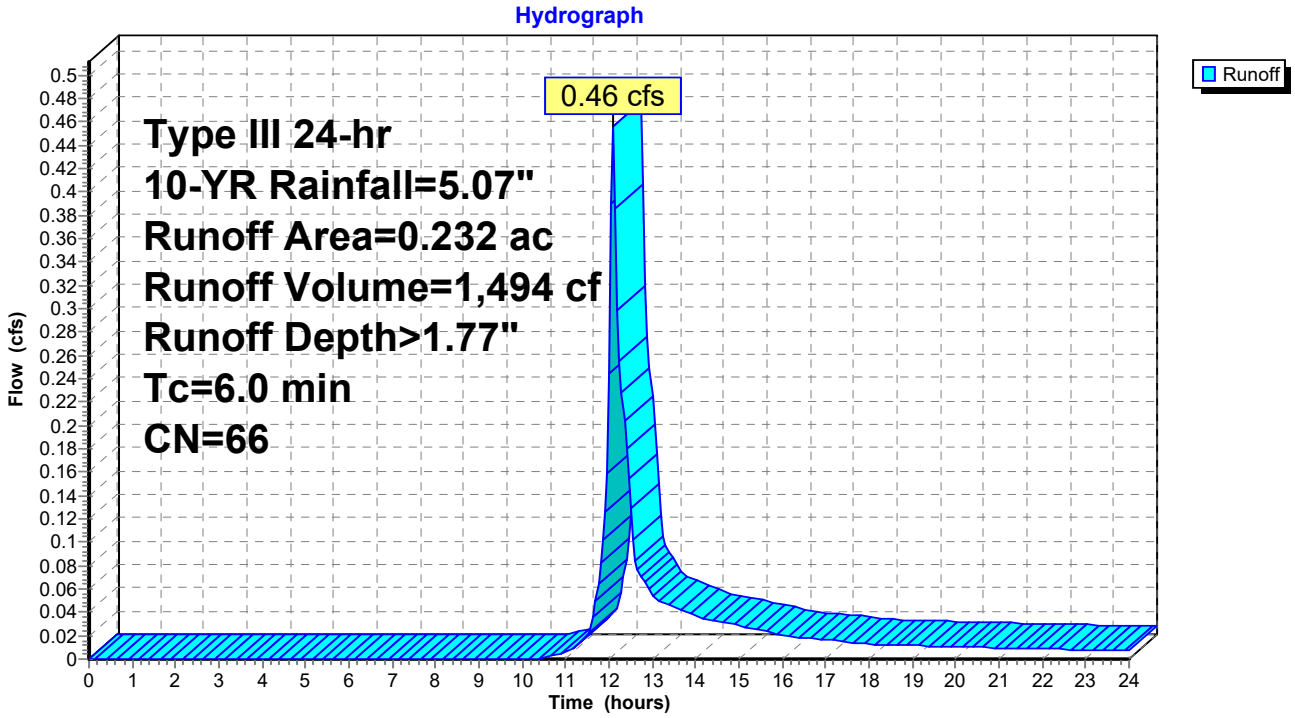
Runoff = 0.46 cfs @ 12.10 hrs, Volume= 1,494 cf, Depth> 1.77"

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-YR Rainfall=5.07"

	Area (ac)	CN	Description
*	0.120	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.071	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.041	98	Paved parking
	0.232	66	Weighted Average
	0.191		82.33% Pervious Area
	0.041		17.67% Impervious Area

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

Subcatchment PD-3a: Prop. Drainage Area 3a



Summary for Subcatchment PD-3b: Prop. Drainage Area 3b

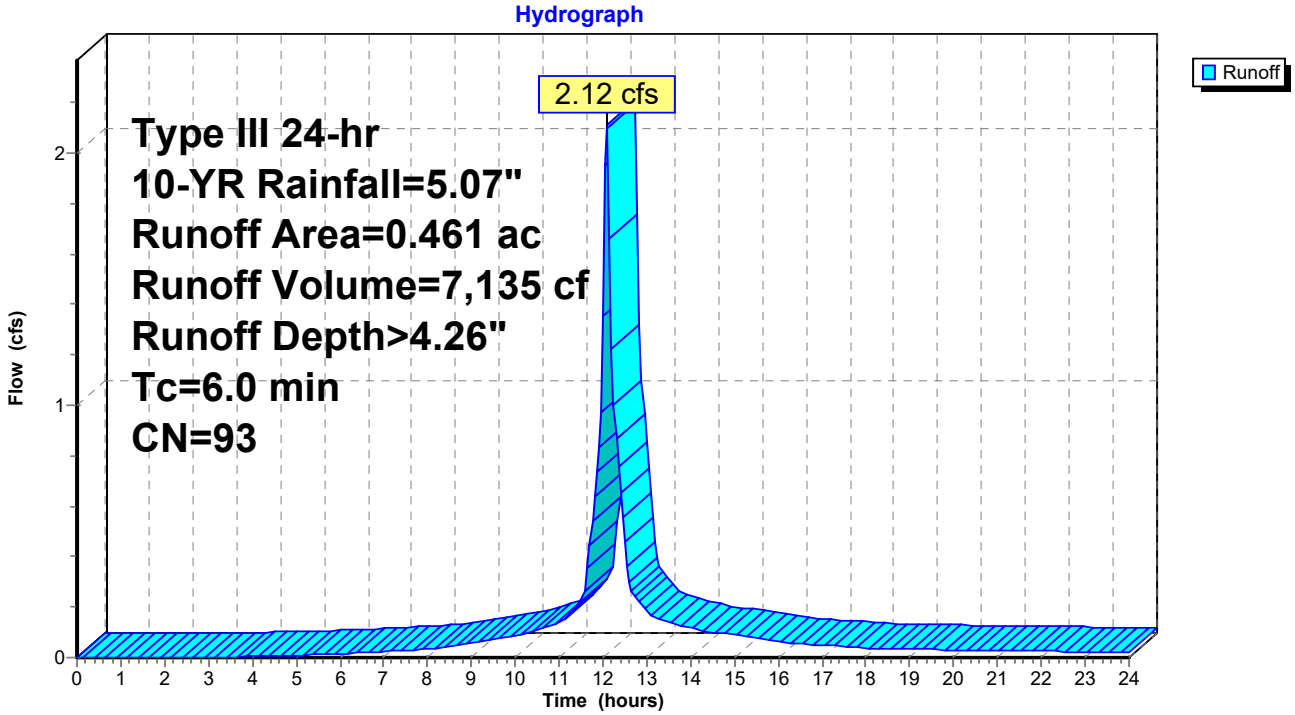
Runoff = 2.12 cfs @ 12.09 hrs, Volume= 7,135 cf, Depth> 4.26"

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-YR Rainfall=5.07"

	Area (ac)	CN	Description
*	0.093	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.019	79	50-75% Grass cover, Fair, HSG C, 701A
*	0.016	98	Paved parking
*	0.333	98	Roofing
	0.461	93	Weighted Average
	0.112		24.30% Pervious Area
	0.349		75.70% Impervious Area

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

Subcatchment PD-3b: Prop. Drainage Area 3b



Summary for Subcatchment PD-3c: Prop. Drainage Area 3c

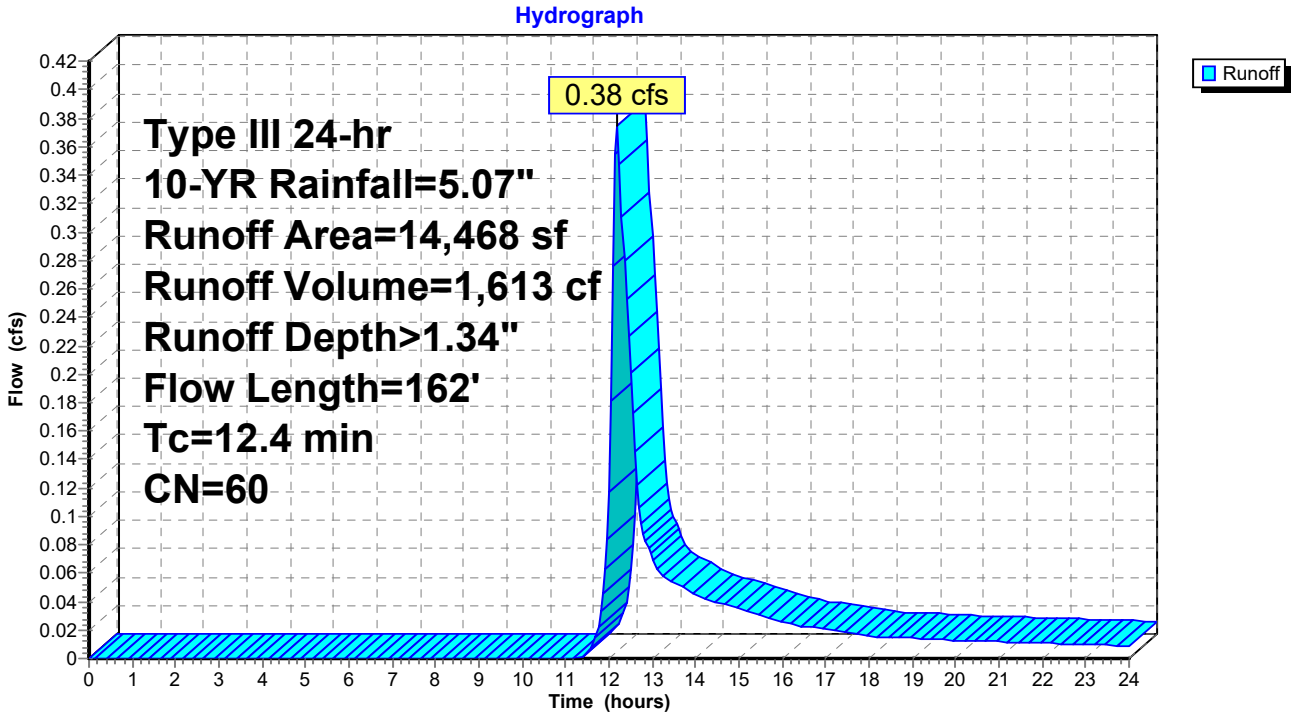
Runoff = 0.38 cfs @ 12.20 hrs, Volume= 1,613 cf, Depth> 1.34"

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-YR Rainfall=5.07"

	Area (sf)	CN	Description
*	6,684	43	Woods/grass comb., Fair, HSG A, 36A
*	5,545	74	Woods/grass comb., Fair, HSG C
	1,501	76	Woods/grass comb., Fair, HSG C
*	738	77	50-75% Grass cover, Fair, HSG C
	14,468	60	Weighted Average
	14,468		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	8	0.0625	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.18"
3.4	17	0.0580	0.08		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.18"
3.2	16	0.0625	0.08		**Sheet Flow, C-D** Woods: Light underbrush n= 0.400 P2= 3.18"
1.5	9	0.1250	0.10		**Sheet Flow, D-E** Woods: Light underbrush n= 0.400 P2= 3.18"
2.5	112	0.0220	0.74		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
12.4	162	Total			

Subcatchment PD-3c: Prop. Drainage Area 3c



Summary for Subcatchment RD-1: Roof 1

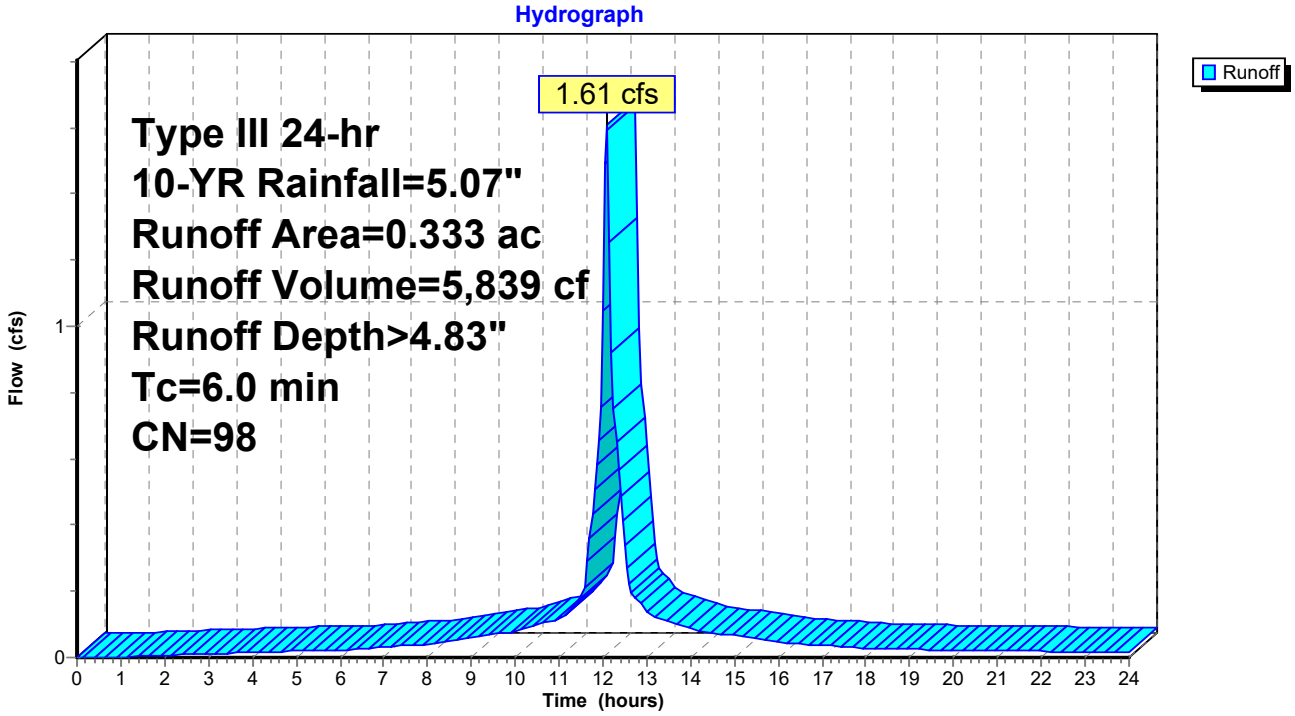
Runoff = 1.61 cfs @ 12.09 hrs, Volume= 5,839 cf, Depth> 4.83"

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-YR Rainfall=5.07"

	Area (ac)	CN	Description
*	0.333	98	Unconnected roofs
	0.333		100.00% Impervious Area
	0.333		100.00% Unconnected

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

Subcatchment RD-1: Roof 1

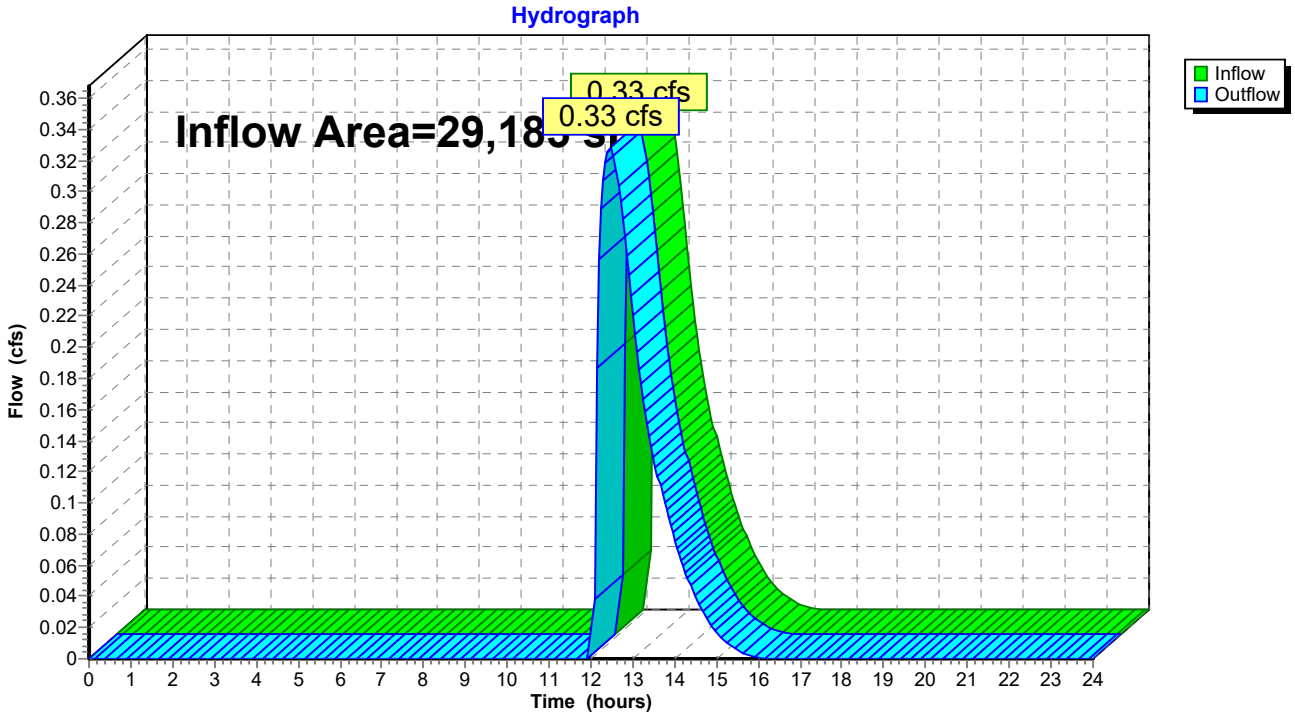


Summary for Reach DP-1a: Design Point 1

Inflow Area = 29,185 sf, 78.51% Impervious, Inflow Depth = 0.65" for 10-YR event
Inflow = 0.33 cfs @ 12.46 hrs, Volume= 1,570 cf
Outflow = 0.33 cfs @ 12.46 hrs, Volume= 1,570 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-1a: Design Point 1

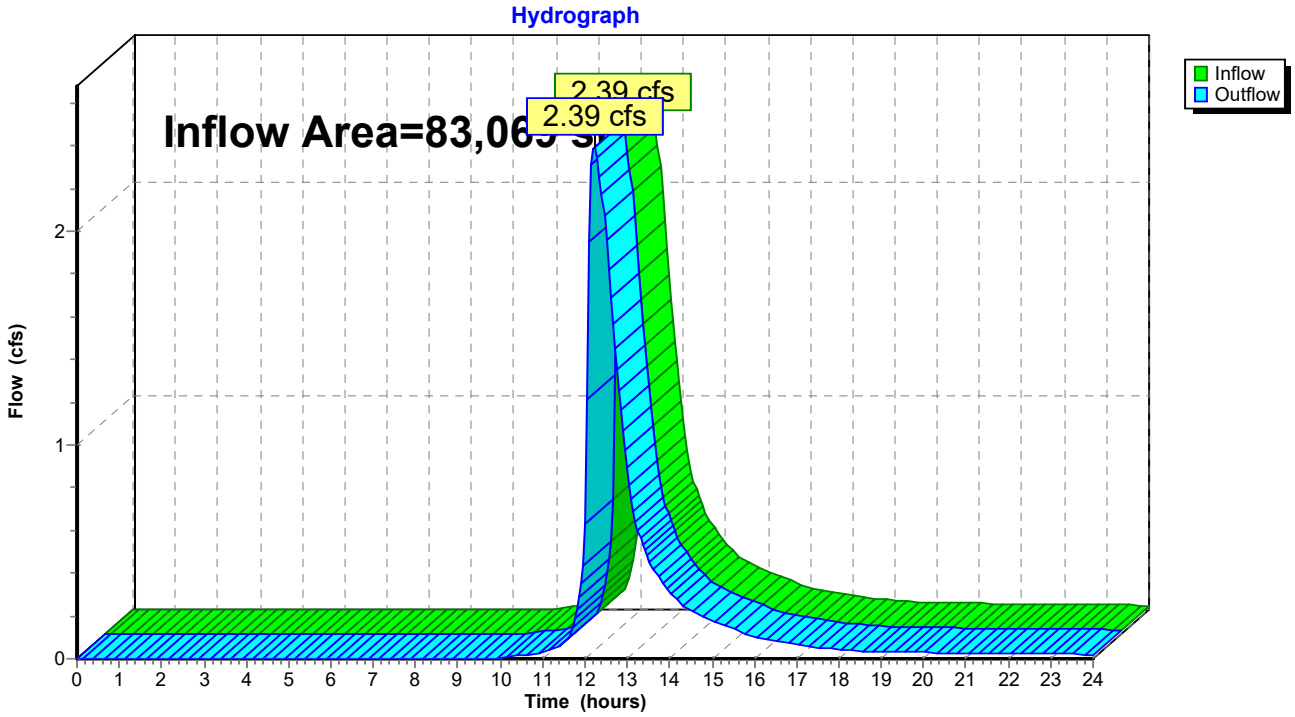


Summary for Reach DP-2a: Design Point 2

Inflow Area = 83,069 sf, 57.73% Impervious, Inflow Depth > 1.58" for 10-YR event
Inflow = 2.39 cfs @ 12.22 hrs, Volume= 10,915 cf
Outflow = 2.39 cfs @ 12.22 hrs, Volume= 10,915 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-2a: Design Point 2

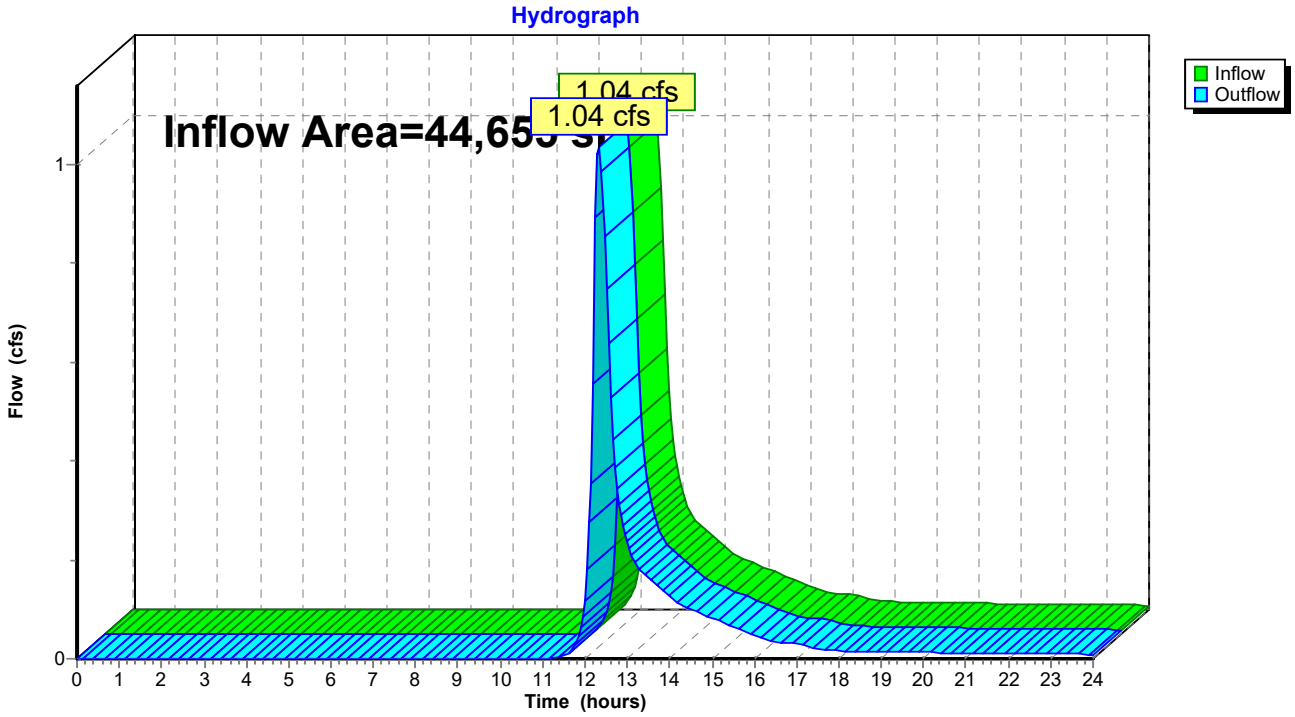


Summary for Reach DP-3a: Design Point 3

Inflow Area = 44,655 sf, 38.04% Impervious, Inflow Depth > 0.97" for 10-YR event
Inflow = 1.04 cfs @ 12.32 hrs, Volume= 3,625 cf
Outflow = 1.04 cfs @ 12.32 hrs, Volume= 3,625 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-3a: Design Point 3



Summary for Pond AB1: Above Ground Infiltration Basin 1

Inflow Area =	29,185 sf, 78.51% Impervious, Inflow Depth > 1.82" for 10-YR event				
Inflow =	1.25 cfs @	12.09 hrs,	Volume=	4,423 cf	
Outflow =	0.42 cfs @	12.46 hrs,	Volume=	4,420 cf,	Atten= 67%, Lag= 22.3 min
Discarded =	0.09 cfs @	12.46 hrs,	Volume=	2,850 cf	
Primary =	0.33 cfs @	12.46 hrs,	Volume=	1,570 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 128.46' @ 12.46 hrs Surf.Area= 1,553 sf Storage= 1,347 cf

Plug-Flow detention time= 86.2 min calculated for 4,410 cf (100% of inflow)
Center-of-Mass det. time= 85.6 min (895.7 - 810.1)

Volume	Invert	Avail.Storage	Storage Description
#1	127.00'	4,542 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 4,798 cf Overall - 256 cf Embedded = 4,542 cf
#2	127.00'	102 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) Inside #1 256 cf Overall x 40.0% Voids
		4,644 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
127.00	512	0	0
128.00	1,218	865	865
129.00	1,949	1,584	2,449
130.00	2,749	2,349	4,798

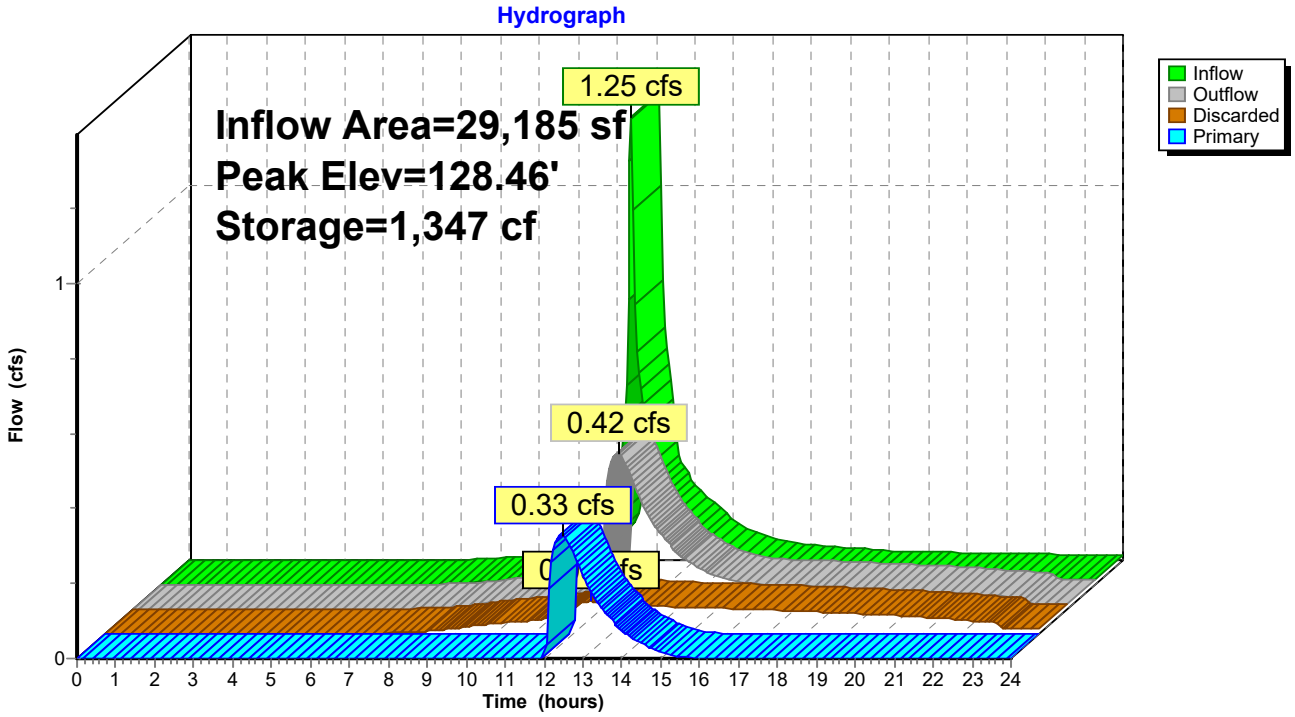
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
127.00	512	0	0
127.50	512	256	256

Device	Routing	Invert	Outlet Devices
#1	Primary	127.57'	**8.0" Round Culvert Barrel** L= 13.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 127.57' / 127.50' S= 0.0054 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.35 sf
#2	Device 1	129.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	127.00'	**2.410 in/hr Exfiltration over Surface area**
#4	Device 1	128.00'	**5.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.09 cfs @ 12.46 hrs HW=128.46' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=0.33 cfs @ 12.46 hrs HW=128.46' (Free Discharge)
└─**1=Culvert Barrel** (Passes 0.33 cfs of 0.79 cfs potential flow)
  ├─**2=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Orifice Controls 0.33 cfs @ 2.41 fps)

Pond AB1: Above Ground Infiltration Basin 1



Stage-Area-Storage for Pond AB1: Above Ground Infiltration Basin 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
127.00	512	0
127.05	547	11
127.10	583	24
127.15	618	39
127.20	653	55
127.25	689	73
127.30	724	93
127.35	759	115
127.40	794	138
127.45	830	164
127.50	865	191
127.55	900	235
127.60	936	281
127.65	971	328
127.70	1,006	378
127.75	1,042	429
127.80	1,077	482
127.85	1,112	537
127.90	1,147	593
127.95	1,183	651
128.00	1,218	711
128.05	1,255	773
128.10	1,291	837
128.15	1,328	902
128.20	1,364	970
128.25	1,401	1,039
128.30	1,437	1,110
128.35	1,474	1,182
128.40	1,510	1,257
128.45	1,547	1,334
128.50	1,584	1,412
128.55	1,620	1,492
128.60	1,657	1,574
128.65	1,693	1,658
128.70	1,730	1,743
128.75	1,766	1,830
128.80	1,803	1,920
128.85	1,839	2,011
128.90	1,876	2,104
128.95	1,912	2,198
129.00	1,949	2,295
129.05	1,989	2,393
129.10	2,029	2,494
129.15	2,069	2,596
129.20	2,109	2,701
129.25	2,149	2,807
129.30	2,189	2,916
129.35	2,229	3,026
129.40	2,269	3,139
129.45	2,309	3,253
129.50	2,349	3,369
129.55	2,389	3,488
129.60	2,429	3,608
129.65	2,469	3,731
129.70	2,509	3,855
129.75	2,549	3,982
129.80	2,589	4,110
129.85	2,629	4,241
129.90	2,669	4,373
129.95	2,709	4,507
130.00	**2,749**	**4,644**

Summary for Pond AB3a: Above Ground Infiltration 3a

Inflow Area =	10,106 sf, 17.67% Impervious, Inflow Depth > 1.77" for 10-YR event				
Inflow =	0.46 cfs @	12.10 hrs,	Volume=	1,494 cf	
Outflow =	0.07 cfs @	12.78 hrs,	Volume=	1,491 cf,	Atten= 85%, Lag= 40.9 min
Discarded =	0.07 cfs @	12.78 hrs,	Volume=	1,491 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= 132.45' @ 12.78 hrs Surf.Area= 1,216 sf Storage= 479 cf

Plug-Flow detention time= 61.8 min calculated for 1,491 cf (100% of inflow)
Center-of-Mass det. time= 60.8 min (917.5 - 856.6)

Volume	Invert	Avail.Storage	Storage Description
#1	132.00'	3,206 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

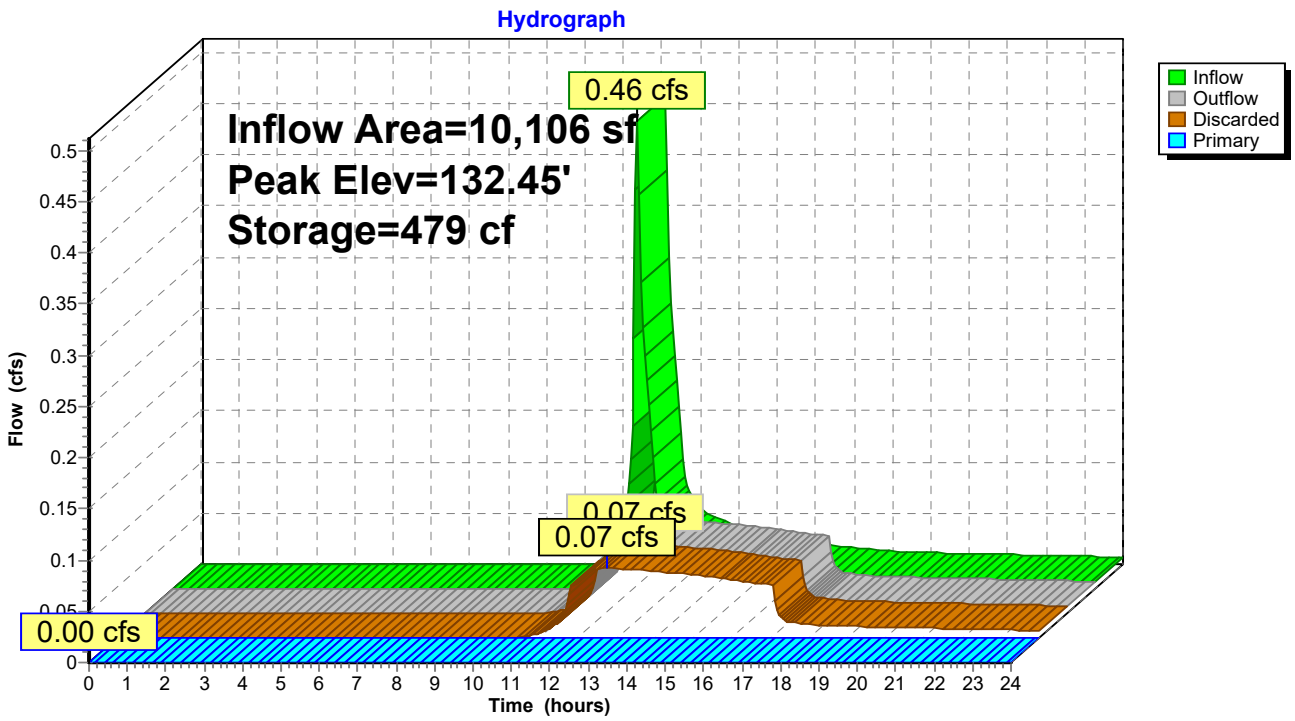
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
132.00	906	0	0
133.00	1,593	1,250	1,250
134.00	2,319	1,956	3,206

Device	Routing	Invert	Outlet Devices
#1	Discarded	132.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	133.00'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.07 cfs @ 12.78 hrs HW=132.45' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=132.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond AB3a: Above Ground Infiltration 3a



Stage-Area-Storage for Pond AB3a: Above Ground Infiltration 3a

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
132.00	906	0
132.02	920	18
132.04	933	37
132.06	947	56
132.08	961	75
132.10	975	94
132.12	988	114
132.14	1,002	134
132.16	1,016	154
132.18	1,030	174
132.20	1,043	195
132.22	1,057	216
132.24	1,071	237
132.26	1,085	259
132.28	1,098	281
132.30	1,112	303
132.32	1,126	325
132.34	1,140	348
132.36	1,153	371
132.38	1,167	394
132.40	1,181	417
132.42	1,195	441
132.44	1,208	465
132.46	1,222	489
132.48	1,236	514
132.50	1,250	539
132.52	1,263	564
132.54	1,277	589
132.56	1,291	615
132.58	1,304	641
132.60	1,318	667
132.62	1,332	694
132.64	1,346	721
132.66	1,359	748
132.68	1,373	775
132.70	1,387	803
132.72	1,401	830
132.74	1,414	859
132.76	1,428	887
132.78	1,442	916
132.80	1,456	945
132.82	1,469	974
132.84	1,483	1,003
132.86	1,497	1,033
132.88	1,511	1,063
132.90	1,524	1,094
132.92	1,538	1,124
132.94	1,552	1,155
132.96	1,566	1,186
132.98	1,579	1,218
133.00	1,593	1,250
133.02	1,608	1,282
133.04	1,622	1,314
133.06	1,637	1,346
133.08	1,651	1,379
133.10	1,666	1,412
133.12	1,680	1,446
133.14	1,695	1,480
133.16	1,709	1,514
133.18	1,724	1,548
133.20	1,738	1,583
133.22	1,753	1,618
133.24	1,767	1,653
133.26	1,782	1,688
133.28	1,796	1,724
133.30	1,811	1,760
133.32	1,825	1,796
133.34	1,840	1,833
133.36	1,854	1,870
133.38	1,869	1,907
133.40	1,883	1,945
133.42	1,898	1,983
133.44	1,912	2,021
133.46	1,927	2,059
133.48	1,941	2,098
133.50	1,956	2,137
133.52	1,971	2,176
133.54	1,985	2,216
133.56	2,000	2,255
133.58	2,014	2,296
133.60	2,029	2,336
133.62	2,043	2,377
133.64	2,058	2,418
133.66	2,072	2,459
133.68	2,087	2,501
133.70	2,101	2,542
133.72	2,116	2,585
133.74	2,130	2,627
133.76	2,145	2,670
133.78	2,159	2,713
133.80	2,174	2,756
133.82	2,188	2,800
133.84	2,203	2,844
133.86	2,217	2,888
133.88	2,232	2,932
133.90	2,246	2,977
133.92	2,261	3,022
133.94	2,275	3,068
133.96	2,290	3,113
133.98	2,304	3,159
134.00	**2,319**	**3,206**

Summary for Pond AB3b: Above Ground Infiltration 3b

Inflow Area =	20,081 sf, 75.70% Impervious, Inflow Depth > 4.26" for 10-YR event				
Inflow =	2.12 cfs @	12.09 hrs,	Volume=	7,135 cf	
Outflow =	0.79 cfs @	12.35 hrs,	Volume=	4,301 cf,	Atten= 63%, Lag= 15.5 min
Discarded =	0.05 cfs @	12.35 hrs,	Volume=	2,289 cf	
Primary =	0.74 cfs @	12.35 hrs,	Volume=	2,012 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 133.30' @ 12.35 hrs Surf.Area= 2,010 sf Storage= 3,474 cf

Plug-Flow detention time= 223.9 min calculated for 4,292 cf (60% of inflow)
Center-of-Mass det. time= 121.8 min (899.2 - 777.4)

Volume	Invert	Avail.Storage	Storage Description
#1	130.00'	5,050 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

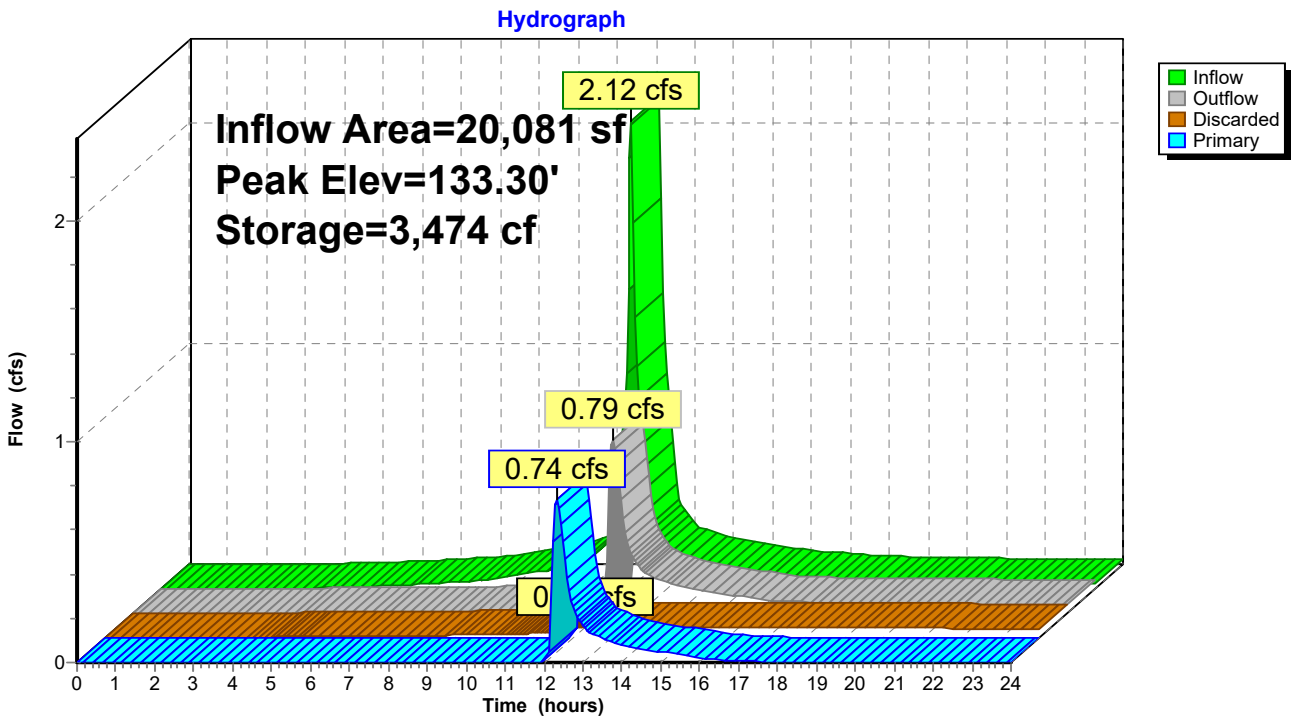
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
130.00	307	0	0
131.00	671	489	489
132.00	1,175	923	1,412
133.00	1,806	1,491	2,903
134.00	2,488	2,147	5,050

Device	Routing	Invert	Outlet Devices
#1	Primary	133.15'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Discarded	130.00'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 12.35 hrs HW=133.30' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.73 cfs @ 12.35 hrs HW=133.30' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 0.73 cfs @ 0.98 fps)

Pond AB3b: Above Ground Infiltration 3b



Stage-Area-Storage for Pond AB3b: Above Ground Infiltration 3b

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.00	307	0
130.05	325	16
130.10	343	33
130.15	362	50
130.20	380	69
130.25	398	88
130.30	416	108
130.35	434	130
130.40	453	152
130.45	471	175
130.50	489	199
130.55	507	224
130.60	525	250
130.65	544	276
130.70	562	304
130.75	580	333
130.80	598	362
130.85	616	392
130.90	635	424
130.95	653	456
131.00	671	489
131.05	696	523
131.10	721	559
131.15	747	595
131.20	772	633
131.25	797	673
131.30	822	713
131.35	847	755
131.40	873	798
131.45	898	842
131.50	923	888
131.55	948	934
131.60	973	982
131.65	999	1,032
131.70	1,024	1,082
131.75	1,049	1,134
131.80	1,074	1,187
131.85	1,099	1,241
131.90	1,125	1,297
131.95	1,150	1,354
132.00	1,175	1,412
132.05	1,207	1,472
132.10	1,238	1,533
132.15	1,270	1,595
132.20	1,301	1,660
132.25	1,333	1,725
132.30	1,364	1,793
132.35	1,396	1,862
132.40	1,427	1,932
132.45	1,459	2,005
132.50	1,491	2,078
132.55	1,522	2,154
132.60	1,554	2,231
132.65	1,585	2,309
132.70	1,617	2,389
132.75	1,648	2,471
132.80	1,680	2,554
132.85	1,711	2,639
132.90	1,743	2,725
132.95	1,774	2,813
133.00	1,806	2,903
133.05	1,840	2,994
133.10	1,874	3,087
133.15	1,908	3,181
133.20	1,942	3,277
133.25	1,977	3,375
133.30	2,011	3,475
133.35	2,045	3,576
133.40	2,079	3,679
133.45	2,113	3,784
133.50	2,147	3,891
133.55	2,181	3,999
133.60	2,215	4,109
133.65	2,249	4,220
133.70	2,283	4,334
133.75	2,318	4,449
133.80	2,352	4,566
133.85	2,386	4,684
133.90	2,420	4,804
133.95	2,454	4,926
134.00	**2,488**	**5,050**

Summary for Pond IB1: Infiltration Basin 1

Inflow Area =	14,505 sf,100.00% Impervious, Inflow Depth > 4.83" for 10-YR event				
Inflow =	1.61 cfs @	12.09 hrs,	Volume=	5,839 cf	
Outflow =	0.19 cfs @	12.67 hrs,	Volume=	5,835 cf,	Atten= 88%, Lag= 35.0 min
Discarded =	0.11 cfs @	10.80 hrs,	Volume=	5,370 cf	
Primary =	0.09 cfs @	12.67 hrs,	Volume=	465 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 130.68' @ 12.67 hrs Surf.Area= 1,889 sf Storage= 2,140 cf

Plug-Flow detention time= 126.4 min calculated for 5,835 cf (100% of inflow)
Center-of-Mass det. time= 126.0 min (873.3 - 747.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	129.00'	1,726 cf	**25.25'W x 74.82'L x 3.50'H Field A** 6,612 cf Overall - 2,297 cf Embedded = 4,315 cf x 40.0% Voids
#2A	129.50'	2,297 cf	**ADS_StormTech SC-740 +Cap** x 50 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 5 Rows of 10 Chambers
		4,023 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	130.24'	**12.0" Round Culvert** L= 10.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 130.24' / 130.00' S= 0.0240 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#2	Discarded	129.00'	**2.410 in/hr Exfiltration over Surface area**
#3	Device 1	130.40'	**3.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	132.05'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.11 cfs @ 10.80 hrs HW=129.04' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.09 cfs @ 12.67 hrs HW=130.68' (Free Discharge)
└─**1=Culvert** (Passes 0.09 cfs of 0.89 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.09 cfs @ 2.14 fps)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB1: Infiltration Basin 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

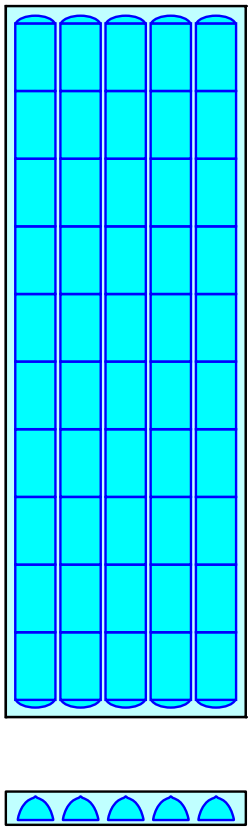
10 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 72.82' Row Length +12.0" End Stone x 2 = 74.82' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

50 Chambers x 45.9 cf = 2,297.0 cf Chamber Storage

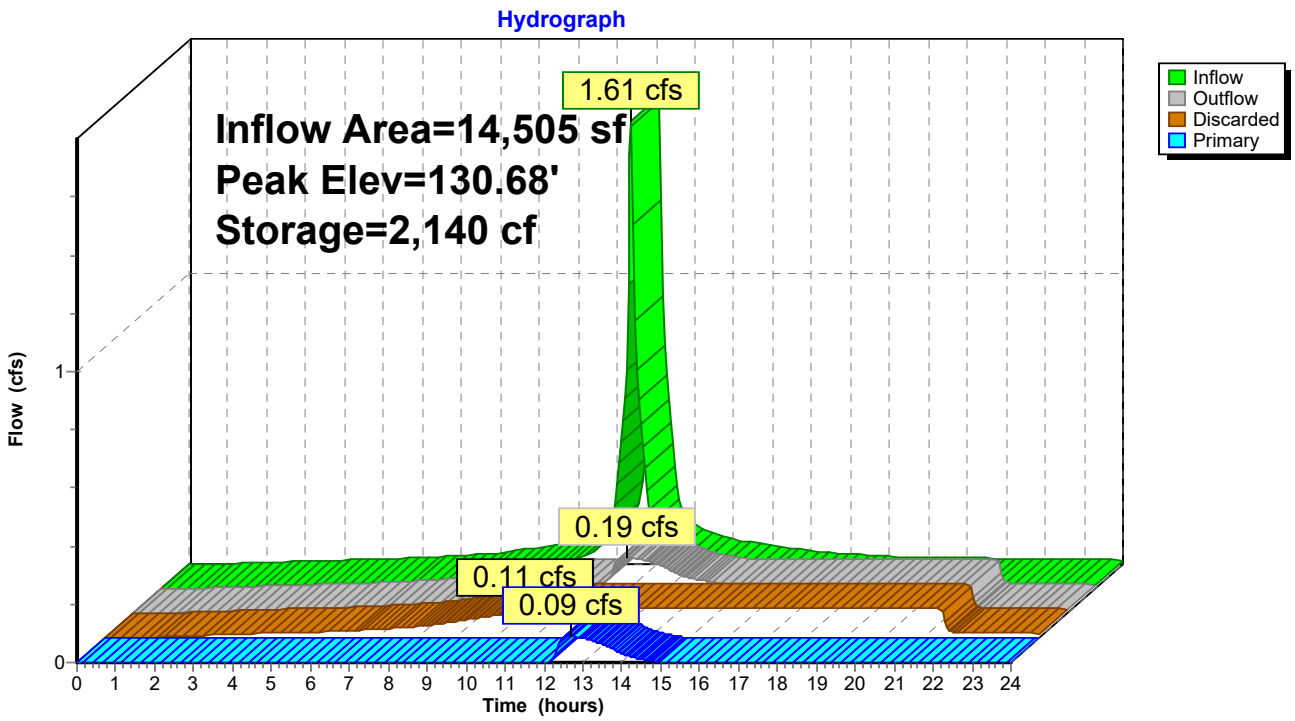
6,611.9 cf Field - 2,297.0 cf Chambers = 4,314.9 cf Stone x 40.0% Voids = 1,726.0 cf Stone Storage

Chamber Storage + Stone Storage = 4,023.0 cf = 0.092 af
Overall Storage Efficiency = 60.8%
Overall System Size = 74.82' x 25.25' x 3.50'

50 Chambers
244.9 cy Field
159.8 cy Stone



Pond IB1: Infiltration Basin 1



Stage-Area-Storage for Pond IB1: Infiltration Basin 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
129.00	**1,889**	0
129.05	1,889	38
129.10	1,889	76
129.15	1,889	113
129.20	1,889	151
129.25	1,889	189
129.30	1,889	227
129.35	1,889	264
129.40	1,889	302
129.45	1,889	340
129.50	1,889	378
129.55	1,889	455
129.60	1,889	533
129.65	1,889	610
129.70	1,889	687
129.75	1,889	764
129.80	1,889	841
129.85	1,889	917
129.90	1,889	993
129.95	1,889	1,069
130.00	1,889	1,145
130.05	1,889	1,220
130.10	1,889	1,295
130.15	1,889	1,369
130.20	1,889	1,444
130.25	1,889	1,517
130.30	1,889	1,591
130.35	1,889	1,664
130.40	1,889	1,736
130.45	1,889	1,809
130.50	1,889	1,880
130.55	1,889	1,952
130.60	1,889	2,022
130.65	1,889	2,093
130.70	1,889	2,162
130.75	1,889	2,232
130.80	1,889	2,300
130.85	1,889	2,368
130.90	1,889	2,435
130.95	1,889	2,502
131.00	1,889	2,568
131.05	1,889	2,634
131.10	1,889	2,698
131.15	1,889	2,762
131.20	1,889	2,825
131.25	1,889	2,887
131.30	1,889	2,948
131.35	1,889	3,008
131.40	1,889	3,067
131.45	1,889	3,124
131.50	1,889	3,181
131.55	1,889	3,236
131.60	1,889	3,290
131.65	1,889	3,342
131.70	1,889	3,392
131.75	1,889	3,439
131.80	1,889	3,484
131.85	1,889	3,526
131.90	1,889	3,567
131.95	1,889	3,607
132.00	1,889	3,645
132.05	1,889	3,683
132.10	1,889	3,721
132.15	1,889	3,758
132.20	1,889	3,796
132.25	1,889	3,834
132.30	1,889	3,872
132.35	1,889	3,910
132.40	1,889	3,947
132.45	1,889	3,985
132.50	1,889	**4,023**

Summary for Pond IB2a: Infiltration Basin 2a

Inflow Area =	26,310 sf, 88.91% Impervious, Inflow Depth > 4.37" for 10-YR event				
Inflow =	2.81 cfs @	12.09 hrs,	Volume=	9,590 cf	
Outflow =	1.10 cfs @	12.32 hrs,	Volume=	7,947 cf,	Atten= 61%, Lag= 13.9 min
Discarded =	0.06 cfs @	8.45 hrs,	Volume=	3,701 cf	
Primary =	1.04 cfs @	12.32 hrs,	Volume=	4,246 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 129.57' @ 12.32 hrs Surf.Area= 2,458 sf Storage= 3,488 cf

Plug-Flow detention time= 137.2 min calculated for 7,931 cf (83% of inflow)
Center-of-Mass det. time= 69.2 min (841.8 - 772.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	127.50'	2,392 cf	**30.00'W x 81.94'L x 3.67'H Field A** 9,013 cf Overall - 3,032 cf Embedded = 5,981 cf x 40.0% Voids
#2A	128.00'	3,032 cf	**ADS_StormTech SC-740 +Cap** x 66 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 6 Rows of 11 Chambers
		5,424 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	128.60'	**15.0" Round Culvert** L= 55.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 128.60' / 128.00' S= 0.0109 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Discarded	127.50'	**1.020 in/hr Exfiltration over Surface area**
#3	Device 1	128.80'	**10.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	130.10'	**10.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	130.99'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.06 cfs @ 8.45 hrs HW=127.54' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=1.04 cfs @ 12.32 hrs HW=129.57' (Free Discharge)
└─**1=Culvert** (Passes 1.04 cfs of 3.81 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 1.04 cfs @ 3.73 fps)
  ├─**4=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB2a: Infiltration Basin 2a - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

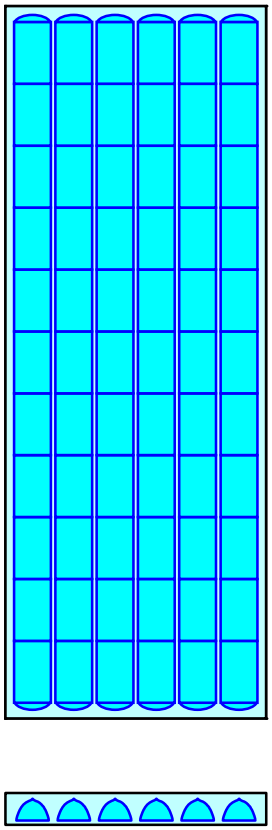
11 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 79.94' Row Length +12.0" End Stone x 2 = 81.94' Base Length
6 Rows x 51.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.00' Base Width
6.0" Base + 30.0" Chamber Height + 8.0" Cover = 3.67' Field Height

66 Chambers x 45.9 cf = 3,032.0 cf Chamber Storage

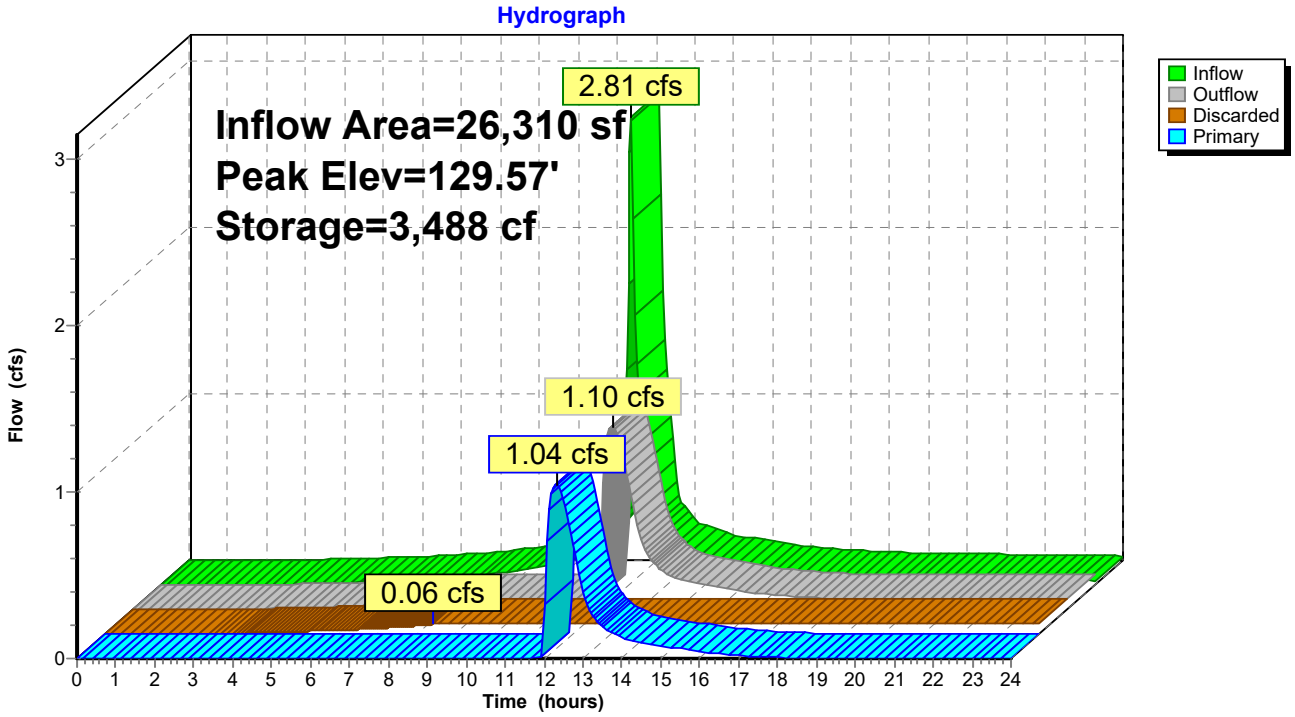
9,013.0 cf Field - 3,032.0 cf Chambers = 5,981.0 cf Stone x 40.0% Voids = 2,392.4 cf Stone Storage

Chamber Storage + Stone Storage = 5,424.4 cf = 0.125 af
Overall Storage Efficiency = 60.2%
Overall System Size = 81.94' x 30.00' x 3.67'

66 Chambers
333.8 cy Field
221.5 cy Stone



Pond IB2a: Infiltration Basin 2a



Stage-Area-Storage for Pond IB2a: Infiltration Basin 2a

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
127.50	**2,458**	0
127.55	2,458	49
127.60	2,458	98
127.65	2,458	147
127.70	2,458	197
127.75	2,458	246
127.80	2,458	295
127.85	2,458	344
127.90	2,458	393
127.95	2,458	442
128.00	2,458	492
128.05	2,458	593
128.10	2,458	695
128.15	2,458	796
128.20	2,458	897
128.25	2,458	998
128.30	2,458	1,099
128.35	2,458	1,199
128.40	2,458	1,298
128.45	2,458	1,398
128.50	2,458	1,497
128.55	2,458	1,595
128.60	2,458	1,694
128.65	2,458	1,791
128.70	2,458	1,888
128.75	2,458	1,985
128.80	2,458	2,081
128.85	2,458	2,177
128.90	2,458	2,272
128.95	2,458	2,367
129.00	2,458	2,461
129.05	2,458	2,554
129.10	2,458	2,647
129.15	2,458	2,739
129.20	2,458	2,830
129.25	2,458	2,921
129.30	2,458	3,011
129.35	2,458	3,100
129.40	2,458	3,188
129.45	2,458	3,275
129.50	2,458	3,362
129.55	2,458	3,447
129.60	2,458	3,532
129.65	2,458	3,615
129.70	2,458	3,698
129.75	2,458	3,779
129.80	2,458	3,858
129.85	2,458	3,937
129.90	2,458	4,014
129.95	2,458	4,089
130.00	2,458	4,164
130.05	2,458	4,236
130.10	2,458	4,306
130.15	2,458	4,374
130.20	2,458	4,439
130.25	2,458	4,501
130.30	2,458	4,559
130.35	2,458	4,614
130.40	2,458	4,667
130.45	2,458	4,719
130.50	2,458	4,769
130.55	2,458	4,818
130.60	2,458	4,867
130.65	2,458	4,916
130.70	2,458	4,966
130.75	2,458	5,015
130.80	2,458	5,064
130.85	2,458	5,113
130.90	2,458	5,162
130.95	2,458	5,211
131.00	2,458	5,261
131.05	2,458	5,310
131.10	2,458	5,359
131.15	2,458	**5,408**

Summary for Pond IB2c: Infiltration Basin Area 2c

Inflow Area =	15,551 sf, 65.27% Impervious, Inflow Depth > 3.53" for 10-YR event				
Inflow =	1.43 cfs @	12.09 hrs,	Volume=	4,574 cf	
Outflow =	0.46 cfs @	12.40 hrs,	Volume=	4,569 cf,	Atten= 68%, Lag= 18.8 min
Discarded =	0.06 cfs @	10.60 hrs,	Volume=	2,956 cf	
Primary =	0.40 cfs @	12.40 hrs,	Volume=	1,613 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 131.09' @ 12.40 hrs Surf.Area= 2,373 sf Storage= 1,500 cf

Plug-Flow detention time= 106.9 min calculated for 4,560 cf (100% of inflow)
Center-of-Mass det. time= 106.0 min (909.4 - 803.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	130.00'	1,505 cf	**27.00'W x 87.91'L x 2.00'H Field A** 4,747 cf Overall - 985 cf Embedded = 3,762 cf x 40.0% Voids
#2A	130.50'	985 cf	**ADS_StormTech SC-160LP +Cap** x 144 Inside #1 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 12 Rows of 12 Chambers
		2,489 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	130.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	129.20'	**8.0" Round Culvert** L= 14.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 129.20' / 129.00' S= 0.0143 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.35 sf
#3	Device 2	130.70'	**11.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 2	131.40'	**2.0" Vert. Orifice/Grate** C= 0.600
#5	Device 2	131.88'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.06 cfs @ 10.60 hrs HW=130.02' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.40 cfs @ 12.40 hrs HW=131.09' (Free Discharge)
└─**2=Culvert** (Passes 0.40 cfs of 2.53 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.40 cfs @ 2.65 fps)
  ├─**4=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB2c: Infiltration Basin Area 2c - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-160LP +Cap (ADS StormTech® SC-160LP with cap length)
Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf
Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap

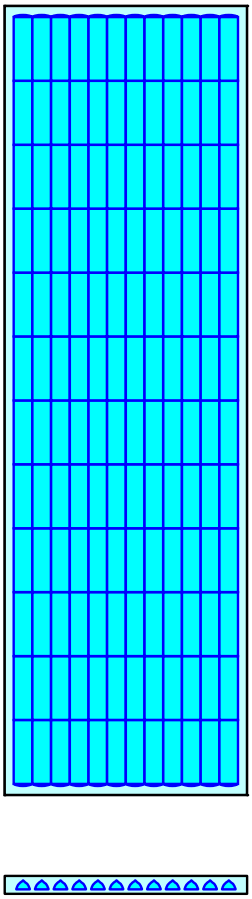
12 Chambers/Row x 7.12' Long +0.23' Cap Length x 2 = 85.91' Row Length +12.0" End Stone x 2 = 87.91' Base Length
12 Rows x 25.0" Wide + 12.0" Side Stone x 2 = 27.00' Base Width
6.0" Base + 12.0" Chamber Height + 6.0" Cover = 2.00' Field Height

144 Chambers x 6.8 cf = 984.5 cf Chamber Storage

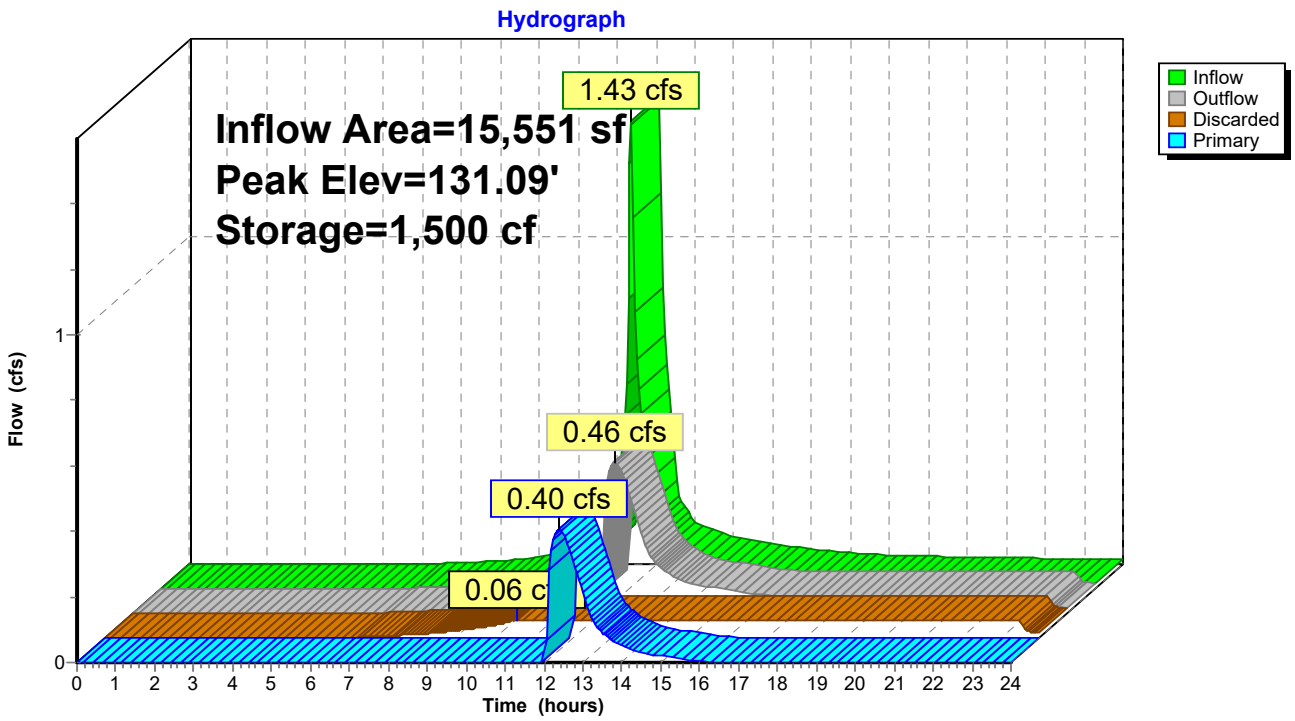
4,747.0 cf Field - 984.5 cf Chambers = 3,762.4 cf Stone x 40.0% Voids = 1,505.0 cf Stone Storage

Chamber Storage + Stone Storage = 2,489.5 cf = 0.057 af
Overall Storage Efficiency = 52.4%
Overall System Size = 87.91' x 27.00' x 2.00'

144 Chambers
175.8 cy Field
139.3 cy Stone



Pond IB2c: Infiltration Basin Area 2c



Stage-Area-Storage for Pond IB2c: Infiltration Basin Area 2c

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.00	**2,373**	0	131.06	2,373	1,457
130.02	2,373	19	131.08	2,373	1,489
130.04	2,373	38	131.10	2,373	1,519
130.06	2,373	57	131.12	2,373	1,550
130.08	2,373	76	131.14	2,373	1,580
130.10	2,373	95	131.16	2,373	1,609
130.12	2,373	114	131.18	2,373	1,638
130.14	2,373	133	131.20	2,373	1,667
130.16	2,373	152	131.22	2,373	1,695
130.18	2,373	171	131.24	2,373	1,722
130.20	2,373	190	131.26	2,373	1,749
130.22	2,373	209	131.28	2,373	1,774
130.24	2,373	228	131.30	2,373	1,799
130.26	2,373	247	131.32	2,373	1,824
130.28	2,373	266	131.34	2,373	1,847
130.30	2,373	285	131.36	2,373	1,870
130.32	2,373	304	131.38	2,373	1,892
130.34	2,373	323	131.40	2,373	1,914
130.36	2,373	342	131.42	2,373	1,935
130.38	2,373	361	131.44	2,373	1,955
130.40	2,373	380	131.46	2,373	1,976
130.42	2,373	399	131.48	2,373	1,995
130.44	2,373	418	131.50	2,373	2,015
130.46	2,373	437	131.52	2,373	2,034
130.48	2,373	456	131.54	2,373	2,053
130.50	2,373	475	131.56	2,373	2,072
130.52	2,373	512	131.58	2,373	2,091
130.54	2,373	549	131.60	2,373	2,110
130.56	2,373	587	131.62	2,373	2,129
130.58	2,373	624	131.64	2,373	2,148
130.60	2,373	661	131.66	2,373	2,167
130.62	2,373	698	131.68	2,373	2,186
130.64	2,373	735	131.70	2,373	2,205
130.66	2,373	772	131.72	2,373	2,224
130.68	2,373	808	131.74	2,373	2,243
130.70	2,373	844	131.76	2,373	2,262
130.72	2,373	880	131.78	2,373	2,281
130.74	2,373	916	131.80	2,373	2,300
130.76	2,373	952	131.82	2,373	2,319
130.78	2,373	987	131.84	2,373	2,338
130.80	2,373	1,022	131.86	2,373	2,357
130.82	2,373	1,057	131.88	2,373	2,376
130.84	2,373	1,092	131.90	2,373	2,395
130.86	2,373	1,127	131.92	2,373	2,414
130.88	2,373	1,161	131.94	2,373	2,433
130.90	2,373	1,195	131.96	2,373	2,452
130.92	2,373	1,229	131.98	2,373	2,471
130.94	2,373	1,263	132.00	2,373	**2,489**
130.96	2,373	1,296			
130.98	2,373	1,329			
131.00	2,373	1,361			
131.02	2,373	1,394			
131.04	2,373	1,426			

Summary for Pond IB2e: Infiltration Basin 2b

Inflow Area =	15,464 sf, 93.24% Impervious, Inflow Depth > 4.49" for 10-YR event				
Inflow =	1.67 cfs @	12.09 hrs,	Volume=	5,781 cf	
Outflow =	0.28 cfs @	12.56 hrs,	Volume=	5,778 cf,	Atten= 83%, Lag= 28.4 min
Discarded =	0.14 cfs @	11.30 hrs,	Volume=	5,231 cf	
Primary =	0.13 cfs @	12.56 hrs,	Volume=	547 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 131.73' @ 12.56 hrs Surf.Area= 2,592 sf Storage= 1,932 cf

Plug-Flow detention time= 74.1 min calculated for 5,778 cf (100% of inflow)
Center-of-Mass det. time= 73.8 min (841.3 - 767.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	130.50'	2,002 cf	**34.83'W x 74.40'L x 2.50'H Field A** 6,479 cf Overall - 1,474 cf Embedded = 5,005 cf x 40.0% Voids
#2A	131.00'	1,474 cf	**ADS_StormTech SC-310 +Cap** x 100 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 10 Rows of 10 Chambers
		3,476 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	130.85'	**15.0" Round Culvert Barrel** L= 69.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 130.85' / 130.50' S= 0.0051 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Discarded	130.50'	**2.410 in/hr Exfiltration over Surface area**
#3	Device 1	131.40'	**3.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	132.63'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.14 cfs @ 11.30 hrs HW=130.53' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=0.13 cfs @ 12.56 hrs HW=131.73' (Free Discharge)
└─**1=Culvert Barrel** (Passes 0.13 cfs of 2.55 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.13 cfs @ 2.12 fps)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB2e: Infiltration Basin 2b - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-310 +Cap (ADS StormTech® SC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

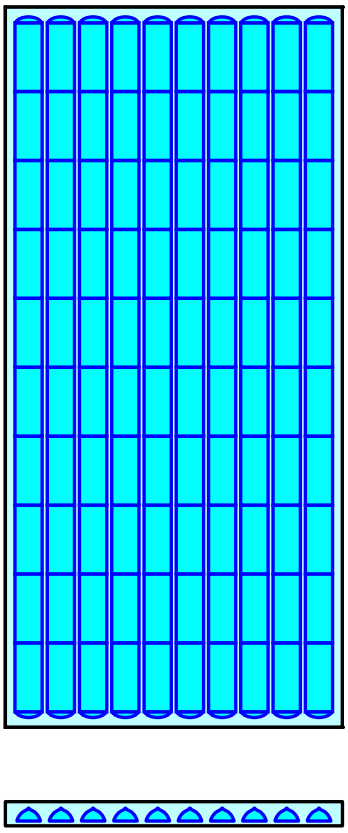
10 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 72.40' Row Length +12.0" End Stone x 2 = 74.40' Base Length
10 Rows x 34.0" Wide + 6.0" Spacing x 9 + 12.0" Side Stone x 2 = 34.83' Base Width
6.0" Base + 16.0" Chamber Height + 8.0" Cover = 2.50' Field Height

100 Chambers x 14.7 cf = 1,474.2 cf Chamber Storage

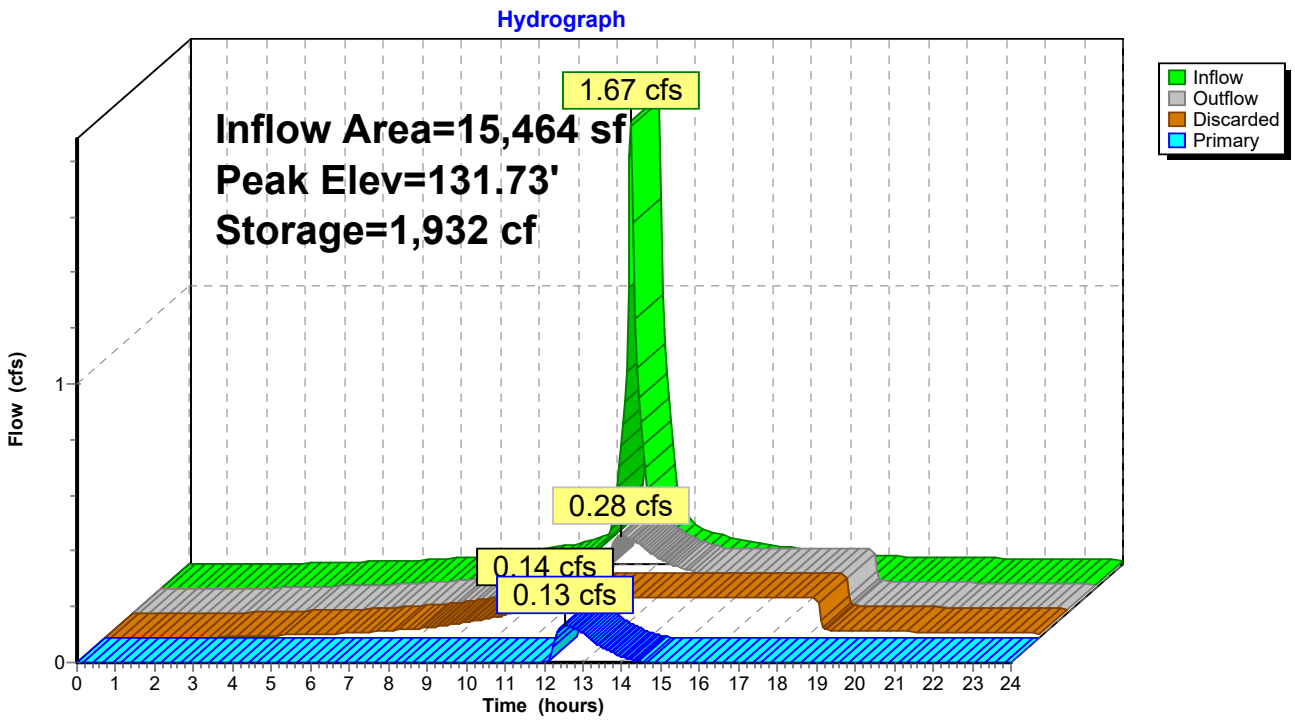
6,479.0 cf Field - 1,474.2 cf Chambers = 5,004.8 cf Stone x 40.0% Voids = 2,001.9 cf Stone Storage

Chamber Storage + Stone Storage = 3,476.1 cf = 0.080 af
Overall Storage Efficiency = 53.7%
Overall System Size = 74.40' x 34.83' x 2.50'

100 Chambers
240.0 cy Field
185.4 cy Stone



Pond IB2e: Infiltration Basin 2b



Stage-Area-Storage for Pond IB2e: Infiltration Basin 2b

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.50	**2,592**	0
130.55	2,592	52
130.60	2,592	104
130.65	2,592	155
130.70	2,592	207
130.75	2,592	259
130.80	2,592	311
130.85	2,592	363
130.90	2,592	415
130.95	2,592	466
131.00	2,592	518
131.05	2,592	622
131.10	2,592	724
131.15	2,592	827
131.20	2,592	928
131.25	2,592	1,029
131.30	2,592	1,129
131.35	2,592	1,227
131.40	2,592	1,325
131.45	2,592	1,422
131.50	2,592	1,517
131.55	2,592	1,611
131.60	2,592	1,703
131.65	2,592	1,794
131.70	2,592	1,884
131.75	2,592	1,972
131.80	2,592	2,057
131.85	2,592	2,141
131.90	2,592	2,222
131.95	2,592	2,301
132.00	2,592	2,377
132.05	2,592	2,449
132.10	2,592	2,516
132.15	2,592	2,579
132.20	2,592	2,638
132.25	2,592	2,695
132.30	2,592	2,750
132.35	2,592	2,802
132.40	2,592	2,854
132.45	2,592	2,906
132.50	2,592	2,958
132.55	2,592	3,010
132.60	2,592	3,061
132.65	2,592	3,113
132.70	2,592	3,165
132.75	2,592	3,217
132.80	2,592	3,269
132.85	2,592	3,321
132.90	2,592	3,372
132.95	2,592	3,424
133.00	2,592	**3,476**

Summary for Subcatchment PD-1: Prop. Drainage Area 1

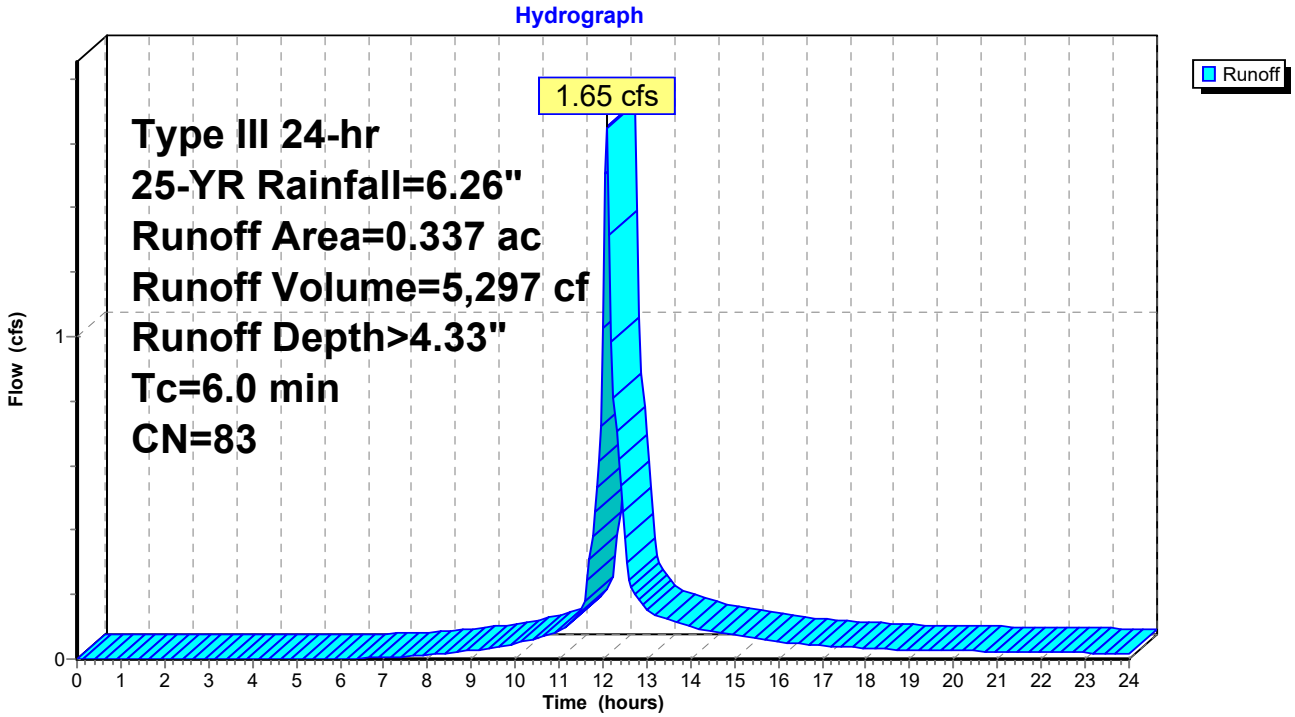
Runoff = 1.65 cfs @ 12.09 hrs, Volume= 5,297 cf, Depth> 4.33"

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-YR Rainfall=6.26"

	Area (ac)	CN	Description
*	0.074	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.070	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.193	98	Paved parking
	0.337	83	Weighted Average
	0.144		42.73% Pervious Area
	0.193		57.27% Impervious Area

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

Subcatchment PD-1: Prop. Drainage Area 1



Summary for Subcatchment PD-2a: Prop. Drainage Area 2a

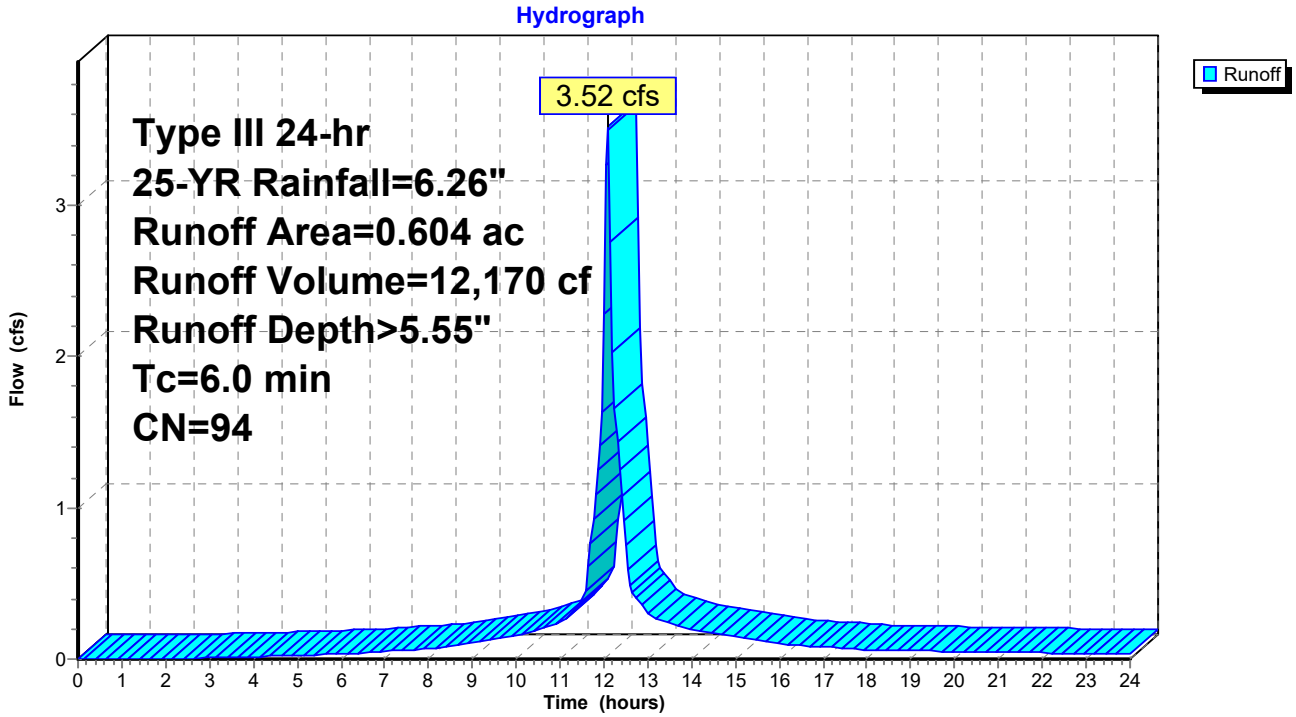
Runoff = 3.52 cfs @ 12.09 hrs, Volume= 12,170 cf, Depth> 5.55"

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-YR Rainfall=6.26"

	Area (ac)	CN	Description
*	0.038	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.029	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.537	98	Paved parking
	0.604	94	Weighted Average
	0.067		11.09% Pervious Area
	0.537		88.91% Impervious Area

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

Subcatchment PD-2a: Prop. Drainage Area 2a



Summary for Subcatchment PD-2b: Prop. Drainage Area 2b

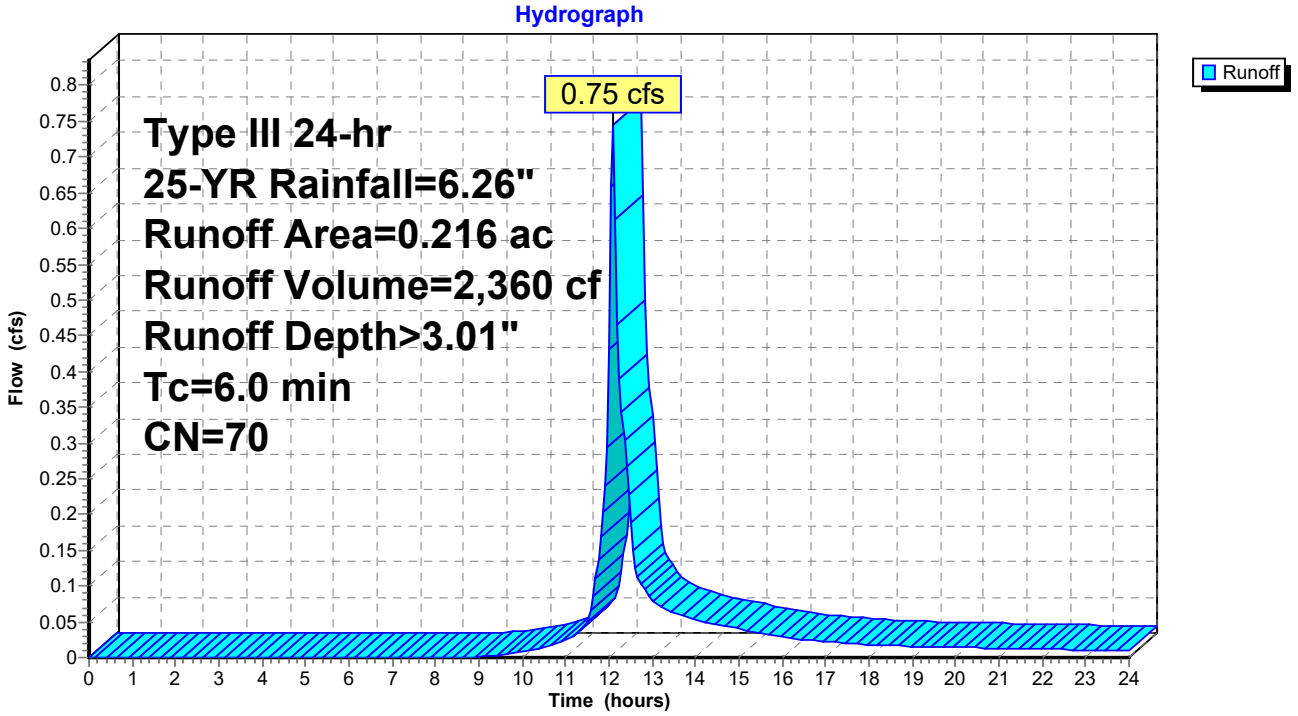
Runoff = 0.75 cfs @ 12.09 hrs, Volume= 2,360 cf, Depth> 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.26"

	Area (ac)	CN	Description
*	0.174	74	Woods/grass comb., Fair, HSG B/D, 13
*	0.018	43	Woods/grass comb., Fair, HSG A. 36A
	0.024	65	Woods/grass comb., Fair, HSG B
	0.216	70	Weighted Average
	0.216		100.00% Pervious Area

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

Subcatchment PD-2b: Prop. Drainage Area 2b



Summary for Subcatchment PD-2c: Prop. Drainage Area 2c

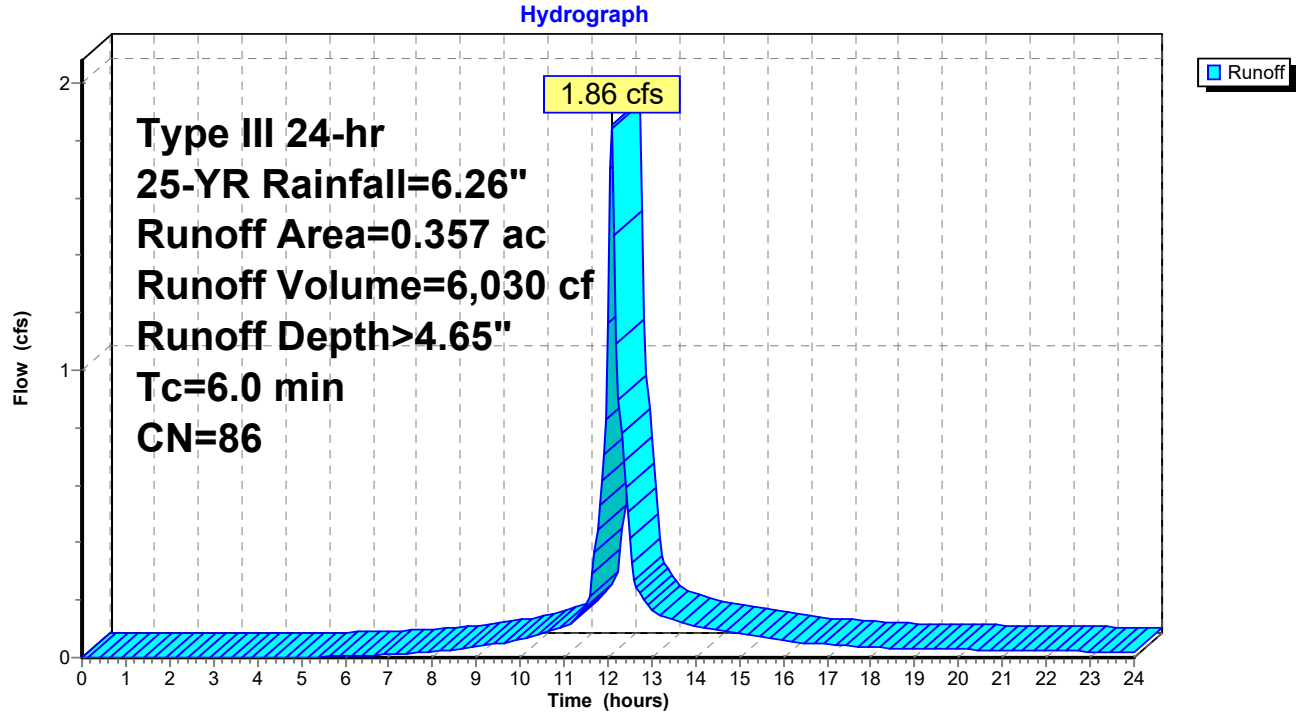
Runoff = 1.86 cfs @ 12.09 hrs, Volume= 6,030 cf, Depth> 4.65"

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-YR Rainfall=6.26"

	Area (ac)	CN	Description
*	0.061	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.042	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.021	49	50-75% Grass cover, Fair, HSG A, 36A
	0.233	98	Paved parking, HSG D
	0.357	86	Weighted Average
	0.124		34.73% Pervious Area
	0.233		65.27% Impervious Area

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

Subcatchment PD-2c: Prop. Drainage Area 2c



Summary for Subcatchment PD-2d: Prop. Drainage Area 2d

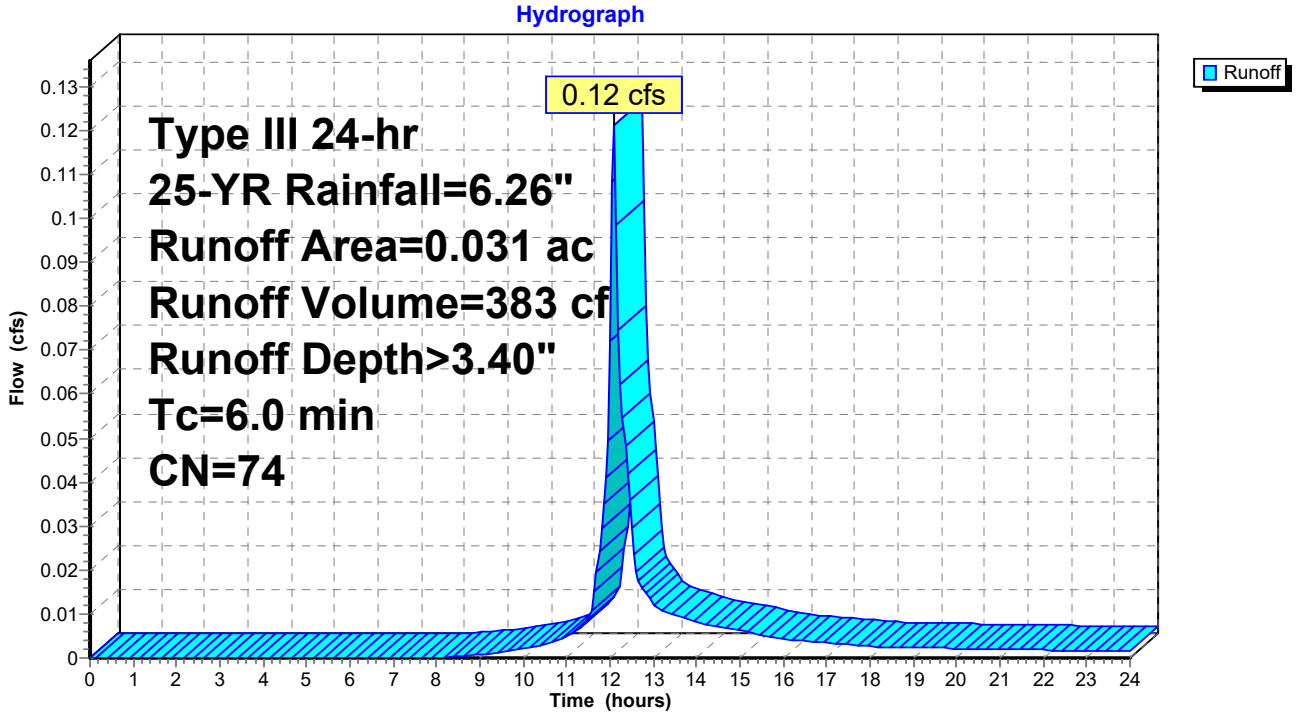
Runoff = 0.12 cfs @ 12.09 hrs, Volume= 383 cf, Depth> 3.40"

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-YR Rainfall=6.26"

	Area (ac)	CN	Description
*	0.031	74	Woods/grass comb., Fair, HSG B/D, 13
	0.031		100.00% Pervious Area

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

Subcatchment PD-2d: Prop. Drainage Area 2d



Summary for Subcatchment PD-2e: Prop. Drainage Area 2e

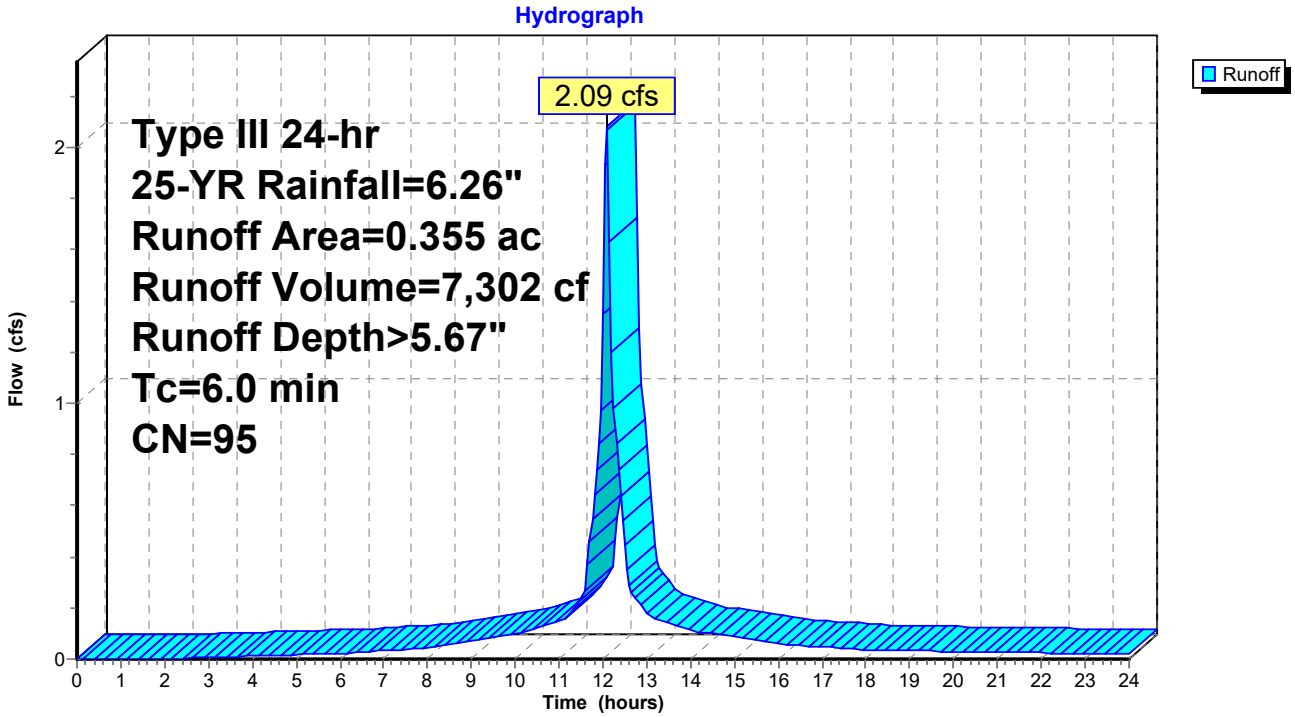
Runoff = 2.09 cfs @ 12.09 hrs, Volume= 7,302 cf, Depth> 5.67"

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-YR Rainfall=6.26"

	Area (ac)	CN	Description
*	0.004	43	Woods/grass comb., Fair, HSG A, 36A
*	0.020	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.331	98	Paved parking
	0.355	95	Weighted Average
	0.024		6.76% Pervious Area
	0.331		93.24% Impervious Area

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

Subcatchment PD-2e: Prop. Drainage Area 2e



Summary for Subcatchment PD-2f: Prop. Drainage Area 2d

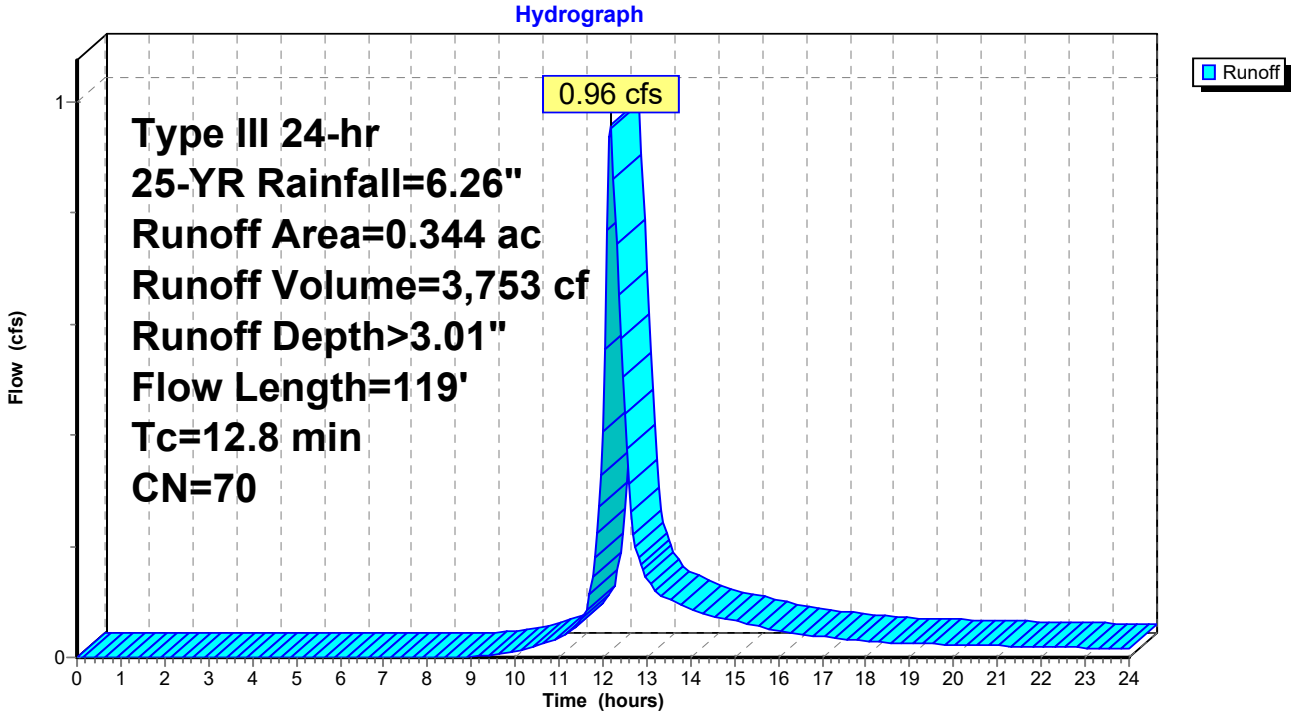
Runoff = 0.96 cfs @ 12.18 hrs, Volume= 3,753 cf, Depth> 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.26"

	Area (ac)	CN	Description
*	0.296	74	Woods/grass comb., Fair, HSG B/D, 13
	0.048	43	Woods/grass comb., Fair, HSG A
	0.344	70	Weighted Average
	0.344		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	23	0.1600	0.13		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.18"
8.4	36	0.0270	0.07		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.18"
1.5	60	0.0167	0.65		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
12.8	119	Total			

Subcatchment PD-2f: Prop. Drainage Area 2d



Summary for Subcatchment PD-3a: Prop. Drainage Area 3a

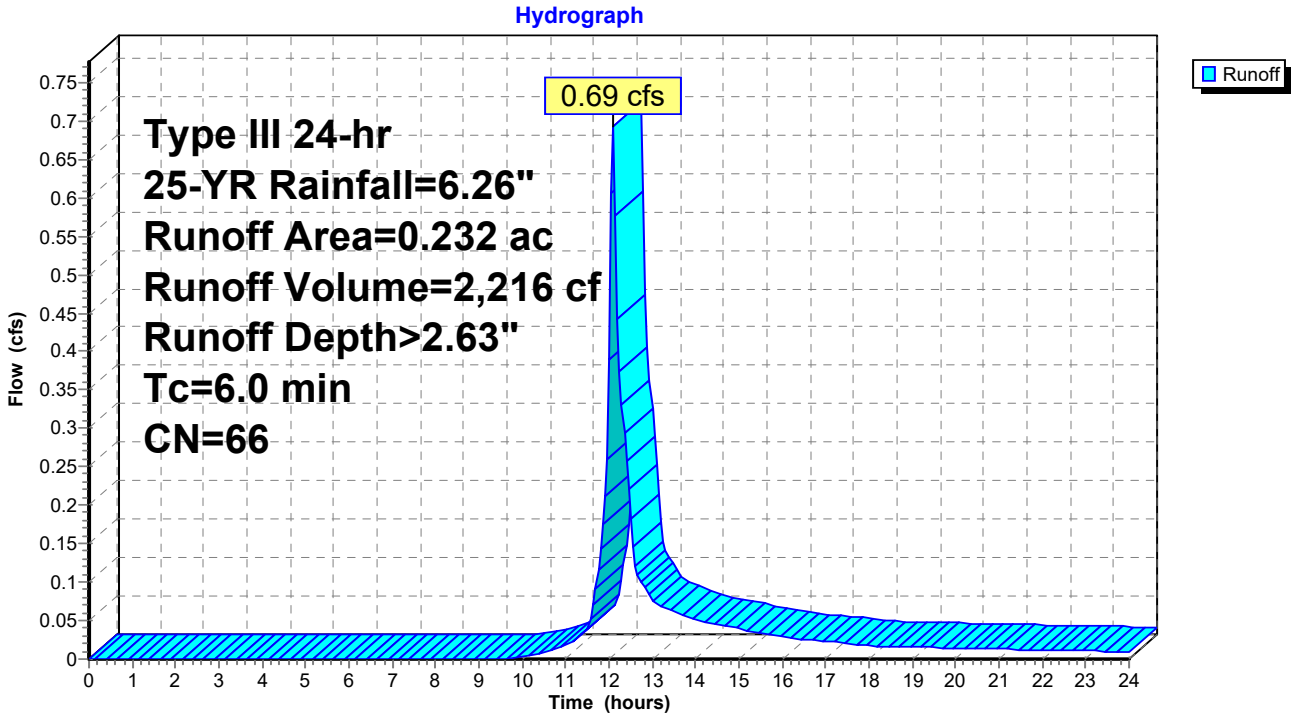
Runoff = 0.69 cfs @ 12.10 hrs, Volume= 2,216 cf, Depth> 2.63"

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-YR Rainfall=6.26"

	Area (ac)	CN	Description
*	0.120	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.071	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.041	98	Paved parking
	0.232	66	Weighted Average
	0.191		82.33% Pervious Area
	0.041		17.67% Impervious Area

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

Subcatchment PD-3a: Prop. Drainage Area 3a



Summary for Subcatchment PD-3b: Prop. Drainage Area 3b

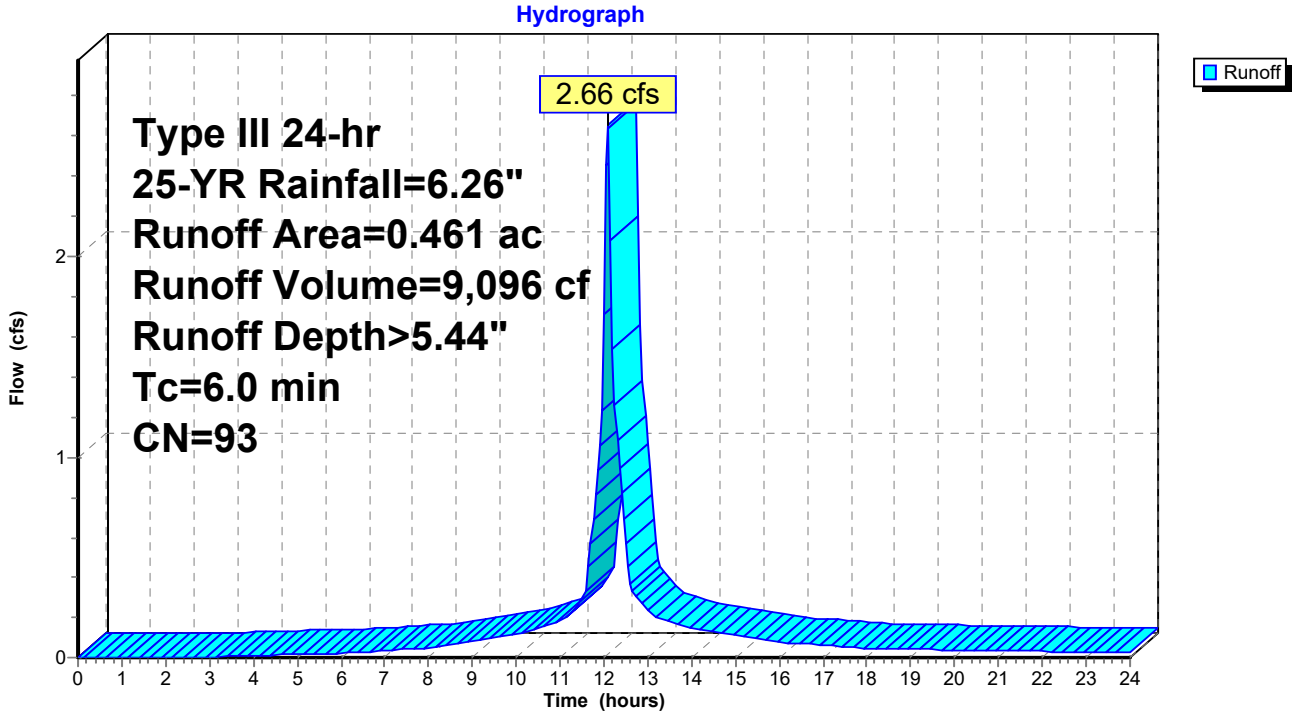
Runoff = 2.66 cfs @ 12.09 hrs, Volume= 9,096 cf, Depth> 5.44"

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-YR Rainfall=6.26"

	Area (ac)	CN	Description
*	0.093	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.019	79	50-75% Grass cover, Fair, HSG C, 701A
*	0.016	98	Paved parking
*	0.333	98	Roofing
	0.461	93	Weighted Average
	0.112		24.30% Pervious Area
	0.349		75.70% Impervious Area

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

Subcatchment PD-3b: Prop. Drainage Area 3b



Summary for Subcatchment PD-3c: Prop. Drainage Area 3c

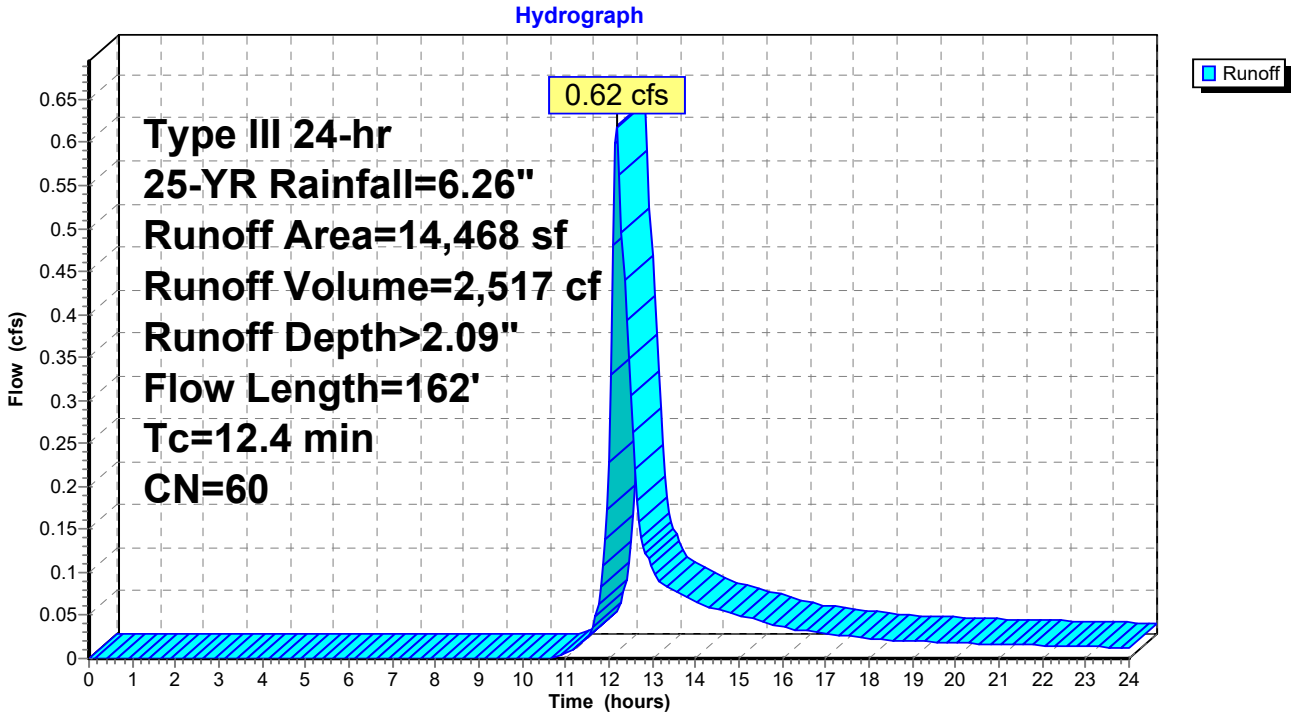
Runoff = 0.62 cfs @ 12.19 hrs, Volume= 2,517 cf, Depth> 2.09"

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-YR Rainfall=6.26"

	Area (sf)	CN	Description
*	6,684	43	Woods/grass comb., Fair, HSG A, 36A
*	5,545	74	Woods/grass comb., Fair, HSG C
	1,501	76	Woods/grass comb., Fair, HSG C
*	738	77	50-75% Grass cover, Fair, HSG C
	14,468	60	Weighted Average
	14,468		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	8	0.0625	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.18"
3.4	17	0.0580	0.08		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.18"
3.2	16	0.0625	0.08		**Sheet Flow, C-D** Woods: Light underbrush n= 0.400 P2= 3.18"
1.5	9	0.1250	0.10		**Sheet Flow, D-E** Woods: Light underbrush n= 0.400 P2= 3.18"
2.5	112	0.0220	0.74		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
12.4	162	Total			

Subcatchment PD-3c: Prop. Drainage Area 3c



Summary for Subcatchment RD-1: Roof 1

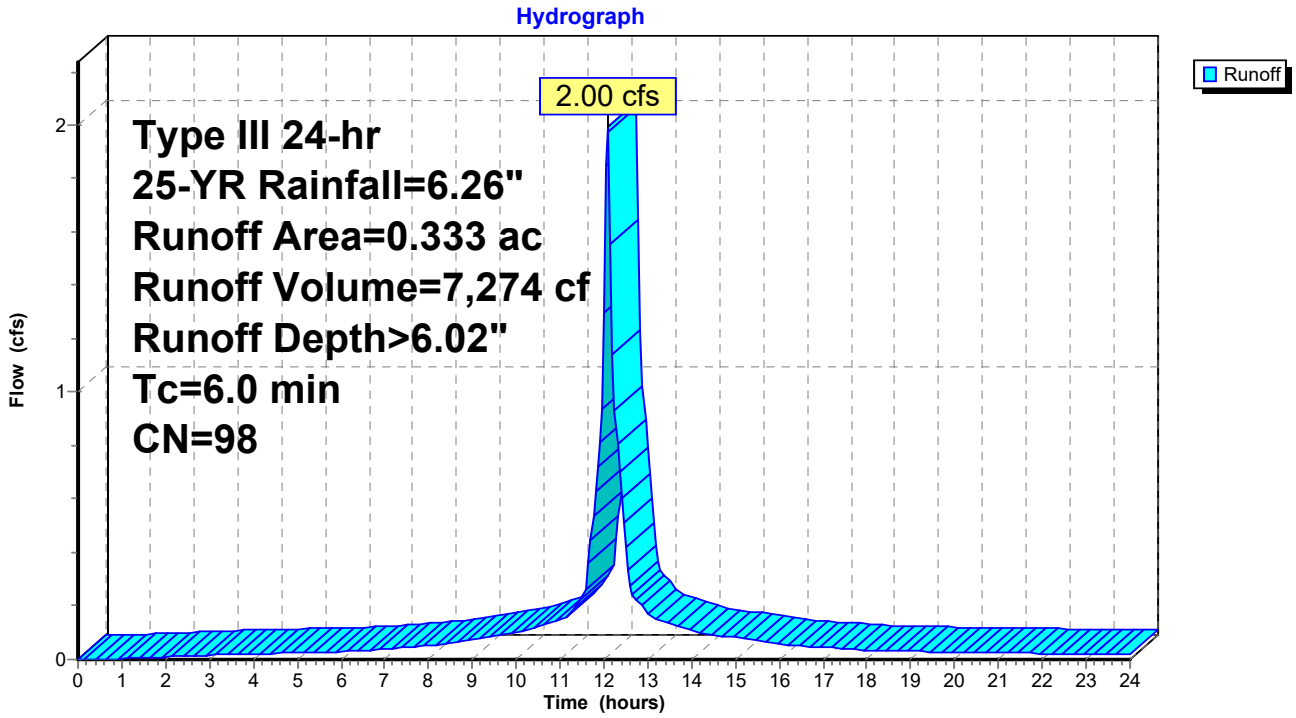
Runoff = 2.00 cfs @ 12.09 hrs, Volume= 7,274 cf, Depth> 6.02"

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 25-YR Rainfall=6.26"

	Area (ac)	CN	Description
*	0.333	98	Unconnected roofs
	0.333		100.00% Impervious Area
	0.333		100.00% Unconnected

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

Subcatchment RD-1: Roof 1

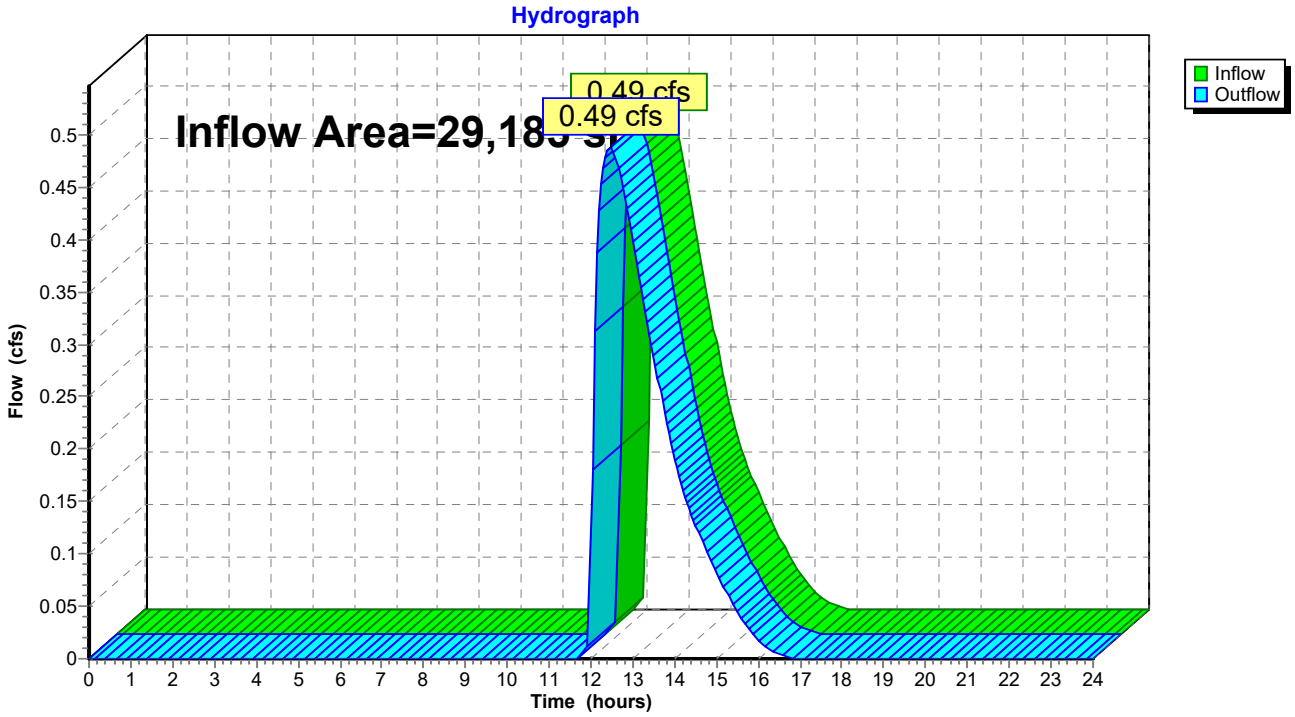


Summary for Reach DP-1a: Design Point 1

Inflow Area = 29,185 sf, 78.51% Impervious, Inflow Depth = 1.32" for 25-YR event
Inflow = 0.49 cfs @ 12.46 hrs, Volume= 3,221 cf
Outflow = 0.49 cfs @ 12.46 hrs, Volume= 3,221 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-1a: Design Point 1

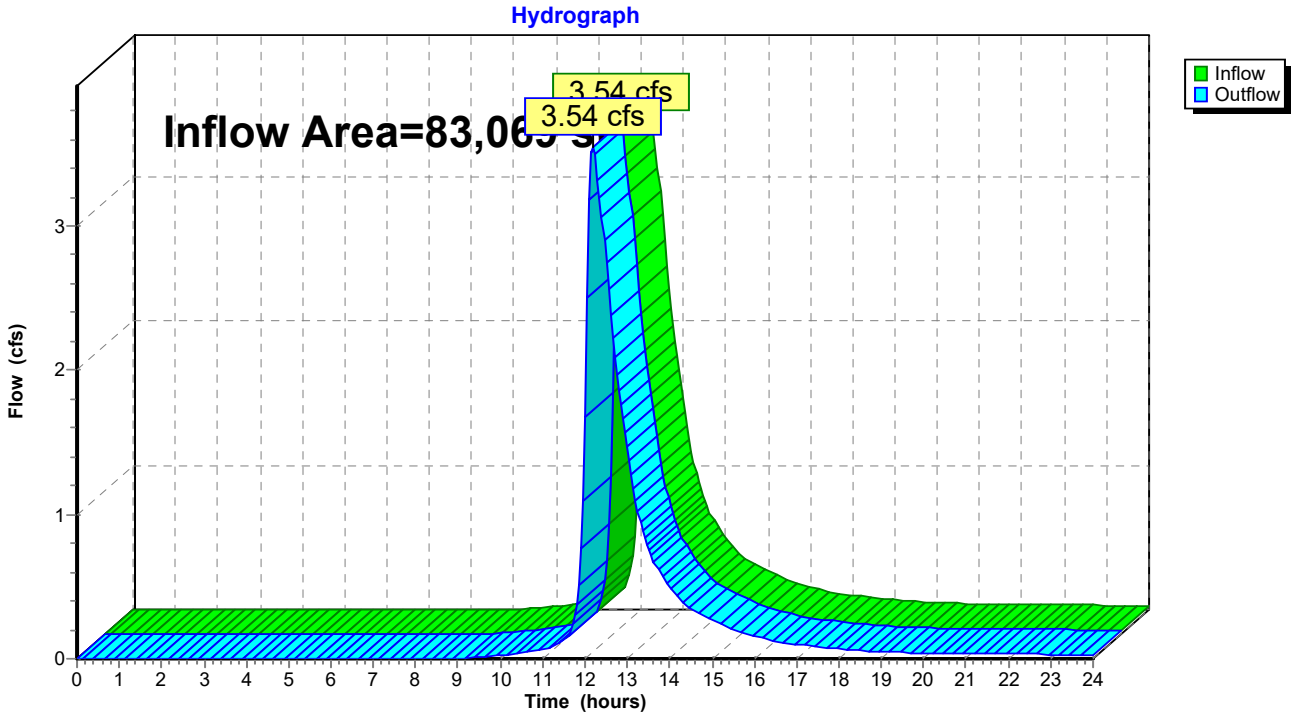


Summary for Reach DP-2a: Design Point 2

Inflow Area = 83,069 sf, 57.73% Impervious, Inflow Depth > 2.45" for 25-YR event
Inflow = 3.54 cfs @ 12.19 hrs, Volume= 16,951 cf
Outflow = 3.54 cfs @ 12.19 hrs, Volume= 16,951 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-2a: Design Point 2

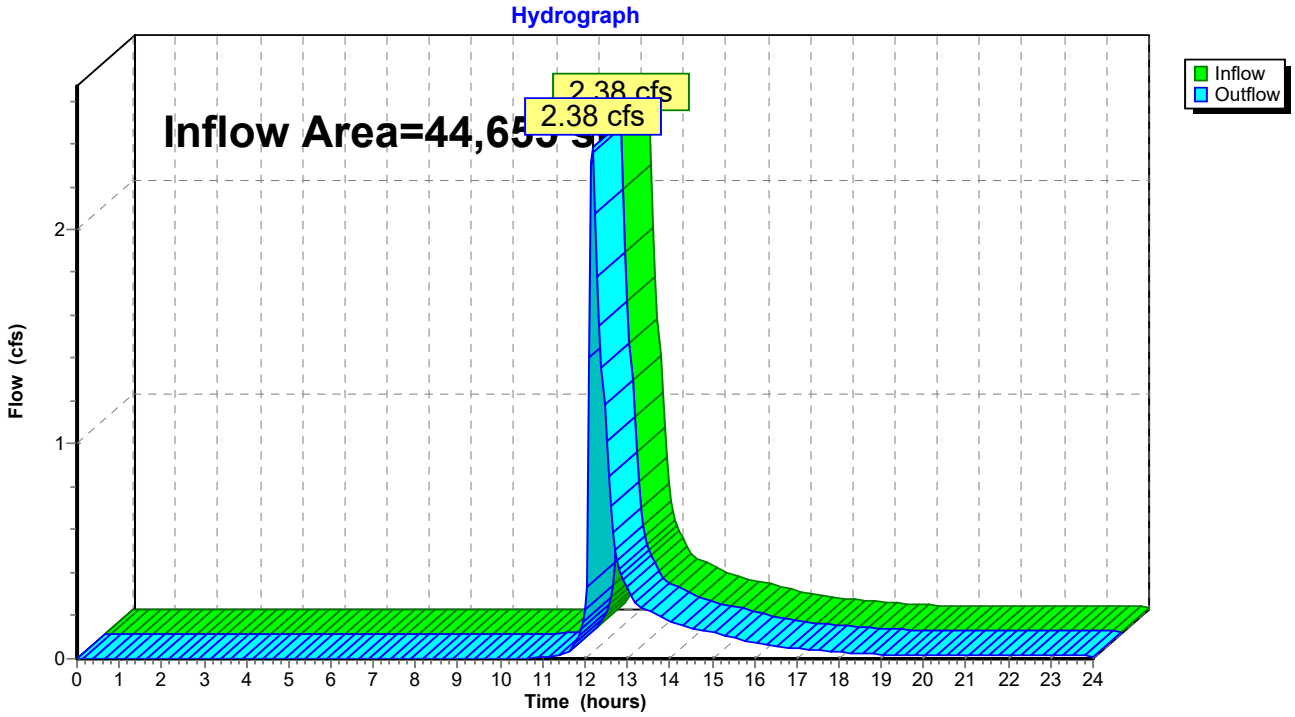


Summary for Reach DP-3a: Design Point 3

Inflow Area = 44,655 sf, 38.04% Impervious, Inflow Depth > 1.68" for 25-YR event
Inflow = 2.38 cfs @ 12.18 hrs, Volume= 6,245 cf
Outflow = 2.38 cfs @ 12.18 hrs, Volume= 6,245 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-3a: Design Point 3



Summary for Pond AB1: Above Ground Infiltration Basin 1

Inflow Area =	29,185 sf, 78.51% Impervious, Inflow Depth > 2.70" for 25-YR event				
Inflow =	1.65 cfs @	12.09 hrs,	Volume=	6,561 cf	
Outflow =	0.59 cfs @	12.46 hrs,	Volume=	6,537 cf,	Atten= 64%, Lag= 22.4 min
Discarded =	0.10 cfs @	12.46 hrs,	Volume=	3,316 cf	
Primary =	0.49 cfs @	12.46 hrs,	Volume=	3,221 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 128.76' @ 12.46 hrs Surf.Area= 1,774 sf Storage= 1,850 cf

Plug-Flow detention time= 76.7 min calculated for 6,537 cf (100% of inflow)
Center-of-Mass det. time= 74.4 min (879.3 - 804.9)

Volume	Invert	Avail.Storage	Storage Description
#1	127.00'	4,542 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 4,798 cf Overall - 256 cf Embedded = 4,542 cf
#2	127.00'	102 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) Inside #1 256 cf Overall x 40.0% Voids
		4,644 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
127.00	512	0	0
128.00	1,218	865	865
129.00	1,949	1,584	2,449
130.00	2,749	2,349	4,798

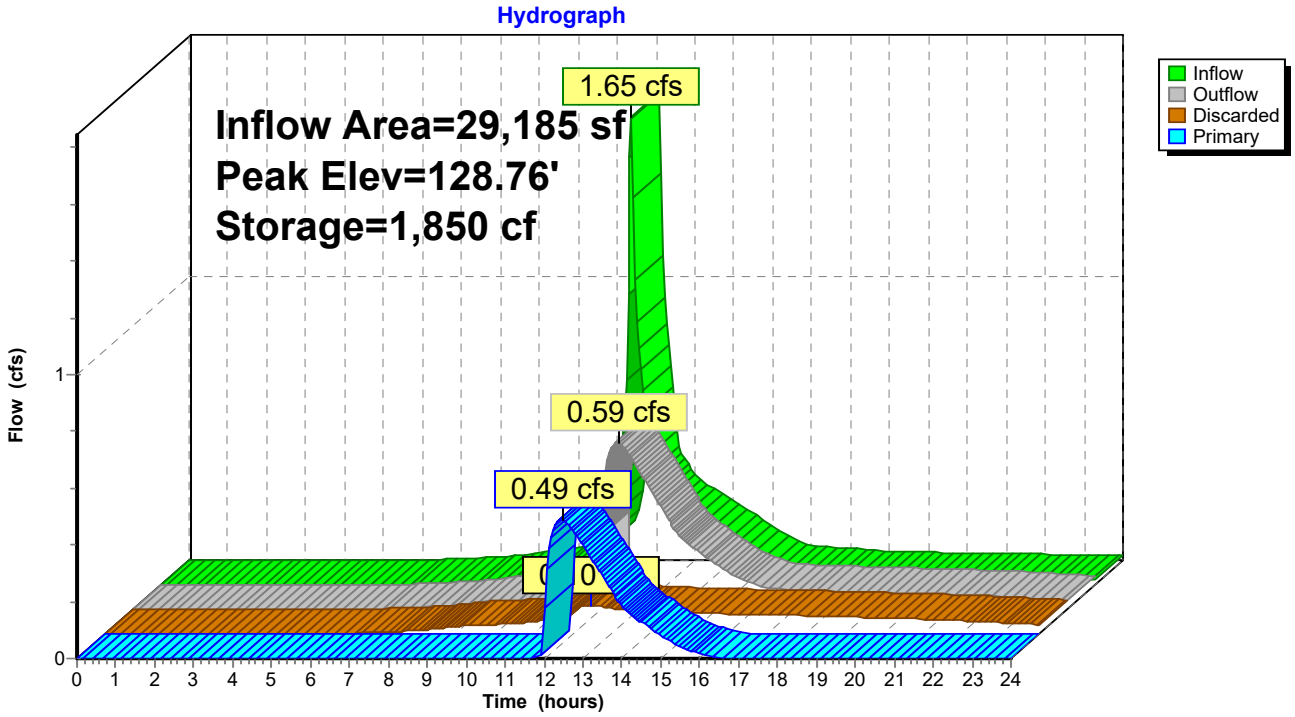
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
127.00	512	0	0
127.50	512	256	256

Device	Routing	Invert	Outlet Devices
#1	Primary	127.57'	**8.0" Round Culvert Barrel** L= 13.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 127.57' / 127.50' S= 0.0054 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.35 sf
#2	Device 1	129.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	127.00'	**2.410 in/hr Exfiltration over Surface area**
#4	Device 1	128.00'	**5.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.10 cfs @ 12.46 hrs HW=128.76' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.49 cfs @ 12.46 hrs HW=128.76' (Free Discharge)
└─**1=Culvert Barrel** (Passes 0.49 cfs of 1.12 cfs potential flow)
  ├─**2=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Orifice Controls 0.49 cfs @ 3.58 fps)

Pond AB1: Above Ground Infiltration Basin 1



Stage-Area-Storage for Pond AB1: Above Ground Infiltration Basin 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
127.00	512	0
127.05	547	11
127.10	583	24
127.15	618	39
127.20	653	55
127.25	689	73
127.30	724	93
127.35	759	115
127.40	794	138
127.45	830	164
127.50	865	191
127.55	900	235
127.60	936	281
127.65	971	328
127.70	1,006	378
127.75	1,042	429
127.80	1,077	482
127.85	1,112	537
127.90	1,147	593
127.95	1,183	651
128.00	1,218	711
128.05	1,255	773
128.10	1,291	837
128.15	1,328	902
128.20	1,364	970
128.25	1,401	1,039
128.30	1,437	1,110
128.35	1,474	1,182
128.40	1,510	1,257
128.45	1,547	1,334
128.50	1,584	1,412
128.55	1,620	1,492
128.60	1,657	1,574
128.65	1,693	1,658
128.70	1,730	1,743
128.75	1,766	1,830
128.80	1,803	1,920
128.85	1,839	2,011
128.90	1,876	2,104
128.95	1,912	2,198
129.00	1,949	2,295
129.05	1,989	2,393
129.10	2,029	2,494
129.15	2,069	2,596
129.20	2,109	2,701
129.25	2,149	2,807
129.30	2,189	2,916
129.35	2,229	3,026
129.40	2,269	3,139
129.45	2,309	3,253
129.50	2,349	3,369
129.55	2,389	3,488
129.60	2,429	3,608
129.65	2,469	3,731
129.70	2,509	3,855
129.75	2,549	3,982
129.80	2,589	4,110
129.85	2,629	4,241
129.90	2,669	4,373
129.95	2,709	4,507
130.00	**2,749**	**4,644**

Summary for Pond AB3a: Above Ground Infiltration 3a

Inflow Area =	10,106 sf, 17.67% Impervious, Inflow Depth > 2.63" for 25-YR event				
Inflow =	0.69 cfs @	12.10 hrs,	Volume=	2,216 cf	
Outflow =	0.08 cfs @	13.00 hrs,	Volume=	2,213 cf,	Atten= 89%, Lag= 54.3 min
Discarded =	0.08 cfs @	13.00 hrs,	Volume=	2,213 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= 132.72' @ 13.00 hrs Surf.Area= 1,401 sf Storage= 831 cf

Plug-Flow detention time= 103.9 min calculated for 2,208 cf (100% of inflow)
Center-of-Mass det. time= 102.8 min (947.6 - 844.9)

Volume	Invert	Avail.Storage	Storage Description
#1	132.00'	3,206 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

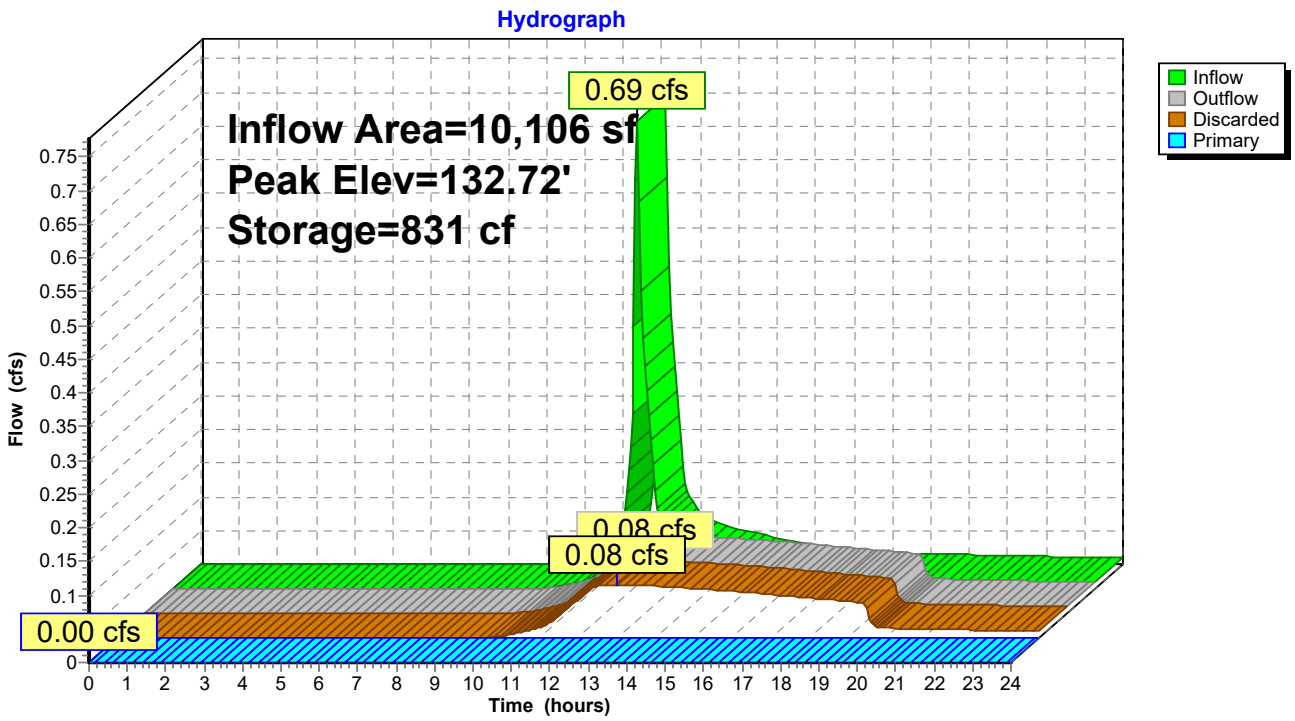
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
132.00	906	0	0
133.00	1,593	1,250	1,250
134.00	2,319	1,956	3,206

Device	Routing	Invert	Outlet Devices
#1	Discarded	132.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	133.00'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.08 cfs @ 13.00 hrs HW=132.72' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=132.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond AB3a: Above Ground Infiltration 3a



Stage-Area-Storage for Pond AB3a: Above Ground Infiltration 3a

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
132.00	906	0
132.02	920	18
132.04	933	37
132.06	947	56
132.08	961	75
132.10	975	94
132.12	988	114
132.14	1,002	134
132.16	1,016	154
132.18	1,030	174
132.20	1,043	195
132.22	1,057	216
132.24	1,071	237
132.26	1,085	259
132.28	1,098	281
132.30	1,112	303
132.32	1,126	325
132.34	1,140	348
132.36	1,153	371
132.38	1,167	394
132.40	1,181	417
132.42	1,195	441
132.44	1,208	465
132.46	1,222	489
132.48	1,236	514
132.50	1,250	539
132.52	1,263	564
132.54	1,277	589
132.56	1,291	615
132.58	1,304	641
132.60	1,318	667
132.62	1,332	694
132.64	1,346	721
132.66	1,359	748
132.68	1,373	775
132.70	1,387	803
132.72	1,401	830
132.74	1,414	859
132.76	1,428	887
132.78	1,442	916
132.80	1,456	945
132.82	1,469	974
132.84	1,483	1,003
132.86	1,497	1,033
132.88	1,511	1,063
132.90	1,524	1,094
132.92	1,538	1,124
132.94	1,552	1,155
132.96	1,566	1,186
132.98	1,579	1,218
133.00	1,593	1,250
133.02	1,608	1,282
133.04	1,622	1,314
133.06	1,637	1,346
133.08	1,651	1,379
133.10	1,666	1,412
133.12	1,680	1,446
133.14	1,695	1,480
133.16	1,709	1,514
133.18	1,724	1,548
133.20	1,738	1,583
133.22	1,753	1,618
133.24	1,767	1,653
133.26	1,782	1,688
133.28	1,796	1,724
133.30	1,811	1,760
133.32	1,825	1,796
133.34	1,840	1,833
133.36	1,854	1,870
133.38	1,869	1,907
133.40	1,883	1,945
133.42	1,898	1,983
133.44	1,912	2,021
133.46	1,927	2,059
133.48	1,941	2,098
133.50	1,956	2,137
133.52	1,971	2,176
133.54	1,985	2,216
133.56	2,000	2,255
133.58	2,014	2,296
133.60	2,029	2,336
133.62	2,043	2,377
133.64	2,058	2,418
133.66	2,072	2,459
133.68	2,087	2,501
133.70	2,101	2,542
133.72	2,116	2,585
133.74	2,130	2,627
133.76	2,145	2,670
133.78	2,159	2,713
133.80	2,174	2,756
133.82	2,188	2,800
133.84	2,203	2,844
133.86	2,217	2,888
133.88	2,232	2,932
133.90	2,246	2,977
133.92	2,261	3,022
133.94	2,275	3,068
133.96	2,290	3,113
133.98	2,304	3,159
134.00	**2,319**	**3,206**

Summary for Pond AB3b: Above Ground Infiltration 3b

Inflow Area =	20,081 sf, 75.70% Impervious, Inflow Depth > 5.44" for 25-YR event				
Inflow =	2.66 cfs @	12.09 hrs,	Volume=	9,096 cf	
Outflow =	1.81 cfs @	12.18 hrs,	Volume=	6,124 cf,	Atten= 32%, Lag= 5.6 min
Discarded =	0.05 cfs @	12.18 hrs,	Volume=	2,397 cf	
Primary =	1.76 cfs @	12.18 hrs,	Volume=	3,728 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 133.42' @ 12.18 hrs Surf.Area= 2,090 sf Storage= 3,712 cf

Plug-Flow detention time= 182.8 min calculated for 6,124 cf (67% of inflow)
Center-of-Mass det. time= 87.4 min (858.8 - 771.4)

Volume	Invert	Avail.Storage	Storage Description
#1	130.00'	5,050 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

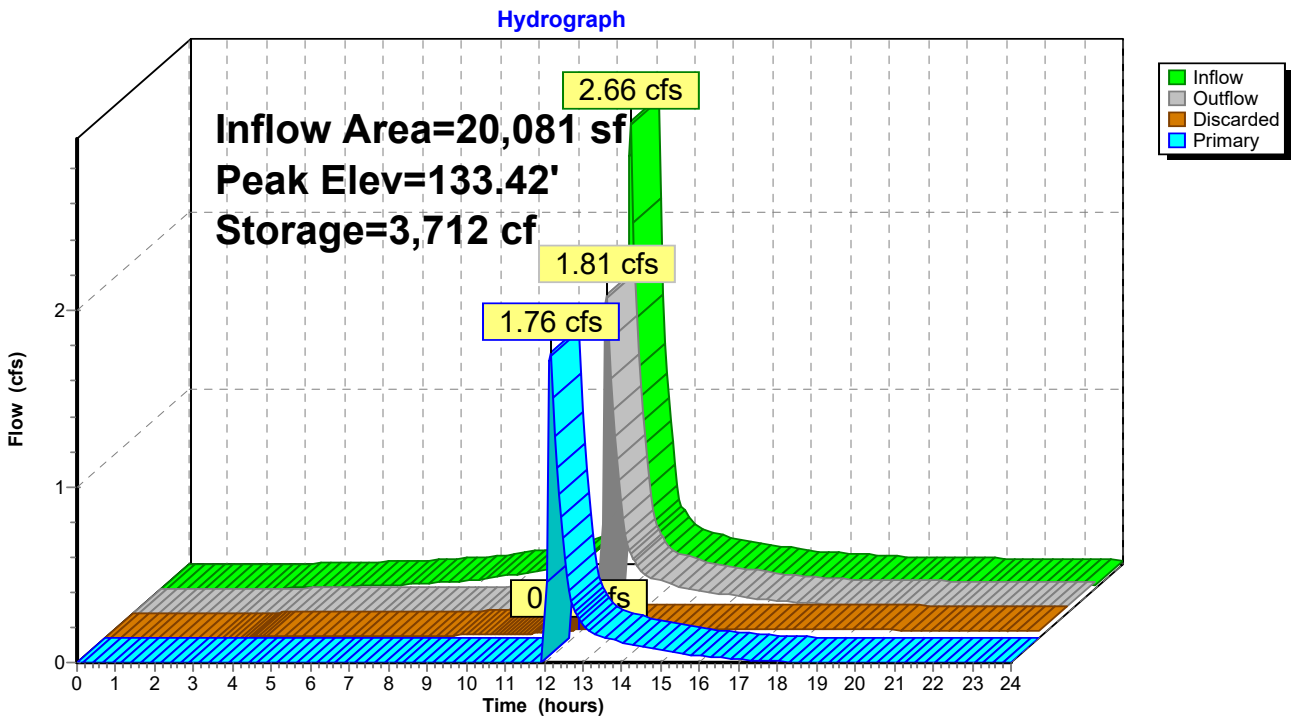
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
130.00	307	0	0
131.00	671	489	489
132.00	1,175	923	1,412
133.00	1,806	1,491	2,903
134.00	2,488	2,147	5,050

Device	Routing	Invert	Outlet Devices
#1	Primary	133.15'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Discarded	130.00'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 12.18 hrs HW=133.41' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=1.72 cfs @ 12.18 hrs HW=133.41' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 1.72 cfs @ 1.31 fps)

Pond AB3b: Above Ground Infiltration 3b



Stage-Area-Storage for Pond AB3b: Above Ground Infiltration 3b

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.00	307	0
130.05	325	16
130.10	343	33
130.15	362	50
130.20	380	69
130.25	398	88
130.30	416	108
130.35	434	130
130.40	453	152
130.45	471	175
130.50	489	199
130.55	507	224
130.60	525	250
130.65	544	276
130.70	562	304
130.75	580	333
130.80	598	362
130.85	616	392
130.90	635	424
130.95	653	456
131.00	671	489
131.05	696	523
131.10	721	559
131.15	747	595
131.20	772	633
131.25	797	673
131.30	822	713
131.35	847	755
131.40	873	798
131.45	898	842
131.50	923	888
131.55	948	934
131.60	973	982
131.65	999	1,032
131.70	1,024	1,082
131.75	1,049	1,134
131.80	1,074	1,187
131.85	1,099	1,241
131.90	1,125	1,297
131.95	1,150	1,354
132.00	1,175	1,412
132.05	1,207	1,472
132.10	1,238	1,533
132.15	1,270	1,595
132.20	1,301	1,660
132.25	1,333	1,725
132.30	1,364	1,793
132.35	1,396	1,862
132.40	1,427	1,932
132.45	1,459	2,005
132.50	1,491	2,078
132.55	1,522	2,154
132.60	1,554	2,231
132.65	1,585	2,309
132.70	1,617	2,389
132.75	1,648	2,471
132.80	1,680	2,554
132.85	1,711	2,639
132.90	1,743	2,725
132.95	1,774	2,813
133.00	1,806	2,903
133.05	1,840	2,994
133.10	1,874	3,087
133.15	1,908	3,181
133.20	1,942	3,277
133.25	1,977	3,375
133.30	2,011	3,475
133.35	2,045	3,576
133.40	2,079	3,679
133.45	2,113	3,784
133.50	2,147	3,891
133.55	2,181	3,999
133.60	2,215	4,109
133.65	2,249	4,220
133.70	2,283	4,334
133.75	2,318	4,449
133.80	2,352	4,566
133.85	2,386	4,684
133.90	2,420	4,804
133.95	2,454	4,926
134.00	**2,488**	**5,050**

Summary for Pond IB1: Infiltration Basin 1

Inflow Area =	14,505 sf,100.00% Impervious, Inflow Depth > 6.02" for 25-YR event				
Inflow =	2.00 cfs @	12.09 hrs,	Volume=	7,274 cf	
Outflow =	0.26 cfs @	12.62 hrs,	Volume=	7,270 cf,	Atten= 87%, Lag= 32.0 min
Discarded =	0.11 cfs @	10.30 hrs,	Volume=	6,006 cf	
Primary =	0.16 cfs @	12.62 hrs,	Volume=	1,264 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 131.11' @ 12.62 hrs Surf.Area= 1,889 sf Storage= 2,715 cf

Plug-Flow detention time= 127.9 min calculated for 7,270 cf (100% of inflow)
Center-of-Mass det. time= 127.5 min (871.6 - 744.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	129.00'	1,726 cf	**25.25'W x 74.82'L x 3.50'H Field A** 6,612 cf Overall - 2,297 cf Embedded = 4,315 cf x 40.0% Voids
#2A	129.50'	2,297 cf	**ADS_StormTech SC-740 +Cap** x 50 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 5 Rows of 10 Chambers
		4,023 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	130.24'	**12.0" Round Culvert** L= 10.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 130.24' / 130.00' S= 0.0240 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#2	Discarded	129.00'	**2.410 in/hr Exfiltration over Surface area**
#3	Device 1	130.40'	**3.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	132.05'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.11 cfs @ 10.30 hrs HW=129.04' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.16 cfs @ 12.62 hrs HW=131.11' (Free Discharge)
└─**1=Culvert** (Passes 0.16 cfs of 2.57 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.16 cfs @ 3.81 fps)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB1: Infiltration Basin 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

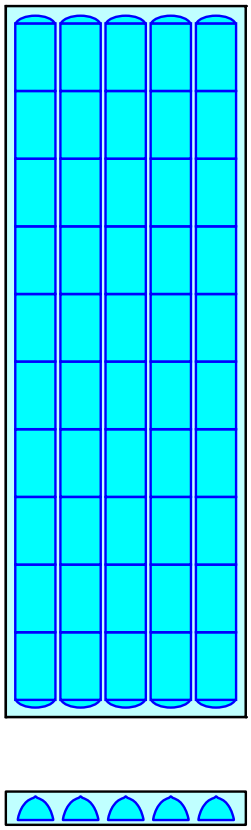
10 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 72.82' Row Length +12.0" End Stone x 2 = 74.82' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

50 Chambers x 45.9 cf = 2,297.0 cf Chamber Storage

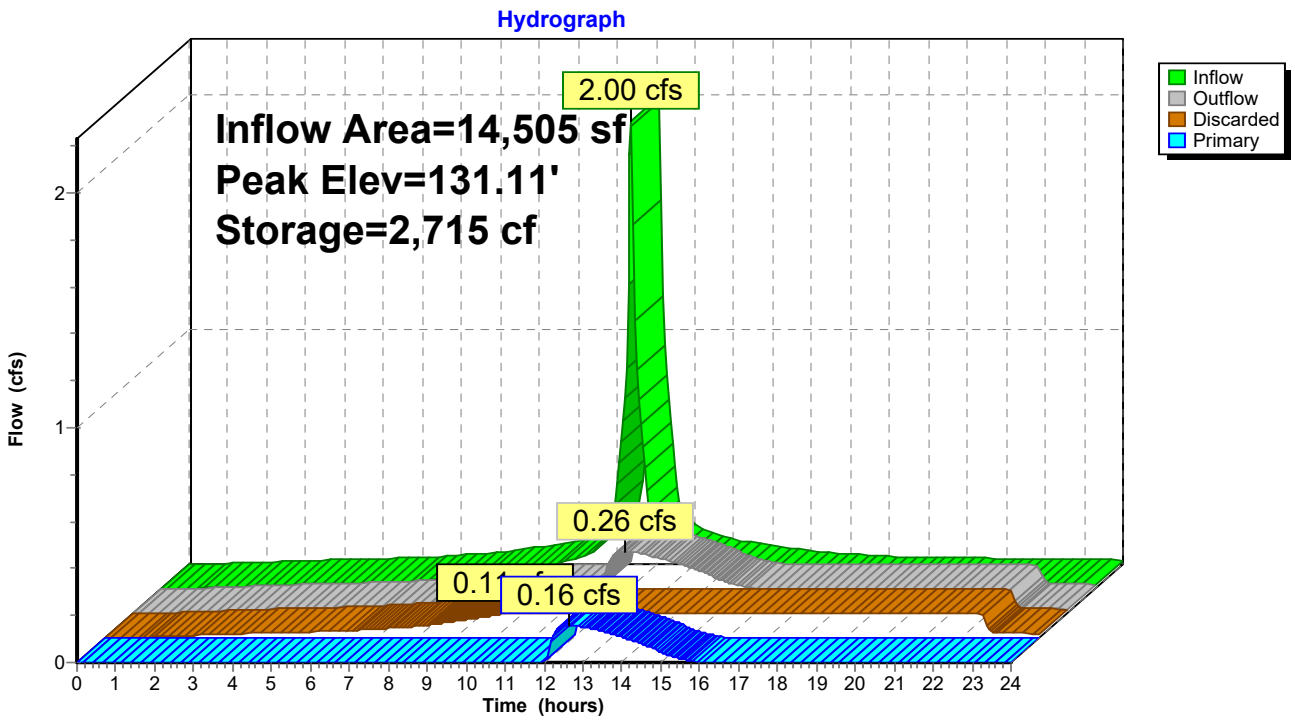
6,611.9 cf Field - 2,297.0 cf Chambers = 4,314.9 cf Stone x 40.0% Voids = 1,726.0 cf Stone Storage

Chamber Storage + Stone Storage = 4,023.0 cf = 0.092 af
Overall Storage Efficiency = 60.8%
Overall System Size = 74.82' x 25.25' x 3.50'

50 Chambers
244.9 cy Field
159.8 cy Stone



Pond IB1: Infiltration Basin 1



Stage-Area-Storage for Pond IB1: Infiltration Basin 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
129.00	**1,889**	0
129.05	1,889	38
129.10	1,889	76
129.15	1,889	113
129.20	1,889	151
129.25	1,889	189
129.30	1,889	227
129.35	1,889	264
129.40	1,889	302
129.45	1,889	340
129.50	1,889	378
129.55	1,889	455
129.60	1,889	533
129.65	1,889	610
129.70	1,889	687
129.75	1,889	764
129.80	1,889	841
129.85	1,889	917
129.90	1,889	993
129.95	1,889	1,069
130.00	1,889	1,145
130.05	1,889	1,220
130.10	1,889	1,295
130.15	1,889	1,369
130.20	1,889	1,444
130.25	1,889	1,517
130.30	1,889	1,591
130.35	1,889	1,664
130.40	1,889	1,736
130.45	1,889	1,809
130.50	1,889	1,880
130.55	1,889	1,952
130.60	1,889	2,022
130.65	1,889	2,093
130.70	1,889	2,162
130.75	1,889	2,232
130.80	1,889	2,300
130.85	1,889	2,368
130.90	1,889	2,435
130.95	1,889	2,502
131.00	1,889	2,568
131.05	1,889	2,634
131.10	1,889	2,698
131.15	1,889	2,762
131.20	1,889	2,825
131.25	1,889	2,887
131.30	1,889	2,948
131.35	1,889	3,008
131.40	1,889	3,067
131.45	1,889	3,124
131.50	1,889	3,181
131.55	1,889	3,236
131.60	1,889	3,290
131.65	1,889	3,342
131.70	1,889	3,392
131.75	1,889	3,439
131.80	1,889	3,484
131.85	1,889	3,526
131.90	1,889	3,567
131.95	1,889	3,607
132.00	1,889	3,645
132.05	1,889	3,683
132.10	1,889	3,721
132.15	1,889	3,758
132.20	1,889	3,796
132.25	1,889	3,834
132.30	1,889	3,872
132.35	1,889	3,910
132.40	1,889	3,947
132.45	1,889	3,985
132.50	1,889	**4,023**

Summary for Pond IB2a: Infiltration Basin 2a

Inflow Area =	26,310 sf, 88.91% Impervious, Inflow Depth > 5.55" for 25-YR event				
Inflow =	3.52 cfs @	12.09 hrs,	Volume=	12,170 cf	
Outflow =	1.45 cfs @	12.30 hrs,	Volume=	10,338 cf,	Atten= 59%, Lag= 12.7 min
Discarded =	0.06 cfs @	7.60 hrs,	Volume=	3,891 cf	
Primary =	1.40 cfs @	12.30 hrs,	Volume=	6,446 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 130.06' @ 12.30 hrs Surf.Area= 2,458 sf Storage= 4,248 cf

Plug-Flow detention time= 117.8 min calculated for 10,316 cf (85% of inflow)
Center-of-Mass det. time= 54.8 min (821.7 - 767.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	127.50'	2,392 cf	**30.00'W x 81.94'L x 3.67'H Field A** 9,013 cf Overall - 3,032 cf Embedded = 5,981 cf x 40.0% Voids
#2A	128.00'	3,032 cf	**ADS_StormTech SC-740 +Cap** x 66 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 6 Rows of 11 Chambers
		5,424 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	128.60'	**15.0" Round Culvert** L= 55.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 128.60' / 128.00' S= 0.0109 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Discarded	127.50'	**1.020 in/hr Exfiltration over Surface area**
#3	Device 1	128.80'	**10.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	130.10'	**10.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	130.99'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.06 cfs @ 7.60 hrs HW=127.54' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=1.40 cfs @ 12.30 hrs HW=130.06' (Free Discharge)
└─**1=Culvert** (Passes 1.40 cfs of 6.42 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 1.40 cfs @ 5.03 fps)
  ├─**4=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB2a: Infiltration Basin 2a - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

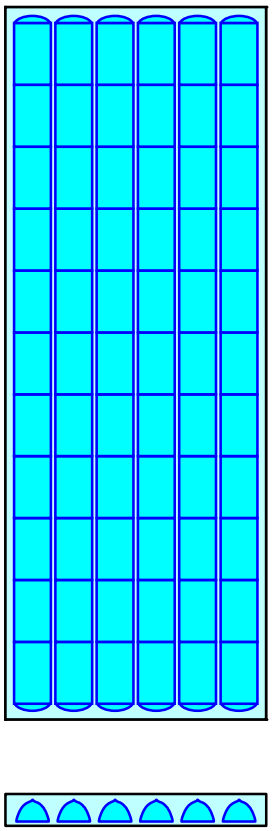
11 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 79.94' Row Length +12.0" End Stone x 2 = 81.94' Base Length
6 Rows x 51.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.00' Base Width
6.0" Base + 30.0" Chamber Height + 8.0" Cover = 3.67' Field Height

66 Chambers x 45.9 cf = 3,032.0 cf Chamber Storage

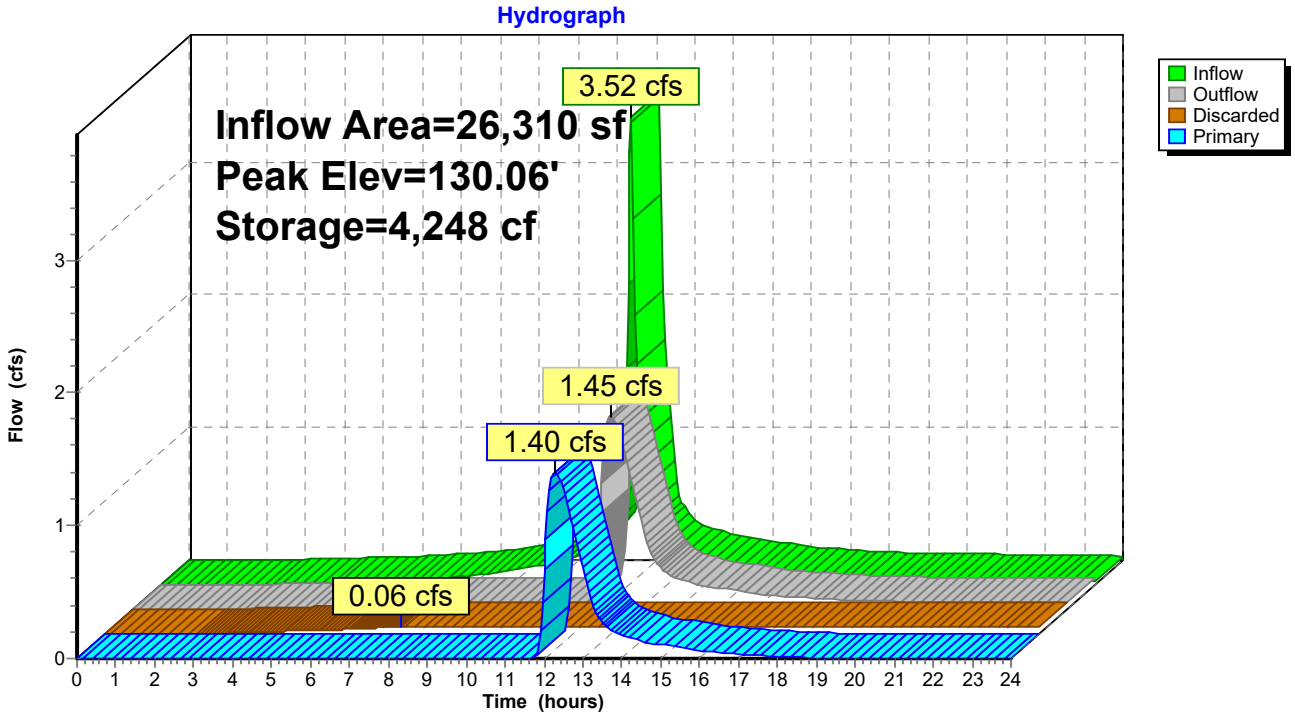
9,013.0 cf Field - 3,032.0 cf Chambers = 5,981.0 cf Stone x 40.0% Voids = 2,392.4 cf Stone Storage

Chamber Storage + Stone Storage = 5,424.4 cf = 0.125 af
Overall Storage Efficiency = 60.2%
Overall System Size = 81.94' x 30.00' x 3.67'

66 Chambers
333.8 cy Field
221.5 cy Stone



Pond IB2a: Infiltration Basin 2a



Stage-Area-Storage for Pond IB2a: Infiltration Basin 2a

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
127.50	**2,458**	0
127.55	2,458	49
127.60	2,458	98
127.65	2,458	147
127.70	2,458	197
127.75	2,458	246
127.80	2,458	295
127.85	2,458	344
127.90	2,458	393
127.95	2,458	442
128.00	2,458	492
128.05	2,458	593
128.10	2,458	695
128.15	2,458	796
128.20	2,458	897
128.25	2,458	998
128.30	2,458	1,099
128.35	2,458	1,199
128.40	2,458	1,298
128.45	2,458	1,398
128.50	2,458	1,497
128.55	2,458	1,595
128.60	2,458	1,694
128.65	2,458	1,791
128.70	2,458	1,888
128.75	2,458	1,985
128.80	2,458	2,081
128.85	2,458	2,177
128.90	2,458	2,272
128.95	2,458	2,367
129.00	2,458	2,461
129.05	2,458	2,554
129.10	2,458	2,647
129.15	2,458	2,739
129.20	2,458	2,830
129.25	2,458	2,921
129.30	2,458	3,011
129.35	2,458	3,100
129.40	2,458	3,188
129.45	2,458	3,275
129.50	2,458	3,362
129.55	2,458	3,447
129.60	2,458	3,532
129.65	2,458	3,615
129.70	2,458	3,698
129.75	2,458	3,779
129.80	2,458	3,858
129.85	2,458	3,937
129.90	2,458	4,014
129.95	2,458	4,089
130.00	2,458	4,164
130.05	2,458	4,236
130.10	2,458	4,306
130.15	2,458	4,374
130.20	2,458	4,439
130.25	2,458	4,501
130.30	2,458	4,559
130.35	2,458	4,614
130.40	2,458	4,667
130.45	2,458	4,719
130.50	2,458	4,769
130.55	2,458	4,818
130.60	2,458	4,867
130.65	2,458	4,916
130.70	2,458	4,966
130.75	2,458	5,015
130.80	2,458	5,064
130.85	2,458	5,113
130.90	2,458	5,162
130.95	2,458	5,211
131.00	2,458	5,261
131.05	2,458	5,310
131.10	2,458	5,359
131.15	2,458	**5,408**

Summary for Pond IB2c: Infiltration Basin Area 2c

Inflow Area =	15,551 sf, 65.27% Impervious, Inflow Depth > 4.65" for 25-YR event				
Inflow =	1.86 cfs @	12.09 hrs,	Volume=	6,030 cf	
Outflow =	0.65 cfs @	12.37 hrs,	Volume=	5,888 cf,	Atten= 65%, Lag= 16.8 min
Discarded =	0.06 cfs @	9.95 hrs,	Volume=	3,172 cf	
Primary =	0.60 cfs @	12.37 hrs,	Volume=	2,716 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 131.43' @ 12.37 hrs Surf.Area= 2,373 sf Storage= 1,949 cf

Plug-Flow detention time= 98.8 min calculated for 5,876 cf (97% of inflow)
Center-of-Mass det. time= 84.7 min (880.4 - 795.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	130.00'	1,505 cf	**27.00'W x 87.91'L x 2.00'H Field A** 4,747 cf Overall - 985 cf Embedded = 3,762 cf x 40.0% Voids
#2A	130.50'	985 cf	**ADS_StormTech SC-160LP +Cap** x 144 Inside #1 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 12 Rows of 12 Chambers
		2,489 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	130.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	129.20'	**8.0" Round Culvert** L= 14.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 129.20' / 129.00' S= 0.0143 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.35 sf
#3	Device 2	130.70'	**11.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 2	131.40'	**2.0" Vert. Orifice/Grate** C= 0.600
#5	Device 2	131.88'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.06 cfs @ 9.95 hrs HW=130.02' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.59 cfs @ 12.37 hrs HW=131.43' (Free Discharge)
└─**2=Culvert** (Passes 0.59 cfs of 2.82 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.59 cfs @ 3.88 fps)
  ├─**4=Orifice/Grate** (Orifice Controls 0.00 cfs @ 0.61 fps)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB2c: Infiltration Basin Area 2c - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-160LP +Cap (ADS StormTech® SC-160LP with cap length)
Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf
Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap

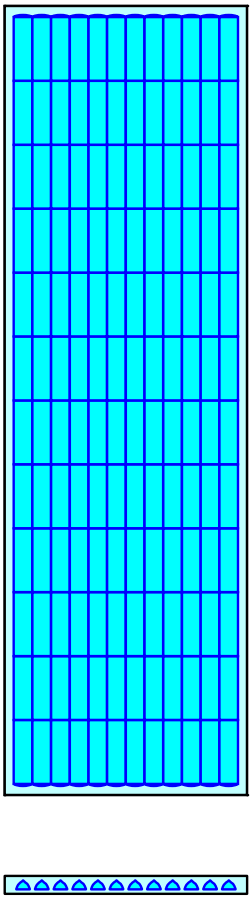
12 Chambers/Row x 7.12' Long +0.23' Cap Length x 2 = 85.91' Row Length +12.0" End Stone x 2 = 87.91' Base Length
12 Rows x 25.0" Wide + 12.0" Side Stone x 2 = 27.00' Base Width
6.0" Base + 12.0" Chamber Height + 6.0" Cover = 2.00' Field Height

144 Chambers x 6.8 cf = 984.5 cf Chamber Storage

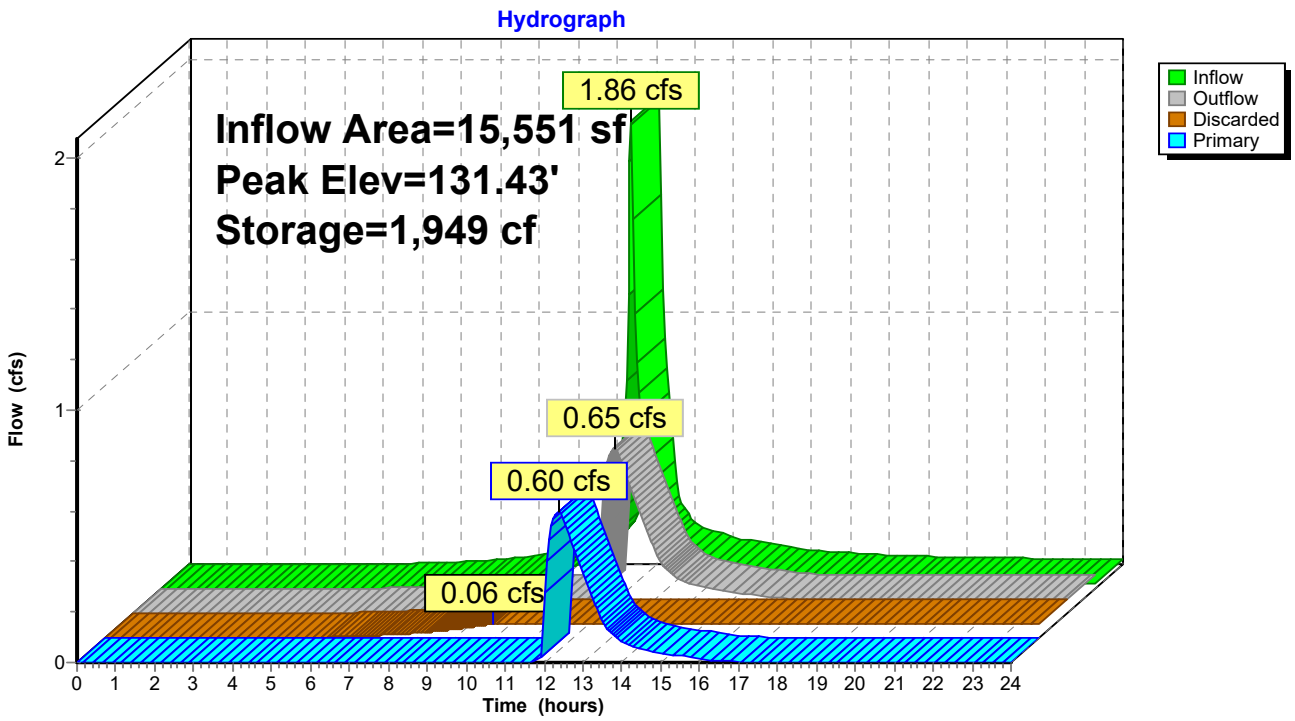
4,747.0 cf Field - 984.5 cf Chambers = 3,762.4 cf Stone x 40.0% Voids = 1,505.0 cf Stone Storage

Chamber Storage + Stone Storage = 2,489.5 cf = 0.057 af
Overall Storage Efficiency = 52.4%
Overall System Size = 87.91' x 27.00' x 2.00'

144 Chambers
175.8 cy Field
139.3 cy Stone



Pond IB2c: Infiltration Basin Area 2c



Stage-Area-Storage for Pond IB2c: Infiltration Basin Area 2c

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.00	**2,373**	0	131.06	2,373	1,457
130.02	2,373	19	131.08	2,373	1,489
130.04	2,373	38	131.10	2,373	1,519
130.06	2,373	57	131.12	2,373	1,550
130.08	2,373	76	131.14	2,373	1,580
130.10	2,373	95	131.16	2,373	1,609
130.12	2,373	114	131.18	2,373	1,638
130.14	2,373	133	131.20	2,373	1,667
130.16	2,373	152	131.22	2,373	1,695
130.18	2,373	171	131.24	2,373	1,722
130.20	2,373	190	131.26	2,373	1,749
130.22	2,373	209	131.28	2,373	1,774
130.24	2,373	228	131.30	2,373	1,799
130.26	2,373	247	131.32	2,373	1,824
130.28	2,373	266	131.34	2,373	1,847
130.30	2,373	285	131.36	2,373	1,870
130.32	2,373	304	131.38	2,373	1,892
130.34	2,373	323	131.40	2,373	1,914
130.36	2,373	342	131.42	2,373	1,935
130.38	2,373	361	131.44	2,373	1,955
130.40	2,373	380	131.46	2,373	1,976
130.42	2,373	399	131.48	2,373	1,995
130.44	2,373	418	131.50	2,373	2,015
130.46	2,373	437	131.52	2,373	2,034
130.48	2,373	456	131.54	2,373	2,053
130.50	2,373	475	131.56	2,373	2,072
130.52	2,373	512	131.58	2,373	2,091
130.54	2,373	549	131.60	2,373	2,110
130.56	2,373	587	131.62	2,373	2,129
130.58	2,373	624	131.64	2,373	2,148
130.60	2,373	661	131.66	2,373	2,167
130.62	2,373	698	131.68	2,373	2,186
130.64	2,373	735	131.70	2,373	2,205
130.66	2,373	772	131.72	2,373	2,224
130.68	2,373	808	131.74	2,373	2,243
130.70	2,373	844	131.76	2,373	2,262
130.72	2,373	880	131.78	2,373	2,281
130.74	2,373	916	131.80	2,373	2,300
130.76	2,373	952	131.82	2,373	2,319
130.78	2,373	987	131.84	2,373	2,338
130.80	2,373	1,022	131.86	2,373	2,357
130.82	2,373	1,057	131.88	2,373	2,376
130.84	2,373	1,092	131.90	2,373	2,395
130.86	2,373	1,127	131.92	2,373	2,414
130.88	2,373	1,161	131.94	2,373	2,433
130.90	2,373	1,195	131.96	2,373	2,452
130.92	2,373	1,229	131.98	2,373	2,471
130.94	2,373	1,263	132.00	2,373	**2,489**
130.96	2,373	1,296			
130.98	2,373	1,329			
131.00	2,373	1,361			
131.02	2,373	1,394			
131.04	2,373	1,426			

Summary for Pond IB2e: Infiltration Basin 2b

Inflow Area =	15,464 sf, 93.24% Impervious, Inflow Depth > 5.67" for 25-YR event				
Inflow =	2.09 cfs @	12.09 hrs,	Volume=	7,302 cf	
Outflow =	0.36 cfs @	12.55 hrs,	Volume=	7,298 cf,	Atten= 83%, Lag= 27.6 min
Discarded =	0.14 cfs @	11.05 hrs,	Volume=	6,005 cf	
Primary =	0.22 cfs @	12.55 hrs,	Volume=	1,293 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 132.06' @ 12.55 hrs Surf.Area= 2,592 sf Storage= 2,468 cf

Plug-Flow detention time= 76.6 min calculated for 7,298 cf (100% of inflow)
Center-of-Mass det. time= 76.3 min (838.4 - 762.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	130.50'	2,002 cf	**34.83'W x 74.40'L x 2.50'H Field A** 6,479 cf Overall - 1,474 cf Embedded = 5,005 cf x 40.0% Voids
#2A	131.00'	1,474 cf	**ADS_StormTech SC-310 +Cap** x 100 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 10 Rows of 10 Chambers
		3,476 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	130.85'	**15.0" Round Culvert Barrel** L= 69.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 130.85' / 130.50' S= 0.0051 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Discarded	130.50'	**2.410 in/hr Exfiltration over Surface area**
#3	Device 1	131.40'	**3.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	132.63'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.14 cfs @ 11.05 hrs HW=130.53' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=0.22 cfs @ 12.55 hrs HW=132.06' (Free Discharge)
└─**1=Culvert Barrel** (Passes 0.22 cfs of 4.21 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.22 cfs @ 3.52 fps)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB2e: Infiltration Basin 2b - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-310 +Cap (ADS StormTech® SC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

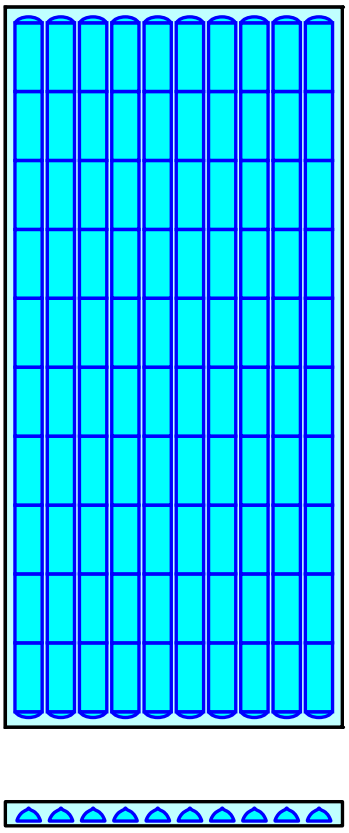
10 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 72.40' Row Length +12.0" End Stone x 2 = 74.40' Base Length
10 Rows x 34.0" Wide + 6.0" Spacing x 9 + 12.0" Side Stone x 2 = 34.83' Base Width
6.0" Base + 16.0" Chamber Height + 8.0" Cover = 2.50' Field Height

100 Chambers x 14.7 cf = 1,474.2 cf Chamber Storage

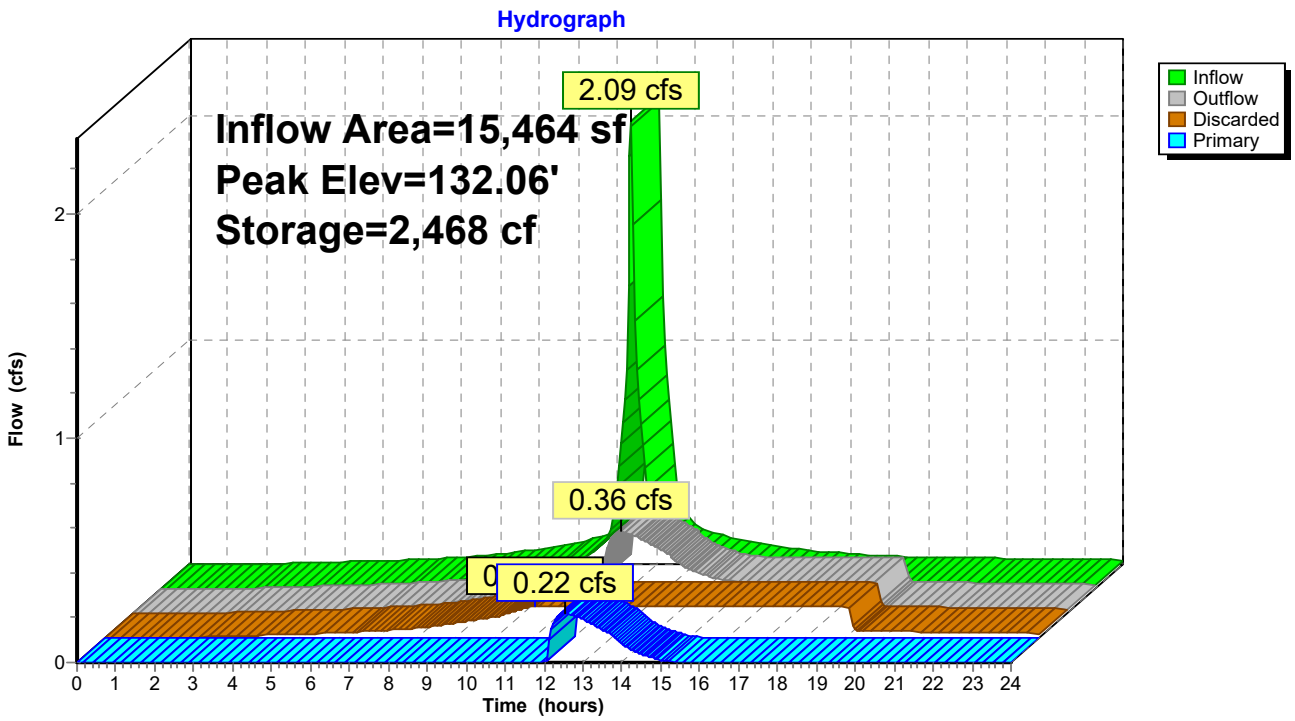
6,479.0 cf Field - 1,474.2 cf Chambers = 5,004.8 cf Stone x 40.0% Voids = 2,001.9 cf Stone Storage

Chamber Storage + Stone Storage = 3,476.1 cf = 0.080 af
Overall Storage Efficiency = 53.7%
Overall System Size = 74.40' x 34.83' x 2.50'

100 Chambers
240.0 cy Field
185.4 cy Stone



Pond IB2e: Infiltration Basin 2b



Stage-Area-Storage for Pond IB2e: Infiltration Basin 2b

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.50	**2,592**	0
130.55	2,592	52
130.60	2,592	104
130.65	2,592	155
130.70	2,592	207
130.75	2,592	259
130.80	2,592	311
130.85	2,592	363
130.90	2,592	415
130.95	2,592	466
131.00	2,592	518
131.05	2,592	622
131.10	2,592	724
131.15	2,592	827
131.20	2,592	928
131.25	2,592	1,029
131.30	2,592	1,129
131.35	2,592	1,227
131.40	2,592	1,325
131.45	2,592	1,422
131.50	2,592	1,517
131.55	2,592	1,611
131.60	2,592	1,703
131.65	2,592	1,794
131.70	2,592	1,884
131.75	2,592	1,972
131.80	2,592	2,057
131.85	2,592	2,141
131.90	2,592	2,222
131.95	2,592	2,301
132.00	2,592	2,377
132.05	2,592	2,449
132.10	2,592	2,516
132.15	2,592	2,579
132.20	2,592	2,638
132.25	2,592	2,695
132.30	2,592	2,750
132.35	2,592	2,802
132.40	2,592	2,854
132.45	2,592	2,906
132.50	2,592	2,958
132.55	2,592	3,010
132.60	2,592	3,061
132.65	2,592	3,113
132.70	2,592	3,165
132.75	2,592	3,217
132.80	2,592	3,269
132.85	2,592	3,321
132.90	2,592	3,372
132.95	2,592	3,424
133.00	2,592	**3,476**

Summary for Subcatchment PD-1: Prop. Drainage Area 1

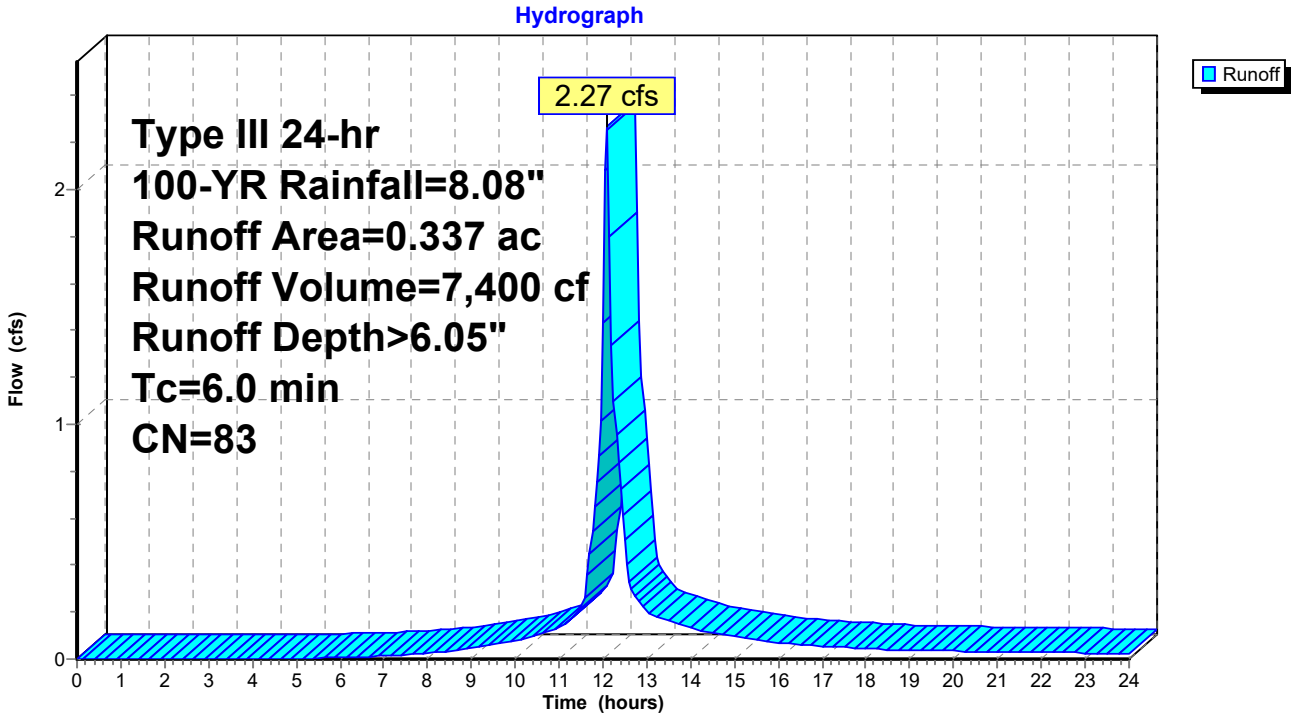
Runoff = 2.27 cfs @ 12.09 hrs, Volume= 7,400 cf, Depth> 6.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=8.08"

	Area (ac)	CN	Description
*	0.074	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.070	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.193	98	Paved parking
	0.337	83	Weighted Average
	0.144		42.73% Pervious Area
	0.193		57.27% Impervious Area

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

Subcatchment PD-1: Prop. Drainage Area 1



Summary for Subcatchment PD-2a: Prop. Drainage Area 2a

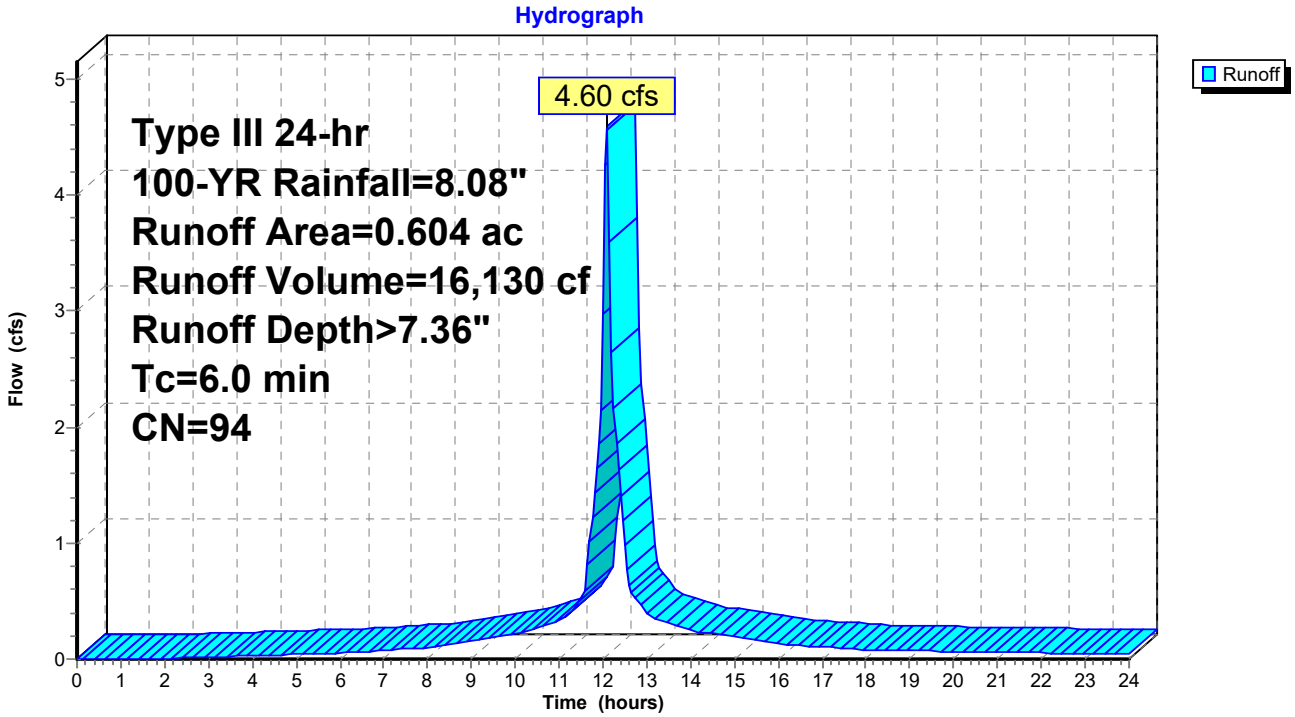
Runoff = 4.60 cfs @ 12.09 hrs, Volume= 16,130 cf, Depth> 7.36"

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-YR Rainfall=8.08"

	Area (ac)	CN	Description
*	0.038	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.029	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.537	98	Paved parking
	0.604	94	Weighted Average
	0.067		11.09% Pervious Area
	0.537		88.91% Impervious Area

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

Subcatchment PD-2a: Prop. Drainage Area 2a



Summary for Subcatchment PD-2b: Prop. Drainage Area 2b

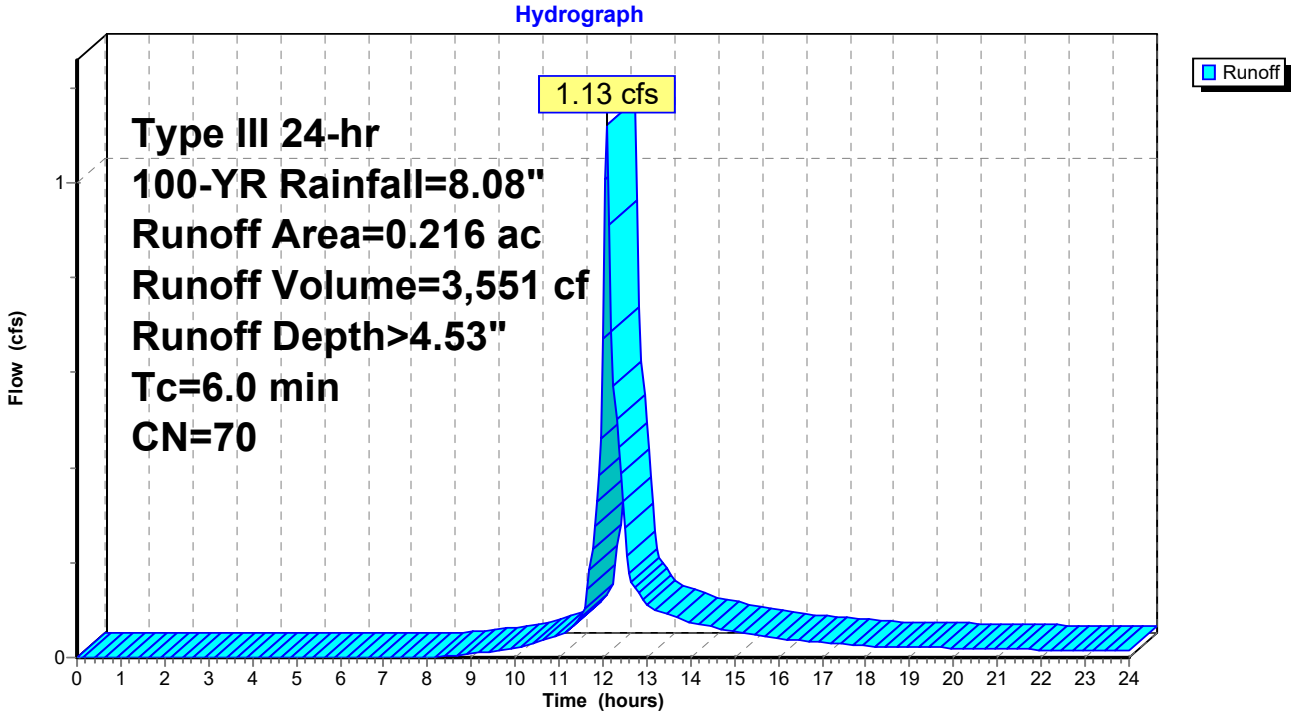
Runoff = 1.13 cfs @ 12.09 hrs, Volume= 3,551 cf, Depth> 4.53"

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-YR Rainfall=8.08"

	Area (ac)	CN	Description
*	0.174	74	Woods/grass comb., Fair, HSG B/D, 13
*	0.018	43	Woods/grass comb., Fair, HSG A. 36A
	0.024	65	Woods/grass comb., Fair, HSG B
	0.216	70	Weighted Average
	0.216		100.00% Pervious Area

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

Subcatchment PD-2b: Prop. Drainage Area 2b



Summary for Subcatchment PD-2c: Prop. Drainage Area 2c

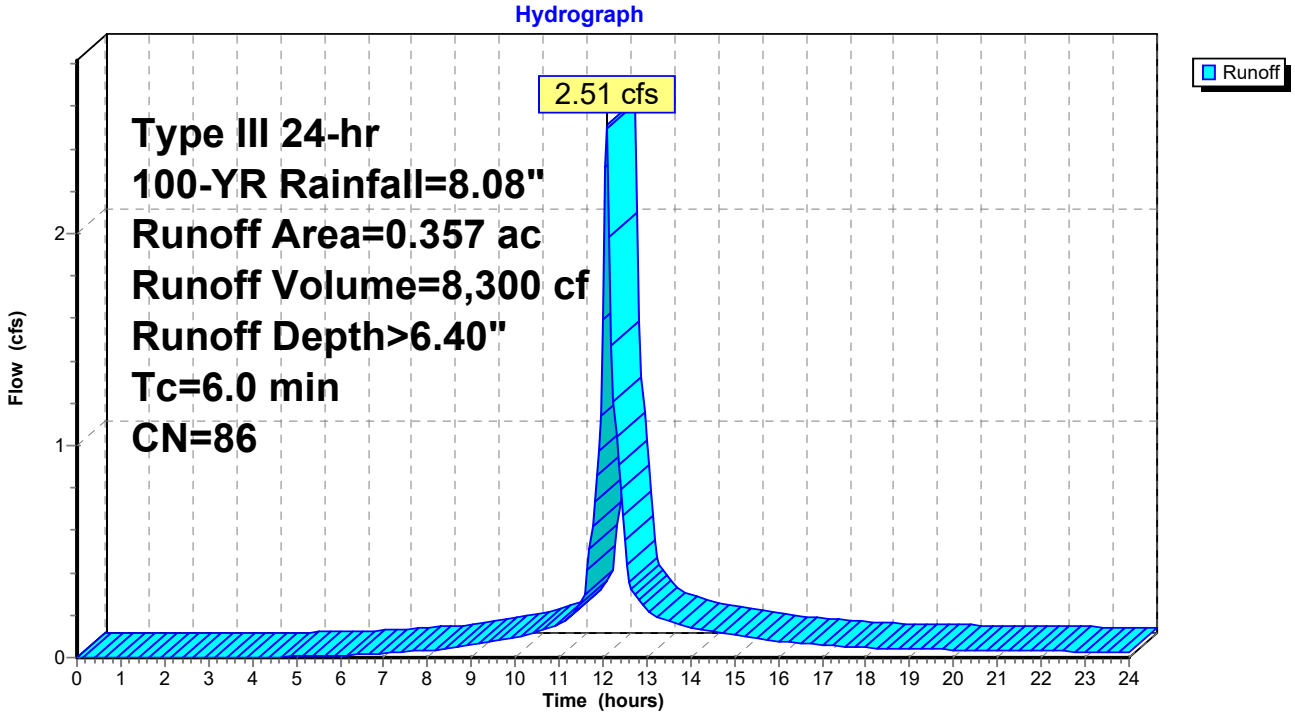
Runoff = 2.51 cfs @ 12.09 hrs, Volume= 8,300 cf, Depth> 6.40"

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-YR Rainfall=8.08"

	Area (ac)	CN	Description
*	0.061	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.042	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.021	49	50-75% Grass cover, Fair, HSG A, 36A
	0.233	98	Paved parking, HSG D
	0.357	86	Weighted Average
	0.124		34.73% Pervious Area
	0.233		65.27% Impervious Area

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

Subcatchment PD-2c: Prop. Drainage Area 2c



Summary for Subcatchment PD-2d: Prop. Drainage Area 2d

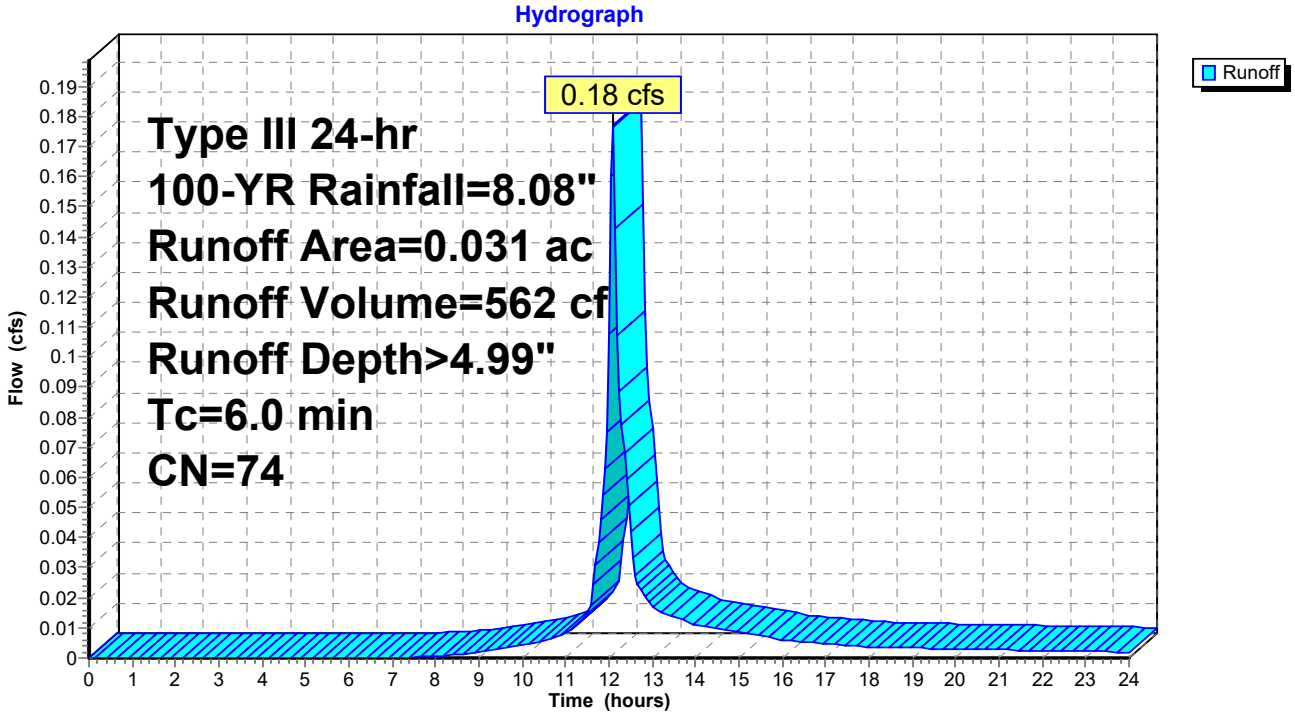
Runoff = 0.18 cfs @ 12.09 hrs, Volume= 562 cf, Depth> 4.99"

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-YR Rainfall=8.08"

	Area (ac)	CN	Description
*	0.031	74	Woods/grass comb., Fair, HSG B/D, 13
	0.031		100.00% Pervious Area

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

Subcatchment PD-2d: Prop. Drainage Area 2d



Summary for Subcatchment PD-2e: Prop. Drainage Area 2e

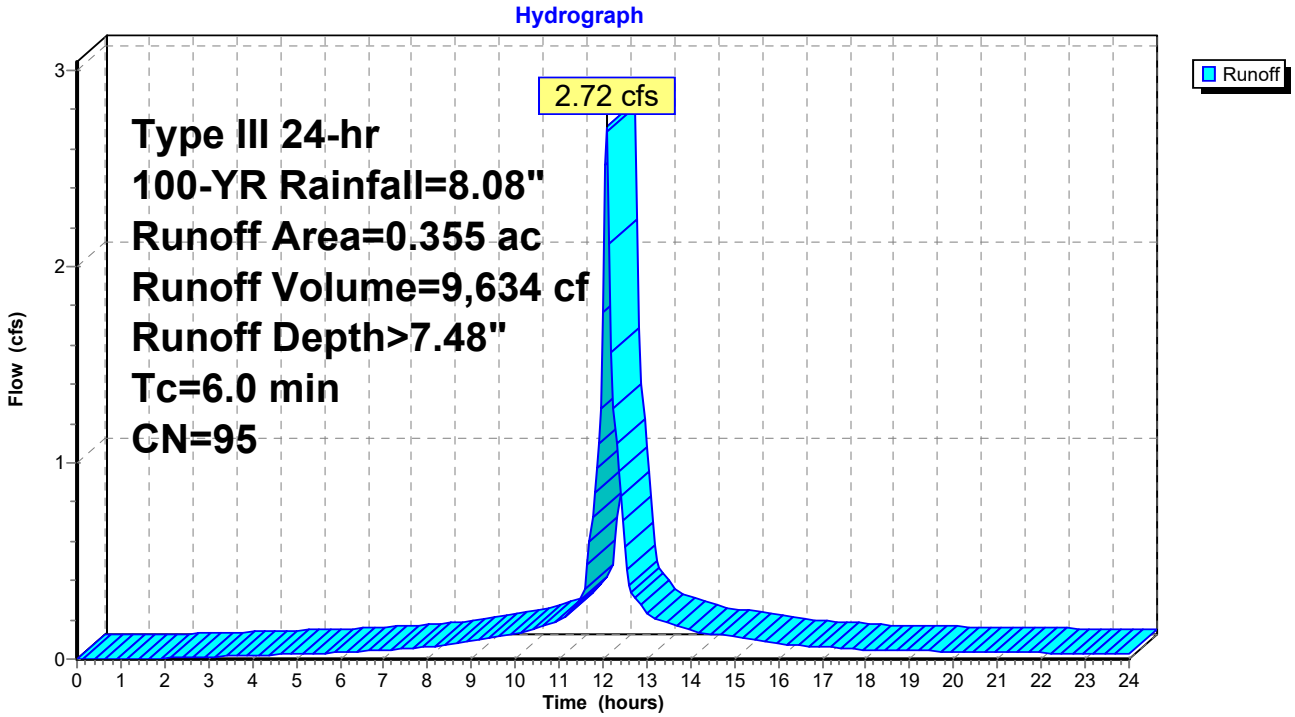
Runoff = 2.72 cfs @ 12.09 hrs, Volume= 9,634 cf, Depth> 7.48"

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 100-YR Rainfall=8.08"

	Area (ac)	CN	Description
*	0.004	43	Woods/grass comb., Fair, HSG A, 36A
*	0.020	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.331	98	Paved parking
	0.355	95	Weighted Average
	0.024		6.76% Pervious Area
	0.331		93.24% Impervious Area

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

Subcatchment PD-2e: Prop. Drainage Area 2e



Summary for Subcatchment PD-2f: Prop. Drainage Area 2d

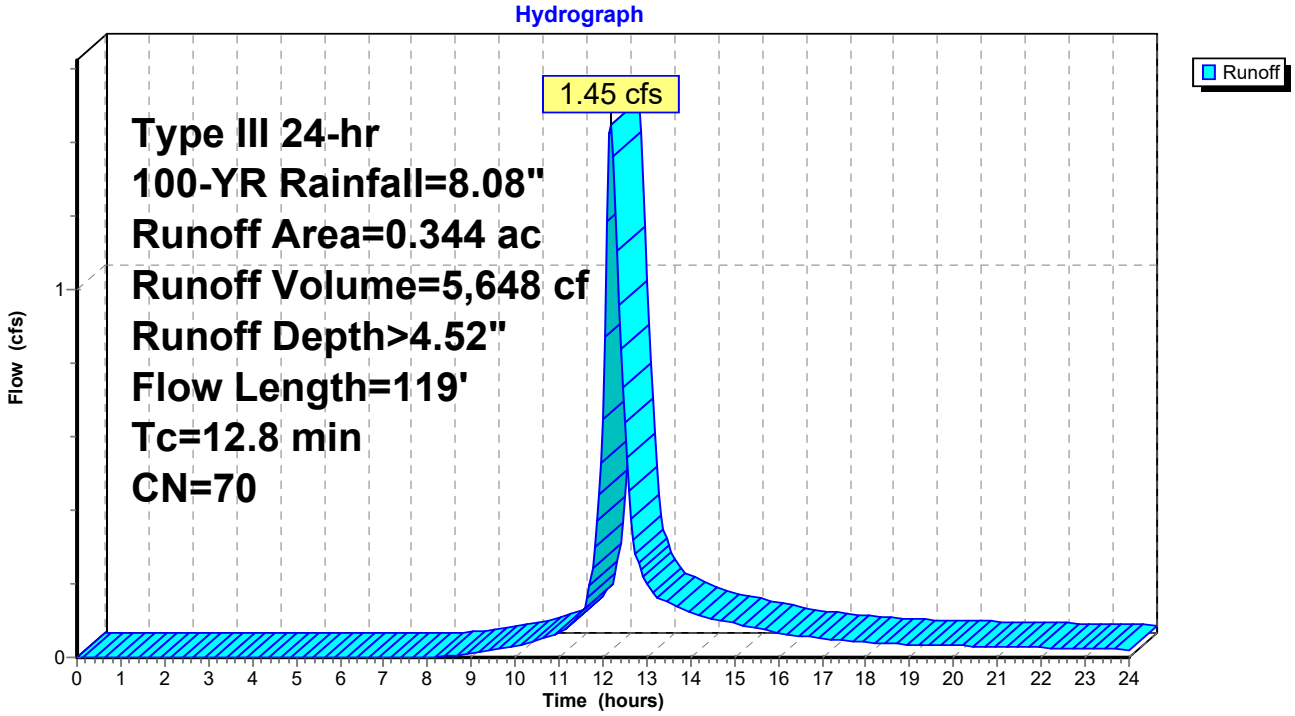
Runoff = 1.45 cfs @ 12.18 hrs, Volume= 5,648 cf, Depth> 4.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=8.08"

	Area (ac)	CN	Description
*	0.296	74	Woods/grass comb., Fair, HSG B/D, 13
	0.048	43	Woods/grass comb., Fair, HSG A
	0.344	70	Weighted Average
	0.344		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	23	0.1600	0.13		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.18"
8.4	36	0.0270	0.07		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.18"
1.5	60	0.0167	0.65		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
12.8	119	Total			

Subcatchment PD-2f: Prop. Drainage Area 2d



Summary for Subcatchment PD-3a: Prop. Drainage Area 3a

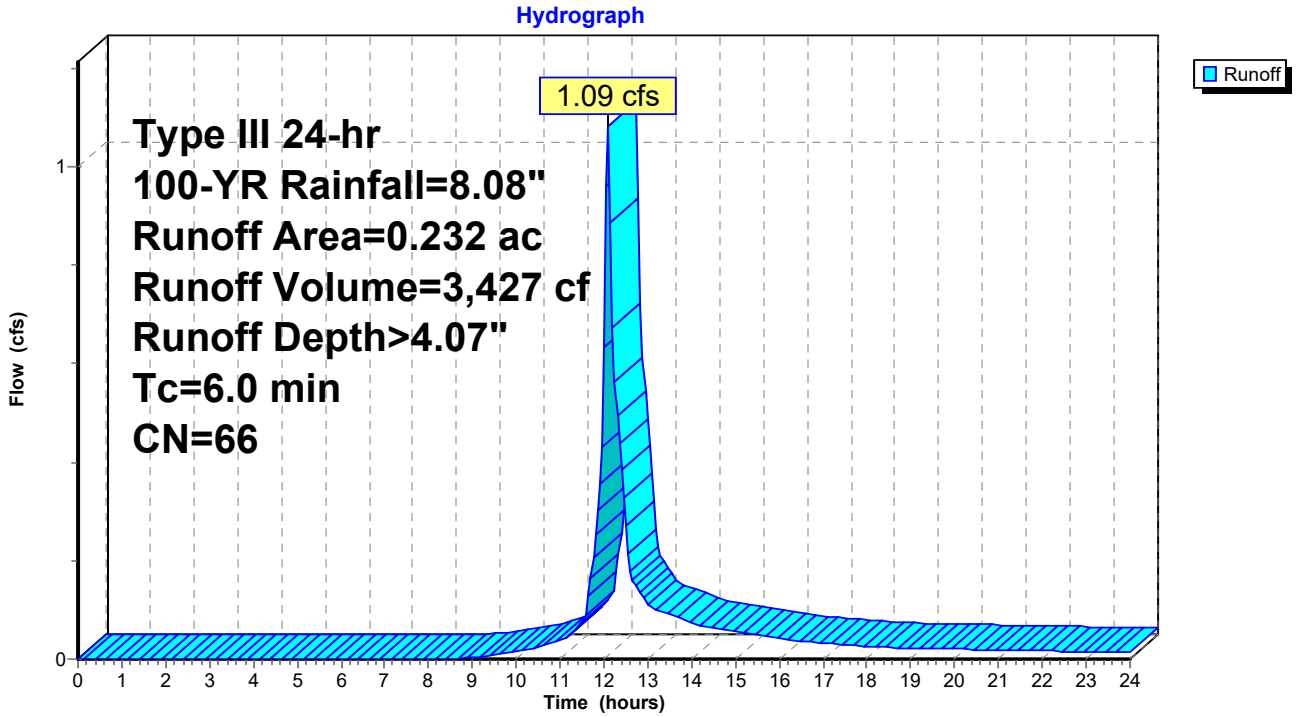
Runoff = 1.09 cfs @ 12.09 hrs, Volume= 3,427 cf, Depth> 4.07"

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 100-YR Rainfall=8.08"

	Area (ac)	CN	Description
*	0.120	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.071	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.041	98	Paved parking
	0.232	66	Weighted Average
	0.191		82.33% Pervious Area
	0.041		17.67% Impervious Area

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

Subcatchment PD-3a: Prop. Drainage Area 3a



Summary for Subcatchment PD-3b: Prop. Drainage Area 3b

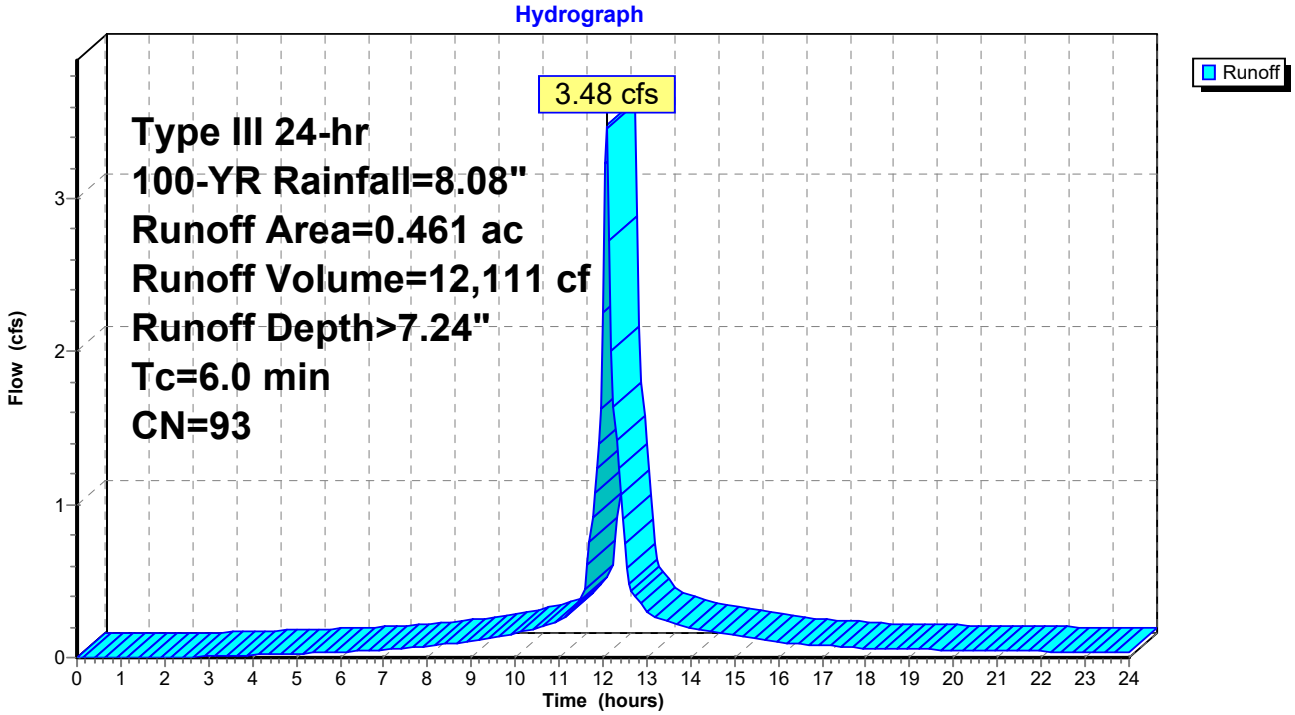
Runoff = 3.48 cfs @ 12.09 hrs, Volume= 12,111 cf, Depth> 7.24"

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-YR Rainfall=8.08"

	Area (ac)	CN	Description
*	0.093	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.019	79	50-75% Grass cover, Fair, HSG C, 701A
*	0.016	98	Paved parking
*	0.333	98	Roofing
	0.461	93	Weighted Average
	0.112		24.30% Pervious Area
	0.349		75.70% Impervious Area

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

Subcatchment PD-3b: Prop. Drainage Area 3b



Summary for Subcatchment PD-3c: Prop. Drainage Area 3c

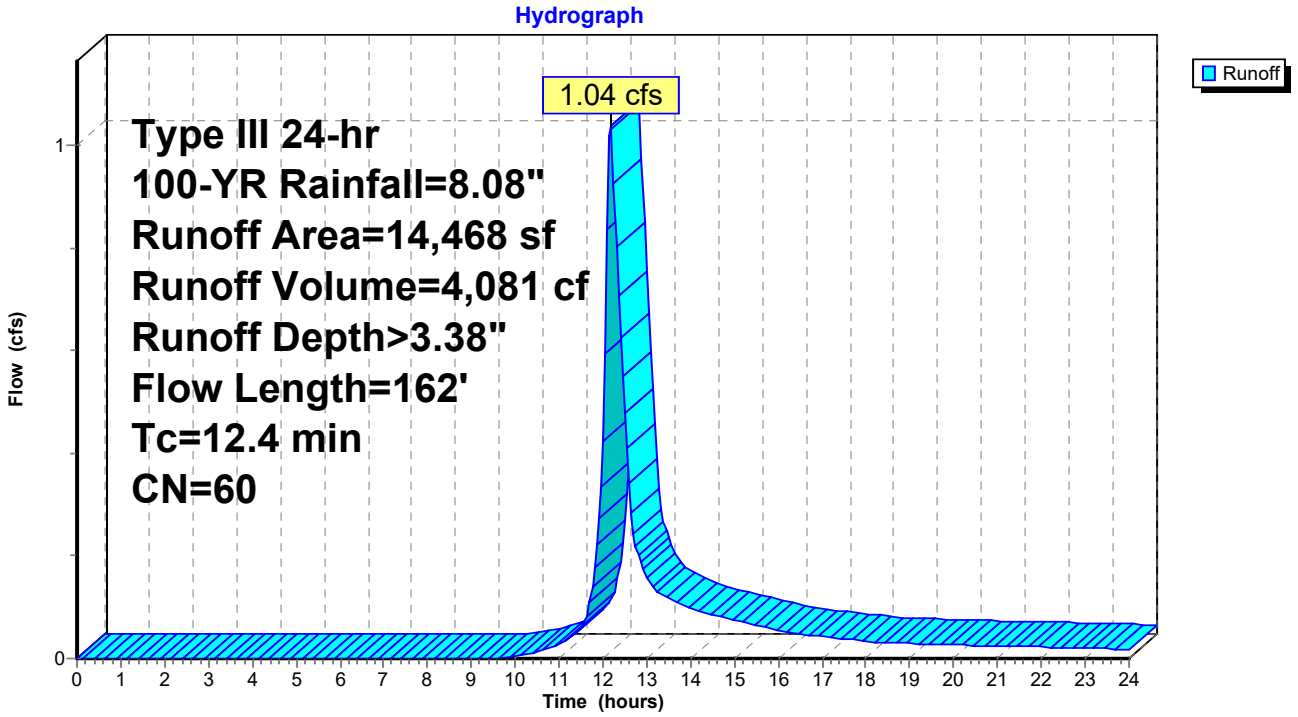
Runoff = 1.04 cfs @ 12.18 hrs, Volume= 4,081 cf, Depth> 3.38"

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 100-YR Rainfall=8.08"

	Area (sf)	CN	Description
*	6,684	43	Woods/grass comb., Fair, HSG A, 36A
*	5,545	74	Woods/grass comb., Fair, HSG C
	1,501	76	Woods/grass comb., Fair, HSG C
*	738	77	50-75% Grass cover, Fair, HSG C
	14,468	60	Weighted Average
	14,468		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	8	0.0625	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.18"
3.4	17	0.0580	0.08		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.18"
3.2	16	0.0625	0.08		**Sheet Flow, C-D** Woods: Light underbrush n= 0.400 P2= 3.18"
1.5	9	0.1250	0.10		**Sheet Flow, D-E** Woods: Light underbrush n= 0.400 P2= 3.18"
2.5	112	0.0220	0.74		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
12.4	162	Total			

Subcatchment PD-3c: Prop. Drainage Area 3c



Summary for Subcatchment RD-1: Roof 1

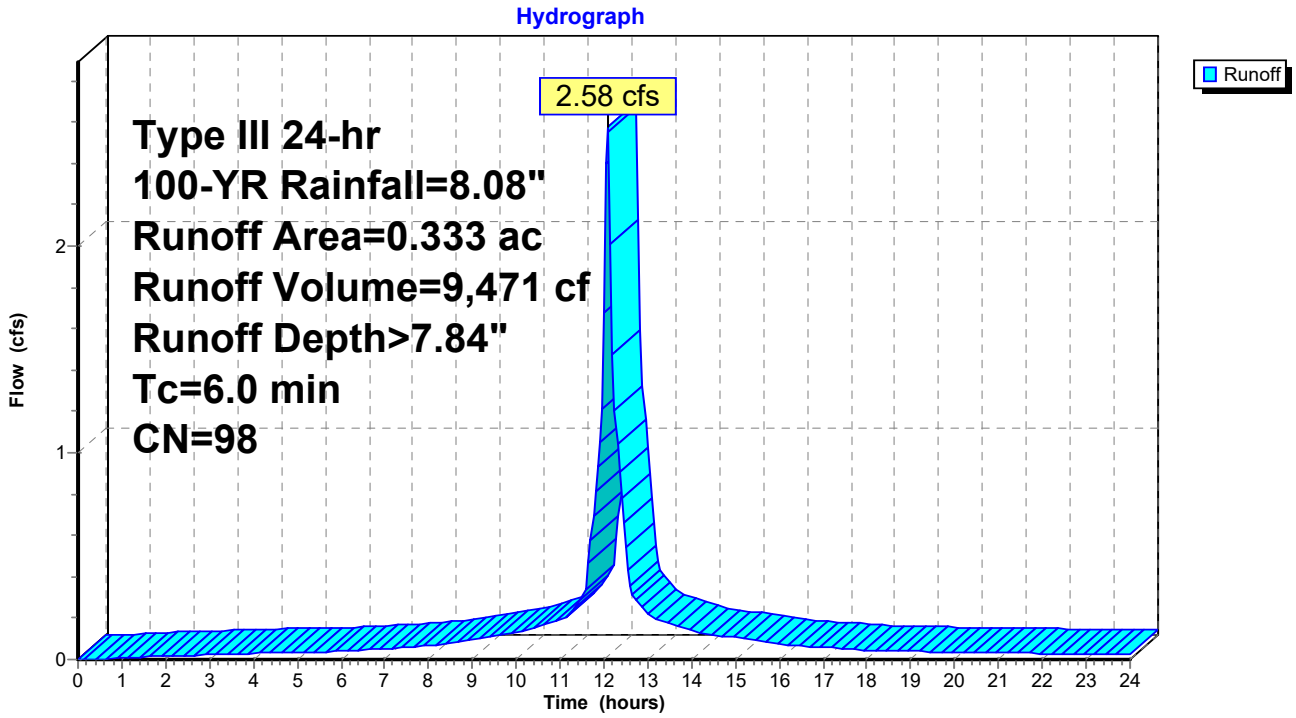
Runoff = 2.58 cfs @ 12.09 hrs, Volume= 9,471 cf, Depth> 7.84"

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-YR Rainfall=8.08"

	Area (ac)	CN	Description
*	0.333	98	Unconnected roofs
	0.333		100.00% Impervious Area
	0.333		100.00% Unconnected

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

Subcatchment RD-1: Roof 1

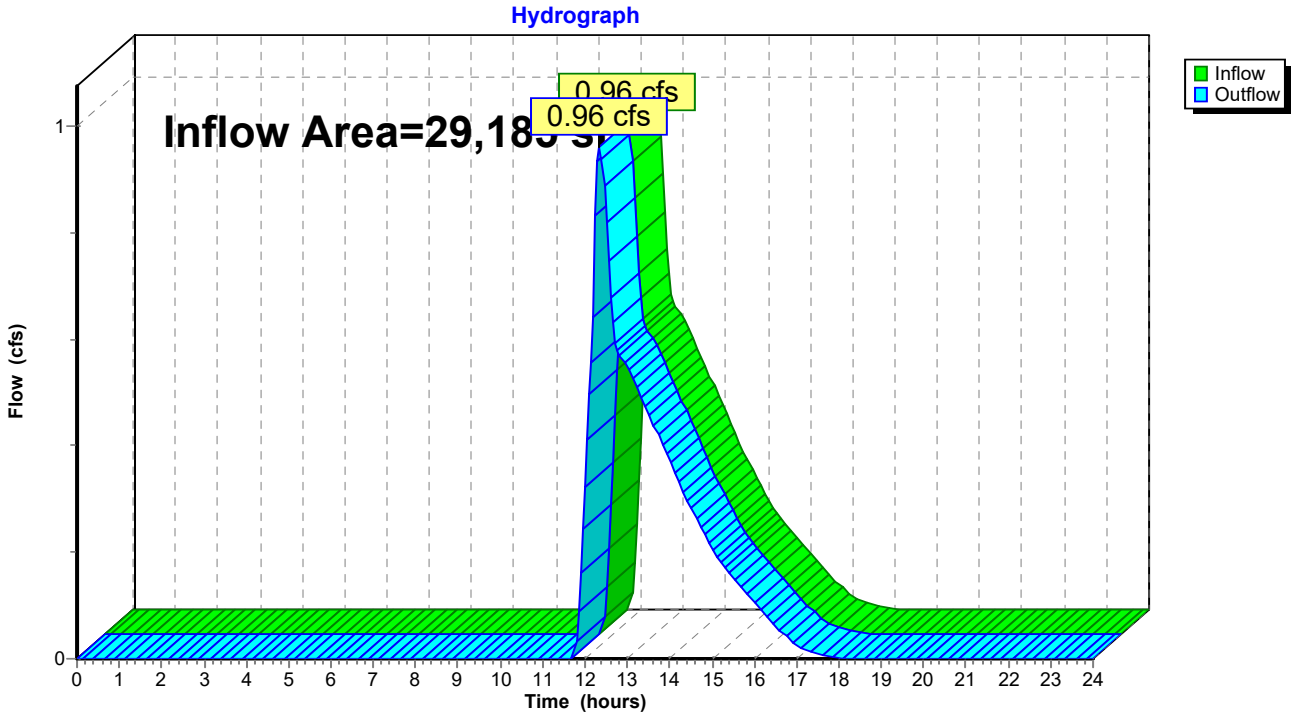


Summary for Reach DP-1a: Design Point 1

Inflow Area = 29,185 sf, 78.51% Impervious, Inflow Depth = 2.49" for 100-YR event
Inflow = 0.96 cfs @ 12.35 hrs, Volume= 6,044 cf
Outflow = 0.96 cfs @ 12.35 hrs, Volume= 6,044 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-1a: Design Point 1

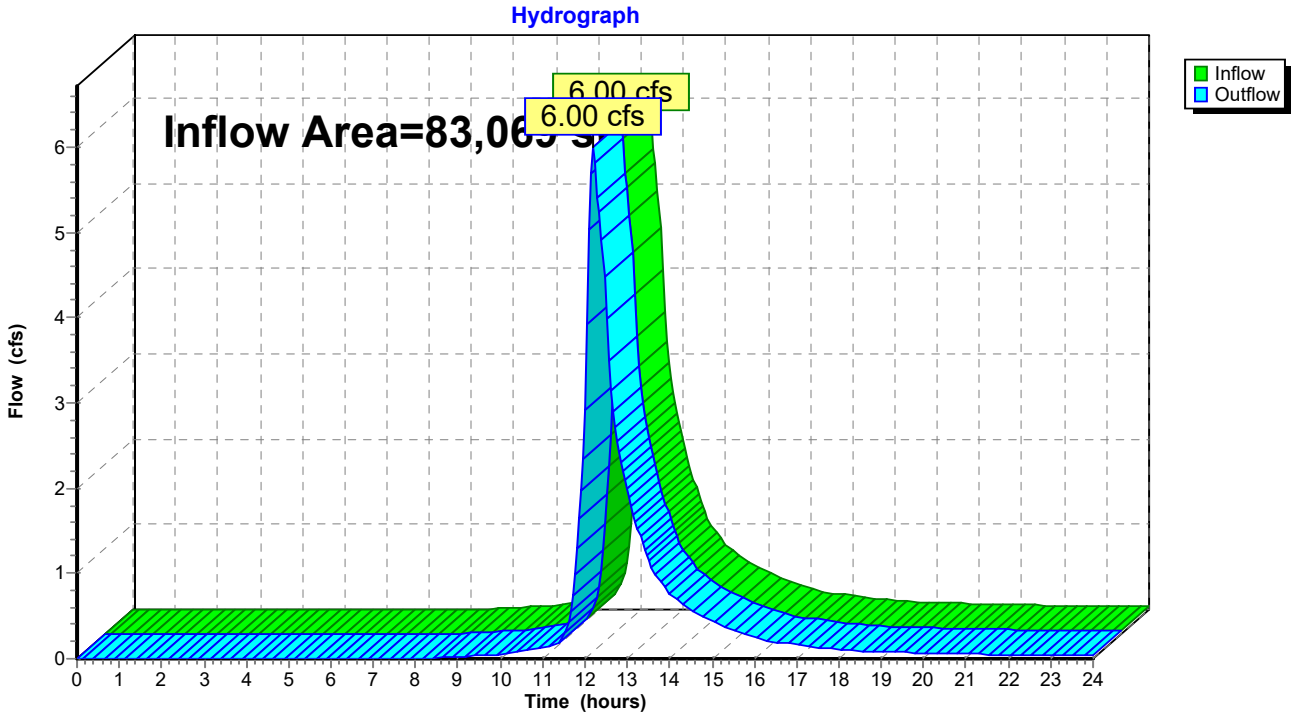


Summary for Reach DP-2a: Design Point 2

Inflow Area = 83,069 sf, 57.73% Impervious, Inflow Depth > 3.90" for 100-YR event
Inflow = 6.00 cfs @ 12.21 hrs, Volume= 26,964 cf
Outflow = 6.00 cfs @ 12.21 hrs, Volume= 26,964 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-2a: Design Point 2

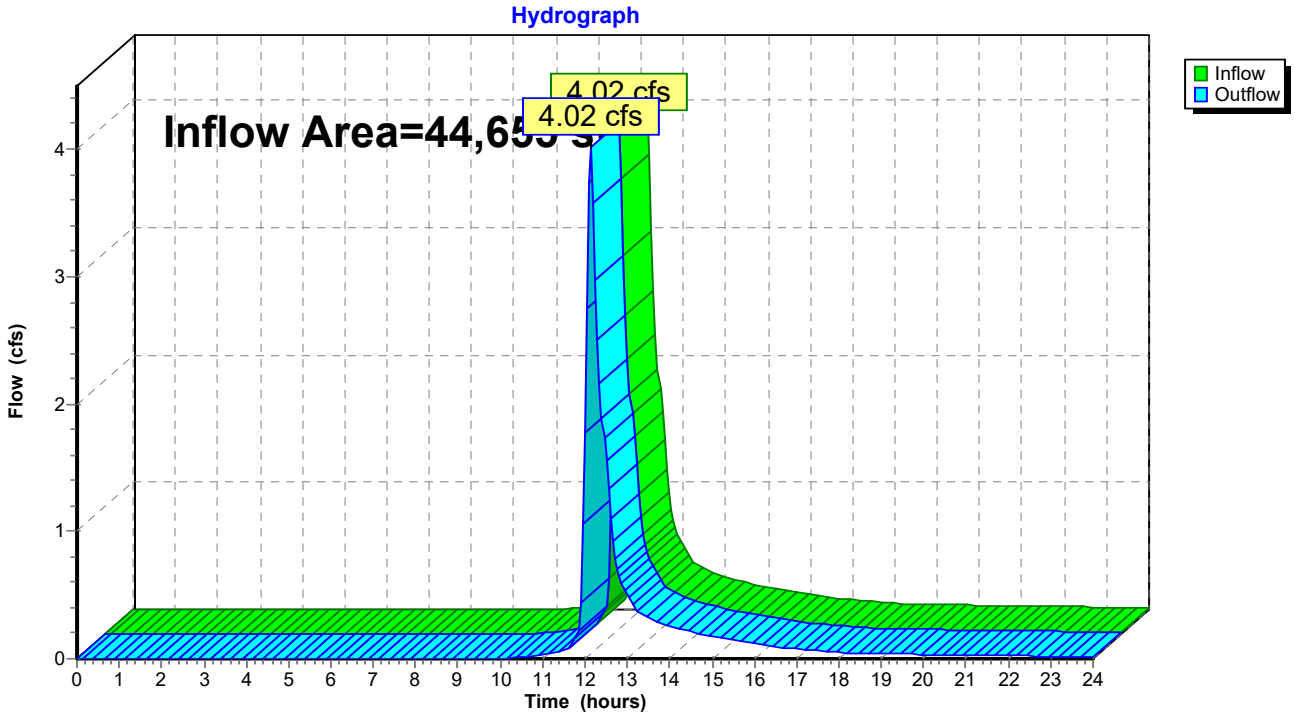


Summary for Reach DP-3a: Design Point 3

Inflow Area = 44,655 sf, 38.04% Impervious, Inflow Depth > 2.89" for 100-YR event
Inflow = 4.02 cfs @ 12.14 hrs, Volume= 10,769 cf
Outflow = 4.02 cfs @ 12.14 hrs, Volume= 10,769 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-3a: Design Point 3



Summary for Pond AB1: Above Ground Infiltration Basin 1

Inflow Area =	29,185 sf, 78.51% Impervious, Inflow Depth > 4.13" for 100-YR event				
Inflow =	2.39 cfs @	12.09 hrs, Volume=	10,050 cf		
Outflow =	1.07 cfs @	12.35 hrs, Volume=	9,894 cf, Atten= 55%, Lag= 15.5 min		
Discarded =	0.11 cfs @	12.35 hrs, Volume=	3,850 cf		
Primary =	0.96 cfs @	12.35 hrs, Volume=	6,044 cf		

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 129.10' @ 12.35 hrs Surf.Area= 2,031 sf Storage= 2,500 cf

Plug-Flow detention time= 68.9 min calculated for 9,874 cf (98% of inflow)
Center-of-Mass det. time= 59.8 min (864.3 - 804.5)

Volume	Invert	Avail.Storage	Storage Description
#1	127.00'	4,542 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 4,798 cf Overall - 256 cf Embedded = 4,542 cf
#2	127.00'	102 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) Inside #1 256 cf Overall x 40.0% Voids
		4,644 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
127.00	512	0	0
128.00	1,218	865	865
129.00	1,949	1,584	2,449
130.00	2,749	2,349	4,798

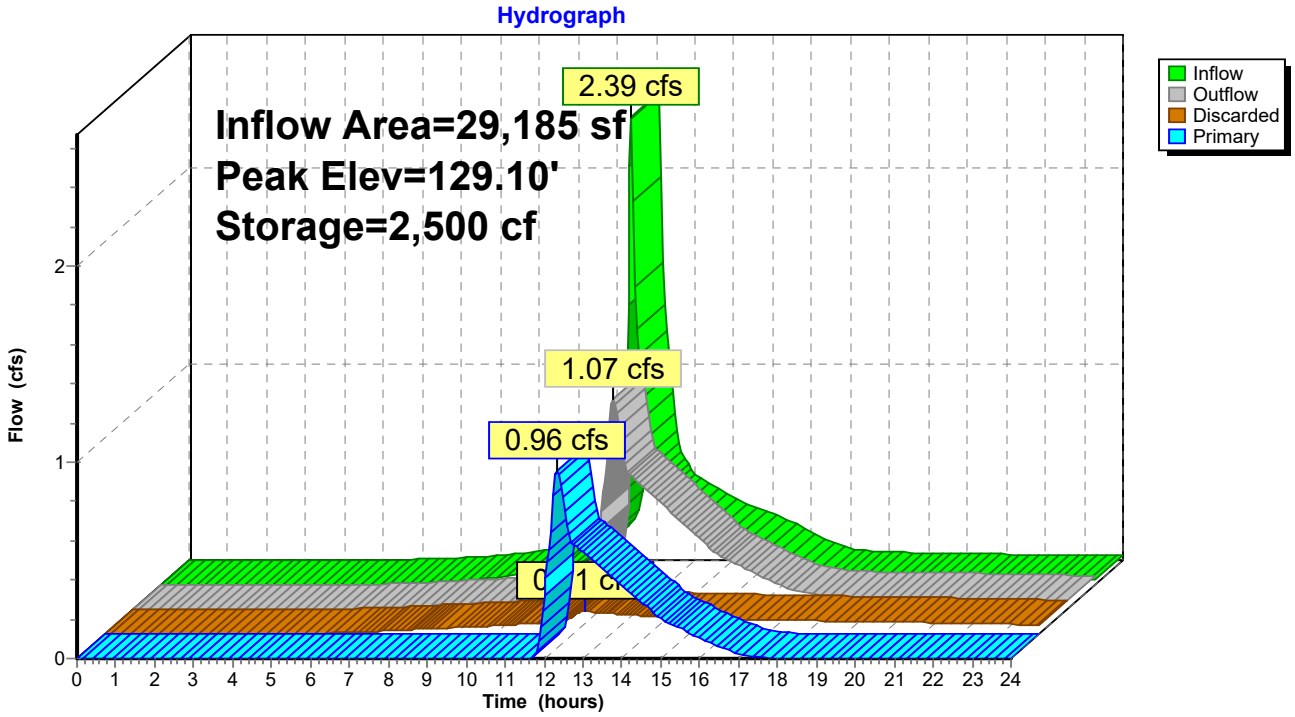
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
127.00	512	0	0
127.50	512	256	256

Device	Routing	Invert	Outlet Devices
#1	Primary	127.57'	**8.0" Round Culvert Barrel** L= 13.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 127.57' / 127.50' S= 0.0054 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.35 sf
#2	Device 1	129.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	127.00'	**2.410 in/hr Exfiltration over Surface area**
#4	Device 1	128.00'	**5.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.11 cfs @ 12.35 hrs HW=129.10' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.96 cfs @ 12.35 hrs HW=129.10' (Free Discharge)
└─**1=Culvert Barrel** (Passes 0.96 cfs of 1.41 cfs potential flow)
  ├─**2=Orifice/Grate** (Weir Controls 0.34 cfs @ 1.05 fps)
  └─**4=Orifice/Grate** (Orifice Controls 0.62 cfs @ 4.55 fps)

Pond AB1: Above Ground Infiltration Basin 1



Stage-Area-Storage for Pond AB1: Above Ground Infiltration Basin 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
127.00	512	0
127.05	547	11
127.10	583	24
127.15	618	39
127.20	653	55
127.25	689	73
127.30	724	93
127.35	759	115
127.40	794	138
127.45	830	164
127.50	865	191
127.55	900	235
127.60	936	281
127.65	971	328
127.70	1,006	378
127.75	1,042	429
127.80	1,077	482
127.85	1,112	537
127.90	1,147	593
127.95	1,183	651
128.00	1,218	711
128.05	1,255	773
128.10	1,291	837
128.15	1,328	902
128.20	1,364	970
128.25	1,401	1,039
128.30	1,437	1,110
128.35	1,474	1,182
128.40	1,510	1,257
128.45	1,547	1,334
128.50	1,584	1,412
128.55	1,620	1,492
128.60	1,657	1,574
128.65	1,693	1,658
128.70	1,730	1,743
128.75	1,766	1,830
128.80	1,803	1,920
128.85	1,839	2,011
128.90	1,876	2,104
128.95	1,912	2,198
129.00	1,949	2,295
129.05	1,989	2,393
129.10	2,029	2,494
129.15	2,069	2,596
129.20	2,109	2,701
129.25	2,149	2,807
129.30	2,189	2,916
129.35	2,229	3,026
129.40	2,269	3,139
129.45	2,309	3,253
129.50	2,349	3,369
129.55	2,389	3,488
129.60	2,429	3,608
129.65	2,469	3,731
129.70	2,509	3,855
129.75	2,549	3,982
129.80	2,589	4,110
129.85	2,629	4,241
129.90	2,669	4,373
129.95	2,709	4,507
130.00	**2,749**	**4,644**

Summary for Pond AB3a: Above Ground Infiltration 3a

Inflow Area =	10,106 sf, 17.67% Impervious, Inflow Depth > 4.07" for 100-YR event				
Inflow =	1.09 cfs @	12.09 hrs, Volume=	3,427 cf		
Outflow =	0.26 cfs @	12.52 hrs, Volume=	3,422 cf, Atten= 76%, Lag= 25.6 min		
Discarded =	0.09 cfs @	12.52 hrs, Volume=	3,197 cf		
Primary =	0.17 cfs @	12.52 hrs, Volume=	225 cf		

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 133.03' @ 12.52 hrs Surf.Area= 1,618 sf Storage= 1,305 cf

Plug-Flow detention time= 139.7 min calculated for 3,415 cf (100% of inflow)
Center-of-Mass det. time= 138.5 min (970.7 - 832.2)

Volume	Invert	Avail.Storage	Storage Description
#1	132.00'	3,206 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

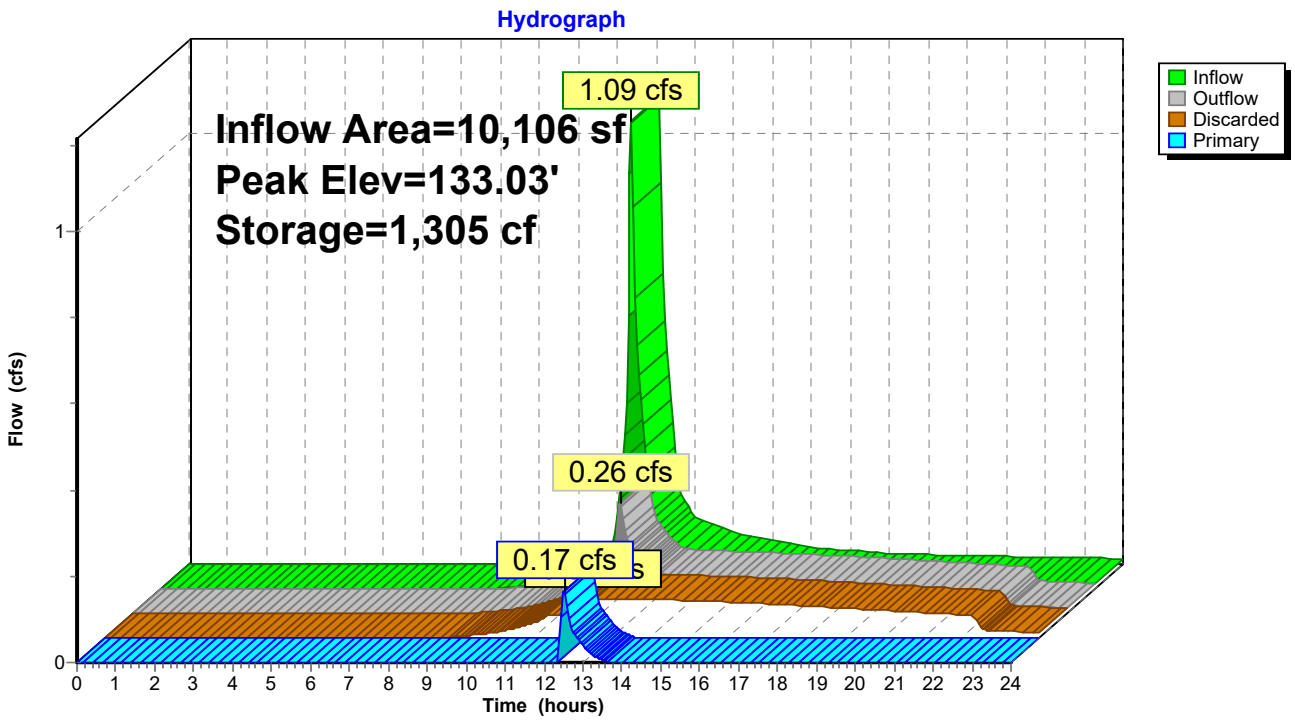
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
132.00	906	0	0
133.00	1,593	1,250	1,250
134.00	2,319	1,956	3,206

Device	Routing	Invert	Outlet Devices
#1	Discarded	132.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	133.00'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.09 cfs @ 12.52 hrs HW=133.03' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=0.15 cfs @ 12.52 hrs HW=133.03' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.15 cfs @ 0.46 fps)

Pond AB3a: Above Ground Infiltration 3a



Stage-Area-Storage for Pond AB3a: Above Ground Infiltration 3a

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
132.00	906	0
132.02	920	18
132.04	933	37
132.06	947	56
132.08	961	75
132.10	975	94
132.12	988	114
132.14	1,002	134
132.16	1,016	154
132.18	1,030	174
132.20	1,043	195
132.22	1,057	216
132.24	1,071	237
132.26	1,085	259
132.28	1,098	281
132.30	1,112	303
132.32	1,126	325
132.34	1,140	348
132.36	1,153	371
132.38	1,167	394
132.40	1,181	417
132.42	1,195	441
132.44	1,208	465
132.46	1,222	489
132.48	1,236	514
132.50	1,250	539
132.52	1,263	564
132.54	1,277	589
132.56	1,291	615
132.58	1,304	641
132.60	1,318	667
132.62	1,332	694
132.64	1,346	721
132.66	1,359	748
132.68	1,373	775
132.70	1,387	803
132.72	1,401	830
132.74	1,414	859
132.76	1,428	887
132.78	1,442	916
132.80	1,456	945
132.82	1,469	974
132.84	1,483	1,003
132.86	1,497	1,033
132.88	1,511	1,063
132.90	1,524	1,094
132.92	1,538	1,124
132.94	1,552	1,155
132.96	1,566	1,186
132.98	1,579	1,218
133.00	1,593	1,250
133.02	1,608	1,282
133.04	1,622	1,314
133.06	1,637	1,346
133.08	1,651	1,379
133.10	1,666	1,412
133.12	1,680	1,446
133.14	1,695	1,480
133.16	1,709	1,514
133.18	1,724	1,548
133.20	1,738	1,583
133.22	1,753	1,618
133.24	1,767	1,653
133.26	1,782	1,688
133.28	1,796	1,724
133.30	1,811	1,760
133.32	1,825	1,796
133.34	1,840	1,833
133.36	1,854	1,870
133.38	1,869	1,907
133.40	1,883	1,945
133.42	1,898	1,983
133.44	1,912	2,021
133.46	1,927	2,059
133.48	1,941	2,098
133.50	1,956	2,137
133.52	1,971	2,176
133.54	1,985	2,216
133.56	2,000	2,255
133.58	2,014	2,296
133.60	2,029	2,336
133.62	2,043	2,377
133.64	2,058	2,418
133.66	2,072	2,459
133.68	2,087	2,501
133.70	2,101	2,542
133.72	2,116	2,585
133.74	2,130	2,627
133.76	2,145	2,670
133.78	2,159	2,713
133.80	2,174	2,756
133.82	2,188	2,800
133.84	2,203	2,844
133.86	2,217	2,888
133.88	2,232	2,932
133.90	2,246	2,977
133.92	2,261	3,022
133.94	2,275	3,068
133.96	2,290	3,113
133.98	2,304	3,159
134.00	**2,319**	**3,206**

Summary for Pond AB3b: Above Ground Infiltration 3b

Inflow Area =	20,081 sf, 75.70% Impervious, Inflow Depth > 7.24" for 100-YR event				
Inflow =	3.48 cfs @	12.09 hrs,	Volume=	12,111 cf	
Outflow =	3.07 cfs @	12.13 hrs,	Volume=	9,000 cf,	Atten= 12%, Lag= 2.8 min
Discarded =	0.05 cfs @	12.13 hrs,	Volume=	2,537 cf	
Primary =	3.02 cfs @	12.13 hrs,	Volume=	6,463 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 133.53' @ 12.13 hrs Surf.Area= 2,166 sf Storage= 3,951 cf

Plug-Flow detention time= 151.2 min calculated for 9,000 cf (74% of inflow)
Center-of-Mass det. time= 65.2 min (829.9 - 764.7)

Volume	Invert	Avail.Storage	Storage Description
#1	130.00'	5,050 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

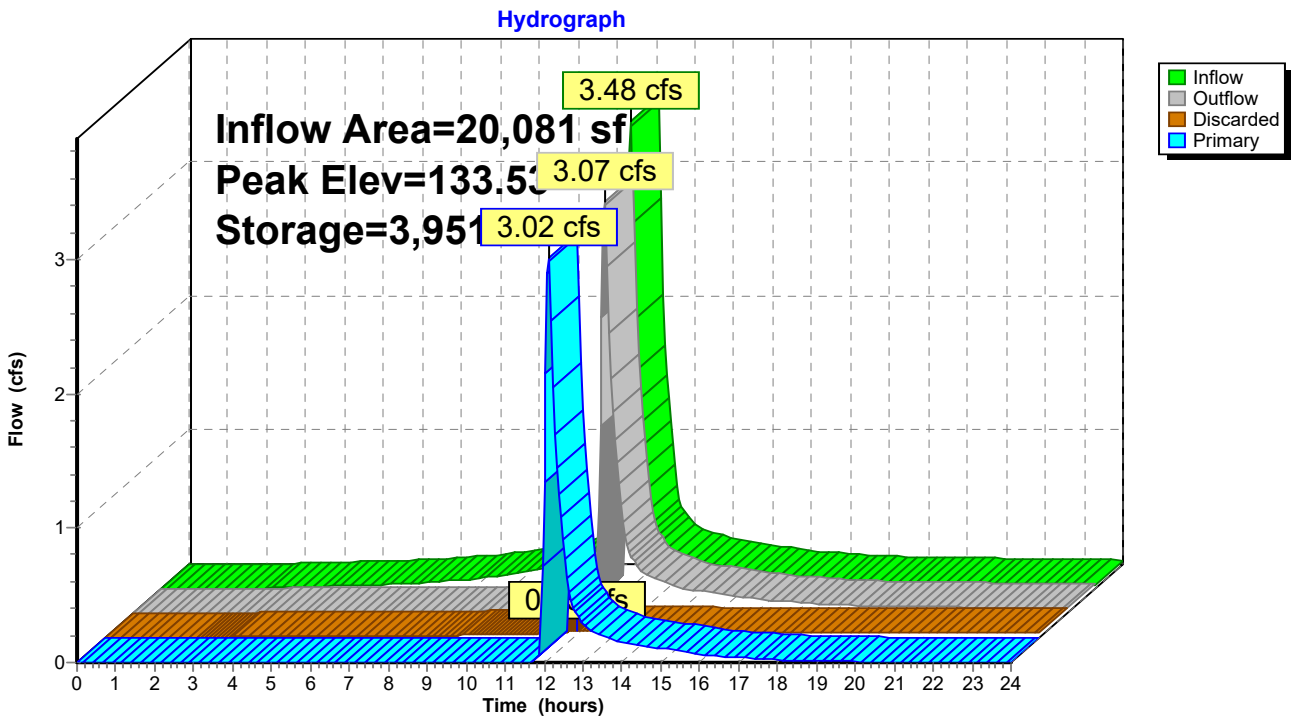
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
130.00	307	0	0
131.00	671	489	489
132.00	1,175	923	1,412
133.00	1,806	1,491	2,903
134.00	2,488	2,147	5,050

Device	Routing	Invert	Outlet Devices
#1	Primary	133.15'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Discarded	130.00'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 12.13 hrs HW=133.52' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=2.96 cfs @ 12.13 hrs HW=133.52' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 2.96 cfs @ 1.59 fps)

Pond AB3b: Above Ground Infiltration 3b



Stage-Area-Storage for Pond AB3b: Above Ground Infiltration 3b

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.00	307	0
130.05	325	16
130.10	343	33
130.15	362	50
130.20	380	69
130.25	398	88
130.30	416	108
130.35	434	130
130.40	453	152
130.45	471	175
130.50	489	199
130.55	507	224
130.60	525	250
130.65	544	276
130.70	562	304
130.75	580	333
130.80	598	362
130.85	616	392
130.90	635	424
130.95	653	456
131.00	671	489
131.05	696	523
131.10	721	559
131.15	747	595
131.20	772	633
131.25	797	673
131.30	822	713
131.35	847	755
131.40	873	798
131.45	898	842
131.50	923	888
131.55	948	934
131.60	973	982
131.65	999	1,032
131.70	1,024	1,082
131.75	1,049	1,134
131.80	1,074	1,187
131.85	1,099	1,241
131.90	1,125	1,297
131.95	1,150	1,354
132.00	1,175	1,412
132.05	1,207	1,472
132.10	1,238	1,533
132.15	1,270	1,595
132.20	1,301	1,660
132.25	1,333	1,725
132.30	1,364	1,793
132.35	1,396	1,862
132.40	1,427	1,932
132.45	1,459	2,005
132.50	1,491	2,078
132.55	1,522	2,154
132.60	1,554	2,231
132.65	1,585	2,309
132.70	1,617	2,389
132.75	1,648	2,471
132.80	1,680	2,554
132.85	1,711	2,639
132.90	1,743	2,725
132.95	1,774	2,813
133.00	1,806	2,903
133.05	1,840	2,994
133.10	1,874	3,087
133.15	1,908	3,181
133.20	1,942	3,277
133.25	1,977	3,375
133.30	2,011	3,475
133.35	2,045	3,576
133.40	2,079	3,679
133.45	2,113	3,784
133.50	2,147	3,891
133.55	2,181	3,999
133.60	2,215	4,109
133.65	2,249	4,220
133.70	2,283	4,334
133.75	2,318	4,449
133.80	2,352	4,566
133.85	2,386	4,684
133.90	2,420	4,804
133.95	2,454	4,926
134.00	**2,488**	**5,050**

Summary for Pond IB1: Infiltration Basin 1

Inflow Area =	14,505 sf,100.00% Impervious, Inflow Depth > 7.84" for 100-YR event				
Inflow =	2.58 cfs @	12.09 hrs,	Volume=	9,471 cf	
Outflow =	0.38 cfs @	12.59 hrs,	Volume=	9,452 cf,	Atten= 85%, Lag= 30.5 min
Discarded =	0.11 cfs @	9.40 hrs,	Volume=	6,802 cf	
Primary =	0.27 cfs @	12.59 hrs,	Volume=	2,650 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 132.06' @ 12.59 hrs Surf.Area= 1,889 sf Storage= 3,690 cf

Plug-Flow detention time= 134.6 min calculated for 9,452 cf (100% of inflow)
Center-of-Mass det. time= 133.2 min (873.9 - 740.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	129.00'	1,726 cf	**25.25'W x 74.82'L x 3.50'H Field A** 6,612 cf Overall - 2,297 cf Embedded = 4,315 cf x 40.0% Voids
#2A	129.50'	2,297 cf	**ADS_StormTech SC-740 +Cap** x 50 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 5 Rows of 10 Chambers
		4,023 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	130.24'	**12.0" Round Culvert** L= 10.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 130.24' / 130.00' S= 0.0240 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#2	Discarded	129.00'	**2.410 in/hr Exfiltration over Surface area**
#3	Device 1	130.40'	**3.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	132.05'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.11 cfs @ 9.40 hrs HW=129.04' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.26 cfs @ 12.59 hrs HW=132.06' (Free Discharge)
└─**1=Culvert** (Passes 0.26 cfs of 5.55 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.25 cfs @ 6.04 fps)
  └─**4=Broad-Crested Rectangular Weir** (Weir Controls 0.01 cfs @ 0.26 fps)

Pond IB1: Infiltration Basin 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

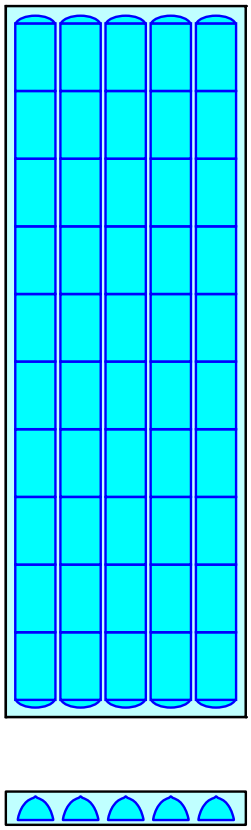
10 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 72.82' Row Length +12.0" End Stone x 2 = 74.82' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

50 Chambers x 45.9 cf = 2,297.0 cf Chamber Storage

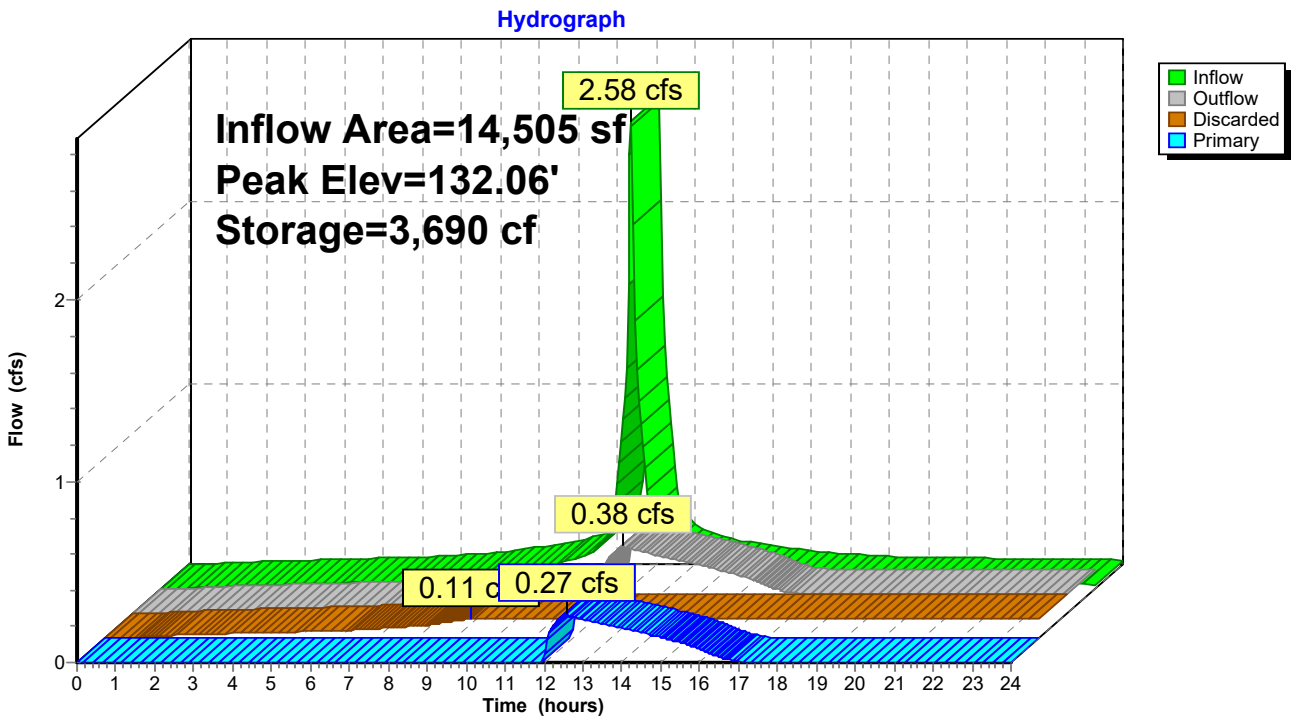
6,611.9 cf Field - 2,297.0 cf Chambers = 4,314.9 cf Stone x 40.0% Voids = 1,726.0 cf Stone Storage

Chamber Storage + Stone Storage = 4,023.0 cf = 0.092 af
Overall Storage Efficiency = 60.8%
Overall System Size = 74.82' x 25.25' x 3.50'

50 Chambers
244.9 cy Field
159.8 cy Stone



Pond IB1: Infiltration Basin 1



Stage-Area-Storage for Pond IB1: Infiltration Basin 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
129.00	**1,889**	0
129.05	1,889	38
129.10	1,889	76
129.15	1,889	113
129.20	1,889	151
129.25	1,889	189
129.30	1,889	227
129.35	1,889	264
129.40	1,889	302
129.45	1,889	340
129.50	1,889	378
129.55	1,889	455
129.60	1,889	533
129.65	1,889	610
129.70	1,889	687
129.75	1,889	764
129.80	1,889	841
129.85	1,889	917
129.90	1,889	993
129.95	1,889	1,069
130.00	1,889	1,145
130.05	1,889	1,220
130.10	1,889	1,295
130.15	1,889	1,369
130.20	1,889	1,444
130.25	1,889	1,517
130.30	1,889	1,591
130.35	1,889	1,664
130.40	1,889	1,736
130.45	1,889	1,809
130.50	1,889	1,880
130.55	1,889	1,952
130.60	1,889	2,022
130.65	1,889	2,093
130.70	1,889	2,162
130.75	1,889	2,232
130.80	1,889	2,300
130.85	1,889	2,368
130.90	1,889	2,435
130.95	1,889	2,502
131.00	1,889	2,568
131.05	1,889	2,634
131.10	1,889	2,698
131.15	1,889	2,762
131.20	1,889	2,825
131.25	1,889	2,887
131.30	1,889	2,948
131.35	1,889	3,008
131.40	1,889	3,067
131.45	1,889	3,124
131.50	1,889	3,181
131.55	1,889	3,236
131.60	1,889	3,290
131.65	1,889	3,342
131.70	1,889	3,392
131.75	1,889	3,439
131.80	1,889	3,484
131.85	1,889	3,526
131.90	1,889	3,567
131.95	1,889	3,607
132.00	1,889	3,645
132.05	1,889	3,683
132.10	1,889	3,721
132.15	1,889	3,758
132.20	1,889	3,796
132.25	1,889	3,834
132.30	1,889	3,872
132.35	1,889	3,910
132.40	1,889	3,947
132.45	1,889	3,985
132.50	1,889	**4,023**

Summary for Pond IB2a: Infiltration Basin 2a

Inflow Area =	26,310 sf, 88.91% Impervious, Inflow Depth > 7.36" for 100-YR event				
Inflow =	4.60 cfs @	12.09 hrs,	Volume=	16,130 cf	
Outflow =	2.38 cfs @	12.23 hrs,	Volume=	14,117 cf,	Atten= 48%, Lag= 8.5 min
Discarded =	0.06 cfs @	6.55 hrs,	Volume=	4,123 cf	
Primary =	2.32 cfs @	12.23 hrs,	Volume=	9,994 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 130.78' @ 12.23 hrs Surf.Area= 2,458 sf Storage= 5,048 cf

Plug-Flow detention time= 101.9 min calculated for 14,117 cf (88% of inflow)
Center-of-Mass det. time= 44.8 min (805.5 - 760.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	127.50'	2,392 cf	**30.00'W x 81.94'L x 3.67'H Field A** 9,013 cf Overall - 3,032 cf Embedded = 5,981 cf x 40.0% Voids
#2A	128.00'	3,032 cf	**ADS_StormTech SC-740 +Cap** x 66 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 6 Rows of 11 Chambers
		5,424 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	128.60'	**15.0" Round Culvert** L= 55.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 128.60' / 128.00' S= 0.0109 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Discarded	127.50'	**1.020 in/hr Exfiltration over Surface area**
#3	Device 1	128.80'	**10.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	130.10'	**10.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	130.99'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.06 cfs @ 6.55 hrs HW=127.54' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=2.31 cfs @ 12.23 hrs HW=130.78' (Free Discharge)
└─**1=Culvert** (Passes 2.31 cfs of 8.21 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 1.80 cfs @ 6.47 fps)
  ├─**4=Orifice/Grate** (Orifice Controls 0.51 cfs @ 3.70 fps)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB2a: Infiltration Basin 2a - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

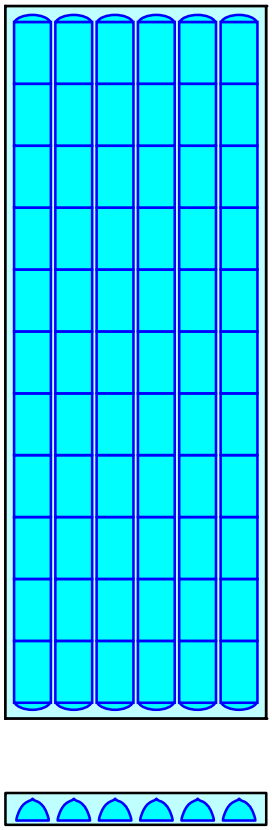
11 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 79.94' Row Length +12.0" End Stone x 2 = 81.94' Base Length
6 Rows x 51.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.00' Base Width
6.0" Base + 30.0" Chamber Height + 8.0" Cover = 3.67' Field Height

66 Chambers x 45.9 cf = 3,032.0 cf Chamber Storage

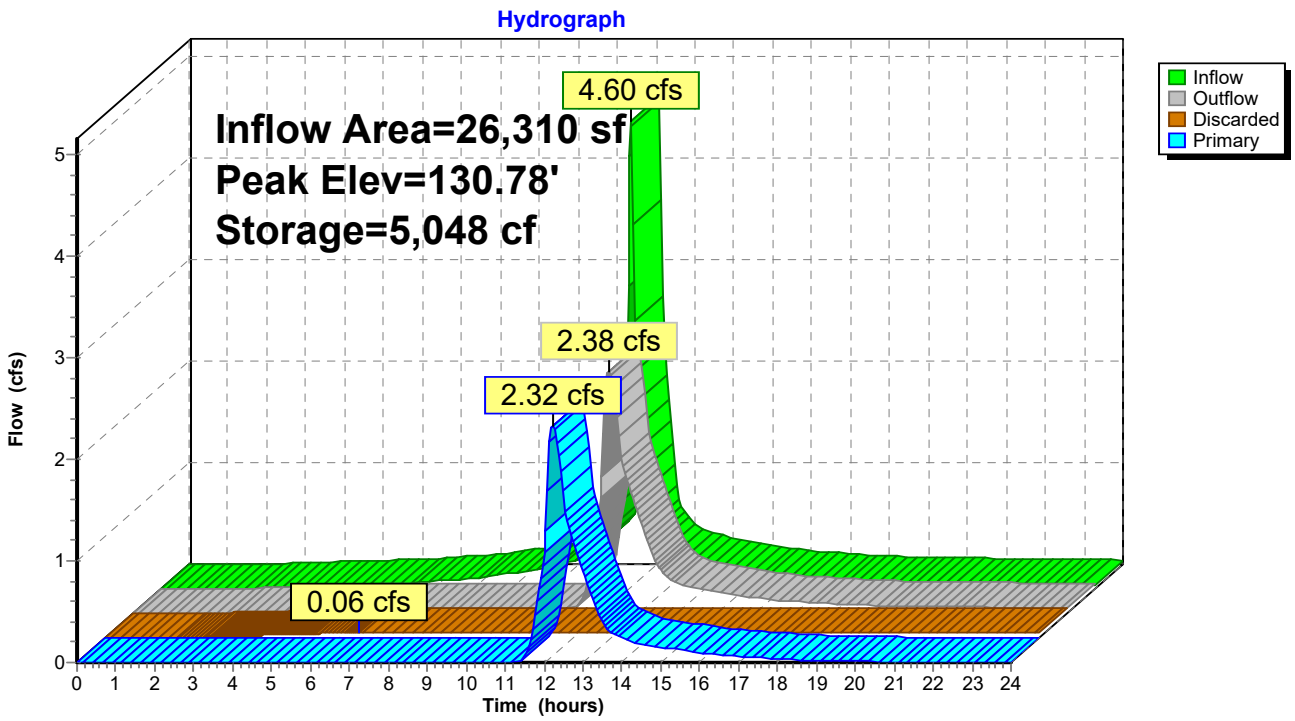
9,013.0 cf Field - 3,032.0 cf Chambers = 5,981.0 cf Stone x 40.0% Voids = 2,392.4 cf Stone Storage

Chamber Storage + Stone Storage = 5,424.4 cf = 0.125 af
Overall Storage Efficiency = 60.2%
Overall System Size = 81.94' x 30.00' x 3.67'

66 Chambers
333.8 cy Field
221.5 cy Stone



Pond IB2a: Infiltration Basin 2a



Stage-Area-Storage for Pond IB2a: Infiltration Basin 2a

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
127.50	**2,458**	0
127.55	2,458	49
127.60	2,458	98
127.65	2,458	147
127.70	2,458	197
127.75	2,458	246
127.80	2,458	295
127.85	2,458	344
127.90	2,458	393
127.95	2,458	442
128.00	2,458	492
128.05	2,458	593
128.10	2,458	695
128.15	2,458	796
128.20	2,458	897
128.25	2,458	998
128.30	2,458	1,099
128.35	2,458	1,199
128.40	2,458	1,298
128.45	2,458	1,398
128.50	2,458	1,497
128.55	2,458	1,595
128.60	2,458	1,694
128.65	2,458	1,791
128.70	2,458	1,888
128.75	2,458	1,985
128.80	2,458	2,081
128.85	2,458	2,177
128.90	2,458	2,272
128.95	2,458	2,367
129.00	2,458	2,461
129.05	2,458	2,554
129.10	2,458	2,647
129.15	2,458	2,739
129.20	2,458	2,830
129.25	2,458	2,921
129.30	2,458	3,011
129.35	2,458	3,100
129.40	2,458	3,188
129.45	2,458	3,275
129.50	2,458	3,362
129.55	2,458	3,447
129.60	2,458	3,532
129.65	2,458	3,615
129.70	2,458	3,698
129.75	2,458	3,779
129.80	2,458	3,858
129.85	2,458	3,937
129.90	2,458	4,014
129.95	2,458	4,089
130.00	2,458	4,164
130.05	2,458	4,236
130.10	2,458	4,306
130.15	2,458	4,374
130.20	2,458	4,439
130.25	2,458	4,501
130.30	2,458	4,559
130.35	2,458	4,614
130.40	2,458	4,667
130.45	2,458	4,719
130.50	2,458	4,769
130.55	2,458	4,818
130.60	2,458	4,867
130.65	2,458	4,916
130.70	2,458	4,966
130.75	2,458	5,015
130.80	2,458	5,064
130.85	2,458	5,113
130.90	2,458	5,162
130.95	2,458	5,211
131.00	2,458	5,261
131.05	2,458	5,310
131.10	2,458	5,359
131.15	2,458	**5,408**

Summary for Pond IB2c: Infiltration Basin Area 2c

Inflow Area =	15,551 sf, 65.27% Impervious, Inflow Depth > 6.40" for 100-YR event				
Inflow =	2.51 cfs @	12.09 hrs,	Volume=	8,300 cf	
Outflow =	1.31 cfs @	12.24 hrs,	Volume=	7,921 cf,	Atten= 48%, Lag= 9.2 min
Discarded =	0.06 cfs @	9.00 hrs,	Volume=	3,371 cf	
Primary =	1.25 cfs @	12.24 hrs,	Volume=	4,550 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 131.98' @ 12.24 hrs Surf.Area= 2,373 sf Storage= 2,473 cf

Plug-Flow detention time= 85.7 min calculated for 7,905 cf (95% of inflow)
Center-of-Mass det. time= 60.1 min (847.1 - 787.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	130.00'	1,505 cf	**27.00'W x 87.91'L x 2.00'H Field A** 4,747 cf Overall - 985 cf Embedded = 3,762 cf x 40.0% Voids
#2A	130.50'	985 cf	**ADS_StormTech SC-160LP +Cap** x 144 Inside #1 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 12 Rows of 12 Chambers
		2,489 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	130.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	129.20'	**8.0" Round Culvert** L= 14.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 129.20' / 129.00' S= 0.0143 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.35 sf
#3	Device 2	130.70'	**11.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 2	131.40'	**2.0" Vert. Orifice/Grate** C= 0.600
#5	Device 2	131.88'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.06 cfs @ 9.00 hrs HW=130.02' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=1.24 cfs @ 12.24 hrs HW=131.98' (Free Discharge)
└─**2=Culvert** (Passes 1.24 cfs of 3.23 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.80 cfs @ 5.27 fps)
  ├─**4=Orifice/Grate** (Orifice Controls 0.07 cfs @ 3.40 fps)
  └─**5=Broad-Crested Rectangular Weir** (Weir Controls 0.36 cfs @ 0.89 fps)

Pond IB2c: Infiltration Basin Area 2c - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-160LP +Cap (ADS StormTech® SC-160LP with cap length)
Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf
Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap

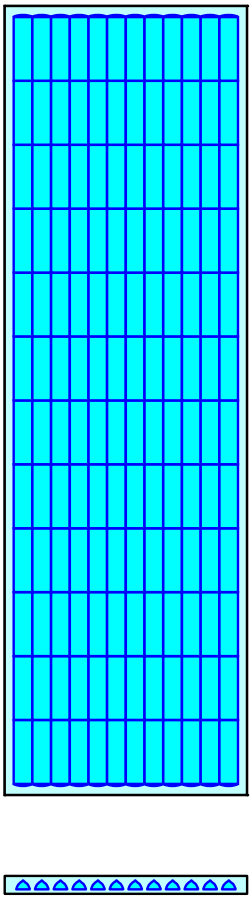
12 Chambers/Row x 7.12' Long +0.23' Cap Length x 2 = 85.91' Row Length +12.0" End Stone x 2 = 87.91' Base Length
12 Rows x 25.0" Wide + 12.0" Side Stone x 2 = 27.00' Base Width
6.0" Base + 12.0" Chamber Height + 6.0" Cover = 2.00' Field Height

144 Chambers x 6.8 cf = 984.5 cf Chamber Storage

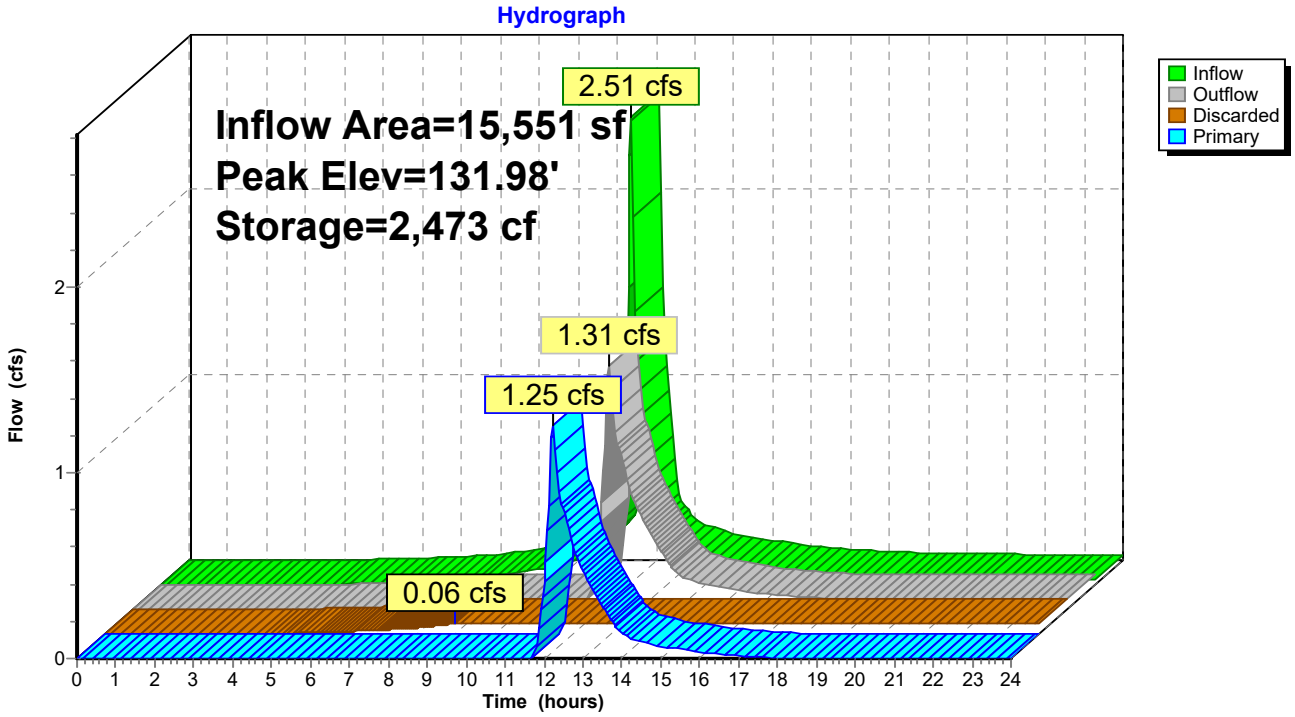
4,747.0 cf Field - 984.5 cf Chambers = 3,762.4 cf Stone x 40.0% Voids = 1,505.0 cf Stone Storage

Chamber Storage + Stone Storage = 2,489.5 cf = 0.057 af
Overall Storage Efficiency = 52.4%
Overall System Size = 87.91' x 27.00' x 2.00'

144 Chambers
175.8 cy Field
139.3 cy Stone



Pond IB2c: Infiltration Basin Area 2c



Stage-Area-Storage for Pond IB2c: Infiltration Basin Area 2c

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.00	**2,373**	0
130.02	2,373	19
130.04	2,373	38
130.06	2,373	57
130.08	2,373	76
130.10	2,373	95
130.12	2,373	114
130.14	2,373	133
130.16	2,373	152
130.18	2,373	171
130.20	2,373	190
130.22	2,373	209
130.24	2,373	228
130.26	2,373	247
130.28	2,373	266
130.30	2,373	285
130.32	2,373	304
130.34	2,373	323
130.36	2,373	342
130.38	2,373	361
130.40	2,373	380
130.42	2,373	399
130.44	2,373	418
130.46	2,373	437
130.48	2,373	456
130.50	2,373	475
130.52	2,373	512
130.54	2,373	549
130.56	2,373	587
130.58	2,373	624
130.60	2,373	661
130.62	2,373	698
130.64	2,373	735
130.66	2,373	772
130.68	2,373	808
130.70	2,373	844
130.72	2,373	880
130.74	2,373	916
130.76	2,373	952
130.78	2,373	987
130.80	2,373	1,022
130.82	2,373	1,057
130.84	2,373	1,092
130.86	2,373	1,127
130.88	2,373	1,161
130.90	2,373	1,195
130.92	2,373	1,229
130.94	2,373	1,263
130.96	2,373	1,296
130.98	2,373	1,329
131.00	2,373	1,361
131.02	2,373	1,394
131.04	2,373	1,426
131.06	2,373	1,457
131.08	2,373	1,489
131.10	2,373	1,519
131.12	2,373	1,550
131.14	2,373	1,580
131.16	2,373	1,609
131.18	2,373	1,638
131.20	2,373	1,667
131.22	2,373	1,695
131.24	2,373	1,722
131.26	2,373	1,749
131.28	2,373	1,774
131.30	2,373	1,799
131.32	2,373	1,824
131.34	2,373	1,847
131.36	2,373	1,870
131.38	2,373	1,892
131.40	2,373	1,914
131.42	2,373	1,935
131.44	2,373	1,955
131.46	2,373	1,976
131.48	2,373	1,995
131.50	2,373	2,015
131.52	2,373	2,034
131.54	2,373	2,053
131.56	2,373	2,072
131.58	2,373	2,091
131.60	2,373	2,110
131.62	2,373	2,129
131.64	2,373	2,148
131.66	2,373	2,167
131.68	2,373	2,186
131.70	2,373	2,205
131.72	2,373	2,224
131.74	2,373	2,243
131.76	2,373	2,262
131.78	2,373	2,281
131.80	2,373	2,300
131.82	2,373	2,319
131.84	2,373	2,338
131.86	2,373	2,357
131.88	2,373	2,376
131.90	2,373	2,395
131.92	2,373	2,414
131.94	2,373	2,433
131.96	2,373	2,452
131.98	2,373	2,471
132.00	2,373	**2,489**

Summary for Pond IB2e: Infiltration Basin 2b

Inflow Area =	15,464 sf, 93.24% Impervious, Inflow Depth > 7.48" for 100-YR event				
Inflow =	2.72 cfs @	12.09 hrs,	Volume=	9,634 cf	
Outflow =	0.84 cfs @	12.41 hrs,	Volume=	9,630 cf,	Atten= 69%, Lag= 19.2 min
Discarded =	0.14 cfs @	10.35 hrs,	Volume=	6,971 cf	
Primary =	0.70 cfs @	12.41 hrs,	Volume=	2,659 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 132.73' @ 12.41 hrs Surf.Area= 2,592 sf Storage= 3,199 cf

Plug-Flow detention time= 77.8 min calculated for 9,630 cf (100% of inflow)
Center-of-Mass det. time= 77.4 min (833.9 - 756.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	130.50'	2,002 cf	**34.83'W x 74.40'L x 2.50'H Field A** 6,479 cf Overall - 1,474 cf Embedded = 5,005 cf x 40.0% Voids
#2A	131.00'	1,474 cf	**ADS_StormTech SC-310 +Cap** x 100 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 10 Rows of 10 Chambers
		3,476 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	130.85'	**15.0" Round Culvert Barrel** L= 69.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 130.85' / 130.50' S= 0.0051 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Discarded	130.50'	**2.410 in/hr Exfiltration over Surface area**
#3	Device 1	131.40'	**3.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	132.63'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.14 cfs @ 10.35 hrs HW=130.53' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=0.69 cfs @ 12.41 hrs HW=132.73' (Free Discharge)
└─**1=Culvert Barrel** (Passes 0.69 cfs of 6.21 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.33 cfs @ 5.29 fps)
  └─**4=Broad-Crested Rectangular Weir** (Weir Controls 0.36 cfs @ 0.89 fps)

Pond IB2e: Infiltration Basin 2b - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-310 +Cap (ADS StormTech® SC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

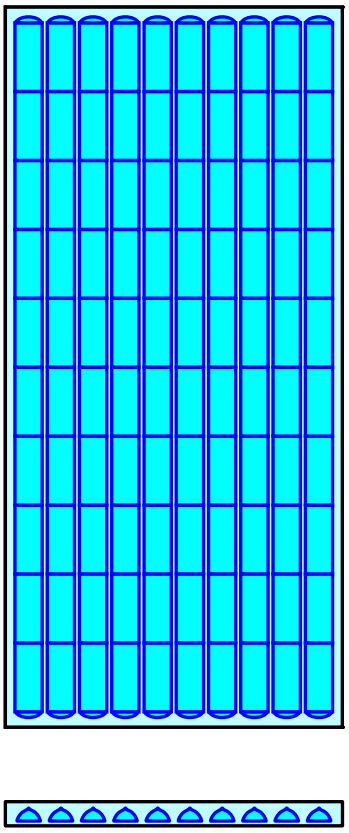
10 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 72.40' Row Length +12.0" End Stone x 2 = 74.40' Base Length
10 Rows x 34.0" Wide + 6.0" Spacing x 9 + 12.0" Side Stone x 2 = 34.83' Base Width
6.0" Base + 16.0" Chamber Height + 8.0" Cover = 2.50' Field Height

100 Chambers x 14.7 cf = 1,474.2 cf Chamber Storage

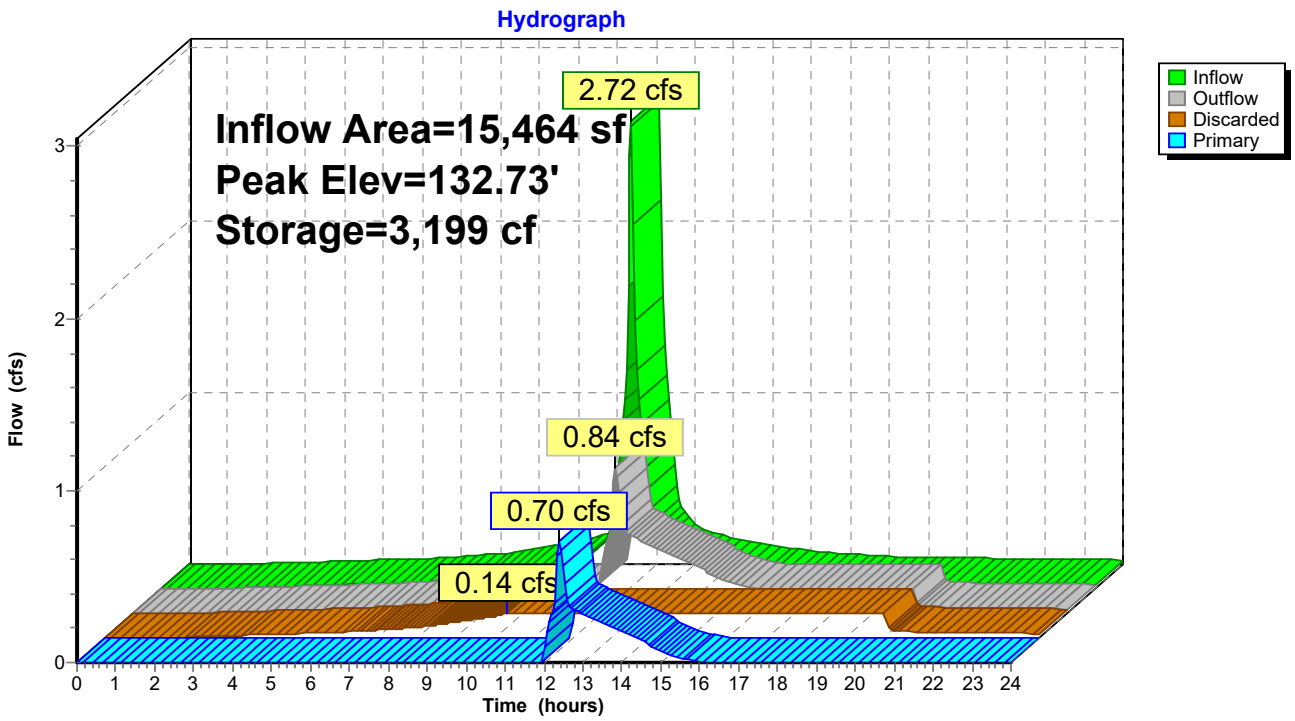
6,479.0 cf Field - 1,474.2 cf Chambers = 5,004.8 cf Stone x 40.0% Voids = 2,001.9 cf Stone Storage

Chamber Storage + Stone Storage = 3,476.1 cf = 0.080 af
Overall Storage Efficiency = 53.7%
Overall System Size = 74.40' x 34.83' x 2.50'

100 Chambers
240.0 cy Field
185.4 cy Stone



Pond IB2e: Infiltration Basin 2b



Stage-Area-Storage for Pond IB2e: Infiltration Basin 2b

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.50	**2,592**	0
130.55	2,592	52
130.60	2,592	104
130.65	2,592	155
130.70	2,592	207
130.75	2,592	259
130.80	2,592	311
130.85	2,592	363
130.90	2,592	415
130.95	2,592	466
131.00	2,592	518
131.05	2,592	622
131.10	2,592	724
131.15	2,592	827
131.20	2,592	928
131.25	2,592	1,029
131.30	2,592	1,129
131.35	2,592	1,227
131.40	2,592	1,325
131.45	2,592	1,422
131.50	2,592	1,517
131.55	2,592	1,611
131.60	2,592	1,703
131.65	2,592	1,794
131.70	2,592	1,884
131.75	2,592	1,972
131.80	2,592	2,057
131.85	2,592	2,141
131.90	2,592	2,222
131.95	2,592	2,301
132.00	2,592	2,377
132.05	2,592	2,449
132.10	2,592	2,516
132.15	2,592	2,579
132.20	2,592	2,638
132.25	2,592	2,695
132.30	2,592	2,750
132.35	2,592	2,802
132.40	2,592	2,854
132.45	2,592	2,906
132.50	2,592	2,958
132.55	2,592	3,010
132.60	2,592	3,061
132.65	2,592	3,113
132.70	2,592	3,165
132.75	2,592	3,217
132.80	2,592	3,269
132.85	2,592	3,321
132.90	2,592	3,372
132.95	2,592	3,424
133.00	2,592	**3,476**

APPENDIX E: STORMWATER CALCULATIONS

- *NOAA RAINFALL DATA*
- *PIPE SIZING*
- *WATER QUALITY VOLUME*
- *RIP RAP SIZING*

NOAA Atlas 14, Volume 10, Version 3
Location name: Enfield, Connecticut, USA*
Latitude: 41.9886°, Longitude: -72.5652°
Elevation: m/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_&_aerials

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	0.339 (0.261-0.440)	0.409 (0.314-0.531)	0.523 (0.400-0.682)	0.617 (0.469-0.809)	0.746 (0.551-1.02)	0.844 (0.611-1.18)	0.946 (0.667-1.38)	1.06 (0.711-1.58)	1.22 (0.791-1.89)	1.36 (0.858-2.14)
10-min	0.481 (0.369-0.624)	0.579 (0.444-0.753)	0.740 (0.566-0.965)	0.873 (0.663-1.15)	1.06 (0.781-1.45)	1.20 (0.865-1.68)	1.34 (0.945-1.95)	1.50 (1.01-2.24)	1.73 (1.12-2.68)	1.92 (1.22-3.03)
15-min	0.566 (0.434-0.734)	0.681 (0.523-0.885)	0.870 (0.665-1.13)	1.03 (0.782-1.35)	1.24 (0.918-1.71)	1.41 (1.02-1.97)	1.58 (1.11-2.30)	1.77 (1.19-2.64)	2.04 (1.32-3.15)	2.26 (1.43-3.57)
30-min	0.762 (0.585-0.990)	0.921 (0.706-1.20)	1.18 (0.902-1.54)	1.40 (1.06-1.83)	1.69 (1.25-2.32)	1.91 (1.39-2.68)	2.15 (1.51-3.13)	2.41 (1.61-3.59)	2.78 (1.80-4.30)	3.08 (1.95-4.86)
60-min	0.959 (0.737-1.25)	1.16 (0.890-1.51)	1.49 (1.14-1.94)	1.76 (1.34-2.31)	2.14 (1.58-2.93)	2.42 (1.75-3.40)	2.72 (1.92-3.95)	3.05 (2.04-4.55)	3.51 (2.27-5.44)	3.89 (2.47-6.15)
2-hr	1.23 (0.950-1.59)	1.48 (1.14-1.91)	1.89 (1.45-2.45)	2.23 (1.70-2.90)	2.69 (2.00-3.68)	3.04 (2.22-4.26)	3.41 (2.43-4.98)	3.85 (2.59-5.71)	4.50 (2.92-6.92)	5.05 (3.20-7.93)
3-hr	1.41 (1.10-1.82)	1.70 (1.32-2.19)	2.17 (1.68-2.80)	2.56 (1.97-3.33)	3.10 (2.31-4.23)	3.49 (2.56-4.89)	3.92 (2.81-5.73)	4.44 (2.99-6.58)	5.24 (3.40-8.03)	5.91 (3.76-9.26)
6-hr	1.77 (1.38-2.27)	2.15 (1.67-2.75)	2.77 (2.15-3.55)	3.28 (2.53-4.23)	3.98 (2.99-5.42)	4.50 (3.33-6.28)	5.06 (3.67-7.40)	5.77 (3.90-8.50)	6.88 (4.49-10.5)	7.85 (5.01-12.2)
12-hr	2.18 (1.71-2.77)	2.68 (2.10-3.41)	3.50 (2.73-4.46)	4.18 (3.24-5.36)	5.11 (3.87-6.93)	5.80 (4.32-8.07)	6.55 (4.78-9.56)	7.52 (5.10-11.0)	9.04 (5.91-13.7)	10.4 (6.64-16.1)
24-hr	2.55 (2.01-3.22)	3.18 (2.51-4.02)	4.22 (3.31-5.35)	5.07 (3.96-6.47)	6.26 (4.76-8.45)	7.12 (5.33-9.87)	8.08 (5.94-11.8)	9.32 (6.35-13.6)	11.3 (7.42-17.1)	13.1 (8.40-20.1)
2-day	2.86 (2.27-3.59)	3.61 (2.86-4.54)	4.84 (3.82-6.10)	5.85 (4.60-7.42)	7.25 (5.56-9.76)	8.27 (6.24-11.4)	9.41 (6.98-13.7)	10.9 (7.46-15.8)	13.4 (8.81-20.1)	15.6 (10.0-23.9)
3-day	3.12 (2.49-3.91)	3.94 (3.14-4.93)	5.28 (4.19-6.63)	6.39 (5.04-8.07)	7.92 (6.09-10.6)	9.03 (6.84-12.5)	10.3 (7.65-14.9)	11.9 (8.17-17.2)	14.7 (9.67-22.0)	17.1 (11.0-26.1)
4-day	3.37 (2.69-4.20)	4.24 (3.38-5.29)	5.67 (4.50-7.10)	6.85 (5.41-8.63)	8.48 (6.54-11.3)	9.66 (7.34-13.3)	11.0 (8.20-15.9)	12.8 (8.75-18.4)	15.7 (10.3-23.4)	18.3 (11.8-27.8)
7-day	4.04 (3.24-5.01)	5.02 (4.03-6.24)	6.64 (5.30-8.28)	7.98 (6.34-10.0)	9.83 (7.61-13.1)	11.2 (8.50-15.3)	12.7 (9.46-18.2)	14.6 (10.1-21.0)	17.9 (11.8-26.5)	20.7 (13.4-31.4)
10-day	4.70 (3.78-5.81)	5.75 (4.62-7.12)	7.47 (5.98-9.28)	8.89 (7.09-11.1)	10.9 (8.41-14.3)	12.3 (9.36-16.7)	13.9 (10.3-19.8)	15.9 (11.0-22.8)	19.2 (12.7-28.5)	22.1 (14.3-33.4)
20-day	6.77 (5.48-8.32)	7.88 (6.38-9.70)	9.71 (7.83-12.0)	11.2 (9.00-13.9)	13.3 (10.3-17.4)	14.9 (11.3-19.9)	16.5 (12.2-23.0)	18.5 (12.9-26.3)	21.6 (14.4-31.7)	24.2 (15.7-36.3)
30-day	8.51 (6.92-10.4)	9.66 (7.84-11.8)	11.5 (9.33-14.2)	13.1 (10.5-16.2)	15.2 (11.8-19.7)	16.8 (12.8-22.2)	18.5 (13.6-25.4)	20.4 (14.2-28.8)	23.1 (15.5-33.8)	25.3 (16.5-37.9)
45-day	10.7 (8.72-13.0)	11.9 (9.68-14.5)	13.8 (11.2-16.9)	15.4 (12.4-19.0)	17.6 (13.7-22.6)	19.3 (14.7-25.3)	21.0 (15.4-28.5)	22.8 (15.9-32.0)	25.1 (16.9-36.6)	26.9 (17.6-40.1)
60-day	12.5 (10.2-15.2)	13.7 (11.2-16.7)	15.7 (12.8-19.2)	17.4 (14.1-21.4)	19.7 (15.3-25.1)	21.5 (16.3-27.9)	23.2 (17.0-31.1)	24.9 (17.4-34.8)	26.9 (18.1-39.1)	28.4 (18.6-42.2)

[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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Kaplan Development
118 Hazard Avenue
Enfield, CT
Bohler Job Number: CT191016
November 25, 2019

Rational Pipe Sizing Calculations

Design Period Storm:		10	Year	Design Period Intensity*			5.63	in/hr									
LOCATION		IMPERVIOUS			OTHER			SUM	Tc	I	Q	D	S	Material	n	Q Full	V Full
FROM	TO	A	C	CA	A	C	CA	CA	(min)	(in/hr)	(cfs)	(in)	(ft/ft)			(cfs)	(fps)
CB-1	CB-2	0.02	0.95	0.02	0.00	0.30	0.00	0.02	6	5.63	0.11	6	0.005	HDPE	0.012	0.43	2.19
CB-2	ICS-1	0.22	0.95	0.21	0.03	0.30	0.01	0.22	6	5.63	1.33	12	0.005	HDPE	0.012	2.73	3.47
CB-3	ICS-2	0.28	0.95	0.27	0.04	0.30	0.01	0.28	6	5.63	1.57	12	0.012	HDPE	0.012	4.23	5.38
CB-4	DMH-1	0.12	0.95	0.11	0.06	0.30	0.02	0.13	6	5.63	0.74	8	0.005	HDPE	0.012	0.93	2.65
DMH-1	ICS-3	0.00	0.95	0.00	0.00	0.30	0.00	0.00	6	5.63	0.00	8	0.005	HDPE	0.012	0.93	2.65
CB-5	ICS-3	0.12	0.95	0.11	0.07	0.30	0.02	0.14	6	5.63	0.76	8	0.005	HDPE	0.012	0.93	2.65
ICS-3	BMP-2	0.00	0.95	0.00	0.00	0.30	0.00	0.00	6	5.63	1.50	8	0.013	HDPE	0.012	1.51	4.33
CB-6	ICS-4	0.33	0.95	0.31	0.03	0.30	0.01	0.32	6	5.63	1.83	12	0.005	HDPE	0.012	2.73	3.47
RD-1	AB3b	0.33	0.95	0.31	0.00	0.30	0.00	0.31	6	5.63	1.77	12	0.005	HDPE	0.012	2.73	3.47
CB-7	FES-7	0.11	0.95	0.10	0.01	0.30	0.00	0.11	6	5.63	0.61	8	0.005	HDPE	0.012	0.93	2.65
CB-8	FES-8	0.08	0.95	0.08	0.02	0.30	0.01	0.08	6	5.63	0.46	8	0.020	HDPE	0.012	1.85	5.30
RD-2	ICS-5	0.33	0.95	0.31	0.11	0.30	0.03	0.35	6	5.63	1.95	12	0.020	HDPE	0.012	5.46	6.95

*Rainfall intensity provided by Cornell University's NRCC Atlas of Precipitation Extremes for the North Eastern United States and Canada on 11/25/19

Prepared By:
Bohler Engineering
352 Turnpike Road
Southborough, MA 01772
(508) 480-9900

Determine Water Quality Volume

From CT 2004 Stormwater Quality Manual:

$$WQV = \frac{(1'')(R)(A)}{12}$$

$$R = 0.05 + 0.009(I)$$

WQV = water quality volume (ac-ft)
R = volumetric runoff coefficient
I = percent impervious cover
A = site area in acres

Area		Total Area		Impervious Area		Impervious Cover	Volumetric Runoff Coefficient	Water Quality Volume (WQV)		Pretreatment Volume (10% of WQV)	Water Quality Volume Provided
ID		ac	ft^2	ac	ft^2	%	R	acre-feet	ft^3	ft^3	ft^3
PD-1		0.652	13,879	0.526	8,395	80.67	0.776	0.042	1,830	183	2,447
PD-2a		0.603	26,287	0.537	23,375	89.05	0.851	0.043	1,873	187	2,081
PD-2c		0.357	15,557	0.233	10,150	65.27	0.637	0.019	828	83	844
PD-2e		0.355	15,852	0.331	14,406	93.24	0.889	0.026	1,133	113	1,325
PD-3a		0.232	20,226	0.041	1,692	17.67	0.209	0.004	174	17	1,304
PD-3b		0.461	9,895	0.349	1,087	75.70	0.731	0.028	1,220	122	3,182
Total			101,696					0.162	7,058		11,183

Rip Rap and Apron Sizing Worksheet

Address: 118 Hazard Avenue
Enfield, CT

Project No.: CT191016
Date: 12/3/2019
Prepared By: MLT

Apron Sizing: FES-1

$$La = \frac{1.7Q}{Do^{3/2}} + 8Do$$

$$W\ end = 3Do + 0.4La\ for\ Tailwater\ \geq 0.5Do$$
$$W\ end = 3Do + La\ for\ Tailwater < 0.5Do$$

INPUT	Quantity	Units	Notes
Do	1.25	ft	Inside diameter of culvert
Q	0.94	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater

OUTPUT	Quantity	Units	Notes
La	11.14344	ft	Length of apron (minimum)
For tailwater elevation greater than or equal to the elevation of the center of the pipe:			
W start	3.75	ft	Width of apron at the culvert (minimum)
W end	8.207374	ft	Width of apron end (minimum)
For tailwater elevation less than the elevation of the center of the pipe:			
W start	3.75	ft	Width of apron at the culvert (minimum)
W end	14.89344	ft	Width of apron end (minimum)

Rip Rap Sizing:

$$d - 50 = \frac{0.02}{TW} * (\frac{Q}{Do})^{4/3}$$

NOTE: calculations based on 25 Year storm to FES-3

INPUT	Quantity	Units	Notes
TW	0.3	ft	Tailwater depth above the invert of the culvert
Do	1.25	ft	Inside diameter of culvert (defined in apron sizing)
Q	0.94	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater (defined in apron sizing)

OUTPUT	Quantity	Units	Notes
d-50	0.04559	ft	Median stone diameter in feet
	0.547075	in	Median stone diameter in inches

Rip Rap and Apron Sizing Worksheet

Address: 118 Hazard Avenue
Enfield, CT

Project No.: CT191016
Date: 12/3/2019
Prepared By: MLT

Apron Sizing: FES-2

$$La = \frac{1.7Q}{Do^{3/2}} + 8Do$$

$$W\ end = 3Do + 0.4La\ for\ Tailwater\ \geq 0.5Do$$
$$W\ end = 3Do + La\ for\ Tailwater < 0.5Do$$

INPUT	Quantity	Units	Notes
Do	1	ft	Inside diameter of culvert
Q	0.4	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater

OUTPUT	Quantity	Units	Notes
La	8.68	ft	Length of apron (minimum)
For tailwater elevation greater than or equal to the elevation of the center of the pipe:			
W start	3	ft	Width of apron at the culvert (minimum)
W end	6.472	ft	Width of apron end (minimum)
For tailwater elevation less than the elevation of the center of the pipe:			
W start	3	ft	Width of apron at the culvert (minimum)
W end	11.68	ft	Width of apron end (minimum)

Rip Rap Sizing:

$$d - 50 = \frac{0.02}{TW} * (\frac{Q}{Do})^{4/3}$$

NOTE: calculations based on 25 Year storm to FES-3

INPUT	Quantity	Units	Notes			
TW	0.3	ft	Tailwater depth above the invert of the culvert			
Do	1	ft	Inside diameter of culvert (defined in apron sizing)			
Q	0.4	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater (defined in apron sizing)			

OUTPUT	Quantity	Units	Notes
d-50	0.019648	ft	Median stone diameter in feet
	0.235778	in	Median stone diameter in inches

Rip Rap and Apron Sizing Worksheet

Address: 118 Hazard Avenue
Enfield, CT

Project No.: CT191016
Date: 12/3/2019
Prepared By: MLT

Apron Sizing: FES-3

$$La = \frac{1.7Q}{Do^{3/2}} + 8Do$$

$$W\ end = 3Do + 0.4La\ for\ Tailwater\ \geq 0.5Do$$
$$W\ end = 3Do + La\ for\ Tailwater < 0.5Do$$

INPUT	Quantity	Units	Notes
Do	1.25	ft	Inside diameter of culvert
Q	0.13	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater

OUTPUT	Quantity	Units	Notes
La	10.15813	ft	Length of apron (minimum)
For tailwater elevation greater than or equal to the elevation of the center of the pipe:			
W start	3.75	ft	Width of apron at the culvert (minimum)
W end	7.813254	ft	Width of apron end (minimum)
For tailwater elevation less than the elevation of the center of the pipe:			
W start	3.75	ft	Width of apron at the culvert (minimum)
W end	13.90813	ft	Width of apron end (minimum)

Rip Rap Sizing:

$$d - 50 = \frac{0.02}{TW} * (\frac{Q}{Do})^{4/3}$$

NOTE: calculations based on 25 Year storm to FES-3

INPUT	Quantity	Units	Notes
TW	0.3	ft	Tailwater depth above the invert of the culvert
Do	1.25	ft	Inside diameter of culvert (defined in apron sizing)
Q	0.13	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater (defined in apron sizing)

OUTPUT	Quantity	Units	Notes
d-50	0.003261	ft	Median stone diameter in feet
	0.039126	in	Median stone diameter in inches

Rip Rap and Apron Sizing Worksheet

Address: 118 Hazard Avenue
Enfield, CT

Project No.: CT191016
Date: 12/3/2019
Prepared By: MLT

Apron Sizing: FES-4

$$La = \frac{1.7Q}{Do^{3/2}} + 8Do$$

$$W\ end = 3Do + 0.4La\ for\ Tailwater\ \geq 0.5Do$$
$$W\ end = 3Do + La\ for\ Tailwater < 0.5Do$$

INPUT	Quantity	Units	Notes
Do	1	ft	Inside diameter of culvert
Q	1.77	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater

OUTPUT	Quantity	Units	Notes
La	11.009	ft	Length of apron (minimum)
For tailwater elevation greater than or equal to the elevation of the center of the pipe:			
W start	3	ft	Width of apron at the culvert (minimum)
W end	7.4036	ft	Width of apron end (minimum)
For tailwater elevation less than the elevation of the center of the pipe:			
W start	3	ft	Width of apron at the culvert (minimum)
W end	14.009	ft	Width of apron end (minimum)

Rip Rap Sizing:

$$d - 50 = \frac{0.02}{TW} * (\frac{Q}{Do})^{4/3}$$

NOTE: calculations based on 25 Year storm to FES-3

INPUT	Quantity	Units	Notes
TW	0.3	ft	Tailwater depth above the invert of the culvert
Do	1	ft	Inside diameter of culvert (defined in apron sizing)
Q	1.77	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater (defined in apron sizing)

OUTPUT	Quantity	Units	Notes
d-50	0.142738	ft	Median stone diameter in feet
	1.712857	in	Median stone diameter in inches

Rip Rap and Apron Sizing Worksheet

Address: 118 Hazard Avenue
Enfield, CT

Project No.: CT191016
Date: 12/3/2019
Prepared By: MLT

Apron Sizing: FES-5

$$La = \frac{1.7Q}{Do^{3/2}} + 8Do$$

$$W\ end = 3Do + 0.4La\ for\ Tailwater\ \geq 0.5Do$$
$$W\ end = 3Do + La\ for\ Tailwater < 0.5Do$$

INPUT	Quantity	Units	Notes
Do	0.667	ft	Inside diameter of culvert
Q	0.61	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater

OUTPUT	Quantity	Units	Notes
La	7.239663	ft	Length of apron (minimum)
For tailwater elevation greater than or equal to the elevation of the center of the pipe:			
W start	2.001	ft	Width of apron at the culvert (minimum)
W end	4.896865	ft	Width of apron end (minimum)
For tailwater elevation less than the elevation of the center of the pipe:			
W start	2.001	ft	Width of apron at the culvert (minimum)
W end	9.240663	ft	Width of apron end (minimum)

Rip Rap Sizing:

$$d - 50 = \frac{0.02}{TW} * (\frac{Q}{Do})^{4/3}$$

NOTE: calculations based on 25 Year storm to FES-3

INPUT	Quantity	Units	Notes
TW	0.3	ft	Tailwater depth above the invert of the culvert
Do	0.667	ft	Inside diameter of culvert (defined in apron sizing)
Q	0.61	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater (defined in apron sizing)

OUTPUT	Quantity	Units	Notes
d-50	0.059181	ft	Median stone diameter in feet
	0.710169	in	Median stone diameter in inches

Rip Rap and Apron Sizing Worksheet

Address: 118 Hazard Avenue
Enfield, CT

Project No.: CT191016
Date: 12/3/2019
Prepared By: MLT

Apron Sizing: FES-6

$$La = \frac{1.7Q}{Do^{3/2}} + 8Do$$

$$W\ end = 3Do + 0.4La\ for\ Tailwater\ \geq 0.5Do$$
$$W\ end = 3Do + La\ for\ Tailwater < 0.5Do$$

INPUT	Quantity	Units	Notes
Do	0.667	ft	Inside diameter of culvert
Q	0.46	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater

OUTPUT	Quantity	Units	Notes
La	6.771549	ft	Length of apron (minimum)
For tailwater elevation greater than or equal to the elevation of the center of the pipe:			
W start	2.001	ft	Width of apron at the culvert (minimum)
W end	4.70962	ft	Width of apron end (minimum)
For tailwater elevation less than the elevation of the center of the pipe:			
W start	2.001	ft	Width of apron at the culvert (minimum)
W end	8.772549	ft	Width of apron end (minimum)

Rip Rap Sizing:

$$d - 50 = \frac{0.02}{TW} * (\frac{Q}{Do})^{4/3}$$

NOTE: calculations based on 25 Year storm to FES-3

INPUT	Quantity	Units	Notes
TW	0.3	ft	Tailwater depth above the invert of the culvert
Do	0.667	ft	Inside diameter of culvert (defined in apron sizing)
Q	0.46	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater (defined in apron sizing)

OUTPUT	Quantity	Units	Notes
d-50	0.040621	ft	Median stone diameter in feet
	0.487453	in	Median stone diameter in inches

Rip Rap and Apron Sizing Worksheet

Address: 118 Hazard Avenue
Enfield, CT

Project No.: CT191016
Date: 12/3/2019
Prepared By: MLT

Apron Sizing: FES-7

$$La = \frac{1.7Q}{Do^{3/2}} + 8Do$$

$$W\ end = 3Do + 0.4La\ for\ Tailwater\ \geq 0.5Do$$
$$W\ end = 3Do + La\ for\ Tailwater < 0.5Do$$

INPUT	Quantity	Units	Notes
Do	1	ft	Inside diameter of culvert
Q	0.09	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater

OUTPUT	Quantity	Units	Notes
La	8.153	ft	Length of apron (minimum)
For tailwater elevation greater than or equal to the elevation of the center of the pipe:			
W start	3	ft	Width of apron at the culvert (minimum)
W end	6.2612	ft	Width of apron end (minimum)
For tailwater elevation less than the elevation of the center of the pipe:			
W start	3	ft	Width of apron at the culvert (minimum)
W end	11.153	ft	Width of apron end (minimum)

Rip Rap Sizing:

$$d - 50 = \frac{0.02}{TW} * (\frac{Q}{Do})^{4/3}$$

NOTE: calculations based on 25 Year storm to FES-3

INPUT	Quantity	Units	Notes
TW	0.3	ft	Tailwater depth above the invert of the culvert
Do	1	ft	Inside diameter of culvert (defined in apron sizing)
Q	0.09	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater (defined in apron sizing)

OUTPUT	Quantity	Units	Notes
d-50	0.002689	ft	Median stone diameter in feet
	0.032266	in	Median stone diameter in inches

Rip Rap and Apron Sizing Worksheet

Address: 118 Hazard Avenue
Enfield, CT

Project No.: CT191016
Date: 12/3/2019
Prepared By: MLT

Apron Sizing: FES-8

$$La = \frac{1.7Q}{Do^{3/2}} + 8Do$$

$$W\ end = 3Do + 0.4La\ for\ Tailwater\ \geq 0.5Do$$
$$W\ end = 3Do + La\ for\ Tailwater < 0.5Do$$

INPUT	Quantity	Units	Notes
Do	0.667	ft	Inside diameter of culvert
Q	0.21	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater

OUTPUT	Quantity	Units	Notes
La	5.991359	ft	Length of apron (minimum)
For tailwater elevation greater than or equal to the elevation of the center of the pipe:			
W start	2.001	ft	Width of apron at the culvert (minimum)
W end	4.397544	ft	Width of apron end (minimum)
For tailwater elevation less than the elevation of the center of the pipe:			
W start	2.001	ft	Width of apron at the culvert (minimum)
W end	7.992359	ft	Width of apron end (minimum)

Rip Rap Sizing:

$$d - 50 = \frac{0.02}{TW} * (\frac{Q}{Do})^{4/3}$$

NOTE: calculations based on 25 Year storm to FES-3

INPUT	Quantity	Units	Notes
TW	0.3	ft	Tailwater depth above the invert of the culvert
Do	0.667	ft	Inside diameter of culvert (defined in apron sizing)
Q	0.21	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater (defined in apron sizing)

OUTPUT	Quantity	Units	Notes
d-50	0.014279	ft	Median stone diameter in feet
	0.171349	in	Median stone diameter in inches

APPENDIX F: OPERATION AND MAINTENANCE

- *STORMWATER OPERATION AND MAINTENANCE PLAN*
- *INSPECTION REPORT*
- *INSPECTION AND MAINTENANCE LOG FORM*
- *LONG-TERM POLLUTION PREVENTION PLAN*
- *ILLICIT DISCHARGE STATEMENT*
- *MANUFACTURER'S INSPECTION AND MAINTENANCE MANUALS*

STORMWATER OPERATION AND MAINTENANCE PLAN

"All American Assisted Living" Facility.
118 Hazard Avenue
Enfield, CT

RESPONSIBLE PARTY DURING CONSTRUCTION:

TBD

RESPONSIBLE PARTY POST CONSTRUCTION:

TBD

Construction Phase

During the construction phase, all erosion control devices and measures shall be maintained in accordance with the final record plans, local/state approvals and conditions, the EPA Construction General Permit and the Stormwater Pollution Prevention Plan (SWPPP) if applicable. Additionally, the maintenance of all erosion / siltation control measures during construction shall be the responsibility of the general contractor. Upon proper notice to the property owner, the Town/City or its authorized designee shall be allowed to enter the property at a reasonable time and in a reasonable manner for the purposes of inspection.

Post Development Controls

Once construction is completed, the post development stormwater controls are to be operated and maintained in compliance with the following permanent procedures (note that the continued implementation of these procedures shall be the responsibility of the Owner or its assignee):

1. Parking lots and on-site driveways: Sweep at least four (4) times per year and on a more frequent basis depending on sanding operations. All resulting sweepings shall be collected and properly disposed of off site in accordance with CTDEEP and other applicable requirements.

   Approximate Maintenance Budget: $1,000/year

2. Catch basins, yard drains, trench drains, manholes and piping: Inspect four (4) times per year and at the end of foliage and snow-removal seasons. These features shall be cleaned four (4) times per year or whenever the depth of deposits is greater than or equal to one half the depth from the bottom of the invert of the lowest pipe in the catch basin or underground system. Accumulated sediment and hydrocarbons present must be removed and properly disposed of off site in accordance with CTDEEP and other applicable requirements.

   Approximate Maintenance Budget: $500/year per structure.

3. Infiltration Basin: Preventative maintenance after every major storm event during the first three (3) months of operation and at least twice per year thereafter. Inspect structure and pretreatment BMP to ensure proper operation after every major storm event

STORMWATER MANAGEMENT SYSTEM

POST-CONSTRUCTION INSPECTION REPORT

LOCATION:

118 Hazard Avenue
Enfield, CT

RESPONSIBLE PARTY:

TBD

NAME OF INSPECTOR:	INSPECTION DATE:
Note Condition of the Following (sediment depth, debris, standing water, damage, etc.):	
Catch Basins:	
Discharge Points/ Flared End Sections / Rip Rap:	
Infiltration Basin:	
Water Quality Units:	
Other:	
Note Recommended Actions to be taken on the Following (sediment and/or debris removal, repairs, etc.):	

Catch Basins:
Discharge Points / Flared End Sections / Rip Rap:
Infiltration Basin:
Water Quality Units:
Other:
Other:
Comments:

STORMWATER INSPECTION AND MAINTENANCE LOG FORM			
All American Assisted Living ***118 Hazard Avenue, Enfield CT***			
Stormwater Management Practice	Responsible Party	Date	Maintenance Activity Performed

LONG-TERM POLLUTION PREVENTION PLAN

"All American Assisted Living" Facility
118 Hazard Avenue
Enfield, CT

RESPONSIBLE PARTY DURING CONSTRUCTION:

TBD

RESPONSIBLE PARTY POST CONSTRUCTION:

TBD

For this site, the Long-Term Pollution Prevention Plan will consist of the following:

- No outdoor maintenance or washing of vehicles allowed.
- The property owner shall be responsible for "good housekeeping" including proper periodic maintenance of building and pavement areas, curbing, landscaping, etc.
- Proper storage and removal of solid waste (dumpsters).
- Sweeping of driveways a minimum of twice per year with a commercial cleaning unit. Any sediment removed shall be disposed of in accordance with applicable local and state requirements.
- Regular inspections and maintenance of Stormwater Management System as noted in the "O&M Plan".
- Snow removal shall be the responsibility of the property owner. Snow shall not be plowed, dumped and/or placed in forebays, infiltration basins or similar stormwater controls. Salting and/or sanding of pavement / walkway areas during winter conditions shall only be done in accordance with all state/local requirements and approvals.

OPERATON AND MAINTENANCE TRAINING PROGRAM

The Owner will coordinate an annual in-house training session to discuss the Operations and Maintenance Plan, the Long-Term Pollution Prevention Plan, and the Spill Prevention Plan and response procedures. Annual training will include the following:

Discuss the Operations and Maintenance Plan

- Explain the general operations of the stormwater management system and its BMPs
- Identify potential sources of stormwater pollution and measures / methods of reducing or eliminating that pollution
- Emphasize good housekeeping measures

Discuss the Spill Prevention and Response Procedures

- Explain the process in the event of a spill
- Identify potential sources of spills and procedures for cleanup and /or reporting and notification
- Complete a yearly inventory or Materials Safety Data sheets of all tenants and confirm that no potentially harmful chemicals are in use.
- Trash and other debris shall be removed from all areas of the site at least twice yearly.

ILLICIT DISCHARGE STATEMENT

Certain types of non-stormwater discharges are allowed under the U.S. Environmental Protection Agency Construction General Permit. These types of discharges will be allowed under the conditions that no pollutants will be allowed to come in contact with the water prior to or after its discharge. The control measures which have been outlined previously in this LTPPP will be strictly followed to ensure that no contamination of these non-storm water discharges takes place. Any existing illicit discharges, if discovered during the course of the work, will be reported to CTDEEP and the local DPW, as applicable, to be addressed in accordance with their respective policies. No illicit discharges will be allowed in conjunction with the proposed improvements.

Duly Acknowledged:

_____

Name & Title

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Save Valuable Land and Protect Water Resources

Isolator® Row O&M Manual

StormTech® Chamber System for Stormwater Management

1.0 The Isolator® Row

1.1 INTRODUCTION

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row is a patented technique to inexpensively enhance Total Suspended Solids (TSS) removal and provide easy access for inspection and maintenance.

Looking down the Isolator Row from the manhole opening, woven geotextile is shown between the chamber and stone base.

1.2 THE ISOLATOR ROW

The Isolator Row is a row of StormTech chambers, either SC-310, SC-310-3, SC-740, DC-780, MC-3500 or MC-4500 models, that is surrounded with filter fabric and connected to a closely located manhole for easy access. The fabric-wrapped chambers provide for settling and filtration of sediment as storm water rises in the Isolator Row and ultimately passes through the filter fabric. The open bottom chambers and perforated sidewalls (SC-310, SC-310-3 and SC-740 models) allow storm water to flow both vertically and horizontally out of the chambers. Sediments are captured in the Isolator Row protecting the storage areas of the adjacent stone and chambers from sediment accumulation.

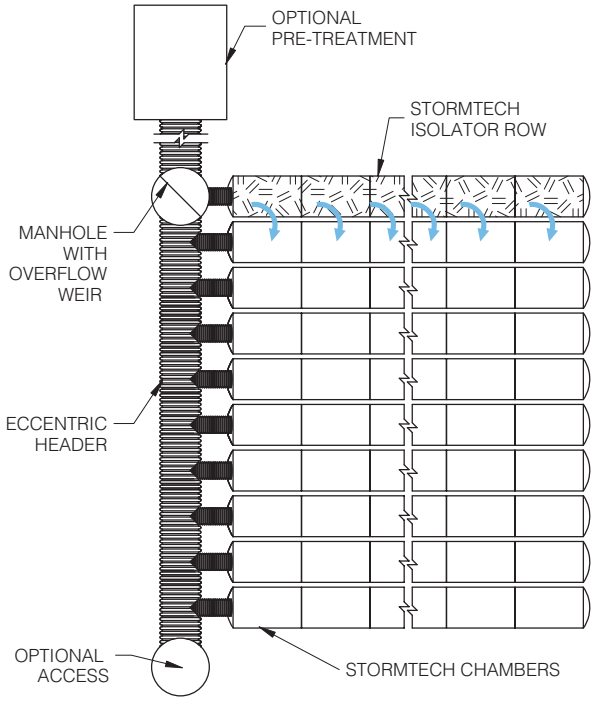
Two different fabrics are used for the Isolator Row. A woven geotextile fabric is placed between the stone and the Isolator Row chambers. The tough geotextile provides a media for storm water filtration and provides a durable surface for maintenance operations. It is also designed to prevent scour of the underlying stone and remain intact during high pressure jetting. A non-woven fabric is placed over the chambers to provide a filter media for flows passing through the perforations in the sidewall of the chamber. The non-woven fabric is not required over the DC-780, MC-3500 or MC-4500 models as these chambers do not have perforated side walls.

The Isolator Row is typically designed to capture the "first flush" and offers the versatility to be sized on a volume basis or flow rate basis. An upstream manhole not only provides access to the Isolator Row but typically includes a high flow weir such that storm water flowrates or volumes that exceed the capacity of the Isolator Row overtop the over flow weir and discharge through a manifold to the other chambers.

The Isolator Row may also be part of a treatment train. By treating storm water prior to entry into the chamber system, the service life can be extended and pollutants such as hydrocarbons can be captured. Pre-treatment best management practices can be as simple as deep sump catch basins, oil-water separators or can be innovative storm water treatment devices. The design of the treatment train and selection of pretreatment devices by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, the Isolator Row is recommended by StormTech as an effective means to minimize maintenance requirements and maintenance costs.

Note: See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row.

StormTech Isolator Row with Overflow Spillway
(not to scale)



2.0 Isolator Row Inspection/Maintenance

StormTech

2.1 INSPECTION

The frequency of Inspection and Maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

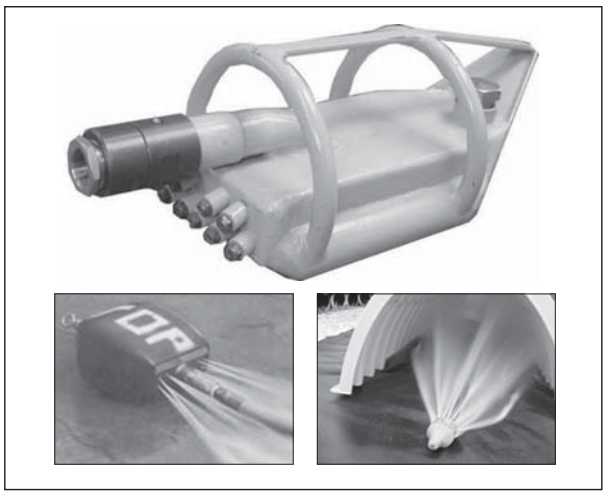
At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

The Isolator Row incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3 inches throughout the length of the Isolator Row, clean-out should be performed.

2.2 MAINTENANCE

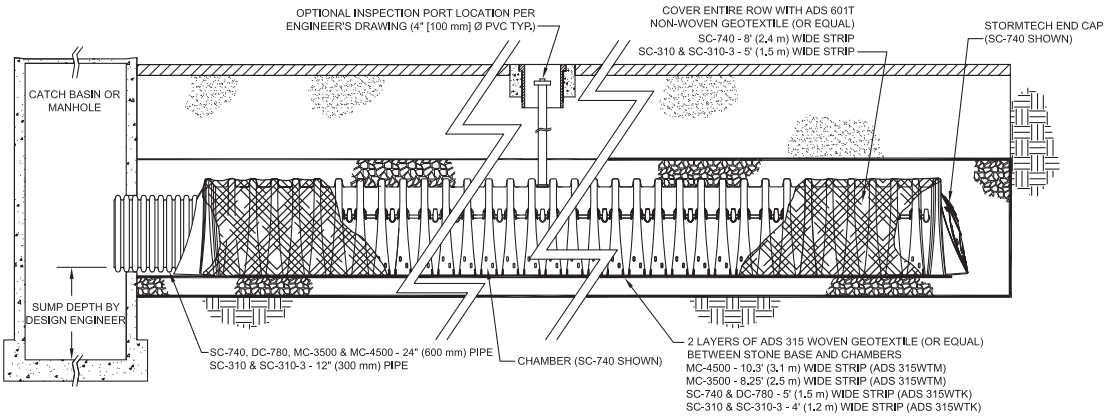
The Isolator Row was designed to reduce the cost of periodic maintenance. By "isolating" sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entries.



Examples of culvert cleaning nozzles appropriate for Isolator Row maintenance. (These are not StormTech products.)

Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45" are best. Most JetVac reels have 400 feet of hose allowing maintenance of an Isolator Row up to 50 chambers long. **The JetVac process shall only be performed on StormTech Isolator Rows that have AASHTO class 1 woven geotextile (as specified by StormTech) over their angular base stone.**

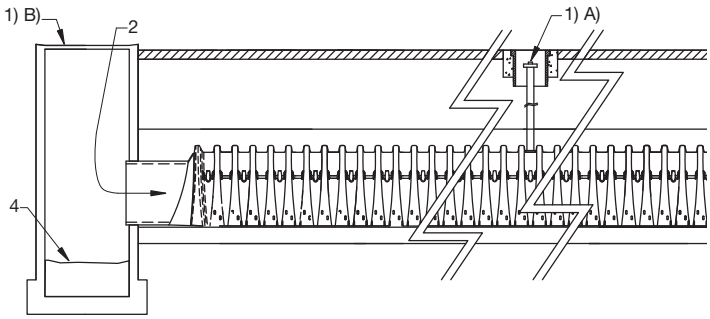
StormTech Isolator Row (not to scale)



NOTE: NON-WOVEN FABRIC IS ONLY REQUIRED OVER THE INLET PIPE CONNECTION INTO THE END CAP FOR DC-780, MC-3500 AND MC-4500 CHAMBER MODELS AND IS NOT REQUIRED OVER THE ENTIRE ISOLATOR ROW.

3.0 Isolator Row Step By Step Maintenance Procedures

StormTech Isolator Row (not to scale)



Step 1) Inspect Isolator Row for sediment

A) Inspection ports (if present)

i. Remove lid from floor box frame

ii. Remove cap from inspection riser

iii. Using a flashlight and stadia rod, measure depth of sediment and record results on maintenance log.

iv. If sediment is at, or above, 3 inch depth proceed to Step 2. If not proceed to step 3.

B) All Isolator Rows

i. Remove cover from manhole at upstream end of Isolator Row

ii. Using a flashlight, inspect down Isolator Row through outlet pipe

1. Mirrors on poles or cameras may be used to avoid a confined space entry
2. Follow OSHA regulations for confined space entry if entering manhole

iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches) proceed to Step 2. If not proceed to Step 3.

Step 2) Clean out Isolator Row using the JetVac process

A) A fixed culvert cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable

B) Apply multiple passes of JetVac until backflush water is clean

C) Vacuum manhole sump as required

Step 3) Replace all caps, lids and covers, record observations and actions

Step 4) Inspect & clean catch basins and manholes upstream of the StormTech system

Sample Maintenance Log

Date	Stadia Rod Readings		Sediment Depth (1) - (2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to top of sediment (2)			
3/15/01	6.3 ft.	none		New installation. Fixed point is CI frame at grade	djm
9/24/01		6.2	0.1 ft.	Some grit felt	sm
6/20/03		5.8	0.5 ft.	Mucky feel, debris visible in manhole and in Isolator row, maintenance due	rv
7/7/03	6.3 ft.		0	System jetted and vacuumed	djm

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(generally equal or greater to 3.0 inches in 24 hours) for the first three months. Mow the buffer area, side slopes and basin bottom if grassed floor, rake if stone or sand bottom, remove trash and debris, remove grass clippings and accumulated organic matter. Any sediment removed shall be disposed of in accordance with CTDEEP and other applicable requirements.

Approximate Maintenance Budget: $2,000/year per basin

4. Underground Infiltration Basins: Preventative maintenance after every major storm event during the first three (3) months of operation and at least twice per year thereafter. Inspect structure and pretreatment BMP to ensure proper operation after every major storm event (generally equal or greater to 3.0 inches in 24 hours) for the first three months. The outlet of the basin, if any, shall be inspected for erosion and sedimentation, and rip-rap shall be promptly repaired in the case of erosion. Sediment collecting in the bottom of the basin shall be inspected twice annually, and removal shall commence any time the sediment reaches a depth of six inches anywhere in the basin. Any sediment removed shall be disposed of in accordance with CTDEEP and other applicable requirements.

   Approximate Maintenance Budget: Cleaning - $1,000/year, Inspection - $200/year

5. Oil/Grit Separators: Cleaning includes removal of accumulated oil and grease and sediment using a vacuum truck or other ordinary catch basin cleaning device. In areas of high sediment loading, inspect and clean inlets after every major storm. At a minimum, inspect oil grit separators monthly, and clean them out at least twice per year. Polluted water or sediments removed from an oil grit separator should be disposed of in accordance with all applicable local, state, and federal laws and regulations.

   Approximate Maintenance Budget: Inspection/cleaning- $1,000/year per separator per year for inspections and semi-annual cleanings.

All components of the stormwater system will be accessible by the owner or their assignee.

DRAINAGE REPORT

For

KAPLAN
DEVELOPMENT GROUP. LLC

PROPOSED

"All American Assisted Living" Facility

118 Hazard Avenue
Enfield, Connecticut
Hartford County

Prepared by:

BOHLER ENGINEERING
16 Old Forge Road
Rocky Hill, CT 06067
(860) 333-8900 TEL.

Jeff G. Bord
Connecticut P.E. Lic. #30414

BOHLER

March 10th, 2020
#CT191016

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I. EXECUTIVE SUMMARY

This report examines the changes in drainage that can be expected as the result of the development of a proposed assisted living facility located on the southerly side of Hazard Avenue in the Town of Enfield, Connecticut. The site, which contains approximately ±19.43 acres of land, contains existing wetlands and wooded areas. The proposed project will disturb approximately ±3.60 acres.

The proposed project includes the construction of a new two-story 29,000 SF footprint freestanding "All American Assisted Living" facility along with new paved parking areas, landscaping, storm water management components and associated utilities. This report addresses a comparative analysis of the pre- and post-development site runoff conditions. Additionally, this report provides calculations documenting the design of the proposed stormwater conveyance/management system as illustrated within the accompanying Site Development Plans prepared by Bohler Engineering. The best management practices (BMPs) incorporated into the proposed stormwater management system have been designed to meet the requirements as set forth in the 2004 Connecticut Stormwater Quality Manual. This correlates to a total required water quality storage volume of 7,058 cubic feet, where we will be providing 11,183 cubic feet of water quality storage volume. The project will also provide erosion and sedimentation controls during the demolition and construction periods, as well as long term stabilization of the site.

On-Site Soil Information

The majority of the soils at the site are mapped as Walpole sandy loam which is classified by the Natural Resource Conservation Service (NRCS) as Hydrologic Soil Group (HSG) "B/D". There is also a portion in the middle of the site that is mapped as Windsor loamy sand which is classified by the NRCS as HSG "A". The remaining soils at the site are Udorthents-Urban land complex and Ninigret fine sandy loam, which are classified by the NRCS as HSG "B" and "C" respectively. Refer to **Appendix B** for additional information.

Design Point Descriptions

For the purposes of this analysis the pre- and post-development drainage conditions were analyzed at three (3) "design points" where stormwater runoff currently drains to under existing conditions. Refer to **Appendix C** for Existing Drainage Map

Design Point #1 (DP-1) is the 24" RCP within the Hazard Avenue right-of-way. Under existing conditions, this design point receives storm water flows from approximately 0.50 acres of land designated as watershed "ED-1". This watershed is entirely made up of wooded and grass areas. This area has a calculated curve number of 63 and a calculated time of concentration of 12.0 minutes.

Design Point #2 (DP-2) is the area of wetlands on the western portion of the site. Under existing conditions, this design point receives storm water flows from 1.68 acres of land designated as watersheds "ED-2a" and "ED-2b". These watersheds are entirely made up of wooded and grass areas as well as portions of the existing wetlands. Watershed "ED-2a" and "ED-2b" have a calculated curve number of 62 and 65, respectively as well as calculated time of concentrations of 11.5 minutes and 11.4 minutes, respectively.

Design Point #3 (DP-3) is the area of wetlands off-site to the east. Under existing conditions, this design point receives storm water flows from 1.42 acres of land designated as watershed "ED-3". This watershed is entirely made up of wooded and grass areas. This area has a calculated curve number of 55 and a calculated time of concentration of 14.5 minutes.

A summary of the existing and proposed conditions peak runoff rates and volumes for the 1-, 2-, 10-, 25-, and 100-year storms can be found in **Table 1.1** below. In addition, the project has been designed to meet or exceed the 2004 Connecticut Stormwater Quality Manual as detailed herein.

Table 1.1: Design Point Peak Runoff Rate Summary

Point of Analysis	1-Year Storm			2-Year Storm			10-Year Storm			25-Year Storm			100-Year Storm		
	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ
DP1	0.03	0.00	**-0.03**	0.07	0.00	**-0.07**	0.36	0.22	**-0.14**	0.59	0.30	**-0.29**	1.00	1.00	**0**
DP2	0.40	0.34	**-0.06**	0.62	0.42	**-0.20**	2.40	2.39	**-0.01**	3.76	3.54	**-0.22**	6.05	6.00	**-0.05**
DP3	0.03	0.03	**0**	0.18	0.07	**-0.11**	1.34	1.04	**-0.30**	2.41	2.38	**-0.03**	4.29	4.02	**-0.27**

**Flows are represented in cubic feet per second (cfs)*

II. EXISTING SITE CONDITIONS

Existing Site Description and Collection/Conveyance

The site consists of approximately 19.44 acres, of which approximately 3.60 acres are being developed. The site is located along the southerly side of Hazard Avenue in the Town of Enfield, Connecticut. Located in the B-P (Business Professional) Zone and Flood Zone X which correlates to a 0.2% annual chance of flood hazard. The site is entirely made up of existing wooded and wetland areas, with slopes varying from 1%-50% with on-site elevations ranging from 136 at the northwesterly corner of the site to 127 at the southern edge of the site. The surrounding area has an existing shopping center and restaurant along the frontage of Hazard Avenue. Refer to **Appendix A** for additional information.

The northeastern portion of the site drains from southwest to the northern edge of the site where it is collected by a 24" RCP within the Hazard Avenue municipal drainage system. The northwestern portion of the site drains from east to west into the existing areas of wetlands. The southwestern portion of the site also drains from east to west into the existing areas of wetlands. The remaining easterly portion of the site drains from west to east off-site into the adjacent property where there is also an area of existing wetlands.

Existing Watersheds and Design Point Information

The site was subdivided into four (4) separate sub catchments for the existing conditions as described below to analyze existing and proposed flow rates at each design point. The minimum time of concentration for all proposed areas is calculated as 6 minutes (0.1 hr).

Subcatchment ED-1 in total is 0.33 acres with existing wooded and grass areas. This area flows overland from southwest to north across the site where it is collected by an existing 24" RCP in the Hazard Avenue right-of-way. The stormwater runoff from this Subcatchment is not treated or attenuated. This subcatchment has a calculated curve number of 60 and a calculated time of concentration of 12.0 minutes

Subcatchment ED-2a in total is 0.79 acres with existing wooded, grass, and wetland areas. This area flows overland from east to west across the site where it drains into the existing wetland area at the western portion of the site. The stormwater runoff from this subcatchment is not treated or

attenuated. This subcatchment has a calculated curve number of 62 and a calculated time of concentration of 11.6 minutes.

Subcatchment ED-2b in total is 0.89 acres with existing wooded, grass, and wetland areas. This area flows from east to west across the site where it drains into the existing wetland area at the western portion of the site. The stormwater runoff from this subcatchment is not treated or attenuated. This subcatchment has a calculated curve number of 65 and a calculated time of concentration of 11.4 minutes.

Subcatchment ED-3 in total is 1.59 acres with existing wooded and grass areas. This area flows from west to east across the site where it drains off-site into the existing wetland area off the subject property. The stormwater runoff from this subcatchment is not treated or attenuated. This subcatchment has a calculated curve number of 56 and a calculated time of concentration of 14.5 minutes.

Refer to **Table 2.1,** for the calculated existing conditions peak rates of runoff and volumes. For additional hydrologic information, refer to **Appendix D** and the Drainage Area Maps in the appendices of this report for a graphical representation of the existing drainage areas.

Table 2.1: Existing Conditions Peak Runoff Rates*

Point of Analysis	1-Year Storm	2-Year Storm	10-Year Storm	25-Year Storm	100-Year Storm
DP1	0.03	0.07	0.36	0.59	1.00
DP2	0.40	0.62	2.40	3.76	6.05
DP3	0.03	0.07	1.04	2.38	4.02

**Flows are represented in cubic feet per second (cfs)*

III. PROPOSED SITE CONDITIONS

Proposed Development Description

The proposed project includes the construction of a new two-story 29,000 SF footprint freestanding "All American Assisted Living" facility along with new paved parking areas, landscaping, storm water management components and associated utilities. The site, including the proposed parking areas, has been designed to drain to deep-sump hooded catch basins. The catch basins will capture and convey stormwater runoff, via an underground pipe system, to one of four (4) subsurface infiltration basins with isolator rows to handle and treat the first inch of runoff pursuant to the 2004 Stormwater Quality Manual. Additionally, three (3) above ground infiltration basins have been proposed to provide treatment for part of the rooftop runoff and remaining impervious runoff.

The project has been designed to maintain existing drainage patterns to the maximum extent practical, utilizing the same design points described in **Section I** above.

Proposed Development Collection and Conveyance

Deep sump hooded catch basins are proposed to collect and route runoff from the paved parking areas to the proposed subsurface basins. Pipes have been designed for the 10-year storm using the Rational Method. Outlet protection sizing calculations are included in **Appendix E**.

The best management practices (BMPs) incorporated into the proposed stormwater management system have been designed to meet or exceed the requirements as set forth in the 2004 Connecticut Stormwater Quality manual. Refer to **Appendix E** for calculations. In addition, a Stormwater Operation and Maintenance (O&M) Plan, attached in **Appendix F**, has been developed which includes scheduled maintenance and periodic inspections of stormwater management structures.

Proposed Watersheds and Design Point Information

The project has been designed to maintain existing drainage watersheds to the greatest extent possible, with the same design points described in **Section II** above. The site was subdivided into ten (10) separate sub catchments for the proposed conditions as described below. The minimum time of concentration for all proposed areas is calculated as 6 minutes (0.1 hr).

Subcatchment PD-1 consists of 0.67 acres of pavement, landscaping and roofing. This area drains to proposed catch basins and is routed to an above ground infiltration basin for water quality treatment. The roof runoff from this area is routed through a SC-740 StormTech. This SC-740 StormTech contains isolator rows for the purpose of water quality treatment prior to discharging into an above ground infiltration basin. From which, it will flow into a 24" RCP headwall, as it does in existing conditions. A 6-minute time of concentration was assumed based on surface cover types and slopes.

Subcatchment PD-2a consists of 0.60 acres of pavement, and landscaping. This area drains to proposed catch basins and is routed through a SC-740 StormTech infiltration basin. This SC-740 infiltration basin contains isolator rows for the purpose of water quality treatment prior to discharging. A 6-minute time of concentration was assumed based on surface cover types and slopes.

Subcatchment PD-2b consists of 0.22 acres of landscaping and woodlands to remain. This area flows overland from east to west, as it does in existing conditions, to existing areas of wetlands to remain. A 6-minute of time of concentration was assumed based on surface cover types and slopes.

Subcatchment PD-2c consists of 0.36 acres of landscaping and pavement. This area drains to proposed catch basins and is routed through a SC-160LP StormTech infiltration basin prior to discharging. A 6-minute time of concentration was assumed based on surface cover types and slopes.

Subcatchment PD-2d consists of 0.03 acres of landscaping and woodlands to remain. This area flows overland from east to west, as it does in existing conditions, to existing areas of wetlands to remain. A 6-minute time of concentration was assumed based on surface cover types and slopes.

Subcatchment PD-2e consists of 0.36 acres of pavement, and landscaping. This area drains to a proposed catch basin and is routed through a SC-310 StormTech infiltration basin. This SC-310 StormTech contains isolator rows for the purpose of water quality treatment prior to discharging. A 6-minute time of concentration was assumed based on surface cover types and slopes.

Subcatchment PD-2f consists of 0.34 acres of landscaping and woodlands to remain. This area drains from east to west, as it does in existing conditions, to existing areas of wetlands to remain. A 12.8 minute time of concentration was calculated based on surface cover types and slopes.

Subcatchment PD-3a consists of 0.23 acres of entirely area consisting of pavement and landscaping. This area drains to proposed above ground infiltration basins prior to discharging. A 6-minute time of concentration was assumed based on surface cover types and slopes.

Subcatchment PD-3b consists of 0.46 acres of entirely area consisting of pavement, landscaping and roofing. This area drains to a proposed above ground infiltration basin prior to discharging. A 6-minute time of concentration was assumed based on surface cover types and slopes.

Subcatchment PD-3c consists of 0.33 acres of entirely area consisting of landscaping and woodlands to remain. This area drains from west to east, as it does in existing conditions, to existing areas of wetlands to remain. A 12.4-minute time of concentration was calculated based on surface cover types and slopes.

Refer to **Table 3.1** for the calculated proposed conditions peak rates of runoff. For additional hydrologic information, refer to **Appendix D** and the Drainage Area Maps in the appendices of this report for a graphical representation of the proposed drainage areas.

Table 3.1: Proposed Conditions Peak Runoff Rates*

Point of Analysis	1-Year Storm	2-Year Storm	10-Year Storm	25-Year Storm	100-Year Storm
DP1	0	0	0.22	0.30	1.00
DP2	0.34	0.42	2.39	3.54	6.00
DP3	0.03	0.07	0.74	2.22	4.13

**Flows are represented in cubic feet per second (cfs)*

IV. METHODOLOGY

Peak Flow Calculations

Methodology utilized to design the proposed stormwater management system includes compliance with the guidelines set forth in the 2004 Connecticut Stormwater Quality Manual. The pre- and post-development runoff rates being discharged from the site were computed using the HydroCAD

computer program. The drainage area and outlet information were entered into the program, which routes storm flows based on NRCS TR-20 and TR-55 methods. The other components of the model were determined following standard NRCS procedures for Curve Numbers (CNs) and times of concentrations documented in the appendices of this report. The rainfall data utilized and listed below in **Table 4.1** below for stormwater calculations was obtained from NOAA. Refer to **Appendix E** for more information.

Table 4.1: NOAA Rainfall Intensities

Frequency	1 year	2 year	10 year	25 year	100 year
Rainfall* (inches)	2.55	3.18	5.07	6.26	8.08

*Values derived from NOAA ATLAS on 10/24/2019

The proposed stormwater management as designed will provide a decrease in peak rates of runoff from the proposed facility for the 1-, 2-, 10-, 25- and 100-year design storm events. Additionally, the proposed project meets, or exceeds, the CTDEEP standards. Compliance with these standards is described further below.

V. SUMMARY

In summary, the proposed stormwater management system illustrated on the drawings prepared by Bohler Engineering results in a reduction in peak rates of runoff from the subject site when compared to pre-development conditions for the1-, 2-, 10-, 25- and 100-year storm frequencies. In addition, the proposed best management practices will result in an effective removal of total suspended solids from the post-development runoff. The pre-development versus post-development stormwater discharge comparisons are contained in **Table 5.1**:

Table 5.1: Design Point Peak Runoff Rate Summary

Point of Analysis	1-Year Storm			2-Year Storm			10-Year Storm			25-Year Storm			100-Year Storm		
	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ
DP1	0.03	0.00	**-0.03**	0.07	0.00	**-0.07**	0.36	0.22	**-0.14**	0.59	0.30	**-0.29**	1.00	1.00	**0**
DP2	0.40	0.34	**-0.06**	0.62	0.42	**-0.20**	2.40	2.39	**-0.01**	3.76	3.54	**-0.22**	6.05	6.00	**-0.05**
DP3	0.03	0.03	**0**	0.18	0.07	**-0.11**	1.34	1.04	**-0.30**	2.41	2.38	**-0.03**	4.29	4.02	**-0.27**

**Flows are represented in cubic feet per second (cfs)*

As outlined in the table above, the proposed stormwater management system as designed will provide a decrease in peak rates of runoff from the proposed facility for the 1-, 2-, 10-, 25- and 100-year storm events. Additionally, the project meets, or exceeds the CTDEEP Stormwater Management Standards as described further herein.

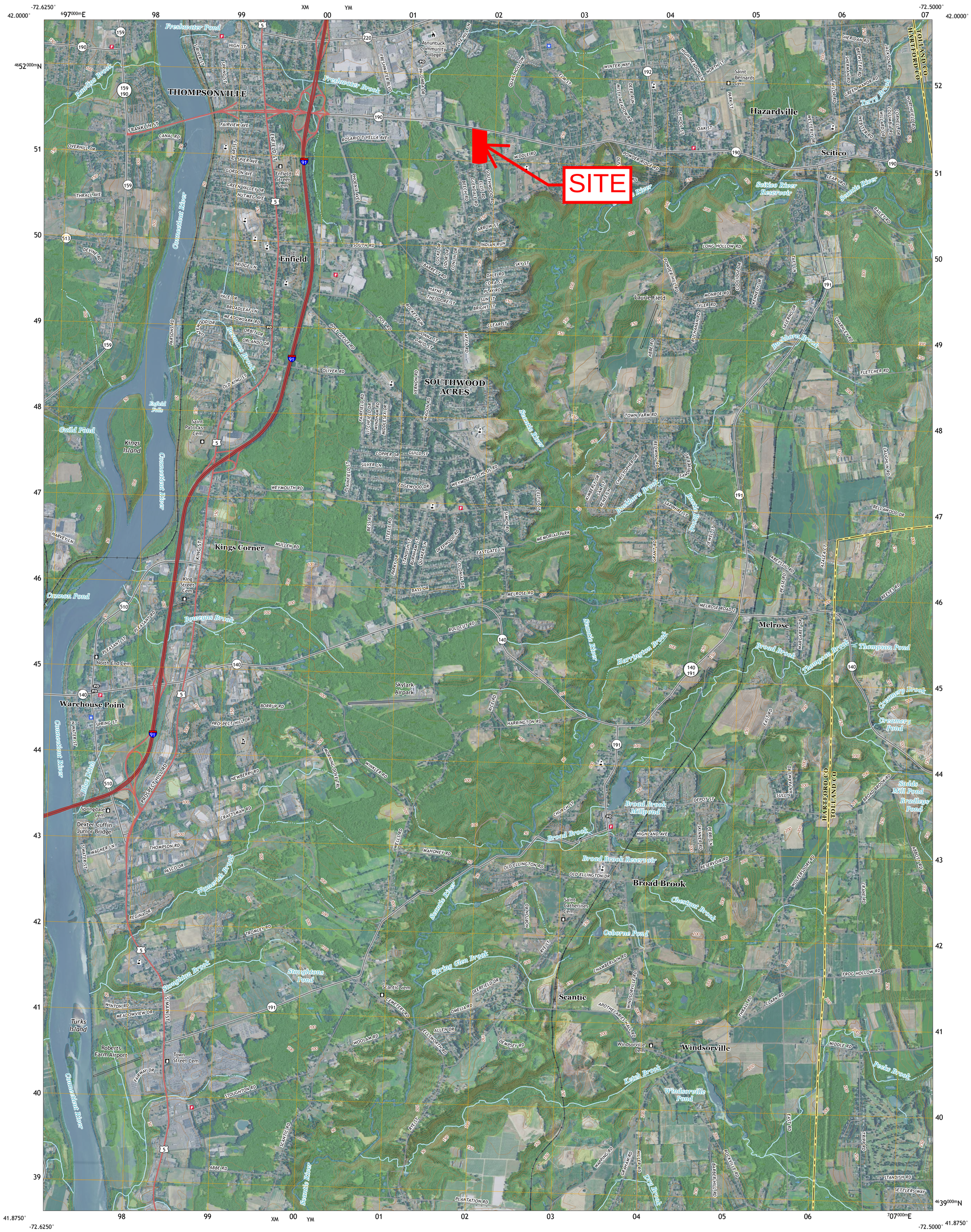
APPENDIX A: PROJECT LOCATION MAPS

- *USGS MAP*
- *FEMA FIRMETTE*

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map
US Topo

BROAD BROOK QUADRANGLE
CONNECTICUT
7.5-MINUTE SERIES



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 18T

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery....NAIP, July 2016 - September 2016
Roads.... U.S. Census Bureau, 2016
Names....GNIS, 1979 - 2017
Hydrography....National Hydrography Dataset, 2004
Contours....National Elevation Dataset, 2012
Boundaries....Multiple sources; see metadata file 2016 - 2017

Wetlands....FWS National Wetlands Inventory 2010

MN
GN
13°55′
247 MILS
1°38′
29 MILS
UTM GRID AND 2017 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000 - m Square ID
'00
XM
YM
Grid Zone Designation
18T

SCALE 1:24 000

KILOMETERS 1 0.5 0 1 2
METERS 1000 500 0 1000 2000
MILES 1 0.5 0 1
FEET 1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the
National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.18

CONNECTICUT
QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

ADJOINING QUADRANGLES
1 West Springfield
2 Springfield South
3 Hampden
4 Windsor Locks
5 Ellington
6 Hartford North
7 Manchester
8 Rockville

ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

BROAD BROOK, CT
2018

7643016360098
NSN. 7643016360098
NGA REF NO. USGSX24K5534

National Flood Hazard Layer FIRMette

FEMA

0 250 500 1,000 1,500 2,000 Feet 1:6,000

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

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

N

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

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/7/2019 at 10:53:09 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

APPENDIX B: SOIL AND WETLAND INFORMATION

- *NCRS CUSTOM SOIL RESOURCE REPORT*

United States Department of Agriculture

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for State of Connecticut

October 24, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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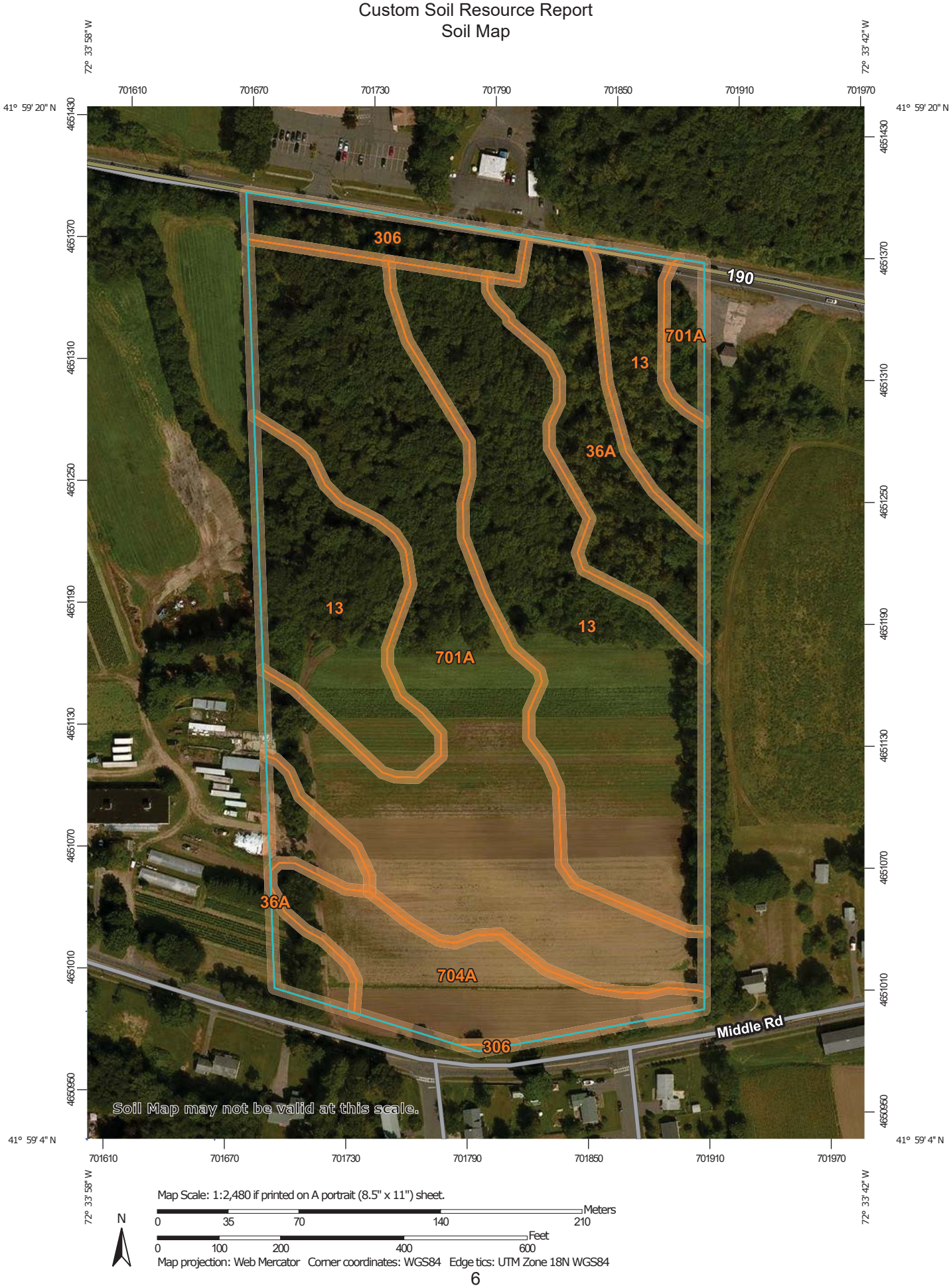
704A—Enfield silt loam, 0 to 3 percent slopes.....15

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

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

Special Point Features

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

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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

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

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

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

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

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

Soil Survey Area: State of Connecticut
Survey Area Data: Version 19, Sep 13, 2019

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

Date(s) aerial images were photographed: Aug 25, 2013—Sep 9, 2013

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
13	Walpole sandy loam, 0 to 3 percent slopes	8.4	39.5%
36A	Windsor loamy sand, 0 to 3 percent slopes	2.6	12.2%
306	Udorthents-Urban land complex	0.8	3.7%
701A	Ninigret fine sandy loam, 0 to 3 percent slopes	7.6	35.8%
704A	Enfield silt loam, 0 to 3 percent slopes	1.9	8.8%
Totals for Area of Interest		**21.3**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

State of Connecticut

13—Walpole sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2svkl
Elevation: 0 to 1,020 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Walpole and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Walpole

Setting

Landform: Outwash plains, depressions, deltas, outwash terraces, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy glaciofluvial deposits derived from igneous, metamorphic and sedimentary rock

Typical profile

Oe - 0 to 1 inches: mucky peat
A - 1 to 7 inches: sandy loam
Bg - 7 to 21 inches: sandy loam
BC - 21 to 25 inches: gravelly sandy loam
C - 25 to 65 inches: very gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 4 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Minor Components

Sudbury

Percent of map unit: 10 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Scarboro

Percent of map unit: 10 percent
Landform: Outwash terraces, outwash plains, deltas
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

36A—Windsor loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2svkg
Elevation: 0 to 990 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Windsor, loamy sand, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor, Loamy Sand

Setting

Landform: Deltas, outwash terraces, dunes, outwash plains
Landform position (three-dimensional): Riser, tread
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

Typical profile

O - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: loamy sand
Bw - 3 to 25 inches: loamy sand

C - 25 to 65 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Deerfield, loamy sand

Percent of map unit: 10 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Hinckley, loamy sand

Percent of map unit: 5 percent
Landform: Kames, outwash plains, deltas, eskers
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

306—Udorthents-Urban land complex

Map Unit Setting

National map unit symbol: 9lmg
Elevation: 0 to 2,000 feet
Mean annual precipitation: 43 to 56 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 120 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 50 percent
Urban land: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Drift

Typical profile

A - 0 to 5 inches: loam
C1 - 5 to 21 inches: gravelly loam
C2 - 21 to 80 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 1.98 in/hr)
Depth to water table: About 54 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Urban Land

Typical profile

H - 0 to 6 inches: material

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: Unranked

Minor Components

Unnamed, undisturbed soils

Percent of map unit: 8 percent
Hydric soil rating: No

Udorthents, wet substratum

Percent of map unit: 5 percent
Down-slope shape: Convex
Across-slope shape: Linear

Hydric soil rating: No

Rock outcrop

Percent of map unit: 2 percent
Hydric soil rating: No

701A—Ninigret fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2y07d
Elevation: 0 to 1,260 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Ninigret and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ninigret

Setting

Landform: Outwash plains, kame terraces, outwash terraces, kames, moraines
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Convex, linear
Across-slope shape: Convex, concave
Parent material: Coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from gneiss, granite, schist, and/or phyllite

Typical profile

Ap - 0 to 8 inches: fine sandy loam
Bw1 - 8 to 16 inches: fine sandy loam
Bw2 - 16 to 26 inches: fine sandy loam
2C - 26 to 65 inches: stratified loamy sand to loamy fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 18 to 38 inches to strongly contrasting textural stratification
Natural drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 17 to 39 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Merrimac

Percent of map unit: 5 percent
Landform: Eskers, outwash terraces, kames, moraines, outwash plains
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Side slope, crest, tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Agawam

Percent of map unit: 5 percent
Landform: Moraines, outwash plains, kame terraces, outwash terraces, kames
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Side slope, crest, tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Tisbury

Percent of map unit: 3 percent
Landform: Outwash terraces, outwash plains, deltas, valley trains
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

Raypol

Percent of map unit: 2 percent
Landform: Drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

704A—Enfield silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2y07p
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Enfield and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Enfield

Setting

Landform: Outwash terraces, outwash plains
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-silty eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite, schist, and/or gneiss

Typical profile

Ap - 0 to 7 inches: silt loam
Bw1 - 7 to 15 inches: silt loam
Bw2 - 15 to 25 inches: silt loam
2C - 25 to 60 inches: stratified very gravelly coarse sand to loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 16 to 39 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Haven

Percent of map unit: 5 percent
Landform: Outwash terraces, outwash plains
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Tisbury

Percent of map unit: 5 percent
Landform: Outwash terraces, outwash plains, deltas, valley trains
Landform position (three-dimensional): Tread
Down-slope shape: Concave

Across-slope shape: Concave
Hydric soil rating: No

Agawam

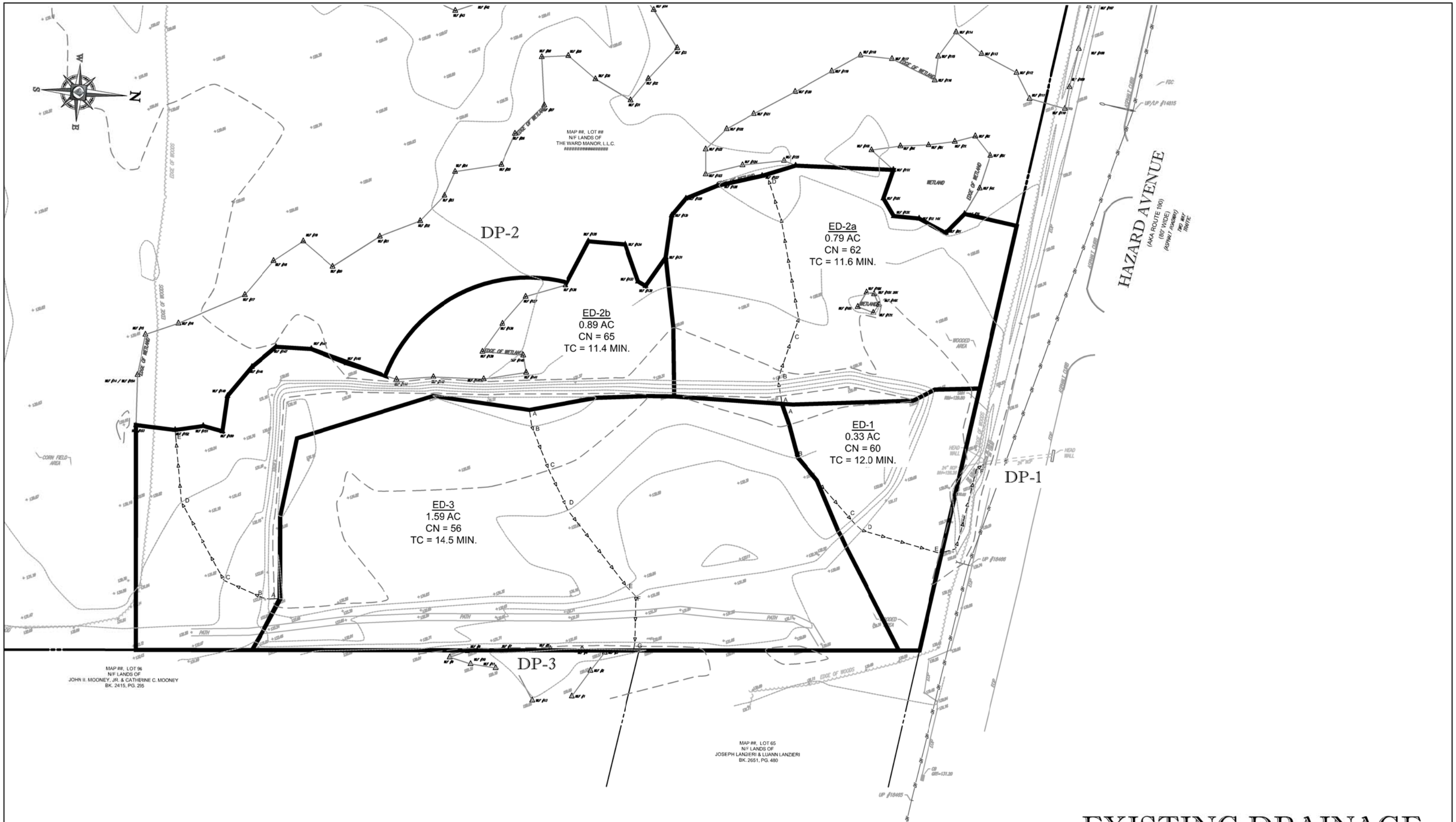
Percent of map unit: 3 percent
Landform: Kame terraces, outwash terraces, kames, moraines, outwash plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Side slope, crest, tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Raypol

Percent of map unit: 2 percent
Landform: Drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

APPENDIX C: EXISTING CONDITIONS HYDROLOGIC ANALYSIS

- *EXISTING CONDITIONS DRAINAGE MAP*
- *EXISTING CONDITIONS HYDROCAD COMPUTATIONS*

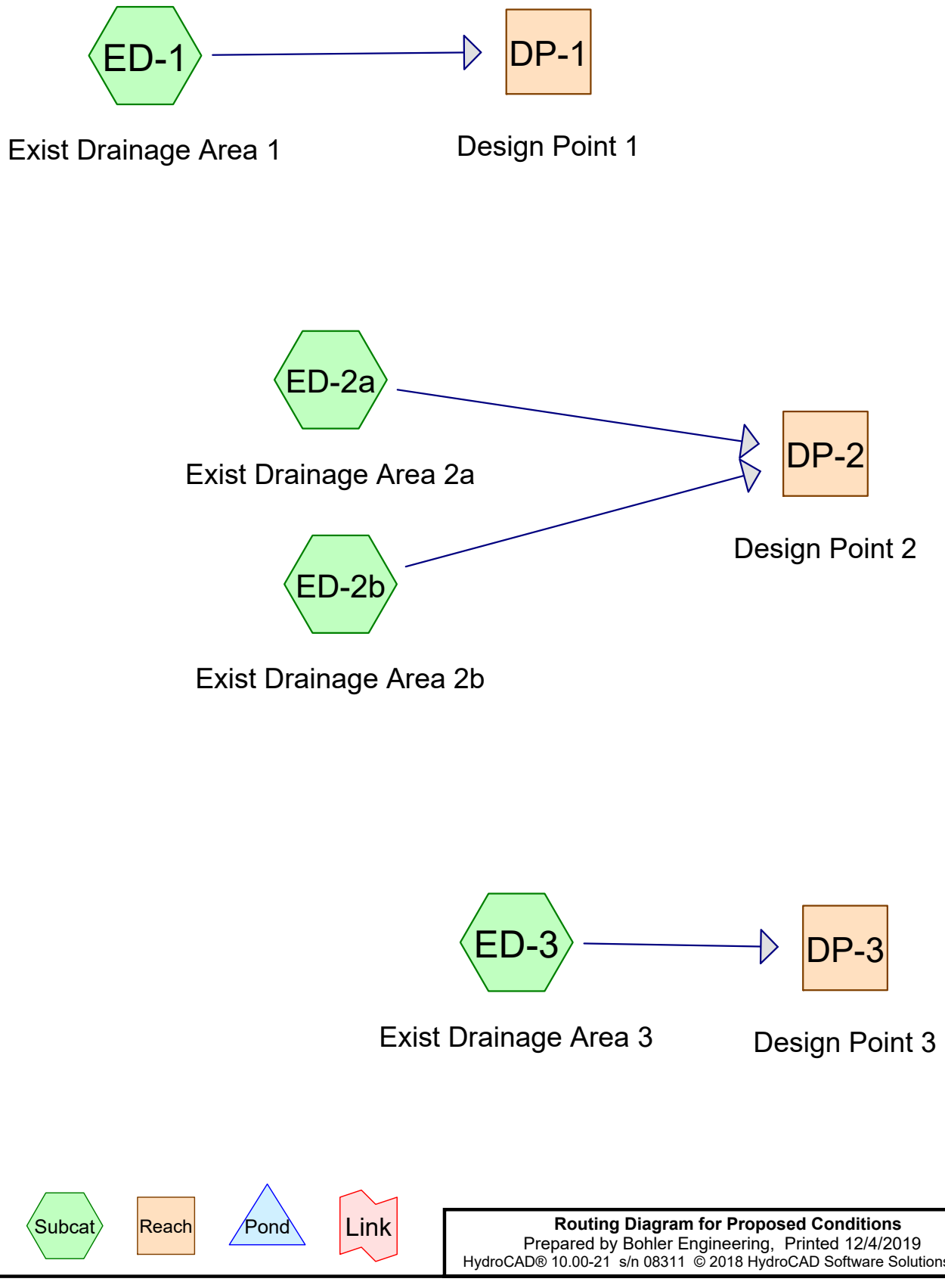


EXISTING DRAINAGE TRIBUTARY MAP

PREPARED BY

BOHLER

NOT TO SCALE



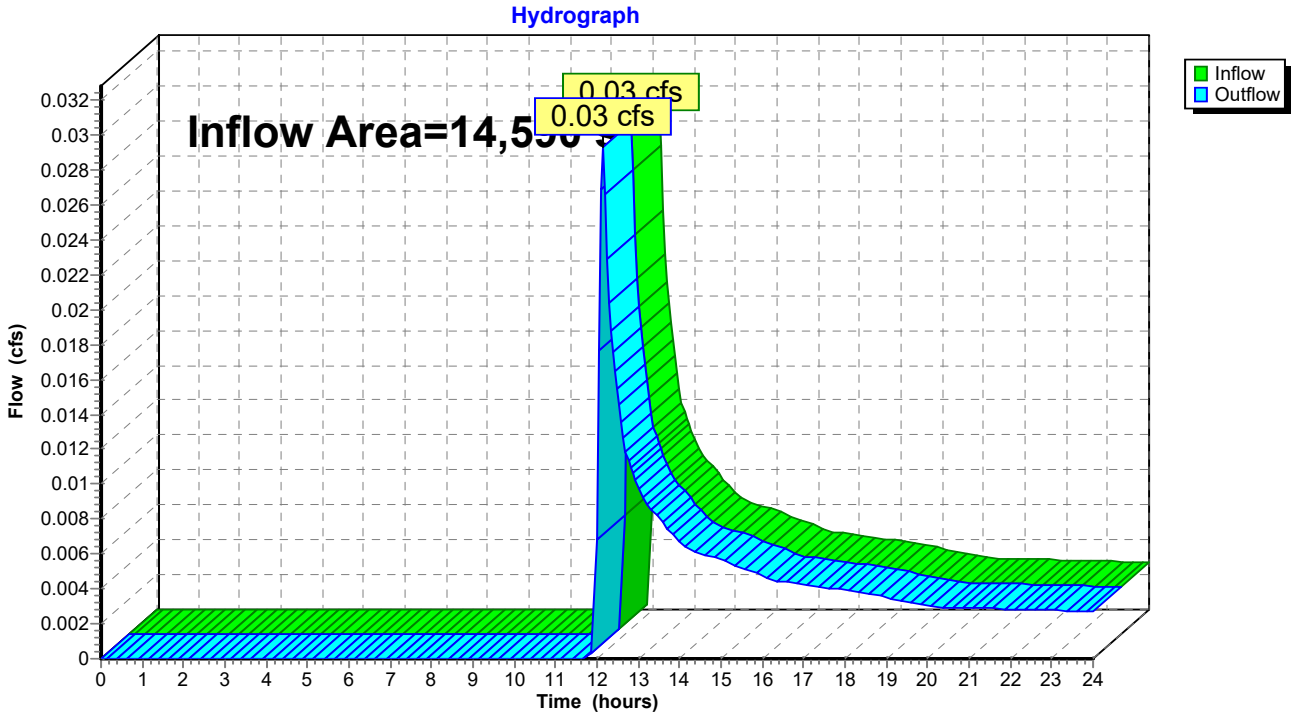
Routing Diagram for Proposed Conditions
Prepared by Bohler Engineering, Printed 12/4/2019
HydroCAD® 10.00-21 s/n 08311 © 2018 HydroCAD Software Solutions LLC

Summary for Reach DP-1: Design Point 1

Inflow Area = 14,590 sf, 0.00% Impervious, Inflow Depth > 0.19" for 1-YR event
Inflow = 0.03 cfs @ 12.15 hrs, Volume= 226 cf
Outflow = 0.03 cfs @ 12.15 hrs, Volume= 226 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: Design Point 1

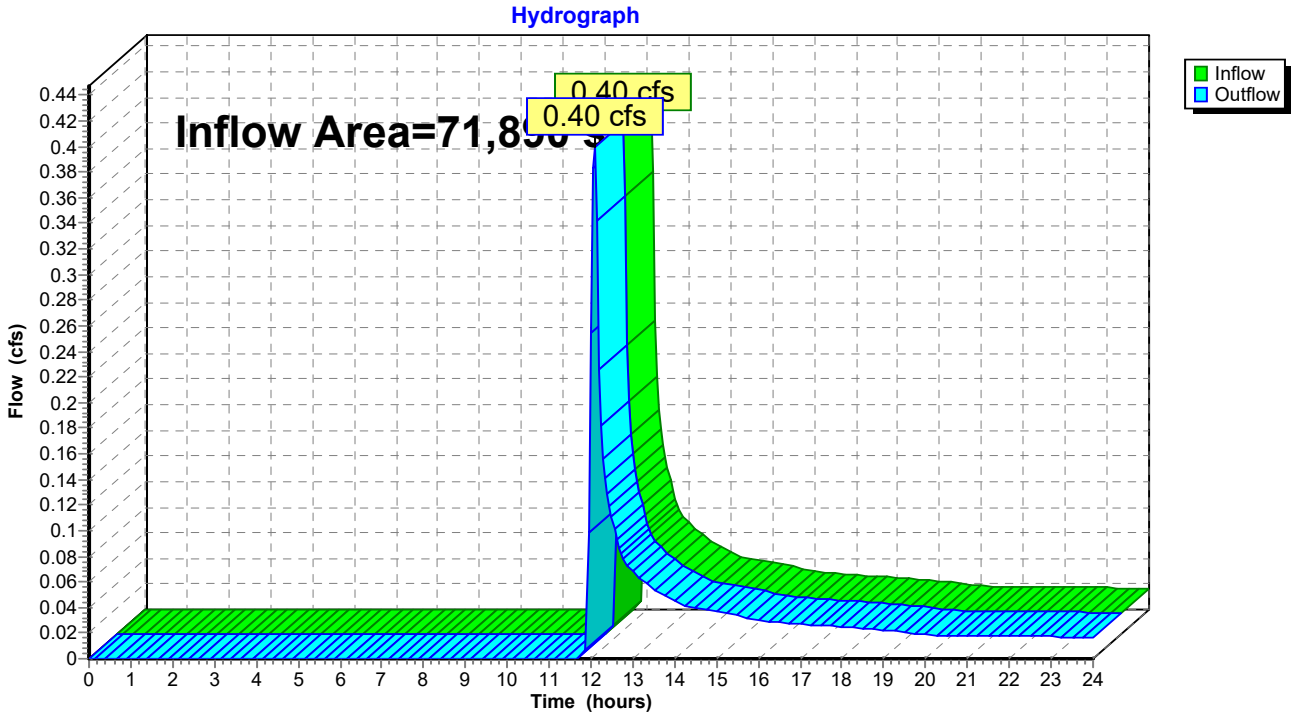


Summary for Reach DP-2: Design Point 2

Inflow Area = 71,890 sf, 0.00% Impervious, Inflow Depth > 0.28" for 1-YR event
Inflow = 0.40 cfs @ 12.07 hrs, Volume= 1,662 cf
Outflow = 0.40 cfs @ 12.07 hrs, Volume= 1,662 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-2: Design Point 2

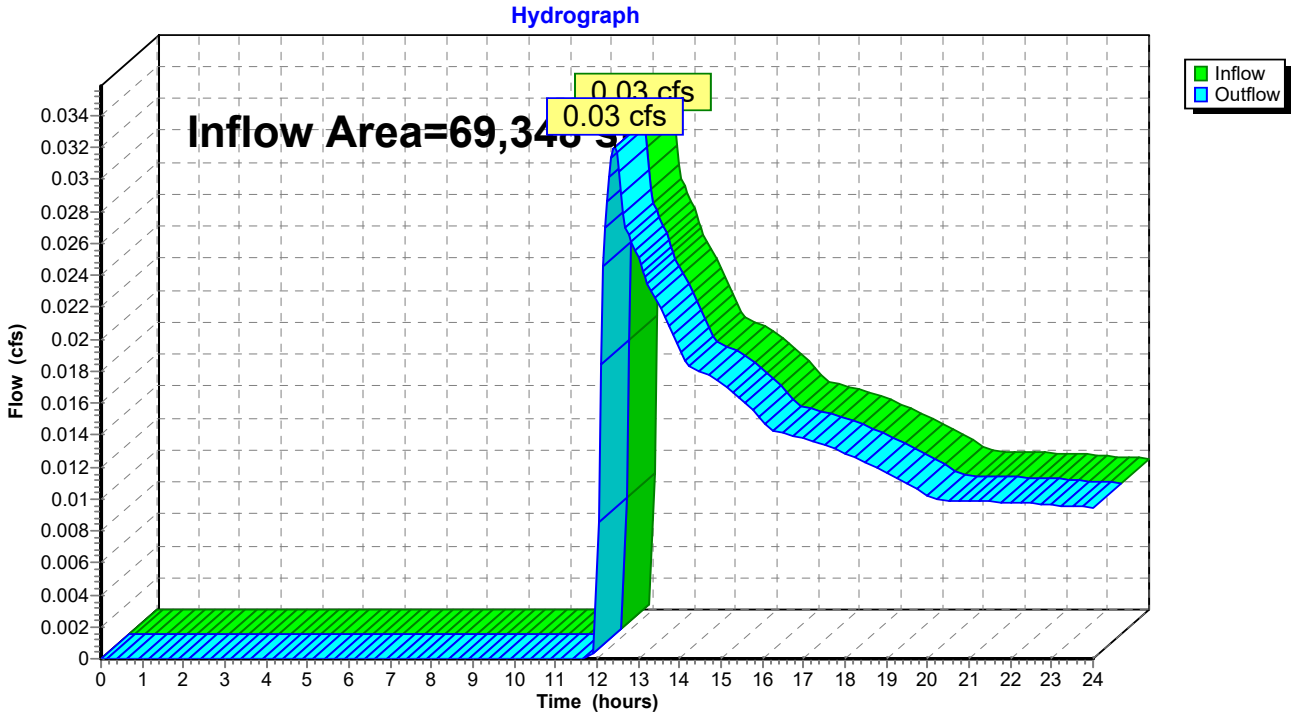


Summary for Reach DP-3: Design Point 3

Inflow Area = 69,348 sf, 0.00% Impervious, Inflow Depth > 0.11" for 1-YR event
Inflow = 0.03 cfs @ 12.43 hrs, Volume= 621 cf
Outflow = 0.03 cfs @ 12.43 hrs, Volume= 621 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-3: Design Point 3

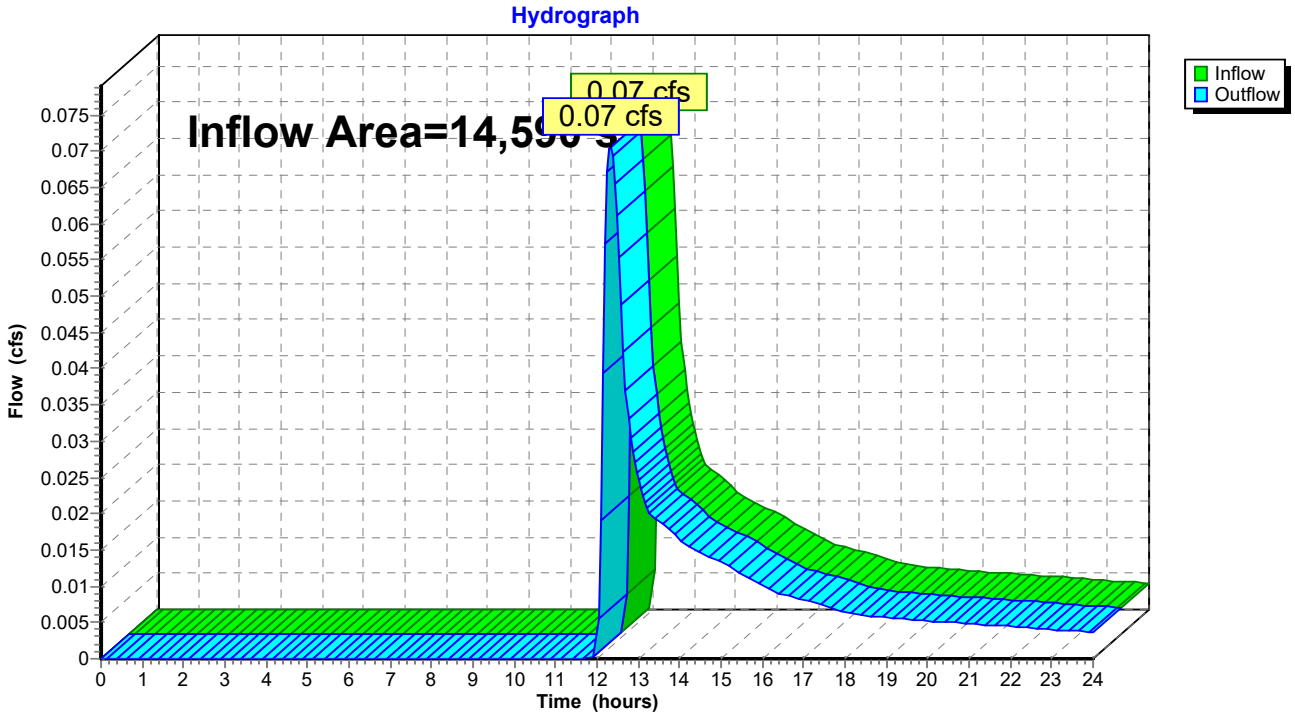


Summary for Reach DP-1: Design Point 1

Inflow Area = 14,590 sf, 0.00% Impervious, Inflow Depth > 0.40" for 2-YR event
Inflow = 0.07 cfs @ 12.32 hrs, Volume= 484 cf
Outflow = 0.07 cfs @ 12.32 hrs, Volume= 484 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: Design Point 1

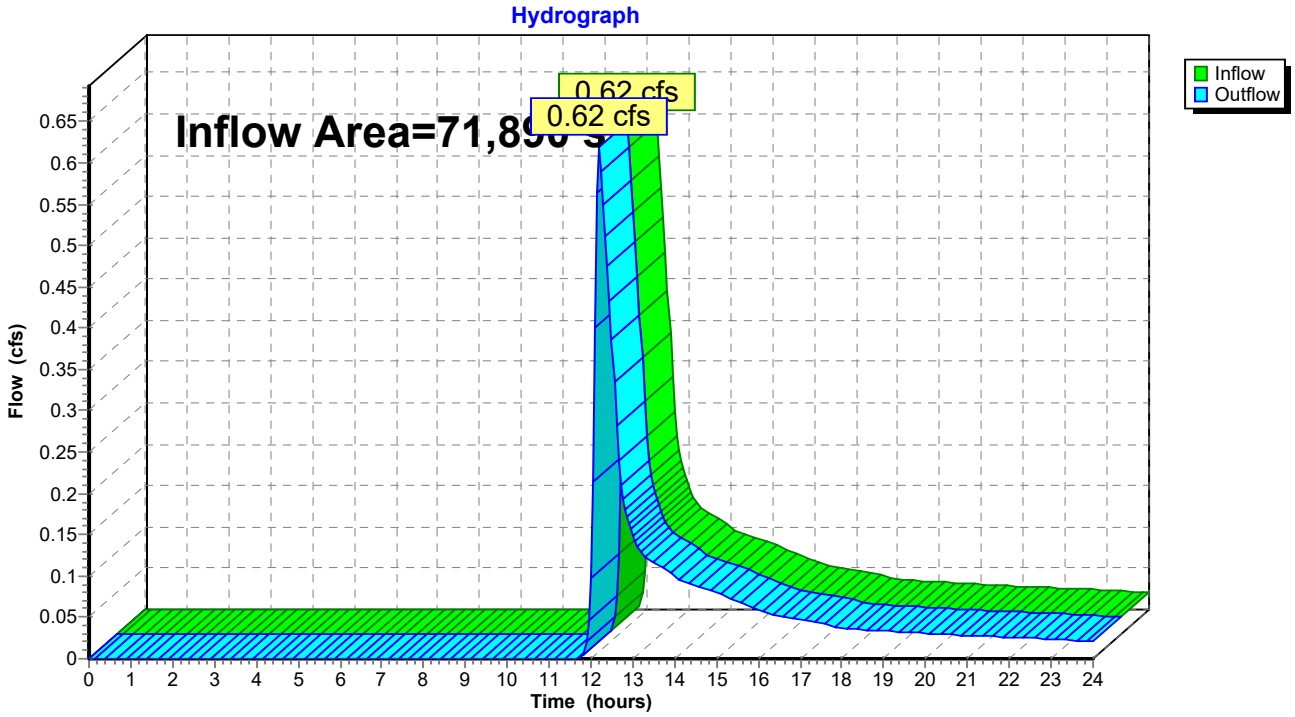


Summary for Reach DP-2: Design Point 2

Inflow Area = 71,890 sf, 0.00% Impervious, Inflow Depth > 0.53" for 2-YR event
Inflow = 0.62 cfs @ 12.21 hrs, Volume= 3,201 cf
Outflow = 0.62 cfs @ 12.21 hrs, Volume= 3,201 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-2: Design Point 2

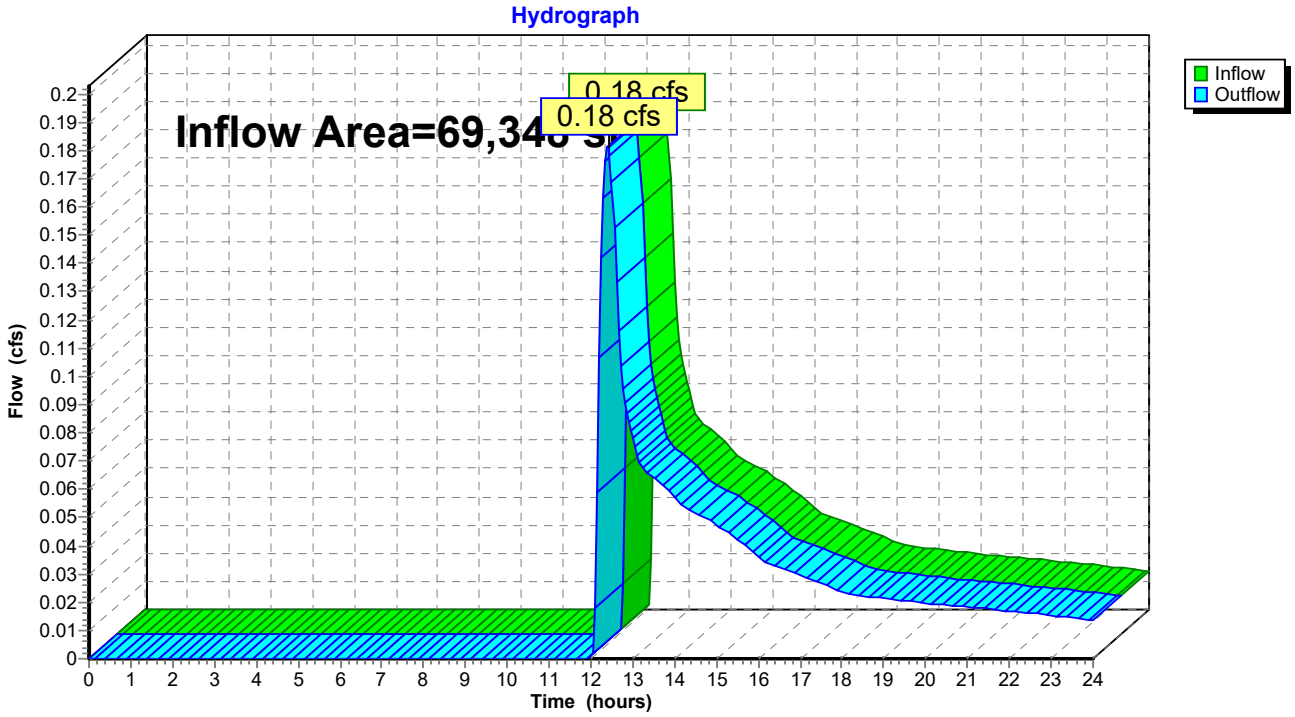


Summary for Reach DP-3: Design Point 3

Inflow Area = 69,348 sf, 0.00% Impervious, Inflow Depth > 0.27" for 2-YR event
Inflow = 0.18 cfs @ 12.41 hrs, Volume= 1,572 cf
Outflow = 0.18 cfs @ 12.41 hrs, Volume= 1,572 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-3: Design Point 3

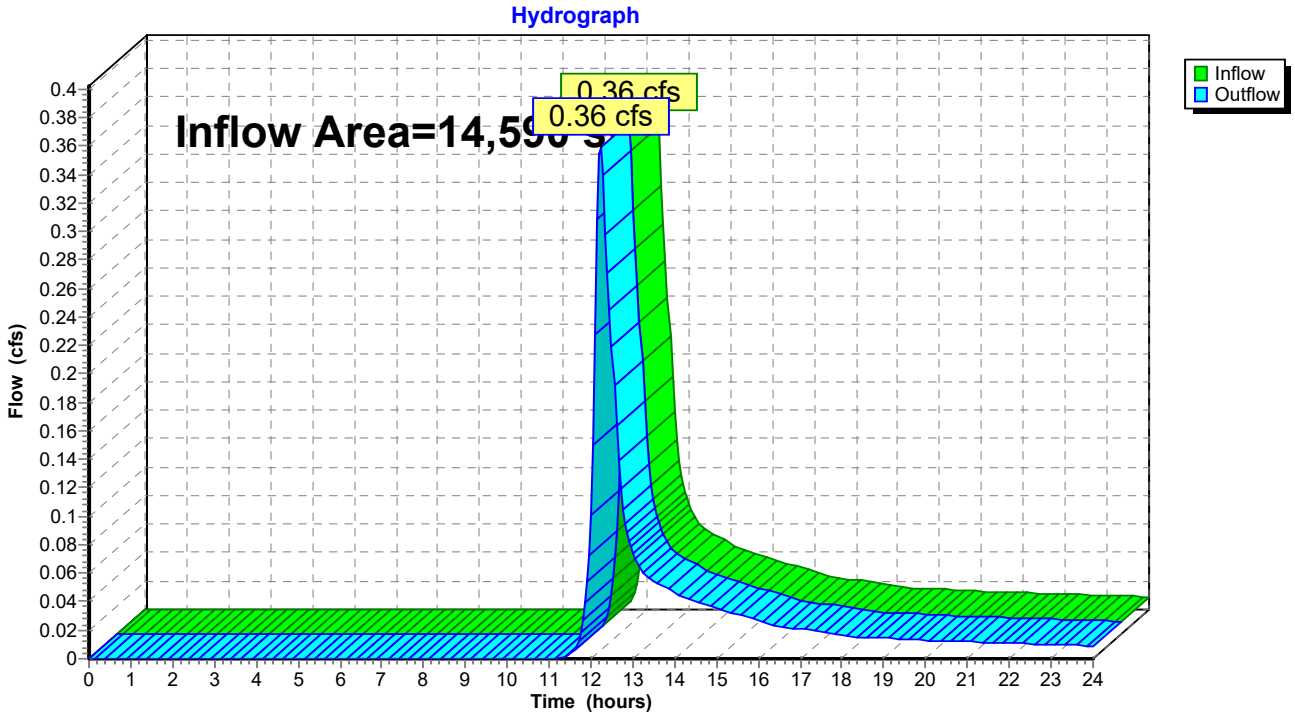


Summary for Reach DP-1: Design Point 1

Inflow Area = 14,590 sf, 0.00% Impervious, Inflow Depth > 1.34" for 10-YR event
Inflow = 0.36 cfs @ 12.22 hrs, Volume= 1,626 cf
Outflow = 0.36 cfs @ 12.22 hrs, Volume= 1,626 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: Design Point 1

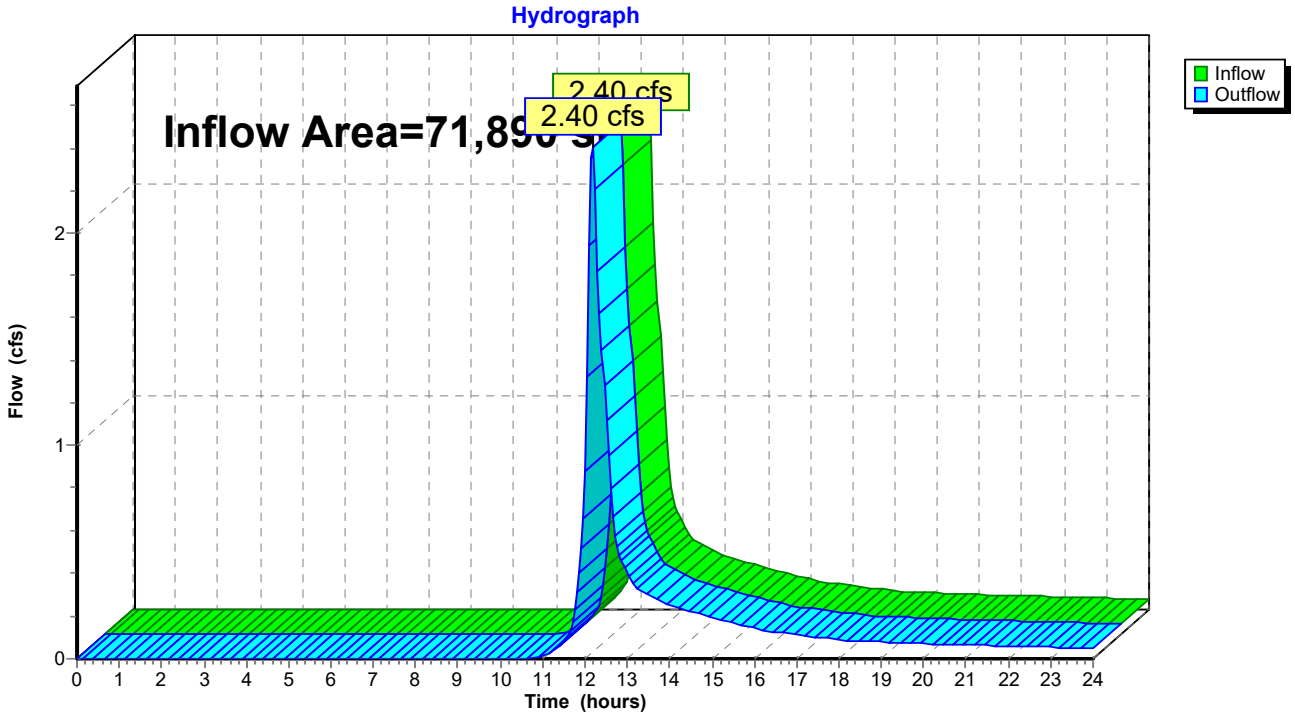


Summary for Reach DP-2: Design Point 2

Inflow Area = 71,890 sf, 0.00% Impervious, Inflow Depth > 1.60" for 10-YR event
Inflow = 2.40 cfs @ 12.17 hrs, Volume= 9,557 cf
Outflow = 2.40 cfs @ 12.17 hrs, Volume= 9,557 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-2: Design Point 2

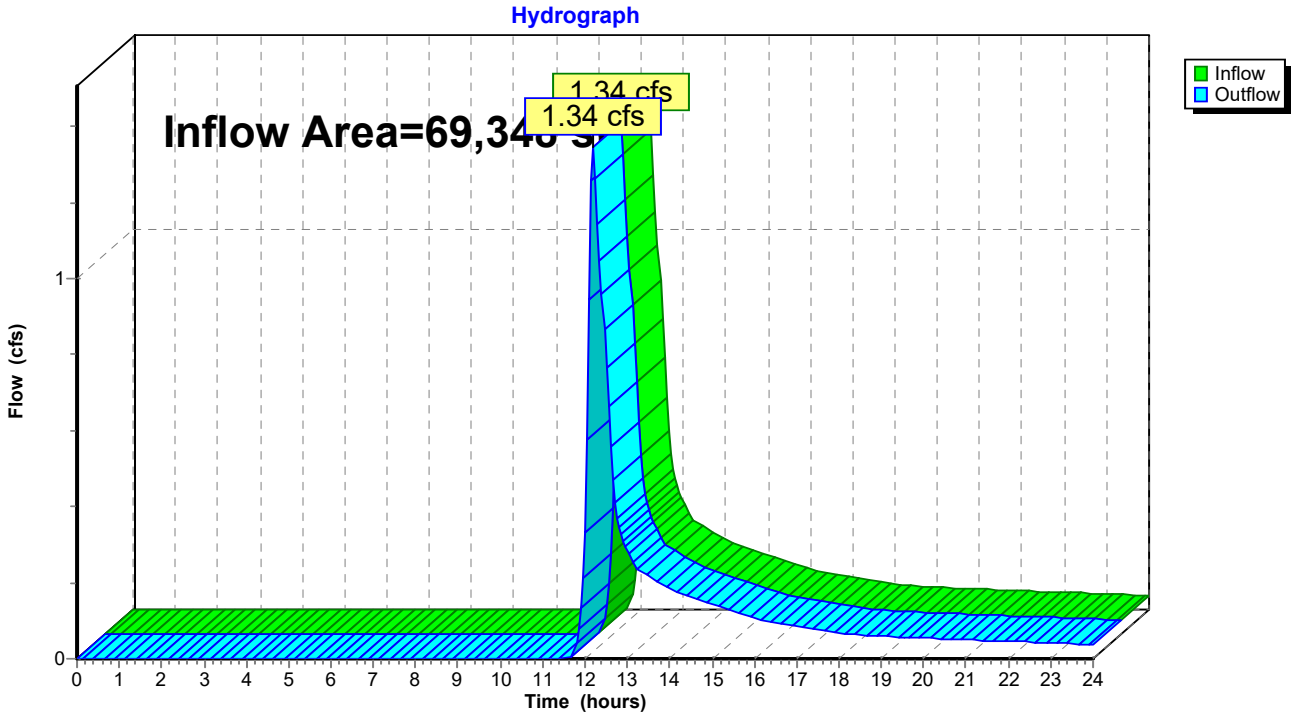


Summary for Reach DP-3: Design Point 3

Inflow Area = 69,348 sf, 0.00% Impervious, Inflow Depth > 1.07" for 10-YR event
Inflow = 1.34 cfs @ 12.20 hrs, Volume= 6,208 cf
Outflow = 1.34 cfs @ 12.20 hrs, Volume= 6,208 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-3: Design Point 3

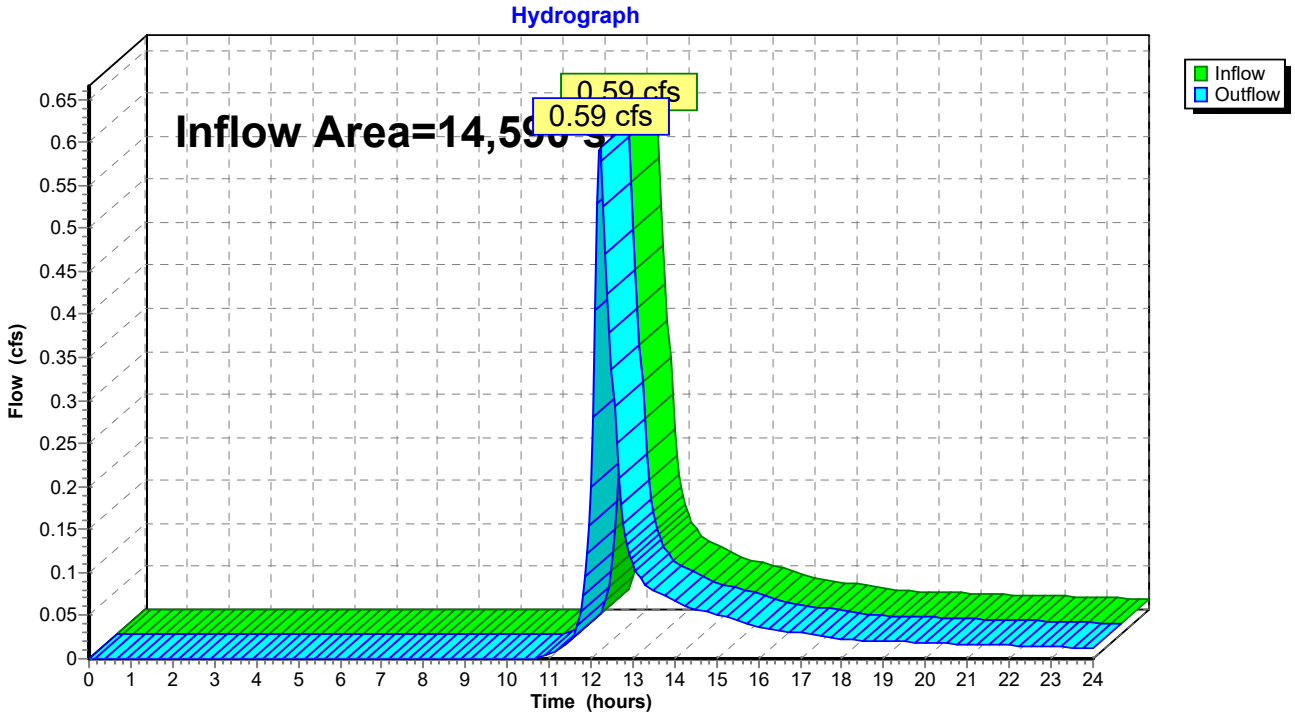


Summary for Reach DP-1: Design Point 1

Inflow Area = 14,590 sf, 0.00% Impervious, Inflow Depth > 2.09" for 25-YR event
Inflow = 0.59 cfs @ 12.22 hrs, Volume= 2,537 cf
Outflow = 0.59 cfs @ 12.22 hrs, Volume= 2,537 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: Design Point 1

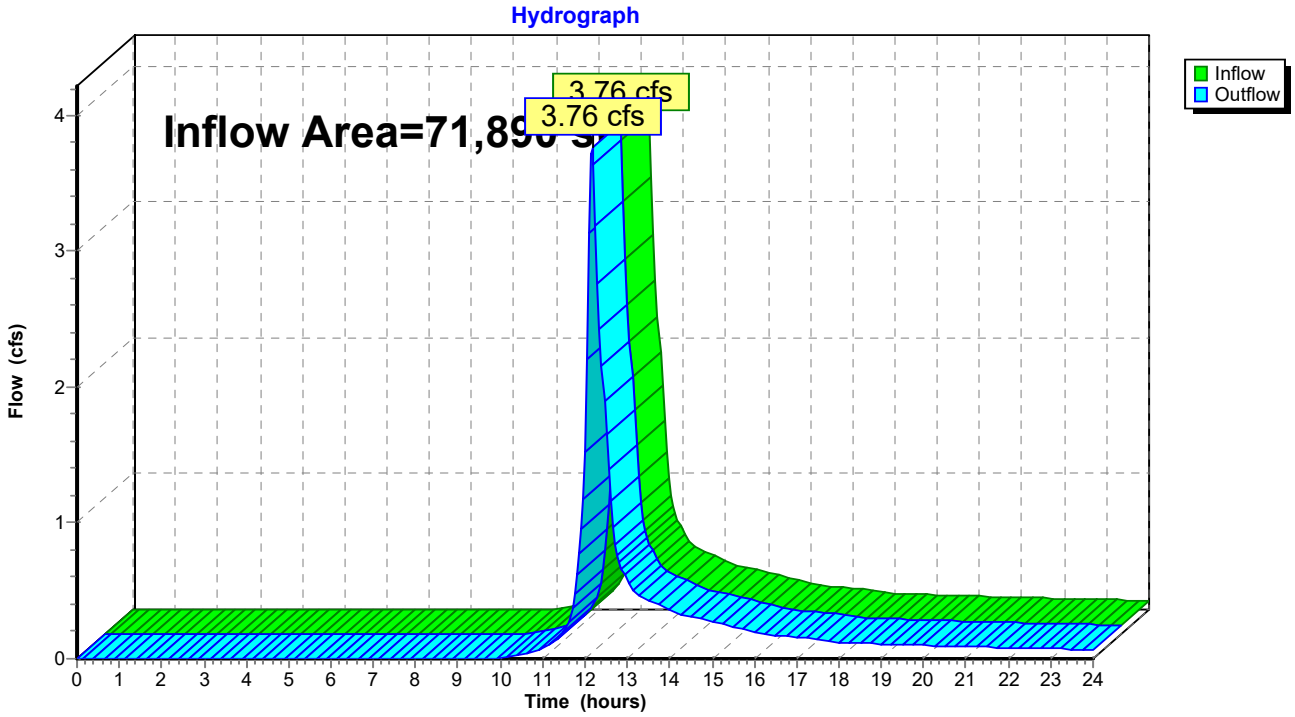


Summary for Reach DP-2: Design Point 2

Inflow Area = 71,890 sf, 0.00% Impervious, Inflow Depth > 2.41" for 25-YR event
Inflow = 3.76 cfs @ 12.17 hrs, Volume= 14,443 cf
Outflow = 3.76 cfs @ 12.17 hrs, Volume= 14,443 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-2: Design Point 2

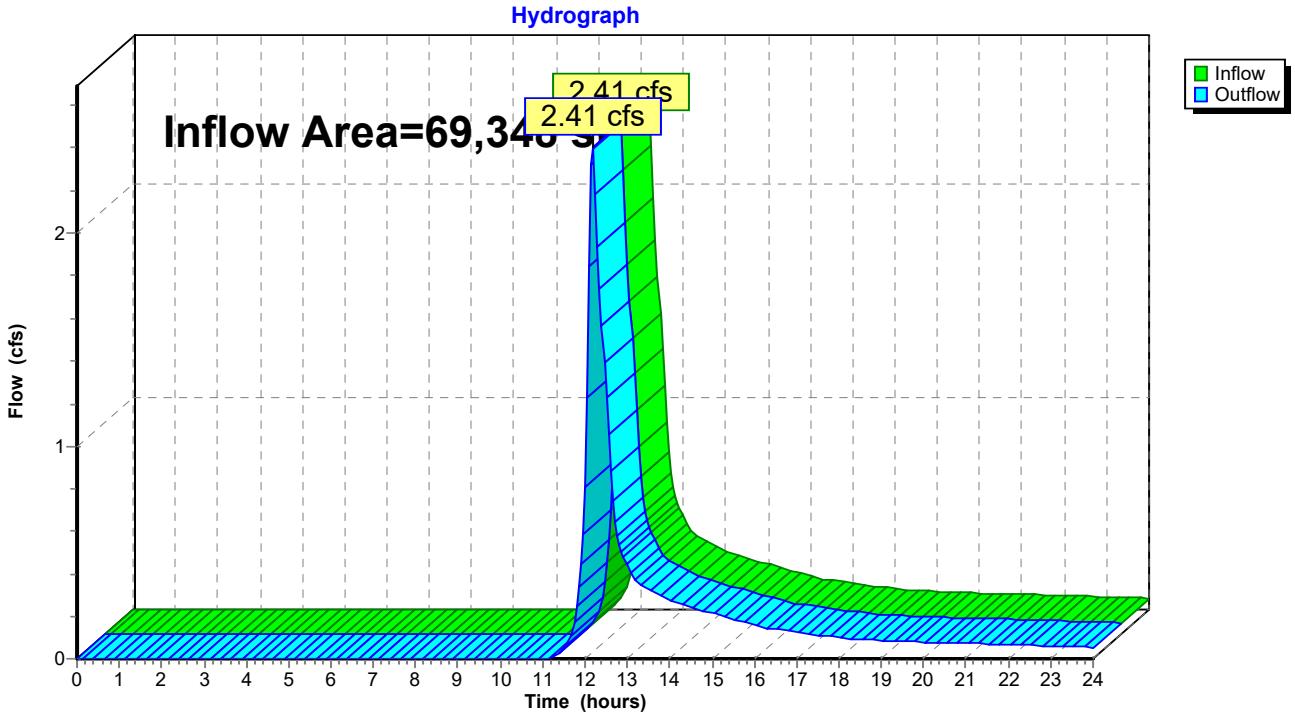


Summary for Reach DP-3: Design Point 3

Inflow Area = 69,348 sf, 0.00% Impervious, Inflow Depth > 1.75" for 25-YR event
Inflow = 2.41 cfs @ 12.19 hrs, Volume= 10,096 cf
Outflow = 2.41 cfs @ 12.19 hrs, Volume= 10,096 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-3: Design Point 3

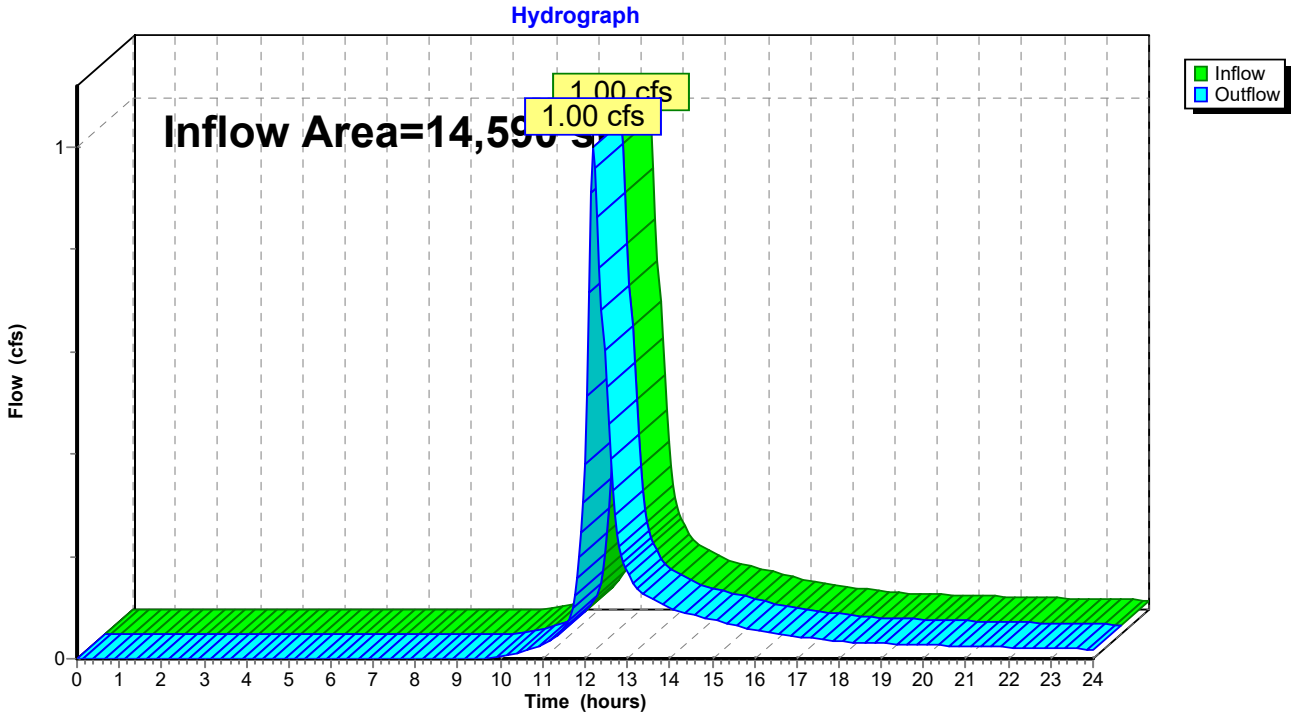


Summary for Reach DP-1: Design Point 1

Inflow Area = 14,590 sf, 0.00% Impervious, Inflow Depth > 3.38" for 100-YR event
Inflow = 1.00 cfs @ 12.21 hrs, Volume= 4,113 cf
Outflow = 1.00 cfs @ 12.21 hrs, Volume= 4,113 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: Design Point 1

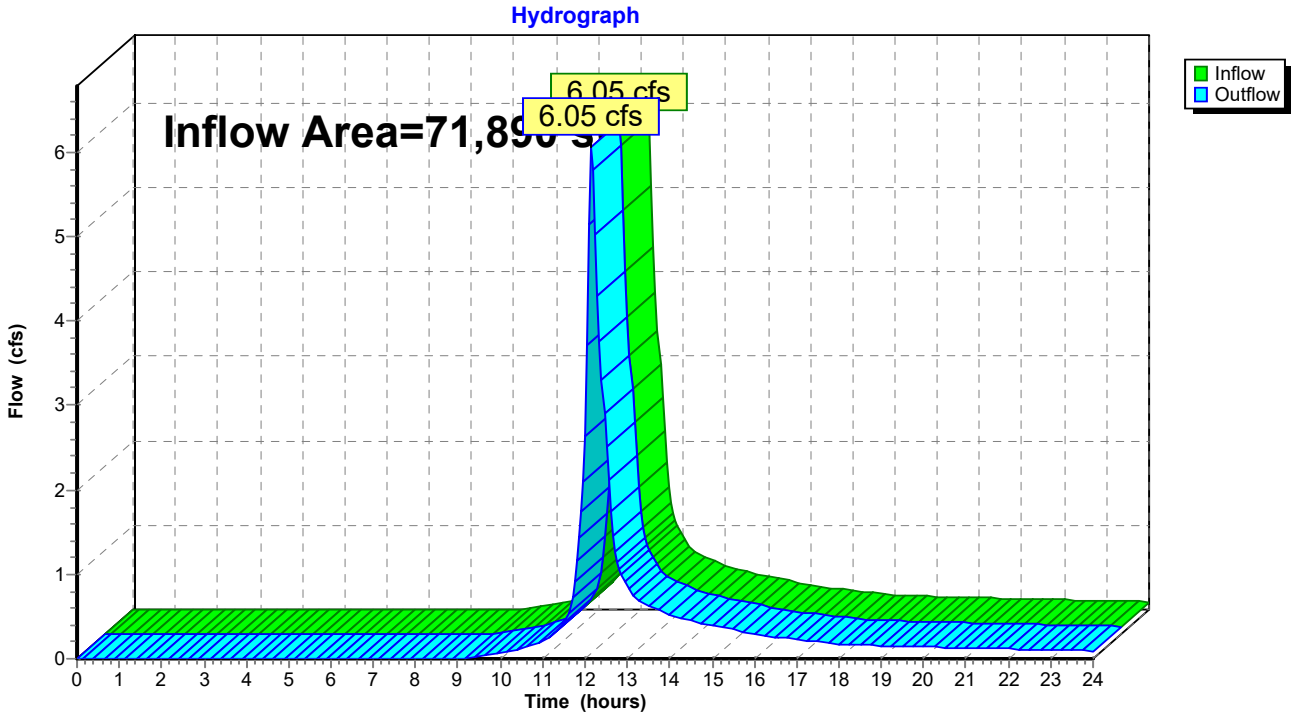


Summary for Reach DP-2: Design Point 2

Inflow Area = 71,890 sf, 0.00% Impervious, Inflow Depth > 3.79" for 100-YR event
Inflow = 6.05 cfs @ 12.16 hrs, Volume= 22,727 cf
Outflow = 6.05 cfs @ 12.16 hrs, Volume= 22,727 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-2: Design Point 2

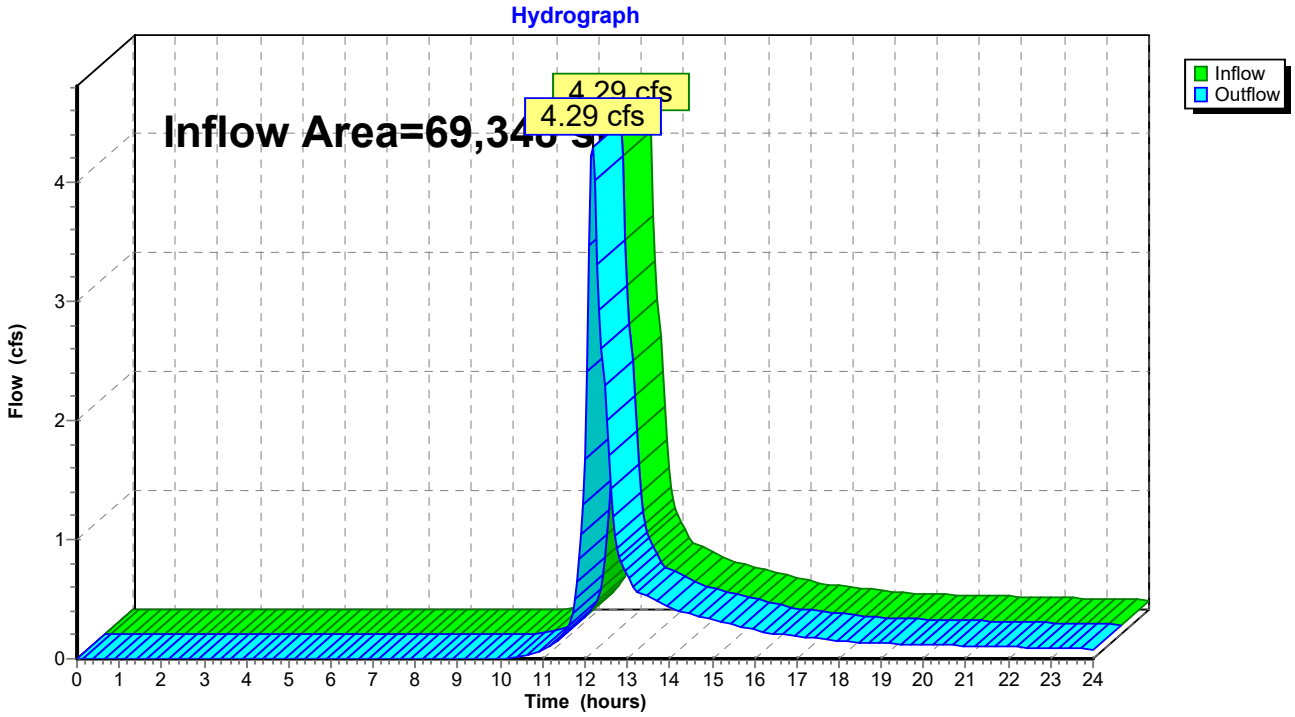


Summary for Reach DP-3: Design Point 3

Inflow Area = 69,348 sf, 0.00% Impervious, Inflow Depth > 2.94" for 100-YR event
Inflow = 4.29 cfs @ 12.18 hrs, Volume= 16,996 cf
Outflow = 4.29 cfs @ 12.18 hrs, Volume= 16,996 cf, Atten= 0%, Lag= 0.0 min

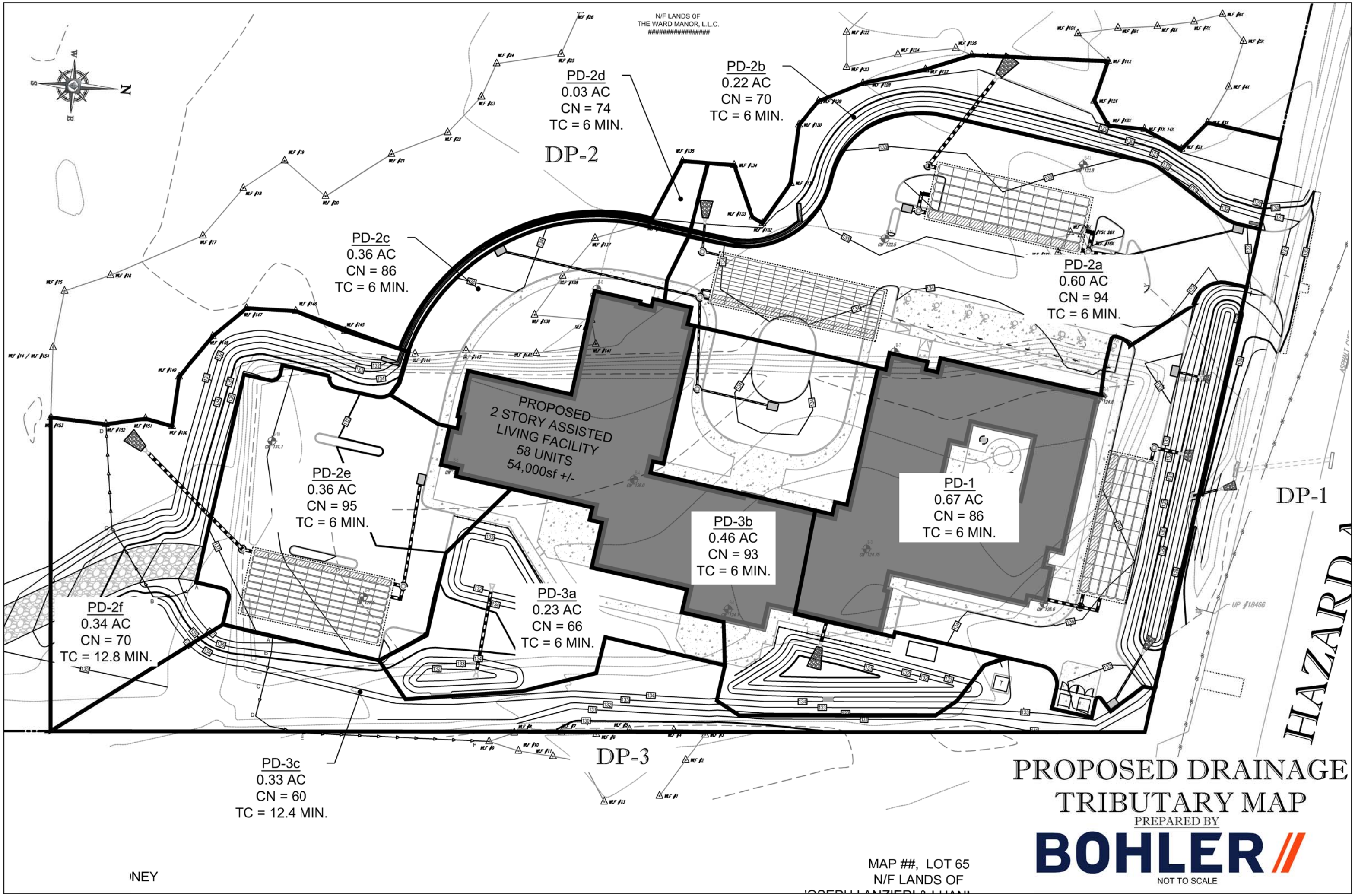
Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach DP-3: Design Point 3



APPENDIX D: PROPOSED CONDITIONS HYDROLOGIC ANALYSIS

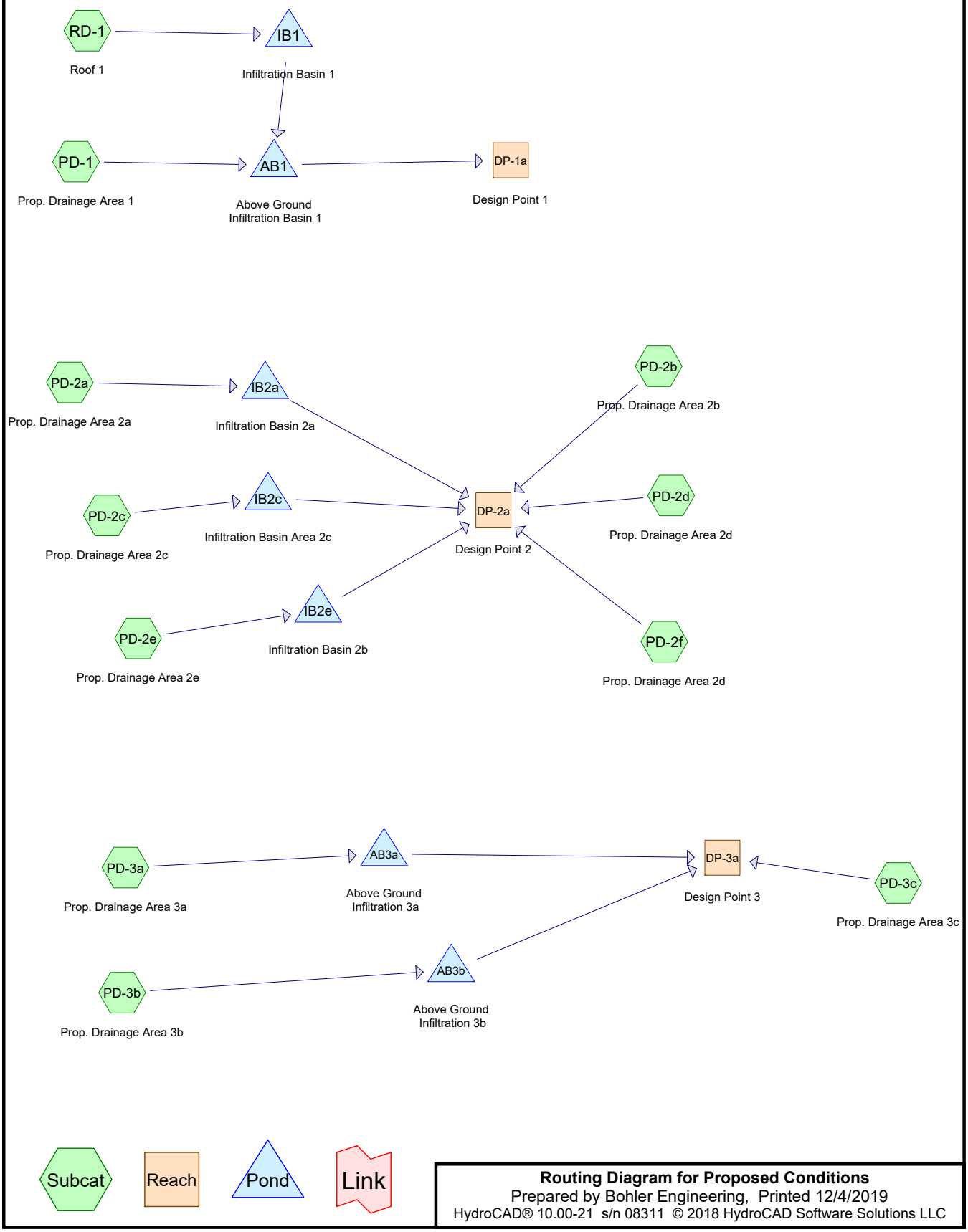
- *PROPOSED CONDITIONS DRAINAGE MAP*
- *PROPOSED CONDITIONS HYDROCAD CALCULATIONS*



PROPOSED DRAINAGE TRIBUTARY MAP

PREPARED BY

BOHLER



Routing Diagram for Proposed Conditions
Prepared by Bohler Engineering, Printed 12/4/2019
HydroCAD® 10.00-21 s/n 08311 © 2018 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
13,721	49	50-75% Grass cover, Fair, HSG A, 36A (PD-1, PD-2a, PD-2c, PD-2e, PD-3a)
14,113	77	50-75% Grass cover, Fair, HSG B/D, 13 (PD-1, PD-2a, PD-2c, PD-3a, PD-3b)
738	77	50-75% Grass cover, Fair, HSG C (PD-3c)
828	79	50-75% Grass cover, Fair, HSG C, 701A (PD-3b)
48,700	98	Paved parking (PD-1, PD-2a, PD-2e, PD-3a, PD-3b)
10,149	98	Paved parking, HSG D (PD-2c)
14,505	98	Roofing (PD-3b)
14,505	98	Unconnected roofs (RD-1)
2,091	43	Woods/grass comb., Fair, HSG A (PD-2f)
6,858	43	Woods/grass comb., Fair, HSG A, 36A (PD-2e, PD-3c)
784	43	Woods/grass comb., Fair, HSG A. 36A (PD-2b)
1,045	65	Woods/grass comb., Fair, HSG B (PD-2b)
21,824	74	Woods/grass comb., Fair, HSG B/D, 13 (PD-2b, PD-2d, PD-2f)
5,545	74	Woods/grass comb., Fair, HSG C (PD-3c)
1,501	76	Woods/grass comb., Fair, HSG C (PD-3c)
156,909	**84**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
23,455	HSG A	PD-1, PD-2a, PD-2b, PD-2c, PD-2e, PD-2f, PD-3a, PD-3c
36,982	HSG B	PD-1, PD-2a, PD-2b, PD-2c, PD-2d, PD-2f, PD-3a, PD-3b
8,612	HSG C	PD-3b, PD-3c
10,149	HSG D	PD-2c
77,711	Other	PD-1, PD-2a, PD-2e, PD-3a, PD-3b, RD-1
156,909		**TOTAL AREA**

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	AB1	127.57	127.50	13.0	0.0054	0.025	8.0	0.0	0.0
2	IB1	130.24	130.00	10.0	0.0240	0.012	12.0	0.0	0.0
3	IB2a	128.60	128.00	55.0	0.0109	0.012	15.0	0.0	0.0
4	IB2c	129.20	129.00	14.0	0.0143	0.012	8.0	0.0	0.0
5	IB2e	130.85	130.50	69.0	0.0051	0.012	15.0	0.0	0.0

Summary for Subcatchment PD-1: Prop. Drainage Area 1

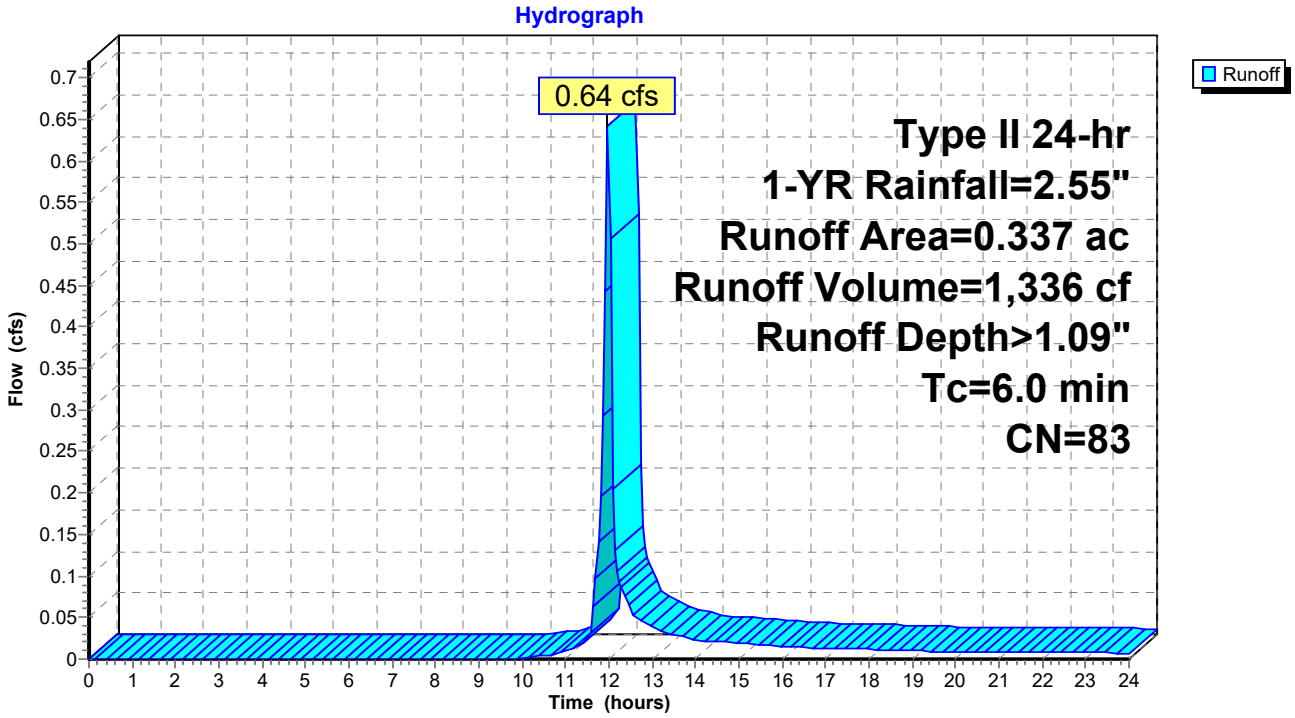
Runoff = 0.64 cfs @ 11.98 hrs, Volume= 1,336 cf, Depth> 1.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.55"

	Area (ac)	CN	Description
*	0.074	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.070	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.193	98	Paved parking
	0.337	83	Weighted Average
	0.144		42.73% Pervious Area
	0.193		57.27% Impervious Area

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

Subcatchment PD-1: Prop. Drainage Area 1



Summary for Subcatchment PD-2a: Prop. Drainage Area 2a

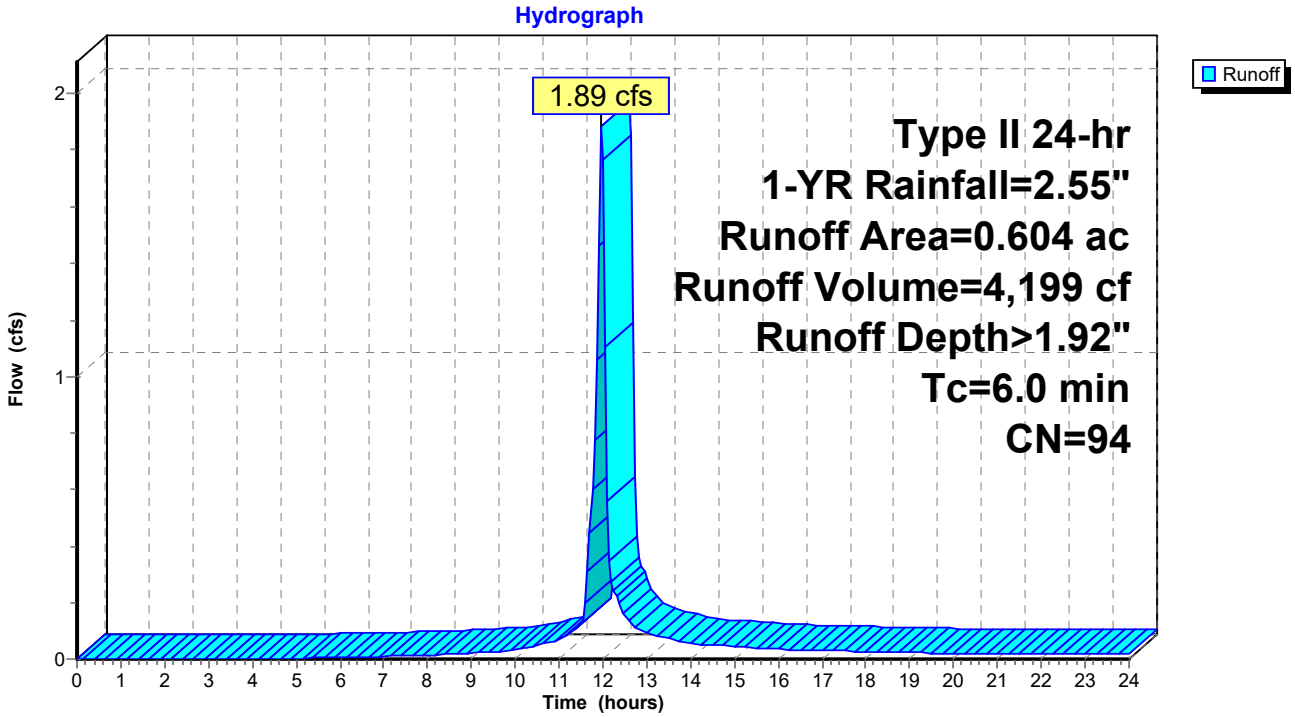
Runoff = 1.89 cfs @ 11.96 hrs, Volume= 4,199 cf, Depth> 1.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.55"

	Area (ac)	CN	Description
*	0.038	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.029	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.537	98	Paved parking
	0.604	94	Weighted Average
	0.067		11.09% Pervious Area
	0.537		88.91% Impervious Area

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

Subcatchment PD-2a: Prop. Drainage Area 2a



Summary for Subcatchment PD-2b: Prop. Drainage Area 2b

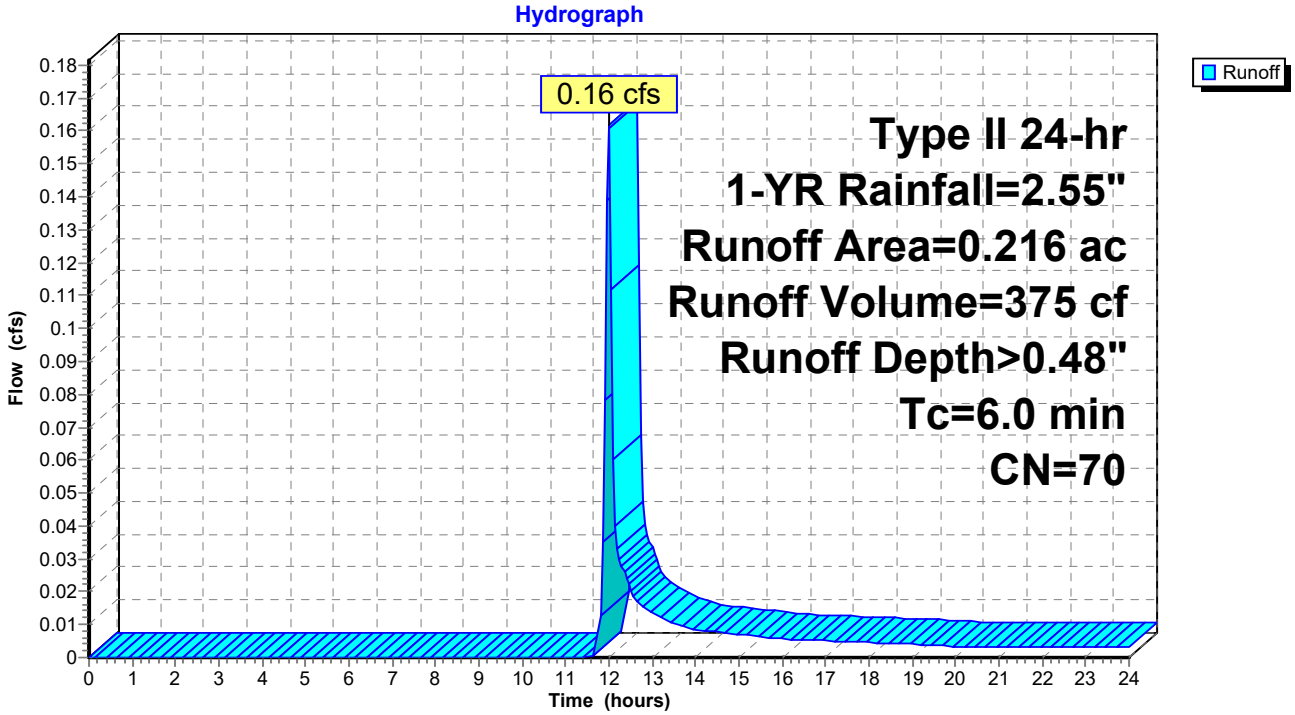
Runoff = 0.16 cfs @ 11.99 hrs, Volume= 375 cf, Depth> 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.55"

	Area (ac)	CN	Description
*	0.174	74	Woods/grass comb., Fair, HSG B/D, 13
*	0.018	43	Woods/grass comb., Fair, HSG A. 36A
	0.024	65	Woods/grass comb., Fair, HSG B
	0.216	70	Weighted Average
	0.216		100.00% Pervious Area

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

Subcatchment PD-2b: Prop. Drainage Area 2b



Summary for Subcatchment PD-2c: Prop. Drainage Area 2c

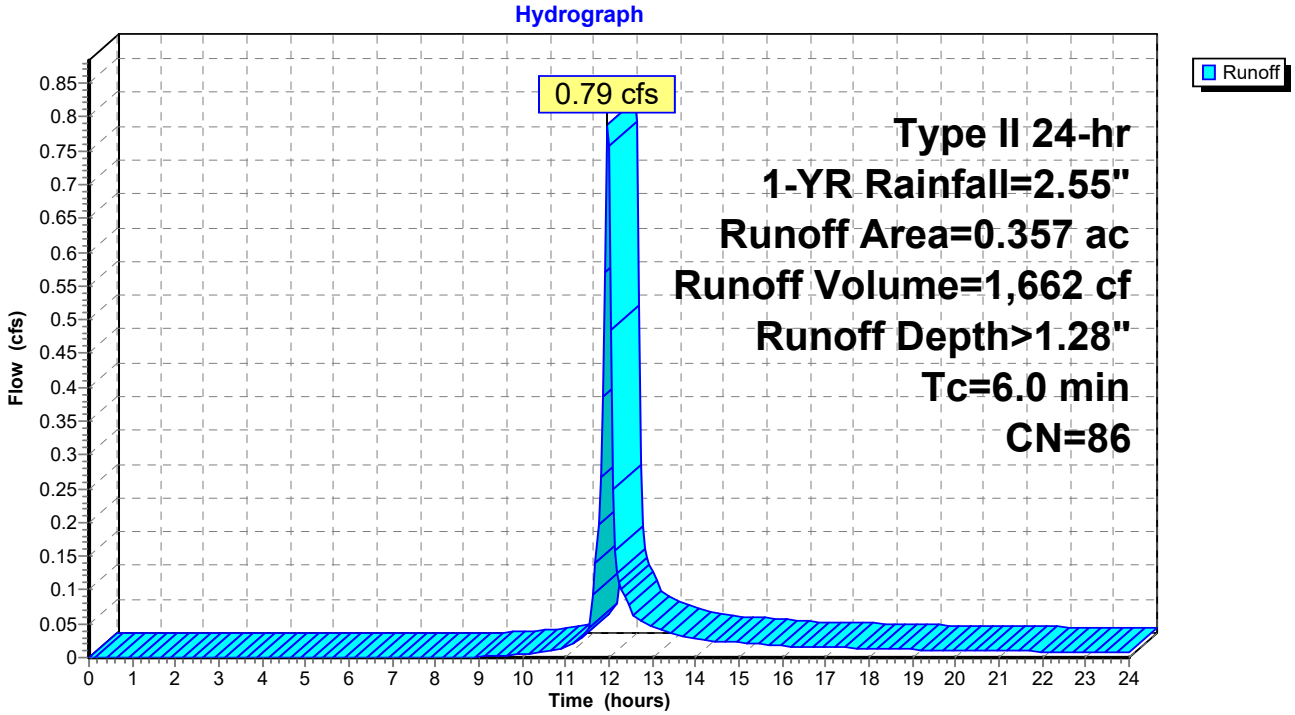
Runoff = 0.79 cfs @ 11.97 hrs, Volume= 1,662 cf, Depth> 1.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.55"

	Area (ac)	CN	Description
*	0.061	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.042	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.021	49	50-75% Grass cover, Fair, HSG A, 36A
	0.233	98	Paved parking, HSG D
	0.357	86	Weighted Average
	0.124		34.73% Pervious Area
	0.233		65.27% Impervious Area

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

Subcatchment PD-2c: Prop. Drainage Area 2c



Summary for Subcatchment PD-2d: Prop. Drainage Area 2d

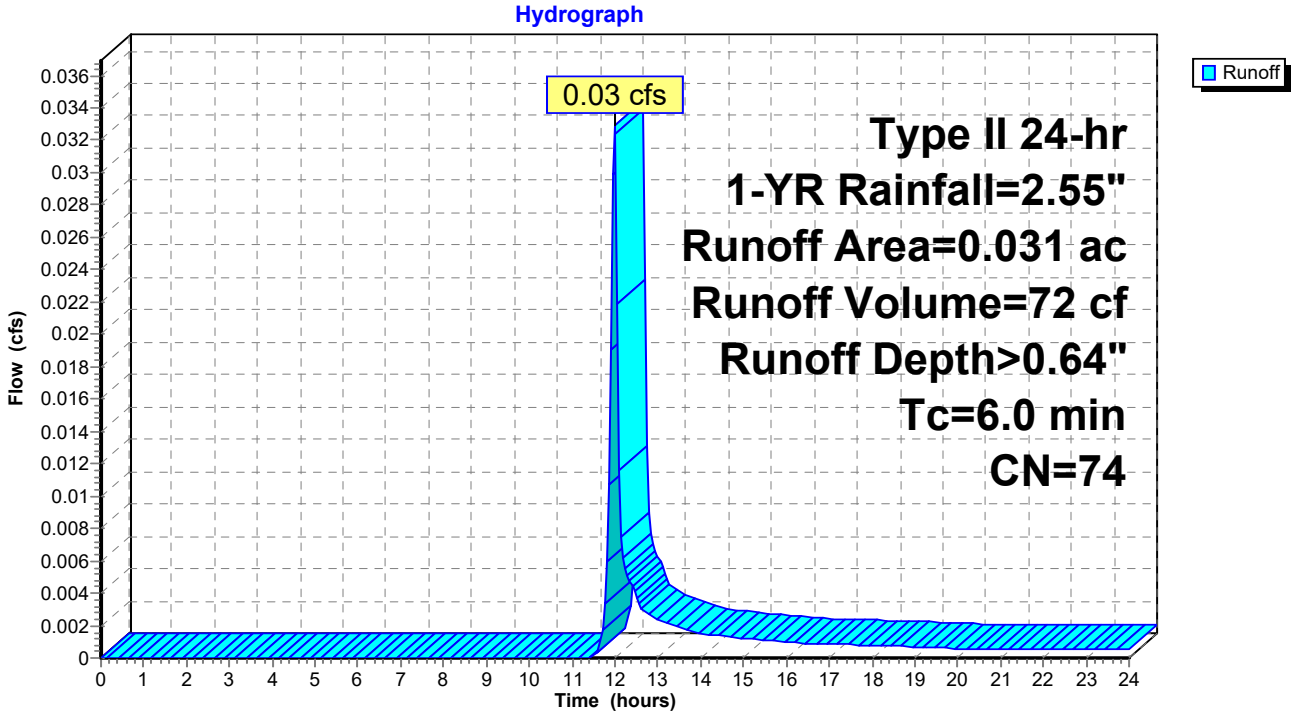
Runoff = 0.03 cfs @ 11.98 hrs, Volume= 72 cf, Depth> 0.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.55"

	Area (ac)	CN	Description
*	0.031	74	Woods/grass comb., Fair, HSG B/D, 13
	0.031		100.00% Pervious Area

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

Subcatchment PD-2d: Prop. Drainage Area 2d



Summary for Subcatchment PD-2e: Prop. Drainage Area 2e

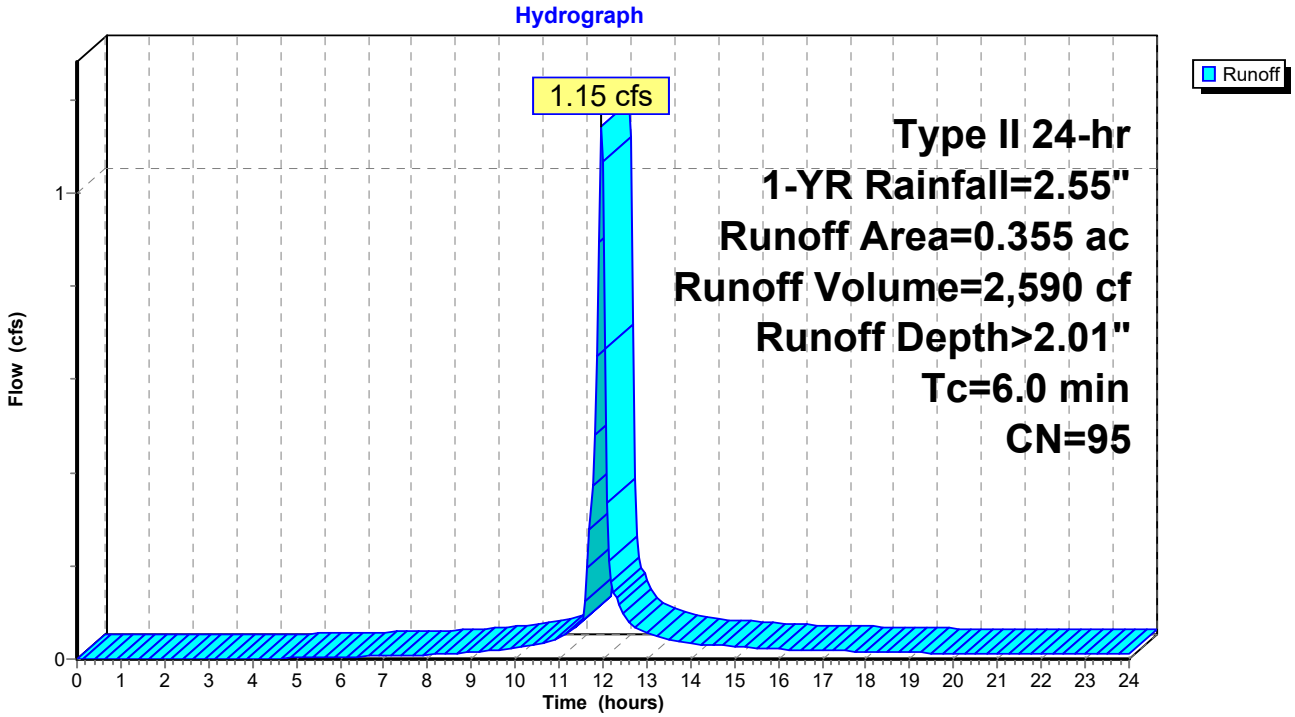
Runoff = 1.15 cfs @ 11.96 hrs, Volume= 2,590 cf, Depth> 2.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.55"

	Area (ac)	CN	Description
*	0.004	43	Woods/grass comb., Fair, HSG A, 36A
*	0.020	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.331	98	Paved parking
	0.355	95	Weighted Average
	0.024		6.76% Pervious Area
	0.331		93.24% Impervious Area

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

Subcatchment PD-2e: Prop. Drainage Area 2e



Summary for Subcatchment PD-2f: Prop. Drainage Area 2d

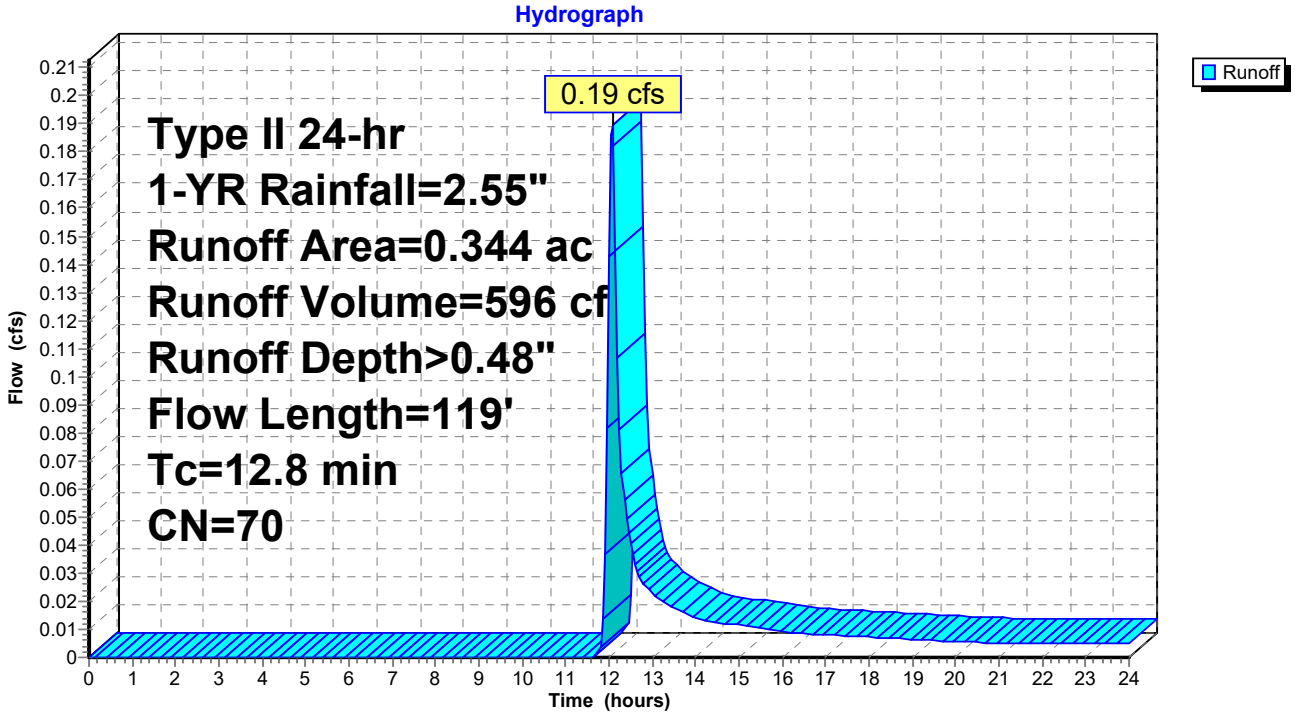
Runoff = 0.19 cfs @ 12.07 hrs, Volume= 596 cf, Depth> 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.55"

	Area (ac)	CN	Description
*	0.296	74	Woods/grass comb., Fair, HSG B/D, 13
	0.048	43	Woods/grass comb., Fair, HSG A
	0.344	70	Weighted Average
	0.344		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	23	0.1600	0.13		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.18"
8.4	36	0.0270	0.07		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.18"
1.5	60	0.0167	0.65		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
12.8	119	Total			

Subcatchment PD-2f: Prop. Drainage Area 2d



Summary for Subcatchment PD-3a: Prop. Drainage Area 3a

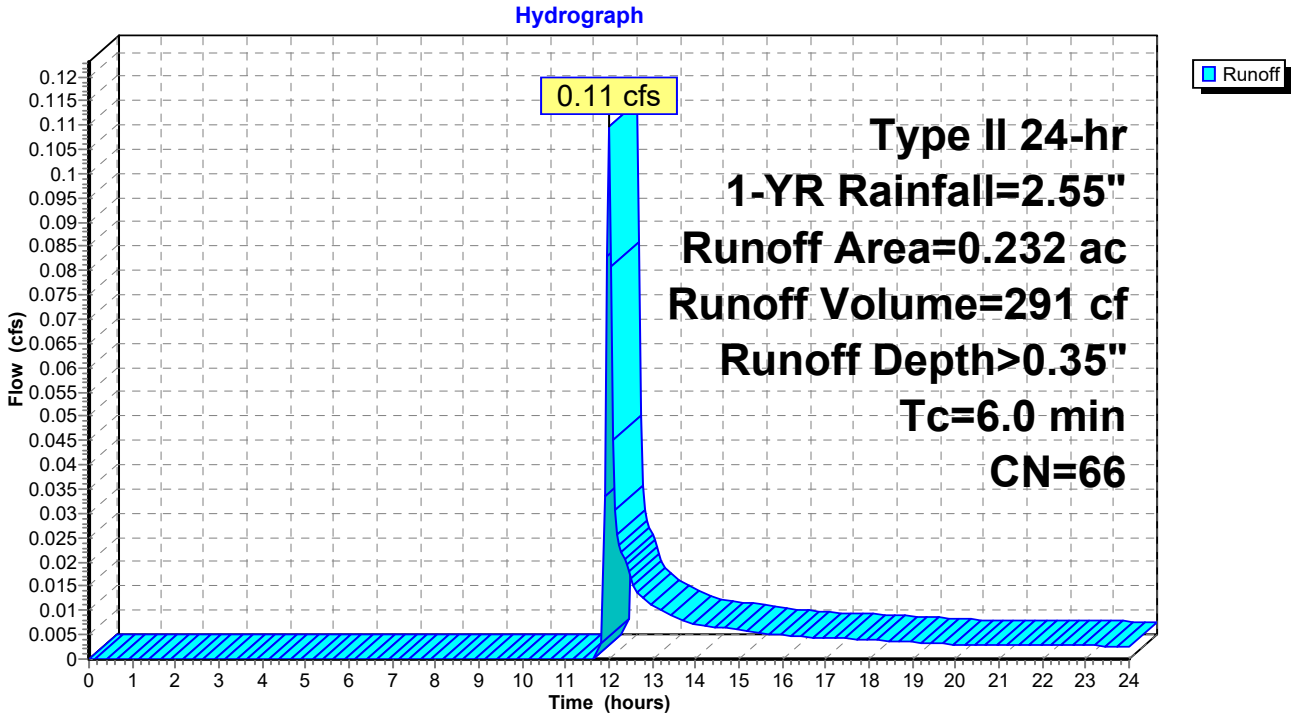
Runoff = 0.11 cfs @ 12.00 hrs, Volume= 291 cf, Depth> 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.55"

	Area (ac)	CN	Description
*	0.120	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.071	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.041	98	Paved parking
	0.232	66	Weighted Average
	0.191		82.33% Pervious Area
	0.041		17.67% Impervious Area

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

Subcatchment PD-3a: Prop. Drainage Area 3a



Summary for Subcatchment PD-3b: Prop. Drainage Area 3b

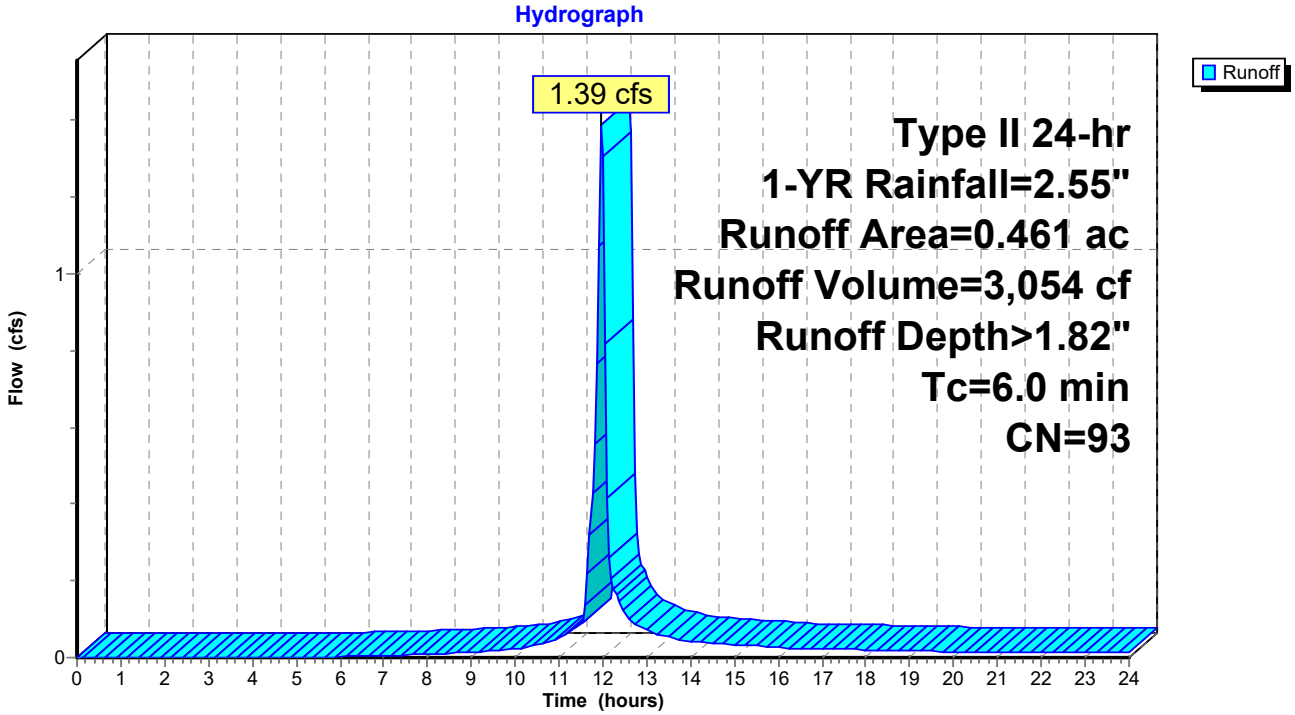
Runoff = 1.39 cfs @ 11.97 hrs, Volume= 3,054 cf, Depth> 1.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.55"

	Area (ac)	CN	Description
*	0.093	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.019	79	50-75% Grass cover, Fair, HSG C, 701A
*	0.016	98	Paved parking
*	0.333	98	Roofing
	0.461	93	Weighted Average
	0.112		24.30% Pervious Area
	0.349		75.70% Impervious Area

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

Subcatchment PD-3b: Prop. Drainage Area 3b



Summary for Subcatchment PD-3c: Prop. Drainage Area 3c

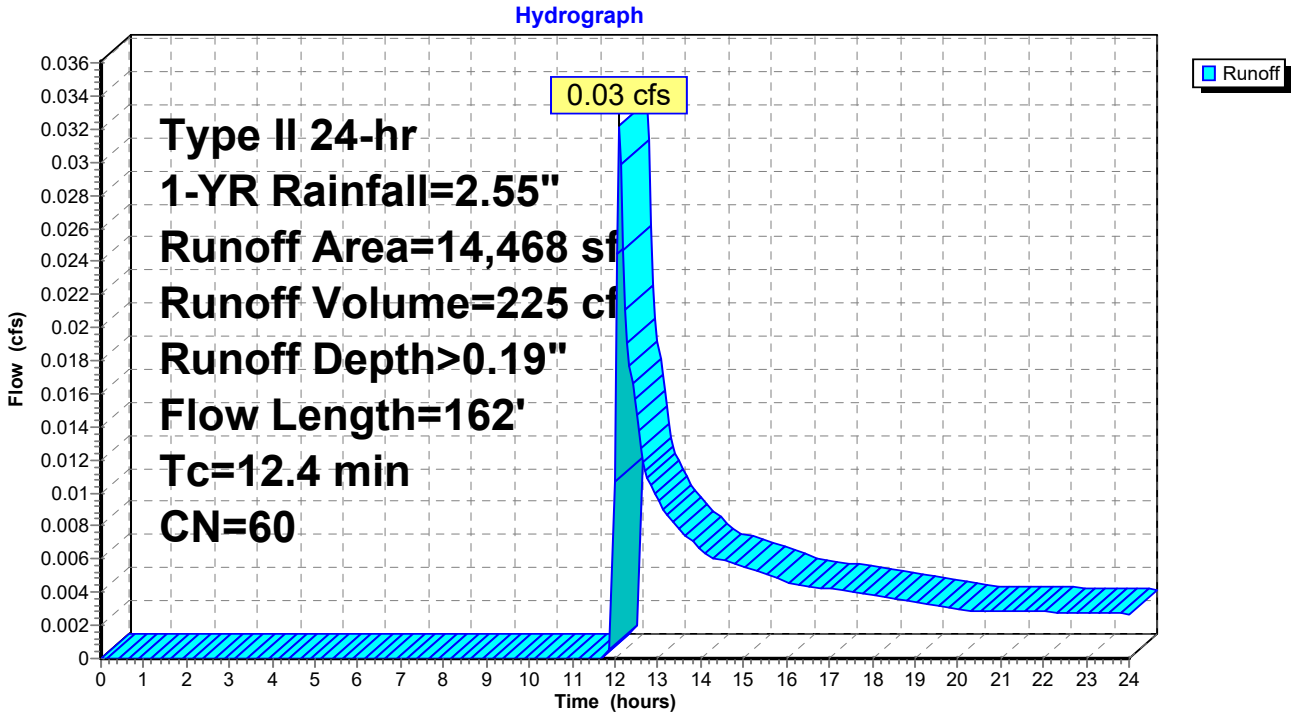
Runoff = 0.03 cfs @ 12.11 hrs, Volume= 225 cf, Depth> 0.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.55"

	Area (sf)	CN	Description
*	6,684	43	Woods/grass comb., Fair, HSG A, 36A
*	5,545	74	Woods/grass comb., Fair, HSG C
	1,501	76	Woods/grass comb., Fair, HSG C
*	738	77	50-75% Grass cover, Fair, HSG C
	14,468	60	Weighted Average
	14,468		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	8	0.0625	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.18"
3.4	17	0.0580	0.08		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.18"
3.2	16	0.0625	0.08		**Sheet Flow, C-D** Woods: Light underbrush n= 0.400 P2= 3.18"
1.5	9	0.1250	0.10		**Sheet Flow, D-E** Woods: Light underbrush n= 0.400 P2= 3.18"
2.5	112	0.0220	0.74		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
12.4	162	Total			

Subcatchment PD-3c: Prop. Drainage Area 3c



Summary for Subcatchment RD-1: Roof 1

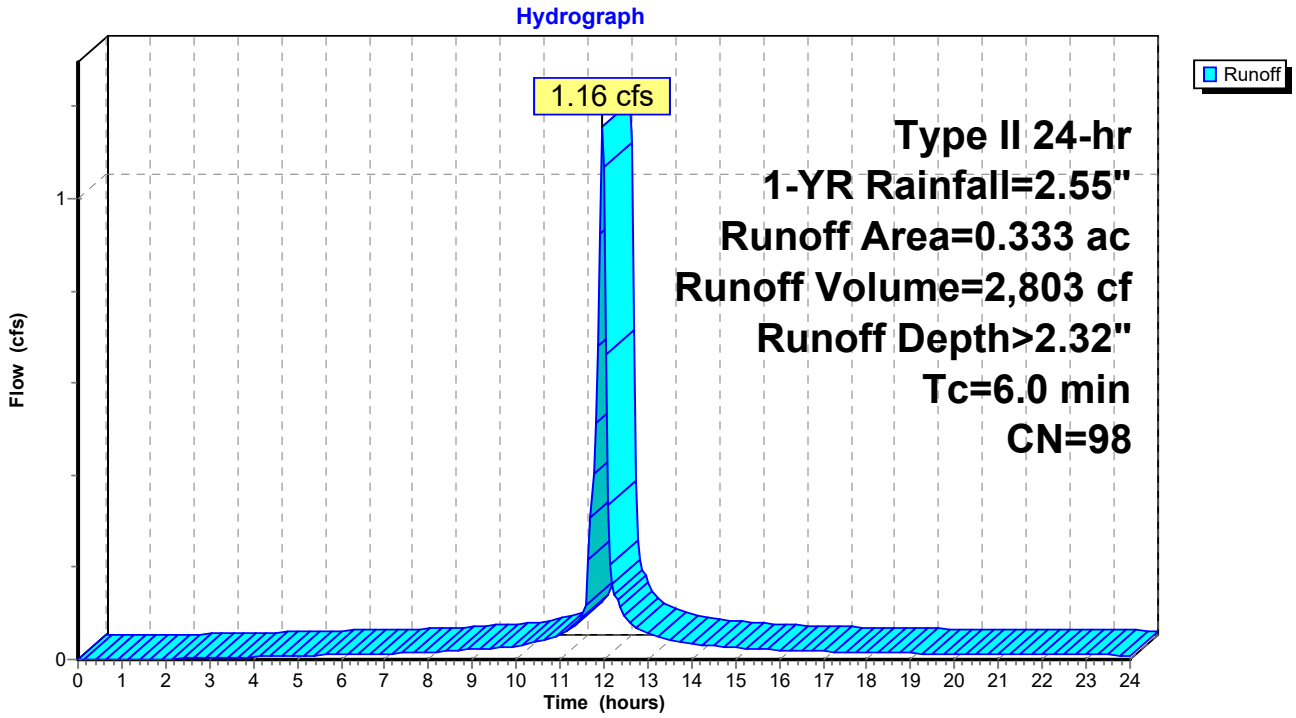
Runoff = 1.16 cfs @ 11.96 hrs, Volume= 2,803 cf, Depth> 2.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.55"

	Area (ac)	CN	Description
*	0.333	98	Unconnected roofs
	0.333		100.00% Impervious Area
	0.333		100.00% Unconnected

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

Subcatchment RD-1: Roof 1

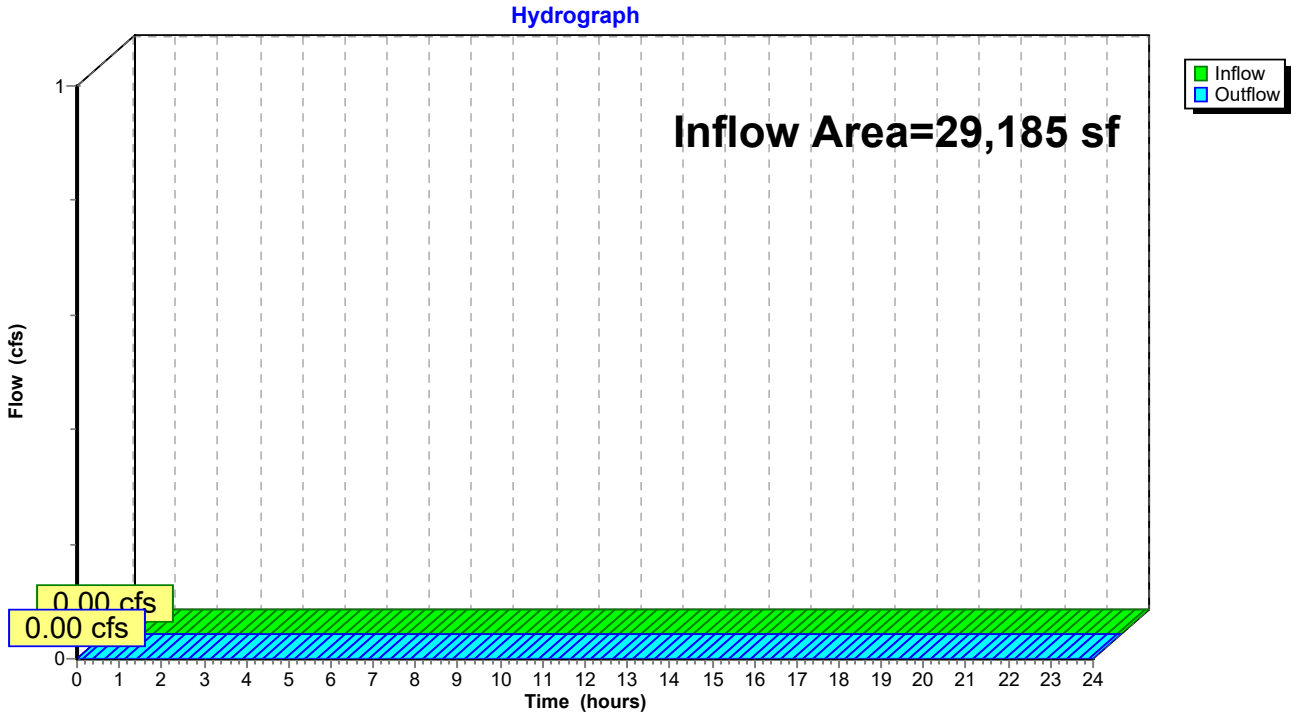


Summary for Reach DP-1a: Design Point 1

Inflow Area = 29,185 sf, 78.51% Impervious, Inflow Depth = 0.00" for 1-YR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 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-1a: Design Point 1

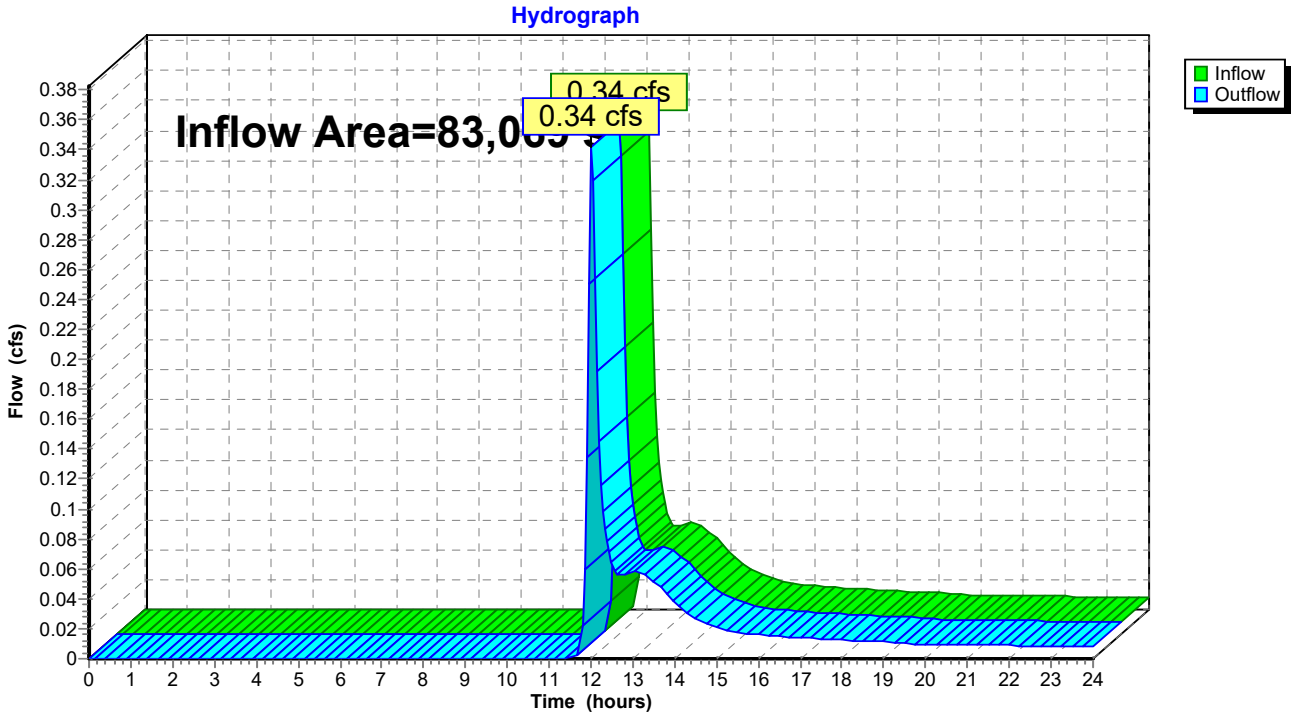


Summary for Reach DP-2a: Design Point 2

Inflow Area = 83,069 sf, 57.73% Impervious, Inflow Depth > 0.17" for 1-YR event
Inflow = 0.34 cfs @ 12.02 hrs, Volume= 1,154 cf
Outflow = 0.34 cfs @ 12.02 hrs, Volume= 1,154 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-2a: Design Point 2

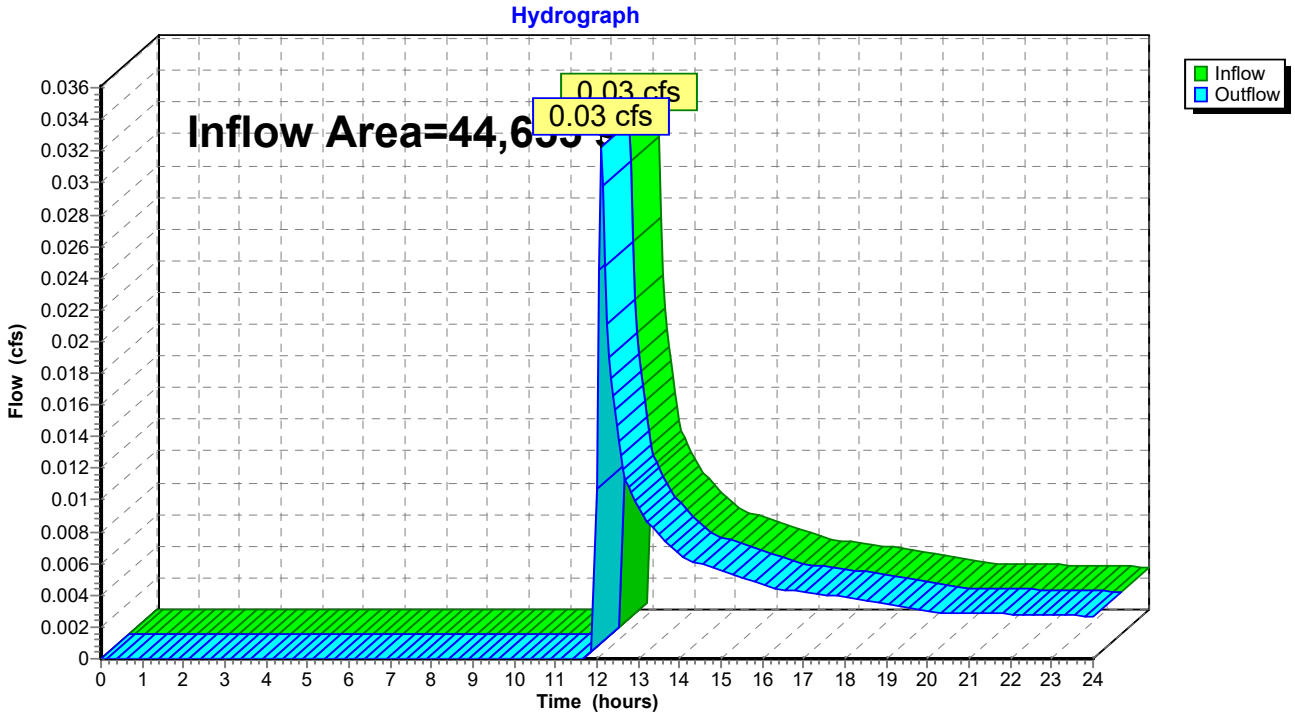


Summary for Reach DP-3a: Design Point 3

Inflow Area = 44,655 sf, 38.04% Impervious, Inflow Depth > 0.06" for 1-YR event
Inflow = 0.03 cfs @ 12.11 hrs, Volume= 225 cf
Outflow = 0.03 cfs @ 12.11 hrs, Volume= 225 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-3a: Design Point 3



Summary for Pond AB1: Above Ground Infiltration Basin 1

Inflow Area =	29,185 sf, 78.51% Impervious, Inflow Depth > 0.55" for 1-YR event				
Inflow =	0.64 cfs @	11.98 hrs,	Volume=	1,336 cf	
Outflow =	0.06 cfs @	12.50 hrs,	Volume=	1,335 cf,	Atten= 90%, Lag= 31.5 min
Discarded =	0.06 cfs @	12.50 hrs,	Volume=	1,335 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= 127.83' @ 12.50 hrs Surf.Area= 1,100 sf Storage= 517 cf

Plug-Flow detention time= 74.4 min calculated for 1,332 cf (100% of inflow)
Center-of-Mass det. time= 73.6 min (913.7 - 840.1)

Volume	Invert	Avail.Storage	Storage Description
#1	127.00'	4,542 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 4,798 cf Overall - 256 cf Embedded = 4,542 cf
#2	127.00'	102 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) Inside #1 256 cf Overall x 40.0% Voids
		4,644 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
127.00	512	0	0
128.00	1,218	865	865
129.00	1,949	1,584	2,449
130.00	2,749	2,349	4,798

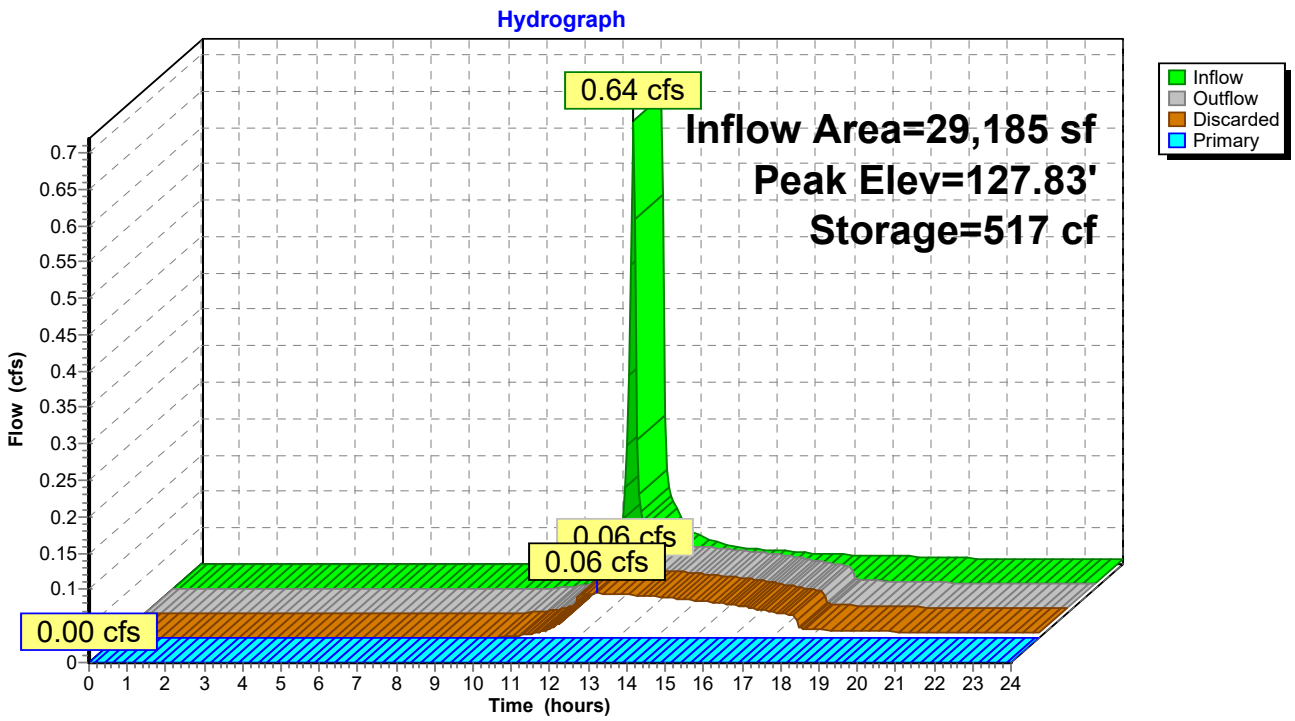
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
127.00	512	0	0
127.50	512	256	256

Device	Routing	Invert	Outlet Devices
#1	Primary	127.57'	**8.0" Round Culvert Barrel** L= 13.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 127.57' / 127.50' S= 0.0054 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.35 sf
#2	Device 1	129.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	127.00'	**2.410 in/hr Exfiltration over Surface area**
#4	Device 1	128.00'	**5.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.06 cfs @ 12.50 hrs HW=127.83' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=127.00' (Free Discharge)
└─**1=Culvert Barrel** (Controls 0.00 cfs)
  ├─**2=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Pond AB1: Above Ground Infiltration Basin 1



Stage-Area-Storage for Pond AB1: Above Ground Infiltration Basin 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
127.00	512	0
127.05	547	11
127.10	583	24
127.15	618	39
127.20	653	55
127.25	689	73
127.30	724	93
127.35	759	115
127.40	794	138
127.45	830	164
127.50	865	191
127.55	900	235
127.60	936	281
127.65	971	328
127.70	1,006	378
127.75	1,042	429
127.80	1,077	482
127.85	1,112	537
127.90	1,147	593
127.95	1,183	651
128.00	1,218	711
128.05	1,255	773
128.10	1,291	837
128.15	1,328	902
128.20	1,364	970
128.25	1,401	1,039
128.30	1,437	1,110
128.35	1,474	1,182
128.40	1,510	1,257
128.45	1,547	1,334
128.50	1,584	1,412
128.55	1,620	1,492
128.60	1,657	1,574
128.65	1,693	1,658
128.70	1,730	1,743
128.75	1,766	1,830
128.80	1,803	1,920
128.85	1,839	2,011
128.90	1,876	2,104
128.95	1,912	2,198
129.00	1,949	2,295
129.05	1,989	2,393
129.10	2,029	2,494
129.15	2,069	2,596
129.20	2,109	2,701
129.25	2,149	2,807
129.30	2,189	2,916
129.35	2,229	3,026
129.40	2,269	3,139
129.45	2,309	3,253
129.50	2,349	3,369
129.55	2,389	3,488
129.60	2,429	3,608
129.65	2,469	3,731
129.70	2,509	3,855
129.75	2,549	3,982
129.80	2,589	4,110
129.85	2,629	4,241
129.90	2,669	4,373
129.95	2,709	4,507
130.00	**2,749**	**4,644**

Summary for Pond AB3a: Above Ground Infiltration 3a

Inflow Area =	10,106 sf, 17.67% Impervious, Inflow Depth > 0.35" for 1-YR event				
Inflow =	0.11 cfs @	12.00 hrs, Volume=	291 cf		
Outflow =	0.05 cfs @	12.10 hrs, Volume=	290 cf, Atten= 53%, Lag= 5.9 min		
Discarded =	0.05 cfs @	12.10 hrs, Volume=	290 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= 132.03' @ 12.10 hrs Surf.Area= 929 sf Storage= 30 cf

Plug-Flow detention time= 6.3 min calculated for 290 cf (100% of inflow)
Center-of-Mass det. time= 4.6 min (918.3 - 913.7)

Volume	Invert	Avail.Storage	Storage Description
#1	132.00'	3,206 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

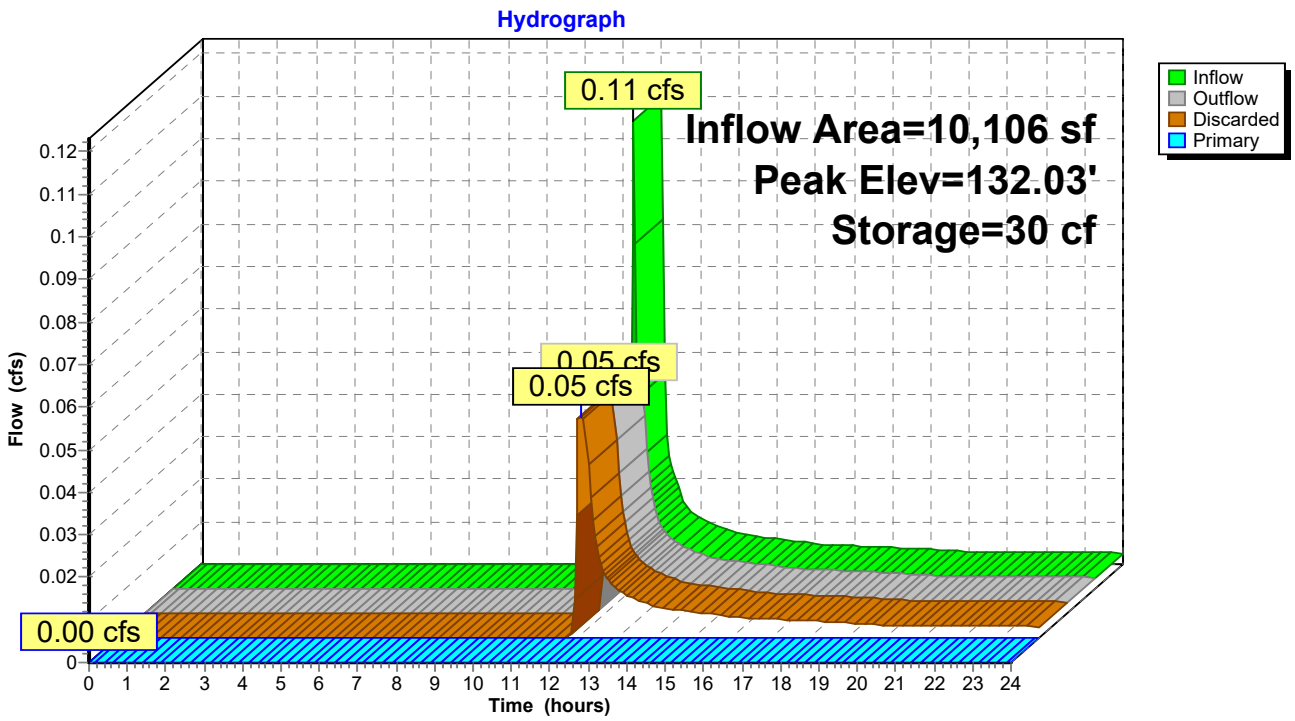
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
132.00	906	0	0
133.00	1,593	1,250	1,250
134.00	2,319	1,956	3,206

Device	Routing	Invert	Outlet Devices
#1	Discarded	132.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	133.00'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.05 cfs @ 12.10 hrs HW=132.03' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=132.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond AB3a: Above Ground Infiltration 3a



Stage-Area-Storage for Pond AB3a: Above Ground Infiltration 3a

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
132.00	906	0
132.02	920	18
132.04	933	37
132.06	947	56
132.08	961	75
132.10	975	94
132.12	988	114
132.14	1,002	134
132.16	1,016	154
132.18	1,030	174
132.20	1,043	195
132.22	1,057	216
132.24	1,071	237
132.26	1,085	259
132.28	1,098	281
132.30	1,112	303
132.32	1,126	325
132.34	1,140	348
132.36	1,153	371
132.38	1,167	394
132.40	1,181	417
132.42	1,195	441
132.44	1,208	465
132.46	1,222	489
132.48	1,236	514
132.50	1,250	539
132.52	1,263	564
132.54	1,277	589
132.56	1,291	615
132.58	1,304	641
132.60	1,318	667
132.62	1,332	694
132.64	1,346	721
132.66	1,359	748
132.68	1,373	775
132.70	1,387	803
132.72	1,401	830
132.74	1,414	859
132.76	1,428	887
132.78	1,442	916
132.80	1,456	945
132.82	1,469	974
132.84	1,483	1,003
132.86	1,497	1,033
132.88	1,511	1,063
132.90	1,524	1,094
132.92	1,538	1,124
132.94	1,552	1,155
132.96	1,566	1,186
132.98	1,579	1,218
133.00	1,593	1,250
133.02	1,608	1,282
133.04	1,622	1,314
133.06	1,637	1,346
133.08	1,651	1,379
133.10	1,666	1,412
133.12	1,680	1,446
133.14	1,695	1,480
133.16	1,709	1,514
133.18	1,724	1,548
133.20	1,738	1,583
133.22	1,753	1,618
133.24	1,767	1,653
133.26	1,782	1,688
133.28	1,796	1,724
133.30	1,811	1,760
133.32	1,825	1,796
133.34	1,840	1,833
133.36	1,854	1,870
133.38	1,869	1,907
133.40	1,883	1,945
133.42	1,898	1,983
133.44	1,912	2,021
133.46	1,927	2,059
133.48	1,941	2,098
133.50	1,956	2,137
133.52	1,971	2,176
133.54	1,985	2,216
133.56	2,000	2,255
133.58	2,014	2,296
133.60	2,029	2,336
133.62	2,043	2,377
133.64	2,058	2,418
133.66	2,072	2,459
133.68	2,087	2,501
133.70	2,101	2,542
133.72	2,116	2,585
133.74	2,130	2,627
133.76	2,145	2,670
133.78	2,159	2,713
133.80	2,174	2,756
133.82	2,188	2,800
133.84	2,203	2,844
133.86	2,217	2,888
133.88	2,232	2,932
133.90	2,246	2,977
133.92	2,261	3,022
133.94	2,275	3,068
133.96	2,290	3,113
133.98	2,304	3,159
134.00	**2,319**	**3,206**

Summary for Pond AB3b: Above Ground Infiltration 3b

Inflow Area =	20,081 sf, 75.70% Impervious, Inflow Depth > 1.82" for 1-YR event				
Inflow =	1.39 cfs @	11.97 hrs,	Volume=	3,054 cf	
Outflow =	0.03 cfs @	14.99 hrs,	Volume=	1,556 cf,	Atten= 98%, Lag= 181.4 min
Discarded =	0.03 cfs @	14.99 hrs,	Volume=	1,556 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= 132.40' @ 14.99 hrs Surf.Area= 1,429 sf Storage= 1,936 cf

Plug-Flow detention time= 334.2 min calculated for 1,556 cf (51% of inflow)
Center-of-Mass det. time= 222.5 min (1,019.5 - 797.0)

Volume	Invert	Avail.Storage	Storage Description
#1	130.00'	5,050 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

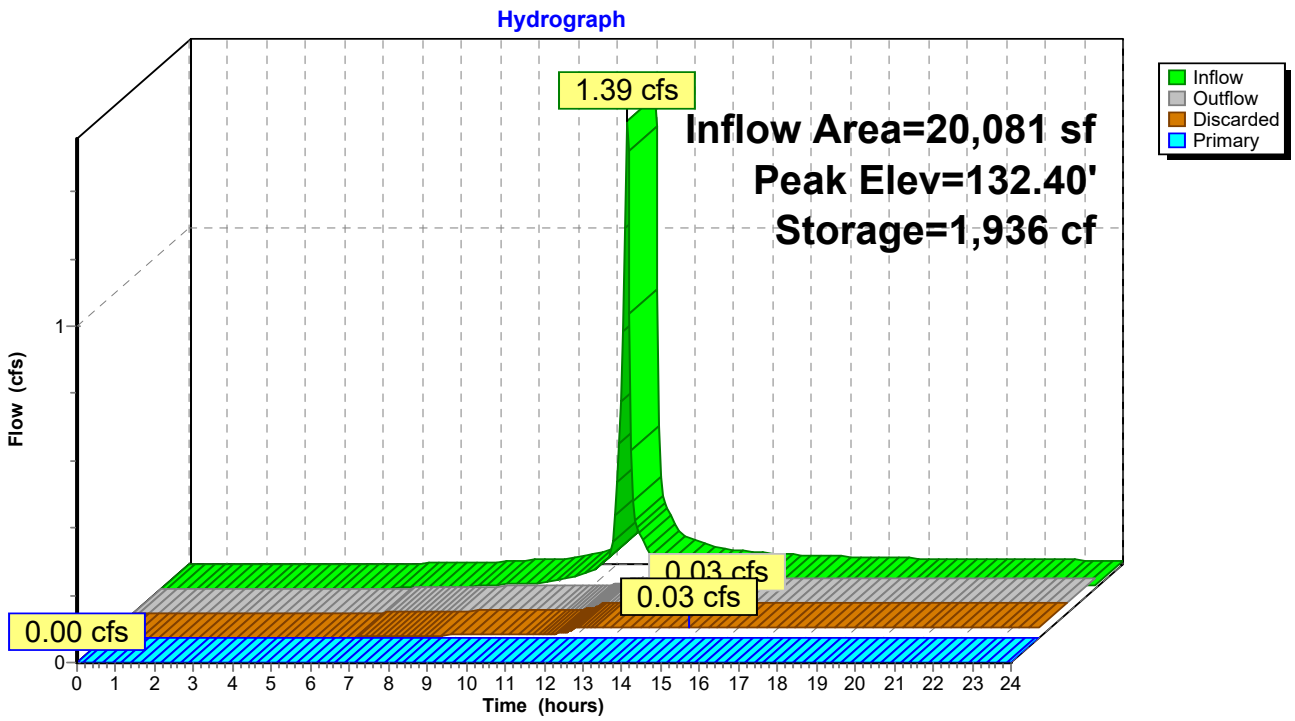
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
130.00	307	0	0
131.00	671	489	489
132.00	1,175	923	1,412
133.00	1,806	1,491	2,903
134.00	2,488	2,147	5,050

Device	Routing	Invert	Outlet Devices
#1	Primary	133.15'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Discarded	130.00'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 14.99 hrs HW=132.40' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=130.00' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond AB3b: Above Ground Infiltration 3b



Stage-Area-Storage for Pond AB3b: Above Ground Infiltration 3b

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.00	307	0
130.05	325	16
130.10	343	33
130.15	362	50
130.20	380	69
130.25	398	88
130.30	416	108
130.35	434	130
130.40	453	152
130.45	471	175
130.50	489	199
130.55	507	224
130.60	525	250
130.65	544	276
130.70	562	304
130.75	580	333
130.80	598	362
130.85	616	392
130.90	635	424
130.95	653	456
131.00	671	489
131.05	696	523
131.10	721	559
131.15	747	595
131.20	772	633
131.25	797	673
131.30	822	713
131.35	847	755
131.40	873	798
131.45	898	842
131.50	923	888
131.55	948	934
131.60	973	982
131.65	999	1,032
131.70	1,024	1,082
131.75	1,049	1,134
131.80	1,074	1,187
131.85	1,099	1,241
131.90	1,125	1,297
131.95	1,150	1,354
132.00	1,175	1,412
132.05	1,207	1,472
132.10	1,238	1,533
132.15	1,270	1,595
132.20	1,301	1,660
132.25	1,333	1,725
132.30	1,364	1,793
132.35	1,396	1,862
132.40	1,427	1,932
132.45	1,459	2,005
132.50	1,491	2,078
132.55	1,522	2,154
132.60	1,554	2,231
132.65	1,585	2,309
132.70	1,617	2,389
132.75	1,648	2,471
132.80	1,680	2,554
132.85	1,711	2,639
132.90	1,743	2,725
132.95	1,774	2,813
133.00	1,806	2,903
133.05	1,840	2,994
133.10	1,874	3,087
133.15	1,908	3,181
133.20	1,942	3,277
133.25	1,977	3,375
133.30	2,011	3,475
133.35	2,045	3,576
133.40	2,079	3,679
133.45	2,113	3,784
133.50	2,147	3,891
133.55	2,181	3,999
133.60	2,215	4,109
133.65	2,249	4,220
133.70	2,283	4,334
133.75	2,318	4,449
133.80	2,352	4,566
133.85	2,386	4,684
133.90	2,420	4,804
133.95	2,454	4,926
134.00	**2,488**	**5,050**

Summary for Pond IB1: Infiltration Basin 1

Inflow Area = 14,505 sf,100.00% Impervious, Inflow Depth > 2.32" for 1-YR event
Inflow = 1.16 cfs @ 11.96 hrs, Volume= 2,803 cf
Outflow = 0.11 cfs @ 11.65 hrs, Volume= 2,800 cf, Atten= 91%, Lag= 0.0 min
Discarded = 0.11 cfs @ 11.65 hrs, Volume= 2,800 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= 129.91' @ 12.43 hrs Surf.Area= 1,889 sf Storage= 1,012 cf

Plug-Flow detention time= 62.2 min calculated for 2,794 cf (100% of inflow)
Center-of-Mass det. time= 61.5 min (818.6 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	129.00'	1,726 cf	**25.25'W x 74.82'L x 3.50'H Field A** 6,612 cf Overall - 2,297 cf Embedded = 4,315 cf x 40.0% Voids
#2A	129.50'	2,297 cf	**ADS_StormTech SC-740 +Cap** x 50 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 5 Rows of 10 Chambers
		4,023 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	130.24'	**12.0" Round Culvert** L= 10.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 130.24' / 130.00' S= 0.0240 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#2	Discarded	129.00'	**2.410 in/hr Exfiltration over Surface area**
#3	Device 1	130.40'	**3.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	132.05'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.11 cfs @ 11.65 hrs HW=129.05' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=129.00' (Free Discharge)
└─**1=Culvert** (Controls 0.00 cfs)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB1: Infiltration Basin 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

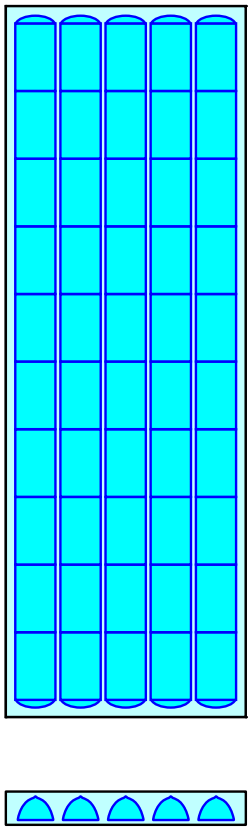
10 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 72.82' Row Length +12.0" End Stone x 2 = 74.82' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

50 Chambers x 45.9 cf = 2,297.0 cf Chamber Storage

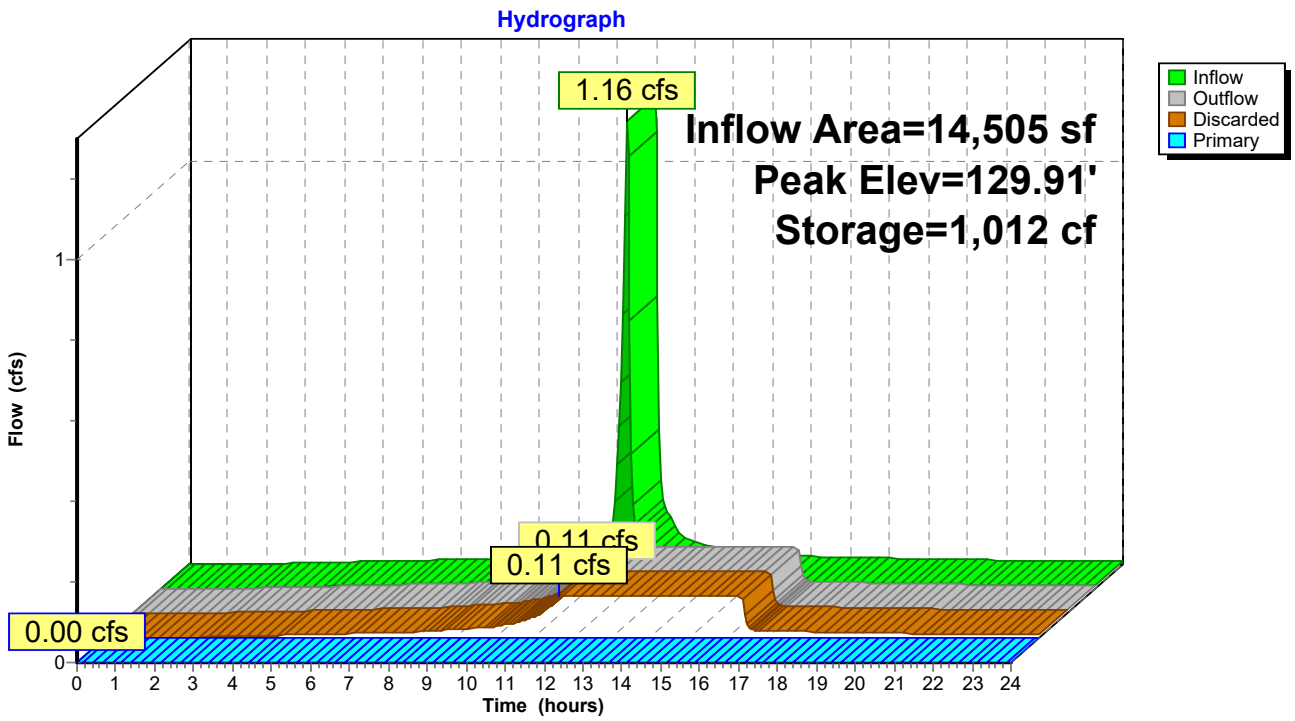
6,611.9 cf Field - 2,297.0 cf Chambers = 4,314.9 cf Stone x 40.0% Voids = 1,726.0 cf Stone Storage

Chamber Storage + Stone Storage = 4,023.0 cf = 0.092 af
Overall Storage Efficiency = 60.8%
Overall System Size = 74.82' x 25.25' x 3.50'

50 Chambers
244.9 cy Field
159.8 cy Stone



Pond IB1: Infiltration Basin 1



Stage-Area-Storage for Pond IB1: Infiltration Basin 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
129.00	**1,889**	0
129.05	1,889	38
129.10	1,889	76
129.15	1,889	113
129.20	1,889	151
129.25	1,889	189
129.30	1,889	227
129.35	1,889	264
129.40	1,889	302
129.45	1,889	340
129.50	1,889	378
129.55	1,889	455
129.60	1,889	533
129.65	1,889	610
129.70	1,889	687
129.75	1,889	764
129.80	1,889	841
129.85	1,889	917
129.90	1,889	993
129.95	1,889	1,069
130.00	1,889	1,145
130.05	1,889	1,220
130.10	1,889	1,295
130.15	1,889	1,369
130.20	1,889	1,444
130.25	1,889	1,517
130.30	1,889	1,591
130.35	1,889	1,664
130.40	1,889	1,736
130.45	1,889	1,809
130.50	1,889	1,880
130.55	1,889	1,952
130.60	1,889	2,022
130.65	1,889	2,093
130.70	1,889	2,162
130.75	1,889	2,232
130.80	1,889	2,300
130.85	1,889	2,368
130.90	1,889	2,435
130.95	1,889	2,502
131.00	1,889	2,568
131.05	1,889	2,634
131.10	1,889	2,698
131.15	1,889	2,762
131.20	1,889	2,825
131.25	1,889	2,887
131.30	1,889	2,948
131.35	1,889	3,008
131.40	1,889	3,067
131.45	1,889	3,124
131.50	1,889	3,181
131.55	1,889	3,236
131.60	1,889	3,290
131.65	1,889	3,342
131.70	1,889	3,392
131.75	1,889	3,439
131.80	1,889	3,484
131.85	1,889	3,526
131.90	1,889	3,567
131.95	1,889	3,607
132.00	1,889	3,645
132.05	1,889	3,683
132.10	1,889	3,721
132.15	1,889	3,758
132.20	1,889	3,796
132.25	1,889	3,834
132.30	1,889	3,872
132.35	1,889	3,910
132.40	1,889	3,947
132.45	1,889	3,985
132.50	1,889	**4,023**

Summary for Pond IB2a: Infiltration Basin 2a

Inflow Area =	26,310 sf, 88.91% Impervious, Inflow Depth > 1.92" for 1-YR event				
Inflow =	1.89 cfs @	11.96 hrs, Volume=	4,199 cf		
Outflow =	0.08 cfs @	13.27 hrs, Volume=	3,210 cf, Atten= 96%, Lag= 78.4 min		
Discarded =	0.06 cfs @	10.95 hrs, Volume=	3,098 cf		
Primary =	0.02 cfs @	13.27 hrs, Volume=	112 cf		

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 128.84' @ 13.27 hrs Surf.Area= 2,458 sf Storage= 2,161 cf

Plug-Flow detention time= 279.5 min calculated for 3,204 cf (76% of inflow)
Center-of-Mass det. time= 193.4 min (984.5 - 791.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	127.50'	2,392 cf	**30.00'W x 81.94'L x 3.67'H Field A** 9,013 cf Overall - 3,032 cf Embedded = 5,981 cf x 40.0% Voids
#2A	128.00'	3,032 cf	**ADS_StormTech SC-740 +Cap** x 66 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 6 Rows of 11 Chambers
		5,424 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	128.60'	**15.0" Round Culvert** L= 55.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 128.60' / 128.00' S= 0.0109 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Discarded	127.50'	**1.020 in/hr Exfiltration over Surface area**
#3	Device 1	128.80'	**10.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	130.10'	**10.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	130.99'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.06 cfs @ 10.95 hrs HW=127.54' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.02 cfs @ 13.27 hrs HW=128.84' (Free Discharge)
└─**1=Culvert** (Passes 0.02 cfs of 0.31 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.02 cfs @ 0.65 fps)
  ├─**4=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB2a: Infiltration Basin 2a - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

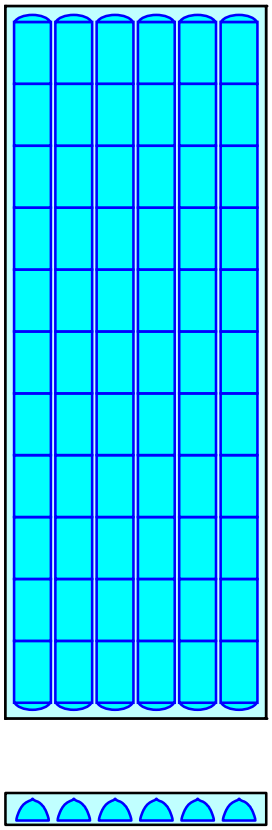
11 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 79.94' Row Length +12.0" End Stone x 2 = 81.94' Base Length
6 Rows x 51.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.00' Base Width
6.0" Base + 30.0" Chamber Height + 8.0" Cover = 3.67' Field Height

66 Chambers x 45.9 cf = 3,032.0 cf Chamber Storage

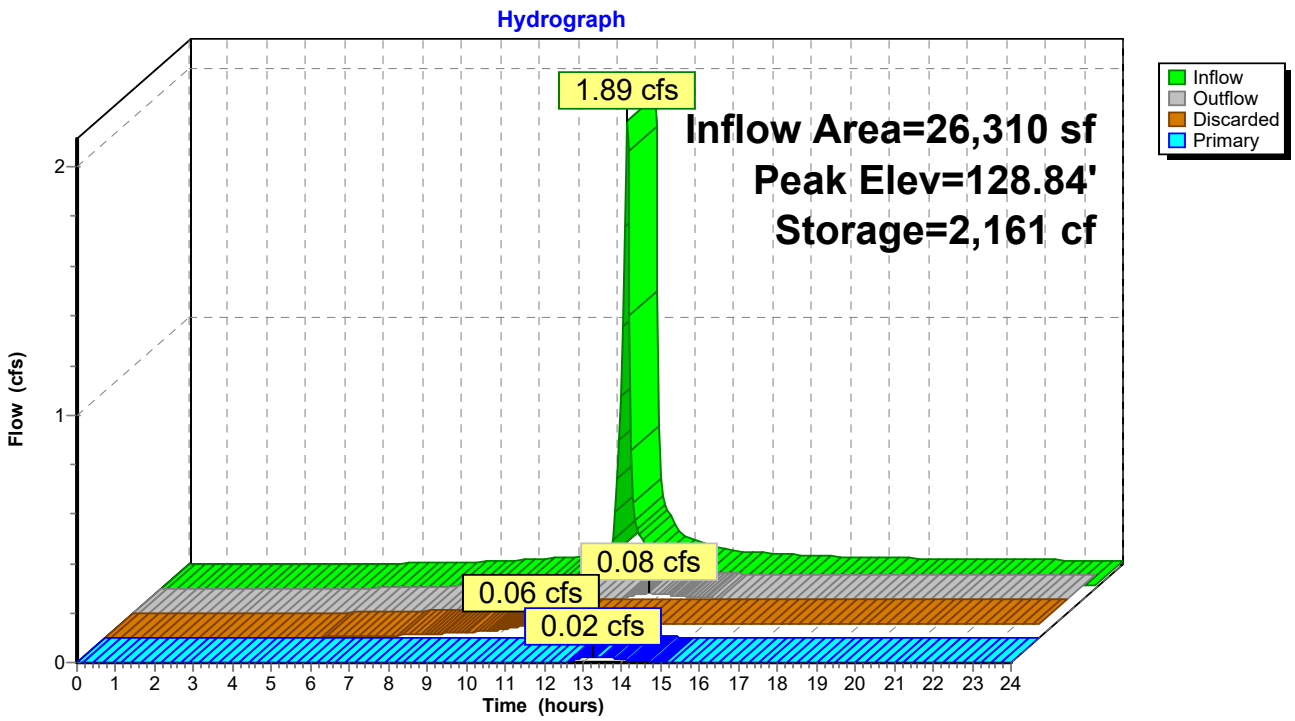
9,013.0 cf Field - 3,032.0 cf Chambers = 5,981.0 cf Stone x 40.0% Voids = 2,392.4 cf Stone Storage

Chamber Storage + Stone Storage = 5,424.4 cf = 0.125 af
Overall Storage Efficiency = 60.2%
Overall System Size = 81.94' x 30.00' x 3.67'

66 Chambers
333.8 cy Field
221.5 cy Stone



Pond IB2a: Infiltration Basin 2a



Stage-Area-Storage for Pond IB2a: Infiltration Basin 2a

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
127.50	**2,458**	0
127.55	2,458	49
127.60	2,458	98
127.65	2,458	147
127.70	2,458	197
127.75	2,458	246
127.80	2,458	295
127.85	2,458	344
127.90	2,458	393
127.95	2,458	442
128.00	2,458	492
128.05	2,458	593
128.10	2,458	695
128.15	2,458	796
128.20	2,458	897
128.25	2,458	998
128.30	2,458	1,099
128.35	2,458	1,199
128.40	2,458	1,298
128.45	2,458	1,398
128.50	2,458	1,497
128.55	2,458	1,595
128.60	2,458	1,694
128.65	2,458	1,791
128.70	2,458	1,888
128.75	2,458	1,985
128.80	2,458	2,081
128.85	2,458	2,177
128.90	2,458	2,272
128.95	2,458	2,367
129.00	2,458	2,461
129.05	2,458	2,554
129.10	2,458	2,647
129.15	2,458	2,739
129.20	2,458	2,830
129.25	2,458	2,921
129.30	2,458	3,011
129.35	2,458	3,100
129.40	2,458	3,188
129.45	2,458	3,275
129.50	2,458	3,362
129.55	2,458	3,447
129.60	2,458	3,532
129.65	2,458	3,615
129.70	2,458	3,698
129.75	2,458	3,779
129.80	2,458	3,858
129.85	2,458	3,937
129.90	2,458	4,014
129.95	2,458	4,089
130.00	2,458	4,164
130.05	2,458	4,236
130.10	2,458	4,306
130.15	2,458	4,374
130.20	2,458	4,439
130.25	2,458	4,501
130.30	2,458	4,559
130.35	2,458	4,614
130.40	2,458	4,667
130.45	2,458	4,719
130.50	2,458	4,769
130.55	2,458	4,818
130.60	2,458	4,867
130.65	2,458	4,916
130.70	2,458	4,966
130.75	2,458	5,015
130.80	2,458	5,064
130.85	2,458	5,113
130.90	2,458	5,162
130.95	2,458	5,211
131.00	2,458	5,261
131.05	2,458	5,310
131.10	2,458	5,359
131.15	2,458	**5,408**

Summary for Pond IB2c: Infiltration Basin Area 2c

Inflow Area =	15,551 sf, 65.27% Impervious, Inflow Depth > 1.28" for 1-YR event				
Inflow =	0.79 cfs @	11.97 hrs, Volume=	1,662 cf		
Outflow =	0.06 cfs @	11.70 hrs, Volume=	1,660 cf,	Atten= 93%,	Lag= 0.0 min
Discarded =	0.06 cfs @	11.70 hrs, Volume=	1,660 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= 130.62' @ 12.69 hrs Surf.Area= 2,373 sf Storage= 690 cf

Plug-Flow detention time= 102.2 min calculated for 1,660 cf (100% of inflow)
Center-of-Mass det. time= 101.1 min (930.0 - 828.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	130.00'	1,505 cf	**27.00'W x 87.91'L x 2.00'H Field A** 4,747 cf Overall - 985 cf Embedded = 3,762 cf x 40.0% Voids
#2A	130.50'	985 cf	**ADS_StormTech SC-160LP +Cap** x 144 Inside #1 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 12 Rows of 12 Chambers
		2,489 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	130.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	129.20'	**8.0" Round Culvert** L= 14.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 129.20' / 129.00' S= 0.0143 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.35 sf
#3	Device 2	130.70'	**11.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 2	131.40'	**2.0" Vert. Orifice/Grate** C= 0.600
#5	Device 2	131.88'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.06 cfs @ 11.70 hrs HW=130.03' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=130.00' (Free Discharge)
└─**2=Culvert** (Passes 0.00 cfs of 1.32 cfs potential flow)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  ├─**4=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB2c: Infiltration Basin Area 2c - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-160LP +Cap (ADS StormTech® SC-160LP with cap length)
Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf
Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap

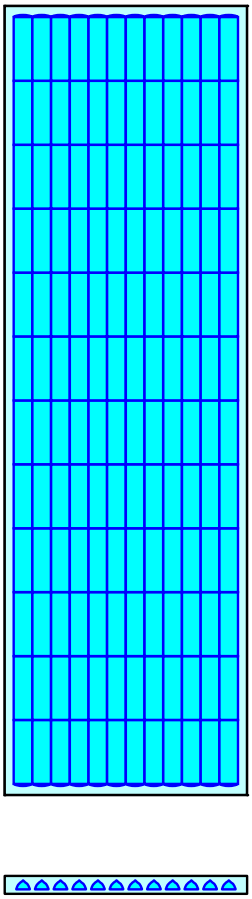
12 Chambers/Row x 7.12' Long +0.23' Cap Length x 2 = 85.91' Row Length +12.0" End Stone x 2 = 87.91' Base Length
12 Rows x 25.0" Wide + 12.0" Side Stone x 2 = 27.00' Base Width
6.0" Base + 12.0" Chamber Height + 6.0" Cover = 2.00' Field Height

144 Chambers x 6.8 cf = 984.5 cf Chamber Storage

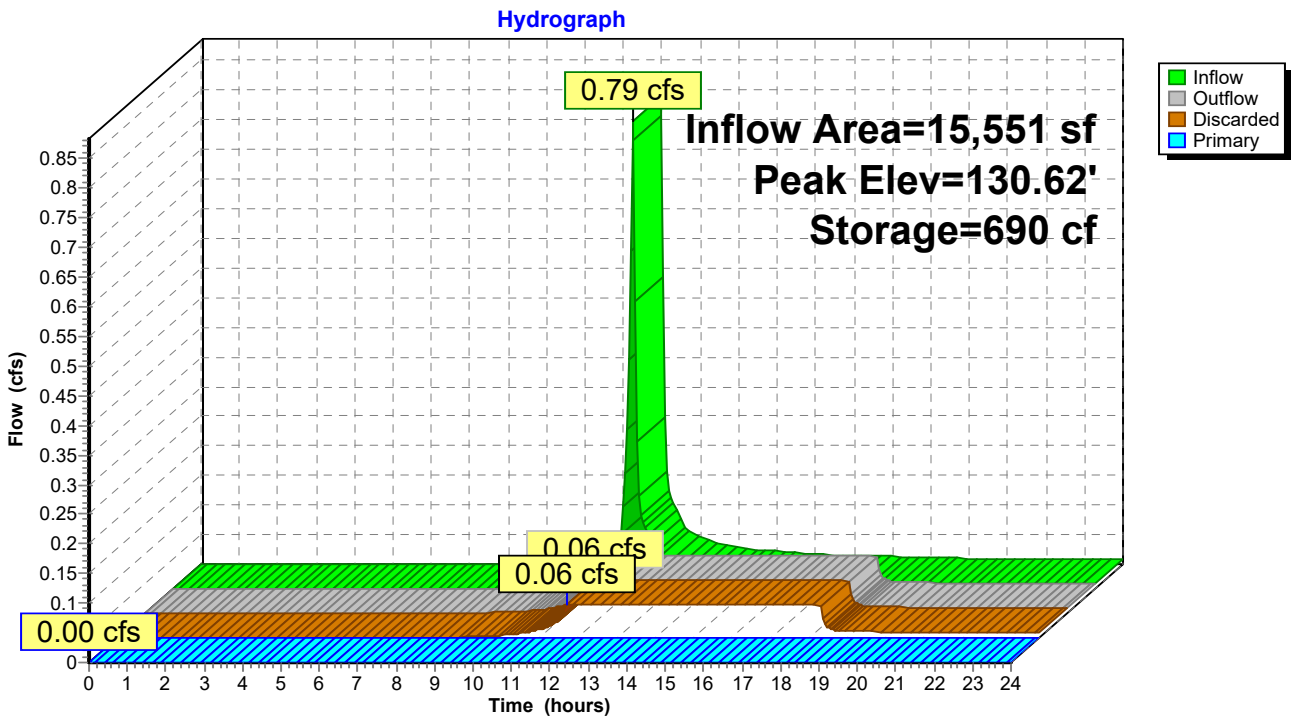
4,747.0 cf Field - 984.5 cf Chambers = 3,762.4 cf Stone x 40.0% Voids = 1,505.0 cf Stone Storage

Chamber Storage + Stone Storage = 2,489.5 cf = 0.057 af
Overall Storage Efficiency = 52.4%
Overall System Size = 87.91' x 27.00' x 2.00'

144 Chambers
175.8 cy Field
139.3 cy Stone



Pond IB2c: Infiltration Basin Area 2c



Stage-Area-Storage for Pond IB2c: Infiltration Basin Area 2c

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.00	**2,373**	0
130.02	2,373	19
130.04	2,373	38
130.06	2,373	57
130.08	2,373	76
130.10	2,373	95
130.12	2,373	114
130.14	2,373	133
130.16	2,373	152
130.18	2,373	171
130.20	2,373	190
130.22	2,373	209
130.24	2,373	228
130.26	2,373	247
130.28	2,373	266
130.30	2,373	285
130.32	2,373	304
130.34	2,373	323
130.36	2,373	342
130.38	2,373	361
130.40	2,373	380
130.42	2,373	399
130.44	2,373	418
130.46	2,373	437
130.48	2,373	456
130.50	2,373	475
130.52	2,373	512
130.54	2,373	549
130.56	2,373	587
130.58	2,373	624
130.60	2,373	661
130.62	2,373	698
130.64	2,373	735
130.66	2,373	772
130.68	2,373	808
130.70	2,373	844
130.72	2,373	880
130.74	2,373	916
130.76	2,373	952
130.78	2,373	987
130.80	2,373	1,022
130.82	2,373	1,057
130.84	2,373	1,092
130.86	2,373	1,127
130.88	2,373	1,161
130.90	2,373	1,195
130.92	2,373	1,229
130.94	2,373	1,263
130.96	2,373	1,296
130.98	2,373	1,329
131.00	2,373	1,361
131.02	2,373	1,394
131.04	2,373	1,426
131.06	2,373	1,457
131.08	2,373	1,489
131.10	2,373	1,519
131.12	2,373	1,550
131.14	2,373	1,580
131.16	2,373	1,609
131.18	2,373	1,638
131.20	2,373	1,667
131.22	2,373	1,695
131.24	2,373	1,722
131.26	2,373	1,749
131.28	2,373	1,774
131.30	2,373	1,799
131.32	2,373	1,824
131.34	2,373	1,847
131.36	2,373	1,870
131.38	2,373	1,892
131.40	2,373	1,914
131.42	2,373	1,935
131.44	2,373	1,955
131.46	2,373	1,976
131.48	2,373	1,995
131.50	2,373	2,015
131.52	2,373	2,034
131.54	2,373	2,053
131.56	2,373	2,072
131.58	2,373	2,091
131.60	2,373	2,110
131.62	2,373	2,129
131.64	2,373	2,148
131.66	2,373	2,167
131.68	2,373	2,186
131.70	2,373	2,205
131.72	2,373	2,224
131.74	2,373	2,243
131.76	2,373	2,262
131.78	2,373	2,281
131.80	2,373	2,300
131.82	2,373	2,319
131.84	2,373	2,338
131.86	2,373	2,357
131.88	2,373	2,376
131.90	2,373	2,395
131.92	2,373	2,414
131.94	2,373	2,433
131.96	2,373	2,452
131.98	2,373	2,471
132.00	2,373	**2,489**

Summary for Pond IB2e: Infiltration Basin 2b

Inflow Area =	15,464 sf, 93.24% Impervious, Inflow Depth > 2.01" for 1-YR event				
Inflow =	1.15 cfs @	11.96 hrs,	Volume=	2,590 cf	
Outflow =	0.14 cfs @	11.70 hrs,	Volume=	2,588 cf,	Atten= 87%, Lag= 0.0 min
Discarded =	0.14 cfs @	11.70 hrs,	Volume=	2,588 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= 131.17' @ 12.26 hrs Surf.Area= 2,592 sf Storage= 871 cf

Plug-Flow detention time= 37.8 min calculated for 2,583 cf (100% of inflow)
Center-of-Mass det. time= 37.3 min (821.6 - 784.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	130.50'	2,002 cf	**34.83'W x 74.40'L x 2.50'H Field A** 6,479 cf Overall - 1,474 cf Embedded = 5,005 cf x 40.0% Voids
#2A	131.00'	1,474 cf	**ADS_StormTech SC-310 +Cap** x 100 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 10 Rows of 10 Chambers
		3,476 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	130.85'	**15.0" Round Culvert Barrel** L= 69.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 130.85' / 130.50' S= 0.0051 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Discarded	130.50'	**2.410 in/hr Exfiltration over Surface area**
#3	Device 1	131.40'	**3.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	132.63'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.14 cfs @ 11.70 hrs HW=130.54' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=130.50' (Free Discharge)
└─**1=Culvert Barrel** (Controls 0.00 cfs)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB2e: Infiltration Basin 2b - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-310 +Cap (ADS StormTech® SC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

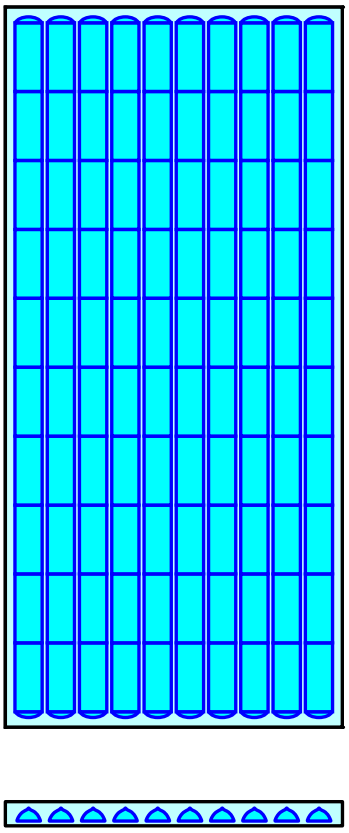
10 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 72.40' Row Length +12.0" End Stone x 2 = 74.40' Base Length
10 Rows x 34.0" Wide + 6.0" Spacing x 9 + 12.0" Side Stone x 2 = 34.83' Base Width
6.0" Base + 16.0" Chamber Height + 8.0" Cover = 2.50' Field Height

100 Chambers x 14.7 cf = 1,474.2 cf Chamber Storage

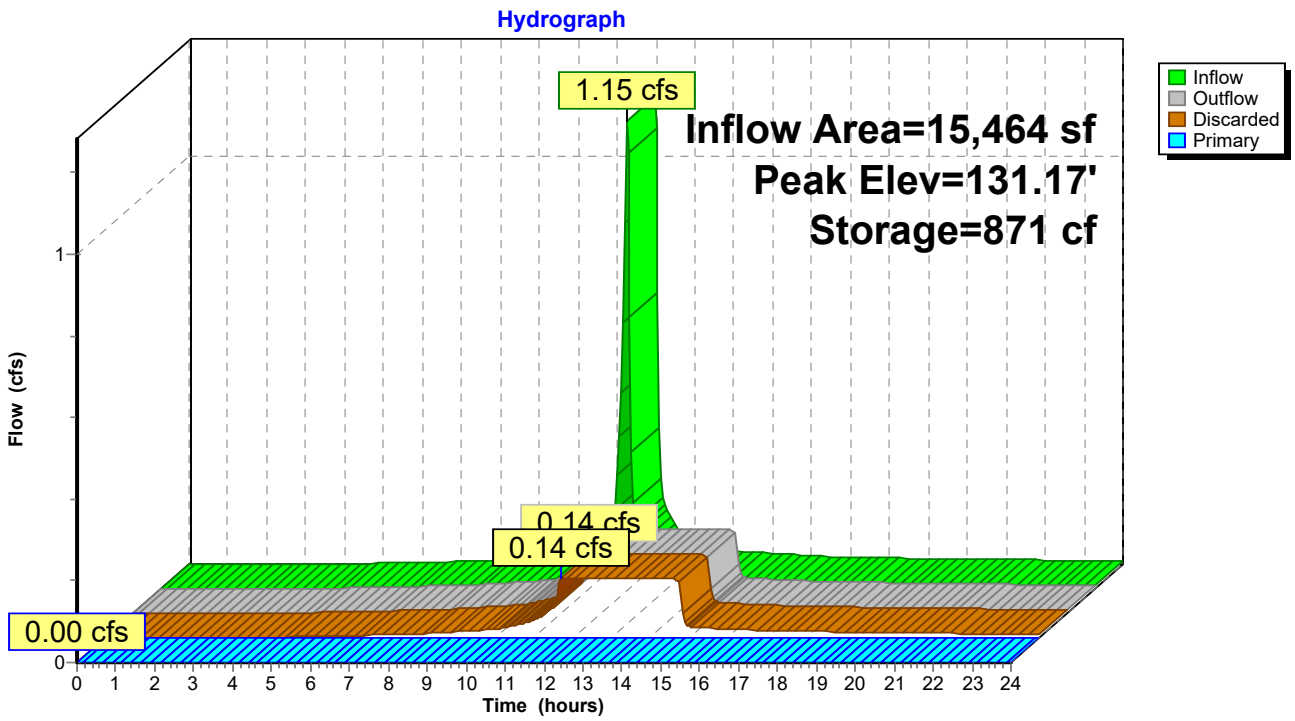
6,479.0 cf Field - 1,474.2 cf Chambers = 5,004.8 cf Stone x 40.0% Voids = 2,001.9 cf Stone Storage

Chamber Storage + Stone Storage = 3,476.1 cf = 0.080 af
Overall Storage Efficiency = 53.7%
Overall System Size = 74.40' x 34.83' x 2.50'

100 Chambers
240.0 cy Field
185.4 cy Stone



Pond IB2e: Infiltration Basin 2b



Stage-Area-Storage for Pond IB2e: Infiltration Basin 2b

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.50	**2,592**	0
130.55	2,592	52
130.60	2,592	104
130.65	2,592	155
130.70	2,592	207
130.75	2,592	259
130.80	2,592	311
130.85	2,592	363
130.90	2,592	415
130.95	2,592	466
131.00	2,592	518
131.05	2,592	622
131.10	2,592	724
131.15	2,592	827
131.20	2,592	928
131.25	2,592	1,029
131.30	2,592	1,129
131.35	2,592	1,227
131.40	2,592	1,325
131.45	2,592	1,422
131.50	2,592	1,517
131.55	2,592	1,611
131.60	2,592	1,703
131.65	2,592	1,794
131.70	2,592	1,884
131.75	2,592	1,972
131.80	2,592	2,057
131.85	2,592	2,141
131.90	2,592	2,222
131.95	2,592	2,301
132.00	2,592	2,377
132.05	2,592	2,449
132.10	2,592	2,516
132.15	2,592	2,579
132.20	2,592	2,638
132.25	2,592	2,695
132.30	2,592	2,750
132.35	2,592	2,802
132.40	2,592	2,854
132.45	2,592	2,906
132.50	2,592	2,958
132.55	2,592	3,010
132.60	2,592	3,061
132.65	2,592	3,113
132.70	2,592	3,165
132.75	2,592	3,217
132.80	2,592	3,269
132.85	2,592	3,321
132.90	2,592	3,372
132.95	2,592	3,424
133.00	2,592	**3,476**

Summary for Subcatchment PD-1: Prop. Drainage Area 1

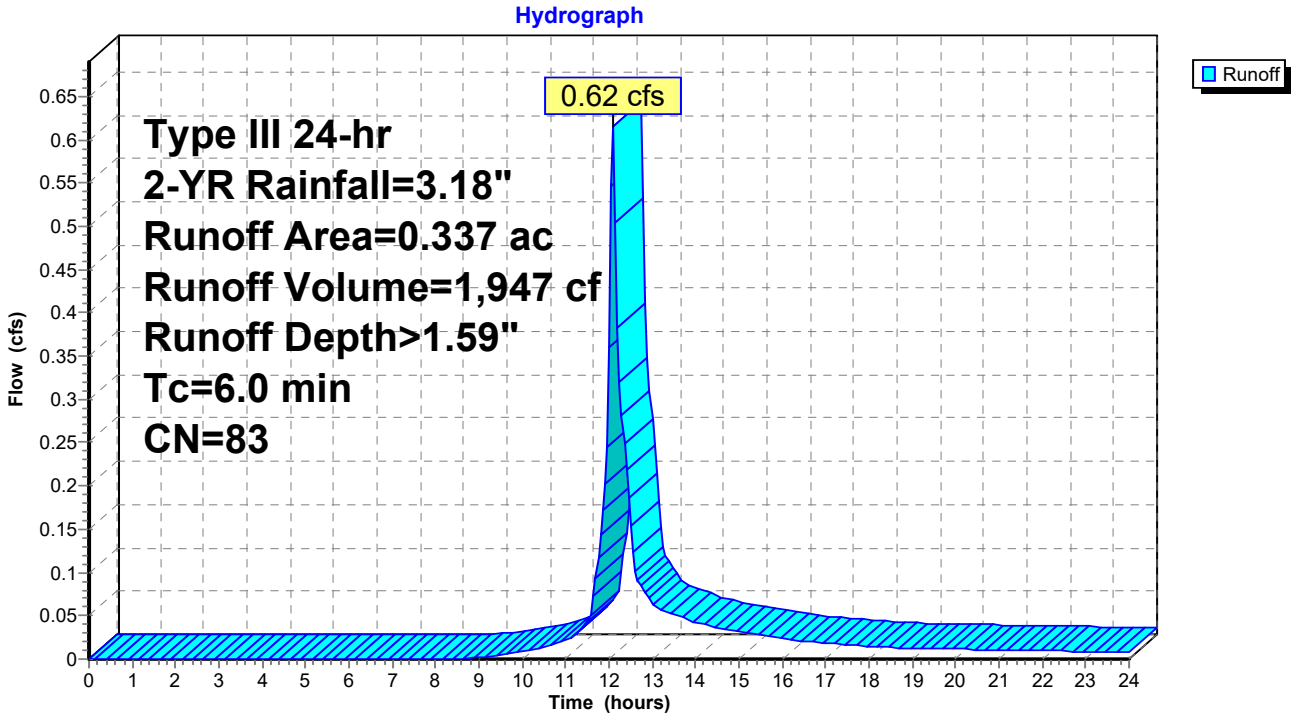
Runoff = 0.62 cfs @ 12.09 hrs, Volume= 1,947 cf, Depth> 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.18"

	Area (ac)	CN	Description
*	0.074	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.070	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.193	98	Paved parking
	0.337	83	Weighted Average
	0.144		42.73% Pervious Area
	0.193		57.27% Impervious Area

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

Subcatchment PD-1: Prop. Drainage Area 1



Summary for Subcatchment PD-2a: Prop. Drainage Area 2a

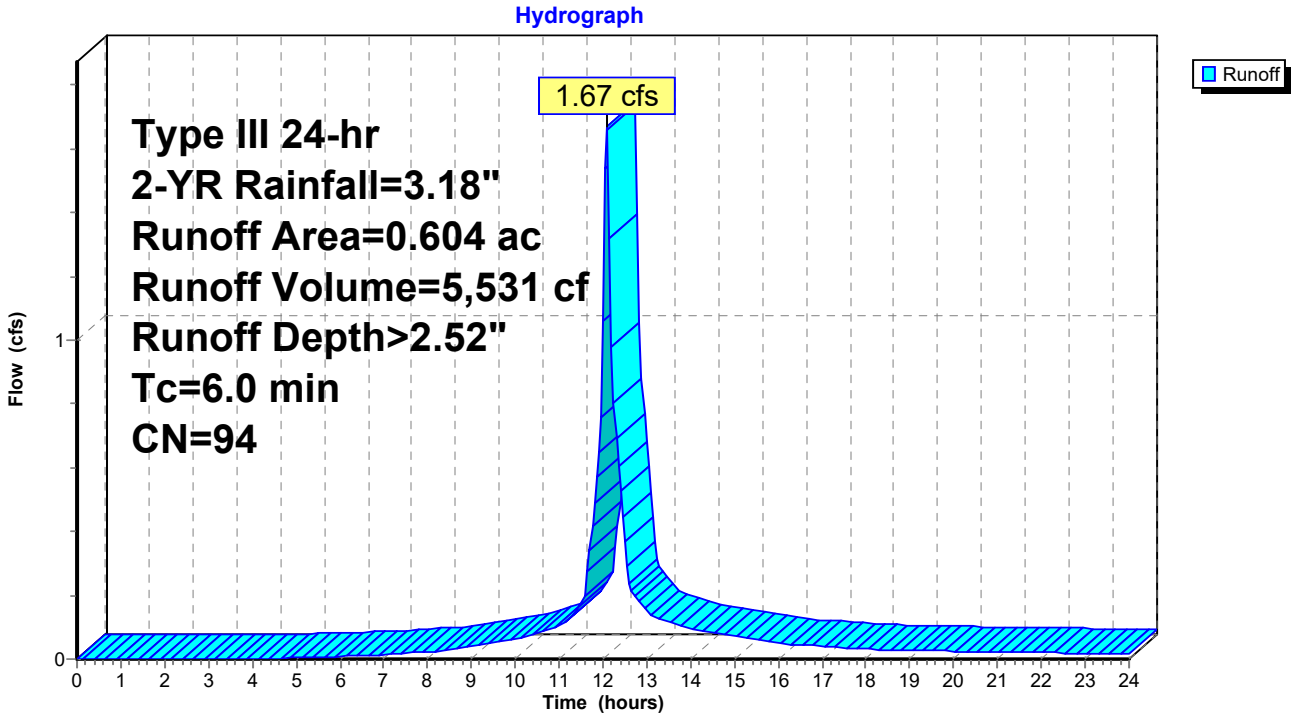
Runoff = 1.67 cfs @ 12.09 hrs, Volume= 5,531 cf, Depth> 2.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.18"

	Area (ac)	CN	Description
*	0.038	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.029	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.537	98	Paved parking
	0.604	94	Weighted Average
	0.067		11.09% Pervious Area
	0.537		88.91% Impervious Area

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

Subcatchment PD-2a: Prop. Drainage Area 2a



Summary for Subcatchment PD-2b: Prop. Drainage Area 2b

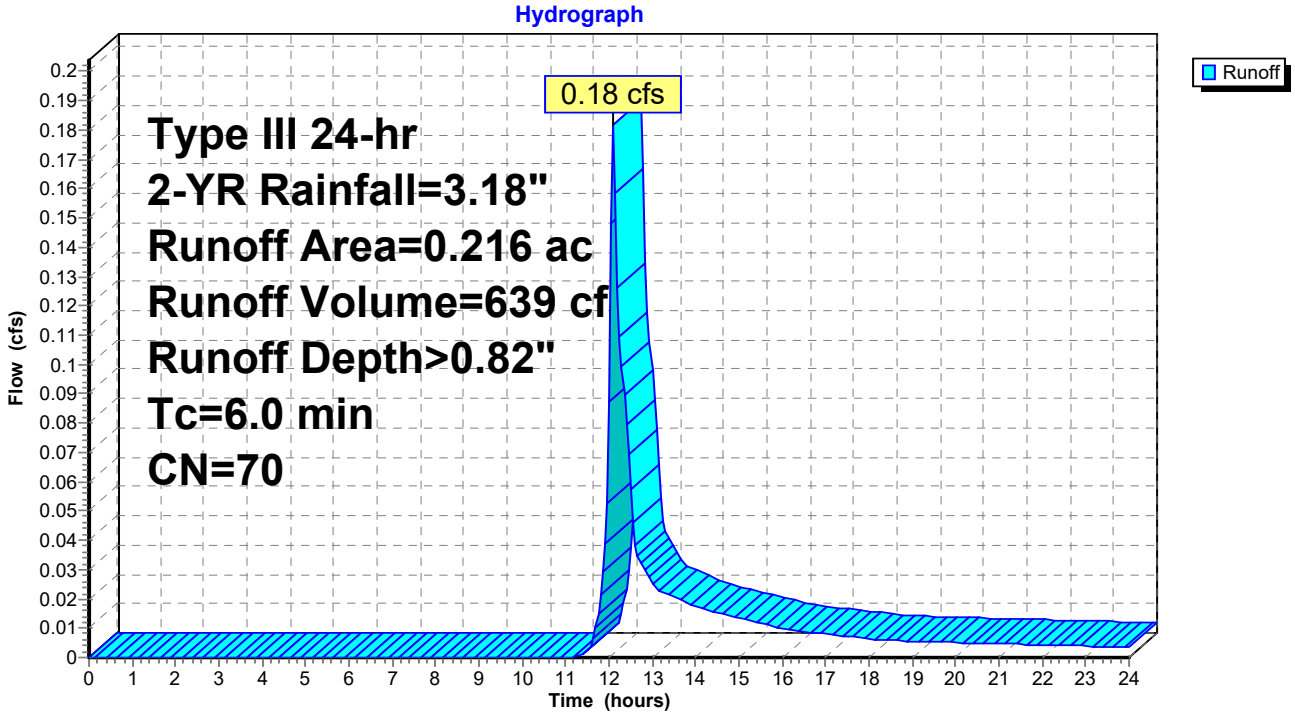
Runoff = 0.18 cfs @ 12.10 hrs, Volume= 639 cf, Depth> 0.82"

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-YR Rainfall=3.18"

	Area (ac)	CN	Description
*	0.174	74	Woods/grass comb., Fair, HSG B/D, 13
*	0.018	43	Woods/grass comb., Fair, HSG A. 36A
	0.024	65	Woods/grass comb., Fair, HSG B
	0.216	70	Weighted Average
	0.216		100.00% Pervious Area

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

Subcatchment PD-2b: Prop. Drainage Area 2b



Summary for Subcatchment PD-2c: Prop. Drainage Area 2c

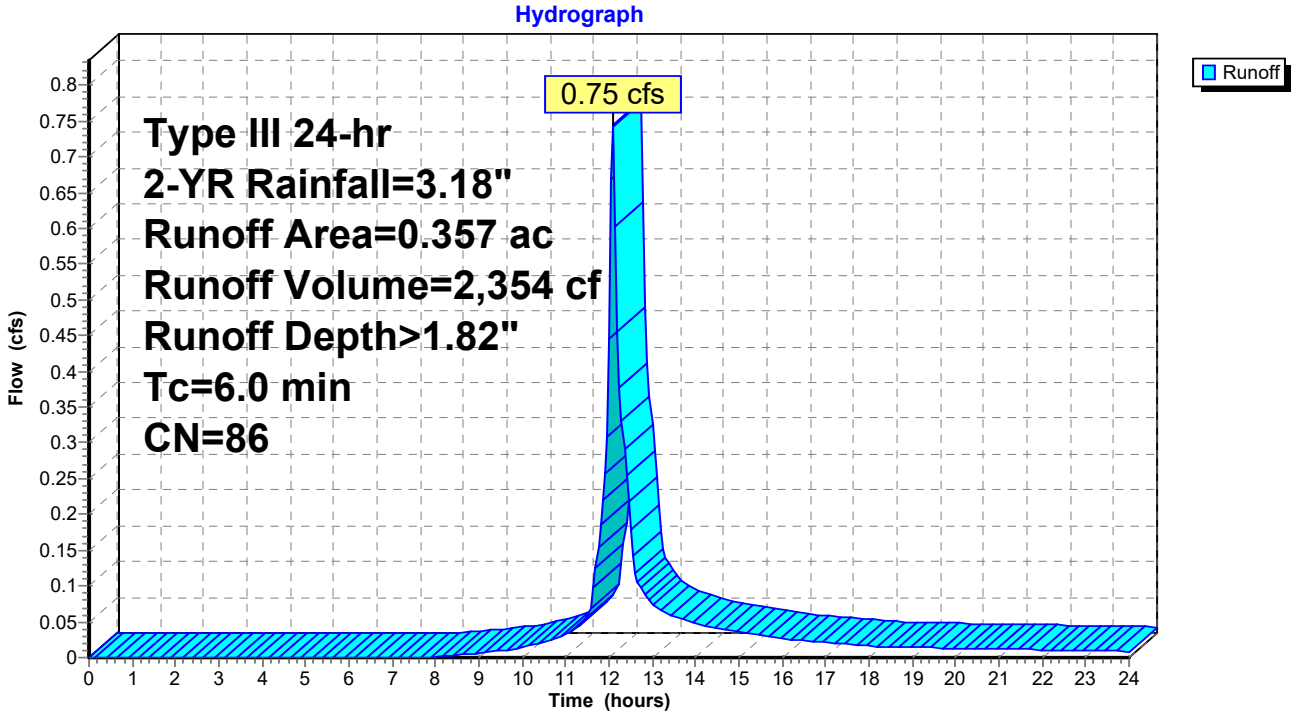
Runoff = 0.75 cfs @ 12.09 hrs, Volume= 2,354 cf, Depth> 1.82"

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-YR Rainfall=3.18"

	Area (ac)	CN	Description
*	0.061	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.042	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.021	49	50-75% Grass cover, Fair, HSG A, 36A
	0.233	98	Paved parking, HSG D
	0.357	86	Weighted Average
	0.124		34.73% Pervious Area
	0.233		65.27% Impervious Area

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

Subcatchment PD-2c: Prop. Drainage Area 2c



Summary for Subcatchment PD-2d: Prop. Drainage Area 2d

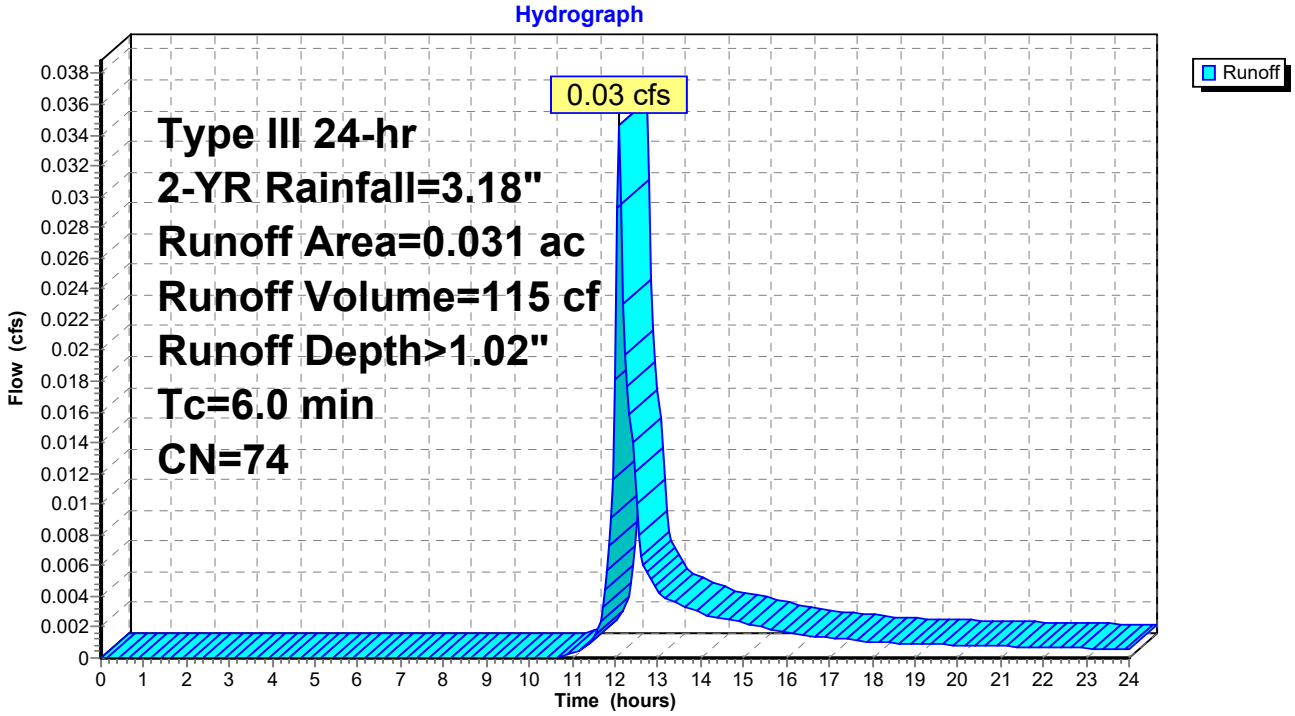
Runoff = 0.03 cfs @ 12.10 hrs, Volume= 115 cf, Depth> 1.02"

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-YR Rainfall=3.18"

	Area (ac)	CN	Description
*	0.031	74	Woods/grass comb., Fair, HSG B/D, 13
	0.031		100.00% Pervious Area

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

Subcatchment PD-2d: Prop. Drainage Area 2d



Summary for Subcatchment PD-2e: Prop. Drainage Area 2e

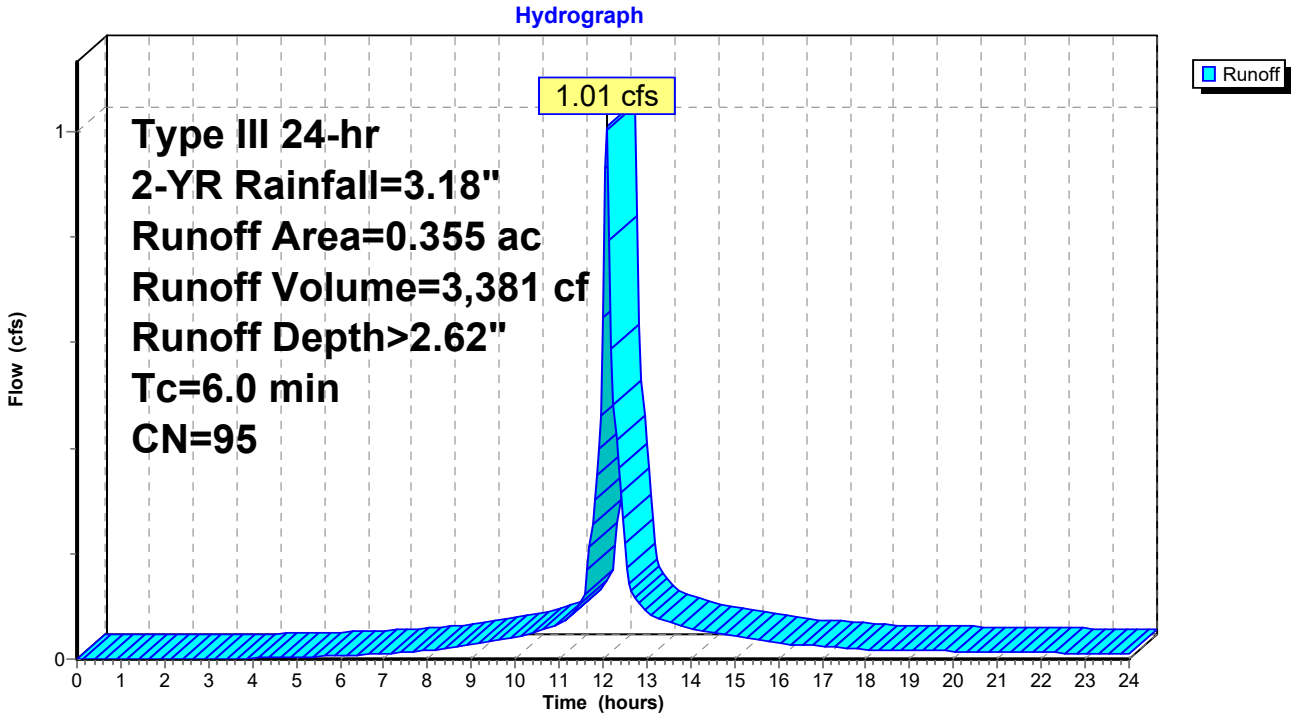
Runoff = 1.01 cfs @ 12.09 hrs, Volume= 3,381 cf, Depth> 2.62"

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-YR Rainfall=3.18"

	Area (ac)	CN	Description
*	0.004	43	Woods/grass comb., Fair, HSG A, 36A
*	0.020	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.331	98	Paved parking
	0.355	95	Weighted Average
	0.024		6.76% Pervious Area
	0.331		93.24% Impervious Area

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

Subcatchment PD-2e: Prop. Drainage Area 2e



Summary for Subcatchment PD-2f: Prop. Drainage Area 2d

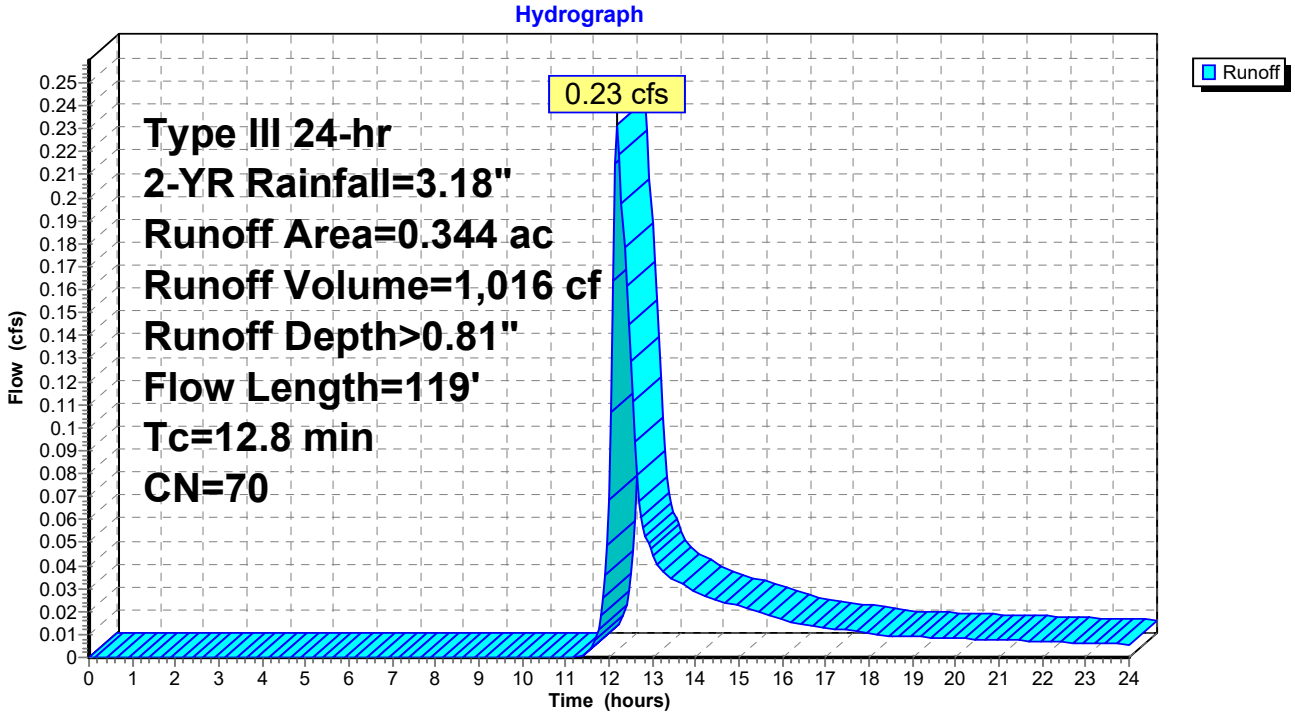
Runoff = 0.23 cfs @ 12.20 hrs, Volume= 1,016 cf, Depth> 0.81"

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-YR Rainfall=3.18"

	Area (ac)	CN	Description
*	0.296	74	Woods/grass comb., Fair, HSG B/D, 13
	0.048	43	Woods/grass comb., Fair, HSG A
	0.344	70	Weighted Average
	0.344		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	23	0.1600	0.13		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.18"
8.4	36	0.0270	0.07		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.18"
1.5	60	0.0167	0.65		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
12.8	119	Total			

Subcatchment PD-2f: Prop. Drainage Area 2d



Summary for Subcatchment PD-3a: Prop. Drainage Area 3a

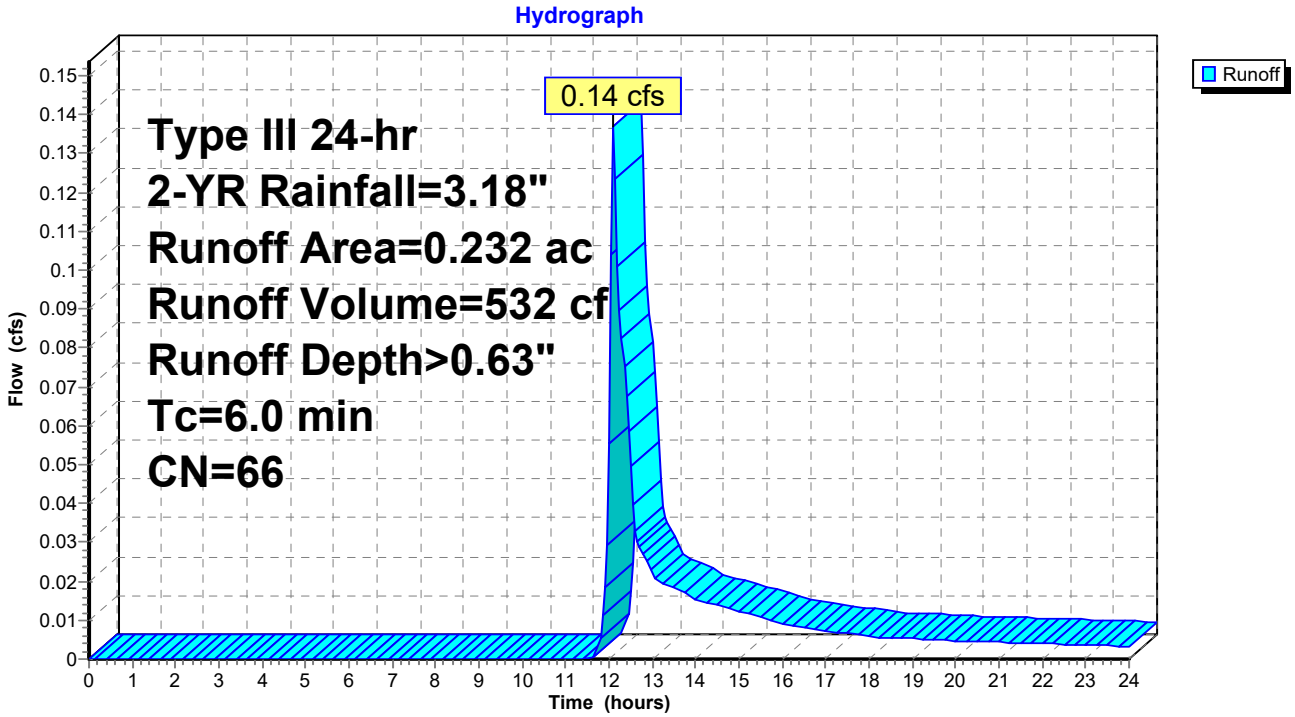
Runoff = 0.14 cfs @ 12.11 hrs, Volume= 532 cf, Depth> 0.63"

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-YR Rainfall=3.18"

	Area (ac)	CN	Description
*	0.120	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.071	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.041	98	Paved parking
	0.232	66	Weighted Average
	0.191		82.33% Pervious Area
	0.041		17.67% Impervious Area

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

Subcatchment PD-3a: Prop. Drainage Area 3a



Summary for Subcatchment PD-3b: Prop. Drainage Area 3b

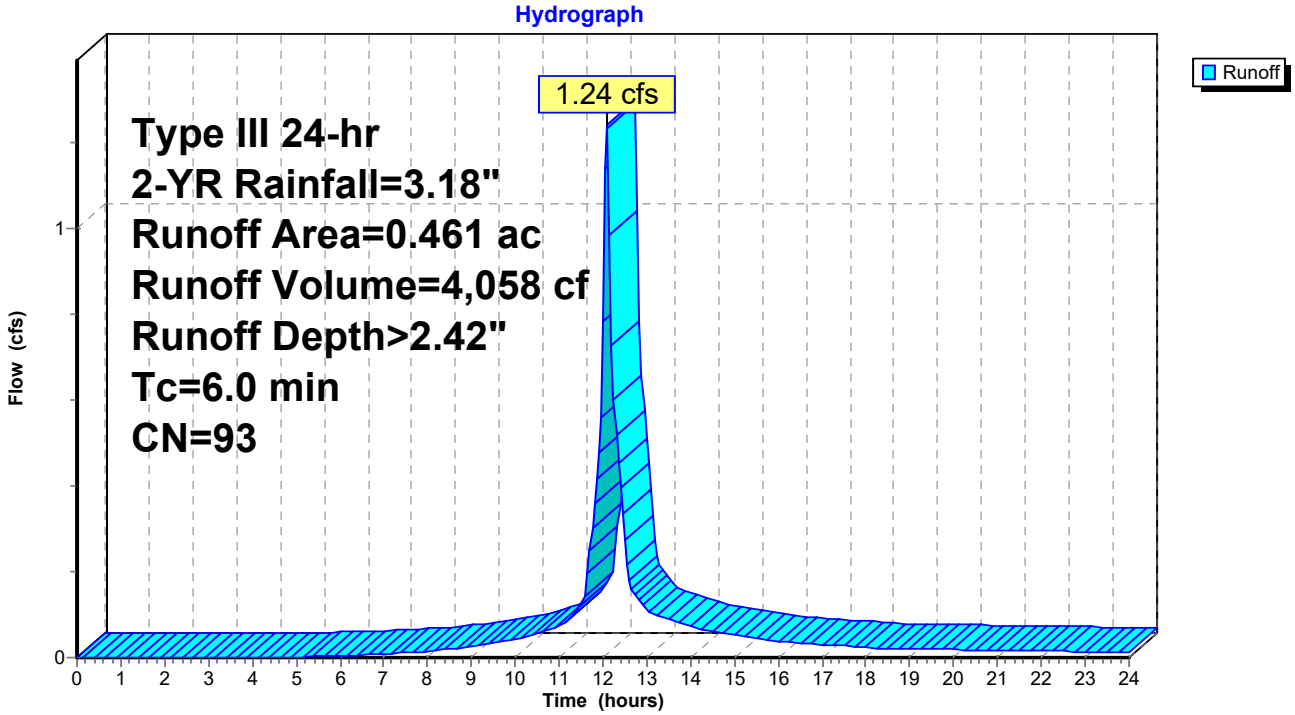
Runoff = 1.24 cfs @ 12.09 hrs, Volume= 4,058 cf, Depth> 2.42"

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-YR Rainfall=3.18"

	Area (ac)	CN	Description
*	0.093	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.019	79	50-75% Grass cover, Fair, HSG C, 701A
*	0.016	98	Paved parking
*	0.333	98	Roofing
	0.461	93	Weighted Average
	0.112		24.30% Pervious Area
	0.349		75.70% Impervious Area

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

Subcatchment PD-3b: Prop. Drainage Area 3b



Summary for Subcatchment PD-3c: Prop. Drainage Area 3c

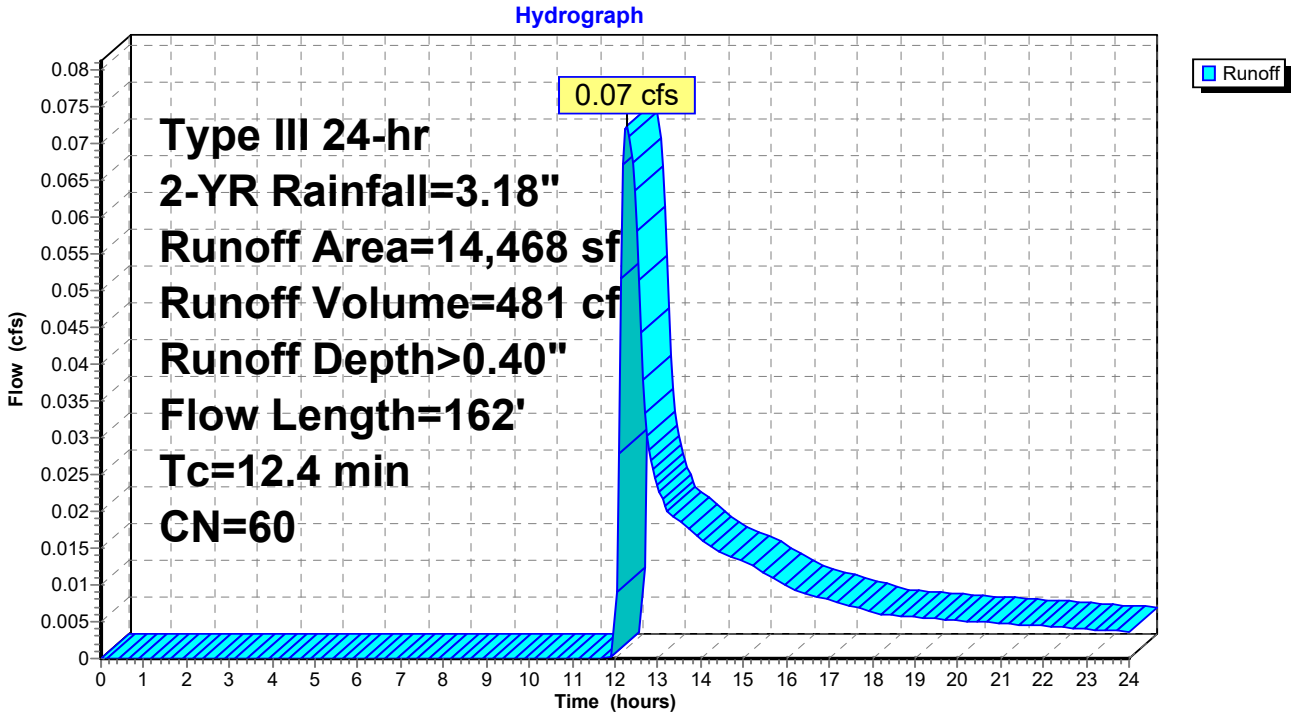
Runoff = 0.07 cfs @ 12.27 hrs, Volume= 481 cf, Depth> 0.40"

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-YR Rainfall=3.18"

	Area (sf)	CN	Description
*	6,684	43	Woods/grass comb., Fair, HSG A, 36A
*	5,545	74	Woods/grass comb., Fair, HSG C
	1,501	76	Woods/grass comb., Fair, HSG C
*	738	77	50-75% Grass cover, Fair, HSG C
	14,468	60	Weighted Average
	14,468		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	8	0.0625	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.18"
3.4	17	0.0580	0.08		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.18"
3.2	16	0.0625	0.08		**Sheet Flow, C-D** Woods: Light underbrush n= 0.400 P2= 3.18"
1.5	9	0.1250	0.10		**Sheet Flow, D-E** Woods: Light underbrush n= 0.400 P2= 3.18"
2.5	112	0.0220	0.74		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
12.4	162	Total			

Subcatchment PD-3c: Prop. Drainage Area 3c



Summary for Subcatchment RD-1: Roof 1

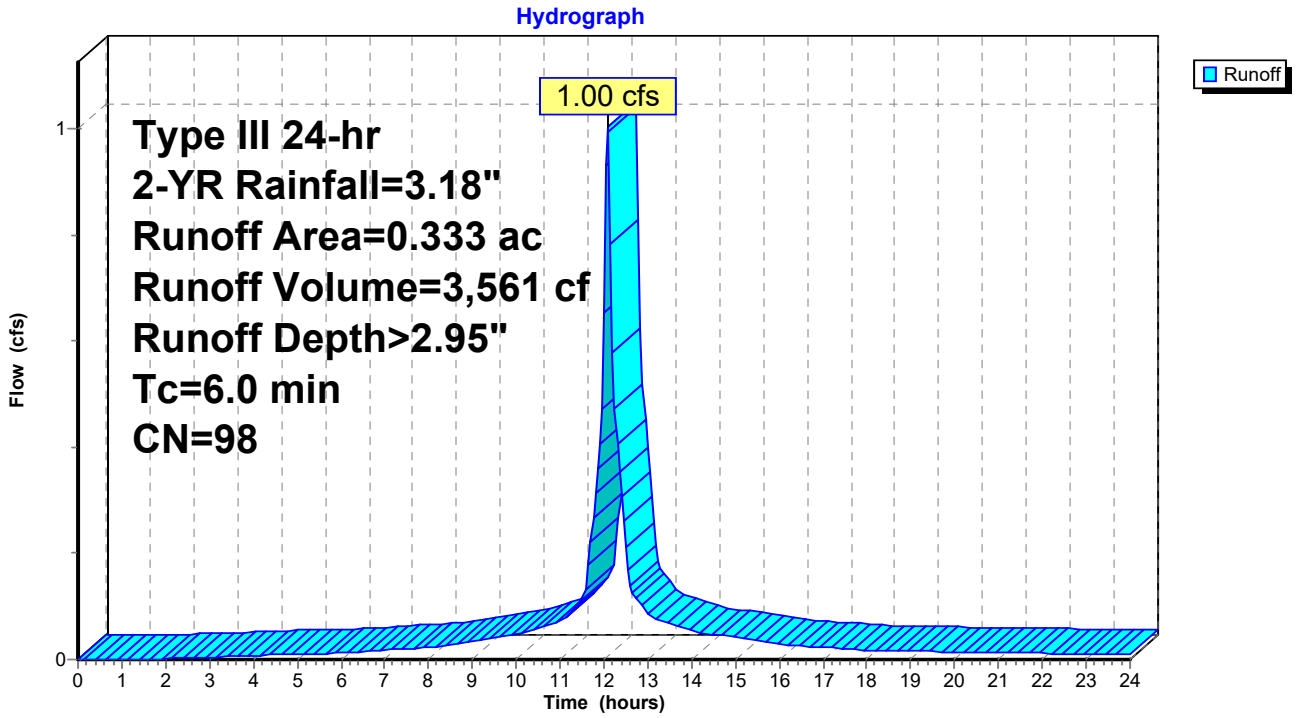
Runoff = 1.00 cfs @ 12.09 hrs, Volume= 3,561 cf, Depth> 2.95"

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-YR Rainfall=3.18"

	Area (ac)	CN	Description
*	0.333	98	Unconnected roofs
	0.333		100.00% Impervious Area
	0.333		100.00% Unconnected

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

Subcatchment RD-1: Roof 1

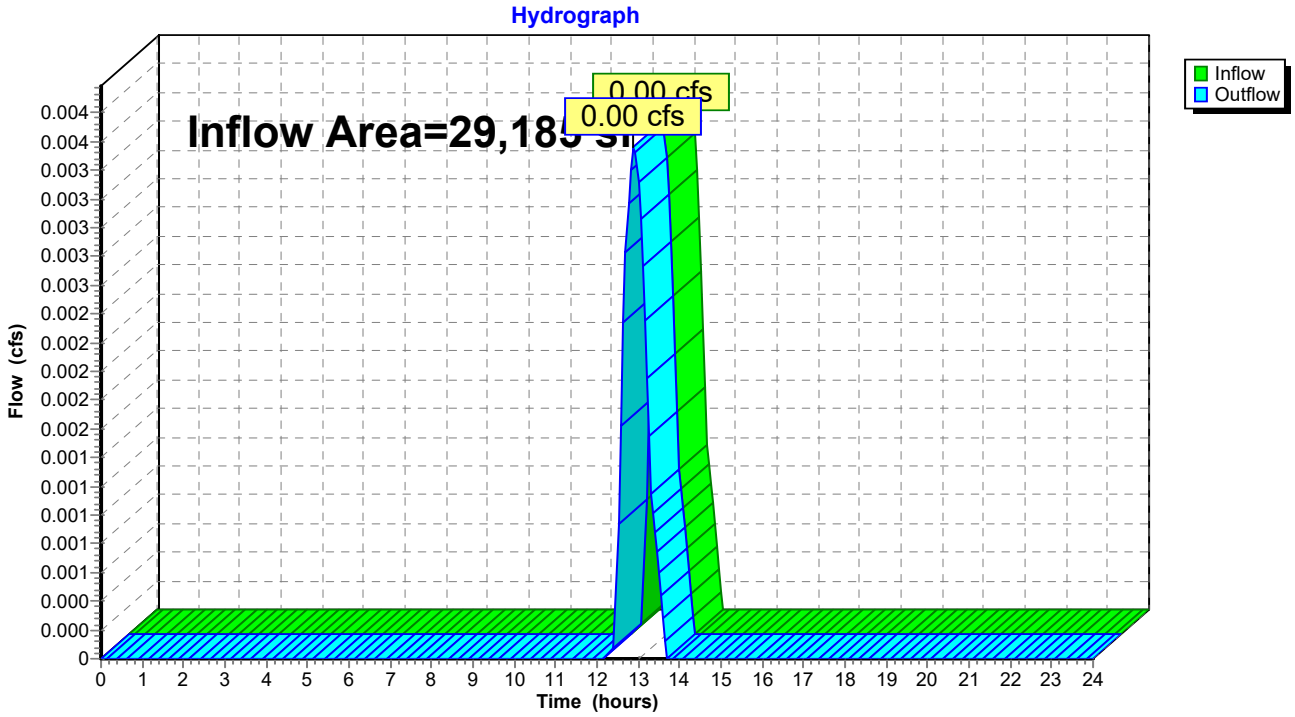


Summary for Reach DP-1a: Design Point 1

Inflow Area = 29,185 sf, 78.51% Impervious, Inflow Depth = 0.00" for 2-YR event
Inflow = 0.00 cfs @ 12.89 hrs, Volume= 8 cf
Outflow = 0.00 cfs @ 12.89 hrs, Volume= 8 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-1a: Design Point 1

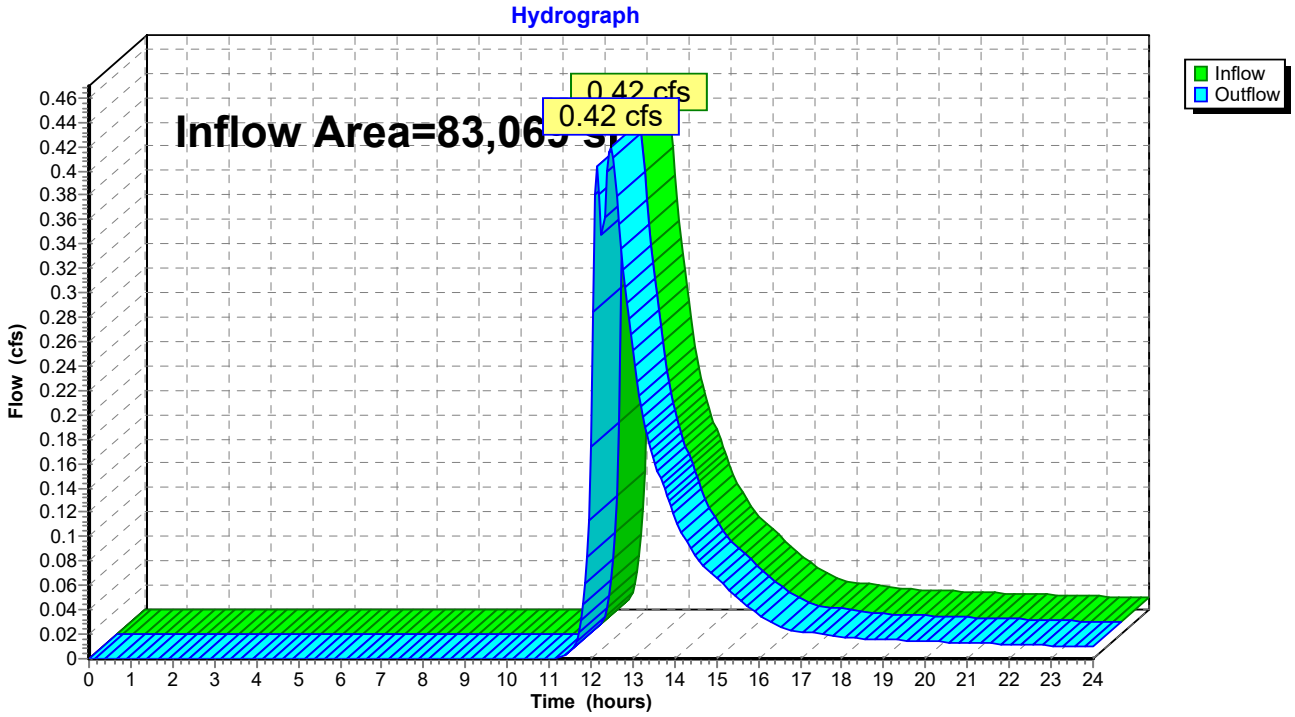


Summary for Reach DP-2a: Design Point 2

Inflow Area = 83,069 sf, 57.73% Impervious, Inflow Depth > 0.42" for 2-YR event
Inflow = 0.42 cfs @ 12.48 hrs, Volume= 2,893 cf
Outflow = 0.42 cfs @ 12.48 hrs, Volume= 2,893 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-2a: Design Point 2

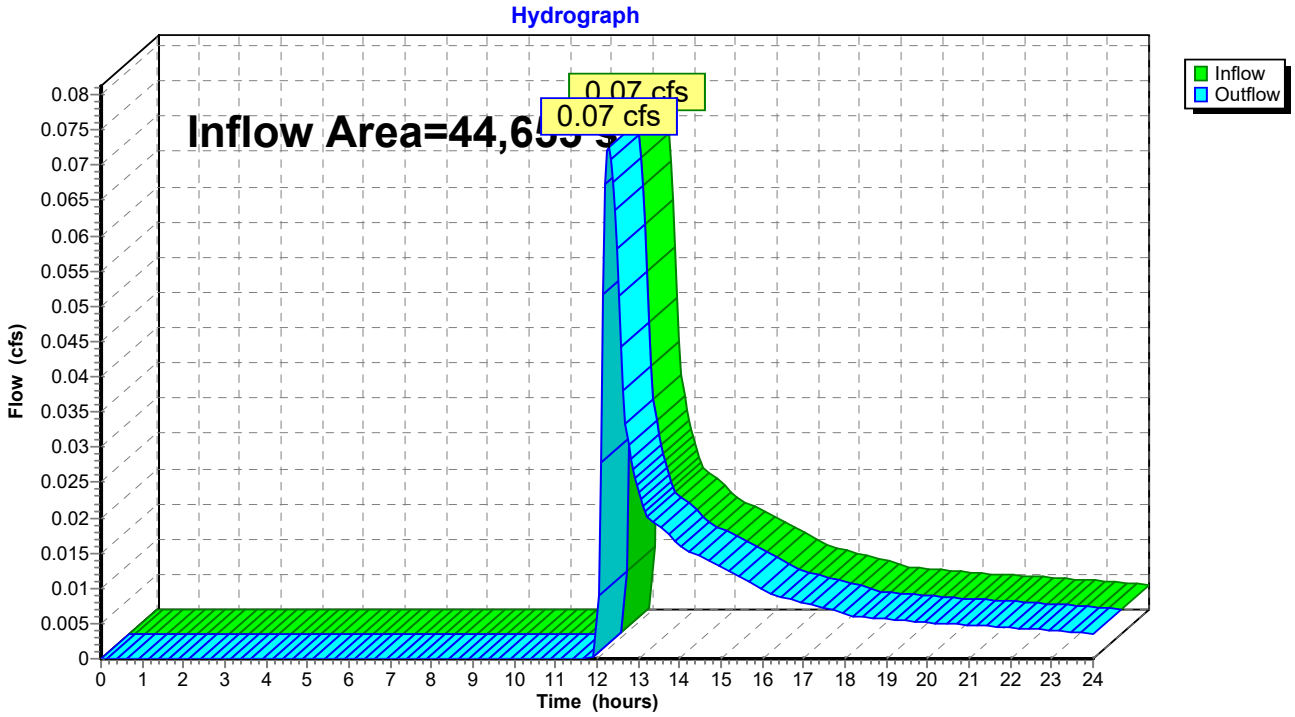


Summary for Reach DP-3a: Design Point 3

Inflow Area = 44,655 sf, 38.04% Impervious, Inflow Depth > 0.13" for 2-YR event
Inflow = 0.07 cfs @ 12.27 hrs, Volume= 481 cf
Outflow = 0.07 cfs @ 12.27 hrs, Volume= 481 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-3a: Design Point 3



Summary for Pond AB1: Above Ground Infiltration Basin 1

Inflow Area =	29,185 sf, 78.51% Impervious, Inflow Depth > 0.80" for 2-YR event				
Inflow =	0.62 cfs @	12.09 hrs,	Volume=	1,947 cf	
Outflow =	0.07 cfs @	12.89 hrs,	Volume=	1,945 cf,	Atten= 88%, Lag= 47.6 min
Discarded =	0.07 cfs @	12.89 hrs,	Volume=	1,937 cf	
Primary =	0.00 cfs @	12.89 hrs,	Volume=	8 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 128.03' @ 12.89 hrs Surf.Area= 1,242 sf Storage= 751 cf

Plug-Flow detention time= 105.7 min calculated for 1,941 cf (100% of inflow)
Center-of-Mass det. time= 104.9 min (937.6 - 832.7)

Volume	Invert	Avail.Storage	Storage Description
#1	127.00'	4,542 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 4,798 cf Overall - 256 cf Embedded = 4,542 cf
#2	127.00'	102 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) Inside #1 256 cf Overall x 40.0% Voids
		4,644 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
127.00	512	0	0
128.00	1,218	865	865
129.00	1,949	1,584	2,449
130.00	2,749	2,349	4,798

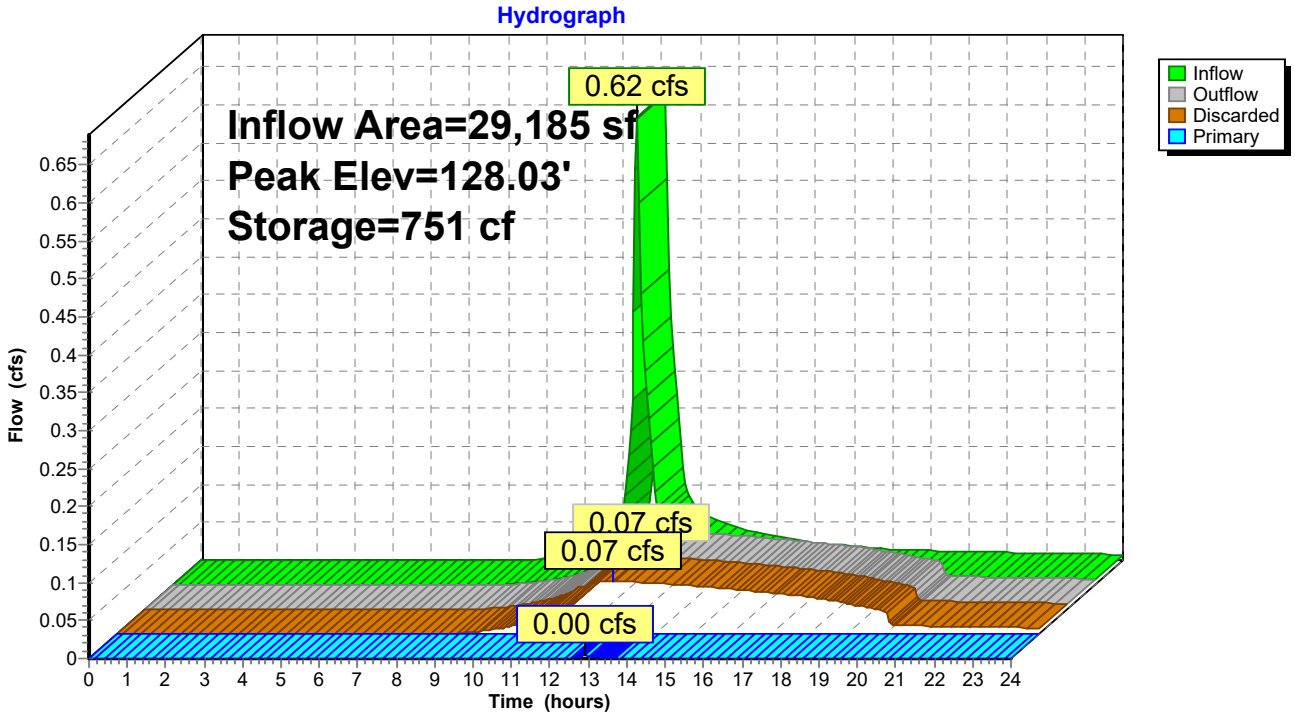
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
127.00	512	0	0
127.50	512	256	256

Device	Routing	Invert	Outlet Devices
#1	Primary	127.57'	**8.0" Round Culvert Barrel** L= 13.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 127.57' / 127.50' S= 0.0054 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.35 sf
#2	Device 1	129.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	127.00'	**2.410 in/hr Exfiltration over Surface area**
#4	Device 1	128.00'	**5.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.07 cfs @ 12.89 hrs HW=128.03' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 12.89 hrs HW=128.03' (Free Discharge)
└─**1=Culvert Barrel** (Passes 0.00 cfs of 0.33 cfs potential flow)
  ├─**2=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Orifice Controls 0.00 cfs @ 0.61 fps)

Pond AB1: Above Ground Infiltration Basin 1



Stage-Area-Storage for Pond AB1: Above Ground Infiltration Basin 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
127.00	512	0
127.05	547	11
127.10	583	24
127.15	618	39
127.20	653	55
127.25	689	73
127.30	724	93
127.35	759	115
127.40	794	138
127.45	830	164
127.50	865	191
127.55	900	235
127.60	936	281
127.65	971	328
127.70	1,006	378
127.75	1,042	429
127.80	1,077	482
127.85	1,112	537
127.90	1,147	593
127.95	1,183	651
128.00	1,218	711
128.05	1,255	773
128.10	1,291	837
128.15	1,328	902
128.20	1,364	970
128.25	1,401	1,039
128.30	1,437	1,110
128.35	1,474	1,182
128.40	1,510	1,257
128.45	1,547	1,334
128.50	1,584	1,412
128.55	1,620	1,492
128.60	1,657	1,574
128.65	1,693	1,658
128.70	1,730	1,743
128.75	1,766	1,830
128.80	1,803	1,920
128.85	1,839	2,011
128.90	1,876	2,104
128.95	1,912	2,198
129.00	1,949	2,295
129.05	1,989	2,393
129.10	2,029	2,494
129.15	2,069	2,596
129.20	2,109	2,701
129.25	2,149	2,807
129.30	2,189	2,916
129.35	2,229	3,026
129.40	2,269	3,139
129.45	2,309	3,253
129.50	2,349	3,369
129.55	2,389	3,488
129.60	2,429	3,608
129.65	2,469	3,731
129.70	2,509	3,855
129.75	2,549	3,982
129.80	2,589	4,110
129.85	2,629	4,241
129.90	2,669	4,373
129.95	2,709	4,507
130.00	**2,749**	**4,644**

Summary for Pond AB3a: Above Ground Infiltration 3a

Inflow Area =	10,106 sf, 17.67% Impervious, Inflow Depth > 0.63" for 2-YR event				
Inflow =	0.14 cfs @	12.11 hrs,	Volume=	532 cf	
Outflow =	0.05 cfs @	12.48 hrs,	Volume=	531 cf,	Atten= 61%, Lag= 22.0 min
Discarded =	0.05 cfs @	12.48 hrs,	Volume=	531 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= 132.08' @ 12.48 hrs Surf.Area= 963 sf Storage= 77 cf

Plug-Flow detention time= 10.4 min calculated for 530 cf (100% of inflow)
Center-of-Mass det. time= 9.2 min (900.1 - 890.9)

Volume	Invert	Avail.Storage	Storage Description
#1	132.00'	3,206 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

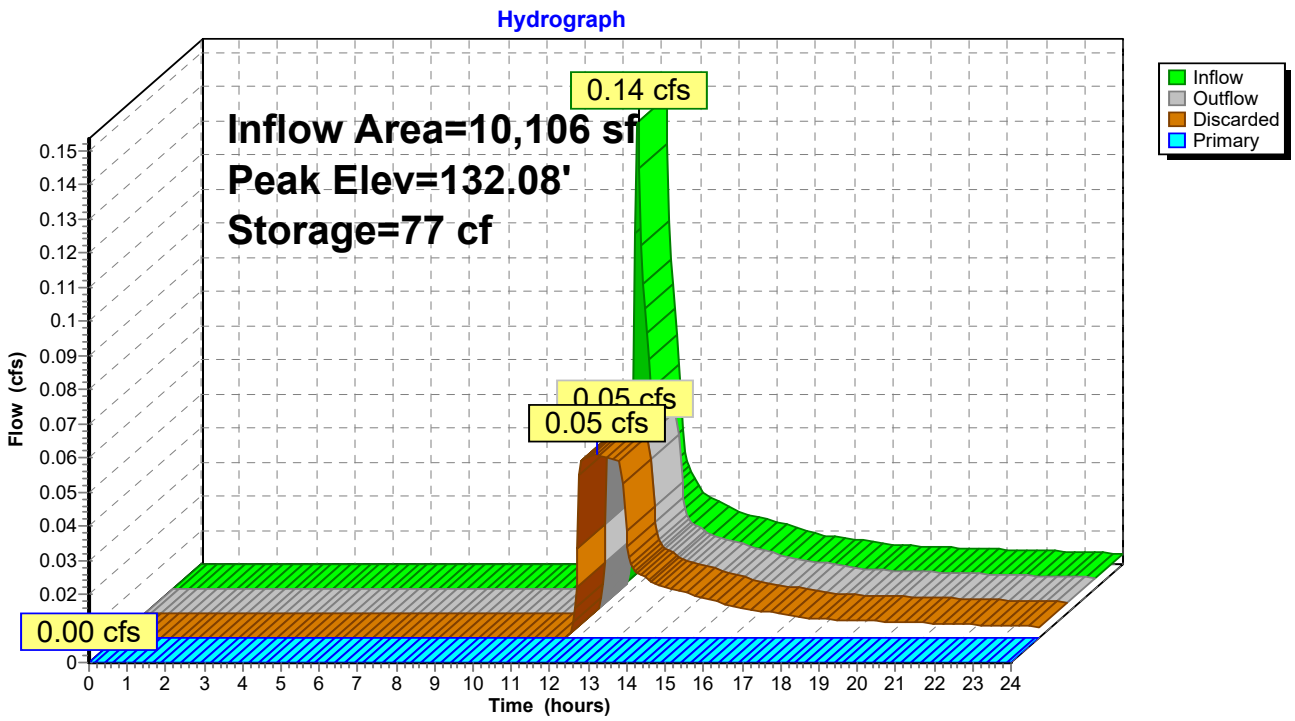
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
132.00	906	0	0
133.00	1,593	1,250	1,250
134.00	2,319	1,956	3,206

Device	Routing	Invert	Outlet Devices
#1	Discarded	132.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	133.00'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.05 cfs @ 12.48 hrs HW=132.08' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=132.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond AB3a: Above Ground Infiltration 3a



Stage-Area-Storage for Pond AB3a: Above Ground Infiltration 3a

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
132.00	906	0
132.02	920	18
132.04	933	37
132.06	947	56
132.08	961	75
132.10	975	94
132.12	988	114
132.14	1,002	134
132.16	1,016	154
132.18	1,030	174
132.20	1,043	195
132.22	1,057	216
132.24	1,071	237
132.26	1,085	259
132.28	1,098	281
132.30	1,112	303
132.32	1,126	325
132.34	1,140	348
132.36	1,153	371
132.38	1,167	394
132.40	1,181	417
132.42	1,195	441
132.44	1,208	465
132.46	1,222	489
132.48	1,236	514
132.50	1,250	539
132.52	1,263	564
132.54	1,277	589
132.56	1,291	615
132.58	1,304	641
132.60	1,318	667
132.62	1,332	694
132.64	1,346	721
132.66	1,359	748
132.68	1,373	775
132.70	1,387	803
132.72	1,401	830
132.74	1,414	859
132.76	1,428	887
132.78	1,442	916
132.80	1,456	945
132.82	1,469	974
132.84	1,483	1,003
132.86	1,497	1,033
132.88	1,511	1,063
132.90	1,524	1,094
132.92	1,538	1,124
132.94	1,552	1,155
132.96	1,566	1,186
132.98	1,579	1,218
133.00	1,593	1,250
133.02	1,608	1,282
133.04	1,622	1,314
133.06	1,637	1,346
133.08	1,651	1,379
133.10	1,666	1,412
133.12	1,680	1,446
133.14	1,695	1,480
133.16	1,709	1,514
133.18	1,724	1,548
133.20	1,738	1,583
133.22	1,753	1,618
133.24	1,767	1,653
133.26	1,782	1,688
133.28	1,796	1,724
133.30	1,811	1,760
133.32	1,825	1,796
133.34	1,840	1,833
133.36	1,854	1,870
133.38	1,869	1,907
133.40	1,883	1,945
133.42	1,898	1,983
133.44	1,912	2,021
133.46	1,927	2,059
133.48	1,941	2,098
133.50	1,956	2,137
133.52	1,971	2,176
133.54	1,985	2,216
133.56	2,000	2,255
133.58	2,014	2,296
133.60	2,029	2,336
133.62	2,043	2,377
133.64	2,058	2,418
133.66	2,072	2,459
133.68	2,087	2,501
133.70	2,101	2,542
133.72	2,116	2,585
133.74	2,130	2,627
133.76	2,145	2,670
133.78	2,159	2,713
133.80	2,174	2,756
133.82	2,188	2,800
133.84	2,203	2,844
133.86	2,217	2,888
133.88	2,232	2,932
133.90	2,246	2,977
133.92	2,261	3,022
133.94	2,275	3,068
133.96	2,290	3,113
133.98	2,304	3,159
134.00	**2,319**	**3,206**

Summary for Pond AB3b: Above Ground Infiltration 3b

Inflow Area =	20,081 sf, 75.70% Impervious, Inflow Depth > 2.42" for 2-YR event				
Inflow =	1.24 cfs @	12.09 hrs,	Volume=	4,058 cf	
Outflow =	0.04 cfs @	15.82 hrs,	Volume=	1,898 cf,	Atten= 97%, Lag= 224.2 min
Discarded =	0.04 cfs @	15.82 hrs,	Volume=	1,898 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= 132.88' @ 15.82 hrs Surf.Area= 1,731 sf Storage= 2,694 cf

Plug-Flow detention time= 344.9 min calculated for 1,898 cf (47% of inflow)
Center-of-Mass det. time= 228.6 min (1,021.0 - 792.4)

Volume	Invert	Avail.Storage	Storage Description
#1	130.00'	5,050 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

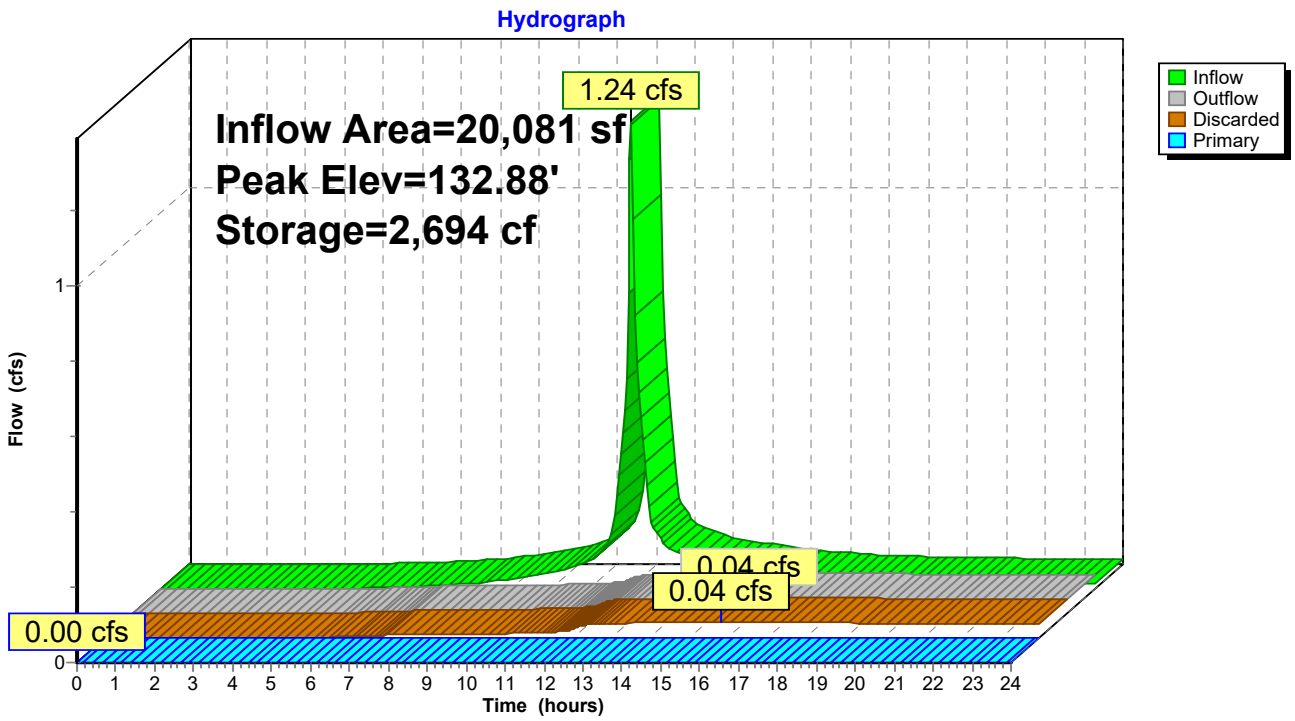
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
130.00	307	0	0
131.00	671	489	489
132.00	1,175	923	1,412
133.00	1,806	1,491	2,903
134.00	2,488	2,147	5,050

Device	Routing	Invert	Outlet Devices
#1	Primary	133.15'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Discarded	130.00'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.04 cfs @ 15.82 hrs HW=132.88' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=130.00' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond AB3b: Above Ground Infiltration 3b



Stage-Area-Storage for Pond AB3b: Above Ground Infiltration 3b

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.00	307	0
130.05	325	16
130.10	343	33
130.15	362	50
130.20	380	69
130.25	398	88
130.30	416	108
130.35	434	130
130.40	453	152
130.45	471	175
130.50	489	199
130.55	507	224
130.60	525	250
130.65	544	276
130.70	562	304
130.75	580	333
130.80	598	362
130.85	616	392
130.90	635	424
130.95	653	456
131.00	671	489
131.05	696	523
131.10	721	559
131.15	747	595
131.20	772	633
131.25	797	673
131.30	822	713
131.35	847	755
131.40	873	798
131.45	898	842
131.50	923	888
131.55	948	934
131.60	973	982
131.65	999	1,032
131.70	1,024	1,082
131.75	1,049	1,134
131.80	1,074	1,187
131.85	1,099	1,241
131.90	1,125	1,297
131.95	1,150	1,354
132.00	1,175	1,412
132.05	1,207	1,472
132.10	1,238	1,533
132.15	1,270	1,595
132.20	1,301	1,660
132.25	1,333	1,725
132.30	1,364	1,793
132.35	1,396	1,862
132.40	1,427	1,932
132.45	1,459	2,005
132.50	1,491	2,078
132.55	1,522	2,154
132.60	1,554	2,231
132.65	1,585	2,309
132.70	1,617	2,389
132.75	1,648	2,471
132.80	1,680	2,554
132.85	1,711	2,639
132.90	1,743	2,725
132.95	1,774	2,813
133.00	1,806	2,903
133.05	1,840	2,994
133.10	1,874	3,087
133.15	1,908	3,181
133.20	1,942	3,277
133.25	1,977	3,375
133.30	2,011	3,475
133.35	2,045	3,576
133.40	2,079	3,679
133.45	2,113	3,784
133.50	2,147	3,891
133.55	2,181	3,999
133.60	2,215	4,109
133.65	2,249	4,220
133.70	2,283	4,334
133.75	2,318	4,449
133.80	2,352	4,566
133.85	2,386	4,684
133.90	2,420	4,804
133.95	2,454	4,926
134.00	**2,488**	**5,050**

Summary for Pond IB1: Infiltration Basin 1

Inflow Area = 14,505 sf,100.00% Impervious, Inflow Depth > 2.95" for 2-YR event
Inflow = 1.00 cfs @ 12.09 hrs, Volume= 3,561 cf
Outflow = 0.11 cfs @ 11.50 hrs, Volume= 3,558 cf, Atten= 89%, Lag= 0.0 min
Discarded = 0.11 cfs @ 11.50 hrs, Volume= 3,558 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= 130.03' @ 12.81 hrs Surf.Area= 1,889 sf Storage= 1,188 cf

Plug-Flow detention time= 76.3 min calculated for 3,558 cf (100% of inflow)
Center-of-Mass det. time= 75.8 min (831.9 - 756.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	129.00'	1,726 cf	**25.25'W x 74.82'L x 3.50'H Field A** 6,612 cf Overall - 2,297 cf Embedded = 4,315 cf x 40.0% Voids
#2A	129.50'	2,297 cf	**ADS_StormTech SC-740 +Cap** x 50 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 5 Rows of 10 Chambers
		4,023 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	130.24'	**12.0" Round Culvert** L= 10.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 130.24' / 130.00' S= 0.0240 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#2	Discarded	129.00'	**2.410 in/hr Exfiltration over Surface area**
#3	Device 1	130.40'	**3.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	132.05'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.11 cfs @ 11.50 hrs HW=129.04' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=129.00' (Free Discharge)
└─**1=Culvert** (Controls 0.00 cfs)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB1: Infiltration Basin 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

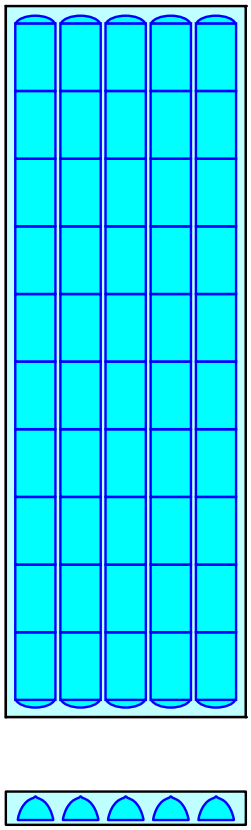
10 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 72.82' Row Length +12.0" End Stone x 2 = 74.82' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

50 Chambers x 45.9 cf = 2,297.0 cf Chamber Storage

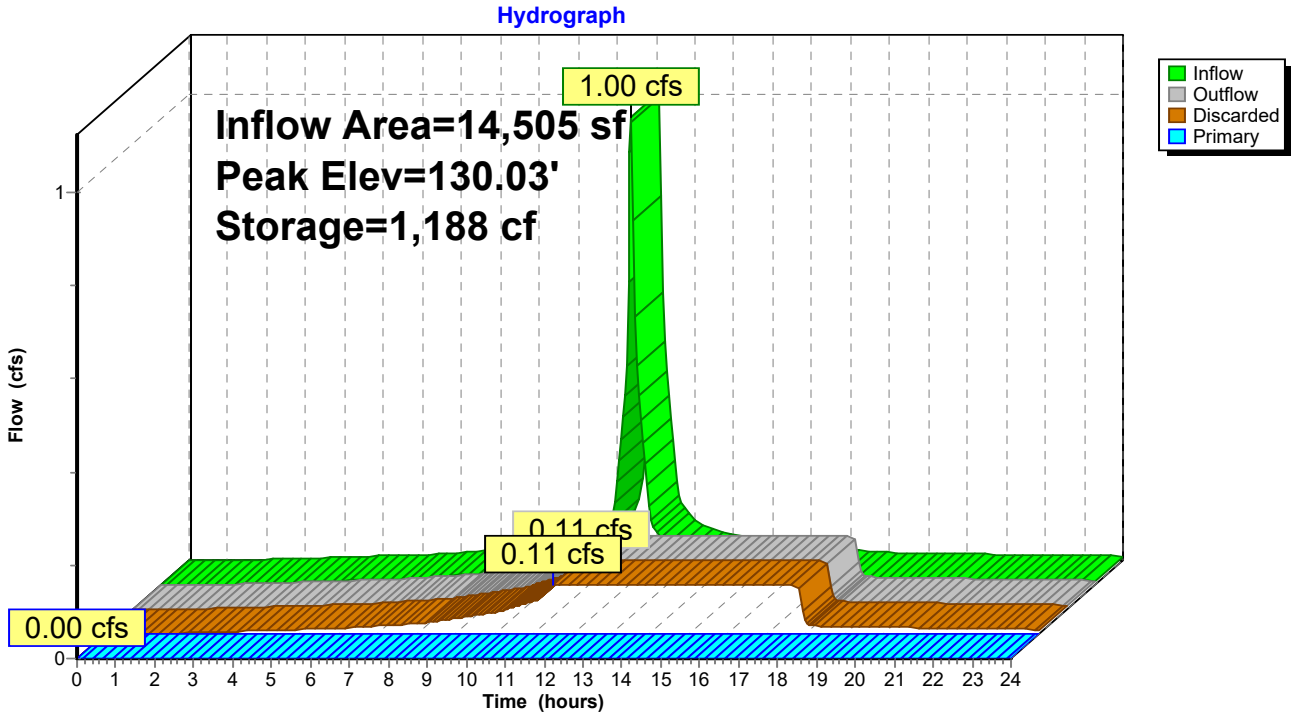
6,611.9 cf Field - 2,297.0 cf Chambers = 4,314.9 cf Stone x 40.0% Voids = 1,726.0 cf Stone Storage

Chamber Storage + Stone Storage = 4,023.0 cf = 0.092 af
Overall Storage Efficiency = 60.8%
Overall System Size = 74.82' x 25.25' x 3.50'

50 Chambers
244.9 cy Field
159.8 cy Stone



Pond IB1: Infiltration Basin 1



Stage-Area-Storage for Pond IB1: Infiltration Basin 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
129.00	**1,889**	0
129.05	1,889	38
129.10	1,889	76
129.15	1,889	113
129.20	1,889	151
129.25	1,889	189
129.30	1,889	227
129.35	1,889	264
129.40	1,889	302
129.45	1,889	340
129.50	1,889	378
129.55	1,889	455
129.60	1,889	533
129.65	1,889	610
129.70	1,889	687
129.75	1,889	764
129.80	1,889	841
129.85	1,889	917
129.90	1,889	993
129.95	1,889	1,069
130.00	1,889	1,145
130.05	1,889	1,220
130.10	1,889	1,295
130.15	1,889	1,369
130.20	1,889	1,444
130.25	1,889	1,517
130.30	1,889	1,591
130.35	1,889	1,664
130.40	1,889	1,736
130.45	1,889	1,809
130.50	1,889	1,880
130.55	1,889	1,952
130.60	1,889	2,022
130.65	1,889	2,093
130.70	1,889	2,162
130.75	1,889	2,232
130.80	1,889	2,300
130.85	1,889	2,368
130.90	1,889	2,435
130.95	1,889	2,502
131.00	1,889	2,568
131.05	1,889	2,634
131.10	1,889	2,698
131.15	1,889	2,762
131.20	1,889	2,825
131.25	1,889	2,887
131.30	1,889	2,948
131.35	1,889	3,008
131.40	1,889	3,067
131.45	1,889	3,124
131.50	1,889	3,181
131.55	1,889	3,236
131.60	1,889	3,290
131.65	1,889	3,342
131.70	1,889	3,392
131.75	1,889	3,439
131.80	1,889	3,484
131.85	1,889	3,526
131.90	1,889	3,567
131.95	1,889	3,607
132.00	1,889	3,645
132.05	1,889	3,683
132.10	1,889	3,721
132.15	1,889	3,758
132.20	1,889	3,796
132.25	1,889	3,834
132.30	1,889	3,872
132.35	1,889	3,910
132.40	1,889	3,947
132.45	1,889	3,985
132.50	1,889	**4,023**

Summary for Pond IB2a: Infiltration Basin 2a

Inflow Area =	26,310 sf, 88.91% Impervious, Inflow Depth > 2.52" for 2-YR event				
Inflow =	1.67 cfs @	12.09 hrs,	Volume=	5,531 cf	
Outflow =	0.28 cfs @	12.57 hrs,	Volume=	4,316 cf,	Atten= 83%, Lag= 28.7 min
Discarded =	0.06 cfs @	10.05 hrs,	Volume=	3,316 cf	
Primary =	0.22 cfs @	12.57 hrs,	Volume=	1,000 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 128.99' @ 12.57 hrs Surf.Area= 2,458 sf Storage= 2,438 cf

Plug-Flow detention time= 216.5 min calculated for 4,316 cf (78% of inflow)
Center-of-Mass det. time= 137.6 min (924.5 - 786.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	127.50'	2,392 cf	**30.00'W x 81.94'L x 3.67'H Field A** 9,013 cf Overall - 3,032 cf Embedded = 5,981 cf x 40.0% Voids
#2A	128.00'	3,032 cf	**ADS_StormTech SC-740 +Cap** x 66 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 6 Rows of 11 Chambers
		5,424 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	128.60'	**15.0" Round Culvert** L= 55.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 128.60' / 128.00' S= 0.0109 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Discarded	127.50'	**1.020 in/hr Exfiltration over Surface area**
#3	Device 1	128.80'	**10.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	130.10'	**10.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	130.99'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.06 cfs @ 10.05 hrs HW=127.54' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.22 cfs @ 12.57 hrs HW=128.99' (Free Discharge)
└─**1=Culvert** (Passes 0.22 cfs of 0.77 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.22 cfs @ 1.39 fps)
  ├─**4=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB2a: Infiltration Basin 2a - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

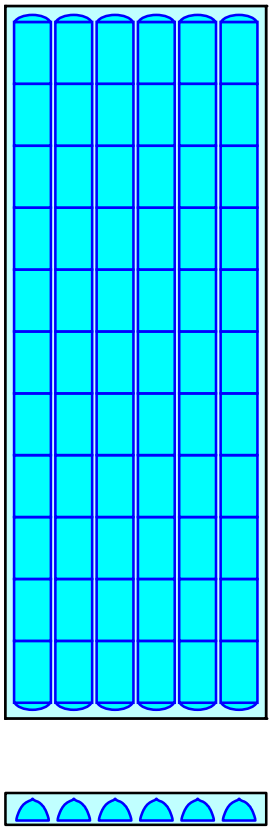
11 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 79.94' Row Length +12.0" End Stone x 2 = 81.94' Base Length
6 Rows x 51.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.00' Base Width
6.0" Base + 30.0" Chamber Height + 8.0" Cover = 3.67' Field Height

66 Chambers x 45.9 cf = 3,032.0 cf Chamber Storage

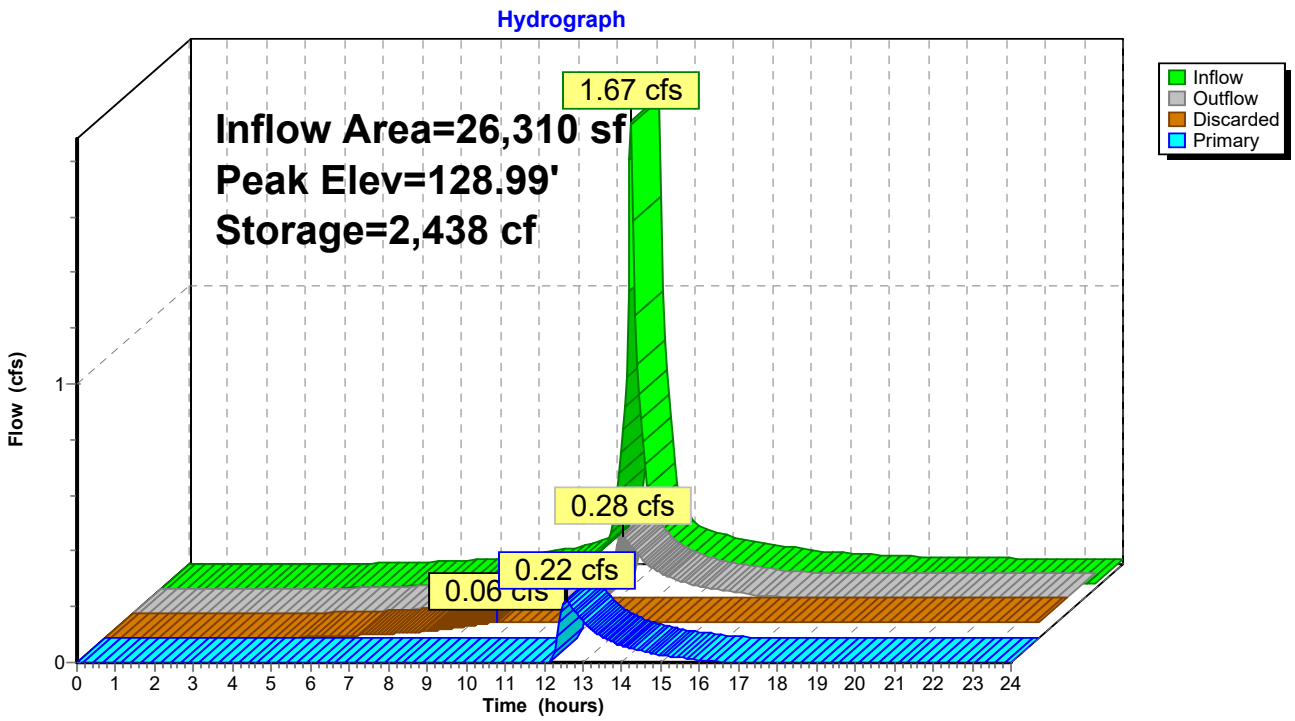
9,013.0 cf Field - 3,032.0 cf Chambers = 5,981.0 cf Stone x 40.0% Voids = 2,392.4 cf Stone Storage

Chamber Storage + Stone Storage = 5,424.4 cf = 0.125 af
Overall Storage Efficiency = 60.2%
Overall System Size = 81.94' x 30.00' x 3.67'

66 Chambers
333.8 cy Field
221.5 cy Stone



Pond IB2a: Infiltration Basin 2a



Stage-Area-Storage for Pond IB2a: Infiltration Basin 2a

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
127.50	**2,458**	0
127.55	2,458	49
127.60	2,458	98
127.65	2,458	147
127.70	2,458	197
127.75	2,458	246
127.80	2,458	295
127.85	2,458	344
127.90	2,458	393
127.95	2,458	442
128.00	2,458	492
128.05	2,458	593
128.10	2,458	695
128.15	2,458	796
128.20	2,458	897
128.25	2,458	998
128.30	2,458	1,099
128.35	2,458	1,199
128.40	2,458	1,298
128.45	2,458	1,398
128.50	2,458	1,497
128.55	2,458	1,595
128.60	2,458	1,694
128.65	2,458	1,791
128.70	2,458	1,888
128.75	2,458	1,985
128.80	2,458	2,081
128.85	2,458	2,177
128.90	2,458	2,272
128.95	2,458	2,367
129.00	2,458	2,461
129.05	2,458	2,554
129.10	2,458	2,647
129.15	2,458	2,739
129.20	2,458	2,830
129.25	2,458	2,921
129.30	2,458	3,011
129.35	2,458	3,100
129.40	2,458	3,188
129.45	2,458	3,275
129.50	2,458	3,362
129.55	2,458	3,447
129.60	2,458	3,532
129.65	2,458	3,615
129.70	2,458	3,698
129.75	2,458	3,779
129.80	2,458	3,858
129.85	2,458	3,937
129.90	2,458	4,014
129.95	2,458	4,089
130.00	2,458	4,164
130.05	2,458	4,236
130.10	2,458	4,306
130.15	2,458	4,374
130.20	2,458	4,439
130.25	2,458	4,501
130.30	2,458	4,559
130.35	2,458	4,614
130.40	2,458	4,667
130.45	2,458	4,719
130.50	2,458	4,769
130.55	2,458	4,818
130.60	2,458	4,867
130.65	2,458	4,916
130.70	2,458	4,966
130.75	2,458	5,015
130.80	2,458	5,064
130.85	2,458	5,113
130.90	2,458	5,162
130.95	2,458	5,211
131.00	2,458	5,261
131.05	2,458	5,310
131.10	2,458	5,359
131.15	2,458	**5,408**

Summary for Pond IB2c: Infiltration Basin Area 2c

Inflow Area =	15,551 sf, 65.27% Impervious, Inflow Depth > 1.82" for 2-YR event				
Inflow =	0.75 cfs @	12.09 hrs,	Volume=	2,354 cf	
Outflow =	0.09 cfs @	12.85 hrs,	Volume=	2,351 cf,	Atten= 88%, Lag= 45.6 min
Discarded =	0.06 cfs @	11.60 hrs,	Volume=	2,228 cf	
Primary =	0.03 cfs @	12.85 hrs,	Volume=	122 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 130.75' @ 12.85 hrs Surf.Area= 2,373 sf Storage= 930 cf

Plug-Flow detention time= 136.6 min calculated for 2,351 cf (100% of inflow)
Center-of-Mass det. time= 135.8 min (958.1 - 822.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	130.00'	1,505 cf	**27.00'W x 87.91'L x 2.00'H Field A** 4,747 cf Overall - 985 cf Embedded = 3,762 cf x 40.0% Voids
#2A	130.50'	985 cf	**ADS_StormTech SC-160LP +Cap** x 144 Inside #1 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 12 Rows of 12 Chambers
		2,489 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	130.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	129.20'	**8.0" Round Culvert** L= 14.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 129.20' / 129.00' S= 0.0143 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.35 sf
#3	Device 2	130.70'	**11.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 2	131.40'	**2.0" Vert. Orifice/Grate** C= 0.600
#5	Device 2	131.88'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.06 cfs @ 11.60 hrs HW=130.02' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.03 cfs @ 12.85 hrs HW=130.75' (Free Discharge)
└─**2=Culvert** (Passes 0.03 cfs of 2.21 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.03 cfs @ 0.70 fps)
  ├─**4=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB2c: Infiltration Basin Area 2c - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-160LP +Cap (ADS StormTech® SC-160LP with cap length)
Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf
Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap

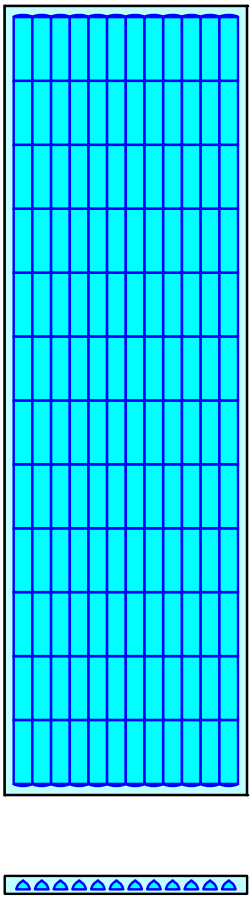
12 Chambers/Row x 7.12' Long +0.23' Cap Length x 2 = 85.91' Row Length +12.0" End Stone x 2 = 87.91' Base Length
12 Rows x 25.0" Wide + 12.0" Side Stone x 2 = 27.00' Base Width
6.0" Base + 12.0" Chamber Height + 6.0" Cover = 2.00' Field Height

144 Chambers x 6.8 cf = 984.5 cf Chamber Storage

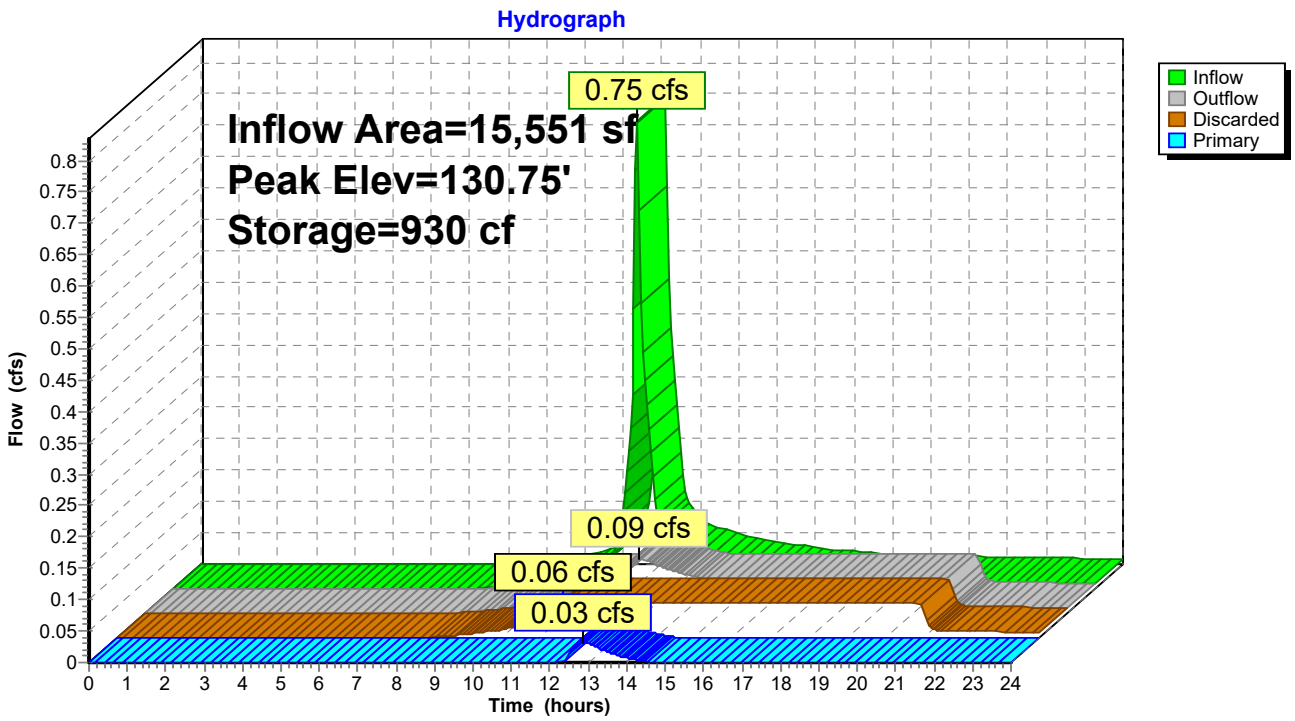
4,747.0 cf Field - 984.5 cf Chambers = 3,762.4 cf Stone x 40.0% Voids = 1,505.0 cf Stone Storage

Chamber Storage + Stone Storage = 2,489.5 cf = 0.057 af
Overall Storage Efficiency = 52.4%
Overall System Size = 87.91' x 27.00' x 2.00'

144 Chambers
175.8 cy Field
139.3 cy Stone



Pond IB2c: Infiltration Basin Area 2c



Stage-Area-Storage for Pond IB2c: Infiltration Basin Area 2c

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.00	**2,373**	0	131.06	2,373	1,457
130.02	2,373	19	131.08	2,373	1,489
130.04	2,373	38	131.10	2,373	1,519
130.06	2,373	57	131.12	2,373	1,550
130.08	2,373	76	131.14	2,373	1,580
130.10	2,373	95	131.16	2,373	1,609
130.12	2,373	114	131.18	2,373	1,638
130.14	2,373	133	131.20	2,373	1,667
130.16	2,373	152	131.22	2,373	1,695
130.18	2,373	171	131.24	2,373	1,722
130.20	2,373	190	131.26	2,373	1,749
130.22	2,373	209	131.28	2,373	1,774
130.24	2,373	228	131.30	2,373	1,799
130.26	2,373	247	131.32	2,373	1,824
130.28	2,373	266	131.34	2,373	1,847
130.30	2,373	285	131.36	2,373	1,870
130.32	2,373	304	131.38	2,373	1,892
130.34	2,373	323	131.40	2,373	1,914
130.36	2,373	342	131.42	2,373	1,935
130.38	2,373	361	131.44	2,373	1,955
130.40	2,373	380	131.46	2,373	1,976
130.42	2,373	399	131.48	2,373	1,995
130.44	2,373	418	131.50	2,373	2,015
130.46	2,373	437	131.52	2,373	2,034
130.48	2,373	456	131.54	2,373	2,053
130.50	2,373	475	131.56	2,373	2,072
130.52	2,373	512	131.58	2,373	2,091
130.54	2,373	549	131.60	2,373	2,110
130.56	2,373	587	131.62	2,373	2,129
130.58	2,373	624	131.64	2,373	2,148
130.60	2,373	661	131.66	2,373	2,167
130.62	2,373	698	131.68	2,373	2,186
130.64	2,373	735	131.70	2,373	2,205
130.66	2,373	772	131.72	2,373	2,224
130.68	2,373	808	131.74	2,373	2,243
130.70	2,373	844	131.76	2,373	2,262
130.72	2,373	880	131.78	2,373	2,281
130.74	2,373	916	131.80	2,373	2,300
130.76	2,373	952	131.82	2,373	2,319
130.78	2,373	987	131.84	2,373	2,338
130.80	2,373	1,022	131.86	2,373	2,357
130.82	2,373	1,057	131.88	2,373	2,376
130.84	2,373	1,092	131.90	2,373	2,395
130.86	2,373	1,127	131.92	2,373	2,414
130.88	2,373	1,161	131.94	2,373	2,433
130.90	2,373	1,195	131.96	2,373	2,452
130.92	2,373	1,229	131.98	2,373	2,471
130.94	2,373	1,263	132.00	2,373	**2,489**
130.96	2,373	1,296			
130.98	2,373	1,329			
131.00	2,373	1,361			
131.02	2,373	1,394			
131.04	2,373	1,426			

Summary for Pond IB2e: Infiltration Basin 2b

Inflow Area =	15,464 sf, 93.24% Impervious, Inflow Depth > 2.62" for 2-YR event				
Inflow =	1.01 cfs @	12.09 hrs,	Volume=	3,381 cf	
Outflow =	0.14 cfs @	11.70 hrs,	Volume=	3,379 cf,	Atten= 86%, Lag= 0.0 min
Discarded =	0.14 cfs @	11.70 hrs,	Volume=	3,379 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= 131.25' @ 12.60 hrs Surf.Area= 2,592 sf Storage= 1,029 cf

Plug-Flow detention time= 45.5 min calculated for 3,379 cf (100% of inflow)
Center-of-Mass det. time= 45.1 min (825.8 - 780.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	130.50'	2,002 cf	**34.83'W x 74.40'L x 2.50'H Field A** 6,479 cf Overall - 1,474 cf Embedded = 5,005 cf x 40.0% Voids
#2A	131.00'	1,474 cf	**ADS_StormTech SC-310 +Cap** x 100 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 10 Rows of 10 Chambers
		3,476 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	130.85'	**15.0" Round Culvert Barrel** L= 69.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 130.85' / 130.50' S= 0.0051 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Discarded	130.50'	**2.410 in/hr Exfiltration over Surface area**
#3	Device 1	131.40'	**3.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	132.63'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.14 cfs @ 11.70 hrs HW=130.53' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=130.50' (Free Discharge)
└─**1=Culvert Barrel** (Controls 0.00 cfs)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB2e: Infiltration Basin 2b - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-310 +Cap (ADS StormTech® SC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

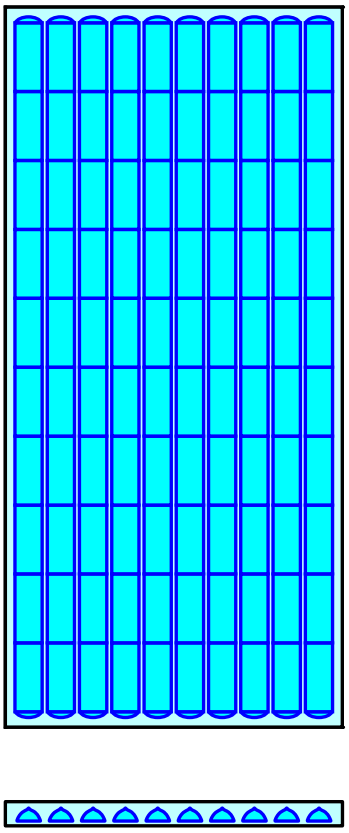
10 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 72.40' Row Length +12.0" End Stone x 2 = 74.40' Base Length
10 Rows x 34.0" Wide + 6.0" Spacing x 9 + 12.0" Side Stone x 2 = 34.83' Base Width
6.0" Base + 16.0" Chamber Height + 8.0" Cover = 2.50' Field Height

100 Chambers x 14.7 cf = 1,474.2 cf Chamber Storage

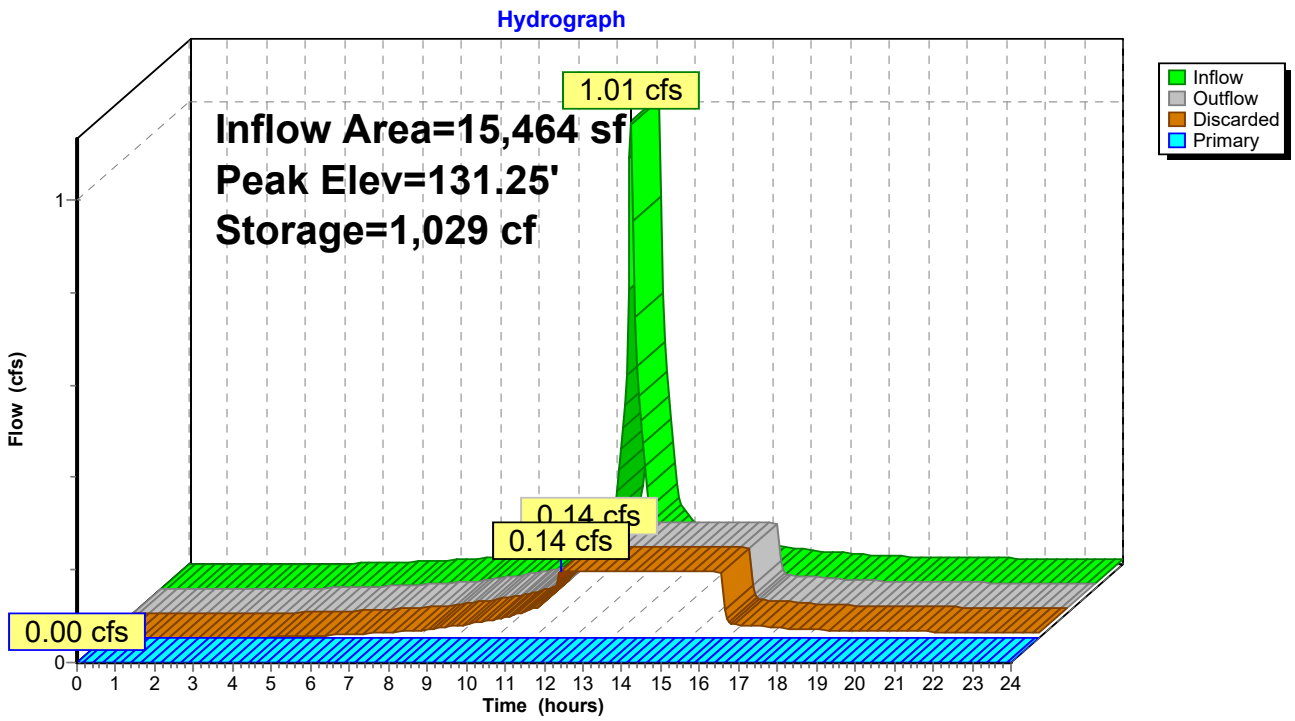
6,479.0 cf Field - 1,474.2 cf Chambers = 5,004.8 cf Stone x 40.0% Voids = 2,001.9 cf Stone Storage

Chamber Storage + Stone Storage = 3,476.1 cf = 0.080 af
Overall Storage Efficiency = 53.7%
Overall System Size = 74.40' x 34.83' x 2.50'

100 Chambers
240.0 cy Field
185.4 cy Stone



Pond IB2e: Infiltration Basin 2b



Stage-Area-Storage for Pond IB2e: Infiltration Basin 2b

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.50	**2,592**	0
130.55	2,592	52
130.60	2,592	104
130.65	2,592	155
130.70	2,592	207
130.75	2,592	259
130.80	2,592	311
130.85	2,592	363
130.90	2,592	415
130.95	2,592	466
131.00	2,592	518
131.05	2,592	622
131.10	2,592	724
131.15	2,592	827
131.20	2,592	928
131.25	2,592	1,029
131.30	2,592	1,129
131.35	2,592	1,227
131.40	2,592	1,325
131.45	2,592	1,422
131.50	2,592	1,517
131.55	2,592	1,611
131.60	2,592	1,703
131.65	2,592	1,794
131.70	2,592	1,884
131.75	2,592	1,972
131.80	2,592	2,057
131.85	2,592	2,141
131.90	2,592	2,222
131.95	2,592	2,301
132.00	2,592	2,377
132.05	2,592	2,449
132.10	2,592	2,516
132.15	2,592	2,579
132.20	2,592	2,638
132.25	2,592	2,695
132.30	2,592	2,750
132.35	2,592	2,802
132.40	2,592	2,854
132.45	2,592	2,906
132.50	2,592	2,958
132.55	2,592	3,010
132.60	2,592	3,061
132.65	2,592	3,113
132.70	2,592	3,165
132.75	2,592	3,217
132.80	2,592	3,269
132.85	2,592	3,321
132.90	2,592	3,372
132.95	2,592	3,424
133.00	2,592	**3,476**

Summary for Subcatchment PD-1: Prop. Drainage Area 1

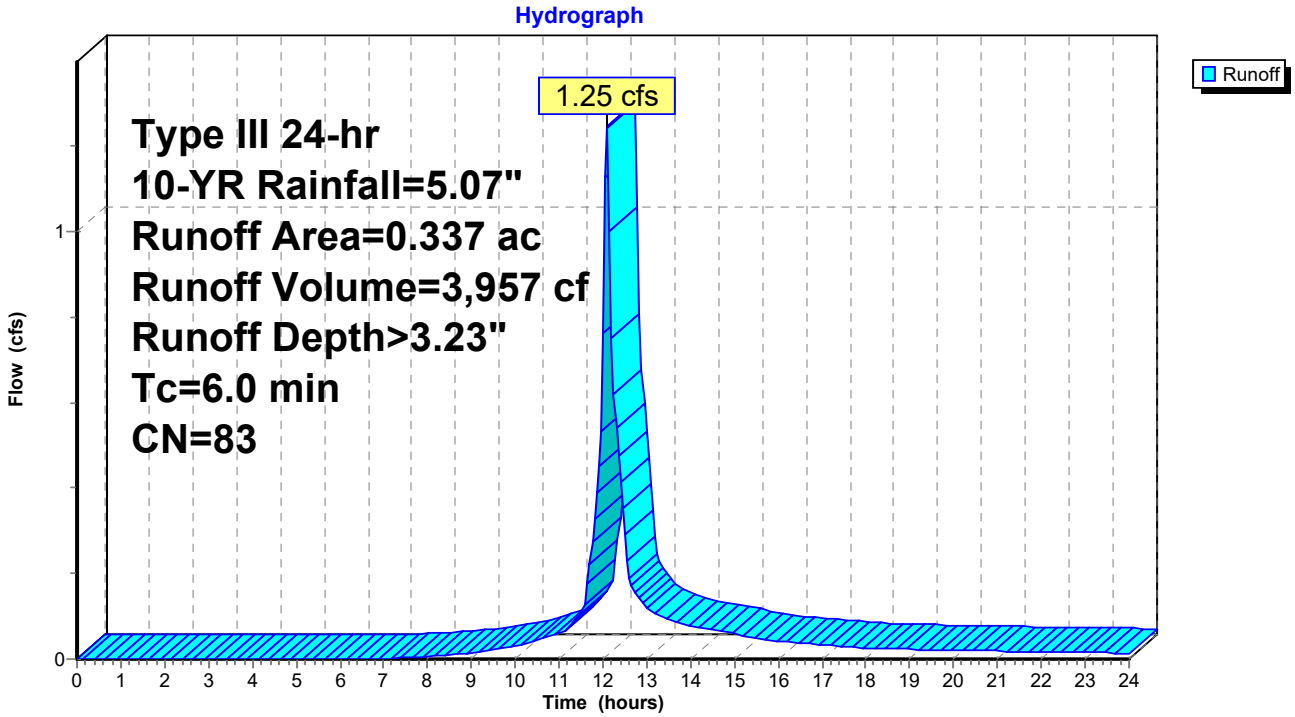
Runoff = 1.25 cfs @ 12.09 hrs, Volume= 3,957 cf, Depth> 3.23"

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-YR Rainfall=5.07"

	Area (ac)	CN	Description
*	0.074	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.070	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.193	98	Paved parking
	0.337	83	Weighted Average
	0.144		42.73% Pervious Area
	0.193		57.27% Impervious Area

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

Subcatchment PD-1: Prop. Drainage Area 1



Summary for Subcatchment PD-2a: Prop. Drainage Area 2a

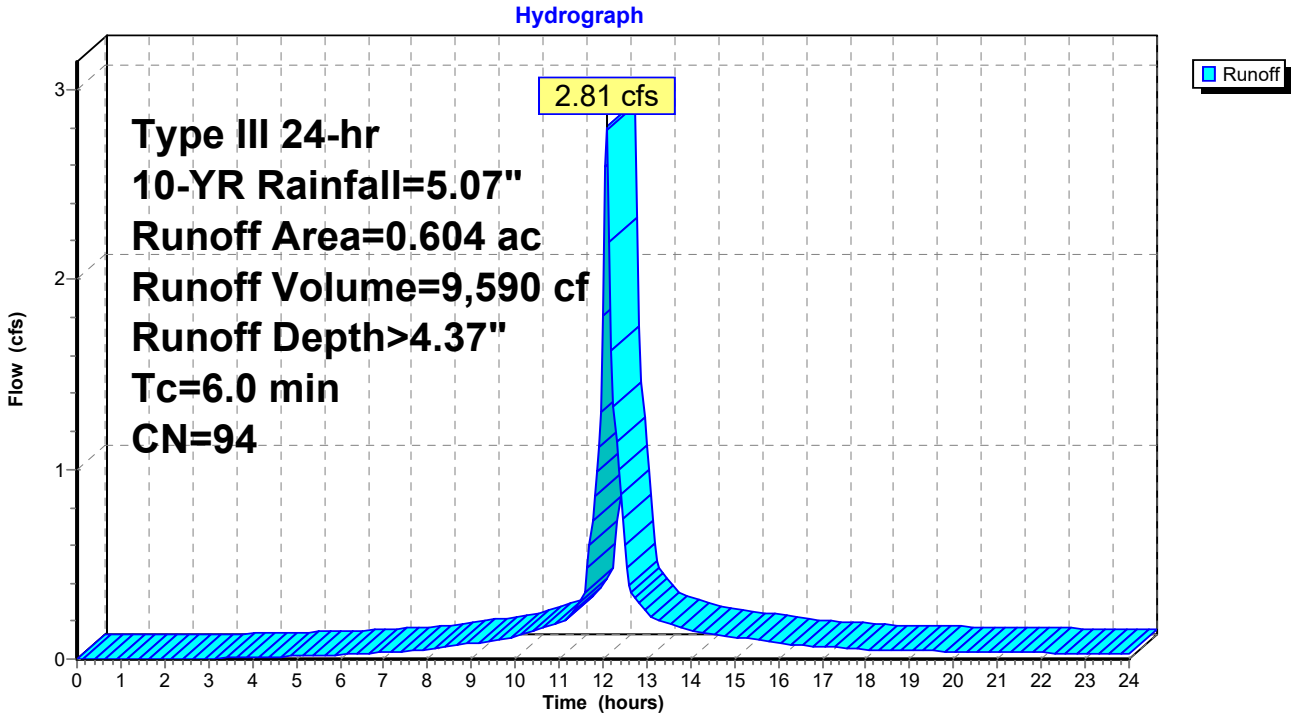
Runoff = 2.81 cfs @ 12.09 hrs, Volume= 9,590 cf, Depth> 4.37"

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-YR Rainfall=5.07"

	Area (ac)	CN	Description
*	0.038	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.029	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.537	98	Paved parking
	0.604	94	Weighted Average
	0.067		11.09% Pervious Area
	0.537		88.91% Impervious Area

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

Subcatchment PD-2a: Prop. Drainage Area 2a



Summary for Subcatchment PD-2b: Prop. Drainage Area 2b

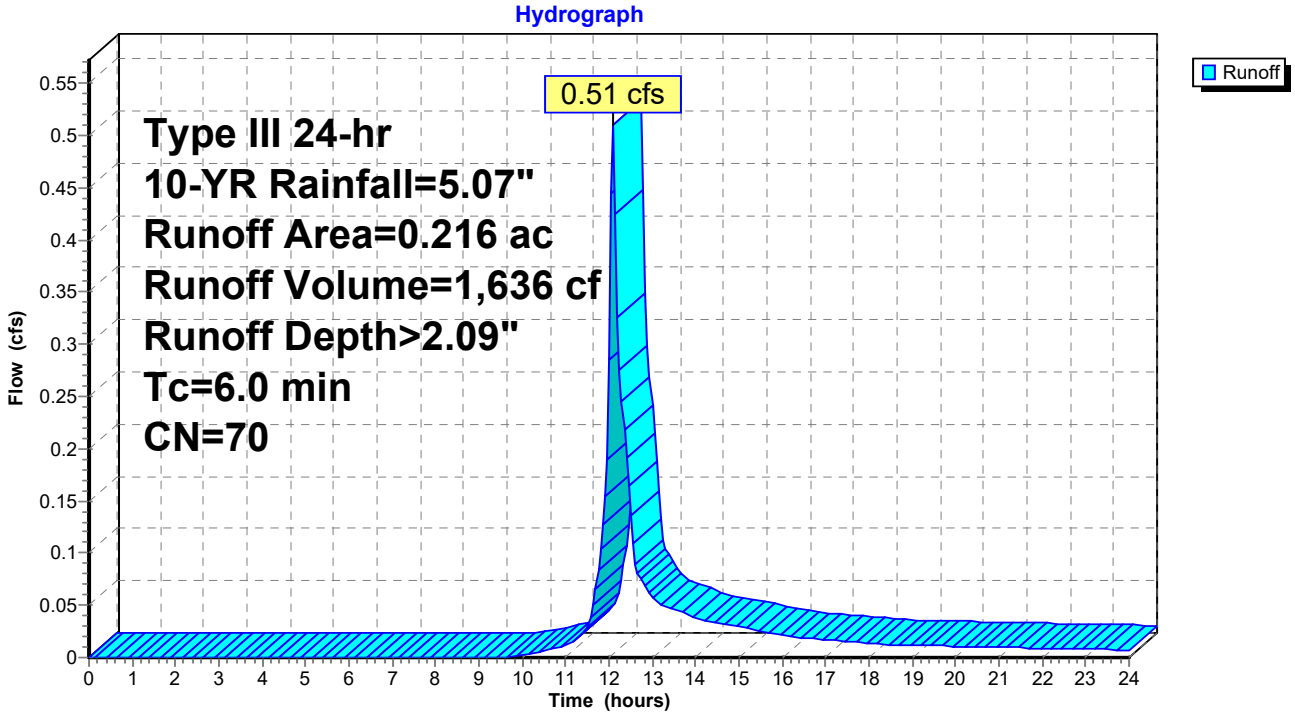
Runoff = 0.51 cfs @ 12.10 hrs, Volume= 1,636 cf, Depth> 2.09"

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-YR Rainfall=5.07"

	Area (ac)	CN	Description
*	0.174	74	Woods/grass comb., Fair, HSG B/D, 13
*	0.018	43	Woods/grass comb., Fair, HSG A. 36A
	0.024	65	Woods/grass comb., Fair, HSG B
	0.216	70	Weighted Average
	0.216		100.00% Pervious Area

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

Subcatchment PD-2b: Prop. Drainage Area 2b



Summary for Subcatchment PD-2c: Prop. Drainage Area 2c

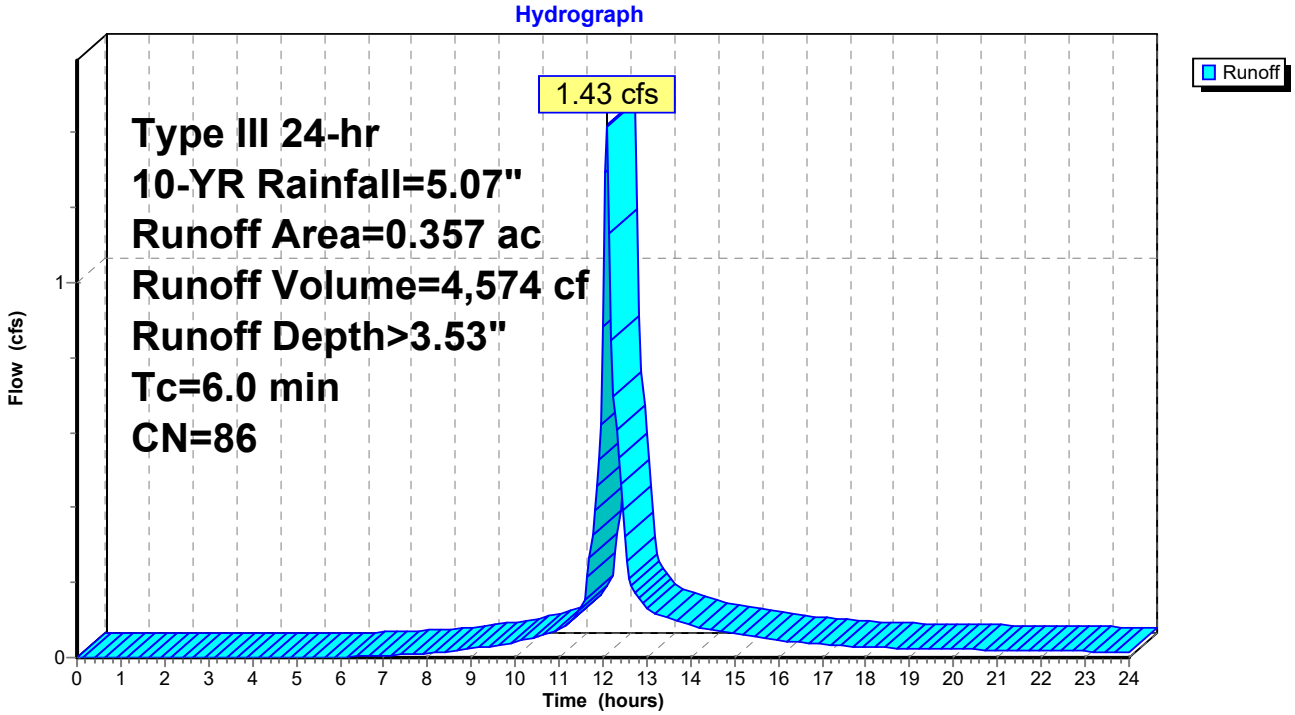
Runoff = 1.43 cfs @ 12.09 hrs, Volume= 4,574 cf, Depth> 3.53"

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-YR Rainfall=5.07"

	Area (ac)	CN	Description
*	0.061	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.042	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.021	49	50-75% Grass cover, Fair, HSG A, 36A
	0.233	98	Paved parking, HSG D
	0.357	86	Weighted Average
	0.124		34.73% Pervious Area
	0.233		65.27% Impervious Area

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

Subcatchment PD-2c: Prop. Drainage Area 2c



Summary for Subcatchment PD-2d: Prop. Drainage Area 2d

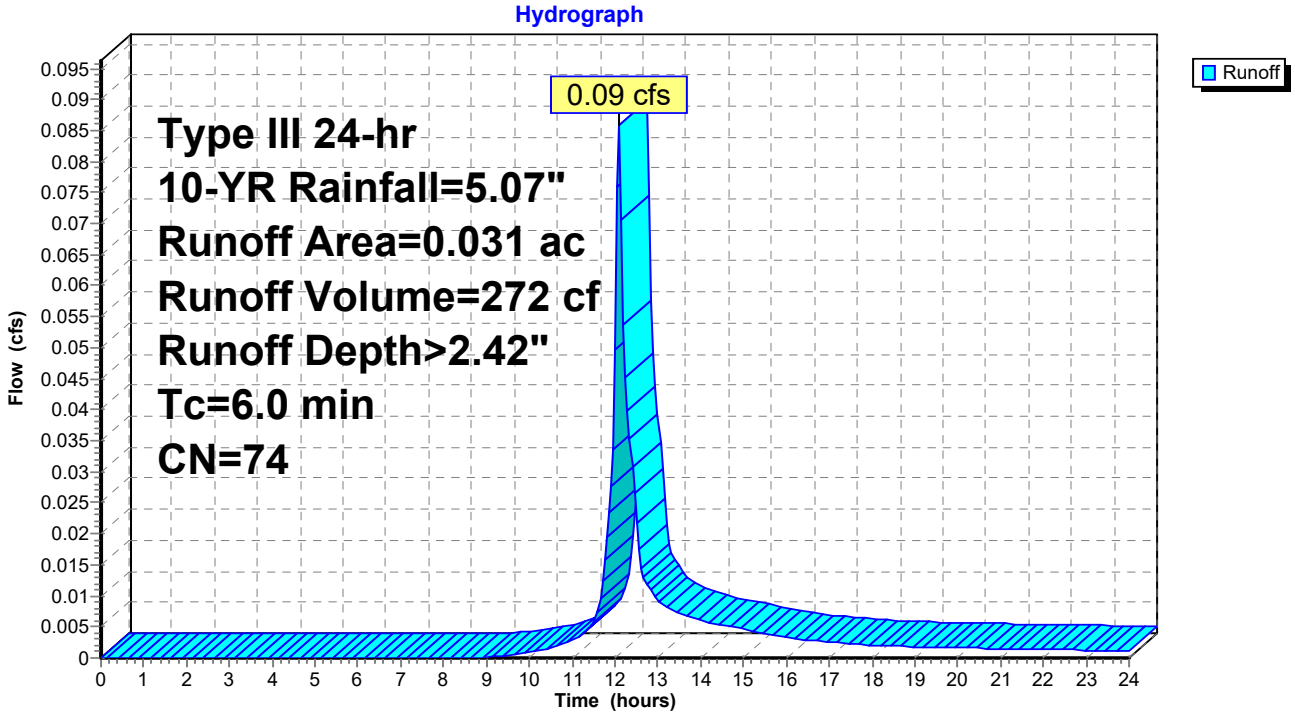
Runoff = 0.09 cfs @ 12.09 hrs, Volume= 272 cf, Depth> 2.42"

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-YR Rainfall=5.07"

	Area (ac)	CN	Description
*	0.031	74	Woods/grass comb., Fair, HSG B/D, 13
	0.031		100.00% Pervious Area

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

Subcatchment PD-2d: Prop. Drainage Area 2d



Summary for Subcatchment PD-2e: Prop. Drainage Area 2e

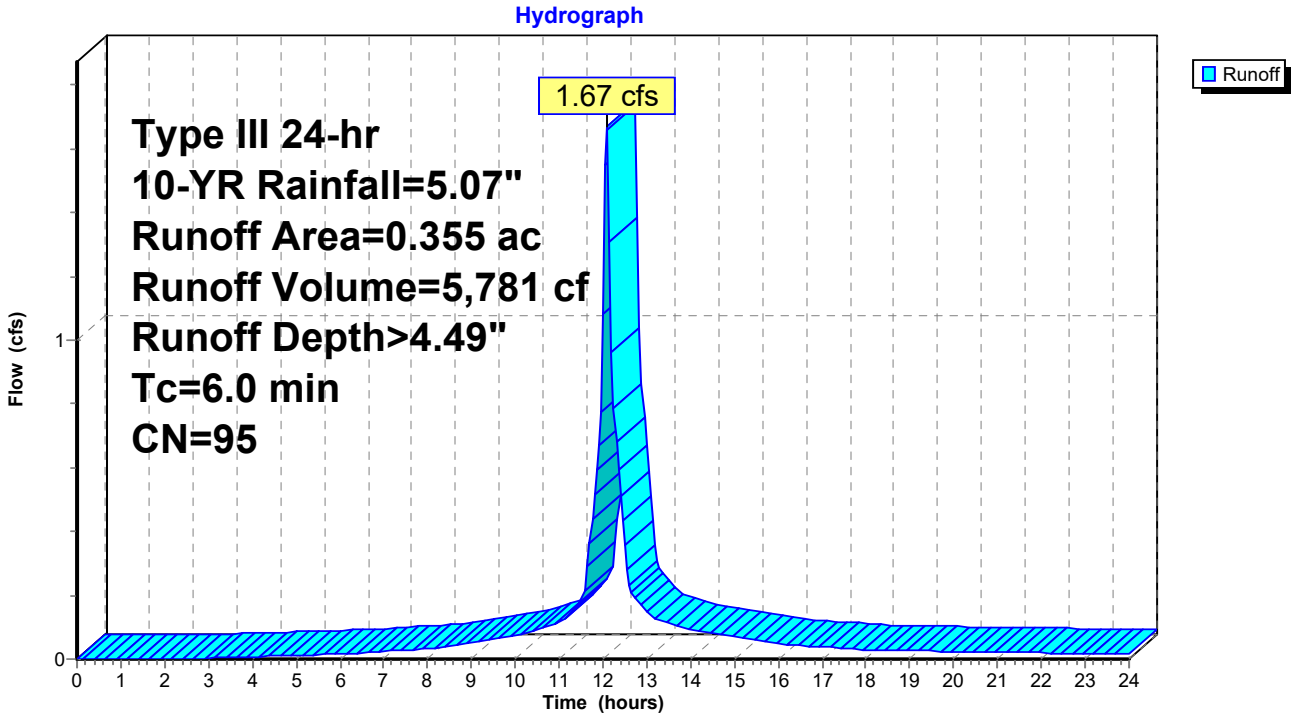
Runoff = 1.67 cfs @ 12.09 hrs, Volume= 5,781 cf, Depth> 4.49"

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 10-YR Rainfall=5.07"

	Area (ac)	CN	Description
*	0.004	43	Woods/grass comb., Fair, HSG A, 36A
*	0.020	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.331	98	Paved parking
	0.355	95	Weighted Average
	0.024		6.76% Pervious Area
	0.331		93.24% Impervious Area

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

Subcatchment PD-2e: Prop. Drainage Area 2e



Summary for Subcatchment PD-2f: Prop. Drainage Area 2d

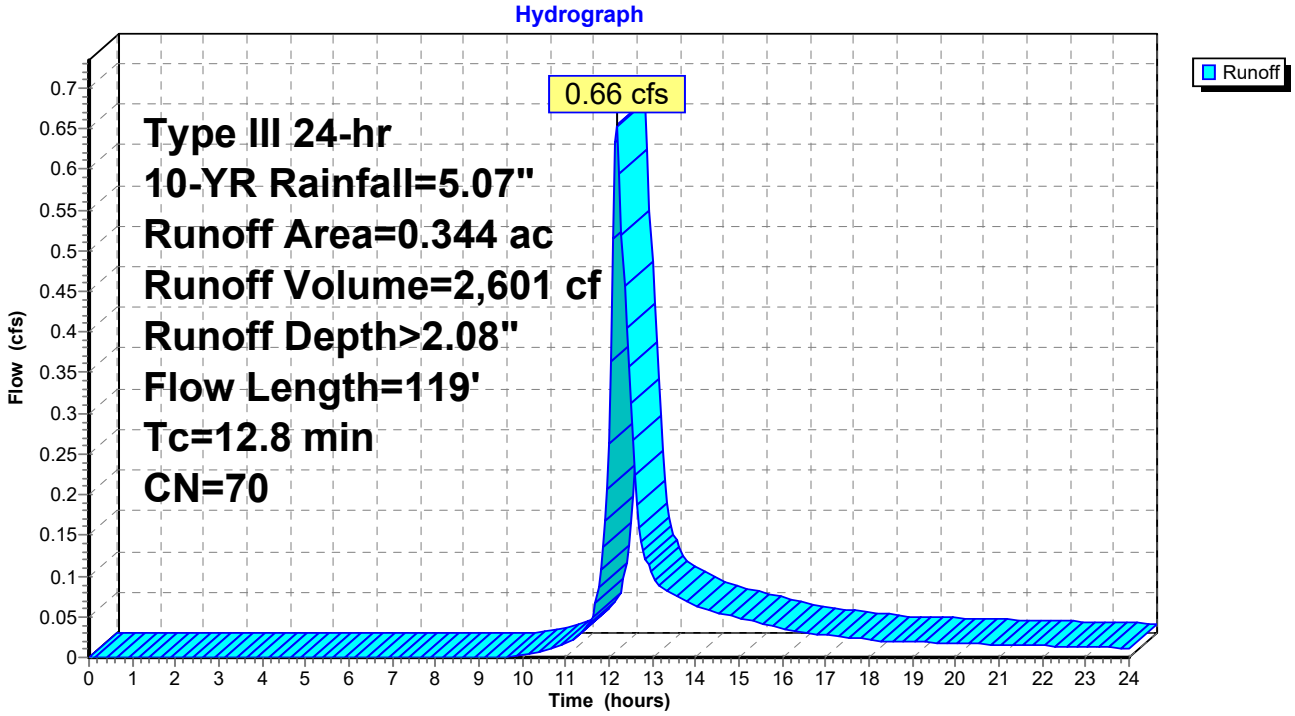
Runoff = 0.66 cfs @ 12.19 hrs, Volume= 2,601 cf, Depth> 2.08"

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-YR Rainfall=5.07"

	Area (ac)	CN	Description
*	0.296	74	Woods/grass comb., Fair, HSG B/D, 13
	0.048	43	Woods/grass comb., Fair, HSG A
	0.344	70	Weighted Average
	0.344		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	23	0.1600	0.13		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.18"
8.4	36	0.0270	0.07		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.18"
1.5	60	0.0167	0.65		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
12.8	119	Total			

Subcatchment PD-2f: Prop. Drainage Area 2d



Summary for Subcatchment PD-3a: Prop. Drainage Area 3a

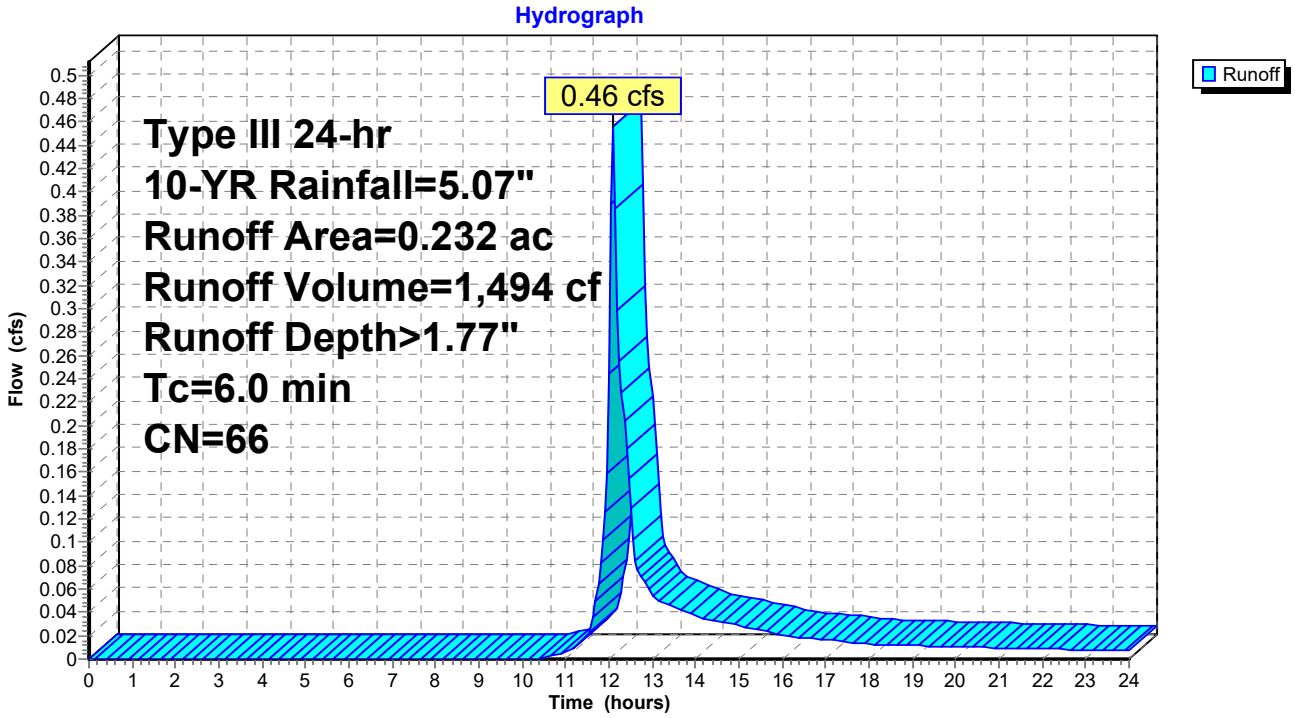
Runoff = 0.46 cfs @ 12.10 hrs, Volume= 1,494 cf, Depth> 1.77"

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-YR Rainfall=5.07"

	Area (ac)	CN	Description
*	0.120	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.071	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.041	98	Paved parking
	0.232	66	Weighted Average
	0.191		82.33% Pervious Area
	0.041		17.67% Impervious Area

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

Subcatchment PD-3a: Prop. Drainage Area 3a



Summary for Subcatchment PD-3b: Prop. Drainage Area 3b

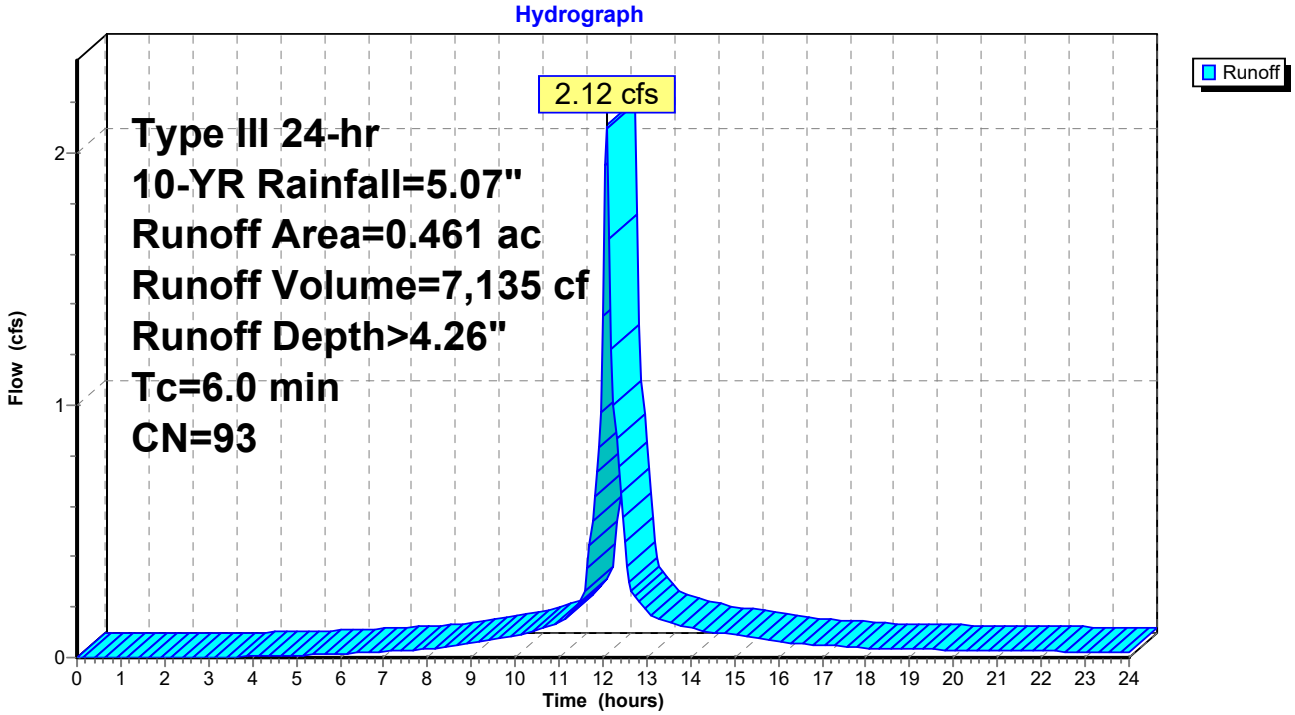
Runoff = 2.12 cfs @ 12.09 hrs, Volume= 7,135 cf, Depth> 4.26"

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-YR Rainfall=5.07"

	Area (ac)	CN	Description
*	0.093	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.019	79	50-75% Grass cover, Fair, HSG C, 701A
*	0.016	98	Paved parking
*	0.333	98	Roofing
	0.461	93	Weighted Average
	0.112		24.30% Pervious Area
	0.349		75.70% Impervious Area

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

Subcatchment PD-3b: Prop. Drainage Area 3b



Summary for Subcatchment PD-3c: Prop. Drainage Area 3c

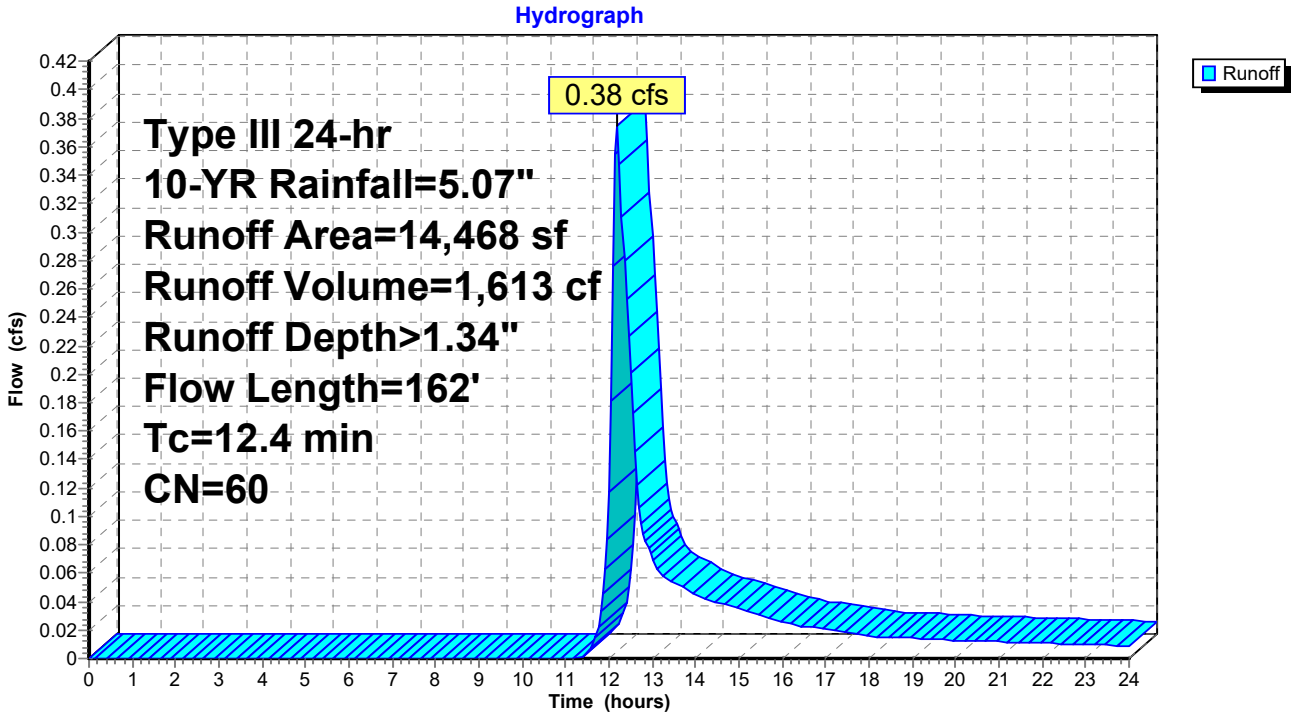
Runoff = 0.38 cfs @ 12.20 hrs, Volume= 1,613 cf, Depth> 1.34"

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-YR Rainfall=5.07"

	Area (sf)	CN	Description
*	6,684	43	Woods/grass comb., Fair, HSG A, 36A
*	5,545	74	Woods/grass comb., Fair, HSG C
	1,501	76	Woods/grass comb., Fair, HSG C
*	738	77	50-75% Grass cover, Fair, HSG C
	14,468	60	Weighted Average
	14,468		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	8	0.0625	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.18"
3.4	17	0.0580	0.08		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.18"
3.2	16	0.0625	0.08		**Sheet Flow, C-D** Woods: Light underbrush n= 0.400 P2= 3.18"
1.5	9	0.1250	0.10		**Sheet Flow, D-E** Woods: Light underbrush n= 0.400 P2= 3.18"
2.5	112	0.0220	0.74		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
12.4	162	Total			

Subcatchment PD-3c: Prop. Drainage Area 3c



Summary for Subcatchment RD-1: Roof 1

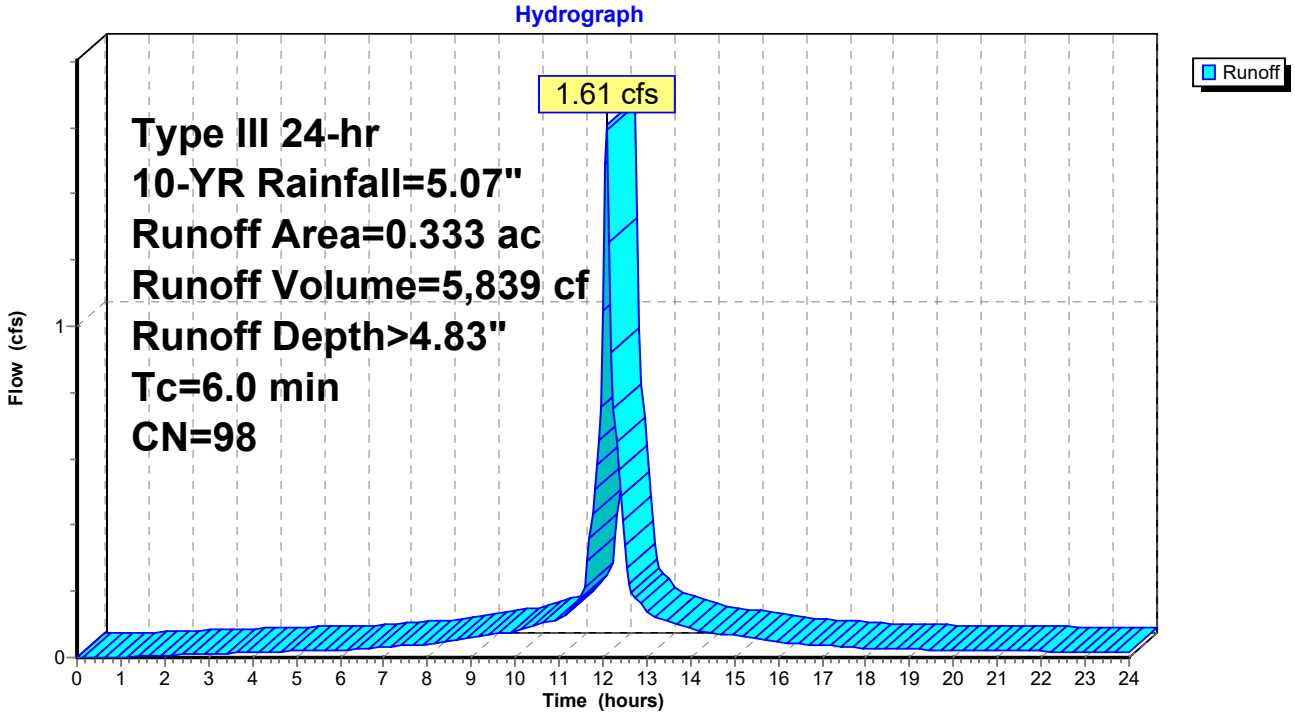
Runoff = 1.61 cfs @ 12.09 hrs, Volume= 5,839 cf, Depth> 4.83"

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-YR Rainfall=5.07"

	Area (ac)	CN	Description
*	0.333	98	Unconnected roofs
	0.333		100.00% Impervious Area
	0.333		100.00% Unconnected

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

Subcatchment RD-1: Roof 1

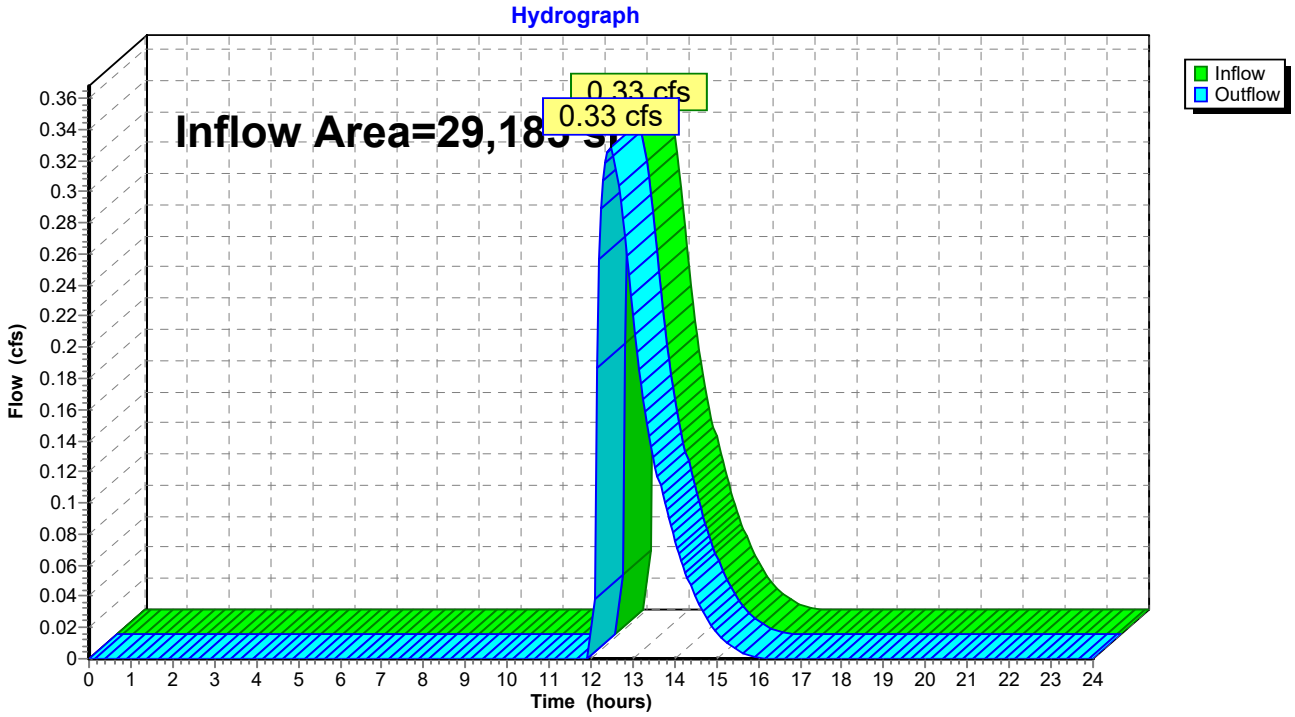


Summary for Reach DP-1a: Design Point 1

Inflow Area = 29,185 sf, 78.51% Impervious, Inflow Depth = 0.65" for 10-YR event
Inflow = 0.33 cfs @ 12.46 hrs, Volume= 1,570 cf
Outflow = 0.33 cfs @ 12.46 hrs, Volume= 1,570 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-1a: Design Point 1

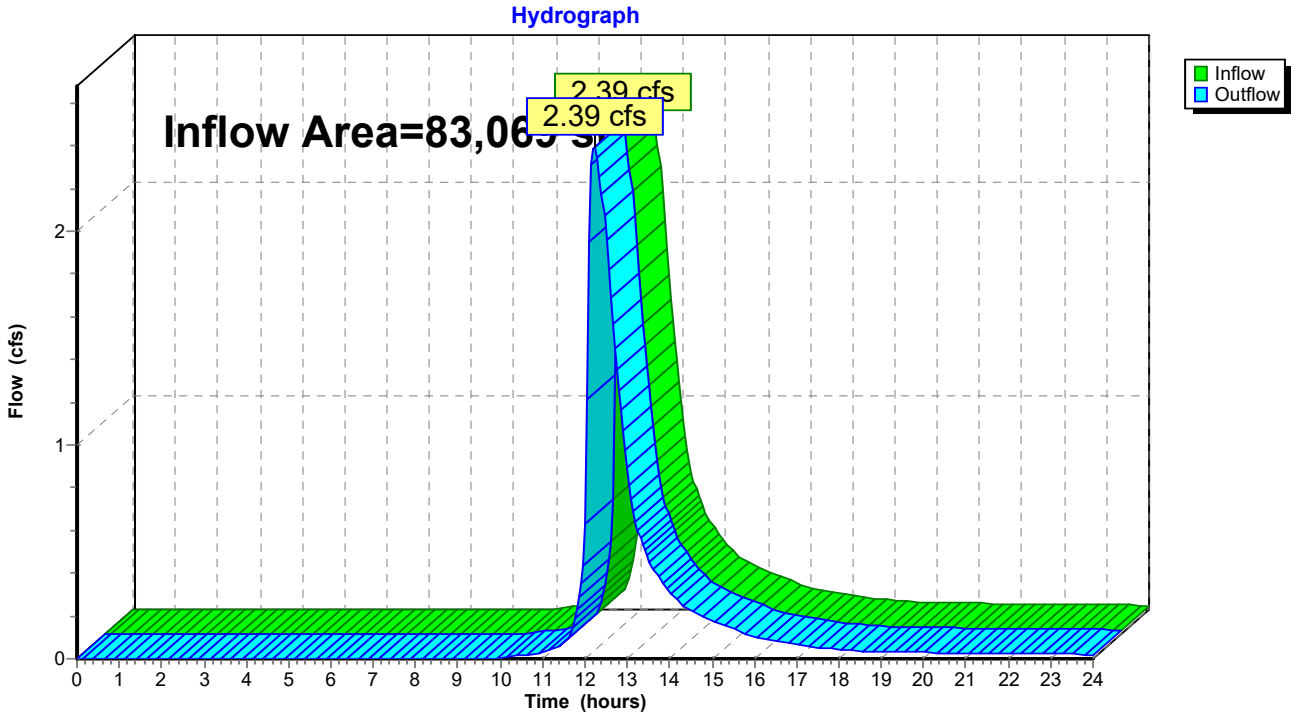


Summary for Reach DP-2a: Design Point 2

Inflow Area = 83,069 sf, 57.73% Impervious, Inflow Depth > 1.58" for 10-YR event
Inflow = 2.39 cfs @ 12.22 hrs, Volume= 10,915 cf
Outflow = 2.39 cfs @ 12.22 hrs, Volume= 10,915 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-2a: Design Point 2

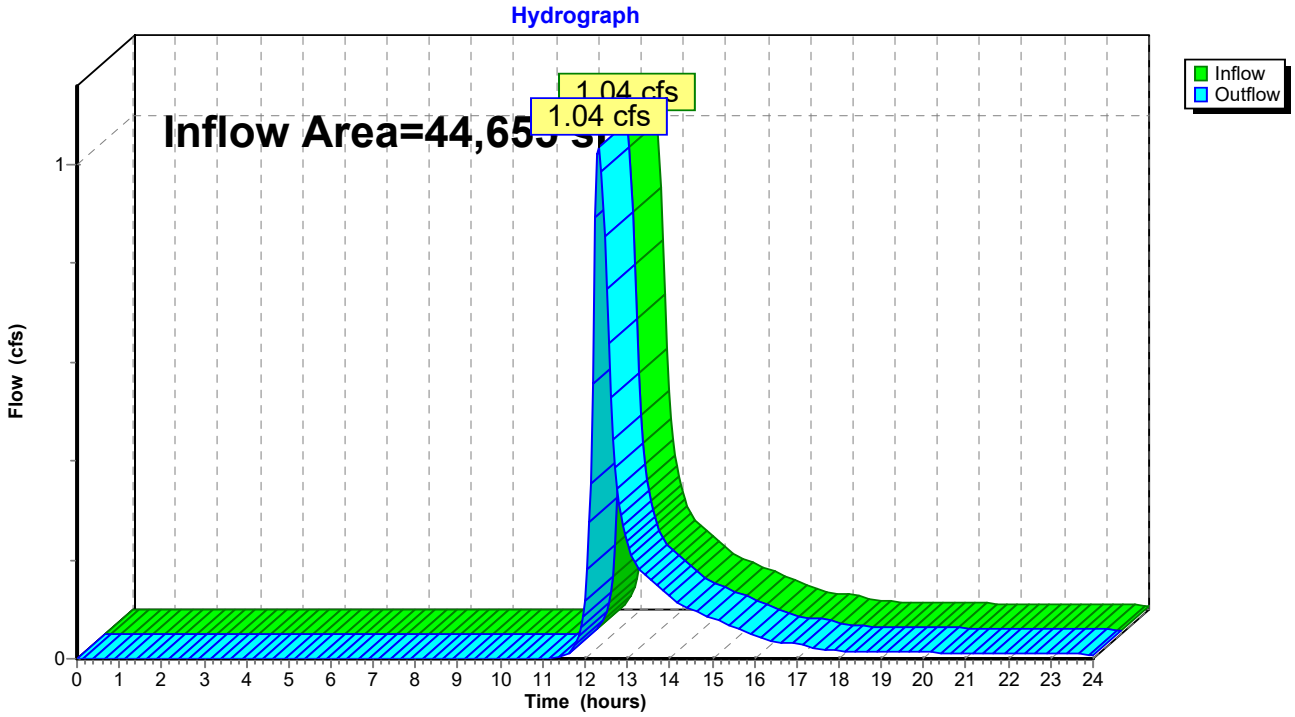


Summary for Reach DP-3a: Design Point 3

Inflow Area = 44,655 sf, 38.04% Impervious, Inflow Depth > 0.97" for 10-YR event
Inflow = 1.04 cfs @ 12.32 hrs, Volume= 3,625 cf
Outflow = 1.04 cfs @ 12.32 hrs, Volume= 3,625 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-3a: Design Point 3



Summary for Pond AB1: Above Ground Infiltration Basin 1

Inflow Area =	29,185 sf, 78.51% Impervious, Inflow Depth > 1.82" for 10-YR event				
Inflow =	1.25 cfs @	12.09 hrs,	Volume=	4,423 cf	
Outflow =	0.42 cfs @	12.46 hrs,	Volume=	4,420 cf,	Atten= 67%, Lag= 22.3 min
Discarded =	0.09 cfs @	12.46 hrs,	Volume=	2,850 cf	
Primary =	0.33 cfs @	12.46 hrs,	Volume=	1,570 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 128.46' @ 12.46 hrs Surf.Area= 1,553 sf Storage= 1,347 cf

Plug-Flow detention time= 86.2 min calculated for 4,410 cf (100% of inflow)
Center-of-Mass det. time= 85.6 min (895.7 - 810.1)

Volume	Invert	Avail.Storage	Storage Description
#1	127.00'	4,542 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 4,798 cf Overall - 256 cf Embedded = 4,542 cf
#2	127.00'	102 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) Inside #1 256 cf Overall x 40.0% Voids
		4,644 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
127.00	512	0	0
128.00	1,218	865	865
129.00	1,949	1,584	2,449
130.00	2,749	2,349	4,798

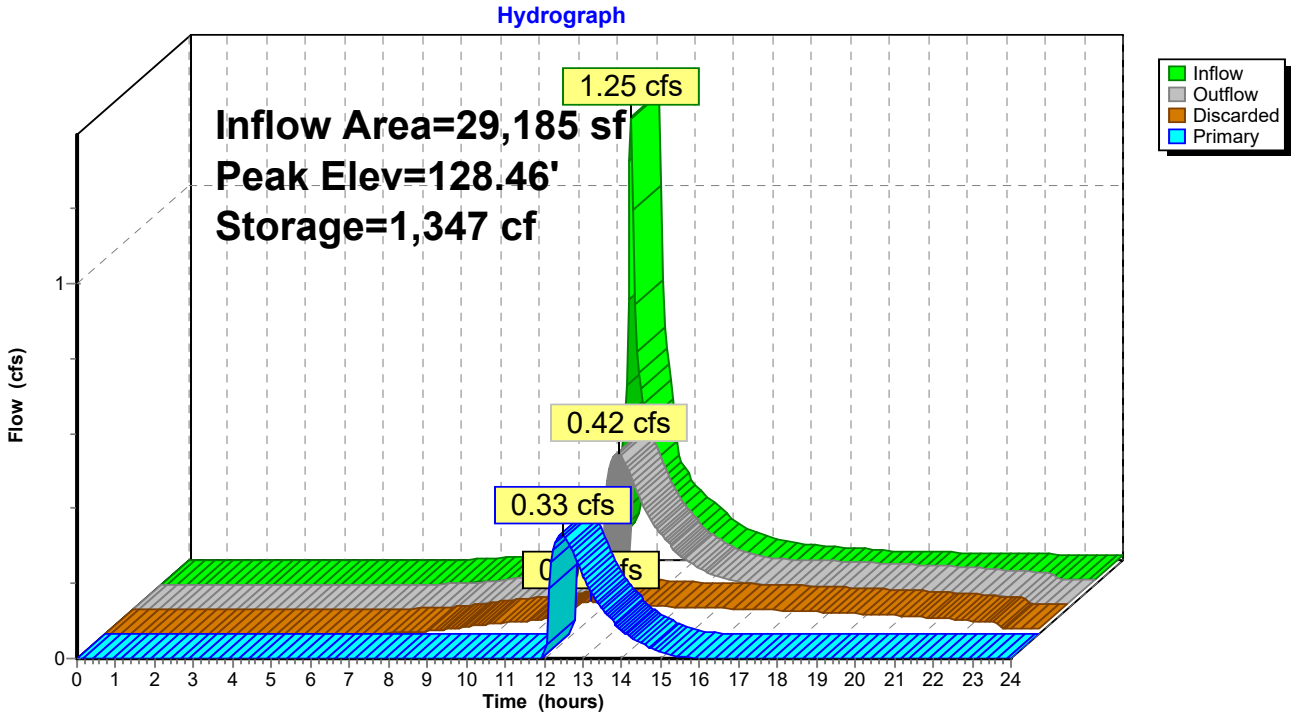
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
127.00	512	0	0
127.50	512	256	256

Device	Routing	Invert	Outlet Devices
#1	Primary	127.57'	**8.0" Round Culvert Barrel** L= 13.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 127.57' / 127.50' S= 0.0054 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.35 sf
#2	Device 1	129.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	127.00'	**2.410 in/hr Exfiltration over Surface area**
#4	Device 1	128.00'	**5.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.09 cfs @ 12.46 hrs HW=128.46' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=0.33 cfs @ 12.46 hrs HW=128.46' (Free Discharge)
└─**1=Culvert Barrel** (Passes 0.33 cfs of 0.79 cfs potential flow)
  ├─**2=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Orifice Controls 0.33 cfs @ 2.41 fps)

Pond AB1: Above Ground Infiltration Basin 1



Stage-Area-Storage for Pond AB1: Above Ground Infiltration Basin 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
127.00	512	0
127.05	547	11
127.10	583	24
127.15	618	39
127.20	653	55
127.25	689	73
127.30	724	93
127.35	759	115
127.40	794	138
127.45	830	164
127.50	865	191
127.55	900	235
127.60	936	281
127.65	971	328
127.70	1,006	378
127.75	1,042	429
127.80	1,077	482
127.85	1,112	537
127.90	1,147	593
127.95	1,183	651
128.00	1,218	711
128.05	1,255	773
128.10	1,291	837
128.15	1,328	902
128.20	1,364	970
128.25	1,401	1,039
128.30	1,437	1,110
128.35	1,474	1,182
128.40	1,510	1,257
128.45	1,547	1,334
128.50	1,584	1,412
128.55	1,620	1,492
128.60	1,657	1,574
128.65	1,693	1,658
128.70	1,730	1,743
128.75	1,766	1,830
128.80	1,803	1,920
128.85	1,839	2,011
128.90	1,876	2,104
128.95	1,912	2,198
129.00	1,949	2,295
129.05	1,989	2,393
129.10	2,029	2,494
129.15	2,069	2,596
129.20	2,109	2,701
129.25	2,149	2,807
129.30	2,189	2,916
129.35	2,229	3,026
129.40	2,269	3,139
129.45	2,309	3,253
129.50	2,349	3,369
129.55	2,389	3,488
129.60	2,429	3,608
129.65	2,469	3,731
129.70	2,509	3,855
129.75	2,549	3,982
129.80	2,589	4,110
129.85	2,629	4,241
129.90	2,669	4,373
129.95	2,709	4,507
130.00	**2,749**	**4,644**

Summary for Pond AB3a: Above Ground Infiltration 3a

Inflow Area =	10,106 sf, 17.67% Impervious, Inflow Depth > 1.77" for 10-YR event				
Inflow =	0.46 cfs @	12.10 hrs,	Volume=	1,494 cf	
Outflow =	0.07 cfs @	12.78 hrs,	Volume=	1,491 cf,	Atten= 85%, Lag= 40.9 min
Discarded =	0.07 cfs @	12.78 hrs,	Volume=	1,491 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= 132.45' @ 12.78 hrs Surf.Area= 1,216 sf Storage= 479 cf

Plug-Flow detention time= 61.8 min calculated for 1,491 cf (100% of inflow)
Center-of-Mass det. time= 60.8 min (917.5 - 856.6)

Volume	Invert	Avail.Storage	Storage Description
#1	132.00'	3,206 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

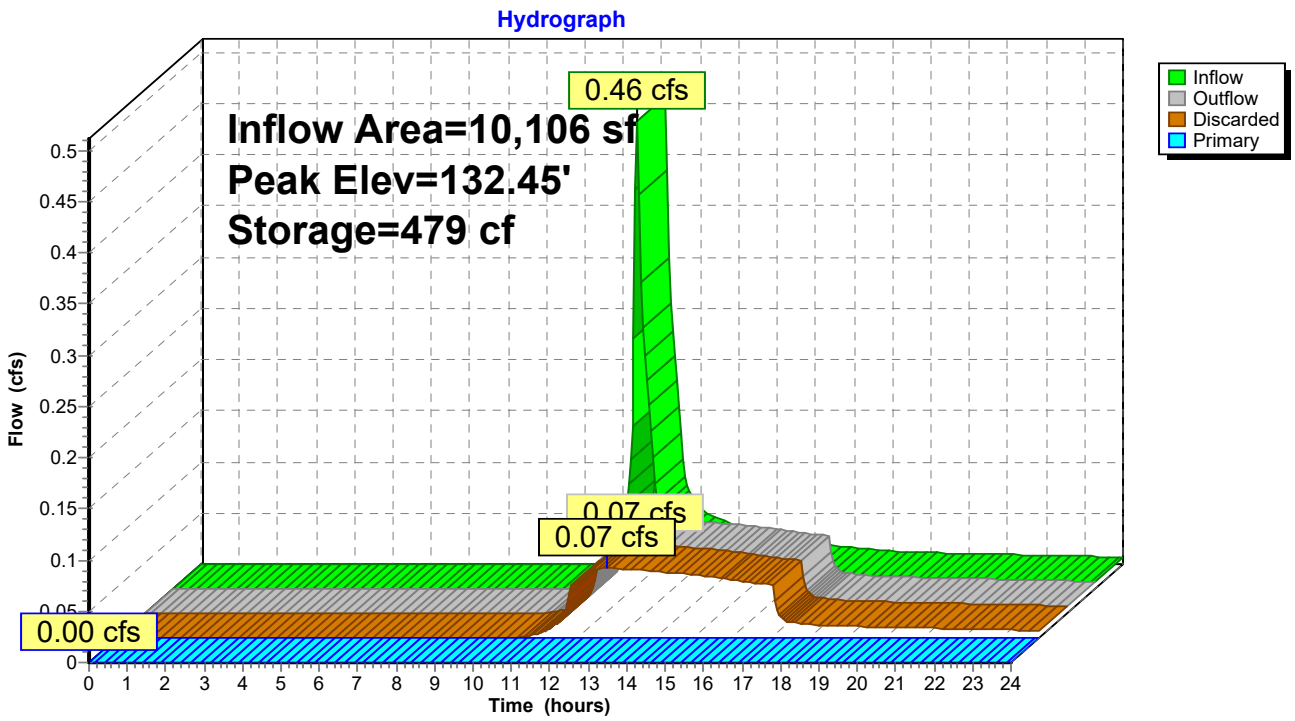
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
132.00	906	0	0
133.00	1,593	1,250	1,250
134.00	2,319	1,956	3,206

Device	Routing	Invert	Outlet Devices
#1	Discarded	132.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	133.00'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.07 cfs @ 12.78 hrs HW=132.45' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=132.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond AB3a: Above Ground Infiltration 3a



Stage-Area-Storage for Pond AB3a: Above Ground Infiltration 3a

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
132.00	906	0
132.02	920	18
132.04	933	37
132.06	947	56
132.08	961	75
132.10	975	94
132.12	988	114
132.14	1,002	134
132.16	1,016	154
132.18	1,030	174
132.20	1,043	195
132.22	1,057	216
132.24	1,071	237
132.26	1,085	259
132.28	1,098	281
132.30	1,112	303
132.32	1,126	325
132.34	1,140	348
132.36	1,153	371
132.38	1,167	394
132.40	1,181	417
132.42	1,195	441
132.44	1,208	465
132.46	1,222	489
132.48	1,236	514
132.50	1,250	539
132.52	1,263	564
132.54	1,277	589
132.56	1,291	615
132.58	1,304	641
132.60	1,318	667
132.62	1,332	694
132.64	1,346	721
132.66	1,359	748
132.68	1,373	775
132.70	1,387	803
132.72	1,401	830
132.74	1,414	859
132.76	1,428	887
132.78	1,442	916
132.80	1,456	945
132.82	1,469	974
132.84	1,483	1,003
132.86	1,497	1,033
132.88	1,511	1,063
132.90	1,524	1,094
132.92	1,538	1,124
132.94	1,552	1,155
132.96	1,566	1,186
132.98	1,579	1,218
133.00	1,593	1,250
133.02	1,608	1,282
133.04	1,622	1,314
133.06	1,637	1,346
133.08	1,651	1,379
133.10	1,666	1,412
133.12	1,680	1,446
133.14	1,695	1,480
133.16	1,709	1,514
133.18	1,724	1,548
133.20	1,738	1,583
133.22	1,753	1,618
133.24	1,767	1,653
133.26	1,782	1,688
133.28	1,796	1,724
133.30	1,811	1,760
133.32	1,825	1,796
133.34	1,840	1,833
133.36	1,854	1,870
133.38	1,869	1,907
133.40	1,883	1,945
133.42	1,898	1,983
133.44	1,912	2,021
133.46	1,927	2,059
133.48	1,941	2,098
133.50	1,956	2,137
133.52	1,971	2,176
133.54	1,985	2,216
133.56	2,000	2,255
133.58	2,014	2,296
133.60	2,029	2,336
133.62	2,043	2,377
133.64	2,058	2,418
133.66	2,072	2,459
133.68	2,087	2,501
133.70	2,101	2,542
133.72	2,116	2,585
133.74	2,130	2,627
133.76	2,145	2,670
133.78	2,159	2,713
133.80	2,174	2,756
133.82	2,188	2,800
133.84	2,203	2,844
133.86	2,217	2,888
133.88	2,232	2,932
133.90	2,246	2,977
133.92	2,261	3,022
133.94	2,275	3,068
133.96	2,290	3,113
133.98	2,304	3,159
134.00	**2,319**	**3,206**

Summary for Pond AB3b: Above Ground Infiltration 3b

Inflow Area =	20,081 sf, 75.70% Impervious, Inflow Depth > 4.26" for 10-YR event				
Inflow =	2.12 cfs @	12.09 hrs,	Volume=	7,135 cf	
Outflow =	0.79 cfs @	12.35 hrs,	Volume=	4,301 cf,	Atten= 63%, Lag= 15.5 min
Discarded =	0.05 cfs @	12.35 hrs,	Volume=	2,289 cf	
Primary =	0.74 cfs @	12.35 hrs,	Volume=	2,012 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 133.30' @ 12.35 hrs Surf.Area= 2,010 sf Storage= 3,474 cf

Plug-Flow detention time= 223.9 min calculated for 4,292 cf (60% of inflow)
Center-of-Mass det. time= 121.8 min (899.2 - 777.4)

Volume	Invert	Avail.Storage	Storage Description
#1	130.00'	5,050 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

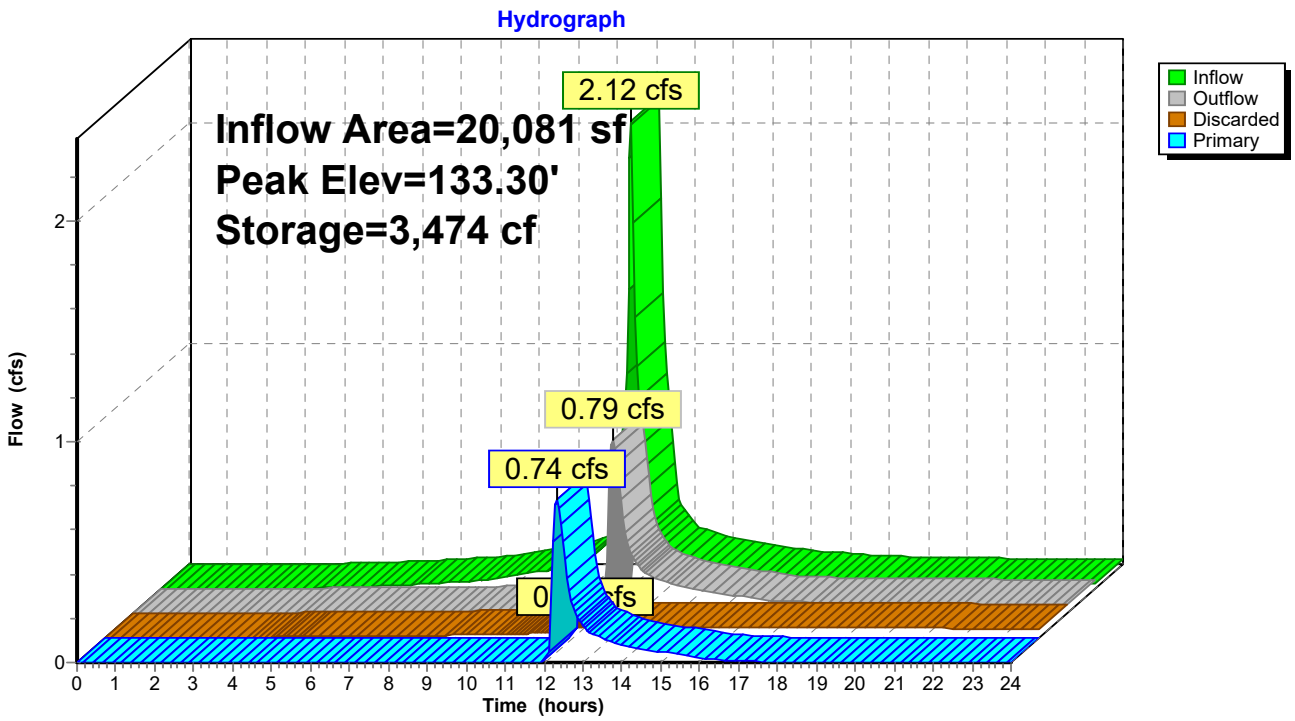
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
130.00	307	0	0
131.00	671	489	489
132.00	1,175	923	1,412
133.00	1,806	1,491	2,903
134.00	2,488	2,147	5,050

Device	Routing	Invert	Outlet Devices
#1	Primary	133.15'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Discarded	130.00'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 12.35 hrs HW=133.30' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.73 cfs @ 12.35 hrs HW=133.30' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 0.73 cfs @ 0.98 fps)

Pond AB3b: Above Ground Infiltration 3b



Stage-Area-Storage for Pond AB3b: Above Ground Infiltration 3b

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.00	307	0
130.05	325	16
130.10	343	33
130.15	362	50
130.20	380	69
130.25	398	88
130.30	416	108
130.35	434	130
130.40	453	152
130.45	471	175
130.50	489	199
130.55	507	224
130.60	525	250
130.65	544	276
130.70	562	304
130.75	580	333
130.80	598	362
130.85	616	392
130.90	635	424
130.95	653	456
131.00	671	489
131.05	696	523
131.10	721	559
131.15	747	595
131.20	772	633
131.25	797	673
131.30	822	713
131.35	847	755
131.40	873	798
131.45	898	842
131.50	923	888
131.55	948	934
131.60	973	982
131.65	999	1,032
131.70	1,024	1,082
131.75	1,049	1,134
131.80	1,074	1,187
131.85	1,099	1,241
131.90	1,125	1,297
131.95	1,150	1,354
132.00	1,175	1,412
132.05	1,207	1,472
132.10	1,238	1,533
132.15	1,270	1,595
132.20	1,301	1,660
132.25	1,333	1,725
132.30	1,364	1,793
132.35	1,396	1,862
132.40	1,427	1,932
132.45	1,459	2,005
132.50	1,491	2,078
132.55	1,522	2,154
132.60	1,554	2,231
132.65	1,585	2,309
132.70	1,617	2,389
132.75	1,648	2,471
132.80	1,680	2,554
132.85	1,711	2,639
132.90	1,743	2,725
132.95	1,774	2,813
133.00	1,806	2,903
133.05	1,840	2,994
133.10	1,874	3,087
133.15	1,908	3,181
133.20	1,942	3,277
133.25	1,977	3,375
133.30	2,011	3,475
133.35	2,045	3,576
133.40	2,079	3,679
133.45	2,113	3,784
133.50	2,147	3,891
133.55	2,181	3,999
133.60	2,215	4,109
133.65	2,249	4,220
133.70	2,283	4,334
133.75	2,318	4,449
133.80	2,352	4,566
133.85	2,386	4,684
133.90	2,420	4,804
133.95	2,454	4,926
134.00	**2,488**	**5,050**

Summary for Pond IB1: Infiltration Basin 1

Inflow Area =	14,505 sf,100.00% Impervious, Inflow Depth > 4.83" for 10-YR event				
Inflow =	1.61 cfs @	12.09 hrs,	Volume=	5,839 cf	
Outflow =	0.19 cfs @	12.67 hrs,	Volume=	5,835 cf,	Atten= 88%, Lag= 35.0 min
Discarded =	0.11 cfs @	10.80 hrs,	Volume=	5,370 cf	
Primary =	0.09 cfs @	12.67 hrs,	Volume=	465 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 130.68' @ 12.67 hrs Surf.Area= 1,889 sf Storage= 2,140 cf

Plug-Flow detention time= 126.4 min calculated for 5,835 cf (100% of inflow)
Center-of-Mass det. time= 126.0 min (873.3 - 747.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	129.00'	1,726 cf	**25.25'W x 74.82'L x 3.50'H Field A** 6,612 cf Overall - 2,297 cf Embedded = 4,315 cf x 40.0% Voids
#2A	129.50'	2,297 cf	**ADS_StormTech SC-740 +Cap** x 50 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 5 Rows of 10 Chambers
		4,023 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	130.24'	**12.0" Round Culvert** L= 10.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 130.24' / 130.00' S= 0.0240 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#2	Discarded	129.00'	**2.410 in/hr Exfiltration over Surface area**
#3	Device 1	130.40'	**3.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	132.05'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.11 cfs @ 10.80 hrs HW=129.04' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.09 cfs @ 12.67 hrs HW=130.68' (Free Discharge)
└─**1=Culvert** (Passes 0.09 cfs of 0.89 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.09 cfs @ 2.14 fps)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB1: Infiltration Basin 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

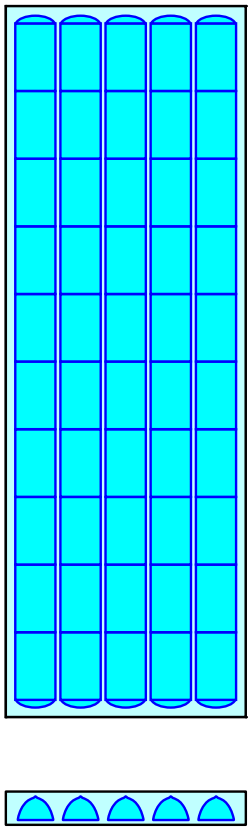
10 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 72.82' Row Length +12.0" End Stone x 2 = 74.82' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

50 Chambers x 45.9 cf = 2,297.0 cf Chamber Storage

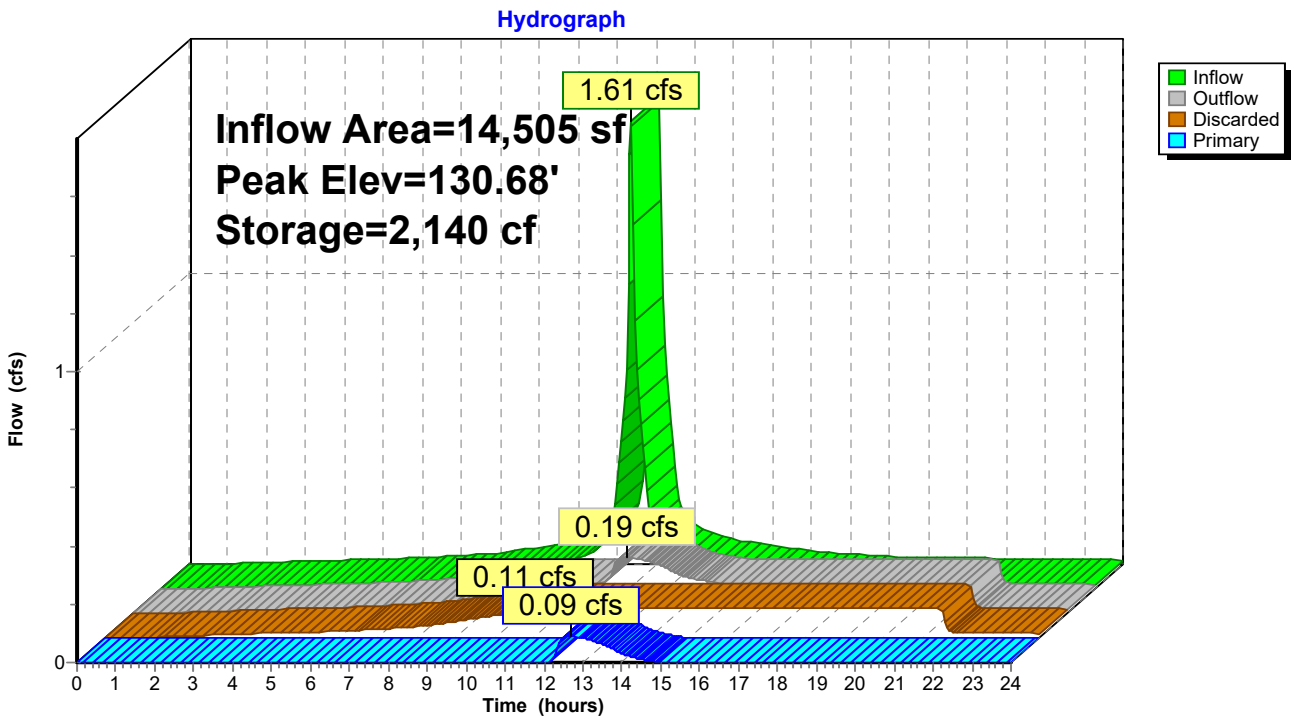
6,611.9 cf Field - 2,297.0 cf Chambers = 4,314.9 cf Stone x 40.0% Voids = 1,726.0 cf Stone Storage

Chamber Storage + Stone Storage = 4,023.0 cf = 0.092 af
Overall Storage Efficiency = 60.8%
Overall System Size = 74.82' x 25.25' x 3.50'

50 Chambers
244.9 cy Field
159.8 cy Stone



Pond IB1: Infiltration Basin 1



Stage-Area-Storage for Pond IB1: Infiltration Basin 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
129.00	**1,889**	0
129.05	1,889	38
129.10	1,889	76
129.15	1,889	113
129.20	1,889	151
129.25	1,889	189
129.30	1,889	227
129.35	1,889	264
129.40	1,889	302
129.45	1,889	340
129.50	1,889	378
129.55	1,889	455
129.60	1,889	533
129.65	1,889	610
129.70	1,889	687
129.75	1,889	764
129.80	1,889	841
129.85	1,889	917
129.90	1,889	993
129.95	1,889	1,069
130.00	1,889	1,145
130.05	1,889	1,220
130.10	1,889	1,295
130.15	1,889	1,369
130.20	1,889	1,444
130.25	1,889	1,517
130.30	1,889	1,591
130.35	1,889	1,664
130.40	1,889	1,736
130.45	1,889	1,809
130.50	1,889	1,880
130.55	1,889	1,952
130.60	1,889	2,022
130.65	1,889	2,093
130.70	1,889	2,162
130.75	1,889	2,232
130.80	1,889	2,300
130.85	1,889	2,368
130.90	1,889	2,435
130.95	1,889	2,502
131.00	1,889	2,568
131.05	1,889	2,634
131.10	1,889	2,698
131.15	1,889	2,762
131.20	1,889	2,825
131.25	1,889	2,887
131.30	1,889	2,948
131.35	1,889	3,008
131.40	1,889	3,067
131.45	1,889	3,124
131.50	1,889	3,181
131.55	1,889	3,236
131.60	1,889	3,290
131.65	1,889	3,342
131.70	1,889	3,392
131.75	1,889	3,439
131.80	1,889	3,484
131.85	1,889	3,526
131.90	1,889	3,567
131.95	1,889	3,607
132.00	1,889	3,645
132.05	1,889	3,683
132.10	1,889	3,721
132.15	1,889	3,758
132.20	1,889	3,796
132.25	1,889	3,834
132.30	1,889	3,872
132.35	1,889	3,910
132.40	1,889	3,947
132.45	1,889	3,985
132.50	1,889	**4,023**

Summary for Pond IB2a: Infiltration Basin 2a

Inflow Area =	26,310 sf, 88.91% Impervious, Inflow Depth > 4.37" for 10-YR event				
Inflow =	2.81 cfs @	12.09 hrs,	Volume=	9,590 cf	
Outflow =	1.10 cfs @	12.32 hrs,	Volume=	7,947 cf,	Atten= 61%, Lag= 13.9 min
Discarded =	0.06 cfs @	8.45 hrs,	Volume=	3,701 cf	
Primary =	1.04 cfs @	12.32 hrs,	Volume=	4,246 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 129.57' @ 12.32 hrs Surf.Area= 2,458 sf Storage= 3,488 cf

Plug-Flow detention time= 137.2 min calculated for 7,931 cf (83% of inflow)
Center-of-Mass det. time= 69.2 min (841.8 - 772.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	127.50'	2,392 cf	**30.00'W x 81.94'L x 3.67'H Field A** 9,013 cf Overall - 3,032 cf Embedded = 5,981 cf x 40.0% Voids
#2A	128.00'	3,032 cf	**ADS_StormTech SC-740 +Cap** x 66 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 6 Rows of 11 Chambers
		5,424 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	128.60'	**15.0" Round Culvert** L= 55.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 128.60' / 128.00' S= 0.0109 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Discarded	127.50'	**1.020 in/hr Exfiltration over Surface area**
#3	Device 1	128.80'	**10.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	130.10'	**10.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	130.99'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.06 cfs @ 8.45 hrs HW=127.54' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=1.04 cfs @ 12.32 hrs HW=129.57' (Free Discharge)
└─**1=Culvert** (Passes 1.04 cfs of 3.81 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 1.04 cfs @ 3.73 fps)
  ├─**4=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB2a: Infiltration Basin 2a - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

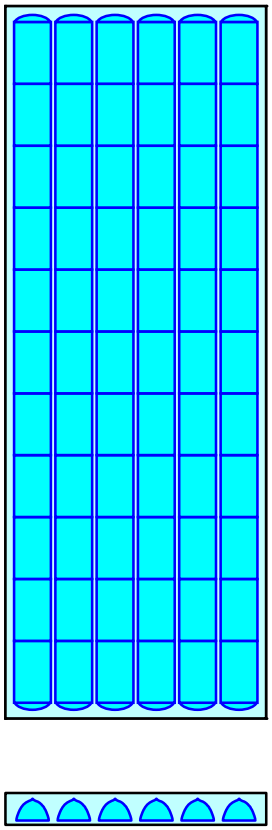
11 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 79.94' Row Length +12.0" End Stone x 2 = 81.94' Base Length
6 Rows x 51.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.00' Base Width
6.0" Base + 30.0" Chamber Height + 8.0" Cover = 3.67' Field Height

66 Chambers x 45.9 cf = 3,032.0 cf Chamber Storage

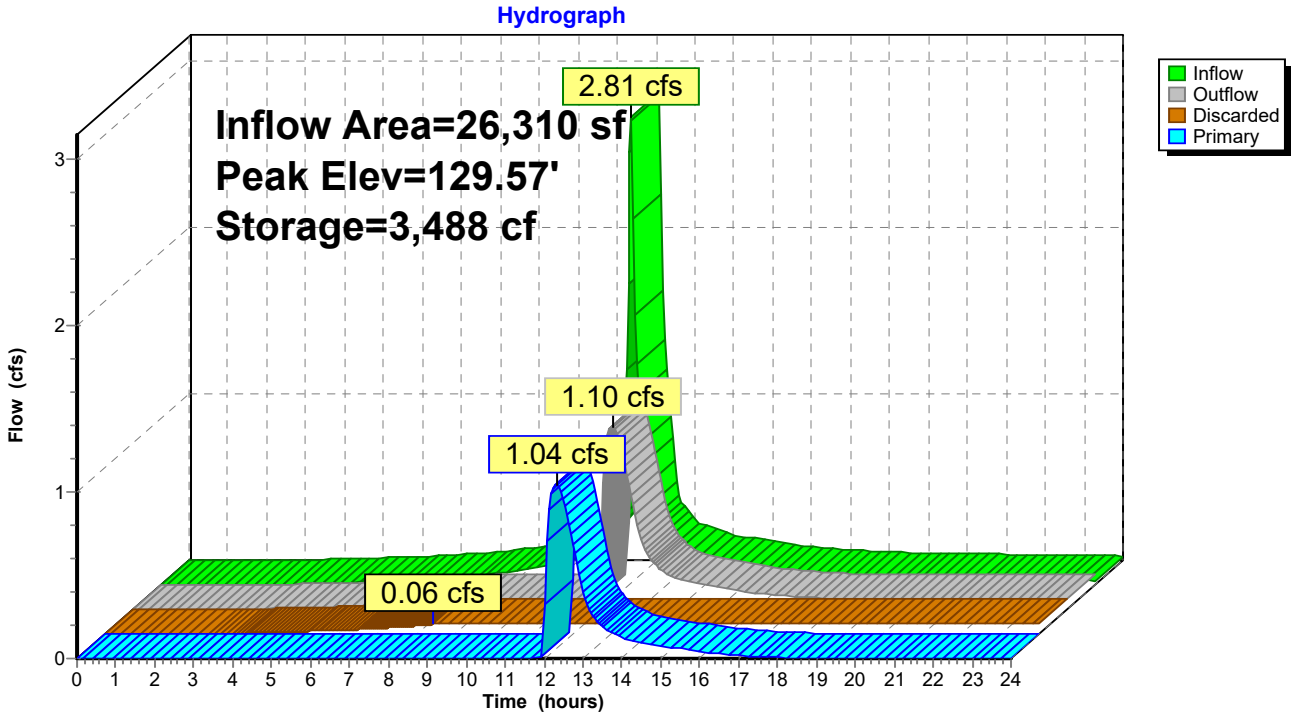
9,013.0 cf Field - 3,032.0 cf Chambers = 5,981.0 cf Stone x 40.0% Voids = 2,392.4 cf Stone Storage

Chamber Storage + Stone Storage = 5,424.4 cf = 0.125 af
Overall Storage Efficiency = 60.2%
Overall System Size = 81.94' x 30.00' x 3.67'

66 Chambers
333.8 cy Field
221.5 cy Stone



Pond IB2a: Infiltration Basin 2a



Stage-Area-Storage for Pond IB2a: Infiltration Basin 2a

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
127.50	**2,458**	0
127.55	2,458	49
127.60	2,458	98
127.65	2,458	147
127.70	2,458	197
127.75	2,458	246
127.80	2,458	295
127.85	2,458	344
127.90	2,458	393
127.95	2,458	442
128.00	2,458	492
128.05	2,458	593
128.10	2,458	695
128.15	2,458	796
128.20	2,458	897
128.25	2,458	998
128.30	2,458	1,099
128.35	2,458	1,199
128.40	2,458	1,298
128.45	2,458	1,398
128.50	2,458	1,497
128.55	2,458	1,595
128.60	2,458	1,694
128.65	2,458	1,791
128.70	2,458	1,888
128.75	2,458	1,985
128.80	2,458	2,081
128.85	2,458	2,177
128.90	2,458	2,272
128.95	2,458	2,367
129.00	2,458	2,461
129.05	2,458	2,554
129.10	2,458	2,647
129.15	2,458	2,739
129.20	2,458	2,830
129.25	2,458	2,921
129.30	2,458	3,011
129.35	2,458	3,100
129.40	2,458	3,188
129.45	2,458	3,275
129.50	2,458	3,362
129.55	2,458	3,447
129.60	2,458	3,532
129.65	2,458	3,615
129.70	2,458	3,698
129.75	2,458	3,779
129.80	2,458	3,858
129.85	2,458	3,937
129.90	2,458	4,014
129.95	2,458	4,089
130.00	2,458	4,164
130.05	2,458	4,236
130.10	2,458	4,306
130.15	2,458	4,374
130.20	2,458	4,439
130.25	2,458	4,501
130.30	2,458	4,559
130.35	2,458	4,614
130.40	2,458	4,667
130.45	2,458	4,719
130.50	2,458	4,769
130.55	2,458	4,818
130.60	2,458	4,867
130.65	2,458	4,916
130.70	2,458	4,966
130.75	2,458	5,015
130.80	2,458	5,064
130.85	2,458	5,113
130.90	2,458	5,162
130.95	2,458	5,211
131.00	2,458	5,261
131.05	2,458	5,310
131.10	2,458	5,359
131.15	2,458	**5,408**

Summary for Pond IB2c: Infiltration Basin Area 2c

Inflow Area =	15,551 sf, 65.27% Impervious, Inflow Depth > 3.53" for 10-YR event				
Inflow =	1.43 cfs @	12.09 hrs,	Volume=	4,574 cf	
Outflow =	0.46 cfs @	12.40 hrs,	Volume=	4,569 cf,	Atten= 68%, Lag= 18.8 min
Discarded =	0.06 cfs @	10.60 hrs,	Volume=	2,956 cf	
Primary =	0.40 cfs @	12.40 hrs,	Volume=	1,613 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 131.09' @ 12.40 hrs Surf.Area= 2,373 sf Storage= 1,500 cf

Plug-Flow detention time= 106.9 min calculated for 4,560 cf (100% of inflow)
Center-of-Mass det. time= 106.0 min (909.4 - 803.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	130.00'	1,505 cf	**27.00'W x 87.91'L x 2.00'H Field A** 4,747 cf Overall - 985 cf Embedded = 3,762 cf x 40.0% Voids
#2A	130.50'	985 cf	**ADS_StormTech SC-160LP +Cap** x 144 Inside #1 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 12 Rows of 12 Chambers
		2,489 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	130.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	129.20'	**8.0" Round Culvert** L= 14.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 129.20' / 129.00' S= 0.0143 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.35 sf
#3	Device 2	130.70'	**11.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 2	131.40'	**2.0" Vert. Orifice/Grate** C= 0.600
#5	Device 2	131.88'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.06 cfs @ 10.60 hrs HW=130.02' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.40 cfs @ 12.40 hrs HW=131.09' (Free Discharge)
└─**2=Culvert** (Passes 0.40 cfs of 2.53 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.40 cfs @ 2.65 fps)
  ├─**4=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB2c: Infiltration Basin Area 2c - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-160LP +Cap (ADS StormTech® SC-160LP with cap length)
Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf
Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap

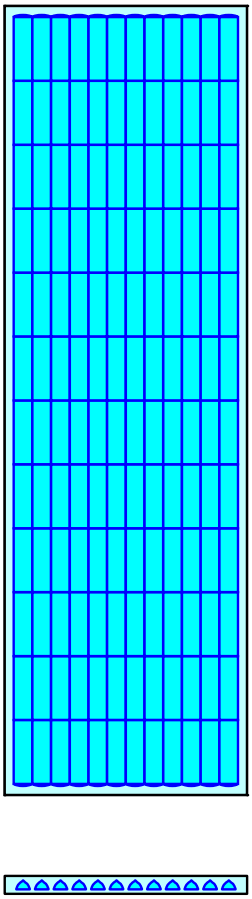
12 Chambers/Row x 7.12' Long +0.23' Cap Length x 2 = 85.91' Row Length +12.0" End Stone x 2 = 87.91' Base Length
12 Rows x 25.0" Wide + 12.0" Side Stone x 2 = 27.00' Base Width
6.0" Base + 12.0" Chamber Height + 6.0" Cover = 2.00' Field Height

144 Chambers x 6.8 cf = 984.5 cf Chamber Storage

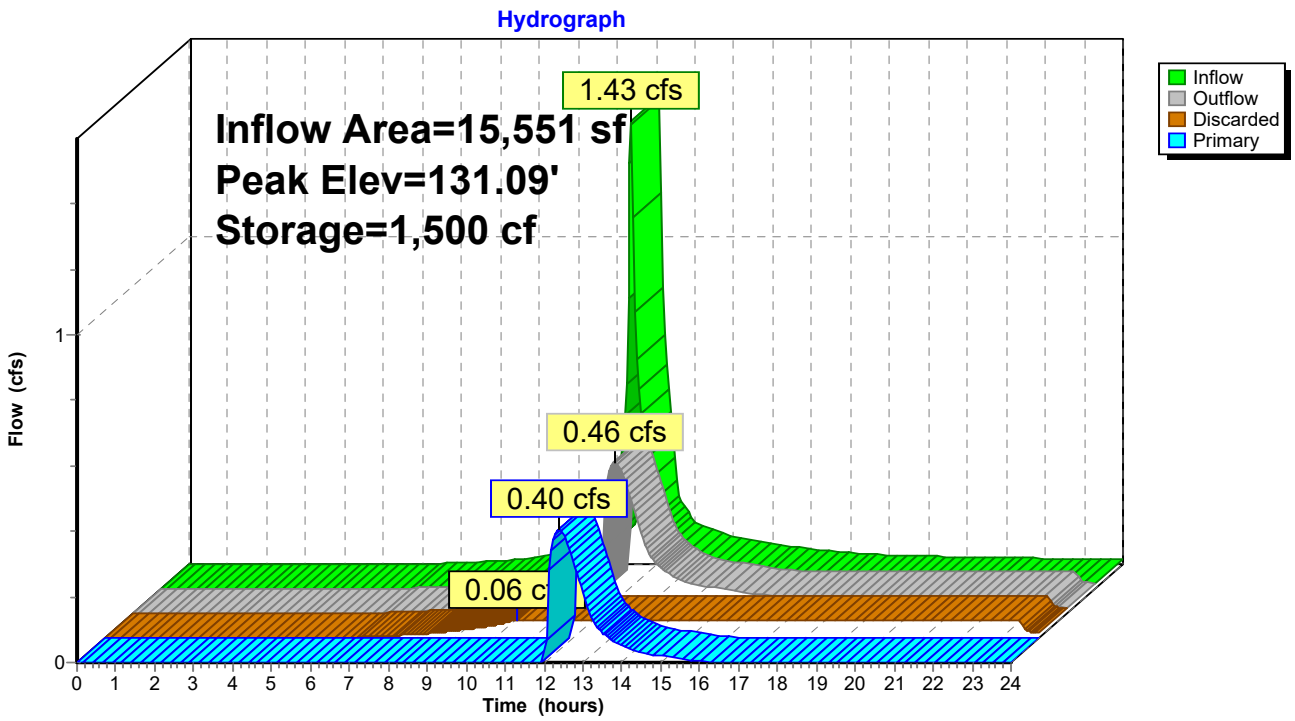
4,747.0 cf Field - 984.5 cf Chambers = 3,762.4 cf Stone x 40.0% Voids = 1,505.0 cf Stone Storage

Chamber Storage + Stone Storage = 2,489.5 cf = 0.057 af
Overall Storage Efficiency = 52.4%
Overall System Size = 87.91' x 27.00' x 2.00'

144 Chambers
175.8 cy Field
139.3 cy Stone



Pond IB2c: Infiltration Basin Area 2c



Stage-Area-Storage for Pond IB2c: Infiltration Basin Area 2c

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.00	**2,373**	0	131.06	2,373	1,457
130.02	2,373	19	131.08	2,373	1,489
130.04	2,373	38	131.10	2,373	1,519
130.06	2,373	57	131.12	2,373	1,550
130.08	2,373	76	131.14	2,373	1,580
130.10	2,373	95	131.16	2,373	1,609
130.12	2,373	114	131.18	2,373	1,638
130.14	2,373	133	131.20	2,373	1,667
130.16	2,373	152	131.22	2,373	1,695
130.18	2,373	171	131.24	2,373	1,722
130.20	2,373	190	131.26	2,373	1,749
130.22	2,373	209	131.28	2,373	1,774
130.24	2,373	228	131.30	2,373	1,799
130.26	2,373	247	131.32	2,373	1,824
130.28	2,373	266	131.34	2,373	1,847
130.30	2,373	285	131.36	2,373	1,870
130.32	2,373	304	131.38	2,373	1,892
130.34	2,373	323	131.40	2,373	1,914
130.36	2,373	342	131.42	2,373	1,935
130.38	2,373	361	131.44	2,373	1,955
130.40	2,373	380	131.46	2,373	1,976
130.42	2,373	399	131.48	2,373	1,995
130.44	2,373	418	131.50	2,373	2,015
130.46	2,373	437	131.52	2,373	2,034
130.48	2,373	456	131.54	2,373	2,053
130.50	2,373	475	131.56	2,373	2,072
130.52	2,373	512	131.58	2,373	2,091
130.54	2,373	549	131.60	2,373	2,110
130.56	2,373	587	131.62	2,373	2,129
130.58	2,373	624	131.64	2,373	2,148
130.60	2,373	661	131.66	2,373	2,167
130.62	2,373	698	131.68	2,373	2,186
130.64	2,373	735	131.70	2,373	2,205
130.66	2,373	772	131.72	2,373	2,224
130.68	2,373	808	131.74	2,373	2,243
130.70	2,373	844	131.76	2,373	2,262
130.72	2,373	880	131.78	2,373	2,281
130.74	2,373	916	131.80	2,373	2,300
130.76	2,373	952	131.82	2,373	2,319
130.78	2,373	987	131.84	2,373	2,338
130.80	2,373	1,022	131.86	2,373	2,357
130.82	2,373	1,057	131.88	2,373	2,376
130.84	2,373	1,092	131.90	2,373	2,395
130.86	2,373	1,127	131.92	2,373	2,414
130.88	2,373	1,161	131.94	2,373	2,433
130.90	2,373	1,195	131.96	2,373	2,452
130.92	2,373	1,229	131.98	2,373	2,471
130.94	2,373	1,263	132.00	2,373	**2,489**
130.96	2,373	1,296			
130.98	2,373	1,329			
131.00	2,373	1,361			
131.02	2,373	1,394			
131.04	2,373	1,426			

Summary for Pond IB2e: Infiltration Basin 2b

Inflow Area =	15,464 sf, 93.24% Impervious, Inflow Depth > 4.49" for 10-YR event				
Inflow =	1.67 cfs @	12.09 hrs,	Volume=	5,781 cf	
Outflow =	0.28 cfs @	12.56 hrs,	Volume=	5,778 cf,	Atten= 83%, Lag= 28.4 min
Discarded =	0.14 cfs @	11.30 hrs,	Volume=	5,231 cf	
Primary =	0.13 cfs @	12.56 hrs,	Volume=	547 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 131.73' @ 12.56 hrs Surf.Area= 2,592 sf Storage= 1,932 cf

Plug-Flow detention time= 74.1 min calculated for 5,778 cf (100% of inflow)
Center-of-Mass det. time= 73.8 min (841.3 - 767.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	130.50'	2,002 cf	**34.83'W x 74.40'L x 2.50'H Field A** 6,479 cf Overall - 1,474 cf Embedded = 5,005 cf x 40.0% Voids
#2A	131.00'	1,474 cf	**ADS_StormTech SC-310 +Cap** x 100 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 10 Rows of 10 Chambers
		3,476 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	130.85'	**15.0" Round Culvert Barrel** L= 69.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 130.85' / 130.50' S= 0.0051 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Discarded	130.50'	**2.410 in/hr Exfiltration over Surface area**
#3	Device 1	131.40'	**3.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	132.63'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.14 cfs @ 11.30 hrs HW=130.53' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=0.13 cfs @ 12.56 hrs HW=131.73' (Free Discharge)
└─**1=Culvert Barrel** (Passes 0.13 cfs of 2.55 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.13 cfs @ 2.12 fps)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB2e: Infiltration Basin 2b - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-310 +Cap (ADS StormTech® SC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

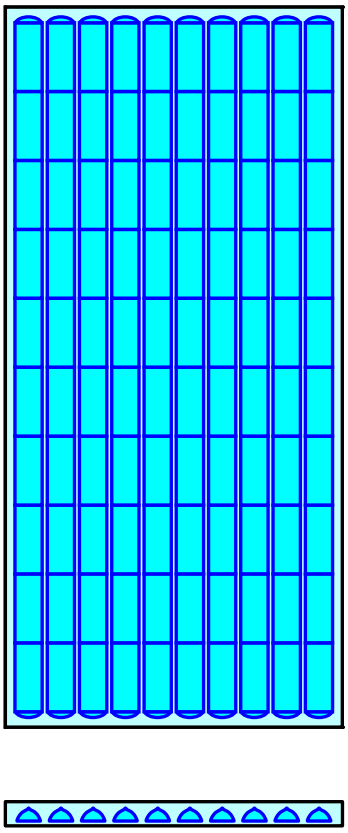
10 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 72.40' Row Length +12.0" End Stone x 2 = 74.40' Base Length
10 Rows x 34.0" Wide + 6.0" Spacing x 9 + 12.0" Side Stone x 2 = 34.83' Base Width
6.0" Base + 16.0" Chamber Height + 8.0" Cover = 2.50' Field Height

100 Chambers x 14.7 cf = 1,474.2 cf Chamber Storage

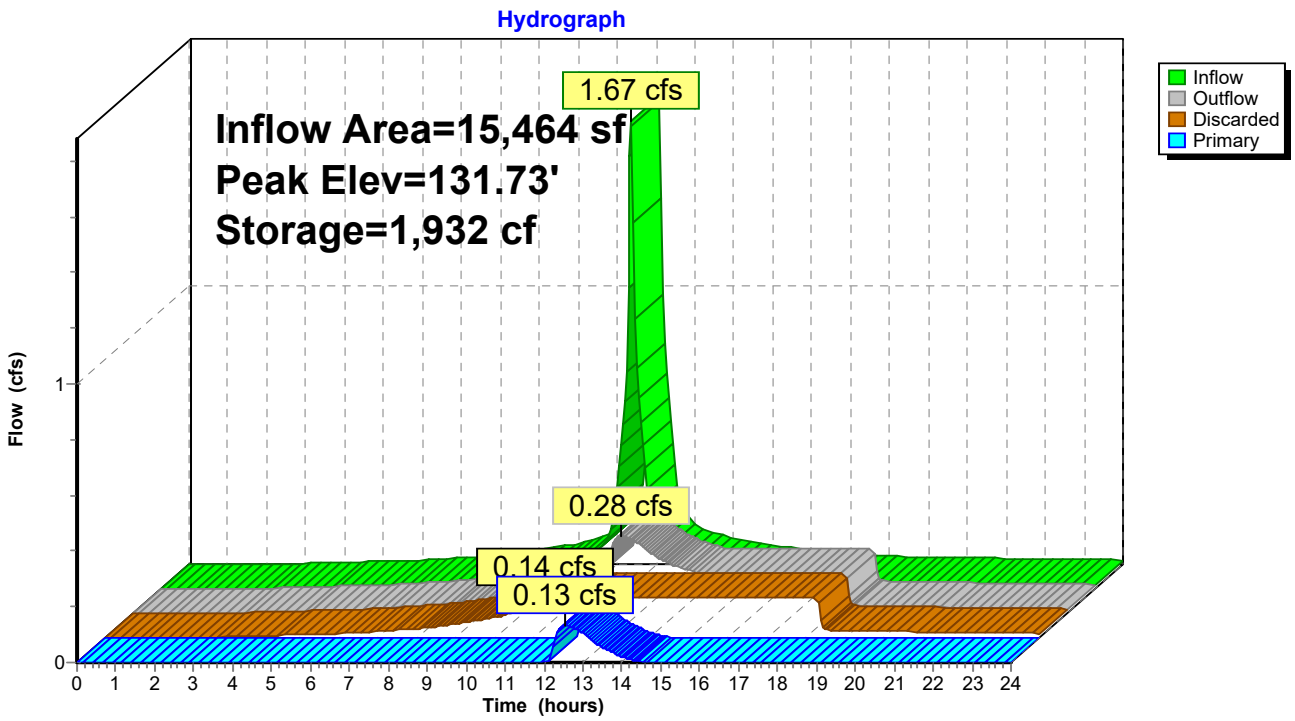
6,479.0 cf Field - 1,474.2 cf Chambers = 5,004.8 cf Stone x 40.0% Voids = 2,001.9 cf Stone Storage

Chamber Storage + Stone Storage = 3,476.1 cf = 0.080 af
Overall Storage Efficiency = 53.7%
Overall System Size = 74.40' x 34.83' x 2.50'

100 Chambers
240.0 cy Field
185.4 cy Stone



Pond IB2e: Infiltration Basin 2b



Stage-Area-Storage for Pond IB2e: Infiltration Basin 2b

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.50	**2,592**	0
130.55	2,592	52
130.60	2,592	104
130.65	2,592	155
130.70	2,592	207
130.75	2,592	259
130.80	2,592	311
130.85	2,592	363
130.90	2,592	415
130.95	2,592	466
131.00	2,592	518
131.05	2,592	622
131.10	2,592	724
131.15	2,592	827
131.20	2,592	928
131.25	2,592	1,029
131.30	2,592	1,129
131.35	2,592	1,227
131.40	2,592	1,325
131.45	2,592	1,422
131.50	2,592	1,517
131.55	2,592	1,611
131.60	2,592	1,703
131.65	2,592	1,794
131.70	2,592	1,884
131.75	2,592	1,972
131.80	2,592	2,057
131.85	2,592	2,141
131.90	2,592	2,222
131.95	2,592	2,301
132.00	2,592	2,377
132.05	2,592	2,449
132.10	2,592	2,516
132.15	2,592	2,579
132.20	2,592	2,638
132.25	2,592	2,695
132.30	2,592	2,750
132.35	2,592	2,802
132.40	2,592	2,854
132.45	2,592	2,906
132.50	2,592	2,958
132.55	2,592	3,010
132.60	2,592	3,061
132.65	2,592	3,113
132.70	2,592	3,165
132.75	2,592	3,217
132.80	2,592	3,269
132.85	2,592	3,321
132.90	2,592	3,372
132.95	2,592	3,424
133.00	2,592	**3,476**

Summary for Subcatchment PD-1: Prop. Drainage Area 1

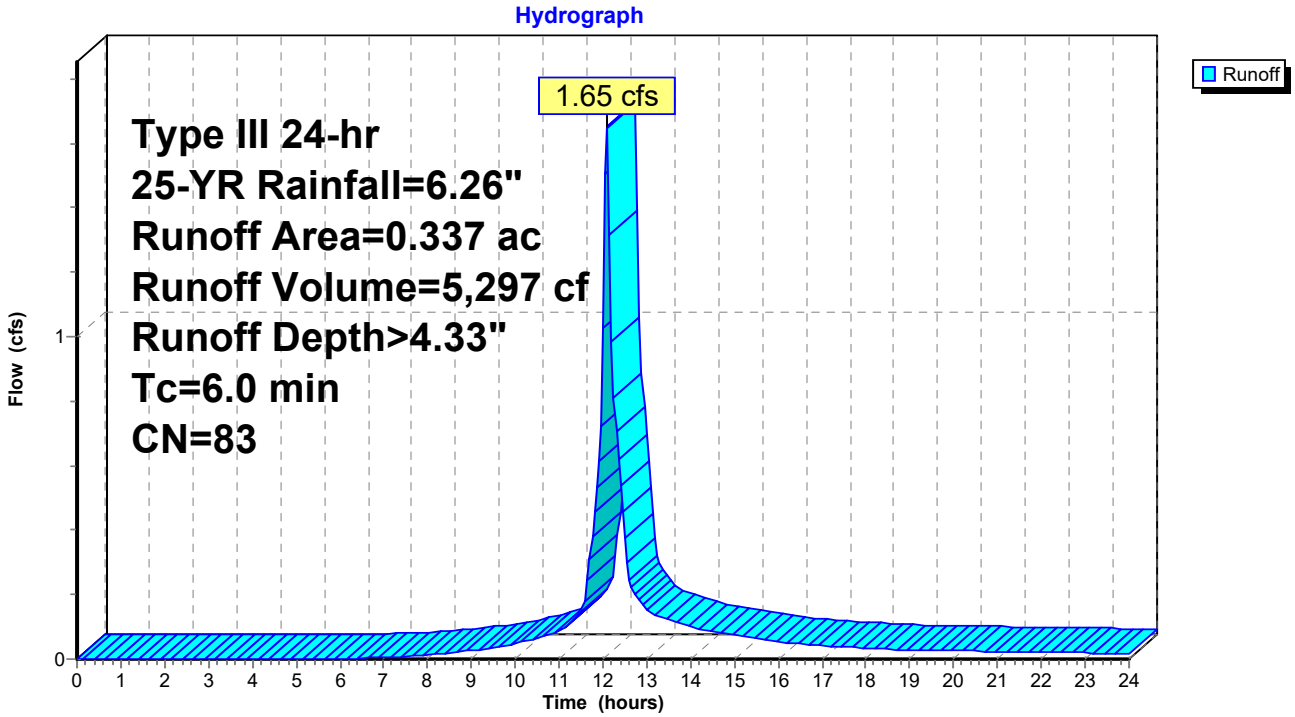
Runoff = 1.65 cfs @ 12.09 hrs, Volume= 5,297 cf, Depth> 4.33"

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-YR Rainfall=6.26"

	Area (ac)	CN	Description
*	0.074	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.070	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.193	98	Paved parking
	0.337	83	Weighted Average
	0.144		42.73% Pervious Area
	0.193		57.27% Impervious Area

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

Subcatchment PD-1: Prop. Drainage Area 1



Summary for Subcatchment PD-2a: Prop. Drainage Area 2a

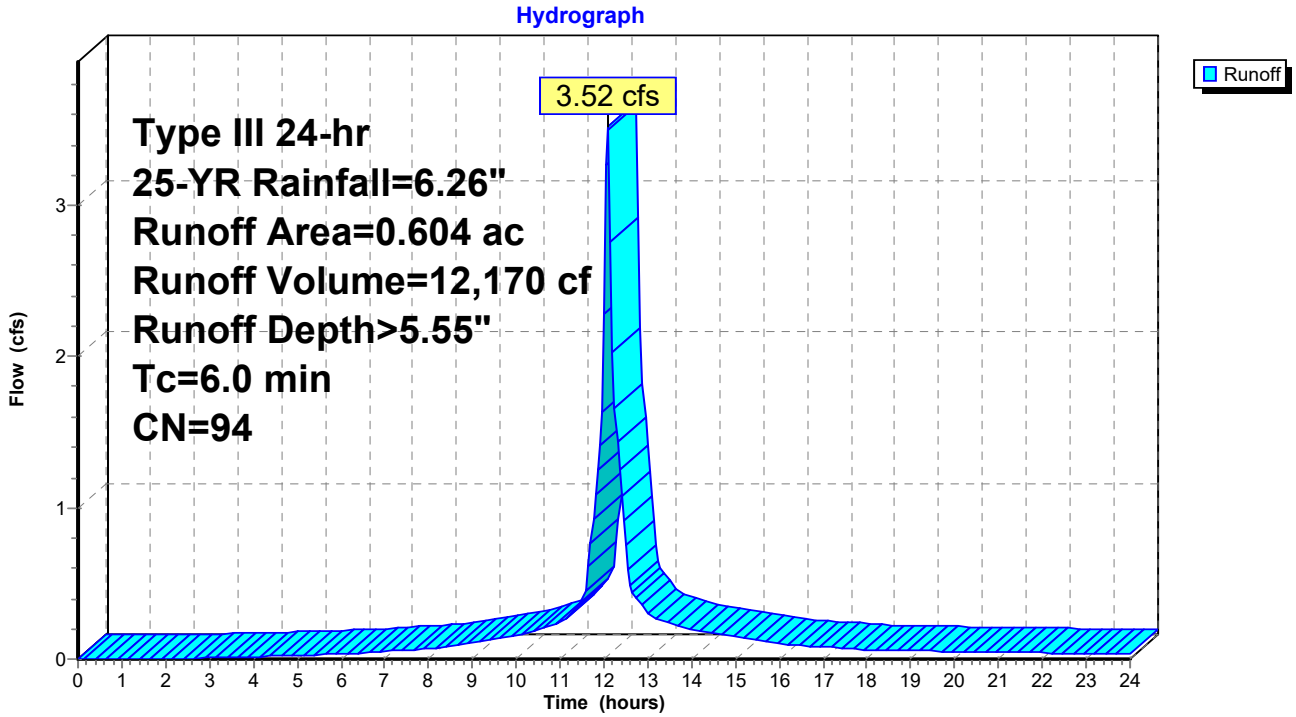
Runoff = 3.52 cfs @ 12.09 hrs, Volume= 12,170 cf, Depth> 5.55"

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-YR Rainfall=6.26"

	Area (ac)	CN	Description
*	0.038	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.029	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.537	98	Paved parking
	0.604	94	Weighted Average
	0.067		11.09% Pervious Area
	0.537		88.91% Impervious Area

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

Subcatchment PD-2a: Prop. Drainage Area 2a



Summary for Subcatchment PD-2b: Prop. Drainage Area 2b

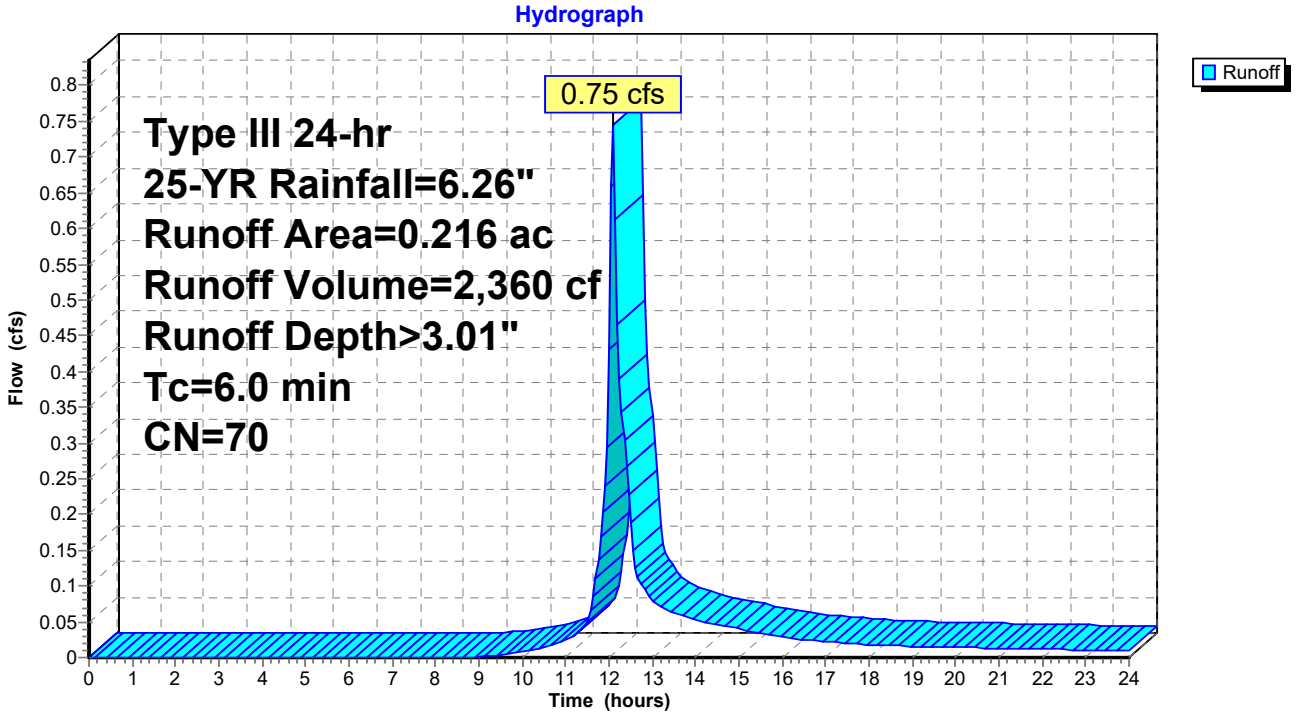
Runoff = 0.75 cfs @ 12.09 hrs, Volume= 2,360 cf, Depth> 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.26"

	Area (ac)	CN	Description
*	0.174	74	Woods/grass comb., Fair, HSG B/D, 13
*	0.018	43	Woods/grass comb., Fair, HSG A. 36A
	0.024	65	Woods/grass comb., Fair, HSG B
	0.216	70	Weighted Average
	0.216		100.00% Pervious Area

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

Subcatchment PD-2b: Prop. Drainage Area 2b



Summary for Subcatchment PD-2c: Prop. Drainage Area 2c

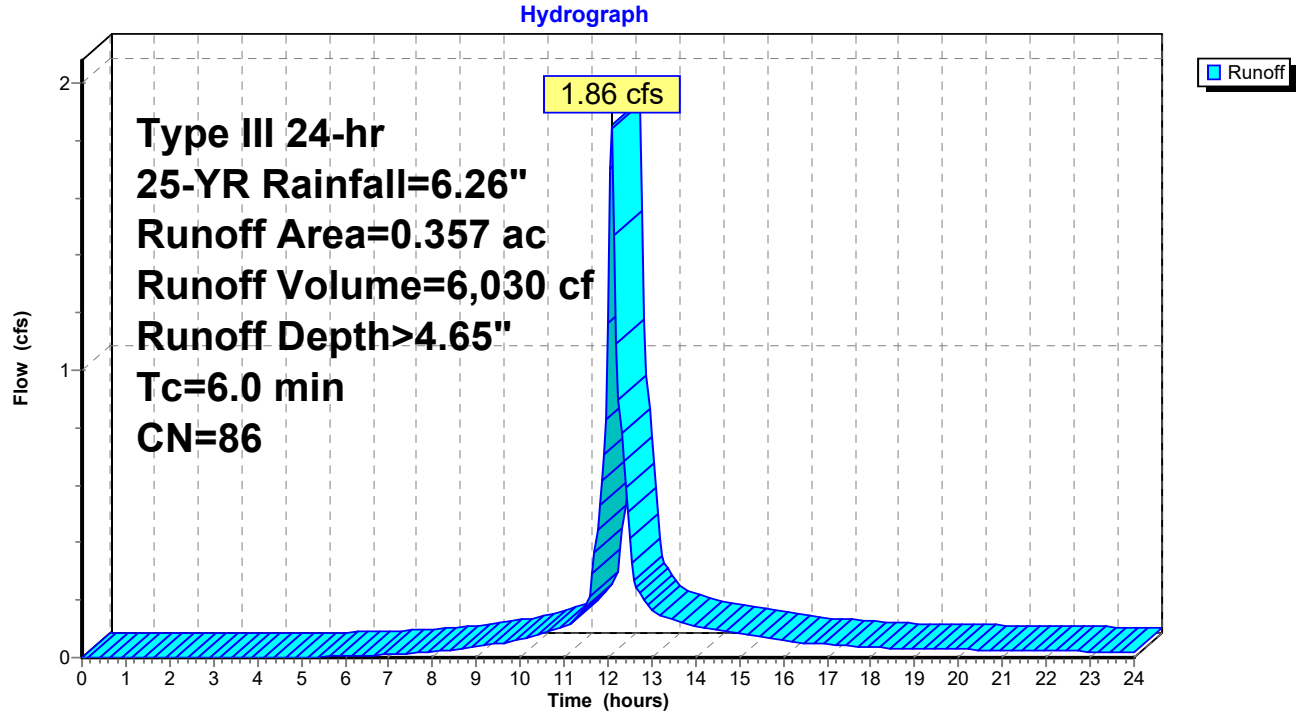
Runoff = 1.86 cfs @ 12.09 hrs, Volume= 6,030 cf, Depth> 4.65"

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-YR Rainfall=6.26"

	Area (ac)	CN	Description
*	0.061	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.042	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.021	49	50-75% Grass cover, Fair, HSG A, 36A
	0.233	98	Paved parking, HSG D
	0.357	86	Weighted Average
	0.124		34.73% Pervious Area
	0.233		65.27% Impervious Area

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

Subcatchment PD-2c: Prop. Drainage Area 2c



Summary for Subcatchment PD-2d: Prop. Drainage Area 2d

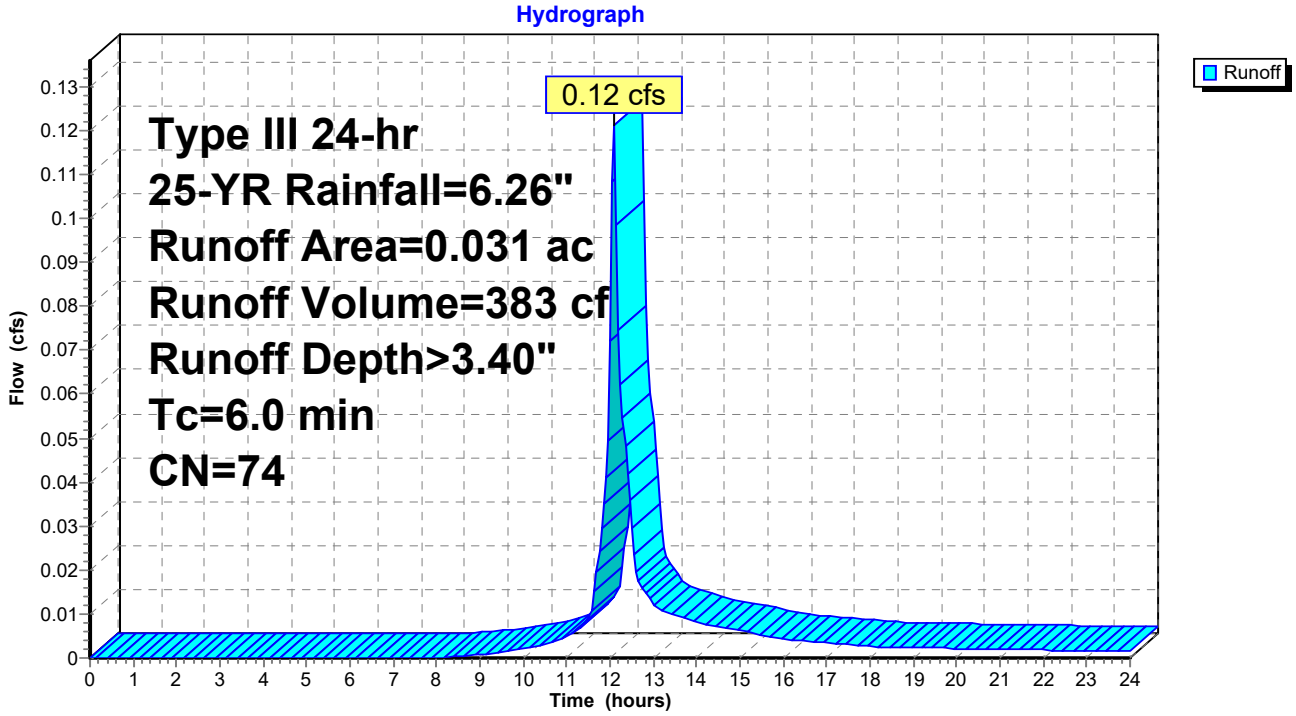
Runoff = 0.12 cfs @ 12.09 hrs, Volume= 383 cf, Depth> 3.40"

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-YR Rainfall=6.26"

	Area (ac)	CN	Description
*	0.031	74	Woods/grass comb., Fair, HSG B/D, 13
	0.031		100.00% Pervious Area

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

Subcatchment PD-2d: Prop. Drainage Area 2d



Summary for Subcatchment PD-2e: Prop. Drainage Area 2e

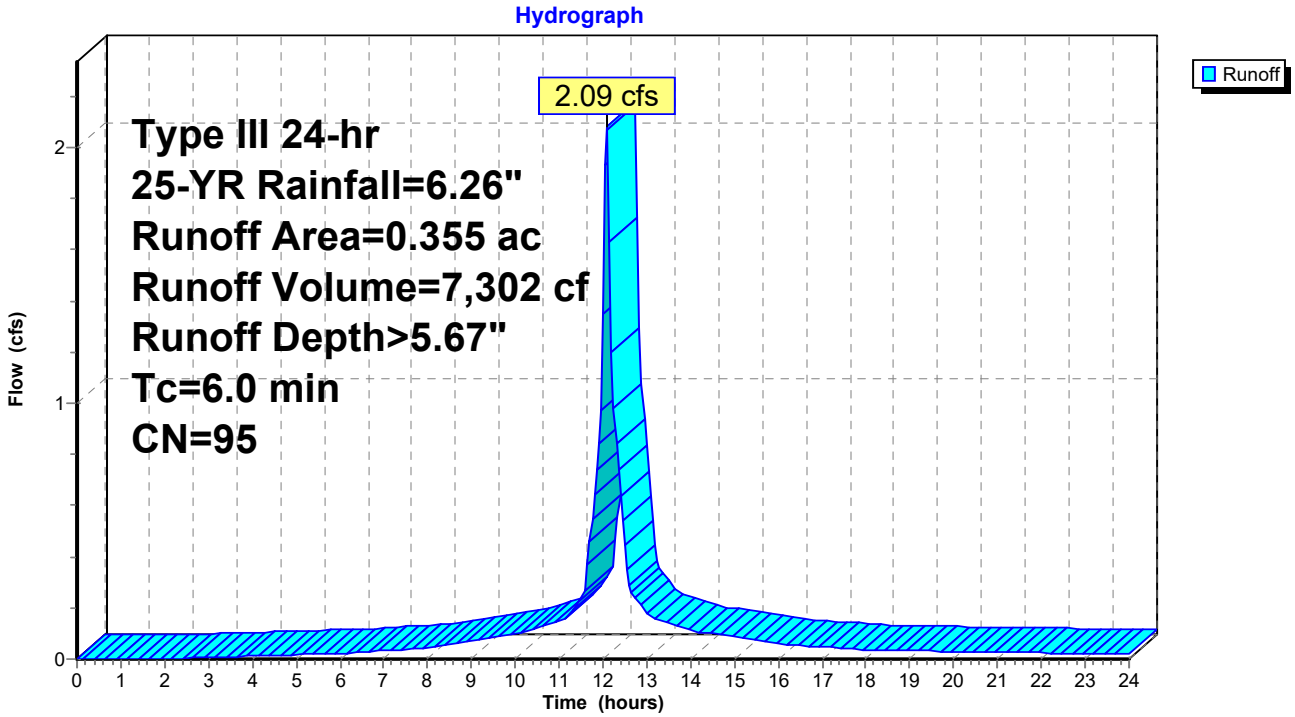
Runoff = 2.09 cfs @ 12.09 hrs, Volume= 7,302 cf, Depth> 5.67"

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-YR Rainfall=6.26"

	Area (ac)	CN	Description
*	0.004	43	Woods/grass comb., Fair, HSG A, 36A
*	0.020	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.331	98	Paved parking
	0.355	95	Weighted Average
	0.024		6.76% Pervious Area
	0.331		93.24% Impervious Area

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

Subcatchment PD-2e: Prop. Drainage Area 2e



Summary for Subcatchment PD-2f: Prop. Drainage Area 2d

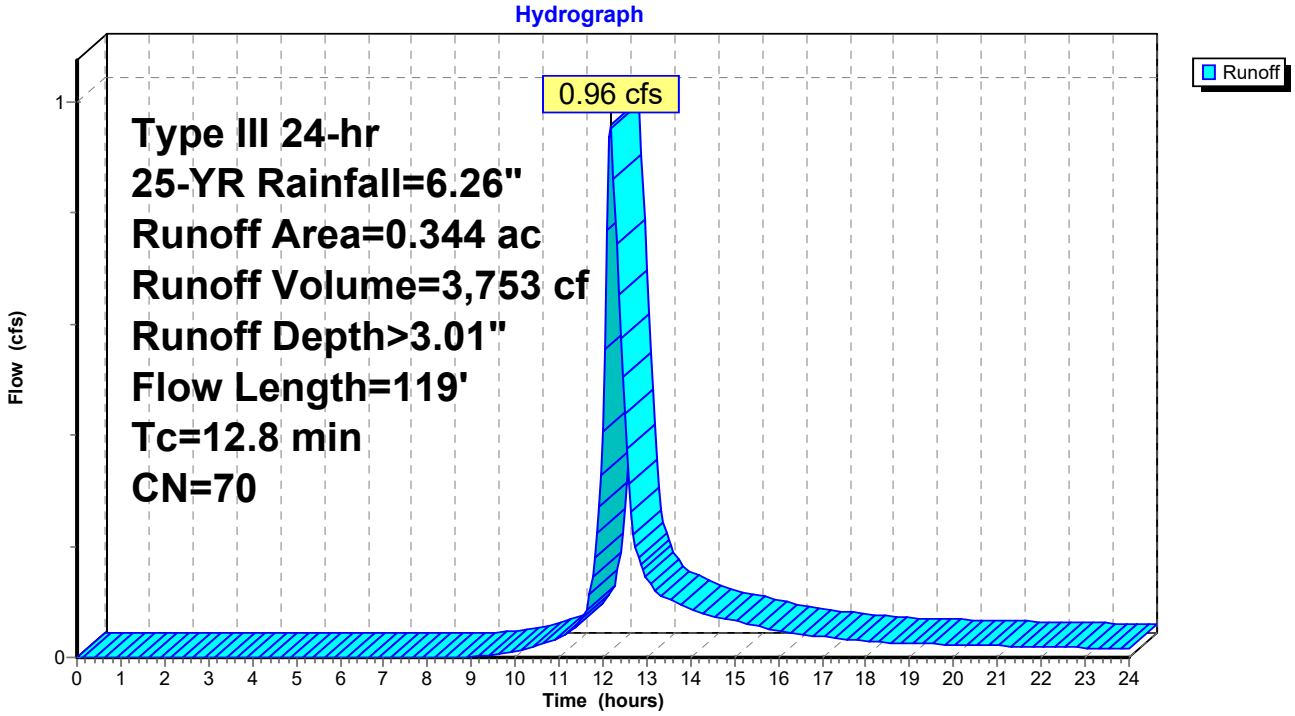
Runoff = 0.96 cfs @ 12.18 hrs, Volume= 3,753 cf, Depth> 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=6.26"

	Area (ac)	CN	Description
*	0.296	74	Woods/grass comb., Fair, HSG B/D, 13
	0.048	43	Woods/grass comb., Fair, HSG A
	0.344	70	Weighted Average
	0.344		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	23	0.1600	0.13		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.18"
8.4	36	0.0270	0.07		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.18"
1.5	60	0.0167	0.65		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
12.8	119	Total			

Subcatchment PD-2f: Prop. Drainage Area 2d



Summary for Subcatchment PD-3a: Prop. Drainage Area 3a

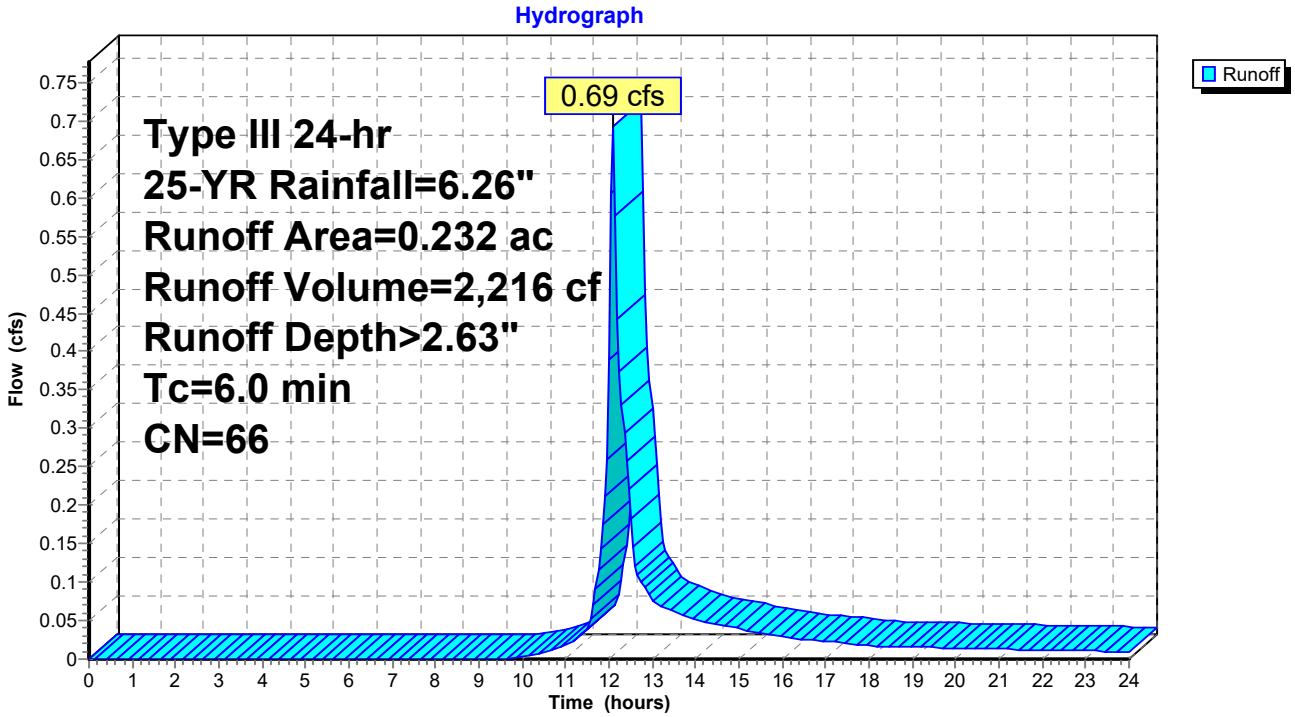
Runoff = 0.69 cfs @ 12.10 hrs, Volume= 2,216 cf, Depth> 2.63"

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-YR Rainfall=6.26"

	Area (ac)	CN	Description
*	0.120	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.071	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.041	98	Paved parking
	0.232	66	Weighted Average
	0.191		82.33% Pervious Area
	0.041		17.67% Impervious Area

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

Subcatchment PD-3a: Prop. Drainage Area 3a



Summary for Subcatchment PD-3b: Prop. Drainage Area 3b

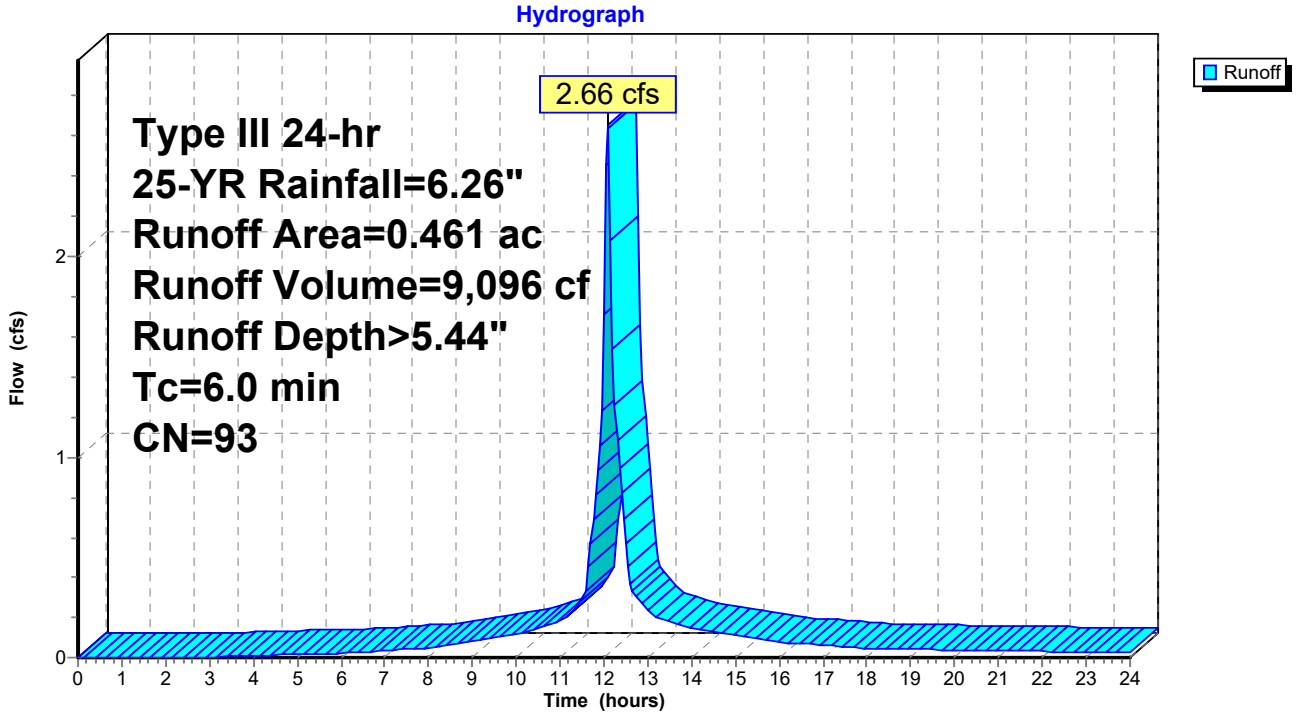
Runoff = 2.66 cfs @ 12.09 hrs, Volume= 9,096 cf, Depth> 5.44"

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-YR Rainfall=6.26"

	Area (ac)	CN	Description
*	0.093	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.019	79	50-75% Grass cover, Fair, HSG C, 701A
*	0.016	98	Paved parking
*	0.333	98	Roofing
	0.461	93	Weighted Average
	0.112		24.30% Pervious Area
	0.349		75.70% Impervious Area

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

Subcatchment PD-3b: Prop. Drainage Area 3b



Summary for Subcatchment PD-3c: Prop. Drainage Area 3c

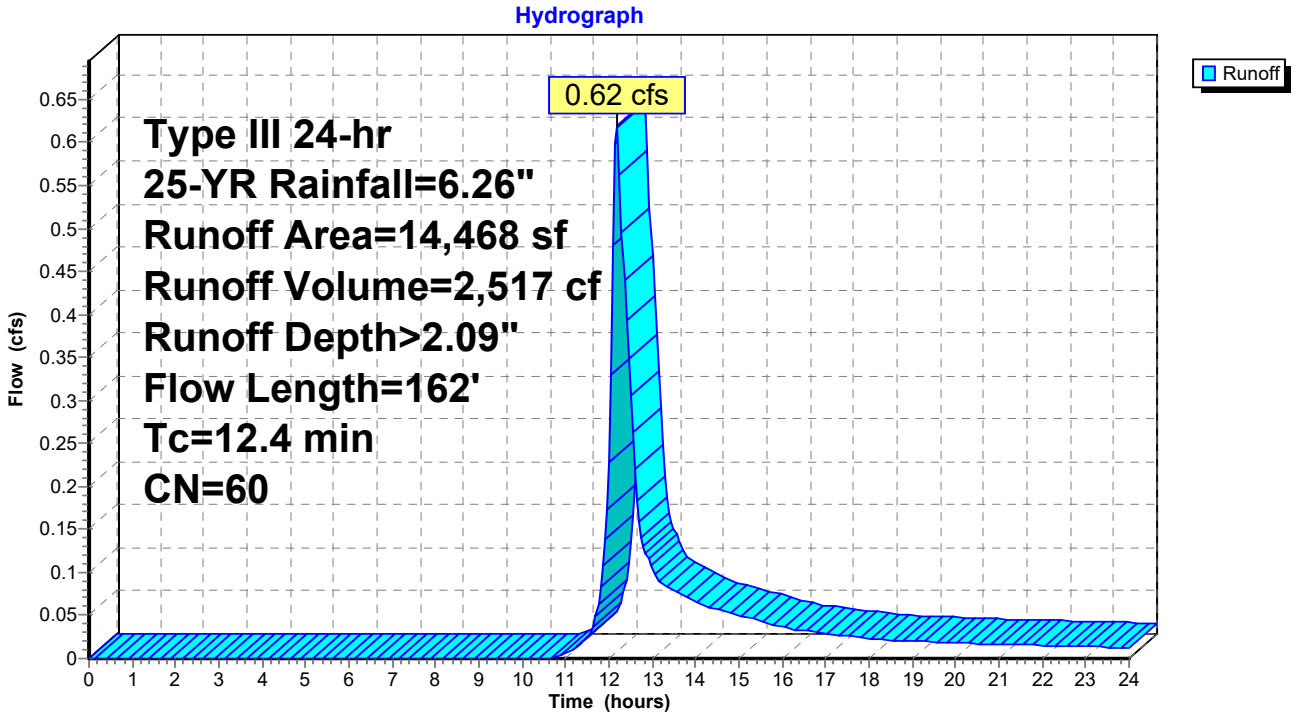
Runoff = 0.62 cfs @ 12.19 hrs, Volume= 2,517 cf, Depth> 2.09"

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-YR Rainfall=6.26"

	Area (sf)	CN	Description
*	6,684	43	Woods/grass comb., Fair, HSG A, 36A
*	5,545	74	Woods/grass comb., Fair, HSG C
	1,501	76	Woods/grass comb., Fair, HSG C
*	738	77	50-75% Grass cover, Fair, HSG C
	14,468	60	Weighted Average
	14,468		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	8	0.0625	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.18"
3.4	17	0.0580	0.08		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.18"
3.2	16	0.0625	0.08		**Sheet Flow, C-D** Woods: Light underbrush n= 0.400 P2= 3.18"
1.5	9	0.1250	0.10		**Sheet Flow, D-E** Woods: Light underbrush n= 0.400 P2= 3.18"
2.5	112	0.0220	0.74		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
12.4	162	Total			

Subcatchment PD-3c: Prop. Drainage Area 3c



Summary for Subcatchment RD-1: Roof 1

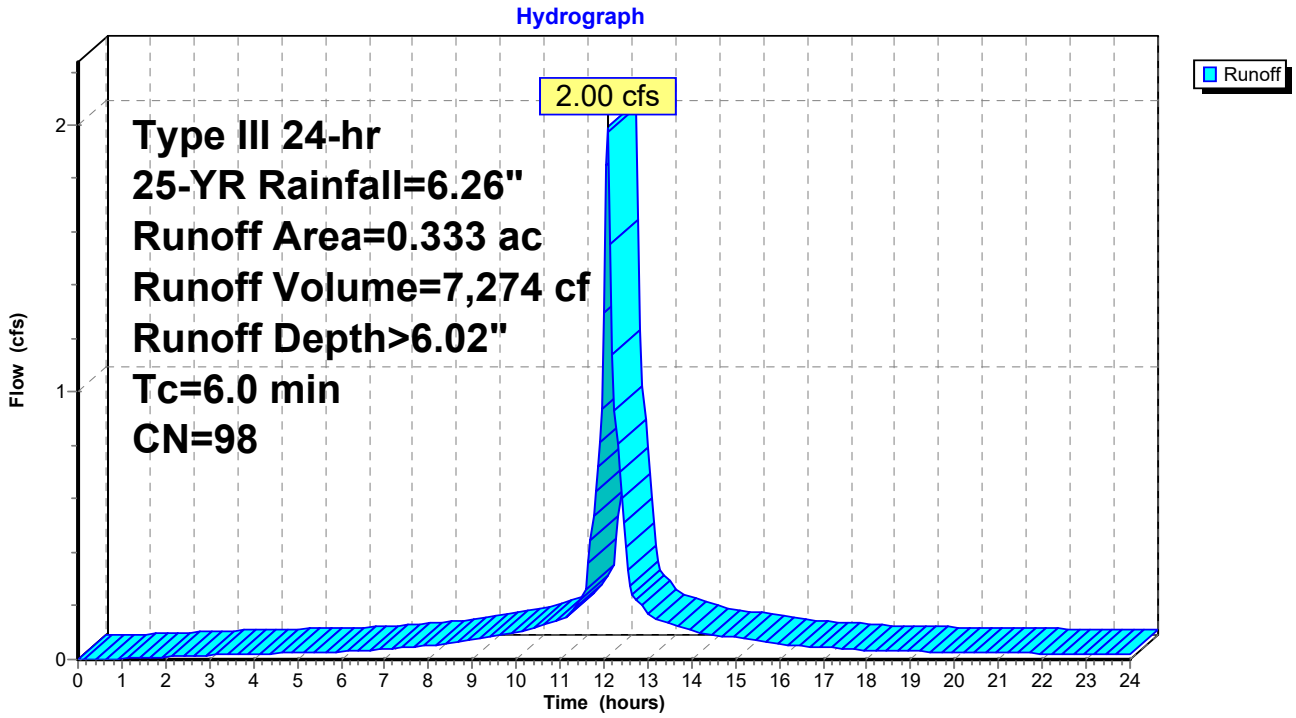
Runoff = 2.00 cfs @ 12.09 hrs, Volume= 7,274 cf, Depth> 6.02"

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 25-YR Rainfall=6.26"

	Area (ac)	CN	Description
*	0.333	98	Unconnected roofs
	0.333		100.00% Impervious Area
	0.333		100.00% Unconnected

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

Subcatchment RD-1: Roof 1

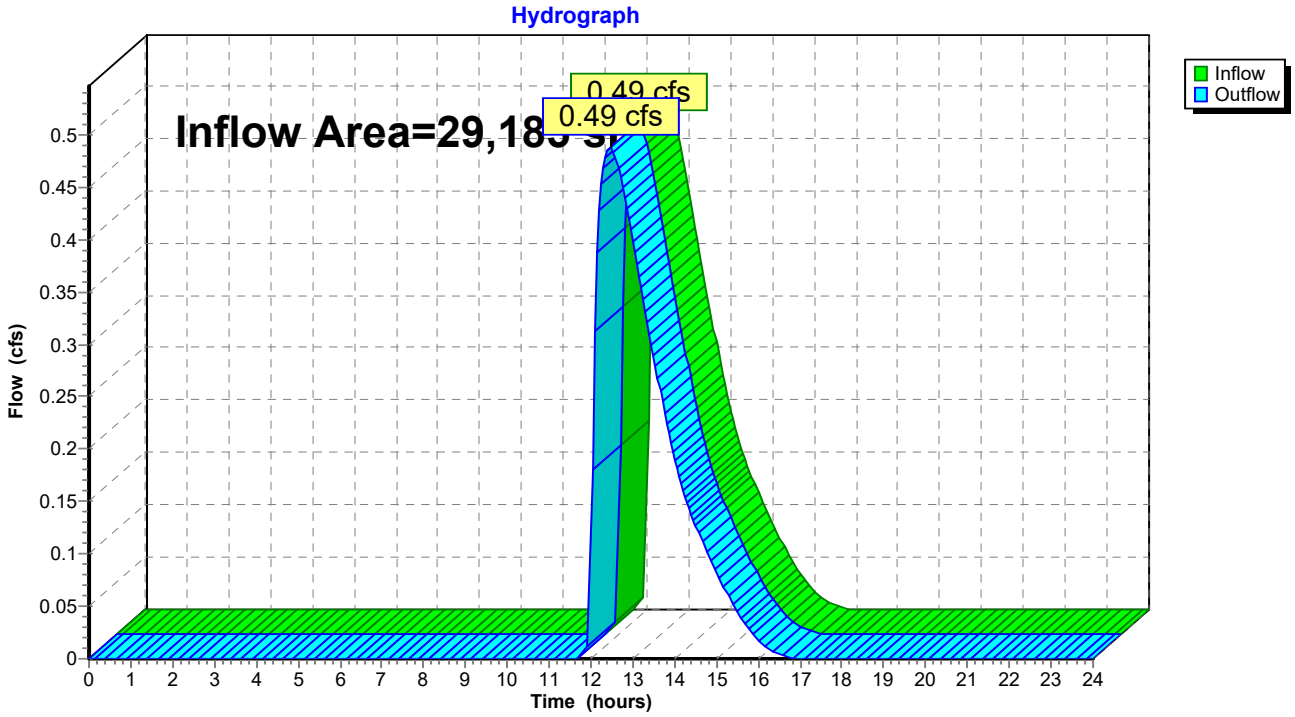


Summary for Reach DP-1a: Design Point 1

Inflow Area = 29,185 sf, 78.51% Impervious, Inflow Depth = 1.32" for 25-YR event
Inflow = 0.49 cfs @ 12.46 hrs, Volume= 3,221 cf
Outflow = 0.49 cfs @ 12.46 hrs, Volume= 3,221 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-1a: Design Point 1

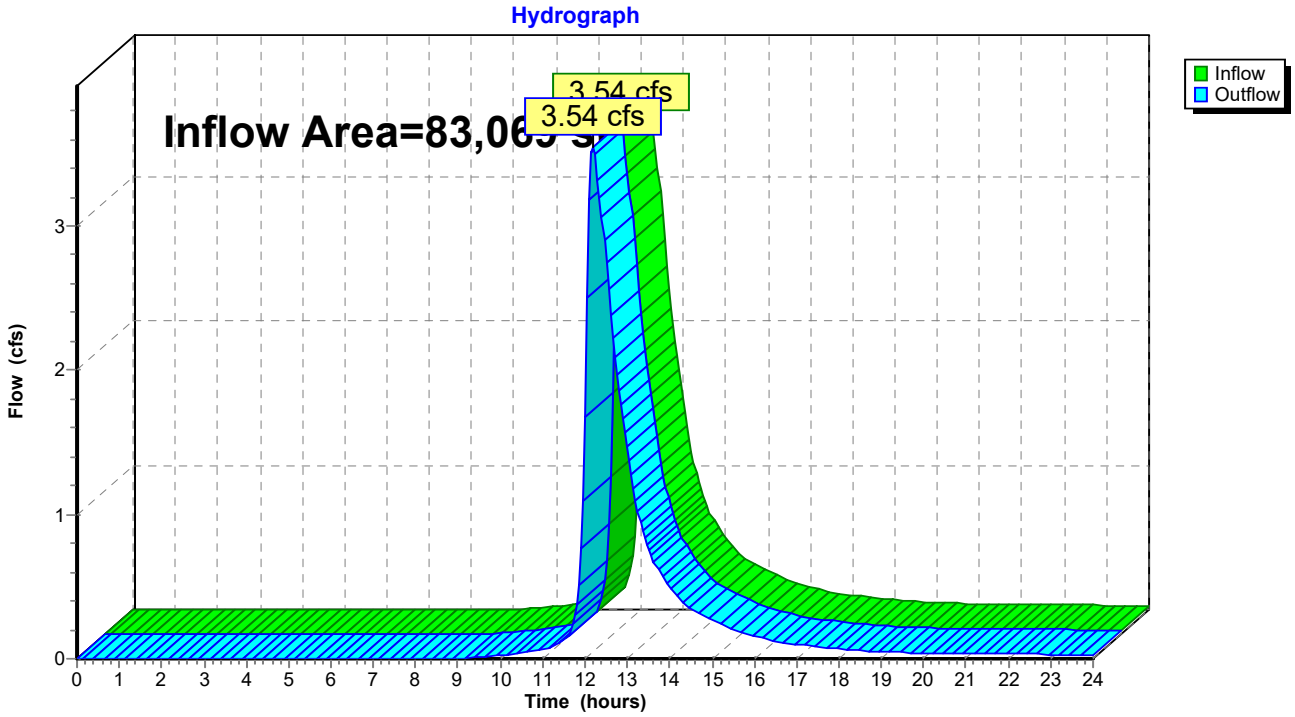


Summary for Reach DP-2a: Design Point 2

Inflow Area = 83,069 sf, 57.73% Impervious, Inflow Depth > 2.45" for 25-YR event
Inflow = 3.54 cfs @ 12.19 hrs, Volume= 16,951 cf
Outflow = 3.54 cfs @ 12.19 hrs, Volume= 16,951 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-2a: Design Point 2

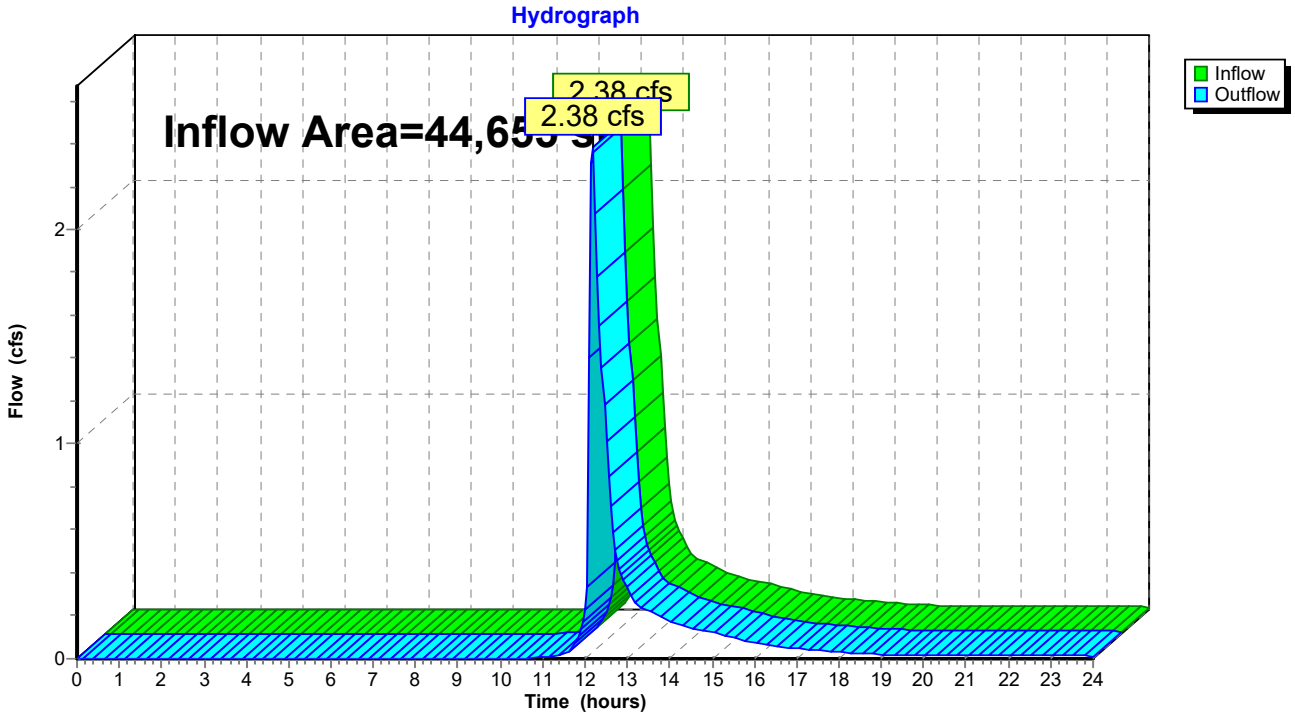


Summary for Reach DP-3a: Design Point 3

Inflow Area = 44,655 sf, 38.04% Impervious, Inflow Depth > 1.68" for 25-YR event
Inflow = 2.38 cfs @ 12.18 hrs, Volume= 6,245 cf
Outflow = 2.38 cfs @ 12.18 hrs, Volume= 6,245 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-3a: Design Point 3



Summary for Pond AB1: Above Ground Infiltration Basin 1

Inflow Area =	29,185 sf, 78.51% Impervious, Inflow Depth > 2.70" for 25-YR event				
Inflow =	1.65 cfs @	12.09 hrs,	Volume=	6,561 cf	
Outflow =	0.59 cfs @	12.46 hrs,	Volume=	6,537 cf,	Atten= 64%, Lag= 22.4 min
Discarded =	0.10 cfs @	12.46 hrs,	Volume=	3,316 cf	
Primary =	0.49 cfs @	12.46 hrs,	Volume=	3,221 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 128.76' @ 12.46 hrs Surf.Area= 1,774 sf Storage= 1,850 cf

Plug-Flow detention time= 76.7 min calculated for 6,537 cf (100% of inflow)
Center-of-Mass det. time= 74.4 min (879.3 - 804.9)

Volume	Invert	Avail.Storage	Storage Description
#1	127.00'	4,542 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 4,798 cf Overall - 256 cf Embedded = 4,542 cf
#2	127.00'	102 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) Inside #1 256 cf Overall x 40.0% Voids
		4,644 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
127.00	512	0	0
128.00	1,218	865	865
129.00	1,949	1,584	2,449
130.00	2,749	2,349	4,798

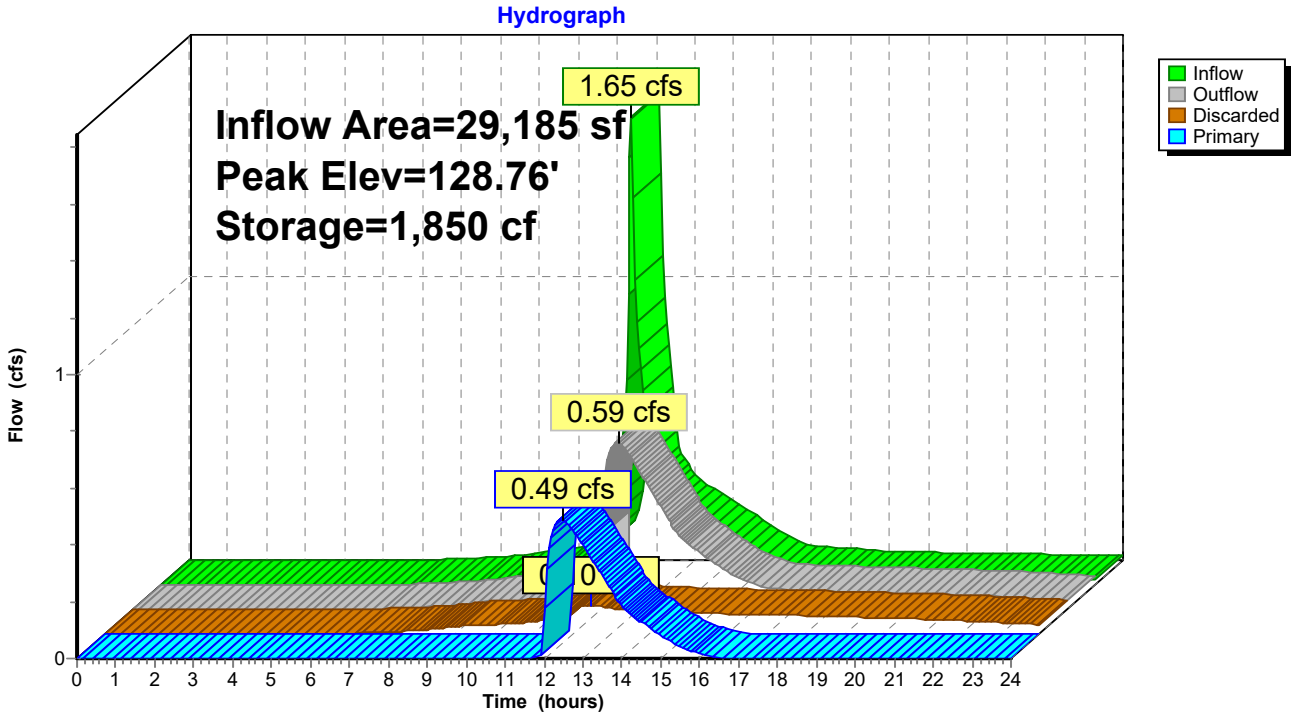
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
127.00	512	0	0
127.50	512	256	256

Device	Routing	Invert	Outlet Devices
#1	Primary	127.57'	**8.0" Round Culvert Barrel** L= 13.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 127.57' / 127.50' S= 0.0054 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.35 sf
#2	Device 1	129.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	127.00'	**2.410 in/hr Exfiltration over Surface area**
#4	Device 1	128.00'	**5.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.10 cfs @ 12.46 hrs HW=128.76' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.49 cfs @ 12.46 hrs HW=128.76' (Free Discharge)
└─**1=Culvert Barrel** (Passes 0.49 cfs of 1.12 cfs potential flow)
  ├─**2=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Orifice Controls 0.49 cfs @ 3.58 fps)

Pond AB1: Above Ground Infiltration Basin 1



Stage-Area-Storage for Pond AB1: Above Ground Infiltration Basin 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
127.00	512	0
127.05	547	11
127.10	583	24
127.15	618	39
127.20	653	55
127.25	689	73
127.30	724	93
127.35	759	115
127.40	794	138
127.45	830	164
127.50	865	191
127.55	900	235
127.60	936	281
127.65	971	328
127.70	1,006	378
127.75	1,042	429
127.80	1,077	482
127.85	1,112	537
127.90	1,147	593
127.95	1,183	651
128.00	1,218	711
128.05	1,255	773
128.10	1,291	837
128.15	1,328	902
128.20	1,364	970
128.25	1,401	1,039
128.30	1,437	1,110
128.35	1,474	1,182
128.40	1,510	1,257
128.45	1,547	1,334
128.50	1,584	1,412
128.55	1,620	1,492
128.60	1,657	1,574
128.65	1,693	1,658
128.70	1,730	1,743
128.75	1,766	1,830
128.80	1,803	1,920
128.85	1,839	2,011
128.90	1,876	2,104
128.95	1,912	2,198
129.00	1,949	2,295
129.05	1,989	2,393
129.10	2,029	2,494
129.15	2,069	2,596
129.20	2,109	2,701
129.25	2,149	2,807
129.30	2,189	2,916
129.35	2,229	3,026
129.40	2,269	3,139
129.45	2,309	3,253
129.50	2,349	3,369
129.55	2,389	3,488
129.60	2,429	3,608
129.65	2,469	3,731
129.70	2,509	3,855
129.75	2,549	3,982
129.80	2,589	4,110
129.85	2,629	4,241
129.90	2,669	4,373
129.95	2,709	4,507
130.00	**2,749**	**4,644**

Summary for Pond AB3a: Above Ground Infiltration 3a

Inflow Area =	10,106 sf, 17.67% Impervious, Inflow Depth > 2.63" for 25-YR event				
Inflow =	0.69 cfs @	12.10 hrs,	Volume=	2,216 cf	
Outflow =	0.08 cfs @	13.00 hrs,	Volume=	2,213 cf,	Atten= 89%, Lag= 54.3 min
Discarded =	0.08 cfs @	13.00 hrs,	Volume=	2,213 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= 132.72' @ 13.00 hrs Surf.Area= 1,401 sf Storage= 831 cf

Plug-Flow detention time= 103.9 min calculated for 2,208 cf (100% of inflow)
Center-of-Mass det. time= 102.8 min (947.6 - 844.9)

Volume	Invert	Avail.Storage	Storage Description
#1	132.00'	3,206 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

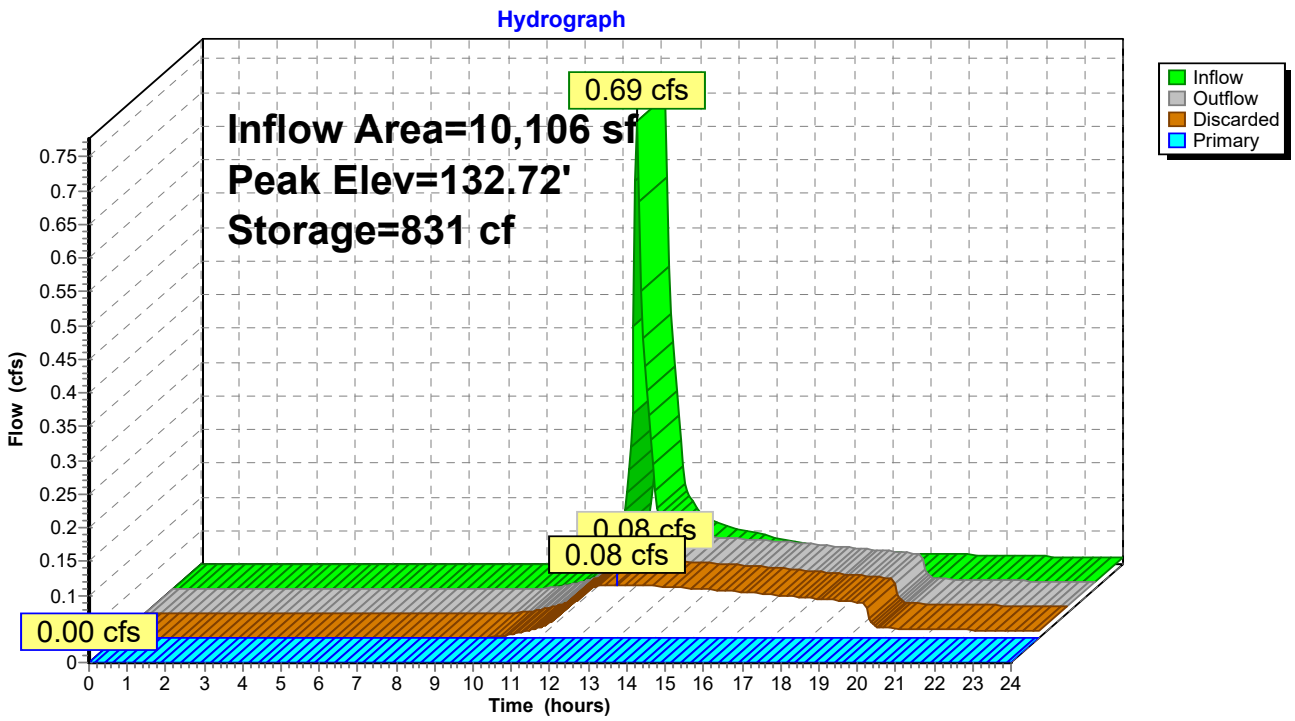
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
132.00	906	0	0
133.00	1,593	1,250	1,250
134.00	2,319	1,956	3,206

Device	Routing	Invert	Outlet Devices
#1	Discarded	132.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	133.00'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.08 cfs @ 13.00 hrs HW=132.72' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=132.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond AB3a: Above Ground Infiltration 3a



Stage-Area-Storage for Pond AB3a: Above Ground Infiltration 3a

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
132.00	906	0
132.02	920	18
132.04	933	37
132.06	947	56
132.08	961	75
132.10	975	94
132.12	988	114
132.14	1,002	134
132.16	1,016	154
132.18	1,030	174
132.20	1,043	195
132.22	1,057	216
132.24	1,071	237
132.26	1,085	259
132.28	1,098	281
132.30	1,112	303
132.32	1,126	325
132.34	1,140	348
132.36	1,153	371
132.38	1,167	394
132.40	1,181	417
132.42	1,195	441
132.44	1,208	465
132.46	1,222	489
132.48	1,236	514
132.50	1,250	539
132.52	1,263	564
132.54	1,277	589
132.56	1,291	615
132.58	1,304	641
132.60	1,318	667
132.62	1,332	694
132.64	1,346	721
132.66	1,359	748
132.68	1,373	775
132.70	1,387	803
132.72	1,401	830
132.74	1,414	859
132.76	1,428	887
132.78	1,442	916
132.80	1,456	945
132.82	1,469	974
132.84	1,483	1,003
132.86	1,497	1,033
132.88	1,511	1,063
132.90	1,524	1,094
132.92	1,538	1,124
132.94	1,552	1,155
132.96	1,566	1,186
132.98	1,579	1,218
133.00	1,593	1,250
133.02	1,608	1,282
133.04	1,622	1,314
133.06	1,637	1,346
133.08	1,651	1,379
133.10	1,666	1,412
133.12	1,680	1,446
133.14	1,695	1,480
133.16	1,709	1,514
133.18	1,724	1,548
133.20	1,738	1,583
133.22	1,753	1,618
133.24	1,767	1,653
133.26	1,782	1,688
133.28	1,796	1,724
133.30	1,811	1,760
133.32	1,825	1,796
133.34	1,840	1,833
133.36	1,854	1,870
133.38	1,869	1,907
133.40	1,883	1,945
133.42	1,898	1,983
133.44	1,912	2,021
133.46	1,927	2,059
133.48	1,941	2,098
133.50	1,956	2,137
133.52	1,971	2,176
133.54	1,985	2,216
133.56	2,000	2,255
133.58	2,014	2,296
133.60	2,029	2,336
133.62	2,043	2,377
133.64	2,058	2,418
133.66	2,072	2,459
133.68	2,087	2,501
133.70	2,101	2,542
133.72	2,116	2,585
133.74	2,130	2,627
133.76	2,145	2,670
133.78	2,159	2,713
133.80	2,174	2,756
133.82	2,188	2,800
133.84	2,203	2,844
133.86	2,217	2,888
133.88	2,232	2,932
133.90	2,246	2,977
133.92	2,261	3,022
133.94	2,275	3,068
133.96	2,290	3,113
133.98	2,304	3,159
134.00	**2,319**	**3,206**

Summary for Pond AB3b: Above Ground Infiltration 3b

Inflow Area =	20,081 sf, 75.70% Impervious, Inflow Depth > 5.44" for 25-YR event				
Inflow =	2.66 cfs @	12.09 hrs,	Volume=	9,096 cf	
Outflow =	1.81 cfs @	12.18 hrs,	Volume=	6,124 cf,	Atten= 32%, Lag= 5.6 min
Discarded =	0.05 cfs @	12.18 hrs,	Volume=	2,397 cf	
Primary =	1.76 cfs @	12.18 hrs,	Volume=	3,728 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 133.42' @ 12.18 hrs Surf.Area= 2,090 sf Storage= 3,712 cf

Plug-Flow detention time= 182.8 min calculated for 6,124 cf (67% of inflow)
Center-of-Mass det. time= 87.4 min (858.8 - 771.4)

Volume	Invert	Avail.Storage	Storage Description
#1	130.00'	5,050 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

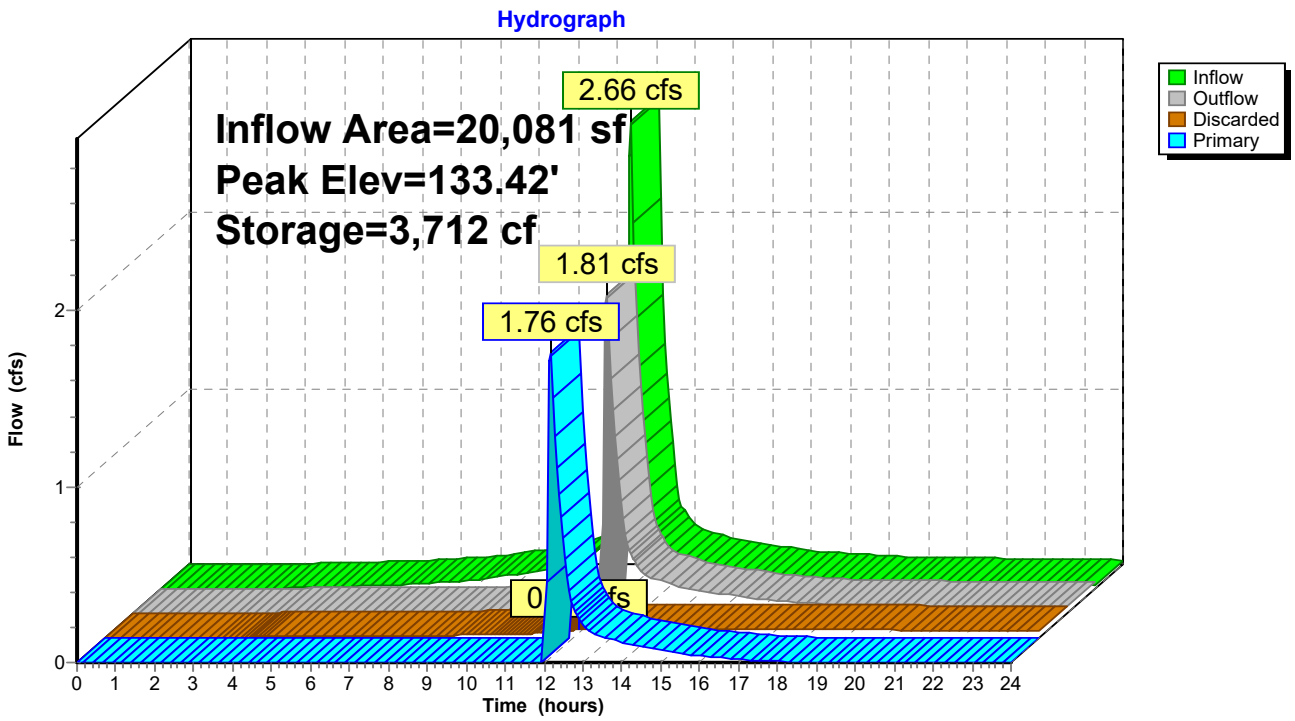
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
130.00	307	0	0
131.00	671	489	489
132.00	1,175	923	1,412
133.00	1,806	1,491	2,903
134.00	2,488	2,147	5,050

Device	Routing	Invert	Outlet Devices
#1	Primary	133.15'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Discarded	130.00'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 12.18 hrs HW=133.41' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=1.72 cfs @ 12.18 hrs HW=133.41' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 1.72 cfs @ 1.31 fps)

Pond AB3b: Above Ground Infiltration 3b



Stage-Area-Storage for Pond AB3b: Above Ground Infiltration 3b

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.00	307	0
130.05	325	16
130.10	343	33
130.15	362	50
130.20	380	69
130.25	398	88
130.30	416	108
130.35	434	130
130.40	453	152
130.45	471	175
130.50	489	199
130.55	507	224
130.60	525	250
130.65	544	276
130.70	562	304
130.75	580	333
130.80	598	362
130.85	616	392
130.90	635	424
130.95	653	456
131.00	671	489
131.05	696	523
131.10	721	559
131.15	747	595
131.20	772	633
131.25	797	673
131.30	822	713
131.35	847	755
131.40	873	798
131.45	898	842
131.50	923	888
131.55	948	934
131.60	973	982
131.65	999	1,032
131.70	1,024	1,082
131.75	1,049	1,134
131.80	1,074	1,187
131.85	1,099	1,241
131.90	1,125	1,297
131.95	1,150	1,354
132.00	1,175	1,412
132.05	1,207	1,472
132.10	1,238	1,533
132.15	1,270	1,595
132.20	1,301	1,660
132.25	1,333	1,725
132.30	1,364	1,793
132.35	1,396	1,862
132.40	1,427	1,932
132.45	1,459	2,005
132.50	1,491	2,078
132.55	1,522	2,154
132.60	1,554	2,231
132.65	1,585	2,309
132.70	1,617	2,389
132.75	1,648	2,471
132.80	1,680	2,554
132.85	1,711	2,639
132.90	1,743	2,725
132.95	1,774	2,813
133.00	1,806	2,903
133.05	1,840	2,994
133.10	1,874	3,087
133.15	1,908	3,181
133.20	1,942	3,277
133.25	1,977	3,375
133.30	2,011	3,475
133.35	2,045	3,576
133.40	2,079	3,679
133.45	2,113	3,784
133.50	2,147	3,891
133.55	2,181	3,999
133.60	2,215	4,109
133.65	2,249	4,220
133.70	2,283	4,334
133.75	2,318	4,449
133.80	2,352	4,566
133.85	2,386	4,684
133.90	2,420	4,804
133.95	2,454	4,926
134.00	**2,488**	**5,050**

Summary for Pond IB1: Infiltration Basin 1

Inflow Area =	14,505 sf,100.00% Impervious, Inflow Depth > 6.02" for 25-YR event				
Inflow =	2.00 cfs @	12.09 hrs,	Volume=	7,274 cf	
Outflow =	0.26 cfs @	12.62 hrs,	Volume=	7,270 cf,	Atten= 87%, Lag= 32.0 min
Discarded =	0.11 cfs @	10.30 hrs,	Volume=	6,006 cf	
Primary =	0.16 cfs @	12.62 hrs,	Volume=	1,264 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 131.11' @ 12.62 hrs Surf.Area= 1,889 sf Storage= 2,715 cf

Plug-Flow detention time= 127.9 min calculated for 7,270 cf (100% of inflow)
Center-of-Mass det. time= 127.5 min (871.6 - 744.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	129.00'	1,726 cf	**25.25'W x 74.82'L x 3.50'H Field A** 6,612 cf Overall - 2,297 cf Embedded = 4,315 cf x 40.0% Voids
#2A	129.50'	2,297 cf	**ADS_StormTech SC-740 +Cap** x 50 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 5 Rows of 10 Chambers
		4,023 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	130.24'	**12.0" Round Culvert** L= 10.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 130.24' / 130.00' S= 0.0240 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#2	Discarded	129.00'	**2.410 in/hr Exfiltration over Surface area**
#3	Device 1	130.40'	**3.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	132.05'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.11 cfs @ 10.30 hrs HW=129.04' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.16 cfs @ 12.62 hrs HW=131.11' (Free Discharge)
└─**1=Culvert** (Passes 0.16 cfs of 2.57 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.16 cfs @ 3.81 fps)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB1: Infiltration Basin 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

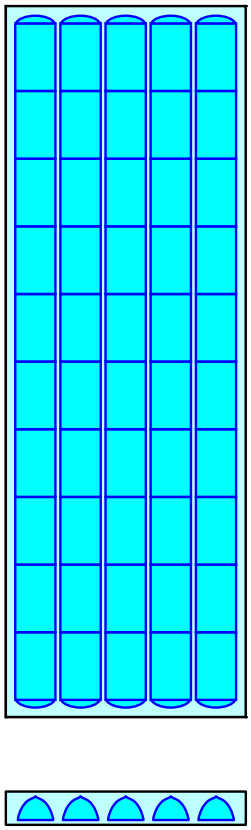
10 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 72.82' Row Length +12.0" End Stone x 2 = 74.82' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

50 Chambers x 45.9 cf = 2,297.0 cf Chamber Storage

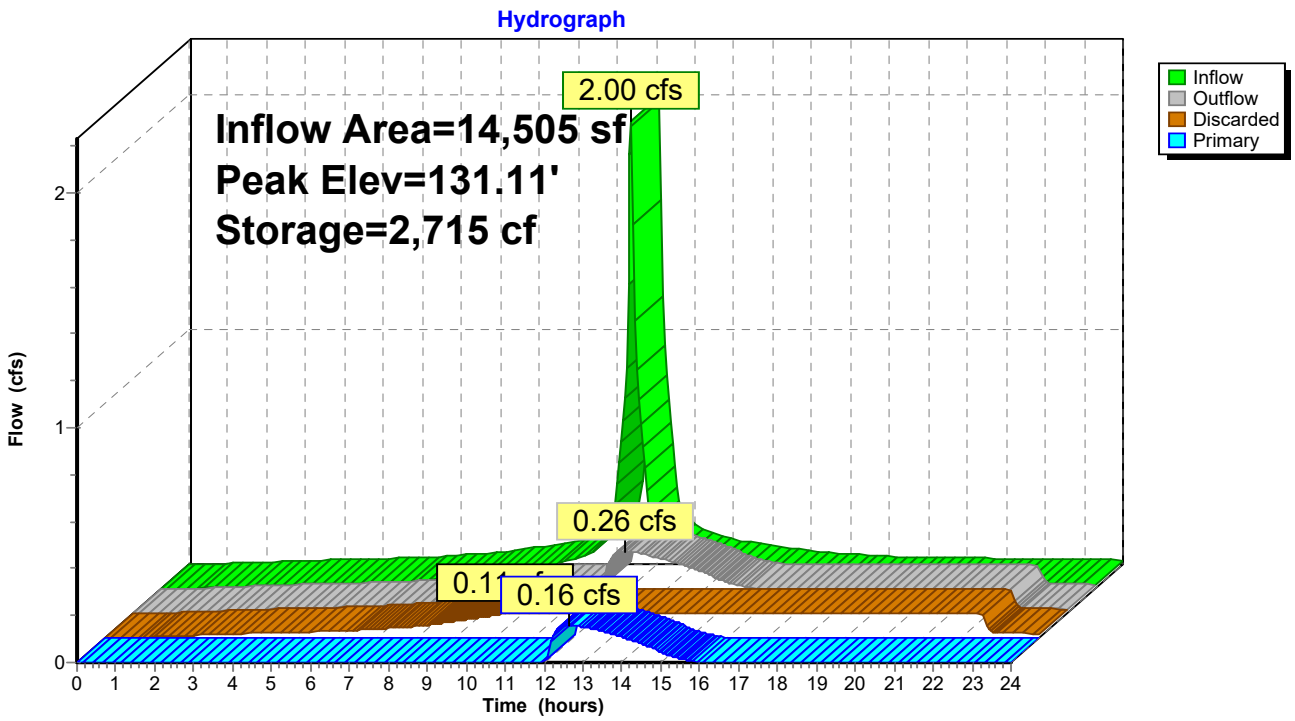
6,611.9 cf Field - 2,297.0 cf Chambers = 4,314.9 cf Stone x 40.0% Voids = 1,726.0 cf Stone Storage

Chamber Storage + Stone Storage = 4,023.0 cf = 0.092 af
Overall Storage Efficiency = 60.8%
Overall System Size = 74.82' x 25.25' x 3.50'

50 Chambers
244.9 cy Field
159.8 cy Stone



Pond IB1: Infiltration Basin 1



Stage-Area-Storage for Pond IB1: Infiltration Basin 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
129.00	**1,889**	0
129.05	1,889	38
129.10	1,889	76
129.15	1,889	113
129.20	1,889	151
129.25	1,889	189
129.30	1,889	227
129.35	1,889	264
129.40	1,889	302
129.45	1,889	340
129.50	1,889	378
129.55	1,889	455
129.60	1,889	533
129.65	1,889	610
129.70	1,889	687
129.75	1,889	764
129.80	1,889	841
129.85	1,889	917
129.90	1,889	993
129.95	1,889	1,069
130.00	1,889	1,145
130.05	1,889	1,220
130.10	1,889	1,295
130.15	1,889	1,369
130.20	1,889	1,444
130.25	1,889	1,517
130.30	1,889	1,591
130.35	1,889	1,664
130.40	1,889	1,736
130.45	1,889	1,809
130.50	1,889	1,880
130.55	1,889	1,952
130.60	1,889	2,022
130.65	1,889	2,093
130.70	1,889	2,162
130.75	1,889	2,232
130.80	1,889	2,300
130.85	1,889	2,368
130.90	1,889	2,435
130.95	1,889	2,502
131.00	1,889	2,568
131.05	1,889	2,634
131.10	1,889	2,698
131.15	1,889	2,762
131.20	1,889	2,825
131.25	1,889	2,887
131.30	1,889	2,948
131.35	1,889	3,008
131.40	1,889	3,067
131.45	1,889	3,124
131.50	1,889	3,181
131.55	1,889	3,236
131.60	1,889	3,290
131.65	1,889	3,342
131.70	1,889	3,392
131.75	1,889	3,439
131.80	1,889	3,484
131.85	1,889	3,526
131.90	1,889	3,567
131.95	1,889	3,607
132.00	1,889	3,645
132.05	1,889	3,683
132.10	1,889	3,721
132.15	1,889	3,758
132.20	1,889	3,796
132.25	1,889	3,834
132.30	1,889	3,872
132.35	1,889	3,910
132.40	1,889	3,947
132.45	1,889	3,985
132.50	1,889	**4,023**

Summary for Pond IB2a: Infiltration Basin 2a

Inflow Area =	26,310 sf, 88.91% Impervious, Inflow Depth > 5.55" for 25-YR event				
Inflow =	3.52 cfs @	12.09 hrs,	Volume=	12,170 cf	
Outflow =	1.45 cfs @	12.30 hrs,	Volume=	10,338 cf,	Atten= 59%, Lag= 12.7 min
Discarded =	0.06 cfs @	7.60 hrs,	Volume=	3,891 cf	
Primary =	1.40 cfs @	12.30 hrs,	Volume=	6,446 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 130.06' @ 12.30 hrs Surf.Area= 2,458 sf Storage= 4,248 cf

Plug-Flow detention time= 117.8 min calculated for 10,316 cf (85% of inflow)
Center-of-Mass det. time= 54.8 min (821.7 - 767.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	127.50'	2,392 cf	**30.00'W x 81.94'L x 3.67'H Field A** 9,013 cf Overall - 3,032 cf Embedded = 5,981 cf x 40.0% Voids
#2A	128.00'	3,032 cf	**ADS_StormTech SC-740 +Cap** x 66 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 6 Rows of 11 Chambers
		5,424 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	128.60'	**15.0" Round Culvert** L= 55.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 128.60' / 128.00' S= 0.0109 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Discarded	127.50'	**1.020 in/hr Exfiltration over Surface area**
#3	Device 1	128.80'	**10.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	130.10'	**10.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	130.99'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.06 cfs @ 7.60 hrs HW=127.54' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=1.40 cfs @ 12.30 hrs HW=130.06' (Free Discharge)
└─**1=Culvert** (Passes 1.40 cfs of 6.42 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 1.40 cfs @ 5.03 fps)
  ├─**4=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB2a: Infiltration Basin 2a - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

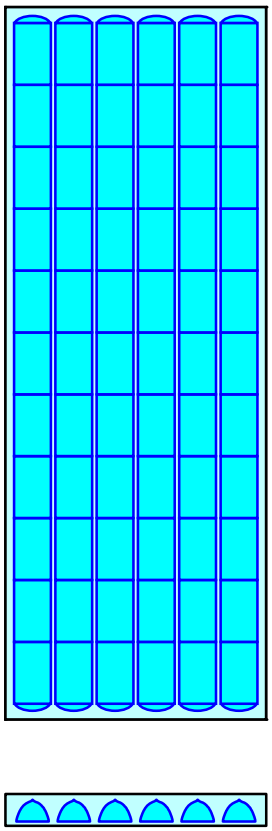
11 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 79.94' Row Length +12.0" End Stone x 2 = 81.94' Base Length
6 Rows x 51.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.00' Base Width
6.0" Base + 30.0" Chamber Height + 8.0" Cover = 3.67' Field Height

66 Chambers x 45.9 cf = 3,032.0 cf Chamber Storage

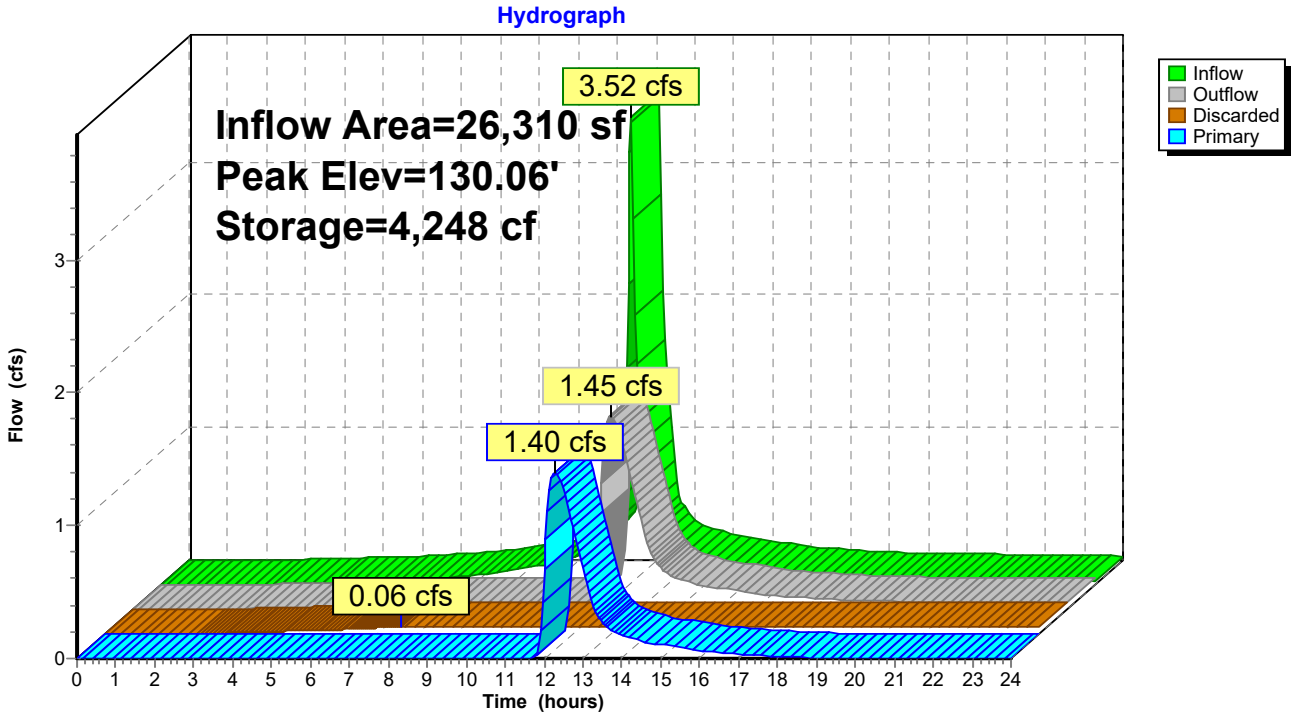
9,013.0 cf Field - 3,032.0 cf Chambers = 5,981.0 cf Stone x 40.0% Voids = 2,392.4 cf Stone Storage

Chamber Storage + Stone Storage = 5,424.4 cf = 0.125 af
Overall Storage Efficiency = 60.2%
Overall System Size = 81.94' x 30.00' x 3.67'

66 Chambers
333.8 cy Field
221.5 cy Stone



Pond IB2a: Infiltration Basin 2a



Stage-Area-Storage for Pond IB2a: Infiltration Basin 2a

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
127.50	**2,458**	0
127.55	2,458	49
127.60	2,458	98
127.65	2,458	147
127.70	2,458	197
127.75	2,458	246
127.80	2,458	295
127.85	2,458	344
127.90	2,458	393
127.95	2,458	442
128.00	2,458	492
128.05	2,458	593
128.10	2,458	695
128.15	2,458	796
128.20	2,458	897
128.25	2,458	998
128.30	2,458	1,099
128.35	2,458	1,199
128.40	2,458	1,298
128.45	2,458	1,398
128.50	2,458	1,497
128.55	2,458	1,595
128.60	2,458	1,694
128.65	2,458	1,791
128.70	2,458	1,888
128.75	2,458	1,985
128.80	2,458	2,081
128.85	2,458	2,177
128.90	2,458	2,272
128.95	2,458	2,367
129.00	2,458	2,461
129.05	2,458	2,554
129.10	2,458	2,647
129.15	2,458	2,739
129.20	2,458	2,830
129.25	2,458	2,921
129.30	2,458	3,011
129.35	2,458	3,100
129.40	2,458	3,188
129.45	2,458	3,275
129.50	2,458	3,362
129.55	2,458	3,447
129.60	2,458	3,532
129.65	2,458	3,615
129.70	2,458	3,698
129.75	2,458	3,779
129.80	2,458	3,858
129.85	2,458	3,937
129.90	2,458	4,014
129.95	2,458	4,089
130.00	2,458	4,164
130.05	2,458	4,236
130.10	2,458	4,306
130.15	2,458	4,374
130.20	2,458	4,439
130.25	2,458	4,501
130.30	2,458	4,559
130.35	2,458	4,614
130.40	2,458	4,667
130.45	2,458	4,719
130.50	2,458	4,769
130.55	2,458	4,818
130.60	2,458	4,867
130.65	2,458	4,916
130.70	2,458	4,966
130.75	2,458	5,015
130.80	2,458	5,064
130.85	2,458	5,113
130.90	2,458	5,162
130.95	2,458	5,211
131.00	2,458	5,261
131.05	2,458	5,310
131.10	2,458	5,359
131.15	2,458	**5,408**

Summary for Pond IB2c: Infiltration Basin Area 2c

Inflow Area =	15,551 sf, 65.27% Impervious, Inflow Depth > 4.65" for 25-YR event				
Inflow =	1.86 cfs @	12.09 hrs,	Volume=	6,030 cf	
Outflow =	0.65 cfs @	12.37 hrs,	Volume=	5,888 cf,	Atten= 65%, Lag= 16.8 min
Discarded =	0.06 cfs @	9.95 hrs,	Volume=	3,172 cf	
Primary =	0.60 cfs @	12.37 hrs,	Volume=	2,716 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 131.43' @ 12.37 hrs Surf.Area= 2,373 sf Storage= 1,949 cf

Plug-Flow detention time= 98.8 min calculated for 5,876 cf (97% of inflow)
Center-of-Mass det. time= 84.7 min (880.4 - 795.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	130.00'	1,505 cf	**27.00'W x 87.91'L x 2.00'H Field A** 4,747 cf Overall - 985 cf Embedded = 3,762 cf x 40.0% Voids
#2A	130.50'	985 cf	**ADS_StormTech SC-160LP +Cap** x 144 Inside #1 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 12 Rows of 12 Chambers
		2,489 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	130.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	129.20'	**8.0" Round Culvert** L= 14.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 129.20' / 129.00' S= 0.0143 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.35 sf
#3	Device 2	130.70'	**11.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 2	131.40'	**2.0" Vert. Orifice/Grate** C= 0.600
#5	Device 2	131.88'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.06 cfs @ 9.95 hrs HW=130.02' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.59 cfs @ 12.37 hrs HW=131.43' (Free Discharge)
└─**2=Culvert** (Passes 0.59 cfs of 2.82 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.59 cfs @ 3.88 fps)
  ├─**4=Orifice/Grate** (Orifice Controls 0.00 cfs @ 0.61 fps)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB2c: Infiltration Basin Area 2c - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-160LP +Cap (ADS StormTech® SC-160LP with cap length)
Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf
Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap

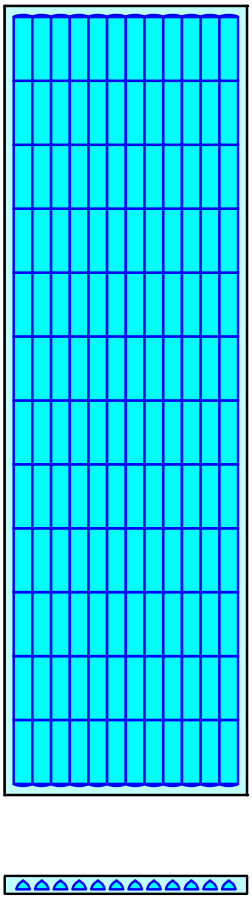
12 Chambers/Row x 7.12' Long +0.23' Cap Length x 2 = 85.91' Row Length +12.0" End Stone x 2 = 87.91' Base Length
12 Rows x 25.0" Wide + 12.0" Side Stone x 2 = 27.00' Base Width
6.0" Base + 12.0" Chamber Height + 6.0" Cover = 2.00' Field Height

144 Chambers x 6.8 cf = 984.5 cf Chamber Storage

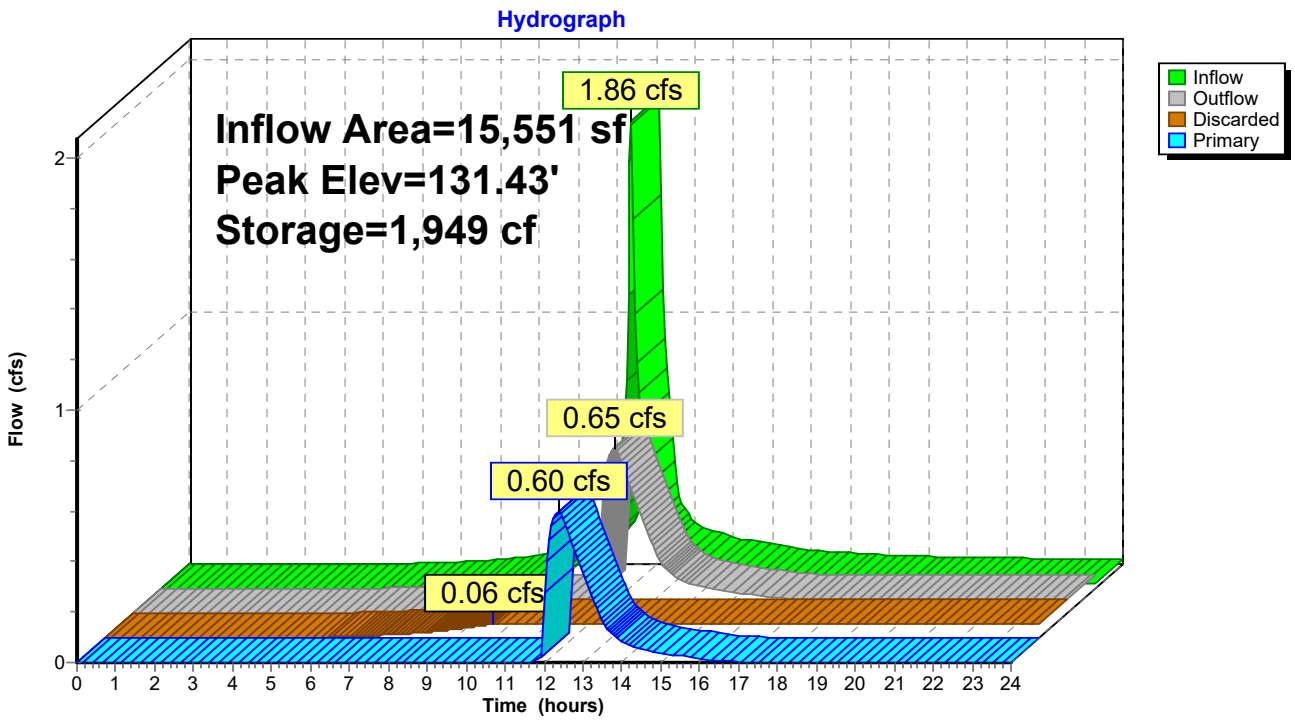
4,747.0 cf Field - 984.5 cf Chambers = 3,762.4 cf Stone x 40.0% Voids = 1,505.0 cf Stone Storage

Chamber Storage + Stone Storage = 2,489.5 cf = 0.057 af
Overall Storage Efficiency = 52.4%
Overall System Size = 87.91' x 27.00' x 2.00'

144 Chambers
175.8 cy Field
139.3 cy Stone



Pond IB2c: Infiltration Basin Area 2c



Stage-Area-Storage for Pond IB2c: Infiltration Basin Area 2c

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.00	**2,373**	0	131.06	2,373	1,457
130.02	2,373	19	131.08	2,373	1,489
130.04	2,373	38	131.10	2,373	1,519
130.06	2,373	57	131.12	2,373	1,550
130.08	2,373	76	131.14	2,373	1,580
130.10	2,373	95	131.16	2,373	1,609
130.12	2,373	114	131.18	2,373	1,638
130.14	2,373	133	131.20	2,373	1,667
130.16	2,373	152	131.22	2,373	1,695
130.18	2,373	171	131.24	2,373	1,722
130.20	2,373	190	131.26	2,373	1,749
130.22	2,373	209	131.28	2,373	1,774
130.24	2,373	228	131.30	2,373	1,799
130.26	2,373	247	131.32	2,373	1,824
130.28	2,373	266	131.34	2,373	1,847
130.30	2,373	285	131.36	2,373	1,870
130.32	2,373	304	131.38	2,373	1,892
130.34	2,373	323	131.40	2,373	1,914
130.36	2,373	342	131.42	2,373	1,935
130.38	2,373	361	131.44	2,373	1,955
130.40	2,373	380	131.46	2,373	1,976
130.42	2,373	399	131.48	2,373	1,995
130.44	2,373	418	131.50	2,373	2,015
130.46	2,373	437	131.52	2,373	2,034
130.48	2,373	456	131.54	2,373	2,053
130.50	2,373	475	131.56	2,373	2,072
130.52	2,373	512	131.58	2,373	2,091
130.54	2,373	549	131.60	2,373	2,110
130.56	2,373	587	131.62	2,373	2,129
130.58	2,373	624	131.64	2,373	2,148
130.60	2,373	661	131.66	2,373	2,167
130.62	2,373	698	131.68	2,373	2,186
130.64	2,373	735	131.70	2,373	2,205
130.66	2,373	772	131.72	2,373	2,224
130.68	2,373	808	131.74	2,373	2,243
130.70	2,373	844	131.76	2,373	2,262
130.72	2,373	880	131.78	2,373	2,281
130.74	2,373	916	131.80	2,373	2,300
130.76	2,373	952	131.82	2,373	2,319
130.78	2,373	987	131.84	2,373	2,338
130.80	2,373	1,022	131.86	2,373	2,357
130.82	2,373	1,057	131.88	2,373	2,376
130.84	2,373	1,092	131.90	2,373	2,395
130.86	2,373	1,127	131.92	2,373	2,414
130.88	2,373	1,161	131.94	2,373	2,433
130.90	2,373	1,195	131.96	2,373	2,452
130.92	2,373	1,229	131.98	2,373	2,471
130.94	2,373	1,263	132.00	2,373	**2,489**
130.96	2,373	1,296			
130.98	2,373	1,329			
131.00	2,373	1,361			
131.02	2,373	1,394			
131.04	2,373	1,426			

Summary for Pond IB2e: Infiltration Basin 2b

Inflow Area =	15,464 sf, 93.24% Impervious, Inflow Depth > 5.67" for 25-YR event				
Inflow =	2.09 cfs @	12.09 hrs,	Volume=	7,302 cf	
Outflow =	0.36 cfs @	12.55 hrs,	Volume=	7,298 cf,	Atten= 83%, Lag= 27.6 min
Discarded =	0.14 cfs @	11.05 hrs,	Volume=	6,005 cf	
Primary =	0.22 cfs @	12.55 hrs,	Volume=	1,293 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 132.06' @ 12.55 hrs Surf.Area= 2,592 sf Storage= 2,468 cf

Plug-Flow detention time= 76.6 min calculated for 7,298 cf (100% of inflow)
Center-of-Mass det. time= 76.3 min (838.4 - 762.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	130.50'	2,002 cf	**34.83'W x 74.40'L x 2.50'H Field A** 6,479 cf Overall - 1,474 cf Embedded = 5,005 cf x 40.0% Voids
#2A	131.00'	1,474 cf	**ADS_StormTech SC-310 +Cap** x 100 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 10 Rows of 10 Chambers
		3,476 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	130.85'	**15.0" Round Culvert Barrel** L= 69.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 130.85' / 130.50' S= 0.0051 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Discarded	130.50'	**2.410 in/hr Exfiltration over Surface area**
#3	Device 1	131.40'	**3.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	132.63'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.14 cfs @ 11.05 hrs HW=130.53' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=0.22 cfs @ 12.55 hrs HW=132.06' (Free Discharge)
└─**1=Culvert Barrel** (Passes 0.22 cfs of 4.21 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.22 cfs @ 3.52 fps)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB2e: Infiltration Basin 2b - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-310 +Cap (ADS StormTech® SC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

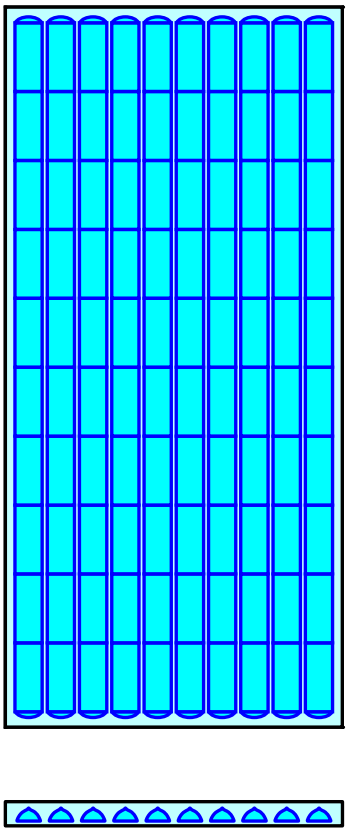
10 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 72.40' Row Length +12.0" End Stone x 2 = 74.40' Base Length
10 Rows x 34.0" Wide + 6.0" Spacing x 9 + 12.0" Side Stone x 2 = 34.83' Base Width
6.0" Base + 16.0" Chamber Height + 8.0" Cover = 2.50' Field Height

100 Chambers x 14.7 cf = 1,474.2 cf Chamber Storage

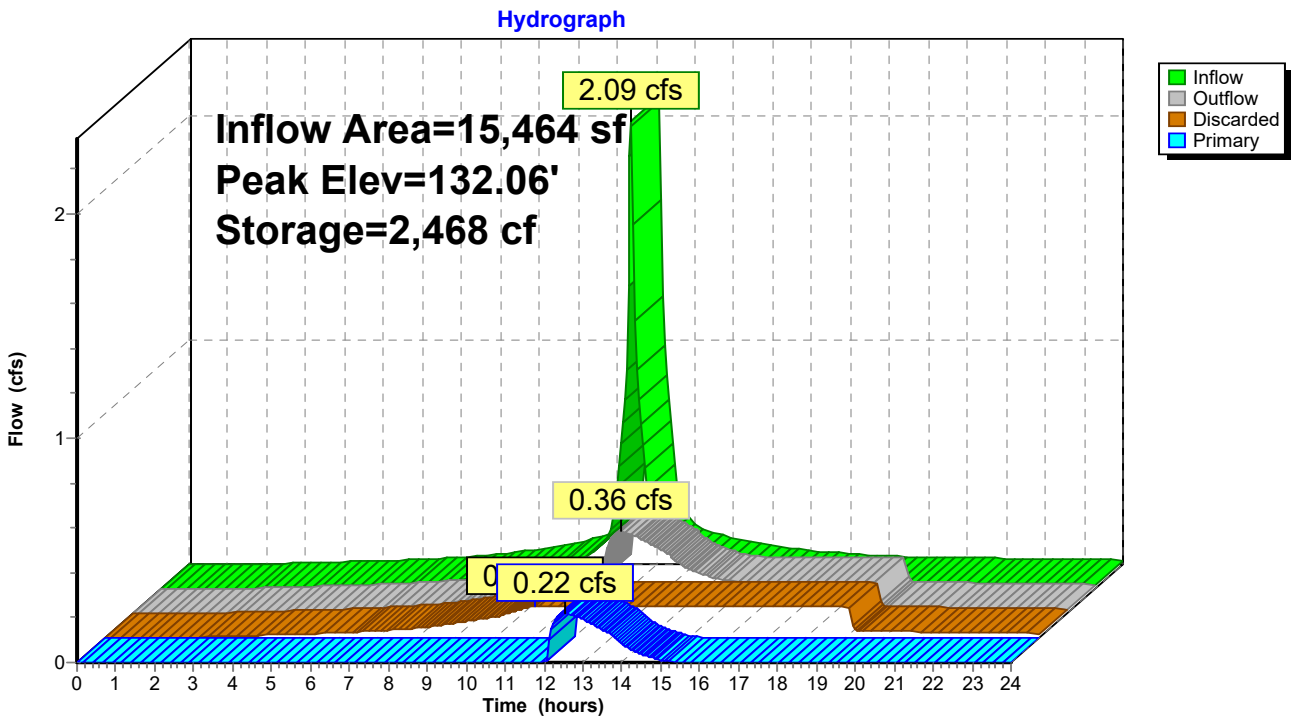
6,479.0 cf Field - 1,474.2 cf Chambers = 5,004.8 cf Stone x 40.0% Voids = 2,001.9 cf Stone Storage

Chamber Storage + Stone Storage = 3,476.1 cf = 0.080 af
Overall Storage Efficiency = 53.7%
Overall System Size = 74.40' x 34.83' x 2.50'

100 Chambers
240.0 cy Field
185.4 cy Stone



Pond IB2e: Infiltration Basin 2b



Stage-Area-Storage for Pond IB2e: Infiltration Basin 2b

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.50	**2,592**	0
130.55	2,592	52
130.60	2,592	104
130.65	2,592	155
130.70	2,592	207
130.75	2,592	259
130.80	2,592	311
130.85	2,592	363
130.90	2,592	415
130.95	2,592	466
131.00	2,592	518
131.05	2,592	622
131.10	2,592	724
131.15	2,592	827
131.20	2,592	928
131.25	2,592	1,029
131.30	2,592	1,129
131.35	2,592	1,227
131.40	2,592	1,325
131.45	2,592	1,422
131.50	2,592	1,517
131.55	2,592	1,611
131.60	2,592	1,703
131.65	2,592	1,794
131.70	2,592	1,884
131.75	2,592	1,972
131.80	2,592	2,057
131.85	2,592	2,141
131.90	2,592	2,222
131.95	2,592	2,301
132.00	2,592	2,377
132.05	2,592	2,449
132.10	2,592	2,516
132.15	2,592	2,579
132.20	2,592	2,638
132.25	2,592	2,695
132.30	2,592	2,750
132.35	2,592	2,802
132.40	2,592	2,854
132.45	2,592	2,906
132.50	2,592	2,958
132.55	2,592	3,010
132.60	2,592	3,061
132.65	2,592	3,113
132.70	2,592	3,165
132.75	2,592	3,217
132.80	2,592	3,269
132.85	2,592	3,321
132.90	2,592	3,372
132.95	2,592	3,424
133.00	2,592	**3,476**

Summary for Subcatchment PD-1: Prop. Drainage Area 1

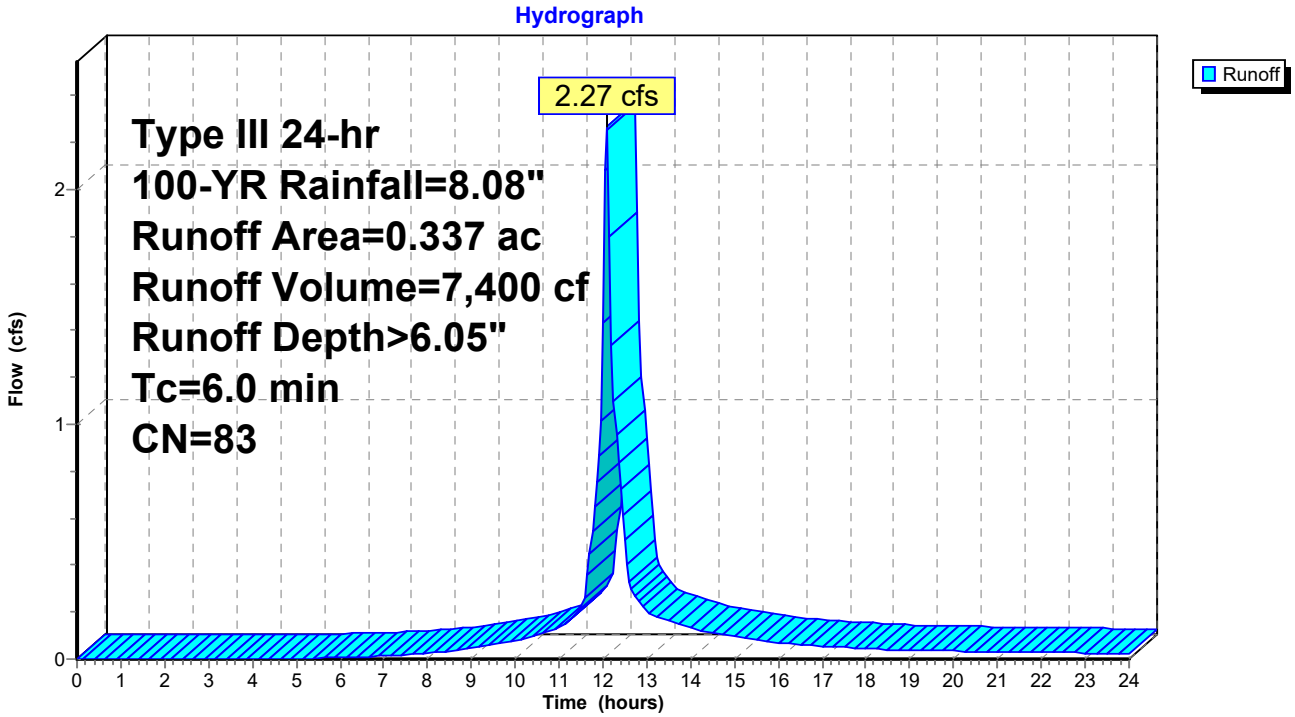
Runoff = 2.27 cfs @ 12.09 hrs, Volume= 7,400 cf, Depth> 6.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=8.08"

	Area (ac)	CN	Description
*	0.074	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.070	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.193	98	Paved parking
	0.337	83	Weighted Average
	0.144		42.73% Pervious Area
	0.193		57.27% Impervious Area

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

Subcatchment PD-1: Prop. Drainage Area 1



Summary for Subcatchment PD-2a: Prop. Drainage Area 2a

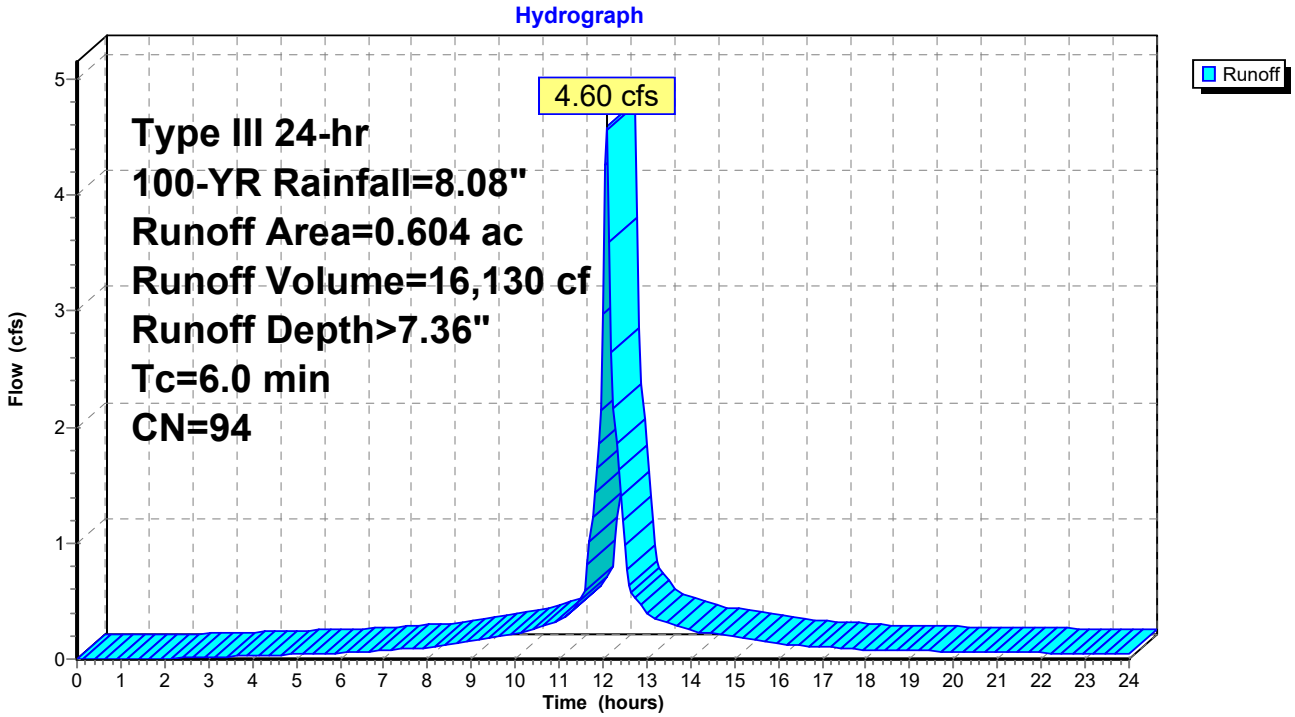
Runoff = 4.60 cfs @ 12.09 hrs, Volume= 16,130 cf, Depth> 7.36"

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-YR Rainfall=8.08"

	Area (ac)	CN	Description
*	0.038	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.029	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.537	98	Paved parking
	0.604	94	Weighted Average
	0.067		11.09% Pervious Area
	0.537		88.91% Impervious Area

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

Subcatchment PD-2a: Prop. Drainage Area 2a



Summary for Subcatchment PD-2b: Prop. Drainage Area 2b

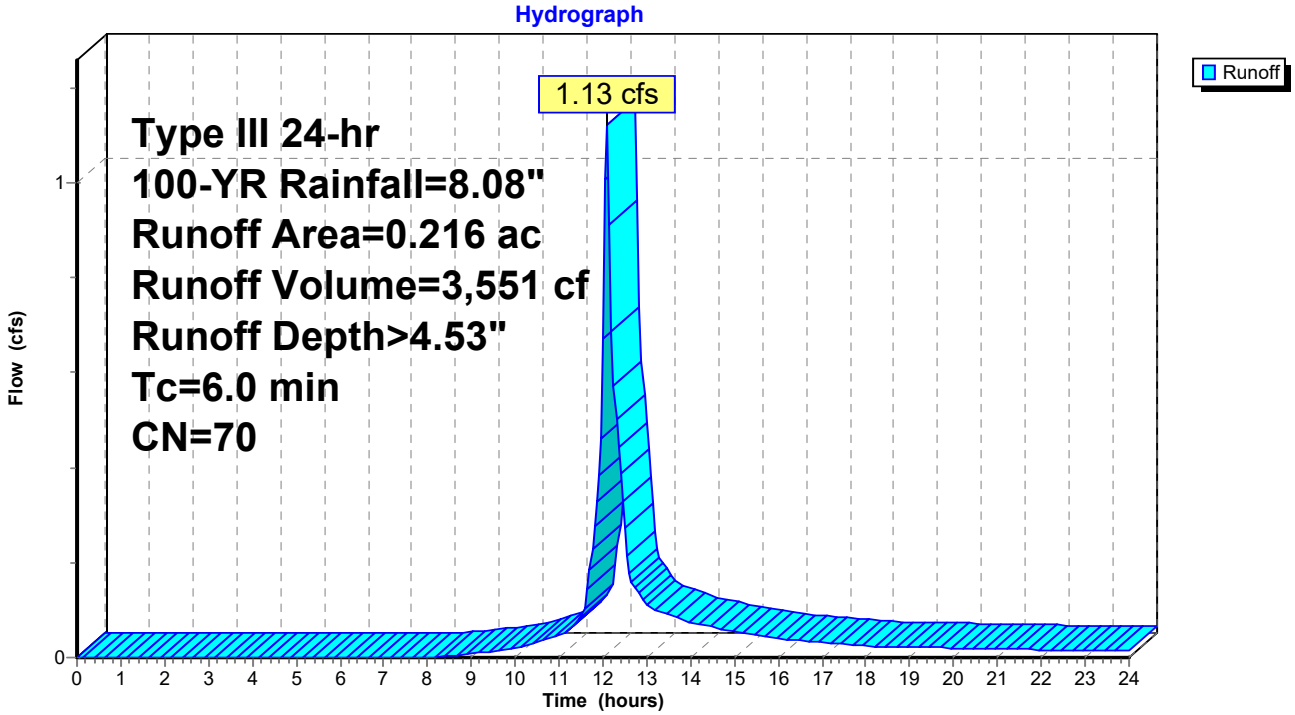
Runoff = 1.13 cfs @ 12.09 hrs, Volume= 3,551 cf, Depth> 4.53"

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-YR Rainfall=8.08"

	Area (ac)	CN	Description
*	0.174	74	Woods/grass comb., Fair, HSG B/D, 13
*	0.018	43	Woods/grass comb., Fair, HSG A. 36A
	0.024	65	Woods/grass comb., Fair, HSG B
	0.216	70	Weighted Average
	0.216		100.00% Pervious Area

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

Subcatchment PD-2b: Prop. Drainage Area 2b



Summary for Subcatchment PD-2c: Prop. Drainage Area 2c

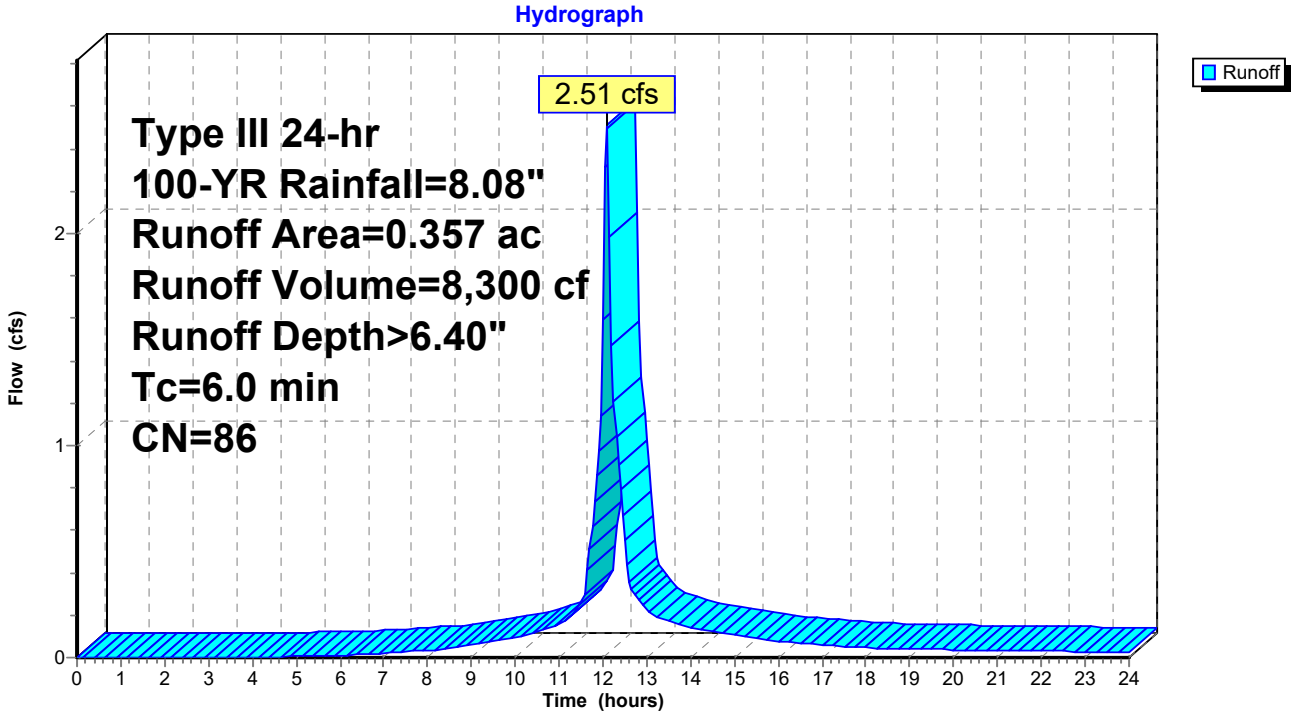
Runoff = 2.51 cfs @ 12.09 hrs, Volume= 8,300 cf, Depth> 6.40"

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-YR Rainfall=8.08"

	Area (ac)	CN	Description
*	0.061	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.042	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.021	49	50-75% Grass cover, Fair, HSG A, 36A
	0.233	98	Paved parking, HSG D
	0.357	86	Weighted Average
	0.124		34.73% Pervious Area
	0.233		65.27% Impervious Area

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

Subcatchment PD-2c: Prop. Drainage Area 2c



Summary for Subcatchment PD-2d: Prop. Drainage Area 2d

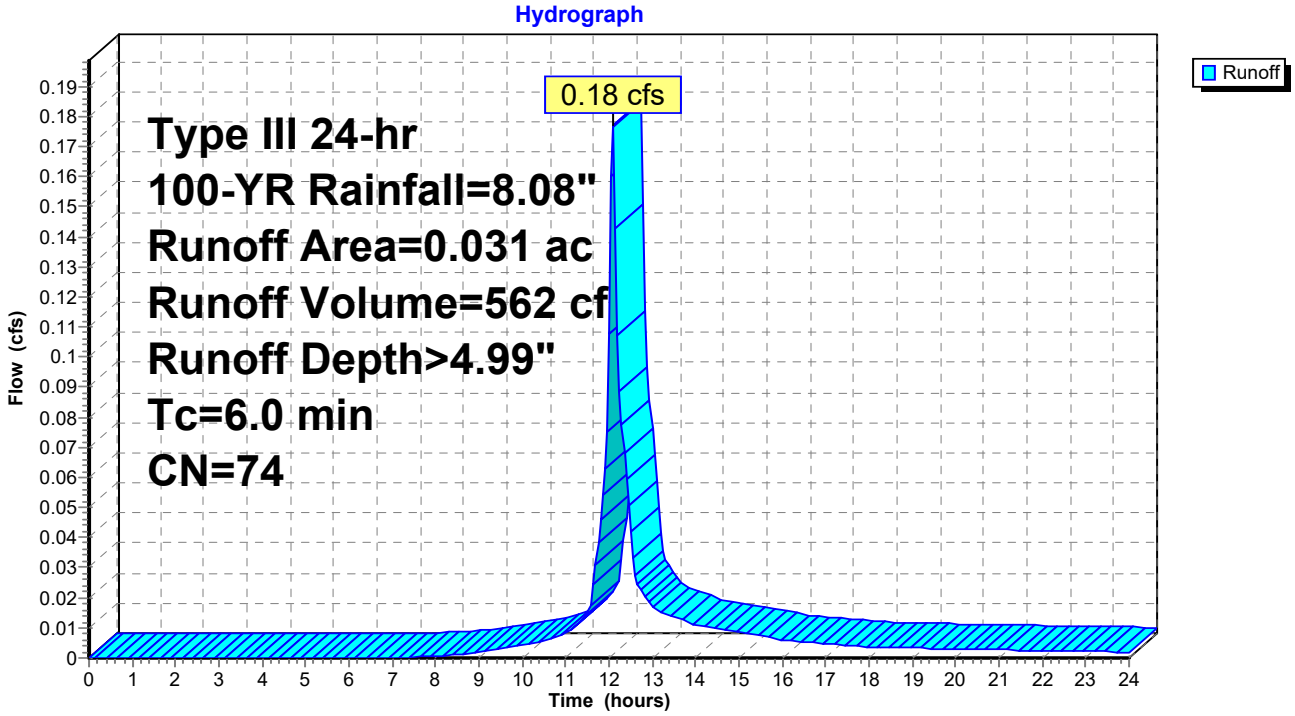
Runoff = 0.18 cfs @ 12.09 hrs, Volume= 562 cf, Depth> 4.99"

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-YR Rainfall=8.08"

	Area (ac)	CN	Description
*	0.031	74	Woods/grass comb., Fair, HSG B/D, 13
	0.031		100.00% Pervious Area

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

Subcatchment PD-2d: Prop. Drainage Area 2d



Summary for Subcatchment PD-2e: Prop. Drainage Area 2e

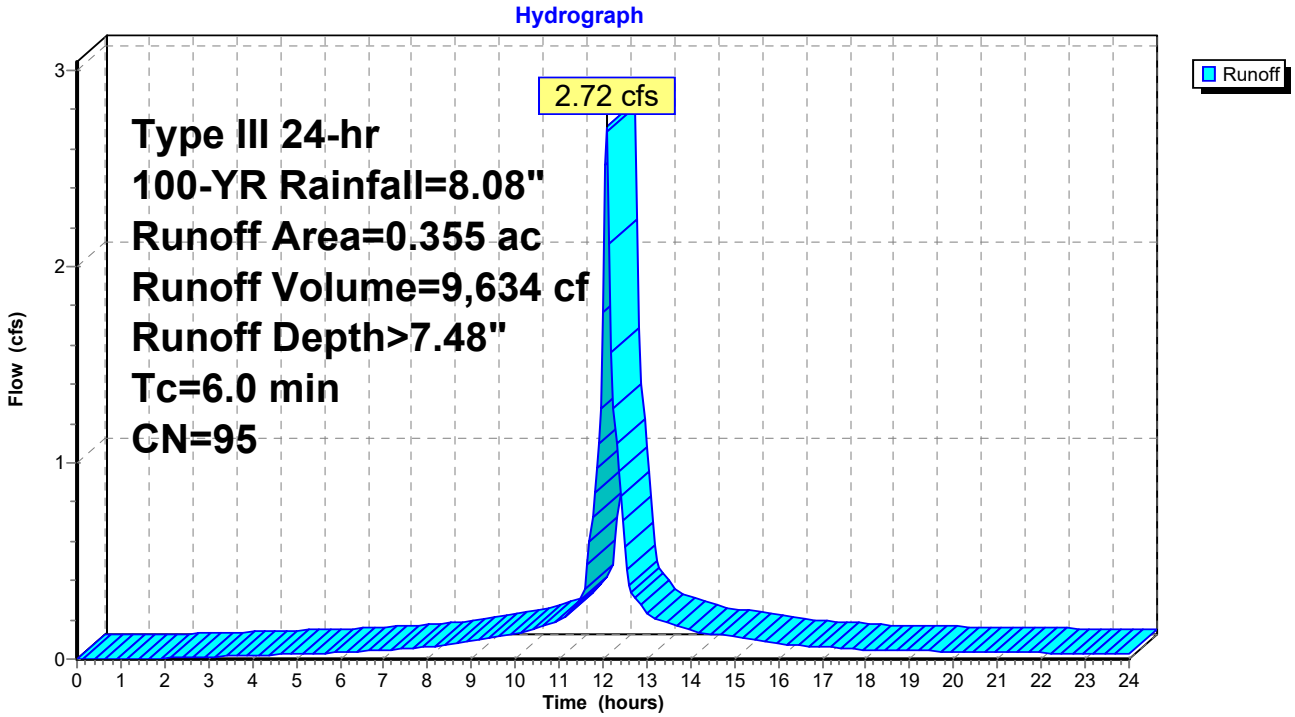
Runoff = 2.72 cfs @ 12.09 hrs, Volume= 9,634 cf, Depth> 7.48"

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 100-YR Rainfall=8.08"

	Area (ac)	CN	Description
*	0.004	43	Woods/grass comb., Fair, HSG A, 36A
*	0.020	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.331	98	Paved parking
	0.355	95	Weighted Average
	0.024		6.76% Pervious Area
	0.331		93.24% Impervious Area

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

Subcatchment PD-2e: Prop. Drainage Area 2e



Summary for Subcatchment PD-2f: Prop. Drainage Area 2d

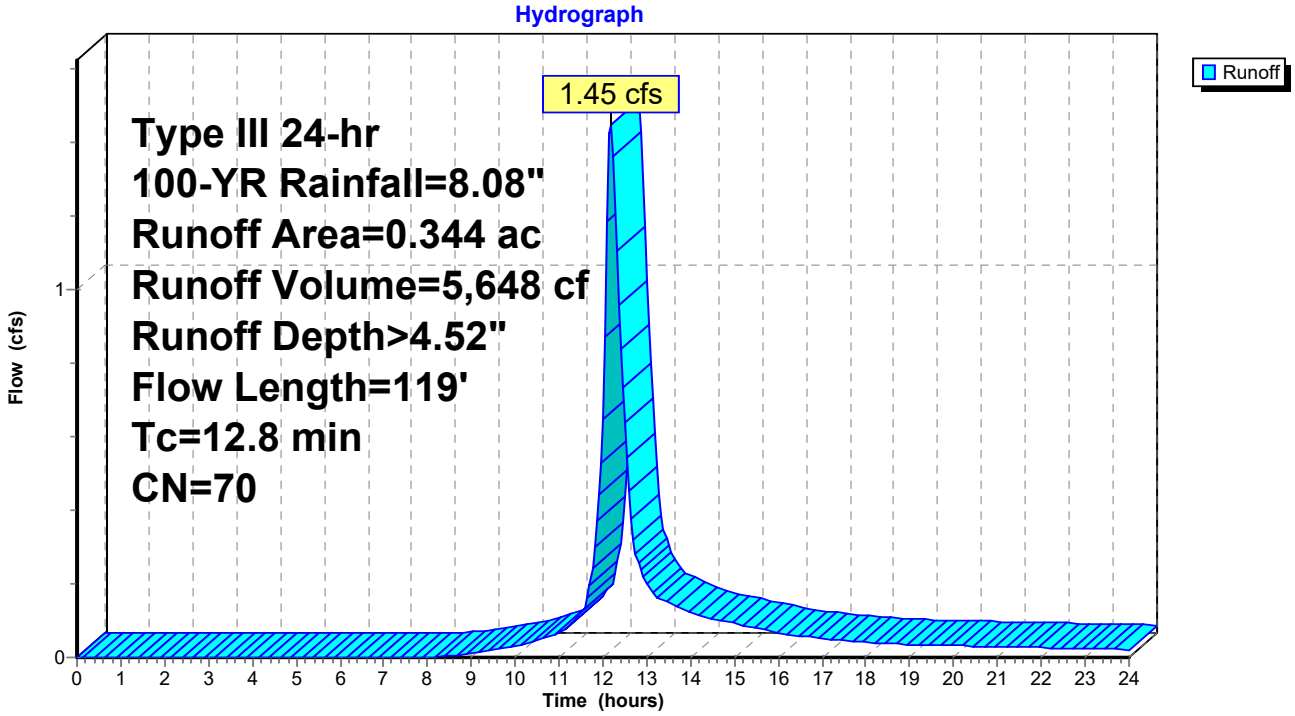
Runoff = 1.45 cfs @ 12.18 hrs, Volume= 5,648 cf, Depth> 4.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR Rainfall=8.08"

	Area (ac)	CN	Description
*	0.296	74	Woods/grass comb., Fair, HSG B/D, 13
	0.048	43	Woods/grass comb., Fair, HSG A
	0.344	70	Weighted Average
	0.344		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	23	0.1600	0.13		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.18"
8.4	36	0.0270	0.07		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.18"
1.5	60	0.0167	0.65		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
12.8	119	Total			

Subcatchment PD-2f: Prop. Drainage Area 2d



Summary for Subcatchment PD-3a: Prop. Drainage Area 3a

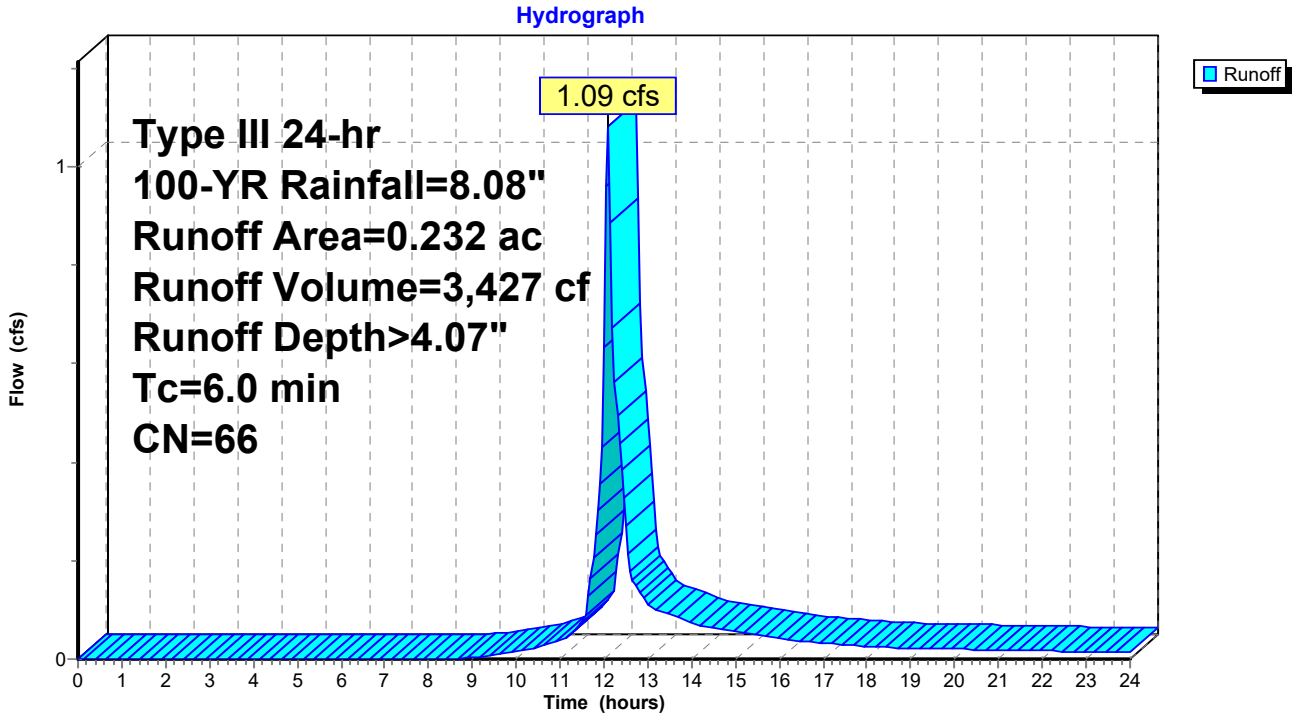
Runoff = 1.09 cfs @ 12.09 hrs, Volume= 3,427 cf, Depth> 4.07"

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 100-YR Rainfall=8.08"

	Area (ac)	CN	Description
*	0.120	49	50-75% Grass cover, Fair, HSG A, 36A
*	0.071	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.041	98	Paved parking
	0.232	66	Weighted Average
	0.191		82.33% Pervious Area
	0.041		17.67% Impervious Area

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

Subcatchment PD-3a: Prop. Drainage Area 3a



Summary for Subcatchment PD-3b: Prop. Drainage Area 3b

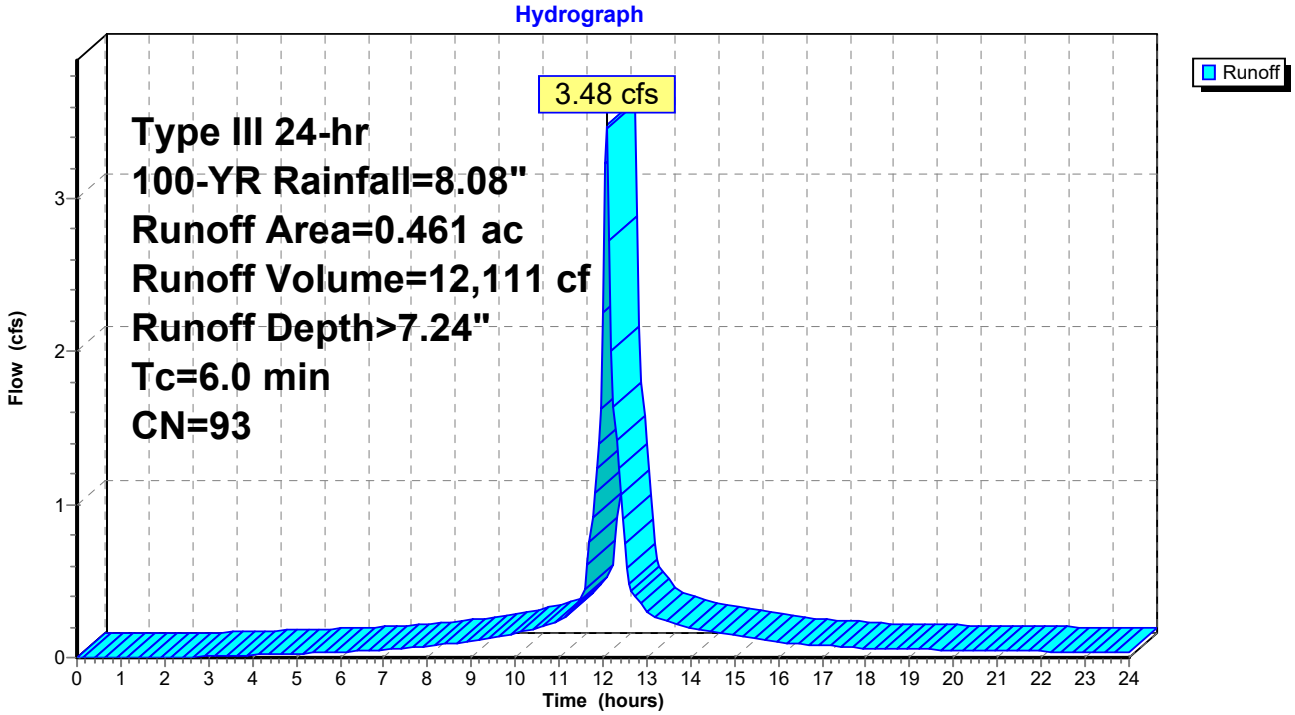
Runoff = 3.48 cfs @ 12.09 hrs, Volume= 12,111 cf, Depth> 7.24"

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-YR Rainfall=8.08"

	Area (ac)	CN	Description
*	0.093	77	50-75% Grass cover, Fair, HSG B/D, 13
*	0.019	79	50-75% Grass cover, Fair, HSG C, 701A
*	0.016	98	Paved parking
*	0.333	98	Roofing
	0.461	93	Weighted Average
	0.112		24.30% Pervious Area
	0.349		75.70% Impervious Area

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

Subcatchment PD-3b: Prop. Drainage Area 3b



Summary for Subcatchment PD-3c: Prop. Drainage Area 3c

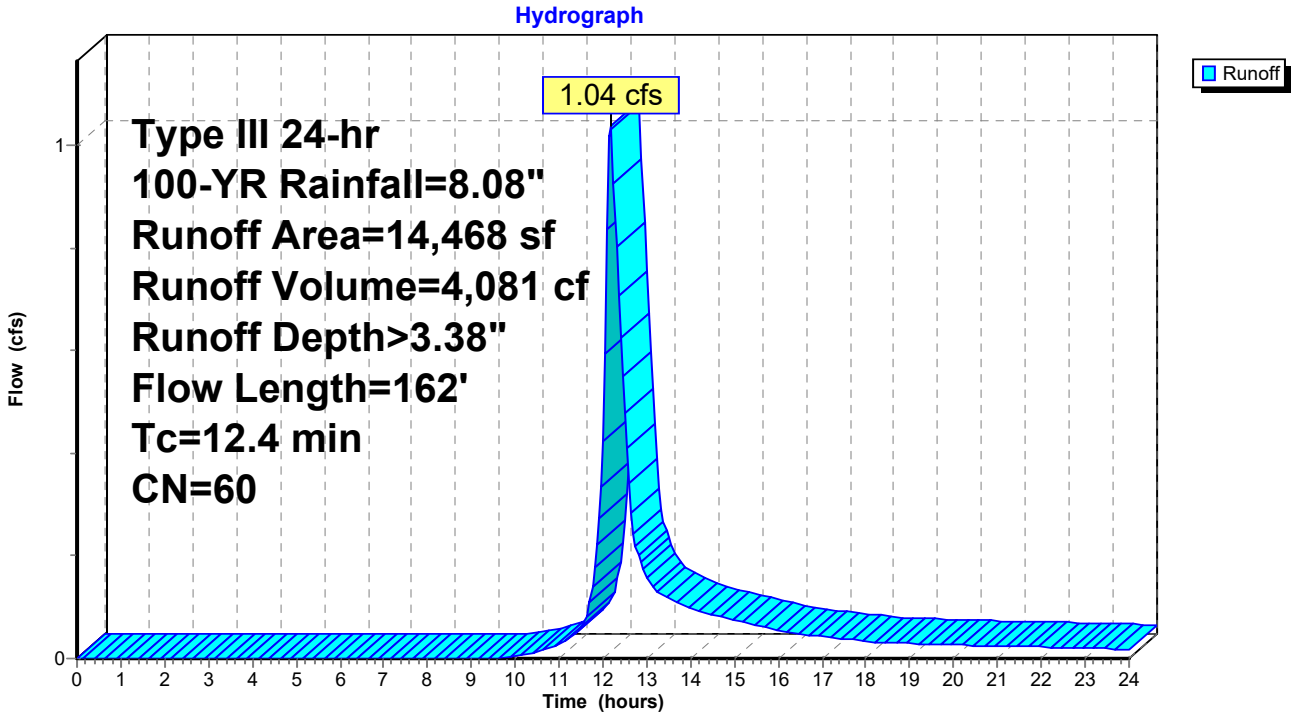
Runoff = 1.04 cfs @ 12.18 hrs, Volume= 4,081 cf, Depth> 3.38"

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 100-YR Rainfall=8.08"

	Area (sf)	CN	Description
*	6,684	43	Woods/grass comb., Fair, HSG A, 36A
*	5,545	74	Woods/grass comb., Fair, HSG C
	1,501	76	Woods/grass comb., Fair, HSG C
*	738	77	50-75% Grass cover, Fair, HSG C
	14,468	60	Weighted Average
	14,468		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	8	0.0625	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.18"
3.4	17	0.0580	0.08		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.18"
3.2	16	0.0625	0.08		**Sheet Flow, C-D** Woods: Light underbrush n= 0.400 P2= 3.18"
1.5	9	0.1250	0.10		**Sheet Flow, D-E** Woods: Light underbrush n= 0.400 P2= 3.18"
2.5	112	0.0220	0.74		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
12.4	162	Total			

Subcatchment PD-3c: Prop. Drainage Area 3c



Summary for Subcatchment RD-1: Roof 1

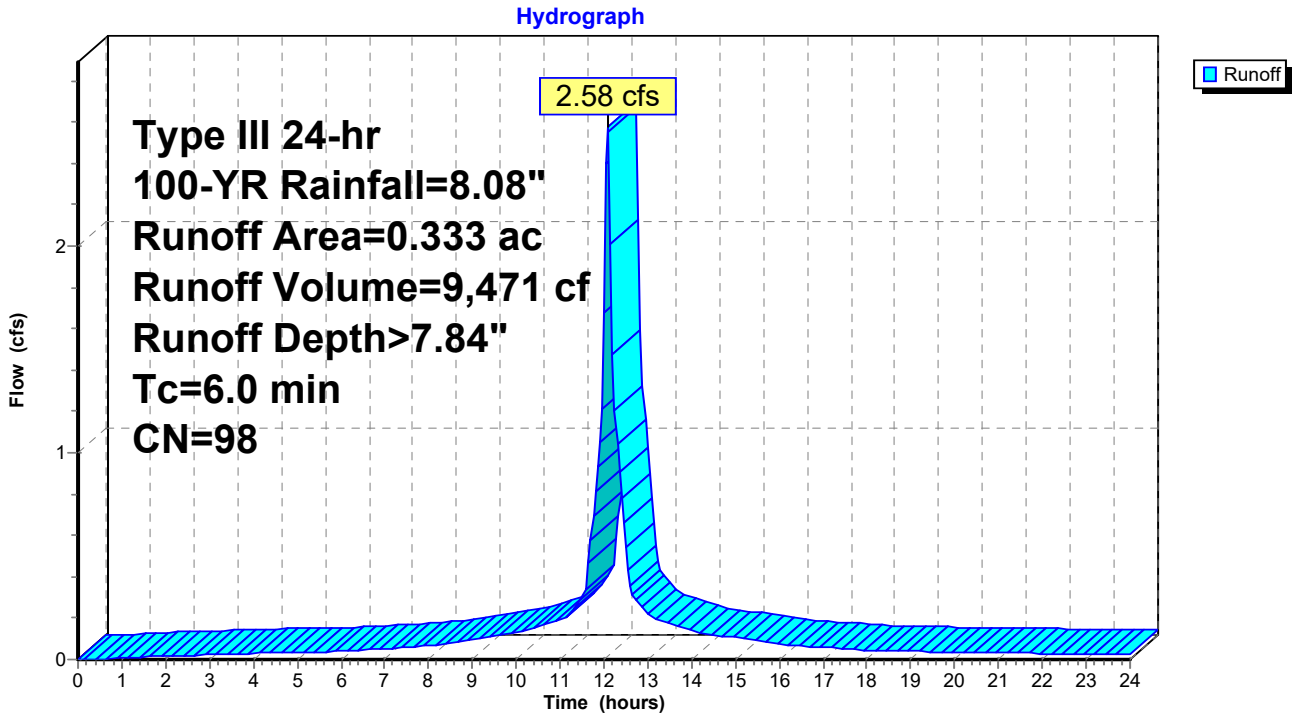
Runoff = 2.58 cfs @ 12.09 hrs, Volume= 9,471 cf, Depth> 7.84"

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-YR Rainfall=8.08"

	Area (ac)	CN	Description
*	0.333	98	Unconnected roofs
	0.333		100.00% Impervious Area
	0.333		100.00% Unconnected

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

Subcatchment RD-1: Roof 1

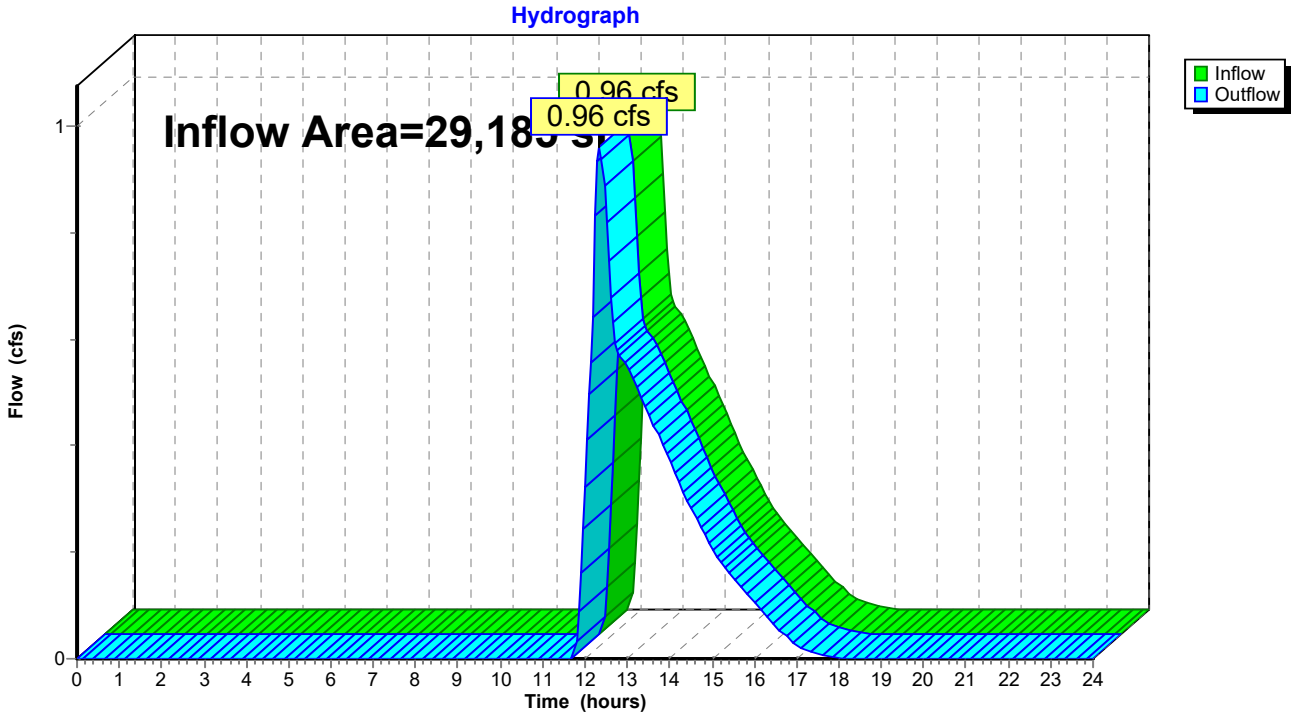


Summary for Reach DP-1a: Design Point 1

Inflow Area = 29,185 sf, 78.51% Impervious, Inflow Depth = 2.49" for 100-YR event
Inflow = 0.96 cfs @ 12.35 hrs, Volume= 6,044 cf
Outflow = 0.96 cfs @ 12.35 hrs, Volume= 6,044 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-1a: Design Point 1

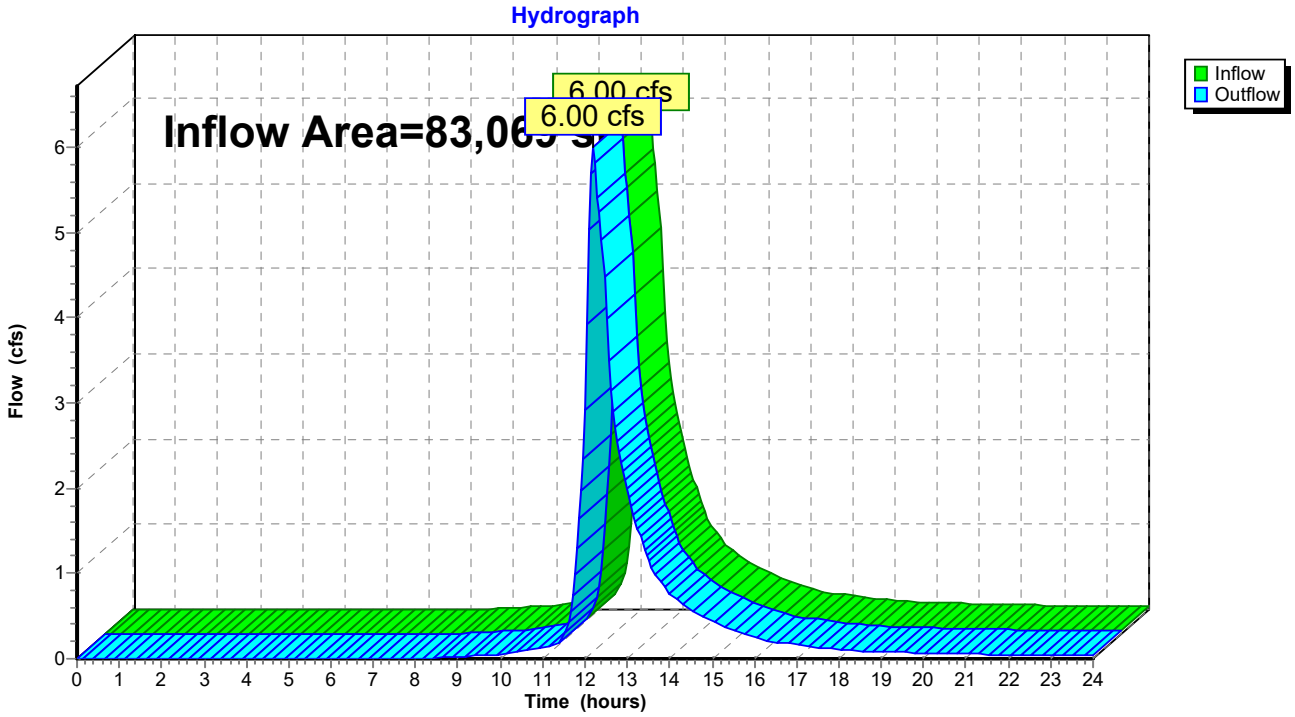


Summary for Reach DP-2a: Design Point 2

Inflow Area = 83,069 sf, 57.73% Impervious, Inflow Depth > 3.90" for 100-YR event
Inflow = 6.00 cfs @ 12.21 hrs, Volume= 26,964 cf
Outflow = 6.00 cfs @ 12.21 hrs, Volume= 26,964 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-2a: Design Point 2

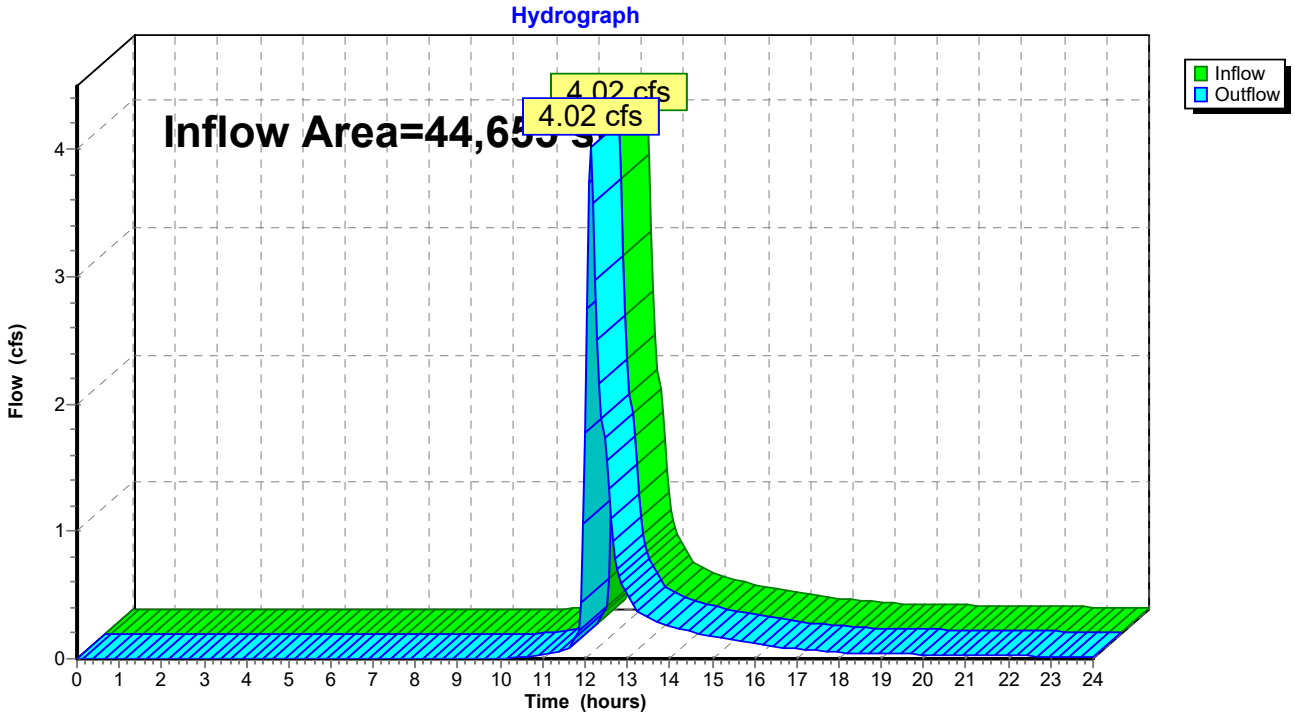


Summary for Reach DP-3a: Design Point 3

Inflow Area = 44,655 sf, 38.04% Impervious, Inflow Depth > 2.89" for 100-YR event
Inflow = 4.02 cfs @ 12.14 hrs, Volume= 10,769 cf
Outflow = 4.02 cfs @ 12.14 hrs, Volume= 10,769 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-3a: Design Point 3



Summary for Pond AB1: Above Ground Infiltration Basin 1

Inflow Area =	29,185 sf, 78.51% Impervious, Inflow Depth > 4.13" for 100-YR event				
Inflow =	2.39 cfs @	12.09 hrs, Volume=	10,050 cf		
Outflow =	1.07 cfs @	12.35 hrs, Volume=	9,894 cf, Atten= 55%, Lag= 15.5 min		
Discarded =	0.11 cfs @	12.35 hrs, Volume=	3,850 cf		
Primary =	0.96 cfs @	12.35 hrs, Volume=	6,044 cf		

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 129.10' @ 12.35 hrs Surf.Area= 2,031 sf Storage= 2,500 cf

Plug-Flow detention time= 68.9 min calculated for 9,874 cf (98% of inflow)
Center-of-Mass det. time= 59.8 min (864.3 - 804.5)

Volume	Invert	Avail.Storage	Storage Description
#1	127.00'	4,542 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 4,798 cf Overall - 256 cf Embedded = 4,542 cf
#2	127.00'	102 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) Inside #1 256 cf Overall x 40.0% Voids
		4,644 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
127.00	512	0	0
128.00	1,218	865	865
129.00	1,949	1,584	2,449
130.00	2,749	2,349	4,798

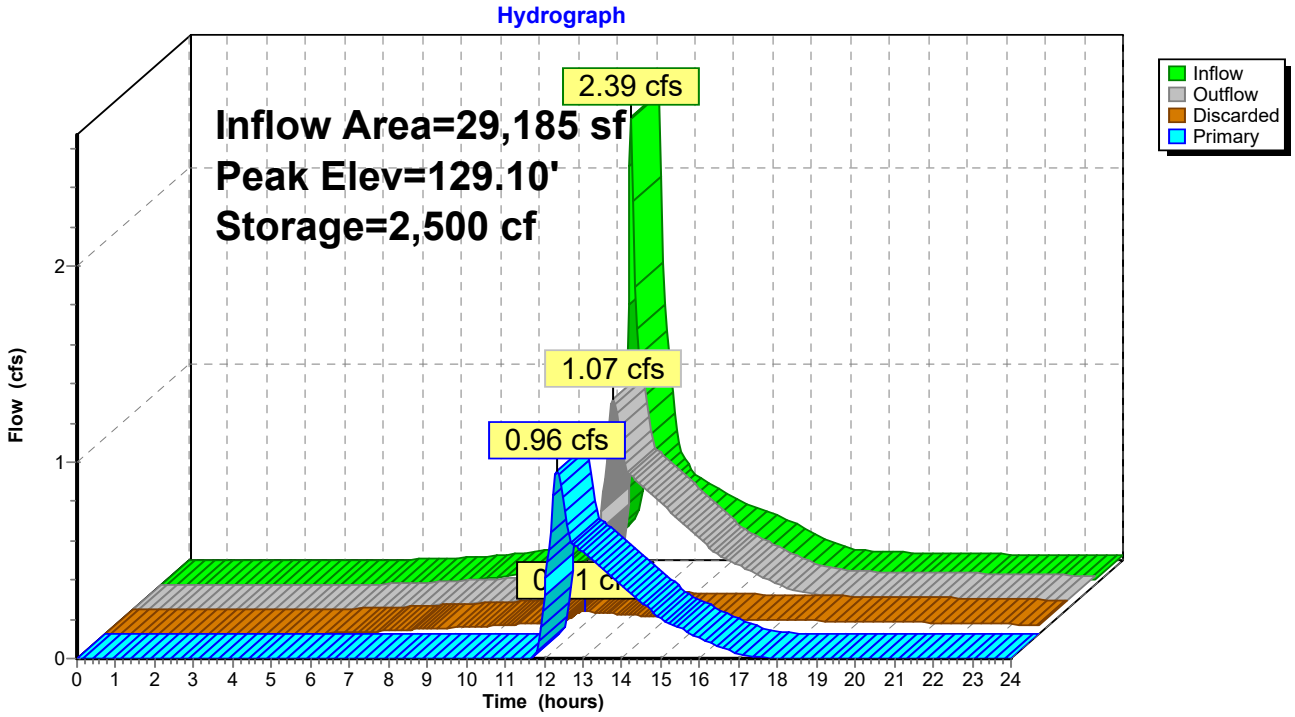
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
127.00	512	0	0
127.50	512	256	256

Device	Routing	Invert	Outlet Devices
#1	Primary	127.57'	**8.0" Round Culvert Barrel** L= 13.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 127.57' / 127.50' S= 0.0054 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.35 sf
#2	Device 1	129.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	127.00'	**2.410 in/hr Exfiltration over Surface area**
#4	Device 1	128.00'	**5.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.11 cfs @ 12.35 hrs HW=129.10' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.96 cfs @ 12.35 hrs HW=129.10' (Free Discharge)
└─**1=Culvert Barrel** (Passes 0.96 cfs of 1.41 cfs potential flow)
  ├─**2=Orifice/Grate** (Weir Controls 0.34 cfs @ 1.05 fps)
  └─**4=Orifice/Grate** (Orifice Controls 0.62 cfs @ 4.55 fps)

Pond AB1: Above Ground Infiltration Basin 1



Stage-Area-Storage for Pond AB1: Above Ground Infiltration Basin 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
127.00	512	0
127.05	547	11
127.10	583	24
127.15	618	39
127.20	653	55
127.25	689	73
127.30	724	93
127.35	759	115
127.40	794	138
127.45	830	164
127.50	865	191
127.55	900	235
127.60	936	281
127.65	971	328
127.70	1,006	378
127.75	1,042	429
127.80	1,077	482
127.85	1,112	537
127.90	1,147	593
127.95	1,183	651
128.00	1,218	711
128.05	1,255	773
128.10	1,291	837
128.15	1,328	902
128.20	1,364	970
128.25	1,401	1,039
128.30	1,437	1,110
128.35	1,474	1,182
128.40	1,510	1,257
128.45	1,547	1,334
128.50	1,584	1,412
128.55	1,620	1,492
128.60	1,657	1,574
128.65	1,693	1,658
128.70	1,730	1,743
128.75	1,766	1,830
128.80	1,803	1,920
128.85	1,839	2,011
128.90	1,876	2,104
128.95	1,912	2,198
129.00	1,949	2,295
129.05	1,989	2,393
129.10	2,029	2,494
129.15	2,069	2,596
129.20	2,109	2,701
129.25	2,149	2,807
129.30	2,189	2,916
129.35	2,229	3,026
129.40	2,269	3,139
129.45	2,309	3,253
129.50	2,349	3,369
129.55	2,389	3,488
129.60	2,429	3,608
129.65	2,469	3,731
129.70	2,509	3,855
129.75	2,549	3,982
129.80	2,589	4,110
129.85	2,629	4,241
129.90	2,669	4,373
129.95	2,709	4,507
130.00	**2,749**	**4,644**

Summary for Pond AB3a: Above Ground Infiltration 3a

Inflow Area =	10,106 sf, 17.67% Impervious, Inflow Depth > 4.07" for 100-YR event				
Inflow =	1.09 cfs @	12.09 hrs, Volume=	3,427 cf		
Outflow =	0.26 cfs @	12.52 hrs, Volume=	3,422 cf, Atten= 76%, Lag= 25.6 min		
Discarded =	0.09 cfs @	12.52 hrs, Volume=	3,197 cf		
Primary =	0.17 cfs @	12.52 hrs, Volume=	225 cf		

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 133.03' @ 12.52 hrs Surf.Area= 1,618 sf Storage= 1,305 cf

Plug-Flow detention time= 139.7 min calculated for 3,415 cf (100% of inflow)
Center-of-Mass det. time= 138.5 min (970.7 - 832.2)

Volume	Invert	Avail.Storage	Storage Description
#1	132.00'	3,206 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

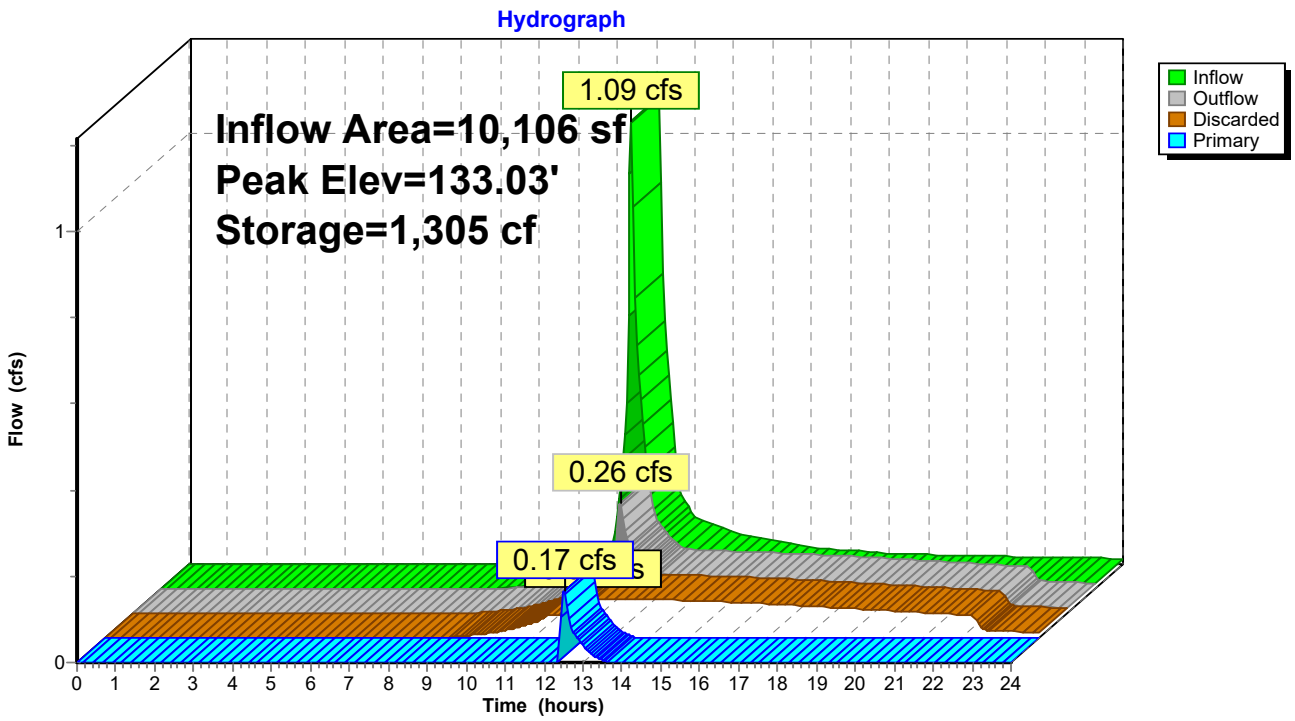
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
132.00	906	0	0
133.00	1,593	1,250	1,250
134.00	2,319	1,956	3,206

Device	Routing	Invert	Outlet Devices
#1	Discarded	132.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	133.00'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.09 cfs @ 12.52 hrs HW=133.03' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=0.15 cfs @ 12.52 hrs HW=133.03' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.15 cfs @ 0.46 fps)

Pond AB3a: Above Ground Infiltration 3a



Stage-Area-Storage for Pond AB3a: Above Ground Infiltration 3a

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
132.00	906	0
132.02	920	18
132.04	933	37
132.06	947	56
132.08	961	75
132.10	975	94
132.12	988	114
132.14	1,002	134
132.16	1,016	154
132.18	1,030	174
132.20	1,043	195
132.22	1,057	216
132.24	1,071	237
132.26	1,085	259
132.28	1,098	281
132.30	1,112	303
132.32	1,126	325
132.34	1,140	348
132.36	1,153	371
132.38	1,167	394
132.40	1,181	417
132.42	1,195	441
132.44	1,208	465
132.46	1,222	489
132.48	1,236	514
132.50	1,250	539
132.52	1,263	564
132.54	1,277	589
132.56	1,291	615
132.58	1,304	641
132.60	1,318	667
132.62	1,332	694
132.64	1,346	721
132.66	1,359	748
132.68	1,373	775
132.70	1,387	803
132.72	1,401	830
132.74	1,414	859
132.76	1,428	887
132.78	1,442	916
132.80	1,456	945
132.82	1,469	974
132.84	1,483	1,003
132.86	1,497	1,033
132.88	1,511	1,063
132.90	1,524	1,094
132.92	1,538	1,124
132.94	1,552	1,155
132.96	1,566	1,186
132.98	1,579	1,218
133.00	1,593	1,250
133.02	1,608	1,282
133.04	1,622	1,314
133.06	1,637	1,346
133.08	1,651	1,379
133.10	1,666	1,412
133.12	1,680	1,446
133.14	1,695	1,480
133.16	1,709	1,514
133.18	1,724	1,548
133.20	1,738	1,583
133.22	1,753	1,618
133.24	1,767	1,653
133.26	1,782	1,688
133.28	1,796	1,724
133.30	1,811	1,760
133.32	1,825	1,796
133.34	1,840	1,833
133.36	1,854	1,870
133.38	1,869	1,907
133.40	1,883	1,945
133.42	1,898	1,983
133.44	1,912	2,021
133.46	1,927	2,059
133.48	1,941	2,098
133.50	1,956	2,137
133.52	1,971	2,176
133.54	1,985	2,216
133.56	2,000	2,255
133.58	2,014	2,296
133.60	2,029	2,336
133.62	2,043	2,377
133.64	2,058	2,418
133.66	2,072	2,459
133.68	2,087	2,501
133.70	2,101	2,542
133.72	2,116	2,585
133.74	2,130	2,627
133.76	2,145	2,670
133.78	2,159	2,713
133.80	2,174	2,756
133.82	2,188	2,800
133.84	2,203	2,844
133.86	2,217	2,888
133.88	2,232	2,932
133.90	2,246	2,977
133.92	2,261	3,022
133.94	2,275	3,068
133.96	2,290	3,113
133.98	2,304	3,159
134.00	**2,319**	**3,206**

Summary for Pond AB3b: Above Ground Infiltration 3b

Inflow Area =	20,081 sf, 75.70% Impervious, Inflow Depth > 7.24" for 100-YR event				
Inflow =	3.48 cfs @	12.09 hrs,	Volume=	12,111 cf	
Outflow =	3.07 cfs @	12.13 hrs,	Volume=	9,000 cf,	Atten= 12%, Lag= 2.8 min
Discarded =	0.05 cfs @	12.13 hrs,	Volume=	2,537 cf	
Primary =	3.02 cfs @	12.13 hrs,	Volume=	6,463 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 133.53' @ 12.13 hrs Surf.Area= 2,166 sf Storage= 3,951 cf

Plug-Flow detention time= 151.2 min calculated for 9,000 cf (74% of inflow)
Center-of-Mass det. time= 65.2 min (829.9 - 764.7)

Volume	Invert	Avail.Storage	Storage Description
#1	130.00'	5,050 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

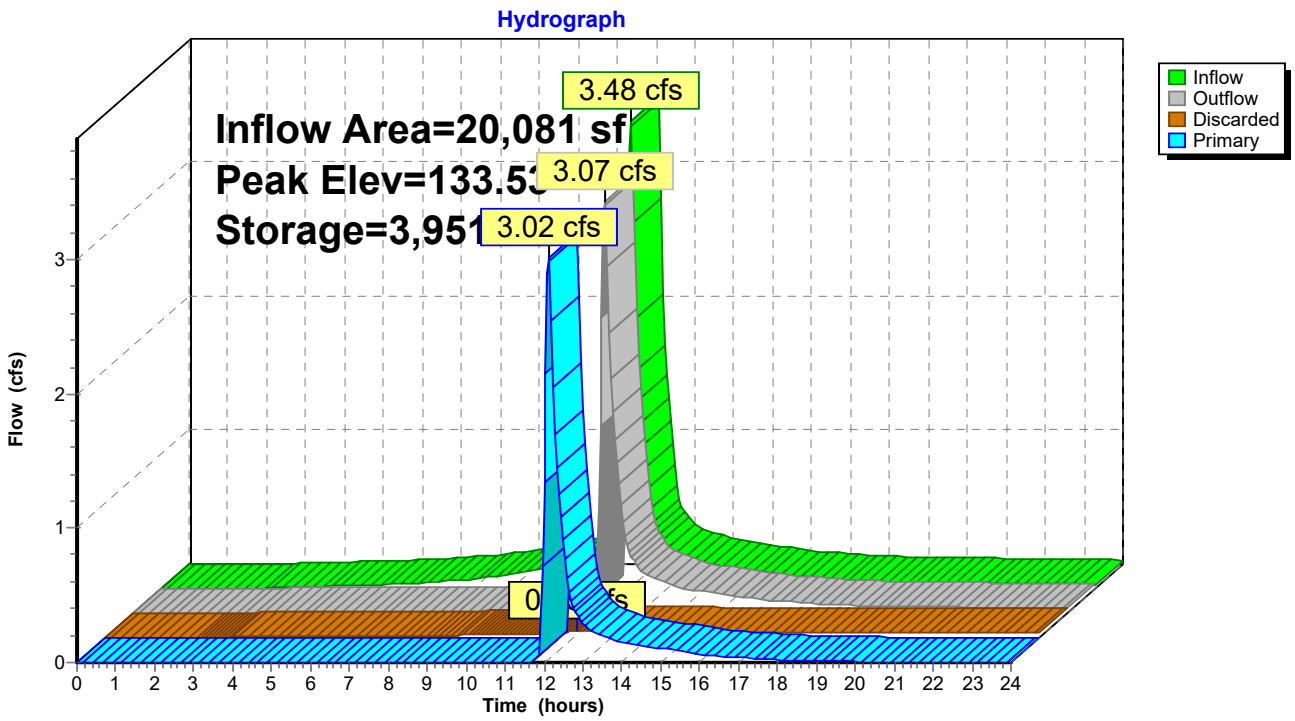
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
130.00	307	0	0
131.00	671	489	489
132.00	1,175	923	1,412
133.00	1,806	1,491	2,903
134.00	2,488	2,147	5,050

Device	Routing	Invert	Outlet Devices
#1	Primary	133.15'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Discarded	130.00'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 12.13 hrs HW=133.52' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=2.96 cfs @ 12.13 hrs HW=133.52' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 2.96 cfs @ 1.59 fps)

Pond AB3b: Above Ground Infiltration 3b



Stage-Area-Storage for Pond AB3b: Above Ground Infiltration 3b

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.00	307	0
130.05	325	16
130.10	343	33
130.15	362	50
130.20	380	69
130.25	398	88
130.30	416	108
130.35	434	130
130.40	453	152
130.45	471	175
130.50	489	199
130.55	507	224
130.60	525	250
130.65	544	276
130.70	562	304
130.75	580	333
130.80	598	362
130.85	616	392
130.90	635	424
130.95	653	456
131.00	671	489
131.05	696	523
131.10	721	559
131.15	747	595
131.20	772	633
131.25	797	673
131.30	822	713
131.35	847	755
131.40	873	798
131.45	898	842
131.50	923	888
131.55	948	934
131.60	973	982
131.65	999	1,032
131.70	1,024	1,082
131.75	1,049	1,134
131.80	1,074	1,187
131.85	1,099	1,241
131.90	1,125	1,297
131.95	1,150	1,354
132.00	1,175	1,412
132.05	1,207	1,472
132.10	1,238	1,533
132.15	1,270	1,595
132.20	1,301	1,660
132.25	1,333	1,725
132.30	1,364	1,793
132.35	1,396	1,862
132.40	1,427	1,932
132.45	1,459	2,005
132.50	1,491	2,078
132.55	1,522	2,154
132.60	1,554	2,231
132.65	1,585	2,309
132.70	1,617	2,389
132.75	1,648	2,471
132.80	1,680	2,554
132.85	1,711	2,639
132.90	1,743	2,725
132.95	1,774	2,813
133.00	1,806	2,903
133.05	1,840	2,994
133.10	1,874	3,087
133.15	1,908	3,181
133.20	1,942	3,277
133.25	1,977	3,375
133.30	2,011	3,475
133.35	2,045	3,576
133.40	2,079	3,679
133.45	2,113	3,784
133.50	2,147	3,891
133.55	2,181	3,999
133.60	2,215	4,109
133.65	2,249	4,220
133.70	2,283	4,334
133.75	2,318	4,449
133.80	2,352	4,566
133.85	2,386	4,684
133.90	2,420	4,804
133.95	2,454	4,926
134.00	**2,488**	**5,050**

Summary for Pond IB1: Infiltration Basin 1

Inflow Area =	14,505 sf,100.00% Impervious, Inflow Depth > 7.84" for 100-YR event				
Inflow =	2.58 cfs @	12.09 hrs,	Volume=	9,471 cf	
Outflow =	0.38 cfs @	12.59 hrs,	Volume=	9,452 cf,	Atten= 85%, Lag= 30.5 min
Discarded =	0.11 cfs @	9.40 hrs,	Volume=	6,802 cf	
Primary =	0.27 cfs @	12.59 hrs,	Volume=	2,650 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 132.06' @ 12.59 hrs Surf.Area= 1,889 sf Storage= 3,690 cf

Plug-Flow detention time= 134.6 min calculated for 9,452 cf (100% of inflow)
Center-of-Mass det. time= 133.2 min (873.9 - 740.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	129.00'	1,726 cf	**25.25'W x 74.82'L x 3.50'H Field A** 6,612 cf Overall - 2,297 cf Embedded = 4,315 cf x 40.0% Voids
#2A	129.50'	2,297 cf	**ADS_StormTech SC-740 +Cap** x 50 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 5 Rows of 10 Chambers
		4,023 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	130.24'	**12.0" Round Culvert** L= 10.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 130.24' / 130.00' S= 0.0240 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#2	Discarded	129.00'	**2.410 in/hr Exfiltration over Surface area**
#3	Device 1	130.40'	**3.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	132.05'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.11 cfs @ 9.40 hrs HW=129.04' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.26 cfs @ 12.59 hrs HW=132.06' (Free Discharge)
└─**1=Culvert** (Passes 0.26 cfs of 5.55 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.25 cfs @ 6.04 fps)
  └─**4=Broad-Crested Rectangular Weir** (Weir Controls 0.01 cfs @ 0.26 fps)

Pond IB1: Infiltration Basin 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

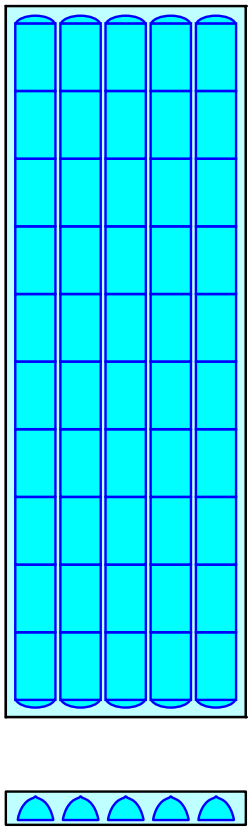
10 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 72.82' Row Length +12.0" End Stone x 2 = 74.82' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

50 Chambers x 45.9 cf = 2,297.0 cf Chamber Storage

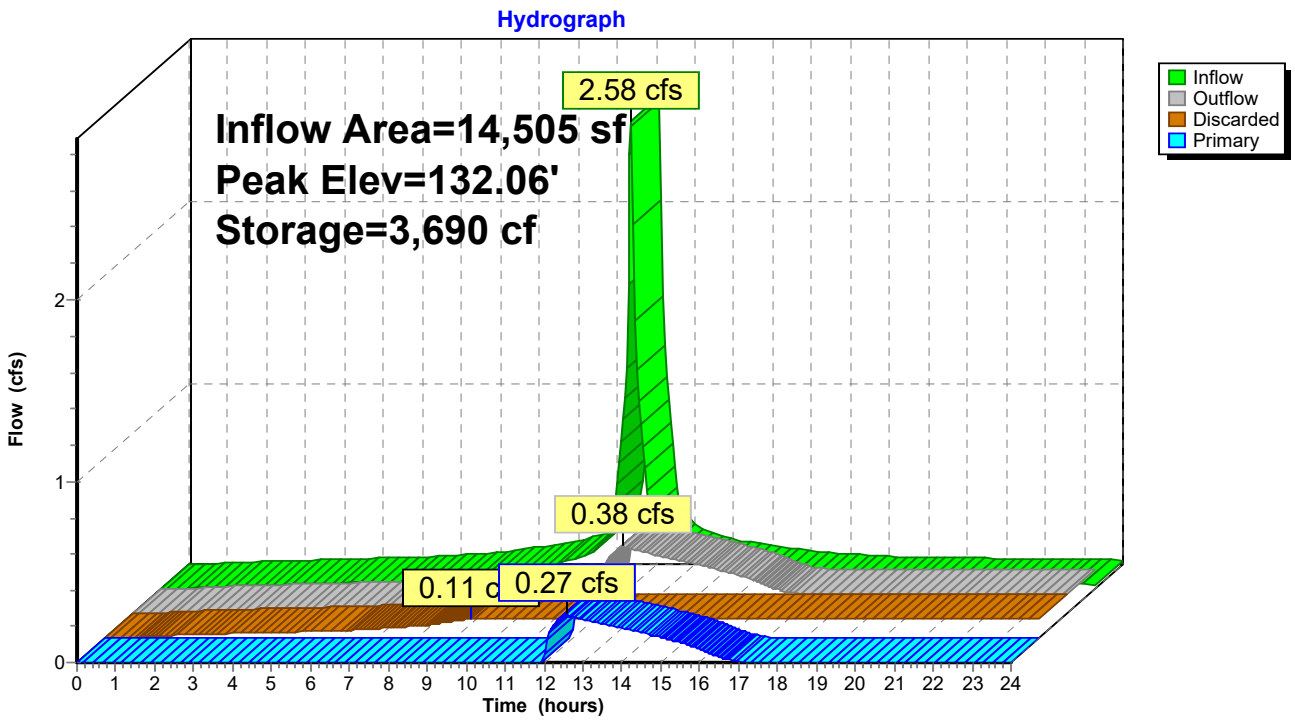
6,611.9 cf Field - 2,297.0 cf Chambers = 4,314.9 cf Stone x 40.0% Voids = 1,726.0 cf Stone Storage

Chamber Storage + Stone Storage = 4,023.0 cf = 0.092 af
Overall Storage Efficiency = 60.8%
Overall System Size = 74.82' x 25.25' x 3.50'

50 Chambers
244.9 cy Field
159.8 cy Stone



Pond IB1: Infiltration Basin 1



Stage-Area-Storage for Pond IB1: Infiltration Basin 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
129.00	**1,889**	0
129.05	1,889	38
129.10	1,889	76
129.15	1,889	113
129.20	1,889	151
129.25	1,889	189
129.30	1,889	227
129.35	1,889	264
129.40	1,889	302
129.45	1,889	340
129.50	1,889	378
129.55	1,889	455
129.60	1,889	533
129.65	1,889	610
129.70	1,889	687
129.75	1,889	764
129.80	1,889	841
129.85	1,889	917
129.90	1,889	993
129.95	1,889	1,069
130.00	1,889	1,145
130.05	1,889	1,220
130.10	1,889	1,295
130.15	1,889	1,369
130.20	1,889	1,444
130.25	1,889	1,517
130.30	1,889	1,591
130.35	1,889	1,664
130.40	1,889	1,736
130.45	1,889	1,809
130.50	1,889	1,880
130.55	1,889	1,952
130.60	1,889	2,022
130.65	1,889	2,093
130.70	1,889	2,162
130.75	1,889	2,232
130.80	1,889	2,300
130.85	1,889	2,368
130.90	1,889	2,435
130.95	1,889	2,502
131.00	1,889	2,568
131.05	1,889	2,634
131.10	1,889	2,698
131.15	1,889	2,762
131.20	1,889	2,825
131.25	1,889	2,887
131.30	1,889	2,948
131.35	1,889	3,008
131.40	1,889	3,067
131.45	1,889	3,124
131.50	1,889	3,181
131.55	1,889	3,236
131.60	1,889	3,290
131.65	1,889	3,342
131.70	1,889	3,392
131.75	1,889	3,439
131.80	1,889	3,484
131.85	1,889	3,526
131.90	1,889	3,567
131.95	1,889	3,607
132.00	1,889	3,645
132.05	1,889	3,683
132.10	1,889	3,721
132.15	1,889	3,758
132.20	1,889	3,796
132.25	1,889	3,834
132.30	1,889	3,872
132.35	1,889	3,910
132.40	1,889	3,947
132.45	1,889	3,985
132.50	1,889	**4,023**

Summary for Pond IB2a: Infiltration Basin 2a

Inflow Area =	26,310 sf, 88.91% Impervious, Inflow Depth > 7.36" for 100-YR event				
Inflow =	4.60 cfs @	12.09 hrs,	Volume=	16,130 cf	
Outflow =	2.38 cfs @	12.23 hrs,	Volume=	14,117 cf,	Atten= 48%, Lag= 8.5 min
Discarded =	0.06 cfs @	6.55 hrs,	Volume=	4,123 cf	
Primary =	2.32 cfs @	12.23 hrs,	Volume=	9,994 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 130.78' @ 12.23 hrs Surf.Area= 2,458 sf Storage= 5,048 cf

Plug-Flow detention time= 101.9 min calculated for 14,117 cf (88% of inflow)
Center-of-Mass det. time= 44.8 min (805.5 - 760.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	127.50'	2,392 cf	**30.00'W x 81.94'L x 3.67'H Field A** 9,013 cf Overall - 3,032 cf Embedded = 5,981 cf x 40.0% Voids
#2A	128.00'	3,032 cf	**ADS_StormTech SC-740 +Cap** x 66 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 6 Rows of 11 Chambers
		5,424 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	128.60'	**15.0" Round Culvert** L= 55.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 128.60' / 128.00' S= 0.0109 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Discarded	127.50'	**1.020 in/hr Exfiltration over Surface area**
#3	Device 1	128.80'	**10.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	130.10'	**10.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	130.99'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.06 cfs @ 6.55 hrs HW=127.54' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=2.31 cfs @ 12.23 hrs HW=130.78' (Free Discharge)
└─**1=Culvert** (Passes 2.31 cfs of 8.21 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 1.80 cfs @ 6.47 fps)
  ├─**4=Orifice/Grate** (Orifice Controls 0.51 cfs @ 3.70 fps)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond IB2a: Infiltration Basin 2a - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

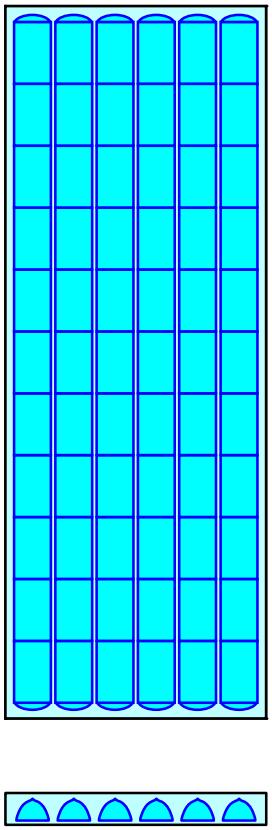
11 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 79.94' Row Length +12.0" End Stone x 2 = 81.94' Base Length
6 Rows x 51.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.00' Base Width
6.0" Base + 30.0" Chamber Height + 8.0" Cover = 3.67' Field Height

66 Chambers x 45.9 cf = 3,032.0 cf Chamber Storage

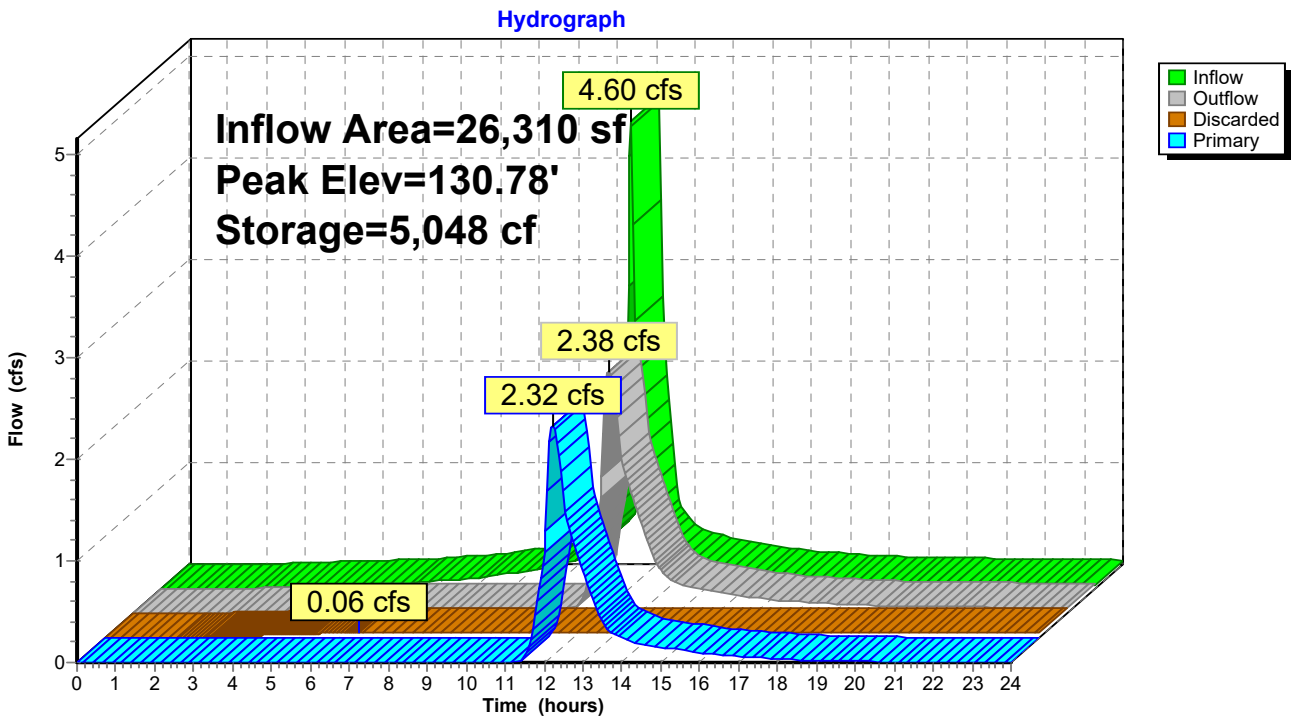
9,013.0 cf Field - 3,032.0 cf Chambers = 5,981.0 cf Stone x 40.0% Voids = 2,392.4 cf Stone Storage

Chamber Storage + Stone Storage = 5,424.4 cf = 0.125 af
Overall Storage Efficiency = 60.2%
Overall System Size = 81.94' x 30.00' x 3.67'

66 Chambers
333.8 cy Field
221.5 cy Stone



Pond IB2a: Infiltration Basin 2a



Stage-Area-Storage for Pond IB2a: Infiltration Basin 2a

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
127.50	**2,458**	0
127.55	2,458	49
127.60	2,458	98
127.65	2,458	147
127.70	2,458	197
127.75	2,458	246
127.80	2,458	295
127.85	2,458	344
127.90	2,458	393
127.95	2,458	442
128.00	2,458	492
128.05	2,458	593
128.10	2,458	695
128.15	2,458	796
128.20	2,458	897
128.25	2,458	998
128.30	2,458	1,099
128.35	2,458	1,199
128.40	2,458	1,298
128.45	2,458	1,398
128.50	2,458	1,497
128.55	2,458	1,595
128.60	2,458	1,694
128.65	2,458	1,791
128.70	2,458	1,888
128.75	2,458	1,985
128.80	2,458	2,081
128.85	2,458	2,177
128.90	2,458	2,272
128.95	2,458	2,367
129.00	2,458	2,461
129.05	2,458	2,554
129.10	2,458	2,647
129.15	2,458	2,739
129.20	2,458	2,830
129.25	2,458	2,921
129.30	2,458	3,011
129.35	2,458	3,100
129.40	2,458	3,188
129.45	2,458	3,275
129.50	2,458	3,362
129.55	2,458	3,447
129.60	2,458	3,532
129.65	2,458	3,615
129.70	2,458	3,698
129.75	2,458	3,779
129.80	2,458	3,858
129.85	2,458	3,937
129.90	2,458	4,014
129.95	2,458	4,089
130.00	2,458	4,164
130.05	2,458	4,236
130.10	2,458	4,306
130.15	2,458	4,374
130.20	2,458	4,439
130.25	2,458	4,501
130.30	2,458	4,559
130.35	2,458	4,614
130.40	2,458	4,667
130.45	2,458	4,719
130.50	2,458	4,769
130.55	2,458	4,818
130.60	2,458	4,867
130.65	2,458	4,916
130.70	2,458	4,966
130.75	2,458	5,015
130.80	2,458	5,064
130.85	2,458	5,113
130.90	2,458	5,162
130.95	2,458	5,211
131.00	2,458	5,261
131.05	2,458	5,310
131.10	2,458	5,359
131.15	2,458	**5,408**

Summary for Pond IB2c: Infiltration Basin Area 2c

Inflow Area =	15,551 sf, 65.27% Impervious, Inflow Depth > 6.40" for 100-YR event				
Inflow =	2.51 cfs @	12.09 hrs,	Volume=	8,300 cf	
Outflow =	1.31 cfs @	12.24 hrs,	Volume=	7,921 cf,	Atten= 48%, Lag= 9.2 min
Discarded =	0.06 cfs @	9.00 hrs,	Volume=	3,371 cf	
Primary =	1.25 cfs @	12.24 hrs,	Volume=	4,550 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 131.98' @ 12.24 hrs Surf.Area= 2,373 sf Storage= 2,473 cf

Plug-Flow detention time= 85.7 min calculated for 7,905 cf (95% of inflow)
Center-of-Mass det. time= 60.1 min (847.1 - 787.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	130.00'	1,505 cf	**27.00'W x 87.91'L x 2.00'H Field A** 4,747 cf Overall - 985 cf Embedded = 3,762 cf x 40.0% Voids
#2A	130.50'	985 cf	**ADS_StormTech SC-160LP +Cap** x 144 Inside #1 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 12 Rows of 12 Chambers
		2,489 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	130.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	129.20'	**8.0" Round Culvert** L= 14.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 129.20' / 129.00' S= 0.0143 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.35 sf
#3	Device 2	130.70'	**11.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 2	131.40'	**2.0" Vert. Orifice/Grate** C= 0.600
#5	Device 2	131.88'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.06 cfs @ 9.00 hrs HW=130.02' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=1.24 cfs @ 12.24 hrs HW=131.98' (Free Discharge)
└─**2=Culvert** (Passes 1.24 cfs of 3.23 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.80 cfs @ 5.27 fps)
  ├─**4=Orifice/Grate** (Orifice Controls 0.07 cfs @ 3.40 fps)
  └─**5=Broad-Crested Rectangular Weir** (Weir Controls 0.36 cfs @ 0.89 fps)

Pond IB2c: Infiltration Basin Area 2c - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-160LP +Cap (ADS StormTech® SC-160LP with cap length)
Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf
Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap

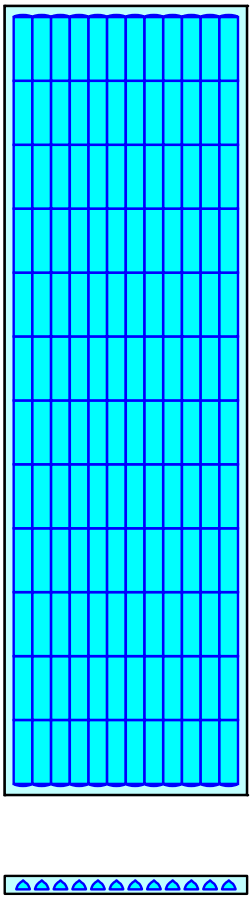
12 Chambers/Row x 7.12' Long +0.23' Cap Length x 2 = 85.91' Row Length +12.0" End Stone x 2 = 87.91' Base Length
12 Rows x 25.0" Wide + 12.0" Side Stone x 2 = 27.00' Base Width
6.0" Base + 12.0" Chamber Height + 6.0" Cover = 2.00' Field Height

144 Chambers x 6.8 cf = 984.5 cf Chamber Storage

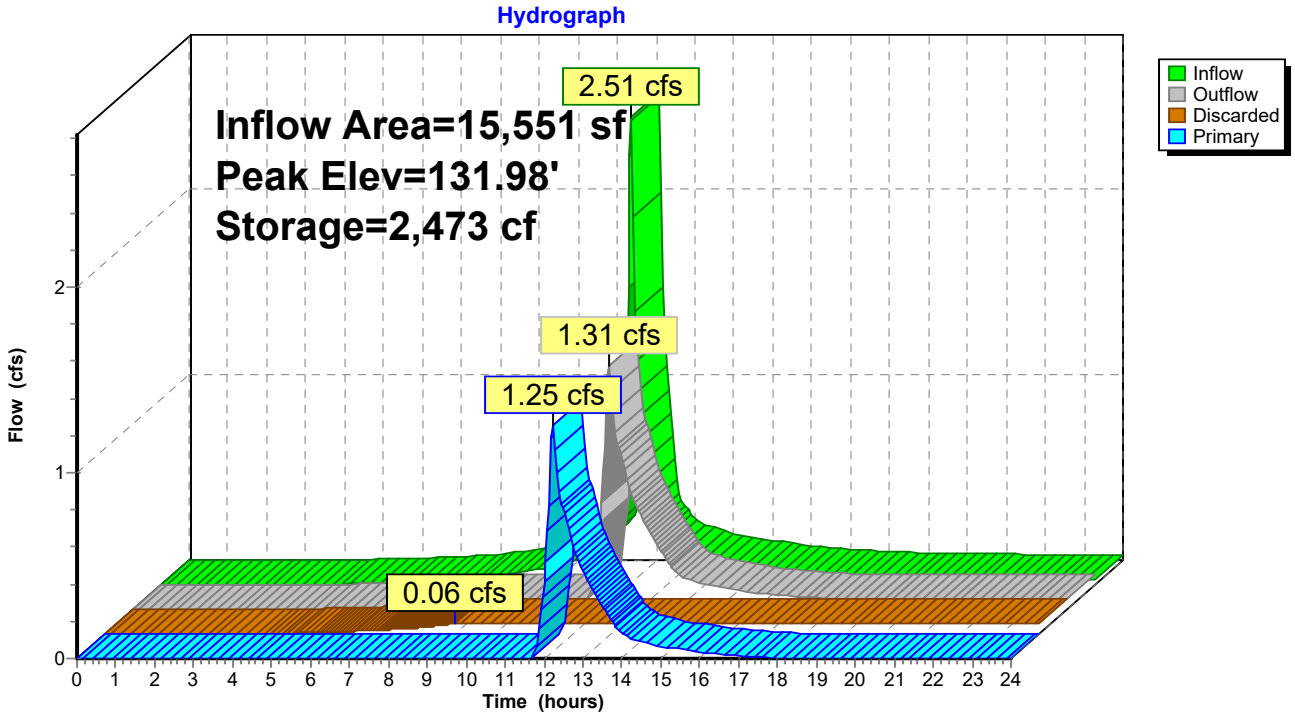
4,747.0 cf Field - 984.5 cf Chambers = 3,762.4 cf Stone x 40.0% Voids = 1,505.0 cf Stone Storage

Chamber Storage + Stone Storage = 2,489.5 cf = 0.057 af
Overall Storage Efficiency = 52.4%
Overall System Size = 87.91' x 27.00' x 2.00'

144 Chambers
175.8 cy Field
139.3 cy Stone



Pond IB2c: Infiltration Basin Area 2c



Stage-Area-Storage for Pond IB2c: Infiltration Basin Area 2c

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.00	**2,373**	0
130.02	2,373	19
130.04	2,373	38
130.06	2,373	57
130.08	2,373	76
130.10	2,373	95
130.12	2,373	114
130.14	2,373	133
130.16	2,373	152
130.18	2,373	171
130.20	2,373	190
130.22	2,373	209
130.24	2,373	228
130.26	2,373	247
130.28	2,373	266
130.30	2,373	285
130.32	2,373	304
130.34	2,373	323
130.36	2,373	342
130.38	2,373	361
130.40	2,373	380
130.42	2,373	399
130.44	2,373	418
130.46	2,373	437
130.48	2,373	456
130.50	2,373	475
130.52	2,373	512
130.54	2,373	549
130.56	2,373	587
130.58	2,373	624
130.60	2,373	661
130.62	2,373	698
130.64	2,373	735
130.66	2,373	772
130.68	2,373	808
130.70	2,373	844
130.72	2,373	880
130.74	2,373	916
130.76	2,373	952
130.78	2,373	987
130.80	2,373	1,022
130.82	2,373	1,057
130.84	2,373	1,092
130.86	2,373	1,127
130.88	2,373	1,161
130.90	2,373	1,195
130.92	2,373	1,229
130.94	2,373	1,263
130.96	2,373	1,296
130.98	2,373	1,329
131.00	2,373	1,361
131.02	2,373	1,394
131.04	2,373	1,426
131.06	2,373	1,457
131.08	2,373	1,489
131.10	2,373	1,519
131.12	2,373	1,550
131.14	2,373	1,580
131.16	2,373	1,609
131.18	2,373	1,638
131.20	2,373	1,667
131.22	2,373	1,695
131.24	2,373	1,722
131.26	2,373	1,749
131.28	2,373	1,774
131.30	2,373	1,799
131.32	2,373	1,824
131.34	2,373	1,847
131.36	2,373	1,870
131.38	2,373	1,892
131.40	2,373	1,914
131.42	2,373	1,935
131.44	2,373	1,955
131.46	2,373	1,976
131.48	2,373	1,995
131.50	2,373	2,015
131.52	2,373	2,034
131.54	2,373	2,053
131.56	2,373	2,072
131.58	2,373	2,091
131.60	2,373	2,110
131.62	2,373	2,129
131.64	2,373	2,148
131.66	2,373	2,167
131.68	2,373	2,186
131.70	2,373	2,205
131.72	2,373	2,224
131.74	2,373	2,243
131.76	2,373	2,262
131.78	2,373	2,281
131.80	2,373	2,300
131.82	2,373	2,319
131.84	2,373	2,338
131.86	2,373	2,357
131.88	2,373	2,376
131.90	2,373	2,395
131.92	2,373	2,414
131.94	2,373	2,433
131.96	2,373	2,452
131.98	2,373	2,471
132.00	2,373	**2,489**

Summary for Pond IB2e: Infiltration Basin 2b

Inflow Area =	15,464 sf, 93.24% Impervious, Inflow Depth > 7.48" for 100-YR event				
Inflow =	2.72 cfs @	12.09 hrs,	Volume=	9,634 cf	
Outflow =	0.84 cfs @	12.41 hrs,	Volume=	9,630 cf,	Atten= 69%, Lag= 19.2 min
Discarded =	0.14 cfs @	10.35 hrs,	Volume=	6,971 cf	
Primary =	0.70 cfs @	12.41 hrs,	Volume=	2,659 cf	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 132.73' @ 12.41 hrs Surf.Area= 2,592 sf Storage= 3,199 cf

Plug-Flow detention time= 77.8 min calculated for 9,630 cf (100% of inflow)
Center-of-Mass det. time= 77.4 min (833.9 - 756.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	130.50'	2,002 cf	**34.83'W x 74.40'L x 2.50'H Field A** 6,479 cf Overall - 1,474 cf Embedded = 5,005 cf x 40.0% Voids
#2A	131.00'	1,474 cf	**ADS_StormTech SC-310 +Cap** x 100 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 10 Rows of 10 Chambers
		3,476 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	130.85'	**15.0" Round Culvert Barrel** L= 69.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 130.85' / 130.50' S= 0.0051 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Discarded	130.50'	**2.410 in/hr Exfiltration over Surface area**
#3	Device 1	131.40'	**3.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	132.63'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.14 cfs @ 10.35 hrs HW=130.53' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=0.69 cfs @ 12.41 hrs HW=132.73' (Free Discharge)
└─**1=Culvert Barrel** (Passes 0.69 cfs of 6.21 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.33 cfs @ 5.29 fps)
  └─**4=Broad-Crested Rectangular Weir** (Weir Controls 0.36 cfs @ 0.89 fps)

Pond IB2e: Infiltration Basin 2b - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-310 +Cap (ADS StormTech® SC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

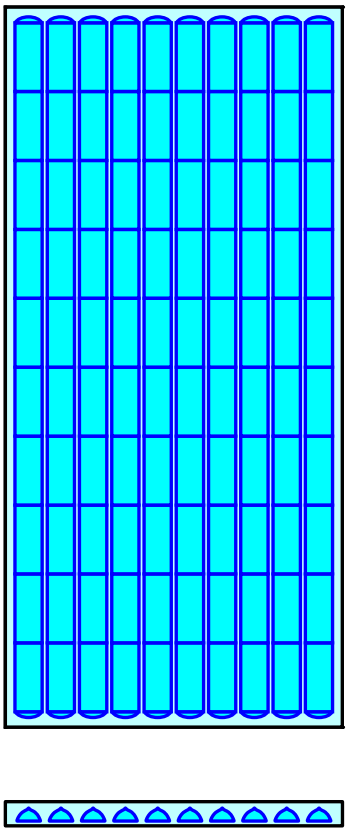
10 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 72.40' Row Length +12.0" End Stone x 2 = 74.40' Base Length
10 Rows x 34.0" Wide + 6.0" Spacing x 9 + 12.0" Side Stone x 2 = 34.83' Base Width
6.0" Base + 16.0" Chamber Height + 8.0" Cover = 2.50' Field Height

100 Chambers x 14.7 cf = 1,474.2 cf Chamber Storage

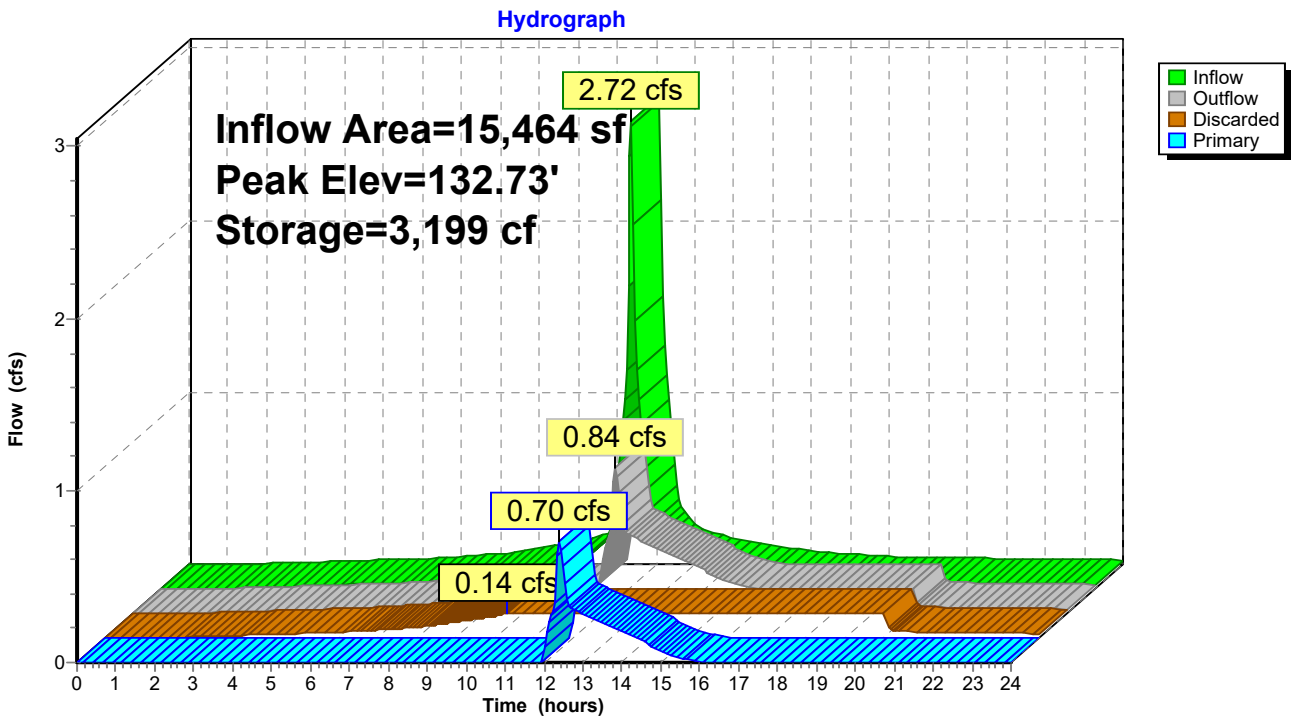
6,479.0 cf Field - 1,474.2 cf Chambers = 5,004.8 cf Stone x 40.0% Voids = 2,001.9 cf Stone Storage

Chamber Storage + Stone Storage = 3,476.1 cf = 0.080 af
Overall Storage Efficiency = 53.7%
Overall System Size = 74.40' x 34.83' x 2.50'

100 Chambers
240.0 cy Field
185.4 cy Stone



Pond IB2e: Infiltration Basin 2b



Stage-Area-Storage for Pond IB2e: Infiltration Basin 2b

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
130.50	**2,592**	0
130.55	2,592	52
130.60	2,592	104
130.65	2,592	155
130.70	2,592	207
130.75	2,592	259
130.80	2,592	311
130.85	2,592	363
130.90	2,592	415
130.95	2,592	466
131.00	2,592	518
131.05	2,592	622
131.10	2,592	724
131.15	2,592	827
131.20	2,592	928
131.25	2,592	1,029
131.30	2,592	1,129
131.35	2,592	1,227
131.40	2,592	1,325
131.45	2,592	1,422
131.50	2,592	1,517
131.55	2,592	1,611
131.60	2,592	1,703
131.65	2,592	1,794
131.70	2,592	1,884
131.75	2,592	1,972
131.80	2,592	2,057
131.85	2,592	2,141
131.90	2,592	2,222
131.95	2,592	2,301
132.00	2,592	2,377
132.05	2,592	2,449
132.10	2,592	2,516
132.15	2,592	2,579
132.20	2,592	2,638
132.25	2,592	2,695
132.30	2,592	2,750
132.35	2,592	2,802
132.40	2,592	2,854
132.45	2,592	2,906
132.50	2,592	2,958
132.55	2,592	3,010
132.60	2,592	3,061
132.65	2,592	3,113
132.70	2,592	3,165
132.75	2,592	3,217
132.80	2,592	3,269
132.85	2,592	3,321
132.90	2,592	3,372
132.95	2,592	3,424
133.00	2,592	**3,476**

APPENDIX E: STORMWATER CALCULATIONS

- *NOAA RAINFALL DATA*
- *PIPE SIZING*
- *WATER QUALITY VOLUME*
- *RIP RAP SIZING*

NOAA Atlas 14, Volume 10, Version 3
Location name: Enfield, Connecticut, USA*
Latitude: 41.9886°, Longitude: -72.5652°
Elevation: m/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_&_aerials

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	0.339 (0.261-0.440)	0.409 (0.314-0.531)	0.523 (0.400-0.682)	0.617 (0.469-0.809)	0.746 (0.551-1.02)	0.844 (0.611-1.18)	0.946 (0.667-1.38)	1.06 (0.711-1.58)	1.22 (0.791-1.89)	1.36 (0.858-2.14)
10-min	0.481 (0.369-0.624)	0.579 (0.444-0.753)	0.740 (0.566-0.965)	0.873 (0.663-1.15)	1.06 (0.781-1.45)	1.20 (0.865-1.68)	1.34 (0.945-1.95)	1.50 (1.01-2.24)	1.73 (1.12-2.68)	1.92 (1.22-3.03)
15-min	0.566 (0.434-0.734)	0.681 (0.523-0.885)	0.870 (0.665-1.13)	1.03 (0.782-1.35)	1.24 (0.918-1.71)	1.41 (1.02-1.97)	1.58 (1.11-2.30)	1.77 (1.19-2.64)	2.04 (1.32-3.15)	2.26 (1.43-3.57)
30-min	0.762 (0.585-0.990)	0.921 (0.706-1.20)	1.18 (0.902-1.54)	1.40 (1.06-1.83)	1.69 (1.25-2.32)	1.91 (1.39-2.68)	2.15 (1.51-3.13)	2.41 (1.61-3.59)	2.78 (1.80-4.30)	3.08 (1.95-4.86)
60-min	0.959 (0.737-1.25)	1.16 (0.890-1.51)	1.49 (1.14-1.94)	1.76 (1.34-2.31)	2.14 (1.58-2.93)	2.42 (1.75-3.40)	2.72 (1.92-3.95)	3.05 (2.04-4.55)	3.51 (2.27-5.44)	3.89 (2.47-6.15)
2-hr	1.23 (0.950-1.59)	1.48 (1.14-1.91)	1.89 (1.45-2.45)	2.23 (1.70-2.90)	2.69 (2.00-3.68)	3.04 (2.22-4.26)	3.41 (2.43-4.98)	3.85 (2.59-5.71)	4.50 (2.92-6.92)	5.05 (3.20-7.93)
3-hr	1.41 (1.10-1.82)	1.70 (1.32-2.19)	2.17 (1.68-2.80)	2.56 (1.97-3.33)	3.10 (2.31-4.23)	3.49 (2.56-4.89)	3.92 (2.81-5.73)	4.44 (2.99-6.58)	5.24 (3.40-8.03)	5.91 (3.76-9.26)
6-hr	1.77 (1.38-2.27)	2.15 (1.67-2.75)	2.77 (2.15-3.55)	3.28 (2.53-4.23)	3.98 (2.99-5.42)	4.50 (3.33-6.28)	5.06 (3.67-7.40)	5.77 (3.90-8.50)	6.88 (4.49-10.5)	7.85 (5.01-12.2)
12-hr	2.18 (1.71-2.77)	2.68 (2.10-3.41)	3.50 (2.73-4.46)	4.18 (3.24-5.36)	5.11 (3.87-6.93)	5.80 (4.32-8.07)	6.55 (4.78-9.56)	7.52 (5.10-11.0)	9.04 (5.91-13.7)	10.4 (6.64-16.1)
24-hr	2.55 (2.01-3.22)	3.18 (2.51-4.02)	4.22 (3.31-5.35)	5.07 (3.96-6.47)	6.26 (4.76-8.45)	7.12 (5.33-9.87)	8.08 (5.94-11.8)	9.32 (6.35-13.6)	11.3 (7.42-17.1)	13.1 (8.40-20.1)
2-day	2.86 (2.27-3.59)	3.61 (2.86-4.54)	4.84 (3.82-6.10)	5.85 (4.60-7.42)	7.25 (5.56-9.76)	8.27 (6.24-11.4)	9.41 (6.98-13.7)	10.9 (7.46-15.8)	13.4 (8.81-20.1)	15.6 (10.0-23.9)
3-day	3.12 (2.49-3.91)	3.94 (3.14-4.93)	5.28 (4.19-6.63)	6.39 (5.04-8.07)	7.92 (6.09-10.6)	9.03 (6.84-12.5)	10.3 (7.65-14.9)	11.9 (8.17-17.2)	14.7 (9.67-22.0)	17.1 (11.0-26.1)
4-day	3.37 (2.69-4.20)	4.24 (3.38-5.29)	5.67 (4.50-7.10)	6.85 (5.41-8.63)	8.48 (6.54-11.3)	9.66 (7.34-13.3)	11.0 (8.20-15.9)	12.8 (8.75-18.4)	15.7 (10.3-23.4)	18.3 (11.8-27.8)
7-day	4.04 (3.24-5.01)	5.02 (4.03-6.24)	6.64 (5.30-8.28)	7.98 (6.34-10.0)	9.83 (7.61-13.1)	11.2 (8.50-15.3)	12.7 (9.46-18.2)	14.6 (10.1-21.0)	17.9 (11.8-26.5)	20.7 (13.4-31.4)
10-day	4.70 (3.78-5.81)	5.75 (4.62-7.12)	7.47 (5.98-9.28)	8.89 (7.09-11.1)	10.9 (8.41-14.3)	12.3 (9.36-16.7)	13.9 (10.3-19.8)	15.9 (11.0-22.8)	19.2 (12.7-28.5)	22.1 (14.3-33.4)
20-day	6.77 (5.48-8.32)	7.88 (6.38-9.70)	9.71 (7.83-12.0)	11.2 (9.00-13.9)	13.3 (10.3-17.4)	14.9 (11.3-19.9)	16.5 (12.2-23.0)	18.5 (12.9-26.3)	21.6 (14.4-31.7)	24.2 (15.7-36.3)
30-day	8.51 (6.92-10.4)	9.66 (7.84-11.8)	11.5 (9.33-14.2)	13.1 (10.5-16.2)	15.2 (11.8-19.7)	16.8 (12.8-22.2)	18.5 (13.6-25.4)	20.4 (14.2-28.8)	23.1 (15.5-33.8)	25.3 (16.5-37.9)
45-day	10.7 (8.72-13.0)	11.9 (9.68-14.5)	13.8 (11.2-16.9)	15.4 (12.4-19.0)	17.6 (13.7-22.6)	19.3 (14.7-25.3)	21.0 (15.4-28.5)	22.8 (15.9-32.0)	25.1 (16.9-36.6)	26.9 (17.6-40.1)
60-day	12.5 (10.2-15.2)	13.7 (11.2-16.7)	15.7 (12.8-19.2)	17.4 (14.1-21.4)	19.7 (15.3-25.1)	21.5 (16.3-27.9)	23.2 (17.0-31.1)	24.9 (17.4-34.8)	26.9 (18.1-39.1)	28.4 (18.6-42.2)

[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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Kaplan Development
118 Hazard Avenue
Enfield, CT
Bohler Job Number: CT191016
November 25, 2019

Rational Pipe Sizing Calculations

Design Period Storm:		10	Year	Design Period Intensity*			5.63	in/hr									
LOCATION		IMPERVIOUS			OTHER			SUM	Tc	I	Q	D	S	Material	n	Q Full	V Full
FROM	TO	A	C	CA	A	C	CA	CA	(min)	(in/hr)	(cfs)	(in)	(ft/ft)			(cfs)	(fps)
CB-1	CB-2	0.02	0.95	0.02	0.00	0.30	0.00	0.02	6	5.63	0.11	6	0.005	HDPE	0.012	0.43	2.19
CB-2	ICS-1	0.22	0.95	0.21	0.03	0.30	0.01	0.22	6	5.63	1.33	12	0.005	HDPE	0.012	2.73	3.47
CB-3	ICS-2	0.28	0.95	0.27	0.04	0.30	0.01	0.28	6	5.63	1.57	12	0.012	HDPE	0.012	4.23	5.38
CB-4	DMH-1	0.12	0.95	0.11	0.06	0.30	0.02	0.13	6	5.63	0.74	8	0.005	HDPE	0.012	0.93	2.65
DMH-1	ICS-3	0.00	0.95	0.00	0.00	0.30	0.00	0.00	6	5.63	0.00	8	0.005	HDPE	0.012	0.93	2.65
CB-5	ICS-3	0.12	0.95	0.11	0.07	0.30	0.02	0.14	6	5.63	0.76	8	0.005	HDPE	0.012	0.93	2.65
ICS-3	BMP-2	0.00	0.95	0.00	0.00	0.30	0.00	0.00	6	5.63	1.50	8	0.013	HDPE	0.012	1.51	4.33
CB-6	ICS-4	0.33	0.95	0.31	0.03	0.30	0.01	0.32	6	5.63	1.83	12	0.005	HDPE	0.012	2.73	3.47
RD-1	AB3b	0.33	0.95	0.31	0.00	0.30	0.00	0.31	6	5.63	1.77	12	0.005	HDPE	0.012	2.73	3.47
CB-7	FES-7	0.11	0.95	0.10	0.01	0.30	0.00	0.11	6	5.63	0.61	8	0.005	HDPE	0.012	0.93	2.65
CB-8	FES-8	0.08	0.95	0.08	0.02	0.30	0.01	0.08	6	5.63	0.46	8	0.020	HDPE	0.012	1.85	5.30
RD-2	ICS-5	0.33	0.95	0.31	0.11	0.30	0.03	0.35	6	5.63	1.95	12	0.020	HDPE	0.012	5.46	6.95

*Rainfall intensity provided by Cornell University's NRCC Atlas of Precipitation Extremes for the North Eastern United States and Canada on 11/25/19

Prepared By:
Bohler Engineering
352 Turnpike Road
Southborough, MA 01772
(508) 480-9900

Determine Water Quality Volume

From CT 2004 Stormwater Quality Manual:

$$WQV = \frac{(1'')(R)(A)}{12}$$

$$R = 0.05 + 0.009(I)$$

WQV = water quality volume (ac-ft)
R = volumetric runoff coefficient
I = percent impervious cover
A = site area in acres

Area		Total Area		Impervious Area		Impervious Cover	Volumetric Runoff Coefficient	Water Quality Volume (WQV)		Pretreatment Volume (10% of WQV)	Water Quality Volume Provided
ID		ac	ft^2	ac	ft^2	%	R	acre-feet	ft^3	ft^3	ft^3
PD-1		0.652	13,879	0.526	8,395	80.67	0.776	0.042	1,830	183	2,447
PD-2a		0.603	26,287	0.537	23,375	89.05	0.851	0.043	1,873	187	2,081
PD-2c		0.357	15,557	0.233	10,150	65.27	0.637	0.019	828	83	844
PD-2e		0.355	15,852	0.331	14,406	93.24	0.889	0.026	1,133	113	1,325
PD-3a		0.232	20,226	0.041	1,692	17.67	0.209	0.004	174	17	1,304
PD-3b		0.461	9,895	0.349	1,087	75.70	0.731	0.028	1,220	122	3,182
Total			101,696					0.162	7,058		11,183

Rip Rap and Apron Sizing Worksheet

Address: 118 Hazard Avenue
Enfield, CT

Project No.: CT191016
Date: 12/3/2019
Prepared By: MLT

Apron Sizing: FES-1

$$La = \frac{1.7Q}{Do^{3/2}} + 8Do$$

$$W\ end = 3Do + 0.4La\ for\ Tailwater\ \geq 0.5Do$$
$$W\ end = 3Do + La\ for\ Tailwater < 0.5Do$$

INPUT	Quantity	Units	Notes
Do	1.25	ft	Inside diameter of culvert
Q	0.94	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater

OUTPUT	Quantity	Units	Notes
La	11.14344	ft	Length of apron (minimum)
For tailwater elevation greater than or equal to the elevation of the center of the pipe:			
W start	3.75	ft	Width of apron at the culvert (minimum)
W end	8.207374	ft	Width of apron end (minimum)
For tailwater elevation less than the elevation of the center of the pipe:			
W start	3.75	ft	Width of apron at the culvert (minimum)
W end	14.89344	ft	Width of apron end (minimum)

Rip Rap Sizing:

$$d - 50 = \frac{0.02}{TW} * (\frac{Q}{Do})^{4/3}$$

NOTE: calculations based on 25 Year storm to FES-3

INPUT	Quantity	Units	Notes
TW	0.3	ft	Tailwater depth above the invert of the culvert
Do	1.25	ft	Inside diameter of culvert (defined in apron sizing)
Q	0.94	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater (defined in apron sizing)

OUTPUT	Quantity	Units	Notes
d-50	0.04559	ft	Median stone diameter in feet
	0.547075	in	Median stone diameter in inches

Rip Rap and Apron Sizing Worksheet

Address: 118 Hazard Avenue
Enfield, CT

Project No.: CT191016
Date: 12/3/2019
Prepared By: MLT

Apron Sizing: FES-2

$$La = \frac{1.7Q}{Do^{3/2}} + 8Do$$

$$W\ end = 3Do + 0.4La\ for\ Tailwater\ \geq 0.5Do$$
$$W\ end = 3Do + La\ for\ Tailwater < 0.5Do$$

INPUT	Quantity	Units	Notes
Do	1	ft	Inside diameter of culvert
Q	0.4	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater

OUTPUT	Quantity	Units	Notes
La	8.68	ft	Length of apron (minimum)
For tailwater elevation greater than or equal to the elevation of the center of the pipe:			
W start	3	ft	Width of apron at the culvert (minimum)
W end	6.472	ft	Width of apron end (minimum)
For tailwater elevation less than the elevation of the center of the pipe:			
W start	3	ft	Width of apron at the culvert (minimum)
W end	11.68	ft	Width of apron end (minimum)

Rip Rap Sizing:

$$d - 50 = \frac{0.02}{TW} * (\frac{Q}{Do})^{4/3}$$

NOTE: calculations based on 25 Year storm to FES-3

INPUT	Quantity	Units	Notes			
TW	0.3	ft	Tailwater depth above the invert of the culvert			
Do	1	ft	Inside diameter of culvert (defined in apron sizing)			
Q	0.4	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater (defined in apron sizing)			

OUTPUT	Quantity	Units	Notes
d-50	0.019648	ft	Median stone diameter in feet
	0.235778	in	Median stone diameter in inches

Rip Rap and Apron Sizing Worksheet

Address: 118 Hazard Avenue
Enfield, CT

Project No.: CT191016
Date: 12/3/2019
Prepared By: MLT

Apron Sizing: FES-3

$$La = \frac{1.7Q}{Do^{3/2}} + 8Do$$

$$W\ end = 3Do + 0.4La\ for\ Tailwater\ \geq 0.5Do$$
$$W\ end = 3Do + La\ for\ Tailwater < 0.5Do$$

INPUT	Quantity	Units	Notes
Do	1.25	ft	Inside diameter of culvert
Q	0.13	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater

OUTPUT	Quantity	Units	Notes
La	10.15813	ft	Length of apron (minimum)
For tailwater elevation greater than or equal to the elevation of the center of the pipe:			
W start	3.75	ft	Width of apron at the culvert (minimum)
W end	7.813254	ft	Width of apron end (minimum)
For tailwater elevation less than the elevation of the center of the pipe:			
W start	3.75	ft	Width of apron at the culvert (minimum)
W end	13.90813	ft	Width of apron end (minimum)

Rip Rap Sizing:

$$d - 50 = \frac{0.02}{TW} * (\frac{Q}{Do})^{4/3}$$

NOTE: calculations based on 25 Year storm to FES-3

INPUT	Quantity	Units	Notes
TW	0.3	ft	Tailwater depth above the invert of the culvert
Do	1.25	ft	Inside diameter of culvert (defined in apron sizing)
Q	0.13	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater (defined in apron sizing)

OUTPUT	Quantity	Units	Notes
d-50	0.003261	ft	Median stone diameter in feet
	0.039126	in	Median stone diameter in inches

Rip Rap and Apron Sizing Worksheet

Address: 118 Hazard Avenue
Enfield, CT

Project No.: CT191016
Date: 12/3/2019
Prepared By: MLT

Apron Sizing: FES-4

$$La = \frac{1.7Q}{Do^{3/2}} + 8Do$$

$$W\ end = 3Do + 0.4La\ for\ Tailwater\ \geq 0.5Do$$
$$W\ end = 3Do + La\ for\ Tailwater < 0.5Do$$

INPUT	Quantity	Units	Notes
Do	1	ft	Inside diameter of culvert
Q	1.77	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater

OUTPUT	Quantity	Units	Notes
La	11.009	ft	Length of apron (minimum)
For tailwater elevation greater than or equal to the elevation of the center of the pipe:			
W start	3	ft	Width of apron at the culvert (minimum)
W end	7.4036	ft	Width of apron end (minimum)
For tailwater elevation less than the elevation of the center of the pipe:			
W start	3	ft	Width of apron at the culvert (minimum)
W end	14.009	ft	Width of apron end (minimum)

Rip Rap Sizing:

$$d - 50 = \frac{0.02}{TW} * (\frac{Q}{Do})^{4/3}$$

NOTE: calculations based on 25 Year storm to FES-3

INPUT	Quantity	Units	Notes
TW	0.3	ft	Tailwater depth above the invert of the culvert
Do	1	ft	Inside diameter of culvert (defined in apron sizing)
Q	1.77	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater (defined in apron sizing)

OUTPUT	Quantity	Units	Notes
d-50	0.142738	ft	Median stone diameter in feet
	1.712857	in	Median stone diameter in inches

Rip Rap and Apron Sizing Worksheet

Address: 118 Hazard Avenue
Enfield, CT

Project No.: CT191016
Date: 12/3/2019
Prepared By: MLT

Apron Sizing: FES-5

$$La = \frac{1.7Q}{Do^{3/2}} + 8Do$$

$$W\ end = 3Do + 0.4La\ for\ Tailwater\ \geq 0.5Do$$
$$W\ end = 3Do + La\ for\ Tailwater < 0.5Do$$

INPUT	Quantity	Units	Notes
Do	0.667	ft	Inside diameter of culvert
Q	0.61	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater

OUTPUT	Quantity	Units	Notes
La	7.239663	ft	Length of apron (minimum)
For tailwater elevation greater than or equal to the elevation of the center of the pipe:			
W start	2.001	ft	Width of apron at the culvert (minimum)
W end	4.896865	ft	Width of apron end (minimum)
For tailwater elevation less than the elevation of the center of the pipe:			
W start	2.001	ft	Width of apron at the culvert (minimum)
W end	9.240663	ft	Width of apron end (minimum)

Rip Rap Sizing:

$$d - 50 = \frac{0.02}{TW} * (\frac{Q}{Do})^{4/3}$$

NOTE: calculations based on 25 Year storm to FES-3

INPUT	Quantity	Units	Notes
TW	0.3	ft	Tailwater depth above the invert of the culvert
Do	0.667	ft	Inside diameter of culvert (defined in apron sizing)
Q	0.61	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater (defined in apron sizing)

OUTPUT	Quantity	Units	Notes
d-50	0.059181	ft	Median stone diameter in feet
	0.710169	in	Median stone diameter in inches

Rip Rap and Apron Sizing Worksheet

Address: 118 Hazard Avenue
Enfield, CT

Project No.: CT191016
Date: 12/3/2019
Prepared By: MLT

Apron Sizing: FES-6

$$La = \frac{1.7Q}{Do^{3/2}} + 8Do$$

$$W\ end = 3Do + 0.4La\ for\ Tailwater\ \geq 0.5Do$$
$$W\ end = 3Do + La\ for\ Tailwater < 0.5Do$$

INPUT	Quantity	Units	Notes
Do	0.667	ft	Inside diameter of culvert
Q	0.46	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater

OUTPUT	Quantity	Units	Notes
La	6.771549	ft	Length of apron (minimum)
For tailwater elevation greater than or equal to the elevation of the center of the pipe:			
W start	2.001	ft	Width of apron at the culvert (minimum)
W end	4.70962	ft	Width of apron end (minimum)
For tailwater elevation less than the elevation of the center of the pipe:			
W start	2.001	ft	Width of apron at the culvert (minimum)
W end	8.772549	ft	Width of apron end (minimum)

Rip Rap Sizing:

$$d - 50 = \frac{0.02}{TW} * (\frac{Q}{Do})^{4/3}$$

NOTE: calculations based on 25 Year storm to FES-3

INPUT	Quantity	Units	Notes
TW	0.3	ft	Tailwater depth above the invert of the culvert
Do	0.667	ft	Inside diameter of culvert (defined in apron sizing)
Q	0.46	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater (defined in apron sizing)

OUTPUT	Quantity	Units	Notes
d-50	0.040621	ft	Median stone diameter in feet
	0.487453	in	Median stone diameter in inches

Rip Rap and Apron Sizing Worksheet

Address: 118 Hazard Avenue
Enfield, CT

Project No.: CT191016
Date: 12/3/2019
Prepared By: MLT

Apron Sizing: FES-7

$$La = \frac{1.7Q}{Do^{3/2}} + 8Do$$

$$W\ end = 3Do + 0.4La\ for\ Tailwater\ \geq 0.5Do$$
$$W\ end = 3Do + La\ for\ Tailwater < 0.5Do$$

INPUT	Quantity	Units	Notes
Do	1	ft	Inside diameter of culvert
Q	0.09	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater

OUTPUT	Quantity	Units	Notes
La	8.153	ft	Length of apron (minimum)
For tailwater elevation greater than or equal to the elevation of the center of the pipe:			
W start	3	ft	Width of apron at the culvert (minimum)
W end	6.2612	ft	Width of apron end (minimum)
For tailwater elevation less than the elevation of the center of the pipe:			
W start	3	ft	Width of apron at the culvert (minimum)
W end	11.153	ft	Width of apron end (minimum)

Rip Rap Sizing:

$$d - 50 = \frac{0.02}{TW} * (\frac{Q}{Do})^{4/3}$$

NOTE: calculations based on 25 Year storm to FES-3

INPUT	Quantity	Units	Notes
TW	0.3	ft	Tailwater depth above the invert of the culvert
Do	1	ft	Inside diameter of culvert (defined in apron sizing)
Q	0.09	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater (defined in apron sizing)

OUTPUT	Quantity	Units	Notes
d-50	0.002689	ft	Median stone diameter in feet
	0.032266	in	Median stone diameter in inches

Rip Rap and Apron Sizing Worksheet

Address: 118 Hazard Avenue
Enfield, CT

Project No.: CT191016
Date: 12/3/2019
Prepared By: MLT

Apron Sizing: FES-8

$$La = \frac{1.7Q}{Do^{3/2}} + 8Do$$

$$W\ end = 3Do + 0.4La\ for\ Tailwater\ \geq 0.5Do$$
$$W\ end = 3Do + La\ for\ Tailwater < 0.5Do$$

INPUT	Quantity	Units	Notes
Do	0.667	ft	Inside diameter of culvert
Q	0.21	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater

OUTPUT	Quantity	Units	Notes
La	5.991359	ft	Length of apron (minimum)
For tailwater elevation greater than or equal to the elevation of the center of the pipe:			
W start	2.001	ft	Width of apron at the culvert (minimum)
W end	4.397544	ft	Width of apron end (minimum)
For tailwater elevation less than the elevation of the center of the pipe:			
W start	2.001	ft	Width of apron at the culvert (minimum)
W end	7.992359	ft	Width of apron end (minimum)

Rip Rap Sizing:

$$d - 50 = \frac{0.02}{TW} * (\frac{Q}{Do})^{4/3}$$

NOTE: calculations based on 25 Year storm to FES-3

INPUT	Quantity	Units	Notes
TW	0.3	ft	Tailwater depth above the invert of the culvert
Do	0.667	ft	Inside diameter of culvert (defined in apron sizing)
Q	0.21	cfs	Pipe discharge for conduit design storm or 25 year storm, whichever is greater (defined in apron sizing)

OUTPUT	Quantity	Units	Notes
d-50	0.014279	ft	Median stone diameter in feet
	0.171349	in	Median stone diameter in inches

APPENDIX F: OPERATION AND MAINTENANCE

- *STORMWATER OPERATION AND MAINTENANCE PLAN*
- *INSPECTION REPORT*
- *INSPECTION AND MAINTENANCE LOG FORM*
- *LONG-TERM POLLUTION PREVENTION PLAN*
- *ILLICIT DISCHARGE STATEMENT*
- *MANUFACTURER'S INSPECTION AND MAINTENANCE MANUALS*

STORMWATER OPERATION AND MAINTENANCE PLAN

"All American Assisted Living" Facility.
118 Hazard Avenue
Enfield, CT

RESPONSIBLE PARTY DURING CONSTRUCTION:

TBD

RESPONSIBLE PARTY POST CONSTRUCTION:

TBD

Construction Phase

During the construction phase, all erosion control devices and measures shall be maintained in accordance with the final record plans, local/state approvals and conditions, the EPA Construction General Permit and the Stormwater Pollution Prevention Plan (SWPPP) if applicable. Additionally, the maintenance of all erosion / siltation control measures during construction shall be the responsibility of the general contractor. Upon proper notice to the property owner, the Town/City or its authorized designee shall be allowed to enter the property at a reasonable time and in a reasonable manner for the purposes of inspection.

Post Development Controls

Once construction is completed, the post development stormwater controls are to be operated and maintained in compliance with the following permanent procedures (note that the continued implementation of these procedures shall be the responsibility of the Owner or its assignee):

1. Parking lots and on-site driveways: Sweep at least four (4) times per year and on a more frequent basis depending on sanding operations. All resulting sweepings shall be collected and properly disposed of off site in accordance with CTDEEP and other applicable requirements.

   Approximate Maintenance Budget: $1,000/year

2. Catch basins, yard drains, trench drains, manholes and piping: Inspect four (4) times per year and at the end of foliage and snow-removal seasons. These features shall be cleaned four (4) times per year or whenever the depth of deposits is greater than or equal to one half the depth from the bottom of the invert of the lowest pipe in the catch basin or underground system. Accumulated sediment and hydrocarbons present must be removed and properly disposed of off site in accordance with CTDEEP and other applicable requirements.

   Approximate Maintenance Budget: $500/year per structure.

3. Infiltration Basin: Preventative maintenance after every major storm event during the first three (3) months of operation and at least twice per year thereafter. Inspect structure and pretreatment BMP to ensure proper operation after every major storm event

STORMWATER MANAGEMENT SYSTEM

POST-CONSTRUCTION INSPECTION REPORT

LOCATION:

118 Hazard Avenue
Enfield, CT

RESPONSIBLE PARTY:

TBD

NAME OF INSPECTOR:	INSPECTION DATE:
Note Condition of the Following (sediment depth, debris, standing water, damage, etc.):	
Catch Basins:	
Discharge Points/ Flared End Sections / Rip Rap:	
Infiltration Basin:	
Water Quality Units:	
Other:	
Note Recommended Actions to be taken on the Following (sediment and/or debris removal, repairs, etc.):	

Catch Basins:
Discharge Points / Flared End Sections / Rip Rap:
Infiltration Basin:
Water Quality Units:
Other:
Other:
Comments:

STORMWATER INSPECTION AND MAINTENANCE LOG FORM			
All American Assisted Living ***118 Hazard Avenue, Enfield CT***			
Stormwater Management Practice	Responsible Party	Date	Maintenance Activity Performed

LONG-TERM POLLUTION PREVENTION PLAN

"All American Assisted Living" Facility
118 Hazard Avenue
Enfield, CT

RESPONSIBLE PARTY DURING CONSTRUCTION:

TBD

RESPONSIBLE PARTY POST CONSTRUCTION:

TBD

For this site, the Long-Term Pollution Prevention Plan will consist of the following:

- No outdoor maintenance or washing of vehicles allowed.
- The property owner shall be responsible for "good housekeeping" including proper periodic maintenance of building and pavement areas, curbing, landscaping, etc.
- Proper storage and removal of solid waste (dumpsters).
- Sweeping of driveways a minimum of twice per year with a commercial cleaning unit. Any sediment removed shall be disposed of in accordance with applicable local and state requirements.
- Regular inspections and maintenance of Stormwater Management System as noted in the "O&M Plan".
- Snow removal shall be the responsibility of the property owner. Snow shall not be plowed, dumped and/or placed in forebays, infiltration basins or similar stormwater controls. Salting and/or sanding of pavement / walkway areas during winter conditions shall only be done in accordance with all state/local requirements and approvals.

OPERATON AND MAINTENANCE TRAINING PROGRAM

The Owner will coordinate an annual in-house training session to discuss the Operations and Maintenance Plan, the Long-Term Pollution Prevention Plan, and the Spill Prevention Plan and response procedures. Annual training will include the following:

Discuss the Operations and Maintenance Plan

- Explain the general operations of the stormwater management system and its BMPs
- Identify potential sources of stormwater pollution and measures / methods of reducing or eliminating that pollution
- Emphasize good housekeeping measures

Discuss the Spill Prevention and Response Procedures

- Explain the process in the event of a spill
- Identify potential sources of spills and procedures for cleanup and /or reporting and notification
- Complete a yearly inventory or Materials Safety Data sheets of all tenants and confirm that no potentially harmful chemicals are in use.
- Trash and other debris shall be removed from all areas of the site at least twice yearly.

ILLICIT DISCHARGE STATEMENT

Certain types of non-stormwater discharges are allowed under the U.S. Environmental Protection Agency Construction General Permit. These types of discharges will be allowed under the conditions that no pollutants will be allowed to come in contact with the water prior to or after its discharge. The control measures which have been outlined previously in this LTPPP will be strictly followed to ensure that no contamination of these non-storm water discharges takes place. Any existing illicit discharges, if discovered during the course of the work, will be reported to CTDEEP and the local DPW, as applicable, to be addressed in accordance with their respective policies. No illicit discharges will be allowed in conjunction with the proposed improvements.

Duly Acknowledged:

_____

Name & Title

StormTech®

Detention • Retention • Water Quality

A division of ADS

Save Valuable Land and Protect Water Resources

Isolator® Row O&M Manual

StormTech® Chamber System for Stormwater Management

1.0 The Isolator® Row

1.1 INTRODUCTION

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row is a patented technique to inexpensively enhance Total Suspended Solids (TSS) removal and provide easy access for inspection and maintenance.

Looking down the Isolator Row from the manhole opening, woven geotextile is shown between the chamber and stone base.

1.2 THE ISOLATOR ROW

The Isolator Row is a row of StormTech chambers, either SC-310, SC-310-3, SC-740, DC-780, MC-3500 or MC-4500 models, that is surrounded with filter fabric and connected to a closely located manhole for easy access. The fabric-wrapped chambers provide for settling and filtration of sediment as storm water rises in the Isolator Row and ultimately passes through the filter fabric. The open bottom chambers and perforated sidewalls (SC-310, SC-310-3 and SC-740 models) allow storm water to flow both vertically and horizontally out of the chambers. Sediments are captured in the Isolator Row protecting the storage areas of the adjacent stone and chambers from sediment accumulation.

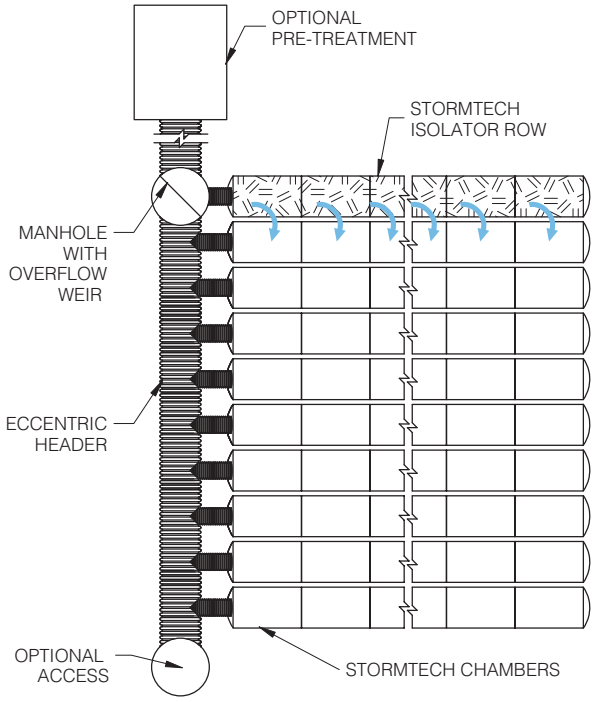
Two different fabrics are used for the Isolator Row. A woven geotextile fabric is placed between the stone and the Isolator Row chambers. The tough geotextile provides a media for storm water filtration and provides a durable surface for maintenance operations. It is also designed to prevent scour of the underlying stone and remain intact during high pressure jetting. A non-woven fabric is placed over the chambers to provide a filter media for flows passing through the perforations in the sidewall of the chamber. The non-woven fabric is not required over the DC-780, MC-3500 or MC-4500 models as these chambers do not have perforated side walls.

The Isolator Row is typically designed to capture the "first flush" and offers the versatility to be sized on a volume basis or flow rate basis. An upstream manhole not only provides access to the Isolator Row but typically includes a high flow weir such that storm water flowrates or volumes that exceed the capacity of the Isolator Row overtop the over flow weir and discharge through a manifold to the other chambers.

The Isolator Row may also be part of a treatment train. By treating storm water prior to entry into the chamber system, the service life can be extended and pollutants such as hydrocarbons can be captured. Pre-treatment best management practices can be as simple as deep sump catch basins, oil-water separators or can be innovative storm water treatment devices. The design of the treatment train and selection of pretreatment devices by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, the Isolator Row is recommended by StormTech as an effective means to minimize maintenance requirements and maintenance costs.

Note: See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row.

StormTech Isolator Row with Overflow Spillway
(not to scale)



2.0 Isolator Row Inspection/Maintenance

StormTech

2.1 INSPECTION

The frequency of Inspection and Maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

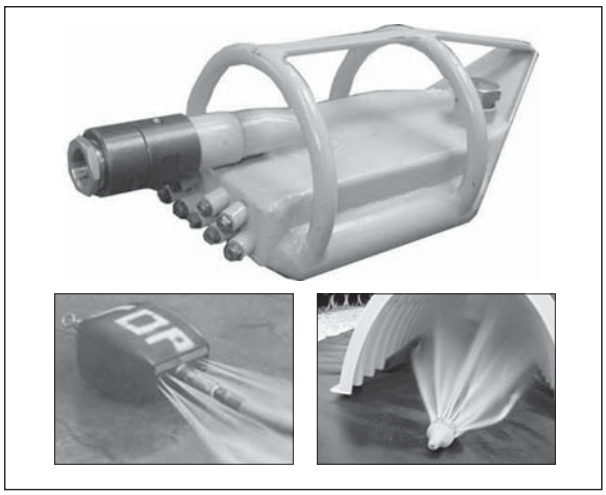
At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

The Isolator Row incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3 inches throughout the length of the Isolator Row, clean-out should be performed.

2.2 MAINTENANCE

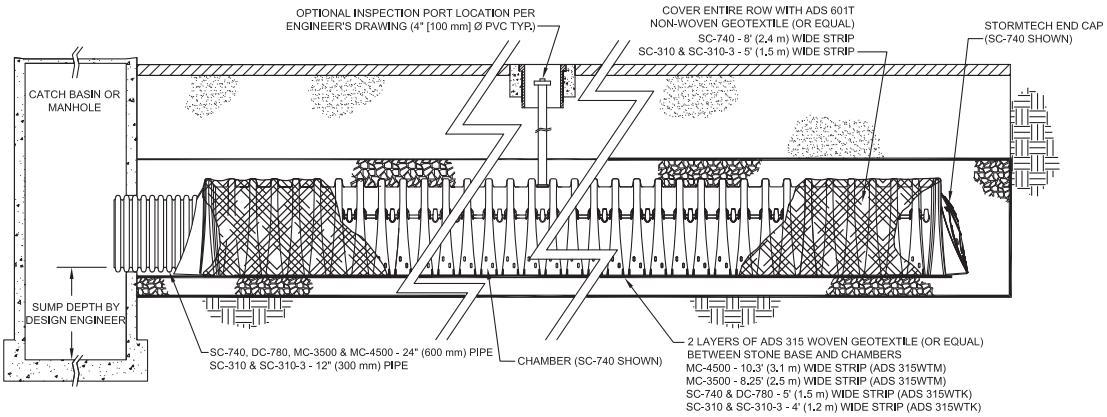
The Isolator Row was designed to reduce the cost of periodic maintenance. By "isolating" sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entries.



Examples of culvert cleaning nozzles appropriate for Isolator Row maintenance. (These are not StormTech products.)

Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45" are best. Most JetVac reels have 400 feet of hose allowing maintenance of an Isolator Row up to 50 chambers long. **The JetVac process shall only be performed on StormTech Isolator Rows that have AASHTO class 1 woven geotextile (as specified by StormTech) over their angular base stone.**

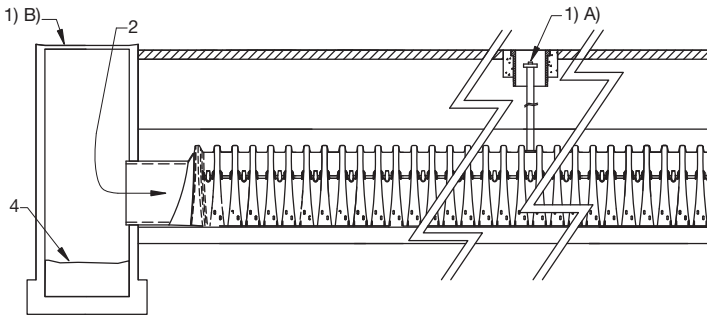
StormTech Isolator Row (not to scale)



NOTE: NON-WOVEN FABRIC IS ONLY REQUIRED OVER THE INLET PIPE CONNECTION INTO THE END CAP FOR DC-780, MC-3500 AND MC-4500 CHAMBER MODELS AND IS NOT REQUIRED OVER THE ENTIRE ISOLATOR ROW.

3.0 Isolator Row Step By Step Maintenance Procedures

StormTech Isolator Row (not to scale)



Step 1) Inspect Isolator Row for sediment

A) Inspection ports (if present)

i. Remove lid from floor box frame

ii. Remove cap from inspection riser

iii. Using a flashlight and stadia rod, measure depth of sediment and record results on maintenance log.

iv. If sediment is at, or above, 3 inch depth proceed to Step 2. If not proceed to step 3.

B) All Isolator Rows

i. Remove cover from manhole at upstream end of Isolator Row

ii. Using a flashlight, inspect down Isolator Row through outlet pipe

1. Mirrors on poles or cameras may be used to avoid a confined space entry
2. Follow OSHA regulations for confined space entry if entering manhole

iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches) proceed to Step 2. If not proceed to Step 3.

Step 2) Clean out Isolator Row using the JetVac process

A) A fixed culvert cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable

B) Apply multiple passes of JetVac until backflush water is clean

C) Vacuum manhole sump as required

Step 3) Replace all caps, lids and covers, record observations and actions

Step 4) Inspect & clean catch basins and manholes upstream of the StormTech system

Sample Maintenance Log

Date	Stadia Rod Readings		Sediment Depth (1) - (2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to top of sediment (2)			
3/15/01	6.3 ft.	none		New installation. Fixed point is CI frame at grade	djm
9/24/01		6.2	0.1 ft.	Some grit felt	sm
6/20/03		5.8	0.5 ft.	Mucky feel, debris visible in manhole and in Isolator row, maintenance due	rv
7/7/03	6.3 ft.		0	System jetted and vacuumed	djm

StormTech®

Detention • Retention • Water Quality

A division of ADS

70 Inwood Road, Suite 3 | Rocky Hill | Connecticut | 06067

860.529.8188 | 888.892.2694 | fax 866.328.8401 | www.stormtech.com

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(generally equal or greater to 3.0 inches in 24 hours) for the first three months. Mow the buffer area, side slopes and basin bottom if grassed floor, rake if stone or sand bottom, remove trash and debris, remove grass clippings and accumulated organic matter. Any sediment removed shall be disposed of in accordance with CTDEEP and other applicable requirements.

Approximate Maintenance Budget: $2,000/year per basin

4. Underground Infiltration Basins: Preventative maintenance after every major storm event during the first three (3) months of operation and at least twice per year thereafter. Inspect structure and pretreatment BMP to ensure proper operation after every major storm event (generally equal or greater to 3.0 inches in 24 hours) for the first three months. The outlet of the basin, if any, shall be inspected for erosion and sedimentation, and rip-rap shall be promptly repaired in the case of erosion. Sediment collecting in the bottom of the basin shall be inspected twice annually, and removal shall commence any time the sediment reaches a depth of six inches anywhere in the basin. Any sediment removed shall be disposed of in accordance with CTDEEP and other applicable requirements.

   Approximate Maintenance Budget: Cleaning - $1,000/year, Inspection - $200/year

5. Oil/Grit Separators: Cleaning includes removal of accumulated oil and grease and sediment using a vacuum truck or other ordinary catch basin cleaning device. In areas of high sediment loading, inspect and clean inlets after every major storm. At a minimum, inspect oil grit separators monthly, and clean them out at least twice per year. Polluted water or sediments removed from an oil grit separator should be disposed of in accordance with all applicable local, state, and federal laws and regulations.

   Approximate Maintenance Budget: Inspection/cleaning- $1,000/year per separator per year for inspections and semi-annual cleanings.

All components of the stormwater system will be accessible by the owner or their assignee.

PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED

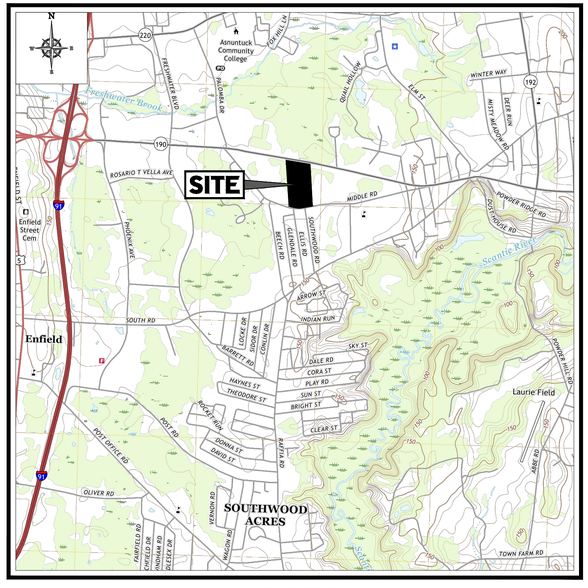
"ALL-AMERICAN ASSISTED LIVING" FACILITY

LOCATION OF SITE

118 HAZARD AVENUE, TOWN OF ENFIELD

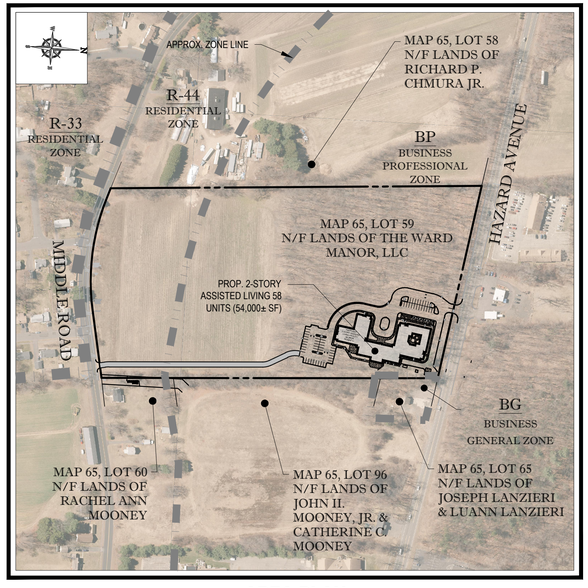
HARTFORD COUNTY, CONNECTICUT

MAP 65, LOT 59



USGS MAP

SCALE: 1" = 2,000'
SOURCE: BROAD BROOK, CT USGS QUADRANGLE



AREA PLAN

SCALE: 1" = 250'
SOURCE: CTECO 2016 AERIAL IMAGERY

DRAWING SHEET INDEX

SHEET TITLE	SHEET NUMBER
COVER SHEET	C-101
GENERAL NOTES SHEET	C-102
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SITE LAYOUT PLAN	C-301
GRADING AND DRAINAGE PLAN	C-401
SOIL EROSION AND SEDIMENT CONTROL PLAN	C-402
SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS	C-403
UTILITY PLAN	C-501
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BOUNDARY & TOPOGRAPHIC SURVEY (BY OTHERS)	2 OF 5
BOUNDARY & TOPOGRAPHIC SURVEY (BY OTHERS)	3 OF 5
BOUNDARY & TOPOGRAPHIC SURVEY (BY OTHERS)	4 OF 5
BOUNDARY & TOPOGRAPHIC SURVEY (BY OTHERS)	5 OF 5

PREPARED BY

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SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

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REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	1/20/20	ART COMMENTS	MLT / JGB
2	03/10/20	EMERGENCY ACCESS	MLT / JGB

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PERMIT SET

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PROJECT No.: CT191016
DRAWN BY: MLT / DE
CHECKED BY: JGB / PM
DATE: 12/06/19
CAD I.D.: CT191016ss2

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT
118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

BOHLER
16 OLD FORGE ROAD, SUITE A
ROCKY HILL, CT 06067
Phone: (860) 333-8900
Fax: (508) 480-9080
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J.G. BORD
STATE OF CONNECTICUT
JEFFREY G. BORD
No. 30414
LICENSED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CONNECTICUT LICENSE No. 30414

SHEET TITLE:

COVER SHEET

SHEET NUMBER:

C-101

REVISION 2 - 3/10/20

P:\19\CT191016\DRAWINGS\PLAN SETS\REV2\CT191016SS2----LAYOUT: C-101 COVER

GENERAL NOTES

CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH THE NOTES AND SPECIFICATIONS CONTAINED HEREIN. CONTRACTOR IS RESPONSIBLE TO ENSURE THAT ALL SUBCONTRACTORS FULLY AND COMPLETELY CONFORM TO AND COMPLY WITH THESE REQUIREMENTS.

1. THE FOLLOWING DOCUMENTS ARE INCORPORATED BY REFERENCE AS PART OF THIS SITE PLAN:
   - "BOUNDARY & TOPOGRAPHIC SURVEY" - PREPARED BY CONTROL POINT ASSOCIATES, INC. DATED 09/05/19.
   - "REPORT OF GEOTECHNICAL INVESTIGATION" - PREPARED BY WHITESTONE ASSOCIATES, INC. DATED 10/31/19.
   - "PHASE I ENVIRONMENTAL SITE ASSESSMNET" - PREPARED BY WHITESTONE ASSOCIATES, INC. DATED 08/19/19

   PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR MUST VERIFY THAT HE/SHE HAS THE LATEST EDITION OF THE DOCUMENTS REFERENCED ABOVE. THIS IS CONTRACTOR'S RESPONSIBILITY.
2. ALL ACCESSIBLE (A/K/A ADA) PARKING SPACES MUST BE CONSTRUCTED TO MEET, AT A MINIMUM, THE MORE STRINGENT OF THE REQUIREMENTS OF THE "AMERICANS WITH DISABILITIES ACT" (ADA) CODE (42 U.S.C. § 12101 et seq. AND 42 U.S.C. § 4151 et seq.) OR THE REQUIREMENTS OF THE JURISDICTION WHERE THE PROJECT IS TO BE CONSTRUCTED, AND ANY AND ALL AMENDMENTS TO BOTH WHICH ARE IN EFFECT WHEN THESE PLANS ARE COMPLETED.
3. PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT ALL REQUIRED PERMITS AND APPROVALS HAVE BEEN OBTAINED. NO CONSTRUCTION OR FABRICATION SHALL BEGIN UNTIL THE CONTRACTOR HAS RECEIVED AND THOROUGHLY REVIEWED THE COMMENTS TO ALL PLANS AND OTHER DOCUMENTS REVIEWED AND APPROVED BY THE PERMITTING AUTHORITIES AND CONFIRMED THAT ALL NECESSARY OR REQUIRED PERMITS HAVE BEEN OBTAINED. CONTRACTOR MUST HAVE COPIES OF ALL PERMITS AND APPROVALS ON SITE AT ALL TIMES.
4. THE OWNER/CONTRACTOR MUST BE FAMILIAR WITH AND RESPONSIBLE FOR THE PROCUREMENT OF ANY AND ALL CERTIFICATIONS REQUIRED FOR THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
5. ALL WORK MUST BE PERFORMED IN ACCORDANCE WITH THESE PLANS, SPECIFICATIONS AND CONDITIONS OF APPROVAL, AND ALL APPLICABLE REQUIREMENTS, RULES, REGULATIONS, STATUTORY REQUIREMENTS, CODES, LAWS AND STANDARDS OF ALL GOVERNMENTAL ENTITIES WITH JURISDICTION OVER THIS PROJECT.
6. THE GEOTECHNICAL REPORT AND RECOMMENDATIONS SET FORTH HEREIN ARE A PART OF THE REQUIRED CONSTRUCTION DOCUMENTS AND, IN CASE OF CONFLICT, DISCREPANCY OR AMBIGUITY, THE MORE STRINGENT REQUIREMENTS AND/OR RECOMMENDATIONS CONTAINED IN THE PLANS AND THE GEOTECHNICAL REPORT AND RECOMMENDATIONS SHALL TAKE PRECEDENCE UNLESS SPECIFICALLY NOTED OTHERWISE ON THE PLANS. THE CONTRACTOR MUST NOTIFY THE ENGINEER, IN WRITING, OF ANY SUCH CONFLICT, DISCREPANCY OR AMBIGUITY BETWEEN THE GEOTECHNICAL REPORTS AND PLANS AND SPECIFICATIONS PRIOR TO PROCEEDING WITH ANY FURTHER WORK.
7. THESE PLANS ARE BASED ON INFORMATION PROVIDED TO BOHLER ENGINEERING BY THE OWNER AND OTHERS PRIOR TO THE TIME OF PLAN PREPARATION. CONTRACTOR MUST FIELD VERIFY EXISTING CONDITIONS AND NOTIFY BOHLER ENGINEERING, IN WRITING, IMMEDIATELY IF ACTUAL SITE CONDITIONS DIFFER FROM THOSE SHOWN ON THE PLAN, OR IF THE PROPOSED WORK CONFLICTS WITH ANY OTHER SITE FEATURES.
8. ALL DIMENSIONS SHOWN ON THE PLANS MUST BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. CONTRACTOR MUST NOTIFY ENGINEER, IN WRITING, IF ANY CONFLICTS, DISCREPANCIES, OR AMBIGUITIES EXIST PRIOR TO PROCEEDING WITH CONSTRUCTION. NO EXTRA COMPENSATION WILL BE PAID TO THE CONTRACTOR FOR WORK WHICH HAS TO BE REDONE OR REPAIRED DUE TO DIMENSIONS OR GRADES SHOWN INCORRECTLY ON THESE PLANS PRIOR TO CONTRACTOR GIVING ENGINEER WRITTEN NOTIFICATION OF SAME AND ENGINEER, THEREAFTER, PROVIDING CONTRACTOR WITH WRITTEN AUTHORIZATION TO PROCEED WITH SUCH ADDITIONAL WORK.
9. CONTRACTOR MUST REFER TO THE ARCHITECTURAL/BUILDING PLANS "OF RECORD" FOR EXACT LOCATIONS AND DIMENSIONS OF ENTRY/EXIT POINTS, ELEVATIONS, PRECISE BUILDING DIMENSIONS, AND EXACT BUILDING UTILITY LOCATIONS.
10. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR MUST COORDINATE THE BUILDING LAYOUT BY CAREFUL REVIEW OF THE ENTIRE SITE PLAN AND THE LATEST ARCHITECTURAL PLANS (INCLUDING, BUT NOT LIMITED TO, STRUCTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND FIRE SUPPRESSION PLAN, WHERE APPLICABLE). CONTRACTOR MUST IMMEDIATELY NOTIFY OWNER, ARCHITECT AND SITE ENGINEER, IN WRITING, OF ANY CONFLICTS, DISCREPANCIES OR AMBIGUITIES WHICH EXIST.
11. DEBRIS MUST NOT BE BURIED ON THE SUBJECT SITE AND ALL UNSUITABLE EXCAVATED MATERIAL AND DEBRIS (SOLID WASTE) MUST BE DISPOSED OF IN ACCORDANCE WITH THE REQUIREMENTS OF ANY AND ALL GOVERNMENTAL AUTHORITIES WHICH HAVE JURISDICTION OVER THIS PROJECT OR OVER CONTRACTOR.
12. THE CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING WHEN SHORING IS REQUIRED AND FOR INSTALLING ALL SHORING REQUIRED DURING EXCAVATION (TO BE PERFORMED IN ACCORDANCE WITH CURRENT OSHA STANDARDS) AND ANY ADDITIONAL PRECAUTIONS TO BE TAKEN TO ASSURE THE STABILITY OF ADJACENT, NEARBY AND CONTIGUOUS STRUCTURES AND PROPERTIES.
13. THE CONTRACTOR IS TO EXERCISE EXTREME CARE WHEN PERFORMING ANY WORK ACTIVITIES ADJACENT TO PAVEMENT, STRUCTURES, ETC. WHICH ARE TO REMAIN EITHER FOR AN INITIAL PHASE OF THE PROJECT OR AS PART OF THE FINAL CONDITION. CONTRACTOR IS RESPONSIBLE FOR TAKING ALL APPROPRIATE MEASURES REQUIRED TO ENSURE THE STRUCTURAL STABILITY OF SIDEWALKS AND PAVEMENT, UTILITIES, BUILDINGS, AND INFRASTRUCTURE WHICH ARE TO REMAIN, AND TO PROVIDE A SAFE WORK AREA FOR THIRD PARTIES, PEDESTRIANS AND ANYONE INVOLVED WITH THE PROJECT.
14. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE DONE TO ANY NEW OR EXISTING CONSTRUCTION OR PROPERTY DURING THE COURSE OF CONSTRUCTION, INCLUDING BUT NOT LIMITED TO DRAINAGE, UTILITIES, PAVEMENT, STRIPING, CURB, ETC. AND SHALL BEAR ALL COSTS ASSOCIATED WITH SAME TO INCLUDE, BUT NOT BE LIMITED TO, REDESIGN, RE-SURVEY, RE-PERMITTING AND CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR AND MUST REPLACE ALL SIGNAL INTERCONNECTION CABLE, WIRING CONDUITS, AND ANY UNDERGROUND ACCESSORY EQUIPMENT DAMAGED DURING CONSTRUCTION AND MUST BEAR ALL COSTS ASSOCIATED WITH SAME. THE REPAIR OF ANY SUCH NEW OR EXISTING CONSTRUCTION OR PROPERTY MUST RESTORE SUCH CONSTRUCTION OR PROPERTY TO A CONDITION EQUIVALENT TO OR BETTER THAN THE CONDITIONS PRIOR TO COMMENCEMENT OF THE CONSTRUCTION, AND IN CONFORMANCE WITH APPLICABLE CODES, LAWS RULES, REGULATIONS, STATUTORY REQUIREMENTS AND STATUTES. CONTRACTOR MUST BEAR ALL COSTS ASSOCIATED WITH SAME. CONTRACTOR IS RESPONSIBLE TO DOCUMENT ALL EXISTING DAMAGE AND TO NOTIFY THE OWNER AND THE CONSTRUCTION MANAGER PRIOR TO THE START OF CONSTRUCTION.
15. ALL CONCRETE MUST BE AIR ENTRAINED AND HAVE THE MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI AT 28 DAYS UNLESS OTHERWISE NOTED ON THE PLANS, DETAILS AND/OR GEOTECHNICAL REPORT.
16. THE ENGINEER IS NOT RESPONSIBLE FOR CONSTRUCTION METHODS, MEANS, TECHNIQUES OR PROCEDURES, GENERALLY OR FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES OR PROCEDURES FOR COMPLETION OF THE WORK DEPICTED BOTH ON THESE PLANS, AND FOR ANY CONFLICTS/SCOPE REVISIONS WHICH RESULT FROM SAME. CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE METHODS/MEANS FOR COMPLETION OF THE WORK PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
17. THE ENGINEER OF RECORD IS NOT RESPONSIBLE FOR JOB SITE SAFETY. THE ENGINEER OF RECORD HAS NOT BEEN RETAINED TO PERFORM OR BE RESPONSIBLE FOR JOB SITE SAFETY, SAME BEING WHOLLY OUTSIDE OF ENGINEER'S SERVICES AS RELATED TO THE PROJECT. THE ENGINEER OF RECORD IS NOT RESPONSIBLE TO IDENTIFY OR REPORT ANY JOB SITE SAFETY ISSUES, AT ANY TIME.
18. ALL CONTRACTORS MUST CARRY THE SPECIFIED STATUTORY WORKER'S COMPENSATION INSURANCE, EMPLOYER'S LIABILITY INSURANCE AND LIMITS OF COMMERCIAL GENERAL LIABILITY INSURANCE (CGL). ALL CONTRACTORS MUST HAVE THEIR CGL POLICIES ENDORSED TO NAME BOHLER ENGINEERING, AND ITS PAST, PRESENT AND FUTURE OWNERS, OFFICERS, DIRECTORS, PARTNERS, SHAREHOLDERS, MEMBERS, PRINCIPALS, COMMISSIONERS, AGENTS, SERVANTS, EMPLOYEES, AFFILIATES, SUBSIDIARIES, AND RELATED ENTITIES, AND ITS SUBCONTRACTORS AND SUBCONSULTANTS AS ADDITIONAL NAMED INSURED AND TO PROVIDE CONTRACTUAL LIABILITY COVERAGE SUFFICIENT TO INSURE THIS HOLD HARMLESS AND INDEMNITY OBLIGATIONS ASSUMED BY THE CONTRACTORS. ALL CONTRACTORS MUST FURNISH BOHLER ENGINEERING WITH CERTIFICATIONS OF INSURANCE AS EVIDENCE OF THE REQUIRED INSURANCE PRIOR TO COMMENCING WORK AND UPON RENEWAL OF EACH POLICY DURING THE ENTIRE PERIOD OF CONSTRUCTION AND FOR ONE YEAR AFTER THE COMPLETION OF CONSTRUCTION. IN ADDITION, ALL CONTRACTORS WILL, TO THE FULLEST EXTENT PERMITTED UNDER THE LAW, INDEMNIFY, DEFEND AND HOLD HARMLESS BOHLER ENGINEERING AND ITS PAST, PRESENT AND FUTURE OWNERS, OFFICERS, DIRECTORS, PARTNERS, SHAREHOLDERS, MEMBERS, PRINCIPALS, COMMISSIONERS, AGENTS, SERVANTS, EMPLOYEES, AFFILIATES, SUBSIDIARIES, AND RELATED ENTITIES, AND ITS SUBCONTRACTORS AND SUBCONSULTANTS FROM AND AGAINST ANY DAMAGES, INJURIES, CLAIMS, ACTIONS, PENALTIES, EXPENSES, PUNITIVE DAMAGES, TORT DAMAGES, STATUTORY CLAIMS, STATUTORY CAUSES OF ACTION, LOSSES, CAUSES OF ACTION, LIABILITIES OR COSTS, INCLUDING, BUT NOT LIMITED TO, REASONABLE ATTORNEYS' FEES AND DEFENSE COSTS, ARISING OUT OF OR IN ANY WAY CONNECTED WITH OR TO THE PROJECT, INCLUDING ALL CLAIMS BY EMPLOYEES OF THE CONTRACTORS, ALL CLAIMS BY THIRD PARTIES AND ALL CLAIMS RELATED TO THE PROJECT. CONTRACTOR MUST NOTIFY ENGINEER, IN WRITING, AT LEAST THIRTY (30) DAYS PRIOR TO ANY TERMINATION, SUSPENSION OR CHANGE OF ITS INSURANCE HEREUNDER.
19. BOHLER ENGINEERING WILL REVIEW OR TAKE OTHER APPROPRIATE ACTION ON THE CONTRACTOR SUBMITTALS, SUCH AS SHOP DRAWINGS, PRODUCT DATA, SAMPLES, AND OTHER DATA, WHICH THE CONTRACTOR IS REQUIRED TO SUBMIT, BUT ONLY FOR THE LIMITED PURPOSE OF CHECKING FOR CONFORMANCE WITH THE DESIGN INTENT AND THE INFORMATION SHOWN IN THE CONSTRUCTION CONTRACT DOCUMENTS. CONSTRUCTION MEANS AND/OR METHODS AND/OR TECHNIQUES OR PROCEDURES, COORDINATION OF THE WORK WITH OTHER TRADES, AND CONSTRUCTION SAFETY PRECAUTIONS ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND BOHLER HAS NO RESPONSIBILITY OR LIABILITY FOR SAME HEREUNDER. BOHLER ENGINEERING'S SHOP DRAWING REVIEW WILL BE CONDUCTED WITH REASONABLE PROMPTNESS WHILE ALLOWING SUFFICIENT TIME TO PERMIT ADEQUATE REVIEW. REVIEW OF A SPECIFIC ITEM MUST NOT INDICATE THAT BOHLER ENGINEERING HAS REVIEWED THE ENTIRE ASSEMBLY OF WHICH THE ITEM IS A COMPONENT. BOHLER ENGINEERING WILL NOT BE RESPONSIBLE FOR ANY DEVIATIONS FROM THE CONSTRUCTION DOCUMENTS NOT PROMPTLY AND IMMEDIATELY BROUGHT TO ITS ATTENTION, IN WRITING, BY THE CONTRACTOR. BOHLER ENGINEERING WILL NOT BE REQUIRED TO REVIEW PARTIAL SUBMISSIONS OR THOSE FOR WHICH SUBMISSIONS OF CORRELATED ITEMS HAVE NOT BEEN RECEIVED.
20. NEITHER THE PROFESSIONAL ACTIVITIES OF BOHLER ENGINEERING, NOR THE PRESENCE OF BOHLER ENGINEERING AND/OR ITS PAST, PRESENT AND FUTURE OWNERS, OFFICERS, DIRECTORS, PARTNERS, SHAREHOLDERS, MEMBERS, PRINCIPALS, COMMISSIONERS, AGENTS, SERVANTS, EMPLOYEES, AFFILIATES, SUBSIDIARIES, AND RELATED ENTITIES, AND ITS SUBCONTRACTORS AND SUBCONSULTANTS AT A CONSTRUCTION/PROJECT SITE, SHALL RELIEVE THE GENERAL CONTRACTOR OF ITS OBLIGATIONS, DUTIES AND RESPONSIBILITIES INCLUDING, BUT NOT LIMITED TO, CONSTRUCTION MEANS, METHODS, SEQUENCE, TECHNIQUES OR PROCEDURES NECESSARY FOR PERFORMING, OVERSEEING, SUPERINTENDING AND COORDINATING THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND COMPLIANCE WITH ANY HEALTH OR SAFETY PRECAUTIONS REQUIRED BY ANY REGULATORY AGENCIES WITH JURISDICTION OVER THE PROJECT AND/OR PROPERTY. BOHLER ENGINEERING AND ITS PERSONNEL HAVE NO AUTHORITY TO EXERCISE ANY CONTROL OVER ANY CONSTRUCTION CONTRACTOR OR ITS EMPLOYEES IN CONNECTION WITH THEIR WORK OR ANY HEALTH OR SAFETY PROGRAMS OR PROCEDURES. THE GENERAL CONTRACTOR IS SOLELY RESPONSIBLE FOR JOB SITE SAFETY. BOHLER ENGINEERING SHALL BE INDEMNIFIED BY THE GENERAL CONTRACTOR AND MUST BE NAMED AN ADDITIONAL INSURED UNDER THE GENERAL CONTRACTOR'S POLICIES OF GENERAL LIABILITY INSURANCE AS DESCRIBED ABOVE IN NOTE 19 FOR JOB SITE SAFETY.
21. IF THE CONTRACTOR DEVIATES FROM THE PLANS AND SPECIFICATIONS, INCLUDING THE NOTES CONTAINED HEREIN, WITHOUT FIRST OBTAINING THE PRIOR WRITTEN AUTHORIZATION OF THE ENGINEER FOR SUCH DEVIATIONS, THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE PAYMENT OF ALL COSTS INCURRED IN CORRECTING ANY WORK DONE WHICH DEVIATES FROM THE PLANS, ALL FINES AND/OR PENALTIES ASSESSED WITH RESPECT THERETO AND ALL COMPENSATORY OR PUNITIVE DAMAGES RESULTING THEREFROM AND, FURTHER, SHALL DEFEND, INDEMNIFY AND HOLD HARMLESS THE ENGINEER, TO THE FULLEST EXTENT PERMITTED UNDER THE LAW, IN ACCORDANCE WITH PARAGRAPH 19 HEREIN, FOR AND FROM ALL FEES, ATTORNEYS' FEES, DAMAGES, COSTS, JUDGMENTS, PENALTIES AND THE LIKE RELATED TO SAME.
22. CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE AND PROTECTION OF TRAFFIC PLAN FOR ALL WORK THAT AFFECTS PUBLIC TRAVEL EITHER IN THE R.O.W. OR ON SITE. THE COST FOR THIS ITEM MUST BE INCLUDED IN THE CONTRACTOR'S PRICE.
23. ALL SIGNING AND PAVEMENT STRIPING MUST CONFORM TO MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES OR LOCALLY APPROVED SUPPLEMENT.
24. ENGINEER IS NOT RESPONSIBLE FOR ANY INJURY OR DAMAGES RESULTING FROM CONTRACTOR'S FAILURE TO BUILD OR CONSTRUCT IN STRICT ACCORDANCE WITH THE APPROVED PLANS. IF CONTRACTOR AND/OR OWNER FAIL TO BUILD OR CONSTRUCT IN STRICT ACCORDANCE WITH APPROVED PLANS, THEY AGREE TO JOINTLY AND SEVERALLY INDEMNIFY AND HOLD ENGINEER HARMLESS FOR ALL INJURIES AND DAMAGES THAT ENGINEER SUFFERS AND COSTS THAT ENGINEER INCURS.
25. OWNER MUST MAINTAIN AND PRESERVE ALL PHYSICAL SITE FEATURES AND DESIGN FEATURES DEPICTED ON THE PLANS AND RELATED DOCUMENTS, IN STRICT ACCORDANCE WITH THE APPROVED PLAN(S) AND DESIGN AND, FURTHER ENGINEER IS NOT RESPONSIBLE FOR ANY FAILURE TO SO MAINTAIN OR PRESERVE SITE AND/OR DESIGN FEATURES. IF OWNER FAILS TO MAINTAIN AND/OR PRESERVE ALL PHYSICAL SITE FEATURES AND/OR DESIGN FEATURES DEPICTED ON THE PLANS AND RELATED DOCUMENTS, OWNER AGREES TO INDEMNIFY AND HOLD ENGINEER HARMLESS FOR ALL INJURIES AND DAMAGES THAT ENGINEER SUFFERS AND COSTS THAT ENGINEER INCURS AS A RESULT OF SAID FAILURE.
26. ALL DIMENSIONS MUST BE TO FACE OF CURB, EDGE OF PAVEMENT, OR EDGE OF BUILDING, UNLESS NOTED OTHERWISE.
27. ALL CONSTRUCTION AND MATERIALS MUST COMPLY WITH AND CONFORM TO APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, LAWS, ORDINANCES, RULES AND CODES, AND ALL APPLICABLE OSHA REQUIREMENTS.
28. CONTRACTOR AND OWNER MUST INSTALL ALL ELEMENTS AND COMPONENTS IN STRICT COMPLIANCE WITH AND ACCORDANCE WITH MANUFACTURER'S STANDARDS AND RECOMMENDED INSTALLATION CRITERIA AND SPECIFICATIONS. IF CONTRACTOR AND/OR OWNER FAIL TO DO SO, THEY AGREE TO JOINTLY AND SEVERALLY INDEMNIFY AND HOLD ENGINEER HARMLESS FOR ALL INJURIES AND DAMAGES THAT ENGINEER SUFFERS AND COSTS THAT ENGINEER INCURS AS A RESULT OF SAID FAILURE.
29. CONTRACTOR IS RESPONSIBLE TO MAINTAIN ON-SITE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) IN COMPLIANCE WITH EPA REQUIREMENTS FOR SITES WHERE ONE (1) ACRE OR MORE (UNLESS THE LOCAL JURISDICTION REQUIRES FEWER) IS DISTURBED BY CONSTRUCTION ACTIVITIES. CONTRACTOR IS RESPONSIBLE TO ENSURE THAT ALL ACTIVITIES, INCLUDING THOSE OF SUBCONTRACTORS, ARE IN COMPLIANCE WITH THE SWPPP, INCLUDING BUT NOT LIMITED TO LOGGING ACTIVITIES (MINIMUM ONCE PER WEEK AND AFTER RAINFALL EVENTS) AND CORRECTIVE MEASURES, AS APPROPRIATE.
30. AS CONTAINED IN THESE DRAWINGS AND ASSOCIATED APPLICATION DOCUMENTS PREPARED BY THE SIGNATORY PROFESSIONAL ENGINEER, THE USE OF THE WORDS CERTIFY OR CERTIFICATION CONSTITUTES AN EXPRESSION OF "PROFESSIONAL OPINION" REGARDING THE INFORMATION WHICH IS THE SUBJECT OF THE UNDERSIGNED PROFESSIONAL'S KNOWLEDGE OR BELIEF AND IN ACCORDANCE WITH COMMON ACCEPTED PROCEDURE CONSISTENT WITH THE APPLICABLE STANDARDS OF PRACTICE, AND DOES NOT CONSTITUTE A WARRANTY OR GUARANTEE, EITHER EXPRESSED OR IMPLIED.

GENERAL GRADING & UTILITY PLAN NOTES

1. LOCATIONS OF ALL EXISTING AND PROPOSED SERVICES ARE APPROXIMATE AND MUST BE INDEPENDENTLY CONFIRMED WITH LOCAL UTILITY COMPANIES PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION OR EXCAVATION. SANITARY SEWER AND ALL OTHER UTILITY SERVICE CONNECTION POINTS MUST BE INDEPENDENTLY CONFIRMED BY THE CONTRACTOR IN THE FIELD PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. ALL DISCREPANCIES MUST IMMEDIATELY BE REPORTED, IN WRITING, TO THE ENGINEER. CONSTRUCTION MUST COMMENCE BEGINNING AT THE LOWEST INVERT (POINT OF CONNECTION) AND PROGRESS UP GRADIENT. PROPOSED INTERFACE POINTS (CROSSINGS) WITH EXISTING UNDERGROUND UTILITIES SHALL BE FIELD VERIFIED BY TEST PIT PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. CONTRACTOR MUST VERTICALLY AND HORIZONTALLY LOCATE ALL UTILITIES AND SERVICES INCLUDING, BUT NOT LIMITED TO, GAS, WATER, ELECTRIC, SANITARY AND STORM SEWER, TELEPHONE, CABLE, FIBER OPTIC CABLE, ETC. WITHIN THE LIMITS OF DISTURBANCE OR WORK SPACE, WHICHEVER IS GREATER. THE CONTRACTOR MUST USE, REFER TO, AND COMPLY WITH THE REQUIREMENTS OF THE APPLICABLE UTILITY NOTIFICATION SYSTEM TO LOCATE ALL THE UNDERGROUND UTILITIES. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL DAMAGE TO ANY EXISTING UTILITIES DURING CONSTRUCTION, AT NO COST TO THE OWNER. CONTRACTOR SHALL BEAR ALL COSTS ASSOCIATED WITH DAMAGE TO ANY EXISTING UTILITIES DURING CONSTRUCTION.
3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW ALL CONSTRUCTION CONTRACT DOCUMENTS INCLUDING, BUT NOT LIMITED TO, ALL OF THE DRAWINGS AND SPECIFICATIONS ASSOCIATED WITH THE PROJECT WORK SCOPE PRIOR TO THE INITIATION AND COMMENCEMENT OF CONSTRUCTION. SHOULD THE CONTRACTOR FIND A CONFLICT AND/OR DISCREPANCY BETWEEN THE DOCUMENTS RELATIVE TO THE SPECIFICATIONS OR THE RELATIVE OR APPLICABLE CODES, REGULATIONS, LAWS, RULES, STATUTES AND/OR ORDINANCES, IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO NOTIFY THE PROJECT ENGINEER OF RECORD, IN WRITING, OF SAID CONFLICT AND/OR DISCREPANCY PRIOR TO THE START OF CONSTRUCTION. CONTRACTOR'S FAILURE TO NOTIFY THE PROJECT ENGINEER SHALL CONSTITUTE CONTRACTOR'S FULL AND COMPLETE ACCEPTANCE OF ALL RESPONSIBILITY TO COMPLETE THE SCOPE OF WORK AS DEFINED BY THE DRAWINGS AND IN FULL COMPLIANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS, LAWS, STATUTES, ORDINANCES AND CODES AND, FURTHER, CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH SAME.
4. THE CONTRACTOR MUST LOCATE AND CLEARLY AND UNAMBIGUOUSLY DEFINE VERTICALLY AND HORIZONTALLY ALL ACTIVE AND INACTIVE UTILITY AND/OR SERVICE SYSTEMS THAT ARE TO BE REMOVED. THE CONTRACTOR IS RESPONSIBLE TO PROTECT AND MAINTAIN ALL ACTIVE AND INACTIVE SYSTEMS THAT ARE NOT BEING REMOVED/RELOCATED DURING SITE ACTIVITY.
5. THE CONTRACTOR MUST FAMILIARIZE ITSELF WITH THE APPLICABLE UTILITY SERVICE PROVIDER REQUIREMENTS AND IS RESPONSIBLE FOR ALL COORDINATION REGARDING UTILITY DEMOLITION AS IDENTIFIED OR REQUIRED FOR THE PROJECT. THE CONTRACTOR MUST PROVIDE THE OWNER WITH WRITTEN NOTIFICATION THAT THE EXISTING UTILITIES AND SERVICES HAVE BEEN TERMINATED AND ABANDONED IN ACCORDANCE WITH THE JURISDICTION AND UTILITY COMPANY REQUIREMENTS AND ALL OTHER APPLICABLE REQUIREMENTS, RULES, STATUTES, LAWS, ORDINANCES AND CODES.
6. THE CONTRACTOR MUST INSTALL ALL STORM SEWER AND SANITARY SEWER COMPONENTS WHICH FUNCTION BY GRAVITY PRIOR TO THE INSTALLATION OF ALL OTHER UTILITIES.
7. CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF SITE PLAN DOCUMENTS AND ARCHITECTURAL DESIGN FOR EXACT BUILDING UTILITY CONNECTION LOCATIONS, GREASE TRAP REQUIREMENTS/DETAILS, DOOR ACCESS, AND EXTERIOR GRADING. THE ARCHITECT WILL DETERMINE THE UTILITY SERVICE SIZES. THE CONTRACTOR MUST COORDINATE INSTALLATION OF UTILITIES/SERVICES WITH THE INDIVIDUAL COMPANIES, TO AVOID CONFLICTS AND TO ENSURE THAT PROPER DEPTHS ARE ACHIEVED. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT INSTALLATION OF ALL IMPROVEMENTS COMPLIES WITH ALL UTILITY REQUIREMENTS WITH JURISDICTION AND/OR CONTROL OF THE SITE, AND ALL OTHER APPLICABLE REQUIREMENTS, RULES, STATUTES, LAWS, ORDINANCES AND CODES AND, FURTHER, IS RESPONSIBLE FOR COORDINATING THE UTILITY TIE-INS/CONNECTIONS PRIOR TO CONNECTING TO THE EXISTING UTILITY/SERVICE. WHERE A CONFLICT(S) EXISTS BETWEEN THESE SITE PLANS AND THE ARCHITECTURAL PLANS, OR WHERE ARCHITECTURAL PLAN UTILITY CONNECTION POINTS DIFFER, THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE ENGINEER, IN WRITING, AND PRIOR TO CONSTRUCTION, RESOLVE SAME.
8. WATER SERVICE MATERIALS, BURIAL DEPTH, AND COVER REQUIREMENTS MUST BE SPECIFIED BY THE LOCAL UTILITY COMPANY. CONTRACTOR'S PRICE FOR WATER SERVICE MUST INCLUDE ALL FEES, COSTS AND APPURTENANCES REQUIRED BY THE UTILITY TO PROVIDE FULL AND COMPLETE WORKING SERVICE. CONTRACTOR MUST CONTACT THE APPLICABLE MUNICIPALITY TO CONFIRM THE PROPER WATER METER AND VAULT, PRIOR TO COMMENCING CONSTRUCTION.
9. ALL NEW UTILITIES/SERVICES, INCLUDING ELECTRIC, TELEPHONE, CABLE TV, ETC. ARE TO BE INSTALLED UNDERGROUND. ALL NEW UTILITIES/SERVICES MUST BE INSTALLED IN ACCORDANCE WITH THE UTILITY/SERVICE PROVIDER INSTALLATION SPECIFICATIONS AND STANDARDS.
10. SITE GRADING MUST BE PERFORMED IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS AND THE RECOMMENDATIONS SET FORTH IN THE GEOTECHNICAL REPORT REFERENCED IN THIS PLAN SET. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING AND REPLACING UNSUITABLE MATERIALS WITH SUITABLE MATERIALS AS SPECIFIED IN THE GEOTECHNICAL REPORT. ALL EXCAVATED OR FILLED AREAS MUST BE COMPACTED AS OUTLINED IN THE GEOTECHNICAL REPORT. MOISTURE CONTENT AT TIME OF PLACEMENT MUST BE SUBMITTED IN A COMPACTION REPORT PREPARED BY A QUALIFIED GEOTECHNICAL ENGINEER, REGISTERED WITH THE STATE WHERE THE WORK IS PERFORMED, VERIFYING THAT ALL FILLED AREAS AND SUBGRADE AREAS WITHIN THE BUILDING PAD AREA AND AREAS TO BE PAVED HAVE BEEN COMPACTED IN ACCORDANCE WITH THESE PLANS, SPECIFICATIONS AND THE RECOMMENDATIONS SET FORTH IN THE GEOTECHNICAL REPORT AND ALL APPLICABLE REQUIREMENTS, RULES, STATUTES, LAWS, ORDINANCES AND CODES. SUBBASE MATERIAL FOR SIDEWALKS, CURB, OR ASPHALT MUST BE FREE OF ORGANICS AND OTHER UNSUITABLE MATERIALS. SHOULD SUBBASE BE DEEMED UNSUITABLE BY OWNER/DEVELOPER, OR OWNER/DEVELOPER'S REPRESENTATIVE, SUBBASE IS TO BE REMOVED AND FILLED WITH APPROVED FILL MATERIAL COMPACTED AS DIRECTED BY THE GEOTECHNICAL REPORT. EARTHWORK ACTIVITIES INCLUDING, BUT NOT LIMITED TO, EXCAVATION, BACKFILL, AND COMPACTING MUST COMPLY WITH THE RECOMMENDATIONS IN THE GEOTECHNICAL REPORT AND ALL APPLICABLE REQUIREMENTS, RULES, STATUTES, LAWS, ORDINANCES AND CODES. EARTHWORK ACTIVITIES MUST COMPLY WITH THE STANDARD STATE DOT SPECIFICATIONS FOR ROADWAY CONSTRUCTION (LATEST EDITION) AND ANY AMENDMENTS OR REVISIONS THERETO.
11. ALL FILL, COMPACTION, AND BACKFILL MATERIALS REQUIRED FOR UTILITY INSTALLATION MUST BE AS PER THE RECOMMENDATIONS PROVIDED IN THE GEOTECHNICAL REPORT AND MUST BE COORDINATED WITH THE APPLICABLE UTILITY COMPANY SPECIFICATIONS. WHEN THE PROJECT DOES NOT HAVE GEOTECHNICAL RECOMMENDATIONS, FILL AND COMPACTION MUST, AT A MINIMUM, COMPLY WITH THE STATE DOT REQUIREMENTS AND SPECIFICATIONS AND CONSULTANT SHALL HAVE NO LIABILITY OR RESPONSIBILITY FOR OR AS RELATED TO FILL, COMPACTION AND BACKFILL. FURTHER, CONTRACTOR IS FULLY RESPONSIBLE FOR EARTHWORK BALANCE.
12. THE CONTRACTOR MUST COMPLY, TO THE FULLEST EXTENT, WITH THE LATEST OSHA STANDARDS AND REGULATIONS, AND/OR ANY OTHER AGENCY WITH JURISDICTION FOR EXCAVATION AND TRENCHING PROCEDURES. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE "MEANS AND METHODS" REQUIRED TO MEET THE INTENT AND PERFORMANCE CRITERIA OF OSHA, AS WELL AS ANY OTHER ENTITY THAT HAS JURISDICTION FOR EXCAVATION AND/OR TRENCHING PROCEDURES AND CONSULTANT SHALL HAVE NO RESPONSIBILITY FOR OR AS RELATED FOR OR AS RELATED TO EXCAVATION AND TRENCHING PROCEDURES.
13. PAVEMENT MUST BE SAW CUT IN STRAIGHT LINES, AND EXCEPT FOR EDGE OF BUTT JOINTS, MUST EXTEND TO THE FULL DEPTH OF THE EXISTING PAVEMENT. ALL DEBRIS FROM REMOVAL OPERATIONS MUST BE REMOVED FROM THE SITE AT THE TIME OF EXCAVATION. STOCKPILING OF DEBRIS WILL NOT BE PERMITTED.
14. THE TOPS OF EXISTING MANHOLES, INLET STRUCTURES, AND SANITARY CLEANOUT TOPS MUST BE ADJUSTED, AS NECESSARY, TO MATCH PROPOSED GRADES IN ACCORDANCE WITH ALL APPLICABLE STANDARDS, REQUIREMENTS, RULES, STATUTES, LAWS, ORDINANCES AND CODES.
15. DURING THE INSTALLATION OF SANITARY SEWER, STORM SEWER, AND ALL UTILITIES, THE CONTRACTOR MUST MAINTAIN A CONTEMPORANEOUS AND THOROUGH RECORD OF CONSTRUCTION TO IDENTIFY THE AS-INSTALLED LOCATIONS OF ALL UNDERGROUND INFRASTRUCTURE. THE CONTRACTOR MUST CAREFULLY NOTE ANY INSTALLATIONS THAT DEVIATE FROM THE INFORMATION CONTAINED IN THE UTILITY PLAN. THIS RECORD MUST BE KEPT ON A CLEAN COPY OF THE DRAINAGE OR UTILITY PLAN, WHICH CONTRACTOR MUST PROMPTLY PROVIDE TO THE OWNER AT THE COMPLETION OF WORK.
16. WHEN THE SITE IMPROVEMENT PLANS INVOLVE MULTIPLE BUILDINGS, SOME OF WHICH MAY BE BUILT AT A LATER DATE, THE CONTRACTOR MUST EXTEND ALL LINES, INCLUDING BUT NOT LIMITED TO STORM SEWER, SANITARY SEWER, UTILITIES, AND IRRIGATION LINE, TO A POINT AT LEAST FIVE (5) FEET BEYOND THE PAVED AREAS FOR WHICH THE CONTRACTOR IS RESPONSIBLE. CONTRACTOR MUST CAP ENDS AS APPROPRIATE, MARK LOCATIONS WITH A 2X4, AND MUST NOTE THE LOCATION OF ALL OF THE ABOVE ON A CLEAN COPY OF THE DRAINAGE OR UTILITY PLAN, WHICH CONTRACTOR MUST PROMPTLY PROVIDE TO THE OWNER UPON COMPLETION OF THE WORK.
17. THE CONTRACTOR IS FULLY RESPONSIBLE FOR VERIFICATION OF EXISTING TOPOGRAPHIC INFORMATION AND UTILITY INVERT ELEVATIONS PRIOR TO COMMENCING ANY CONSTRUCTION. CONTRACTOR MUST CONFIRM AND ENSURE 0.75% MINIMUM SLOPE AGAINST ALL ISLANDS, GUTTERS, AND CURBS; 1.0% ON ALL CONCRETE SURFACES; AND 1.5% MINIMUM ON ASPHALT (EXCEPT WHERE ADA REQUIREMENTS OR EXISTING TOPOGRAPHY LIMIT GRADES), TO PREVENT PONDING. CONTRACTOR MUST IMMEDIATELY IDENTIFY, IN WRITING TO THE ENGINEER, ANY DISCREPANCIES THAT MAY OR COULD AFFECT THE PUBLIC SAFETY, HEALTH OR GENERAL WELFARE, OR PROJECT COST. IF CONTRACTOR PROCEEDS WITH CONSTRUCTION WITHOUT PROVIDING PROPER NOTIFICATION, MUST BE AT THE CONTRACTOR'S OWN RISK AND, FURTHER, CONTRACTOR SHALL INDEMNIFY, DEFEND AND HOLD HARMLESS THE DESIGN ENGINEER FOR ANY DAMAGES, COSTS, INJURIES, ATTORNEY'S FEES AND THE LIKE WHICH RESULT FROM SAME.
18. PROPOSED TOP OF CURB ELEVATIONS ARE GENERALLY 6" ABOVE EXISTING LOCAL ASPHALT GRADE UNLESS OTHERWISE NOTED. FIELD ADJUST TO CREATE A MINIMUM OF .075% GUTTER GRADE ALONG CURB FACE. IT IS CONTRACTOR'S OBLIGATION TO ENSURE THAT DESIGN ENGINEER APPROVES FINAL CURBING CUT SHEETS PRIOR TO INSTALLATION OF SAME.
19. REFER TO THIS SHEET FOR ADDITIONAL NOTES.
20. IN THE EVENT OF DISCREPANCIES AND/OR CONFLICTS BETWEEN PLANS OR RELATIVE TO OTHER PLANS, THE SITE PLAN WILL TAKE PRECEDENCE AND CONTROL. CONTRACTOR MUST IMMEDIATELY NOTIFY THE DESIGN ENGINEER, IN WRITING, OF ANY DISCREPANCIES AND/OR CONFLICTS.
21. CONTRACTOR IS REQUIRED TO SECURE ALL NECESSARY AND/OR REQUIRED PERMITS AND APPROVALS FOR ALL OFF SITE MATERIAL SOURCES AND DISPOSAL FACILITIES. CONTRACTOR MUST SUPPLY A COPY OF APPROVALS TO ENGINEER AND OWNER PRIOR TO INITIATING ANY WORK.
22. WHERE RETAINING WALLS (WHETHER OR NOT THEY MEET THE JURISDICTIONAL DEFINITION) ARE IDENTIFIED ON PLANS, ELEVATIONS IDENTIFIED ARE FOR THE EXPOSED PORTION OF THE WALL. WALL FOOTINGS/FOUNDATION ELEVATIONS ARE NOT IDENTIFIED HEREIN AND ARE TO BE SET/DETERMINED BY THE CONTRACTOR BASED ON FINAL STRUCTURAL DESIGN SHOP DRAWINGS PREPARED BY THE APPROPRIATE PROFESSIONAL LICENSED IN THE STATE WHERE THE CONSTRUCTION OCCURS.
23. STORM DRAINAGE PIPE:UNLESS INDICATED OTHERWISE, ALL STORM SEWER PIPE MUST BE REINFORCED CONCRETE PIPE (RCP) CLASS III WITH SILT TIGHT JOINTS. WHEN HIGH-DENSITY POLYETHYLENE PIPE (HDPE) IS CALLED FOR ON THE PLANS, IT MUST CONFORM TO AASHTO M294 AND TYPE S (SMOOTH INTERIOR WITH ANGULAR CORRUGATIONS) WITH GASKET FOR SILT TIGHT JOINT. PVC PIPE FOR ROOF DRAIN CONNECTION MUST BE SDR 26 OR SCHEDULE 40 UNLESS INDICATED OTHERWISE.
24. UNLESS INDICATED OTHERWISE ON THE DRAWINGS, SANITARY SEWER PIPE SHALL BE AS FOLLOWS:
    - FOR PIPES LESS THAN 12 FT. DEEP: POLYVINYL CHLORIDE (PVC) SDR 35 PER ASTM D3034
    - FOR PIPES MORE THAN 12 FT. DEEP: POLYVINYL CHLORIDE (PVC) SDR 26 PER ASTM D3034
    - FOR PIPE WITHIN 10 FT. OF BUILDING, PIPE MATERIAL SHALL COMPLY WITH APPLICABLE BUILDING AND PLUMBING CODES. CONTRACTOR TO VERIFY WITH LOCAL OFFICIALS.
25. STORM AND SANITARY SEWER PIPE LENGTHS INDICATED ARE NOMINAL AND MEASURED CENTER OF INLET AND/OR MANHOLES STRUCTURE TO CENTER OF STRUCTURE.
26. STORMWATER ROOF DRAIN LOCATIONS ARE BASED ON PRELIMINARY ARCHITECTURAL PLANS. CONTRACTOR IS RESPONSIBLE TO AND FOR VERIFYING LOCATIONS OF SAME BASED ON FINAL ARCHITECTURAL PLANS.
27. SEWERS CROSSING STREAMS AND/OR LOCATION WITHIN 10 FEET OF THE STREAM EMBANKMENT, OR WHERE SITE CONDITIONS SO INDICATE, MUST BE CONSTRUCTED OF STEEL, REINFORCED CONCRETE, DUCTILE IRON OR OTHER SUITABLE MATERIAL. SEWERS CONVEYING SANITARY FLOW COMBINED SANITARY AND STORMWATER FLOW OR INDUSTRIAL FLOW MUST BE SEPARATED FROM WATER MAINS BY A DISTANCE OF AT LEAST 10 FEET HORIZONTALLY. IF SUCH LATERAL SEPARATION IS NOT POSSIBLE, THE PIPES MUST BE IN SEPARATE TRENCHES WITH THE SEWER AT LEAST 18 INCHES BELOW THE BOTTOM OF THE WATER MAIN, OR SUCH OTHER SEPARATION AS APPROVED BY THE GOVERNMENT AGENCY WITH JURISDICTION OVER SAME.
    - WHERE APPROPRIATE SEPARATION FROM A WATER MAIN IS NOT POSSIBLE, THE SEWER MUST BE ENCASED IN CONCRETE, OR CONSTRUCTED OF DUCTILE IRON PIPE USING MECHANICAL OR SLIP-ON JOINTS FOR A DISTANCE OF AT LEAST 10 FEET ON EITHER SIDE OF THE CROSSING. IN ADDITION, ONE FULL LENGTH OF SEWER PIPE SHOULD BE LOCATED SO BOTH JOINTS WILL BE AS FAR FROM THE WATER LINE AS POSSIBLE. WHERE A WATER MAIN CROSSES UNDER A SEWER, ADEQUATE STRUCTURAL SUPPORT FOR THE SEWER MUST BE PROVIDED.
28. WATER MAIN PIPING MUST BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS AND SPECIFICATIONS OF THE LOCAL WATER PURVEYOR. IN THE ABSENCE OF SUCH REQUIREMENTS, WATER MAIN PIPING MUST BE CEMENT-LINED DUCTILE IRON (DIP) MINIMUM CLASS 52 THICKNESS. ALL PIPE AND APPURTENANCES MUST COMPLY WITH THE APPLICABLE AWWA STANDARDS IN EFFECT AT THE TIME OF APPLICATION.
29. CONTRACTOR MUST ENSURE THAT ALL UTILITY TRENCHES LOCATED IN EXISTING PAVED ROADWAYS INCLUDING SEWER, WATER AND STORM SYSTEMS, MUST BE REPAIRED IN ACCORDANCE WITH REFERENCED MUNICIPAL, COUNTY AND/OR DOT DETAILS AS APPLICABLE. CONTRACTOR MUST COORDINATE INSPECTION AND APPROVAL OF COMPLETED WORK WITH THE AGENCY WITH JURISDICTION OVER SAME.
30. LOCATION OF PROPOSED UTILITY POLE RELOCATION IS AT THE SOLE DISCRETION OF UTILITY COMPANY.
31. CONSULTANT IS NEITHER LIABLE NOR RESPONSIBLE FOR ANY SUBSURFACE CONDITIONS AND FURTHER, SHALL HAVE NO LIABILITY FOR ANY HAZARDOUS MATERIALS, HAZARDOUS SUBSTANCES, OR POLLUTANTS ON, ABOUT OR UNDER THE PROPERTY.

GENERAL DEMOLITION NOTES

1. THIS PLAN REFERENCES DOCUMENTS AND INFORMATION BY:
   - "BOUNDARY & TOPOGRAPHIC SURVEY" - PREPARED BY CONTROL POINT ASSOCIATES, INC. DATED 09/05/19.
2. CONTRACTOR SHALL PERFORM ALL WORK IN ACCORDANCE WITH THE REQUIREMENTS OF THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970, (29 U.S.C. 651 et seq.), AS AMENDED AND ANY MODIFICATIONS, AMENDMENTS OR REVISIONS TO SAME.
3. BOHLER ENGINEERING HAS NO CONTRACTUAL, LEGAL, OR OTHER RESPONSIBILITY FOR JOB SITE SAFETY OR JOB SITE SUPERVISION, OR ANYTHING RELATED TO SAME.
4. THE DEMOLITION PLAN IS INTENDED TO PROVIDE GENERAL INFORMATION, ONLY, REGARDING ITEMS TO BE DEMOLISHED AND/OR REMOVED. THE CONTRACTOR MUST ALSO REVIEW THE OTHER SITE PLAN DRAWINGS AND INCLUDE IN DEMOLITION ACTIVITIES ALL INCIDENTAL WORK NECESSARY FOR THE CONSTRUCTION OF THE NEW SITE IMPROVEMENTS.
5. CONTRACTOR MUST RAISE ANY QUESTIONS CONCERNING THE ACCURACY OR INTENT OF THESE PLANS OR SPECIFICATIONS, CONCERNS REGARDING THE APPLICABLE SAFETY STANDARDS, OR THE SAFETY OF THE CONTRACTOR OR THIRD PARTIES IN PERFORMING THE WORK ON THIS PROJECT, WITH BOHLER ENGINEERING, IN WRITING, AND RESPONDED TO BY BOHLER, IN WRITING, PRIOR TO THE INITIATION OF ANY SITE ACTIVITY AND ANY DEMOLITION ACTIVITY. ALL DEMOLITION ACTIVITIES MUST BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THESE PLANS AND SPECIFICATIONS AND ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, RULES, REQUIREMENTS, STATUTES, ORDINANCES AND CODES.
6. PRIOR TO STARTING ANY DEMOLITION, CONTRACTOR IS RESPONSIBLE FOR/TO:
   - A. OBTAINING ALL REQUIRED PERMITS AND MAINTAINING THE SAME ON SITE FOR REVIEW BY THE ENGINEER AND OTHER PUBLIC AGENCIES WITH JURISDICTION THROUGHOUT THE DURATION OF THE PROJECT, SITE WORK, AND DEMOLITION WORK.
   - B. NOTIFYING, AT A MINIMUM, THE MUNICIPAL ENGINEER, DESIGN ENGINEER, AND LOCAL SOIL CONSERVATION DISTRICT, 72 HOURS PRIOR TO THE START OF WORK.
   - C. INSTALLING THE REQUIRED SOIL EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO SITE DISTURBANCE.
   - D. IN ACCORDANCE WITH STATE LAW, THE CONTRACTOR MUST CALL THE STATE ONE-CALL DAMAGE PROTECTION SYSTEM FOR UTILITY MARKOUT, IN ADVANCE OF ANY EXCAVATION.
   - E. LOCATING AND PROTECTING ALL UTILITIES AND SERVICES, INCLUDING BUT NOT LIMITED TO GAS, WATER, ELECTRIC, SANITARY AND STORM SEWER, TELEPHONE, CABLE, FIBER OPTIC CABLE, ETC. WITHIN AND ADJACENT TO THE LIMITS OF PROJECT ACTIVITIES. THE CONTRACTOR MUST USE AND COMPLY WITH THE REQUIREMENTS OF THE APPLICABLE UTILITY NOTIFICATION SYSTEM TO LOCATE ALL THE UNDERGROUND UTILITIES.
   - F. PROTECTING AND MAINTAINING IN OPERATION, ALL ACTIVE UTILITIES AND SYSTEMS THAT ARE NOT BEING REMOVED DURING ALL DEMOLITION ACTIVITIES.
   - G. ARRANGING FOR AND COORDINATING WITH THE APPLICABLE UTILITY SERVICE PROVIDER(S) FOR THE TEMPORARY OR PERMANENT TERMINATION OF SERVICE REQUIRED BY THE PROJECT PLANS AND SPECIFICATIONS. THE CONTRACTOR MUST PROVIDE THE UTILITY ENGINEER AND OWNER WRITTEN NOTIFICATION THAT THE EXISTING UTILITIES AND SERVICES HAVE BEEN TERMINATED AND ABANDONED IN ACCORDANCE WITH JURISDICTIONAL AND UTILITY COMPANY REQUIREMENTS.
   - H. COORDINATION WITH UTILITY COMPANIES REGARDING WORKING "OFF-PEAK" HOURS OR ON WEEKENDS AS MAY BE REQUIRED TO MINIMIZE THE IMPACT ON THE AFFECTED PARTIES. WORK REQUIRED TO BE DONE "OFF-PEAK" IS TO BE DONE AT NO ADDITIONAL COST TO THE OWNER.
   - I. IN THE EVENT THE CONTRACTOR DISCOVERS ANY HAZARDOUS MATERIAL, THE REMOVAL OF WHICH IS NOT ADDRESSED IN THE PROJECT PLANS AND SPECIFICATIONS, THE CONTRACTOR MUST IMMEDIATELY CEASE ALL WORK AND IMMEDIATELY NOTIFY THE OWNER AND ENGINEER OF THE DISCOVERY OF SUCH MATERIALS.
7. THE FIRM OR ENGINEER OF RECORD IS NOT RESPONSIBLE FOR JOB SITE SAFETY OR SUPERVISION. CONTRACTOR MUST PROCEED WITH THE DEMOLITION IN A SYSTEMATIC AND SAFE MANNER, FOLLOWING ALL THE OSHA REQUIREMENTS, TO ENSURE PUBLIC AND CONTRACTOR SAFETY.
8. THE CONTRACTOR MUST PROVIDE ALL "MEANS AND METHODS" NECESSARY TO PREVENT MOVEMENT, SETTLEMENT, OR COLLAPSE OF EXISTING STRUCTURES, AND ANY OTHER IMPROVEMENTS THAT ARE REMAINING ON OR OFF SITE. THE CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS OF DAMAGE TO ALL ITEMS THAT ARE TO REMAIN. CONTRACTOR MUST USE NEW MATERIAL FOR ALL REPAIRS. CONTRACTOR'S REPAIR MUST INCLUDE THE RESTORATION OF ANY ITEMS REPAIRED TO THE PRE-DEMOLITION CONDITION, OR BETTER. CONTRACTOR SHALL PERFORM ALL REPAIRS AT THE CONTRACTOR'S SOLE EXPENSE.
9. THE CONTRACTOR MUST NOT PERFORM ANY EARTH MOVEMENT ACTIVITIES, DEMOLITION OR REMOVAL OF FOUNDATION WALLS, FOOTINGS, OR OTHER MATERIALS WITHIN THE LIMITS OF DISTURBANCE UNLESS SAME IS IN STRICT ACCORDANCE AND CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS, AND/OR UNDER THE WRITTEN DIRECTION OF THE OWNER'S STRUCTURAL OR GEOTECHNICAL ENGINEER.
10. CONTRACTOR MUST BACKFILL ALL EXCAVATION RESULTING FROM, OR INCIDENTAL TO, DEMOLITION ACTIVITIES. BACKFILL MUST BE ACCOMPLISHED WITH APPROVED BACKFILL MATERIALS, AND MUST BE SUFFICIENTLY COMPACTED TO SUPPORT NEW IMPROVEMENTS AND PERFORMED IN COMPLIANCE WITH THE RECOMMENDATIONS AND GUIDANCE IN THE GEOTECHNICAL REPORT. BACKFILLING MUST OCCUR IMMEDIATELY AFTER DEMOLITION ACTIVITIES, AND MUST BE DONE SO AS TO PREVENT WATER ENTERING THE EXCAVATION. FINISHED SURFACES MUST BE GRADED TO PROMOTE POSITIVE DRAINAGE.
11. EXPLOSIVES MUST NOT BE USED WITHOUT PRIOR WRITTEN CONSENT OF BOTH THE OWNER AND ALL APPLICABLE GOVERNMENTAL AUTHORITIES. ALL THE REQUIRED PERMITS AND EXPLOSIVE CONTROL MEASURES THAT ARE REQUIRED BY THE FEDERAL, STATE, AND LOCAL GOVERNMENTS MUST BE IN PLACE PRIOR TO CONTRACTOR STARTING AN EXPLOSIVE PROGRAM AND/OR ANY DEMOLITION. THE CONTRACTOR IS ALSO RESPONSIBLE FOR ALL INSPECTION AND SEISMIC VIBRATION TESTING THAT IS REQUIRED TO MONITOR THE EFFECTS ON ALL LOCAL STRUCTURES.
12. CONTRACTOR MUST PROVIDE TRAFFIC CONTROL AND GENERALLY ACCEPTED SAFE PRACTICES IN CONFORMANCE WITH THE CURRENT FHWA "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD), AND THE FEDERAL, STATE, AND LOCAL REGULATIONS WHEN DEMOLITION RELATED ACTIVITIES IMPACT ROADWAYS AND/OR ROADWAY RIGHT-OF-WAY.
13. CONTRACTOR MUST CONDUCT DEMOLITION ACTIVITIES IN SUCH A MANNER TO ENSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, SIDEWALKS, WALKWAYS, AND OTHER ADJACENT FACILITIES. STREET CLOSURE PERMITS MUST BE RECEIVED FROM THE APPROPRIATE GOVERNMENTAL AUTHORITY PRIOR TO THE COMMENCEMENT OF ANY ROAD OPENING OR DEMOLITION ACTIVITIES IN OR ADJACENT TO THE RIGHT-OF-WAY.
14. DEMOLITION ACTIVITIES AND EQUIPMENT MUST NOT USE AREAS OUTSIDE THE DEFINED PROJECT LIMIT LINE, WITHOUT WRITTEN PERMISSION OF THE OWNER AND ALL GOVERNMENTAL AGENCIES WITH JURISDICTION.
15. THE CONTRACTOR MUST USE DUST CONTROL MEASURES TO LIMIT AIRBORNE DUST AND DIRT RISING AND SCATTERING IN THE AIR IN ACCORDANCE WITH FEDERAL, STATE, AND/OR LOCAL STANDARDS. AFTER THE DEMOLITION IS COMPLETE, CONTRACTOR MUST CLEAN ALL ADJACENT STRUCTURES AND IMPROVEMENTS TO REMOVE ALL DUST AND DEBRIS CAUSED BY THE DEMOLITION OPERATIONS. THE CONTRACTOR IS RESPONSIBLE FOR RETURNING ALL ADJACENT AREAS TO THEIR "PRE-DEMOLITION" CONDITION.
16. CONTRACTOR IS RESPONSIBLE TO SAFEGUARD THE SITE AS NECESSARY TO PERFORM THE DEMOLITION IN SUCH A MANNER AS TO PREVENT THE ENTRY OF UNAUTHORIZED PERSONS AT ANY TIME.
17. CONTRACTOR IS RESPONSIBLE FOR SITE JOB SAFETY, WHICH MUST INCLUDE, BUT NOT BE LIMITED TO, THE INSTALLATION AND MAINTENANCE OF BARRIERS, FENCING AND OTHER APPROPRIATE SAFETY ITEMS NECESSARY TO PROTECT THE PUBLIC FROM AREAS OF CONSTRUCTION AND CONSTRUCTION ACTIVITY.
18. THIS DEMOLITION PLAN IS INTENDED TO IDENTIFY THOSE EXISTING ITEMS/CONDITIONS WHICH ARE TO BE REMOVED. IT IS NOT INTENDED TO PROVIDE DIRECTION AS TO THE MEANS, METHODS, SEQUENCING, TECHNIQUES AND PROCEDURES TO BE USED TO ACCOMPLISH THAT WORK. ALL MEANS, METHODS, SEQUENCING, TECHNIQUES AND PROCEDURES TO BE USED MUST BE IN STRICT ACCORDANCE WITH ALL STATE, FEDERAL, LOCAL, AND JURISDICTIONAL REQUIREMENTS. THE CONTRACTOR MUST COMPLY WITH ALL OSHA AND OTHER SAFETY PRECAUTIONS NECESSARY TO PROVIDE A SAFE WORK SITE.
19. DEBRIS MUST NOT BE BURIED ON THE SUBJECT SITE. ALL DEMOLITION WASTES AND DEBRIS (SOLID WASTE) MUST BE DISPOSED OF IN ACCORDANCE WITH ALL MUNICIPAL, COUNTY, STATE, AND FEDERAL LAWS AND APPLICABLE CODES. THE CONTRACTOR MUST MAINTAIN RECORDS TO DEMONSTRATE PROPER DISPOSAL ACTIVITIES, TO BE PROMPTLY PROVIDED TO THE OWNER UPON REQUEST.
20. CONTRACTOR MUST MAINTAIN A RECORD SET OF PLANS UPON WHICH IS INDICATED THE LOCATION OF EXISTING UTILITIES THAT ARE CAPPED, ABANDONED IN PLACE, OR RELOCATED DUE TO DEMOLITION ACTIVITIES. THIS RECORD DOCUMENT MUST BE PREPARED IN A NEAT AND WORKMAN-LIKE MANNER, AND TURNED OVER TO THE OWNER/DEVELOPER UPON COMPLETION OF THE WORK.

ADA INSTRUCTIONS TO CONTRACTOR:

CONTRACTORS MUST EXERCISE APPROPRIATE CARE AND PRECISION IN CONSTRUCTION OF ADA (ACCESSIBLE) ACCESSIBLE COMPONENTS AND ACCESS ROUTES FOR THE SITE. THESE COMPONENTS, AS CONSTRUCTED, MUST COMPLY WITH ALL APPLICABLE STATE AND LOCAL ACCESSIBILITY LAWS AND REGULATIONS AND THE CURRENT ADA AND/OR STATE ARCHITECTURAL ACCESS BOARD STANDARDS AND REGULATIONS' BARRIER FREE ACCESS AND ANY MODIFICATIONS, REVISIONS OR UPDATES TO SAME. FINISHED SURFACES ALONG THE ACCESSIBLE ROUTE OF TRAVEL FROM PARKING SPACE, PUBLIC TRANSPORTATION, PEDESTRIAN ACCESS, INTER-BUILDING ACCESS, TO POINTS OF ACCESSIBLE BUILDING ENTRANCE/EXIT, MUST COMPLY WITH THESE ADA AND/OR ARCHITECTURAL ACCESS BOARD CODE REQUIREMENTS. THESE INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:

- PARKING SPACES AND PARKING AISLES - SLOPE SHALL NOT EXCEED 1:50 (1/4" PER FOOT OR NOMINALLY 2.0%) IN ANY DIRECTION.
- CURB RAMPS - SLOPE MUST NOT EXCEED 1:12 (8.3%) FOR A MAXIMUM OF SIX (6) FEET.
- LANDINGS - MUST BE PROVIDED AT EACH END OF RAMPS, MUST PROVIDE POSITIVE DRAINAGE, AND MUST NOT EXCEED 1:50 (1/4" PER FOOT OR NOMINALLY 2.0%) IN ANY DIRECTION.
- PATH OF TRAVEL ALONG ACCESSIBLE ROUTE - MUST PROVIDE A 36-INCH OR GREATER UNOBSTRUCTED WIDTH OF TRAVEL (CAR OVERHANGS AND/OR HANDRAILS CANNOT REDUCE THIS MINIMUM WIDTH). THE SLOPE MUST BE NO GREATER THAN 1:20 (5.0%) IN THE DIRECTION OF TRAVEL, AND MUST NOT EXCEED 1:50 (1/4" PER FOOT OR NOMINALLY 2.0%) IN CROSS SLOPE. WHERE PATH OF TRAVEL WILL BE GREATER THAN 1:20 (5.0%), ADA RAMP MUST BE ADHERED TO. A MAXIMUM SLOPE OF 1:12 (8.3%), FOR A MAXIMUM RISE OF 2.5 FEET, MUST BE PROVIDED. THE RAMP MUST HAVE ADA HAND RAILS AND "LEVEL" LANDINGS ON EACH END THAT ARE CROSS SLOPED NO MORE THAN 1:50 IN ANY DIRECTION (1/4" PER FOOT OR NOMINALLY 2.0%) FOR POSITIVE DRAINAGE.
- DOORWAYS - MUST HAVE A "LEVEL" LANDING AREA ON THE EXTERIOR SIDE OF THE DOOR THAT IS SLOPED AWAY FROM THE DOOR NO MORE THAN 1:50 (1/4" PER FOOT OR NOMINALLY 2.0%) FOR POSITIVE DRAINAGE. THIS LANDING AREA MUST BE NO LESS THAN 60 INCHES (5 FEET) LONG, EXCEPT WHERE OTHERWISE PERMITTED BY ADA STANDARDS FOR ALTERNATIVE DOORWAY OPENING CONDITIONS. (SEE ICC/ANSI A117.1-2003 AND OTHER REFERENCED INCORPORATED BY CODE.)
- WHEN THE PROPOSED CONSTRUCTION INVOLVES RECONSTRUCTION, MODIFICATION, REVISION OR EXTENSION OF OR TO ADA COMPONENTS FROM EXISTING DOORWAYS OR SURFACES, CONTRACTOR MUST VERIFY EXISTING ELEVATIONS SHOWN ON THE PLAN. NOTE THAT TABLE 405.2 OF THE DEPARTMENT OF JUSTICE'S ADA STANDARDS FOR ACCESSIBLE DESIGN ALLOWS FOR STEEPER RAMP SLOPES, IN RARE CIRCUMSTANCES. THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE DESIGN ENGINEER OF ANY DISCREPANCIES AND/OR FIELD CONDITIONS THAT DIFFER IN ANY WAY OR ANY RESPECT FROM WHAT IS SHOWN ON THE PLANS, IN WRITING, BEFORE COMMENCEMENT OF WORK. CONSTRUCTED IMPROVEMENTS MUST FALL WITHIN THE MAXIMUM AND MINIMUM LIMITATIONS IMPOSED BY THE BARRIER FREE REGULATIONS AND THE ADA REQUIREMENTS.
- THE CONTRACTOR MUST VERIFY THE SLOPES OF CONTRACTOR'S FORMS PRIOR TO POURING CONCRETE. IF ANY NON-CONFORMANCE IS OBSERVED OR EXISTS, CONTRACTOR MUST IMMEDIATELY NOTIFY THE ENGINEER PRIOR TO POURING CONCRETE. CONTRACTOR IS RESPONSIBLE FOR ALL COSTS TO REMOVE, REPAIR AND REPLACE NON-CONFORMING CONCRETE.

IT IS STRONGLY RECOMMENDED THAT THE CONTRACTOR REVIEW THE INTENDED CONSTRUCTION WITH THE LOCAL BUILDING CODE PRIOR TO COMMENCEMENT OF CONSTRUCTION.

TYPICAL ABBREVIATIONS

KEY	DESCRIPTION	KEY	DESCRIPTION
BC	BOTTOM CURB	PROP.	PROPOSED
TC	TOP CURB	TBR/R	TO BE REMOVED AND REPLACED
BOC	BACK OF CURB	TBR	TO BE REMOVED
BW	BOTTOM OF WALL GRADE	TPF	TREE PROTECTION FENCE
TW	TOP OF WALL	BLDG.	BUILDING
EXIST.	EXISTING	SF	SQUARE FEET
BM.	BENCHMARK	SMH	SEWER MANHOLE
EOP	EDGE OF PAVEMENT	DMH	DRAIN MANHOLE
℄	CENTERLINE	STM.	STORM
FF	FINISHED FLOOR	SAN.	SANITARY
V.I.F.	VERIFY IN FIELD	CONC.	CONCRETE
GC	GENERAL CONTRACTOR	ARCH.	ARCHITECTURAL
HP	HIGH POINT	DEP.	DEPRESSED
LP	LOW POINT	R	RADIUS
TYP.	TYPICAL	MIN.	MINIMUM
INT.	INTERSECTION	MAX.	MAXIMUM
PC.	POINT OF CURVATURE	No. / #	NUMBER
PT.	POINT OF TANGENCY	W.	WIDE
PI.	POINT OF INTERSECTION	DEC.	DECORATIVE
PVI.	POINT OF VERTICAL INTERSECTION	ELEV.	ELEVATION
STA.	STATION	UNG.	UNDERGROUND
GRT	GRATE	R.O.W.	RIGHT OF WAY
INV.	INVERT	LF	LINEAR FOOT
DIP	DUCTILE IRON PIPE	LOD	LIMIT OF DISTURBANCE
PVC	POLYVINYL CHLORIDE PIPE	LOW	LIMIT OF WORK
HDPE	HIGH DENSITY POLYETHYLENE PIPE	L.S.A.	LANDSCAPED AREA
RCP	REINFORCED CONCRETE PIPE	±	PLUS OR MINUS
S	SLOPE	°	DEGREE
ME	MEET EXISTING	Ø / DIA.	DIAMETER

TYPICAL LEGEND

EXISTING		PROPOSED
	PROPERTY LINE	
	SETBACK	
	EASEMENT	
	CURB	
D	STORM MANHOLE	D
S	SEWER MANHOLE	S
	CATCH BASIN	
WF#5	WETLAND FLAG	
	WETLAND LINE	
× 54.83	SPOT ELEVATION	53.52
× TC 54.58 G 53.78	TOP & BOTTOM OF CURB	TC=54.32 BC=53.82
53	CONTOUR	50
	FLOW ARROW	5%
	PAINTED ARROW	
	RIDGE LINE	
G G	GAS LINE	G G
T T	TELEPHONE LINE	T T
E E	ELECTRIC LINE	E E
W W	WATER LINE	W W
OH OH	OVERHEAD WIRE	OH OH
	STORM PIPE	
	SANITARY LINE	S S
10	PARKING COUNT	4
	SIGN	
	LIGHT POLE	
	GUIDE RAIL	
	UTILITY POLE	

REFER TO SITE PLAN FOR ZONING ANALYSIS TABLE AND LAND USE/ ZONING INFORMATION & NOTES

REFER TO SOIL EROSION CONTROL NOTES & DETAILS SHEET FOR TYPICAL EROSION NOTES AND DETAILS

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DATE:	12/06/19
CAD I.D.:	CT191016ss2

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

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CONNECTICUT LICENSE No. 30414

SHEET TITLE:

GENERAL NOTES SHEET

SHEET NUMBER:

C-102

REVISION 2 - 3/10/20

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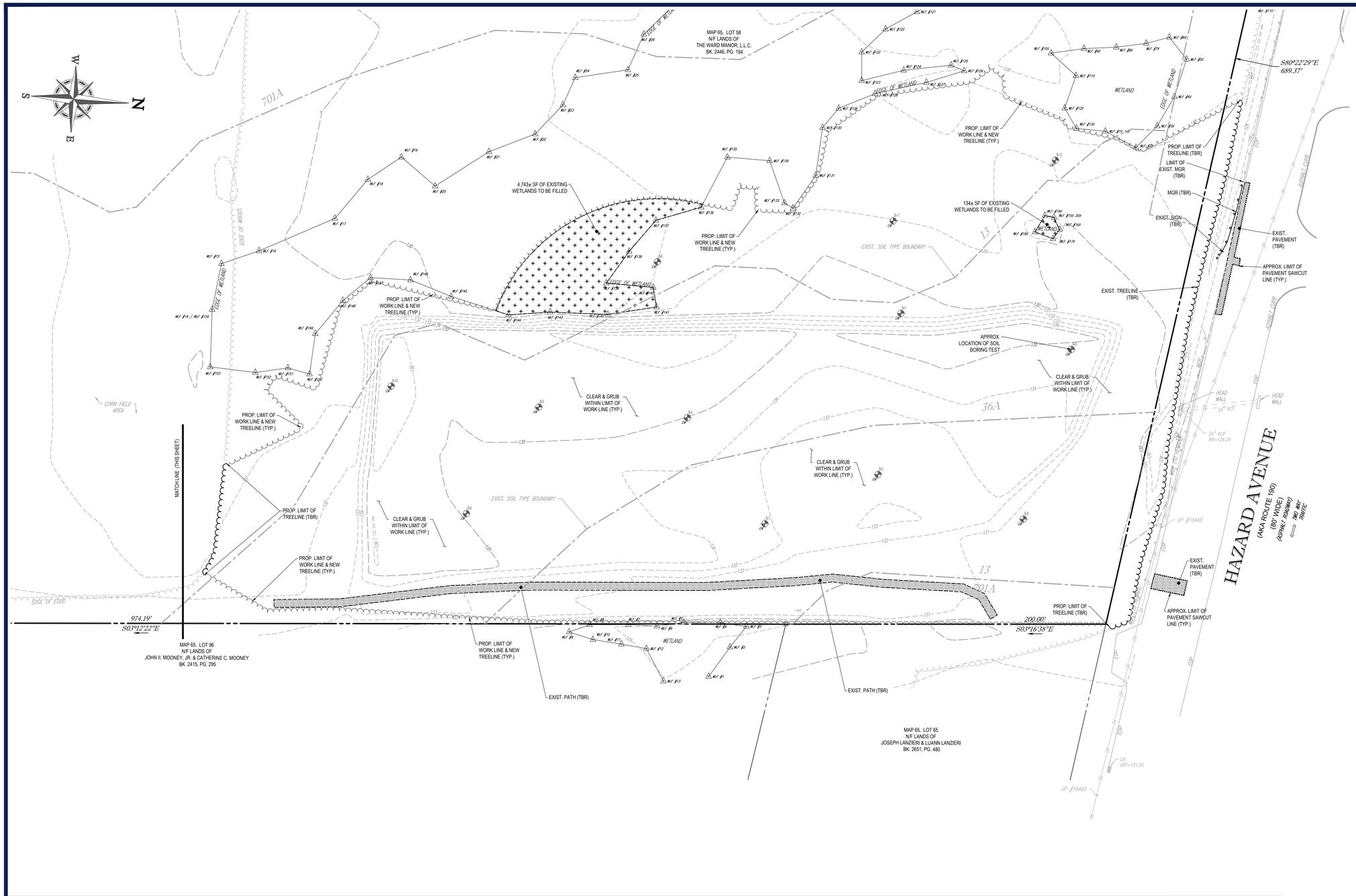

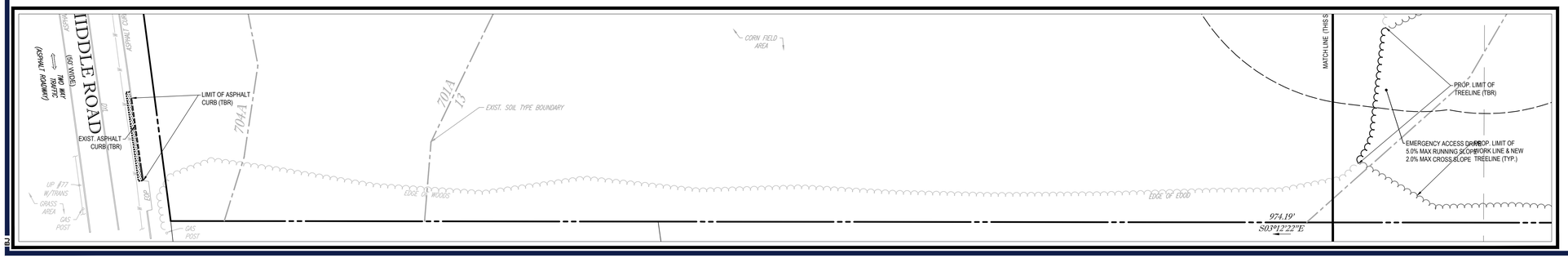

REFER TO GENERAL NOTES SHEET FOR DEMOLITION NOTES

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CAD I.D.:	CT191016es2

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

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CONNECTICUT LICENSE NO. 30414

SHEET TITLE:

DEMOLITION PLAN

SHEET NUMBER:

C-201

REVISION 2 - 3/10/20

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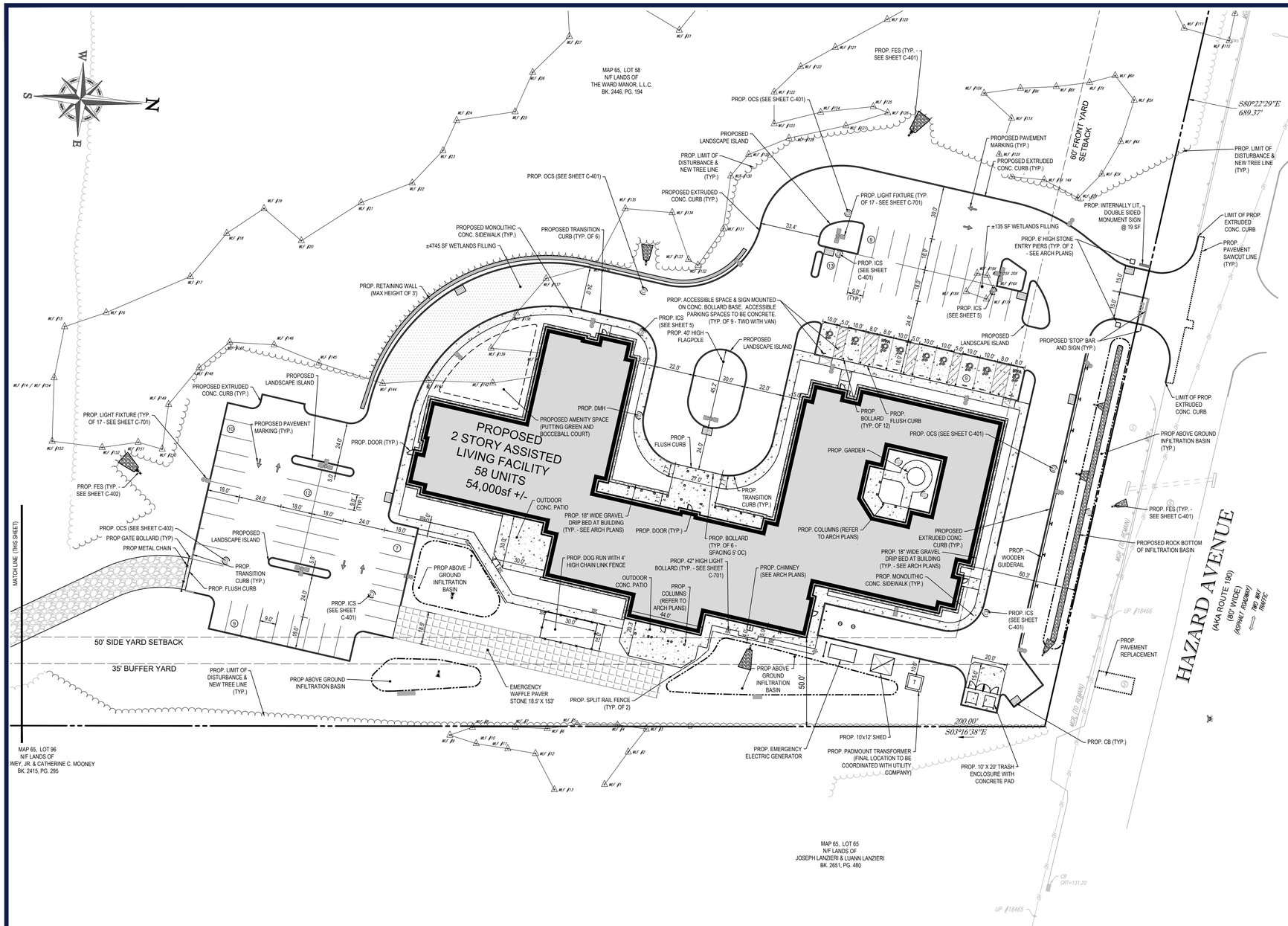


LAND USE / ZONING INFORMATION & NOTES

1. APPLICANT:
   KAPLAN DEVELOPMENT GROUP, LLC
   100 JERICHO QUADRANGLE, STE 142
   JERICHO, NY 11753
2. OWNER:
   WARD MANOR, LLC
   82 POTTER SCHOOL ROAD
   WILLINGTON, CT 06279
3. PARCEL:
   MAP 65, LOT 59
   118 HAZARD AVENUE
   TOWN OF ENFIELD
   HARTFORD COUNTY, CT

ZONING ANALYSIS TABLE

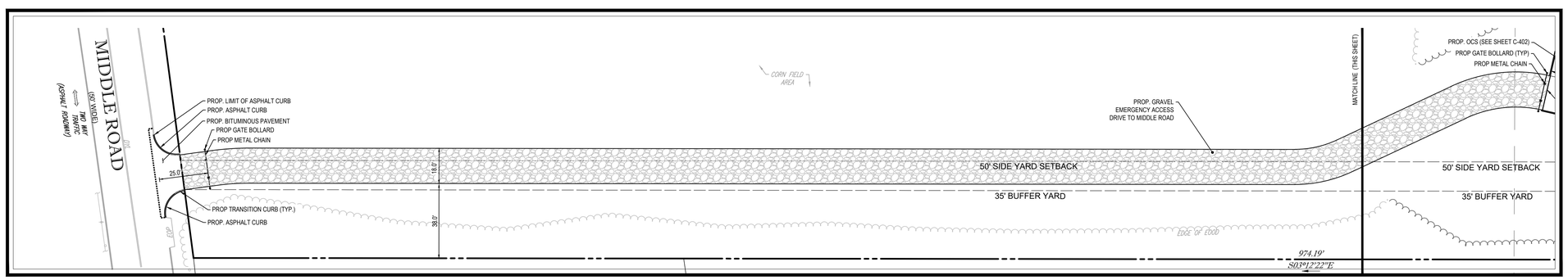
ZONING DISTRICT: B-P BUSINESS PROFESSIONAL	PERMITTED USES: ASSISTED LIVING FACILITY		
ZONE CRITERIA	REQUIRED	EXISTING	PROPOSED
MINIMUM LOT AREA	10 ACRES	19.435 Ac.	NO CHANGE
MINIMUM LOT WIDTH	N/A	N/A	N/A
MAX. BUILDING COVERAGE	25%	N/A	4%
MIN. FRONT SETBACK	60'	N/A	60.3'
MIN. SIDE SETBACK	50'	N/A	50.0'
MIN. REAR SETBACK	50'	N/A	452.5'
MAX. BUILDING HEIGHT	35'	N/A	2 STORIES (24')
MAX. IMPERVIOUS COVERAGE	60%	0%	100,443 SF / 846,574 SF = 11.86%
PARKING SPACES	TBD	0	69
ACCESSIBLE PARKING SPACES	9	0	9
PARKING CRITERIA	- ONE (1) SPACE FOR EVERY TWO (2) DWELLING UNITS. ONE (1) SPACE FOR EVERY TWO(2) EMPLOYEES. ONE (1) PARKING SPOT FOR SHUTTLE OR FACILITY VEHICLE.		
ACCESSIBLE PARKING CRITERIA (STANDARD SPACE- 8'x18' W/ 5' ACCESS AISLE) (VAN ACCESSIBLE SPACE-8'x18' W/ 8' ACCESS AISLE)	TOTAL PARKING 51 TO 75 = 3 ACCESSIBLE SPACES + 1 ACCESSIBLE SPACE FOR EACH ACCESSIBLE UNIT (6 UNITS) VAN ACCESSIBLE SPACES= 1 / 6 SPACES		

(N/A): NOT APLLICABLE

SIGN SUMMARY TABLE

TYPE	ALLOWED	EXISTING	PROPOSED
SITE SIGNAGE			
FREESTANDING I.D. SIGN	ONE (1) @ 50 SF MAX @ 20' HIGH	-	ONE (1) DOUBLE SIDED @ 19 SF 6' HIGH
BUILDING SIGNAGE			
FRONT WALL SIGN	ONE PER FRONTAGE MAX 32 SF	-	-
NON DRIVE THRU WALL SIGN		-	-
DRIVE THRU WALL SIGN		-	-
REAR WALL SIGN		-	-
TOTAL BUILDING SIGNAGE	82 SF	-	1 @ 38 SF

NOTE: ALL SIGNS AREAS ARE "BOXED" FOR CALCULATIONS



REFER TO GENERAL NOTES SHEET FOR NOTES

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PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

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CONNECTICUT LICENSE NO. 30414

SHEET TITLE:

SITE LAYOUT PLAN

SHEET NUMBER:

C-301

REVISION 2 - 3/10/20

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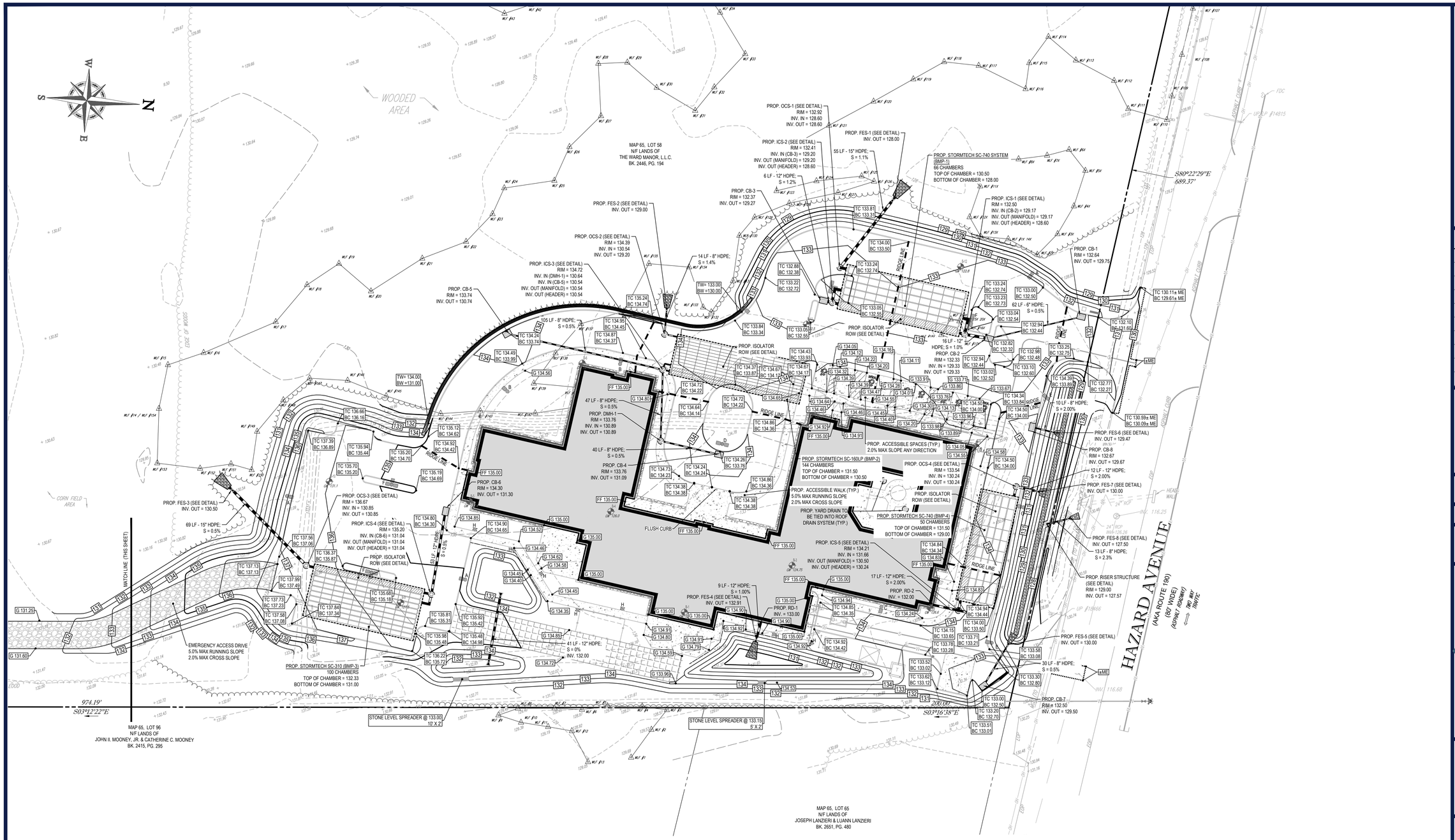

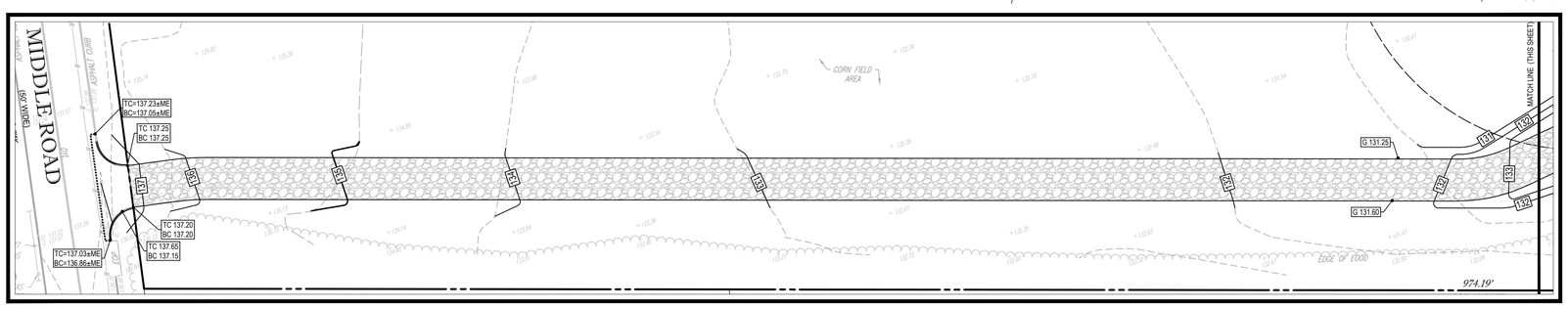

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REFER TO GENERAL NOTES SHEET FOR GRADING & UTILITY NOTES

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KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

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CONNECTICUT LICENSE No. 30414

SHEET TITLE:

GRADING & DRAINAGE PLAN

SHEET NUMBER:

C-401

REVISION 2 - 3/10/20

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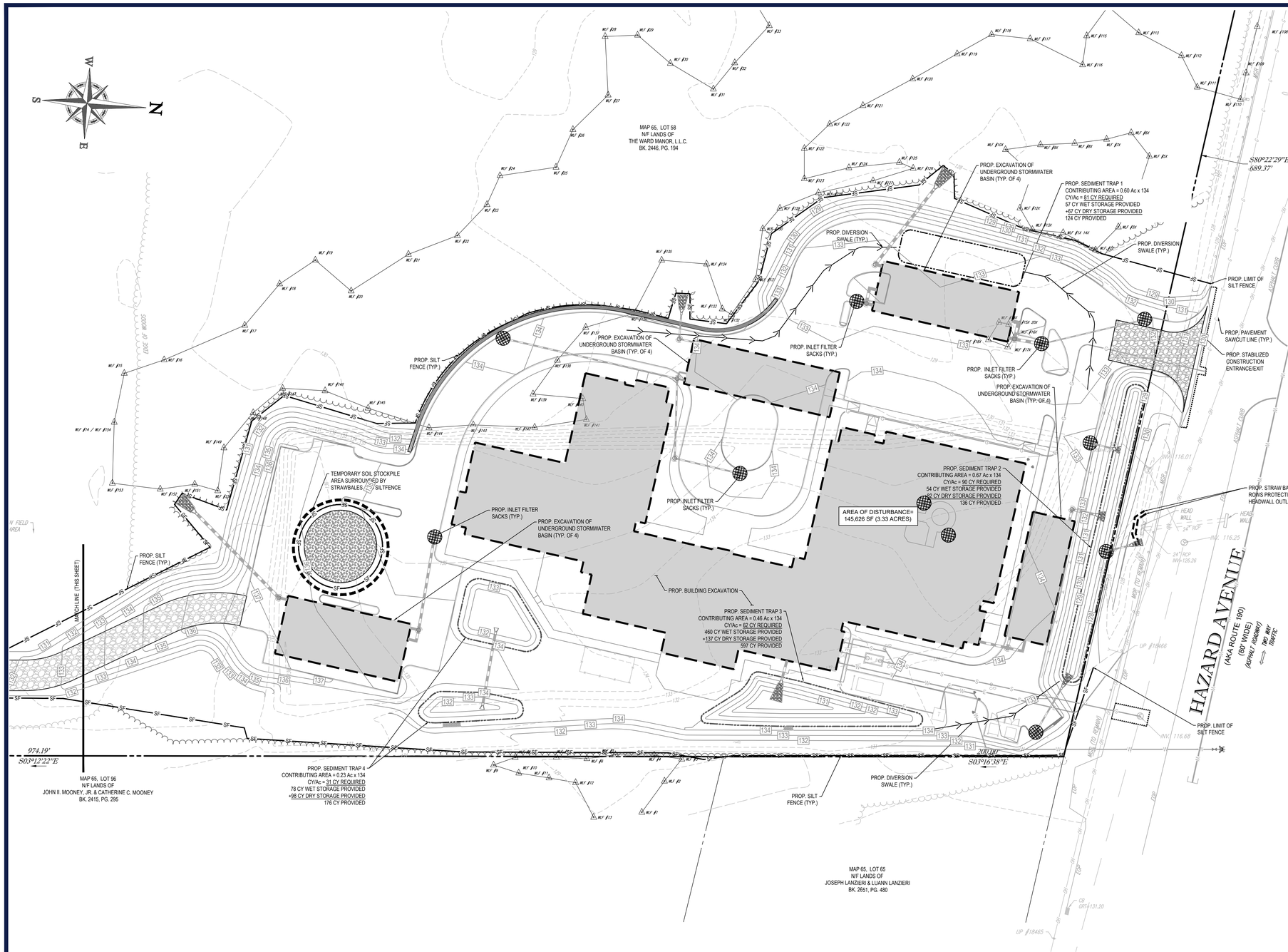

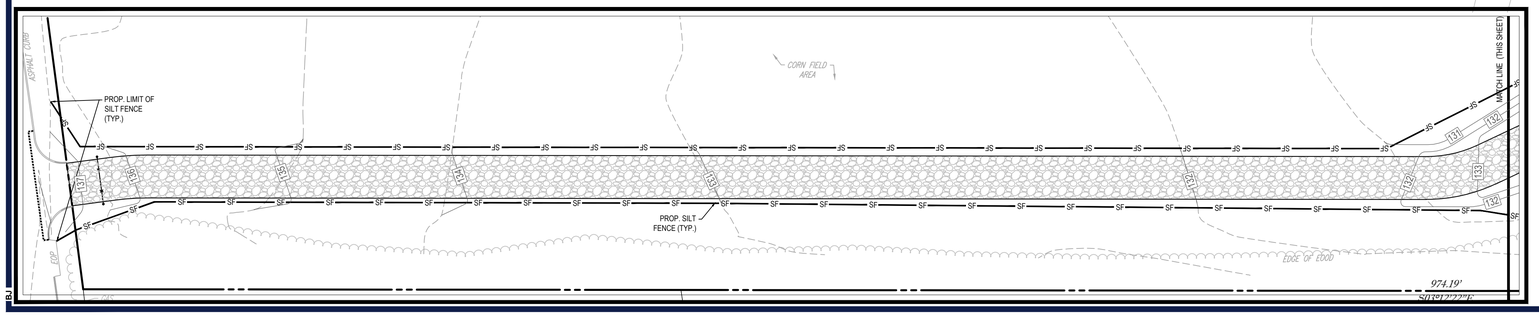

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REFER TO SOIL EROSION CONTROL NOTES & DETAIL SHEET FOR EROSION NOTES AND DETAILS

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PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

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CONNECTICUT LICENSE No. 30414

SHEET TITLE:

SOIL EROSION & SEDIMENT CONTROL PLAN

SHEET NUMBER:

C-402

REVISION 2 - 3/10/20

EROSION & SEDIMENT CONTROL NOTES

1. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE DONE AS SET FORTH IN THE MOST CURRENT STATE SEDIMENT AND EROSION CONTROL MANUAL.

2. THOSE AREAS UNDERGOING ACTUAL CONSTRUCTION WILL BE LEFT IN AN UNTREATED OR UNVEGETATED CONDITION FOR A MINIMUM TIME. AREAS SHALL BE PERMANENTLY STABILIZED WITHIN 15 DAYS OF FINAL GRADING AND TEMPORARILY STABILIZED WITHIN 30 DAYS OF INITIAL DISTURBANCE OF THE SOIL. IF THE DISTURBANCE IS WITHIN 100 FEET OF A STREAM OR POND, THE AREA SHALL BE STABILIZED WITHIN 7 DAYS OR PRIOR TO ANY STORM EVENT (THIS WOULD INCLUDE WETLANDS).

3. SEDIMENT BARRIERS (SILT FENCE, STRAW BARRIERS, ETC.) SHOULD BE INSTALLED PRIOR TO ANY SOIL DISTURBANCE OF THE CONTRIBUTING DRAINAGE AREA ABOVE THEM. MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL AREAS WITH SLOPES GREATER THAN 15% AFTER OCTOBER 1ST THE SAME APPLIES FOR ALL SLOPES GREATER THAN 8%.

4. INSTALL SILTATION BARRIER AT TOE OF SLOPE TO FILTER SILT FROM RUNOFF. SEE SILTATION BARRIER DETAILS FOR PROPER INSTALLATION. SILTATION BARRIER WILL REMAIN IN PLACE PER NOTE #5.

5. ALL EROSION CONTROL STRUCTURES WILL BE INSPECTED, REPLACED AND/OR REPAIRED EVERY 7 DAYS AND IMMEDIATELY FOLLOWING ANY SIGNIFICANT RAINFALL OR SNOW MELT OR WHEN NO LONGER SERVICEABLE DUE TO SEDIMENT ACCUMULATION OR DECOMPOSITION. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER. SEDIMENT CONTROL DEVICES SHALL REMAIN IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL AREAS UPSLOPE ARE STABILIZED BY TURF.

6. NO SLOPES, EITHER PERMANENT OR TEMPORARY, SHALL BE STEEPER THAN TWO TO ONE (2:1).

7. IF FINAL SEEDING OF THE DISTURBED AREAS IS NOT COMPLETED 45 DAYS PRIOR TO THE FIRST KILLING FROST, USE TEMPORARY MULCH (DORMANT SEEDING MAY BE ATTEMPTED AS WELL) TO PROTECT THE SITE AND DELAY SEEDING UNTIL THE NEXT RECOMMENDED SEEDING PERIOD.

8. TEMPORARY SEEDING OF DISTURBED AREAS THAT HAVE NOT BEEN FINAL GRADED SHALL BE COMPLETED 45 DAYS PRIOR TO THE FIRST KILLING FROST TO PROTECT FROM SPRING RUNOFF PROBLEMS.

9. DURING THE CONSTRUCTION PHASE, INTERCEPTED SEDIMENT WILL BE RETURNED TO THE SITE AND REGRADED ONTO OPEN AREAS.

10. REVEGETATION MEASURES WILL COMMENCE UPON COMPLETION OF CONSTRUCTION EXCEPT AS NOTED ABOVE. ALL DISTURBED AREAS NOT OTHERWISE STABILIZED WILL BE GRADED, SMOOTHED, AND PREPARED FOR FINAL SEEDING AS FOLLOWS:

10.1. SIX INCHES OF LOAM WILL BE SPREAD OVER DISTURBED AREAS AND SMOOTHED TO A UNIFORM SURFACE.

10.2. APPLY LIMESTONE AND FERTILIZER ACCORDING TO SOIL TEST. IF SOIL TESTING IS NOT FEASIBLE ON SMALL OR VARIABLE SITES, OR WHERE TIMING IS CRITICAL, FERTILIZER MAY BE APPLIED AT THE RATE OF 800 LB PER ACRE OR 18.4 LB PER 1,000 SF USING 10-20-20 OR EQUIVALENT. APPLY GROUND LIMESTONE (EQUIVALENT TO 50% CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF 3 TONS PER ACRE (138 LB PER1,000 SF).

10.3. FOLLOWING SEED BED PREPARATION, DITCHES AND BACK SLOPES WILL BE SEEDED TO A MIXTURE OF 47% CREEPING RED FESCUE, 5% REDTOP, AND 48% TALL FESCUE. THE LAWN AREAS WILL BE SEEDED TO A PREMIUM TURF MIXTURE OF 44% KENTUCKY BLUE-GRASS, 44% CREEPING RED FESCUE, AND 12% PERENNIAL RYEGRASS. SEEDING RATE IS 1.03 LBS PER 1,000 SF LAWN QUALITY SOD MAY BE SUBSTITUTED FOR SEED.

10.4. STRAW MULCH AT THE RATE OF 70-90 LBS PER 1,000 SF. A HYDRO-APPLICATION OF WOOD OR PAPER FIBER SHALL BE APPLIED FOLLOWING SEEDING. A SUITABLE BINDER SUCH AS CURASOL OR RMB PLUS WILL BE USED ON STRAW MULCH FOR WIND CONTROL.

11. ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED ONCE THE SITE IS STABILIZED.

12. WETLANDS WILL BE PROTECTED W/STRAW BALES AND/OR SILT FENCE INSTALLED AT THE EDGE OF THE WETLAND OR THE BOUNDARY OF WETLAND DISTURBANCE.

13. ALL AREAS WITHIN 100 FEET OF A FLAGGED WETLAND OR STREAM SHALL HAVE AN EXPOSURE WINDOW OF NOT MORE THAN 7 DAYS.

14. ALL AREAS WITHIN 100 FEET OF A FLAGGED WETLAND OR STREAM SHALL FOLLOW APPROPRIATE EROSION CONTROL MEASURES PRIOR TO EACH STORM IF NOT BEING ACTIVELY WORKED,

MULCH

LOCATION	MULCH	RATE (1000 SF)
PROTECT AREA	STRAW	100 POUNDS
WINDY AREA	SHREDDED OR CHOPPED CORNSTALKS STRAW (ANCHORED)*	185-275 POUNDS 100 POUNDS
MODERATE TO HIGH VELOCITY AREAS OR STEEP SLOPES GREATER THAN 3:1	JUTE MESH OR EXCELSIOR MAT	AS REQUIRED
GREATER THAN 3:1	(REFER TO GEOTECHNICAL REPORT FOR FINAL DESIGN REQUIREMENT)	

* A HYDRO-APPLICATION OF WOOD, OR PAPER FIBER MAY BE APPLIED FOLLOWING SEEDING. A SUITABLE BINDER SUCH AS CURASOL OR RMB PLUS SHALL BE USED ON STRAW MULCH FOR WIND CONTROL.

MULCH ANCHORING
ANCHOR MULCH WITH PEG AND TWINE (1 SQ. YD/BLOCK); MULCH NETTING (AS PER MANUFACTURER); WOOD CELLULOSE FIBER (750 LBS/ACRE); CHEMICAL TACK (AS PER MANUFACTURER'S SPECIFICATIONS); USE OF A SERRATED STRAIGHT DISK. WETTING FOR SMALL AREAS AND ROAD DITCHES MAY BE PERMITTED.

EROSION CONTROL NOTES DURING WINTER CONSTRUCTION

1. WINTER CONSTRUCTION PERIOD: NOVEMBER 1 THROUGH APRIL 15.

2. WINTER EXCAVATION AND EARTHWORK SHALL BE DONE SUCH THAT NO MORE THAN 1 ACRE OF THE SITE IS WITHOUT STABILIZATION AT ANY ONE TIME.

3. EXPOSED AREA SHOULD BE LIMITED TO THAT WHICH CAN BE MULCHED IN ONE DAY PRIOR TO ANY SNOW EVENT.

4. CONTINUATION OF EARTHWORK OPERATION ON ADDITIONAL AREAS SHALL NOT BEGIN UNTIL THE EXPOSED SOIL SURFACE ON THE AREA BEING WORKED HAS BEEN STABILIZED SUCH THAT NO LARGER AREA OF THE SITE IS WITHOUT EROSION CONTROL PROTECTION AS LISTED IN ITEM 2 ABOVE.

5. AN AREA SHALL BE CONSIDERED TO HAVE BEEN STABILIZED WHEN EXPOSED SURFACES HAVE BEEN EITHER MULCHED WITH STRAW OR straw AT A RATE OF 100 LB. PER 1,000 SQUARE FEET (WITH OR WITHOUT SEEDING) OR DORMANT SEEDED, MULCHED AND ADEQUATELY ANCHORED BY AN APPROVED ANCHORING TECHNIQUE.

6. BETWEEN THE DATES OF OCTOBER 15 AND APRIL 1ST, LOAM OR SEED WILL NOT BE REQUIRED. DURING PERIODS OF ABOVE FREEZING TEMPERATURES THE SLOPES SHALL BE FINE GRADED AND EITHER PROTECTED WITH MULCH OR TEMPORARILY SEEDED AND MULCHED UNTIL SUCH TIME AS THE FINAL TREATMENT CAN BE APPLIED. IF THE DATE IS AFTER NOVEMBER 1ST AND IF THE EXPOSED AREA HAS BEEN LOAMED, FINAL GRADED AND IS SMOOTH, THEN THE AREA MAY BE DORMANT SEEDED AT A RATE OF 200 - 300% HIGHER THAN SPECIFIED FOR PERMANENT SEED AND THEN MULCHED. IF CONSTRUCTION CONTINUES DURING FREEZING WEATHER, ALL EXPOSED AREAS SHALL BE CONTINUOUSLY GRADED BEFORE FREEZING AND THE SURFACE TEMPORARILY PROTECTED FROM EROSION BY THE APPLICATION OF MULCH. SLOPES SHALL NOT BE LEFT UNEXPOSED OVER THE WINTER OR ANY OTHER EXTENDED TIME OF WORK SUSPENSION UNLESS TREATED IN THE ABOVE MANNER. UNTIL SUCH TIME AS WEATHER CONDITIONS ALLOW DITCHES TO BE FINISHED WITH THE PERMANENT SURFACE TREATMENT, EROSION SHALL BE CONTROLLED BY THE INSTALLATION OF BALES OF straw OR STONE CHECK DAMS IN ACCORDANCE WITH THE STANDARD DETAILS.

7. MULCHING REQUIREMENTS:

7.1. BETWEEN THE DATES OF NOVEMBER 1ST AND APRIL 15TH ALL MULCH SHALL BE ANCHORED BY EITHER PEG LINE, MULCH NETTING OR WOOD CELLULOSE FIBER.

7.2. MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL DRAINAGE WAYS WITH A SLOPE GREATER THAN 3% FOR SLOPE EXPOSED TO DIRECT WINDS AND FOR ALL OTHER SLOPES GREATER THAN 8%.

7.3. MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL AREAS WITH SLOPES GREATER THAN 15% AFTER OCTOBER 1ST THE SAME APPLIES FOR ALL SLOPES GREATER THAN 8%.

8. AFTER NOVEMBER 1ST THE CONTRACTOR SHALL APPLY DORMANT SEEDING OR MULCH AND ANCHORING ON ALL BARE EARTH AT THE END OF EACH WORKING DAY.

9. DURING THE WINTER CONSTRUCTION PERIOD ALL SNOW SHALL BE REMOVED FROM AREAS OF SEEDING AND MULCHING PRIOR TO PLACEMENT.

10. STOCKPILING OF MATERIALS (DIRT, WOOD, CONSTRUCTION MATERIALS, ETC.) MUST REMAIN COVERED AT ALL TIMES TO MINIMIZE ANY DUST PROBLEMS THAT MAY OCCUR WITH ADJACENT PROPERTIES AND TO PROVIDE MAXIMUM PROTECTION AGAINST EROSION RUNOFF.

11. EXISTING CATCH BASIN STRUCTURES SHALL BE PROTECTED UNTIL SUCH TIME AS THEY ARE REMOVED.

CONSTRUCTION SEQUENCE

THE FOLLOWING CONSTRUCTION SEQUENCE IS RECOMMENDED:

-INSTALLATION OF STABILIZED CONSTRUCTION ENTRANCE/EXIT (AS SHOWN)

-INSTALLATION OF EROSION CONTROL BARRIER (STRAW BALES AND SILT FENCE) (AS SHOWN)

-INSTALLATION OF INLET PROTECTION IN STREET (AS SHOWN)

-DEMOLITION OF EXISTING SITE STRUCTURES (SEE DEMOLITION PLAN)

-DEMOLITION OF EXISTING SITE PAVEMENT AND AMENITIES (SEE DEMOLITION PLAN)

-CLEARING AND GRUBBING

-INSTALLATION OF TEMPORARY SWALES AND SEDIMENT BASINS

-EARTHWORK AND EXCAVATION/FILLING AS NECESSARY

-CONSTRUCTION OF UTILITIES

-STABILIZE PERMANENT LAWN AREAS AND SLOPES WITH TEMPORARY SEEDING

-INSTALLATION OF INLET PROTECTION OF ON-SITE UTILITIES (AS SHOWN)

-CONSTRUCTION OF BUILDINGS

-CONSTRUCTION OF ALL CURBING AND LANDSCAPE ISLANDS AS INDICATED ON THE PLANS

-SPREAD TOPSOIL ON SLOPED AREAS AND SEED AND MULCH

-FINAL GRADING OF ALL SLOPED AREAS

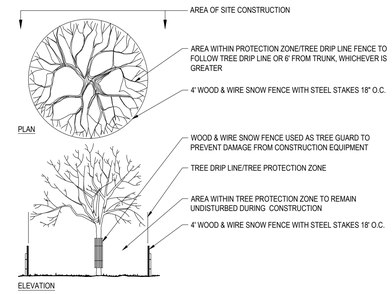
-PLACE 6" TOPSOIL ON SLOPES AFTER FINAL GRADING COMPLETED. FERTILIZE, SEED, AND MULCH SEED MIXTURE TO BE INSTALLED AS REQUIRED.

-REMOVAL OF THE TEMPORARY SEDIMENT BASINS

-PAVE PARKING LOT

-LANDSCAPING PER LANDSCAPING PLAN

-REMOVE EROSION CONTROLS AS DISTURBED AREAS BECOME STABILIZED TO 70% STABILIZATION OR GREATER.



TREE PROTECTION DURING CONSTRUCTION

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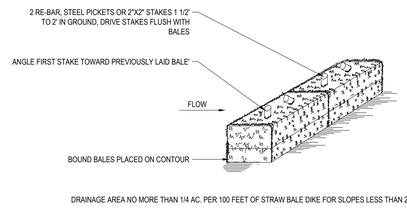

DRAINAGE AREA NO MORE THAN 1/4 AC. PER 100 FEET OF STRAW BALE DIKE FOR SLOPES LESS THAN 25%

NOTES:
1. BALES SHALL BE PLACED AT THE TOP OF A SLOPE OR ON THE CONTOUR AND IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.

2. EACH BALE SHALL BE PLACED SO THE BINDINGS ARE HORIZONTAL.

3. BALES SHALL BE SECURELY ANCHORED IN PLACE BY EITHER TWO STAKES OR RE-BARS DRIVEN THROUGH THE BALE. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE AT AN ANGLE TO FORCE THE BALES TOGETHER. STAKES SHALL BE DRIVEN FLUSH WITH THE BALE.

4. INSPECTION SHALL BE FREQUENT AND REPAIR REPLACEMENT SHALL BE PROMPTLY AS NEEDED.

5. BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

STRAW BALE DETAIL

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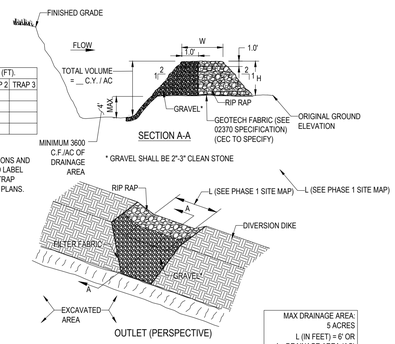


OUTLET DIM (FT).			
	TRAP 1	TRAP 2	TRAP 3
L			
H			
W			
V			

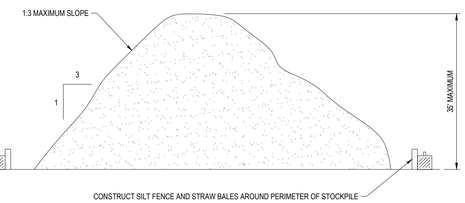
NOTE:
PROVIDE DIMENSIONS AND VOLUME FOR AND LABEL EACH SEDIMENT TRAP LOCATED ON THE PLANS. (SEE SITE MAPS)

MAX DRAINAGE AREA: 5 ACRES
L (IN FEET) = 6' OR 1 x DRAINAGE AREA (AC) WHICHEVER IS LARGER

CEC TO PROVIDE, IN THE 02370 SPECIFICATION, DRAINAGE AREAS AND VOLUME CALCULATIONS FOR ALL SEDIMENT TRAPS SHOWN ON THE SITE MAPS (AS STIPULATED IN THE GENERAL PERMIT, AGENCY REQUIREMENTS, OR STANDARD ENGINEERING PRACTICES) TO DEMONSTRATE ADEQUATE VOLUME TO RETAIN RUNOFF AND ALLOW SETTLEMENT OF SUSPENDED SOILS BEFORE DISCHARGING DOWNSTREAM.

TEMPORARY SEDIMENT TRAP

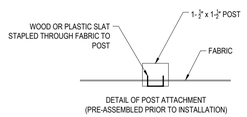
N.T.S.



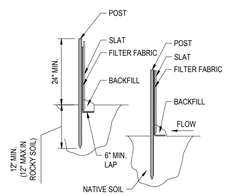
TEMPORARY STOCKPILE DETAIL

N.T.S.

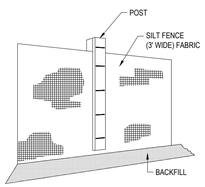
INSTALLATION:
1. EXCAVATE A 6"x 6" TRENCH ALONG THE LINE OF EROSION CONTROL OF THE SITE.
2. UNROLL SILTATION FENCE AND POSITION THE POSTS AGAINST THE BACK (DOWNSTREAM) WALL OF THE TRENCH (NET SIDE AWAY FROM FLOW DIRECTION).
3. DRIVE THE POST INTO THE GROUND UNTIL THE NETTING IS LAYING ACROSS THE TRENCH BOTTOM.
4. LAY THE TOE-IN FLAP OF THE FABRIC ONTO THE UNDISTURBED BOTTOM OF THE TRENCH, BACKFILL THE TRENCH AND TAMP THE SOIL. TOE-IN CAN ALSO BE ACCOMPLISHED BY LAYING FABRIC FLAP ON UNDISTURBED GROUND AND PILING & TAMP- ING FILL AT THE BASE.



DETAIL OF POST ATTACHMENT
(PRE-ASSEMBLED PRIOR TO INSTALLATION)



TOE-IN METHODS



PERSPECTIVE OF FENCE

TYP. SILTATION FENCE DETAIL

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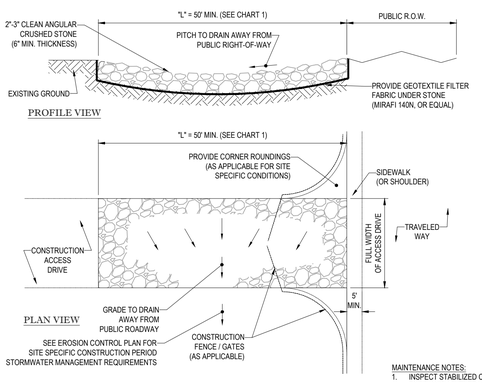

CHART 1

PERCENT SLOPE OF ROADWAY	LENGTH OF STONE REQUIRED	
	COARSE GRAINED SOILS	FINE GRAINED SOILS
0 TO 2%	50 FT	100 FT
2% TO 5%	100 FT	200FT
>5%	ENTIRE ENTRANCE STABILIZED WITH FABC BASE COURSE (1)	

(1) AS PRESCRIBED BY LOCAL ORDINANCE OR OTHER GOVERNING AUTHORITY.

MAINTENANCE NOTES:
1. INSPECT STABILIZED CONSTRUCTION ENTRANCE / ANTI-TRACKING PAD AND SEDIMENT DISPOSAL AREA WEEKLY OR AFTER EVERY MAJOR RAIN STORM EVENT.
2. WASH WATER (IF USED) SHALL BE DIRECTED TOWARD A SEDIMENT TRAP. SUFFICIENTLY SIZED FOR SPECIFIC SITE CONDITIONS.
3. EXCESSIVELY MUD-CLOGGED STONE SHALL BE REMOVED AND REPLACED, AS NEEDED.

STABILIZED CONSTRUCTION EXIT

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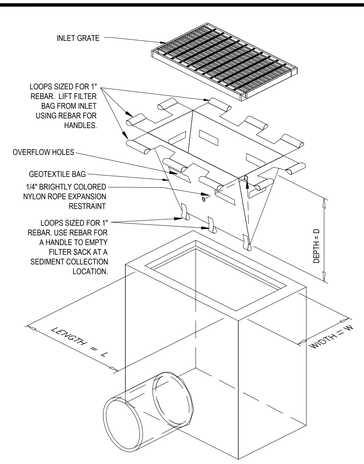
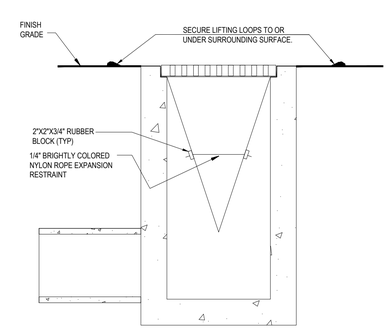


ISOMETRIC VIEW



SECTION VIEW
PROFILE VIEW OF INSTALLED FILTER SACK

LOW TO MODERATE FLOW GEOTEXTILE FABRIC SPECIFICATION TABLE		
PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D-4632	300 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	20 %
PUNCTURE	ASTM D-4833	120 LBS
MULLEN BURST	ASTM D-3786	800 PSI
TRAPEZOID TEAR	ASTM D-4533	120 LBS
UV RESISTANCE	ASTM D-4355	80 %
APPARENT OPENING SIZE	ASTM D-4751	40 US SIEVE
FLOW RATE	ASTM D-4491	40 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491	0.55 SEC -1

MODERATE TO HIGH FLOW GEOTEXTILE FABRIC SPECIFICATION TABLE		
PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D-4632	265 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	20 %
PUNCTURE	ASTM D-4833	135 LBS
MULLEN BURST	ASTM D-3786	420 PSI
TRAPEZOID TEAR	ASTM D-4533	45 LBS
UV RESISTANCE	ASTM D-4355	90 %
APPARENT OPENING SIZE	ASTM D-4751	20 US SIEVE
FLOW RATE	ASTM D-4491	200 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491	1.5 SEC -1

1. REMOVE TRAPPED SEDIMENT WHEN BRIGHTLY COLORED EXPANSION RESTRAINT CAN NO LONGER BE SEEN.
2. GEOTEXTILE SHALL BE A WOVEN POLYPROPYLENE FABRIC THAT MEETS OR EXCEEDS REQUIREMENTS IN THE SPECIFICATIONS TABLE.
3. PLACE AN OIL ADSORBENT PAD OR PILLOW OVER INLET GRATE WHEN OIL SPILLS ARE A CONCERN.
4. INSPECT PER REGULATORY REQUIREMENTS.
5. THE WIDTH, "W", OF THE FILTER SACK SHALL MATCH THE INSIDE WIDTH OF THE GRATED INLET BOX.
6. THE DEPTH, "D", OF THE FILTER SACK SHALL BE BETWEEN 18 INCHES AND 36 INCHES
7. THE LENGTH, "L", OF THE FILTER SACK SHALL MATCH THE INSIDE LENGTH OF THE GRATED INLET BOX.

DO NOT USE IN PAVED AREAS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

TO BE USED IN EXISTING RIGHT OF WAY

FILTER SACKS (GRATED INLETS)

N.T.S.

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PROJECT No.: CT191016
DRAWN BY: MLT / DE
CHECKED BY: JGB / PM
DATE: 12/06/19
CAD I.D.: CT191016ss2

PROJECT:
PROPOSED SITE PLAN DOCUMENTS
FOR
KAPLAN DEVELOPMENT GROUP LLC

PROPOSED DEVELOPMENT
118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

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JEFFREY G. BORD
30414
LICENSED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CONNECTICUT LICENSE No. 30414

SHEET TITLE:
SOIL EROSION & SEDIMENT CONTROL NOTES & DETAILS

SHEET NUMBER:
C-403

REVISION 2 - 3/10/20

P:\19\CT191016\DRAWINGS\PLAN SET\REV2\CT191016SS2----\LAYOUT: C-403 SOIL EROSION NOTES
BJ

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SHEET TITLE:

UTILITY PLAN

SHEET NUMBER:

C-501

REVISION 2 - 3/10/20

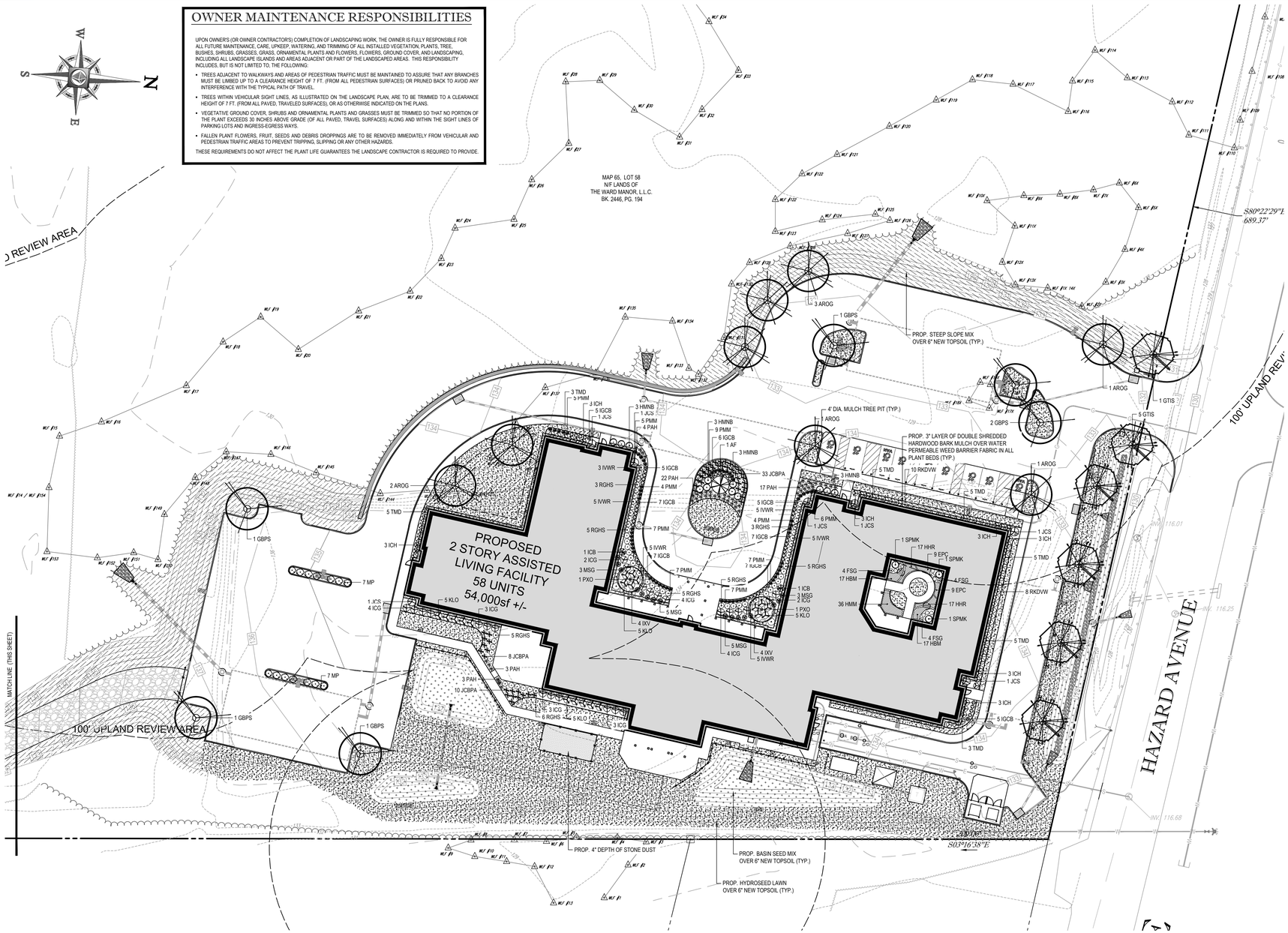
P:\19\CT191016\DRAWINGS\PLAN SET\SITE\V2\CT191016SS2----\LAYOUT: C-501 UTIL

OWNER MAINTENANCE RESPONSIBILITIES

UPON OWNER'S (OR OWNER CONTRACTOR'S) COMPLETION OF LANDSCAPING WORK, THE OWNER IS FULLY RESPONSIBLE FOR ALL FUTURE MAINTENANCE, CARE, UPKEEP, WATERING, AND TRIMMING OF ALL INSTALLED VEGETATION, PLANTS, TREE, BUSHES, SHRUBS, GRASSES, GRASS, ORNAMENTAL PLANTS AND FLOWERS, FLOWERS, GROUND COVER, AND LANDSCAPING, INCLUDING ALL LANDSCAPE ISLANDS AND AREAS ADJACENT OR PART OF THE LANDSCAPED AREAS. THIS RESPONSIBILITY INCLUDES, BUT IS NOT LIMITED TO, THE FOLLOWING:

- TREES ADJACENT TO WALKWAYS AND AREAS OF PEDESTRIAN TRAFFIC MUST BE MAINTAINED TO ASSURE THAT ANY BRANCHES MUST BE LIMBED UP TO A CLEARANCE HEIGHT OF 7 FT. (FROM ALL PEDESTRIAN SURFACES) OR PRUNED BACK TO AVOID ANY INTERFERENCE WITH THE TYPICAL PATH OF TRAVEL.
- TREES WITHIN VEHICULAR SIGHT LINES, AS ILLUSTRATED ON THE LANDSCAPE PLAN, ARE TO BE TRIMMED TO A CLEARANCE HEIGHT OF 7 FT. (FROM ALL PAVED, TRAVELED SURFACES), OR AS OTHERWISE INDICATED ON THE PLANS.
- VEGETATIVE GROUND COVER, SHRUBS AND ORNAMENTAL PLANTS AND GRASSES MUST BE TRIMMED SO THAT NO PORTION OF THE PLANT EXCEEDS 30 INCHES ABOVE GRADE (OF ALL PAVED, TRAVEL SURFACES) ALONG AND WITHIN THE SIGHT LINES OF PARKING LOTS AND INGRESS-EGRESS WAYS.
- FALLEN PLANT FLOWERS, FRUIT, SEEDS AND DEBRIS DROPPINGS ARE TO BE REMOVED IMMEDIATELY FROM VEHICULAR AND PEDESTRIAN TRAFFIC AREAS TO PREVENT TRIPPING, SLIPPING OR ANY OTHER HAZARDS.

THESE REQUIREMENTS DO NOT AFFECT THE PLANT LIFE GUARANTEES THE LANDSCAPE CONTRACTOR IS REQUIRED TO PROVIDE.

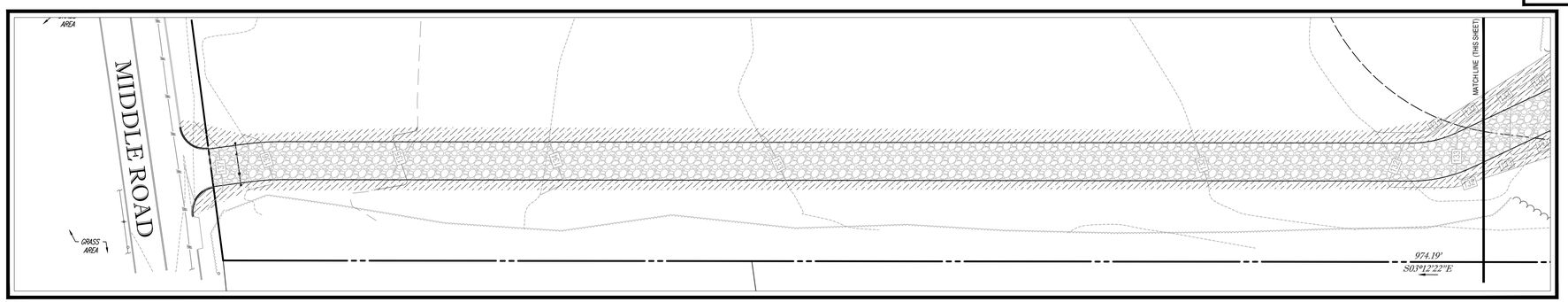


TOWN OF ENFIELD
LANDSCAPE REQUIREMENTS

SECTION	REQUIREMENTS	CALCULATIONS/PROPOSED
10.10.7 A	ii. ANY PARKING AREA DESIGNED OR INTENDED FOR USE BY MORE THAN 25 PARKING SPACES SHALL HAVE A MINIMUM LANDSCAPED SETBACK FROM THE RIGHT OF WAY OF 8 FEET iv. LANDSCAPED AREAS SHALL BE PLANTED WITH GROUND COVER AND ONE CANOPY TREE FOR EACH 50 FEET OF FRONTAGE vi. ANY PARKING AREA WITH AT LEAST 3 PARKING SPACES SHALL HAVE A MINIMUM LANDSCAPED SETBACK OF ALL PARKING SPACES/DRIVEWAYS/AISLES/ FROM ALL SIDE AND REAR PROPERTY LINES OF 10 FEET, AS WELL AS 10 FEET OF SEPARATION FROM BUIDLINGS	HAZARD AVENUE FRONTAGE: 258 LF REQUIRED: 258 LF/ 50= 5.1, OR 6TREES PROVIDED: 6 TREES
10.10.7 D	i. ANY PARKING AREA DESIGNED OR INTENDED FOR USE BY AT LEAST 3 PARKING SPACES SHALL HAVE A MINIMUM OF 15 PERCENT GROSS PARKING AREA IN LANDSCAPES AREAS. LANDSCAPE AREAS SHALL OCCUR IN INTERIOR OR END ISLANDS AT 10 FEET IN WIDTH. vi. LANDSCAPE AREAS SHALL HAVE A MINIMUM OF GROUNDCOVER AND 1 TREE PER 5 PARKING SPACES	NUMBER OR PROPOSED PARKING SPACES: 72 REQUIRED: 72 SPACES/ 5= 14.4, OR 15 TREES PROVIDED: 15 TREES
10.20 A	i. CANOPY TREES SHALL BE A MINIMUM OF TWO AND ONE-HALF (2 1/2) INCHES IN CALIPER. ii. EVERGREEN TREES SHALL BE A MINIMUM OF SIX (6) FEET IN HEIGHT. iii. UNDERSTORY TREES SHALL BE A MINIMUM OF ONE AND ONE-HALF (1 1/2) INCHES IN CALIPER. iv. DECIDUOUS SHRUBS SHALL BE A MINIMUM OF TWO AND ONE-HALF (1/2) FEET IN SPREAD. v. EVERGREEN SHRUBS SHALL BE A MINIMUM OF TWO AND ONE-HALF (1/2) FEET IN HEIGHT WITH A MATURE HEIGHT OF AT LEAST SIX (6) FEET	PROVIDED

LANDSCAPE SCHEDULE

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	CONT.
SHADE TREES					
AROG	8	ACER RUBRUM 'OCTOBER GLORY'	OCTOBER GLORY RED MAPLE	2 1/2-3" CAL.	B+B
GBPS	6	GINKGO BILOBA 'PRINCETON SENTRY'	PRINCETON SENTRY BRAND GINKGO	2 1/2-3" CAL.	B+B
GTIS	6	GLEDITSIA TRIACANTHOS VAR. INERMIS 'SHADEMASTER'	SHADEMASTER HONEYLOCUST	2 1/2-3" CAL.	B+B
SUBTOTAL:	20				
ORNAMENTAL TREES					
PXO	2	PRUNUS X 'OKAME'	OKAME CHERRY	2-2 1/2" CAL.	B+B
SUBTOTAL:	2				
EVERGREEN TREES					
AF	1	ABIES FRASERI	FRASER FIR	7-8'	B+B
SUBTOTAL:	1				
DECIDUOUS SHRUBS					
FSG	12	FORSYTHIA X INTERMEDIA 'GOLD TIDE'	COMPACT FORSYTHIA	18-24"	CONTAINER
HMNB	12	HYDRANGEA MACROPHYLLA 'NIKKO BLUE'	NIKKO BLUE HORTENSIA HYDRANGEA	18-24"	CONTAINER
IVWR	26	ILEX VERTICILLATA 'WINTER RED'	WINTER RED WINTERBERRY HOLLY	30-36"	CONTAINER
IXV	8	ILEX X VERTICILLATA 'HARVEST RED'	HARVEST RED WINTERBERRY	30-36"	CONTAINER
MP	14	MYRICA PENSYLVANICA	NORTHERN BAYBERRY	30-36"	B+B
SPMK	3	SYRINGA PATTULA 'MISS KIM'	MISS KIM LILAC	24-30"	B+B
SUBTOTAL:	75				
EVERGREEN SHRUBS					
ICB	2	ILEX X MESERVEAE 'CHINA BOY'	CHINA BOY HOLLY	30-36"	CONTAINER
ICG	25	ILEX X MESERVEAE 'CHINA GIRL'	CHINA GIRL HOLLY	30-36"	B+B
ICH	21	ILEX CRENATA 'HELLERI'	HELLERI JAPANESE HOLLY	15-18"	B+B
IGCB	54	ILEX GLABRA 'GEM BOX'	DWARF INKBERRY HOLLY	18-24"	CONTAINER
JCS	7	JUNIPERUS CHINENSIS 'SPARTAN'	SPARTAN JUNIPER	3-4'	B+B
KLO	20	KALMIA LATIFOLIA 'OLYMPIC FIRE'	OLYMPIC FIRE MOUNTAIN LAUREL	30-36"	B+B
PMM	61	PINUS MUGO MUGUS	DWARF MUGO PINE	18-24"	CONTAINER
RGHS	37	RHODODENDRON X GIRARD 'GIRARD HOT SHOT'	GIRARD HOT SHOT AZALEA	18-24"	CONTAINER
RKDVW	18	RHODODENDRON X KURUME 'DELAWARE VALLEY WHITE'	'DELAWARE VALLEY WHITE' AZALEA	18-24"	CONTAINER
TMD	31	TAXUS X MEDIA 'DENSIFORMIS'	DENSIFORMIS YEW	24-30"	B+B
SUBTOTAL:	276				
GROUND COVERS					
JCBPA	51	JUNIPERUS CONFERTA 'BLUE PACIFIC'	BLUE PACIFIC SHORE JUNIPER	15-18" SPRD.	CONTAINER
SUBTOTAL:	51				
PERENNIALS					
EPC	18	ECHINACEA PURPUREA 'CHEYENNE SPIRIT'	CONEFLOWER	2 GAL.	CONTAINER
HBM	34	HOSTA 'BLUEBERRY MUFFIN'	BLUEBERRY MUFFIN HOSTA	2 GAL.	CONTAINER
HHR	34	HEMEROCALLIS 'HAPPY RETURNS'	HAPPY RETURNS DAYLILY	2 GAL.	CONTAINER
HMM	36	HOSTA 'MINUTEMAN'	MINUTEMAN HOSTA	2 GAL.	CONTAINER
SUBTOTAL:	122				
ORNAMENTAL GRASSES					
MSG	16	MISCANTHUS SINENSIS 'GRACILLIMUS'	MAIDEN GRASS	2 GAL.	CONTAINER
PAH	49	PENNISETUM ALOPECUROIDES 'HAMELN'	DWARF FOUNTAIN GRASS	2 GAL.	CONTAINER
SUBTOTAL:	65				



SEED MIX KEY

- PROPOSED HYDROSEED
- PROPOSED STEEP SLOPE MIX
- PROPOSED BASIN SEED MIX

THIS PLAN TO BE UTILIZED FOR LANDSCAPE PURPOSES ONLY

REFER LANDSCAPE NOTES & DETAILS SHEET FOR LANDSCAPE NOTES AND DETAILS

30 15 7.5 0 30
1"= 30'

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REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	1/20/20	ART COMMENTS	MLT / JGB
2	03/10/20	EMERGENCY ACCESS	MLT / JGB

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PROJECT No.:	CT191016
DRAWN BY:	MLT / DE
CHECKED BY:	JGB / PM
DATE:	12/06/19
CAD I.D.:	CT191016ss2

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

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CONNECTICUT No. 1359

SHEET TITLE:

LANDSCAPE PLAN

SHEET NUMBER:

C-601

REVISION 2 - 3/10/20

P:\19\CT191016\DRAWINGS\PLAN SETS\REVOX-LANDSCAPE----\LAYOUT: L-1 LAND

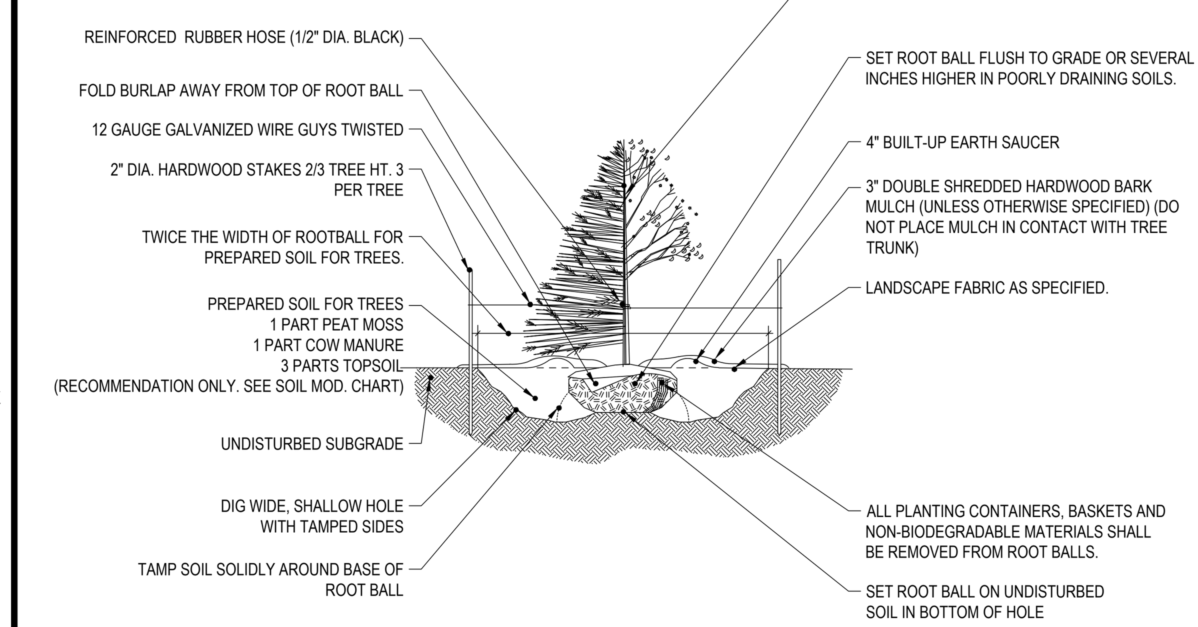
LANDSCAPE SPECIFICATIONS

1. SCOPE OF WORK:
   1.1. THE LANDSCAPE CONTRACTOR SHALL BE REQUIRED TO PERFORM ALL CLEARING, FINISHED GRADING, SOIL PREPARATION, PERMANENT SEEDING OR SODDING, PLANTING AND MULCHING INCLUDING ALL LABOR, MATERIALS, TOOLS AND EQUIPMENT NECESSARY FOR THE COMPLETION OF THIS PROJECT, UNLESS OTHERWISE CONTRACTED BY THE GENERAL CONTRACTOR.
2. MATERIALS
   2.1. GENERAL - ALL HARDSCAPE MATERIALS SHALL MEET OR EXCEED SPECIFICATIONS AS OUTLINED IN THE STATE DEPARTMENT OF TRANSPORTATION'S SPECIFICATIONS.
   2.2. TOPSOIL - NATURAL, FRIABLE, LOAMY SILT SOIL HAVING AN ORGANIC CONTENT NOT LESS THAN 5%, A PH RANGE BETWEEN 4.5-7.0. IT SHALL BE FREE OF DEBRIS, ROCKS LARGER THAN ONE INCH (1"), WOOD, ROOTS, VEGETABLE MATTER AND CLAY CLODS.
   2.3. LAWN - ALL DISTURBED AREAS ARE TO BE TREATED WITH A MINIMUM 6" THICK LAYER OF TOPSOIL, OR AS DIRECTED BY THE LOCAL ORDINANCE OR CLIENT, AND SEEDED OR SODDED IN ACCORDANCE WITH THE PERMANENT STABILIZATION METHODS INDICATED ON THE LANDSCAPE PLAN
   2.3.1. LAWN SEED MIXTURE SHALL BE FRESH, CLEAN NEW CROP SEED.
   2.3.2. SOD SHALL BE STRONGLY ROOTED, WEED AND DISEASE/PEST FREE WITH A UNIFORM THICKNESS. SOD INSTALLED ON SLOPES GREATER THAN 4:1 SHALL BE PEGGED TO HOLD SOD IN PLACE.
   2.4. MULCH - ALL PLANTING BEDS SHALL BE MULCHED WITH A 3" THICK LAYER OF DOUBLE SHREDDED HARDWOOD BARK MULCH, UNLESS OTHERWISE STATED ON THE LANDSCAPE PLAN AND/OR LANDSCAPE PLAN NOTES /DETAILS.
   2.5. FERTILIZER
   2.5.1. FERTILIZER SHALL BE DELIVERED TO THE SITE MIXED AS SPECIFIED IN THE ORIGINAL UNOPENED STANDARD BAGS SHOWING WEIGHT, ANALYSIS AND NAME OF MANUFACTURER. FERTILIZER SHALL BE STORED IN A WEATHERPROOF PLACE SO THAT IT CAN BE KEPT DRY PRIOR TO USE.
   2.5.2. FOR THE PURPOSE OF BIDDING, ASSUME THAT FERTILIZER SHALL BE 10% NITROGEN, 6% PHOSPHORUS AND 4% POTASSIUM BY WEIGHT. A FERTILIZER SHOULD NOT BE SELECTED WITHOUT A SOIL TEST PERFORMED BY A CERTIFIED SOIL LABORATORY.
   2.6. PLANT MATERIAL
   2.6.1. ALL PLANTS SHALL IN ALL CASES CONFORM TO THE REQUIREMENTS OF THE "AMERICAN STANDARD FOR NURSERY STOCK" (ANSI Z60.1), LATEST EDITION, AS PUBLISHED BY THE AMERICAN NURSERY & LANDSCAPE ASSOCIATION (FORMERLY THE AMERICAN ASSOCIATION OF NURSERYMEN).
   2.6.2. IN ALL CASES, BOTANICAL NAMES SHALL TAKE PRECEDENCE OVER COMMON NAMES FOR ANY AND ALL PLANT MATERIAL.
   2.6.3. PLANTS SHALL BE LEGIBLY TAGGED WITH THE PROPER NAME AND SIZE. TAGS ARE TO REMAIN ON AT LEAST ONE PLANT OF EACH SPECIES FOR VERIFICATION PURPOSES DURING THE FINAL INSPECTION.
   2.6.4. TREES WITH ABRASION OF THE BARK, SUN SCALDS, DISFIGURATION OR FRESH CUTS OF LIMBS OVER 1¼", WHICH HAVE NOT BEEN COMPLETELY CALLUSED, SHALL BE REJECTED. PLANTS SHALL NOT BE BOUND WITH WIRE OR ROPE AT ANY TIME SO AS TO DAMAGE THE BARK OR BREAK BRANCHES.
   2.6.5. ALL PLANTS SHALL BE TYPICAL OF THEIR SPECIES OR VARIETY AND SHALL HAVE A NORMAL HABIT OF GROWTH: WELL DEVELOPED BRANCHES, DENSELY FOLIATED, VIGOROUS ROOT SYSTEMS AND BE FREE OF DISEASE, INSECTS, PESTS, EGGS OR LARVAE.
   2.6.6. CALIPER MEASUREMENTS OF NURSERY GROWN TREES SHALL BE TAKEN AT A POINT ON THE TRUNK SIX INCHES (6") ABOVE THE NATURAL GRADE FOR TREES UP TO AND INCLUDING A FOUR INCH (4") CALIPER SIZE. IF THE CALIPER AT SIX INCHES (6") ABOVE THE GROUND EXCEEDS FOUR INCHES (4") IN CALIPER, THE CALIPER SHOULD BE MEASURED AT A POINT 12" ABOVE THE NATURAL GRADE.
   2.6.7. SHRUBS SHALL BE MEASURED TO THE AVERAGE HEIGHT OR SPREAD OF THE SHRUB, AND NOT TO THE LONGEST BRANCH.
   2.6.8. TREES AND SHRUBS SHALL BE HANDLED WITH CARE BY THE ROOT BALL.
3. GENERAL WORK PROCEDURES
   3.1. CONTRACTOR TO UTILIZE WORKMANLIKE INDUSTRY STANDARDS IN PERFORMING ALL LANDSCAPE CONSTRUCTION. THE SITE IS TO BE LEFT IN A CLEAN STATE AT THE END OF EACH WORKDAY. ALL DEBRIS, MATERIALS AND TOOLS SHALL BE PROPERLY STORED, STOCKPILED OR DISPOSED OF.
   3.2. WASTE MATERIALS AND DEBRIS SHALL BE COMPLETELY DISPOSED OF AT THE CONTRACTOR'S EXPENSE. DEBRIS SHALL NOT BE BURIED, INCLUDING ORGANIC MATERIALS, BUT SHALL BE REMOVED COMPLETELY FROM THE SITE.
4. SITE PREPARATIONS
   4.1. BEFORE AND DURING PRELIMINARY GRADING AND FINISHED GRADING, ALL WEEDS AND GRASSES SHALL BE DUG OUT BY THE ROOTS AND DISPOSED OF IN ACCORDANCE WITH GENERAL WORK PROCEDURES OUTLINED HEREIN.
   4.2. ALL EXISTING TREES TO REMAIN SHALL BE PRUNED TO REMOVE ANY DAMAGED BRANCHES. THE ENTIRE LIMB OF ANY DAMAGED BRANCH SHALL BE CUT OFF AT THE BRANCH COLLAR. CONTRACTOR SHALL ENSURE THAT CUTS ARE SMOOTH AND STRAIGHT. ANY EXPOSED ROOTS SHALL BE CUT BACK WITH CLEAN, SHARP TOOLS AND TOPSOIL SHALL BE PLACED AROUND THE REMAINDER OF THE ROOTS. EXISTING TREES SHALL BE MONITORED ON A REGULAR BASIS FOR ADDITIONAL ROOT OR BRANCH DAMAGE AS A RESULT OF CONSTRUCTION. ROOTS SHALL NOT BE LEFT EXPOSED FOR MORE THAN ONE (1) DAY. CONTRACTOR SHALL WATER EXISTING TREES AS NEEDED TO PREVENT SHOCK OR DECLINE.
   4.3. CONTRACTOR SHALL ARRANGE TO HAVE A UTILITY STAKE-OUT TO LOCATE ALL UNDERGROUND UTILITIES PRIOR TO INSTALLATION OF ANY LANDSCAPE MATERIAL. UTILITY COMPANIES SHALL BE CONTACTED THREE (3) DAYS PRIOR TO THE BEGINNING OF WORK.
5. TREE PROTECTION
   5.1. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING TREES TO REMAIN. A TREE PROTECTION ZONE SHALL BE ESTABLISHED AT THE DRIP LINE OR AT THE LIMIT OF CONSTRUCTION DISTURBANCE, WHICHEVER IS GREATER. LOCAL STANDARDS THAT MAY REQUIRE A MORE STRICT TREE PROTECTION ZONE SHALL BE HONORED.
   5.2. A FORTY-EIGHT INCH (48") HIGH WOODEN SNOW FENCE OR ORANGE COLORED HIGH-DENSITY 'VISI-FENCE', OR APPROVED EQUAL, MOUNTED ON STEEL POSTS SHALL BE PLACED ALONG THE BOUNDARY OF THE TREE PROTECTION ZONE. POSTS SHALL BE LOCATED AT A MAXIMUM OF EIGHT FEET (8') ON CENTER OR AS INDICATED WITHIN THE TREE PROTECTION DETAIL.
   5.3. WHEN THE TREE PROTECTION FENCING HAS BEEN INSTALLED, IT SHALL BE INSPECTED BY THE APPROVING AGENCY PRIOR TO DEMOLITION, GRADING, TREE CLEARING OR ANY OTHER CONSTRUCTION. THE FENCING ALONG THE TREE PROTECTION ZONE SHALL BE REGULARLY INSPECTED BY THE LANDSCAPE CONTRACTOR AND MAINTAINED UNTIL ALL CONSTRUCTION ACTIVITY HAS BEEN COMPLETED.
   5.4. AT NO TIME SHALL MACHINERY, DEBRIS, FALLEN TREES OR OTHER MATERIALS BE PLACED, STOCKPILED OR LEFT STANDING IN THE TREE PROTECTION ZONE.
6. SOIL MODIFICATIONS
   6.1. CONTRACTOR SHALL ATTAIN A SOIL TEST FOR ALL AREAS OF THE SITE PRIOR TO CONDUCTING ANY PLANTING. SOIL TESTS SHALL BE PERFORMED BY A CERTIFIED SOIL LABORATORY.
   6.2. LANDSCAPE CONTRACTOR SHALL REPORT ANY SOIL OR DRAINAGE CONDITIONS CONSIDERED DETRIMENTAL TO THE GROWTH OF PLANT MATERIAL. SOIL MODIFICATIONS, AS SPECIFIED HEREIN, MAY NEED TO BE CONDUCTED BY THE LANDSCAPE CONTRACTOR DEPENDING ON SITE CONDITIONS.
   6.3. THE FOLLOWING AMENDMENTS AND QUANTITIES ARE APPROXIMATE AND ARE FOR BIDDING PURPOSES ONLY. COMPOSITION OF AMENDMENTS SHOULD BE REVISED DEPENDING ON THE OUTCOME OF A TOPSOIL ANALYSIS PERFORMED BY A CERTIFIED SOIL LABORATORY.
   6.3.1. TO INCREASE A SANDY SOIL'S ABILITY TO RETAIN WATER AND NUTRIENTS, THOROUGHLY TILL ORGANIC MATTER INTO THE TOP 6-12". USE COMPOSTED BARK, COMPOSTED LEAF MULCH OR PEAT MOSS. ALL PRODUCTS SHOULD BE COMPOSTED TO A DARK COLOR AND BE FREE OF PIECES WITH IDENTIFIABLE LEAF OR WOOD STRUCTURE. AVOID MATERIAL WITH A PH HIGHER THAN 7.5.
   6.3.2. TO INCREASE DRAINAGE, MODIFY HEAVY CLAY OR SILT (MORE THAN 40% CLAY OR SILT) BY ADDING COMPOSTED PINE BARK (UP TO 30% BY VOLUME) AND/OR AGRICULTURAL GYPSUM. COARSE SAND MAY BE USED IF ENOUGH IS ADDED TO BRING THE SAND CONTENT TO MORE THAN 60% OF THE TOTAL MIX. SUBSURFACE DRAINAGE LINES MAY NEED TO BE ADDED TO INCREASE DRAINAGE.
   6.3.3. MODIFY EXTREMELY SANDY SOILS (MORE THAN 85%) BY ADDING ORGANIC MATTER AND/OR DRY, SHREDDED CLAY LOAM UP TO 30% OF THE TOTAL MIX.
7. FINISHED GRADING
   7.1. UNLESS OTHERWISE CONTRACTED, THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF TOPSOIL AND THE ESTABLISHMENT OF FINE-GRADING WITHIN THE DISTURBANCE AREA OF THE SITE.
   7.2. LANDSCAPE CONTRACTOR SHALL VERIFY THAT SUBGRADE FOR INSTALLATION OF TOPSOIL HAS BEEN ESTABLISHED. THE SUBGRADE OF THE SITE MUST MEET THE FINISHED GRADE LESS THE REQUIRED TOPSOIL THICKNESS (1"±).
   7.3. ALL LAWN AND PLANTING AREAS SHALL BE GRADED TO A SMOOTH, EVEN AND UNIFORM PLANE WITH NO ABRUPT CHANGE OF SURFACE AS DEPICTED WITHIN THIS SET OF CONSTRUCTION PLANS, UNLESS OTHERWISE DIRECTED BY THE PROJECT ENGINEER OR LANDSCAPE ARCHITECT.
   7.4. ALL PLANTING AREAS SHALL BE GRADED AND MAINTAINED TO ALLOW FREE FLOW OF SURFACE WATER IN AND AROUND THE PLANTING BEDS. STANDING WATER SHALL NOT BE PERMITTED IN PLANTING BEDS.
8. TOPSOILING
   8.1. CONTRACTOR SHALL PROVIDE A 6" THICK MINIMUM LAYER OF TOPSOIL, OR AS DIRECTED BY THE LOCAL ORDINANCE OR CLIENT, IN ALL PLANTING AREAS. TOPSOIL SHOULD BE SPREAD OVER A PREPARED SURFACE IN A UNIFORM LAYER TO ACHIEVE THE DESIRED COMPACTED THICKNESS.
   8.2. ON-SITE TOPSOIL MAY BE USED TO SUPPLEMENT THE TOTAL AMOUNT REQUIRED. TOPSOIL FROM THE SITE MAY BE REJECTED IF IT HAS NOT BEEN PROPERLY REMOVED, STORED AND PROTECTED PRIOR TO CONSTRUCTION.
   8.3. CONTRACTOR SHALL FURNISH TO THE APPROVING AGENCY AN ANALYSIS OF BOTH IMPORTED AND ON-SITE TOPSOIL TO BE UTILIZED IN ALL PLANTING AREAS. THE PH AND NUTRIENT LEVELS MAY NEED TO BE ADJUSTED THROUGH SOIL MODIFICATIONS AS NEEDED TO ACHIEVE THE REQUIRED LEVELS AS SPECIFIED IN THE MATERIALS SECTION ABOVE.
   8.4. ALL LAWN AREAS ARE TO BE CULTIVATED TO A DEPTH OF SIX INCHES (6"). ALL DEBRIS EXPOSED FROM EXCAVATION AND CULTIVATION SHALL BE DISPOSED OF IN ACCORDANCE WITH GENERAL WORK PROCEDURES SECTION ABOVE. THE FOLLOWING SHALL BE TILLED INTO THE TOP FOUR INCHES (4") IN TWO DIRECTIONS (QUANTITIES BASED ON A 1,000 SQUARE FOOT AREA - FOR BID PURPOSES ONLY [SEE SPECIFICATION 6.A.]):
   8.4.1. 20 POUNDS 'GRO-POWER' OR APPROVED SOIL CONDITIONER/FERTILIZER
   8.4.2. 20 POUNDS NITRO-FORM (COURSE) 38-0-0 BLUE CHIP OR APPROVED NITROGEN FERTILIZER
   8.5. THE SPREADING OF TOPSOIL SHALL NOT BE CONDUCTED UNDER MUDDY OR FROZEN CONDITIONS.
9. PLANTING
   9.1. INSOFAR THAT IT IS FEASIBLE, PLANT MATERIAL SHALL BE PLANTED ON THE DAY OF DELIVERY. IN THE EVENT THAT THIS IS NOT POSSIBLE, LANDSCAPE CONTRACTOR SHALL PROTECT UNINSTALLED PLANT MATERIAL. PLANTS SHALL NOT REMAIN UNPLANTED FOR LONGER THAN A THREE DAY PERIOD AFTER DELIVERY. PLANTS THAT WILL NOT BE PLANTED FOR A PERIOD OF TIME GREATER THAN THREE DAYS SHALL BE HEALED IN WITH TOPSOIL OR MULCH TO HELP PRESERVE ROOT MOISTURE.
   9.2. PLANTING OPERATIONS SHALL BE PERFORMED DURING PERIODS WITHIN THE PLANTING SEASON WHEN WEATHER AND SOIL CONDITIONS ARE SUITABLE AND IN ACCORDANCE WITH ACCEPTED LOCAL PRACTICE. PLANTS SHALL NOT BE INSTALLED IN TOPSOIL THAT IS IN A MUDDY OR FROZEN CONDITION.
   9.3. ANY INJURED ROOTS OR BRANCHES SHALL BE PRUNED TO MAKE CLEAN-CUT ENDS PRIOR TO PLANTING UTILIZING CLEAN, SHARP TOOLS. ONLY INJURED OR DISEASED BRANCHING SHALL BE REMOVED.
   9.4. ALL PLANTING CONTAINERS, BASKETS AND NON-BIODEGRADABLE MATERIALS SHALL BE REMOVED FROM ROOT BALLS DURING PLANTING. NATURAL FIBER BURLAP MUST BE CUT FROM AROUND THE TRUNK OF THE TREE AND FOLDED DOWN AGAINST THE ROOT BALL PRIOR TO BACKFILLING.
   9.5. POSITION TREES AND SHRUBS AT THEIR INTENDED LOCATIONS AS PER THE PLANS AND SECURE THE APPROVAL OF THE LANDSCAPE ARCHITECT PRIOR TO EXCAVATING PITS, MAKING NECESSARY ADJUSTMENTS AS DIRECTED.
   9.6. PRIOR TO THE ISSUANCE OF ANY CERTIFICATE OF OCCUPANCY, THE PROPOSED LANDSCAPE, AS SHOWN ON THE APPROVED LANDSCAPE PLAN, MUST BE INSTALLED, INSPECTED AND APPROVED BY THE APPROVING AGENCY. THE APPROVING AGENCY SHALL TAKE INTO ACCOUNT SEASONAL CONSIDERATIONS IN THIS REGARD AS FOLLOWS. THE PLANTING OF TREES, SHRUBS, VINES OR GROUND COVER SHALL OCCUR ONLY DURING THE FOLLOWING PLANTING SEASONS:
   9.6.1. PLANTS: MARCH 15 TO DECEMBER 15
   9.6.2. LAWN: MARCH 15 TO JUNE 15 OR SEPT. 1 TO DECEMBER 1
   9.6.3. PLANTINGS REQUIRED FOR A CERTIFICATE OF OCCUPANCY SHALL BE PROVIDED DURING THE NEXT APPROPRIATE SEASON AT THE MUNICIPALITY'S DISCRETION. CONTRACTOR SHOULD CONTACT APPROVING AGENCY FOR POTENTIAL SUBSTITUTIONS.
   9.7. FURTHERMORE, THE FOLLOWING TREE VARIETIES ARE UNUSUALLY SUSCEPTIBLE TO WINTER DAMAGE. WITH TRANSPLANT SHOCK AND THE SEASONAL LACK OF NITROGEN AVAILABILITY, THE RISK OF PLANT DEATH IS GREATLY INCREASED. IT IS NOT RECOMMENDED THAT THESE SPECIES BE PLANTED DURING THE FALL PLANTING SEASON:

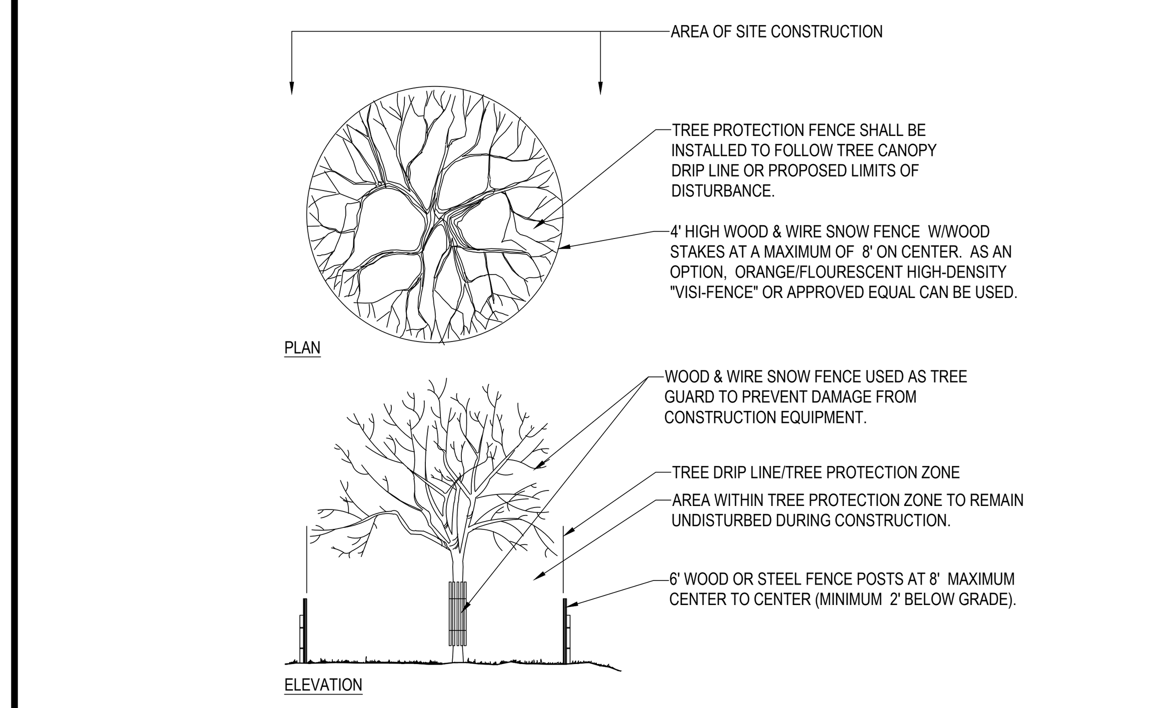
ACER RUBRUM	PLATANUS X ACERIFOLIA
BETULA VARIETIES	POPULUS VARIETIES
CARPINUS VARIETIES	PRUNUS VARIETIES
CRATAEGUS VARIETIES	PYRUS VARIETIES
KOELREUTERIA	QUERCUS VARIETIES
LIQUIDAMBAR STYRACIFLUA	TILIA TOMENTOSA
LIRIODENDRON TULIPIFERA	ZELKOVA VARIETIES

   9.8. PLANTING PITS SHALL BE DUG WITH LEVEL BOTTOMS, WITH THE WIDTH TWICE THE DIAMETER OF ROOT BALL. THE ROOT BALL SHALL REST ON UNDISTURBED GRADE. EACH PLANT PIT SHALL BE BACKFILLED IN LAYERS WITH THE FOLLOWING PREPARED SOIL MIXED THOROUGHLY:
   9.8.1. 1 PART PEAT MOSS
   9.8.2. 1 PART COMPOSTED COW MANURE BY VOLUME
   9.8.3. 3 PARTS TOPSOIL BY VOLUME
   9.8.4. 21 GRAMS 'AGRIFORM' PLANTING TABLETS (OR APPROVED EQUAL) AS FOLLOWS:
   9.8.4.1. 2 TABLETS PER 1 GALLON PLANT
   9.8.4.2. 3 TABLETS PER 5 GALLON PLANT
   9.8.4.3. 4 TABLETS PER 15 GALLON PLANT
   9.8.4.4. LARGER PLANTS: 2 TABLETS PER ½" CALIPER OF TRUNK
   9.9. FILL PREPARED SOIL AROUND BALL OF PLANT HALF-WAY AND INSERT PLANT TABLETS. COMPLETE BACKFILL AND WATER THOROUGHLY.
   9.10. ALL PLANTS SHALL BE PLANTED SO THAT THE TOP OF THE ROOT BALL, THE POINT AT WHICH THE ROOT FLARE BEGINS, IS SET AT GROUND LEVEL AND IN THE CENTER OF THE PIT. NO SOIL IS TO BE PLACED DIRECTLY ON TOP OF THE ROOT BALL.
   9.11. ALL PROPOSED TREES DIRECTLY ADJACENT TO WALKWAYS OR DRIVEWAYS SHALL BE PRUNED AND MAINTAINED TO A MINIMUM BRANCHING HEIGHT OF 7' FROM GRADE.
   9.12. GROUND COVER AREAS SHALL RECEIVE A ¼" LAYER OF HUMUS RAKED INTO THE TOP 1" OF PREPARED SOIL PRIOR TO PLANTING. ALL GROUND COVER AREAS SHALL BE WEEDED AND TREATED WITH A PRE-EMERGENT CHEMICAL AS PER MANUFACTURER'S RECOMMENDATION.
   9.13. NO PLANT, EXCEPT GROUND COVERS, GRASSES OR VINES, SHALL BE PLANTED LESS THAN TWO FEET (2') FROM EXISTING STRUCTURES AND SIDEWALKS.
   9.14. ALL PLANTING AREAS AND PLANTING PITS SHALL BE MULCHED AS SPECIFIED HEREIN TO FILL THE ENTIRE BED AREA OR SAUCER. NO MULCH IS TO TOUCH THE TRUNK OF THE TREE OR SHRUB.
   9.15. ALL PLANTING AREAS SHALL BE WATERED IMMEDIATELY UPON INSTALLATION IN ACCORDANCE WITH THE WATERING SPECIFICATIONS AS LISTED HEREIN.
10. TRANSPLANTING (WHEN REQUIRED)
   10.1. ALL TRANSPLANTS SHALL BE DUG WITH INTACT ROOT BALLS CAPABLE OF SUSTAINING THE PLANT.
   10.2. IF PLANTS ARE TO BE STOCKPILED BEFORE REPLANTING, THEY SHALL BE HEALED IN WITH MULCH OR SOIL, ADEQUATELY WATERED AND PROTECTED FROM EXTREME HEAT, SUN AND WIND.
   10.3. PLANTS SHALL NOT BE DUG FOR TRANSPLANTING BETWEEN APRIL 10 AND JUNE 30.
   10.4. UPON REPLANTING, BACKFILL SOIL SHALL BE AMENDED WITH FERTILIZER AND ROOT GROWTH HORMONE.
   10.5. TRANSPLANTS SHALL BE GUARANTEED FOR THE LENGTH OF THE GUARANTEE PERIOD SPECIFIED HEREIN.
   10.6. F TRANSPLANTS DIE, SHRUBS AND TREES LESS THAN SIX INCHES (6") DBH SHALL BE REPLACED IN KIND. TREES GREATER THAN SIX INCHES (6") DBH MAY BE REQUIRED TO BE REPLACED IN ACCORDANCE WITH THE MUNICIPALITY'S TREE REPLACEMENT GUIDELINES.
11. WATERING
   11.1. NEW PLANTINGS OR LAWN AREAS SHALL BE ADEQUATELY IRRIGATED BEGINNING IMMEDIATELY AFTER PLANTING. WATER SHALL BE APPLIED TO EACH TREE AND SHRUB IN SUCH MANNER AS NOT TO DISTURB BACKFILL AND TO THE EXTENT THAT ALL MATERIALS IN THE PLANTING HOLE ARE THOROUGHLY SATURATED. WATERING SHALL CONTINUE AT LEAST UNTIL PLANTS ARE ESTABLISHED.
   11.2. SITE OWNER SHALL PROVIDE WATER IF AVAILABLE ON SITE AT TIME OF PLANTING. IF WATER IS NOT AVAILABLE ON SITE, CONTRACTOR SHALL SUPPLY ALL NECESSARY WATER. THE USE OF WATERING BAGS IS RECOMMENDED FOR ALL NEWLY PLANTED TREES.
   11.3. IF AN IRRIGATION SYSTEM HAS BEEN INSTALLED ON THE SITE, IT SHALL BE USED TO WATER PROPOSED PLANT MATERIAL, BUT ANY FAILURE OF THE SYSTEM DOES NOT ELIMINATE THE CONTRACTOR'S RESPONSIBILITY OF MAINTAINING THE DESIRED MOISTURE LEVEL FOR VIGOROUS, HEALTHY GROWTH.
12. GUARANTEE
   12.1. THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL PLANTS FOR A PERIOD OF 1 YEAR FROM APPROVAL OF LANDSCAPE INSTALLATION BY THE APPROVING AGENCY. CONTRACTOR SHALL SUPPLY THE OWNER WITH A MAINTENANCE BOND FOR TEN PERCENT (10%) OF THE VALUE OF THE LANDSCAPE INSTALLATION WHICH WILL BE RELEASED AT THE CONCLUSION OF THE GUARANTEE PERIOD AND WHEN A FINAL INSPECTION HAS BEEN COMPLETED AND APPROVED BY THE OWNER OR AUTHORIZED REPRESENTATIVE.
   12.2. ANY DEAD OR DYING PLANT MATERIAL SHALL BE REPLACED FOR THE LENGTH OF THE GUARANTEE PERIOD. REPLACEMENT OF PLANT MATERIAL SHALL BE CONDUCTED AT THE FIRST SUCCEEDING PLANTING SEASON. ANY DEBRIS SHALL BE DISPOSED OF OFF-SITE, WITHOUT EXCEPTION.
   12.3. TREES AND SHRUBS SHALL BE MAINTAINED BY THE CONTRACTOR DURING CONSTRUCTION AND THROUGHOUT THE 90 DAY MAINTENANCE PERIOD AS SPECIFIED HEREIN. CULTIVATION, WEEDING, WATERING AND THE PREVENTATIVE TREATMENTS SHALL BE PERFORMED AS NECESSARY TO KEEP PLANT MATERIAL IN GOOD CONDITION AND FREE OF INSECTS AND DISEASE.
   12.4. LAWNS SHALL BE MAINTAINED THROUGH WATERING, FERTILIZING, WEEDING, MOWING, TRIMMING AND OTHER OPERATIONS SUCH AS ROLLING, REGARDING AND REPLANTING AS REQUIRED TO ESTABLISH A SMOOTH, ACCEPTABLE LAWN, FREE OF ERODED OR BARE AREAS.
13. CLEANUP
   13.1. UPON THE COMPLETION OF ALL LANDSCAPE INSTALLATION AND BEFORE THE FINAL ACCEPTANCE, THE CONTRACTOR SHALL REMOVE ALL UNUSED MATERIALS, EQUIPMENT AND DEBRIS FROM THE SITE. ALL PAVED AREAS ARE TO BE CLEANED.
   13.2. THE SITE SHALL BE CLEANED AND LEFT IN A NEAT AND ACCEPTABLE CONDITION AS APPROVED BY THE OWNER OR AUTHORIZED REPRESENTATIVE.
14. MAINTENANCE (ALTERNATIVE BID):
   14.1. A 90 DAY MAINTENANCE PERIOD SHALL COMMENCE AT THE END OF ALL LANDSCAPE INSTALLATION OPERATIONS. THE 90 DAY MAINTENANCE PERIOD ENSURES TO THE OWNER/OPERATOR THAT THE NEWLY INSTALLED LANDSCAPING HAS BEEN MAINTAINED AS SPECIFIED ON THE APPROVED LANDSCAPE PLAN. ONCE THE INITIAL 90 DAY MAINTENANCE PERIOD HAS EXPIRED, THE OWNER/OPERATOR MAY REQUEST THAT BIDDERS SUBMIT AN ALTERNATE MAINTENANCE BID FOR A MONTHLY MAINTENANCE CONTRACT. THE ALTERNATE MAINTENANCE CONTRACT WILL ENCOMPASS ANY WORK THAT IS CONSIDERED APPROPRIATE TO ENSURE THAT PLANT AND LAWN AREAS ARE HEALTHY AND MANICURED TO THE APPROVAL OF THE OWNER/OPERATOR.

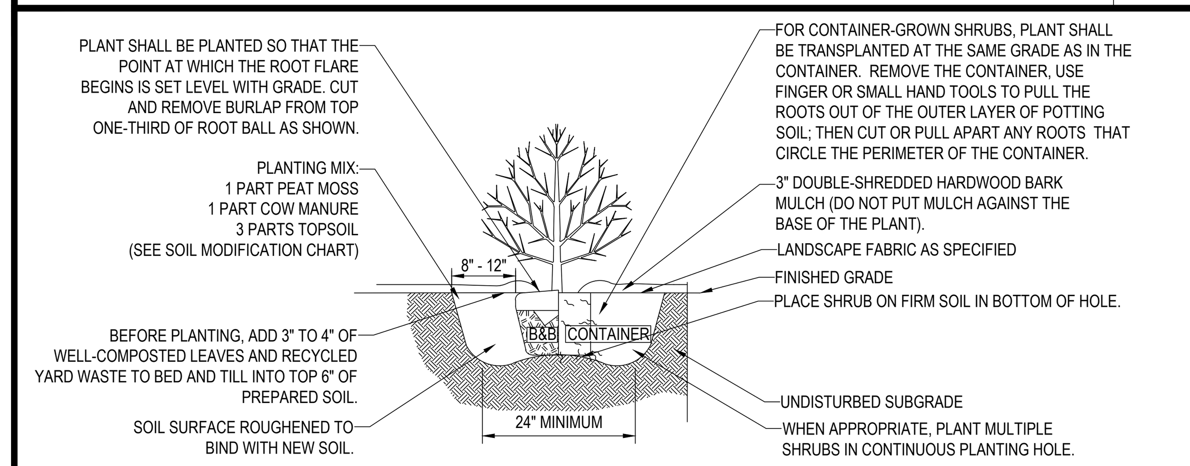
NOTES:
1.) NO SOIL OR MULCH SHALL BE PLACED AGAINST ROOT COLLAR OF PLANT.
2.) REMOVE ALL NON-BIODEGRADABLE MATERIAL AND ROPE FROM TRUNK & TOP OF ROOT BALL. FOLD BURLAP BACK 1/3 FROM ROOT BALL.
3.) PLANTING DEPTH SHALL BE THE SAME AS GROWN IN NURSERY.
4.) THOROUGHLY SOAK THE TREE ROOT BALL AND ADJACENT PREPARED SOIL SEVERAL TIMES DURING THE FIRST MONTH AFTER PLANTING AND REGULARLY THROUGHOUT THE FOLLOWING TWO SUMMERS.
5.) THE BOTTOM OF PLANTING PIT EXCAVATIONS SHOULD BE ROUGH TO AVOID MATTING OF SOIL LAYERS AS NEW SOIL IS ADDED. IT IS PREFERABLE TO TILL THE FIRST LIFT (2 TO 3 IN.) OF PLANTING SOIL INTO THE SUBSOIL.
6.) REFER TO THE CHART "GENERAL RANGE OF SOIL MODIFICATIONS & VOLUMES FOR VARIOUS SOIL CONDITIONS" TO DETERMINE MINIMUM WIDTH OF PREPARED SOIL.
7.) SUBSTITUTE ARBORVITAE STAKING SYSTEM WHEN SPECIFIED.



TREE PLANTING DETAIL
N.T.S.

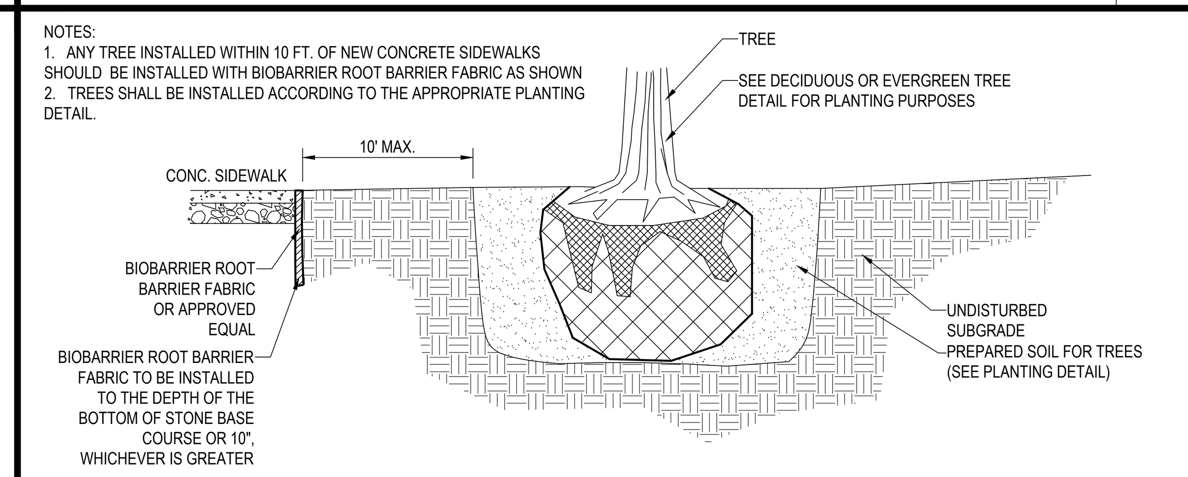


TREE PROTECTION DURING SITE CONSTRUCTION
N.T.S.

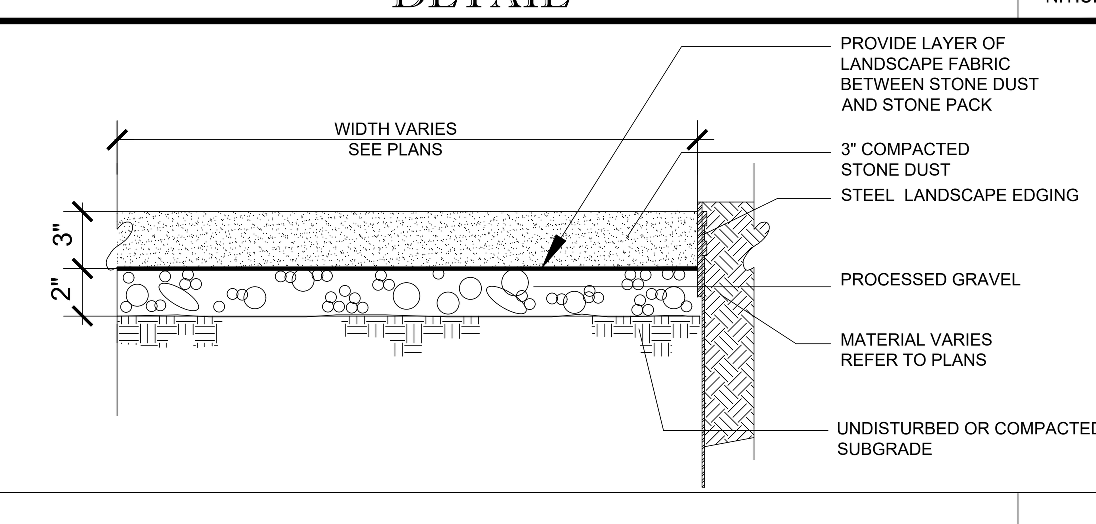


SHRUB PLANTING DETAIL
N.T.S.

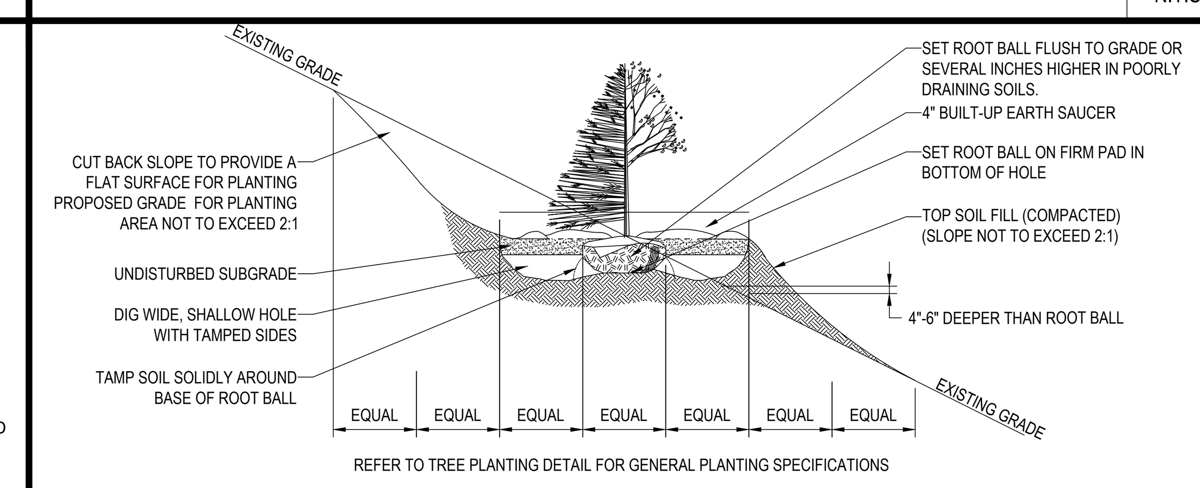
NOTES:
1. ANY TREE INSTALLED WITHIN 10 FT. OF NEW CONCRETE SIDEWALKS SHOULD BE INSTALLED WITH BIOBARRIER ROOT BARRIER FABRIC AS SHOWN
2. TREES SHALL BE INSTALLED ACCORDING TO THE APPROPRIATE PLANTING DETAIL.



BIOBARRIER ROOT BARRIER DETAIL
N.T.S.



STONE DUST PAVING
N.T.S.



TREE PLANTING DETAIL - ON SLOPE
N.T.S.

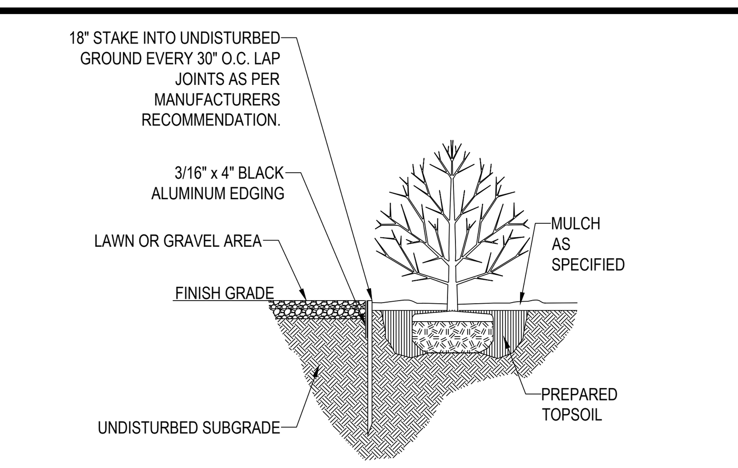
"NATIVE DETENTION AREA MIX" AS PREPARED BY:

ERNST CONSERVATION SEEDS, INC.
8884 MERCER PIKE, MEADVILLE, PA 16335
PHONE: 800-873-3321 / 814-336-2404
EMAIL: SALES@ERNSTSEED.COM
WEBSITE: WWW.ERNSTSEED.COM

APPLICATION RATE: 1/2 LB. / 1000 SQ. FT. (20 LBS. / ACRE)

MIX COMPOSITION:
25.0% PANICUM VIRGATUM, 'SHELTER' (SWITCHGRASS, 'SHELTER')
24.0% PANICUM CLANDESTINUM, 'TIOGA' (DEERTONGUE, 'TIOGA')
22.0% CAREX VULPINOIDEA, PA ECOTYPE (FOX SEDGE, PA ECOTYPE)
21.0% ELYMUS VIRGINICUS, PA ECOTYPE (VIRGINIA WILDRYE, PA ECOTYPE)
6.0% AGROSTIS PERENNANS, ALBANY PINE BUSH-NY ECOTYPE (AUTUMN BENTGRASS, ALBANY PINE BUSH-NY ECOTYPE)
1.0% JUNCUS EFFUSUS (SOFT RUSH)
1.0% PANICUM RIGIDULUM, PA ECOTYPE (REDTOP PANICGRASS, PA ECOTYPE)

BASIN SEED MIX SPECIFICATIONS



BLACK ALUMINUM EDGING
N.T.S.

1. PRIOR TO SEEDING, AREA IS TO BE TOPSOILED, FINE GRADED, AND RAKED OF ALL DEBRIS LARGER THAN 2" DIAMETER.
2. PRIOR TO SEEDING, CONSULT MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS.
3. SEEDING RATES:

• PERENNIAL RYEGRASS	1/2 LB/1000 SQ FT
• KENTUCKY BLUEGRASS	1 LB/1000 SQ FT
• RED FESCUE	1/2 LB/1000 SQ FT
• SPREADING FESCUE	1/2 LB/1000 SQ FT
• FERTILIZER (16.32.16)	2 LB/1000 SQ FT
• LIQUID LIME	1 GAL/800 GAL.
• TANK TACKIFIER	35 LB/800 GAL.
• TANK FIBER MULCH	30 LB/1000 SQ FT

4. GERMINATION RATES WILL VARY AS TO TIME OF YEAR FOR SOWING. CONTRACTOR TO IRRIGATE SEEDED AREA UNTIL AN ACCEPTABLE STAND OF COVER IS ESTABLISHED BY OWNER.

HYDROSEED SPECIFICATIONS

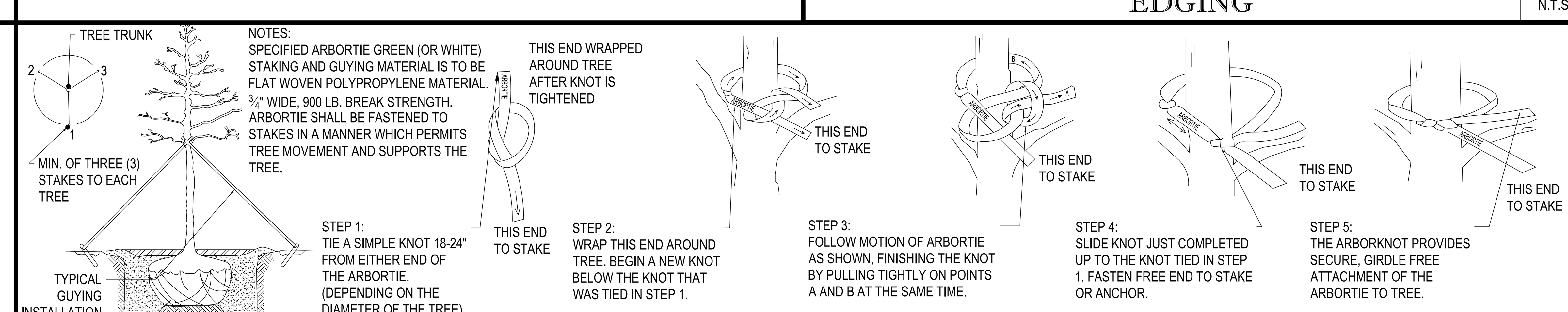
"QUICK EROSION CONTROL COVER MIX" AS PREPARED BY:

ERNST CONSERVATION SEEDS, INC.
8884 MERCER PIKE, MEADVILLE, PA 16335
PHONE: 800-873-3321 / 814-336-2404
EMAIL: SALES@ERNSTSEED.COM
WEBSITE: WWW.ERNSTSEED.COM

APPLICATION RATE: 50 LBS. / ACRE

MIX COMPOSITION:
50.0% Lolium multiflorum (Annual Ryegrass)
50.0% Lolium perenne, 'Blackcat II' (Perennial Ryegrass)

SLOPE SEED MIX SPECIFICATIONS



ARBORTIE STAKING DETAIL
N.T.S.

BOHLER//
SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

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REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	1/20/20	ART COMMENTS	MLT / JGB
2	03/10/20	EMERGENCY ACCESS	MLT / JGB

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PROJECT No.:	CT191016
DRAWN BY:	MLT / DE
CHECKED BY:	JGB / PM
DATE:	12/06/19
CAD I.D.:	CT191016ss2

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

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16 OLD FORGE ROAD, SUITE A
ROCKY HILL, CT 06067
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RHODE ISLAND No. 419
NEW YORK No. 002359
NEW HAMPSHIRE No. 109
CONNECTICUT No. 1359

SHEET TITLE:

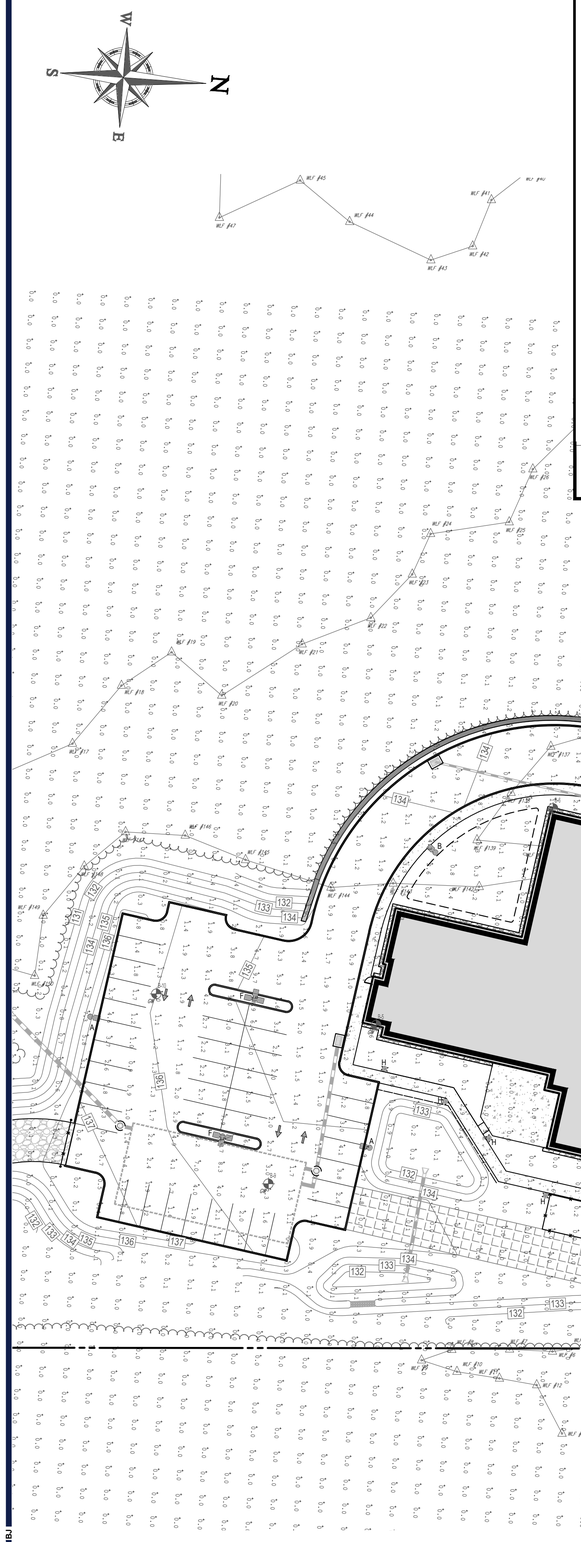
LANDSCAPE NOTES & DETAILS

SHEET NUMBER:

C-602

REVISION 2 - 3/10/20

P:\19\CT191016\DRAWINGS\PLAN SETS\REV2\X-LANDSCAPE---->LAYOUT: L-2 LNOTE



LUMIERE BOLLARD LIGHT

N.T.S.

GARDCO ECF-S

N.T.S.

LIGHTING NOTES:

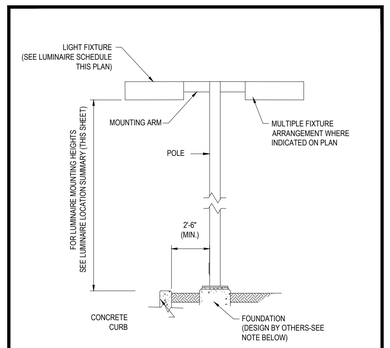
1. THIS LIGHTING PLAN DEPICTS PROPOSED SUSTAINED ILLUMINATION LEVELS CALCULATED USING DATA PROVIDED BY THE NOTED MANUFACTURER(S). ACTUAL SUSTAINED SITE ILLUMINATION LEVELS AND PERFORMANCE OF LUMINAIRES MAY VARY DUE TO VARIATIONS IN WEATHER, ELECTRICAL VOLTAGE, TOLERANCE IN LAMPS, THE SERVICE LIFE OF EQUIPMENT AND LUMINAIRES AND OTHER RELATED VARIABLE FIELD CONDITIONS.
2. THE LIGHT LOSS FACTORS USED IN THESE LIGHTING CALCULATIONS ARE 0.85 FOR ALL LED LUMINAIRES, 0.80 FOR ALL HIGH PRESSURE SODIUM LUMINAIRES OR 0.72 FOR ALL METAL HALIDE LUMINAIRES UNLESS OTHERWISE SPECIFIED. THESE FACTORS ARE INDICATIVE OF TYPICAL LIGHTING INDUSTRY MODELING STANDARDS.
3. THE LIGHTING VALUES AND CALCULATION POINTS DEPICTED ON THIS PLAN ARE ALL ANALYZED ON A HORIZONTAL GEOMETRIC PLANE AT ELEVATION ZERO (GROUND LEVEL) UNLESS OTHERWISE NOTED. THE VALUES DEPICTED ON THIS PLAN ARE IN FOOTCANDLES.
4. THE LUMINAIRES, LAMPS AND LENSES MUST BE REGULARLY INSPECTED/MAINTAINED TO ENSURE THAT THEY FUNCTION PROPERLY. THIS WORK SHOULD INCLUDE, BUT NOT BE LIMITED TO, FREQUENT VISUAL INSPECTIONS, CLEANING OF LENSES, AND RELAMPING (IF NECESSARY) AT LEAST ONCE EVERY SIX (6) MONTHS. FAILURE TO FOLLOW THE ABOVE STEPS COULD CAUSE THE LUMINAIRES, LAMPS AND LENSES TO FAIL PROPERLY TO FUNCTION.
5. WHERE APPLICABLE, THE EXISTING CONDITION LIGHT LEVELS ILLUSTRATED ARE REPRESENTATIVE OF AN APPROXIMATION UTILIZING LABORATORY DATA FOR SIMILAR FIXTURES, UNLESS ACTUAL FIELD MEASUREMENTS ARE TAKEN WITH A LIGHT METER AND ARE, CONSEQUENTLY, APPROXIMATIONS ONLY. DUE TO FACTORS SUCH AS FIXTURE MAINTENANCE, EQUIPMENT TOLERANCES, WEATHER CONDITIONS, ETC, ACTUAL LIGHT LEVELS MAY DIFFER. EXISTING LIGHT LEVELS DEPICTED ON THIS PLAN SHOULD BE CONSIDERED APPROXIMATE.
6. THIS LIGHTING PLAN IS INTENDED TO SHOW THE LOCATIONS AND TYPE OF LUMINAIRES, ONLY. POWER SYSTEM, CONDUITS, WIRING, VOLTAGES AND OTHER ELECTRICAL COMPONENTS ARE THE RESPONSIBILITY OF THE ARCHITECT, MEP AND/OR LIGHTING CONTRACTOR, AS INDICATED IN THE CONSTRUCTION CONTRACT DOCUMENTS. THESE ITEMS MUST BE INSTALLED AS REQUIRED BY STATE AND LOCAL REGULATIONS. LIGHT POLE BASES ARE THE RESPONSIBILITY OF THE STRUCTURAL ENGINEER, AS INDICATED IN THE CONSTRUCTION CONTRACT DOCUMENTS. CONTRACTOR IS RESPONSIBLE FOR INSTALLING LIGHTING FIXTURES AND APPURTENANCES IN ACCORDANCE WITH ALL APPLICABLE BUILDING AND ELECTRICAL CODES AND ALL OTHER APPLICABLE RULES, REGULATIONS, LAWS AND STATUTES.
7. CONTRACTOR MUST BRING TO DESIGNER'S ATTENTION, PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, ANY LIGHT LOCATIONS THAT CONFLICT WITH DRAINAGE, UTILITIES, OR OTHER STRUCTURES.
8. IT IS LIGHTING CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH THE PROJECT ARCHITECT OR OWNER REGARDING THE POWER SOURCE(S) FROM WITHIN THE BUILDING, AND TIMING DEVICES NECESSARY TO MEET THE DESIGN INTENT.
9. THE LIGHTING CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CONTRACTOR REQUIREMENTS INDICATED IN THE SITE PLAN, INCLUDING BUT NOT LIMITED TO, GENERAL NOTES, GRADING AND UTILITY NOTES, SITE SAFETY, AND ALL GOVERNMENTAL RULES, LAWS, ORDINANCES, REGULATIONS AND THE LIKE.
10. THE CONTRACTOR MUST VERIFY THAT INSTALLATION OF LIGHTING FIXTURES COMPLIES WITH THE REQUIREMENTS FOR SEPARATION FROM OVERHEAD ELECTRICAL WIRES PER STATE REGULATIONS.
11. WHEN A BANK ATM IS INCLUDED IN THE PLAN, THE LIGHTING DESIGN REPRESENTS BOHLER'S UNDERSTANDING AND INTERPRETATION OF THE REGULATORY LIGHTING LEVELS INTENDED BY PUBLISHED STANDARDS.
12. UPON OWNER'S ACCEPTANCE OF THE COMPLETED PROJECT, THE OWNER SHALL BE RESPONSIBLE FOR ALL MAINTENANCE, SERVICING, REPAIR AND INSPECTION OF THE LIGHTING SYSTEM AND ALL OF ITS COMPONENTS AND RELATED SYSTEMS, TO ENSURE ADEQUATE LIGHTING LEVELS ARE PRESENT AND FUNCTIONING AT ALL TIMES.

NUMERIC SUMMARY

LABEL	CALCTYPE	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
AREA SUMMARY	ILLUMINANCE	FC	0.47	15.1	0.0	N.A	N.A

LUMINAIRE SCHEDULE

SYMBOL	QTY	ARRANGEMENT	LUMENS	LLF	BUG RATING	LUM. WATTS	DESCRIPTION
A	3	SINGLE	6864	0.85	B2-U0-G2	55.7	GARDCO ECF-S-32L-530-G2-2 @ 14' HIGH
B	3	SINGLE	6715	0.85	B1-U0-G2	55.7	GARDCO ECF-S-32L-530-NW-G2-3 @ 14' HIGH
C	4	SINGLE	7025	0.85	B1-U0-G2	55.7	GACRDCO-ECF-S-32L-530-NW-G2-4 @ 14' HIGH
D	1	DOUBLE	7025	0.85	B1-U0-G2	55.7	GARDCO-ECF-S-32L-530-NW-G2-4 BACK TO BACK @ 14' HIGH
E	1	SINGLE	5348	0.85	B1-U0-G2	55.7	GARDCO-ECF-S-32L-530-NW-G2-3-HIS @ 14' HIGH
F	4	TRIPLE @ 90	7025	0.85	B1-U0-G2	55.7	GARDCO-ECF-S-32L-530-NW-G2-4 @ 14' HIGH
G	1	SINGLE	5509	0.85	B1-U0-G2	55.7	GARDCO-ECF-S-32L-530-NW-G2-4-HIS @ 14' HIGH
H	8	SINGLE	1300	0.85	B1-U0-G1	15.5	LUMIERE EON LED 303-B1-LED82-3000-UNV-T2-DIM10-BK @ 3.5' HIGH



AREA LIGHT DETAIL

N.T.S.

NOTE: THIS DETAIL IS FOR BID AND BUDGETARY PURPOSES ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR HAVING A FOUNDATION DESIGN PREPARED BY A QUALIFIED STRUCTURAL ENGINEER CONSIDERING LIGHTING MANUFACTURER REQUIREMENTS, LOCAL WIND LOADS AND SITE SPECIFIC SOIL PARAMETERS.

- SOME SITE CONDITIONS AND/OR LOCATIONS MAY REQUIRE VIBRATION DAMPENING MEASURES AS DETERMINED BY A STRUCTURAL ENGINEER.
- THE STRUCTURAL ENGINEER SHALL BE NOTIFIED OF THE INTENT TO MOUNT ANYTHING TO THE POLE, ASIDE FROM THE LIGHT FIXTURES, INCLUDING BUT NOT LIMITED TO CAMERAS, BANNERS, FLAGS, SIGNAGE, ETC. AS IT WILL IMPACT THE POLE AND FOUNDATION DESIGN.

THIS PLAN TO BE UTILIZED FOR LIGHTING PURPOSES ONLY

30 15 7.5 0 30

1"= 30'

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SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
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SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

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PROJECT No.:	CT191016
DRAWN BY:	MLT / DE
CHECKED BY:	JGB / PM
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CAD I.D.:	CT191016ss2

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

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STATE OF CONNECTICUT
JEFFREY G. BORD
No. 30414
LICENSED PROFESSIONAL ENGINEER

PROFESSIONAL ENGINEER
CONNECTICUT LICENSE NO. 30414

SHEET TITLE:

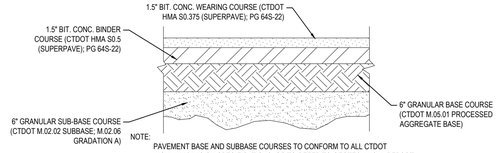
LIGHTING PLAN

SHEET NUMBER:

C-701

REVISION 2 - 3/10/20

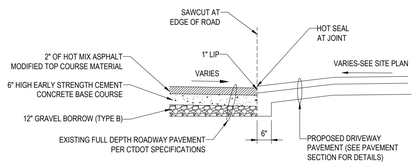
P:\19\CT191016\DRAWINGS\PLAN SETS\REZX\CT191016SS2----LAYOUT: C-701 LIGHT



NOTE: PAVEMENT BASE AND SUBBASE COURSES TO CONFORM TO ALL CTDOT HIGHWAY DIVISION SPECIFICATIONS. GC TO REFER TO GEOTECHNICAL REPORT PREPARED BY WHITESTONE ASSOCIATES INC. DATED 10/31/19 FOR PAVEMENT SPECIFICATIONS.

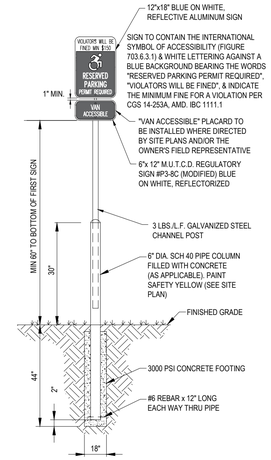
TYPICAL PAVEMENT SECTION

N.T.S.



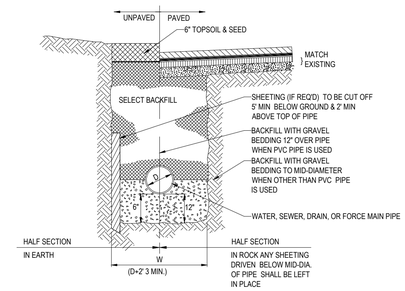
DRIVEWAY CONSTRUCTION DETAIL

N.T.S.



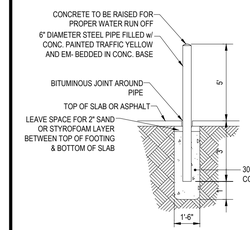
STATE OF CT 'ACCESSIBLE PARKING ONLY' SIGN

N.T.S.



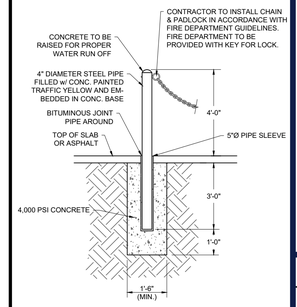
TYPICAL UTILITY TRENCH

N.T.S.



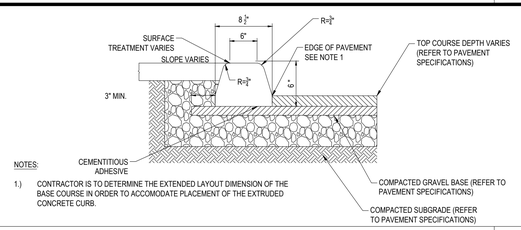
BOLLARD DETAIL

N.T.S.



FIRE GATE BOLLARD DETAIL

N.T.S.

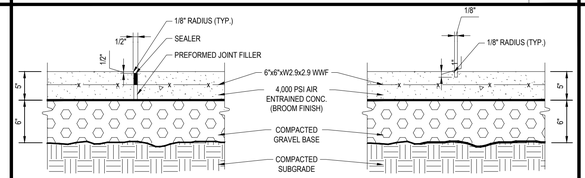


NOTES:

1.) CONTRACTOR IS TO DETERMINE THE EXTENDED LAYOUT DIMENSION OF THE BASE COURSE IN ORDER TO ACCOMODATE PLACEMENT OF THE EXTRUDED CONCRETE CURB.

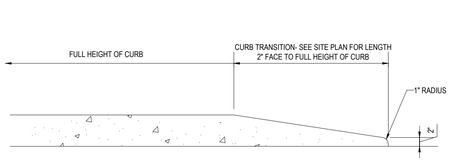
EXTRUDED CONCRETE CURB

N.T.S.



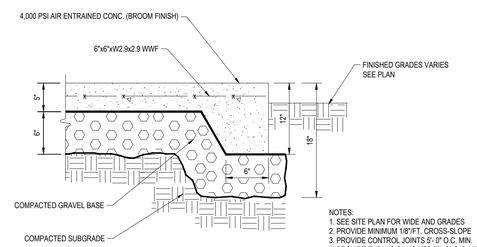
EXPANSION JOINT

CONTROL JOINT



TRANSITION CURB DETAIL

N.T.S.

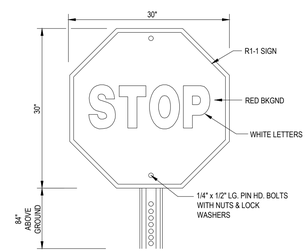


END SECTION
TO BE USED FOR BUILDING SURROUND AND OTHER CONCRETE WALKS. USE CHAIRS TO SUPPORT REINFORCING STEEL DURING POUR.

NOTES;
1. SEE SITE PLAN FOR WIDE AND GRADES
2. PROVIDE MINIMUM 1/8"/FT. CROSS-SLOPE
3. PROVIDE CONTROL JOINTS 5'- 0" O.C. MIN.
4. PROVIDE EXPANSION JOINTS 20'- 0" O.C. MIN.

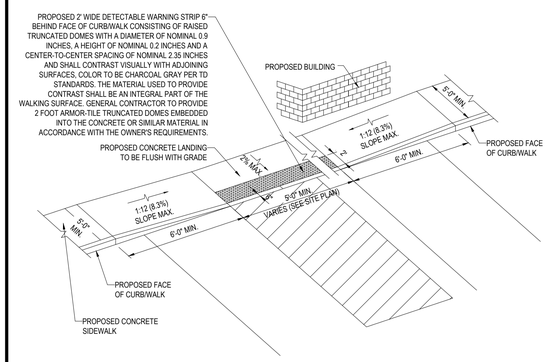
MONOLITHIC CONC. SIDEWALK DETAILS

N.T.S.



'STOP' SIGN

N.T.S.



(FOR SIDEWALK SLOPES LESS THAN 1:20 (5.0%) MAX.)

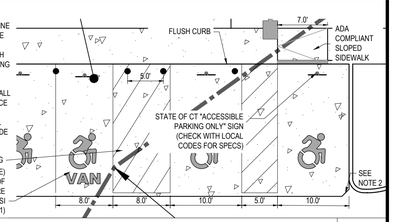
NOTE: SLOPES OF ACCESSIBLE PARKING SPACES AND PARKING ACCESS AISLES SHALL NOT EXCEED 1:50 (2.0%) MAX. IN ANY DIRECTION.

SLOPED WALK DETAIL

N.T.S.

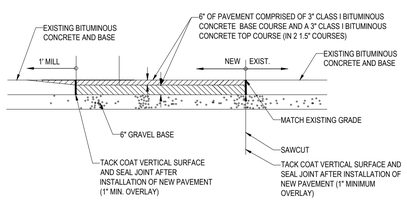
NOTES:

1. ALL MINIMUM DIMENSIONS ARE FROM CENTERLINE OF STRIPE TO CENTERLINE OF STRIPE OR INSIDE FACE OF CURB.
2. POUR CONCRETE MAT 3-INCHES WIDER ON BOTH SIDES TO ENSURE ENTIRE WIDTH OF ADA PARKING SPACE STRIPE IS LOCATED ENTIRELY WITHIN CONCRETE MAT.
3. A DESIGNATED 5-FOOT WIDE STRIPED AISLE SHALL ONLY BE REQUIRED IF A 3RD ADA PARKING SPACE IS PROVIDED.
4. ENSURE ACCESSIBLE VAN PARKING SPACE WILL PROVIDE ACCESS AISLE ON THE PASSENGER SIDE WHEN ANGLED PARKING IS USED.



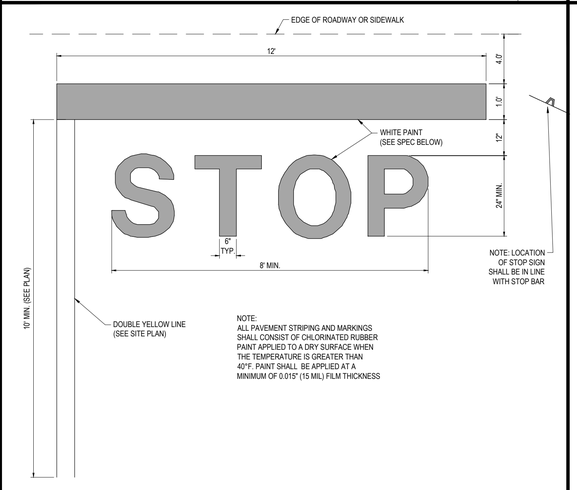
ACCESSIBLE SPACE DETAIL

N.T.S.



ROADWAY PATCHING DETAIL

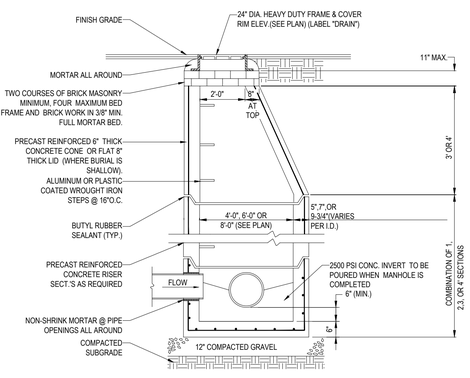
N.T.S.



NOTE:
ALL PAVEMENT STRIPING AND MARKINGS SHALL CONSIST OF CHLORINATED RUBBER PAINT APPLIED TO A DRY SURFACE WHEN THE TEMPERATURE IS GREATER THAN 40°F. PAINT SHALL BE APPLIED AT A MINIMUM OF 0.015" (15 MIL) FILM THICKNESS

'STOP' BAR DETAIL

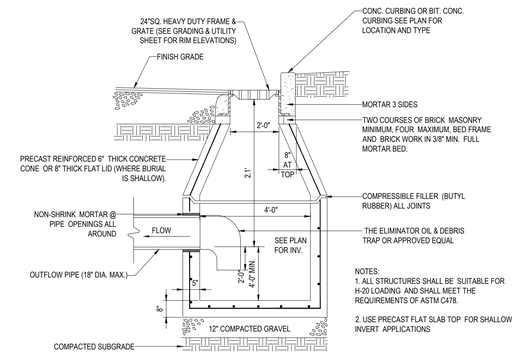
N.T.S.



NOTE:
ALL STRUCTURES SHALL BE SUITABLE FOR H-20 LOADING AND SHALL MEET THE REQUIREMENTS OF ASTM C478.

TYP. PRECAST CONCRETE MANHOLE STORM DRAIN

N.T.S.



NOTES:
1. ALL STRUCTURES SHALL BE SUITABLE FOR H-20 LOADING AND SHALL MEET THE REQUIREMENTS OF ASTM C478.

2. USE PRECAST FLAT SLAB TOP FOR SHALLOW INVERT APPLICATIONS

PRECAST CONCRETE DEEP SUMP CATCH BASIN DETAIL

N.T.S.

P:\19\CT191016\DRAWINGS\PLAN SETS\REV2\CT191016SS2----\LAYOUT: C-901 DETAIL

BJ

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REVISIONS

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1	1/20/20	ART COMMENTS	MLT / JGB
2	03/10/20	EMERGENCY ACCESS	MLT / JGB

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PROJECT No.:	CT191016
DRAWN BY:	MLT / DE
CHECKED BY:	JGB / PM
DATE:	12/06/19
CAD I.D.:	CT191016ss2

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

BOHLER
16 OLD FORGE ROAD, SUITE A
ROCKY HILL, CT 06067
Phone: (860) 333-8900
Fax: (508) 480-9080
www.BohlerEngineering.com

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STATE OF CONNECTICUT
JEFFREY G. BORD
No. 30414
LICENSED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CONNECTICUT LICENSE NO. 30414

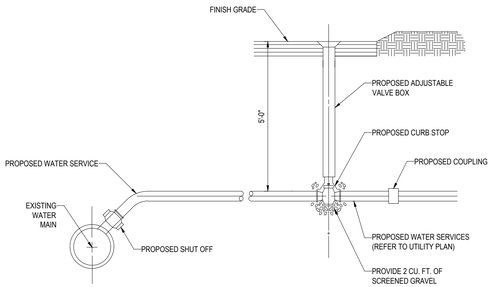
SHEET TITLE:

DETAIL SHEET

SHEET NUMBER:

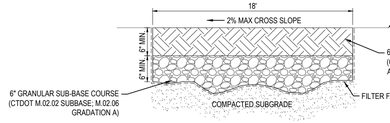
C-901

REVISION 2 - 3/10/20



WATER SERVICE CONNECTION DETAIL

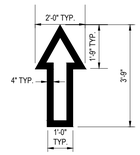
N.T.S.



NOTE:
BASE AND SUBBASE COURSES TO CONFORM TO ALL CTDOT HIGHWAY DIVISION SPECIFICATIONS.

EMERGENCY ACCESS DRIVE DETAIL

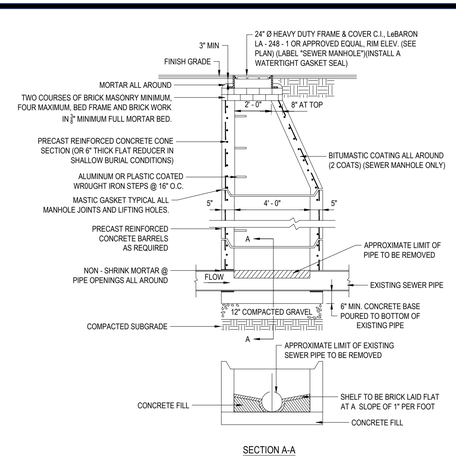
N.T.S.



NOTE: ALL TRAFFIC FLOW ARROWS TO BE REFLECTIVE WHITE PAINT PER SPECS.

TRAFFIC FLOW ARROW

N.T.S.

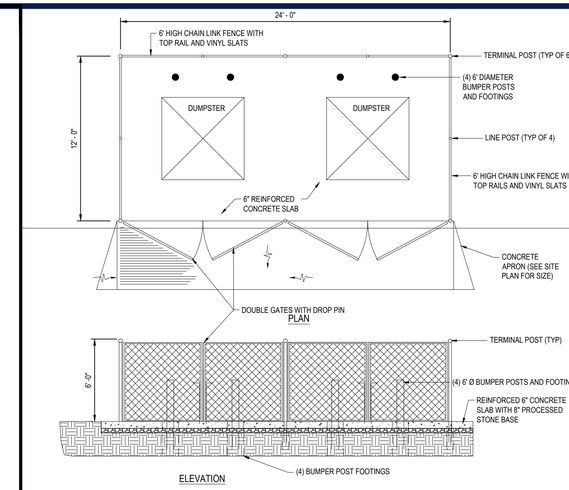


SECTION A-A

NOTE:
1. ALL STRUCTURES SHALL BE SUITABLE FOR H - 20 LOADING AND SHALL MEET THE REQUIREMENTS OF ASTM C478.
2. PROVIDE SUPPORT FOR EXISTING DRAIN PIPE WHEN POURING CONCRETE BASE

DETAIL OF PRECAST CONCRETE MANHOLE CONSTRUCTED ON EXIST. SEWER LINE

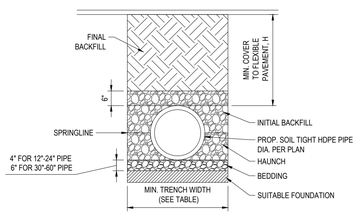
N.T.S.



ELEVATION

TRASH ENCLOSURE CHAIN LINK FENCE WITH VINYL SLATS

N.T.S.



RECOMMENDED MIN. TRENCH WIDTH	
PIPE DIA.	MIN. TRANCH WIDTH
6"	23"
8"	26"
10"	28"
12"	30"
15"	34"
18"	39"
24"	48"
30"	56"
36"	64"
48"	80"
60"	96"

NOTES:

1. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321 , "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST ADDITION.

2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.

3. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.

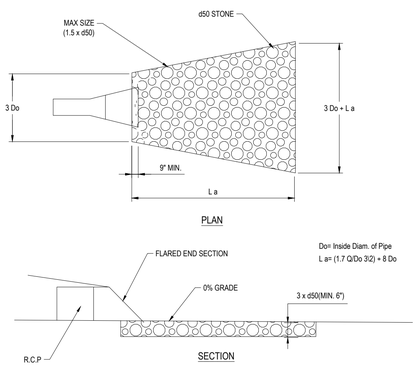
4. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II OR III. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (100mm) FOR 4"-24" (100mm-600mm); 6" (150mm) FOR 30"-60" (750mm-900mm).

5. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II OR III IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.

6. MINIMUM COVER: MINIMUM COVER, H, IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" FROM THE TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER, H, IS 12" UP TO 48" DIAMETER PIPE AND 24" OF COVER FOR 54"-60" DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT.

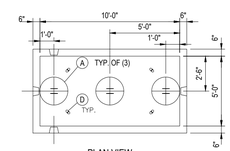
HDPE STORM DRAINAGE TRENCH

N.T.S.



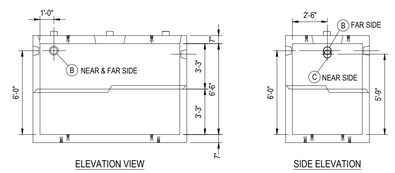
FLARED END RIP RAP DETAIL

N.T.S.



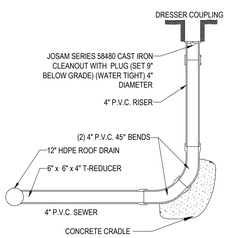
GENERAL NOTES:

1. CONCRETE: 28 DAY COMPRESSIVE STRENGTH F'C = 5,000 PSI TYPE I OR III.
2. REBAR: GRADE 60 PER ASTM A615 (BLACK).
3. DESIGN LOADING: AASHTO HS20-44 (2'-5' COVER).
4. GENERAL CONTRACTOR TO VERIFY ALL OPENINGS SIZES AND LOCATIONS.
5. ALL PIPE AND ROOF OPENINGS HAVE ADDITIONAL REBAR REINFORCEMENT.
6. JOINT TO BE SEALED WITH 1" BUTYL RUBBER.
7. ANY HARDWARE SHOWN BUT NOT DIMENSIONED IS FOR VISUAL REFERENCE ONLY-DO NOT SCALE FOR PLACEMENT.



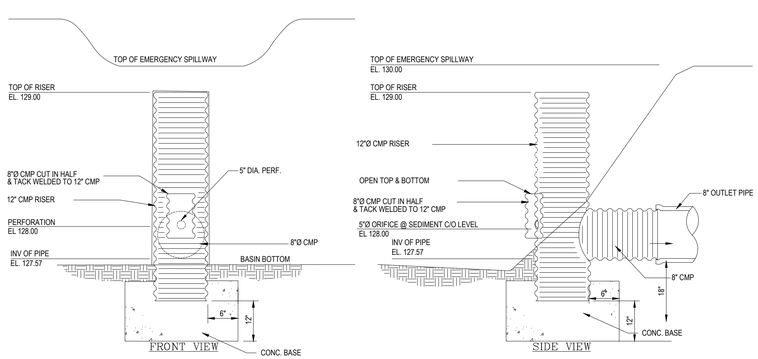
5' - 0" X 10' - 0" X 6' - 6" ID GREASE TRAP 2,000 GALLON CAPACITY

N.T.S.



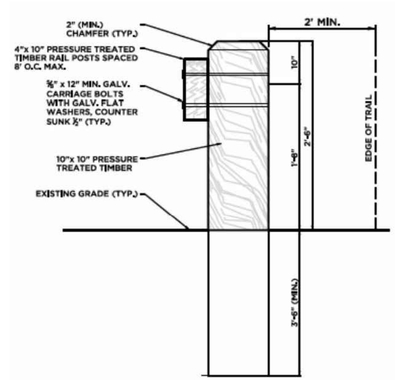
CLEANOUT DETAIL

N.T.S.



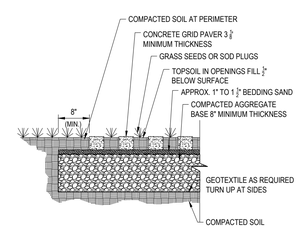
RISER STRUCTURE DETAIL

N.T.S.



TIMBER GUARDRAIL DETAIL

N.T.S.



WAFFLE PAVER STONE

N.T.S.

P:\19\CT191016\DRAWINGS\PLAN SETS\REV2\CT191016SS2----LAYOUT: C-902 DETAIL

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DRAWN BY:	MLT / DE
CHECKED BY:	JGB / PM
DATE:	12/06/19
CAD I.D.:	CT191016ss2

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

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ROCKY HILL, CT 06067
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No. 30414
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CONNECTICUT LICENSE NO. 30414

SHEET TITLE:

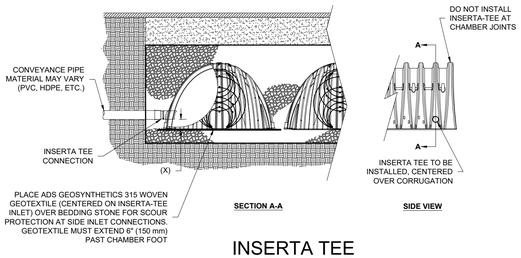
DETAIL SHEET

SHEET NUMBER:

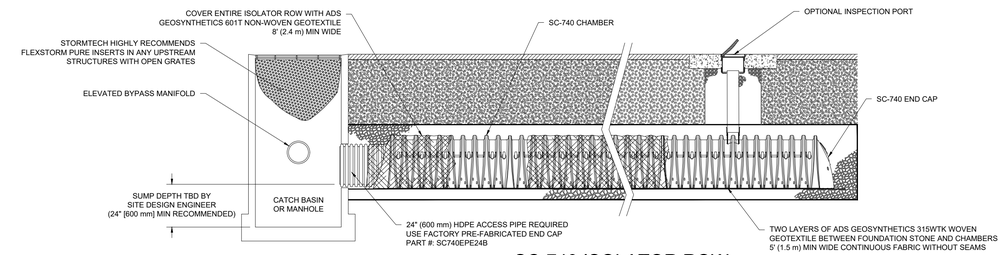
C-902

REVISION 2 - 3/10/20

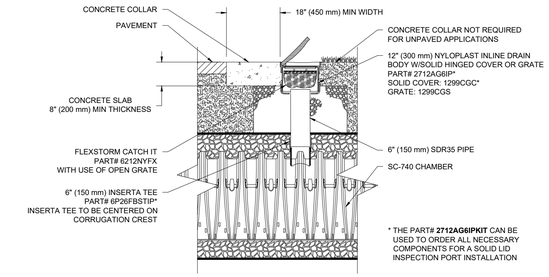
CHAMBER	MAX DIAMETER OF INSERTA TEE	HEIGHT FROM BASE OF CHAMBER (X)
SC-740	10" (250 mm)	4" (100 mm)



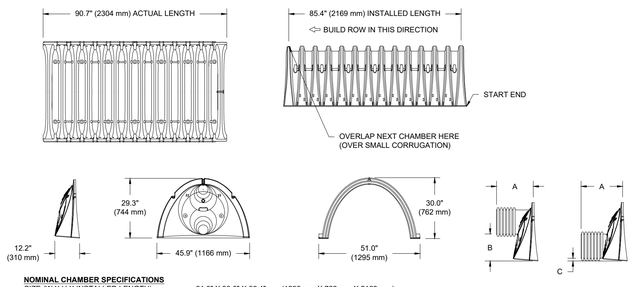
INSERTA TEE



SC-740 ISOLATOR ROW



SC-740 6" (150 mm) INSPECTION PORT



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	51.0" X 30.0" X 85.4"	(1295 mm X 762 mm X 2169 mm)
CHAMBER STORAGE	45.9 CUBIC FEET	(1.30 m³)
MINIMUM INSTALLED STORAGE*	74.9 CUBIC FEET	(2.12 m³)
WEIGHT	75.0 lbs.	(33.6 kg)

*ASSUMES 6" (152 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS

PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PRE-FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
PRE-CORED END CAPS END WITH "PC"

PART #	STUB	A	B	C
SC740EPE06T / SC740EPE06TPC	6" (150 mm)	10.9" (277 mm)	18.5" (470 mm)	---
SC740EPE06B / SC740EPE06BPC			---	0.5" (13 mm)
SC740EPE08T /SC740EPE08TPC	8" (200 mm)	12.2" (310 mm)	16.5" (419 mm)	---
SC740EPE08B / SC740EPE08BPC			---	0.6" (15 mm)
SC740EPE10T / SC740EPE10TPC	10" (250 mm)	13.4" (340 mm)	14.5" (368 mm)	---
SC740EPE10B / SC740EPE10BPC			---	0.7" (18 mm)
SC740EPE12T / SC740EPE12TPC	12" (300 mm)	14.7" (373 mm)	12.5" (318 mm)	---
SC740EPE12B / SC740EPE12BPC			---	1.2" (30 mm)
SC740EPE15T / SC740EPE15TPC	15" (375 mm)	18.4" (467 mm)	9.0" (229 mm)	---
SC740EPE15B / SC740EPE15BPC			---	1.3" (33 mm)
SC740EPE18T / SC740EPE18TPC	18" (450 mm)	19.7" (500 mm)	5.0" (127 mm)	
SC740EPE18B / SC740EPE18BPC				1.6" (41 mm)
SC740EPE24B*	24" (600 mm)	18.5" (470 mm)	---	0.1" (3 mm)

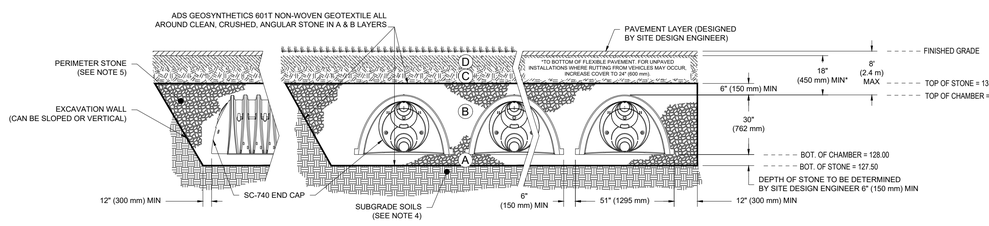
ALL STUBS, EXCEPT FOR THE SC740EPE24B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.
* FOR THE SC740EPE24B THE 24" (600 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75" (44 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.
NOTE: ALL DIMENSIONS ARE NOMINAL

SC-740 TECHNICAL SPECIFICATIONS

ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



SC-740 CROSS SECTION

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

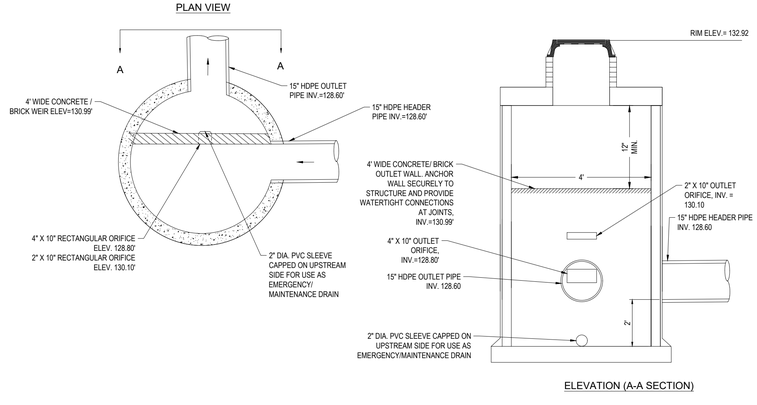
1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

NOTES:

1. SC-740 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS", OR ASTM F2922 "STANDARD SPECIFICATION FOR POLYETHYLENE (PE) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
4. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
5. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
6. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

STORMTECH SC-740 SUBSURFACE DETENTION/INFILTRATION BASIN DETAILS (BMP-1)

N.T.S.



OUTLET CONTROL STRUCTURE (OCS-1)

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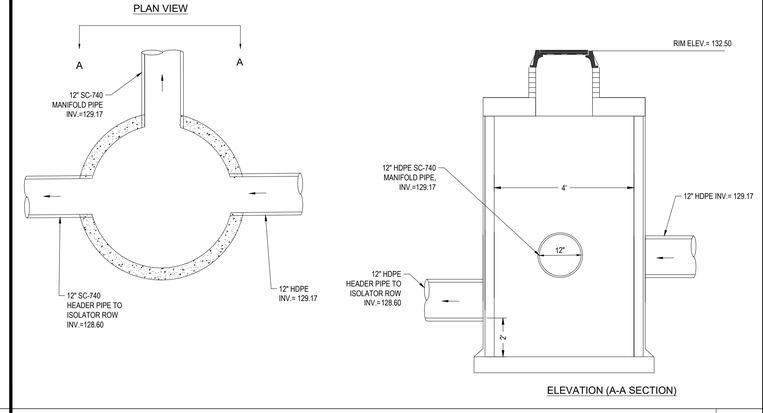
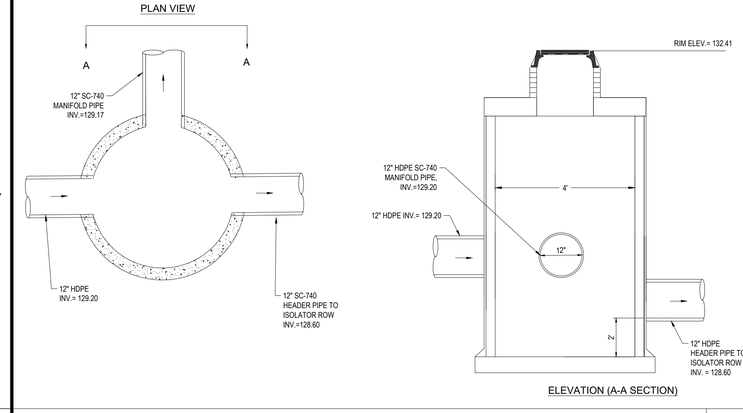


INLET CONTROL STRUCTURE (ICS-1)

N.T.S.



INLET CONTROL STRUCTURE (ICS-2)

N.T.S.

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DRAWN BY:	MLT / DE
CHECKED BY:	JGB / PM
DATE:	12/06/19
CAD I.D.:	CT191016ss2

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

BOHLER
16 OLD FORGE ROAD, SUITE A
ROCKY HILL, CT 06067
Phone: (860) 333-8900
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JEFFREY G. BORD
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LICENSED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CONNECTICUT LICENSE NO. 30414

SHEET TITLE:

DETAIL SHEET

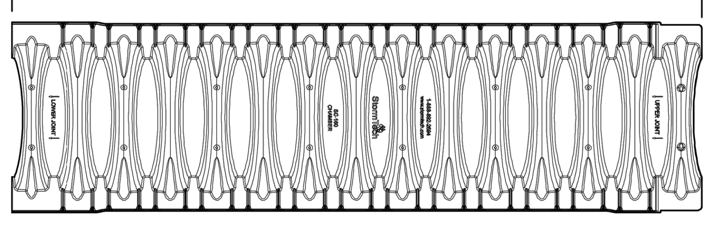
SHEET NUMBER:

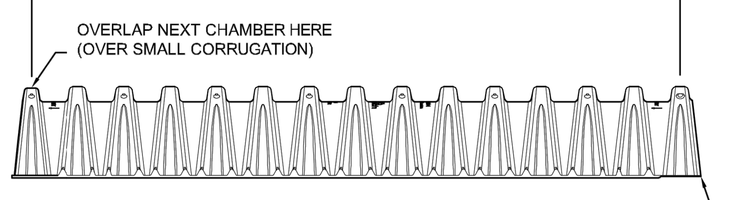
C-903

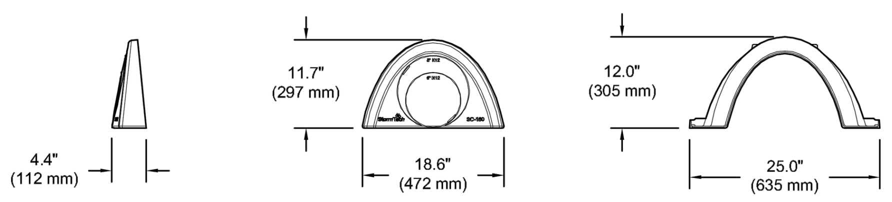
REVISION 2 - 3/10/20

P:\19CT191016\DRAWINGS\PLAN SETS\REV2CT191016SS2----->LAYOUT: C-903 DETAIL
BJ

SC-160LP TECHNICAL SPECIFICATION
NTS





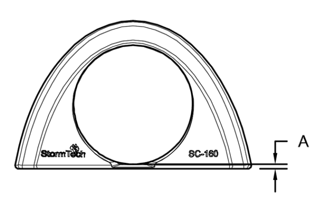


NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	25.0" X 12.0" X 85.4"	(635 mm X 305 mm X 2169 mm)
CHAMBER STORAGE	6.85 CUBIC FEET	(0.19 m³)
MINIMUM INSTALLED STORAGE*	16.0 CUBIC FEET	(0.45 m³)
WEIGHT	24.0 lbs.	(10.9 kg)

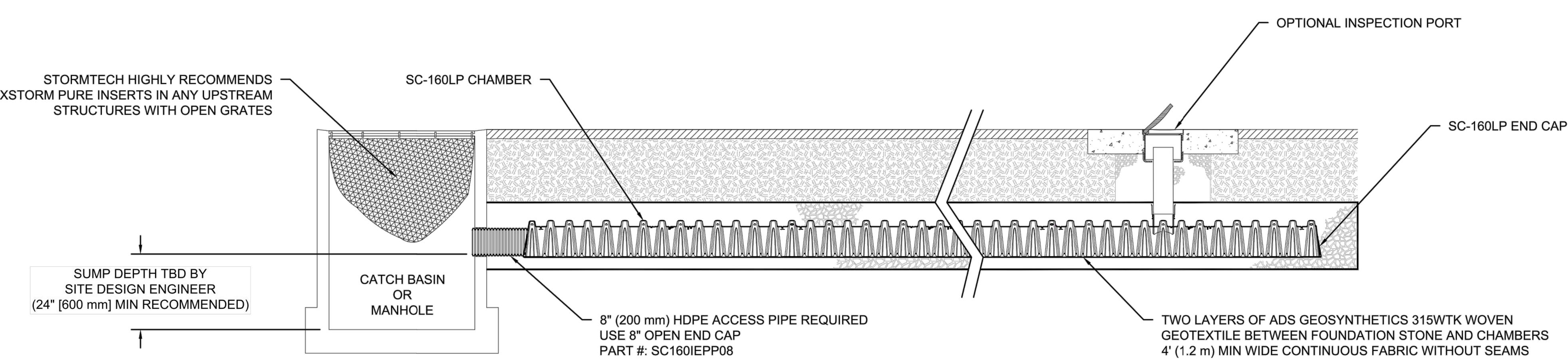
*ASSUMES 6" (152 mm) ABOVE, 6" (152 mm) BELOW, AND STONE BETWEEN CHAMBERS WITH 40% STONE POROSITY.

PART #	STUB	A
SC160IEPP	6" (150 mm)	0.66" (16 mm)
	8" (200 mm)	0.80" (20 mm)
SC160IEPP08	8" (200 mm)	0.96" (24 mm)



ALL STUBS ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

NOTE: ALL DIMENSIONS ARE NOMINAL

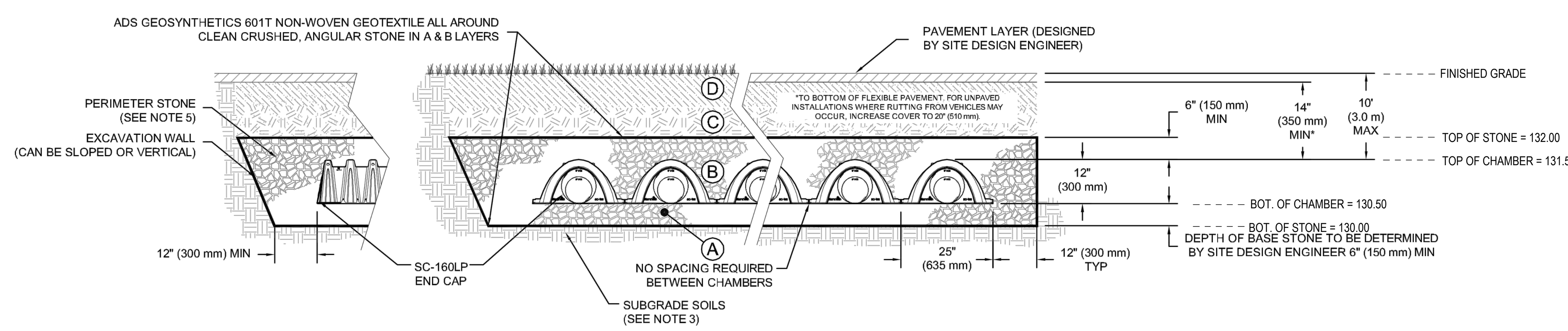


SC-160LP ISOLATOR ROW DETAIL
NTS

ACCEPTABLE FILL MATERIALS: STORMTECH SC-160LP CHAMBER SYSTEMS

	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 14" (355 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. [2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



NOTES:

1. SC-160LP CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
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4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

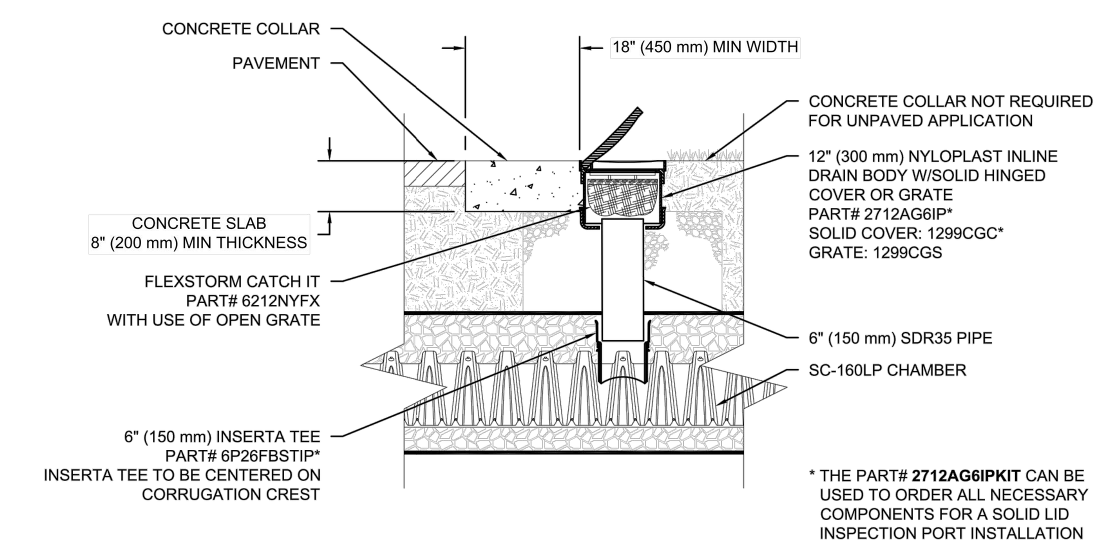
STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



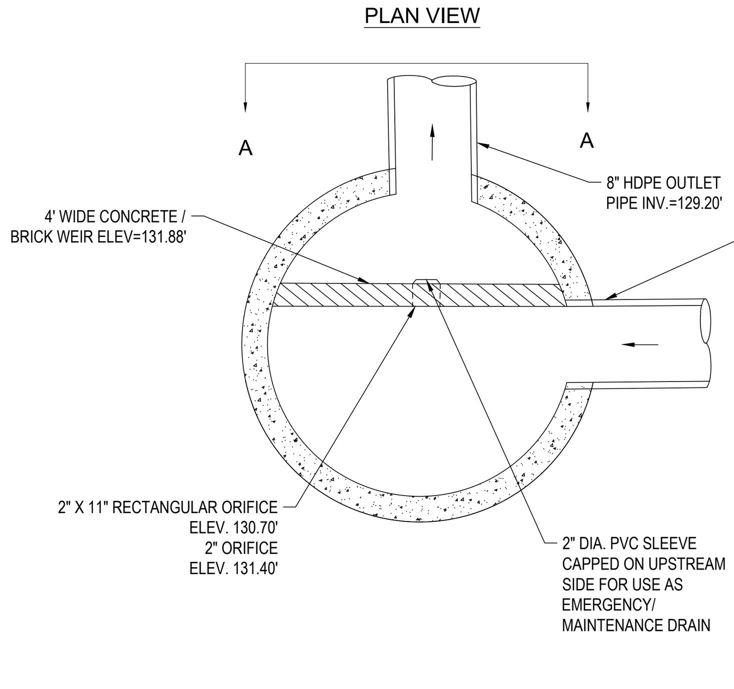
* THE PART# **2712AG6IPKIT** CAN BE USED TO ORDER ALL NECESSARY COMPONENTS FOR A SOLID LID INSPECTION PORT INSTALLATION

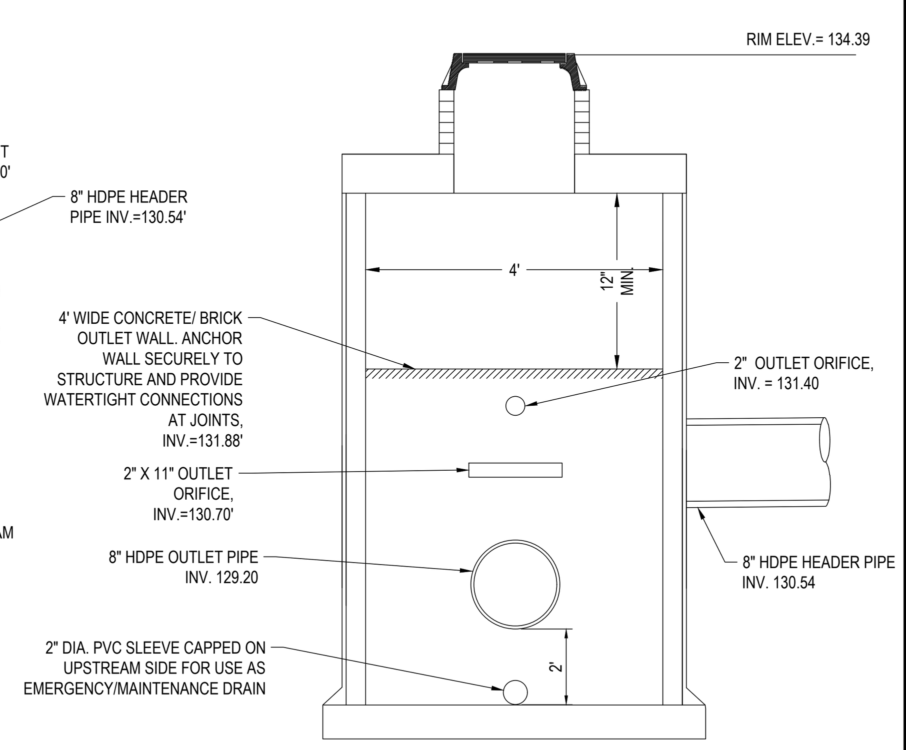
SC-160LP 6" INSPECTION PORT DETAIL
NTS

STORMTECH SC-160LP SUBSURFACE DETENTION/INFILTRATION BASIN DETAILS (BMP-2)

N.T.S.

PLAN VIEW



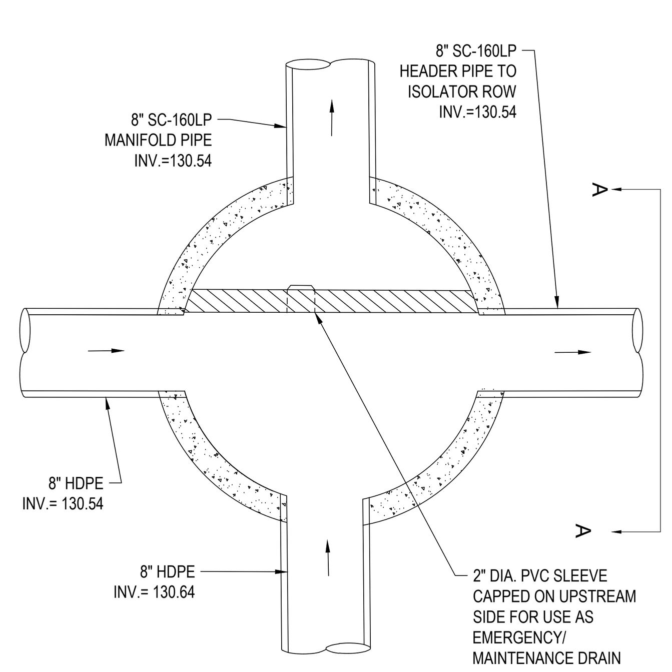


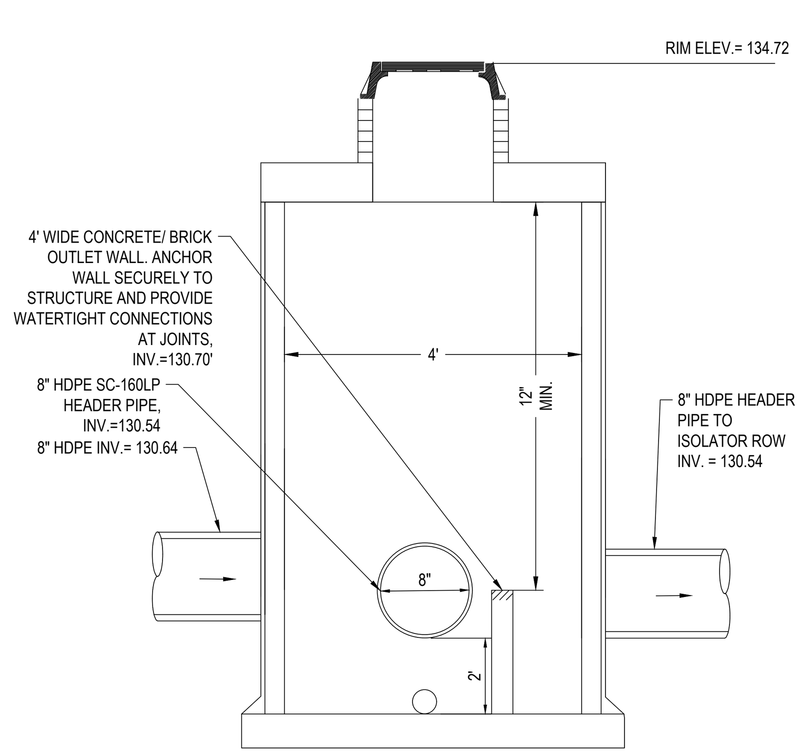
ELEVATION (A-A SECTION)

OUTLET CONTROL STRUCTURE (OCS-2)

N.T.S.

PLAN VIEW

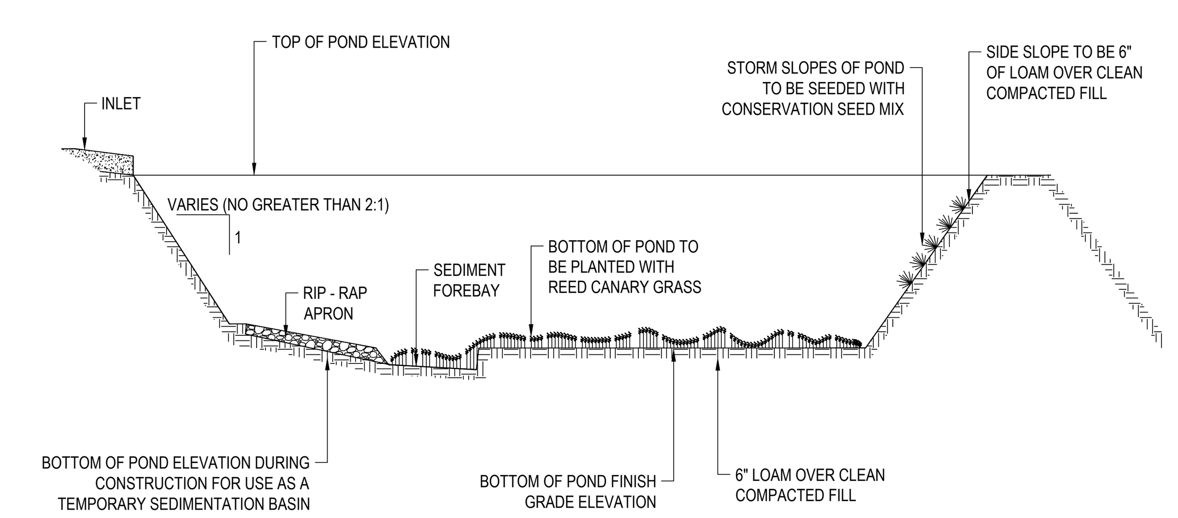




ELEVATION (A-A SECTION)

INLET CONTROL STRUCTURE (ICS-3)

N.T.S.



NOTE:
1. THE SIDE SLOPES OF THE DETENTION POND SHALL BE PLANTED WITH A SEED MIX CONSISTING OF CREEPING RED FESCUE, TALL FESCUE, AND LADINO CLOVER.
2. SIDE SLOPES CONSISTING OF SLOPES STEEPER THAN 3:1 SHALL USE SLOPE STABILIZATION FABRIC.

INFILTRATION BASIN DETAIL

N.T.S.

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CHECKED BY:	JGB / PM
DATE:	12/06/19
CAD I.D.:	CT191016ss2

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

BOHLER
16 OLD FORGE ROAD, SUITE A
ROCKY HILL, CT 06067
Phone: (860) 333-8900
Fax: (508) 480-9080
www.BohlerEngineering.com

J.G. BORD
STATE OF CONNECTICUT JEFFREY G. BORD No. 30414 LICENSED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CONNECTICUT LICENSE No. 30414

SHEET TITLE:

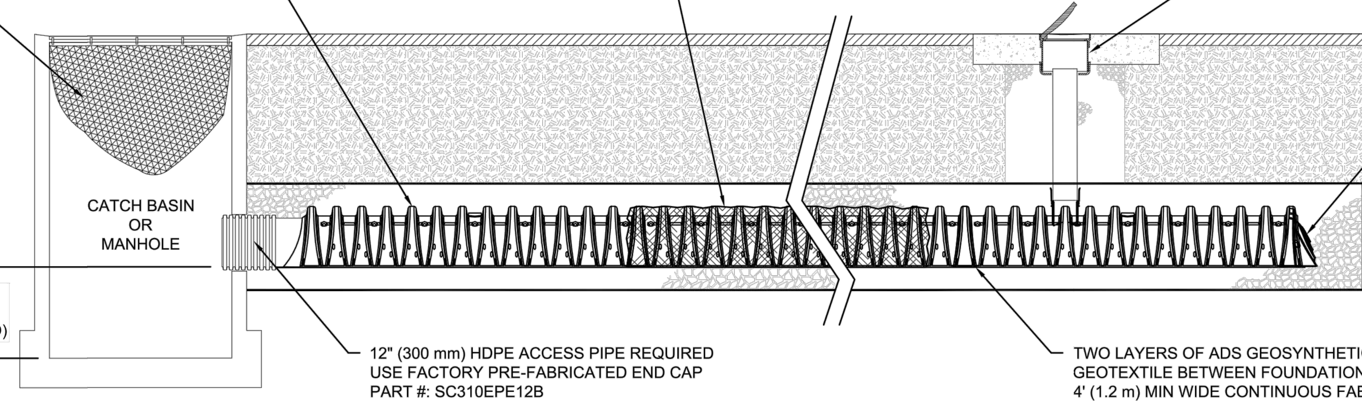
DETAIL SHEET

SHEET NUMBER:

C-904

REVISION 2 - 3/10/20

P:\19\CT191016\DRAWINGS\PLAN SETS\REV2\CT191016SS2----->LAYOUT: C-904 DETAIL
BJ



SC-310 ISOLATOR ROW DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

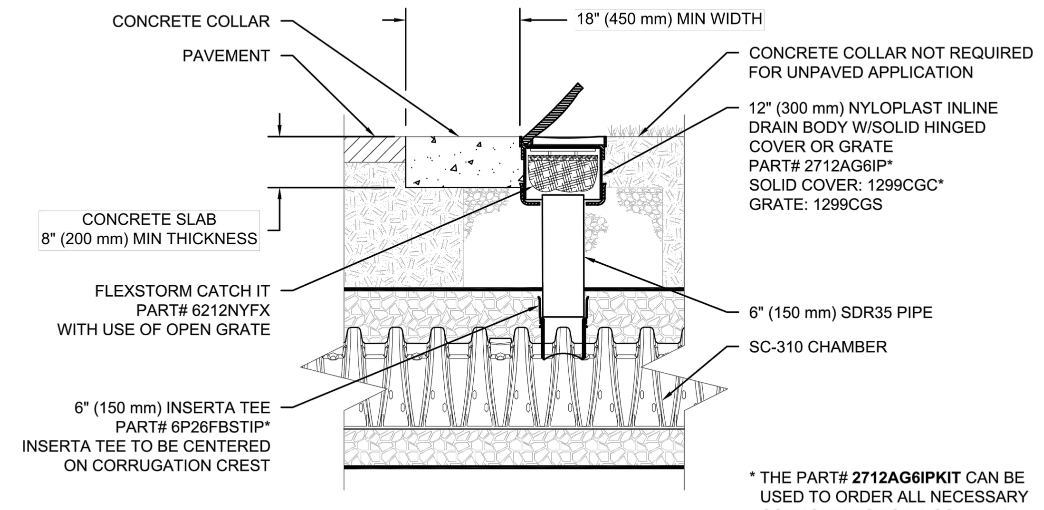
STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

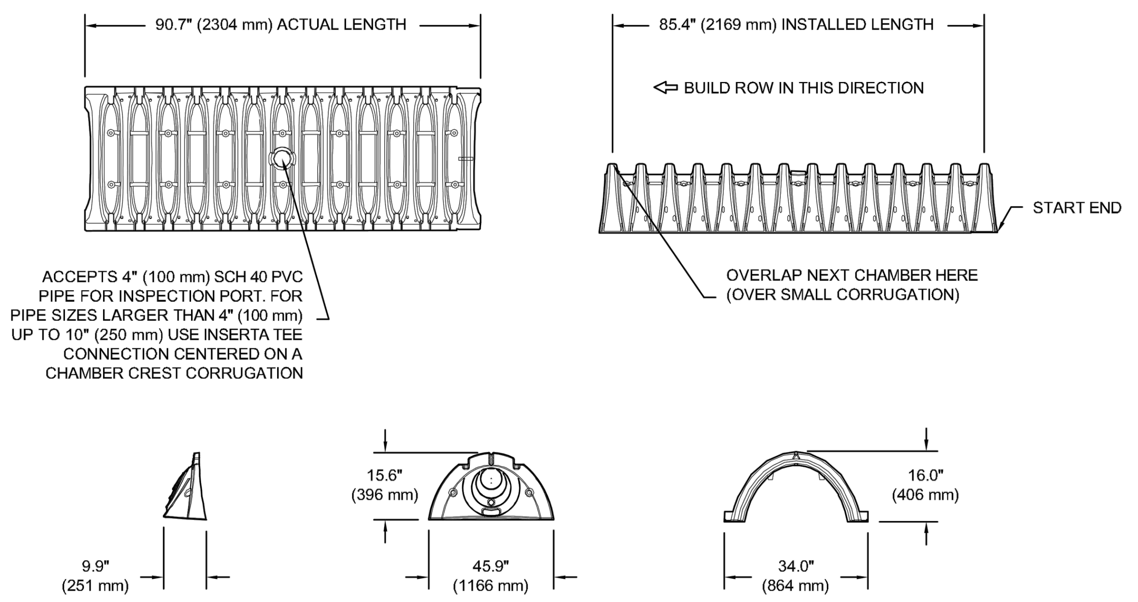
1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



* THE PART# **2712AG6IPKIT** CAN BE USED TO ORDER ALL NECESSARY COMPONENTS FOR A SOLID LID INSPECTION PORT INSTALLATION

SC-310 6" INSPECTION PORT DETAIL
NTS

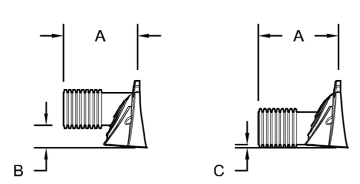
SC-310 TECHNICAL SPECIFICATION
NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	34.0" X 16.0" X 85.4"	(864 mm X 406 mm X 2169 mm)
CHAMBER STORAGE	14.7 CUBIC FEET	(0.42 m³)
MINIMUM INSTALLED STORAGE*	31.0 CUBIC FEET	(0.88 m³)
WEIGHT	35.0 lbs.	(16.8 kg)

*ASSUMES 6" (152 mm) ABOVE, BELOW, AND BETWEEN CHAMBERS



STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

PART #	STUB	A	B	C
SC310EPE06T / SC310EPE06TPC	6" (150 mm)	9.6" (244 mm)	5.8" (147 mm)	---
SC310EPE06B / SC310EPE06BPC			---	0.5" (13 mm)
SC310EPE08T / SC310EPE08TPC	8" (200 mm)	11.9" (302 mm)	3.5" (89 mm)	---
SC310EPE08B / SC310EPE08BPC			---	0.6" (15 mm)
SC310EPE10T / SC310EPE10TPC	10" (250 mm)	12.7" (323 mm)	1.4" (36 mm)	---
SC310EPE10B / SC310EPE10BPC			---	0.7" (18 mm)
SC310EPE12B	12" (300 mm)	13.5" (343 mm)	---	0.9" (23 mm)

ALL STUBS, EXCEPT FOR THE SC310EPE12B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

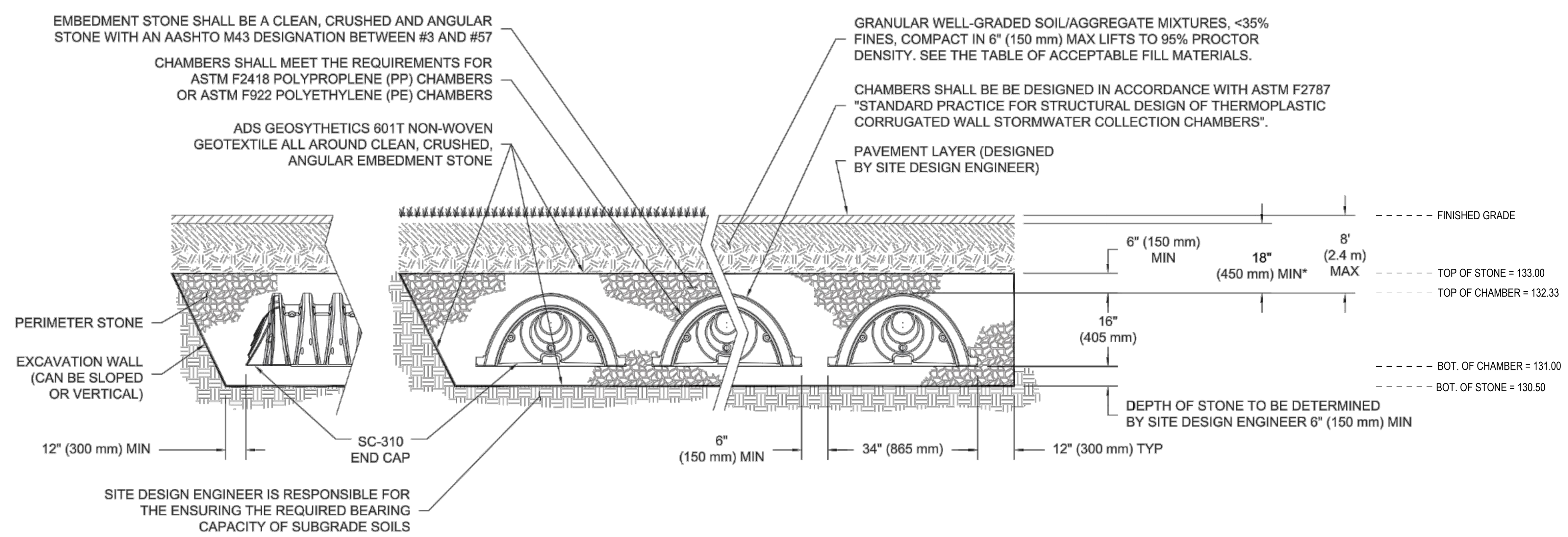
* FOR THE SC310EPE12B THE 12" (300 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 0.25" (6 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL

ACCEPTABLE FILL MATERIALS: STORMTECH SC-310 CHAMBER SYSTEMS

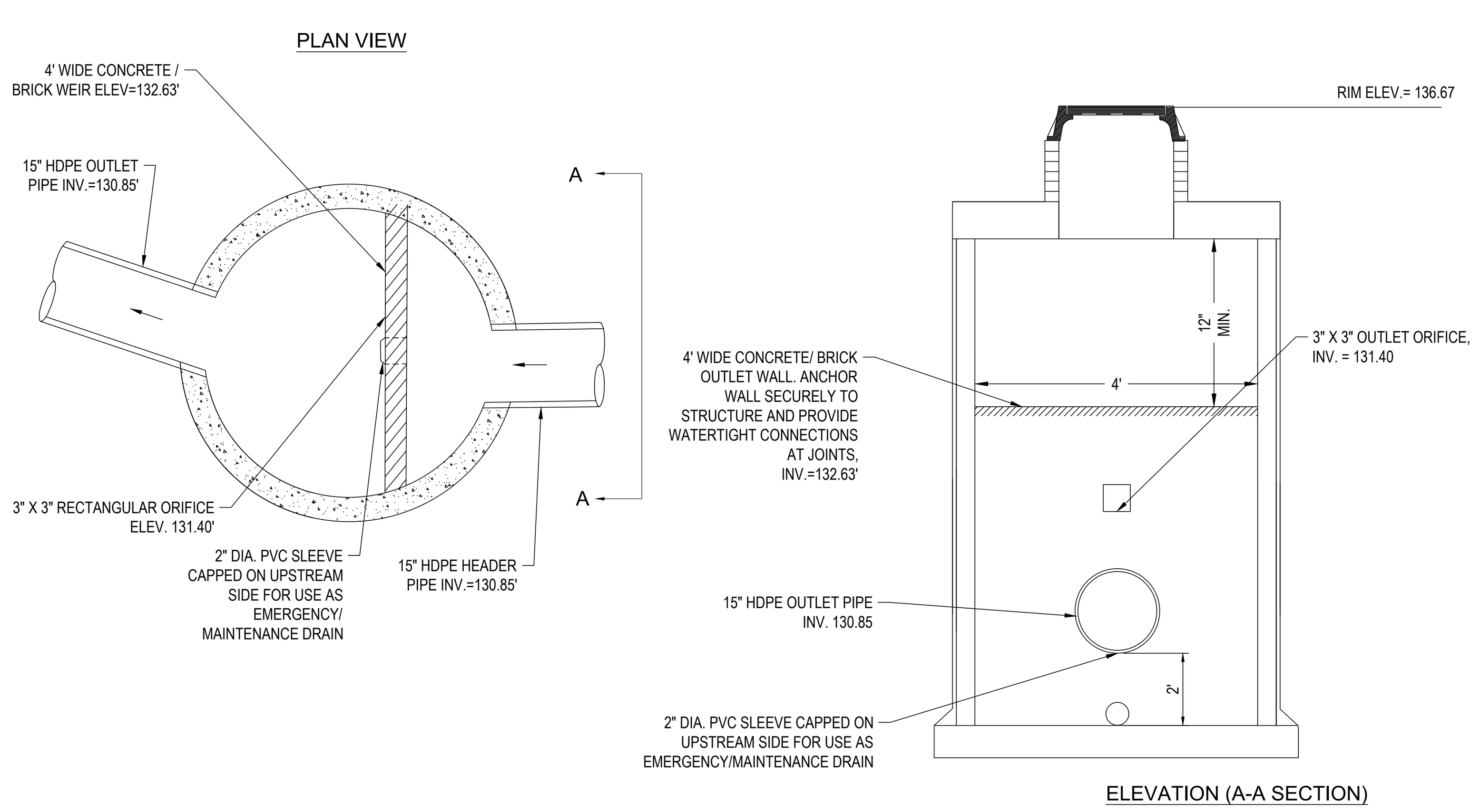
	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. [2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.

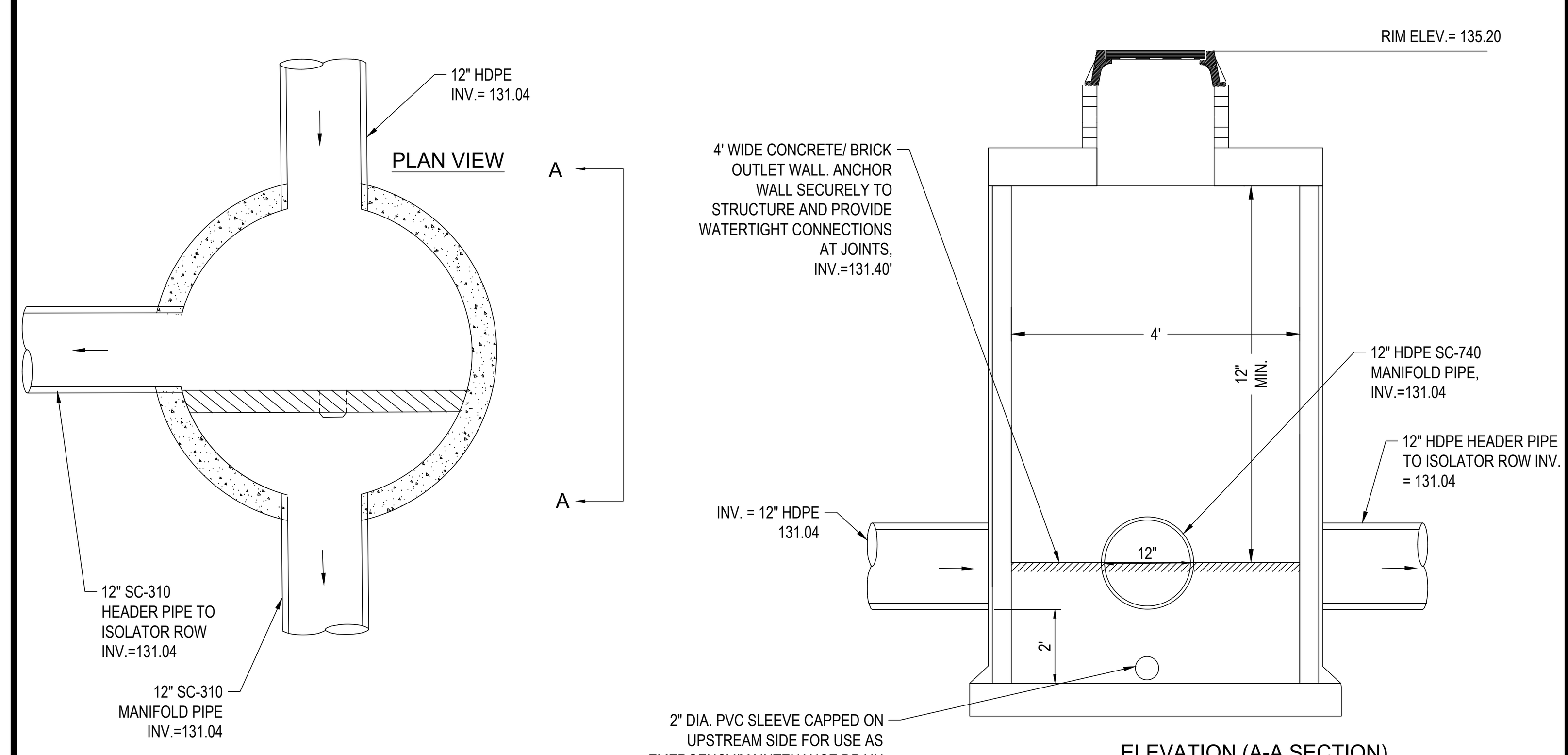


*MINIMUM COVER TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 24" (600 mm).

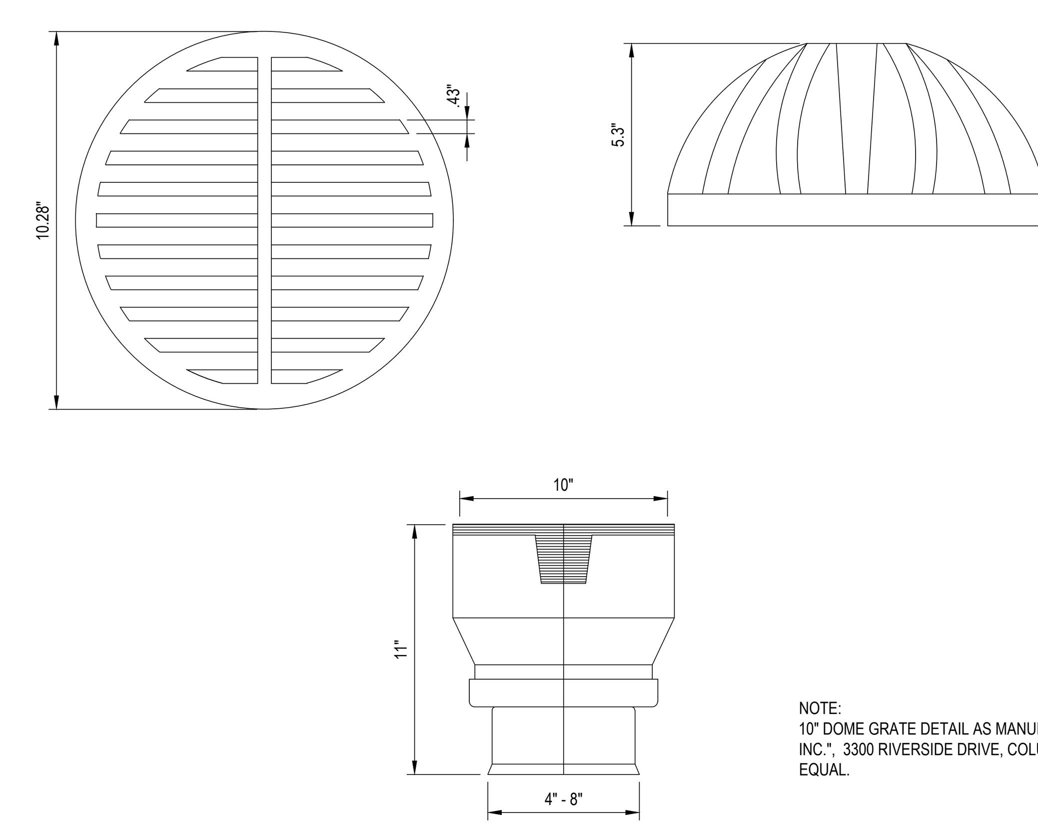
STORMTECH SC-310 SUBSURFACE DETENTION/INFILTRATION BASIN DETAILS (BMP-3)
N.T.S.



OUTLET CONTROL STRUCTURE (OCS-3)
N.T.S.



INLET CONTROL STRUCTURE (ICS-4)
N.T.S.



NOTE:
10" DOME GRATE DETAIL AS MANUFACTURED BY "ADVANCED DRAINAGE SYSTEMS, INC.", 3300 RIVERSIDE DRIVE, COLUMBUS, OH 43221, (800) 821-6710, OR APPROVED EQUAL.

YARD DRAIN
N.T.S.

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
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REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	1/20/20	ART COMMENTS	MLT / JGB
2	03/10/20	EMERGENCY ACCESS	MLT / JGB

Know what's **below.** **Call** before you dig.
ALWAYS CALL 811
It's fast. It's free. It's the law.

PERMIT SET

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PROJECT No.:	CT191016
DRAWN BY:	MLT / DE
CHECKED BY:	JGB / PM
DATE:	12/06/19
CAD I.D.:	CT191016ss2

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

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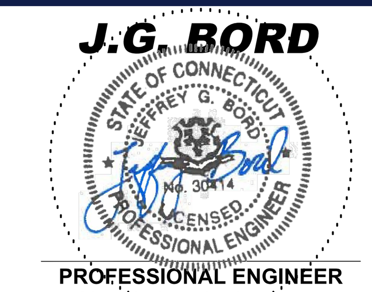


PROFESSIONAL ENGINEER
CONNECTICUT LICENSE No. 30414

SHEET TITLE:

DETAIL SHEET

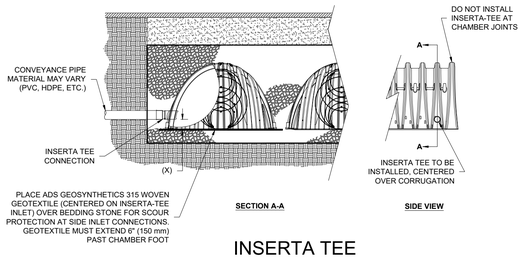
SHEET NUMBER:

C-905

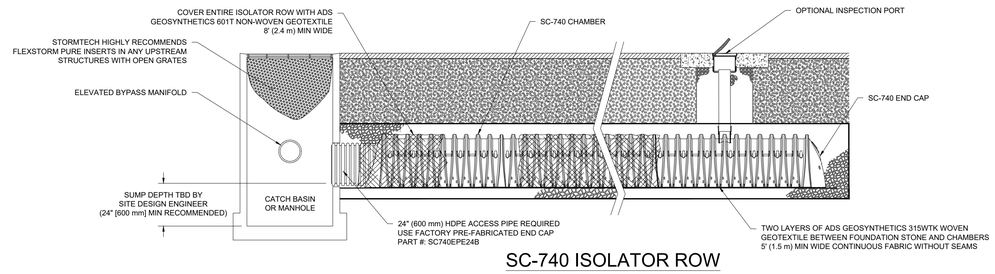
REVISION 2 - 3/10/20

P:\19\CT191016\DRAWINGS\PLAN SETS\REV2\CT191016SS2----->LAYOUT: C-905 DETAIL
BJ

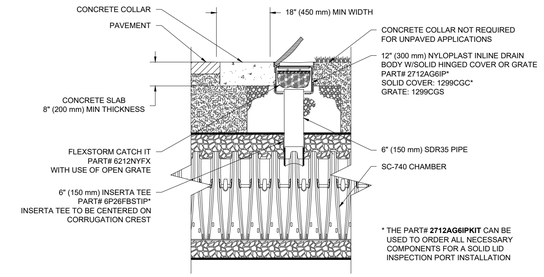
CHAMBER	MAX DIAMETER OF INSERTA TEE	HEIGHT FROM BASE OF CHAMBER (X)
SC-740	10" (250 mm)	4" (100 mm)



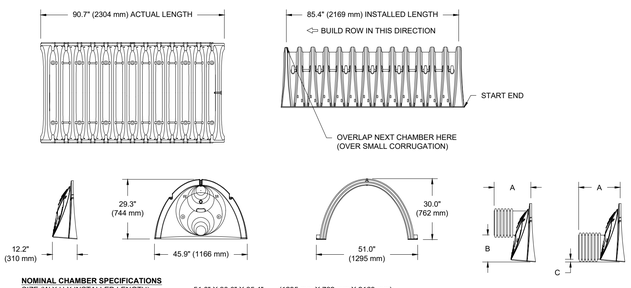
INSERTA TEE



SC-740 ISOLATOR ROW



SC-740 6" (150 mm) INSPECTION PORT



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	51.0" X 30.0" X 85.4"	(1295 mm X 762 mm X 2169 mm)
CHAMBER STORAGE	45.9 CUBIC FEET	(1.30 m³)
MINIMUM INSTALLED STORAGE*	74.9 CUBIC FEET	(2.12 m³)
WEIGHT	75.0 lbs.	(33.6 kg)

*ASSUMES 6" (152 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS

PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PRE-FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
PRE-CORED END CAPS END WITH "PC"

PART #	STUB	A	B	C
SC740EPE06T / SC740EPE06TPC	6" (150 mm)	10.9" (277 mm)	18.5" (470 mm)	---
SC740EPE06B / SC740EPE06BPC			---	0.5" (13 mm)
SC740EPE08T /SC740EPE08TPC	8" (200 mm)	12.2" (310 mm)	16.5" (419 mm)	---
SC740EPE08B / SC740EPE08BPC			---	0.6" (15 mm)
SC740EPE10T / SC740EPE10TPC	10" (250 mm)	13.4" (340 mm)	14.5" (368 mm)	---
SC740EPE10B / SC740EPE10BPC			---	0.7" (18 mm)
SC740EPE12T / SC740EPE12TPC	12" (300 mm)	14.7" (373 mm)	12.5" (318 mm)	---
SC740EPE12B / SC740EPE12BPC			---	1.2" (30 mm)
SC740EPE15T / SC740EPE15TPC	15" (375 mm)	18.4" (467 mm)	9.0" (229 mm)	---
SC740EPE15B / SC740EPE15BPC			---	1.3" (33 mm)
SC740EPE18T / SC740EPE18TPC	18" (450 mm)	19.7" (500 mm)	5.0" (127 mm)	---
SC740EPE18B / SC740EPE18BPC			---	1.6" (41 mm)
SC740EPE24B*	24" (600 mm)	18.5" (470 mm)	---	0.1" (3 mm)

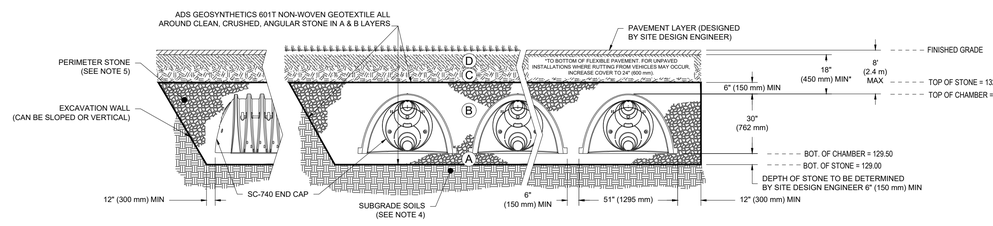
ALL STUBS, EXCEPT FOR THE SC740EPE24B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.
* FOR THE SC740EPE24B THE 24" (600 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75" (44 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.
NOTE: ALL DIMENSIONS ARE NOMINAL

SC-740 TECHNICAL SPECIFICATIONS

ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



SC-740 CROSS SECTION

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

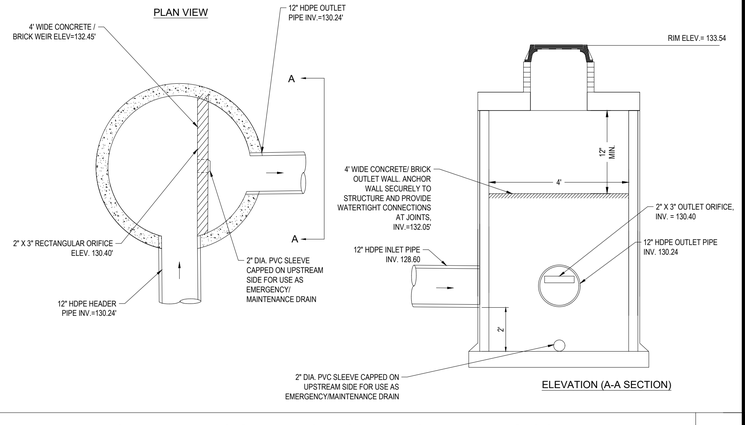
1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

NOTES:

1. SC-740 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS", OR ASTM F2922 "STANDARD SPECIFICATION FOR POLYETHYLENE (PE) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
4. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
5. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
6. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

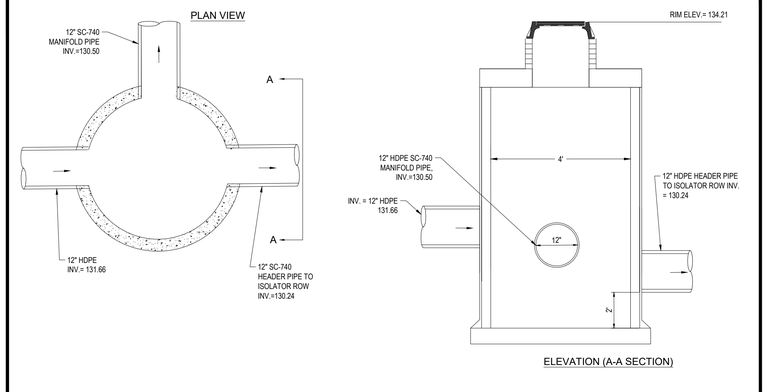
STORMTECH SC-740 SUBSURFACE DETENTION/INFILTRATION BASIN DETAILS (BMP-4)

N.T.S.



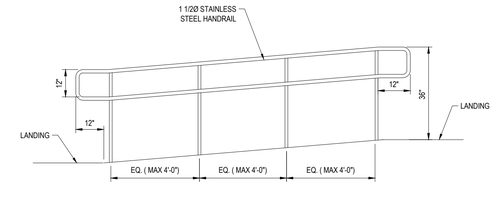
OUTLET CONTROL STRUCTURE (OCS-4)

N.T.S.



INLET CONTROL STRUCTURE (ICS-5)

N.T.S.



SPLIT RAIL FENCE DETAIL

N.T.S.

BOHLER

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

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REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	1/20/20	ART COMMENTS	MLT / JGB
2	03/10/20	EMERGENCY ACCESS	MLT / JGB

Know what's below. Call before you dig.
ALWAYS CALL 811
It's fast. It's free. It's the law.

PERMIT SET

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PROJECT No.:	CT191016
DRAWN BY:	MLT / DE
CHECKED BY:	JGB / PM
DATE:	12/06/19
CAD I.D.:	CT191016ss2

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

BOHLER
16 OLD FORGE ROAD, SUITE A
ROCKY HILL, CT 06067
Phone: (860) 333-8900
Fax: (508) 480-9080
www.BohlerEngineering.com

J.G. BORD
STATE OF CONNECTICUT JEFFREY G. BORD No. 30414 LICENSED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CONNECTICUT LICENSE NO. 30414

SHEET TITLE:

DETAIL SHEET

SHEET NUMBER:

C-906

REVISION 2 - 3/10/20

P:\19\CT191016\DRAWINGS\PLAN SETS\REV2\CT191016SS2----LAYOUT: C-906 DETAIL

LEGEND

124	EXISTING CONTOUR
125	
× 123.45	EXISTING SPOT ELEVATION
× TC 123.45	EXISTING TOP OF CURB ELEVATION
× G 122.95	EXISTING GUTTER ELEVATION
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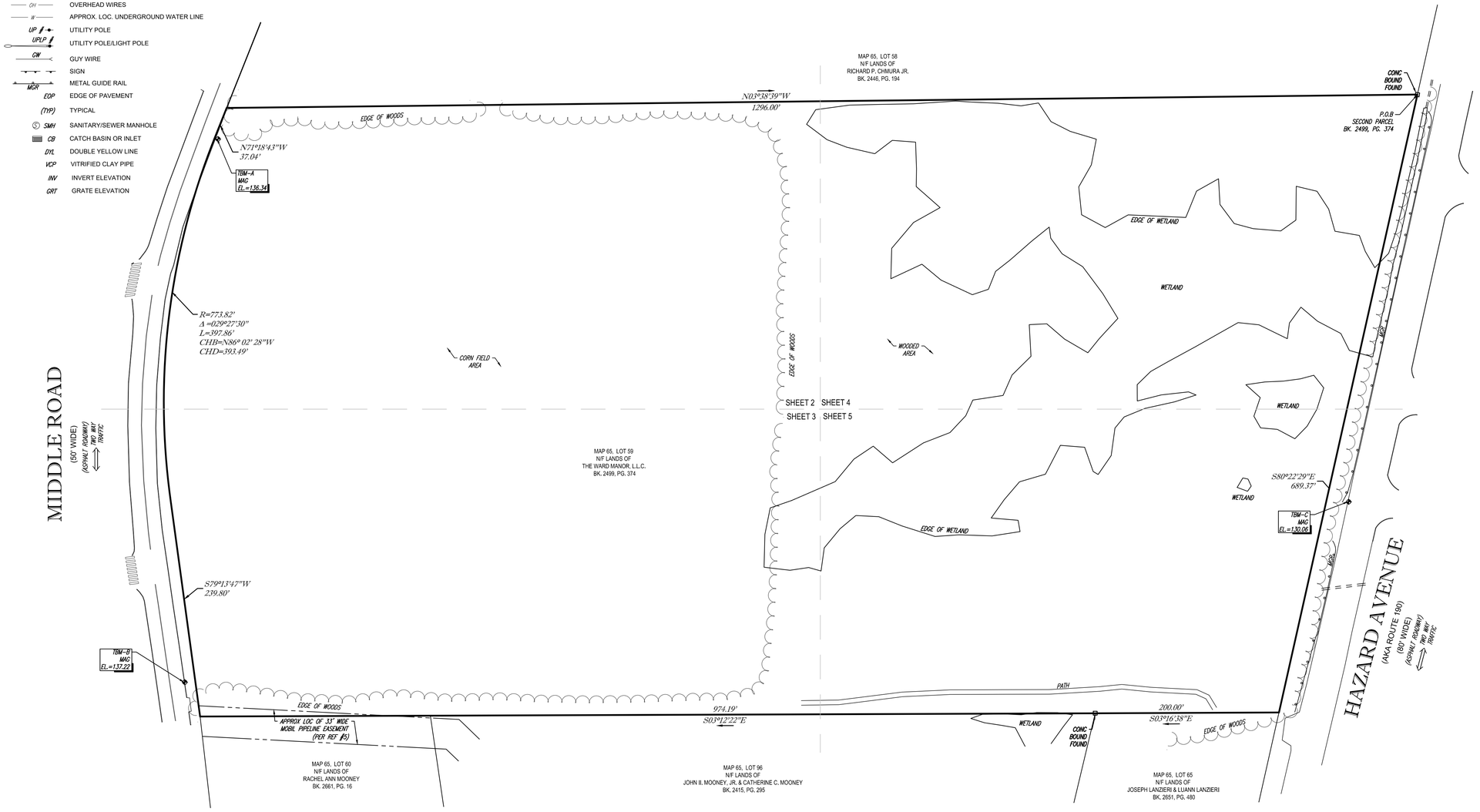

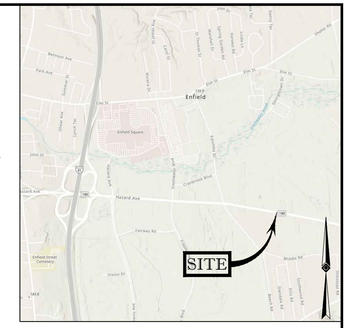

LOCUS MAP
©2013 ESRI WORLD STREET MAPS
NOT TO SCALE

NOTES:

1. THIS IS A BOUNDARY AND TOPOGRAPHIC SURVEY PREPARED IN ACCORDANCE WITH THE STANDARDS OF A CLASS A-2 AND T-2 SURVEY AS DEFINED IN THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTION 20-300B, EFFECTIVE DATE JUNE 21, 1996. THIS SURVEY IS ALSO PREPARED IN ACCORDANCE WITH THE MINIMUM STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT, ADOPTED ON SEPTEMBER 26, 1996, BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS INC., THE BOUNDARY LINES SHOWN HEREON ARE BASED UPON A RESURVEY OF THE SUBJECT PROPERTY.

   PROPERTY KNOWN AS LOT 59 AS SHOWN ON THE TOWN OF ENFIELD, HARTFORD COUNTY, STATE OF CONNECTICUT; MAP NO. 65.

2. AREA = 846,574 SQUARE FEET OR 19.435 ACRES.

3. LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE. LOCATIONS AND SIZES ARE BASED ON UTILITY MARK-OUTS, ABOVE GROUND STRUCTURES THAT WERE VISIBLE & ACCESSIBLE IN THE FIELD, AND THE MAPS AS LISTED IN THE REFERENCES AVAILABLE AT THE TIME OF THE SURVEY. AVAILABLE AS-BUILT PLANS AND UTILITY MARKOUT DOES NOT ENSURE MAPPING OF ALL UNDERGROUND UTILITIES AND STRUCTURES. BEFORE ANY EXCAVATION IS TO BEGIN, ALL UNDERGROUND UTILITIES SHOULD BE VERIFIED AS TO THEIR LOCATION, SIZE AND TYPE BY THE PROPER UTILITY COMPANIES. CONTROL POINT ASSOCIATES, INC. DOES NOT GUARANTEE THE UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA EITHER IN SERVICE OR ABANDONED.

4. THIS PLAN IS BASED ON INFORMATION PROVIDED BY A SURVEY PREPARED IN THE FIELD BY CONTROL POINT ASSOCIATES, INC. AND OTHER REFERENCE MATERIAL AS LISTED HEREON.

5. THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT AND IS SUBJECT TO THE RESTRICTIONS, COVENANTS AND/OR EASEMENTS THAT MAY BE CONTAINED THEREIN.

6. BY GRAPHIC PLOTTING ONLY PROPERTY IS LOCATED IN FLOOD HAZARD ZONE X (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN) PER REF. #2

7. ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), BASED ON GPS OBSERVATIONS UTILIZING THE KEYSTONE VRS NETWORK (KEYNETGPS) TAKEN AT THE TIME OF THE FIELD SURVEY.

   TEMPORARY BENCH MARKS SET:
   - TBM-A: MAG NAIL SET AT ELEVATION 136.34.
   - TBM-B: SPIKE SET AT ELEVATION 137.22.
   - TBM-C: MAG NAIL SET AT ELEVATION 130.06.

   PRIOR TO CONSTRUCTION IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THAT THE BENCHMARKS ILLUSTRATED ON THIS SKETCH HAVE NOT BEEN DISTURBED AND THEIR ELEVATIONS HAVE BEEN CONFIRMED. ANY CONFLICTS MUST BE REPORTED PRIOR TO CONSTRUCTION.

REFERENCES:

1. THE TAX ASSESSOR'S MAP OF ENFIELD, HARTFORD COUNTY, MAP 65.
2. MAP ENTITLED "NATIONAL FLOOD INSURANCE PROGRAM, FIRM, FLOOD INSURANCE RATE MAP, HARTFORD COUNTY, CONNECTICUT PANEL 227 OF 675," COMMUNITY-PANEL NUMBER 090028 0227 F, EFFECTIVE DATE: SEPTEMBER 26, 2008.
3. MAP ENTITLED "CONNECTICUT STATE HIGHWAY DEPARTMENT RIGHT OF WAY MAP TOWN OF ENFIELD HAZARD AVENUE FROM MIDDLE ROAD WESTERLY ABOUT 5,700.0 FEET ROUTE NO.105" DATED AUGUST 29, 1930.
4. MAP ENTITLED "PROPERTY OF RICHARD P. CHMURA" DATED DECEMBER 7, 1960, FILED WITH THE ENFIELD LAND RECORDS AS PLAN #1072.
5. MAP ENTITLED "RESUBDIVISION PREPARED FOR JOHN H. CATHERINE C. MOONEY" DATED APRIL 11, 1990. FILED WITH THE ENFIELD LAND RECORDS AS VOLUME 226, PAGE 3310.
6. MAP ENTITLED "TOWN OF ENFIELD PLAN MIDDLE ROAD" DATED APRIL 1968, FILED WITH THE TOWN OF ENFIELD ENGINEERS OFFICE.

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REQUEST NUMBER: 20193102803

UTILITY COMPANY	PHONE NUMBER
BUCKEYE PARTNERS, LP	1-610-904-4940
COX COMMUNICATIONS	1-800-778-9140
EVERSOURCE ELECTRIC	1-800-778-9140
EVERSOURCE GAS	1-203-206-5702
FRONTIER COMMUNICATIONS	1-800-778-9140
HAZARDVILLE WATER CO	1-860-749-0779
TOWN OF ENFIELD	1-860-209-1615

1-800-922-4455
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GRAPHIC SCALE
60' 0 30' 60' 120' 240'
(IN FEET)
1 inch = 60' ft.

TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

NOT A VALID ORIGINAL DOCUMENT UNLESS EMBOSSED WITH RAISED IMPRESSION OR BLUE INK SEAL

STATE OF CONNECTICUT · WILLIAM THEODORE WHIMPLE · No. 70290 · LICENSED · LAND SURVEYOR

SEPTEMBER 05, 2019
DATE

WILLIAM T. WHIMPLE
CONNECTICUT PROFESSIONAL LAND SURVEYOR #70290

FIELD DATE	8-30-19
FIELD BOOK NO.	19-12
FIELD BOOK PG.	47
FIELD CREW	J.O.
DRAWN:	P.V.

BOUNDARY & TOPOGRAPHIC SURVEY
118 HAZARD AVENUE
PREPARED FOR BOHLER ENGINEERING
LOT 59, MAP 65
TOWN OF ENFIELD, HARTFORD COUNTY
STATE OF CONNECTICUT

CONTROL POINT ASSOCIATES, INC.
352 TURNPIKE ROAD
SOUTHBOROUGH, MA 01772
508.948.3000 - 508.948.3003 FAX
ALBANY, NY 5182175010
CHALFONT, PA 2157129800
MANHATTAN, NY 6467800411
MT LAUREL, NJ 6098572099
WARREN, NJ 9086680099

REVIEWED:	APPROVED:	DATE	SCALE	FILE NO.	DWG. NO.
A.J.D.	W.T.W.	9-5-19	1"=60'	03-190182-00	1 OF 5

LEGEND

124	EXISTING CONTOUR
125	EXISTING CONTOUR
× 123.45	EXISTING SPOT ELEVATION
× TC 123.45	EXISTING TOP OF CURB ELEVATION
× G 122.95	EXISTING GUTTER ELEVATION
× TW 123.45	EXISTING TOP OF WALL ELEVATION
× BW 122.95	EXISTING BOTTOM OF WALL ELEVATION
	HYDRANT
WV	WATER VALVE
OH	OVERHEAD WIRES
W	APPROX. LOC. UNDERGROUND WATER LINE
UP	UTILITY POLE
UPLP	UTILITY POLE/LIGHT POLE
GW	GUY WIRE
	SIGN
MGR	METAL GUIDE RAIL
EOP	EDGE OF PAVEMENT
(TYP)	TYPICAL
SMH	SANITARY/SEWER MANHOLE
CB	CATCH BASIN OR INLET
DYL	DOUBLE YELLOW LINE
VCP	VITRIFIED CLAY PIPE
INV	INVERT ELEVATION
GRT	GRATE ELEVATION

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STATE OF CONNECTICUT
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No. 70290
LICENSED
LAND SURVEYOR

SEPTEMBER 05, 2019
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REVIEWED:	A.J.D.
APPROVED:	W.T.W.
DATE	9-5-19
SCALE	1"=30'
FILE NO.	03-190182-00
DWG. NO.	2 OF 5

BOUNDARY & TOPOGRAPHIC SURVEY

118 HAZARD AVENUE

PREPARED FOR BOHLER ENGINEERING
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TOWN OF ENFIELD, HARTFORD COUNTY
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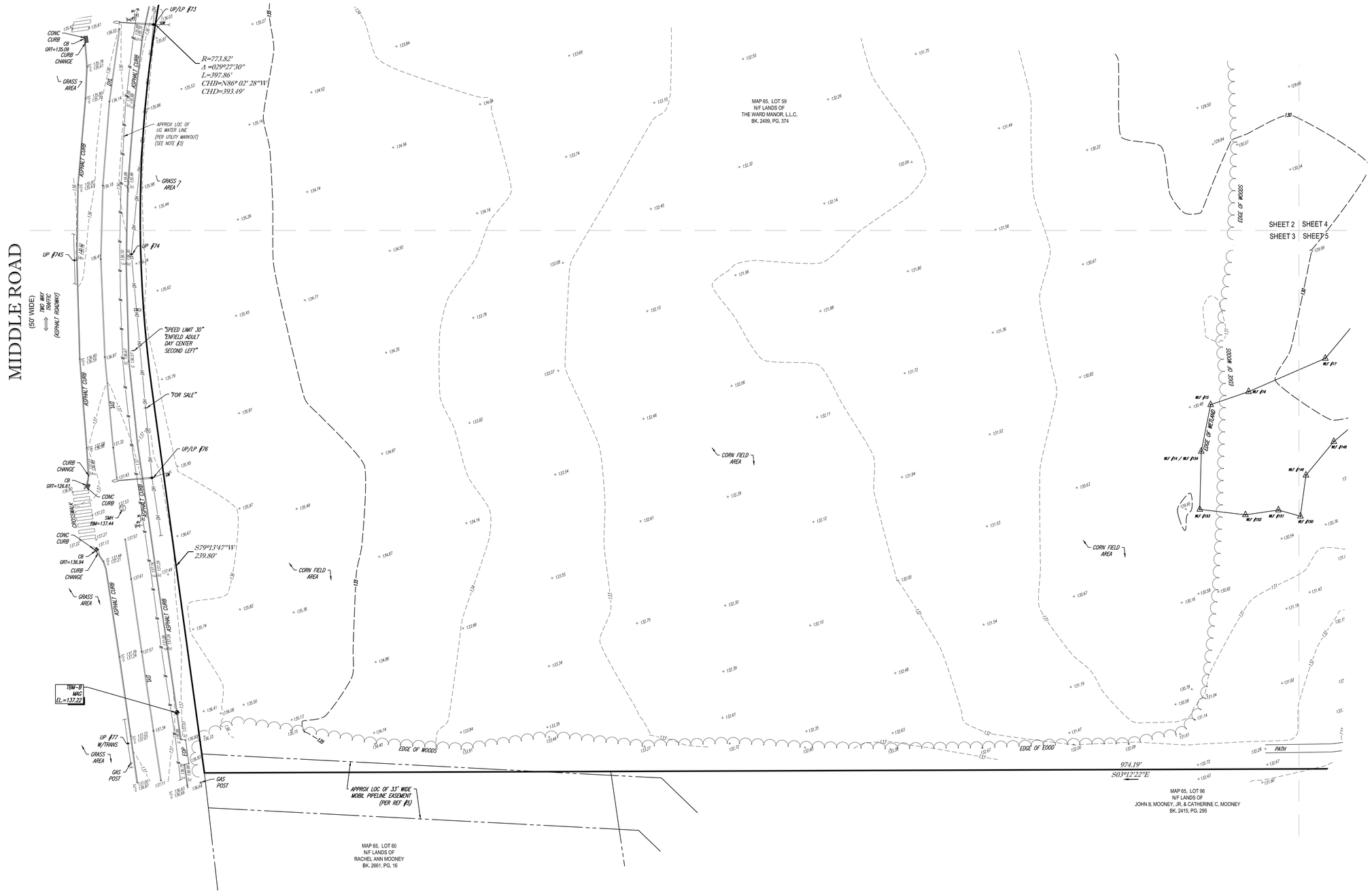

CONNECTICUT STATE PLANE COORDINATE SYSTEM (NAD 83)

LEGEND

124	EXISTING CONTOUR
125	EXISTING CONTOUR
× 123.45	EXISTING SPOT ELEVATION
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No. 70290
LICENSED
LAND SURVEYOR

SEPTEMBER 05, 2019
DATE

WILLIAM T. WHIMPLE
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FIELD DATE	8-30-19
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DRAWN:	P.V.
REVIEWED:	A.J.D.

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APPROVED:	DATE	SCALE	FILE NO.	DWG. NO.
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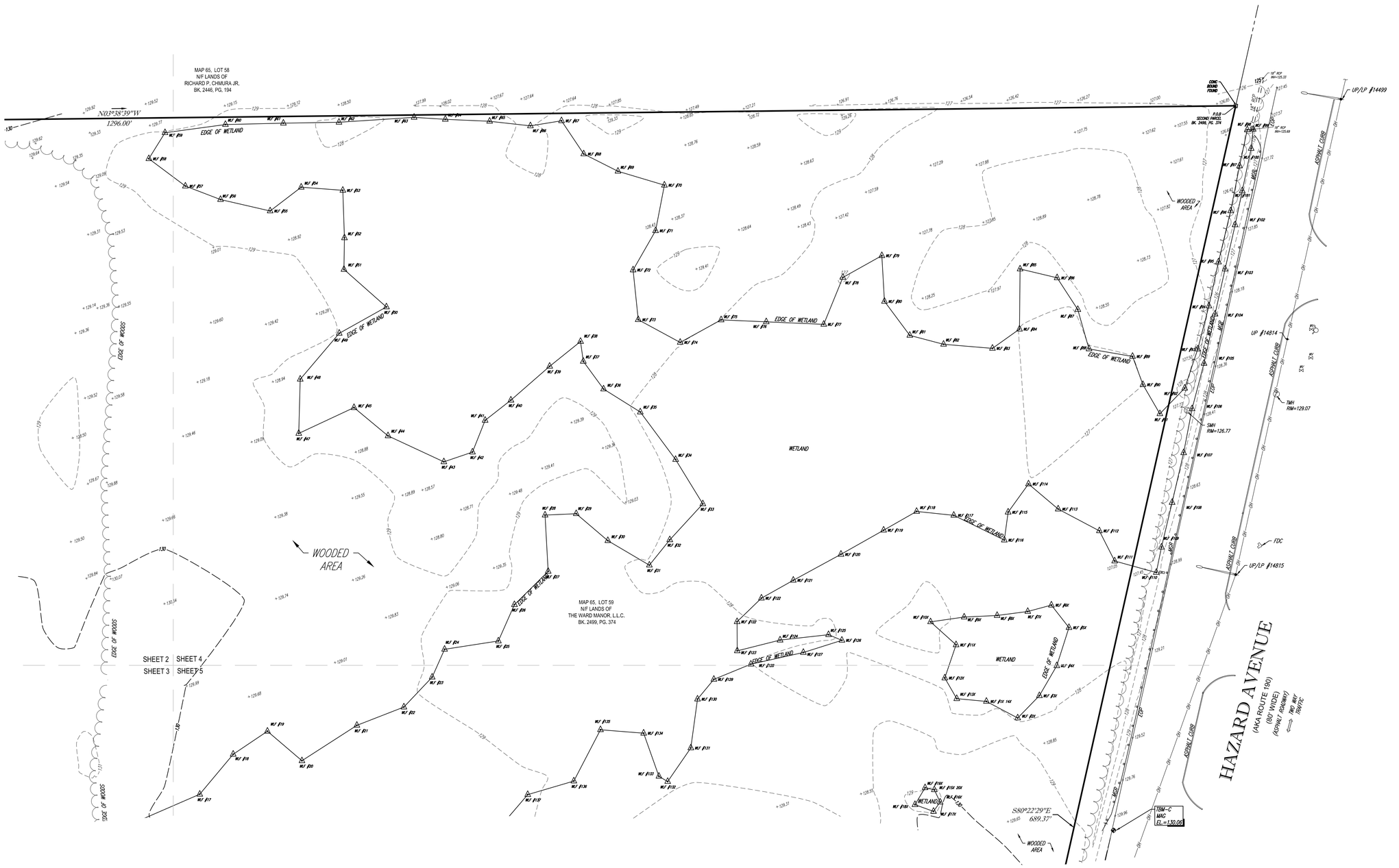
CONNECTICUT STATE PLANE COORDINATE SYSTEM (NAD 83)



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BOUNDARY & TOPOGRAPHIC SURVEY

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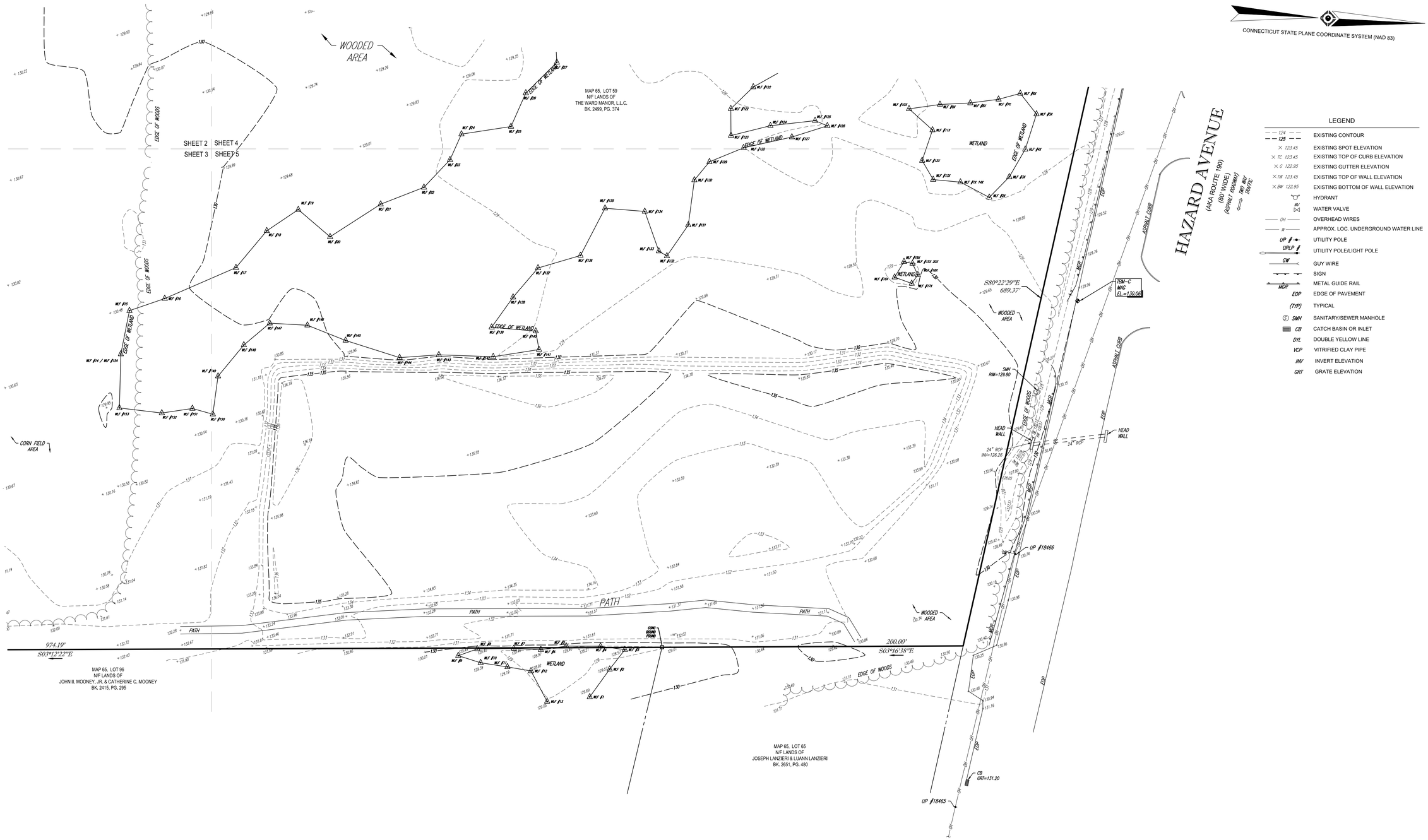

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SMH	SANITARY/SEWER MANHOLE
CB	CATCH BASIN OR INLET
DYL	DOUBLE YELLOW LINE
VCP	VITRIFIED CLAY PIPE
INV	INVERT ELEVATION
GRT	GRATE ELEVATION

UTILITIES:

THE FOLLOWING COMPANIES WERE NOTIFIED BY CONNECTICUT ONE-CALL SYSTEM (1-888-344-7233) AND REQUESTED TO MARK OUT UNDERGROUND FACILITIES AFFECTING AND SERVICING THIS SITE. THE UNDERGROUND UTILITY INFORMATION SHOWN HEREON IS BASED UPON THE UTILITY COMPANIES RESPONSE TO THIS REQUEST.
REQUEST NUMBER: 20193102803

UTILITY COMPANY	PHONE NUMBER
BUCKEYE PARTNERS, LP	1-610-904-4940
COX COMMUNICATIONS	1-800-778-9140
EVERSOURCE ELECTRIC	1-800-778-9140
EVERSOURCE GAS	1-203-206-5702
FRONTIER COMMUNICATIONS	1-800-778-9140
HAZARDVILLE WATER CO	1-860-749-0779
TOWN OF ENFIELD	1-860-209-1615

1-800-922-4455
STOP, CALL BEFORE YOU DIG!

THE STATE OF CONNECTICUT REQUIRES NOTIFICATION BY EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN THE STATE.

GRAPHIC SCALE

30' 0 15' 30' 60' 120'

(IN FEET)
1 inch = 30' ft.

TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

NOT A VALID ORIGINAL DOCUMENT UNLESS EMBOSSED WITH RAISED IMPRESSION OR BLUE INK SEAL.

STATE OF CONNECTICUT
WILLIAM THEODORE WHIMPLE
No. 70290
LICENSED
LAND SURVEYOR

SEPTEMBER 05, 2019
DATE

WILLIAM T. WHIMPLE
CONNECTICUT PROFESSIONAL LAND SURVEYOR #70290

FIELD DATE	FIELD BOOK NO.	FIELD BOOK PG.	FIELD CREW	DRAWN:
8-30-19	19-12	47	J.O.	P.V.

BOUNDARY & TOPOGRAPHIC SURVEY
118 HAZARD AVENUE
PREPARED FOR BOHLER ENGINEERING
LOT 59, MAP 65
TOWN OF ENFIELD, HARTFORD COUNTY
STATE OF CONNECTICUT

CONTROL POINT ASSOCIATES, INC.
352 TURNPIKE ROAD
SOUTHBOROUGH, MA 01772
508.948.3000 - 508.948.3003 FAX
ALBANY, NY 5182175910
CHALFONT, PA 2157129800
MANHATTAN, NY 6467800411
MT LAUREL, NJ 6098572099
WARREN, NJ 9086680099

REVIEWED:	APPROVED:	DATE	SCALE	FILE NO.	DWG. NO.
A.J.D.	W.T.W.	9-5-19	1"=30'	03-190182-00	5 OF 5

CONTROL POINT ASSOCIATES, INC. ALL RIGHTS RESERVED
THE OUTPUT HEREIN IS ASSOCIATE OWNERSHIP, AND MAY NOT BE USED IN ANY OTHER ORIGINAL PROJECT OR THE PURPOSE ORIGINALLY INTENDED, WITHOUT THE WRITTEN PERMISSION OF CONTROL POINT ASSOCIATES, INC. IS PROHIBITED.

PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED

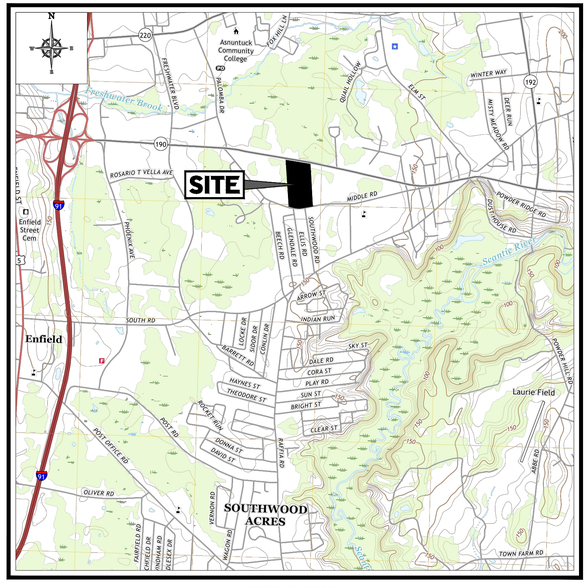
"ALL-AMERICAN ASSISTED LIVING" FACILITY

LOCATION OF SITE

118 HAZARD AVENUE, TOWN OF ENFIELD

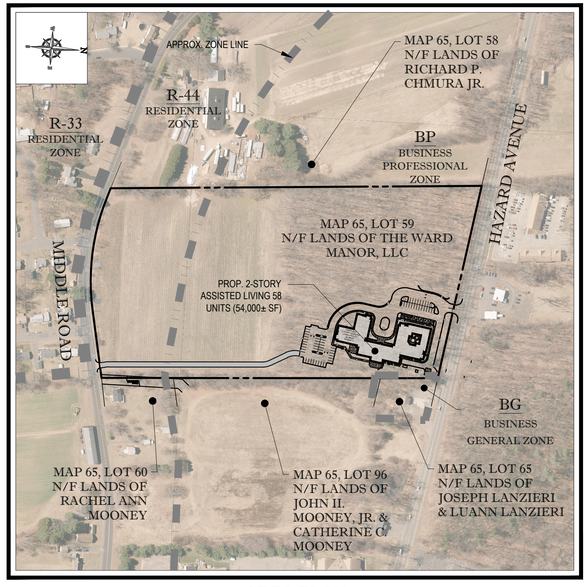
HARTFORD COUNTY, CONNECTICUT

MAP 65, LOT 59



USGS MAP

SCALE: 1" = 2,000'
SOURCE: BROAD BROOK, CT USGS QUADRANGLE



AREA PLAN

SCALE: 1" = 250'
SOURCE: CTECO 2016 AERIAL IMAGERY

DRAWING SHEET INDEX

SHEET TITLE	SHEET NUMBER
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SOIL EROSION AND SEDIMENT CONTROL PLAN	C-402
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DETAIL SHEET	C-906
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BOUNDARY & TOPOGRAPHIC SURVEY (BY OTHERS)	4 OF 5
BOUNDARY & TOPOGRAPHIC SURVEY (BY OTHERS)	5 OF 5

PREPARED BY

BOHLER

BOHLER™

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

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REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	1/20/20	ART COMMENTS	MLT / JGB
2	3/10/20	EMERGENCY ACCESS	MLT / JGB
3	6/4/20	UPDATED WETLAND DELINEATION	BTJ / JGB

811 Know what's below. Call before you dig.

ALWAYS CALL 811
It's fast. It's free. It's the law.

PERMIT SET

THIS DRAWING IS INTENDED FOR MUNICIPAL AND/OR AGENCY REVIEW AND APPROVAL. IT IS NOT INTENDED AS A CONSTRUCTION DOCUMENT UNLESS INDICATED OTHERWISE.

PROJECT No.: CT191016
DRAWN BY: MLT / DE
CHECKED BY: JGB / PM
DATE: 12/06/19
CAD I.D.: CT191016ss2

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

BOHLER
16 OLD FORGE ROAD, SUITE A
ROCKY HILL, CT 06067
Phone: (860) 333-8900
Fax: (508) 480-9080
www.BohlerEngineering.com

J.G. BORD
STATE OF CONNECTICUT
JEFFREY G. BORD
No. 30414
LICENSED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CONNECTICUT LICENSE No. 30414

SHEET TITLE:

COVER SHEET

SHEET NUMBER:

C-101

REVISION 3 - 6/4/20

P:\19\CT191016\DRAWINGS\PLAN SETS\REV3 - WETLAND FLAG REVISIONS\CT191016SS3----ALAYOUT C-101 COVER

GENERAL NOTES

CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH THE NOTES AND SPECIFICATIONS CONTAINED HEREIN. CONTRACTOR IS RESPONSIBLE TO ENSURE THAT ALL SUBCONTRACTORS FULLY AND COMPLETELY CONFORM TO AND COMPLY WITH THESE REQUIREMENTS.

1. THE FOLLOWING DOCUMENTS ARE INCORPORATED BY REFERENCE AS PART OF THIS SITE PLAN:
   - "BOUNDARY & TOPOGRAPHIC SURVEY" - PREPARED BY CONTROL POINT ASSOCIATES, INC. DATED 09/05/19 REVISED 06/04/20.
   - "REPORT OF GEOTECHNICAL INVESTIGATION" - PREPARED BY WHITESTONE ASSOCIATES, INC. DATED 10/31/19.
   - "PHASE I ENVIRONMENTAL SITE ASSESSMNET" - PREPARED BY WHITESTONE ASSOCIATES, INC. DATED 08/19/19

   PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR MUST VERIFY THAT HE/SHE HAS THE LATEST EDITION OF THE DOCUMENTS REFERENCED ABOVE. THIS IS CONTRACTOR'S RESPONSIBILITY.
2. ALL ACCESSIBLE (A/K/A ADA) PARKING SPACES MUST BE CONSTRUCTED TO MEET, AT A MINIMUM, THE MORE STRINGENT OF THE REQUIREMENTS OF THE "AMERICANS WITH DISABILITIES ACT" (ADA) CODE (42 U.S.C. § 12101 et seq. AND 42 U.S.C. § 4151 et seq.) OR THE REQUIREMENTS OF THE JURISDICTION WHERE THE PROJECT IS TO BE CONSTRUCTED, AND ANY AND ALL AMENDMENTS TO BOTH WHICH ARE IN EFFECT WHEN THESE PLANS ARE COMPLETED.
3. PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT ALL REQUIRED PERMITS AND APPROVALS HAVE BEEN OBTAINED. NO CONSTRUCTION OR FABRICATION SHALL BEGIN UNTIL THE CONTRACTOR HAS RECEIVED AND THOROUGHLY REVIEWED THE COMMENTS TO ALL PLANS AND OTHER DOCUMENTS REVIEWED AND APPROVED BY THE PERMITTING AUTHORITIES AND CONFIRMED THAT ALL NECESSARY OR REQUIRED PERMITS HAVE BEEN OBTAINED. CONTRACTOR MUST HAVE COPIES OF ALL PERMITS AND APPROVALS ON SITE AT ALL TIMES.
4. THE OWNER/CONTRACTOR MUST BE FAMILIAR WITH AND RESPONSIBLE FOR THE PROCUREMENT OF ANY AND ALL CERTIFICATIONS REQUIRED FOR THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
5. ALL WORK MUST BE PERFORMED IN ACCORDANCE WITH THESE PLANS, SPECIFICATIONS AND CONDITIONS OF APPROVAL, AND ALL APPLICABLE REQUIREMENTS, RULES, REGULATIONS, STATUTORY REQUIREMENTS, CODES, LAWS AND STANDARDS OF ALL GOVERNMENTAL ENTITIES WITH JURISDICTION OVER THIS PROJECT.
6. THE GEOTECHNICAL REPORT AND RECOMMENDATIONS SET FORTH HEREIN ARE A PART OF THE REQUIRED CONSTRUCTION DOCUMENTS AND, IN CASE OF CONFLICT, DISCREPANCY OR AMBIGUITY, THE MORE STRINGENT REQUIREMENTS AND/OR RECOMMENDATIONS CONTAINED IN THE PLANS AND THE GEOTECHNICAL REPORT AND RECOMMENDATIONS SHALL TAKE PRECEDENCE UNLESS SPECIFICALLY NOTED OTHERWISE ON THE PLANS. THE CONTRACTOR MUST NOTIFY THE ENGINEER, IN WRITING, OF ANY SUCH CONFLICT, DISCREPANCY OR AMBIGUITY BETWEEN THE GEOTECHNICAL REPORTS AND PLANS AND SPECIFICATIONS PRIOR TO PROCEEDING WITH ANY FURTHER WORK.
7. THESE PLANS ARE BASED ON INFORMATION PROVIDED TO BOHLER ENGINEERING BY THE OWNER AND OTHERS PRIOR TO THE TIME OF PLAN PREPARATION. CONTRACTOR MUST FIELD VERIFY EXISTING CONDITIONS AND NOTIFY BOHLER ENGINEERING, IN WRITING, IMMEDIATELY IF ACTUAL SITE CONDITIONS DIFFER FROM THOSE SHOWN ON THE PLAN, OR IF THE PROPOSED WORK CONFLICTS WITH ANY OTHER SITE FEATURES.
8. ALL DIMENSIONS SHOWN ON THE PLANS MUST BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. CONTRACTOR MUST NOTIFY ENGINEER, IN WRITING, IF ANY CONFLICTS, DISCREPANCIES, OR AMBIGUITIES EXIST PRIOR TO PROCEEDING WITH CONSTRUCTION. NO EXTRA COMPENSATION WILL BE PAID TO THE CONTRACTOR FOR WORK WHICH HAS TO BE REDONE OR REPAIRED DUE TO DIMENSIONS OR GRADES SHOWN INCORRECTLY ON THESE PLANS PRIOR TO CONTRACTOR GIVING ENGINEER WRITTEN NOTIFICATION OF SAME AND ENGINEER, THEREAFTER, PROVIDING CONTRACTOR WITH WRITTEN AUTHORIZATION TO PROCEED WITH SUCH ADDITIONAL WORK.
9. CONTRACTOR MUST REFER TO THE ARCHITECTURAL/BUILDING PLANS "OF RECORD" FOR EXACT LOCATIONS AND DIMENSIONS OF ENTRY/EXIT POINTS, ELEVATIONS, PRECISE BUILDING DIMENSIONS, AND EXACT BUILDING UTILITY LOCATIONS.
10. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR MUST COORDINATE THE BUILDING LAYOUT BY CAREFUL REVIEW OF THE ENTIRE SITE PLAN AND THE LATEST ARCHITECTURAL PLANS (INCLUDING, BUT NOT LIMITED TO, STRUCTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND FIRE SUPPRESSION PLAN, WHERE APPLICABLE). CONTRACTOR MUST IMMEDIATELY NOTIFY OWNER, ARCHITECT AND SITE ENGINEER, IN WRITING, OF ANY CONFLICTS, DISCREPANCIES OR AMBIGUITIES WHICH EXIST.
11. DEBRIS MUST NOT BE BURIED ON THE SUBJECT SITE AND ALL UNSUITABLE EXCAVATED MATERIAL AND DEBRIS (SOLID WASTE) MUST BE DISPOSED OF IN ACCORDANCE WITH THE REQUIREMENTS OF ANY AND ALL GOVERNMENTAL AUTHORITIES WHICH HAVE JURISDICTION OVER THIS PROJECT OR OVER CONTRACTOR.
12. THE CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING WHEN SHORING IS REQUIRED AND FOR INSTALLING ALL SHORING REQUIRED DURING EXCAVATION (TO BE PERFORMED IN ACCORDANCE WITH CURRENT OSHA STANDARDS) AND ANY ADDITIONAL PRECAUTIONS TO BE TAKEN TO ASSURE THE STABILITY OF ADJACENT, NEARBY AND CONTIGUOUS STRUCTURES AND PROPERTIES.
13. THE CONTRACTOR IS TO EXERCISE EXTREME CARE WHEN PERFORMING ANY WORK ACTIVITIES ADJACENT TO PAVEMENT, STRUCTURES, ETC. WHICH ARE TO REMAIN EITHER FOR AN INITIAL PHASE OF THE PROJECT OR AS PART OF THE FINAL CONDITION. CONTRACTOR IS RESPONSIBLE FOR TAKING ALL APPROPRIATE MEASURES REQUIRED TO ENSURE THE STRUCTURAL STABILITY OF SIDEWALKS AND PAVEMENT, UTILITIES, BUILDINGS, AND INFRASTRUCTURE WHICH ARE TO REMAIN, AND TO PROVIDE A SAFE WORK AREA FOR THIRD PARTIES, PEDESTRIANS AND ANYONE INVOLVED WITH THE PROJECT.
14. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE DONE TO ANY NEW OR EXISTING CONSTRUCTION OR PROPERTY DURING THE COURSE OF CONSTRUCTION, INCLUDING BUT NOT LIMITED TO DRAINAGE, UTILITIES, PAVEMENT, STRIPING, CURB, ETC. AND SHALL BEAR ALL COSTS ASSOCIATED WITH SAME TO INCLUDE, BUT NOT BE LIMITED TO, REDESIGN, RE-SURVEY, RE-PERMITTING AND CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR AND MUST REPLACE ALL SIGNAL INTERCONNECTION CABLE, WIRING CONDUITS, AND ANY UNDERGROUND ACCESSORY EQUIPMENT DAMAGED DURING CONSTRUCTION AND MUST BEAR ALL COSTS ASSOCIATED WITH SAME. THE REPAIR OF ANY SUCH NEW OR EXISTING CONSTRUCTION OR PROPERTY MUST RESTORE SUCH CONSTRUCTION OR PROPERTY TO A CONDITION EQUIVALENT TO OR BETTER THAN THE CONDITIONS PRIOR TO COMMENCEMENT OF THE CONSTRUCTION, AND IN CONFORMANCE WITH APPLICABLE CODES, LAWS RULES, REGULATIONS, STATUTORY REQUIREMENTS AND STATUTES. CONTRACTOR MUST BEAR ALL COSTS ASSOCIATED WITH SAME. CONTRACTOR IS RESPONSIBLE TO DOCUMENT ALL EXISTING DAMAGE AND TO NOTIFY THE OWNER AND THE CONSTRUCTION MANAGER PRIOR TO THE START OF CONSTRUCTION.
15. ALL CONCRETE MUST BE AIR ENTRAINED AND HAVE THE MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI AT 28 DAYS UNLESS OTHERWISE NOTED ON THE PLANS, DETAILS AND/OR GEOTECHNICAL REPORT.
16. THE ENGINEER IS NOT RESPONSIBLE FOR CONSTRUCTION METHODS, MEANS, TECHNIQUES OR PROCEDURES, GENERALLY OR FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES OR PROCEDURES FOR COMPLETION OF THE WORK DEPICTED BOTH ON THESE PLANS, AND FOR ANY CONFLICTS/SCOPE REVISIONS WHICH RESULT FROM SAME. CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE METHODS/MEANS FOR COMPLETION OF THE WORK PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
17. THE ENGINEER OF RECORD IS NOT RESPONSIBLE FOR JOB SITE SAFETY. THE ENGINEER OF RECORD HAS NOT BEEN RETAINED TO PERFORM OR BE RESPONSIBLE FOR JOB SITE SAFETY, SAME BEING WHOLLY OUTSIDE OF ENGINEER'S SERVICES AS RELATED TO THE PROJECT. THE ENGINEER OF RECORD IS NOT RESPONSIBLE TO IDENTIFY OR REPORT ANY JOB SITE SAFETY ISSUES, AT ANY TIME.
18. ALL CONTRACTORS MUST CARRY THE SPECIFIED STATUTORY WORKER'S COMPENSATION INSURANCE, EMPLOYER'S LIABILITY INSURANCE AND LIMITS OF COMMERCIAL GENERAL LIABILITY INSURANCE (CGL). ALL CONTRACTORS MUST HAVE THEIR CGL POLICIES ENDORSED TO NAME BOHLER ENGINEERING, AND ITS PAST, PRESENT AND FUTURE OWNERS, OFFICERS, DIRECTORS, PARTNERS, SHAREHOLDERS, MEMBERS, PRINCIPALS, COMMISSIONERS, AGENTS, SERVANTS, EMPLOYEES, AFFILIATES, SUBSIDIARIES, AND RELATED ENTITIES, AND ITS SUBCONTRACTORS AND SUBCONSULTANTS AS ADDITIONAL NAMED INSURED AND TO PROVIDE CONTRACTUAL LIABILITY COVERAGE SUFFICIENT TO INSURE THIS HOLD HARMLESS AND INDEMNITY OBLIGATIONS ASSUMED BY THE CONTRACTORS. ALL CONTRACTORS MUST FURNISH BOHLER ENGINEERING WITH CERTIFICATIONS OF INSURANCE AS EVIDENCE OF THE REQUIRED INSURANCE PRIOR TO COMMENCING WORK AND UPON RENEWAL OF EACH POLICY DURING THE ENTIRE PERIOD OF CONSTRUCTION AND FOR ONE YEAR AFTER THE COMPLETION OF CONSTRUCTION. IN ADDITION, ALL CONTRACTORS WILL, TO THE FULLEST EXTENT PERMITTED UNDER THE LAW, INDEMNIFY, DEFEND AND HOLD HARMLESS BOHLER ENGINEERING AND ITS PAST, PRESENT AND FUTURE OWNERS, OFFICERS, DIRECTORS, PARTNERS, SHAREHOLDERS, MEMBERS, PRINCIPALS, COMMISSIONERS, AGENTS, SERVANTS, EMPLOYEES, AFFILIATES, SUBSIDIARIES, AND RELATED ENTITIES, AND ITS SUBCONTRACTORS AND SUBCONSULTANTS FROM AND AGAINST ANY DAMAGES, INJURIES, CLAIMS, ACTIONS, PENALTIES, EXPENSES, PUNITIVE DAMAGES, TORT DAMAGES, STATUTORY CLAIMS, STATUTORY CAUSES OF ACTION, LOSSES, CAUSES OF ACTION, LIABILITIES OR COSTS, INCLUDING, BUT NOT LIMITED TO, REASONABLE ATTORNEYS' FEES AND DEFENSE COSTS, ARISING OUT OF OR IN ANY WAY CONNECTED WITH OR TO THE PROJECT, INCLUDING ALL CLAIMS BY EMPLOYEES OF THE CONTRACTORS, ALL CLAIMS BY THIRD PARTIES AND ALL CLAIMS RELATED TO THE PROJECT. CONTRACTOR MUST NOTIFY ENGINEER, IN WRITING, AT LEAST THIRTY (30) DAYS PRIOR TO ANY TERMINATION, SUSPENSION OR CHANGE OF ITS INSURANCE HEREUNDER.
19. BOHLER ENGINEERING WILL REVIEW OR TAKE OTHER APPROPRIATE ACTION ON THE CONTRACTOR SUBMITTALS, SUCH AS SHOP DRAWINGS, PRODUCT DATA, SAMPLES, AND OTHER DATA, WHICH THE CONTRACTOR IS REQUIRED TO SUBMIT, BUT ONLY FOR THE LIMITED PURPOSE OF CHECKING FOR CONFORMANCE WITH THE DESIGN INTENT AND THE INFORMATION SHOWN IN THE CONSTRUCTION CONTRACT DOCUMENTS. CONSTRUCTION MEANS AND/OR METHODS AND/OR TECHNIQUES OR PROCEDURES, COORDINATION OF THE WORK WITH OTHER TRADES, AND CONSTRUCTION SAFETY PRECAUTIONS ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND BOHLER HAS NO RESPONSIBILITY OR LIABILITY FOR SAME HEREUNDER. BOHLER ENGINEERING'S SHOP DRAWING REVIEW WILL BE CONDUCTED WITH REASONABLE PROMPTNESS WHILE ALLOWING SUFFICIENT TIME TO PERMIT ADEQUATE REVIEW. REVIEW OF A SPECIFIC ITEM MUST NOT INDICATE THAT BOHLER ENGINEERING HAS REVIEWED THE ENTIRE ASSEMBLY OF WHICH THE ITEM IS A COMPONENT. BOHLER ENGINEERING WILL NOT BE RESPONSIBLE FOR ANY DEVIATIONS FROM THE CONSTRUCTION DOCUMENTS NOT PROMPTLY AND IMMEDIATELY BROUGHT TO ITS ATTENTION, IN WRITING, BY THE CONTRACTOR. BOHLER ENGINEERING WILL NOT BE REQUIRED TO REVIEW PARTIAL SUBMISSIONS OR THOSE FOR WHICH SUBMISSIONS OF CORRELATED ITEMS HAVE NOT BEEN RECEIVED.
20. NEITHER THE PROFESSIONAL ACTIVITIES OF BOHLER ENGINEERING, NOR THE PRESENCE OF BOHLER ENGINEERING AND/OR ITS PAST, PRESENT AND FUTURE OWNERS, OFFICERS, DIRECTORS, PARTNERS, SHAREHOLDERS, MEMBERS, PRINCIPALS, COMMISSIONERS, AGENTS, SERVANTS, EMPLOYEES, AFFILIATES, SUBSIDIARIES, AND RELATED ENTITIES, AND ITS SUBCONTRACTORS AND SUBCONSULTANTS AT A CONSTRUCTION/PROJECT SITE, SHALL RELIEVE THE GENERAL CONTRACTOR OF ITS OBLIGATIONS, DUTIES AND RESPONSIBILITIES INCLUDING, BUT NOT LIMITED TO, CONSTRUCTION MEANS, METHODS, SEQUENCE, TECHNIQUES OR PROCEDURES NECESSARY FOR PERFORMING, OVERSEEING, SUPERINTENDING AND COORDINATING THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND COMPLIANCE WITH ANY HEALTH OR SAFETY PRECAUTIONS REQUIRED BY ANY REGULATORY AGENCIES WITH JURISDICTION OVER THE PROJECT AND/OR PROPERTY. BOHLER ENGINEERING AND ITS PERSONNEL HAVE NO AUTHORITY TO EXERCISE ANY CONTROL OVER ANY CONSTRUCTION CONTRACTOR OR ITS EMPLOYEES IN CONNECTION WITH THEIR WORK OR ANY HEALTH OR SAFETY PROGRAMS OR PROCEDURES. THE GENERAL CONTRACTOR IS SOLELY RESPONSIBLE FOR JOB SITE SAFETY. BOHLER ENGINEERING SHALL BE INDEMNIFIED BY THE GENERAL CONTRACTOR AND MUST BE NAMED AN ADDITIONAL INSURED UNDER THE GENERAL CONTRACTOR'S POLICIES OF GENERAL LIABILITY INSURANCE AS DESCRIBED ABOVE IN NOTE 19 FOR JOB SITE SAFETY.
21. IF THE CONTRACTOR DEVIATES FROM THE PLANS AND SPECIFICATIONS, INCLUDING THE NOTES CONTAINED HEREIN, WITHOUT FIRST OBTAINING THE PRIOR WRITTEN AUTHORIZATION OF THE ENGINEER FOR SUCH DEVIATIONS, THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE PAYMENT OF ALL COSTS INCURRED IN CORRECTING ANY WORK DONE WHICH DEVIATES FROM THE PLANS, ALL FINES AND/OR PENALTIES ASSESSED WITH RESPECT THERETO AND ALL COMPENSATORY OR PUNITIVE DAMAGES RESULTING THEREFROM AND, FURTHER, SHALL DEFEND, INDEMNIFY AND HOLD HARMLESS THE ENGINEER, TO THE FULLEST EXTENT PERMITTED UNDER THE LAW, IN ACCORDANCE WITH PARAGRAPH 19 HEREIN, FOR AND FROM ALL FEES, ATTORNEYS' FEES, DAMAGES, COSTS, JUDGMENTS, PENALTIES AND THE LIKE RELATED TO SAME.
22. CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE AND PROTECTION OF TRAFFIC PLAN FOR ALL WORK THAT AFFECTS PUBLIC TRAVEL EITHER IN THE R.O.W. OR ON SITE. THE COST FOR THIS ITEM MUST BE INCLUDED IN THE CONTRACTOR'S PRICE.
23. ALL SIGNING AND PAVEMENT STRIPING MUST CONFORM TO MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES OR LOCALLY APPROVED SUPPLEMENT.
24. ENGINEER IS NOT RESPONSIBLE FOR ANY INJURY OR DAMAGES RESULTING FROM CONTRACTOR'S FAILURE TO BUILD OR CONSTRUCT IN STRICT ACCORDANCE WITH THE APPROVED PLANS. IF CONTRACTOR AND/OR OWNER FAIL TO BUILD OR CONSTRUCT IN STRICT ACCORDANCE WITH APPROVED PLANS, THEY AGREE TO JOINTLY AND SEVERALLY INDEMNIFY AND HOLD ENGINEER HARMLESS FOR ALL INJURIES AND DAMAGES THAT ENGINEER SUFFERS AND COSTS THAT ENGINEER INCURS.
25. OWNER MUST MAINTAIN AND PRESERVE ALL PHYSICAL SITE FEATURES AND DESIGN FEATURES DEPICTED ON THE PLANS AND RELATED DOCUMENTS, IN STRICT ACCORDANCE WITH THE APPROVED PLAN(S) AND DESIGN AND, FURTHER ENGINEER IS NOT RESPONSIBLE FOR ANY FAILURE TO SO MAINTAIN OR PRESERVE SITE AND/OR DESIGN FEATURES. IF OWNER FAILS TO MAINTAIN AND/OR PRESERVE ALL PHYSICAL SITE FEATURES AND/OR DESIGN FEATURES DEPICTED ON THE PLANS AND RELATED DOCUMENTS, OWNER AGREES TO INDEMNIFY AND HOLD ENGINEER HARMLESS FOR ALL INJURIES AND DAMAGES THAT ENGINEER SUFFERS AND COSTS THAT ENGINEER INCURS AS A RESULT OF SAID FAILURE.
26. ALL DIMENSIONS MUST BE TO FACE OF CURB, EDGE OF PAVEMENT, OR EDGE OF BUILDING, UNLESS NOTED OTHERWISE.
27. ALL CONSTRUCTION AND MATERIALS MUST COMPLY WITH AND CONFORM TO APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, LAWS, ORDINANCES, RULES AND CODES, AND ALL APPLICABLE OSHA REQUIREMENTS.
28. CONTRACTOR AND OWNER MUST INSTALL ALL ELEMENTS AND COMPONENTS IN STRICT COMPLIANCE WITH AND ACCORDANCE WITH MANUFACTURER'S STANDARDS AND RECOMMENDED INSTALLATION CRITERIA AND SPECIFICATIONS. IF CONTRACTOR AND/OR OWNER FAIL TO DO SO, THEY AGREE TO JOINTLY AND SEVERALLY INDEMNIFY AND HOLD ENGINEER HARMLESS FOR ALL INJURIES AND DAMAGES THAT ENGINEER SUFFERS AND COSTS THAT ENGINEER INCURS AS A RESULT OF SAID FAILURE.
29. CONTRACTOR IS RESPONSIBLE TO MAINTAIN ON-SITE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) IN COMPLIANCE WITH EPA REQUIREMENTS FOR SITES WHERE ONE (1) ACRE OR MORE (UNLESS THE LOCAL JURISDICTION REQUIRES FEWER) IS DISTURBED BY CONSTRUCTION ACTIVITIES. CONTRACTOR IS RESPONSIBLE TO ENSURE THAT ALL ACTIVITIES, INCLUDING THOSE OF SUBCONTRACTORS, ARE IN COMPLIANCE WITH THE SWPPP, INCLUDING BUT NOT LIMITED TO LOGGING ACTIVITIES (MINIMUM ONCE PER WEEK AND AFTER RAINFALL EVENTS) AND CORRECTIVE MEASURES, AS APPROPRIATE.
30. AS CONTAINED IN THESE DRAWINGS AND ASSOCIATED APPLICATION DOCUMENTS PREPARED BY THE SIGNATORY PROFESSIONAL ENGINEER, THE USE OF THE WORDS CERTIFY OR CERTIFICATION CONSTITUTES AN EXPRESSION OF "PROFESSIONAL OPINION" REGARDING THE INFORMATION WHICH IS THE SUBJECT OF THE UNDERSIGNED PROFESSIONAL'S KNOWLEDGE OR BELIEF AND IN ACCORDANCE WITH COMMON ACCEPTED PROCEDURE CONSISTENT WITH THE APPLICABLE STANDARDS OF PRACTICE, AND DOES NOT CONSTITUTE A WARRANTY OR GUARANTEE, EITHER EXPRESSED OR IMPLIED.

GENERAL GRADING & UTILITY PLAN NOTES

1. LOCATIONS OF ALL EXISTING AND PROPOSED SERVICES ARE APPROXIMATE AND MUST BE INDEPENDENTLY CONFIRMED WITH LOCAL UTILITY COMPANIES PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION OR EXCAVATION. SANITARY SEWER AND ALL OTHER UTILITY SERVICE CONNECTION POINTS MUST BE INDEPENDENTLY CONFIRMED BY THE CONTRACTOR IN THE FIELD PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. ALL DISCREPANCIES MUST IMMEDIATELY BE REPORTED, IN WRITING, TO THE ENGINEER. CONSTRUCTION MUST COMMENCE BEGINNING AT THE LOWEST INVERT (POINT OF CONNECTION) AND PROGRESS UP GRADIENT. PROPOSED INTERFACE POINTS (CROSSINGS) WITH EXISTING UNDERGROUND UTILITIES SHALL BE FIELD VERIFIED BY TEST PIT PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. CONTRACTOR MUST VERTICALLY AND HORIZONTALLY LOCATE ALL UTILITIES AND SERVICES INCLUDING, BUT NOT LIMITED TO, GAS, WATER, ELECTRIC, SANITARY AND STORM SEWER, TELEPHONE, CABLE, FIBER OPTIC CABLE, ETC. WITHIN THE LIMITS OF DISTURBANCE OR WORK SPACE, WHICHEVER IS GREATER. THE CONTRACTOR MUST USE, REFER TO, AND COMPLY WITH THE REQUIREMENTS OF THE APPLICABLE UTILITY NOTIFICATION SYSTEM TO LOCATE ALL THE UNDERGROUND UTILITIES. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL DAMAGE TO ANY EXISTING UTILITIES DURING CONSTRUCTION, AT NO COST TO THE OWNER. CONTRACTOR SHALL BEAR ALL COSTS ASSOCIATED WITH DAMAGE TO ANY EXISTING UTILITIES DURING CONSTRUCTION.
3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW ALL CONSTRUCTION CONTRACT DOCUMENTS INCLUDING, BUT NOT LIMITED TO, ALL OF THE DRAWINGS AND SPECIFICATIONS ASSOCIATED WITH THE PROJECT WORK SCOPE PRIOR TO THE INITIATION AND COMMENCEMENT OF CONSTRUCTION. SHOULD THE CONTRACTOR FIND A CONFLICT AND/OR DISCREPANCY BETWEEN THE DOCUMENTS RELATIVE TO THE SPECIFICATIONS OR THE RELATIVE OR APPLICABLE CODES, REGULATIONS, LAWS, RULES, STATUTES AND/OR ORDINANCES, IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO NOTIFY THE PROJECT ENGINEER OF RECORD, IN WRITING, OF SAID CONFLICT AND/OR DISCREPANCY PRIOR TO THE START OF CONSTRUCTION. CONTRACTOR'S FAILURE TO NOTIFY THE PROJECT ENGINEER SHALL CONSTITUTE CONTRACTOR'S FULL AND COMPLETE ACCEPTANCE OF ALL RESPONSIBILITY TO COMPLETE THE SCOPE OF WORK AS DEFINED BY THE DRAWINGS AND IN FULL COMPLIANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS, LAWS, STATUTES, ORDINANCES AND CODES AND, FURTHER, CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH SAME.
4. THE CONTRACTOR MUST LOCATE AND CLEARLY AND UNAMBIGUOUSLY DEFINE VERTICALLY AND HORIZONTALLY ALL ACTIVE AND INACTIVE UTILITY AND/OR SERVICE SYSTEMS THAT ARE TO BE REMOVED. THE CONTRACTOR IS RESPONSIBLE TO PROTECT AND MAINTAIN ALL ACTIVE AND INACTIVE SYSTEMS THAT ARE NOT BEING REMOVED/RELOCATED DURING SITE ACTIVITY.
5. THE CONTRACTOR MUST FAMILIARIZE ITSELF WITH THE APPLICABLE UTILITY SERVICE PROVIDER REQUIREMENTS AND IS RESPONSIBLE FOR ALL COORDINATION REGARDING UTILITY DEMOLITION AS IDENTIFIED OR REQUIRED FOR THE PROJECT. THE CONTRACTOR MUST PROVIDE THE OWNER WITH WRITTEN NOTIFICATION THAT THE EXISTING UTILITIES AND SERVICES HAVE BEEN TERMINATED AND ABANDONED IN ACCORDANCE WITH THE JURISDICTION AND UTILITY COMPANY REQUIREMENTS AND ALL OTHER APPLICABLE REQUIREMENTS, RULES, STATUTES, LAWS, ORDINANCES AND CODES.
6. THE CONTRACTOR MUST INSTALL ALL STORM SEWER AND SANITARY SEWER COMPONENTS WHICH FUNCTION BY GRAVITY PRIOR TO THE INSTALLATION OF ALL OTHER UTILITIES.
7. CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF SITE PLAN DOCUMENTS AND ARCHITECTURAL DESIGN FOR EXACT BUILDING UTILITY CONNECTION LOCATIONS, GREASE TRAP REQUIREMENTS/DETAILS, DOOR ACCESS, AND EXTERIOR GRADING. THE ARCHITECT WILL DETERMINE THE UTILITY SERVICE SIZES. THE CONTRACTOR MUST COORDINATE INSTALLATION OF UTILITIES/SERVICES WITH THE INDIVIDUAL COMPANIES, TO AVOID CONFLICTS AND TO ENSURE THAT PROPER DEPTHS ARE ACHIEVED. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT INSTALLATION OF ALL IMPROVEMENTS COMPLIES WITH ALL UTILITY REQUIREMENTS WITH JURISDICTION AND/OR CONTROL OF THE SITE, AND ALL OTHER APPLICABLE REQUIREMENTS, RULES, STATUTES, LAWS, ORDINANCES AND CODES AND, FURTHER, IS RESPONSIBLE FOR COORDINATING THE UTILITY TIE-INS/CONNECTIONS PRIOR TO CONNECTING TO THE EXISTING UTILITY/SERVICE. WHERE A CONFLICT(S) EXISTS BETWEEN THESE SITE PLANS AND THE ARCHITECTURAL PLANS, OR WHERE ARCHITECTURAL PLAN UTILITY CONNECTION POINTS DIFFER, THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE ENGINEER, IN WRITING, AND PRIOR TO CONSTRUCTION, RESOLVE SAME.
8. WATER SERVICE MATERIALS, BURIAL DEPTH, AND COVER REQUIREMENTS MUST BE SPECIFIED BY THE LOCAL UTILITY COMPANY. CONTRACTOR'S PRICE FOR WATER SERVICE MUST INCLUDE ALL FEES, COSTS AND APPURTENANCES REQUIRED BY THE UTILITY TO PROVIDE FULL AND COMPLETE WORKING SERVICE. CONTRACTOR MUST CONTACT THE APPLICABLE MUNICIPALITY TO CONFIRM THE PROPER WATER METER AND VAULT, PRIOR TO COMMENCING CONSTRUCTION.
9. ALL NEW UTILITIES/SERVICES, INCLUDING ELECTRIC, TELEPHONE, CABLE TV, ETC. ARE TO BE INSTALLED UNDERGROUND. ALL NEW UTILITIES/SERVICES MUST BE INSTALLED IN ACCORDANCE WITH THE UTILITY/SERVICE PROVIDER INSTALLATION SPECIFICATIONS AND STANDARDS.
10. SITE GRADING MUST BE PERFORMED IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS AND THE RECOMMENDATIONS SET FORTH IN THE GEOTECHNICAL REPORT REFERENCED IN THIS PLAN SET. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING AND REPLACING UNSUITABLE MATERIALS WITH SUITABLE MATERIALS AS SPECIFIED IN THE GEOTECHNICAL REPORT. ALL EXCAVATED OR FILLED AREAS MUST BE COMPACTED AS OUTLINED IN THE GEOTECHNICAL REPORT. MOISTURE CONTENT AT TIME OF PLACEMENT MUST BE SUBMITTED IN A COMPACTION REPORT PREPARED BY A QUALIFIED GEOTECHNICAL ENGINEER, REGISTERED WITH THE STATE WHERE THE WORK IS PERFORMED, VERIFYING THAT ALL FILLED AREAS AND SUBGRADE AREAS WITHIN THE BUILDING PAD AREA AND AREAS TO BE PAVED HAVE BEEN COMPACTED IN ACCORDANCE WITH THESE PLANS, SPECIFICATIONS AND THE RECOMMENDATIONS SET FORTH IN THE GEOTECHNICAL REPORT AND ALL APPLICABLE REQUIREMENTS, RULES, STATUTES, LAWS, ORDINANCES AND CODES. SUBBASE MATERIAL FOR SIDEWALKS, CURB, OR ASPHALT MUST BE FREE OF ORGANICS AND OTHER UNSUITABLE MATERIALS. SHOULD SUBBASE BE DEEMED UNSUITABLE BY OWNER/DEVELOPER, OR OWNER/DEVELOPER'S REPRESENTATIVE, SUBBASE IS TO BE REMOVED AND FILLED WITH APPROVED FILL MATERIAL COMPACTED AS DIRECTED BY THE GEOTECHNICAL REPORT. EARTHWORK ACTIVITIES INCLUDING, BUT NOT LIMITED TO, EXCAVATION, BACKFILL, AND COMPACTING MUST COMPLY WITH THE RECOMMENDATIONS IN THE GEOTECHNICAL REPORT AND ALL APPLICABLE REQUIREMENTS, RULES, STATUTES, LAWS, ORDINANCES AND CODES. EARTHWORK ACTIVITIES MUST COMPLY WITH THE STANDARD STATE DOT SPECIFICATIONS FOR ROADWAY CONSTRUCTION (LATEST EDITION) AND ANY AMENDMENTS OR REVISIONS THERETO.
11. ALL FILL, COMPACTION, AND BACKFILL MATERIALS REQUIRED FOR UTILITY INSTALLATION MUST BE AS PER THE RECOMMENDATIONS PROVIDED IN THE GEOTECHNICAL REPORT AND MUST BE COORDINATED WITH THE APPLICABLE UTILITY COMPANY SPECIFICATIONS. WHEN THE PROJECT DOES NOT HAVE GEOTECHNICAL RECOMMENDATIONS, FILL AND COMPACTION MUST, AT A MINIMUM, COMPLY WITH THE STATE DOT REQUIREMENTS AND SPECIFICATIONS AND CONSULTANT SHALL HAVE NO LIABILITY OR RESPONSIBILITY FOR OR AS RELATED TO FILL, COMPACTION AND BACKFILL. FURTHER, CONTRACTOR IS FULLY RESPONSIBLE FOR EARTHWORK BALANCE.
12. THE CONTRACTOR MUST COMPLY, TO THE FULLEST EXTENT, WITH THE LATEST OSHA STANDARDS AND REGULATIONS, AND/OR ANY OTHER AGENCY WITH JURISDICTION FOR EXCAVATION AND TRENCHING PROCEDURES. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE "MEANS AND METHODS" REQUIRED TO MEET THE INTENT AND PERFORMANCE CRITERIA OF OSHA, AS WELL AS ANY OTHER ENTITY THAT HAS JURISDICTION FOR EXCAVATION AND/OR TRENCHING PROCEDURES AND CONSULTANT SHALL HAVE NO RESPONSIBILITY FOR OR AS RELATED FOR OR AS RELATED TO EXCAVATION AND TRENCHING PROCEDURES.
13. PAVEMENT MUST BE SAW CUT IN STRAIGHT LINES, AND EXCEPT FOR EDGE OF BUTT JOINTS, MUST EXTEND TO THE FULL DEPTH OF THE EXISTING PAVEMENT. ALL DEBRIS FROM REMOVAL OPERATIONS MUST BE REMOVED FROM THE SITE AT THE TIME OF EXCAVATION. STOCKPILING OF DEBRIS WILL NOT BE PERMITTED.
14. THE TOPS OF EXISTING MANHOLES, INLET STRUCTURES, AND SANITARY CLEANOUT TOPS MUST BE ADJUSTED, AS NECESSARY, TO MATCH PROPOSED GRADES IN ACCORDANCE WITH ALL APPLICABLE STANDARDS, REQUIREMENTS, RULES, STATUTES, LAWS, ORDINANCES AND CODES.
15. DURING THE INSTALLATION OF SANITARY SEWER, STORM SEWER, AND ALL UTILITIES, THE CONTRACTOR MUST MAINTAIN A CONTEMPORANEOUS AND THOROUGH RECORD OF CONSTRUCTION TO IDENTIFY THE AS-INSTALLED LOCATIONS OF ALL UNDERGROUND INFRASTRUCTURE. THE CONTRACTOR MUST CAREFULLY NOTE ANY INSTALLATIONS THAT DEVIATE FROM THE INFORMATION CONTAINED IN THE UTILITY PLAN. THIS RECORD MUST BE KEPT ON A CLEAN COPY OF THE DRAINAGE OR UTILITY PLAN, WHICH CONTRACTOR MUST PROMPTLY PROVIDE TO THE OWNER AT THE COMPLETION OF WORK.
16. WHEN THE SITE IMPROVEMENT PLANS INVOLVE MULTIPLE BUILDINGS, SOME OF WHICH MAY BE BUILT AT A LATER DATE, THE CONTRACTOR MUST EXTEND ALL LINES, INCLUDING BUT NOT LIMITED TO STORM SEWER, SANITARY SEWER, UTILITIES, AND IRRIGATION LINE, TO A POINT AT LEAST FIVE (5) FEET BEYOND THE PAVED AREAS FOR WHICH THE CONTRACTOR IS RESPONSIBLE. CONTRACTOR MUST CAP ENDS AS APPROPRIATE, MARK LOCATIONS WITH A 2X4, AND MUST NOTE THE LOCATION OF ALL OF THE ABOVE ON A CLEAN COPY OF THE DRAINAGE OR UTILITY PLAN, WHICH CONTRACTOR MUST PROMPTLY PROVIDE TO THE OWNER UPON COMPLETION OF THE WORK.
17. THE CONTRACTOR IS FULLY RESPONSIBLE FOR VERIFICATION OF EXISTING TOPOGRAPHIC INFORMATION AND UTILITY INVERT ELEVATIONS PRIOR TO COMMENCING ANY CONSTRUCTION. CONTRACTOR MUST CONFIRM AND ENSURE 0.75% MINIMUM SLOPE AGAINST ALL ISLANDS, GUTTERS, AND CURBS; 1.0% ON ALL CONCRETE SURFACES; AND 1.5% MINIMUM ON ASPHALT (EXCEPT WHERE ADA REQUIREMENTS OR EXISTING TOPOGRAPHY LIMIT GRADES), TO PREVENT PONDING. CONTRACTOR MUST IMMEDIATELY IDENTIFY, IN WRITING TO THE ENGINEER, ANY DISCREPANCIES THAT MAY OR COULD AFFECT THE PUBLIC SAFETY, HEALTH OR GENERAL WELFARE, OR PROJECT COST. IF CONTRACTOR PROCEEDS WITH CONSTRUCTION WITHOUT PROVIDING PROPER NOTIFICATION, MUST BE AT THE CONTRACTOR'S OWN RISK AND, FURTHER, CONTRACTOR SHALL INDEMNIFY, DEFEND AND HOLD HARMLESS THE DESIGN ENGINEER FOR ANY DAMAGES, COSTS, INJURIES, ATTORNEY'S FEES AND THE LIKE WHICH RESULT FROM SAME.
18. PROPOSED TOP OF CURB ELEVATIONS ARE GENERALLY 6" ABOVE EXISTING LOCAL ASPHALT GRADE UNLESS OTHERWISE NOTED. FIELD ADJUST TO CREATE A MINIMUM OF .075% GUTTER GRADE ALONG CURB FACE. IT IS CONTRACTOR'S OBLIGATION TO ENSURE THAT DESIGN ENGINEER APPROVES FINAL CURBING CUT SHEETS PRIOR TO INSTALLATION OF SAME.
19. REFER TO THIS SHEET FOR ADDITIONAL NOTES.
20. IN THE EVENT OF DISCREPANCIES AND/OR CONFLICTS BETWEEN PLANS OR RELATIVE TO OTHER PLANS, THE SITE PLAN WILL TAKE PRECEDENCE AND CONTROL. CONTRACTOR MUST IMMEDIATELY NOTIFY THE DESIGN ENGINEER, IN WRITING, OF ANY DISCREPANCIES AND/OR CONFLICTS.
21. CONTRACTOR IS REQUIRED TO SECURE ALL NECESSARY AND/OR REQUIRED PERMITS AND APPROVALS FOR ALL OFF SITE MATERIAL SOURCES AND DISPOSAL FACILITIES. CONTRACTOR MUST SUPPLY A COPY OF APPROVALS TO ENGINEER AND OWNER PRIOR TO INITIATING ANY WORK.
22. WHERE RETAINING WALLS (WHETHER OR NOT THEY MEET THE JURISDICTIONAL DEFINITION) ARE IDENTIFIED ON PLANS, ELEVATIONS IDENTIFIED ARE FOR THE EXPOSED PORTION OF THE WALL. WALL FOOTINGS/FOUNDATION ELEVATIONS ARE NOT IDENTIFIED HEREIN AND ARE TO BE SET/DETERMINED BY THE CONTRACTOR BASED ON FINAL STRUCTURAL DESIGN SHOP DRAWINGS PREPARED BY THE APPROPRIATE PROFESSIONAL LICENSED IN THE STATE WHERE THE CONSTRUCTION OCCURS.
23. STORM DRAINAGE PIPE:UNLESS INDICATED OTHERWISE, ALL STORM SEWER PIPE MUST BE REINFORCED CONCRETE PIPE (RCP) CLASS III WITH SILT TIGHT JOINTS. WHEN HIGH-DENSITY POLYETHYLENE PIPE (HDPE) IS CALLED FOR ON THE PLANS, IT MUST CONFORM TO AASHTO M294 AND TYPE S (SMOOTH INTERIOR WITH ANGULAR CORRUGATIONS) WITH GASKET FOR SILT TIGHT JOINT. PVC PIPE FOR ROOF DRAIN CONNECTION MUST BE SDR 26 OR SCHEDULE 40 UNLESS INDICATED OTHERWISE.
24. UNLESS INDICATED OTHERWISE ON THE DRAWINGS, SANITARY SEWER PIPE SHALL BE AS FOLLOWS:
    - FOR PIPES LESS THAN 12 FT. DEEP: POLYVINYL CHLORIDE (PVC) SDR 35 PER ASTM D3034
    - FOR PIPES MORE THAN 12 FT. DEEP: POLYVINYL CHLORIDE (PVC) SDR 26 PER ASTM D3034
    - FOR PIPE WITHIN 10 FT. OF BUILDING, PIPE MATERIAL SHALL COMPLY WITH APPLICABLE BUILDING AND PLUMBING CODES. CONTRACTOR TO VERIFY WITH LOCAL OFFICIALS.
25. STORM AND SANITARY SEWER PIPE LENGTHS INDICATED ARE NOMINAL AND MEASURED CENTER OF INLET AND/OR MANHOLES STRUCTURE TO CENTER OF STRUCTURE.
26. STORMWATER ROOF DRAIN LOCATIONS ARE BASED ON PRELIMINARY ARCHITECTURAL PLANS. CONTRACTOR IS RESPONSIBLE TO AND FOR VERIFYING LOCATIONS OF SAME BASED ON FINAL ARCHITECTURAL PLANS.
27. SEWERS CROSSING STREAMS AND/OR LOCATION WITHIN 10 FEET OF THE STREAM EMBANKMENT, OR WHERE SITE CONDITIONS SO INDICATE, MUST BE CONSTRUCTED OF STEEL, REINFORCED CONCRETE, DUCTILE IRON OR OTHER SUITABLE MATERIAL. SEWERS CONVEYING SANITARY FLOW COMBINED SANITARY AND STORMWATER FLOW OR INDUSTRIAL FLOW MUST BE SEPARATED FROM WATER MAINS BY A DISTANCE OF AT LEAST 10 FEET HORIZONTALLY. IF SUCH LATERAL SEPARATION IS NOT POSSIBLE, THE PIPES MUST BE IN SEPARATE TRENCHES WITH THE SEWER AT LEAST 18 INCHES BELOW THE BOTTOM OF THE WATER MAIN, OR SUCH OTHER SEPARATION AS APPROVED BY THE GOVERNMENT AGENCY WITH JURISDICTION OVER SAME.
    - WHERE APPROPRIATE SEPARATION FROM A WATER MAIN IS NOT POSSIBLE, THE SEWER MUST BE ENCASED IN CONCRETE, OR CONSTRUCTED OF DUCTILE IRON PIPE USING MECHANICAL OR SLIP-ON JOINTS FOR A DISTANCE OF AT LEAST 10 FEET ON EITHER SIDE OF THE CROSSING. IN ADDITION, ONE FULL LENGTH OF SEWER PIPE SHOULD BE LOCATED SO BOTH JOINTS WILL BE AS FAR FROM THE WATER LINE AS POSSIBLE. WHERE A WATER MAIN CROSSES UNDER A SEWER, ADEQUATE STRUCTURAL SUPPORT FOR THE SEWER MUST BE PROVIDED.
28. WATER MAIN PIPING MUST BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS AND SPECIFICATIONS OF THE LOCAL WATER PURVEYOR. IN THE ABSENCE OF SUCH REQUIREMENTS, WATER MAIN PIPING MUST BE CEMENT-LINED DUCTILE IRON (DIP) MINIMUM CLASS 52 THICKNESS. ALL PIPE AND APPURTENANCES MUST COMPLY WITH THE APPLICABLE AWWA STANDARDS IN EFFECT AT THE TIME OF APPLICATION.
29. CONTRACTOR MUST ENSURE THAT ALL UTILITY TRENCHES LOCATED IN EXISTING PAVED ROADWAYS INCLUDING SEWER, WATER AND STORM SYSTEMS, MUST BE REPAIRED IN ACCORDANCE WITH REFERENCED MUNICIPAL, COUNTY AND/OR DOT DETAILS AS APPLICABLE. CONTRACTOR MUST COORDINATE INSPECTION AND APPROVAL OF COMPLETED WORK WITH THE AGENCY WITH JURISDICTION OVER SAME.
30. LOCATION OF PROPOSED UTILITY POLE RELOCATION IS AT THE SOLE DISCRETION OF UTILITY COMPANY.
31. CONSULTANT IS NEITHER LIABLE NOR RESPONSIBLE FOR ANY SUBSURFACE CONDITIONS AND FURTHER, SHALL HAVE NO LIABILITY FOR ANY HAZARDOUS MATERIALS, HAZARDOUS SUBSTANCES, OR POLLUTANTS ON, ABOUT OR UNDER THE PROPERTY.

GENERAL DEMOLITION NOTES

1. THIS PLAN REFERENCES DOCUMENTS AND INFORMATION BY:
   - "BOUNDARY & TOPOGRAPHIC SURVEY" - PREPARED BY CONTROL POINT ASSOCIATES, INC. DATED 09/05/19.
2. CONTRACTOR SHALL PERFORM ALL WORK IN ACCORDANCE WITH THE REQUIREMENTS OF THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970, (29 U.S.C. 651 et seq.), AS AMENDED AND ANY MODIFICATIONS, AMENDMENTS OR REVISIONS TO SAME.
3. BOHLER ENGINEERING HAS NO CONTRACTUAL, LEGAL, OR OTHER RESPONSIBILITY FOR JOB SITE SAFETY OR JOB SITE SUPERVISION, OR ANYTHING RELATED TO SAME.
4. THE DEMOLITION PLAN IS INTENDED TO PROVIDE GENERAL INFORMATION, ONLY, REGARDING ITEMS TO BE DEMOLISHED AND/OR REMOVED. THE CONTRACTOR MUST ALSO REVIEW THE OTHER SITE PLAN DRAWINGS AND INCLUDE IN DEMOLITION ACTIVITIES ALL INCIDENTAL WORK NECESSARY FOR THE CONSTRUCTION OF THE NEW SITE IMPROVEMENTS.
5. CONTRACTOR MUST RAISE ANY QUESTIONS CONCERNING THE ACCURACY OR INTENT OF THESE PLANS OR SPECIFICATIONS, CONCERNS REGARDING THE APPLICABLE SAFETY STANDARDS, OR THE SAFETY OF THE CONTRACTOR OR THIRD PARTIES IN PERFORMING THE WORK ON THIS PROJECT, WITH BOHLER ENGINEERING, IN WRITING, AND RESPONDED TO BY BOHLER, IN WRITING, PRIOR TO THE INITIATION OF ANY SITE ACTIVITY AND ANY DEMOLITION ACTIVITY. ALL DEMOLITION ACTIVITIES MUST BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THESE PLANS AND SPECIFICATIONS AND ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, RULES, REQUIREMENTS, STATUTES, ORDINANCES AND CODES.
6. PRIOR TO STARTING ANY DEMOLITION, CONTRACTOR IS RESPONSIBLE FOR/TO:
   - A. OBTAINING ALL REQUIRED PERMITS AND MAINTAINING THE SAME ON SITE FOR REVIEW BY THE ENGINEER AND OTHER PUBLIC AGENCIES WITH JURISDICTION THROUGHOUT THE DURATION OF THE PROJECT, SITE WORK, AND DEMOLITION WORK.
   - B. NOTIFYING, AT A MINIMUM, THE MUNICIPAL ENGINEER, DESIGN ENGINEER, AND LOCAL SOIL CONSERVATION DISTRICT, 72 HOURS PRIOR TO THE START OF WORK.
   - C. INSTALLING THE REQUIRED SOIL EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO SITE DISTURBANCE.
   - D. IN ACCORDANCE WITH STATE LAW, THE CONTRACTOR MUST CALL THE STATE ONE-CALL DAMAGE PROTECTION SYSTEM FOR UTILITY MARKOUT, IN ADVANCE OF ANY EXCAVATION.
   - E. LOCATING AND PROTECTING ALL UTILITIES AND SERVICES, INCLUDING BUT NOT LIMITED TO GAS, WATER, ELECTRIC, SANITARY AND STORM SEWER, TELEPHONE, CABLE, FIBER OPTIC CABLE, ETC. WITHIN AND ADJACENT TO THE LIMITS OF PROJECT ACTIVITIES. THE CONTRACTOR MUST USE AND COMPLY WITH THE REQUIREMENTS OF THE APPLICABLE UTILITY NOTIFICATION SYSTEM TO LOCATE ALL THE UNDERGROUND UTILITIES.
   - F. PROTECTING AND MAINTAINING IN OPERATION, ALL ACTIVE UTILITIES AND SYSTEMS THAT ARE NOT BEING REMOVED DURING ALL DEMOLITION ACTIVITIES.
   - G. ARRANGING FOR AND COORDINATING WITH THE APPLICABLE UTILITY SERVICE PROVIDER(S) FOR THE TEMPORARY OR PERMANENT TERMINATION OF SERVICE REQUIRED BY THE PROJECT PLANS AND SPECIFICATIONS. THE CONTRACTOR MUST PROVIDE THE UTILITY ENGINEER AND OWNER WRITTEN NOTIFICATION THAT THE EXISTING UTILITIES AND SERVICES HAVE BEEN TERMINATED AND ABANDONED IN ACCORDANCE WITH JURISDICTIONAL AND UTILITY COMPANY REQUIREMENTS.
   - H. COORDINATION WITH UTILITY COMPANIES REGARDING WORKING "OFF-PEAK" HOURS OR ON WEEKENDS AS MAY BE REQUIRED TO MINIMIZE THE IMPACT ON THE AFFECTED PARTIES. WORK REQUIRED TO BE DONE "OFF-PEAK" IS TO BE DONE AT NO ADDITIONAL COST TO THE OWNER.
   - I. IN THE EVENT THE CONTRACTOR DISCOVERS ANY HAZARDOUS MATERIAL, THE REMOVAL OF WHICH IS NOT ADDRESSED IN THE PROJECT PLANS AND SPECIFICATIONS, THE CONTRACTOR MUST IMMEDIATELY CEASE ALL WORK AND IMMEDIATELY NOTIFY THE OWNER AND ENGINEER OF THE DISCOVERY OF SUCH MATERIALS.
7. THE FIRM OR ENGINEER OF RECORD IS NOT RESPONSIBLE FOR JOB SITE SAFETY OR SUPERVISION. CONTRACTOR MUST PROCEED WITH THE DEMOLITION IN A SYSTEMATIC AND SAFE MANNER, FOLLOWING ALL THE OSHA REQUIREMENTS, TO ENSURE PUBLIC AND CONTRACTOR SAFETY.
8. THE CONTRACTOR MUST PROVIDE ALL "MEANS AND METHODS" NECESSARY TO PREVENT MOVEMENT, SETTLEMENT, OR COLLAPSE OF EXISTING STRUCTURES, AND ANY OTHER IMPROVEMENTS THAT ARE REMAINING ON OR OFF SITE. THE CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS OF DAMAGE TO ALL ITEMS THAT ARE TO REMAIN. CONTRACTOR MUST USE NEW MATERIAL FOR ALL REPAIRS. CONTRACTOR'S REPAIR MUST INCLUDE THE RESTORATION OF ANY ITEMS REPAIRED TO THE PRE-DEMOLITION CONDITION, OR BETTER. CONTRACTOR SHALL PERFORM ALL REPAIRS AT THE CONTRACTOR'S SOLE EXPENSE.
9. THE CONTRACTOR MUST NOT PERFORM ANY EARTH MOVEMENT ACTIVITIES, DEMOLITION OR REMOVAL OF FOUNDATION WALLS, FOOTINGS, OR OTHER MATERIALS WITHIN THE LIMITS OF DISTURBANCE UNLESS SAME IS IN STRICT ACCORDANCE AND CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS, AND/OR UNDER THE WRITTEN DIRECTION OF THE OWNER'S STRUCTURAL OR GEOTECHNICAL ENGINEER.
10. CONTRACTOR MUST BACKFILL ALL EXCAVATION RESULTING FROM, OR INCIDENTAL TO, DEMOLITION ACTIVITIES. BACKFILL MUST BE ACCOMPLISHED WITH APPROVED BACKFILL MATERIALS, AND MUST BE SUFFICIENTLY COMPACTED TO SUPPORT NEW IMPROVEMENTS AND PERFORMED IN COMPLIANCE WITH THE RECOMMENDATIONS AND GUIDANCE IN THE GEOTECHNICAL REPORT. BACKFILLING MUST OCCUR IMMEDIATELY AFTER DEMOLITION ACTIVITIES, AND MUST BE DONE SO AS TO PREVENT WATER ENTERING THE EXCAVATION. FINISHED SURFACES MUST BE GRADED TO PROMOTE POSITIVE DRAINAGE.
11. EXPLOSIVES MUST NOT BE USED WITHOUT PRIOR WRITTEN CONSENT OF BOTH THE OWNER AND ALL APPLICABLE GOVERNMENTAL AUTHORITIES. ALL THE REQUIRED PERMITS AND EXPLOSIVE CONTROL MEASURES THAT ARE REQUIRED BY THE FEDERAL, STATE, AND LOCAL GOVERNMENTS MUST BE IN PLACE PRIOR TO CONTRACTOR STARTING AN EXPLOSIVE PROGRAM AND/OR ANY DEMOLITION. THE CONTRACTOR IS ALSO RESPONSIBLE FOR ALL INSPECTION AND SEISMIC VIBRATION TESTING THAT IS REQUIRED TO MONITOR THE EFFECTS ON ALL LOCAL STRUCTURES.
12. CONTRACTOR MUST PROVIDE TRAFFIC CONTROL AND GENERALLY ACCEPTED SAFE PRACTICES IN CONFORMANCE WITH THE CURRENT FHWA "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD), AND THE FEDERAL, STATE, AND LOCAL REGULATIONS WHEN DEMOLITION RELATED ACTIVITIES IMPACT ROADWAYS AND/OR ROADWAY RIGHT-OF-WAY.
13. CONTRACTOR MUST CONDUCT DEMOLITION ACTIVITIES IN SUCH A MANNER TO ENSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, SIDEWALKS, WALKWAYS, AND OTHER ADJACENT FACILITIES. STREET CLOSURE PERMITS MUST BE RECEIVED FROM THE APPROPRIATE GOVERNMENTAL AUTHORITY PRIOR TO THE COMMENCEMENT OF ANY ROAD OPENING OR DEMOLITION ACTIVITIES IN OR ADJACENT TO THE RIGHT-OF-WAY.
14. DEMOLITION ACTIVITIES AND EQUIPMENT MUST NOT USE AREAS OUTSIDE THE DEFINED PROJECT LIMIT LINE, WITHOUT WRITTEN PERMISSION OF THE OWNER AND ALL GOVERNMENTAL AGENCIES WITH JURISDICTION.
15. THE CONTRACTOR MUST USE DUST CONTROL MEASURES TO LIMIT AIRBORNE DUST AND DIRT RISING AND SCATTERING IN THE AIR IN ACCORDANCE WITH FEDERAL, STATE, AND/OR LOCAL STANDARDS. AFTER THE DEMOLITION IS COMPLETE, CONTRACTOR MUST CLEAN ALL ADJACENT STRUCTURES AND IMPROVEMENTS TO REMOVE ALL DUST AND DEBRIS CAUSED BY THE DEMOLITION OPERATIONS. THE CONTRACTOR IS RESPONSIBLE FOR RETURNING ALL ADJACENT AREAS TO THEIR "PRE-DEMOLITION" CONDITION.
16. CONTRACTOR IS RESPONSIBLE TO SAFEGUARD THE SITE AS NECESSARY TO PERFORM THE DEMOLITION IN SUCH A MANNER AS TO PREVENT THE ENTRY OF UNAUTHORIZED PERSONS AT ANY TIME.
17. CONTRACTOR IS RESPONSIBLE FOR SITE JOB SAFETY, WHICH MUST INCLUDE, BUT NOT BE LIMITED TO, THE INSTALLATION AND MAINTENANCE OF BARRIERS, FENCING AND OTHER APPROPRIATE SAFETY ITEMS NECESSARY TO PROTECT THE PUBLIC FROM AREAS OF CONSTRUCTION AND CONSTRUCTION ACTIVITY.
18. THIS DEMOLITION PLAN IS INTENDED TO IDENTIFY THOSE EXISTING ITEMS/CONDITIONS WHICH ARE TO BE REMOVED. IT IS NOT INTENDED TO PROVIDE DIRECTION AS TO THE MEANS, METHODS, SEQUENCING, TECHNIQUES AND PROCEDURES TO BE USED TO ACCOMPLISH THAT WORK. ALL MEANS, METHODS, SEQUENCING, TECHNIQUES AND PROCEDURES TO BE USED MUST BE IN STRICT ACCORDANCE WITH ALL STATE, FEDERAL, LOCAL, AND JURISDICTIONAL REQUIREMENTS. THE CONTRACTOR MUST COMPLY WITH ALL OSHA AND OTHER SAFETY PRECAUTIONS NECESSARY TO PROVIDE A SAFE WORK SITE.
19. DEBRIS MUST NOT BE BURIED ON THE SUBJECT SITE. ALL DEMOLITION WASTES AND DEBRIS (SOLID WASTE) MUST BE DISPOSED OF IN ACCORDANCE WITH ALL MUNICIPAL, COUNTY, STATE, AND FEDERAL LAWS AND APPLICABLE CODES. THE CONTRACTOR MUST MAINTAIN RECORDS TO DEMONSTRATE PROPER DISPOSAL ACTIVITIES, TO BE PROMPTLY PROVIDED TO THE OWNER UPON REQUEST.
20. CONTRACTOR MUST MAINTAIN A RECORD SET OF PLANS UPON WHICH IS INDICATED THE LOCATION OF EXISTING UTILITIES THAT ARE CAPPED, ABANDONED IN PLACE, OR RELOCATED DUE TO DEMOLITION ACTIVITIES. THIS RECORD DOCUMENT MUST BE PREPARED IN A NEAT AND WORKMAN-LIKE MANNER, AND TURNED OVER TO THE OWNER/DEVELOPER UPON COMPLETION OF THE WORK.

ADA INSTRUCTIONS TO CONTRACTOR:

CONTRACTORS MUST EXERCISE APPROPRIATE CARE AND PRECISION IN CONSTRUCTION OF ADA (ACCESSIBLE) ACCESSIBLE COMPONENTS AND ACCESS ROUTES FOR THE SITE. THESE COMPONENTS, AS CONSTRUCTED, MUST COMPLY WITH ALL APPLICABLE STATE AND LOCAL ACCESSIBILITY LAWS AND REGULATIONS AND THE CURRENT ADA AND/OR STATE ARCHITECTURAL ACCESS BOARD STANDARDS AND REGULATIONS' BARRIER FREE ACCESS AND ANY MODIFICATIONS, REVISIONS OR UPDATES TO SAME. FINISHED SURFACES ALONG THE ACCESSIBLE ROUTE OF TRAVEL FROM PARKING SPACE, PUBLIC TRANSPORTATION, PEDESTRIAN ACCESS, INTER-BUILDING ACCESS, TO POINTS OF ACCESSIBLE BUILDING ENTRANCE/EXIT, MUST COMPLY WITH THESE ADA AND/OR ARCHITECTURAL ACCESS BOARD CODE REQUIREMENTS. THESE INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:

- PARKING SPACES AND PARKING AISLES - SLOPE SHALL NOT EXCEED 1:50 (1/4" PER FOOT OR NOMINALLY 2.0%) IN ANY DIRECTION.
- CURB RAMPS - SLOPE MUST NOT EXCEED 1:12 (8.3%) FOR A MAXIMUM OF SIX (6) FEET.
- LANDINGS - MUST BE PROVIDED AT EACH END OF RAMPS, MUST PROVIDE POSITIVE DRAINAGE, AND MUST NOT EXCEED 1:50 (1/4" PER FOOT OR NOMINALLY 2.0%) IN ANY DIRECTION.
- PATH OF TRAVEL ALONG ACCESSIBLE ROUTE - MUST PROVIDE A 36-INCH OR GREATER UNOBSTRUCTED WIDTH OF TRAVEL (CAR OVERHANGS AND/OR HANDRAILS CANNOT REDUCE THIS MINIMUM WIDTH). THE SLOPE MUST BE NO GREATER THAN 1:20 (5.0%) IN THE DIRECTION OF TRAVEL, AND MUST NOT EXCEED 1:50 (1/4" PER FOOT OR NOMINALLY 2.0%) IN CROSS SLOPE. WHERE PATH OF TRAVEL WILL BE GREATER THAN 1:20 (5.0%), ADA RAMP MUST BE ADHERED TO. A MAXIMUM SLOPE OF 1:12 (8.3%), FOR A MAXIMUM RISE OF 2.5 FEET, MUST BE PROVIDED. THE RAMP MUST HAVE ADA HAND RAILS AND "LEVEL" LANDINGS ON EACH END THAT ARE CROSS SLOPED NO MORE THAN 1:50 IN ANY DIRECTION (1/4" PER FOOT OR NOMINALLY 2.0%) FOR POSITIVE DRAINAGE.
- DOORWAYS - MUST HAVE A "LEVEL" LANDING AREA ON THE EXTERIOR SIDE OF THE DOOR THAT IS SLOPED AWAY FROM THE DOOR NO MORE THAN 1:50 (1/4" PER FOOT OR NOMINALLY 2.0%) FOR POSITIVE DRAINAGE. THIS LANDING AREA MUST BE NO LESS THAN 60 INCHES (5 FEET) LONG, EXCEPT WHERE OTHERWISE PERMITTED BY ADA STANDARDS FOR ALTERNATIVE DOORWAY OPENING CONDITIONS. (SEE ICC/ANSI A117.1-2003 AND OTHER REFERENCED INCORPORATED BY CODE.)
- WHEN THE PROPOSED CONSTRUCTION INVOLVES RECONSTRUCTION, MODIFICATION, REVISION OR EXTENSION OF OR TO ADA COMPONENTS FROM EXISTING DOORWAYS OR SURFACES, CONTRACTOR MUST VERIFY EXISTING ELEVATIONS SHOWN ON THE PLAN. NOTE THAT TABLE 405.2 OF THE DEPARTMENT OF JUSTICE'S ADA STANDARDS FOR ACCESSIBLE DESIGN ALLOWS FOR STEEPER RAMP SLOPES, IN RARE CIRCUMSTANCES. THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE DESIGN ENGINEER OF ANY DISCREPANCIES AND/OR FIELD CONDITIONS THAT DIFFER IN ANY WAY OR ANY RESPECT FROM WHAT IS SHOWN ON THE PLANS, IN WRITING, BEFORE COMMENCEMENT OF WORK. CONSTRUCTED IMPROVEMENTS MUST FALL WITHIN THE MAXIMUM AND MINIMUM LIMITATIONS IMPOSED BY THE BARRIER FREE REGULATIONS AND THE ADA REQUIREMENTS.
- THE CONTRACTOR MUST VERIFY THE SLOPES OF CONTRACTOR'S FORMS PRIOR TO POURING CONCRETE. IF ANY NON-CONFORMANCE IS OBSERVED OR EXISTS, CONTRACTOR MUST IMMEDIATELY NOTIFY THE ENGINEER PRIOR TO POURING CONCRETE. CONTRACTOR IS RESPONSIBLE FOR ALL COSTS TO REMOVE, REPAIR AND REPLACE NON-CONFORMING CONCRETE.

IT IS STRONGLY RECOMMENDED THAT THE CONTRACTOR REVIEW THE INTENDED CONSTRUCTION WITH THE LOCAL BUILDING CODE PRIOR TO COMMENCEMENT OF CONSTRUCTION.

TYPICAL ABBREVIATIONS

KEY	DESCRIPTION	KEY	DESCRIPTION
BC	BOTTOM CURB	PROP.	PROPOSED
TC	TOP CURB	TBR/R	TO BE REMOVED AND REPLACED
BOC	BACK OF CURB	TBR	TO BE REMOVED
BW	BOTTOM OF WALL GRADE	TPF	TREE PROTECTION FENCE
TW	TOP OF WALL	BLDG.	BUILDING
EXIST.	EXISTING	SF	SQUARE FEET
BM.	BENCHMARK	SMH	SEWER MANHOLE
EOP	EDGE OF PAVEMENT	DMH	DRAIN MANHOLE
℄	CENTERLINE	STM.	STORM
FF	FINISHED FLOOR	SAN.	SANITARY
V.I.F.	VERIFY IN FIELD	CONC.	CONCRETE
GC	GENERAL CONTRACTOR	ARCH.	ARCHITECTURAL
HP	HIGH POINT	DEP.	DEPRESSED
LP	LOW POINT	R	RADIUS
TYP.	TYPICAL	MIN.	MINIMUM
INT.	INTERSECTION	MAX.	MAXIMUM
PC.	POINT OF CURVATURE	No. / #	NUMBER
PT.	POINT OF TANGENCY	W.	WIDE
PI.	POINT OF INTERSECTION	DEC.	DECORATIVE
PVI.	POINT OF VERTICAL INTERSECTION	ELEV.	ELEVATION
STA.	STATION	UNG.	UNDERGROUND
GRT	GRATE	R.O.W.	RIGHT OF WAY
INV.	INVERT	LF	LINEAR FOOT
DIP	DUCTILE IRON PIPE	LOD	LIMIT OF DISTURBANCE
PVC	POLYVINYL CHLORIDE PIPE	LOW	LIMIT OF WORK
HDPE	HIGH DENSITY POLYETHYLENE PIPE	L.S.A.	LANDSCAPED AREA
RCP	REINFORCED CONCRETE PIPE	±	PLUS OR MINUS
S	SLOPE	°	DEGREE
ME	MEET EXISTING	Ø / DIA.	DIAMETER

TYPICAL LEGEND

EXISTING		PROPOSED
	PROPERTY LINE	
	SETBACK	
	EASEMENT	
	CURB	
D	STORM MANHOLE	D
S	SEWER MANHOLE	S
	CATCH BASIN	
WF#5	WETLAND FLAG	
	WETLAND LINE	
54.83	SPOT ELEVATION	53.52
TC 54.58 G 53.78	TOP & BOTTOM OF CURB	TC=54.32 BC=53.82
53	CONTOUR	50
	FLOW ARROW	5%
	PAINTED ARROW	
	RIDGE LINE	
G G	GAS LINE	G G
T T	TELEPHONE LINE	T T
E E	ELECTRIC LINE	E E
W W	WATER LINE	W W
OH OH	OVERHEAD WIRE	OH OH
	STORM PIPE	
	SANITARY LINE	S S
10	PARKING COUNT	4
	SIGN	
	LIGHT POLE	
	GUIDE RAIL	
	UTILITY POLE	

REFER TO SITE PLAN FOR ZONING ANALYSIS TABLE AND LAND USE/ ZONING INFORMATION & NOTES

REFER TO SOIL EROSION CONTROL NOTES & DETAILS SHEET FOR TYPICAL EROSION NOTES AND DETAILS

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DRAWN BY:	MLT / DE
CHECKED BY:	JGB / PM
DATE:	12/06/19
CAD I.D.:	CT191016ss2

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

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STATE OF CONNECTICUT JEFFREY G. BORD No. 30414 LICENSED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CONNECTICUT LICENSE No. 30414

SHEET TITLE:

GENERAL NOTES SHEET

SHEET NUMBER:

C-102

REVISION 3 - 6/4/20

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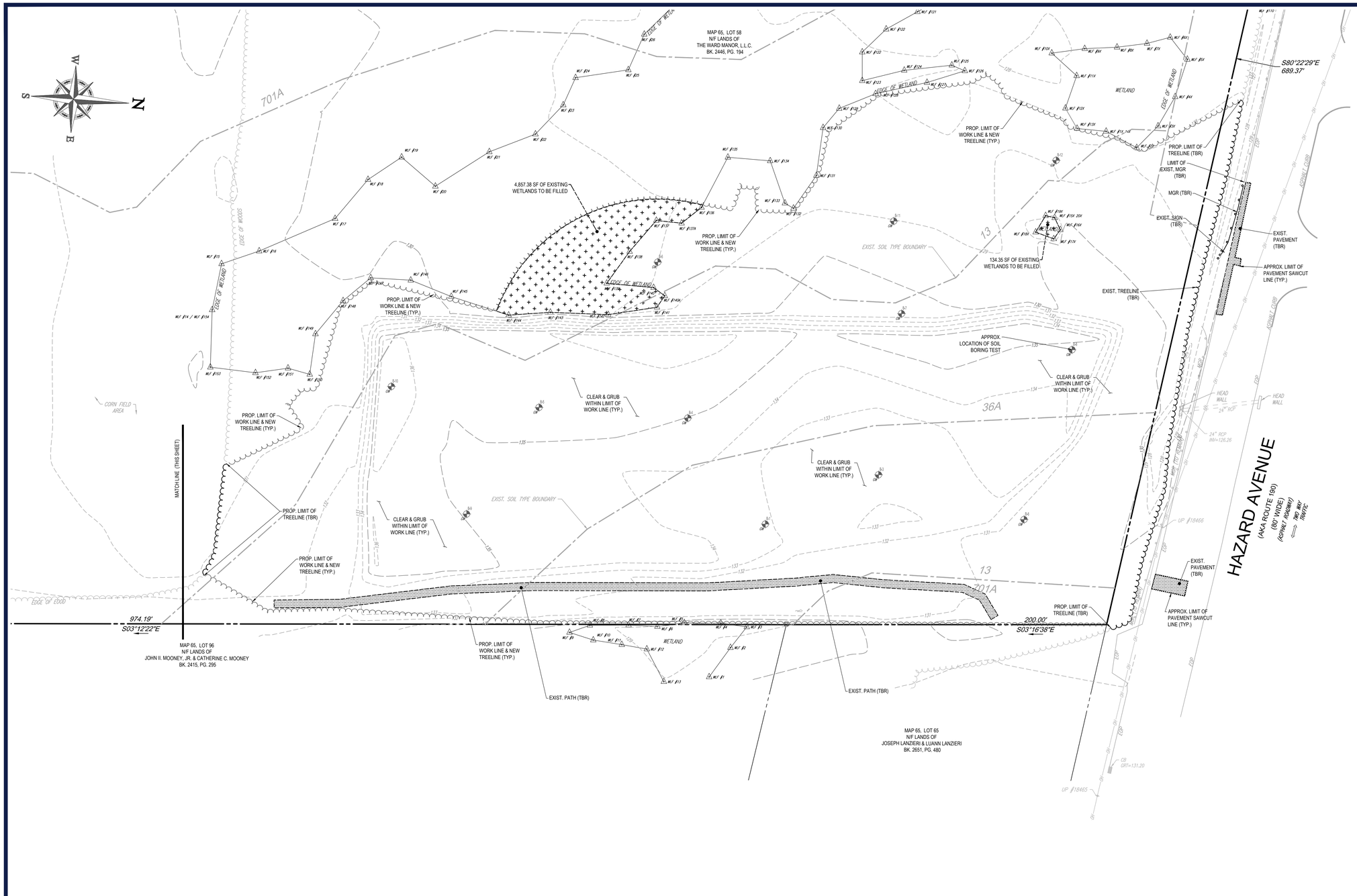

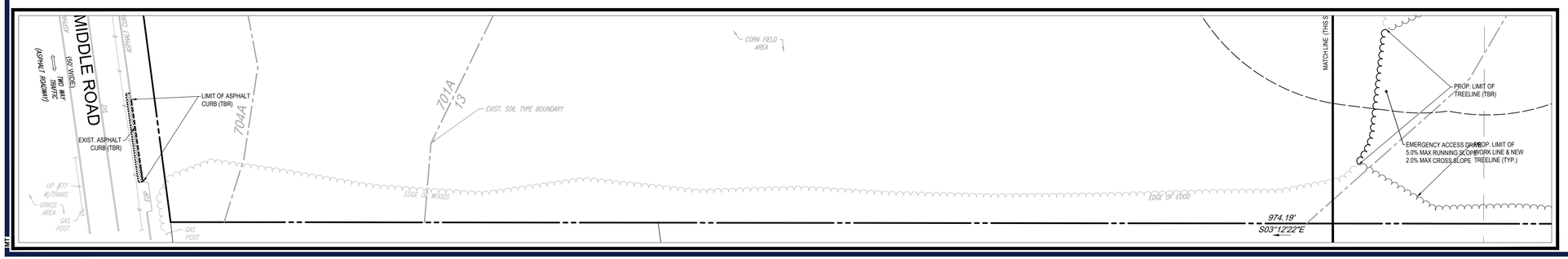

REFER TO GENERAL NOTES SHEET FOR DEMOLITION NOTES

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1"= 30'

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PROJECT No.: CT191016
DRAWN BY: MLT / DE
CHECKED BY: JGB / PM
DATE: 12/06/19
CAD I.D.: CT191016es2

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

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JEFFREY G. BORD
30414
LICENSED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CONNECTICUT LICENSE NO. 30414

SHEET TITLE:

DEMOLITION PLAN

SHEET NUMBER:

C-201

REVISION 3 - 6/4/20

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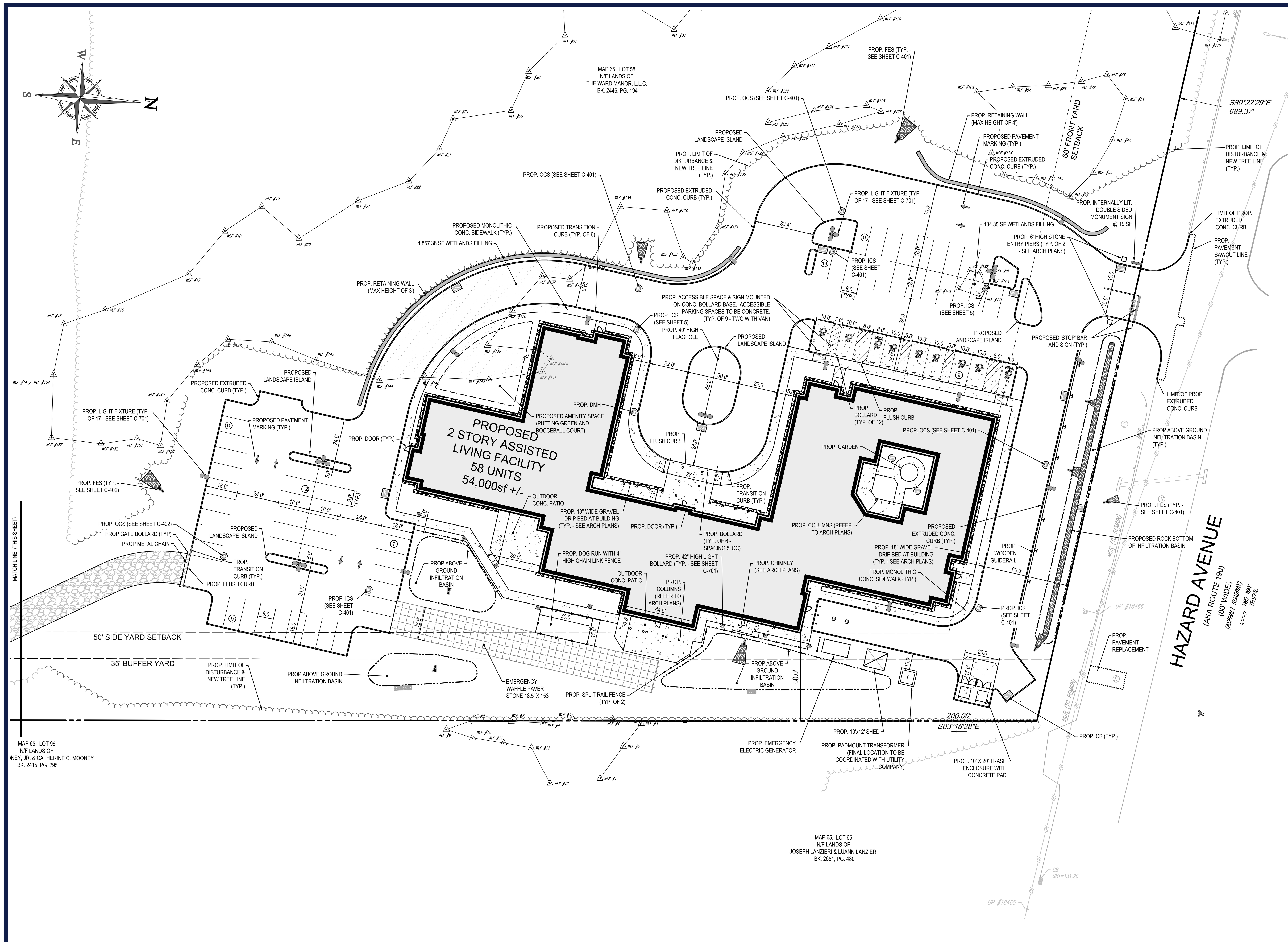
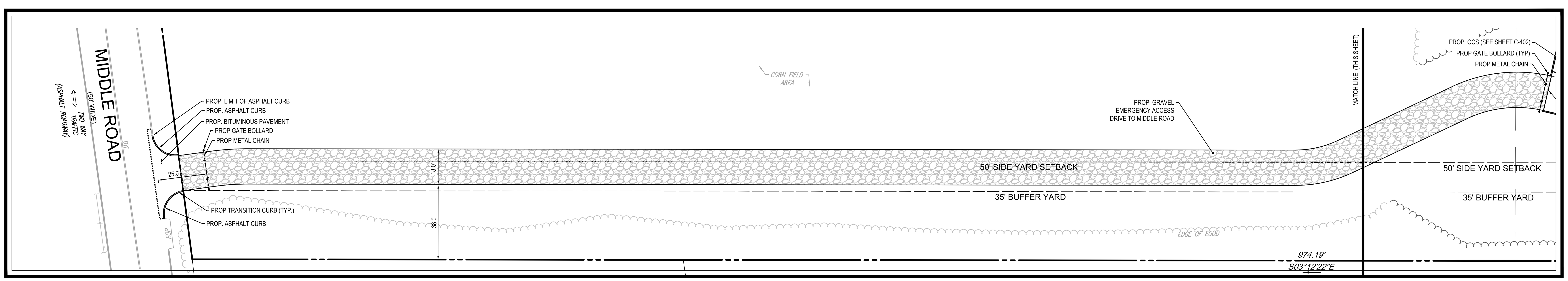
MT





LAND USE / ZONING INFORMATION & NOTES

1. APPLICANT:
   KAPLAN DEVELOPMENT GROUP, LLC
   100 JERICHO QUADRANGLE, STE 142
   JERICHO, NY 11753
2. OWNER:
   WARD MANOR, LLC
   82 POTTER SCHOOL ROAD
   WILLINGTON, CT 06279
3. PARCEL:
   MAP 65, LOT 59
   118 HAZARD AVENUE
   TOWN OF ENFIELD
   HARTFORD COUNTY, CT

ZONING ANALYSIS TABLE

ZONING DISTRICT: B-P BUSINESS PROFESSIONAL	PERMITTED USES: ASSISTED LIVING FACILITY		
ZONE CRITERIA	REQUIRED	EXISTING	PROPOSED
MINIMUM LOT AREA	10 ACRES	19.435 Ac.	NO CHANGE
MINIMUM LOT WIDTH	N/A	N/A	N/A
MAX. BUILDING COVERAGE	25%	N/A	4%
MIN. FRONT SETBACK	60'	N/A	60.3'
MIN. SIDE SETBACK	50'	N/A	50.0'
MIN. REAR SETBACK	50'	N/A	452.5'
MAX. BUILDING HEIGHT	35'	N/A	2 STORIES (24')
MAX. IMPERVIOUS COVERAGE	60%	0%	100,443 SF / 846,574 SF = 11.86%
PARKING SPACES	TBD	0	69
ACCESSIBLE PARKING SPACES	9	0	9
PARKING CRITERIA	- ONE (1) SPACE FOR EVERY TWO (2) DWELLING UNITS. ONE (1) SPACE FOR EVERY TWO(2) EMPLOYEES. ONE (1) PARKING SPOT FOR SHUTTLE OR FACILITY VEHICLE.		
ACCESSIBLE PARKING CRITERIA (STANDARD SPACE- 8'x18' W/ 5' ACCESS AISLE) (VAN ACCESSIBLE SPACE-8'x18' W/ 8' ACCESS AISLE)	TOTAL PARKING 51 TO 75 = 3 ACCESSIBLE SPACES + 1 ACCESSIBLE SPACE FOR EACH ACCESSIBLE UNIT (6 UNITS) VAN ACCESSIBLE SPACES= 1 / 6 SPACES		

(N/A): NOT APLLICABLE

SIGN SUMMARY TABLE

TYPE	ALLOWED	EXISTING	PROPOSED
SITE SIGNAGE			
FREESTANDING I.D. SIGN	ONE (1) @ 50 SF MAX @ 20' HIGH	-	ONE (1) DOUBLE SIDED @ 19 SF 6' HIGH
BUILDING SIGNAGE			
FRONT WALL SIGN	ONE PER FRONTAGE MAX 32 SF	-	-
NON DRIVE THRU WALL SIGN		-	-
DRIVE THRU WALL SIGN		-	-
REAR WALL SIGN		-	-
TOTAL BUILDING SIGNAGE	82 SF	-	1 @ 38 SF

NOTE: ALL SIGNS AREAS ARE "BOXED" FOR CALCULATIONS

REFER TO GENERAL NOTES SHEET FOR NOTES

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DRAWN BY:	MLT / DE
CHECKED BY:	JGB / PM
DATE:	12/06/19
CAD I.D.:	CT191016ss2

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

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16 OLD FORGE ROAD, SUITE A
ROCKY HILL, CT 06067
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Fax: (508) 480-9080
www.BohlerEngineering.com

J.G. BORD
STATE OF CONNECTICUT JEFFREY G. BORD No. 30414 LICENSED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CONNECTICUT LICENSE No. 30414

SHEET TITLE:

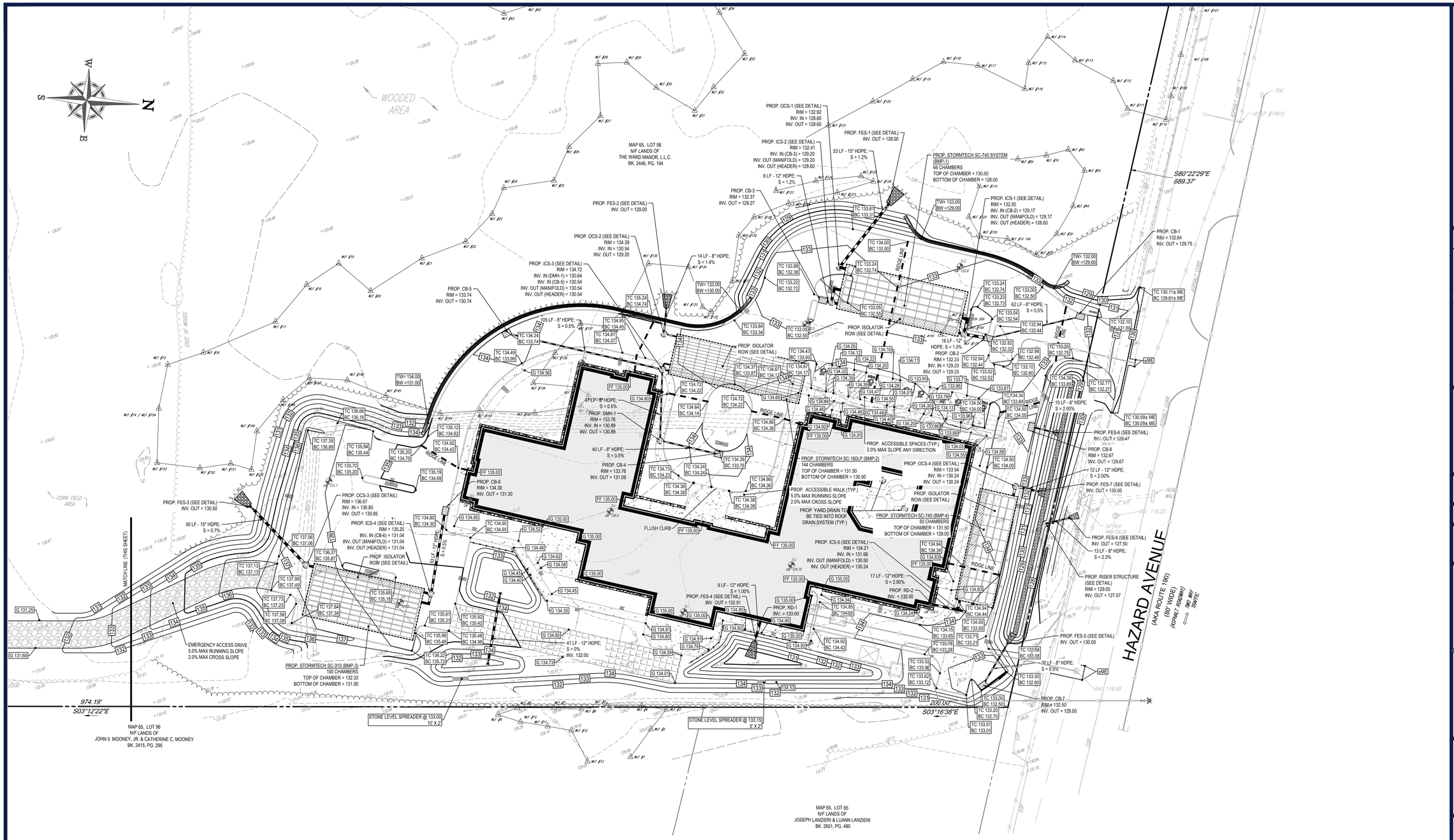
SITE LAYOUT PLAN

SHEET NUMBER:

C-301

REVISION 3 - 6/4/20

P:\19\CT191016\DRAWINGS\PLAN SETS\REV3 - WETLAND FLAG REVISIONS\CT191016SS3----->LAYOUT: C-301 SITE
MT



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REFER TO GENERAL NOTES SHEET FOR GRADING & UTILITY NOTES

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PROJECT:

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PROFESSIONAL ENGINEER
CONNECTICUT LICENSE NO. 30414

SHEET TITLE:

GRADING & DRAINAGE PLAN

SHEET NUMBER:

C-401

REVISION 3 - 6/4/20

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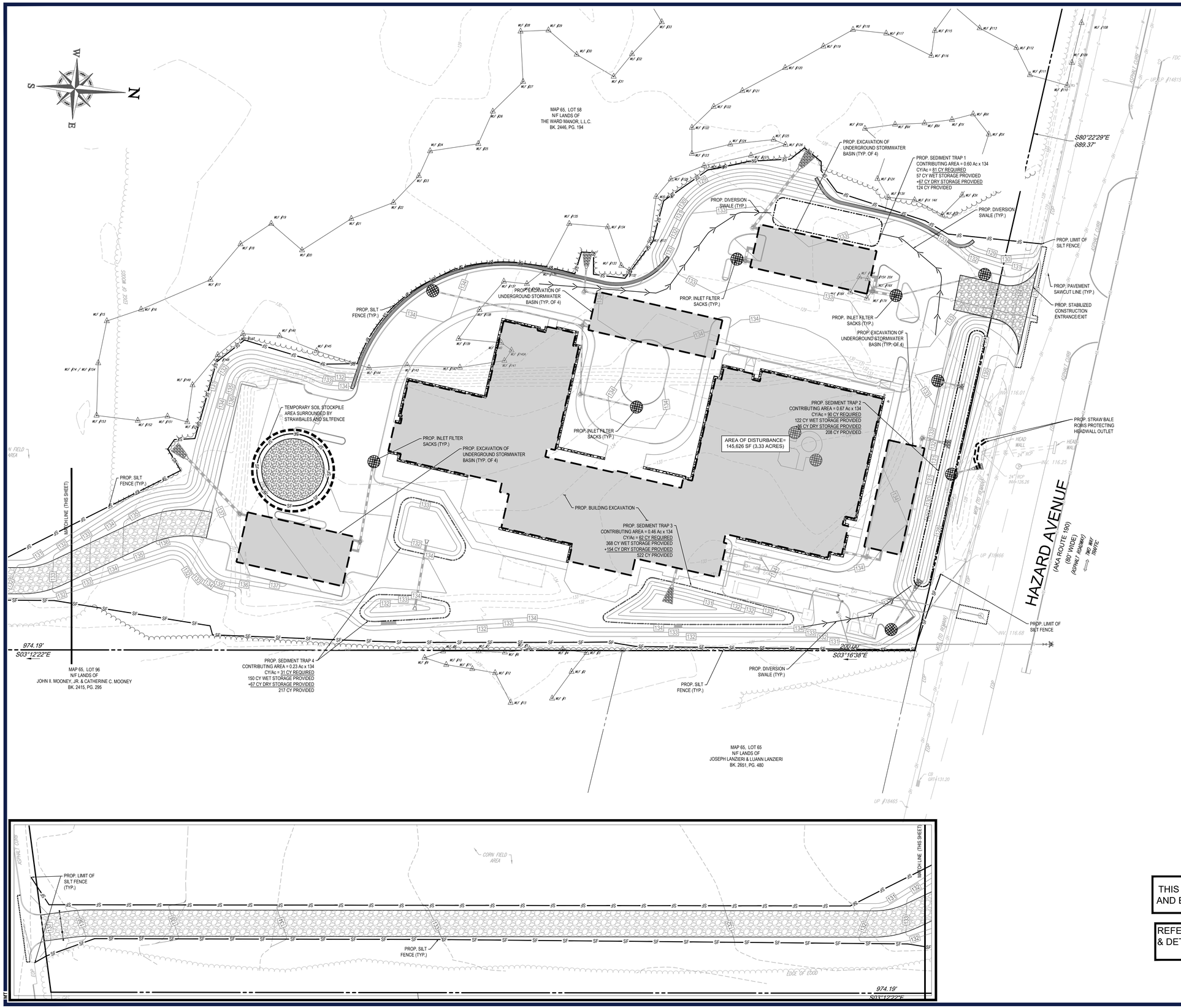

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REFER TO SOIL EROSION CONTROL NOTES & DETAIL SHEET FOR EROSION NOTES AND DETAILS

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PROFESSIONAL ENGINEER
CONNECTICUT LICENSE NO. 30414

SHEET TITLE:

SOIL EROSION & SEDIMENT CONTROL PLAN

SHEET NUMBER:

C-402

REVISION 3 - 6/4/20

P:\19\CT191016\DRAWING\SPLAN SETS\REV3 - WETLAND FLAG REVISIONS\CT191016SS3----\LAYOUT: C-402 EROS

EROSION & SEDIMENT CONTROL NOTES

1. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE DONE AS SET FORTH IN THE MOST CURRENT STATE SEDIMENT AND EROSION CONTROL MANUAL.
2. THOSE AREAS UNDERGOING ACTUAL CONSTRUCTION WILL BE LEFT IN AN UNTREATED OR UNVEGETATED CONDITION FOR A MINIMUM TIME. AREAS SHALL BE PERMANENTLY STABILIZED WITHIN 15 DAYS OF FINAL GRADING AND TEMPORARILY STABILIZED WITHIN 30 DAYS OF INITIAL DISTURBANCE OF THE SOIL. IF THE DISTURBANCE IS WITHIN 100 FEET OF A STREAM OR POND, THE AREA SHALL BE STABILIZED WITHIN 7 DAYS OR PRIOR TO ANY STORM EVENT (THIS WOULD INCLUDE WETLANDS).
3. SEDIMENT BARRIERS (SILT FENCE, STRAW BARRIERS, ETC.) SHOULD BE INSTALLED PRIOR TO ANY SOIL DISTURBANCE OF THE CONTRIBUTING DRAINAGE AREA ABOVE THEM. MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL AREAS WITH SLOPES GREATER THAN 15% AFTER OCTOBER 1ST THE SAME APPLIES FOR ALL SLOPES GREATER THAN 8%.
4. INSTALL SILTATION BARRIER AT TOE OF SLOPE TO FILTER SILT FROM RUNOFF. SEE SILTATION BARRIER DETAILS FOR PROPER INSTALLATION. SILTATION BARRIER WILL REMAIN IN PLACE PER NOTE #5.
5. ALL EROSION CONTROL STRUCTURES WILL BE INSPECTED, REPLACED AND/OR REPAIRED EVERY 7 DAYS AND IMMEDIATELY FOLLOWING ANY SIGNIFICANT RAINFALL OR SNOW MELT OR WHEN NO LONGER SERVICEABLE DUE TO SEDIMENT ACCUMULATION OR DECOMPOSITION. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER. SEDIMENT CONTROL DEVICES SHALL REMAIN IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL AREAS UPSLOPE ARE STABILIZED BY TURF.
6. NO SLOPES, EITHER PERMANENT OR TEMPORARY, SHALL BE STEEPER THAN TWO TO ONE (2:1).
7. IF FINAL SEEDING OF THE DISTURBED AREAS IS NOT COMPLETED 45 DAYS PRIOR TO THE FIRST KILLING FROST, USE TEMPORARY MULCH (DORMANT SEEDING MAY BE ATTEMPTED AS WELL) TO PROTECT THE SITE AND DELAY SEEDING UNTIL THE NEXT RECOMMENDED SEEDING PERIOD.
8. TEMPORARY SEEDING OF DISTURBED AREAS THAT HAVE NOT BEEN FINAL GRADED SHALL BE COMPLETED 45 DAYS PRIOR TO THE FIRST KILLING FROST TO PROTECT FROM SPRING RUNOFF PROBLEMS.
9. DURING THE CONSTRUCTION PHASE, INTERCEPTED SEDIMENT WILL BE RETURNED TO THE SITE AND REGRADED ONTO OPEN AREAS.
10. REVEGETATION MEASURES WILL COMMENCE UPON COMPLETION OF CONSTRUCTION EXCEPT AS NOTED ABOVE. ALL DISTURBED AREAS NOT OTHERWISE STABILIZED WILL BE GRADED, SMOOTHED, AND PREPARED FOR FINAL SEEDING AS FOLLOWS:
   - 10.1. SIX INCHES OF LOAM WILL BE SPREAD OVER DISTURBED AREAS AND SMOOTHED TO A UNIFORM SURFACE.
   - 10.2. APPLY LIMESTONE AND FERTILIZER ACCORDING TO SOIL TEST. IF SOIL TESTING IS NOT FEASIBLE ON SMALL OR VARIABLE SITES, OR WHERE TIMING IS CRITICAL, FERTILIZER MAY BE APPLIED AT THE RATE OF 800 LB PER ACRE OR 18.4 LB PER 1,000 SF USING 10-20-20 OR EQUIVALENT. APPLY GROUND LIMESTONE (EQUIVALENT TO 50% CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF 3 TONS PER ACRE (138 LB PER1,000 SF).
   - 10.3. FOLLOWING SEED BED PREPARATION, DITCHES AND BACK SLOPES WILL BE SEEDED TO A MIXTURE OF 47% CREEPING RED FESCUE, 5% REDTOP, AND 48% TALL FESCUE. THE LAWN AREAS WILL BE SEEDED TO A PREMIUM TURF MIXTURE OF 44% KENTUCKY BLUE-GRASS, 44% CREEPING RED FESCUE, AND 12% PERENNIAL RYEGRASS: SEEDING RATE IS 1.03 LBS PER 1,000 SF LAWN QUALITY SOD MAY BE SUBSTITUTED FOR SEED.
   - 10.4. STRAW MULCH AT THE RATE OF 70-90 LBS PER 1,000 SF. A HYDRO-APPLICATION OF WOOD OR PAPER FIBER SHALL BE APPLIED FOLLOWING SEEDING. A SUITABLE BINDER SUCH AS CURASOL OR RMB PLUS WILL BE USED ON STRAW MULCH FOR WIND CONTROL.
11. ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED ONCE THE SITE IS STABILIZED.
12. WETLANDS WILL BE PROTECTED W/STRAW BALES AND/OR SILT FENCE INSTALLED AT THE EDGE OF THE WETLAND OR THE BOUNDARY OF WETLAND DISTURBANCE.
13. ALL AREAS WITHIN 100 FEET OF A FLAGGED WETLAND OR STREAM SHALL HAVE AN EXPOSURE WINDOW OF NOT MORE THAN 7 DAYS.
14. ALL AREAS WITHIN 100 FEET OF A FLAGGED WETLAND OR STREAM SHALL FOLLOW APPROPRIATE EROSION CONTROL MEASURES PRIOR TO EACH STORM IF NOT BEING ACTIVELY WORKED,

MULCH

LOCATION	MULCH	RATE (1000 SF)
PROTECT AREA	STRAW	100 POUNDS
WINDY AREA	SHREDDED OR CHOPPED CORNSTALKS STRAW (ANCHORED)*	185-275 POUNDS 100 POUNDS
MODERATE TO HIGH VELOCITY AREAS OR STEEP SLOPES GREATER THAN 3:1	JUTE MESH OR EXCELSIOR MAT	AS REQUIRED
GREATER THAN 3:1	(REFER TO GEOTECHNICAL REPORT FOR FINAL DESIGN REQUIREMENT)	

* A HYDRO-APPLICATION OF WOOD, OR PAPER FIBER MAY BE APPLIED FOLLOWING SEEDING. A SUITABLE BINDER SUCH AS CURASOL OR RMB PLUS SHALL BE USED ON STRAW MULCH FOR WIND CONTROL.

MULCH ANCHORING
ANCHOR MULCH WITH PEG AND TWINE (1 SQ. YD/BLOCK); MULCH NETTING (AS PER MANUFACTURER); WOOD CELLULOSE FIBER (750 LBS/ACRE); CHEMICAL TACK (AS PER MANUFACTURER'S SPECIFICATIONS); USE OF A SERRATED STRAIGHT DISK. WETTING FOR SMALL AREAS AND ROAD DITCHES MAY BE PERMITTED.

EROSION CONTROL NOTES DURING WINTER CONSTRUCTION

1. WINTER CONSTRUCTION PERIOD: NOVEMBER 1 THROUGH APRIL 15.
2. WINTER EXCAVATION AND EARTHWORK SHALL BE DONE SUCH THAT NO MORE THAN 1 ACRE OF THE SITE IS WITHOUT STABILIZATION AT ANY ONE TIME.
3. EXPOSED AREA SHOULD BE LIMITED TO THAT WHICH CAN BE MULCHED IN ONE DAY PRIOR TO ANY SNOW EVENT.
4. CONTINUATION OF EARTHWORK OPERATION ON ADDITIONAL AREAS SHALL NOT BEGIN UNTIL THE EXPOSED SOIL SURFACE ON THE AREA BEING WORKED HAS BEEN STABILIZED SUCH THAT NO LARGER AREA OF THE SITE IS WITHOUT EROSION CONTROL PROTECTION AS LISTED IN ITEM 2 ABOVE.
5. AN AREA SHALL BE CONSIDERED TO HAVE BEEN STABILIZED WHEN EXPOSED SURFACES HAVE BEEN EITHER MULCHED WITH STRAW OR straw AT A RATE OF 100 LB. PER 1,000 SQUARE FEET (WITH OR WITHOUT SEEDING) OR DORMANT SEEDED, MULCHED AND ADEQUATELY ANCHORED BY AN APPROVED ANCHORING TECHNIQUE.
6. BETWEEN THE DATES OF OCTOBER 15 AND APRIL 1ST, LOAM OR SEED WILL NOT BE REQUIRED. DURING PERIODS OF ABOVE FREEZING TEMPERATURES THE SLOPES SHALL BE FINE GRADED AND EITHER PROTECTED WITH MULCH OR TEMPORARILY SEEDED AND MULCHED UNTIL SUCH TIME AS THE FINAL TREATMENT CAN BE APPLIED. IF THE DATE IS AFTER NOVEMBER 1ST AND IF THE EXPOSED AREA HAS BEEN LOAMED, FINAL GRADED AND IS SMOOTH, THEN THE AREA MAY BE DORMANT SEEDED AT A RATE OF 200 - 300% HIGHER THAN SPECIFIED FOR PERMANENT SEED AND THEN MULCHED. IF CONSTRUCTION CONTINUES DURING FREEZING WEATHER, ALL EXPOSED AREAS SHALL BE CONTINUOUSLY GRADED BEFORE FREEZING AND THE SURFACE TEMPORARILY PROTECTED FROM EROSION BY THE APPLICATION OF MULCH. SLOPES SHALL NOT BE LEFT UNEXPOSED OVER THE WINTER OR ANY OTHER EXTENDED TIME OF WORK SUSPENSION UNLESS TREATED IN THE ABOVE MANNER. UNTIL SUCH TIME AS WEATHER CONDITIONS ALLOW DITCHES TO BE FINISHED WITH THE PERMANENT SURFACE TREATMENT, EROSION SHALL BE CONTROLLED BY THE INSTALLATION OF BALES OF straw OR STONE CHECK DAMS IN ACCORDANCE WITH THE STANDARD DETAILS.
7. MULCHING REQUIREMENTS:
   - 7.1. BETWEEN THE DATES OF NOVEMBER 1ST AND APRIL 15TH ALL MULCH SHALL BE ANCHORED BY EITHER PEG LINE, MULCH NETTING OR WOOD CELLULOSE FIBER.
   - 7.2. MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL DRAINAGE WAYS WITH A SLOPE GREATER THAN 3% FOR SLOPE EXPOSED TO DIRECT WINDS AND FOR ALL OTHER SLOPES GREATER THAN 8%.
   - 7.3. MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL AREAS WITH SLOPES GREATER THAN 15% AFTER OCTOBER 1ST THE SAME APPLIES FOR ALL SLOPES GREATER THAN 8%.
8. AFTER NOVEMBER 1ST THE CONTRACTOR SHALL APPLY DORMANT SEEDING OR MULCH AND ANCHORING ON ALL BARE EARTH AT THE END OF EACH WORKING DAY.
9. DURING THE WINTER CONSTRUCTION PERIOD ALL SNOW SHALL BE REMOVED FROM AREAS OF SEEDING AND MULCHING PRIOR TO PLACEMENT.
10. STOCKPILING OF MATERIALS (DIRT, WOOD, CONSTRUCTION MATERIALS, ETC.) MUST REMAIN COVERED AT ALL TIMES TO MINIMIZE ANY DUST PROBLEMS THAT MAY OCCUR WITH ADJACENT PROPERTIES AND TO PROVIDE MAXIMUM PROTECTION AGAINST EROSION RUNOFF.
11. EXISTING CATCH BASIN STRUCTURES SHALL BE PROTECTED UNTIL SUCH TIME AS THEY ARE REMOVED.

CONSTRUCTION SEQUENCE

THE FOLLOWING CONSTRUCTION SEQUENCE IS RECOMMENDED:

-INSTALLATION OF STABILIZED CONSTRUCTION ENTRANCE/EXIT (AS SHOWN)

-INSTALLATION OF EROSION CONTROL BARRIER (STRAW BALES AND SILT FENCE) (AS SHOWN)

-INSTALLATION OF INLET PROTECTION IN STREET (AS SHOWN)

-DEMOLITION OF EXISTING SITE STRUCTURES (SEE DEMOLITION PLAN)

-DEMOLITION OF EXISTING SITE PAVEMENT AND AMENITIES (SEE DEMOLITION PLAN)

-CLEARING AND GRUBBING

-INSTALLATION OF TEMPORARY SWALES AND SEDIMENT BASINS

-EARTHWORK AND EXCAVATION/FILLING AS NECESSARY

-CONSTRUCTION OF UTILITIES

-STABILIZE PERMANENT LAWN AREAS AND SLOPES WITH TEMPORARY SEEDING

-INSTALLATION OF INLET PROTECTION OF ON-SITE UTILITIES (AS SHOWN)

-CONSTRUCTION OF BUILDINGS

-CONSTRUCTION OF ALL CURBING AND LANDSCAPE ISLANDS AS INDICATED ON THE PLANS

-SPREAD TOPSOIL ON SLOPED AREAS AND SEED AND MULCH

-FINAL GRADING OF ALL SLOPED AREAS

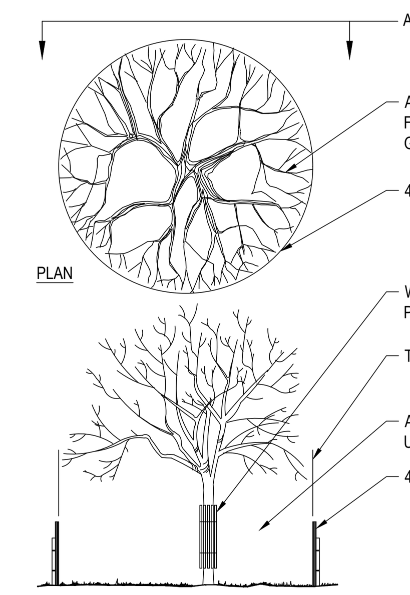
-PLACE 6" TOPSOIL ON SLOPES AFTER FINAL GRADING COMPLETED. FERTILIZE, SEED, AND MULCH SEED MIXTURE TO BE INSTALLED AS REQUIRED.

-REMOVAL OF THE TEMPORARY SEDIMENT BASINS

-PAVE PARKING LOT

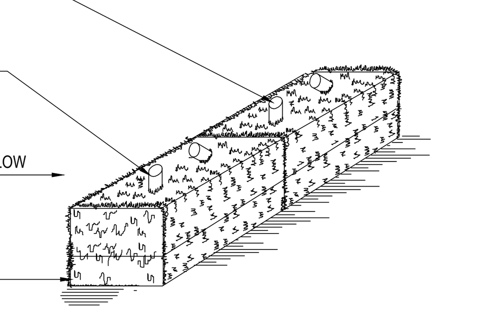
-LANDSCAPING PER LANDSCAPING PLAN

-REMOVE EROSION CONTROLS AS DISTURBED AREAS BECOME STABILIZED TO 70% STABILIZATION OR GREATER.



TREE PROTECTION DURING CONSTRUCTION

N.T.S.



DRAINAGE AREA NO MORE THAN 1/4 AC. PER 100 FEET OF STRAW BALE DIKE FOR SLOPES LESS THAN 25%

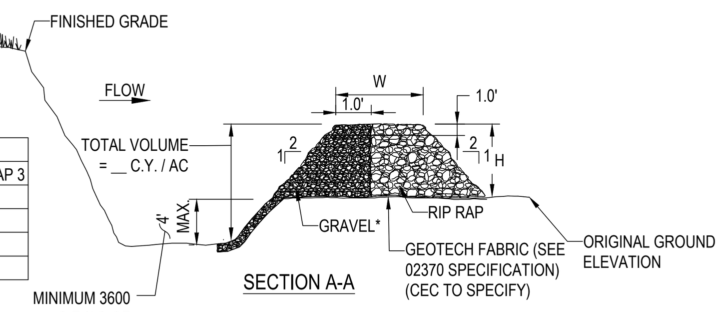
NOTES:
1. BALES SHALL BE PLACED AT THE TOP OF A SLOPE OR ON THE CONTOUR AND IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
2. EACH BALE SHALL BE PLACED SO THE BINDINGS ARE HORIZONTAL.
3. BALES SHALL BE SECURELY ANCHORED IN PLACE BY EITHER TWO STAKES OR RE-BARS DRIVEN THROUGH THE BALE. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE AT AN ANGLE TO FORCE THE BALES TOGETHER. STAKES SHALL BE DRIVEN FLUSH WITH THE BALE.
4. INSPECTION SHALL BE FREQUENT AND REPAIR REPLACEMENT SHALL BE PROMPTLY AS NEEDED.
5. BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

STRAW BALE DETAIL

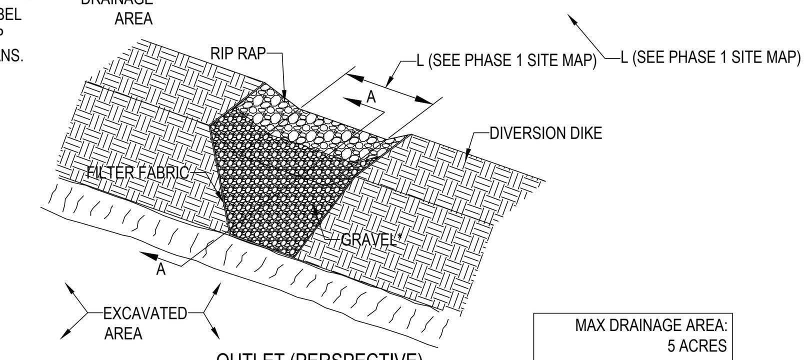
N.T.S.

	OUTLET DIM (FT).		
	TRAP 1	TRAP 2	TRAP 3
L			
H			
W			
V			

NOTE:
PROVIDE DIMENSIONS AND VOLUME FOR AND LABEL EACH SEDIMENT TRAP LOCATED ON THE PLANS. (SEE SITE MAPS)



* GRAVEL SHALL BE 2"-3" CLEAN STONE

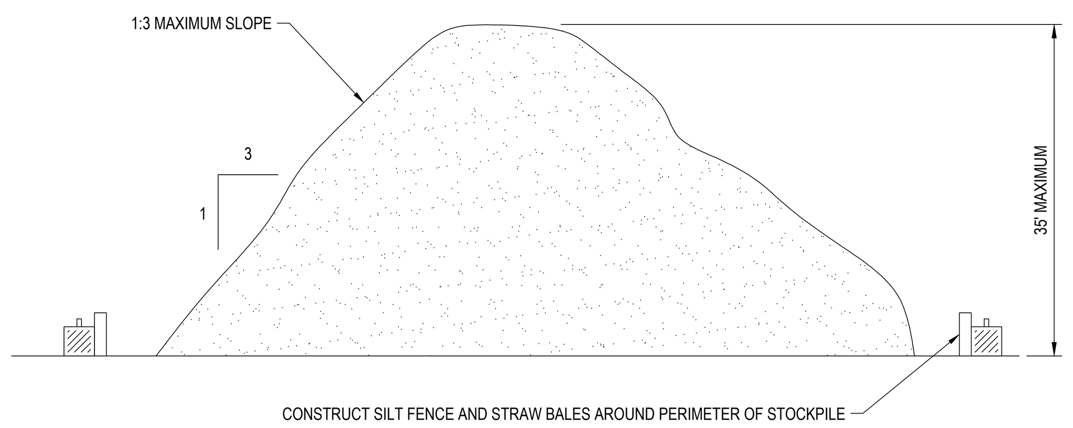


MAX DRAINAGE AREA: 5 ACRES
L (IN FEET) = 6' OR 1 x DRAINAGE AREA (AC) WHICHEVER IS LARGER

CEC TO PROVIDE, IN THE 02370 SPECIFICATION, DRAINAGE AREAS AND VOLUME CALCULATIONS FOR ALL SEDIMENT TRAPS SHOWN ON THE SITE MAPS (AS STIPULATED IN THE GENERAL PERMIT, AGENCY REQUIREMENTS, OR STANDARD ENGINEERING PRACTICES) TO DEMONSTRATE ADEQUATE VOLUME TO RETAIN RUNOFF AND ALLOW SETTLEMENT OF SUSPENDED SOILS BEFORE DISCHARGING DOWNSTREAM.

TEMPORARY SEDIMENT TRAP

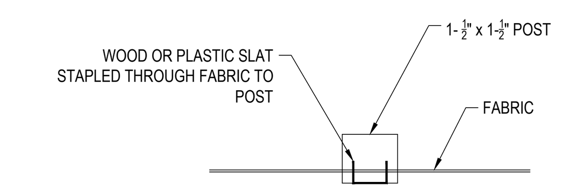
N.T.S.

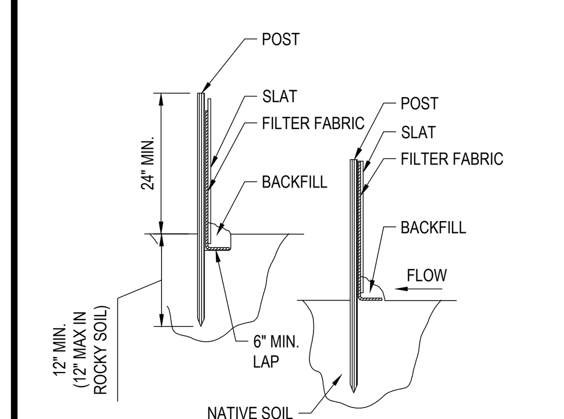


TEMPORARY STOCKPILE DETAIL

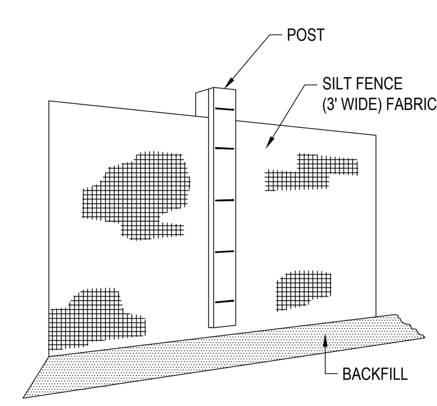
N.T.S.

INSTALLATION:
1. EXCAVATE A 6"x 6" TRENCH ALONG THE LINE OF EROSION CONTROL OF THE SITE.
2. UNROLL SILTATION FENCE AND POSITION THE POSTS AGAINST THE BACK (DOWNSTREAM) WALL OF THE TRENCH (NET SIDE AWAY FROM FLOW DIRECTION).
3. DRIVE THE POST INTO THE GROUND UNTIL THE NETTING IS LAYING ACROSS THE TRENCH BOTTOM.
4. LAY THE TOE-IN FLAP OF THE FABRIC ONTO THE UNDISTURBED BOTTOM OF THE TRENCH, BACKFILL THE TRENCH AND TAMP THE SOIL. TOE-IN CAN ALSO BE ACCOMPLISHED BY LAYING FABRIC FLAP ON UNDISTURBED GROUND AND PILING & TAMP- ING FILL AT THE BASE.





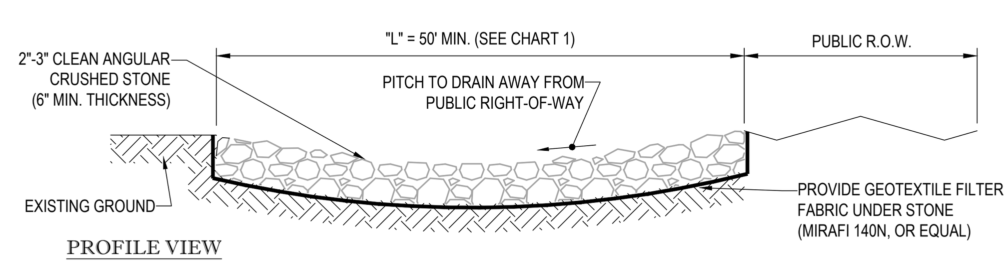
TOE-IN METHODS



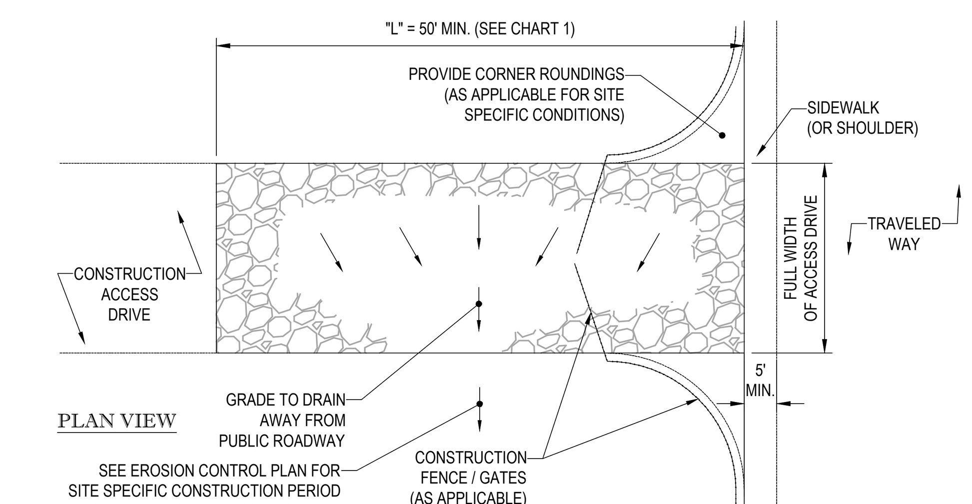
PERSPECTIVE OF FENCE

TYP. SILTATION FENCE DETAIL

N.T.S.



PROFILE VIEW



PLAN VIEW

CHART 1

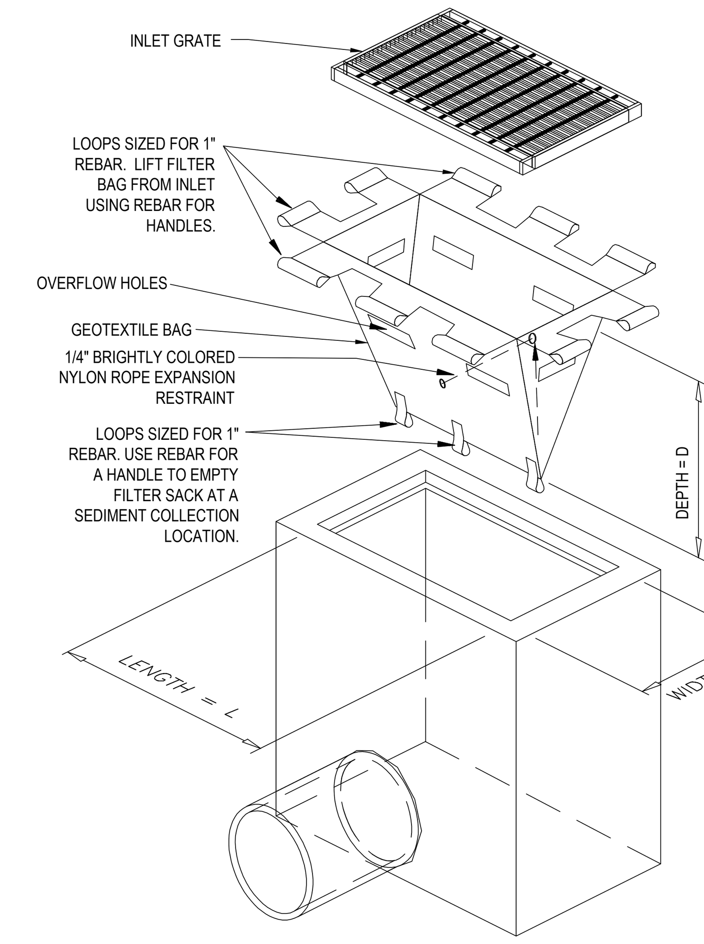
PERCENT SLOPE OF ROADWAY	LENGTH OF STONE REQUIRED	
	COARSE GRAINED SOILS	FINE GRAINED SOILS
0 TO 2%	50 FT	100 FT
2% TO 5%	100 FT	200FT
>5%	ENTIRE ENTRANCE STABILIZED WITH FABC BASE COURSE (1)	

(1) AS PRESCRIBED BY LOCAL ORDINANCE OR OTHER GOVERNING AUTHORITY.

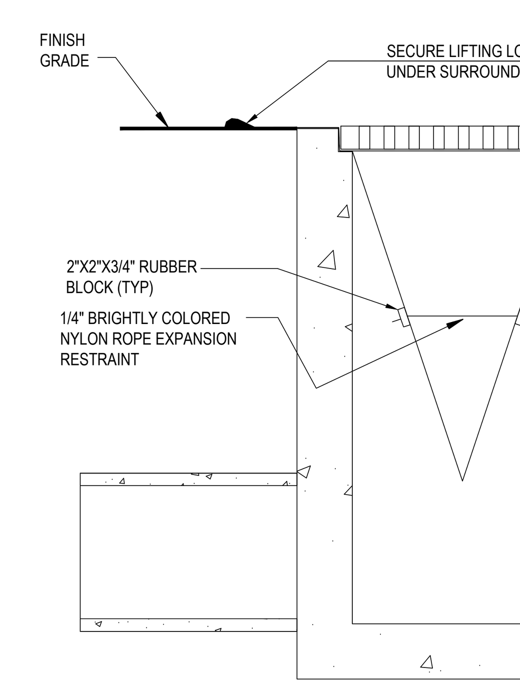
MAINTENANCE NOTES:
1. INSPECT STABILIZED CONSTRUCTION ENTRANCE / ANTI-TRACKING PAD AND SEDIMENT DISPOSAL AREA WEEKLY OR AFTER EVERY MAJOR RAIN STORM EVENT.
2. WASH WATER (IF USED) SHALL BE DIRECTED TOWARD A SEDIMENT TRAP, SUFFICIENTLY SIZED FOR SPECIFIC SITE CONDITIONS.
3. EXCESSIVELY MUD-CLOGGED STONE SHALL BE REMOVED AND REPLACED, AS NEEDED.

STABILIZED CONSTRUCTION EXIT

N.T.S.



ISOMETRIC VIEW



SECTION VIEW
PROFILE VIEW OF INSTALLED FILTER SACK

LOW TO MODERATE FLOW GEOTEXTILE FABRIC SPECIFICATION TABLE		
PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D-4632	300 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	20 %
PUNCTURE	ASTM D-4833	120 LBS
MULLEN BURST	ASTM D-3786	800 PSI
TRAPEZOID TEAR	ASTM D-4533	120 LBS
UV RESISTANCE	ASTM D-4355	80 %
APPARENT OPENING SIZE	ASTM D-4751	40 US SIEVE
FLOW RATE	ASTM D-4491	40 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491	0.55 SEC -1
MODERATE TO HIGH FLOW GEOTEXTILE FABRIC SPECIFICATION TABLE		
PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D-4632	265 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	20 %
PUNCTURE	ASTM D-4833	135 LBS
MULLEN BURST	ASTM D-3786	420 PSI
TRAPEZOID TEAR	ASTM D-4533	45 LBS
UV RESISTANCE	ASTM D-4355	90 %
APPARENT OPENING SIZE	ASTM D-4751	20 US SIEVE
FLOW RATE	ASTM D-4491	200 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491	1.5 SEC -1

1. REMOVE TRAPPED SEDIMENT WHEN BRIGHTLY COLORED EXPANSION RESTRAINT CAN NO LONGER BE SEEN.
2. GEOTEXTILE SHALL BE A WOVEN POLYPROPYLENE FABRIC THAT MEETS OR EXCEEDS REQUIREMENTS IN THE SPECIFICATIONS TABLE.
3. PLACE AN OIL ADSORBENT PAD OR PILLOW OVER INLET GRATE WHEN OIL SPILLS ARE A CONCERN.
4. INSPECT PER REGULATORY REQUIREMENTS.
5. THE WIDTH, "W", OF THE FILTER SACK SHALL MATCH THE INSIDE WIDTH OF THE GRATED INLET BOX.
6. THE DEPTH, "D", OF THE FILTER SACK SHALL BE BETWEEN 18 INCHES AND 36 INCHES
7. THE LENGTH, "L", OF THE FILTER SACK SHALL MATCH THE INSIDE LENGTH OF THE GRATED INLET BOX.

DO NOT USE IN PAVED AREAS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

TO BE USED IN EXISTING RIGHT OF WAY

FILTER SACKS (GRATED INLETS)

N.T.S.

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REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	1/20/20	ART COMMENTS	MLT / JGB
2	3/10/20	EMERGENCY ACCESS	MLT / JGB
3	6/4/20	UPDATED WETLAND DELINEATION	BTJ / JGB

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PROJECT No.:	CT191016
DRAWN BY:	MLT / DE
CHECKED BY:	JGB / PM
DATE:	12/06/19
CAD I.D.:	CT191016ss2

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

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16 OLD FORGE ROAD, SUITE A
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STATE OF CONNECTICUT JEFFREY G. BORD No. 30414 LICENSED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CONNECTICUT LICENSE No. 30414

SHEET TITLE:
SOIL EROSION & SEDIMENT CONTROL NOTES & DETAILS

SHEET NUMBER:
C-403

REVISION 3 - 6/4/20

P:\19\CT191016\DRAWINGS\PLAN SETS\REV3 - WETLAND FLAG REVISIONS\CT191016SS3----->LAYOUT: C-403 SOIL EROSION NOTES
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CONNECTICUT LICENSE No. 30414

SHEET TITLE:

UTILITY PLAN

SHEET NUMBER:

C-501

REVISION 3 - 6/4/20

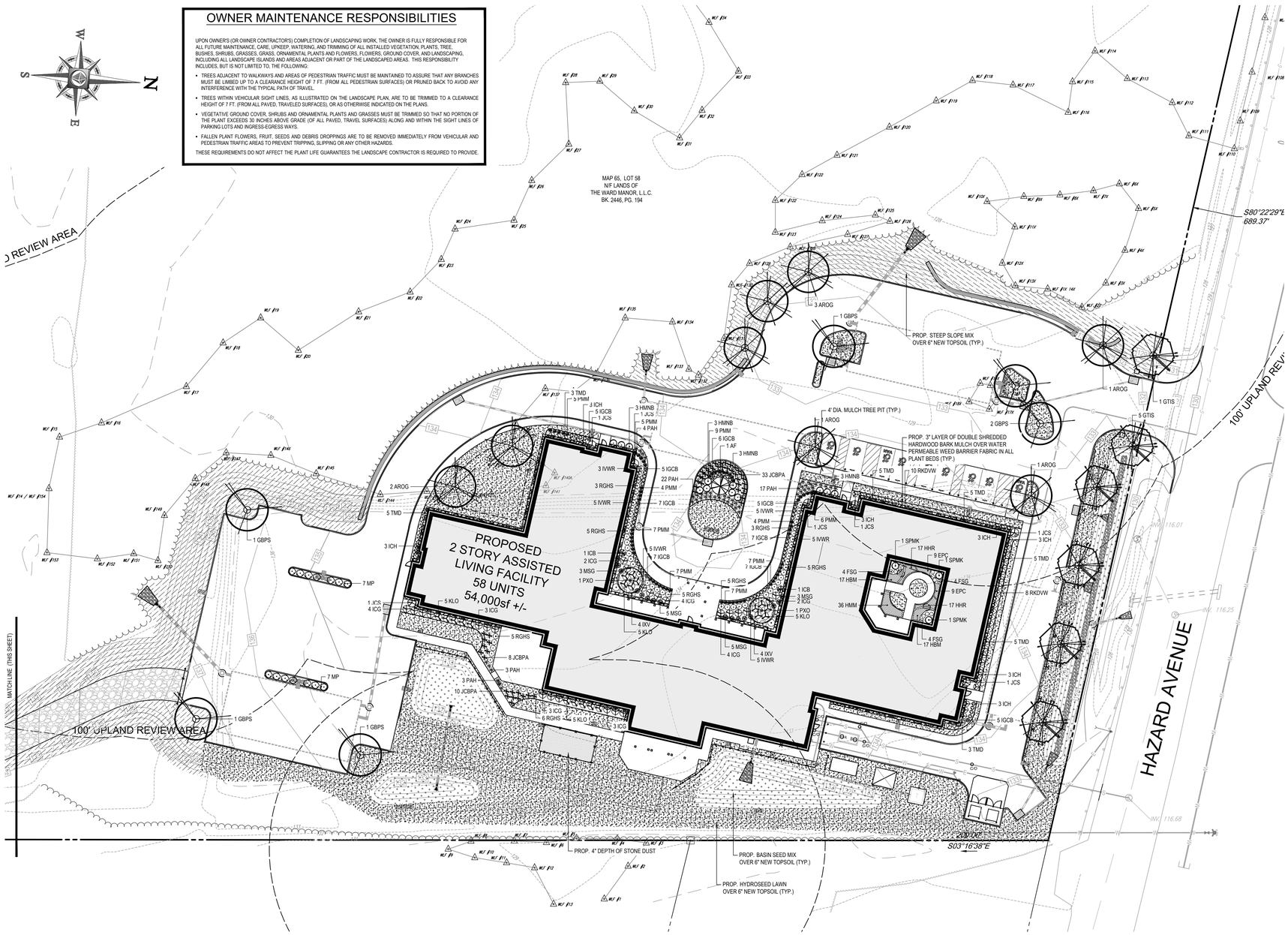
P:\19\CT191016\DRAWINGS\PLAN SET\SREV3 - WETLAND FLAG REVISIONS\CT191016SS3----LAYOUT: C-501 UTIL

OWNER MAINTENANCE RESPONSIBILITIES

UPON OWNER'S (OR OWNER CONTRACTOR'S) COMPLETION OF LANDSCAPING WORK, THE OWNER IS FULLY RESPONSIBLE FOR ALL FUTURE MAINTENANCE, CARE, UPKEEP, WATERING, AND TRIMMING OF ALL INSTALLED VEGETATION, PLANTS, TREE, BUSHES, SHRUBS, GRASSES, GRASS, ORNAMENTAL PLANTS AND FLOWERS, FLOWERS, GROUND COVER, AND LANDSCAPING, INCLUDING ALL LANDSCAPE ISLANDS AND AREAS ADJACENT OR PART OF THE LANDSCAPED AREAS. THIS RESPONSIBILITY INCLUDES, BUT IS NOT LIMITED TO, THE FOLLOWING:

- TREES ADJACENT TO WALKWAYS AND AREAS OF PEDESTRIAN TRAFFIC MUST BE MAINTAINED TO ASSURE THAT ANY BRANCHES MUST BE LIMBED UP TO A CLEARANCE HEIGHT OF 7 FT. (FROM ALL PEDESTRIAN SURFACES) OR PRUNED BACK TO AVOID ANY INTERFERENCE WITH THE TYPICAL PATH OF TRAVEL.
- TREES WITHIN VEHICULAR SIGHT LINES, AS ILLUSTRATED ON THE LANDSCAPE PLAN, ARE TO BE TRIMMED TO A CLEARANCE HEIGHT OF 7 FT. (FROM ALL PAVED, TRAVELED SURFACES), OR AS OTHERWISE INDICATED ON THE PLANS.
- VEGETATIVE GROUND COVER, SHRUBS AND ORNAMENTAL PLANTS AND GRASSES MUST BE TRIMMED SO THAT NO PORTION OF THE PLANT EXCEEDS 30 INCHES ABOVE GRADE (OF ALL PAVED, TRAVEL SURFACES) ALONG AND WITHIN THE SIGHT LINES OF PARKING LOTS AND INGRESS-EGRESS WAYS.
- FALLEN PLANT FLOWERS, FRUIT, SEEDS AND DEBRIS DROPPINGS ARE TO BE REMOVED IMMEDIATELY FROM VEHICULAR AND PEDESTRIAN TRAFFIC AREAS TO PREVENT TRIPPING, SLIPPING OR ANY OTHER HAZARDS.

THESE REQUIREMENTS DO NOT AFFECT THE PLANT LIFE GUARANTEES THE LANDSCAPE CONTRACTOR IS REQUIRED TO PROVIDE.

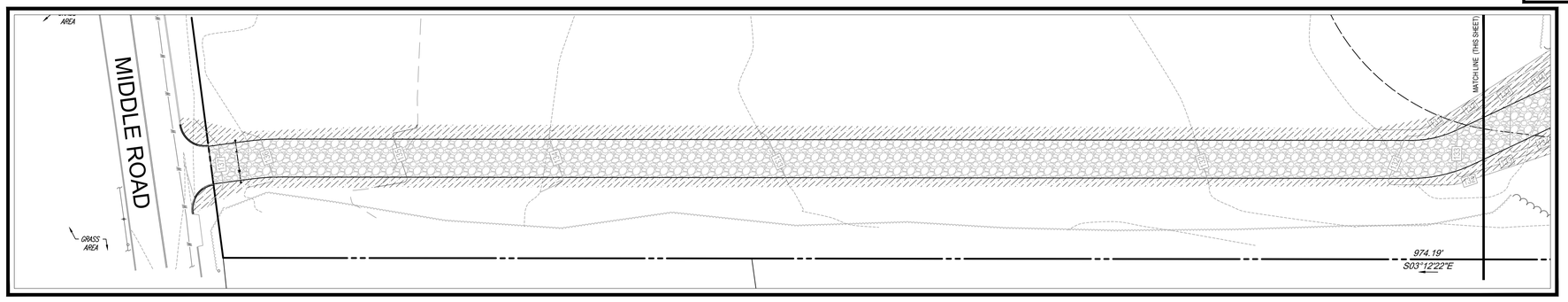


TOWN OF ENFIELD
LANDSCAPE REQUIREMENTS

SECTION	REQUIREMENTS	CALCULATIONS/PROPOSED
10.10.7 A	ii. ANY PARKING AREA DESIGNED OR INTENDED FOR USE BY MORE THAN 25 PARKING SPACES SHALL HAVE A MINIMUM LANDSCAPED SETBACK FROM THE RIGHT OF WAY OF 8 FEET iv. LANDSCAPED AREAS SHALL BE PLANTED WITH GROUND COVER AND ONE CANOPY TREE FOR EACH 50 FEET OF FRONTAGE vi. ANY PARKING AREA WITH AT LEAST 3 PARKING SPACES SHALL HAVE A MINIMUM LANDSCAPED SETBACK OF ALL PARKING SPACES/DRIVEWAYS/AISLES/ FROM ALL SIDE AND REAR PROPERTY LINES OF 10 FEET, AS WELL AS 10 FEET OF SEPARATION FROM BUIDLINGS	HAZARD AVENUE FRONTAGE: 258 LF REQUIRED: 258 LF/ 50= 5.1, OR 6TREES PROVIDED: 6 TREES
10.10.7 D	i. ANY PARKING AREA DESIGNED OR INTENDED FOR USE BY AT LEAST 3 PARKING SPACES SHALL HAVE A MINIMUM OF 15 PERCENT GROSS PARKING AREA IN LANDSCAPES AREAS. LANDSCAPE AREAS SHALL OCCUR IN INTERIOR OR END ISLANDS AT 10 FEET IN WIDTH. vi. LANDSCAPE AREAS SHALL HAVE A MINIMUM OF GROUNDCOVER AND 1 TREE PER 5 PARKING SPACES	NUMBER OR PROPOSED PARKING SPACES: 72 REQUIRED: 72 SPACES/ 5= 14.4, OR 15 TREES PROVIDED: 15 TREES
10.20 A	i. CANOPY TREES SHALL BE A MINIMUM OF TWO AND ONE-HALF (2 1/2) INCHES IN CALIPER. ii. EVERGREEN TREES SHALL BE A MINIMUM OF SIX (6) FEET IN HEIGHT. iii. UNDERSTORY TREES SHALL BE A MINIMUM OF ONE AND ONE-HALF (1 1/2) INCHES IN CALIPER. iv. DECIDUOUS SHRUBS SHALL BE A MINIMUM OF TWO AND ONE-HALF (1/2) FEET IN SPREAD. v. EVERGREEN SHRUBS SHALL BE A MINIMUM OF TWO AND ONE-HALF (1/2) FEET IN HEIGHT WITH A MATURE HEIGHT OF AT LEAST SIX (6) FEET	PROVIDED

LANDSCAPE SCHEDULE

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	CONT.
SHADE TREES					
AROG	8	ACER RUBRUM 'OCTOBER GLORY'	OCTOBER GLORY RED MAPLE	2 1/2-3" CAL.	B+B
GBPS	6	GINKGO BILOBA 'PRINCETON SENTRY'	PRINCETON SENTRY BRAND GINKGO	2 1/2-3" CAL.	B+B
GTIS	6	GLEDITSIA TRIACANTHOS VAR. INERMIS 'SHADEMASTER'	SHADEMASTER HONEYLOCUST	2 1/2-3" CAL.	B+B
SUBTOTAL:	20				
ORNAMENTAL TREES					
PXO	2	PRUNUS X 'OKAME'	OKAME CHERRY	2-2 1/2" CAL.	B+B
SUBTOTAL:	2				
EVERGREEN TREES					
AF	1	ABIES FRASERI	FRASER FIR	7-8'	B+B
SUBTOTAL:	1				
DECIDUOUS SHRUBS					
FSG	12	FORSYTHIA X INTERMEDIA 'GOLD TIDE'	COMPACT FORSYTHIA	18-24"	CONTAINER
HMNB	12	HYDRANGEA MACROPHYLLA 'NIKKO BLUE'	NIKKO BLUE HORTENSIA HYDRANGEA	18-24"	CONTAINER
IVWR	26	ILEX VERTICILLATA 'WINTER RED'	WINTER RED WINTERBERRY HOLLY	30-36"	CONTAINER
IXV	8	ILEX X VERTICILLATA 'HARVEST RED'	HARVEST RED WINTERBERRY	30-36"	CONTAINER
MP	14	MYRICA PENSYLVANICA	NORTHERN BAYBERRY	30-36"	B+B
SPMK	3	SYRINGA PATTULA 'MISS KIM'	MISS KIM LILAC	24-30"	B+B
SUBTOTAL:	75				
EVERGREEN SHRUBS					
ICB	2	ILEX X MESERVEAE 'CHINA BOY'	CHINA BOY HOLLY	30-36"	CONTAINER
ICG	25	ILEX X MESERVEAE 'CHINA GIRL'	CHINA GIRL HOLLY	30-36"	B+B
ICH	21	ILEX CRENATA 'HELLERI'	HELLERI JAPANESE HOLLY	15-18"	B+B
IGCB	54	ILEX GLABRA 'GEM BOX'	DWARF INKBERRY HOLLY	18-24"	CONTAINER
JCS	7	JUNIPERUS CHINENSIS 'SPARTAN'	SPARTAN JUNIPER	3-4'	B+B
KLO	20	KALMIA LATIFOLIA 'OLYMPIC FIRE'	OLYMPIC FIRE MOUNTAIN LAUREL	30-36"	B+B
PMM	61	PINUS MUGO MUGUS	DWARF MUGO PINE	18-24"	CONTAINER
RGHS	37	RHODODENDRON X GIRARD 'GIRARD HOT SHOT'	GIRARD HOT SHOT AZALEA	18-24"	CONTAINER
RKDVW	18	RHODODENDRON X KURUME 'DELAWARE VALLEY WHITE'	'DELAWARE VALLEY WHITE' AZALEA	18-24"	CONTAINER
TMD	31	TAXUS X MEDIA 'DENSIFORMIS'	DENSIFORMIS YEW	24-30"	B+B
SUBTOTAL:	276				
GROUND COVERS					
JCBPA	51	JUNIPERUS CONFERTA 'BLUE PACIFIC'	BLUE PACIFIC SHORE JUNIPER	15-18" SPRD.	CONTAINER
SUBTOTAL:	51				
PERENNIALS					
EPC	18	ECHINACEA PURPUREA 'CHEYENNE SPIRIT'	CONEFLOWER	2 GAL.	CONTAINER
HBM	34	HOSTA 'BLUEBERRY MUFFIN'	BLUEBERRY MUFFIN HOSTA	2 GAL.	CONTAINER
HHR	34	HEMEROCALLIS 'HAPPY RETURNS'	HAPPY RETURNS DAYLILY	2 GAL.	CONTAINER
HMM	36	HOSTA 'MINUTEMAN'	MINUTEMAN HOSTA	2 GAL.	CONTAINER
SUBTOTAL:	122				
ORNAMENTAL GRASSES					
MSG	16	MISCANTHUS SINENSIS 'GRACILLIMUS'	MAIDEN GRASS	2 GAL.	CONTAINER
PAH	49	PENNISETUM ALOPECUROIDES 'HAMELN'	DWARF FOUNTAIN GRASS	2 GAL.	CONTAINER
SUBTOTAL:	65				



SEED MIX KEY

- PROPOSED HYDROSEED
- PROPOSED STEEP SLOPE MIX
- PROPOSED BASIN SEED MIX

THIS PLAN TO BE UTILIZED FOR LANDSCAPE PURPOSES ONLY

REFER LANDSCAPE NOTES & DETAILS SHEET FOR LANDSCAPE NOTES AND DETAILS

30 15 7.5 0 30
1"= 30'

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REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	1/20/20	ART COMMENTS	MLT / JGB
2	3/10/20	EMERGENCY ACCESS	MLT / JGB
3	6/4/20	UPDATED WETLAND DELINEATION	BTJ / JGB

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PROJECT No.: CT191016
DRAWN BY: MLT / DE
CHECKED BY: JGB / PM
DATE: 12/06/19
CAD I.D.: CT191016ss2

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

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CONNECTICUT No. 1359

SHEET TITLE:

LANDSCAPE PLAN

SHEET NUMBER:

C-601

REVISION 3 - 6/4/20

P:\19\CT191016\DRAWINGS\PLAN SETS\REV3 - WETLAND FLAG REVISIONS\X-LANDSCAPE----LAYOUT, L-1 LAND

LANDSCAPE SPECIFICATIONS

1. SCOPE OF WORK:

1.1. THE LANDSCAPE CONTRACTOR SHALL BE REQUIRED TO PERFORM ALL CLEARING, FINISHED GRADING, SOIL PREPARATION, PERMANENT SEEDING OR SODDING, PLANTING AND MULCHING INCLUDING ALL LABOR, MATERIALS, TOOLS AND EQUIPMENT NECESSARY FOR THE COMPLETION OF THIS PROJECT, UNLESS OTHERWISE CONTRACTED BY THE GENERAL CONTRACTOR.

2. MATERIALS

2.1. GENERAL - ALL HARDSCAPE MATERIALS SHALL MEET OR EXCEED SPECIFICATIONS AS OUTLINED IN THE STATE DEPARTMENT OF TRANSPORTATION'S SPECIFICATIONS.

2.2. TOPSOIL - NATURAL, FRIABLE, LOAMY SILT SOIL HAVING AN ORGANIC CONTENT NOT LESS THAN 5%, A PH RANGE BETWEEN 4.5-7.0. IT SHALL BE FREE OF DEBRIS, ROCKS LARGER THAN ONE INCH (1"), WOOD, ROOTS, VEGETABLE MATTER AND CLAY CLODS.

2.3. LAWN - ALL DISTURBED AREAS ARE TO BE TREATED WITH A MINIMUM 6" THICK LAYER OF TOPSOIL, OR AS DIRECTED BY THE LOCAL ORDINANCE OR CLIENT, AND SEEDED OR SODDED IN ACCORDANCE WITH THE PERMANENT STABILIZATION METHODS INDICATED ON THE LANDSCAPE PLAN

2.3.1. LAWN SEED MIXTURE SHALL BE FRESH, CLEAN NEW CROP SEED.

2.3.2. SOD SHALL BE STRONGLY ROOTED, WEED AND DISEASE/PEST FREE WITH A UNIFORM THICKNESS. SOD INSTALLED ON SLOPES GREATER THAN 4:1 SHALL BE PEGGED TO HOLD SOD IN PLACE.

2.4. MULCH - ALL PLANTING BEDS SHALL BE MULCHED WITH A 3" THICK LAYER OF DOUBLE SHREDDED HARDWOOD BARK MULCH, UNLESS OTHERWISE STATED ON THE LANDSCAPE PLAN AND/OR LANDSCAPE PLAN NOTES /DETAILS.

2.5. FERTILIZER

2.5.1. FERTILIZER SHALL BE DELIVERED TO THE SITE MIXED AS SPECIFIED IN THE ORIGINAL UNOPENED STANDARD BAGS SHOWING WEIGHT, ANALYSIS AND NAME OF MANUFACTURER. FERTILIZER SHALL BE STORED IN A WEATHERPROOF PLACE SO THAT IT CAN BE KEPT DRY PRIOR TO USE.

2.5.2. FOR THE PURPOSE OF BIDDING, ASSUME THAT FERTILIZER SHALL BE 10% NITROGEN, 6% PHOSPHORUS AND 4% POTASSIUM BY WEIGHT. A FERTILIZER SHOULD NOT BE SELECTED WITHOUT A SOIL TEST PERFORMED BY A CERTIFIED SOIL LABORATORY.

2.6. PLANT MATERIAL

2.6.1. ALL PLANTS SHALL IN ALL CASES CONFORM TO THE REQUIREMENTS OF THE "AMERICAN STANDARD FOR NURSERY STOCK" (ANSI Z60.1), LATEST EDITION, AS PUBLISHED BY THE AMERICAN NURSERY & LANDSCAPE ASSOCIATION (FORMERLY THE AMERICAN ASSOCIATION OF NURSERYMEN).

2.6.2. IN ALL CASES, BOTANICAL NAMES SHALL TAKE PRECEDENCE OVER COMMON NAMES FOR ANY AND ALL PLANT MATERIAL.

2.6.3. PLANTS SHALL BE LEGIBLY TAGGED WITH THE PROPER NAME AND SIZE. TAGS ARE TO REMAIN ON AT LEAST ONE PLANT OF EACH SPECIES FOR VERIFICATION PURPOSES DURING THE FINAL INSPECTION.

2.6.4. TREES WITH ABRASION OF THE BARK, SUN SCALDS, DISFIGURATION OR FRESH CUTS OF LIMBS OVER 1¼", WHICH HAVE NOT BEEN COMPLETELY CALLUSED, SHALL BE REJECTED. PLANTS SHALL NOT BE BOUND WITH WIRE OR ROPE AT ANY TIME SO AS TO DAMAGE THE BARK OR BREAK BRANCHES.

2.6.5. ALL PLANTS SHALL BE TYPICAL OF THEIR SPECIES OR VARIETY AND SHALL HAVE A NORMAL HABIT OF GROWTH: WELL DEVELOPED BRANCHES, DENSELY FOLIATED, VIGOROUS ROOT SYSTEMS AND BE FREE OF DISEASE, INSECTS, PESTS, EGGS OR LARVAE.

2.6.6. CALIPER MEASUREMENTS OF NURSERY GROWN TREES SHALL BE TAKEN AT A POINT ON THE TRUNK SIX INCHES (6") ABOVE THE NATURAL GRADE FOR TREES UP TO AND INCLUDING A FOUR INCH (4") CALIPER SIZE. IF THE CALIPER AT SIX INCHES (6") ABOVE THE GROUND EXCEEDS FOUR INCHES (4") IN CALIPER, THE CALIPER SHOULD BE MEASURED AT A POINT 12" ABOVE THE NATURAL GRADE.

2.6.7. SHRUBS SHALL BE MEASURED TO THE AVERAGE HEIGHT OR SPREAD OF THE SHRUB, AND NOT TO THE LONGEST BRANCH.

2.6.8. TREES AND SHRUBS SHALL BE HANDLED WITH CARE BY THE ROOT BALL.

3. GENERAL WORK PROCEDURES

3.1. CONTRACTOR TO UTILIZE WORKMANLIKE INDUSTRY STANDARDS IN PERFORMING ALL LANDSCAPE CONSTRUCTION. THE SITE IS TO BE LEFT IN A CLEAN STATE AT THE END OF EACH WORKDAY. ALL DEBRIS, MATERIALS AND TOOLS SHALL BE PROPERLY STORED, STOCKPILED OR DISPOSED OF.

3.2. WASTE MATERIALS AND DEBRIS SHALL BE COMPLETELY DISPOSED OF AT THE CONTRACTOR'S EXPENSE. DEBRIS SHALL NOT BE BURIED, INCLUDING ORGANIC MATERIALS, BUT SHALL BE REMOVED COMPLETELY FROM THE SITE.

4. SITE PREPARATIONS

4.1. BEFORE AND DURING PRELIMINARY GRADING AND FINISHED GRADING, ALL WEEDS AND GRASSES SHALL BE DUG OUT BY THE ROOTS AND DISPOSED OF IN ACCORDANCE WITH GENERAL WORK PROCEDURES OUTLINED HEREIN.

4.2. ALL EXISTING TREES TO REMAIN SHALL BE PRUNED TO REMOVE ANY DAMAGED BRANCHES. THE ENTIRE LIMB OF ANY DAMAGED BRANCH SHALL BE CUT OFF AT THE BRANCH COLLAR. CONTRACTOR SHALL ENSURE THAT CUTS ARE SMOOTH AND STRAIGHT. ANY EXPOSED ROOTS SHALL BE CUT BACK WITH CLEAN, SHARP TOOLS AND TOPSOIL SHALL BE PLACED AROUND THE REMAINDER OF THE ROOTS. EXISTING TREES SHALL BE MONITORED ON A REGULAR BASIS FOR ADDITIONAL ROOT OR BRANCH DAMAGE AS A RESULT OF CONSTRUCTION. ROOTS SHALL NOT BE LEFT EXPOSED FOR MORE THAN ONE (1) DAY. CONTRACTOR SHALL WATER EXISTING TREES AS NEEDED TO PREVENT SHOCK OR DECLINE.

4.3. CONTRACTOR SHALL ARRANGE TO HAVE A UTILITY STAKE-OUT TO LOCATE ALL UNDERGROUND UTILITIES PRIOR TO INSTALLATION OF ANY LANDSCAPE MATERIAL. UTILITY COMPANIES SHALL BE CONTACTED THREE (3) DAYS PRIOR TO THE BEGINNING OF WORK.

5. TREE PROTECTION

5.1. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING TREES TO REMAIN. A TREE PROTECTION ZONE SHALL BE ESTABLISHED AT THE DRIP LINE OR AT THE LIMIT OF CONSTRUCTION DISTURBANCE, WHICHEVER IS GREATER. LOCAL STANDARDS THAT MAY REQUIRE A MORE STRICT TREE PROTECTION ZONE SHALL BE HONORED.

5.2. A FORTY-EIGHT INCH (48") HIGH WOODEN SNOW FENCE OR ORANGE COLORED HIGH-DENSITY 'VISI-FENCE', OR APPROVED EQUAL, MOUNTED ON STEEL POSTS SHALL BE PLACED ALONG THE BOUNDARY OF THE TREE PROTECTION ZONE. POSTS SHALL BE LOCATED AT A MAXIMUM OF EIGHT FEET (8') ON CENTER OR AS INDICATED WITHIN THE TREE PROTECTION DETAIL.

5.3. WHEN THE TREE PROTECTION FENCING HAS BEEN INSTALLED, IT SHALL BE INSPECTED BY THE APPROVING AGENCY PRIOR TO DEMOLITION, GRADING, TREE CLEARING OR ANY OTHER CONSTRUCTION. THE FENCING ALONG THE TREE PROTECTION ZONE SHALL BE REGULARLY INSPECTED BY THE LANDSCAPE CONTRACTOR AND MAINTAINED UNTIL ALL CONSTRUCTION ACTIVITY HAS BEEN COMPLETED.

5.4. AT NO TIME SHALL MACHINERY, DEBRIS, FALLEN TREES OR OTHER MATERIALS BE PLACED, STOCKPILED OR LEFT STANDING IN THE TREE PROTECTION ZONE.

6. SOIL MODIFICATIONS

6.1. CONTRACTOR SHALL ATTAIN A SOIL TEST FOR ALL AREAS OF THE SITE PRIOR TO CONDUCTING ANY PLANTING. SOIL TESTS SHALL BE PERFORMED BY A CERTIFIED SOIL LABORATORY.

6.2. LANDSCAPE CONTRACTOR SHALL REPORT ANY SOIL OR DRAINAGE CONDITIONS CONSIDERED DETRIMENTAL TO THE GROWTH OF PLANT MATERIAL. SOIL MODIFICATIONS, AS SPECIFIED HEREIN, MAY NEED TO BE CONDUCTED BY THE LANDSCAPE CONTRACTOR DEPENDING ON SITE CONDITIONS.

6.3. THE FOLLOWING AMENDMENTS AND QUANTITIES ARE APPROXIMATE AND ARE FOR BIDDING PURPOSES ONLY. COMPOSITION OF AMENDMENTS SHOULD BE REVISED DEPENDING ON THE OUTCOME OF A TOPSOIL ANALYSIS PERFORMED BY A CERTIFIED SOIL LABORATORY.

6.3.1. TO INCREASE A SANDY SOIL'S ABILITY TO RETAIN WATER AND NUTRIENTS, THOROUGHLY TILL ORGANIC MATTER INTO THE TOP 6-12". USE COMPOSTED BARK, COMPOSTED LEAF MULCH OR PEAT MOSS. ALL PRODUCTS SHOULD BE COMPOSTED TO A DARK COLOR AND BE FREE OF PIECES WITH IDENTIFIABLE LEAF OR WOOD STRUCTURE. AVOID MATERIAL WITH A PH HIGHER THAN 7.5.

6.3.2. TO INCREASE DRAINAGE, MODIFY HEAVY CLAY OR SILT (MORE THAN 40% CLAY OR SILT) BY ADDING COMPOSTED PINE BARK (UP TO 30% BY VOLUME) AND/OR AGRICULTURAL GYPSUM. COARSE SAND MAY BE USED IF ENOUGH IS ADDED TO BRING THE SAND CONTENT TO MORE THAN 60% OF THE TOTAL MIX. SUBSURFACE DRAINAGE LINES MAY NEED TO BE ADDED TO INCREASE DRAINAGE.

6.3.3. MODIFY EXTREMELY SANDY SOILS (MORE THAN 85%) BY ADDING ORGANIC MATTER AND/OR DRY, SHREDDED CLAY LOAM UP TO 30% OF THE TOTAL MIX.

7. FINISHED GRADING

7.1. UNLESS OTHERWISE CONTRACTED, THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF TOPSOIL AND THE ESTABLISHMENT OF FINE-GRADING WITHIN THE DISTURBANCE AREA OF THE SITE.

7.2. LANDSCAPE CONTRACTOR SHALL VERIFY THAT SUBGRADE FOR INSTALLATION OF TOPSOIL HAS BEEN ESTABLISHED. THE SUBGRADE OF THE SITE MUST MEET THE FINISHED GRADE LESS THE REQUIRED TOPSOIL THICKNESS (1"±).

7.3. ALL LAWN AND PLANTING AREAS SHALL BE GRADED TO A SMOOTH, EVEN AND UNIFORM PLANE WITH NO ABRUPT CHANGE OF SURFACE AS DEPICTED WITHIN THIS SET OF CONSTRUCTION PLANS, UNLESS OTHERWISE DIRECTED BY THE PROJECT ENGINEER OR LANDSCAPE ARCHITECT.

7.4. ALL PLANTING AREAS SHALL BE GRADED AND MAINTAINED TO ALLOW FREE FLOW OF SURFACE WATER IN AND AROUND THE PLANTING BEDS. STANDING WATER SHALL NOT BE PERMITTED IN PLANTING BEDS.

8. TOPSOILING

8.1. CONTRACTOR SHALL PROVIDE A 6" THICK MINIMUM LAYER OF TOPSOIL, OR AS DIRECTED BY THE LOCAL ORDINANCE OR CLIENT, IN ALL PLANTING AREAS. TOPSOIL SHOULD BE SPREAD OVER A PREPARED SURFACE IN A UNIFORM LAYER TO ACHIEVE THE DESIRED COMPACTED THICKNESS.

8.2. ON-SITE TOPSOIL MAY BE USED TO SUPPLEMENT THE TOTAL AMOUNT REQUIRED. TOPSOIL FROM THE SITE MAY BE REJECTED IF IT HAS NOT BEEN PROPERLY REMOVED, STORED AND PROTECTED PRIOR TO CONSTRUCTION.

8.3. CONTRACTOR SHALL FURNISH TO THE APPROVING AGENCY AN ANALYSIS OF BOTH IMPORTED AND ON-SITE TOPSOIL TO BE UTILIZED IN ALL PLANTING AREAS. THE PH AND NUTRIENT LEVELS MAY NEED TO BE ADJUSTED THROUGH SOIL MODIFICATIONS AS NEEDED TO ACHIEVE THE REQUIRED LEVELS AS SPECIFIED IN THE MATERIALS SECTION ABOVE.

8.4. ALL LAWN AREAS ARE TO BE CULTIVATED TO A DEPTH OF SIX INCHES (6"). ALL DEBRIS EXPOSED FROM EXCAVATION AND CULTIVATION SHALL BE DISPOSED OF IN ACCORDANCE WITH GENERAL WORK PROCEDURES SECTION ABOVE. THE FOLLOWING SHALL BE TILLED INTO THE TOP FOUR INCHES (4") IN TWO DIRECTIONS (QUANTITIES BASED ON A 1,000 SQUARE FOOT AREA - FOR BID PURPOSES ONLY [SEE SPECIFICATION 6.A.]):

8.4.1. 20 POUNDS 'GRO-POWER' OR APPROVED SOIL CONDITIONER/FERTILIZER

8.4.2. 20 POUNDS NITRO-FORM (COURSE) 38-0-0 BLUE CHIP OR APPROVED NITROGEN FERTILIZER

8.5. THE SPREADING OF TOPSOIL SHALL NOT BE CONDUCTED UNDER MUDDY OR FROZEN CONDITIONS.

9. PLANTING

9.1. INSOFAR THAT IT IS FEASIBLE, PLANT MATERIAL SHALL BE PLANTED ON THE DAY OF DELIVERY. IN THE EVENT THAT THIS IS NOT POSSIBLE, LANDSCAPE CONTRACTOR SHALL PROTECT UNINSTALLED PLANT MATERIAL. PLANTS SHALL NOT REMAIN UNPLANTED FOR LONGER THAN A THREE DAY PERIOD AFTER DELIVERY. PLANTS THAT WILL NOT BE PLANTED FOR A PERIOD OF TIME GREATER THAN THREE DAYS SHALL BE HEALED IN WITH TOPSOIL OR MULCH TO HELP PRESERVE ROOT MOISTURE.

9.2. PLANTING OPERATIONS SHALL BE PERFORMED DURING PERIODS WITHIN THE PLANTING SEASON WHEN WEATHER AND SOIL CONDITIONS ARE SUITABLE AND IN ACCORDANCE WITH ACCEPTED LOCAL PRACTICE. PLANTS SHALL NOT BE INSTALLED IN TOPSOIL THAT IS IN A MUDDY OR FROZEN CONDITION.

9.3. ANY INJURED ROOTS OR BRANCHES SHALL BE PRUNED TO MAKE CLEAN-CUT ENDS PRIOR TO PLANTING UTILIZING CLEAN, SHARP TOOLS. ONLY INJURED OR DISEASED BRANCHING SHALL BE REMOVED.

9.4. ALL PLANTING CONTAINERS, BASKETS AND NON-BIODEGRADABLE MATERIALS SHALL BE REMOVED FROM ROOT BALLS DURING PLANTING. NATURAL FIBER BURLAP MUST BE CUT FROM AROUND THE TRUNK OF THE TREE AND FOLDED DOWN AGAINST THE ROOT BALL PRIOR TO BACKFILLING.

9.5. POSITION TREES AND SHRUBS AT THEIR INTENDED LOCATIONS AS PER THE PLANS AND SECURE THE APPROVAL OF THE LANDSCAPE ARCHITECT PRIOR TO EXCAVATING PITS, MAKING NECESSARY ADJUSTMENTS AS DIRECTED.

9.6. PRIOR TO THE ISSUANCE OF ANY CERTIFICATE OF OCCUPANCY, THE PROPOSED LANDSCAPE, AS SHOWN ON THE APPROVED LANDSCAPE PLAN, MUST BE INSTALLED, INSPECTED AND APPROVED BY THE APPROVING AGENCY. THE APPROVING AGENCY SHALL TAKE INTO ACCOUNT SEASONAL CONSIDERATIONS IN THIS REGARD AS FOLLOWS. THE PLANTING OF TREES, SHRUBS, VINES OR GROUND COVER SHALL OCCUR ONLY DURING THE FOLLOWING PLANTING SEASONS:

9.6.1. PLANTS: MARCH 15 TO DECEMBER 15

9.6.2. LAWN: MARCH 15 TO JUNE 15 OR SEPT. 1 TO DECEMBER 1

9.6.3. PLANTINGS REQUIRED FOR A CERTIFICATE OF OCCUPANCY SHALL BE PROVIDED DURING THE NEXT APPROPRIATE SEASON AT THE MUNICIPALITY'S DISCRETION. CONTRACTOR SHOULD CONTACT APPROVING AGENCY FOR POTENTIAL SUBSTITUTIONS.

9.7. FURTHERMORE, THE FOLLOWING TREE VARIETIES ARE UNUSUALLY SUSCEPTIBLE TO WINTER DAMAGE. WITH TRANSPLANT SHOCK AND THE SEASONAL LACK OF NITROGEN AVAILABILITY, THE RISK OF PLANT DEATH IS GREATLY INCREASED. IT IS NOT RECOMMENDED THAT THESE SPECIES BE PLANTED DURING THE FALL PLANTING SEASON:

ACER RUBRUM	PLATANUS X ACERIFOLIA
BETULA VARIETIES	POPULUS VARIETIES
CARPINUS VARIETIES	PRUNUS VARIETIES
CRATAEGUS VARIETIES	PYRUS VARIETIES
KOELREUTERIA	QUERCUS VARIETIES
LIQUIDAMBAR STYRACIFLUA	TILIA TOMENTOSA
LIRIODENDRON TULIPIFERA	ZELKOVA VARIETIES

9.8. PLANTING PITS SHALL BE DUG WITH LEVEL BOTTOMS, WITH THE WIDTH TWICE THE DIAMETER OF ROOT BALL. THE ROOT BALL SHALL REST ON UNDISTURBED GRADE. EACH PLANT PIT SHALL BE BACKFILLED IN LAYERS WITH THE FOLLOWING PREPARED SOIL MIXED THOROUGHLY:

9.8.1. 1 PART PEAT MOSS

9.8.2. 1 PART COMPOSTED COW MANURE BY VOLUME

9.8.3. 3 PARTS TOPSOIL BY VOLUME

9.8.4. 21 GRAMS 'AGRIFORM' PLANTING TABLETS (OR APPROVED EQUAL) AS FOLLOWS:

9.8.4.1. 2 TABLETS PER 1 GALLON PLANT

9.8.4.2. 3 TABLETS PER 5 GALLON PLANT

9.8.4.3. 4 TABLETS PER 15 GALLON PLANT

9.8.4.4. LARGER PLANTS: 2 TABLETS PER ½" CALIPER OF TRUNK

9.9. FILL PREPARED SOIL AROUND BALL OF PLANT HALF-WAY AND INSERT PLANT TABLETS. COMPLETE BACKFILL AND WATER THOROUGHLY.

9.10. ALL PLANTS SHALL BE PLANTED SO THAT THE TOP OF THE ROOT BALL, THE POINT AT WHICH THE ROOT FLARE BEGINS, IS SET AT GROUND LEVEL AND IN THE CENTER OF THE PIT. NO SOIL IS TO BE PLACED DIRECTLY ON TOP OF THE ROOT BALL.

9.11. ALL PROPOSED TREES DIRECTLY ADJACENT TO WALKWAYS OR DRIVEWAYS SHALL BE PRUNED AND MAINTAINED TO A MINIMUM BRANCHING HEIGHT OF 7' FROM GRADE.

9.12. GROUND COVER AREAS SHALL RECEIVE A ¼" LAYER OF HUMUS RAKED INTO THE TOP 1" OF PREPARED SOIL PRIOR TO PLANTING. ALL GROUND COVER AREAS SHALL BE WEEDED AND TREATED WITH A PRE-EMERGENT CHEMICAL AS PER MANUFACTURER'S RECOMMENDATION.

9.13. NO PLANT, EXCEPT GROUND COVERS, GRASSES OR VINES, SHALL BE PLANTED LESS THAN TWO FEET (2') FROM EXISTING STRUCTURES AND SIDEWALKS.

9.14. ALL PLANTING AREAS AND PLANTING PITS SHALL BE MULCHED AS SPECIFIED HEREIN TO FILL THE ENTIRE BED AREA OR SAUCER. NO MULCH IS TO TOUCH THE TRUNK OF THE TREE OR SHRUB.

9.15. ALL PLANTING AREAS SHALL BE WATERED IMMEDIATELY UPON INSTALLATION IN ACCORDANCE WITH THE WATERING SPECIFICATIONS AS LISTED HEREIN.

10. TRANSPLANTING (WHEN REQUIRED)

10.1. ALL TRANSPLANTS SHALL BE DUG WITH INTACT ROOT BALLS CAPABLE OF SUSTAINING THE PLANT.

10.2. IF PLANTS ARE TO BE STOCKPILED BEFORE REPLANTING, THEY SHALL BE HEALED IN WITH MULCH OR SOIL, ADEQUATELY WATERED AND PROTECTED FROM EXTREME HEAT, SUN AND WIND.

10.3. PLANTS SHALL NOT BE DUG FOR TRANSPLANTING BETWEEN APRIL 10 AND JUNE 30.

10.4. UPON REPLANTING, BACKFILL SOIL SHALL BE AMENDED WITH FERTILIZER AND ROOT GROWTH HORMONE.

10.5. TRANSPLANTS SHALL BE GUARANTEED FOR THE LENGTH OF THE GUARANTEE PERIOD SPECIFIED HEREIN.

10.6. F TRANSPLANTS DIE, SHRUBS AND TREES LESS THAN SIX INCHES (6") DBH SHALL BE REPLACED IN KIND. TREES GREATER THAN SIX INCHES (6") DBH MAY BE REQUIRED TO BE REPLACED IN ACCORDANCE WITH THE MUNICIPALITY'S TREE REPLACEMENT GUIDELINES.

11. WATERING

11.1. NEW PLANTINGS OR LAWN AREAS SHALL BE ADEQUATELY IRRIGATED BEGINNING IMMEDIATELY AFTER PLANTING. WATER SHALL BE APPLIED TO EACH TREE AND SHRUB IN SUCH MANNER AS NOT TO DISTURB BACKFILL AND TO THE EXTENT THAT ALL MATERIALS IN THE PLANTING HOLE ARE THOROUGHLY SATURATED. WATERING SHALL CONTINUE AT LEAST UNTIL PLANTS ARE ESTABLISHED.

11.2. SITE OWNER SHALL PROVIDE WATER IF AVAILABLE ON SITE AT TIME OF PLANTING. IF WATER IS NOT AVAILABLE ON SITE, CONTRACTOR SHALL SUPPLY ALL NECESSARY WATER. THE USE OF WATERING BAGS IS RECOMMENDED FOR ALL NEWLY PLANTED TREES.

11.3. IF AN IRRIGATION SYSTEM HAS BEEN INSTALLED ON THE SITE, IT SHALL BE USED TO WATER PROPOSED PLANT MATERIAL, BUT ANY FAILURE OF THE SYSTEM DOES NOT ELIMINATE THE CONTRACTOR'S RESPONSIBILITY OF MAINTAINING THE DESIRED MOISTURE LEVEL FOR VIGOROUS, HEALTHY GROWTH.

12. GUARANTEE

12.1. THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL PLANTS FOR A PERIOD OF 1 YEAR FROM APPROVAL OF LANDSCAPE INSTALLATION BY THE APPROVING AGENCY. CONTRACTOR SHALL SUPPLY THE OWNER WITH A MAINTENANCE BOND FOR TEN PERCENT (10%) OF THE VALUE OF THE LANDSCAPE INSTALLATION WHICH WILL BE RELEASED AT THE CONCLUSION OF THE GUARANTEE PERIOD AND WHEN A FINAL INSPECTION HAS BEEN COMPLETED AND APPROVED BY THE OWNER OR AUTHORIZED REPRESENTATIVE.

12.2. ANY DEAD OR DYING PLANT MATERIAL SHALL BE REPLACED FOR THE LENGTH OF THE GUARANTEE PERIOD. REPLACEMENT OF PLANT MATERIAL SHALL BE CONDUCTED AT THE FIRST SUCCEEDING PLANTING SEASON. ANY DEBRIS SHALL BE DISPOSED OF OFF-SITE, WITHOUT EXCEPTION.

12.3. TREES AND SHRUBS SHALL BE MAINTAINED BY THE CONTRACTOR DURING CONSTRUCTION AND THROUGHOUT THE 90 DAY MAINTENANCE PERIOD AS SPECIFIED HEREIN. CULTIVATION, WEEDING, WATERING AND THE PREVENTATIVE TREATMENTS SHALL BE PERFORMED AS NECESSARY TO KEEP PLANT MATERIAL IN GOOD CONDITION AND FREE OF INSECTS AND DISEASE.

12.4. LAWNS SHALL BE MAINTAINED THROUGH WATERING, FERTILIZING, WEEDING, MOWING, TRIMMING AND OTHER OPERATIONS SUCH AS ROLLING, REGARDING AND REPLANTING AS REQUIRED TO ESTABLISH A SMOOTH, ACCEPTABLE LAWN, FREE OF ERODED OR BARE AREAS.

13. CLEANUP

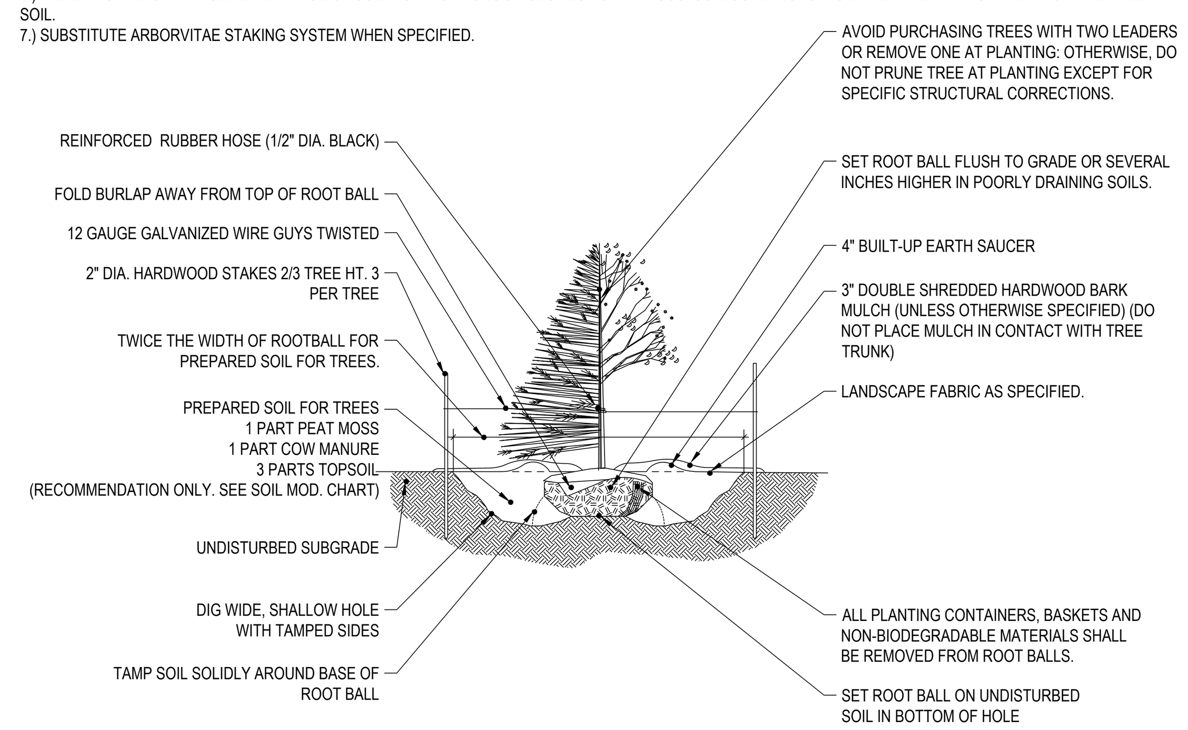
13.1. UPON THE COMPLETION OF ALL LANDSCAPE INSTALLATION AND BEFORE THE FINAL ACCEPTANCE, THE CONTRACTOR SHALL REMOVE ALL UNUSED MATERIALS, EQUIPMENT AND DEBRIS FROM THE SITE. ALL PAVED AREAS ARE TO BE CLEANED.

13.2. THE SITE SHALL BE CLEANED AND LEFT IN A NEAT AND ACCEPTABLE CONDITION AS APPROVED BY THE OWNER OR AUTHORIZED REPRESENTATIVE.

14. MAINTENANCE (ALTERNATIVE BID):

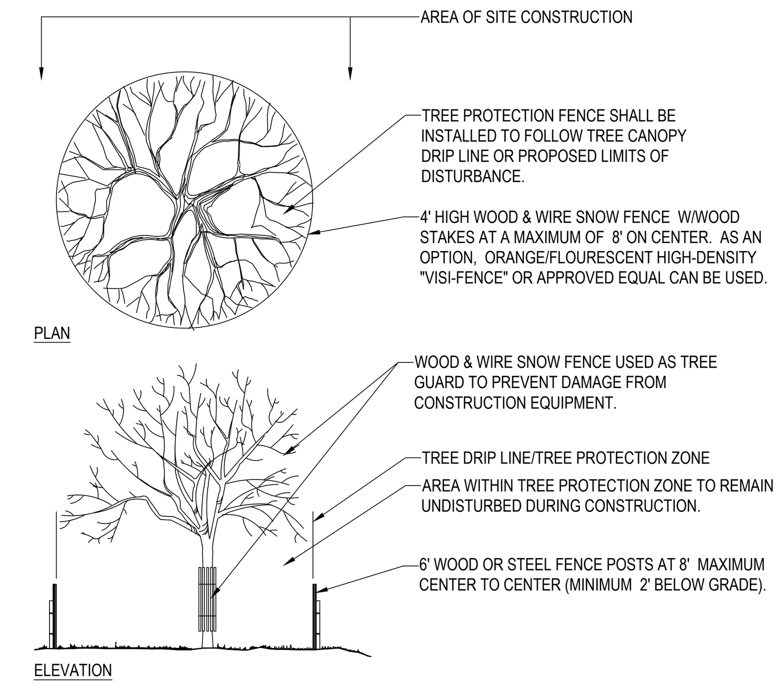
14.1. A 90 DAY MAINTENANCE PERIOD SHALL COMMENCE AT THE END OF ALL LANDSCAPE INSTALLATION OPERATIONS. THE 90 DAY MAINTENANCE PERIOD ENSURES TO THE OWNER/OPERATOR THAT THE NEWLY INSTALLED LANDSCAPING HAS BEEN MAINTAINED AS SPECIFIED ON THE APPROVED LANDSCAPE PLAN. ONCE THE INITIAL 90 DAY MAINTENANCE PERIOD HAS EXPIRED, THE OWNER/OPERATOR MAY REQUEST THAT BIDDERS SUBMIT AN ALTERNATE MAINTENANCE BID FOR A MONTHLY MAINTENANCE CONTRACT. THE ALTERNATE MAINTENANCE CONTRACT WILL ENCOMPASS ANY WORK THAT IS CONSIDERED APPROPRIATE TO ENSURE THAT PLANT AND LAWN AREAS ARE HEALTHY AND MANICURED TO THE APPROVAL OF THE OWNER/OPERATOR.

NOTES:
1.) NO SOIL OR MULCH SHALL BE PLACED AGAINST ROOT COLLAR OF PLANT.
2.) REMOVE ALL NON-BIODEGRADABLE MATERIAL AND ROPE FROM TRUNK & TOP OF ROOT BALL. FOLD BURLAP BACK 1/3 FROM ROOT BALL.
3.) PLANTING DEPTH SHALL BE THE SAME AS GROWN IN NURSERY.
4.) THOROUGHLY SOAK THE TREE ROOT BALL AND ADJACENT PREPARED SOIL SEVERAL TIMES DURING THE FIRST MONTH AFTER PLANTING AND REGULARLY THROUGHOUT THE FOLLOWING TWO SUMMERS.
5.) THE BOTTOM OF PLANTING PIT EXCAVATIONS SHOULD BE ROUGH TO AVOID MATTING OF SOIL LAYERS AS NEW SOIL IS ADDED. IT IS PREFERABLE TO TILL THE FIRST LIFT (2 TO 3 IN.) OF PLANTING SOIL INTO THE SUBSOIL.
6.) REFER TO THE CHART "GENERAL RANGE OF SOIL MODIFICATIONS & VOLUMES FOR VARIOUS SOIL CONDITIONS" TO DETERMINE MINIMUM WIDTH OF PREPARED SOIL.
7.) SUBSTITUTE ARBORVITAE STAKING SYSTEM WHEN SPECIFIED.



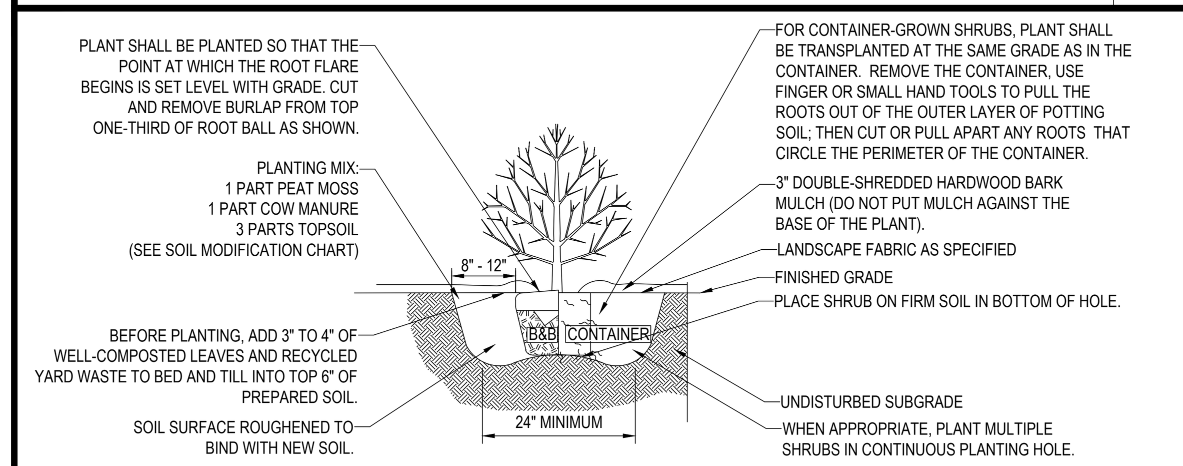
TREE PLANTING DETAIL

N.T.S.



TREE PROTECTION DURING SITE CONSTRUCTION

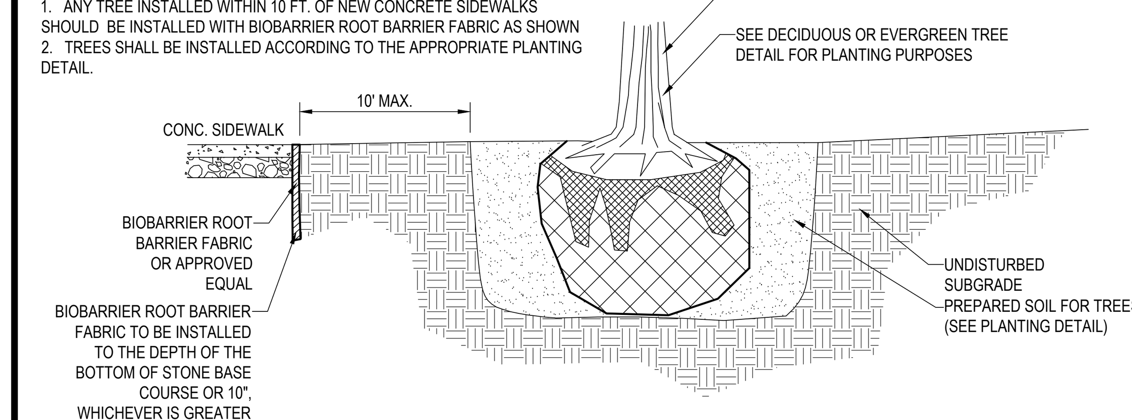
N.T.S.



SHRUB PLANTING DETAIL

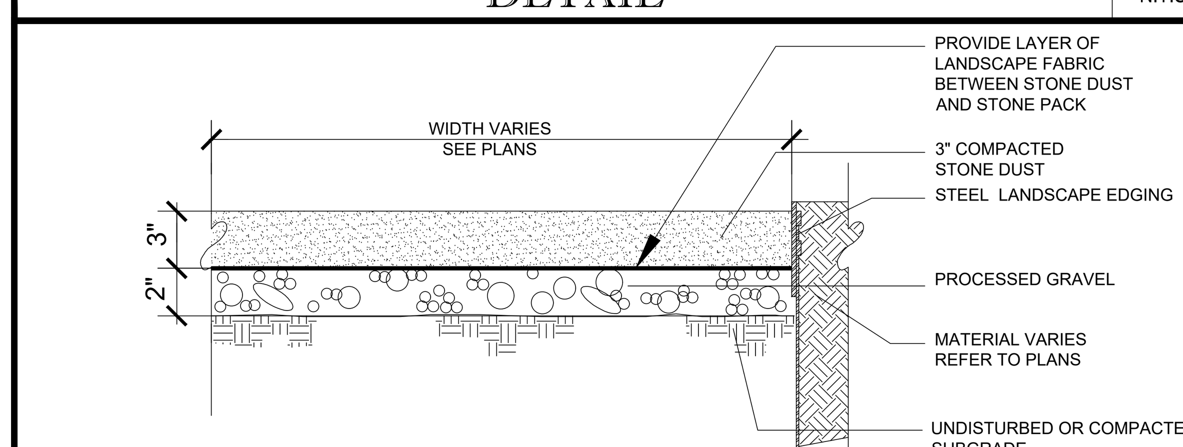
N.T.S.

NOTES:
1. ANY TREE INSTALLED WITHIN 10 FT. OF NEW CONCRETE SIDEWALKS SHOULD BE INSTALLED WITH BIOBARRIER ROOT BARRIER FABRIC AS SHOWN
2. TREES SHALL BE INSTALLED ACCORDING TO THE APPROPRIATE PLANTING DETAIL.



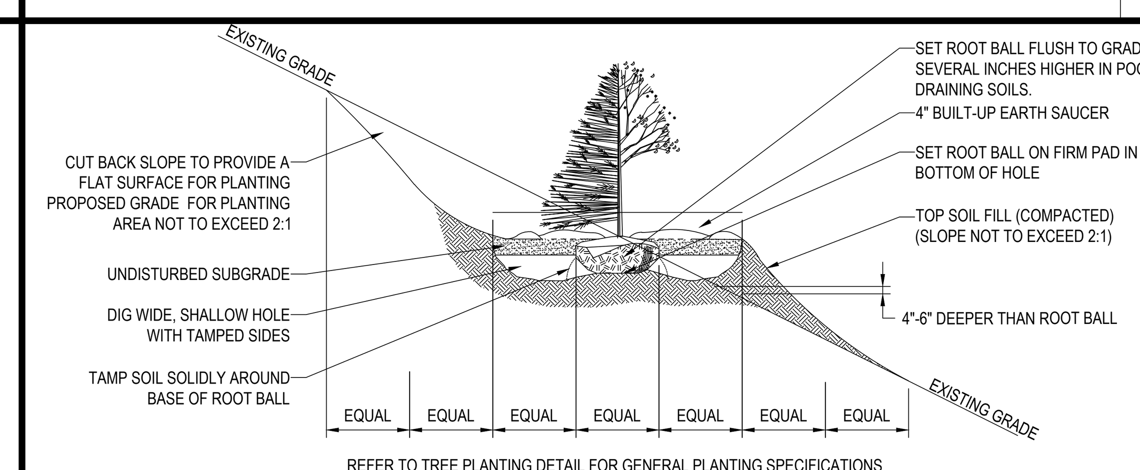
BIOBARRIER ROOT BARRIER DETAIL

N.T.S.



STONE DUST PAVING

N.T.S.



TREE PLANTING DETAIL - ON SLOPE

N.T.S.

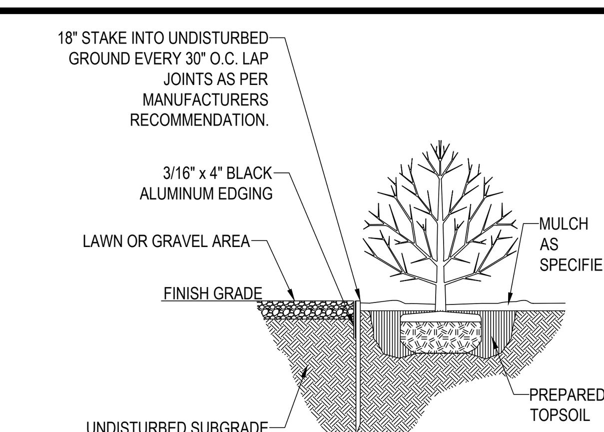
"NATIVE DETENTION AREA MIX" AS PREPARED BY:

ERNST CONSERVATION SEEDS, INC.
8884 MERCER PIKE, MEADVILLE, PA 16335
PHONE: 800-873-3321 / 814-336-2404
EMAIL: SALES@ERNSTSEED.COM
WEBSITE: WWW.ERNSTSEED.COM

APPLICATION RATE: 1/2 LB. / 1000 SQ. FT. (20 LBS. / ACRE)

MIX COMPOSITION:
25.0% PANICUM VIRGATUM, 'SHELTER' (SWITCHGRASS, 'SHELTER')
24.0% PANICUM CLANDESTINUM, 'TIOGA' (DEERTONGUE, 'TIOGA')
22.0% CAREX VULPINOIDEA, PA ECOTYPE (FOX SEDGE, PA ECOTYPE)
21.0% ELYMUS VIRGINICUS, PA ECOTYPE (VIRGINIA WILDRYE, PA ECOTYPE)
6.0% AGROSTIS PERENNANS, ALBANY PINE BUSH-NY ECOTYPE (AUTUMN BENTGRASS, ALBANY PINE BUSH-NY ECOTYPE)
1.0% JUNCUS EFFUSUS (SOFT RUSH)
1.0% PANICUM RIGIDULUM, PA ECOTYPE (REDTOP PANICGRASS, PA ECOTYPE)

BASIN SEED MIX SPECIFICATIONS



BLACK ALUMINUM EDGING

N.T.S.

1. PRIOR TO SEEDING, AREA IS TO BE TOPSOILED, FINE GRADED, AND RAKED OF ALL DEBRIS LARGER THAN 2" DIAMETER.
2. PRIOR TO SEEDING, CONSULT MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS.
3. SEEDING RATES:
   - PERENNIAL RYEGRASS 1/2 LB/1000 SQ FT
   - KENTUCKY BLUEGRASS 1 LB/1000 SQ FT
   - RED FESCUE 1/2 LB/1000 SQ FT
   - SPREADING FESCUE 1/2 LB/1000 SQ FT
   - FERTILIZER (16.32.16) 2 LB/1000 SQ FT
   - LIQUID LIME 1 GAL/800 GAL.
   - TANK TACKIFIER 35 LB/800 GAL.
   - TANK FIBER MULCH 30 LB/1000 SQ FT
4. GERMINATION RATES WILL VARY AS TO TIME OF YEAR FOR SOWING. CONTRACTOR TO IRRIGATE SEEDED AREA UNTIL AN ACCEPTABLE STAND OF COVER IS ESTABLISHED BY OWNER.

HYDROSEED SPECIFICATIONS

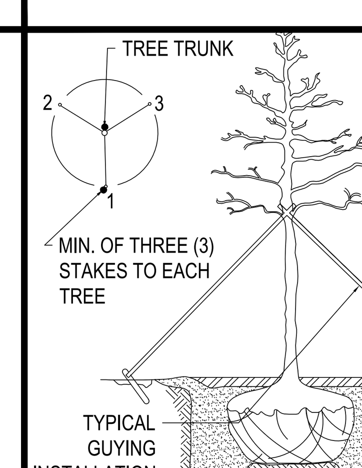
"QUICK EROSION CONTROL COVER MIX" AS PREPARED BY:

ERNST CONSERVATION SEEDS, INC.
8884 MERCER PIKE, MEADVILLE, PA 16335
PHONE: 800-873-3321 / 814-336-2404
EMAIL: SALES@ERNSTSEED.COM
WEBSITE: WWW.ERNSTSEED.COM

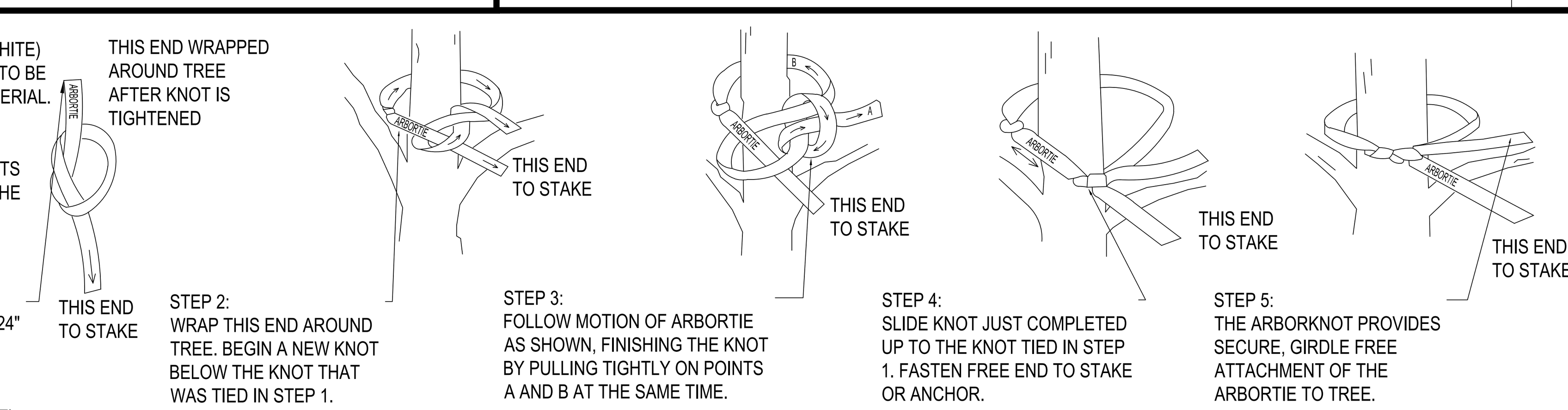
APPLICATION RATE: 50 LBS. / ACRE

MIX COMPOSITION:
50.0% Lolium multiflorum (Annual Ryegrass)
50.0% Lolium perenne, 'Blackcat II' (Perennial Ryegrass)

SLOPE SEED MIX SPECIFICATIONS



NOTES:
SPECIFIED ARBORTIE GREEN (OR WHITE) STAKING AND GUYING MATERIAL IS TO BE FLAT WOVEN POLYPROPYLENE MATERIAL. ¾" WIDE, 900 LB. BREAK STRENGTH. ARBORTIE SHALL BE FASTENED TO STAKES IN A MANNER WHICH PERMITS TREE MOVEMENT AND SUPPORTS THE TREE.



ARBORTIE STAKING DETAIL

N.T.S.

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2	3/10/20	EMERGENCY ACCESS	MLT / JGB
3	6/4/20	UPDATED WETLAND DELINEATION	BTJ / JGB

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PROJECT No.:	CT191016
DRAWN BY:	MLT / DE
CHECKED BY:	JGB / PM
DATE:	12/06/19
CAD I.D.:	CT191016ss2

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

— FOR —

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

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16 OLD FORGE ROAD, SUITE A
ROCKY HILL, CT 06067
Phone: (860) 333-8900
Fax: (508) 480-9080
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NEW YORK No. 002359
NEW HAMPSHIRE No. 109
CONNECTICUT No. 1359

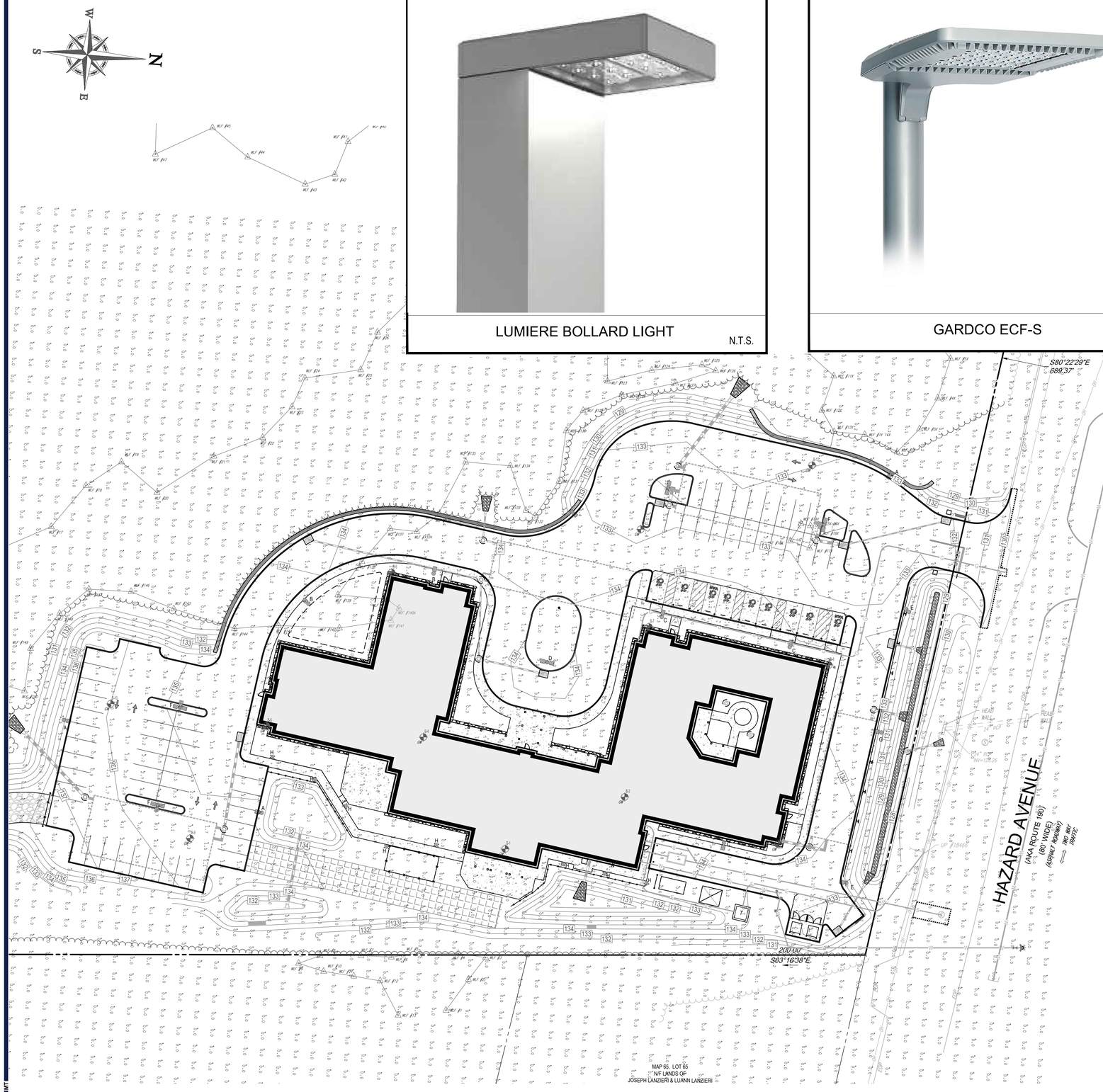
SHEET TITLE:

LANDSCAPE NOTES & DETAILS

SHEET NUMBER:

C-602

REVISION 3 - 6/4/20



LUMIERE BOLLARD LIGHT

N.T.S.

GARDCO ECF-S

N.T.S.

LIGHTING NOTES:

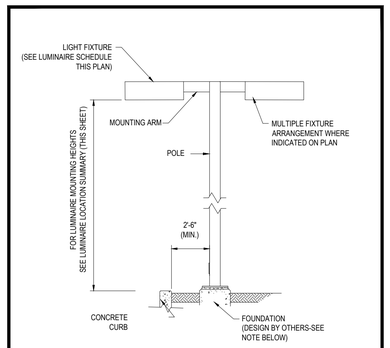
1. THIS LIGHTING PLAN DEPICTS PROPOSED SUSTAINED ILLUMINATION LEVELS CALCULATED USING DATA PROVIDED BY THE NOTED MANUFACTURER(S). ACTUAL SUSTAINED SITE ILLUMINATION LEVELS AND PERFORMANCE OF LUMINAIRES MAY VARY DUE TO VARIATIONS IN WEATHER, ELECTRICAL VOLTAGE, TOLERANCE IN LAMPS, THE SERVICE LIFE OF EQUIPMENT AND LUMINAIRES AND OTHER RELATED VARIABLE FIELD CONDITIONS.
2. THE LIGHT LOSS FACTORS USED IN THESE LIGHTING CALCULATIONS ARE 0.85 FOR ALL LED LUMINAIRES, 0.80 FOR ALL HIGH PRESSURE SODIUM LUMINAIRES OR 0.72 FOR ALL METAL HALIDE LUMINAIRES UNLESS OTHERWISE SPECIFIED. THESE FACTORS ARE INDICATIVE OF TYPICAL LIGHTING INDUSTRY MODELING STANDARDS.
3. THE LIGHTING VALUES AND CALCULATION POINTS DEPICTED ON THIS PLAN ARE ALL ANALYZED ON A HORIZONTAL GEOMETRIC PLANE AT ELEVATION ZERO (GROUND LEVEL) UNLESS OTHERWISE NOTED. THE VALUES DEPICTED ON THIS PLAN ARE IN FOOTCANDLES.
4. THE LUMINAIRES, LAMPS AND LENSES MUST BE REGULARLY INSPECTED/MAINTAINED TO ENSURE THAT THEY FUNCTION PROPERLY. THIS WORK SHOULD INCLUDE, BUT NOT BE LIMITED TO, FREQUENT VISUAL INSPECTIONS, CLEANING OF LENSES, AND RELAMPING (IF NECESSARY) AT LEAST ONCE EVERY SIX (6) MONTHS. FAILURE TO FOLLOW THE ABOVE STEPS COULD CAUSE THE LUMINAIRES, LAMPS AND LENSES TO FAIL PROPERLY TO FUNCTION.
5. WHERE APPLICABLE, THE EXISTING CONDITION LIGHT LEVELS ILLUSTRATED ARE REPRESENTATIVE OF AN APPROXIMATION UTILIZING LABORATORY DATA FOR SIMILAR FIXTURES, UNLESS ACTUAL FIELD MEASUREMENTS ARE TAKEN WITH A LIGHT METER AND ARE, CONSEQUENTLY, APPROXIMATIONS ONLY. DUE TO FACTORS SUCH AS FIXTURE MAINTENANCE, EQUIPMENT TOLERANCES, WEATHER CONDITIONS, ETC, ACTUAL LIGHT LEVELS MAY DIFFER. EXISTING LIGHT LEVELS DEPICTED ON THIS PLAN SHOULD BE CONSIDERED APPROXIMATE.
6. THIS LIGHTING PLAN IS INTENDED TO SHOW THE LOCATIONS AND TYPE OF LUMINAIRES, ONLY. POWER SYSTEM, CONDUITS, WIRING, VOLTAGES AND OTHER ELECTRICAL COMPONENTS ARE THE RESPONSIBILITY OF THE ARCHITECT, MEP AND/OR LIGHTING CONTRACTOR, AS INDICATED IN THE CONSTRUCTION CONTRACT DOCUMENTS. THESE ITEMS MUST BE INSTALLED AS REQUIRED BY STATE AND LOCAL REGULATIONS. LIGHT POLE BASES ARE THE RESPONSIBILITY OF THE STRUCTURAL ENGINEER, AS INDICATED IN THE CONSTRUCTION CONTRACT DOCUMENTS. CONTRACTOR IS RESPONSIBLE FOR INSTALLING LIGHTING FIXTURES AND APPURTENANCES IN ACCORDANCE WITH ALL APPLICABLE BUILDING AND ELECTRICAL CODES AND ALL OTHER APPLICABLE RULES, REGULATIONS, LAWS AND STATUTES.
7. CONTRACTOR MUST BRING TO DESIGNER'S ATTENTION, PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, ANY LIGHT LOCATIONS THAT CONFLICT WITH DRAINAGE, UTILITIES, OR OTHER STRUCTURES.
8. IT IS LIGHTING CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH THE PROJECT ARCHITECT OR OWNER REGARDING THE POWER SOURCE(S) FROM WITHIN THE BUILDING, AND TIMING DEVICES NECESSARY TO MEET THE DESIGN INTENT.
9. THE LIGHTING CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CONTRACTOR REQUIREMENTS INDICATED IN THE SITE PLAN, INCLUDING BUT NOT LIMITED TO, GENERAL NOTES, GRADING AND UTILITY NOTES, SITE SAFETY, AND ALL GOVERNMENTAL RULES, LAWS, ORDINANCES, REGULATIONS AND THE LIKE.
10. THE CONTRACTOR MUST VERIFY THAT INSTALLATION OF LIGHTING FIXTURES COMPLIES WITH THE REQUIREMENTS FOR SEPARATION FROM OVERHEAD ELECTRICAL WIRES PER STATE REGULATIONS.
11. WHEN A BANK ATM IS INCLUDED IN THE PLAN, THE LIGHTING DESIGN REPRESENTS BOHLER'S UNDERSTANDING AND INTERPRETATION OF THE REGULATORY LIGHTING LEVELS INTENDED BY PUBLISHED STANDARDS.
12. UPON OWNER'S ACCEPTANCE OF THE COMPLETED PROJECT, THE OWNER SHALL BE RESPONSIBLE FOR ALL MAINTENANCE, SERVICING, REPAIR AND INSPECTION OF THE LIGHTING SYSTEM AND ALL OF ITS COMPONENTS AND RELATED SYSTEMS, TO ENSURE ADEQUATE LIGHTING LEVELS ARE PRESENT AND FUNCTIONING AT ALL TIMES.

NUMERIC SUMMARY

LABEL	CALCTYPE	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
AREA SUMMARY	ILLUMINANCE	FC	0.47	15.1	0.0	N.A	N.A

LUMINAIRE SCHEDULE

SYMBOL	QTY	ARRANGEMENT	LUMENS	LLF	BUG RATING	LUM. WATTS	DESCRIPTION
A	3	SINGLE	6864	0.85	B2-U0-G2	55.7	GARDCO ECF-S-32L-530-G2-2 @ 14' HIGH
B	3	SINGLE	6715	0.85	B1-U0-G2	55.7	GARDCO ECF-S-32L-530-NW-G2-3 @ 14' HIGH
C	4	SINGLE	7025	0.85	B1-U0-G2	55.7	GACRDCO-ECF-S-32L-530-NW-G2-4 @ 14' HIGH
D	1	DOUBLE	7025	0.85	B1-U0-G2	55.7	GARDCO-ECF-S-32L-530-NW-G2-4 BACK TO BACK @ 14' HIGH
E	1	SINGLE	5348	0.85	B1-U0-G2	55.7	GARDCO-ECF-S-32L-530-NW-G2-3-HIS @ 14' HIGH
F	4	TRIPLE @ 90	7025	0.85	B1-U0-G2	55.7	GARDCO-ECF-S-32L-530-NW-G2-4 @ 14' HIGH
G	1	SINGLE	5509	0.85	B1-U0-G2	55.7	GARDCO-ECF-S-32L-530-NW-G2-4-HIS @ 14' HIGH
H	8	SINGLE	1300	0.85	B1-U0-G1	15.5	LUMIERE EON LED 303-B1-LED82-3000-UNV-T2-DIM10-BK @ 3.5' HIGH



AREA LIGHT DETAIL

N.T.S.

NOTE: THIS DETAIL IS FOR BID AND BUDGETARY PURPOSES ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR HAVING A FOUNDATION DESIGN PREPARED BY A QUALIFIED STRUCTURAL ENGINEER CONSIDERING LIGHTING MANUFACTURER REQUIREMENTS, LOCAL WIND LOADS AND SITE SPECIFIC SOIL PARAMETERS.

- SOME SITE CONDITIONS AND/OR LOCATIONS MAY REQUIRE VIBRATION DAMPENING MEASURES AS DETERMINED BY A STRUCTURAL ENGINEER.
- THE STRUCTURAL ENGINEER SHALL BE NOTIFIED OF THE INTENT TO MOUNT ANYTHING TO THE POLE, ASIDE FROM THE LIGHT FIXTURES, INCLUDING BUT NOT LIMITED TO CAMERAS, BANNERS, FLAGS, SIGNAGE, ETC. AS IT WILL IMPACT THE POLE AND FOUNDATION DESIGN.

THIS PLAN TO BE UTILIZED FOR LIGHTING PURPOSES ONLY

30 15 7.5 0 30

1"= 30'

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PROJECT No.:	CT191016
DRAWN BY:	MLT / DE
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PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

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JEFFREY G. BORD
No. 30414
LICENSED PROFESSIONAL ENGINEER

PROFESSIONAL ENGINEER
CONNECTICUT LICENSE NO. 30414

SHEET TITLE:

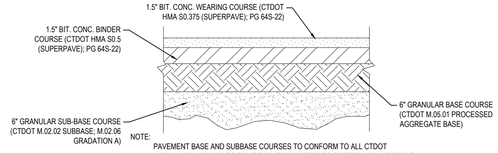
LIGHTING PLAN

SHEET NUMBER:

C-701

REVISION 3 - 6/4/20

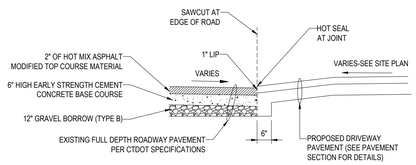
P:\19\CT191016\DRAWINGS\PLAN SETS\REV3 - WETLAND FLAG REVISION\CT191016SS3----LAYOUT C-701 LIGHT



NOTE: PAVEMENT BASE AND SUBBASE COURSES TO CONFORM TO ALL CTDOT HIGHWAY DIVISION SPECIFICATIONS. GC TO REFER TO GEOTECHNICAL REPORT PREPARED BY WHITESTONE ASSOCIATES INC. DATED 10/31/19 FOR PAVEMENT SPECIFICATIONS.

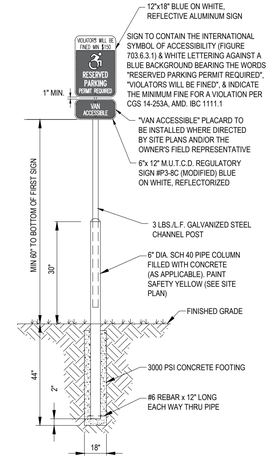
TYPICAL PAVEMENT SECTION

N.T.S.



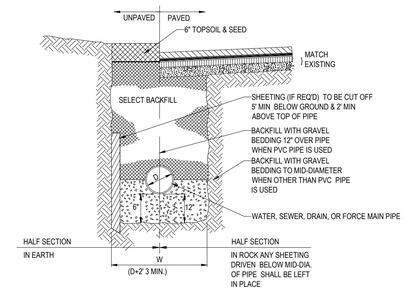
DRIVEWAY CONSTRUCTION DETAIL

N.T.S.



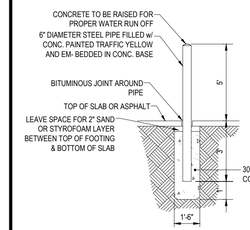
STATE OF CT 'ACCESSIBLE PARKING ONLY' SIGN

N.T.S.



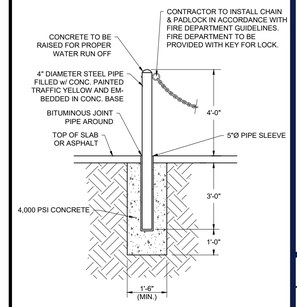
TYPICAL UTILITY TRENCH

N.T.S.



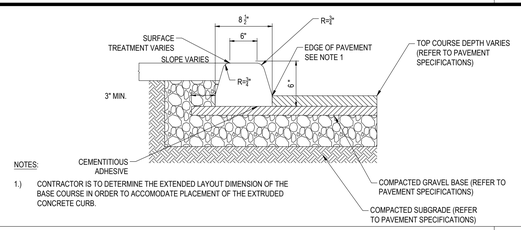
BOLLARD DETAIL

N.T.S.



FIRE GATE BOLLARD DETAIL

N.T.S.

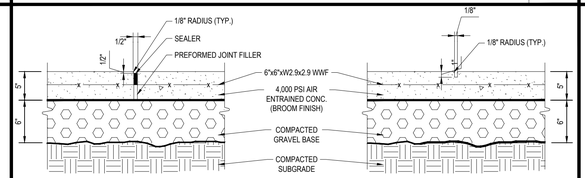


NOTES:

1.) CONTRACTOR IS TO DETERMINE THE EXTENDED LAYOUT DIMENSION OF THE BASE COURSE IN ORDER TO ACCOMODATE PLACEMENT OF THE EXTRUDED CONCRETE CURB.

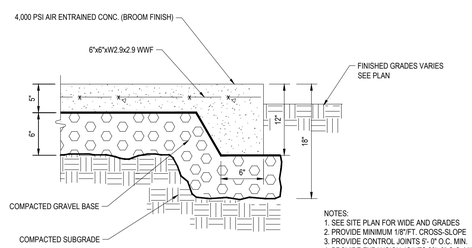
EXTRUDED CONCRETE CURB

N.T.S.



EXPANSION JOINT

CONTROL JOINT

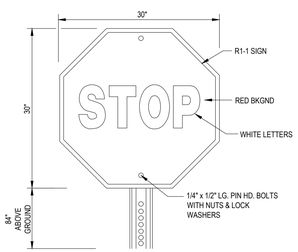


END SECTION
TO BE USED FOR BUILDING SURROUND AND OTHER CONCRETE WALKS. USE CHAIRS TO SUPPORT REINFORCING STEEL DURING POUR.

NOTES:
1. SEE SITE PLAN FOR WIDE AND GRADES
2. PROVIDE MINIMUM 1/8"/FT. CROSS-SLOPE
3. PROVIDE CONTROL JOINTS 5'- 0" O.C. MIN.
4. PROVIDE EXPANSION JOINTS 20'- 0" O.C. MIN.

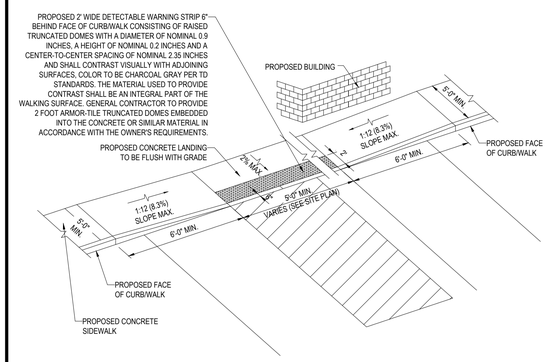
MONOLITHIC CONC. SIDEWALK DETAILS

N.T.S.



'STOP' SIGN

N.T.S.

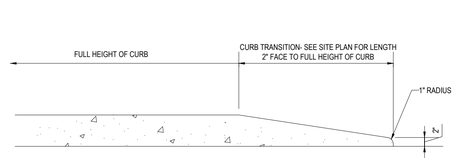


(FOR SIDEWALK SLOPES LESS THAN 1:20 (5.0%) MAX.)

NOTE: SLOPES OF ACCESSIBLE PARKING SPACES AND PARKING ACCESS AISLES SHALL NOT EXCEED 1:50 (2.0%) MAX. IN ANY DIRECTION.

SLOPED WALK DETAIL

N.T.S.

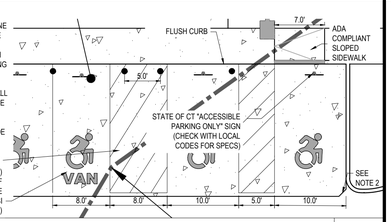


TRANSITION CURB DETAIL

N.T.S.

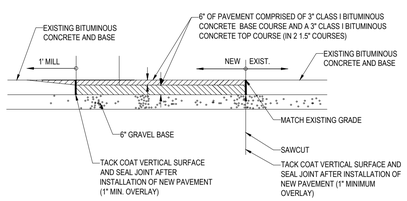
NOTES:

1. ALL MINIMUM DIMENSIONS ARE FROM CENTERLINE OF STRIPE TO CENTERLINE OF STRIPE OR INSIDE FACE OF CURB.
2. POUR CONCRETE MAT 3-INCHES WIDER ON BOTH SIDES TO ENSURE ENTIRE WIDTH OF ADA PARKING SPACE STRIPE IS LOCATED ENTIRELY WITHIN CONCRETE MAT.
3. A DESIGNATED 5-FOOT WIDE STRIPED AISLE SHALL ONLY BE REQUIRED IF A 3RD ADA PARKING SPACE IS PROVIDED.
4. ENSURE ACCESSIBLE VAN PARKING SPACE WILL PROVIDE ACCESS AISLE ON THE PASSENGER SIDE WHEN ANGLED PARKING IS USED.



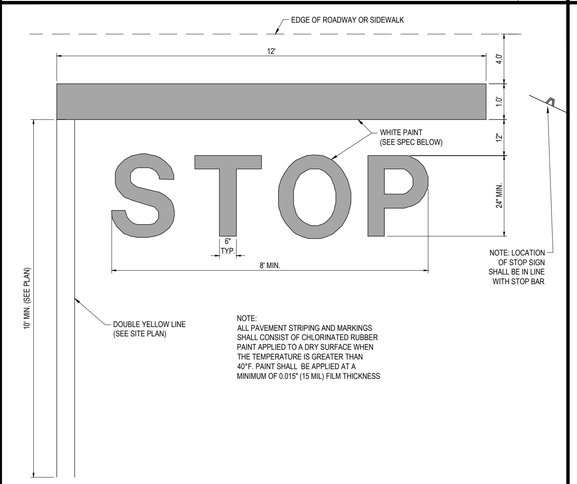
ACCESSIBLE SPACE DETAIL

N.T.S.



ROADWAY PATCHING DETAIL

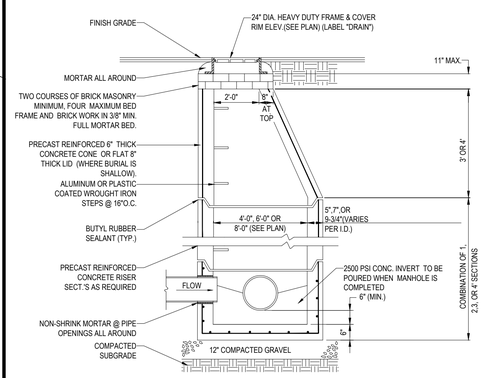
N.T.S.



NOTE:
ALL PAVEMENT STRIPING AND MARKINGS SHALL CONSIST OF CHLORINATED RUBBER PAINT APPLIED TO A DRY SURFACE WHEN THE TEMPERATURE IS GREATER THAN 40°F. PAINT SHALL BE APPLIED AT A MINIMUM OF 0.015" (15 MIL) FILM THICKNESS

'STOP' BAR DETAIL

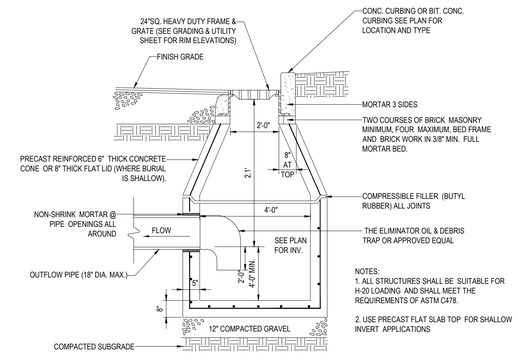
N.T.S.



NOTE:
ALL STRUCTURES SHALL BE SUITABLE FOR H-20 LOADING AND SHALL MEET THE REQUIREMENTS OF ASTM C478.

TYP. PRECAST CONCRETE MANHOLE STORM DRAIN

N.T.S.



NOTES:
1. ALL STRUCTURES SHALL BE SUITABLE FOR H-20 LOADING AND SHALL MEET THE REQUIREMENTS OF ASTM C478.

2. USE PRECAST FLAT SLAB TOP FOR SHALLOW INVERT APPLICATIONS

PRECAST CONCRETE DEEP SUMP CATCH BASIN DETAIL

N.T.S.

P:\19\CT191016\DRAWINGS\PLAN SETS\REV3 - WETLAND FLAG REVISIONS\CT191016SS3----3-LAYOUT, C-901 DETAIL

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1	1/20/20	ART COMMENTS	MLT / JGB
2	3/10/20	EMERGENCY ACCESS	MLT / JGB
3	6/4/20	UPDATED WETLAND DELINEATION	BTJ / JGB

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PROJECT No.:	CT191016
DRAWN BY:	MLT / DE
CHECKED BY:	JGB / PM
DATE:	12/06/19
CAD I.D.:	CT191016ss2

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

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16 OLD FORGE ROAD, SUITE A
ROCKY HILL, CT 06067
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No. 30414
LICENSED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CONNECTICUT LICENSE NO. 30414

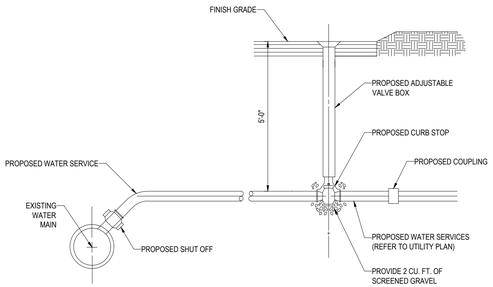
SHEET TITLE:

DETAIL SHEET

SHEET NUMBER:

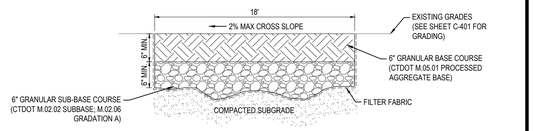
C-901

REVISION 3 - 6/4/20



WATER SERVICE CONNECTION DETAIL

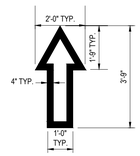
N.T.S.



NOTE:
BASE AND SUBBASE COURSES TO CONFORM TO ALL CTDOT HIGHWAY DIVISION SPECIFICATIONS.

EMERGENCY ACCESS DRIVE DETAIL

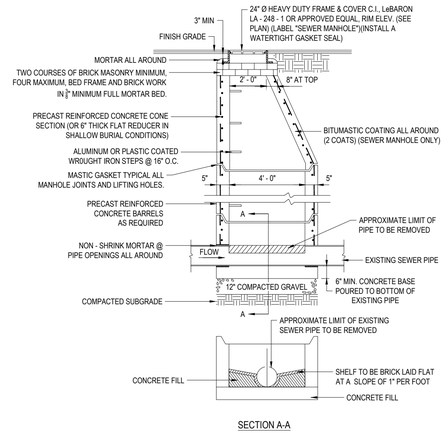
N.T.S.



NOTE: ALL TRAFFIC FLOW ARROWS TO BE REFLECTIVE WHITE PAINT PER SPECS.

TRAFFIC FLOW ARROW

N.T.S.

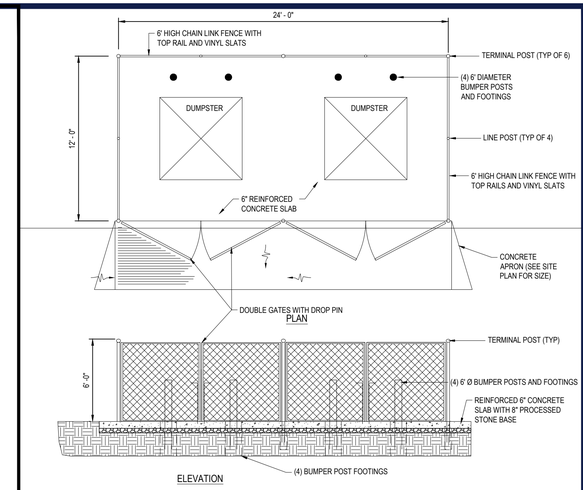


SECTION A-A

NOTE:
1. ALL STRUCTURES SHALL BE SUITABLE FOR H - 20 LOADING AND SHALL MEET THE REQUIREMENTS OF ASTM C478.
2. PROVIDE SUPPORT FOR EXISTING DRAIN PIPE WHEN POURING CONCRETE BASE

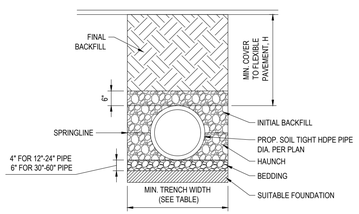
DETAIL OF PRECAST CONCRETE MANHOLE CONSTRUCTED ON EXIST. SEWER LINE

N.T.S.



TRASH ENCLOSURE CHAIN LINK FENCE WITH VINYL SLATS

N.T.S.



RECOMMENDED MIN. TRENCH WIDTH	
PIPE DIA.	MIN. TRANCH WIDTH
6"	23"
8"	26"
10"	28"
12"	30"
15"	34"
18"	39"
24"	48"
30"	56"
36"	64"
48"	80"
60"	96"

NOTES:

1. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321 , "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST ADDITION.

2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.

3. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER, AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.

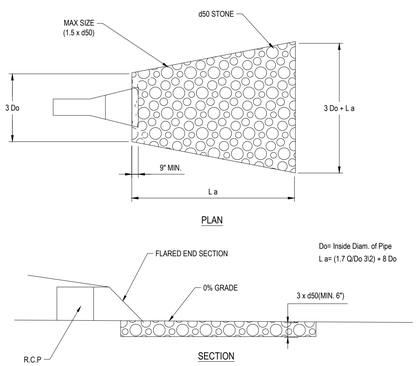
4. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II OR III. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (100mm) FOR 4"-24" (100mm-600mm); 6" (150mm) FOR 30"-60" (750mm-900mm).

5. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II OR III IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.

6. MINIMUM COVER: MINIMUM COVER, H, IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" FROM THE TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER, H, IS 12" UP TO 48" DIAMETER PIPE AND 24" OF COVER FOR 54"-60" DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT.

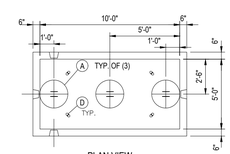
HDPE STORM DRAINAGE TRENCH

N.T.S.



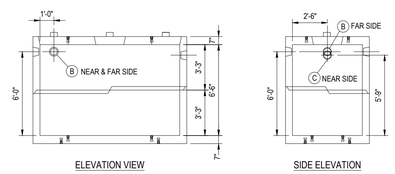
FLARED END RIP RAP DETAIL

N.T.S.



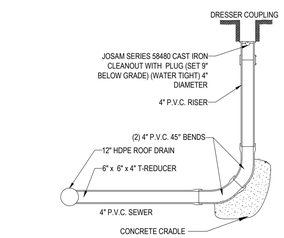
GENERAL NOTES:

1. CONCRETE: 28 DAY COMPRESSIVE STRENGTH F'C = 5,000 PSI TYPE I OR III.
2. REBAR: GRADE 60 PER ASTM A615 (BLACK).
3. DESIGN LOADING: AASHTO HS20-44 (2'-5' COVER).
4. GENERAL CONTRACTOR TO VERIFY ALL OPENINGS SIZES AND LOCATIONS.
5. ALL PIPE AND ROOF OPENINGS HAVE ADDITIONAL REBAR REINFORCEMENT.
6. JOINT TO BE SEALED WITH 1" BUTYL RUBBER.
7. ANY HARDWARE SHOWN BUT NOT DIMENSIONED IS FOR VISUAL REFERENCE ONLY-DO NOT SCALE FOR PLACEMENT.



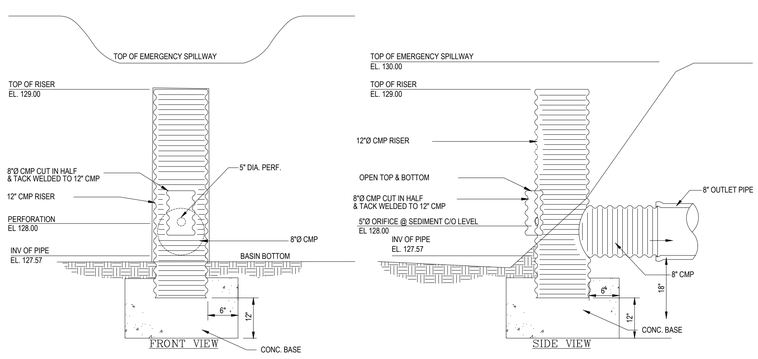
5' - 0" X 10' - 0" X 6' - 6" ID GREASE TRAP 2,000 GALLON CAPACITY

N.T.S.



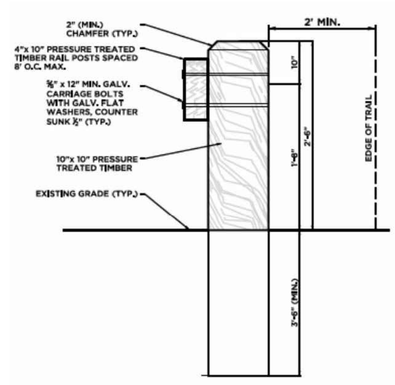
CLEANOUT DETAIL

N.T.S.



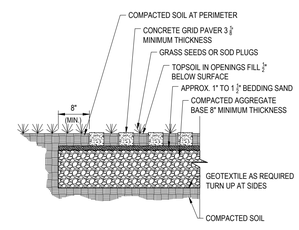
RISER STRUCTURE DETAIL

N.T.S.



TIMBER GUARDRAIL DETAIL

N.T.S.



WAFFLE PAVER STONE

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2	3/10/20	EMERGENCY ACCESS	MLT / JGB
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PROJECT No.:	CT191016
DRAWN BY:	MLT / DE
CHECKED BY:	JGB / PM
DATE:	12/06/19
CAD I.D.:	CT191016ss2

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

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LICENSED PROFESSIONAL ENGINEER
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CONNECTICUT LICENSE NO. 30414

SHEET TITLE:

DETAIL SHEET

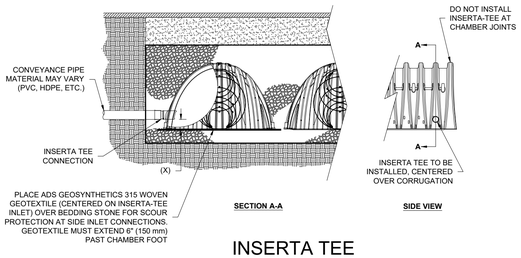
SHEET NUMBER:

C-902

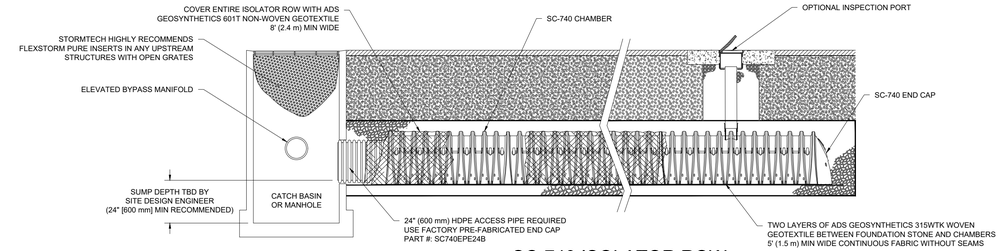
REVISION 3 - 6/4/20

P:\19\CT191016\DRAWINGS\PLAN SETS\REV3 - WETLAND FLAG REVISIONS\CT191016SS3-----LAYOUT: C-902 DETAIL

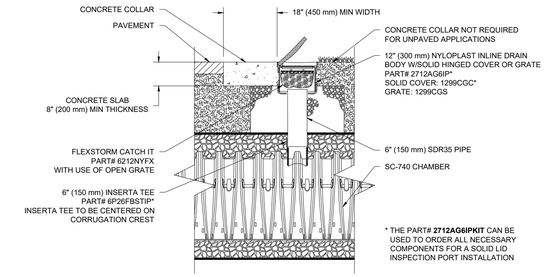
CHAMBER	MAX DIAMETER OF INSERTA TEE	HEIGHT FROM BASE OF CHAMBER (X)
SC-740	10" (250 mm)	4" (100 mm)



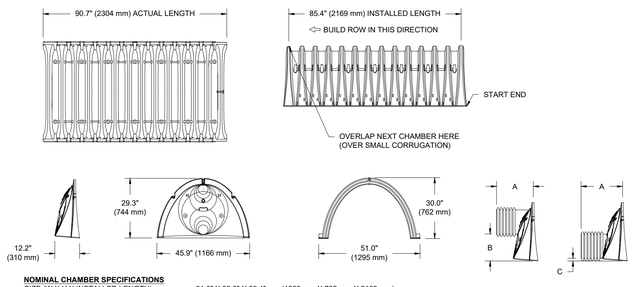
INSERTA TEE



SC-740 ISOLATOR ROW



SC-740 6" (150 mm) INSPECTION PORT



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	51.0" X 30.0" X 85.4"	(1295 mm X 762 mm X 2169 mm)
CHAMBER STORAGE	45.9 CUBIC FEET	(1.30 m^3)
MINIMUM INSTALLED STORAGE*	74.9 CUBIC FEET	(2.12 m^3)
WEIGHT	75.0 lbs.	(33.6 kg)

*ASSUMES 6" (152 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS

PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PRE-FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
PRE-CORED END CAPS END WITH "PC"

PART #	STUB	A	B	C
SC740EPE06T / SC740EPE06TPC	6" (150 mm)	10.9" (277 mm)	18.5" (470 mm)	---
SC740EPE06B / SC740EPE06BPC			---	0.5" (13 mm)
SC740EPE08T /SC740EPE08TPC	8" (200 mm)	12.2" (310 mm)	16.5" (419 mm)	---
SC740EPE08B / SC740EPE08BPC			---	0.6" (15 mm)
SC740EPE10T / SC740EPE10TPC	10" (250 mm)	13.4" (340 mm)	14.5" (368 mm)	---
SC740EPE10B / SC740EPE10BPC			---	0.7" (18 mm)
SC740EPE12T / SC740EPE12TPC	12" (300 mm)	14.7" (373 mm)	12.5" (318 mm)	---
SC740EPE12B / SC740EPE12BPC			---	1.2" (30 mm)
SC740EPE15T / SC740EPE15TPC	15" (375 mm)	18.4" (467 mm)	9.0" (229 mm)	---
SC740EPE15B / SC740EPE15BPC			---	1.3" (33 mm)
SC740EPE18T / SC740EPE18TPC	18" (450 mm)	19.7" (500 mm)	5.0" (127 mm)	
SC740EPE18B / SC740EPE18BPC				1.6" (41 mm)
SC740EPE24B*	24" (600 mm)	18.5" (470 mm)	---	0.1" (3 mm)

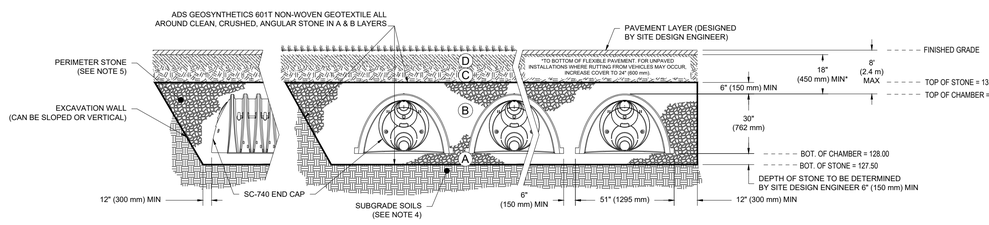
ALL STUBS, EXCEPT FOR THE SC740EPE24B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.
* FOR THE SC740EPE24B THE 24" (600 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75" (44 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.
NOTE: ALL DIMENSIONS ARE NOMINAL

SC-740 TECHNICAL SPECIFICATIONS

ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



SC-740 CROSS SECTION

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

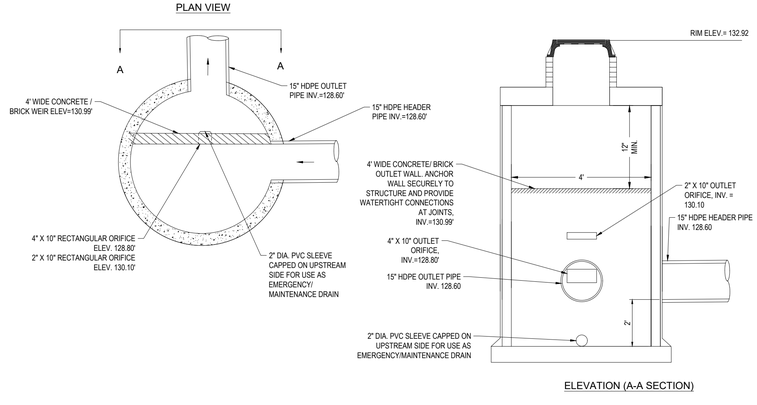
1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

NOTES:

1. SC-740 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS", OR ASTM F2922 "STANDARD SPECIFICATION FOR POLYETHYLENE (PE) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
4. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
5. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
6. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

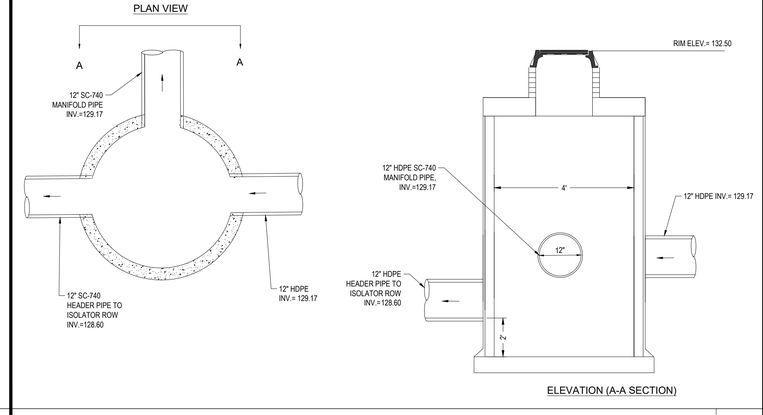
STORMTECH SC-740 SUBSURFACE DETENTION/INFILTRATION BASIN DETAILS (BMP-1)

N.T.S.



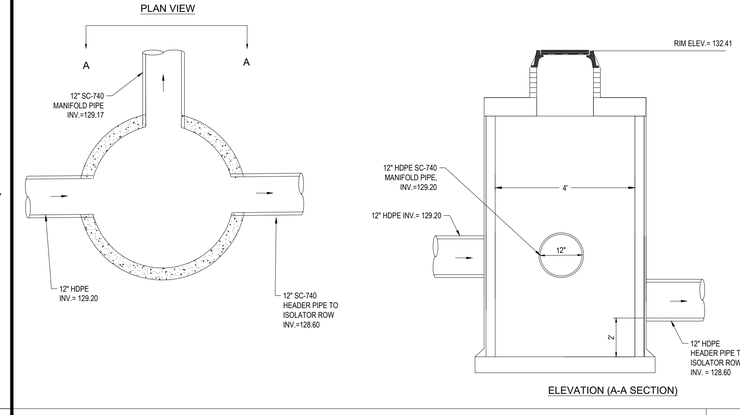
OUTLET CONTROL STRUCTURE (OCS-1)

N.T.S.



INLET CONTROL STRUCTURE (ICS-1)

N.T.S.



INLET CONTROL STRUCTURE (ICS-2)

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2	3/10/20	EMERGENCY ACCESS	MLT / JGB
3	6/4/20	UPDATED WETLAND DELINEATION	BTJ / JGB

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DRAWN BY:	MLT / DE
CHECKED BY:	JGB / PM
DATE:	12/06/19
CAD I.D.:	CT191016ss2

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

BOHLER
16 OLD FORGE ROAD, SUITE A
ROCKY HILL, CT 06067
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JEFFREY G. BORD
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LICENSED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CONNECTICUT LICENSE NO. 30414

SHEET TITLE:

DETAIL SHEET

SHEET NUMBER:

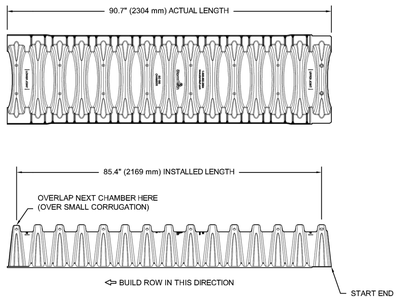
C-903

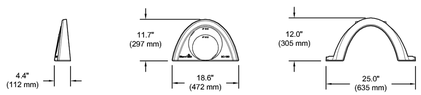
REVISION 3 - 6/4/20

P:\19\CT191016\DRAWINGS\PLAN SETS\REV3 - WETLAND FLAG REVISIONS\CT191016SS3----3-LAYOUT C-903 DETAIL
BJ

SC-160LP TECHNICAL SPECIFICATION

NTS



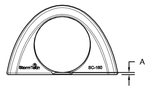


NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	25.0" X 12.0" X 85.4"	(635 mm X 305 mm X 2169 mm)
CHAMBER STORAGE	6.85 CUBIC FEET	(0.19 m³)
MINIMUM INSTALLED STORAGE*	16.0 CUBIC FEET	(0.45 m³)
WEIGHT	24.0 lbs.	(10.9 kg)

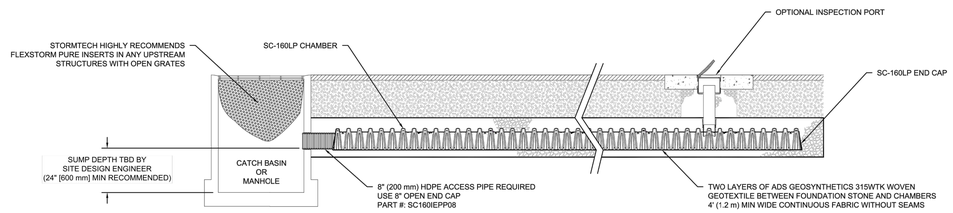
*ASSUMES 6" (152 mm) ABOVE, 6" (152 mm) BELOW, AND STONE BETWEEN CHAMBERS WITH 40% STONE POROSITY.

PART #	STUB	A
SC160IEPP	6" (150 mm)	0.66" (16 mm)
	8" (200 mm)	0.80" (20 mm)
SC160IEPP08	8" (200 mm)	0.96" (24 mm)



ALL STUBS ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

NOTE: ALL DIMENSIONS ARE NOMINAL



SC-160LP ISOLATOR ROW DETAIL

NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

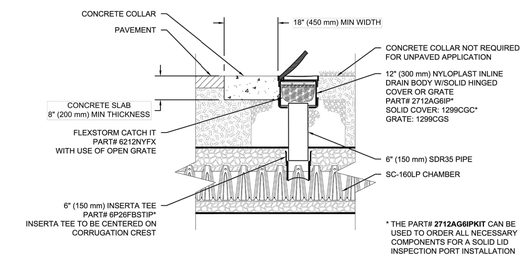
NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

ACCEPTABLE FILL MATERIALS: STORMTECH SC-160LP CHAMBER SYSTEMS

	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ("B" LAYER) TO 14" (355 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ("A" LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. [2,3]

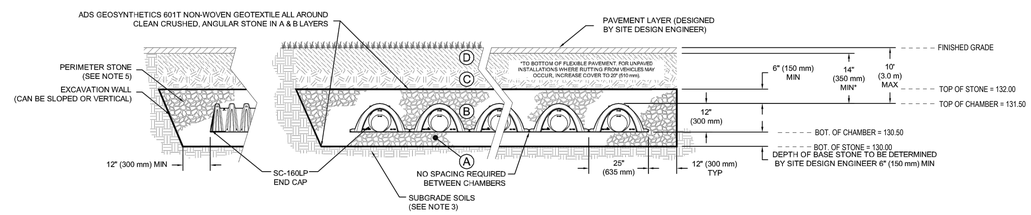
PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



* THE PART# **2712AG6IPKIT** CAN BE USED TO ORDER ALL NECESSARY COMPONENTS FOR A SOLID LID INSPECTION PORT INSTALLATION

SC-160LP 6" INSPECTION PORT DETAIL

NTS

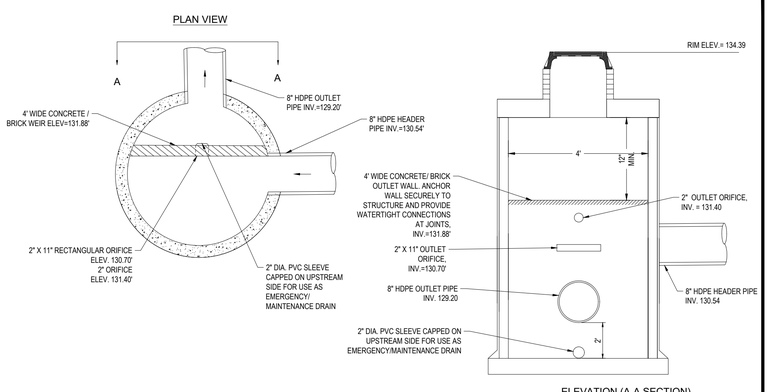


NOTES:

1. SC-160LP CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

STORMTECH SC-160LP SUBSURFACE DETENTION/INFILTRATION BASIN DETAILS (BMP-2)

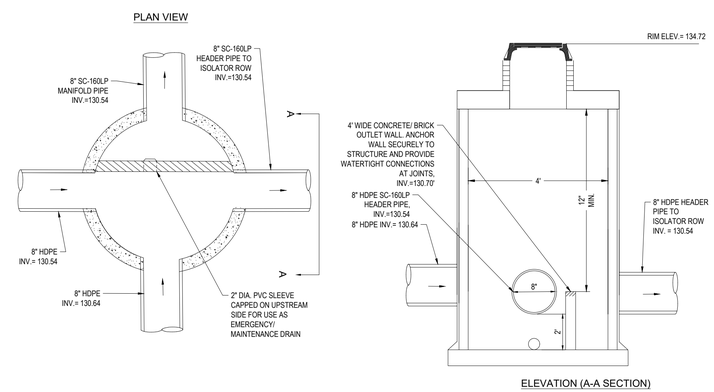
N.T.S.



ELEVATION (A-A SECTION)

OUTLET CONTROL STRUCTURE (OCS-2)

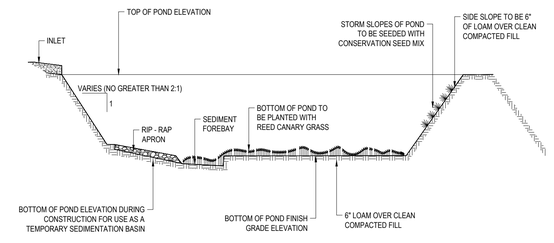
N.T.S.



ELEVATION (A-A SECTION)

INLET CONTROL STRUCTURE (ICS-3)

N.T.S.



NOTE:
1. THE SIDE SLOPES OF THE DETENTION POND SHALL BE PLANTED WITH A SEED MIX CONSISTING OF CREEPING RED FESCUE, TALL FESCUE, AND LADINO CLOVER.
2. SIDE SLOPES CONSISTING OF SLOPES STEEPER THAN 3:1 SHALL USE SLOPE STABILIZATION FABRIC.

INFILTRATION BASIN DETAIL

N.T.S.

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CHECKED BY:	JGB / PM
DATE:	12/06/19
CAD I.D.:	CT191016ss2

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

BOHLER
16 OLD FORGE ROAD, SUITE A
ROCKY HILL, CT 06067
Phone: (860) 333-8900
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J.G. BORD
STATE OF CONNECTICUT
JEFFREY G. BORD
No. 30414
LICENSED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CONNECTICUT LICENSE NO. 30414

SHEET TITLE:

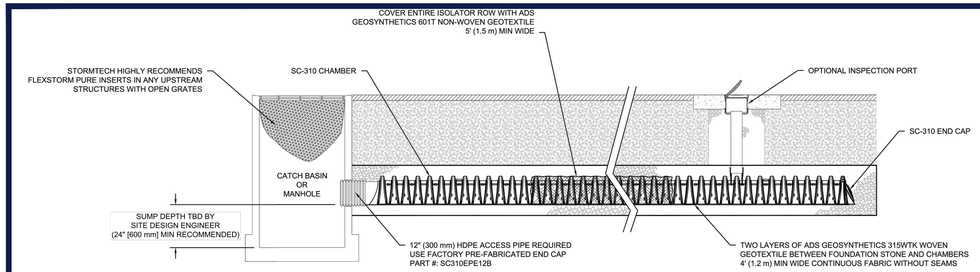
DETAIL SHEET

SHEET NUMBER:

C-904

REVISION 3 - 6/4/20

P:\BOHLER\CT191016\DRAWINGS\PLAN SETS\REV3 - WETLAND FLAG REVISIONS\CT191016SS3------LAYOUT C-904 DETAIL



SC-310 ISOLATOR ROW DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

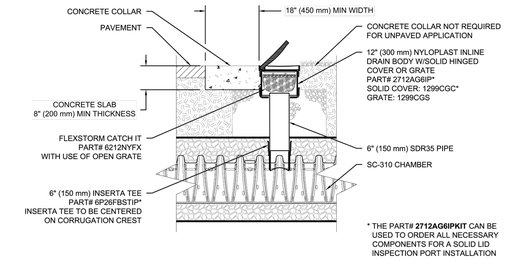
STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

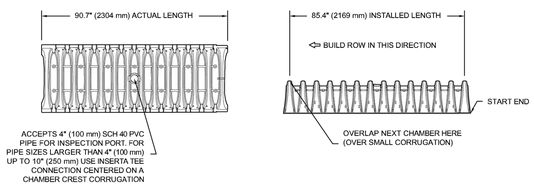
1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

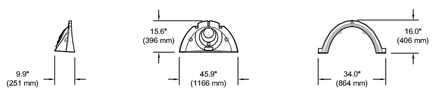


SC-310 6" INSPECTION PORT DETAIL
NTS

SC-310 TECHNICAL SPECIFICATION

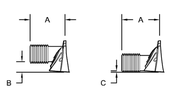
NTS





NOMINAL CHAMBER SPECIFICATIONS		
SIZE (W X H X INSTALLED LENGTH)	34.0" X 16.0" X 85.4"	(864 mm X 406 mm X 2169 mm)
CHAMBER STORAGE	14.7 CUBIC FEET	(0.42 m³)
MINIMUM INSTALLED STORAGE*	31.0 CUBIC FEET	(0.88 m³)
WEIGHT	35.0 lbs.	(16.8 kg)

*ASSUMES 6" (152 mm) ABOVE, BELOW, AND BETWEEN CHAMBERS



STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

PART #	STUB	A	B	C
SC310EPE06T / SC310EPE06TPC	6" (150 mm)	9.6" (244 mm)	5.8" (147 mm)	---
SC310EPE06B / SC310EPE06BPC			---	0.5" (13 mm)
SC310EPE08T / SC310EPE08TPC	8" (200 mm)	11.9" (302 mm)	3.5" (89 mm)	---
SC310EPE08B / SC310EPE08BPC			---	0.6" (15 mm)
SC310EPE10T / SC310EPE10TPC	10" (250 mm)	12.7" (323 mm)	1.4" (36 mm)	---
SC310EPE10B / SC310EPE10BPC			---	0.7" (18 mm)
SC310EPE12B	12" (300 mm)	13.5" (343 mm)	---	0.9" (23 mm)

ALL STUBS, EXCEPT FOR THE SC310EPE12B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

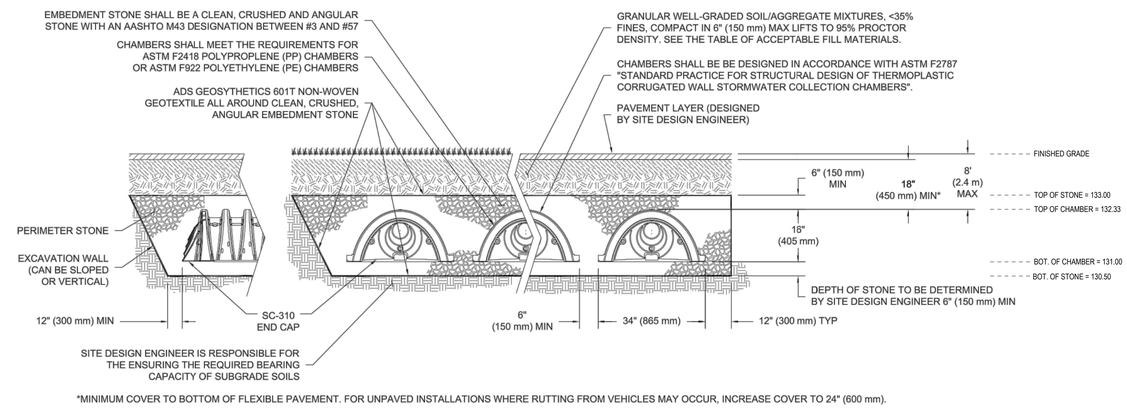
* FOR THE SC310EPE12B THE 12" (300 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 0.25" (6 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL

ACCEPTABLE FILL MATERIALS: STORMTECH SC-310 CHAMBER SYSTEMS

	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. [2 3]

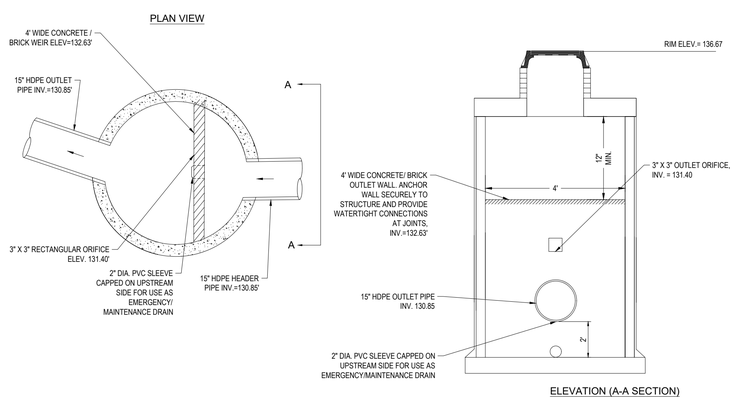
PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



*MINIMUM COVER TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 24" (600 mm).

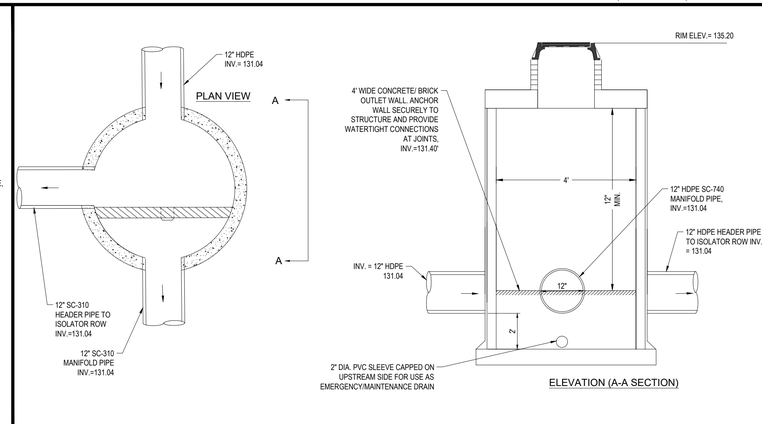
STORMTECH SC-310 SUBSURFACE DETENTION/INFILTRATION BASIN DETAILS (BMP-3)

N.T.S.



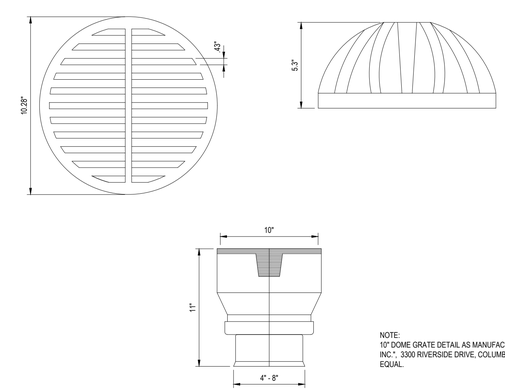
OUTLET CONTROL STRUCTURE (OCS-3)

N.T.S.



INLET CONTROL STRUCTURE (ICS-4)

N.T.S.



NOTE:
10" DOME GRATE DETAIL AS MANUFACTURED BY "ADVANCED DRAINAGE SYSTEMS, INC.", 3300 RIVERSIDE DRIVE, COLUMBUS, OH 43221, (800) 821-6710, OR APPROVED EQUAL.

YARD DRAIN

N.T.S.

BOHLER

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REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	1/20/20	ART COMMENTS	MLT / JGB
2	3/10/20	EMERGENCY ACCESS	MLT / JGB
3	6/4/20	UPDATED WETLAND DELINEATION	BTJ / JGB

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It's fast. It's free. It's the law.

PERMIT SET

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PROJECT No.: CT191016
DRAWN BY: MLT / DE
CHECKED BY: JGB / PM
DATE: 12/06/19
CAD I.D.: CT191016ss2

PROJECT:
PROPOSED SITE PLAN DOCUMENTS
FOR
KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT
118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

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PROFESSIONAL ENGINEER
CONNECTICUT LICENSE NO. 30414

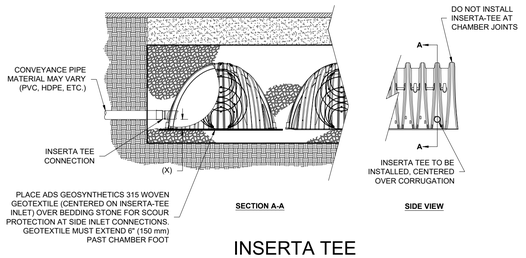
SHEET TITLE:
DETAIL SHEET

SHEET NUMBER:
C-905

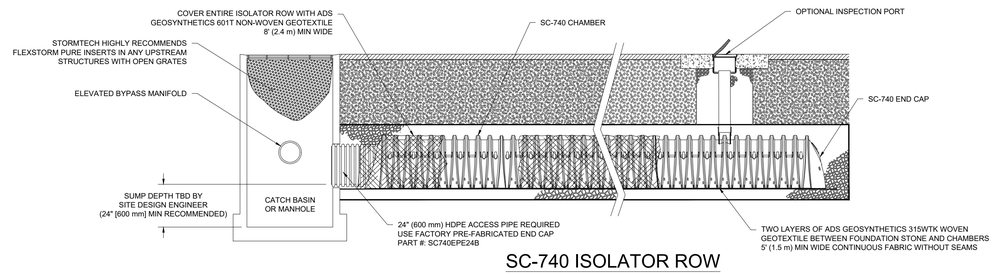
REVISION 3 - 6/4/20

P:\191CT191016\DRAWING\SPLAN SETS\REV3 - WETLAND FLAG REVISIONS\CT191016SS3----LAYOUT: C-905 DETAIL
BJ

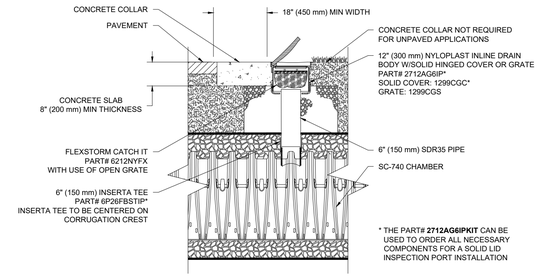
CHAMBER	MAX DIAMETER OF INSERTA TEE	HEIGHT FROM BASE OF CHAMBER (X)
SC-740	10" (250 mm)	4" (100 mm)



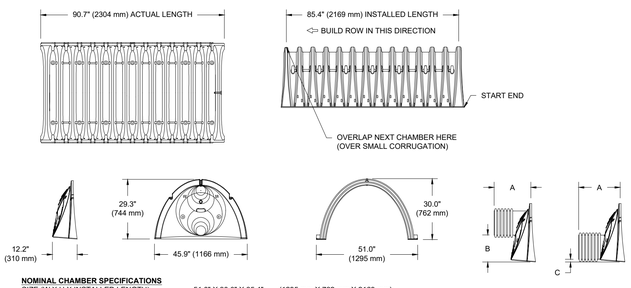
INSERTA TEE



SC-740 ISOLATOR ROW



SC-740 6" (150 mm) INSPECTION PORT



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	51.0" X 30.0" X 85.4"	(1295 mm X 762 mm X 2169 mm)
CHAMBER STORAGE	45.9 CUBIC FEET	(1.30 m³)
MINIMUM INSTALLED STORAGE*	74.9 CUBIC FEET	(2.12 m³)
WEIGHT	75.0 lbs.	(33.6 kg)

*ASSUMES 6" (152 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS

PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PRE-FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
PRE-CORED END CAPS END WITH "PC"

PART #	STUB	A	B	C
SC740EPE06T / SC740EPE06TPC	6" (150 mm)	10.9" (277 mm)	18.5" (470 mm)	---
SC740EPE06B / SC740EPE06BPC			---	0.5" (13 mm)
SC740EPE08T /SC740EPE08TPC	8" (200 mm)	12.2" (310 mm)	16.5" (419 mm)	---
SC740EPE08B / SC740EPE08BPC			---	0.6" (15 mm)
SC740EPE10T / SC740EPE10TPC	10" (250 mm)	13.4" (340 mm)	14.5" (368 mm)	---
SC740EPE10B / SC740EPE10BPC			---	0.7" (18 mm)
SC740EPE12T / SC740EPE12TPC	12" (300 mm)	14.7" (373 mm)	12.5" (318 mm)	---
SC740EPE12B / SC740EPE12BPC			---	1.2" (30 mm)
SC740EPE15T / SC740EPE15TPC	15" (375 mm)	18.4" (467 mm)	9.0" (229 mm)	---
SC740EPE15B / SC740EPE15BPC			---	1.3" (33 mm)
SC740EPE18T / SC740EPE18TPC	18" (450 mm)	19.7" (500 mm)	5.0" (127 mm)	---
SC740EPE18B / SC740EPE18BPC			---	1.6" (41 mm)
SC740EPE24B*	24" (600 mm)	18.5" (470 mm)	---	0.1" (3 mm)

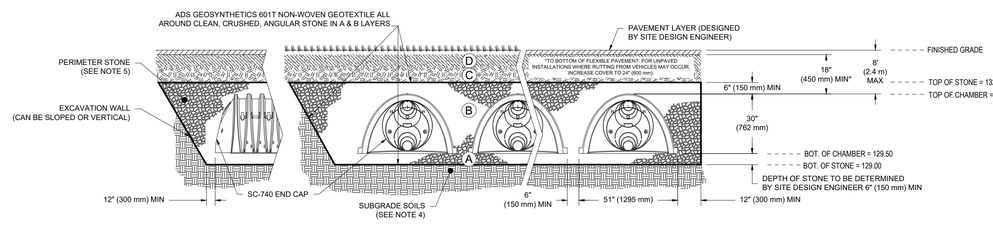
ALL STUBS, EXCEPT FOR THE SC740EPE24B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.
* FOR THE SC740EPE24B THE 24" (600 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75" (44 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.
NOTE: ALL DIMENSIONS ARE NOMINAL

SC-740 TECHNICAL SPECIFICATIONS

ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



SC-740 CROSS SECTION

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

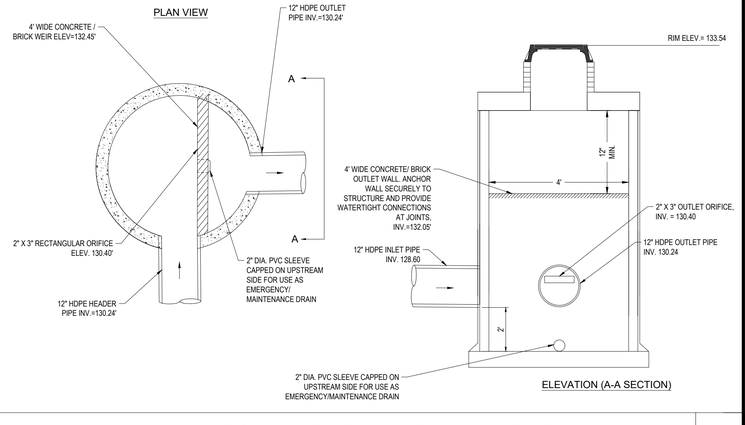
1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

NOTES:

1. SC-740 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS", OR ASTM F2922 "STANDARD SPECIFICATION FOR POLYETHYLENE (PE) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
4. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
5. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
6. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

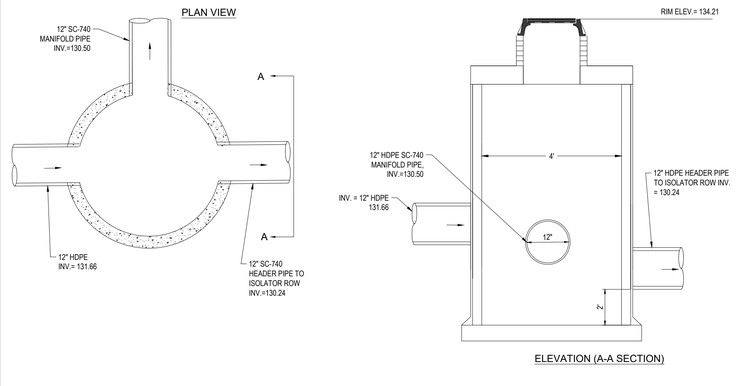
STORMTECH SC-740 SUBSURFACE DETENTION/INFILTRATION BASIN DETAILS (BMP-4)

N.T.S.



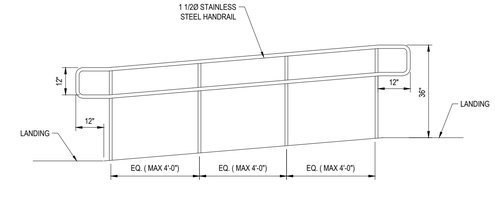
OUTLET CONTROL STRUCTURE (OCS-4)

N.T.S.



INLET CONTROL STRUCTURE (ICS-5)

N.T.S.



SPLIT RAIL FENCE DETAIL

N.T.S.

BOHLER™

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
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REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	1/20/20	ART COMMENTS	MLT / JGB
2	3/10/20	EMERGENCY ACCESS	MLT / JGB
3	6/4/20	UPDATED WETLAND DELINEATION	BTJ / JGB

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ALWAYS CALL 811
It's fast. It's free. It's the law.

PERMIT SET

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PROJECT No.: CT191016
DRAWN BY: MLT / DE
CHECKED BY: JGB / PM
DATE: 12/06/19
CAD I.D.: CT191016ss2

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

KAPLAN DEVELOPMENT GROUP, LLC

PROPOSED DEVELOPMENT

118 HAZARD AVENUE
HARTFORD COUNTY
TOWN OF ENFIELD, CT
MAP & LOT: 65 - 59

BOHLER
16 OLD FORGE ROAD, SUITE A
ROCKY HILL, CT 06067
Phone: (860) 333-8900
Fax: (508) 480-9080
www.BohlerEngineering.com

J.G. BORD
STATE OF CONNECTICUT · JEFFREY G. BORD · No. 30414 · LICENSED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CONNECTICUT LICENSE NO. 30414

SHEET TITLE:

DETAIL SHEET

SHEET NUMBER:

C-906

REVISION 3 - 6/4/20

P:\19\CT191016\DRAWINGS\PLAN SETS\REV3 - WETLAND FLAG REVISION\SCT191016SS3------LAYOUT: C-906 DETAIL

LEGEND

124	EXISTING CONTOUR
125	EXISTING CONTOUR
× 123.45	EXISTING SPOT ELEVATION
× TC 123.45	EXISTING TOP OF CURB ELEVATION
× G 122.95	EXISTING GUTTER ELEVATION
× TW 123.45	EXISTING TOP OF WALL ELEVATION
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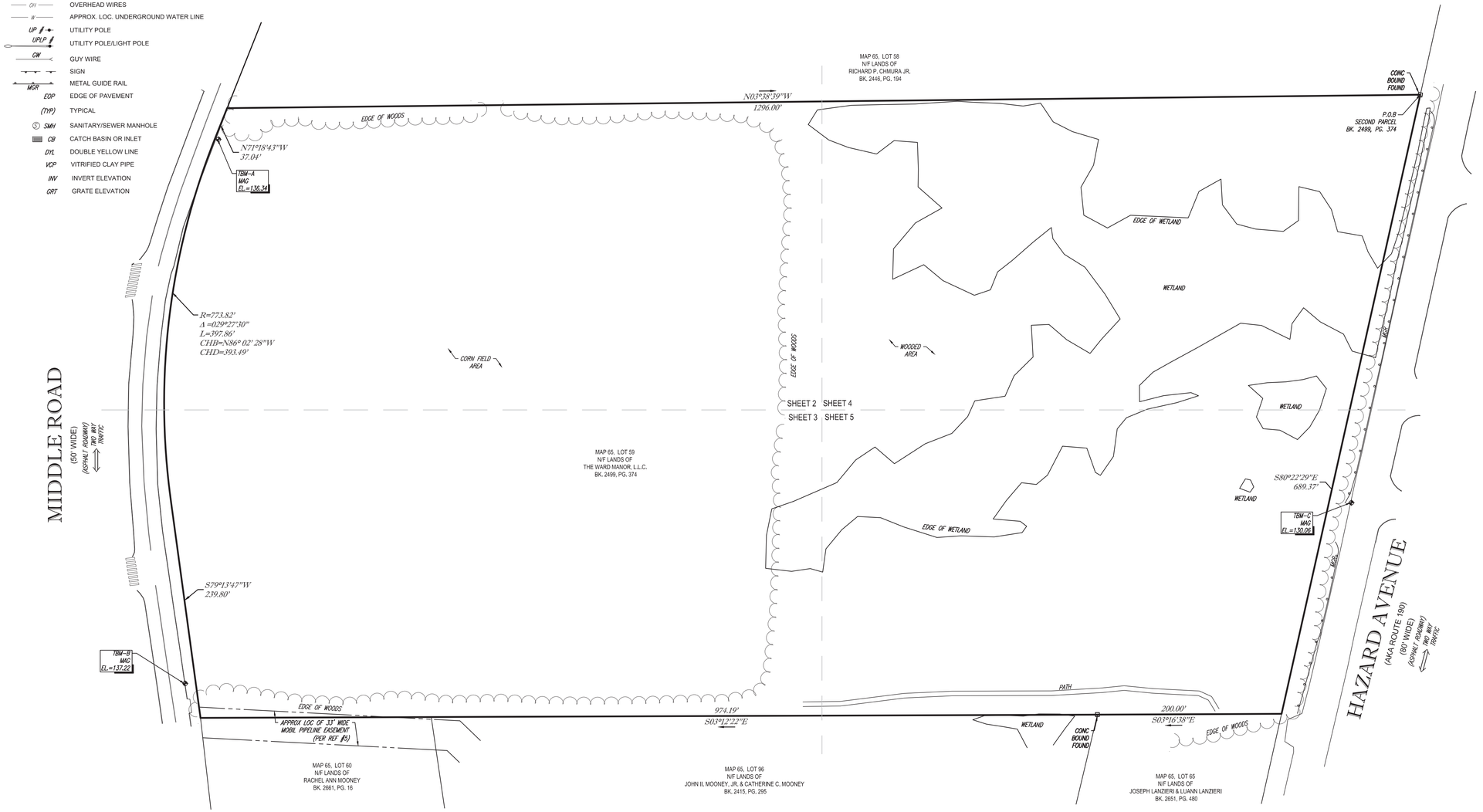

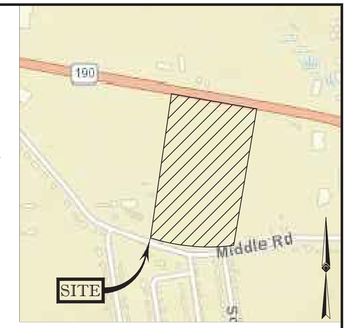

LOCUS MAP
©2013 ESRI WORLD STREET MAPS
NOT TO SCALE

NOTES:

1. THIS IS A BOUNDARY AND TOPOGRAPHIC SURVEY PREPARED IN ACCORDANCE WITH THE STANDARDS OF A CLASS A-2 AND T-2 SURVEY AS DEFINED IN THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTION 20-300B, EFFECTIVE DATE JUNE 21, 1996. THIS SURVEY IS ALSO PREPARED IN ACCORDANCE WITH THE MINIMUM STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT, ADOPTED ON SEPTEMBER 26, 1996, BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS INC., THE BOUNDARY LINES SHOWN HEREON ARE BASED UPON A RESURVEY OF THE SUBJECT PROPERTY.

   PROPERTY KNOWN AS LOT 59 AS SHOWN ON THE TOWN OF ENFIELD, HARTFORD COUNTY, STATE OF CONNECTICUT; MAP NO. 65.

2. AREA = 846,574 SQUARE FEET OR 19.435 ACRES.

3. LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE. LOCATIONS AND SIZES ARE BASED ON UTILITY MARK-OUTS, ABOVE GROUND STRUCTURES THAT WERE VISIBLE & ACCESSIBLE IN THE FIELD, AND THE MAPS AS LISTED IN THE REFERENCES AVAILABLE AT THE TIME OF THE SURVEY. AVAILABLE AS-BUILT PLANS AND UTILITY MARKOUT DOES NOT ENSURE MAPPING OF ALL UNDERGROUND UTILITIES AND STRUCTURES. BEFORE ANY EXCAVATION IS TO BEGIN, ALL UNDERGROUND UTILITIES SHOULD BE VERIFIED AS TO THEIR LOCATION, SIZE AND TYPE BY THE PROPER UTILITY COMPANIES. CONTROL POINT ASSOCIATES, INC. DOES NOT GUARANTEE THE UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA EITHER IN SERVICE OR ABANDONED.

4. THIS PLAN IS BASED ON INFORMATION PROVIDED BY A SURVEY PREPARED IN THE FIELD BY CONTROL POINT ASSOCIATES, INC. AND OTHER REFERENCE MATERIAL AS LISTED HEREON.

5. THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT AND IS SUBJECT TO THE RESTRICTIONS, COVENANTS AND/OR EASEMENTS THAT MAY BE CONTAINED THEREIN.

6. BY GRAPHIC PLOTTING ONLY PROPERTY IS LOCATED IN FLOOD HAZARD ZONE X (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN) PER REF. #2

7. ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), BASED ON GPS OBSERVATIONS UTILIZING THE KEYSTONE VRS NETWORK (KEYNETGPS) TAKEN AT THE TIME OF THE FIELD SURVEY.

   TEMPORARY BENCH MARKS SET:
   - TBM-A: MAG NAIL SET AT ELEVATION 136.34.
   - TBM-B: SPIKE SET AT ELEVATION 137.22.
   - TBM-C: MAG NAIL SET AT ELEVATION 130.06.

   PRIOR TO CONSTRUCTION IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THAT THE BENCHMARKS ILLUSTRATED ON THIS SKETCH HAVE NOT BEEN DISTURBED AND THEIR ELEVATIONS HAVE BEEN CONFIRMED. ANY CONFLICTS MUST BE REPORTED PRIOR TO CONSTRUCTION.

REFERENCES:

1. THE TAX ASSESSOR'S MAP OF ENFIELD, HARTFORD COUNTY, MAP 65.
2. MAP ENTITLED "NATIONAL FLOOD INSURANCE PROGRAM, FIRM, FLOOD INSURANCE RATE MAP, HARTFORD COUNTY, CONNECTICUT PANEL 227 OF 675," COMMUNITY-PANEL NUMBER 090028 0227 F, EFFECTIVE DATE: SEPTEMBER 26, 2008.
3. MAP ENTITLED "CONNECTICUT STATE HIGHWAY DEPARTMENT RIGHT OF WAY MAP TOWN OF ENFIELD HAZARD AVENUE FROM MIDDLE ROAD WESTERLY ABOUT 5,700.0 FEET ROUTE NO.105" DATED AUGUST 29, 1930.
4. MAP ENTITLED "PROPERTY OF RICHARD P. CHMURA" DATED DECEMBER 7, 1960, FILED WITH THE ENFIELD LAND RECORDS AS PLAN #1072.
5. MAP ENTITLED "RESUBDIVISION PREPARED FOR JOHN H. CATHERINE C. MOONEY" DATED APRIL 11, 1990. FILED WITH THE ENFIELD LAND RECORDS AS VOLUME 226, PAGE 3310.
6. MAP ENTITLED "TOWN OF ENFIELD PLAN MIDDLE ROAD" DATED APRIL 1968, FILED WITH THE TOWN OF ENFIELD ENGINEERS OFFICE.

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THE FOLLOWING COMPANIES WERE NOTIFIED BY CONNECTICUT ONE-CALL SYSTEM (1-888-344-7233) AND REQUESTED TO MARK OUT UNDERGROUND FACILITIES AFFECTING AND SERVICING THIS SITE. THE UNDERGROUND UTILITY INFORMATION SHOWN HEREON IS BASED UPON THE UTILITY COMPANIES RESPONSE TO THIS REQUEST.
REQUEST NUMBER: 20193102803

UTILITY COMPANY	PHONE NUMBER
BUCKEYE PARTNERS, LP	1-610-904-4940
COX COMMUNICATIONS	1-800-778-9140
EVERSOURCE ELECTRIC	1-800-778-9140
EVERSOURCE GAS	1-203-206-5702
FRONTIER COMMUNICATIONS	1-800-778-9140
HAZARDVILLE WATER CO	1-860-749-0779
TOWN OF ENFIELD	1-860-209-1615

1-800-922-4455
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GRAPHIC SCALE
60' 0 30' 60' 120' 240'
(IN FEET)
1 inch = 60' ft.

TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

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STATE OF CONNECTICUT
WILLIAM THEODORE WHIMPLE
No. 70290
LICENSED
LAND SURVEYOR

6-4-2020
DATE

WILLIAM T. WHIMPLE
CONNECTICUT PROFESSIONAL LAND SURVEYOR #70290

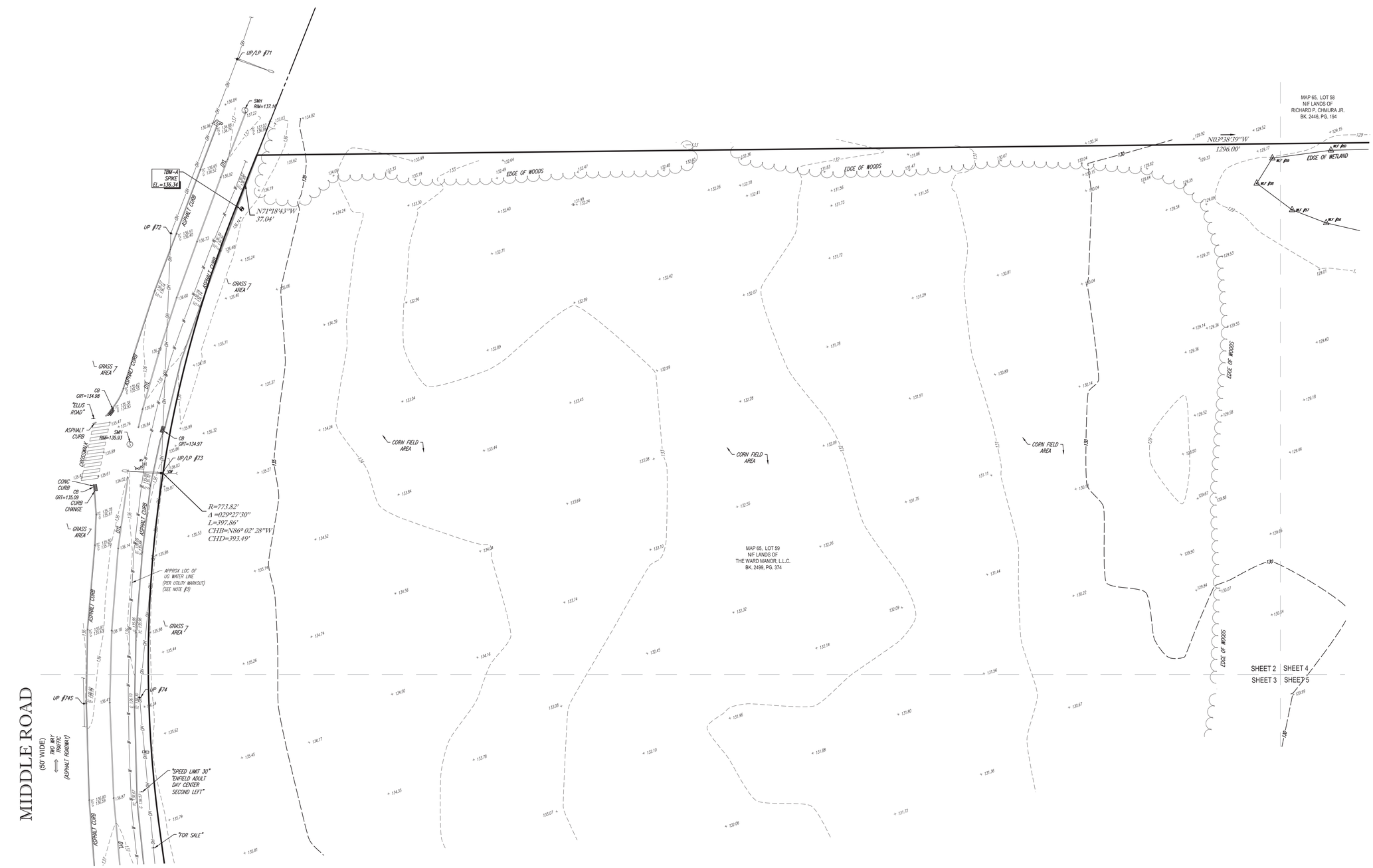
No.	DESCRIPTION OF REVISION	FIELD CREW	DRAWN:	APPROVED:	DATE
1	REVISED PER CLIENT COMMENTS	N/A	R.J.K.	G.L.H.	6-4-2020

FIELD DATE	8-30-19
FIELD BOOK NO.	19-12
FIELD BOOK PG.	47
FIELD CREW	J.O.
DRAWN:	P.V.
REVIEWED:	A.J.D.

BOUNDARY & TOPOGRAPHIC SURVEY
118 HAZARD AVENUE
PREPARED FOR BOHLER ENGINEERING
LOT 59, MAP 65
TOWN OF ENFIELD, HARTFORD COUNTY
STATE OF CONNECTICUT

CONTROL POINT ASSOCIATES, INC.
352 TURNPIKE ROAD
SOUTHBOROUGH, MA 01772
508.948.3000 - 508.948.3003 FAX
ALBANY, NY 5182175010
CHALFONT, PA 2157129800
MANHATTAN, NY 6467800411
MT LAUREL, NJ 6098572099
WARREN, NJ 9086680099

APPROVED:	DATE	SCALE	FILE NO.	DWG. NO.
W.T.W.	9-5-19	1"=60'	03-190182-00	1 OF 5



LEGEND

124 / 125	EXISTING CONTOUR
× 123.45	EXISTING SPOT ELEVATION
× TC 123.45	EXISTING TOP OF CURB ELEVATION
× G 122.95	EXISTING GUTTER ELEVATION
× TW 123.45	EXISTING TOP OF WALL ELEVATION
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VCP	VITRIFIED CLAY PIPE
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GRAPHIC SCALE

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(IN FEET)
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No. 70290
LICENSED
LAND SURVEYOR

6-4-2020
DATE

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CONNECTICUT PROFESSIONAL LAND SURVEYOR #70290

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1	REVISED PER CLIENT COMMENTS	N/A	R.J.K.	G.L.H.	6-4-2020

FIELD DATE: 8-30-19
FIELD BOOK NO.: 19-12
FIELD BOOK PG.: 47
FIELD CREW: J.O.
DRAWN: P.V.

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118 HAZARD AVENUE
PREPARED FOR BOHLER ENGINEERING
LOT 59, MAP 65
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REVIEWED:	APPROVED:	DATE	SCALE	FILE NO.	DWG. NO.
A.J.D.	W.T.W.	9-5-19	1"=30'	03-190182-00	2 OF 5

CONNECTICUT STATE PLANE COORDINATE SYSTEM (NAD 83)

LEGEND

124	EXISTING CONTOUR
125	EXISTING CONTOUR
× 123.45	EXISTING SPOT ELEVATION
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OH	OVERHEAD WIRES
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MGR	METAL GUIDE RAIL
EOP	EDGE OF PAVEMENT
(TYP)	TYPICAL
SMH	SANITARY/SEWER MANHOLE
CB	CATCH BASIN OR INLET
DYL	DOUBLE YELLOW LINE
VCP	VITRIFIED CLAY PIPE
INV	INVERT ELEVATION
GRT	GRATE ELEVATION

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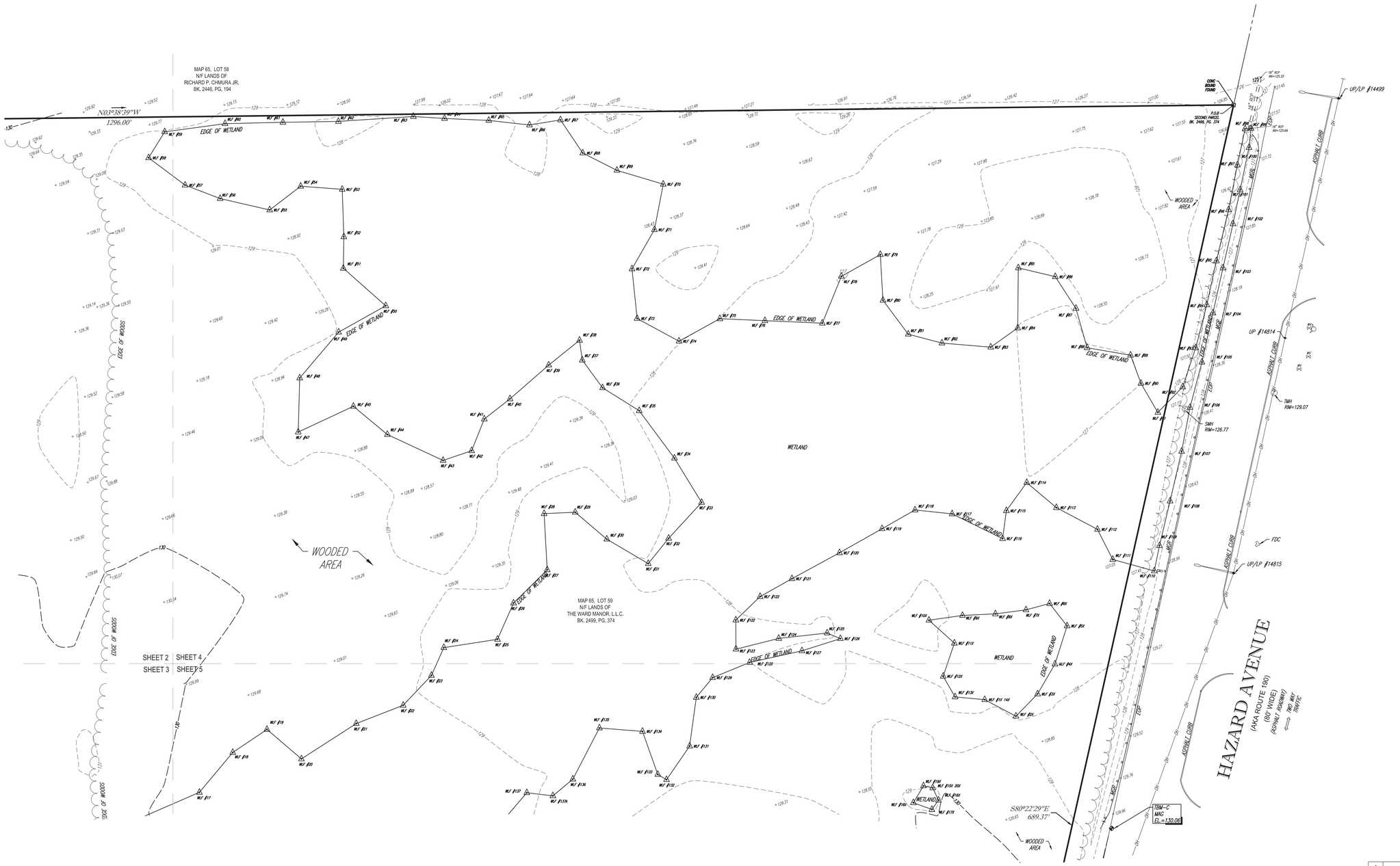

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FIELD DATE: 8-30-19
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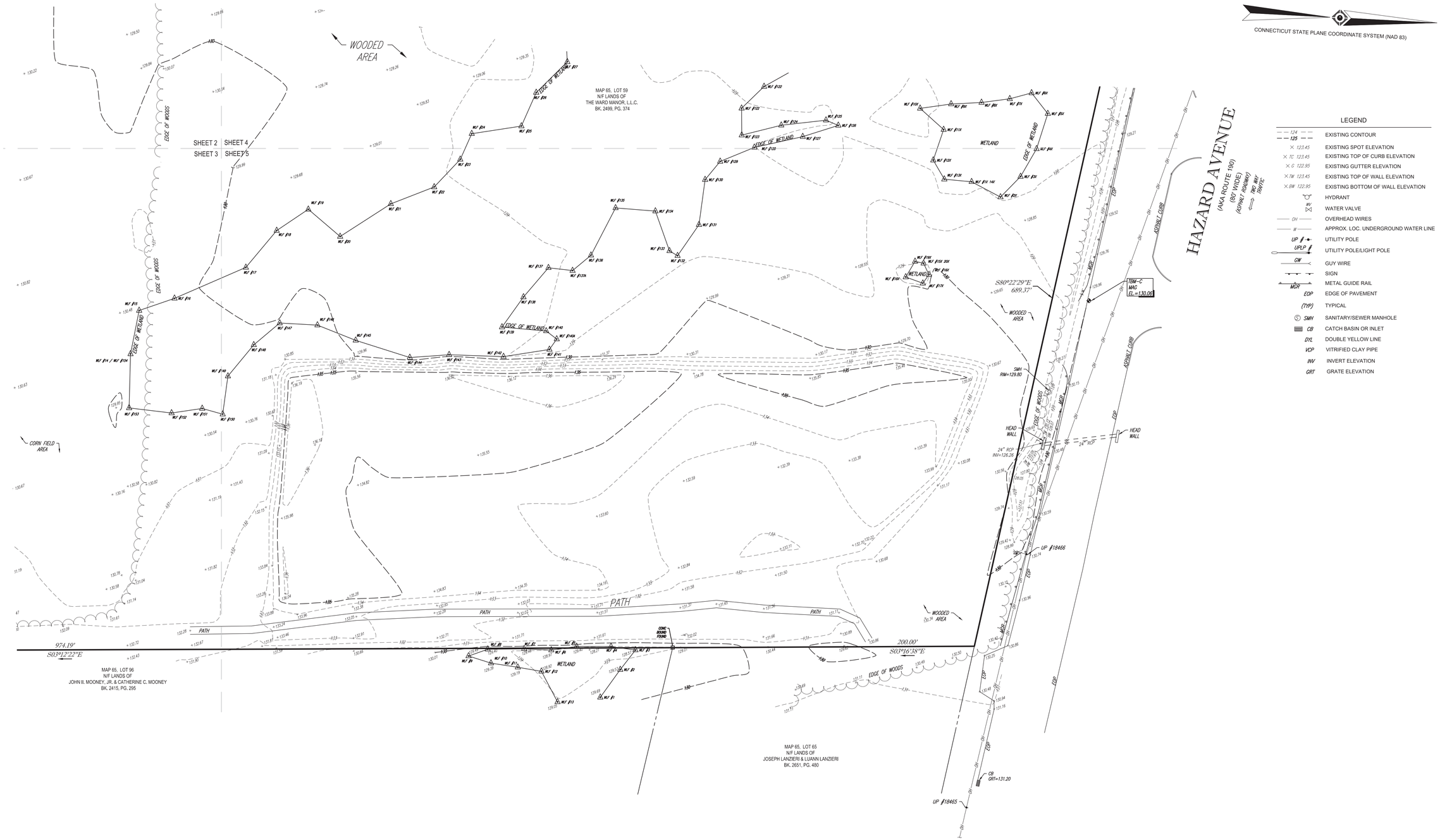
WARREN, NJ 9086680099

REVIEWED:	APPROVED:	DATE	SCALE	FILE NO.	DWG. NO.
A.J.D.	W.T.W.	9-5-19	1"=30'	03-190182-00	4 OF 5



LEGEND

124 / 125	EXISTING CONTOUR
× 123.45	EXISTING SPOT ELEVATION
× TC 123.45	EXISTING TOP OF CURB ELEVATION
× G 122.95	EXISTING GUTTER ELEVATION
× TW 123.45	EXISTING TOP OF WALL ELEVATION
× BW 122.95	EXISTING BOTTOM OF WALL ELEVATION
	HYDRANT
WV	WATER VALVE
OH	OVERHEAD WIRES
W	APPROX. LOC. UNDERGROUND WATER LINE
UP	UTILITY POLE
UPLP	UTILITY POLE/LIGHT POLE
GW	GUY WIRE
	SIGN
MGR	METAL GUIDE RAIL
EOP	EDGE OF PAVEMENT
(TYP)	TYPICAL
SMH	SANITARY/SEWER MANHOLE
CB	CATCH BASIN OR INLET
DYL	DOUBLE YELLOW LINE
VCP	VITRIFIED CLAY PIPE
INV	INVERT ELEVATION
GRT	GRATE ELEVATION

UTILITIES:

THE FOLLOWING COMPANIES WERE NOTIFIED BY CONNECTICUT ONE-CALL SYSTEM (1-888-344-7233) AND REQUESTED TO MARK OUT UNDERGROUND FACILITIES AFFECTING AND SERVICING THIS SITE. THE UNDERGROUND UTILITY INFORMATION SHOWN HEREON IS BASED UPON THE UTILITY COMPANIES RESPONSE TO THIS REQUEST.
REQUEST NUMBER: 20193102803

UTILITY COMPANY	PHONE NUMBER
BUCKEYE PARTNERS, LP	1-610-904-4940
COX COMMUNICATIONS	1-800-778-9140
EVERSOURCE ELECTRIC	1-800-778-9140
EVERSOURCE GAS	1-203-206-5702
FRONTIER COMMUNICATIONS	1-800-778-9140
HAZARDVILLE WATER CO	1-860-749-0779
TOWN OF ENFIELD	1-860-209-1615

1-800-922-4455
STOP, CALL BEFORE YOU DIG!!

THE STATE OF CONNECTICUT REQUIRES NOTIFICATION BY EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN THE STATE.

GRAPHIC SCALE

30' 0 15' 30' 60' 120'

(IN FEET)
1 inch = 30' ft.

TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

NOT A VALID ORIGINAL DOCUMENT UNLESS EMBOSSED WITH RAISED IMPRESSION OR BLUE INK SEAL.

STATE OF CONNECTICUT
WILLIAM THEODORE WHIMPLE
No. 70290
LICENSED
LAND SURVEYOR

6-4-2020
DATE

WILLIAM T. WHIMPLE
CONNECTICUT PROFESSIONAL LAND SURVEYOR #70290

No.	DESCRIPTION OF REVISION	FIELD CREW	DRAWN:	APPROVED:	DATE
1	REVISED PER CLIENT COMMENTS	N/A	R.J.K.	G.L.H.	6-4-2020

FIELD DATE 8-30-19
FIELD BOOK NO. 19-12
FIELD BOOK PG. 47
FIELD CREW J.O.
DRAWN: P.V.
REVIEWED: A.J.D.

BOUNDARY & TOPOGRAPHIC SURVEY
118 HAZARD AVENUE
PREPARED FOR BOHLER ENGINEERING
LOT 59, MAP 65
TOWN OF ENFIELD, HARTFORD COUNTY
STATE OF CONNECTICUT

CONTROL POINT ASSOCIATES, INC.
352 TURNPIKE ROAD
SOUTHBOROUGH, MA 01772
508.948.3000 - 508.948.3003 FAX
ALBANY, NY 5182175010
CHALFONT, PA 2157129800
MANHATTAN, NY 6467800411
MT LAUREL, NJ 6098572099
WARREN, NJ 9086680099

APPROVED:	DATE	SCALE	FILE NO.	DWG. NO.
W.T.W.	9-5-19	1"=30'	03-190182-00	5 OF 5

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WETLAND DELINEATION AND FUNCTIONAL EVALUATION

118 HAZARD AVENUE
ENFIELD, CONNECTICUT

Submitted To:
Bohler Engineering
16 Old Forge Road, Suite A
Rocky Hill, CT 06067

Prepared By:
Davison Environmental, LLC
Eric Davison, PWS, PSS
Michael Klein, PWS, PSS

February 28, 2020

1.0 INTRODUCTION

The applicant, Kaplan Development Group, LLC is proposing to construct an assisted living facility in the northeast portion of a 19.44± acre parcel of land at 118 Hazard Avenue, Enfield, CT. Davison Environmental, LLC soils and wetland scientists conducted site investigations on August 4, 2019 and January 15, 2020 in order to delineate the wetland boundaries, evaluate the characteristics of the wetlands and watercourses, and identify potential Project impacts to these resources.

2.0 EXISTING ENVIRONMENT

2.1 General Site Description

The Site is a nearly level, undeveloped parcel of land that lies between Hazard Avenue on the north and Middle Road on the south (see Figure 1). The southern half (more or less) is currently in agriculture, and the northern portion is wooded (see Figure 2). Examination of historical aerial photographs indicates the entire site was used for row crops in the past. The site grades downward slightly to the northwest toward Hazard Avenue. A system of ditches was apparently constructed to facilitate drainage in that direction, with flows eventually directed toward Freshwater Brook. Site photographs are provided in Appendix A.

2.2 Surficial Geology and Watershed

The Site's surficial geology is comprised of sands overlying fines (glacial-fluvial derived soil types). The Site lies within the Freshwater Brook subregional drainage basin (#4003).

2.3 Wetland Description

Davison Environmental, LLC soil scientists delineated the Site wetlands on August 14, 2019 and January 15, 2020. The Wetland Delineation Report is provided in Appendix B. The delineated wetlands generally lie in the north-central portion of the site and as noted above, generally drain slowly to the north and northwest. There are no defined watercourses at the site. Flows enter a a ditch that leads to culvert in Hazard Avenue. On-site, the wetland is seasonally saturated and characterized by scrub-shrub and forested cover types. It has been subject to historic disturbance associated with the row crop agriculture.

2.4 Soil Types

Digitally available updated soil survey information was obtained from the Natural Resources Conservation Service and generally confirmed during the field investigation. Soil classifications present on the property are as follows:

<u>Wetland Soils</u> - Wetland soils on the site consist of the Walpole series, The Walpole series consists of very deep, poorly drained sandy soils formed in water-sorted glacial outwash and stratified drift. They are nearly level to gently sloping soils in low-lying positions on terraces and plains. Walpole soils have a water table within 1' of the soil surface much of the year. Walpole soils are regulated inland wetland soils.

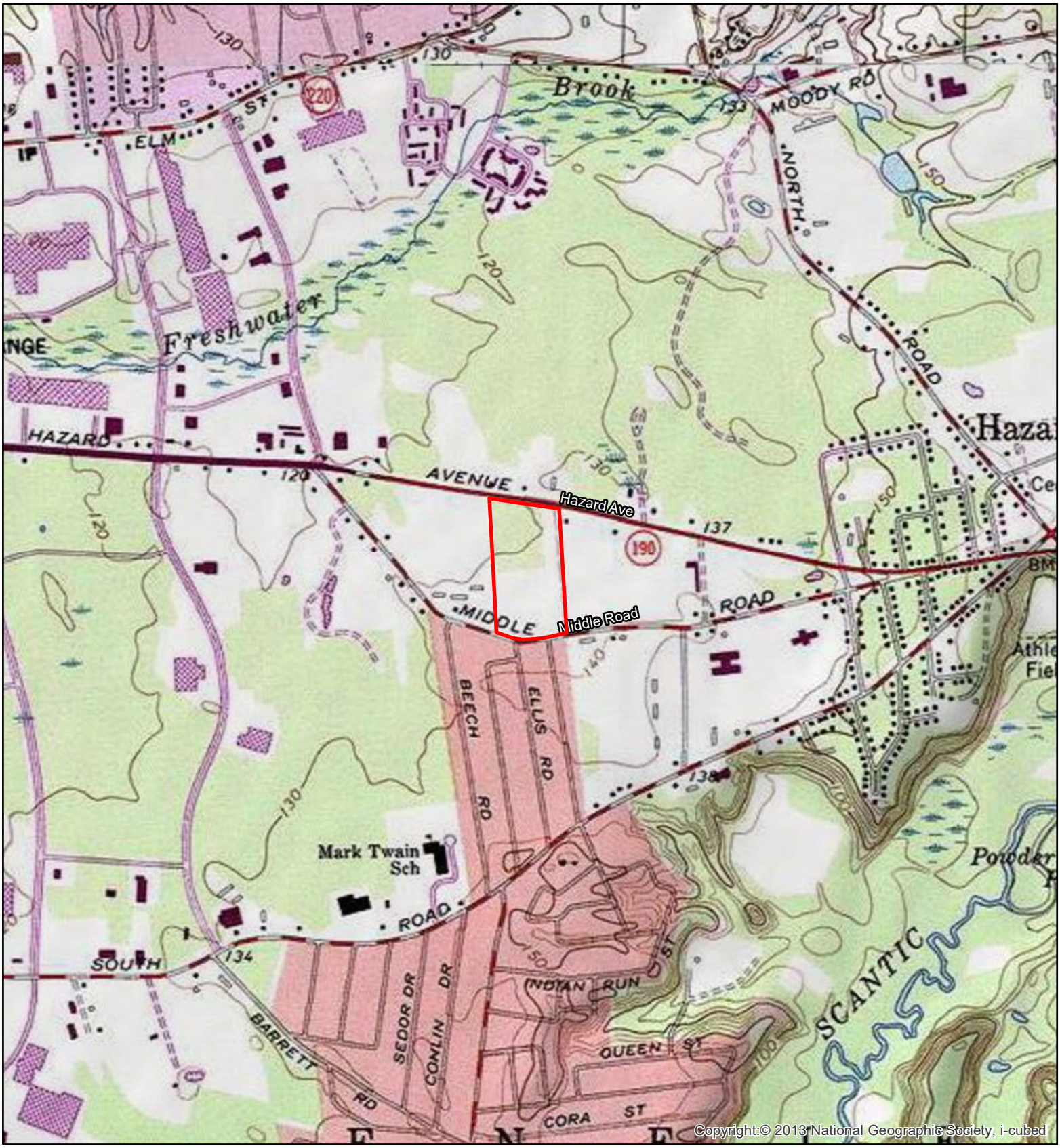

FIGURE 1
Topographic Map
118 Hazard Ave
Enfield, CT

Site Boundary (approx)

Map Description: USGS topographic map showing parcel boundary. Parcel data taken from CT DEEP GIS data. This map is intended for general planning purposes only.

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Davison Environmental, LLC
10 Maple Street
Chester, CT
www.davisonenvironmental.com

FIGURE 2
Aerial Map
118 Hazard Ave
Enfield, CT

Site Boundary (approx)

Map Description: 2019 aerial photograph (source CT ECO) showing parcel boundary. Parcel data taken from CT DEEP GIS data. This map is intended for general planning purposes only.

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Non-Wetland Soils - The non-wetland soils were not examined in detail, except as was necessary to determine the wetland boundary. Non-wetland soils consist of Ninigret and Tisbury soils, Haven and Enfield soils, and Windsor loamy sand.

The Ninigret and Tisbury map unit contains two soil series that are intermingled in a complex pattern on the landscape that is not practical or necessary to separate. The Ninigret series consists of very deep, moderately well drained soils formed in loamy over sandy and gravelly glacial outwash. They are nearly level to strongly sloping soils on glaciofluvial landforms, typically in slight depressions and broad drainageways. The soil has a seasonal high water table. The Tisbury series consists of very deep, moderately well drained loamy soils formed in silty eolian deposits overlying outwash. They are nearly level and gently sloping soils on outwash plains and terraces, typically in slight depressions and broad drainageways. The soil has a seasonal high water table at a depth of about 18-42".

The Haven and Enfield map unit contains two soil series that are intermingled in a complex pattern on the landscape that is not practical or necessary to separate. Haven soils are nearly level to moderately sloping soils of glacial outwash plains, valley trains and water-sorted morainic deposits. The soil profile consists of 18 to 36 inches of water-sorted loamy material low in gravel over stratified gravel and sand. The Enfield series consists of very deep, well drained loamy soils formed in silty mantled glacial outwash. They are nearly level to sloping soils on outwash plains and terraces. Slopes range from 0 to 15 percent but are generally less than 8 percent. The soils formed in a silty mantle over stratified sandy and gravelly fluvial materials derived from a variety of acid rocks.

The Windsor series consists of very deep, excessively drained soils formed in sandy glacial outwash. They are nearly level to very steep soils on glaciofluvial landforms.

Although not mapped separately, the on-site investigations identified and area that would be classified as Udorthents. This is a miscellaneous land type used to denote moderately well to excessively drained earthen material which has been so disturbed by cutting, filling, or grading that the original soil profile can no longer be discerned (see photo 2).

2.5 Rare Species Habitat

Based on a review of the most recently updated (January 2020) Connecticut Department of Energy and Environmental Protection Natural Diversity Database mapping, no State-listed species or critical habitats are located on, or in close proximity to the Site.

3.0 WETLAND FUNCTIONS AND VALUES

3.1 Wetland Functions and Values

The functions and values of the wetland and watercourse which would be subject to filling or enhancement are summarized in Table 1 and discussed in Sections 4.2 and 4.3. The *Highway Methodology* recognizes 13 separate wetland functions and values, including: groundwater recharge/discharge, floodwater storage, fish and shellfish habitat, sediment/toxicant/pathogen retention, nutrient removal/retention/transformation, production export, sediment/shoreline

stabilization, wetland wildlife habitat, recreational value, educational/scientific value, uniqueness, visual/aesthetic quality and threatened and endangered species habitat.

The degree to which a wetland provides each of these functions is determined by one or more of the following factors: landscape position, substrate, hydrology, vegetation, history of disturbance, and size. Each wetland may provide one or more of the listed functions at significant levels. The determining factors that affect the level of function provided by a wetland can often be broken into two categories. The effectiveness of a wetland to provide a specified function is generally dependent on factors within the wetland whereas the opportunity to provide a function is often influenced by the wetland's position in the landscape as well as adjacent land uses. For example, a depressed wetland with a restricted outlet may be considered highly effective in trapping sediment due to the long residence time of runoff water passing through the system. If this wetland is located in gently sloping woodland, however, there is no significant source of sediment in the runoff therefore the wetland is considered to have a small opportunity of providing this function.

The functions and values potentially provided also vary depending on the ecological system present in the wetland. At this site, most of the flagged area is a seasonally saturated, deciduous forested wetland, typically classified in southern New England as a red maple swamp (see photos 1 & 3). This plant community has multiple strata, dominated by trees 20' or taller. At the project site, the trees are typically red maple, pin oak 8-12" in diameter at breast height (dbh) with scattered specimen trees 18-24" dbh. The understory was relatively open, with spicebush and silky dogwood common and some Japanese barberry present. Persistent herbaceous species included cinnamon fern, evergreen Woodfern, sensitive fern sedges, club moss, and sphagnum moss.

Table 1: Summary of Wetland Functions and Values

Wetland Functions and Values	Groundwater Recharge/Discharge	Sediment/Shoreline Stabilization	Floodflow Alteration	Fish & Shellfish Habitat	Sediment/Toxicant/ Pathogen Retention	Nutrient Removal/Attenuation	Production Export	Wildlife Habitat	Recreation	Educational/Scientific Value	Uniqueness/Heritage	Visual Quality/Aesthetics	Listed Species Habitat
Onsite Wetland	P	S	P	N/A	P	P	S	*	U	U	U	U	U

Suitability
P = principal function
S = secondary function
U = function unlikely to be provided at a significant level
N/A = not applicable

3.2 Functions and Values of Onsite Wetland

A brief description of the on-site wetland's principal functions and values is provided below.

Groundwater Recharge / Discharge functions are provided at a principal level. The wetland is a low-gradient system underlain by glacial-fluvial derived soils which promote groundwater recharge (effectiveness). Some groundwater is also discharged and conveyed to the downgradient watercourse (off-site) via diffuse surficial flows.

Floodflow Alteration functions are provided at a principal level. This wetland area is a low-gradient system (effectiveness) that exists in a low-lying area and captures and detains stormwater runoff from surrounding uplands (opportunity), which includes actively farmed areas.

Sediment/Toxicant/Pathogen Retention and Nutrient Removal/Attenuation functions are provided at a principal level. This wetland area exists in a low-lying area and captures and detains stormwater runoff from surrounding uplands, which includes farmed areas (which provides an opportunity to promote this function). This wetland is low gradient and adequately vegetated to promote pollutant attenuation.

Wildlife Habitat function is potentially provided at a principal level due the presence of potential vernal pools. However, this cannot be determined at this time, but requires additional surveys be conducted from March through June. During our initial field investigations in August 2019, we identified portions of the wetland that were enclosed depressions that exhibited the morphological characteristics of vernal pools. During our January 2020 work, some of these localized depressions were ponded to a depth of 6-18" and therefore possess the hydrological characteristics of vernal pools (see photo 4). In order to accurately assess the *wildlife function* of the wetland system, these additional investigations are required to conduct egg mass surveys for vernal pool indicator amphibians and determine if/where amphibian breeding is occurring.

4.0 REGULATED ACTIVITIES

The proposed assisted living facility has been located in the northeast portion of the site, in an area that has been disturbed by deposition of earthen materials. However due to the needs of the Project and the location and proximity of surrounding wetland and watercourse resources, some activities are proposed in Site wetlands and their associated regulated upland review areas. Approximately 4878 square feet (±0.11 acres) of permanent wetland impact (filling) is required to accommodate the site driveway and a very small portion of the building. Approximately 112,733 square feet (±2.59 acres) of additional activity is required in the upland review area, associated with the access driveway, stormwater management facilities, grading and landscaping. The amount of work within regulated areas has been minimized by the use of a retaining wall.

5.0 RECOMMENDATIONS

5.1 Impact Assessment

Evaluation of the ecological impacts of the proposed work at the site requires additional biological surveys in late winter and early spring to determine if any of the depressions

embedded in the wetlands support breeding populations of vernal pool indicator amphibians, such as wood frog (*lithobates sylvaticus*) and mole salamanders.

5.2 Mitigation

As noted above, the project requires filling of approximately 4,878 square feet (±0.11 acres) of the wetland along its eastern edge. Typically, permanent wetland losses such as these are mitigated by construction of compensatory wetlands. The project site is generally favorable for compensatory mitigation due to the presence of soils that typically have a seasonal high-water table within the upper 2-3 feet and that do not support mature significant vegetation types. Development of detailed plans and specifications requires additional subsurface investigations to verify the depth and thickness of the various soil horizons and the actual location of the seasonal high-water table. Such work also can be conducted in the late winter/spring time frame. Based on these results, we can develop grading and planting recommendations, a construction sequence, and monitoring plan.

6.0 REFERENCES

Connecticut Environmental Conditions Online (CTECO) (http://www.cteco.uconn.edu/)

Dowhan, J. and R. J. Craig. 1976. Rare and Endangered Species of Connecticut and Their Habitats. State Geological and Natural History Survey of Connecticut.

Mitsch, W.J. and Gosselink, J.G. 2007. Wetlands, fourth edition. John Wiley and Sons, Inc.

U.S. Army Corp of Engineers. 1995. The Highway Methodology Workbook – Wetland Functions and Values: A Descriptive Approach.

APPENDIX A - WETLAND PHOTOS, TAKEN JANUARY 31, 2020

Photo 1: Red Maple Swamp at site; view to northwest towards Hazard Avenue.

Photo 2: Edge of disturbed area with historic fill slope; east side of wetland.

Photo 3: Red Maple Swamp looking north; note overall saturated wetland condition.

Photo 4: Example of potential vernal pool with seasonally flooded hydrology near hazard Avenue.

APPENDIX B - WETLAND DELINEATION REPORT

DAVISON ENVIRONMENTAL

10 Maple Street
Chester, CT 06412
860-803-0938
www.davisonenvironmental.com

Biodiversity Studies • Wetland Delineation & Assessment • Habitat Management • GIS Mapping • Permitting • Forestry

WETLANDS / WATERCOURSES DELINEATION REPORT

Date of Work: *8/4/2019& 1/15/2020*

Project Location: *118 Hazard Ave., Enfield, CT*

Client:
Jeff Bord
Bohler Engineering
16 Old Forge Rd
Rocky Hill, CT 06067

IDENTIFICATION OF WETLANDS AND WATERCOURSES RESOURCES

Wetlands and watercourses present on property? Yes ☒ No ☐

Wetlands:		Watercourses:		Identification Method:	
Inland Wetlands	☒	Perennial Streams	☐	Auger and Spade	☒
Tidal Wetlands	☐	Intermittent Watercourses	☐	Backhoe Pits	☐

Numbering Sequences:

1-13	
14-154	
1X-14X	
15X-20X	

Wetland Plant Communities Present:

Forest ☒
Sapling/Shrub ☒
Wet Meadow ☐
Marsh ☐
Pond ☐

Definitions and methodology for identification of state regulated wetlands & watercourses

Wetlands and watercourses are regulated in the State of Connecticut General Statutes, Chapter 440, sections 22a-28 to 22a-45. The Statutes are divided into the Inland Wetlands and Watercourses Act (sections 22a-36 to 22a-45) and the Tidal Wetlands Act (sections 22a-28 to 22a-35). Inland Wetlands "means land, including submerged land, not regulated pursuant to sections 22a-28 to 22a-35, inclusive, which consists of any of the soil types designated as poorly drained, very poorly drained, alluvial, and floodplain by the National Cooperative Soils Survey, as may be amended from time to time, of the National Resources Conservation Service (NRCS) of the United States Department of Agriculture" section 22a-38(15). Watercourses "means rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent, public or private which are contained within, flow through or border upon this state or any portion thereof, not regulated pursuant to sections 22a-28 to 22a-35, inclusive. Intermittent watercourses shall be delineated by a defined permanent channel and bank and the occurrence of two or more of the following characteristics: (A) Evidence of scour or deposits of recent alluvium or detritus, (B) the presence of standing or flowing water for a duration longer than a particular storm incident, and (C) the presence of hydrophytic vegetation" section 22a-38(16). Tidal Wetlands are defined as "those areas which border on or lie beneath tidal waters, such as, but not limited to banks, bogs, salt marsh, swamps, meadows, flats, or other low lands subject to tidal action, including those areas now or formerly connected to tidal waters, and whose surface is at or below an elevation of one foot above local extreme high water; and upon which may grow or be capable of growing some, but not necessarily all of the following" (includes plant list) section 22a-29(2).

WETLAND SOIL TYPES

Wetland soils on the site consist of the Walpole series, The Walpole series consists of very deep, poorly drained sandy soils formed in water-sorted glacial outwash and stratified drift. They are nearly level to gently sloping soils in low-lying positions on terraces and plains. Walpole soils have a water table within 1' of the soil surface much of the year. Walpole soils are regulated inland wetland soils.

NON-WETLAND SOILS

The non-wetland soils were not examined in detail, except as was necessary to determine the wetland boundary. Non-wetland soils consist of Ninigret and Tisbury soils, Haven and Enfield soils, and Windsor loamy sand.

The Ninigret and Tisbury map unit contains two soil series that are intermingled in a complex pattern on the landscape that is not practical or necessary to separate. The Ninigret series consists of very deep, moderately well drained soils formed in loamy over sandy and gravelly glacial outwash. They are nearly level to strongly sloping soils on glaciofluvial landforms, typically in slight depressions and broad drainageways. The soil has a seasonal high water table. The Tisbury series consists of very deep, moderately well drained loamy soils formed in silty eolian deposits overlying outwash. They are nearly level and gently sloping soils on outwash plains and terraces, typically in slight depressions and broad drainageways. The soil has a seasonal high water table at a depth of about 18-42".

The Haven and Enfield map unit contains two soil series that are intermingled in a complex pattern on the landscape that is not practical or necessary to separate. Haven soils are nearly level to moderately sloping soils of glacial outwash plains, valley trains and water-sorted morainic deposits. The soil profile consists of 18 to 36 inches of water-sorted loamy material low in gravel over stratified gravel and sand. The Enfield series consists of very deep, well drained loamy soils formed in silty mantled glacial outwash. They are nearly level to sloping soils on outwash plains and terraces. Slopes range from 0 to 15 percent, but are generally less than 8 percent. The soils formed in a silty mantle over stratified sandy and gravelly fluvial materials derived from a variety of acid rocks.

The Windsor series consists of very deep, excessively drained soils formed in sandy glacial outwash. They are nearly level to very steep soils on glaciofluvial landforms.

Although not mapped separately, the on-site investigations identified and area that would be classified as Udorthents. This is a miscellaneous land type used to denote moderately well to excessively drained earthen material which has been so disturbed by cutting, filling, or grading that the original soil profile can no longer be discerned.

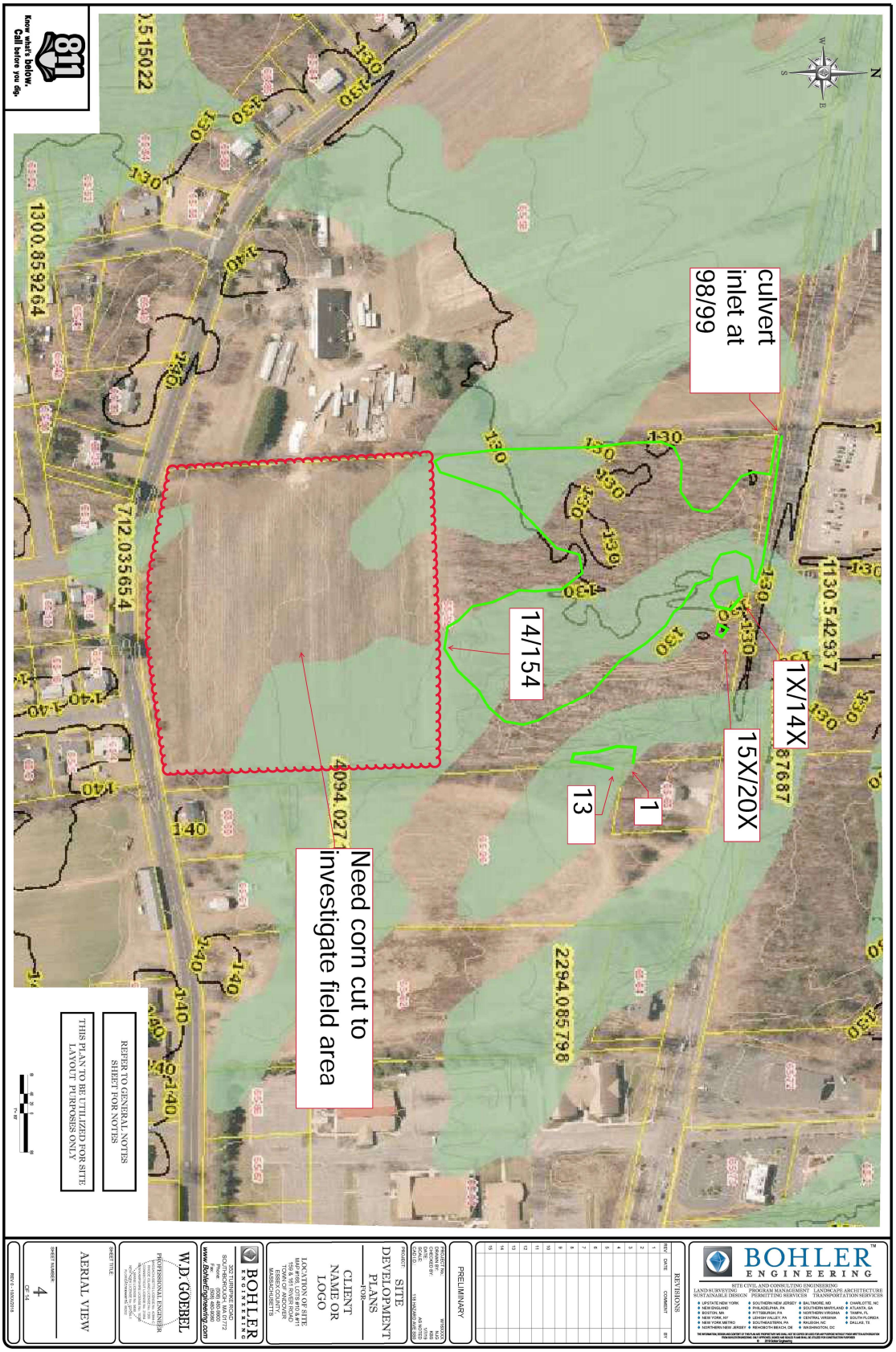
NOTES:

Wetlands were delineated in the wooded, northern portion on August 4, 2019. An additional soils investigation was conducted on January 15, 2020, in a 50'-75' wide strip running north south along the eastern property line, to assess the feasibility of providing access to the south. No additional wetland soils were identified during the January, 2020 field work.

Eric Davison
Certified Professional Wetland Scientist
Registered Soil Scientist

Attachment: Wetland Sketch Map

WETLAND SKETCH MAP



WETLAND FUNCTIONS & VALUES ASSESMENT and VERNAL POOL SURVEY RESULTS

Proposed "All American Assisted Living Facility" Development Project
118 Hazard Avenue
Enfield, Connecticut

Submitted To:

Jeff Bord, P.E.
Bohler Engineering
16 Old Forge Road, Suite A
Rocky Hill, CT 06067

Prepared By:

Davison Environmental, LLC
Eric Davison, Wildlife Biologist, PWS, PSS
Michael Klein, PWS, PSS

June 5, 2020

1.0 INTRODUCTION

The subject property totals 19.44± acres, located at 118 Hazard Avenue, Enfield, CT ("the site" hereinafter). Davison Environmental, LLC Biologist and Soil/Wetland scientist Eric Davison and Soil/Wetland Scientist Michael Klein conducted site investigations on August 4, 2019, January 15, March 12th and 26th, May 1st and June 3, 2020. The purpose of those visits was to delineate the wetland boundaries, evaluate the characteristics of the wetlands and watercourses in order to assess their functions and values and survey the subject wetlands for the presence of vernal pools.

2.0 EXISTING ENVIRONMENT

2.1 General Site Description

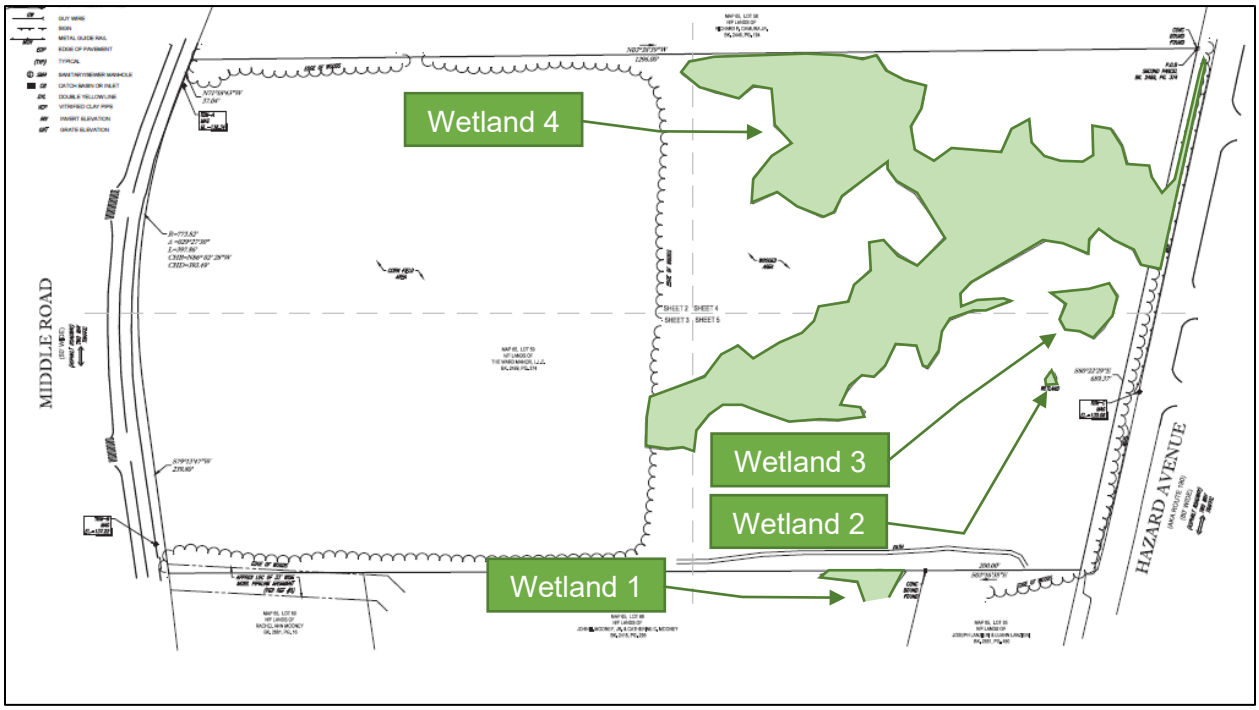
The Site is a nearly level, undeveloped parcel of land that lies between Hazard Avenue on the north and Middle Road on the south (see Figure 1). The southern half (more or less) is currently in agriculture (cornfield), and the northern portion is forested (see Figure 2). Examination of historical aerial photographs indicates ongoing agriculture, removal of forested and subsequent reforestation (northern portions of the site) and historic fill deposition (northeast corner of the site). The site grades downward slightly to the northwest toward Hazard Avenue. Site photographs are provided in Appendix A.

2.2 Surficial Geology and Watershed

The Site's is situated within former Glacial Lake Hitchcock. Surficial geology is comprised of sands overlying fines (glacial-fluvial derived soil types). The Site lies within the Freshwater Brook subregional drainage basin (#4003). Freshwater Brook lies approximately 2,400 feet to the northwest of the site (at its closest point).

2.3 Wetland Description

Davison Environmental, LLC soil scientists delineated the Site wetlands on August 14, 2019 and January 15, 2020. Four wetlands occur on the Site, referred to hereinafter as Wetlands 1 through 4. All wetlands are isolated on the landscape, with surface water connection between them. There are no intermittent or perennial watercourses present on the site. The graphic below illustrates the delineated wetland boundary with the wetland numbers indicated:



Wetland 1

Wetland 1 is a small isolated wetland that is located primarily offsite. The wetland is bordered on the west side by the farm road that runs south to the cornfield. The western edge of the wetland skirts the northeastern property boundary. The wetland hydrology is best characterized as "temporarily flooded". Temporarily flooded hydrology refers to wetlands that are flooded for brief periods during the growing season, but water table is otherwise well below surface.

The wetland cover type is forested. The tree canopy consists of red maple (*Acer rubrum*), American elm (*Ulmus americana*), black gum (*Nyssa sylvatica*) and pin oak (*Quercus palustris*). The shrub and ground cover layer are dominated by winterberry (*Ilex verticillata*), cinnamon fern (*Osmunda cinnamomea*), sensitive fern (*Onoclea sensibilis*), royal fern (*Osmunda regalis*) and Virginia creeper (*Parthenocissus quinquefolia*).

Wetland 2

Wetland 2 is a very small isolated wetland located between Wetland 3 and Wetland 1. The wetland totals 134 sq ft. It is a concentric depression embedded within an upland forest. The hydrology is temporarily flooded. The wetland basin is largely unvegetated. The wetland edge is vegetated with red maple trees, skunk cabbage (*Symplocarpus foetidus*) and upland hardwood trees bordering the wetland.

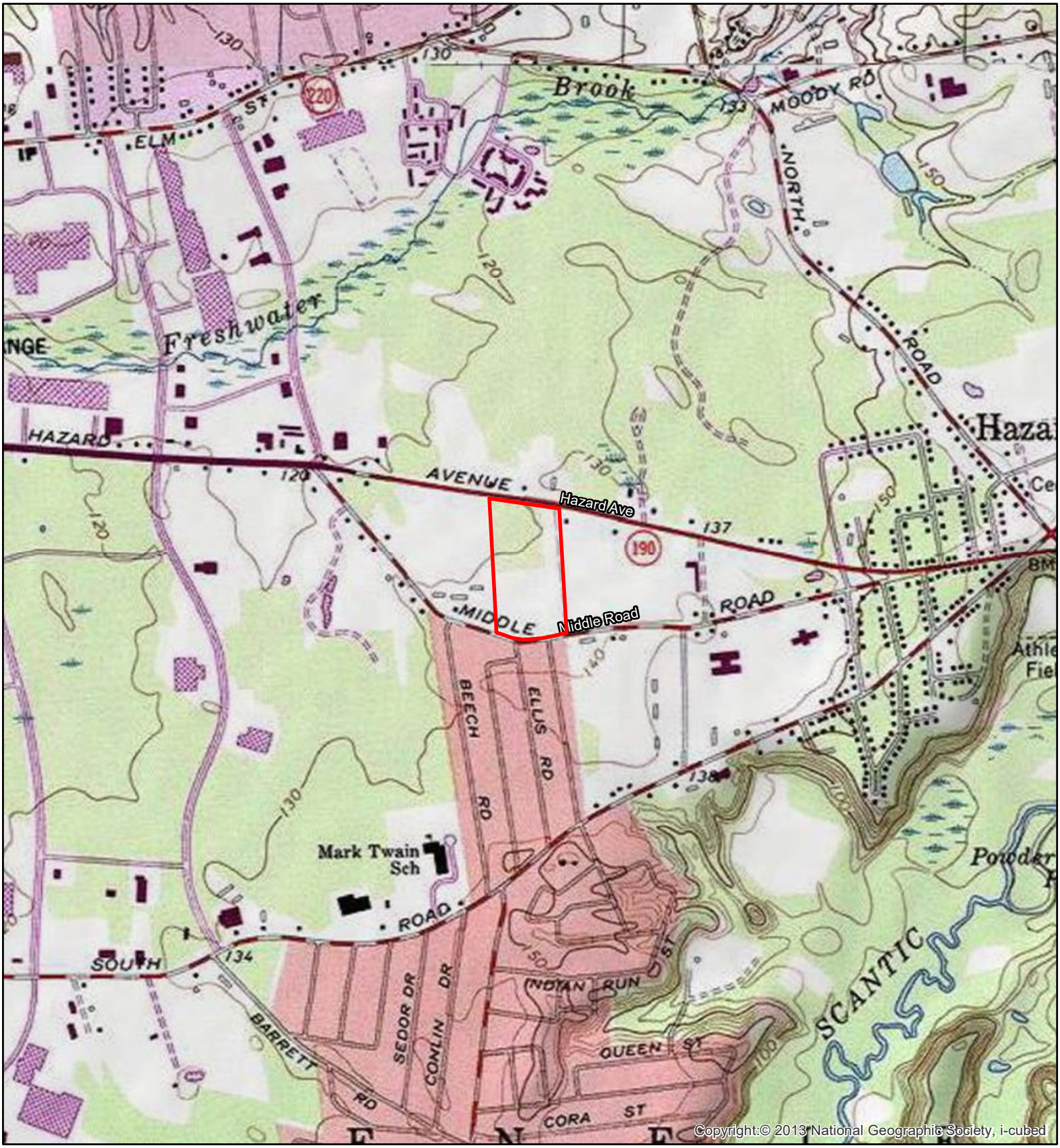


FIGURE 1
Topographic Map
118 Hazard Ave
Enfield, CT

Site Boundary (approx)

Map Description: USGS topographic map showing parcel boundary. Parcel data taken from CT DEEP GIS data. This map is intended for general planning purposes only.

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Davison Environmental, LLC
10 Maple Street
Chester, CT
www.davisonenvironmental.com

FIGURE 2
Aerial Map
118 Hazard Ave
Enfield, CT

Site Boundary (approx)

Map Description: 2019 aerial photograph (source CT ECO) showing parcel boundary. Parcel data taken from CT DEEP GIS data. This map is intended for general planning purposes only.

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Wetland 3

Wetland 3 is an isolated forested wetland with a seasonally flooded hydrology. Seasonally flooded hydrology refers to wetlands that are flooded for extended periods during the growing season, but usually no surface water by the end of the growing season. Dominant wetland vegetation consists of red maple and swamp white oak in the tree canopy, highbush blueberry and winterberry in the shrub layer, and cinnamon fern and royal fern in the herbaceous layer.

Wetland 4

Wetland 4 consists of a large forested wetland that occupies the northwest corner of the site. The wetland receives road runoff via a ditch from Hazard Avenue that discharges at the northwest corner of the wetland. It also receives runoff from the agricultural lands to the west and south. At both locations, thick filamentous algae was present, and trash was present in the runoff discharging from Hazard Avenue.

Wetland hydrology ranges from saturated to seasonally flooded. Vegetation consists of: red maple, swamp white oak, pin oak, American elm and black gum in the tree canopy; spicebush, highbush blueberry, arrowwood and winterberry in the shrub layer; and cinnamon fern, sensitive fern, Virginia creeper, skunk cabbage, jack-in-the-pulpit (*Arisaema triphyllum*) and royal fern in the herbaceous layer.

The southern edge of the wetland extends slightly into the existing cornfield. This area consists of dense herbaceous cover (non-forested).

2.4 Soil Types

Digitally available updated soil survey information was obtained from the Natural Resources Conservation Service and generally confirmed during the field investigation. Soil classifications present on the property are as follows:

Wetland Soils - Wetland soils on the site consist of the Walpole series, The Walpole series consists of very deep, poorly drained sandy soils formed in water-sorted glacial outwash and stratified drift. They are nearly level to gently sloping soils in low-lying positions on terraces and plains. Walpole soils have a water table within 1' of the soil surface much of the year. Walpole soils are regulated inland wetland soils.

Non-Wetland Soils - The non-wetland soils were not examined in detail, except as was necessary to determine the wetland boundary. Non-wetland soils consist of Ninigret and Tisbury soils, Haven and Enfield soils, and Windsor loamy sand.

The Ninigret and Tisbury map unit contains two soil series that are intermingled in a complex pattern on the landscape that is not practical or necessary to separate. The Ninigret series consists of very deep, moderately well drained soils formed in loamy over sandy and gravelly glacial outwash. They are nearly level to strongly sloping soils on glaciofluvial landforms, typically in slight depressions and broad drainageways. The soil has a seasonal high water table. The Tisbury series consists of very deep, moderately well drained loamy soils formed in silty eolian deposits overlying outwash. They are nearly level and gently sloping soils on outwash plains and terraces, typically in slight depressions and broad drainageways. The soil has a seasonal high water table at a depth of about 18-42".

The Haven and Enfield map unit contains two soil series that are intermingled in a complex pattern on the landscape that is not practical or necessary to separate. Haven soils are nearly level to moderately sloping soils of glacial outwash plains, valley trains and water-sorted morainic deposits. The soil profile consists of 18 to 36 inches of water-sorted loamy material low in gravel over stratified gravel and sand. The Enfield series consists of very deep, well drained loamy soils formed in silty mantled glacial outwash. They are nearly level to sloping soils on outwash plains and terraces. The soils formed in a silty mantle over stratified sandy and gravelly fluvial materials derived from a variety of acid rocks.

The Windsor series consists of very deep, excessively drained soils formed in sandy glacial outwash. They are nearly level to very steep soils on glaciofluvial landforms.

Although not mapped separately, the on-site investigations identified and area that would be classified as Udorthents. This is a miscellaneous land type used to denote moderately well to excessively drained earthen material which has been so disturbed by cutting, filling, or grading that the original soil profile can no longer be discerned.

2.5 Upland Habitats

Upland (non-wetland) habitats consist of mixed hardwood forest along with agricultural land (cornfield). The uplands located between Wetlands 1 and 2 consists of deposited earthen fill along with piles of bedrock (arkose sandstone). The forest located atop these historic fill piles is younger in age that the surrounding undisturbed forest.

The dominant tree species within the forested areas of the site include sugar maple (*Acer saccharum*), red maple, red oak (*Quercus rubra*), black cherry (*Prunus serotina*), black locust (*Robinia pseudoacacia*), mockernut hickory (*Carya tomentosa*), gray birch (*Betula populifolia*), black birch (*Betula lenta*), poplar (*Populus sp.*) and scattered white pine (*Pinus strobus*). The

shrub layer ranges from dense to relatively open, and consists of invasive non-native species including multiflora rose (*Rosa multiflora*), autumn olive (*Elaeagnus umbellata*) and bush honeysuckle (*Lonicera morrowii*), along with native species including highbush and lowbush blueberry. The understory consists of poison ivy (*Toxicodendron radicans*), club mosses, cinnamon fern, Canada mayflower (*Maianthemum canadense*), Virginia creeper, and ornamental myrtle. Dense invasive Asiatic bittersweet (*Celastrus orbiculatus*) is also present.

2.6 Natural Diversity Database Review

Based on a review of the most recently updated (December 2019) Connecticut Department of Energy and Environmental Protection Natural Diversity Database mapping, no State-listed species or critical habitats are located on, or in close proximity to the Site. The nearest cluster of species polygons is located north of the site near Freshwater Brook.

3.0 WETLAND FUNCTIONS AND VALUES

3.1 Wetland Functions and Values

The functions and values of the wetland and watercourse which would be subject to filling or enhancement are summarized in Table 1 and discussed in Sections 4.2 and 4.3. The *Highway Methodology* recognizes 13 separate wetland functions and values, including: groundwater recharge/discharge, floodwater storage, fish and shellfish habitat, sediment/toxicant/pathogen retention, nutrient removal/retention/transformation, production export, sediment/shoreline stabilization, wetland wildlife habitat, recreational value, educational/scientific value, uniqueness, visual/aesthetic quality and threatened and endangered species habitat.

The degree to which a wetland provides each of these functions is determined by one or more of the following factors: landscape position, substrate, hydrology, vegetation, history of disturbance, and size. Each wetland may provide one or more of the listed functions at significant levels. The determining factors that affect the level of function provided by a wetland can often be broken into two categories. The <u>effectiveness</u> of a wetland to provide a specified function is generally dependent on factors within the wetland whereas the <u>opportunity</u> to provide a function is often influenced by the wetland's position in the landscape as well as adjacent land uses. For example, a depressed wetland with a restricted outlet may be considered highly effective in trapping sediment due to the long residence time of runoff water passing through the system. If this wetland is located in gently sloping woodland, however, there is no significant source of sediment in the runoff therefore the wetland is considered to have a small opportunity of providing this function.

The functions and values potentially provided also vary depending on the ecological system present in the wetland. At this site, most of the wetlands are saturated, deciduous forested habitat, typically classified in southern New England as a red maple swamp. This plant community has multiple strata, dominated by trees 20' or taller. At the project site, the trees are typically red maple along with pin oak, elm and black gum averaging 10-15" in diameter at breast height (dbh) with scattered larger trees over 15" dbh. The understory was relatively open, with winterberry, highbush blueberry, spicebush and silky dogwood common. Invasive species including multiflora rose and Japanese barberry are present. Persistent herbaceous species included cinnamon fern, evergreen wood fern, sensitive fern, sedges, club moss, and sphagnum moss.

Table 1: Summary of Wetland Functions and Values

Wetland Functions and Values	Groundwater Recharge/Discharge	Sediment/Shoreline Stabilization	Floodflow Alteration	Fish & Shellfish Habitat	Sediment/Toxicant/ Pathogen Retention	Nutrient Removal/Attenuation	Production Export	Wildlife Habitat	Recreation	Educational/Scientific Value	Uniqueness/Heritage	Visual Quality/Aesthetics	Listed Species Habitat
Wetlands 1-4	P	S	P	N/A	P	P	S	S	U	U	U	U	S

Suitability
P = principal function
S = secondary function
U = function unlikely to be provided at a significant level
N/A = not applicable

3.2 Functions and Values of Onsite Wetland

A brief description of the on-site wetland's principal functions and values is provided below. The primary limited factor with respect to overall wetland function is the presence of Hazard Avenue and the historic fill deposition and disturbance within the buffer of all four wetlands, as well as the ongoing intensive agriculture within the buffer of Wetland 4.

Groundwater Recharge / Discharge functions are provided at a principal level. The wetland is a low-gradient system underlain by glacial-fluvial derived soils which promote groundwater recharge (effectiveness).

Floodflow Alteration functions are provided at a principal level. This wetland area is a low-gradient system (effectiveness) that exists in a low-lying area and captures and detains stormwater runoff from surrounding uplands (opportunity), which includes actively farmed areas.

Sediment/Toxicant/Pathogen Retention and Nutrient Removal/Attenuation functions are provided at a principal level. This wetland area exists in a low-lying area and captures and detains stormwater runoff from surrounding uplands, which includes farmed areas (which provides an opportunity to promote this function). This wetland is low gradient and adequately vegetated to promote pollutant attenuation.

4.0 VERNAL POOL SURVEYS

4.1 Vernal Pool Survey Results

Vernal pool surveys were conducted on March 12th and 26th, and May 1st. Survey methods included visual surveys to identify egg masses as well as adults, audial surveys to record breeding choruses and dipnet surveys to identify amphibian larvae.

A single vernal pool was identified within Wetland 3. The limits of the vernal pool (as defined by the spring high water mark) were field located using a Trimble GPS unit and plotted using ESRI ArcMap software. The limits of the pool lie interior to the wetland boundary, but portions of the pool's edge are identical to the wetland flag line. A single vernal pool indicator species, the wood frog (*lithobates sylvaticus*), was observed. A total of two (2) egg masses were found in the pool.

In addition to Wetland 3, areas of standing water within Wetland 4 were also investigated for egg masses, but none were found. Most of these areas were shallowly ponded and did not retain water for throughout March. Wetland 2 had not standing water during early March when egg mass deposition occurred.

No other indicator species were observed. Other species observed included spring peeper (*Pseudacris crucifer*), gray treefrog (*Hyla versicolor*) and green frog (*Rana clamitans*). These observations consisted of adults, observed or heard chorusing. Invertebrate species observed in the vernal pool included aquatic worms, (Class: Oligochaeta), mosquito larvae and isopods.

4.2 Vernal Pool Habitat Evaluation

In order to evaluate potential impacts to this vernal pool and its surrounding upland habitat, the pool was assessed using the methodology developed by Calhoun and Klemens (2002) as described in *Best Development Practices: Conserving Pool-Breeding Amphibians in Residential and Commerical Developments in the Northeastern United States* (the BDP, hereinafter). This methodology assesses vernal pool ecological significance based on two parameters:

1) The ***biological value*** of the vernal pool, and
2) The ***terrestrial habitat condition*** of the critical terrestrial habitat.

The ***biological value*** is rated is based on the presence of state-listed species and/or the abundance (based on total egg masses) and species richness of vernal pool indicator species. In this case, only one indicator species (wood frog) were present, and the number of total egg masses was low (i.e., less than 25).

The ***terrestrial habitat condition*** is assessed based on the integrity of two "management zones" surrounding the pool. These zones are referred to as the ***Vernal Pool Envelope*** (land within 100 feet of the pool's edge; "VPE") and the ***Critical Terrestrial Habitat*** (land within 100-750 feet of the pool's edge; "CTH"). The lower the level of developed land and greater extent of forested habitat within these zones, the higher the value to the vernal pool biota. Pools with 25% or less developed area in the CTH are identified as having high priority for protection.

We conducted an evaluation of the habitat condition within the VPE and CTH zones using Arcmap GIS software and 2019 aerial photography (source: CT ECO). The results of that evaluation are summarized below in Table 2 and illustrated on Figure 3.

Table 2: Vernal Pool VPE and CTH Habitat Evaluation Summary

Habitat Zone	Total Area	
Pool basin	2,283 square feet	
Vernal Pool Envelope (VPE)	50,318 square feet	
Critical Terrestrial Habitat Zone (CTH)	1,859,913 square feet	
Habitat Calculations (total %)	VPE	CTH
Forest - Functionally Unavailable	0%	27.5% (512,182sf)
Developed	11.7% (5,878sf)	11.76% (218,649sf)
Forested (wetland/upland)	88.3% (44,440sf)	26.4% (491,430sf)
Agricultural	0%	34.2% (636458sf)

Based on these factors - the number of vernal pool indicator species, their breeding productive, and the quality of the surrounding terrestrial habitat, pools are rated from 1 to 3. Tier 1 pools are the highest in value, while Tier 3 pools are the lowest value. This vernal pool meets the criteria for a Tier 3 pool. This is due to the presence of only a single indicator species, a low number of egg masses, and the highly degraded condition of the terrestrial habitat within the VPE and CTH management zones.

FIGURE 3
Vernal Pool Map
118 Hazard Ave
Enfield, CT

Site Boundary (approx)

Vernal Pool

VPE & CTH Conservation Zones

VPE-CTH Landscape Condition

Land Use

Agricultural Land

Developed

Unavailable Forest

Forested

Map Description: 2019 aerial photograph (source CT ECO) showing land use/cover types within the vernal pool conservation zones. This map is intended for general planning purposes only.

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As noted in Table 2, the total forest cover within the CTH zone is 53.9%. However, 27.5% of this forest is located on the north side of Hazard Avenue. Due to the high traffic volumes[1] on this road, this habitat is considered functionally unavailable due to the high mortality risk associated with movement across this road for adults during the breeding migration and juveniles during the dispersal period. This leaves 26.4% of the CTH as functionally available forest habitat, which is a low level of forest cover to provide adequate terrestrial habitat for vernal pool amphibians.

Agricultural land occupies 34.2% of the CTH zone. Agricultural lands are not considered non-compatible habitat like developed lands in the BDP analysis. In fact, they are tallied as undeveloped land for the purposes of the habitat evaluation calculations. This is due to the fact that while they do not provide long-term terrestrial habitat (due to a lack of vegetative cover and fossorial habitat), they can provide temporary habitat (e.g., movement corridors), particularly for highly mobile species like wood frog. Additionally, agricultural lands have the potential for future reforestation that could provide additional terrestrial habitat over time. However, in this case, the agricultural land within the CTH does not provide a movement corridor to other forested habitat patches on the landscape.

The primary and most significant factor impacting this vernal pool is its location adjacent to Hazard Avenue. The road (edge of pavement) is located within approximately 50 feet of the northern edge of the pool. The result is a fragmented habitat landscape, and impacted VPE zone that is subject to noise and light disturbance that affects migratory and dispersal activities and disrupts mating choruses.

In summary, this is an extremely low functioning vernal pool. The pool supports only a single indicator species, the wood frog. Wood frog are the most common vernal pool indicator species in the region. The breeding productivity is very low when you consider that a single female wood frog can lay more than 2 individual egg masses.

Due to the low productivity of this pool, and the degraded terrestrial habitat condition so degraded (particularly when considering the location of Hazard Avenue), the long-term viability of this pool is questionable - even if conditions on the site remain unchanged.

It should be noted that in certain landscape settings, such low productivity pools can have more significant resource value when they occur as part of a larger complex of pools that function as a

[1] The BDP Manual (page 19) identifies roadways of 5-10 cars per hour as negatively affecting vernal pools when sited within the CTH zone).

metapopulation. However, this is not the case in this situation, as this pool appears to be entirely isolated on the landscape, with no other pools located in the vicinity.

4.3 Vernal Pool Habitat Impact Assessment

As discussed in Section 4.2 above, the overall value of this vernal pool is extremely low. Given that this is an already stressed population on the brink of collapse, the development, as proposed, is likely to seal the fate of this pool. It is unlikely that this pool will retain any function due to the impacts that would occur to the vernal pool terrestrial (non-wetland) habitat.

The proposed development does not comply with the habitat protection recommendations of the BDP guidelines. Primarily, that no development should occur within the VPE zone (within 100 feet of the vernal pool). The proposed development will result in grading within 9 feet of Wetland 3, where the vernal pool boundary lies just several feet interior to the wetland at that location. Moreover, a large portion of the development lies within the VPE zone.

The most significant impact to the vernal pool is the loss of the majority of what remains of the forest surrounding the pool. The existing population, however diminished, is likely inhabiting this small remaining forest patch that is proposed for development. It should be noted that this impact is not specific to this project, but rather would be anticipated to occur should any material change occur within this small remaining forest patch, even a much smaller scale project.

Other vernal pool impacts that might occur include changes in water quantity (via watershed alterations that are may alter the wetland hydroperiod[2]), and changes in water quality including increased water temperatures. While these are not likely to adversely affect the wetland as a whole, subtle changes to water quality/quantity are more significant when considering amphibian habitat, particularly on an already stressed and degraded wood frog population. Impacts of nighttime light spillage into the vernal pool are also anticipated.

5.0 WETLAND IMPACTS & MITIGATION MEASURES

5.1 Potential Short-term Impact Recommendations

Potential short-term Project impacts to wetlands and watercourses are primarily related to sediment discharges during construction. The Soil Erosion and Sediment Control Plan (Plan Sheet C-402) developed by Bohler Engineering utilizes measures designed in accordance with the “2002 Connecticut Guidelines for Soil Erosion and Sediment Control”, CT DEEP Bulletin No.

[2] Hydroperiod refers to the depth and duration of standing water within the wetland.

34. In order to further minimize the potential for wetland impacts associated with erosion and sedimentation, the following recommendations should be considered:

1. Due to the close proximity of grading and the direct impact to Wetland 4 that will require installation of erosion control measures within the wetland, substantial diligence on the part of the contractor will be required to minimize additional impacts to wetlands resulting from construction related activities. Therefore, it is strongly recommended that regular (weekly, or more frequently) inspections of the erosion and sedimentation control measures be conducted by a 3rd party inspector whose principal focus is insuring that such measures are properly installed and maintained throughout the construction period.

2. The erosion and sedimentation control plan should consider (or allow for) alternative measures other than silt fencing for use within the wetland. Silt fencing requires trenching and burying for proper installation, and then subsequent removal. As an alternative, biodegradable coir fiber logs, or straw wattles, can be installed with minimal soil disturbance and left in place post-construction.

3. The installation of the erosion and sediment controls within the wetland disturbance area should be done in a manner that does not require additional tree removal. Measures installed should be modified in a manner that preserves trees (and other vegetation) to the maximum extent practicable.

5.2 Potential Long-term Impacts & Recommendations

Potential long-term Project impacts to wetlands and watercourses are related to loss of wetland functions and values resulting from filling and water quality degradation from stormwater discharges. The following sections provide discussion and recommendations regarding the minimization of impacts resulting from the filling of water resources and stormwater discharges.

Local wetland regulatory guidance and long-standing practice dictate a stepwise approach to wetland impacts associated with land development. That approach consists of ***avoidance*** of wetland impact firstly; ***minimization*** of wetland impacts secondly; and where avoidance and minimization cannot be achieved, ***mitigation*** of wetland impacts is proposed. While efforts have been made to minimize the direct impact to wetlands by using retaining walls to limit grading, efforts should be made to seek alternatives that further minimize total wetland loss. The loss of Wetland 2 is not deemed significant, due to its extremely small size and resulting limited overall function. However, it is recommended that alternative design measures that minimize impacts to Wetland 4 be considered. This could be accomplished through the utilization of additional upland

(non-wetland) areas located within the southern portions to accommodate aspects of the project. Should additional methods/design measures be developed to minimize direct wetland impacts, the mitigation measures discussed below in Section 6.0 would be modified accordingly.

To minimize impacts to wetland water quality from stormwater discharges, a robust stormwater management plan has been designed in compliance with Connecticut Department of Environmental Protection's guidance and recommendations contained in the 2004 Connecticut Stormwater Quality Manual.

Primary treatment practices as described in CTDEEP's 2004 Stormwater Quality Manual ("the Manual") are preferred for raw land developments. Both above ground and underground infiltration (or Subsurface Stormwater Management Systems) is proposed for on-site stormwater treatment. This treatment practice is considered an emerging and innovative technology (secondary treatment) in the Manual. Since the Manual acknowledges that advances in technology and treatment efficacies are likely following publication, the use of secondary treatment practices such as underground infiltration can be considered as stand-alone treatment devices (i.e., primary treatment practices) if they meet the performance standards of primary treatment practices. Testing of underground infiltration systems by the University of New Hampshire Stormwater Center yielded pollutant removal results similar to primary treatment practices provided that pre-treatment (e.g., isolator rows) was provided. Isolator rows are being utilized for these proposed systems. Davison Environmental assumes that infiltration system design parameters[3] would be adhered to, including infiltration rates and separation to groundwater.

6.0 MITIGATION

Through consultation with Bohler Engineering and the applicant, and based on feedback from staff and the public during the Wetland Boundary Amendment approval, we have developed two conceptual mitigation strategies as described below:

(1) agricultural conservation easement

(2) wetland creation

<u>Agricultural Easement</u>

The applicant proposed to place 8.91 acres of the existing farmland located between Middle Road and the wetland/development area into an agricultural easement, thereby providing permanent protection of the active farmland and restricting future development of this land. The easement

[3] 2004 CTDEP Stormwater Quality Manual, Infiltration Practices (11-S12)

would restrict use of this land to agricultural practices only. While this mitigation measure is not specific to wetlands, it preserves the primary societal/natural resource value of the property.

This location is ideal for agricultural protection, as it is being actively farmed, and includes land classified as both "prime farmland" (Ninigret and Tisbury soils, and Haven and Enfield soils) and "farmland soils of statewide importance" (the Windsor and Walpole soil series). Both of these soil types/designations are targeted by the State Department of Agriculture for protection.

Wetland Creation

Wetland fill is proposed at Wetlands 2 and 4. The entirety of Wetland 2 (134 sq.ft.) and 4,857sq.ft. of Wetland 4 are proposed for filling. Compensation for a loss of these wetland areas and their associated functions would be required to minimize the potential for long-term impacts to wetlands. To achieve this, the project is proposing to expand (via wetland creation) Wetland 4 at a ratio of just over 2:1 wetland creation to wetland fill. The proposed mitigation activities are intended to enhance pollutant and floodflow attenuation functions associated with this wetland.

Bohler Engineering has indicated a proposed wetland creation area totaling 10,010sq.ft (refer to Sheet EX-01). This area would be located at the southeast tip of Wetland 4 adjacent to wetland flags 14-18/152-154. The mitigation area consists of a low-lying ground adjacent to the wetland, extending into the cornfield. The area includes only a few larger trees (approx. 3 red maple and 1 red oak) along with a patch of red oak saplings. The remainder of the area is simply tall herbaceous vegetation.

Davison Environmental offers the following comments and recommendations regarding the wetland creation area:

Recommended Wetland Creation Area Construction Sequence

1. Prior to construction, deep test pits be conducted within the mitigation area to determine depth to seasonal high groundwater in order to establish the appropriate bottom elevation. Based on the hydrology of the adjacent wetland area, hydrology will likely range from permanently saturated to temporarily flooded, with some shallow surface water anticipated.
2. Monitoring of the Wetland Creation Area is recommended for three (3) growing seasons.
3. The Town of Enfield Inland Wetlands Office Director shall be notified five business days in advance of any phase of the wetland creation area construction.
4. A qualified wetland scientist responsible for this planting design shall be notified 48 hours prior to any phase of the planting to monitor implementation of the construction.
5. Invasive non-native species shall be eradicated or removed from the wetland creation area prior to the start of construction.

6. Any herbicide used for invasive eradication or control shall be approved by the project wetland scientist and applied by a licensed pesticide applicator.

7. Disposal of invasive plant material shall comply with CT DEEP guidelines. Since the most prevalent invasive species is emergent (Japanese knotweed) plant material shall be disposed of off-site by being bagged, transported securely, and incinerated.

8. Maximize the protection of native trees and shrubs at the limit of disturbance using orange construction fencing or equivalent. Existing trees within the creation area should remain if possible and be graded around to create hummock island habitat.

9. The creation area will be cleared of existing trees, shrubs, and other woody vegetation. Roots and stumps will be grubbed out and deposited outside of the creation area. The area will be excavated approximately 12 inches below final grades to allow for the placement of a wetland topsoil layer to achieve final grades.

10. The wetland creation area will be excavated and formed to the limits shown on the Project Plans (Sheet EX-01). The interior limits (bordering the existing wetland) should be demarcated/protection by installing a double row of 12” coir fiber logs to remain in place after construction. Only products with biodegradable netting should be utilized.

11. Minor modifications to this grading plan may be made in the field by the wetland scientist in response to observed subsurface hydraulic conditions in order to achieve the proper hydrology conditions for the created wetland habitat.

12. Compaction of the wetland creation area shall be minimized to the maximum extent feasible by using temporary construction matting, grading from outside of the creation area, using light equipment with turf tires, or wide track equipment. The contractor shall ensure that proper soil compaction levels (loose to friable) are maintained.

13. If compaction does occur, the compacted zone shall be tilled to refracture at least 12” of underlying natural soil.

14. Wetland topsoil consisting of a 1:1 mixture (or equal volumes) of organic and mineral materials that contains at least 12 percent organic carbon content by weight will be placed over the bottom of the creation area. Clean leaf compost or commercially available compost (well to partially decomposed) is the preferred amendment to achieve this standard, though other materials may be used if approved by the supervising wetland scientist. Materials should be uncontaminated and void of any woodchips.

15. The qualified wetland scientist may determine that dewatering is needed during the grading and planting of the creation area. If necessary, excess water will be discharged into a temporary sediment trap. The need for dewatering and any specific method for dewatering is site specific and may be modified by the Contractor to accommodate field conditions. The Contractor shall provide the means and methods of dewatering consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control.

16. Creation area plantings will take place once the above listed tasks have been completed. The species, size and quantity of the plantings will follow the constructed Wetland Creation Area Planting Schedule shown below. Note that amendments may be made at the time of construction based upon the location of groundwater.

17. Seed non-ponded emergent marsh areas with New England Wetmix (New England Wetland Plants, Inc. 413-548-8000) at a rate of 1 LB/2,500 SF

18. Seed side slopes and any disturbed surrounding areas with New England Conservation/Wildlife Mix at a rate of 1 LB/1,750 SF

19. All plantings to be spaced to provide a dense planting bed. Final plant locations shall be reviewed in the field and approved by a qualified wetland scientist.

20. The contractor hired to construct the creation area shall be responsible for the careful installation, maintenance (including watering if necessary), and establishment of the plant material in the basin area. All plants shall be guaranteed by the contractor to remain alive and healthy for a full twenty four (24) month period.

Recommended Wetland Creation Area Planting Schedule

Botanical Name	Common Name	Size	Spacing
Herbaceous Plants			
Carex comosa	Bearded sedge	2” plugs	2FT-O.C.
Schoenoplectus (Scirpus) Acutus	Hard-stem Bulrush	2” plugs	2FT-O.C.
Sparganium americanum	Burreed	2” plugs	2FT-O.C.
Carex stricta	Tussock sedge	2” plugs	2FT-O.C.
Juncus effuses	Soft rush	2” plugs	2FT-O.C.
Iris versicolor	Blue flag iris	2” plugs	2FT-O.C.
Scirpus atrovirens	Green bulrush	2” plugs	2FT-O.C.
Scirpus cyperinus	Woolgrass	2” plugs	2FT-O.C.
Pontederia cordata	Pickerelweed	2” plugs	2FT-O.C.
Sagittaria latifolia	Northern arrowhead	2” plugs	2FT-O.C.
Schoenoplectus acutus	Hard-stem bulrush	2” plugs	2FT-O.C.
Schoenoplectus tabernaemontani	Soft-stem bulrush	2” plugs	2FT-O.C.
Trees and Shrubs			
Quercus palustris	Pin Oak	4’ min.	25FT-O.C.
Quercus bicolor	Swamp White Oak	4’ min.	25FT-O.C.
Acer rubrum	Red Maple	4’ min.	25FT-O.C.
Vaccinium corymbosum	Highbush Blueberry	3’ min.	15FT-O.C.
Ilex verticillata	Winterberry	3’ min.	15FT-O.C.
Cornus amomum	Silky Dogwood	3’ min.	15FT-O.C.

1. a Minimum of 10 herbaceous species, 3 tree species, and 3 shrub species should be utilized from the planting list.

2. Plants to be provided by New England Wetland Plants, Inc. (413-548-8000), or other approved nursery. Seed non-ponded emergent marsh areas with New England Wetmix (New England Wetland Plants, Inc.) at a rate of 1 LB/2,500 SF

Monitoring

1. Monitoring of the wetland creation area will be conducted as follows. The area will be monitored for the first three growing seasons following construction. Monitoring reports will be submitted to the Town of Enfield no later than December 15 of each year. The reports will provide details on the success standards described below with the goal being that these standards are satisfied by year three. Monitoring reports shall include the percent survival of plantings, extent of herbivory and observations of vegetation development. Remedial actions recommended and/or completed will also be provided. The first year of monitoring will be the first year that this area has been through a full growing season after completion of construction and planting. For monitoring purposes, a growing season starts no later than May 31. If the success standards are not met, recommendations for additional monitoring/corrective actions will be required.

2. The wetland creation area will be assessed using the following success standards: Standard 1: At least 75% of the surface area of the mitigation area shall be established with indigenous species within two growing seasons. Standard 2: The mitigation area is properly stabilized.

7.0 REFERENCES

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Calhoun, A.J.K. and M.W. Klemens. 2002. Best Development Practices: Conserving Pool-Breeding Amphibians in Residential and Commerical Developments in the Northeastern United States. Technical Paper No. 5. Metropolitan Conservation Alliance. Wildlife Conservation Society, Bronx, New York.

APPENDIX A - WETLAND PHOTOS

Photo 1: Wetland 1 (June 2020)

Photo 2: Wetland 1 (June 2020)

Photo 3: Wetland 2 (June 2020)

Photo 4: Wetland 3 (June 2020)

Photo 5: Wetland 3 (March 2020)

Photo 6: View of wood frog (*Lithobates sylvaticus*) egg masses, Wetland 3 (March 2020)

Photo 7: Wetland 4 June 2020)

Photo 8: Wetland 4 (March 2020)

Photo 9: Wetland 4, showing flooded wetland bordering agricultural field, March 2020

Photo 10: Proposed wetland mitigation area, looking north from cornfield edge

Photo 11: view south from WF 18 of proposed mitigation area

Photo 12: Proposed mitigation area looking west from WF 153

Photo 13: view south of cornfield proposed for agricultural easement

Photo 14: Upland forest within historically disturbed area

Photo 15: historic fill slope (west edge) showing bedrock debris

CONNECTICUT FARM BUREAU

78 Beaver Road, Suite 2A, Wethersfield CT 06109-2201
860-768-1100 • Fax 860-768-1108 • www.cfba.org

May 5, 2020

Ms. Donna Corbin-Sobinski, Chairman
Enfield Inland Wetlands and Watercourses Agency
Town of Enfield
820 Enfield Street
Enfield, CT 06082

Re: IW# 604 118 Hazard Avenue – Wetlands Permit Application

Dear Chairman,

I am writing to express my concern with the above-mentioned application and the potential impact it will have on an immediately adjacent farm owned by Richard Chumra located at 38 Middle Road.

Mr. Chumra operates a full-time vegetable and diversified farm operation. His farm abuts the above-mentioned property to the west.

As land abutting working farmland converts from open space to intense development the impact to farmland becomes acute. Redirection of storm water, filling of wetlands, removal of natural vegetation, increase in impervious surface all create problems for working farmland. Wetlands and forestland naturally hold and filter water. Natural vegetation provides a buffer between the working farm and land use of a more intensive nature.

As is in this case, the farm was there first. As surrounding land is converted to residential or commercial development, the open land provided by working farmland often becomes the dumping ground for excess storm water. Clearing of natural vegetation exposes the farm to future complaints and concerns from neighboring developed properties. Noise and dust can be common occurrences in the course of any farming operation as are long working hours, the need to store equipment both inside and outside of farm buildings, and truck and vehicle traffic on and off the farm.

Many farms, including the Chumra farm, practice crop rotation. This means that during certain years fields will lay fallow to be put back in production in subsequent years. This practice helps maintain soil health and productivity. Abutting property owners cannot assume that the land will lay fallow and unproductive in perpetuity. Famers need to be assured that impact from abutting properties will not change the hydrologic characteristics of their land, reduce soil productivity or diminish the use of any of their farmland for food production.

On behalf of Mr. Chumra I ask that the Enfield Inland Wetland Agency consider the impact of this proposal on working farmland and impose the following provisions:

- The maintenance of an undisturbed 100 foot natural vegetative buffer in perpetuity along the entire length of the western boundary of this property abutting the Chumra farm.

- There will be zero run-off or diversion of water from this site towards the Chumra farm in perpetuity.

- There shall be a notation made on the final plans stating that this property abuts a working farm and working farmland.

Ideally, these types of provisions should be adopted by the Enfield Inland Wetland and Watercourse Agency any time an application comes before the Agency that abuts working farmland.

As such, the development of this property will involve the further loss of productive farmland. Connecticut cannot afford to lose any additional working farmland as a result of insufficient planning or lack of consideration for the precious amount of farmland our farmers rely on for their livelihoods and a source of local food.

Respectfully submitted,

Joan Nichols
Executive Director

Connecticut Farm Bureau Association is a non-profit member servicing organization representing nearly 2,600 Connecticut farm families.

IW# 605 – REFERENCED PLANS:

1/17 "Proposed All-American Assisted Living Facility, 118 Hazard Avenue, Enfield, Connecticut 06082"; Cover Sheet with Site Location Map, Aerial Area Plan and Drawing Sheet Index; Sheet: C-101; Scale: As Noted; Prepared by Bohler Engineering, 16 Old Forge Road, Suite A, Rocky Hill, CT 06067. Prepared for Kaplan Development Group, LLC, 100 Jericho Quadrangle, Suite 142, Jericho, NY 11753. Dated December 6, 2019. Revised to March 10, 2020.

2/17 "General Notes Sheet" – Sheet C-102; Scale: None

3/17 "Demolition Plan" – Sheet C-201; Scale: 1" = 30'

4/17 "Site Layout Plan" – Sheet C-301; Scale: 1" = 30'

5/17 "Grading and Drainage Plan" – Sheet C-401; Scale: 1" = 30'

6/17 "Soil Erosion and Sediment Control Plan" – Sheet C-402; Scale: 1" = 30'

7/17 "Soil Erosion and Sediment Control Notes and Details" – Sheet C-403; Scale: None

8/17 "Utility Plan" – Sheet C-501; Scale: 1" = 30'

9/17 "Landscape Plan" – Sheet C-601; Scale: 1" = 30'

10/17 "Landscape Notes and Details" – Sheet C-602; Scale: None

11/17 "Lighting Plan" – Sheet C-701; Scale: 1" = 30'

12/17 "Detail Sheet" – Sheet C-901; Scale: None

13/17 "Detail Sheet" – Sheet C-902; Scale: None

14/17 "Detail Sheet" – Sheet C-903; Scale: None

15/17 "Detail Sheet" – Sheet C-904; Scale: None

16/17 "Detail Sheet" – Sheet C-905; Scale: None

17/17 "Detail Sheet" – Sheet C-906; Scale: None

Boundary and Topographic Survey

1/5 "Proposed All-American Assisted Living Facility, 118 Hazard Avenue, Enfield, Connecticut 06082"; Boundary and Topographic Survey with Location Map, Legend, Notes, Abutters Information and Map References; Scale: 1" = 60'; Prepared by Bohler Engineering, 16 Old

Forge Road, Suite A, Rocky Hill, CT 06067. Prepared for Kaplan Development Group, LLC, 100 Jericho Quadrangle, Suite 142, Jericho, NY 11753. Dated September 5, 2019.

2/5 “Boundary and Topographic Survey” – Scale: 1” = 30’

3/5 “Boundary and Topographic Survey” – Scale: 1” = 30’

4/5 “Boundary and Topographic Survey” – Scale: 1” = 30’

5/5 “Boundary and Topographic Survey” – Scale: 1” = 30’

TOWN OF ENFIELD

Environmental History:

Is any portion of the property located within 500 feet of an adjoining municipality? ☐ Yes ☒ No

Name Municipalities: _____

_____

Area of wetlands located on the property: 123,072.27 Square Feet

Area of wetlands to be impacted: 4,991.73 Square Feet

Watercourses located on the property: ☐ Yes ☒ No

Name and type of watercourses: _____

_____

_____

_____

_____

Are proposed activities located within the 100-Year floodplain? ☐ Yes ☒ No

Are proposed activities located within a floodway? ☐ Yes ☒ No

Are there slopes with grades in excess of 15% located on the property? ☒ Yes ☐ No

Is any portion of the project located within a public water supply aquifer or watershed area?

☒ Yes ☐ No

Phase I: Land Records reviewed for environmental hazards? ☒ Yes ☐ No

Phase II: Environmental Hazards Identified? ☐ Yes ☒ No

If yes, please list the environmental conditions found: _____

_____

_____

_____

_____

_____

_____

_____

TOWN OF ENFIELD

Inland Wetlands & Watercourses Agency

Planning Division • 820 Enfield Street Enfield, CT 06082
Telephone: 860-253-6355 Website: www.enfield-ct.gov

Permit Application for Inland Wetlands & Watercourses Activity

Application For: ☐ Permit ☐ Extension ☐ Agent Approval ☐ Other _____
☐ Modification (Existing Permit/ Application #'s): _____

Staff Use Only			
IW #:	607	**View Permit #:**	
IWWA Regulation Section:			

PLEASE REVIEW LAND USE APPLICATION GUIDE FOR INSTRUCTIONS

Property Address: 113 NORTH MAPLE STREET **Map #:** 82 **Lot #:** 1-4
Zone(s): INDUSTRIAL - 1 **Size of Parcel:** 71.2 AC **Account #:** _____
Current Use: UNDEVELOPED
Project Name: PROPOSED AGRI-MARK DISTRIBUTION FACILITY
Summary Description: See PROJECT NARRATIVE

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2020 JUN -1 AM 11:00

Applicant's Name: WE 113 NORTH MAPLE STREET, LLC
Applicant's Address: 150 BAKER AVE EXT, CONCORD, MA 01742
Contact #: 978-287-5000 **Email:** awinstanley@winent.com
Applicant's Representative: JAMES PETROPULOS (HSI) VAL FERRO (GEA)
Representative Address: 3 CONGRESS ST, NASHUA, NH 03062
Contact #: 603-882-2057 **Email:** jpetropulos@hoyner-swanson.com
Does Applicant own the Property? ☑ Yes (Attach Copy of DEED)
☐ No (Provide Information Below)

TOWN OF ENFIELD

Owner's Name: WE 113 NORTH MAPLE STREET, LLC
Owner's Contact #: 978-287-5000
Owner's Address: 150 BAKER AVE., EXT., CONCORD, MA 01742
Owner's Email: awinstanley@winent.com

Project Information:

Septic: ☐ Yes ☑ No

Public Sewer: ☑ Yes ☐ No

Well Water: ☐ Yes ☑ No

Public Water: ☑ Yes ☐ No

Outdoor Storage: ☐ Yes ☑ No

Design District: ☐ Yes ☑ No

Do wetlands and watercourses affect this application? ☑ Yes ☐ No

Is the property within a Level A or Level B Aquifer Protection Area? ☑ Yes ☐ No

Does this application include any regulated activity in a floodplain ☐ Yes ☑ No

(If yes, you will need to also submit a Flood Hazard Development Permit application to the Planning & Zoning Commission)

What is the total lot acreage? 71.2 ACRES (TOTAL)

What is the length of the property frontage? (List by Street)
NORTH MAPLE STREET: 1575± FEET MOODY ROAD: 725± FEET

Name the abutting street(s): LEGO WAY (WEST)
WINTER WAY (SOUTH)

What are the existing land uses and zoning districts for abutting properties or across the street(s)?

North Commercial/Residential uses: I-1 Zone
East Institutional/Residential uses: R-33 Zone
South Residential use: R-33/R-44 Zones
West Commercial use: I-1 Zone

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Environmental History:

Is any portion of the property located within 500 feet of an adjoining municipality? ☐ Yes ☑ No

Name Municipalities: NONE

Area of wetlands located on the property: _____ Square Feet

Area of wetlands to be impacted: NONE Square Feet

Watercourses located on the property: ☑ Yes ☐ No

Name and type of watercourses:

DRAINAGE SWALE IN NORTHWEST CORNER OF SITE.
SEE ATTACHED SOIL SCIENTIST REPORT.

Are proposed activities located within the 100-Year floodplain? ☐ Yes ☑ No

Are proposed activities located within a floodway? ☐ Yes ☑ No

Are there slopes with grades in excess of 15% located on the property? ☐ Yes ☑ No

Is any portion of the project located within a public water supply aquifer or watershed area? ☑ Yes ☐ No

Phase I: Land Records reviewed for environmental hazards? ☑ Yes ☐ No

Phase II: Environmental Hazards Identified? ☐ Yes ☑ No

If yes, please list the environmental conditions found:

Applicant routinely conducts Phase II REPORTS AS PART OF DUE DILIGENCE.

NO ENVIRONMENTAL HAZARDS IDENTIFIED.

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The applicant understands that this application is to be considered complete only when all information and documents required by the Agency have been submitted. The undersigned warrants the truth of all statements contained herein and in all supporting documents according to the best of his/her knowledge and belief. Permission is granted to the Town of Enfield, Inland Wetlands & Watercourses Agency, and its agent(s) to walk the land, at reasonable times, and perform those tests necessary to properly review the application, both before and after a final decision has been issued.

☐ **I have reviewed and acknowledge the Land Use Application Guide for further instructions on how to complete my application.**

Applicant Signature: Adam D. Winstanley **Date:** 5/26/20

Print Name: Adam D. Winstanley

Owner's Signature: Adam D. Winstanley **Date:** 5/26/20

Print Name: Adam D. Winstanley

Subscribed and sworn to before me 26th **day of** may **, 20** 20 **.**

Pamela M. D'Ambrosio

Notary Public

PAMELA M. D'AMBROSIO
Notary Public
COMMONWEALTH OF MASSACHUSETTS
My Commission Expires:
April 1, 2022

For Office Use	
Application #:	**Date Submitted:**
DEP Form Submitted Date:	

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TOWN OF ENFIELD

Enfield Inland Wetlands and Watercourses Agency Application Checklist

	Documents Required
☑	All plans including revised plans must be submitted to the Department **25 days prior** to a Board or Commission meeting. Plans will be reviewed, circulated, and commented by appropriate Departments.
☑	An original of the completed application form and site plan and fourteen (14) full size copies of the set of site plans and any report.
☑	**Fourteen (14) copies** of 24 X 36 plans are to be submitted in complete sets- stapled and map folded. Part II of the DEEP Reporting Form completed. ELECTRONIC SUBMISSION
☑	**Four (4) copies** of all reports required are to be submitted. i.e. Drainage, stormwater, soils, etc.
☑	Application Fee
☑	If any portion of the project is located within a public water supply aquifer or watershed areas Public Act No. 06-53 of the CT G.S. requires the following: 1. Written notice including Project Notification Form (PNF) to the involved Water Company within seven (7) days of submittal of any application, petition, request, or plan to the Town of Enfield. 2. Notice to the Water Company by the applicant is to be by certified mail, return receipt requested. The PNF and Level A Aquifer Protection Area mapping can be obtained from the Town of Enfield Planning Department as well as online.
☑	Pre and post development storm water drainage calculation, with drainage area map.
☑	Report on soil types and characteristics from Professional Soil Scientist who delineated wetlands. Report shall include a minimum of one (1) field soil profile for each wetland soil type within project area. Profile shall be presented in data sheet format. As needed as mapped.
	The applicant must certify whether any portion of the property is within 500 feet of an adjoining municipality, whether streets from an adjoining municipality will be used for entering or exiting the site, whether sewer or water drainage will flow through or impact and adjoin municipality or whether water run-off will impact streets or adjoining municipal or private property within an adjoining municipality. If the project falls within any of the above mentioned definition, then a letter must be sent by certified mail to the adjoining municipality. ▪ If the project falls within any of the above mentioned definitions, then a letter must be sent by certified mail to the adjoining municipalities Inland Wetland Agency along with a copy of the application and site plan being submitted to this Agency. Evidence of submission shall be submitted to the Enfield IWWA.
☑	For proposed wetland impacts, a wetland assessment report from a soil scientist or other qualified individual.

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	Site Plan Requirements
☑	Signed and Sealed by appropriate design professional (Surveyor, Engineer, Architect, and Landscape Architect) registered in the State of Connecticut.
☑	Property boundaries, north arrow, name of project, date and type of drawing, subsequent dates of revision with description, names and addresses of engineers and surveyors (when appropriate), location map, property owner(s) and adjacent property owners.
☑	Existing and proposed topography, structures, utilities, roadways and buildings. Plan/profile sheet shall be included for roads and all off road pipelines.
☑	Soil types as mapped by the National Resource Conservation Service.
☑	Wetlands located on adjacent properties, within approximately 100-feet of subject property.
☑	Alternatives considered and rejected to be either shown on a site plan or explained in narrative form. SEE PROJECT NARRATIVE
☑	Soil and Erosion Control Measures including narrative, per 2002 CT E&S Control Guidelines at a minimum.
☑	Wetlands boundaries delineated by a Professional Soil Scientist whose signatures are required on the site plan.
☑	Limit of Upland Review Areas.
☑	Cuts and fill volumes indicating source and type of fill, destination of removed fill, expect for single-family homes or similar. SEE PROJECT NARRATIVE
☑	Limits of woody vegetation clearing.
☐	Well locations and setbacks from septic system and drainage swales.
☑	Septic system locations including reserve areas, existing and proposed grading, spot grades and setbacks from wetland areas. N/A
☑	Storm water drainage systems.
☑	All existing and proposed pipe sizes, length and inverts.
☑	Test pit and soil profile locations.
☑	Acreage of wetlands/watercourses on the site and the acreages presented separately of wetland, watercourses or upland review areas to be altered.
☑	Boundaries of 100-year floodplain or floodway as determined by FEMA. N/A

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TOWN OF ENFIELD

	Detail Sheet
☑	Erosion and sediment control details along with a sequence plan.
☑	Test pit logs.
☑	Details of all proposed site improvements (i.e. drainage structures, pipes, footing drains, curtain drains, dewatering, cross section of septic system or sewer connection, cross section of detention, retention, or sediment basins, etc.).
☑	Construction sequence specifications.
	Public Hearing (If Required)
☐	Notice to immediate abutters by certified mail not less that twenty-one **(21) days prior** to the start of the public hearing.
☐	A copy of the abutter's letter and proof of mailing notification is to be provided to the Planning Office **5 days prior** to the scheduled public hearing. (If applicable).
☐	Deadline to post public hearing sign(s) is **10 days prior** to the scheduled meeting at which the application will be discussed.
	▪ THE ENFIELD IWWA AND/OR THE PLANNING OFFICE MAY REQUEST ADDITIONAL INFORMATION DURING THE PERMIT PROCESS AS NECESSARY.
	Additional Information
	▪ The Planning Department requires an electronic submission of all documents received in CD Format or on a USB drive.
	▪ When multiple Commissions are involved the applicant must meet all conditions of approvals including final plan(s) revisions to obtain the appropriate signature of approval prior to applying to any other Land Use Commission.

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TOWN OF ENFIELD

Memorandum

To: Inland Wetlands & Watercourses Agency

From: Laurie P. Whitten, CZEO, AICP, Dir. Development Services –
Acting Inland Wetlands Agent

Date: June 12, 2020

Re: IW #607 – Application of owner WE 113 North Maple Street, LLC requesting a permit to construct a distribution facility and associated improvements within the upland review area at 113 North Maple St. Map 82/Merged lots 1,2,3 & 4 in the Industrial 1 zone

---

SITE & PROPOSAL:

The subject parcel is a 71.2 ac. parcel located on the southwest corner of Moody Road and North Maple St, with frontage on both streets. The existing conditions of the site include active tilled farmland for the eastern 2/3rds of the site, with the western 1/3rd being wooded with some pockets of wetlands. Historically, the entire site has been farmed, with parts of it mined for sand.

The proposed development is for a one story 501,500 sq.. ft. distribution facility for two tenants, and associated development inclusive of drive aisles, walkways, stormwater management features, utilities and landscaping. Two 100,000 sq. ft. building additions have also been designed into the plan, but are not anticipated to be built until and if needed.

WETLANDS:

The wetlands have been described as having been disturbed, with agriculture and pathways. Three areas of wetlands and/or watercourses occur on the site.

Wetlands Area #1 – 0.36 ac.+/- Isolated 4-6 feet deep depression located in an upland forest on the southwest corner of the site. Surface runoff from the fields seem to be the primary source of water. In 2017 when the site was investigated, there was no indication of a vernal pool, nor any standing water. Subsequently in May of 2020, a supplementary site review was conducted. It was then that the presence of wood frog tadpoles were discovered, thus indicating the presence of a vernal pool. Other new indicators of underground hydrology were also observed.

The vernal pool lies within the wetlands. Without monitoring the pool during the breeding season, it is very difficult to determine the viability of the pool. The 100' Vernal Pool Envelope is

wooded to the west and is mostly farmland to the east, where the development will occur. The pre-development 100'-750' Critical Terrestrial Habitat (CTH), is essentially cut in half with farmland and woods. The habitat and breeding areas for the wood frog would normally be in the wooded area, not the upland farmland. This pool will need to be monitored in the future to determine it's viability and quality.

The Natural Diversity Database delineates this area with a population of Eastern Box Turtle and six species of ground beetles.

Wetlands Area #2 – located just southwest of wetland area #1, this is a small palustrine linear wetlands area with an intermittent watercourse that is separated by a small 20 ft wide access road. Hydrology is fed primarily by groundwater, and some overland flow.

Wetlands Area #3 – located in the northwest corner of the site , this area is designated as a heavily disturbed watercourse fed mostly by overland flow

Overall impact will be in a portion of the uplands review area totaling 12,695 sq. ft.

DRAINAGE:

Overall the site slopes gently from the northeast to the southwest, and therefore drains in a similar direction. The stormwater plan essentially divides the site into two stormwater management areas. The stormwater report states:

"Runoff will be directed into two stormwater management areas (Stormwater Management Areas A and B) that will provide primary treatment for the post-developed condition. Each basin will accommodate roughly one-half of the runoff from the proposed building and pavement areas. The northern practice (SMA A) will be an infiltration basin that will serve as a combination treatment and flood control facility. Sediment forebays are provided at the inlets as a pre-treatment measure for contributing runoff. The southern practice (SMA B) will be a stormwater pond with a sediment forebay acting as pre-treatment. Coupled with the secondary treatment practices described above, SMA A and SMA B will form a stormwater treatment train, providing storage, infiltration (where applicable), and detention of stormwater runoff. "

The proposed stormwater management system will decrease the peak rates of runoff from pre-development flows for the 1,2,10, 25, and 100 year storms.

"In summary, the proposed stormwater management design for the Proposed AGRI-MARK Distribution Facility meets the qualitative and quantitative requirements set forth in the Town of Enfield Stormwater Regulations and CT DEEP Stormwater Quality Manual.

1. The proposed development maintains existing drainage patterns and provides qualitative treatment of stormwater runoff throughout the site by use of the various 'primary' and 'secondary' treatment measures such as an infiltration basin, stormwater pond, rain garden, recharge trenches, grass swales, sediment forebays and deep-sump catch basins. 2. Stormwater runoff generated by the proposed development will be captured through curbing, catch basins, grass swales and roof drains, and conveyed to one of two stormwater management areas (SMA A and SMA B). SMA A and SMA B are designed as combination qualitative treatment and flood control facilities. 3. The proposed stormwater management areas provide sufficient storage capacity so that the post-development peak flows leaving the site are less than or equal to the pre-development peak flows for the 1, 2, 10, 25 and 100-year storm events leaving the site to all Points of Analysis. "

EROSION & SEDIMENTATION CONTROLS:

The proposal is for a two phased plan. Short term impacts to the wetlands will be from sediment discharges from construction activities. Temporary measures to minimize such impact include standard measures such as silt fencing, silt sacks at catch basins, check dams in the stormwater basins, seeding mulching, etc. Permanent measures include landscaping, lot sweeping, sediment forebays, and stormwater management areas to allow settling of suspended solids and use of vegetation to uptake pollutants.

Staff Comments:

1. The applicant should be prepared to discuss the prudent and feasible alternatives that were considered.
2. The applicant should explain how the overall wetlands hydrologic regime will be preserved, in particular the area of the vernal pool.
3. The limit of work around the vernal pool should be expanded outward into the regulated area as much as possible. A silt cock rather than silt fencing should be utilized, particularly during breeding season. (sheet 10/22)
4. Silt fencing should be utilized to keep box turtle , frogs from construction area
5. Staff should be informed prior to when clearing will occur and meet in the field to discuss final plans for sedimentation and erosion controls.

6. The photometric plan (sheet 22/22) shows light shining into the wetlands/vernal pool area. This should be modified such that there is no light encroachment into this are. Consideration of alternative plantings may also help to minimize light pollution.
7. As the viability of the vernal pool is still in question, the applicant should prepare a monitoring plan for the next 2-3 years.
8. The applicant should also discuss plans to protect the eastern box turtle and the 6 species of ground beetles.

Inland Wetlands and Watercourse Permit
Standard Conditions of Approval

Application #, Referenced Plans:

Map 82, Lots 1,2,3,4 Proposed Agri-Mark Distribution Facility, 113 North Maple St., Enfield CT , prepared for record owner WE 113 North Maple ST, LLC, c/o Winstanley Enterprises, LLC 150 Baker Ave. Ext, Concord MA 01742;978-287-5000, www.winent.com, prepared by HIS Civil Engineers/Land Surveyors, 3 Congress St., Nashua NH 03062, 603-883-2057; 131 Middlesex Turnpike, Burlington MA 01803, 781-203 1501; dated June 1, 2020

1/22	Master Site Plan
2/22	Abuttors, Notes and Legend
3-4/22	Existing Conditions
5-6/22	Site Grading & Utility Plan
7-8/22	Site Layout Plan
9/22	Erosion Control Plan – Phase1
10/22	Erosion Control Plan – Phase 2
11-13/22	Utility Profiles
14-17/22	Detail Sheet – General Site
18/22	Detail Sheet – Erosion Controls
19-20/22	Landscape Plan
21/22	Detail Sheet – Landscaping
22/22	Photometric Plan

Regulated Area Impact Plan
Sheets 1 &2, dated May 28, 2020

Site Specific Conditions Prior to Recording the Permit on the Land Records

Prior to the Start of Construction:

1. Prior to the start of construction or, if applicable, the issuance of a building permit(s) the full-size plans as approved by the Agency (and the Planning and Zoning Commission) shall be submitted to the Inland Wetlands Agent;
2. The permittee/contractor shall schedule a pre-construction meeting (if required) with the Inland Wetlands Agent to be held no sooner than two (2) weeks before the regulated activities are to begin. The permittee shall, at that time, review with the Inland Wetlands Agent, the procedures to be taken to protect the regulated areas prior to and during construction;
3. The applicant must submit a Sediment & Erosion Control Bond in an amount to be determined by the Director of Planning and the Town Engineer. This bond can be returned to the applicant upon completion and inspection of all work to be done on the property;
4. The Inland Wetlands and Watercourses Agency or its designated Agent must be notified in writing within three (3) business days of the proposed commencement of permitted activities, and upon completion of said activities; a "business day" is a day when the Town Hall is open for business.
5. Prior to the start of construction, adequate erosion and sedimentation control measures shall be implemented, and shall be maintained throughout the entire construction phase and shall meet or exceed the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as revised, until the site has become stabilized with permanent vegetative cover.
6. The Permittee shall submit a plan noting plant type, caliper size, and number of plants to be placed in affected area.
7. The Standard Town Notes must be added to the final plans submitted to the Planning Office.

General Conditions:

8. This approval shall be valid for five (5) years from the date of approval unless otherwise revoked or specifically extended;
9. All work and all regulated activities conducted pursuant to this permit shall be consistent with these terms and conditions hereof. Any structures, excavation, fill, obstruction, encroachments or regulated activities not specifically identified and authorized herein shall constitute a violation of this permit and may result in its modification, suspension, or revocation. Upon initiation of the activities authorized herein, the permittee thereby accepts and agrees to comply with the terms and conditions hereof;
10. This approval is not transferable without the written consent of the Enfield Inland Wetlands and Watercourses Agency or its designated Agent;
11. In issuing this approval, the Agency has relied on information provided by the applicant and, if such information subsequently proves to be false, deceptive, incomplete and/or inaccurate this permit shall be modified, suspended or revoked;
12. This approval shall be made a part of all construction contracts and sub-contracts pertaining to the proposed regulated activities and shall supersede all other contract requirements;
13. The permittee shall permit the Agency, its authorized representative(s) or designee(s) to make periodic inspections at any time deemed necessary in order to assure that the activity

being performed under authority of this permit is in accordance with the terms and conditions prescribed herein;

14. No equipment or material including without limitation, fill, construction materials, or debris, shall be deposited, placed, or stored in any wetland or watercourse on or off site unless specifically authorized by this permit;
15. This approval is subject to and does not derogate any present or future property rights or other rights or powers of the Town of Enfield, and conveys no property rights or in real estate of material nor any exclusive privileges, and is further subject to any and all public and private rights and to any activity affected hereby;
16. The construction site shall be left in a stable condition at the close of each day. An adequate stockpile of erosion control materials shall be on site at all times for emergency or routine replacement and shall include materials to repair silt fences, hay bales, mulch, stone-riprap filter dikes or any other devices planned for use during construction. Additional erosion/stormwater control measures are to be installed as directed by the Inland Wetland Agency, its authorized representative(s) or designee(s) if field conditions necessitate.
17. The permittee shall immediately inform the Planning office of any problems involving wetlands or watercourses which have developed in the course of, or which are caused by, the authorized work;
18. All temporary barriers, including erosion and sedimentation controls are to be removed when the site is stabilized in suitable weather conditions. The site is considered stabilized when there is equal to or greater than 70% vegetative cover;
19. With the exception of the addition of the items stated in these conditions, this application is approved in accordance with the plans referenced above. Any changes that would potentially cause greater impact to wetlands or watercourses, such as enlargement of the area of disturbance or reorientation of building footprints, from the plans shall require the permittee to come before the Enfield Inland Wetlands and Watercourses Agency for a Determination of Permit Modification.
20. The Inland Wetlands and Watercourses Permit number shall be located on all future plans to any Town or State Agency.
21. The Wetland Permittee shall complete the permit prerequisites and file the permit on the Land Records within 365 days.

The Inland Wetlands and Watercourses permit, when issued, does not abrogate the applicant's responsibility to obtain permits that may be necessary from other agencies at the local, state or federal level prior to commencing the project.

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors

May 29, 2020
Job #5476

Ms. Lauren Whitten, AICP
Town of Enfield
Planning Department
820 Enfield Street
Enfield, CT 06082

RE: IWWA Application
Proposed AGRI-MARK Distribution Building
113 North Maple Street
Enfield, CT

Dear Ms. Whitten:

Please find enclosed plans, an IWWA application and supporting information for the above reference project. Kindly note that the original notarized application and the submittal fee check will be delivered to your office under separate cover.

The purpose of the application is to show the Regulated Area impacts resulting from the proposed building and site improvements. We are respectfully requesting, on behalf of our client, to be placed on the June 16, 2020 Inland Wetlands & Watercourse Agency agenda.

In advance we thank you for your assistance. As always, please do not hesitate to contact us if you have any questions or comments regarding this project.

Respectfully,

James N. Petropulos, P.E.
President/Principal Engineer
HAYNER/SWANSON, INC.

Inland Wetlands and Watercourses Application
Project Narrative
Proposed Agri-Mark Distribution Facility
113 North Maple Street - Enfield, CT

The subject site is 71.2 acres, all of which is zoned industrial (I-1). A lot consolidation has been filed with the Town to merge four parcels originally purchased by the Applicant. The majority of the site is undeveloped and historically been used for agricultural purposes although a former AGWAY store (97 N. Maple) has most recently been occupied by L.R Hawthorne and Sons Trucking.

The intent is to develop a one-story 501,500 square foot distribution facility that would accommodate two tenants. AGRI-MARK, a Massachusetts-based company that distributes a wide variety of dairy products throughout the United States will occupy 260,500 SF of the northern portion of the building and an undetermined Tenant 'B' would occupy the remaining 241,000 SF location in the southern portion. Building expansion of 100,000 SF is being programmed for each tenant but will not be built at this time.

The proposed building and associated site improvements have been planned to avoid direct impacts to the 68,366 SF of wetlands that occur on the site. Of the 319,052 SF of regulated area comprising the Upland Review Area (URA) on the site, 12,695 SF will be impacted as a result of the proposed project.

Site Characteristics

The property has frontage along Moody Road to the north and North Maple Street to the east. Single-family residential homes directly abut the site's southern border. Commercial and institutional uses, namely the 3M warehouse and the Jablonski Public Works Complex on Lego Way and RPS Associates (industrial air pollution control) on Moody Road abut the site to the west. The Enfield Town Annex (formerly Fermi High School) and residential properties are located across North Maple Street. Residential properties are located across Moody Road.

The entire site was cleared and farmed at one time, with approximately 60% of the site still in agriculture throughout the central portion of the site. Although the site appears flat, topography gently slopes from the North Maple Street to the west. The western portion of the site is a mix of forested uplands and wetlands, historic drainage ditches, and former agricultural lands that are currently dominated by mid- to late-successional vegetation communities (i.e., scrub-shrub/saplings).

Connecticut Wetlands and Watercourses

Connecticut jurisdictional wetlands were delineated by Mark E. Friend, PE, Soil Scientist from Meagson, Heagle & Friend on February 8 and 22, 2016. Wetland functional values were determined by Scott Egan, MS, CPSS-Wetland and Wildlife Ecologist and Dennis Lowry, Wetland Ecologist (both from AECOM) on February 8, and March 9, 2017.

On May 22, 2020 an additional site investigation was conducted by Dennis Lowry in anticipation of filing a Safe Harbor provision with the Connecticut Department of Environmental Protection Natural Diversity Database (NDDB). The wetland delineation flagging was also re-confirmed by AECOM during the site visit.

Two areas with aquic (saturated) soil moisture were found on the site and denoted as Wetland Areas 1 and 2 on the accompanying maps. Wetlands 1 and 2 are part of the same drainage feature, which is a long narrow gully dissecting an outwash plain.

Wetland 1 is an approximately 0.36-acre isolated depression located within an upland forest patch near the southwest corner of the parcel. It is a deep (4 to 6 feet) depression dominated by a forest canopy of red maple (*Acer rubrum*) and white ash (*Fraxinus americana*), with silky dogwood (*Cornus amomum*), tussock sedge (*Carex stricta*) and water smartweed (*Polygonum sp.*) in the understory. Hydrologic inputs appear to be derived primarily of surface runoff from the adjacent agricultural fields located north and east of the wetland.

During the 2017 investigations there was no surface water present in the wetland, and no water table or soil saturation noted at 20 inches depth below the ground surface. However, during AECOM's May 22nd site visit, it was determined that Wetland 1 had developed into a vernal pool in the last two years. This determination was based upon the evidence of wood frog breeding activity in the flooded portion of Wetland 1; wood frog is generally considered an obligate vernal pool breeding species.

The Natural Diversity Database was consulted during due diligence activities. The Connecticut Department of Environmental Protection's database indicated that extant populations of State Listed Species occurring within or close to the boundaries of the proposed project include the Eastern Box Turtle and six species of ground beetles. Further investigation determined that as part of the development of the LEGO Fulfillment Center in 2000, a mitigation plan for the big sand tiger beetle (*Cicindela formosa generosa)* was implemented. This species prefers open sandy habitat, primarily remnant glacial dunes that formed in association with Glacial Lake Hitchcock. Since the area of proposed development consists almost entirely of agricultural fields that have been in continuous crop production for many years, impacts to any habitat areas suitable for the listed ground beetles is not anticipated. Similarly, the primary potential Eastern Box Turtle habitat on the site is west of the proposed development area, and this area will be protected from development activities to minimize potential impacts to this species; note that CTDEEP will be directly engaged in anticipation of obtaining a General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. During consultation with NDDB it is also anticipated that the need for addressing any mitigation for sand tiger beetle habitat will be fully evaluated.

Wetland 2 is a long narrow palustrine wetland system containing a small intermittent watercourse located just west of Wetland 1 and is separated from Wetland 1 only by an approximately 20-foot wide access/farm road and waterline easement. These two wetlands may have been once connected, however based on inspection of 1934 aerial photographs the existing access road has been in place for at least 83 years. This wetland and watercourse drain west and then northwest through a series of small ponds and eventually enters into Freshwater Brook

approximately 3700 linear feet downstream. Wetland 2 is dominated by red maple in the canopy with arrowwood (*Viburnum dentatum*), winterberry (*Ilex verticillata*), cinnamon fern (*Osmunda cinnamomea*) and skunk cabbage (*Symplocarpus foetidus*) in the understory.

An additional area in the northwest corner of the site immediately east of Lego Way and south of residential development along Moody Road was also investigated. The soils appeared to have been disturbed in the past, making a confirmatory delineation difficult. While hydric soils were not evident at the time of the delineation to meet the definition of a "wetland" under the Connecticut Inland Wetlands and Watercourses Act (IWWA; CGS Sections 22a-36 through 22a-45), the area was delineated as a watercourse (**Watercourse 1**). Physical features suggest that this area may pond during times of significant rainfall or wetter times of the year. No standing water was present during any of the site visits. The area is hydrologically isolated, with no surface water connection to any other regulated wetland or watercourse.

AECOM's inspection of historic and aerial photographs confirmed that this area and adjacent uplands have been heavily disturbed over a number of years. Active farming to the edge of area is evident at least through the mid-1980's. The area is dominated by red maple and white willow (Salix alba) in the canopy, with silky dogwood, speckled alder (Alnus rugosa), tussock sedge and marsh fern (Thelypteris palustris) in the understory. Given consideration to hydrology and vegetation, this area could be classified as a wetland under US Army Corps of Engineers' (USACE) 1987 Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Regions (January 2012); however, the isolated condition of this area could render it non-jurisdictional under federal regulations.

Stormwater Management

In general, the intent of the stormwater management system is to address the qualitative and quantitative aspects of post-development runoff so that there are no downstream adverse impacts created by this project. The proposed stormwater system contains a number of elements that will collect, convey, recharge, treat and detain stormwater runoff from development areas. The proposed system will consist of a rain garden (secondary treatment - LID), recharge trenches for rooftop runoff (LID), grass swales (secondary treatment), sediment forebays (secondary treatment) and stormwater management areas (primary treatment).

Runoff will be directed into two stormwater management areas that will provide primary treatment for the post-developed condition. Each basin will accommodate roughly one-half of the runoff from the proposed building and pavement areas. The northern basin (SMA A) will be a dry-type detention area. A sediment forebay is provided at this inlet as a pretreatment measure for paved surface runoff. The southern area (SMA B) will be a constructed wetland with a sediment forebay acting as pretreatment. Coupled with the secondary treatment practices described above, the constructed basins will form a stormwater treatment train, providing storage and infiltration for stormwater runoff. The grading of the constructed wetland area (SMA B) has been designed to provide for the development of wetter conditions (shallow pools and marsh areas) in the central areas, intermittently wet fringing wet meadow areas along the peripheral areas, and border side slopes established primarily with shrub species to buffer the stormwater wetland and contribute to visual and habitat diversity. Within the constructed wetland a planting plan has been developed that will establish plant species appropriate for the anticipated hydrology

in each area of the system. The vegetation will aid in stabilizing the basin, provide additional biological attenuation of stormwater constituents, and provide both habitat and visual enhancement of the stormwater wetland area. The infiltration promoted by the "focused recharge" in the stormwater system will contribute to the subsurface groundwater system that supports the vernal pool conditions in Wetland 1.

As a component of the planting plan, a wetland seed mix is specified in the lower portions of the basins and of an erosion control mix in the remaining areas. These seed mixes are intended to provide an initial vegetative cover in the wetland area to ensure soil stabilization and non-erosive conditions. Additionally, the plant materials selected for these newly created basins will aid in stabilizing the disturbed area, provide additional biological attenuation of stormwater constituents, and provide both habitat and visual enhancement of the stormwater wetland area.

Erosion Control Measures

Best management practices and erosion and sedimentation control measures are proposed throughout the project, to ensure that the wetlands and adjacent off-site areas are protected from erosion/siltation and debris during construction of this project. These measures include silt fencing, stone check dams, erosion control matting and Siltsack controls at catch basin inlets in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control (DEP Bulletin 34).

Temporary Erosion and Sediment Control Measures

During the construction phase of the project, specific erosion and sedimentation controls have been developed into the design of the project and details of these items are included in the project plans. The erosion control notes and construction sequence were developed to limit soil loss due to erosion and are therefore directed at minimizing the degradation of water quality on and off the site. The following temporary erosion and sedimentation control devices will be implemented throughout the site:

- Seeding: Installation of temporary or permanent seeding to establish vegetative growth to minimize erosion.
- Temporary/Permanent Mulching: Placement of materials to the soil surface to reduce the potential of erosion and aid in establishing vegetative cover.
- Dust Control: Implementing dust control activities such as watering to minimize dust from exposed surfaces.
- Temporary Stockpile Areas: Stockpiling material allows for materials to be managed and protected to reduce or eliminate wind and water erosion and prevent pollution from displaced sediment.
- Temporary Sediment Basins/Traps: Small temporary ponding areas to intercept sediment laden runoff from small disturbed areas allowing settling of sediment particles from runoff.
- Silt Fencing: Temporary sediment barrier installed across or at the toes of a slope to intercept and retain small amounts of sediment from disturbed or unprotected areas.
- Temporary Stone Check Dams: Temporary stone check dams installed across swales to intercept and retain small amounts of sediment from disturbed or unprotected areas.

- Construction Entrances/Exit: A pad of stone aggregated located at points of entrance/exit to the construction site to reduce or eliminated tracking of sediment onto public roads by construction vehicles.
- Inlet Protection (Siltsack): A sediment barrier installed in and around a storm drain inlet to reduce sediment discharge into the drainage system.
- Construction Fencing: Construction-phase fencing is proposed in the vicinity of Wetland No.1 to protect that treed area and potential habitat functions. As a standard approach to protecting species such as the Eastern Box Turtle, silt fencing (or similar) will be used to minimize the movement of this state-listed species into the area of active construction. Depending on the time of year construction is occurring, the fencing may be used in combination with monitoring in the form of sweeps along the limits of construction to ensure the area of active construction is free of turtle use. Contactor education will also be provided to ensure awareness of the potential presence of state-listed turtles in the habitat west of the construction activities.

Permanent Erosion and Sediment Control Measures

Permanent erosion control measures have been included in the design of the project to limit long-term erosion conditions. Loam and seed requirements have been specified to establish conditions that minimize erodible conditions. This is complemented by the minimization of stormwater flow lengths to keep runoff quantities and velocities as low as possible. Permanent sediment control features include the selection of best management practices to control sediment on the site. The following permanent measures, when completed and in place, will provide the treatment methods that maintain long-term water quality standards in waterways:

- Vegetation: Landscaping and surface treatments that prevent or minimize soil erosion.
- Street/Parking Lot Sweeping: Pollution and prevention practice that removes sediment, debris and trash that accumulates along streets, roads and parking lots from winter sanding practiced and everyday use.
- Sediment Forebay: Sediment forebays are designed to dissipate the energy of incoming runoff and allow for initial settling of coarse sediments.
- Stormwater Management Areas: Stormwater management areas A & B were designed to temporarily store runoff, allowing settling of suspended solids and facilitate the uptake of certain pollutants by the wetland vegetation.

Impact Evaluation

The proposed building and associated site improvements have been planned to avoid direct impacts to the 68,366 SF of wetlands that occur on the site. Of the 319,052 SF of regulated area comprising the Upland Review Area (URA) on the site, 12,695 SF will be impacted as a result of in two locations. The URA associated with Wetland 1 is being disturbed by the construction of the trailer parking spaces located behind the proposed building. A small portion of Wetland 2's URA also would be disturbed to install an outlet pipe from Stormwater Management Area B.

Given that the construction activities are being restricted to within the area of long-term active agricultural production, and that exclusionary fencing will be installed and monitored along the

limits of the work nearest to wetlands and their wooded buffers, it is not anticipated that adverse impacts will occur to any state-listed species or other non-agricultural habitats on the site. With the specified erosion and sedimentation control measures in place, short-term construction-related impacts to the Upland Review Areas and associated wetlands will be minimized. The construction of two stormwater basins will provide long term water quality protection. the proposed project is not expected to have a significant impact on the adjacent wetlands as follows:

1. Construction and operations will not cause deposition or removal of material which will or may have a substantial effect on the wetland or watercourse or on wetlands or watercourses outside the area for which the activity is proposed.

2. The proposed project will not substantially change the natural channel or may inhibit the natural dynamics of a watercourse system.

3. The proposed project will not diminish the natural capacity and function of inland wetlands or watercourses.

4. Water quality basins will reduce substantial turbidity, siltation or sedimentation in a wetland or watercourse.

5. Neither construction nor operations will cause substantial diminution of flow of a natural watercourse or groundwater levels of the wetland or watercourse.

6. Impacts related to short-term construction activities will be mitigated and long-term operations at the site will not cause pollution of a wetland or watercourse.

7. The proposed development will not damage or destroy unique wetland or watercourse areas or such areas having demonstrable scientific or educational value.

Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
Three Congress Street, Nashua, NH 03062-3399

LETTER OF TRANSMITTAL

To:
Enfield Planning Department
Attn: Lauren Whitten, AICP – IWWA Agent
820 Enfield Street
Enfield, CT 06082
860-253-6355

Date: May 29, 2020 | #5476
Re:
Proposed AGRI-MARK Distribution Building
113 North Maple Street
Enfield, CT

WE ARE SENDING YOU ☑ Attached ☐ Under separate cover via_____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of letter ☐ Change order ☐ Permit Application_____

Scope:

COPIES	DATE	NO.	DESCRIPTION
1			IWWA Application w/FEE (COPY)
1			Cover Letter from Hayner/Swanson, Inc.
14		1-2	Regulated Area Impact Plans
1			Wetland Delineation Report - AECOM
1			Project Narrative
1			Stormwater Management Study (To be submitted at a later date)
1			Abutters List
1			Copy of Property Deeds
1			Set of Locus Maps (USGS/Aerial/Tax)
1			Copy of CT DEEP Reporting Form
1			Soil Scientist Report (Megson, Heagle & Friend)
1			Thumb Drive Containing Submittal Information in PDF

James N. Petropulos, P.E.
President/Principal Engineer

(If enclosures are not as noted, please notify us immediately.)

AECOM
500 Enterprise Drive, Suite 1A
Rocky Hill, CT 06067

860-263-5800 tel
860-263-5777 fax

Memo

To: Val Ferro

From: Dennis Lowry, AECOM Wetland Ecologist

Date: 6/9/2020

Re: North Maple Street at Moody Road, Enfield CT Wetlands Update

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As you know, AECOM Wetland and Soil Scientists have conducted site investigations at the above-referenced site for the purposes of documenting wetland, soil, and habitat conditions on the site. Investigations were originally conducted in February and March of 2017. As requested, on May 21, 2020 we conducted a supplementary site review to assess current conditions, particularly related to confirming the previously delineated wetland boundaries as well as to provide an initial updated habitat assessment.

During the recent (May 21, 2020) site review, AECOM confirmed that the previously delineated wetland boundaries on the site remain applicable; previously placed wetland flags remain largely visible and identifiable. Further, habitat conditions have remained consistent with our 2017 observations. We did note, however, that Wetland 1 on the site was providing vernal pool breeding habitat for wood frogs (*Lithobates sylvaticus*), typically considered an obligate vernal pool indicator. During our observations in 2017 Wetland 1 did not contain standing water to serve as vernal pool habitat, despite the March site review being within the time of year that such hydrology should be present. This suggests that this area may provide vernal pool habitat during some years but not necessarily during all years. As we have discussed, the upland area proposed for development to the east of Wetland 1 is not conducive for wood frog habitat needs during the non-breeding season. The non-breeding upland habitat conditions in the wooded areas west of Wetland 1 provide the more optimum conditions and are likely the location of wood frog emigration from the vernal pool during the non-breeding season. Accordingly, we would not anticipate any adverse impacts to the vernal pool functions of Wetland 1 from the proposed development of the site as currently laid out to the east of Wetland 1. Further, it is our opinion that the proposed stormwater management system designed for the project, which focuses on infiltration, will sustain the groundwater contribution toward Wetland 1 which likely provides the source of the ephemeral ponding in this vernal pool area.

Please contact me with any further questions regarding this assessment.

AECOM
500 Enterprise Drive, Suite 1A
Rocky Hill, CT 06067

860-263-5800 tel
860-263-5777 fax

Memo

To: Val Ferro

From: Dennis Lowry, AECOM Wetland Ecologist

Date: 6/12/2020

Re: North Maple Street at Moody Road, Enfield CT Wetlands Update

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Please contact me with any further questions regarding this assessment.

ABUTTER LIST

Job No. 5476

June 2, 2020

Map	Lot No.	Name & Address
***OWNER(S)*:**		
82	1, 2, 3, &4	WE 113 North Maple Street, LLC c/o Winstanley Enterprises, LLC 150 Baker Ave. Ext., Suite 303 Concord, MA 01742 Zone: I-1 – Industrial 1
***ABUTTERS*:**		
75	16	Gary L. Wilcox 48 Moody Road Enfield, CT 06082 Zone: I-1 – Industrial 1
75	17	Raymond S. Gwozdz 44 Moody Road Enfield, CT 06082 Zone: I-1 – Industrial 1
75	26 & 27	Town of Enfield Town Garage 820 Enfield Street Enfield, CT 06082 Zone: I-1 – Industrial 1
75	104 & 106	Rock Ridge Realty, LLC 33 Shaws Lane Springfield, MA 01104 Zone: I-1 – Industrial 1
82	5	Warren T. & Catherine B. Kessler 56 Moody Road Enfield, CT 06082 Zone: I-1 – Industrial 1
82	6	Elizabeth LaPalme 50 Moody Road Enfield, CT 06082 Zone: I-1 – Industrial 1
82	9	Jeanne Smith & Jeanne E. McGuire 75 Moody Road Enfield, CT 06082 Zone: I-1 – Industrial 1
82	10	Jeanne Smith 75 Moody Road Enfield, CT 06082 Zone: I-1 – Industrial 1

IW# 607

82	11	Conn Light & Power Company P.O. Box 270 Hartford, CT 06140-0270 Zone: I-1 – Industrial 1
82	14	Town of Enfield Fermi High School 124 Maple Street Enfield, CT 06082 Zone: R-33 – One Family Residence
82	15	Gerald T. Hamilton 9 Willard Avenue Enfield, CT 06082 Zone: R-33 – One Family Residence
82	16	Maple Heights Association, Inc. c/o Cheryl J. Butenas, President 102 N. Maple Street, Unit #2B Enfield, CT 06082 Zone: R-33 – One Family Residence
82	16	Maple Heights Association, Inc. c/o Gerald Ouellette, Vice President 102 N. Maple Street, Unit #14B Enfield, CT 06082 Zone: R-33 – One Family Residence
82	17	Islamic Center of Conn, Inc. c/o Mohamed Haidara P.O. Box 624 Windsor, CT 06095 Zone: R-33 – One Family Residence
82	18	Mary L. Howland Rev. Trust Mary L. Howland, Trustee 90 North Maple Street Enfield, CT 06082 Zone: R-33 – One Family Residence
82	28	Barbara Crabb 389 Elm Street Enfield, CT 06082 Zone: R-33 – One Family Residence
82	64	Leland R. & Joanne M. Hawthorne P.O. Box 325 Somers, CT 06071 Zone: R-33 – One Family Residence
82	65	Gary R. & Patricia A LaFlamme 4 Winter Way Enfield, CT 06082 Zone: R-33 – One Family Residence
82	66	John J., Jr. & Evelyn Macala 6 Winter Way Enfield, CT 06082 Zone: R-33 – One Family Residence

82	67	Mathieu J. & Lisa Rogers 8 Winter Way Enfield, CT 06082 Zone: R-33 – One Family Residence
82	68	Lee S. & Loren T. Garrity 10 Winter Way Enfield, CT 06082 Zone: R-33 – One Family Residence
82	69	Kamlesh S. & Rachna K. Mistri 12 Winter Way Enfield, CT 06082 Zone: R-33 – One Family Residence
82	70	Kenneth J. & Celeste L. Estvanik 14 Winter Way Enfield, CT 06082 Zone: R-33 – One Family Residence
82	71	Gary J. & Angela R. Czarnecki 16 Winter Way Enfield, CT 06082 Zone: R-33 – One Family Residence
82	72	Peter T. & Barbara L. Fontaine 18 Winter Way Enfield, CT 06082 Zone: R-33 – One Family Residence
82	73	Clayton A. & Teresa A. Pirie 20 Winter Way Enfield, CT 06082 Zone: R-33 – One Family Residence
82	74	Lerory P. & Sheryl M. Champagne 22 Winter Way Enfield, CT 06082 Zone: R-33 – One Family Residence
82	75	Miguel & Anne Marie Villa 24 Winter Way Enfield, CT 06082 Zone: R-33 – One Family Residence
82	87	Al & Karen L. Severino 2 Winter Way Enfield, CT 06082 Zone: R-33 – One Family Residence
82	93	58 Moody Rd, LLC 58 Moody Road Enfield, CT 06082 Zone: I-1 – Industrial 1

AECOM
500 Enterprise Drive, Suite 1A
Rocky Hill, CT 06067

860-263-5800 tel
860-263-5777 fax

March 23, 2017

Brooke Foley
Winstanley Enterprises, LLC
150 Baker Ave Ext., Suite 303
Concord, MA 01742

Subject: Soil Scientist Report and Wetland Delineation – 97 and 113 North Maple Street, Enfield, CT

Dear Brooke,

At your request AECOM has prepared this report, which summarizes the results of a wetland and soil field survey conducted by an AECOM Certified Professional Soil Scientist (American Registry of Certified Professionals in Agronomy Crops and Soils; CPSS #21734) at the above referenced Site (Figure 1). The site is located southwest of the North Maple Street and Moody Road intersection in Enfield, CT. The site is bounded by Moody Road and agricultural lands to the north, a commercial storage/warehousing facility to the west, North Maple Street and the former Fermi High School (now an adult continuing education center) to the east and a residential neighborhood to the south.

Field surveys were conducted in support of anticipated site redevelopment. The survey included identification of inland wetland and watercourse limits on the project site as well as documentation of soil characteristics from both wetland and upland portions of the site. The objectives of this report are to review the approach used to identify wetlands and watercourses for the Project, and soils characteristics on the Site, and to describe the observed conditions of these resources.

METHODS OF INVESTIGATION

AECOM identified wetland resource areas at the site in two phases; initial desktop studies of existing data sources followed by a detailed field survey effort. Resources consulted during the desktop analyses included U.S. Geological Survey (USGS) topographic quadrangle maps, Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps, U.S. Department of Agriculture/Natural Resources Conservation Service (USDA/NRCS) Soil Survey data, most recent color aerial photographs (leaf-off), and other data layers available from the Connecticut Department of Energy and Environmental Protection's (CTDEEP) GIS data depot.

Site investigations were conducted on February 8, and March 9, 2017. Wetlands and watercourses were identified in accordance with the US Army Corps of Engineers' (USACE) *1987 Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Regions* (January 2012), the Connecticut Inland Wetlands and Watercourses Act (IWWA; CGS Sections 22a-36 through 22a-45), and the Inland Wetlands and Watercourses Regulations of the Town of Enfield, Connecticut (March 21, 2011). Upper limits of jurisdictional wetlands were surveyed using traditional means by Megson, Heagle & Friend – Civil Engineers and Land Surveyors, LLC.

AECOM identified plant species using appropriate botanical reference material for the region. The indicator status of each species was identified using *The National Wetland Plant List* (Lichvar et al., 2014). Hydrophytic vegetation was determined to be prevalent following dominance criteria outlined in the USACE *Supplement*.

To categorize soils in the field, a hand auger was used and soils were generally inspected to a depth of 18-24 inches. The information collected for each soil profile included soil horizons, depth, texture, color, and the presence or absence of redoximorphic features (mottles and other features). Colors of the soil matrix and mottles were identified using Munsell Soil Color Charts. All hydric soil determinations were based on criteria established in Field Indicators for Identifying Hydric Soils in New England (NEIWPCC, 2004) and guidance in the USACE *Supplement*. Soil mapping was based on field collected data and inspection of digital sources outlined above.

Under Section 2 of IWWA, a wetland is defined as "land, including submerged land…which consists of poorly drained, very poorly drained, alluvial and floodplain soils as defined by the National Cooperative Soils Survey. Alluvial (i.e., floodplain) soils are regulated as inland wetlands whether or not they meet the criteria of a poorly drained soil. However, no alluvial soils were observed on the Site.

Representative photographs of the Site and jurisdictional resource areas are presented in Attachment A and completed USACE wetland delineation data forms for each wetland are presented in Attachment B.

WETLANDS AND WATERCOURSES

AECOM delineated three wetland areas on the site that are identified as Wetland #1, Wetland #2, and Wetland #3 on Figure 2. Characteristics of each wetland are described in further detail below.

<u>Wetland #1</u> is an approximately 0.36-acre isolated depression located within an upland forest patch near the southwest corner of the 113 North Maple Street parcel. It is a deep (4 to 6 feet) depression dominated by a forest canopy of red maple (*Acer rubrum*) and white ash (*Fraxinus americana*), with silky dogwood (*Cornus amomum*), tussock sedge (*Carex stricta*) and water smartweed (*Polygonum sp.*) in the understory. Hydrologic inputs appear to be derived primarily of surface runoff from the adjacent agricultural fields located north and east of the wetland. During the 2017 investigations there was no surface water present in the wetland, and no water table or soil saturation noted at 20 inches depth below the ground surface. However, other indicators of hydrology including low chroma matrix and redoximorphic features were noted within 10 inches of the soil surface.

The NRCS maps this area as an Agawam fine sandy loam, which is a well-drained soil formed on glacial outwash plains and consist of water deposited sandy materials. However, soils in Wetland #1 are poorly drained and more closely resemble the Walpole series, which is considered a geographically associated soil to the Agawam series and is also formed in sandy outwash materials.

<u>Wetland #2</u> is a long narrow palustrine wetland system containing a small intermittent watercourse located just west of Wetland #1 and is separated from Wetland #1 only by an approximately 20-foot wide access/farm road and waterline easement. These two wetlands may have been once connected, however based on inspection of 1934 aerial photographs the existing access road has been in place for at least 83 years.

This wetland and watercourse drains west and then northwest through a series of small ponds and into Freshwater Brook approximately 3700 linear feet downstream. It is dominated by red maple in the canopy with arrowwood (*Viburnum dentatum*), winterberry (*Ilex verticillata*), cinnamon fern (*Osmunda cinnamomea*) and skunk cabbage (*Symplocarpus foetidus*) in the understory.

The wetland is situated between two broad plateaus of glaciofluvial deposited materials (i.e., outwash plain) with steep 12-16 foot tall escarpments from the wetland surface to the top of the terrace. Wetland hydrology is primarily groundwater influenced with some surface run-off of adjacent agricultural fields, forested uplands and historic gravel removal areas. NRCS maps the area as well-drained Agawam fine sandy loam and excessively drained Windsor loamy sand. However, soils in Wetland #2 are very deep and very poorly drained with 10 to 30 inches of accumulated organic material observed. Based on geologic setting and level of organic accumulation, Wetland #2 is similar to the Timakwa soil series.

Wetland #3 is located in the northwest corner of the site just east of Lego Road and south of residential development along Moody Road. Based on inspection of historic aerial photographs and conditions observed in the field during the 2017 site visits, this wetland and adjacent uplands have been heavily disturbed over the years. Wetland #3 is in a similar geologic position to Wetland #1, and lies at the top of an old drainage feature that flows west-southwest and then northwest into Freshwater Brook. The 1970 aerial photographs show this as one continuous feature; however by 1986 Wetland #3 was hydrologically isolated by the construction of Lego Road and a farm access road to fields located south of the Wetland #3. All adjacent areas were cleared and farmed up to the wetland edge at least through the mid-1980's.

Currently, this small isolated wetland dominated by red maple and white willow (*Salix alba*) in the canopy, with silky dogwood, speckled alder (*Alnus rugosa*), tussock sedge and marsh fern (*Thelypteris palustris*) in the understory. Hydrologic inputs appear to be derived primarily of surface runoff from the adjacent upland areas. During the 2017 investigations there was no surface water present in the wetland, and no water table or soil saturation noted at 20 inches depth below the ground surface. However, other indicators of hydrology including low chroma matrix and redoximorphic features were noted within 10 inches of the soil surface.

The NRCS maps this area as a poorly drained Rippowam fine sandy loam, which is an alluvial floodplain deposited soil. Field observations of the soil profile do not concur with this mapping and no evidence of a stream and floodplain system was observed. Wetland #3 being similar to Wetland #1 in geologic position also exhibited similar a soil profile, which closely resembles the Walpole series.

UPLAND AREAS

With the exception of wetlands areas identified and described above, the entire approximately 71-acre site was in agriculture at one time, and approximately 60% of the site currently exhibits evidence of recent tilling and planting. The former agricultural areas are now mixed forest (18%), and early- to late-successional vegetation communities (i.e., sparse grasses and scrub-shrub/saplings) making up about 15% of the site, including one area in the southwest corner of the site had been stripped of mineral organic soils (i.e., the A-Horizon) and mined for the underlying sandy-gravelly material, but is now sparsely covered with young vegetation. The remaining land area on the site is develop with paved and gravel parking areas and maintained lawn.

The entire site is in an area of sandy to gravelly glaciofluvial material deposited over Glacial Lake Hitchcock lake-bottom deposits (i.e., outwash plain). Soils formed in these deposits are typically very deep and well drained to excessively drained, and include Agawam fine sandy loam, and Windsor loamy sand.

Summary

Three wetland areas were identified on the approximately 71-acre site. Wetland #1 and Wetland #2 are part of the same drainage feature, which is a long narrow gully dissecting an outwash plain. There is a small intermittent stream in Wetland #2 and the soils are poorly to very poorly drained. Wetland #3 is also the upper end of a long narrow drainage feature, but has been isolated for at least 30 years. Field observations of soil characteristics in adjacent upland areas are generally consistent with the NRCS mapping and consist of well drained to excessively drained soils. Except for the wetland areas, the entire site was cleared and farmed at one time, with approximately 60% of the site still in agriculture.

Yours sincerely,

Dennis Lowry
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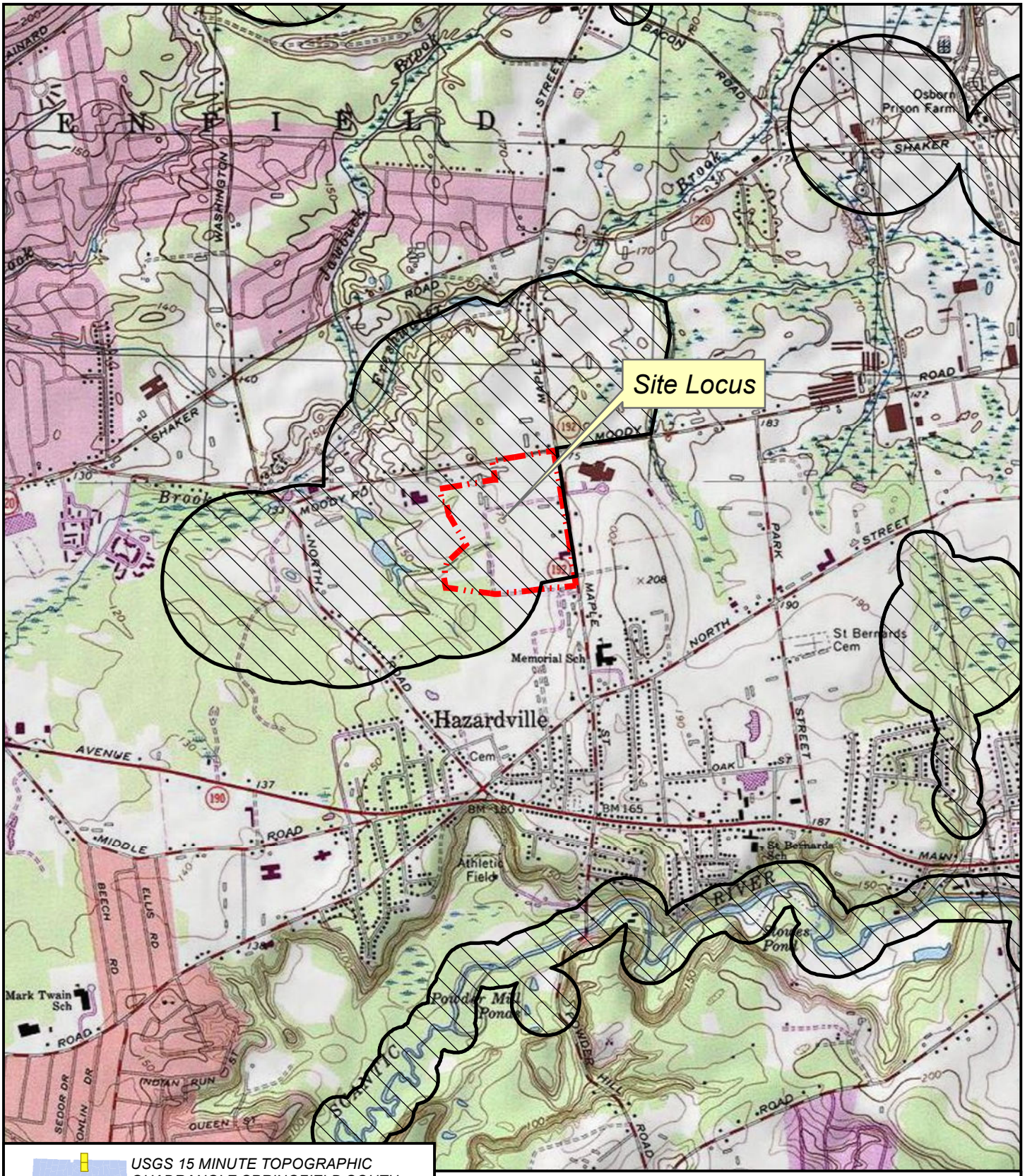
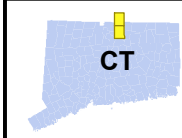
Scott Egan
Professional Soil Scientist, CPSS #21734
scott.egan@aecom.com

References

Lichvar, R.W., M. Butterwick, N.C. Melvin, and W.N. Kirchner. 2014. The National Wetland Plant List: 2014 Update of Wetland Ratings. Phytoneuron 2014-41: 1-42.





USGS 15 MINUTE TOPOGRAPHIC QUADRANGLE SPRINGFIELD SOUTH, AND BROAD BROOK, CT

Legend

Natural Diversity Area

0 1,000 2,000 4,000 Feet

Site Locus

North Maple Street
Enfield, Connecticut

SCALE	DATE	PROJECT NO.
1:24,000	01/17	60535910

AECOM

Figure Number

1

Legend

- Property Boundary
- Wetland

Cover Types

- Agriculture
- Building
- Early Succession Open Field/Scrub-shrub
- Maintained Lawn
- Late Succession Scrub-shrub/Sapling
- Dirt Road
- Forested Upland
- Gravel Parking
- Paved

0 150 300 600 Feet

N

Current Land Use and Identified Wetland Areas
97-113 North Maple Street
Enfield, Connecticut

SCALE	DATE	PROJECT NO.
1:3,600	01/17	60535910

AECOM

Figure Number

2

Attachment A – Representative Photographs

AECOM

PHOTOGRAPHIC LOG

Client Name:	**Site Location:**	**Project No.**
Winstanley Enterprises, LLC	Maple Street – Enfield, CT	60535910

Photo No.	**Date:**
1	02/08/17

Direction Photo Taken:

South

Description:

Existing structure and yard

Photo No.	**Date:**
2	02/08/17

Direction Photo Taken:

North

Description:

Late succession scrub-shrub/sapling habitat. Piles of old firewood throughout area.

AECOM

PHOTOGRAPHIC LOG

Client Name:	**Site Location:**	**Project No.**
Winstanley Enterprises, LLC	Maple Street – Enfield, CT	60535910

Photo No.	**Date:**
3	02/08/17

Direction Photo Taken:

Northeast

Description:

Early succession open field/scrub-shrub habitat. Piles of old firewood throughout area.

Photo No.	**Date:**
4	02/08/17

Direction Photo Taken:

North-northeast

Description:

White pine wind-row along Maple Street and small agricultural field.

AECOM

PHOTOGRAPHIC LOG

Client Name:	**Site Location:**	**Project No.**
Winstanley Enterprises, LLC	Maple Street – Enfield, CT	60535910

Photo No.	**Date:**
5	02/08/17

Direction Photo Taken:

North

Description:

Agriculture fields

Photo No.	**Date:**
6	02/08/17

Direction Photo Taken:

South

Description:

Agriculture fields.

AECOM

PHOTOGRAPHIC LOG

Client Name:	**Site Location:**	**Project No.**
Winstanley Enterprises, LLC	Maple Street – Enfield, CT	60535910

Photo No.	**Date:**
7	02/08/17

Direction Photo Taken:
North

Description:
Isolated Wetland #1

Photo No.	**Date:**
8	02/08/17

Direction Photo Taken:
South

Description:
Old access road to barn

AECOM

PHOTOGRAPHIC LOG

Client Name:	**Site Location:**	**Project No.**
Winstanley Enterprises, LLC	Maple Street – Enfield, CT	60535910

Photo No.	**Date:**
9	02/08/17

Direction Photo Taken:

Southeast

Description:

Southern fields looking from old barn

Photo No.	**Date:**
10	02/08/17

Direction Photo Taken:

West

Description:

Access road out to old sandpit.

AECOM

PHOTOGRAPHIC LOG

Client Name:	**Site Location:**	**Project No.**
Winstanley Enterprises, LLC	Maple Street – Enfield, CT	60535910

Photo No.	**Date:**
11	02/08/17

Direction Photo Taken:

West

Description:

Forested area south of access road out to old sandpit

Photo No.	**Date:**
12	02/08/17

Direction Photo Taken:

Northwest

Description:

Old sandpit

AECOM

PHOTOGRAPHIC LOG

Client Name:	**Site Location:**	**Project No.**
Winstanley Enterprises, LLC	Maple Street – Enfield, CT	60535910

Photo No.	**Date:**
13	02/08/17

Direction Photo Taken:

Northwest

Description:

Wetland #2.

Photo No.	**Date:**
14	02/08/17

Direction Photo Taken:

Northeast

Description:

Wetland #2 with intermittent stream

AECOM

PHOTOGRAPHIC LOG

Client Name:	**Site Location:**	**Project No.**
Winstanley Enterprises, LLC	Maple Street – Enfield, CT	60535910

Photo No.	**Date:**
15	02/08/17

Direction Photo Taken:

Northeast

Description:

Wetland #2 and intermittent stream further east (upstream).

Photo No.	**Date:**
16	02/08/17

Direction Photo Taken:

Southeast

Description:

Forested uplands west of old barn.

AECOM

PHOTOGRAPHIC LOG

Client Name:	**Site Location:**	**Project No.**
Winstanley Enterprises, LLC	Maple Street – Enfield, CT	60535910

Photo No.	**Date:**
17	02/08/17

Direction Photo Taken:

Northwest

Description:

Early succession open field/scrub-shrub habitat.

Photo No.	**Date:**
18	02/08/17

Direction Photo Taken:

Southeast

Description:

View of northern field

AECOM

PHOTOGRAPHIC LOG

Client Name:	**Site Location:**	**Project No.**
Winstanley Enterprises, LLC	Maple Street – Enfield, CT	60535910

Photo No.	**Date:**
19	02/08/17

Direction Photo Taken:

North

Description:

Late succession scrub-shrub/sapling habitat. Some trees > 4 inch Diameter.

Photo No.	**Date:**
20	02/08/17

Direction Photo Taken:

West

Description:

Stormwater easement/ drainage swale

AECOM

PHOTOGRAPHIC LOG

Client Name:	**Site Location:**	**Project No.**
Winstanley Enterprises, LLC	Maple Street – Enfield, CT	60535910

Photo No.	**Date:**
21	02/08/17

Direction Photo Taken:

West

Description:

Wetland #3 located in northeast corner of site.

Photo No.	**Date:**
22	02/08/17

Direction Photo Taken:

East

Description:

Forested upland, young trees.

AECOM

PHOTOGRAPHIC LOG

Client Name:	**Site Location:**	**Project No.**
Winstanley Enterprises, LLC	Maple Street – Enfield, CT	60535910

Photo No.	**Date:**
23	02/08/17

Direction Photo Taken:

North

Description:

Existing agricultural field and late succession scrub-shrub/sapling habitats.

Photo No.	**Date:**
24	02/08/17

Direction Photo Taken:

East

Description:

Agricultural fields

AECOM

PHOTOGRAPHIC LOG

Client Name:	**Site Location:**	**Project No.**
Winstanley Enterprises, LLC	Maple Street – Enfield, CT	60535910

Photo No.	**Date:**
25	03/09/17

Direction Photo Taken:

North

Description:

Wetland #1 – Upland Plot.

Photo No.	**Date:**
26	03/09/17

Direction Photo Taken:

East

Description:

Wetland #1 – Wetland Plot.

AECOM

PHOTOGRAPHIC LOG

Client Name:	**Site Location:**	**Project No.**
Winstanley Enterprises, LLC	Maple Street – Enfield, CT	60535910

Photo No.	**Date:**
27	03/09/17

Direction Photo Taken:

North

Description:

Wetland #2 – Upland Plot.

Photo No.	**Date:**
28	03/09/17

Direction Photo Taken:

East

Description:

Wetland #2 – Wetland Plot.

AECOM

PHOTOGRAPHIC LOG

Client Name:	**Site Location:**	**Project No.**
Winstanley Enterprises, LLC	Maple Street – Enfield, CT	60535910

Photo No.	**Date:**
29	03/09/17

Direction Photo Taken:

North

Description:

Wetland #3 – Upland Plot.

Photo No.	**Date:**
30	03/09/17

Direction Photo Taken:

East

Description:

Wetland #3 – Wetland Plot.

Attachment B - USACE Wetland Delineation Data Forms

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: North Maple Street City/County: Enfield, CT Sampling Date: 3/9/2017

Applicant/Owner: _____ State: CT Sampling Point: W1-UP

Investigator(s): SE Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave

Slope (%): 5 Lat: -72.544900 Long: 41.997400 Datum: WGS84

Soil Map Unit Name: Agawam fine sandy loam NWI Classification: _____

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒
Hydric Soil Present?	Yes ☐	No ☒	
Wetland Hydrology Present?	Yes ☐	No ☒	If yes, optional Wetland Site ID: _____

Remarks: (explain alternative procedures here or in separate report)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches)
Water Table Present?	Yes ☐	No ☒	Depth (inches)
Saturation Present? (include capillary fringe)	Yes ☐	No ☒	Depth (inches)

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants **Sampling Point:** W1UP

Tree Stratum (Plot size:30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus alba	28	Y	FACU
2. Quercus rubra	13	Y	FACU
3 .Acer rubrum	8	N	FAC
4.			
5.			
6.			
7.			
	49 = Total Cover		
Sapling/Shrub Stratum (Plot size:15 ft)			
1. Viburnum dentatum	3	Y	FAC
2. Vaccinium angustifolium	8	Y	FACU
3 .			
4.			
5.			
6.			
7.			
8.			
	11 = Total Cover		
Herb Stratum (Plot size:5 ft)			
1. Carex pennsylvanicum	28	Y	FACU
2.			
3 .			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	28 = Total Cover		
Woody Vine Stratum (Plot size:30 ft)			
1.			
2.			
3 .			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	20%	(C)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.01
- ☐ Morphological Adaptations1 (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBHand greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardlessof size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height

Hydrophytic Vegetation Present? **Yes** ☐ **No** ☒

Remarks: (Include photo numbers here or on a separate sheet.)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-4	10YR 2/1	100					FSL	
4-8	10YR 4/3	100					FSL	
8-20	2.5Y 5/4	100					LFS	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grain. [2]Location: PL=Pore Lining M=Matrix

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR, R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR K, L**)
- ☐ Thin Dark Surface (S9) (**LRR K, L**)
- ☐ Iron-Manganese Masses (F12)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): 0

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: North Maple Street City/County: Enfield, CT Sampling Date: 3/9/2017

Applicant/Owner: _____ State: CT Sampling Point: W1-WET

Investigator(s): SE Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Outwash plain Local relief (concave, convex, none): Concave

Slope (%): 0 Lat: -72.545000 Long: 41.997400 Datum: WGS84

Soil Map Unit Name: Agawam fine sandy loam NWI Classification: PFO

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	**Is the Sampled Area within a Wetland?** **Yes** ☒ **No** ☐
Hydric Soil Present?	Yes ☒	No ☐	
Wetland Hydrology Present?	Yes ☒	No ☐	If yes, optional Wetland Site ID: Wetland #1

Remarks: (explain alternative procedures here or in separate report)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☒ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☒ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☒ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres on Living Roots (C3)
- ☒ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches)
Water Table Present?	Yes ☐	No ☒	Depth (inches)
Saturation Present? (include capillary fringe)	Yes ☐	No ☒	Depth (inches)

Wetland Hydrology Present? Yes ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland was dry at time of investigation, but clear indicators of hydrology in soil profile and at soil surface are present

VEGETATION – Use scientific names of plants **Sampling Point:** W1WET

Tree Stratum (Plot size:30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	43	Y	FAC
2. Fraxinus americana	13	Y	FACU
3 .			
4.			
5.			
6.			
7.			
	26 = Total Cover		
Sapling/Shrub Stratum (Plot size:15 ft)			
1. Cornus amomum	13	Y	FACW
2.			
3 .			
4.			
5.			
6.			
7.			
8.			
	13 = Total Cover		
Herb Stratum (Plot size:5 ft)			
1. Carex stricta	28	Y	OBL
2. Polygonum sp.	13	Y	FACW
3 .			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	41 = Total Cover		
Woody Vine Stratum (Plot size:30 ft)			
1.			
2.			
3 .			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	4	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	80%	(C)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.01
- ☐ Morphological Adaptations1 (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBHand greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardlessof size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: (Include photo numbers here or on a separate sheet.)

Photo #2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-8	10YR 3/1	100					Mucky	Mineral component
8-20	10YR 4/2	80	10YR 5/4	20	C	PL	LFS	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grain. [2]Location: PL=Pore Lining M=Matrix

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☒ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☒ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR, R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☒ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR K, L**)
- ☐ Thin Dark Surface (S9) (**LRR K, L**)
- ☐ Iron-Manganese Masses (F12)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): 0

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

Soil profile and geologic setting resemble Walpole fine sandy loam

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: North Maple Street City/County: Enfield, CT Sampling Date: 3/9/2017

Applicant/Owner: _____ State: CT Sampling Point: W2-UP

Investigator(s): SE Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Outwash plain Local relief (concave, convex, none): Concave

Slope (%): 3 Lat: -72.546700 Long: 41.996700 Datum: WGS84

Soil Map Unit Name: Windsor loamy sand NWI Classification: _____

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒
Hydric Soil Present?	Yes ☐	No ☒	
Wetland Hydrology Present?	Yes ☐	No ☒	If yes, optional Wetland Site ID: _____

Remarks: (explain alternative procedures here or in separate report)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches)
Water Table Present?	Yes ☐	No ☒	Depth (inches)
Saturation Present? (include capillary fringe)	Yes ☐	No ☒	Depth (inches)

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants **Sampling Point:** W2UP

Tree Stratum (Plot size:30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus alba	63	Y	FACU
2. Quercus rubra	18	N	FACU
3 .Acer rubrum	13	N	FAC
4.			
5.			
6.			
7.			
	94 = Total Cover		
Sapling/Shrub Stratum (Plot size:15 ft)			
1. Pinus strobus	18	Y	FACU
2. Corylus americana	13	Y	FACU
3 .			
4.			
5.			
6.			
7.			
8.			
	31 = Total Cover		
Herb Stratum (Plot size:5 ft)			
1. Carex pennsylvanicum	43	Y	FACU
2.			
3 .			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	43 = Total Cover		
Woody Vine Stratum (Plot size:30 ft)			
1.			
2.			
3 .			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0%	(C)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.01
- ☐ Morphological Adaptations1 (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBHand greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardlessof size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height

Hydrophytic Vegetation Present? **Yes** ☐ **No** ☒

Remarks: (Include photo numbers here or on a separate sheet.)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-8	10YR 3/2	100					FSL	
8-16	10YR 4/4	100					FSL	
16-20	10YR 5/6	100					FSL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grain. [2]Location: PL=Pore Lining M=Matrix

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR, R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR K, L**)
- ☐ Thin Dark Surface (S9) (**LRR K, L**)
- ☐ Iron-Manganese Masses (F12)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): 0

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: North Maple Street City/County: Enfield, CT Sampling Date: 3/9/2017

Applicant/Owner: _____ State: CT Sampling Point: W2-WET

Investigator(s): SE Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Outwash plain gully Local relief (concave, convex, none): Concave

Slope (%): 0 Lat: -72.546900 Long: 41.996700 Datum: WGS84

Soil Map Unit Name: Windsor loamy sand NWI Classification: PFO

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	**Is the Sampled Area within a Wetland?** **Yes** ☒ **No** ☐
Hydric Soil Present?	Yes ☒	No ☐	
Wetland Hydrology Present?	Yes ☒	No ☐	If yes, optional Wetland Site ID: Wetland #2

Remarks: (explain alternative procedures here or in separate report)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☒ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☒ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☒ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☒ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☒ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches)
Water Table Present?	Yes ☒	No ☐	Depth (inches) 20
Saturation Present? (include capillary fringe)	Yes ☒	No ☐	Depth (inches) 10

Wetland Hydrology Present? **Yes** ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants **Sampling Point:** W2WET

Tree Stratum (Plot size:30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	18	Y	FAC
2.			
3 .			
4.			
5.			
6.			
7.			
	156 = Total Cover		
Sapling/Shrub Stratum (Plot size:15 ft)			
1. Viburnum dentatum	13	Y	FACW
2. Ilex verticillata	18	Y	FACW
3 .			
4.			
5.			
6.			
7.			
8.			
	31 = Total Cover		
Herb Stratum (Plot size:5 ft)			
1. Osmunda cinnamomea	13	Y	FACW
2. Symplocarpus foetidus	8	Y	OBL
3 .			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	21 = Total Cover		
Woody Vine Stratum (Plot size:30 ft)			
1.			
2.			
3 .			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	5	(A)
Total Number of Dominant Species Across All Strata:	0	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100%	(C)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.01
- ☐ Morphological Adaptations1 (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBHand greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardlessof size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: (Include photo numbers here or on a separate sheet.)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-30	10YR 2/1	100					Organic	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grain. [2]Location: PL=Pore Lining M=Matrix

Hydric Soil Indicators:

- [x] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Dark Surface (S7) (**LRR, R, MLRA 149B**)
- [ ] Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- [ ] Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- [ ] Loamy Mucky Mineral (F1) (**LRR K, L**)
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- [ ] 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- [ ] Coast Prairie Redox (A16) (**LRR K, L, R**)
- [ ] 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- [ ] Dark Surface (S7) (**LRR K, L**)
- [ ] Polyvalue Below Surface (S8) (**LRR K, L**)
- [ ] Thin Dark Surface (S9) (**LRR K, L**)
- [ ] Iron-Manganese Masses (F12)
- [ ] Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- [ ] Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- [ ] Red Parent Material (TF2)
- [ ] Very Shallow Dark Surface (TF12)
- [ ] Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): 0

Hydric Soil Present? **Yes** [x] **No** [ ]

Remarks:

Fits description and geologic setting of Timakwa soil series

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: North Maple Street City/County: Enfield, CT Sampling Date: 3/9/2017

Applicant/Owner: _____ State: CT Sampling Point: W3-UP

Investigator(s): SE Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Outwash plain Local relief (concave, convex, none): Concave

Slope (%): 1 Lat: -72.547000 Long: 41.999400 Datum: WGS84

Soil Map Unit Name: Rippowam fine sandy loam NWI Classification: _____

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒
Hydric Soil Present?	Yes ☐	No ☒	
Wetland Hydrology Present?	Yes ☐	No ☒	If yes, optional Wetland Site ID: _____

Remarks: (explain alternative procedures here or in separate report)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches)
Water Table Present?	Yes ☐	No ☒	Depth (inches)
Saturation Present? (include capillary fringe)	Yes ☐	No ☒	Depth (inches)

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants **Sampling Point:** W3UP

Tree Stratum (Plot size:30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus grandidentata	63	Y	FACU
2.			
3 .			
4.			
5.			
6.			
7.			
	63 = Total Cover		
Sapling/Shrub Stratum (Plot size:15 ft)			
1. Elaeagnus umbellata	33	Y	UPL
2. Lonicera tatarica	48	Y	FACU
3 .			
4.			
5.			
6.			
7.			
8.			
	81 = Total Cover		
Herb Stratum (Plot size:5 ft)			
1.			
2.			
3 .			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	43 = Total Cover		
Woody Vine Stratum (Plot size:30 ft)			
1. Celastrus orbiculatus	23	Y	UPL
2.			
3 .			
4.			
	23 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0%	(C)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.01
- ☐ Morphological Adaptations1 (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBHand greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardlessof size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height

Hydrophytic Vegetation Present? **Yes** ☐ **No** ☒

Remarks: (Include photo numbers here or on a separate sheet.)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-14	10YR 3/2	100					FSL	
14-20	10YR 5/4	100					FSL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grain. [2]Location: PL=Pore Lining M=Matrix

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR, R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR K, L**)
- ☐ Thin Dark Surface (S9) (**LRR K, L**)
- ☐ Iron-Manganese Masses (F12)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): 0

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks:

NRCS mapping is Rippowam alluvial soil. No stream or floodplain present. Soil more closely resembles Agawam fine sandy loam that has been farmed/plowed

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: North Maple Street City/County: Enfield, CT Sampling Date: 3/9/2017

Applicant/Owner: _____ State: CT Sampling Point: W3-WET

Investigator(s): SE Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Outwash plain Local relief (concave, convex, none): Concave

Slope (%): 0 Lat: -72.547100 Long: 41.999500 Datum: WGS84

Soil Map Unit Name: Rippowam fine sandy loam NWI Classification: PFO

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	**Is the Sampled Area within a Wetland?** **Yes** ☒ **No** ☐
Hydric Soil Present?	Yes ☒	No ☐	
Wetland Hydrology Present?	Yes ☒	No ☐	If yes, optional Wetland Site ID: Wetland #3

Remarks: (explain alternative procedures here or in separate report)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☒ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☒ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☒ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☒ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☒ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches)
Water Table Present?	Yes ☐	No ☒	Depth (inches)
Saturation Present? (include capillary fringe)	Yes ☐	No ☒	Depth (inches)

Wetland Hydrology Present? **Yes** ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland was dry at time of investigation, but clear indicators of hydrology in soil profile and at soils surface are present

VEGETATION – Use scientific names of plants **Sampling Point:** W3WET

Tree Stratum (Plot size:30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix alba	28	Y	FACW
2.			
3 .			
4.			
5.			
6.			
7.			
	28 = Total Cover		
Sapling/Shrub Stratum (Plot size:15 ft)			
1. Cornus amomum	38	Y	FACW
2. Alnus rugosa	23	Y	FACW
3 .			
4.			
5.			
6.			
7.			
8.			
	61 = Total Cover		
Herb Stratum (Plot size:5 ft)			
1. Carex stricta	13	Y	OBL
2. Thelypteris palustris	8	Y	FACW
3 .			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	21 = Total Cover		
Woody Vine Stratum (Plot size:30 ft)			
1.			
2.			
3 .			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	5	(A)
Total Number of Dominant Species Across All Strata:	0	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100%	(C)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.01
- ☐ Morphological Adaptations1 (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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Herb – All herbaceous (non-woody) plants, regardlessof size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: (Include photo numbers here or on a separate sheet.)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-8	10YR 3/2	100					FSL	
8-14	2.5Y 5/2	96	7.5YR 4/6	3	C	M	FSL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grain. [2]Location: PL=Pore Lining M=Matrix

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☒ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
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- ☐ Loamy Gleyed Matrix (F2)
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- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
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- ☐ Dark Surface (S7) (**LRR K, L**)
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- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): 0

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

Fits description and geologic setting of Walpole series

MEGSON, HEAGLE & FRIEND
CIVIL ENGINEERS & LAND SURVEYORS, LLC
81 RANKIN ROAD
GLASTONBURY, CONNECTICUT 06033
PHONE (860) 659-0587
FAX (860) 657-4429

February 23, 2017

Winstanley Enterprises, LLC
Attn. Ms. Brooke Foley
150 Baker Avenue Extension
Concord, MA 01742

Re: Soil Scientist Report
Moody Road/North Maple Street
Enfield, CT

Dear Brooke;

The purpose of this letter is to serve as the Soil Scientist report for the referenced project. This will document the findings of my field delineation of wetland soils on four adjacent parcels of land ("the site") located on the southwest side of the intersection of North Maple Street and Moody Road. A majority of the site is recently tilled agricultural land. A vacant house is situated on one of the properties with an address of 113 North Maple Street according the Town of Enfield GIS site. Another building is located on a second property at 97 North Maple Street and is currently a business known as Hawthorne's Agway. The other two parcels are agricultural land. The properties are shown on a map attached to this report.

METHODOLOGY

Field visits were conducted on 2-8-16 and 2-22-16. The site was ranged for the presence of wetlands and watercourses. Potential areas were examined with the use of a Dutch Hand Auger. Several soil samples were taken to observe the subsurface soil and groundwater conditions in potential areas. Soil indicators observed were used to determine the limits of wetland soil conditions.

Wetlands and watercourses are defined by the State of Connecticut and Inland Wetlands and Watercourses Regulations of the Town of Enfield as follows:

"Wetlands" means land, including submerged land as defined in this section, not regulated pursuant to sections 22a-28 through 22a-35, inclusive, of the Connecticut General Statutes, which consists of any of the soil types designated as poorly drained, very poorly drained, alluvial and floodplain by the National Cooperative Soils Survey, as it may be amended from time to time, of the Natural Resources Conservation Service of the U.S. Department of

Agriculture (USDA). Such areas may include filled, graded, or excavated sites which possess an aquic (saturated) soil moisture regime as defined by the USDA Cooperative Soil Survey.

"Watercourses" means rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs, and all other bodies of water, natural or artificial, vernal or intermittent, public or private, which are contained within, flow through or border upon the Town or any portion thereof not regulated pursuant to sections 22a-28 through 22a-35, inclusive, of the Connecticut General Statutes. Intermittent watercourses shall be delineated by a defined permanent channel and bank and the occurrence of two or more of the following characteristics: (a) evidence of scour or deposits of Enfield IWW Regulations -6- 03/21/11 recent alluvium or detritus, (b) the presence of standing or flowing water for a duration longer than a particular storm incident, and (c) the presence of hydrophytic vegetation.

TOPOGRAPHY

In general, the site has a very gentle topography with most of the slopes being less than 3%. A depression is located near the center of the property which is wooded. A wooded shallow ravine is located in the southwesterly area of the properties. Both of these areas contain wetlands. These are a majority of the site with slopes greater than 3%.

SOILS

Wetlands

Two areas with aquic (saturated) soil moisture regimes were found on the site. These are shown as Wetland Areas 1 and 2 on the attached map. These appear to have originally been connected prior to an old farm road which currently bisects them. The soil profiles in these areas do not fit into any NRCS Official Soil Series Description (OSD) due to more than two feet of sedimentation of organic materials from the surrounding agricultural fields.

It is assumed the profile underneath the deposits is in the Rippowam series. However, due to the depth of the organic layers over the probable B horizons the deeper profiles could not be observed. The overlying organic deposits were silt loam in texture with prominent redoximorphic features throughout. The Rippowam series consists of very deep, poorly drained loamy soils formed in alluvial sediments. Based on the observations of the colors and redoximorphic features in the overlying organic layers, these profiles appear to be more in the very poorly drained drainage class.

Wetland Area 1 has the potential to pond water in certain conditions. This would most likely occur in the spring. No surface water was present when the site visits were done but the groundwater was at approximately 18" Wetland Area 2 has an intermittent watercourse which flows from east to west through the middle of it.

Uplands

A majority of the upland soils on this site are classified in the Agawam and Windsor Series according to the NRCS mapping. Field observations indicate this to be accurate. These soils consist of very deep, well drained and excessively well drained soils formed in sandy outwash or eolian deposits. They are nearly level soils on glaciofluvial landforms. Saturated conductivity is high to very high.

WATERCOURSES

Watercourse Area 1 is a small isolated area in the northwest portion of the site immediately east of Lego Way. The soil profiles do not meet the definition of a wetland but the area does appear to meet the watercourses definition. Based on the herbaceous vegetation (sedge grasses) and other physical features, the area does appear to pond water for significant periods during the wetter times of the year. No standing water was present during the site visits.

Mark W. Friend, P.E. Soil Scientist
LEED AP

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

STATEWIDE INLAND WETLANDS & WATERCOURSES ACTIVITY REPORTING FORM

Pursuant to section 22a-39(m) of the General Statutes of Connecticut and section 22a-39-14 of the Regulations of Connecticut State Agencies, inland wetlands agencies must complete the Statewide Inland Wetlands & Watercourses Activity Reporting Form for **each** action taken by such agency.

This form may be made part of a municipality's inland wetlands application package. If the municipality chooses to do this, it is recommended that a copy of the Town and Quadrangle Index of Connecticut and a copy of the municipality's subregional drainage basin map be included in the package.

Please remember, the inland wetlands agency is responsible for ensuring that the information provided is **accurate** and that it reflects the **final** action of the agency. Incomplete or incomprehensible forms will be mailed back to the agency. Instructions for completing the form are located on the following pages.

The inland wetlands agency shall mail completed forms for actions taken during a calendar month no later than the 15th day of the following month to the Department of Energy and Environmental Protection (DEEP). Do **not** mail this cover page or the instruction pages. Please mail **only** the **completed** reporting form to:

DEEP Land & Water Resources Division
Inland Wetlands Management Program
79 Elm Street, 3rd Floor
Hartford, CT 06106

Questions may be directed to the DEEP's Inland Wetlands Management Program at (860) 424-3019.

INSTRUCTIONS FOR COMPLETING

THE STATEWIDE INLAND WETLANDS & WATERCOURSES ACTIVITY REPORTING FORM

Use a separate form to report EACH action taken by the Agency. Complete this electronic fill-in form as described below. If completing by hand please print and use the pdf version at www.ct.gov/deep/inlandwetlands (click the "status & trends" tab). Do NOT submit a reporting form for withdrawn actions.

PART I: Must Be Completed By The Inland Wetlands Agency

1. Choose the year and month the Inland Wetlands Agency took the action being reported. If multiple actions were taken regarding the same project or activity then multiple forms need to be completed.

2. Choose ONE code letter to describe the final action or decision taken by the Inland Wetlands Agency. Do NOT submit a reporting form for withdrawn actions. Do NOT enter multiple code letters (e.g.: if an enforcement notice was given and subsequent permit issued - two forms for the two separate actions are to be completed).

- **A** = A Permit Granted by the Inland Wetlands Agency (not including map amendments, see code D below)
- **B** = Any Permit Denied by the Inland Wetlands Agency
- **C** = A Permit Renewed or Amended by the Inland Wetlands Agency
- **D** = A Map Amendment to the Official Town Wetlands Map - or -
  An Approved/Permitted Wetland or Watercourse Boundary Amendment to a Project Site Map
- **E** = An Enforcement Action: Permit Revocation, Citation, Notice of Violation, Order, Court Injunction, or Court Fines
- **F** = A Jurisdictional Ruling by the Inland Wetlands Agency (i.e.: activities "permitted as of right" or activities considered non-regulated)
- **G** = An Agent Approval pursuant to CGS 22a-42a(c)(2)
- **H** = An Appeal of Agent Approval Pursuant to 22a-42a(c)(2)

3. Check "yes" if a public hearing was held in regards to the action taken; otherwise check "no".

4. Enter the name of the Inland Wetlands Agency official verifying that the information provided on this form is accurate and that it reflects the FINAL action of the agency.

PART II: To Be Completed By The Inland Wetlands Agency Or The Applicant - If Part II is completed by the applicant, the applicant MUST return the form to the Inland Wetlands Agency. The Inland Wetlands Agency MUST ensure that the information provided is accurate and that it reflects the FINAL action of the Agency.

5. Enter the name of the municipality for which the Inland Wetlands Agency has jurisdiction and in which the action/project/activity is occurring.

Check "yes" if the action/project/activity crosses municipal boundaries and enter the name(s) of the other municipality(ies) where indicated. Check "no" if it does not cross municipal boundaries.

6. Enter the USGS Quad Map name or number (1 through 115) as found on the CT Town and Quadrangle Index Map that contains the location of the action/project/activity. USGS Quad Map information is available at: http://ct.gov/deep/lib/deep/gis/resources/Index_NamedQuadTown.pdf

ALSO enter the four-digit identification number of the corresponding Subregional Drainage Basin in which the action/project/activity is located. If located in more than one subregional drainage basin, enter the number of the basin in which the majority of the action/project/activity is located. Town subregional drainage basin maps available at UConn CLEAR's website: http://clear.uconn.edu/data/map_set/index.htm (no roads depicted) or at CTECO: http://www.cteco.uconn.edu/map_catalog.asp (depicts roads, choose town and a natural drainage basin map).

7. Enter the name of the individual applying for, petitioning, or receiving the action.

8. Enter the name and address or location of the action/project/activity. Check if the action/project/activity is TEMPORARY or PERMANENT in nature. Also provide a brief description of the action/project/activity. It is always best to provide as much information as possible (i.e., don't just state "forestry", provide details such as "20 acre forestry harvest, permit required for stream crossing".)

9. Carefully review the list below and enter ONLY ONE code letter which best characterizes the action/project/activity. All state agency projects must code "N."

A = Residential Improvement by Homeowner
B = New Residential Development for Single Family Units
C = New Residential Development for Multi-Family / Condos
D = Commercial / Industrial Uses
E = Municipal Project
F = Utility Company Project
G = Agriculture, Forestry or Conservation
H = Wetland Restoration, Enhancement, Creation
I = Storm Water / Flood Control
J = Erosion / Sedimentation Control
K = Recreation / Boating / Navigation
L = Routine Maintenance
M = Map Amendment
N = State Agency Project
P = Other (this code includes the approval of concept plans with no-on-the-ground work)

10. Enter between one and four code numbers to best characterize the project or activity being reported. Enter "NA" if this form is being completed for the action of map amendment. You MUST provide code 12 if the activity is located in an established upland review area. You MUST provide code 14 if the activity is located beyond the established upland review area or no established upland review area exists.

1 = Filling
2 = Excavation
3 = Land Clearing / Grubbing (no other activity)
4 = Stream Channelization
5 = Stream Stabilization (includes lakeshore stabilization)
6 = Stream Clearance (removal of debris only)
7 = Culverting (not for roadways)
8 = Underground Utilities Only (no other activities)
9 = Roadway / Driveway Construction
10 = Drainage Improvements
11 = Pond, Lake Dredging / Dam Construction
12 = Activity in an Established Upland Review Area
14 = Activity in Upland

Examples: Jurisdictional ruling allowing construction of a parking lot in an upland where the municipality does not have an established upland review area must use code 14, other possible codes are 2 and 10. Permitted construction of a free standing garage (residential improvement by homeowner) partially in an established upland review area with the remainder in the upland must use code 12 and 14, other possible codes are 1 and 2.

11. Leave blank for TEMPORARY alterations but please indicate action/project/activity is temporary under question #8 on the form. For PERMANENT alterations, enter in acres the area of wetland soils or watercourses altered. Include areas that are permanently altered, or are proposed to be, for all agency permits, denials, amendments, renewals, jurisdictional rulings, and enforcement actions. For those activities that involve filling or dredging of lakes, ponds or similar open water bodies enter the acres filled or dredged under "open water body". For those activities that involve directly altering a linear reach of a brook, river, lakeshore or similar linear watercourse, enter the total linear feet altered under "stream". Remember that these figures represent only the acreage altered not the total acreage of wetlands or watercourses on the site. You MUST provide all information in ACRES (or linear feet as indicated) including those areas less than one acre. To convert from square feet to acres, divide square feet by the number 43,560. If this report is being completed for an agency jurisdictional ruling and detailed information is not available, provide an estimate. Enter zero if there is no alteration.

12. Enter in acres the area of upland altered as a result of an ACTIVITY REGULATED BY the inland wetlands agency, or as a result of an AGENT APPROVAL pursuant to CGS section 22a-42a(c)(2). Leave blank for TEMPORARY alterations but please indicate action/project/activity is temporary under question #8 on the form. Include areas that are permanently altered, or proposed to be permanently altered, for all agent approvals, agency permits, denials, amendments, renewals, jurisdictional rulings, and enforcement actions. You MUST provide all information in ACRES including those areas less than one acre. See directions above (#11) for conversion factor. If this report is being completed for an agent approval or an agency jurisdictional ruling and detailed information is not available, provide an estimate. Enter zero if there is no alteration.

13. Enter the acres that are, or are proposed to be, restored, enhanced or created for all agency permits, denials, amendments, renewals, jurisdictional rulings and enforcement actions. NOTE restored or enhanced applies to previously existing wetlands or watercourses. Created applies to a non-wetland or non-watercourse area which is converted into wetlands or watercourses (question #10 must provide 12 and/or 14 as an answer, and question #12 must also be answered). You MUST provide all information in ACRES including those areas less than one acre. See directions above (#11) for conversion factor. Enter zero if there is no restoration, enhancement or creation.

PART III: To Be Completed By The DEEP - Please leave this area blank. Incomplete or incomprehensible forms will be mailed back to the municipal inland wetlands agency.

Connecticut Department of
ENERGY & ENVIRONMENTAL PROTECTION

GIS CODE #: ___ ___ ___ ___ ___ ___ ___ ___ ___
For DEEP Use Only

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

Statewide Inland Wetlands & Watercourses Activity Reporting Form

Please complete and mail this form in accordance with the instructions on pages 2 and 3 to:
DEEP Land & Water Resources Division, Inland Wetlands Management Program, 79 Elm Street, 3rd Floor, Hartford, CT 06106
Incomplete or incomprehensible forms will be mailed back to the municipal inland wetlands agency.

PART I: Must Be Completed By The Inland Wetlands Agency

1. DATE ACTION WAS TAKEN: year: **Click Here for Year** month: **Click Here for Month**

2. CHOOSE ACTION TAKEN (see instructions for codes): **Click Here to Choose a Code**

3. WAS A PUBLIC HEARING HELD (check one)? yes ☐ no ☐

4. NAME OF AGENCY OFFICIAL VERIFYING AND COMPLETING THIS FORM:

(type name) _____ (signature) _____

PART II: To Be Completed By The Inland Wetlands Agency Or The Applicant

5. TOWN IN WHICH THE ACTION IS OCCURRING (type name): **Enfield**
does this project cross municipal boundaries (check one)? yes ☐ no ☒
if yes, list the other town(s) in which the action is occurring (type name(s)): _____, _____

6. LOCATION (click on hyperlinks for information): USGS quad map name: **Broad Brook** or quad number: _____
subregional drainage basin number: **4003**

7. NAME OF APPLICANT, VIOLATOR OR PETITIONER (type name): **WE 113 NORTH MAPLE STREET, LLC**

8. NAME & ADDRESS / LOCATION OF PROJECT SITE (type information): **113 North Maple Street, Enfield, CT**
briefly describe the action/project/activity (check and type information): temporary ☐ permanent ☒ description: **Impact to Upland Review Area to construct trailer parking and a pipe outlet from stormwater management area.**

9. ACTIVITY *PURPOSE* CODE (see instructions for codes): **D**

10. ACTIVITY *TYPE* CODE(S) (see instructions for codes): **1, 3, 10, 12**

11. WETLAND / WATERCOURSE AREA ALTERED (type acres or linear feet as indicated):
wetlands: **0.00** acres open water body: **0.00** acres stream: **0.00** linear feet

12. UPLAND AREA ALTERED (type acres as indicated): **0.33** acres

13. AREA OF WETLANDS / WATERCOURSES RESTORED, ENHANCED OR CREATED (type acres as indicated): **0.00** acres

DATE RECEIVED:

PART III: To Be Completed By The DEEP

DATE RETURNED TO DEEP:

FORM COMPLETED: YES NO

FORM CORRECTED / COMPLETED: YES NO

Public Water Supply Watershed or Aquifer Area
Project Notification Form

Requirement:
All applicants before a municipal Zoning Commission, Planning and Zoning Commission, Zoning Board of Appeals, or Inland Wetlands Agency for any project located within a public water supply aquifer or watershed area are required by Section 8-3i and Sec. 22a-42 of the CT General Statutes to notify Connecticut Water Company of the proposed project by certified mail not later than 7 days after the date of the application. The notice should be sent to: Jessica Demar, Environmental & Regulatory Compliance Coordinator, Connecticut Water Company, 93 West Main Street, Clinton, CT 06413 by Certified Mail, Return Receipt.

General Information:

1. Location map of the project site (please show enough information to locate site).

2. Site plans, including soil erosion and sediment control plan, which have been submitted to the town commission for review.

3. Project address 113 NORTH MAPLE STREET

4. Total acreage of project site 71.2 ACRES

5. Existing land use UNDEVELOPED PROPERTY

6. Description of proposed project PROJECT INVOLVES 501,500 SQ.FT. WAREHOUSE/DISTRIBUTION BUILDING ALONG WITH ACCOMPANYING SITE IMPROVEMENTS

7. Acreage of area to be disturbed including structures, additions, paving, and soil disturbance
47.3± ACRES

8. Type of sanitary system (circle one): septic system / public sewer / none

9. Number of **existing or proposed** floor drains and their point of discharge e.g. sanitary sewer, holding tank, or ground
4 PROPOSED FLOOR DRAINS into SANITARY SEWER line

10. Water accessed by (circle one): private well / public water / none
If other, please specify

11. Distance of site disturbance to nearest watercourse or wetland

55-feet

12. Brief description of **existing and proposed** stormwater management system, including roof drainage, paved areas etc., and discharge points e.g. municipal sewers, drywells, streams, vegetated areas, detention basins etc.

Project will include a number of stormwater practices (catch basins, rain garden, infiltration trenches, roof drains and stormwater management areas all designed to address both quantitative and qualitative aspects of stormwater runoff

13. Type of heat for facility Natural Gas

14. List of **existing and proposed** underground or above-ground storage tanks including age, capacity and contents

None

15. List of potentially harmful chemicals stored or used on property (**existing and proposed**) and typical onsite volumes, including but not limited to petroleum products, lubricants, solvents, detergents and pesticides Given the nature of operations and intended land use (distrib.) there will be limited use and storage of potentially harmful chemicals. Less than 10 gal of cleaning or other products will be stored on site (see attached list)

16. Describe any wastes generated and their means of disposal

Minor amounts of cardboard, plastic stretch wrap and other shipping supplies will require disposal by a dedicated trash/recycling dumpster. Minor residual water from floor washing will be disposed via public sewer.

17. Date application will be heard by Planning and Zoning Commission 6-25-2020

18. Date application will be heard by Zoning Board of Appeals N/A

19. Date application will be heard by Inland Wetlands Commission 6-16-2020

20. Name, address and telephone number of contact person for the project:

WE 113 North Maple St, 150 Boker Ave Ext, Concord, MA 01742

Adam Winstanley Adam D. Winstanley 6/2/20

Name of person completing form Signature Date

Approved Warehouse Chemical List

February 21, 2019

• Green Sweeping Compound Box
• Klean Strip Lacquer Thinner
• Betco Hybrid Floor Finish
• Alex Plus Latex Caulk plus Silicone
• Great Stuff Insulating Foam
• Super Spec HP Urethane Alkyd Gloss Enamel Safety White Paint
• SSS tri-Max Disinfecting Glass& Multi-surface Glass Cleaner
• Clorox Disinfecting Bleach
• James Austin Elite Professional Bleach
• Clorox Healthcare Disinfecting Germicidal Wipes
• Germ-X Advanced Aloe Hand Sanitizer
• Vaseline Intensive Lotions
• MST Dust Mop Treatment
• MST Heavy Duty Glass Cleaner
• NCL White Pearl Hand Soap

STORMWATER MANAGEMENT REPORT

PROPOSED AGRI-MARK DISTRIBUTION FACILITY

113 NORTH MAPLE STREET
ENFIELD, CONNECTICUT

JUNE 1, 2020

PREPARED FOR:

WE 113 NORTH MAPLE STREET, LLC
C/O WINSTANLEY ENTERPRISES, LLC
150 BAKER AVE EXT.
CONCORD, MASSACHUSETTS 01742

PREPARED BY:

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
Three Congress Street Nashua, New Hampshire 03062-3301
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Stormwater Management Report

Proposed AGRI-MARK Distribution Facility
113 North Maple Street
Enfield, Connecticut

June 1, 2020

Prepared for:
WE 113 North Maple Street, LLC
c/o Winstanley Enterprises, LLC
150 Baker Ave Ext.
Concord, Massachusetts 01742

Prepared by:
Hayner/Swanson, Inc.
3 Congress Street
Nashua, NH 03062

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Exhibits:

Figure 1: USGS Vicinity Map
Figure 2: NRCS Soils Map
Figure 3: Aerial Photo
Figure 4: Off-Site Drainage Area Map
Figure 5: Pre-Development Drainage Area Map
Figure 6: Post-Development Drainage Area Map

1. Introduction

The following is a detailed stormwater management study for the proposed AGRI-MARK Distribution Facility to be located at 113 North Maple Street in Enfield, Connecticut. This study, along with accompanying support materials and site plans, is being submitted by WE 113 North Maple Street, LLC, the owners of the site, to various town, state and federal agencies in support of required permit applications and project approvals regarding stormwater management. The submitted materials have been prepared by a team of consultants who have been working collectively with the property owner for the development of this 71.2 +/- acre parcel of land in the central portion of the Town of Enfield. The purpose of the study is to provide a detailed analysis of the qualitative and quantitative stormwater impacts, including a peak flow rate comparison between the pre-development and post-development conditions for this property.

Historically, the majority of this site has been used for agricultural purposes. A small AGWAY business operated a facility on a part of the property at 97 North Maple Street. At present, the property is undeveloped except for several small abandoned buildings.

This property was recently purchased by the Applicant with the intent of developing a distribution facility upon the site. The building is expected to contain two tenants. AGRI-MARK, a Massachusetts – headquartered company that distributes a wide variety of dairy products throughout the United States will occupy the tenant space on the northern half of the building. The southern half, labeled on the plans as Tenant 'B' is undetermined at the time of this application.

2. Existing Conditions

The entire property consists of 71.2 acres of land. The property has frontage along Moody Road to the north and North Maple Street to the east. Single-family residential homes abut the site to the south, several commercial properties to the west, a mix of institutional and residential properties are located across North Maple Street.

With regard to the topography of the area being considered for development can generally be considered as slight. There is a gentle overall slope from the North Maple Street to the west. Wetland swales exist to the east of this area. Borings and test pits have been performed on the site and they confirm the NRCS mapping that the site contains deep, well-drained sandy soils. Wetlands were flagged and mapped by Megson, Heald and Friend, of Glastonbury, CT. Two wetland areas, bisected by an old farm road, were identified on the site. A small pocketed area is labeled as Wetland Area 1 and is subject to period ponding of water; likely due to the fact there is no outlet. Wetland Area 2 contains an intermittent watercourse that flows off-site to the west. Additionally, Watercourse Area 3, likely a former farm swale, exists in the northwest corner of the site.

3. Proposed Development

It is being proposed to construct a 1-story, 501,500 square foot distribution facility upon this project. The building will contain two tenants, each occupying approximately 250,000 square feet of floor space. Access to the development will come from two curb cuts along North Maple Street and one from Moody Road. Employee parking areas shall be located in front of the building and the trailer parking/loading dock areas will be located behind the structure. To the best of our knowledge the sewer, water, gas, telecommunication and electric utilities present in the adjacent roadways have adequate capacity to service this intended use. New lighting and landscaping improvements are proposed as part of the development of this building and site.

With regards to stormwater management, runoff from the proposed development areas will enter the proposed stormwater management areas in two locations, each will accommodate roughly one-half of the runoff from the proposed building and pavement areas. Sediment forebays are provided at the inlets as a pre-treatment measure for paved surface runoff. Coupled with the site swales and sediment forebays, these stormwater management areas form a 'treatment train', providing storage, infiltration and detention of stormwater runoff. Given the favorable soil conditions in this part of the site, Stormwater Management Area A is designed to store and infiltrate stormwater runoff. The grading of Stormwater Management Area B has been designed to provide for the development of wetter conditions (shallow pools and marsh areas) in the central areas, intermittently wet fringing wet meadow areas along the peripheral areas, and border side slopes established primarily with shrub species to buffer the stormwater wetland and contribute to visual and habitat diversity. Within the constructed wetland a planting plan has been developed that will establish plant species appropriate for the anticipated hydrology in each area of the system. The vegetation will aid in stabilizing the basin, provide additional biological attenuation of stormwater constituents, and provide both habitat and visual enhancement of the stormwater wetland area.

We also note that a component of the planting program is the seeding of a conservation/wildlife seed mix in and around the basins and the proposed landscape berm. These seed mixes are intended to provide an initial vegetative cover in the stormwater areas to ensure soil stabilization and non-erosive conditions. The seed mixes are not intended to have a long-term substantial effect on the vegetative composition of the constructed, as the formal plantings listed in on the plans will form the predominant plant cover.

4. Storm Drainage Analysis

A. Intent

In general, the intent of the stormwater management system is to address the qualitative and quantitative aspects of post-development runoff so that there are no downstream adverse impacts created by this project. The proposed stormwater management design contains a number of elements that will collect, convey, recharge, treat and detain

stormwater runoff from development areas, including the following 'primary' and 'secondary' stormwater treatment practices:

Primary Treatment:

- Infiltration Basin (SMA A)
- Stormwater Pond (SMA B)

Secondary Treatment:

- Rain Garden (RG A)
- Roof Recharge Trenches (East side of building)
- Grass Swales
- Sediment Forebays

Conservatively, many of the secondary treatment practices were not included in the hydrologic analysis (including the recharge trenches and infiltration within the grass swales).

Runoff will be directed into two stormwater management areas (Stormwater Management Areas A and B) that will provide primary treatment for the post-developed condition. Each basin will accommodate roughly one-half of the runoff from the proposed building and pavement areas. The northern practice (SMA A) will be an infiltration basin that will serve as a combination treatment and flood control facility. Sediment forebays are provided at the inlets as a pre-treatment measure for contributing runoff. The southern practice (SMA B) will be a stormwater pond with a sediment forebay acting as pre-treatment. Coupled with the secondary treatment practices described above, SMA A and SMA B will form a stormwater treatment train, providing storage, infiltration (where applicable), and detention of stormwater runoff.

B. Methodology

In accordance with the Town of Enfield and CT DEEP stormwater regulations the 1-year, 2-year, 10-year, 25-year, and 100-year storms will be analyzed. Evaluation of the quantitative runoff impacts of the proposed development were determined by comparing the post-development flows with the pre-development existing flows for the site. Flows were measured at the property line or a potential impact point downstream, and are represented on the plans and report as **Points of Analysis (POA)**.

Total drainage area calculations for pre-development conditions and post development conditions were evaluated and designed using the HydroCAD® version 10.0 stormwater modeling program for the Soil Conservation Service (SCS) type III storm distribution. Values for time of concentration used in the analysis were calculated using the methodology contained within U.S.D.A-S.C.S. publication Urban Hydrology for Small Watersheds Technical Release No. 55 (TR55).

The Rational Method of determining peak rates of runoff was used to size and design the individual drain lines for this project. The pipe sizing for the closed drainage systems was designed for the 25-year storm event (per the Town of Enfield Regulations) using the Rational Method of analysis and shown in Appendix C.

Stormwater Management Areas were designed in accordance with the methodology for the "best management practice" (BMP), as presented in the Connecticut DEEP Stormwater Quality Manual and shown in Appendix D.

It should be noted that the overall stormwater management design for this project includes the future building and parking expansion areas as shown on the attached plans. It is our opinion that this is the most responsible and conservative approach to the design of the stormwater management system for this property.

C. Pre-Development Drainage Conditions

As can be seen on the attached Pre-Development Drainage Area Map, there are two main drainage patterns that exist in this part of the site. The first watershed (Subcatchment 'NW'), measuring approximately 27-acres in size, accommodates runoff from the northerly part of this property. Runoff is conveyed in a westerly direction via overland flow and then a man-made swale that was constructed as part of the development of abutting parcels to the north and west of the subject site. The swale eventually flows west through Lego Drive and ultimately connects with Freshwater Brook. The summation of runoff leaving the site in this location will be analyzed in this study as **Point of Analysis Northwest (POA NW).**

The second watershed (Subcatchments 'SW1' & 'SW2') includes the main body of the property along with two off-site contributing drainage areas (Subcatchments 'Off-Site 1' & 'Off-Site 2') that discharge runoff onto and through this property. Runoff from this watershed, which measures approximately 54-acres, makes its way into an existing wetland complex located in the southwest part of the site which also flows west and eventually reaches Freshwater Brook. The summation of runoff from the project area entering the wetland in this location will be analyzed in this study as **Point of Analysis Southwest (POA SW).**

The pre-development peak rates of runoff to each of these locations are shown below in Table 1. Detailed calculations of the pre-development conditions are provided in Appendix A.

TABLE 1: PRE-DEVELOPMENT RUNOFF CONDITIONS

Location	Storm Frequency	Pre-Development Peak Rates of Runoff (cfs)
POA NW	1-year	0.31
	2-year	1.66
	10-year	10.68
	25-year	17.93
	100-year	33.03
POA SW	1-year	2.72
	2-year	8.06
	10-year	31.20
	25-year	47.33
	100-year	79.02

D. Post-Development Drainage Conditions

As stated above, the approach to stormwater management for this project is to provide qualitative treatment and quantitative attenuation as to minimize adverse impacts to the downstream drainage condition. As can be seen on the Post-Development Drainage Area Map, the post development drainage condition attempts to maintain the pre-development drainage pattern. Runoff from the northern half of the project (Subcatchment 'A') will be run through a series of 'secondary' treatment practices (including a rain garden practice – Rain Garden 'A') and eventually end up in a large, infiltration basin **(Stormwater Management Area A)** located in the northwest part of the project. A riprap spillway outlet is proposed to convey overflow to the man-made swale that carries flow off the site to the northwest. The perimeter watershed area (Subcatchment 'NW') will continue to drain in a westerly direction via overland flow and the man-made swale. Similar to the pre-development condition, the summation of runoff from the project area leaving the site in this location will be analyzed in this study as **Point of Analysis Northwest (POA NW).**

Stormwater Management Area A completely stores/infiltrates up to and including the 100-year storm event.

Runoff from the southern half of the site (Subcatchment 'B') and the two off-site contributing drainage areas (Subcatchments 'Off-Site 1' & 'Off-Site 2') will similarly run through various secondary treatment measures (including numerous roof recharge trenches) before ultimately reaching a large, stormwater pond **(Stormwater Management Area B)** to be constructed southwest part of the development. SMA B will include an outlet control structure that discharges into the on-site wetland complex in a controlled manner. Similar to the pre-development conditions, the summation of runoff from the project area entering the wetland in this location will be analyzed in this study as **Point of Analysis Southwest (POA SW).**

The grading of the constructed stormwater pond (SMA B) has been designed to provide for the development of wetter conditions (permanent pool areas with 4-6 feet of standing water) in the central areas, intermittently wet fringing wet meadow areas along the peripheral areas, and border side slopes established primarily with shrub species to buffer the stormwater pond and contribute to visual and habitat diversity. A planting plan has been developed that will establish plant species appropriate for the anticipated hydrology in each area of the system. The vegetation will aid in stabilizing the basin, provide additional biological attenuation of stormwater constituents, and provide both habitat and visual enhancement of the stormwater pond area. The infiltration promoted by the "focused recharge" in the above-referenced stormwater system will contribute to the subsurface groundwater system that supports the permanent pool conditions in the proposed stormwater pond and adjacent wetland areas.

A summary of the stormwater management area characteristics in post-development condition is located below in Table 2.

TABLE 2: POST DEVELOPMENT STORMWATER MANAGEMENT AREA A & B CHARACTERISTICS

	Storm Frequency	Inflow (cfs)	Primary Outflow (cfs)	Bottom Elev./ Top Elev.	Max. Water Surface Elev.
SMA A	1-year	18.53	0.00	158.0 (Bottom) 163.0 (Overflow)	158.81
	2-year	27.36	0.00		159.35
	10-year	51.18	0.00		160.44
	25-year	65.06	0.00		161.04
	100-year	89.99	0.00		162.11
SMA B	1-year	22.60	2.25	159.5 (Perm. Pool) 164.6 (Overflow)	160.74
	2-year	35.39	4.09		161.23
	10-year	71.47	9.93		162.49
	25-year	91.98	11.69		163.26
	100-year	128.88	14.16		164.56

Table 3 below shows the comparative results of the peak rates of runoff leaving this site at both POA NW and POA SW. Detailed calculations for the post-development conditions are located in Appendix B. Relevant test pit and boring information can be found in the referenced geotechnical report prepared by GEI Consultants, Inc. (see Appendix G).

TABLE 3: COMPARISON OF PRE-DEVELOPMENT AND POST DEVELOPMENT RUNOFF CONDITIONS

Location	Storm Frequency	Pre-Development Peak Rates of Runoff (cfs)	Post Development Peak Rates of Runoff (cfs)
POA NW	1-year	0.31	0.06
	2-year	1.66	0.25
	10-year	10.68	3.04
	25-year	17.93	5.69
	100-year	33.03	11.69
POA SW	1-year	2.72	2.33
	2-year	8.06	4.27
	10-year	31.20	10.65
	25-year	47.33	13.02
	100-year	79.02	17.53

E. Results

In summary, the proposed stormwater management design for the Proposed AGRI-MARK Distribution Facility meets the qualitative and quantitative requirements set forth in the Town of Enfield Stormwater Regulations and CT DEEP Stormwater Quality Manual.

1. The proposed development maintains existing drainage patterns and provides qualitative treatment of stormwater runoff throughout the site by use of the various 'primary' and 'secondary' treatment measures such as an infiltration basin, stormwater pond, rain garden, recharge trenches, grass swales, sediment forebays and deep-sump catch basins.
2. Stormwater runoff generated by the proposed development will be captured through curbing, catch basins, grass swales and roof drains, and conveyed to one of two stormwater management areas (SMA A and SMA B). SMA A and SMA B are designed as combination qualitative treatment and flood control facilities.
3. The proposed stormwater management areas provide sufficient storage capacity so that the post-development peak flows leaving the site are less than or equal to the pre-development peak flows for the 1, 2, 10, 25 and 100-year storm events leaving the site to all Points of Analysis.

5. Erosion and Sedimentation Control Provisions

Best management practices and erosion and sedimentation control measures are proposed throughout the project, to ensure that the wetlands and adjacent off-site areas are protected from erosion/siltation and debris during construction of this project. These measures include silt fencing, stone check dams, erosion control matting and Siltsack controls at catch basin inlets in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control (DEP Bulletin 34).

A. Temporary Erosion and Sediment Control Measures

During the construction phase of the project, specific erosion and sedimentation controls have been developed into the design of the project and details of these items are included in the project plans. The erosion control notes and construction sequence were developed to limit soil loss due to erosion and are therefore directed at minimizing the degradation of water quality on and off the site. The following temporary erosion and sedimentation control devices will be implemented throughout the site:

- Seeding: Installation of temporary or permanent seeding to establish vegetative growth to minimize erosion.
- Temporary/Permanent Mulching: Placement of materials to the soil surface to reduce the potential of erosion and aid in establishing vegetative cover.
- Dust Control: Implementing dust control activities such as watering to minimize dust from exposed surfaces.
- Temporary Stockpile Areas: Stockpiling material allows for materials to be managed and protected to reduce or eliminate wind and water erosion and prevent pollution from displaced sediment.
- Temporary Sediment Basins/Traps: Small temporary ponding areas to intercept sediment laden runoff from small disturbed areas allowing settling of sediment particles from runoff.
- Silt Fencing: Temporary sediment barrier installed across or at the toes of a slope to intercept and retain small amounts of sediment from disturbed or unprotected areas.
- Temporary Stone Check Dams: Temporary stone check dams installed across swales to intercept and retain small amounts of sediment from disturbed or unprotected areas.
- Construction Entrances/Exit: A pad of stone aggregated located at points of entrance/exit to the construction site to reduce or eliminated tracking of sediment onto public roads by construction vehicles.
- Inlet Protection (Siltsack): A sediment barrier installed in and around a storm drain inlet to reduce sediment discharge into the drainage system.
- Construction Fencing: Construction-phase fencing is proposed in the vicinity of Wetland No.1 to protect that treed area and potential habitat functions. As a standard approach to protecting species such as the Eastern Box Turtle, silt fencing (or similar) will be used to minimize the movement of this state-listed species into the area of active construction. Depending on the time of year construction is occurring, the fencing may be used in combination with monitoring in the form of sweeps along the limits of construction to ensure the area of active construction is free of turtle use. Contactor education will also be provided to ensure awareness of the potential presence of state-listed turtles in the habitat west of the construction activities.

B. Permanent Erosion and Sediment Control Measures

Permanent erosion control measures have been included in the design of the project to limit long-term erosion conditions. Loam and seed requirements have been specified to establish conditions that minimize erodible conditions. This is complemented by the minimization of stormwater flow lengths to keep runoff quantities and velocities as low as possible. Permanent sediment control features include the selection of best management practices to control sediment on the site. The following permanent measures, when completed and in place, will provide the treatment methods that maintain long-term water quality standards in waterways:

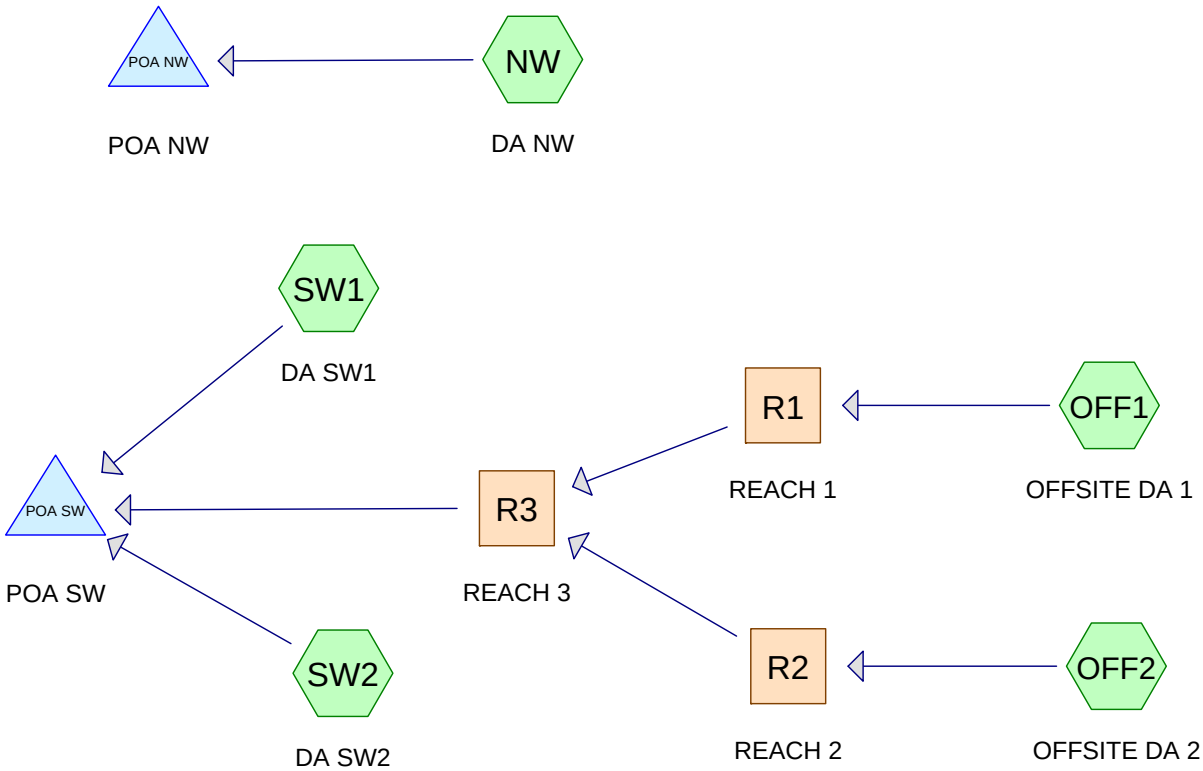
- Vegetation: Landscaping and surface treatments that prevent or minimize soil erosion.
- Street/Parking Lot Sweeping: Pollution and prevention practice that removes sediment, debris and trash that accumulates along streets, roads and parking lots from winter sanding practiced and everyday use.
- Sediment Forebay: Sediment forebays are designed to dissipate the energy of incoming runoff and allow for initial settling of coarse sediments.
- Stormwater Management Areas: Stormwater management areas A & B were designed to temporarily store runoff, allowing settling of suspended solids and facilitate the uptake of certain pollutants by the wetland vegetation.

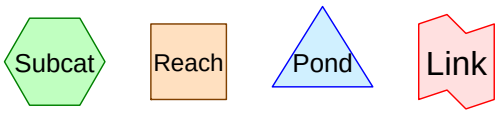
6. References

- "Geotechnical Engineering Report, Proposed Industrial Building, Enfield, Connecticut" dated March, 2020 and prepared by GEI Consultants, Inc., Glastonbury, Connecticut.
- Connecticut Guidelines for Soil Erosion and Sediment Control, State of Connecticut Department of Energy and Environmental Protection, latest edition.
- Connecticut Guidelines for Stormwater Quality Management, State of Connecticut Department of Energy and Environmental Protection, latest edition.
- Urban Hydrology for Small Watersheds Technical Release No. 55 (TR55).
- ConnDOT Drainage Manual, State of Connecticut Department of Transportation, latest revision.

APPENDIX A

PRE DEVELOPMENT DRAINAGE CALCULATIONS





Routing Diagram for Pre-Development 5-29-20
Prepared by Hayner/Swanson, Inc. , Printed 6/4/2020
HydroCAD® 10.00-25 s/n 05005 © 2019 HydroCAD Software Solutions LLC

Project Notes

Rainfall events imported from "POST-DEVELOPMENT.hcp"

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
4.370	51	1 acre lots, 20% imp, HSG A (NW)
4.750	68	1 acre lots, 20% imp, HSG B (NW, SW2)
5.250	61	>75% Grass cover, Good, HSG B (OFF1, OFF2)
0.780	85	Gravel roads, HSG B (SW2)
5.920	39	Pasture/grassland/range, Good, HSG A (NW, SW2)
36.230	61	Pasture/grassland/range, Good, HSG B (NW, SW1, SW2)
1.810	98	Paved parking, HSG B (NW, OFF1, OFF2, SW2)
0.210	98	Roofs, HSG B (SW2)
2.610	30	Woods, Good, HSG A (NW)
12.330	55	Woods, Good, HSG B (NW, OFF1, OFF2, SW1, SW2)
1.540	32	Woods/grass comb., Good, HSG A (SW2)
5.380	58	Woods/grass comb., Good, HSG B (NW, SW2)
81.180	**58**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
14.440	HSG A	NW, SW2
66.740	HSG B	NW, OFF1, OFF2, SW1, SW2
0.000	HSG C	
0.000	HSG D	
0.000	Other	
81.180		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
4.370	4.750	0.000	0.000	0.000	9.120	1 acre lots, 20% imp	NW, SW 2
0.000	5.250	0.000	0.000	0.000	5.250	>75% Grass cover, Good	OFF 1, OFF 2
0.000	0.780	0.000	0.000	0.000	0.780	Gravel roads	SW 2
5.920	36.230	0.000	0.000	0.000	42.150	Pasture/grassland/range, Good	NW, SW 1, SW 2
0.000	1.810	0.000	0.000	0.000	1.810	Paved parking	NW, OFF 1, OFF 2, SW 2
0.000	0.210	0.000	0.000	0.000	0.210	Roofs	SW 2
2.610	12.330	0.000	0.000	0.000	14.940	Woods, Good	NW, OFF 1, OFF 2, SW 1, SW 2
1.540	5.380	0.000	0.000	0.000	6.920	Woods/grass comb., Good	NW, SW 2
14.440	**66.740**	**0.000**	**0.000**	**0.000**	**81.180**	**TOTAL AREA**	

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment NW: DA NW Runoff Area=26.780 ac 4.93% Impervious Runoff Depth=1.17"
Flow Length=2,125' Tc=28.1 min CN=54 Runoff=17.93 cfs 2.612 af

Subcatchment OFF1: OFFSITE DA 1 Runoff Area=2.100 ac 16.67% Impervious Runoff Depth=2.08"
Flow Length=816' Slope=0.0368 '/' Tc=20.9 min CN=66 Runoff=3.27 cfs 0.363 af

Subcatchment OFF2: OFFSITE DA 2 Runoff Area=6.400 ac 6.25% Impervious Runoff Depth=1.68"
Flow Length=816' Slope=0.0368 '/' Tc=23.8 min CN=61 Runoff=7.34 cfs 0.895 af

Subcatchment SW1: DA SW1 Runoff Area=2.030 ac 0.00% Impervious Runoff Depth=1.31"
Flow Length=280' Tc=31.4 min CN=56 Runoff=1.51 cfs 0.222 af

Subcatchment SW2: DA SW2 Runoff Area=43.870 ac 4.04% Impervious Runoff Depth=1.60"
Flow Length=1,120' Tc=36.9 min CN=60 Runoff=39.02 cfs 5.859 af

Reach R1: REACH 1 Avg. Flow Depth=0.64' Max Vel=0.79 fps Inflow=3.27 cfs 0.363 af
n=0.130 L=500.0' S=0.0146 '/' Capacity=32.94 cfs Outflow=2.80 cfs 0.363 af

Reach R2: REACH 2 Avg. Flow Depth=0.99' Max Vel=0.85 fps Inflow=7.34 cfs 0.895 af
n=0.130 L=780.0' S=0.0106 '/' Capacity=28.12 cfs Outflow=5.85 cfs 0.895 af

Reach R3: REACH 3 Avg. Flow Depth=1.25' Max Vel=0.74 fps Inflow=8.50 cfs 1.259 af
n=0.130 L=600.0' S=0.0062 '/' Capacity=21.41 cfs Outflow=7.39 cfs 1.259 af

Pond POA NW: POA NW Inflow=17.93 cfs 2.612 af
Primary=17.93 cfs 2.612 af

Pond POA SW: POA SW Inflow=47.33 cfs 7.339 af
Primary=47.33 cfs 7.339 af

Total Runoff Area = 81.180 ac Runoff Volume = 9.951 af Average Runoff Depth = 1.47"
95.26% Pervious = 77.336 ac 4.74% Impervious = 3.844 ac

Summary for Subcatchment NW: DA NW

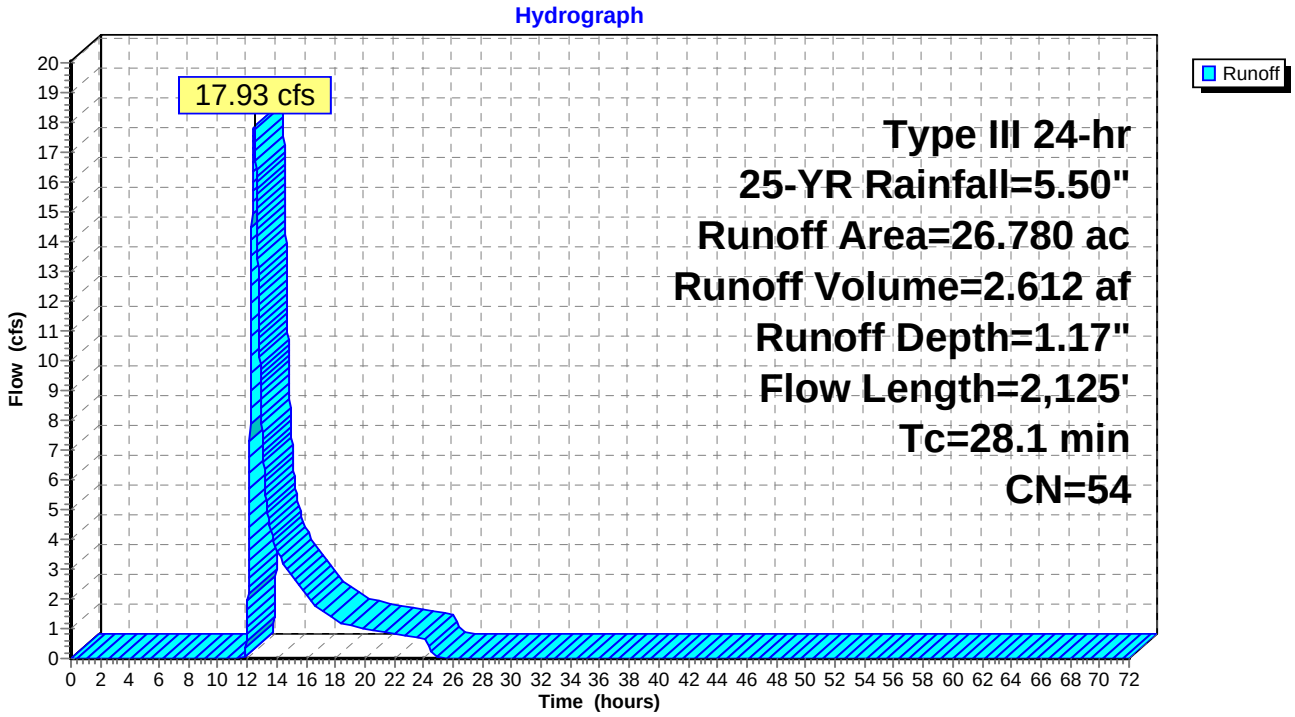
Runoff = 17.93 cfs @ 12.46 hrs, Volume= 2.612 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
4.370	51	1 acre lots, 20% imp, HSG A
1.030	68	1 acre lots, 20% imp, HSG B
2.350	39	Pasture/grassland/range, Good, HSG A
9.080	61	Pasture/grassland/range, Good, HSG B
2.610	30	Woods, Good, HSG A
6.190	55	Woods, Good, HSG B
0.240	98	Paved parking, HSG B
0.910	58	Woods/grass comb., Good, HSG B
26.780	54	Weighted Average
25.460		95.07% Pervious Area
1.320		4.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0300	0.20		**Sheet Flow,** Range n= 0.130 P2= 3.20"
20.7	1,060	0.0090	0.85		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
3.1	1,015	0.0100	5.44	97.88	**Trap/Vee/Rect Channel Flow,** Bot.W=3.00' D=2.00' Z= 3.0 '/' Top.W=15.00' n= 0.030 Earth, grassed & winding
28.1	2,125	Total			

Subcatchment NW: DA NW



Summary for Subcatchment OFF1: OFFSITE DA 1

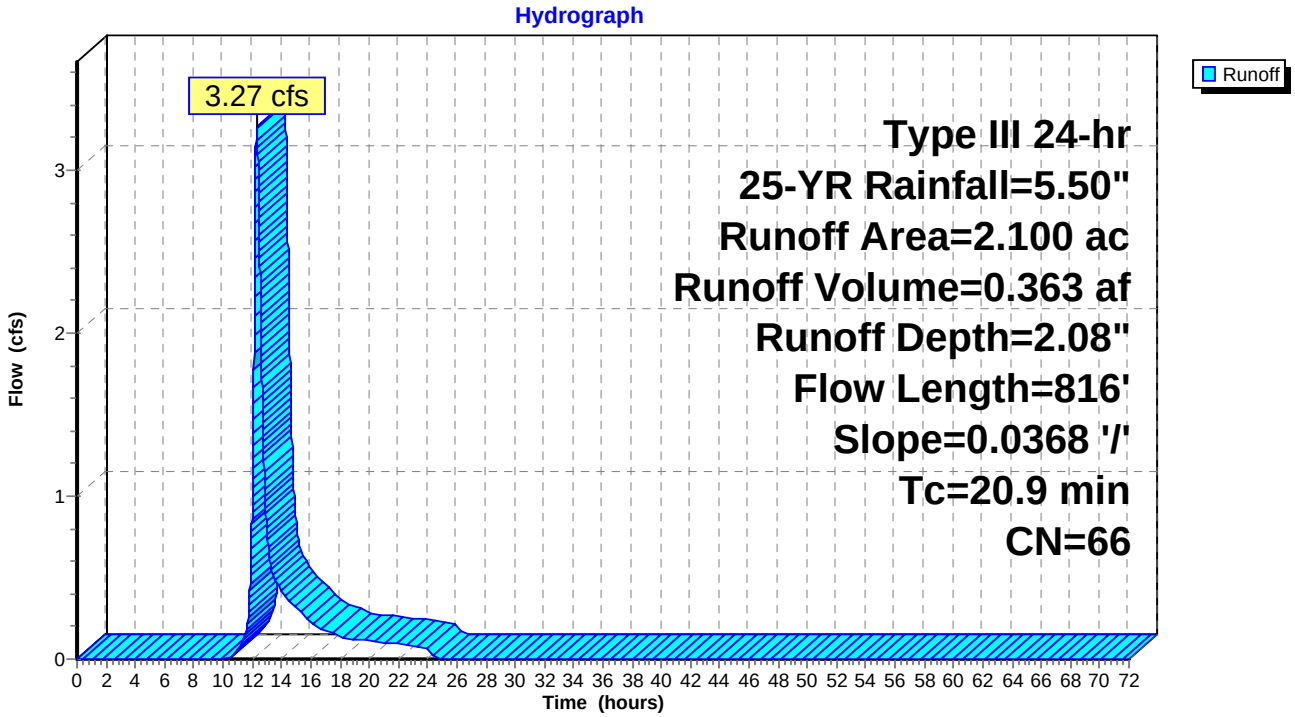
Runoff = 3.27 cfs @ 12.31 hrs, Volume= 0.363 af, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
0.500	55	Woods, Good, HSG B
1.250	61	>75% Grass cover, Good, HSG B
0.350	98	Paved parking, HSG B
2.100	66	Weighted Average
1.750		83.33% Pervious Area
0.350		16.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.9	816	0.0368	0.65		**Lag/CN Method,**

Subcatchment OFF1: OFFSITE DA 1



Summary for Subcatchment OFF2: OFFSITE DA 2

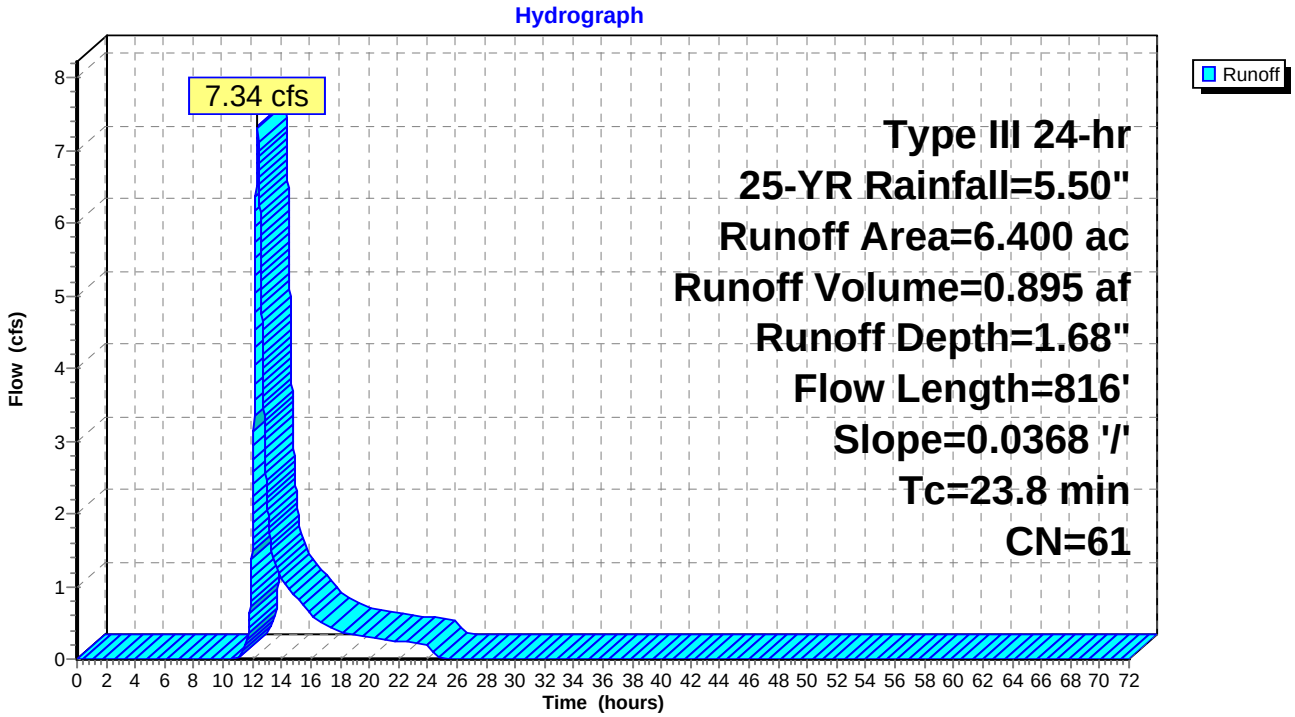
Runoff = 7.34 cfs @ 12.35 hrs, Volume= 0.895 af, Depth= 1.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
2.000	55	Woods, Good, HSG B
4.000	61	>75% Grass cover, Good, HSG B
0.400	98	Paved parking, HSG B
6.400	61	Weighted Average
6.000		93.75% Pervious Area
0.400		6.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.8	816	0.0368	0.57		**Lag/CN Method,**

Subcatchment OFF2: OFFSITE DA 2



Summary for Subcatchment SW1: DA SW1

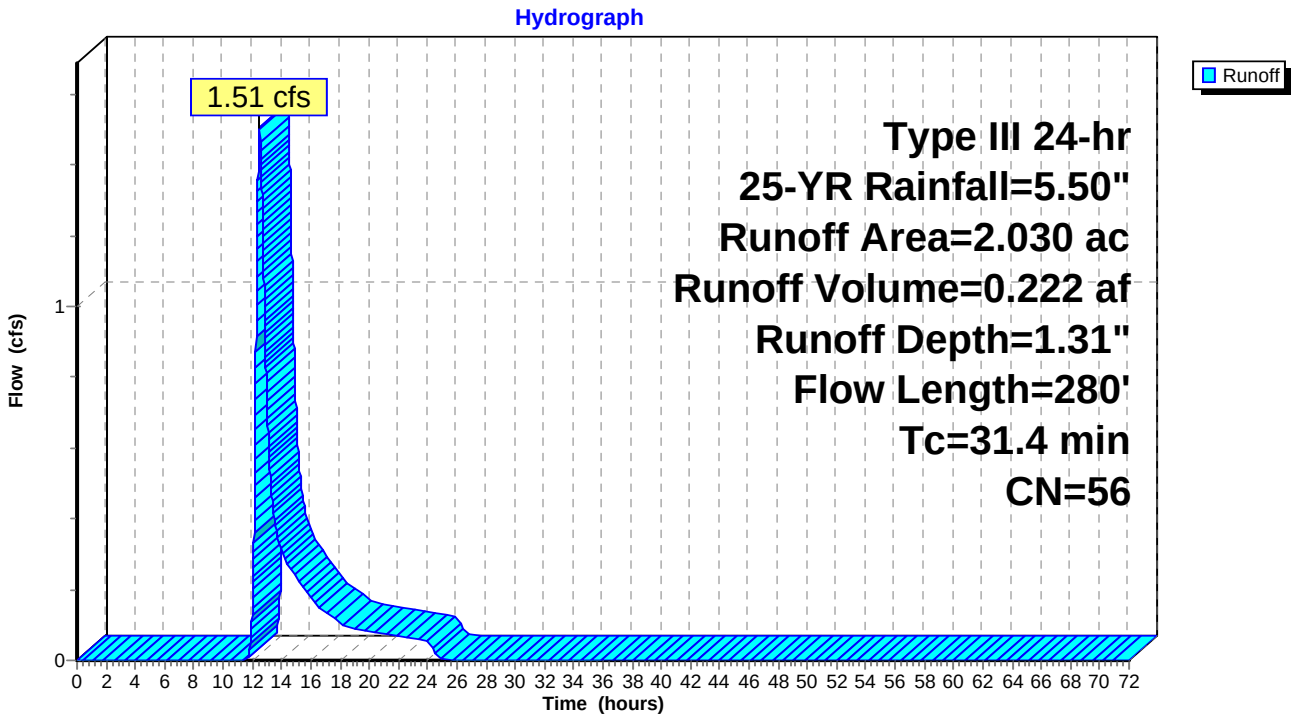
Runoff = 1.51 cfs @ 12.52 hrs, Volume= 0.222 af, Depth= 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
0.200	61	Pasture/grassland/range, Good, HSG B
1.830	55	Woods, Good, HSG B
2.030	56	Weighted Average
2.030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.5	50	0.0050	0.04		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
9.9	230	0.0060	0.39		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
31.4	280	Total			

Subcatchment SW1: DA SW1



Summary for Subcatchment SW2: DA SW2

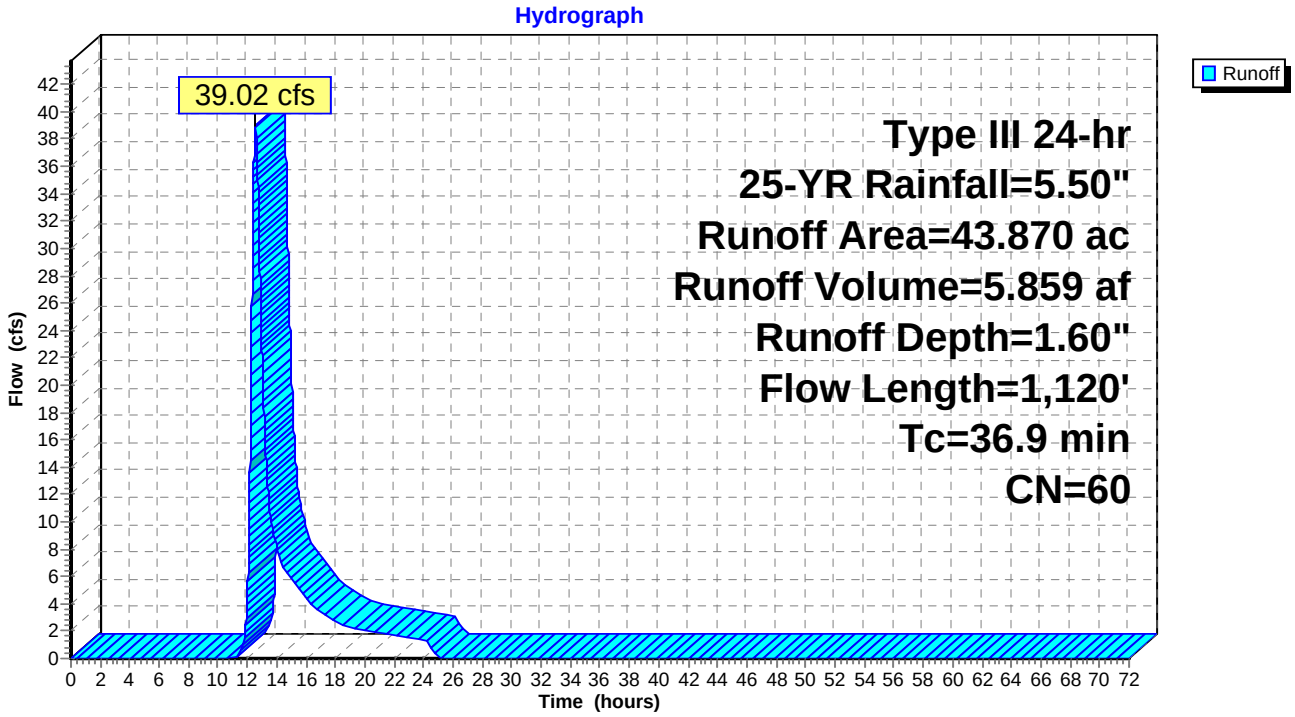
Runoff = 39.02 cfs @ 12.58 hrs, Volume= 5.859 af, Depth= 1.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
3.570	39	Pasture/grassland/range, Good, HSG A
26.950	61	Pasture/grassland/range, Good, HSG B
1.810	55	Woods, Good, HSG B
1.540	32	Woods/grass comb., Good, HSG A
4.470	58	Woods/grass comb., Good, HSG B
3.720	68	1 acre lots, 20% imp, HSG B
0.210	98	Roofs, HSG B
0.820	98	Paved parking, HSG B
0.780	85	Gravel roads, HSG B
43.870	60	Weighted Average
42.096		95.96% Pervious Area
1.774		4.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	50	0.0070	0.04		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
18.1	1,070	0.0120	0.99		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
36.9	1,120	Total			

Subcatchment SW2: DA SW2



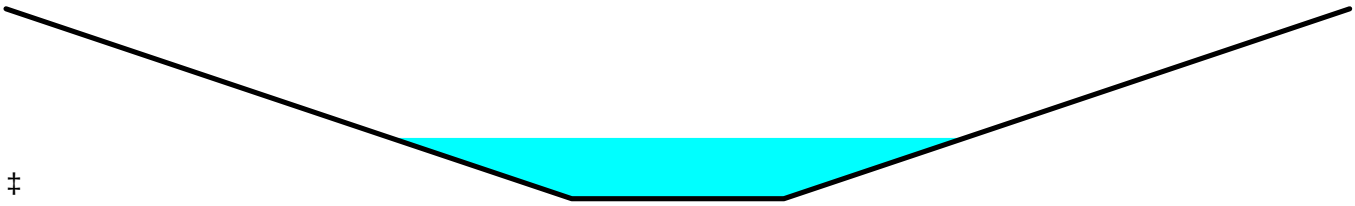
Summary for Reach R1: REACH 1

Inflow Area = 2.100 ac, 16.67% Impervious, Inflow Depth = 2.08" for 25-YR event
Inflow = 3.27 cfs @ 12.31 hrs, Volume= 0.363 af
Outflow = 2.80 cfs @ 12.44 hrs, Volume= 0.363 af, Atten= 14%, Lag= 8.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.79 fps, Min. Travel Time= 10.6 min
Avg. Velocity = 0.25 fps, Avg. Travel Time= 33.8 min

Peak Storage= 1,781 cf @ 12.44 hrs
Average Depth at Peak Storage= 0.64'
Bank-Full Depth= 2.00' Flow Area= 22.0 sf, Capacity= 32.94 cfs

3.00' x 2.00' deep channel, n= 0.130 Sheet flow over Range
Side Slope Z-value= 4.0 '/' Top Width= 19.00'
Length= 500.0' Slope= 0.0146 '/'
Inlet Invert= 174.00', Outlet Invert= 166.70'



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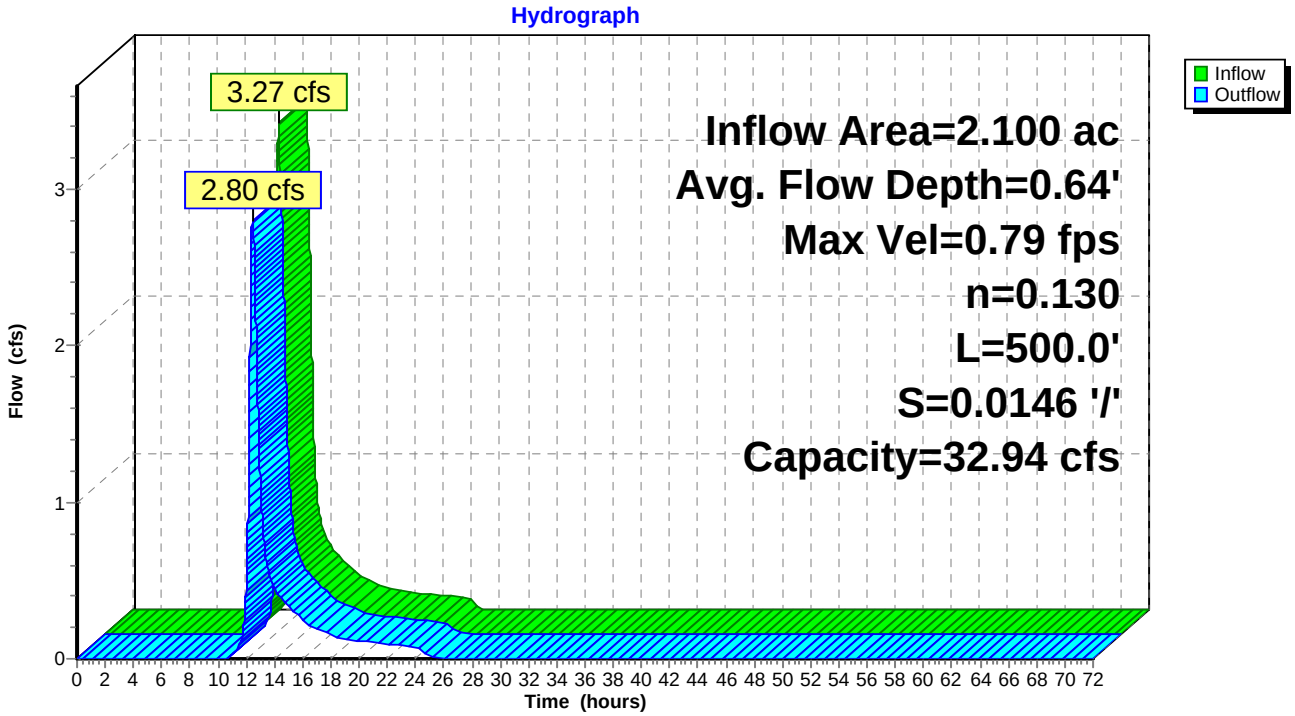
Reach R1: REACH 1



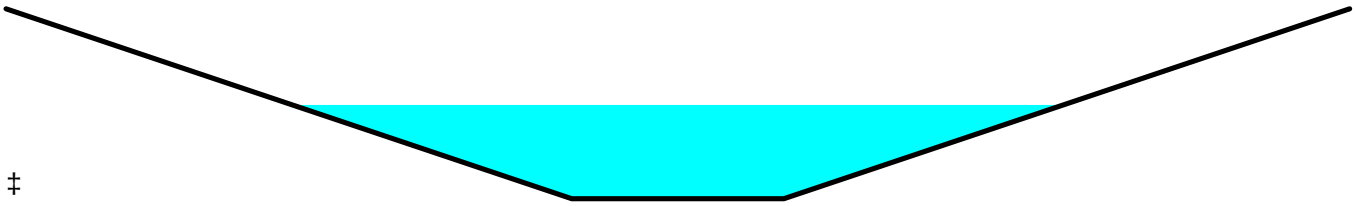
Summary for Reach R2: REACH 2

Inflow Area = 6.400 ac, 6.25% Impervious, Inflow Depth = 1.68" for 25-YR event
Inflow = 7.34 cfs @ 12.35 hrs, Volume= 0.895 af
Outflow = 5.85 cfs @ 12.56 hrs, Volume= 0.895 af, Atten= 20%, Lag= 12.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.85 fps, Min. Travel Time= 15.2 min
Avg. Velocity = 0.23 fps, Avg. Travel Time= 56.0 min

Peak Storage= 5,345 cf @ 12.56 hrs
Average Depth at Peak Storage= 0.99'
Bank-Full Depth= 2.00' Flow Area= 22.0 sf, Capacity= 28.12 cfs

3.00' x 2.00' deep channel, n= 0.130 Sheet flow over Range
Side Slope Z-value= 4.0 '/' Top Width= 19.00'
Length= 780.0' Slope= 0.0106 '/'
Inlet Invert= 175.00', Outlet Invert= 166.70'



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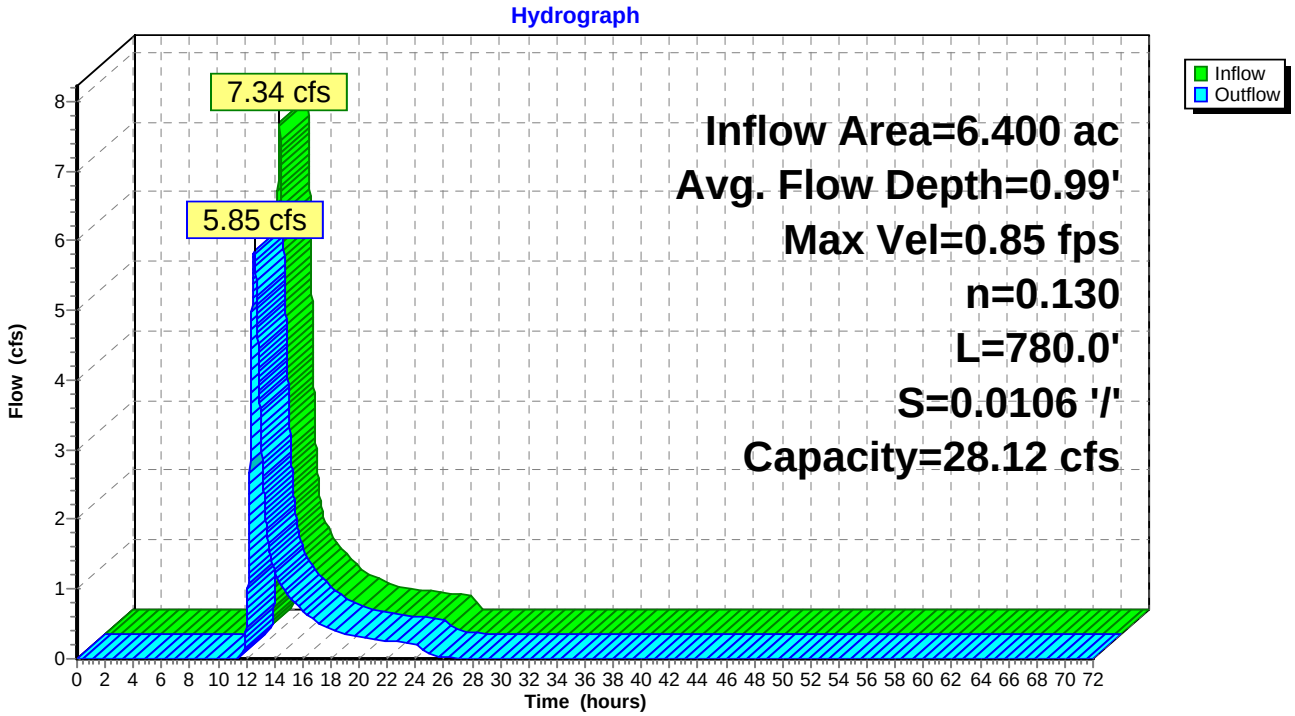
Reach R2: REACH 2



Summary for Reach R3: REACH 3

Inflow Area = 8.500 ac, 8.82% Impervious, Inflow Depth = 1.78" for 25-YR event
Inflow = 8.50 cfs @ 12.52 hrs, Volume= 1.259 af
Outflow = 7.39 cfs @ 12.71 hrs, Volume= 1.259 af, Atten= 13%, Lag= 11.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.74 fps, Min. Travel Time= 13.5 min
Avg. Velocity = 0.18 fps, Avg. Travel Time= 54.3 min

Peak Storage= 5,979 cf @ 12.71 hrs
Average Depth at Peak Storage= 1.25'
Bank-Full Depth= 2.00' Flow Area= 22.0 sf, Capacity= 21.41 cfs

3.00' x 2.00' deep channel, n= 0.130 Sheet flow over Range
Side Slope Z-value= 4.0 '/' Top Width= 19.00'
Length= 600.0' Slope= 0.0062 '/'
Inlet Invert= 166.70', Outlet Invert= 163.00'

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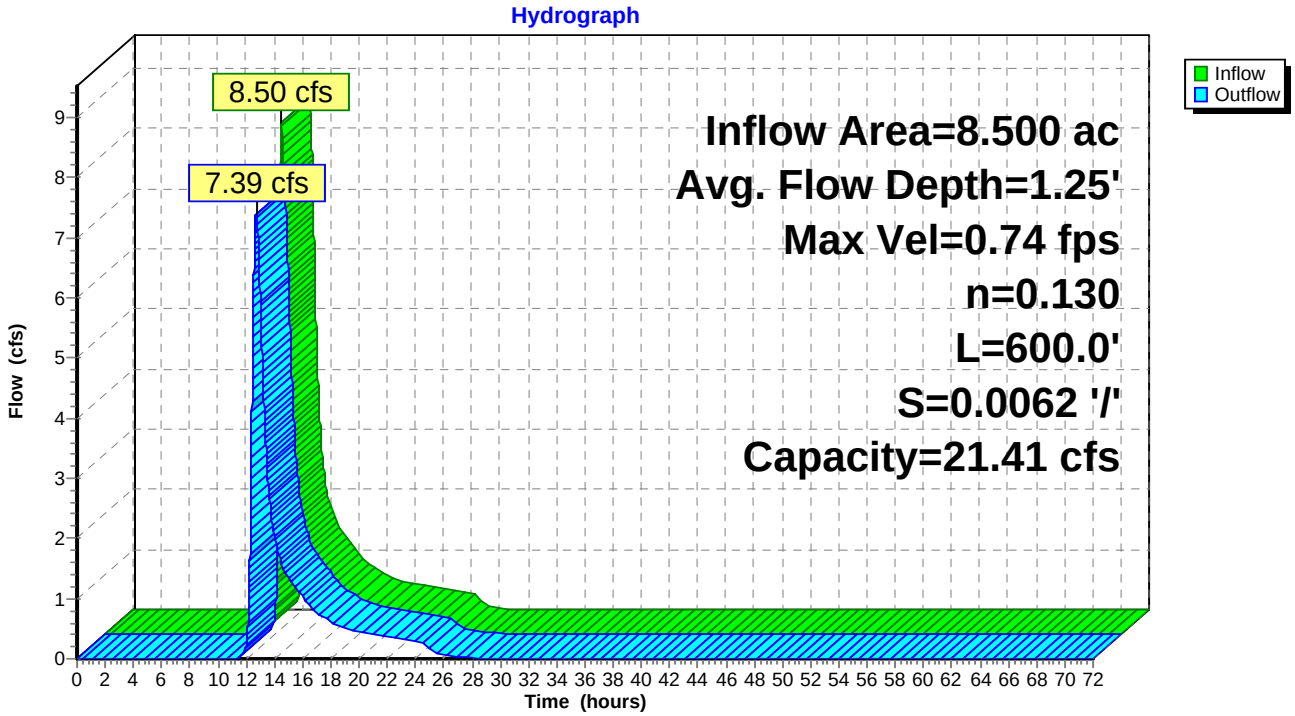
Reach R3: REACH 3

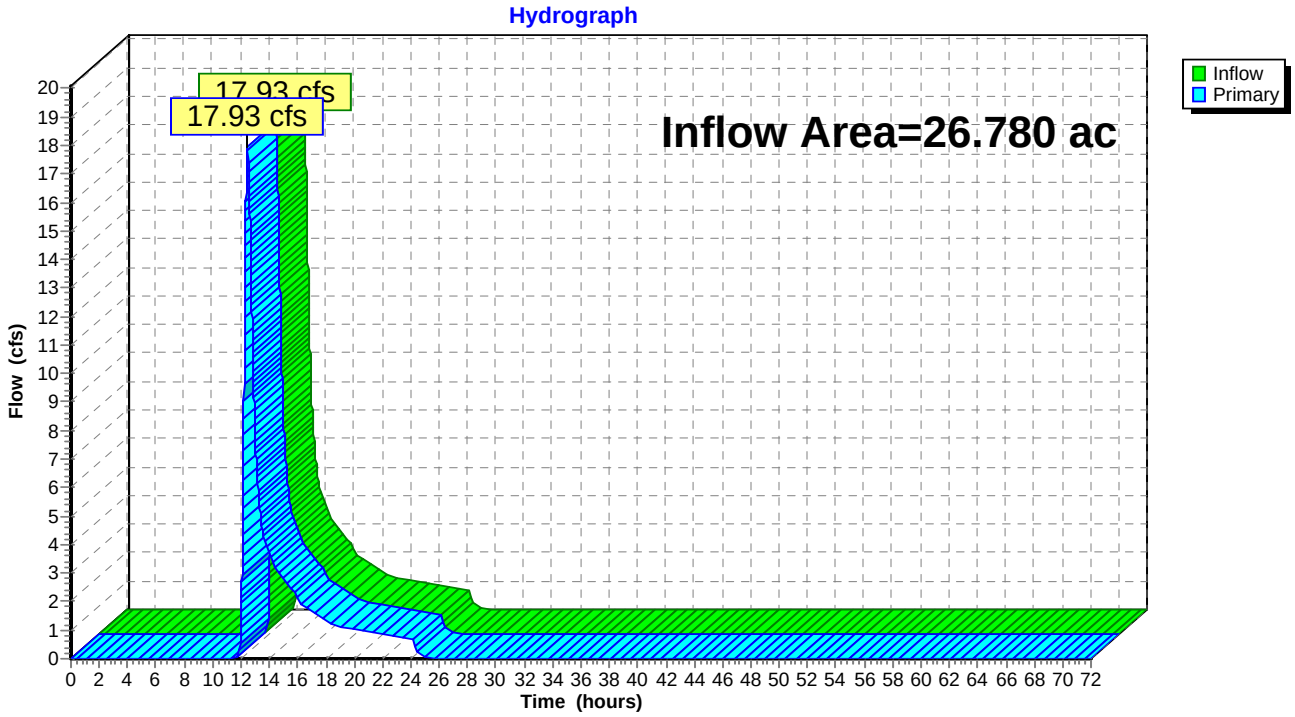


Summary for Pond POA NW: POA NW

Inflow Area = 26.780 ac, 4.93% Impervious, Inflow Depth = 1.17" for 25-YR event
Inflow = 17.93 cfs @ 12.46 hrs, Volume= 2.612 af
Primary = 17.93 cfs @ 12.46 hrs, Volume= 2.612 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Pond POA NW: POA NW

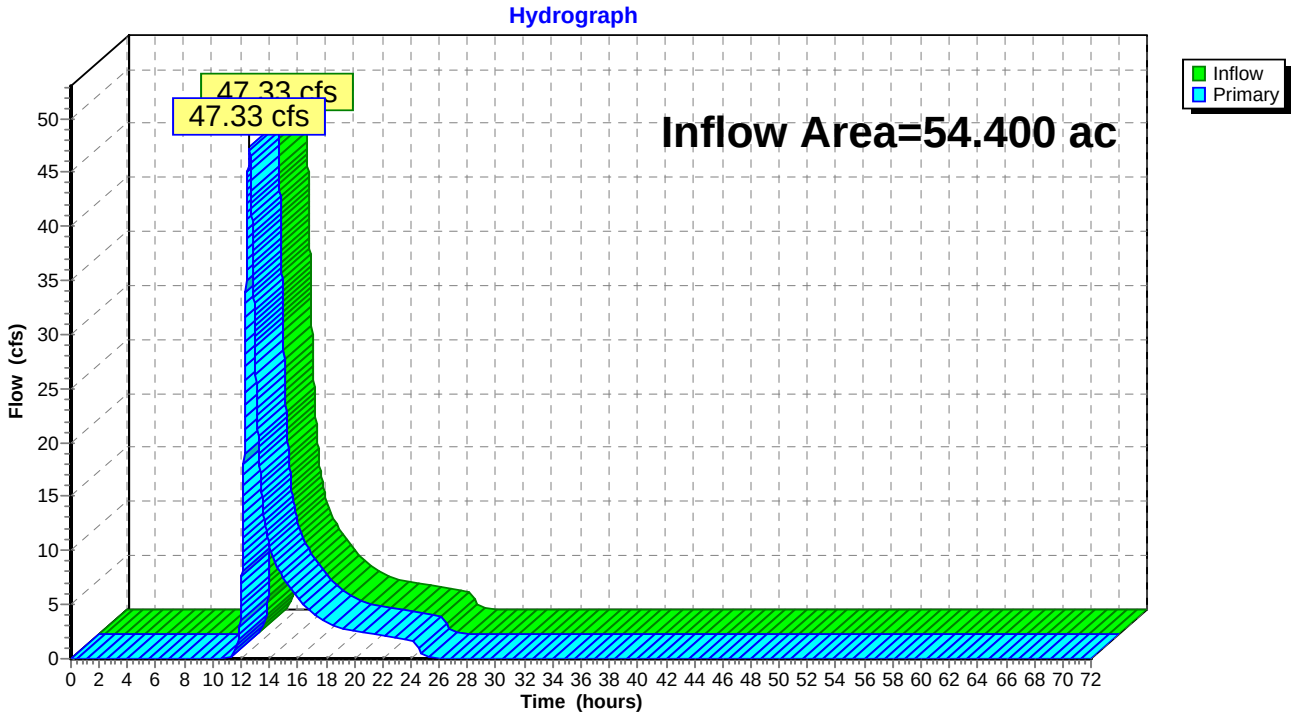


Summary for Pond POA SW: POA SW

Inflow Area = 54.400 ac, 4.64% Impervious, Inflow Depth = 1.62" for 25-YR event
Inflow = 47.33 cfs @ 12.59 hrs, Volume= 7.339 af
Primary = 47.33 cfs @ 12.59 hrs, Volume= 7.339 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Pond POA SW: POA SW



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment NW: DA NW Runoff Area=26.780 ac 4.93% Impervious Runoff Depth=0.09"
Flow Length=2,125' Tc=28.1 min CN=54 Runoff=0.31 cfs 0.190 af

Subcatchment OFF1: OFFSITE DA 1 Runoff Area=2.100 ac 16.67% Impervious Runoff Depth=0.37"
Flow Length=816' Slope=0.0368 '/' Tc=20.9 min CN=66 Runoff=0.40 cfs 0.064 af

Subcatchment OFF2: OFFSITE DA 2 Runoff Area=6.400 ac 6.25% Impervious Runoff Depth=0.23"
Flow Length=816' Slope=0.0368 '/' Tc=23.8 min CN=61 Runoff=0.52 cfs 0.121 af

Subcatchment SW1: DA SW1 Runoff Area=2.030 ac 0.00% Impervious Runoff Depth=0.12"
Flow Length=280' Tc=31.4 min CN=56 Runoff=0.04 cfs 0.020 af

Subcatchment SW2: DA SW2 Runoff Area=43.870 ac 4.04% Impervious Runoff Depth=0.20"
Flow Length=1,120' Tc=36.9 min CN=60 Runoff=2.42 cfs 0.739 af

Reach R1: REACH 1 Avg. Flow Depth=0.19' Max Vel=0.40 fps Inflow=0.40 cfs 0.064 af
n=0.130 L=500.0' S=0.0146 '/' Capacity=32.94 cfs Outflow=0.29 cfs 0.064 af

Reach R2: REACH 2 Avg. Flow Depth=0.22' Max Vel=0.37 fps Inflow=0.52 cfs 0.121 af
n=0.130 L=780.0' S=0.0106 '/' Capacity=28.12 cfs Outflow=0.31 cfs 0.121 af

Reach R3: REACH 3 Avg. Flow Depth=0.30' Max Vel=0.34 fps Inflow=0.55 cfs 0.185 af
n=0.130 L=600.0' S=0.0062 '/' Capacity=21.41 cfs Outflow=0.44 cfs 0.185 af

Pond POA NW: POA NW Inflow=0.31 cfs 0.190 af
Primary=0.31 cfs 0.190 af

Pond POA SW: POA SW Inflow=2.72 cfs 0.944 af
Primary=2.72 cfs 0.944 af

Total Runoff Area = 81.180 ac Runoff Volume = 1.135 af Average Runoff Depth = 0.17"
95.26% Pervious = 77.336 ac 4.74% Impervious = 3.844 ac

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment NW: DA NW Runoff Area=26.780 ac 4.93% Impervious Runoff Depth=0.22"
Flow Length=2,125' Tc=28.1 min CN=54 Runoff=1.66 cfs 0.499 af

Subcatchment OFF1: OFFSITE DA 1 Runoff Area=2.100 ac 16.67% Impervious Runoff Depth=0.64"
Flow Length=816' Slope=0.0368 '/' Tc=20.9 min CN=66 Runoff=0.85 cfs 0.113 af

Subcatchment OFF2: OFFSITE DA 2 Runoff Area=6.400 ac 6.25% Impervious Runoff Depth=0.44"
Flow Length=816' Slope=0.0368 '/' Tc=23.8 min CN=61 Runoff=1.40 cfs 0.237 af

Subcatchment SW1: DA SW1 Runoff Area=2.030 ac 0.00% Impervious Runoff Depth=0.28"
Flow Length=280' Tc=31.4 min CN=56 Runoff=0.18 cfs 0.047 af

Subcatchment SW2: DA SW2 Runoff Area=43.870 ac 4.04% Impervious Runoff Depth=0.41"
Flow Length=1,120' Tc=36.9 min CN=60 Runoff=7.03 cfs 1.493 af

Reach R1: REACH 1 Avg. Flow Depth=0.30' Max Vel=0.52 fps Inflow=0.85 cfs 0.113 af
n=0.130 L=500.0' S=0.0146 '/' Capacity=32.94 cfs Outflow=0.65 cfs 0.113 af

Reach R2: REACH 2 Avg. Flow Depth=0.40' Max Vel=0.52 fps Inflow=1.40 cfs 0.237 af
n=0.130 L=780.0' S=0.0106 '/' Capacity=28.12 cfs Outflow=0.94 cfs 0.237 af

Reach R3: REACH 3 Avg. Flow Depth=0.52' Max Vel=0.46 fps Inflow=1.53 cfs 0.349 af
n=0.130 L=600.0' S=0.0062 '/' Capacity=21.41 cfs Outflow=1.21 cfs 0.349 af

Pond POA NW: POA NW Inflow=1.66 cfs 0.499 af
Primary=1.66 cfs 0.499 af

Pond POA SW: POA SW Inflow=8.06 cfs 1.889 af
Primary=8.06 cfs 1.889 af

Total Runoff Area = 81.180 ac Runoff Volume = 2.388 af Average Runoff Depth = 0.35"
95.26% Pervious = 77.336 ac 4.74% Impervious = 3.844 ac

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment NW: DA NW Runoff Area=26.780 ac 4.93% Impervious Runoff Depth=0.78"
Flow Length=2,125' Tc=28.1 min CN=54 Runoff=10.68 cfs 1.740 af

Subcatchment OFF1: OFFSITE DA 1 Runoff Area=2.100 ac 16.67% Impervious Runoff Depth=1.53"
Flow Length=816' Slope=0.0368 '/' Tc=20.9 min CN=66 Runoff=2.34 cfs 0.267 af

Subcatchment OFF2: OFFSITE DA 2 Runoff Area=6.400 ac 6.25% Impervious Runoff Depth=1.19"
Flow Length=816' Slope=0.0368 '/' Tc=23.8 min CN=61 Runoff=4.96 cfs 0.636 af

Subcatchment SW1: DA SW1 Runoff Area=2.030 ac 0.00% Impervious Runoff Depth=0.89"
Flow Length=280' Tc=31.4 min CN=56 Runoff=0.94 cfs 0.151 af

Subcatchment SW2: DA SW2 Runoff Area=43.870 ac 4.04% Impervious Runoff Depth=1.13"
Flow Length=1,120' Tc=36.9 min CN=60 Runoff=26.13 cfs 4.130 af

Reach R1: REACH 1 Avg. Flow Depth=0.54' Max Vel=0.71 fps Inflow=2.34 cfs 0.267 af
n=0.130 L=500.0' S=0.0146 '/' Capacity=32.94 cfs Outflow=1.96 cfs 0.267 af

Reach R2: REACH 2 Avg. Flow Depth=0.80' Max Vel=0.76 fps Inflow=4.96 cfs 0.636 af
n=0.130 L=780.0' S=0.0106 '/' Capacity=28.12 cfs Outflow=3.81 cfs 0.636 af

Reach R3: REACH 3 Avg. Flow Depth=1.02' Max Vel=0.66 fps Inflow=5.65 cfs 0.903 af
n=0.130 L=600.0' S=0.0062 '/' Capacity=21.41 cfs Outflow=4.80 cfs 0.903 af

Pond POA NW: POA NW Inflow=10.68 cfs 1.740 af
Primary=10.68 cfs 1.740 af

Pond POA SW: POA SW Inflow=31.20 cfs 5.184 af
Primary=31.20 cfs 5.184 af

Total Runoff Area = 81.180 ac Runoff Volume = 6.924 af Average Runoff Depth = 1.02"
95.26% Pervious = 77.336 ac 4.74% Impervious = 3.844 ac

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment NW: DA NW Runoff Area=26.780 ac 4.93% Impervious Runoff Depth=1.97"
Flow Length=2,125' Tc=28.1 min CN=54 Runoff=33.03 cfs 4.394 af

Subcatchment OFF1: OFFSITE DA 1 Runoff Area=2.100 ac 16.67% Impervious Runoff Depth=3.13"
Flow Length=816' Slope=0.0368 '/' Tc=20.9 min CN=66 Runoff=5.04 cfs 0.547 af

Subcatchment OFF2: OFFSITE DA 2 Runoff Area=6.400 ac 6.25% Impervious Runoff Depth=2.63"
Flow Length=816' Slope=0.0368 '/' Tc=23.8 min CN=61 Runoff=12.00 cfs 1.403 af

Subcatchment SW1: DA SW1 Runoff Area=2.030 ac 0.00% Impervious Runoff Depth=2.15"
Flow Length=280' Tc=31.4 min CN=56 Runoff=2.66 cfs 0.364 af

Subcatchment SW2: DA SW2 Runoff Area=43.870 ac 4.04% Impervious Runoff Depth=2.53"
Flow Length=1,120' Tc=36.9 min CN=60 Runoff=64.47 cfs 9.260 af

Reach R1: REACH 1 Avg. Flow Depth=0.80' Max Vel=0.89 fps Inflow=5.04 cfs 0.547 af
n=0.130 L=500.0' S=0.0146 '/' Capacity=32.94 cfs Outflow=4.42 cfs 0.547 af

Reach R2: REACH 2 Avg. Flow Depth=1.26' Max Vel=0.98 fps Inflow=12.00 cfs 1.403 af
n=0.130 L=780.0' S=0.0106 '/' Capacity=28.12 cfs Outflow=9.93 cfs 1.403 af

Reach R3: REACH 3 Avg. Flow Depth=1.58' Max Vel=0.85 fps Inflow=14.15 cfs 1.950 af
n=0.130 L=600.0' S=0.0062 '/' Capacity=21.41 cfs Outflow=12.57 cfs 1.950 af

Pond POA NW: POA NW Inflow=33.03 cfs 4.394 af
Primary=33.03 cfs 4.394 af

Pond POA SW: POA SW Inflow=79.02 cfs 11.574 af
Primary=79.02 cfs 11.574 af

Total Runoff Area = 81.180 ac Runoff Volume = 15.968 af Average Runoff Depth = 2.36"
95.26% Pervious = 77.336 ac 4.74% Impervious = 3.844 ac

Events for Pond POA SW: POA SW

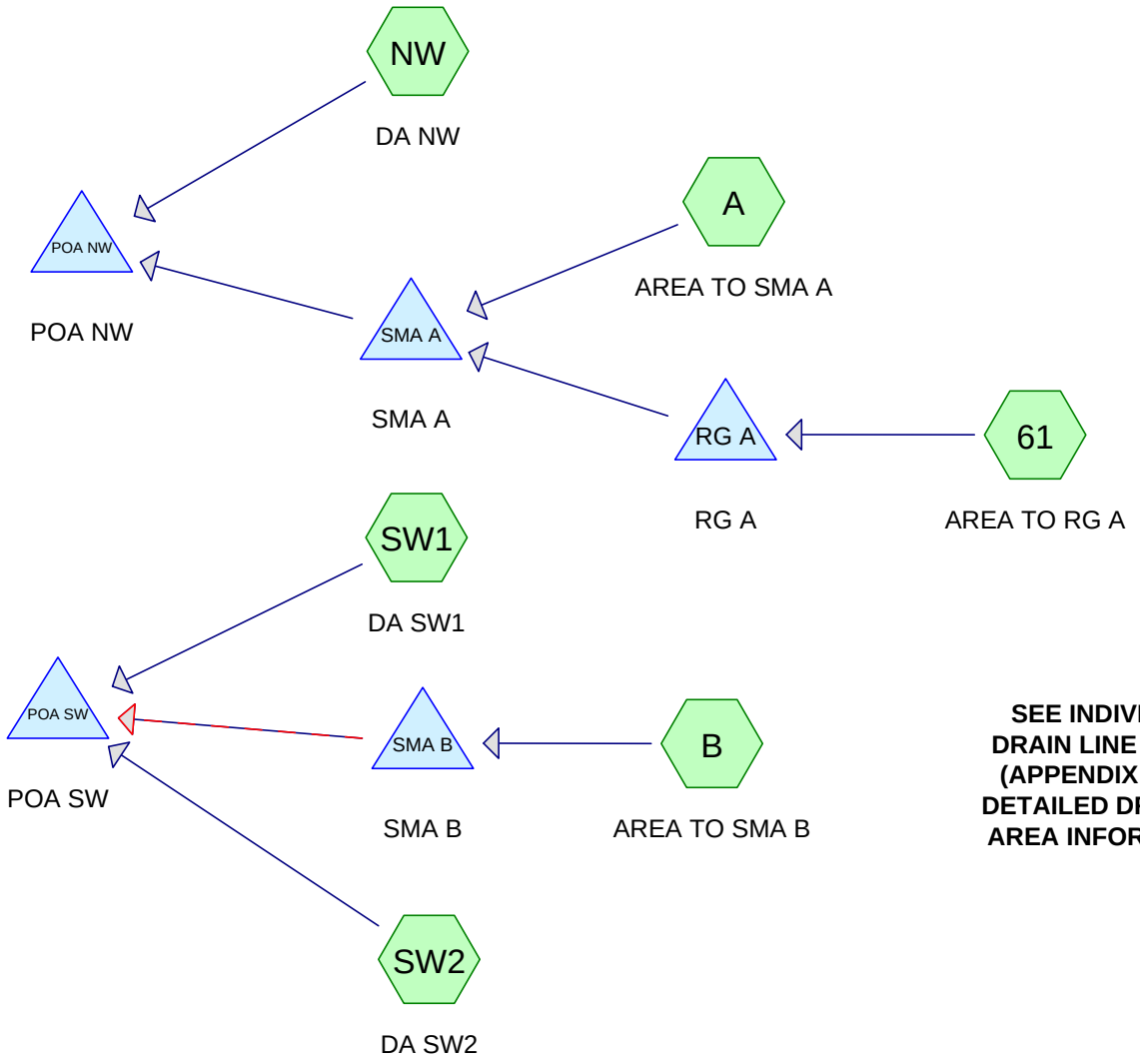
Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1-YR	2.72	2.72	**0.00**	**0**
2-YR	8.06	8.06	0.00	0
10-YR	31.20	31.20	0.00	0
25-YR	47.33	47.33	0.00	0
100-YR	**79.02**	**79.02**	0.00	0

Events for Pond POA NW: POA NW

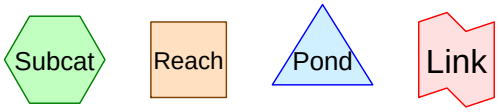
Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1-YR	0.31	0.31	**0.00**	**0**
2-YR	1.66	1.66	0.00	0
10-YR	10.68	10.68	0.00	0
25-YR	17.93	17.93	0.00	0
100-YR	**33.03**	**33.03**	0.00	0

APPENDIX B

POST DEVELOPMENT DRAINAGE CALCULATIONS



SEE INDIVIDUAL DRAIN LINE DESIGN (APPENDIX C) FOR DETAILED DRAINAGE AREA INFORMATION



Routing Diagram for Post-Development 5-29-20
Prepared by Hayner/Swanson, Inc. , Printed 6/5/2020
HydroCAD® 10.00-25 s/n 05005 © 2019 HydroCAD Software Solutions LLC

Project Notes

Rainfall events imported from "POST-DEVELOPMENT.hcp"

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
4.370	51	1 acre lots, 20% imp, HSG A (NW)
4.750	68	1 acre lots, 20% imp, HSG B (B, NW)
1.970	39	>75% Grass cover, Good, HSG A (A, B)
24.930	61	>75% Grass cover, Good, HSG B (61, A, B, SW2)
0.200	61	Pasture/grassland/range, Good, HSG B (SW1)
1.620	98	Paved parking, HSG A (A, B)
10.550	98	Paved parking, HSG B (61, A, B)
4.020	98	Roofs, HSG A (A, B)
11.980	98	Roofs, HSG B (A, B)
1.000	98	Water Surface, 0% imp, HSG B (B)
2.460	30	Woods, Good, HSG A (NW)
13.330	55	Woods, Good, HSG B (61, B, NW, SW1, SW2)
81.180	**72**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
14.440	HSG A	A, B, NW
66.740	HSG B	61, A, B, NW, SW1, SW2
0.000	HSG C	
0.000	HSG D	
0.000	Other	
81.180		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
4.370	4.750	0.000	0.000	0.000	9.120	1 acre lots, 20% imp	B, NW
1.970	24.930	0.000	0.000	0.000	26.900	>75% Grass cover, Good	61, A, B, SW 2
0.000	0.200	0.000	0.000	0.000	0.200	Pasture/grassland/range, Good	SW 1
1.620	10.550	0.000	0.000	0.000	12.170	Paved parking	61, A, B
4.020	11.980	0.000	0.000	0.000	16.000	Roofs	A, B
0.000	1.000	0.000	0.000	0.000	1.000	Water Surface, 0% imp	B
2.460	13.330	0.000	0.000	0.000	15.790	Woods, Good	61, B, NW, SW 1, SW 2
14.440	**66.740**	**0.000**	**0.000**	**0.000**	**81.180**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	SMA B	159.50	159.00	165.0	0.0030	0.012	18.0	0.0	0.0

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 61: AREA TO RG A Runoff Area=2.900 ac 17.24% Impervious Runoff Depth=2.08"
Tc=5.0 min CN=66 Runoff=7.12 cfs 0.502 af

Subcatchment A: AREA TO SMA A Runoff Area=18.450 ac 58.54% Impervious Runoff Depth=3.43"
Tc=10.2 min CN=81 Runoff=64.31 cfs 5.275 af

Subcatchment B: AREA TO SMA B Runoff Area=41.350 ac 42.60% Impervious Runoff Depth=3.05"
Tc=24.2 min CN=77 Runoff=91.98 cfs 10.498 af

Subcatchment NW: DA NW Runoff Area=13.530 ac 7.98% Impervious Runoff Depth=0.91"
Flow Length=780' Tc=35.0 min CN=50 Runoff=5.69 cfs 1.023 af

Subcatchment SW1: DA SW1 Runoff Area=2.030 ac 0.00% Impervious Runoff Depth=1.31"
Flow Length=280' Tc=31.4 min CN=56 Runoff=1.51 cfs 0.222 af

Subcatchment SW2: DA SW2 Runoff Area=2.920 ac 0.00% Impervious Runoff Depth=1.38"
Flow Length=275' Tc=12.8 min CN=57 Runoff=3.33 cfs 0.336 af

Pond POA NW: POA NW Inflow=5.69 cfs 1.023 af
Primary=5.69 cfs 1.023 af

Pond POA SW: POA SW Inflow=13.02 cfs 10.957 af
Primary=13.02 cfs 10.957 af

Pond RG A: RG A Peak Elev=171.56' Storage=5,313 cf Inflow=7.12 cfs 0.502 af
Discarded=1.29 cfs 0.425 af Primary=1.36 cfs 0.076 af Outflow=2.66 cfs 0.502 af

Pond SMA A: SMA A Peak Elev=161.04' Storage=106,189 cf Inflow=65.06 cfs 5.352 af
Discarded=5.70 cfs 5.352 af Primary=0.00 cfs 0.000 af Outflow=5.70 cfs 5.352 af

Pond SMA B: SMA B Peak Elev=163.26' Storage=409,236 cf Inflow=91.98 cfs 10.498 af
Primary=11.69 cfs 10.399 af Secondary=0.00 cfs 0.000 af Outflow=11.69 cfs 10.399 af

Total Runoff Area = 81.180 ac Runoff Volume = 17.855 af Average Runoff Depth = 2.64"
63.05% Pervious = 51.186 ac 36.95% Impervious = 29.994 ac

Summary for Subcatchment 61: AREA TO RG A

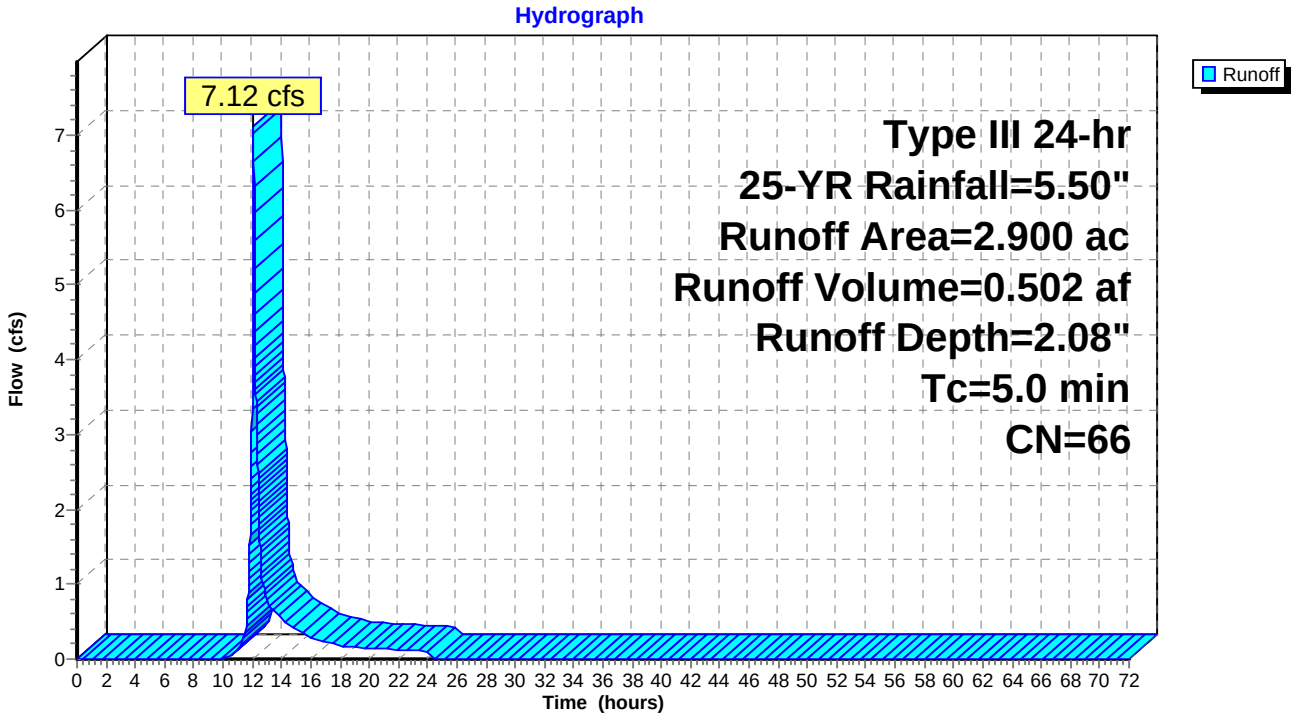
Runoff = 7.12 cfs @ 12.08 hrs, Volume= 0.502 af, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
0.450	55	Woods, Good, HSG B
1.950	61	>75% Grass cover, Good, HSG B
0.500	98	Paved parking, HSG B
2.900	66	Weighted Average
2.400		82.76% Pervious Area
0.500		17.24% Impervious Area

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

Subcatchment 61: AREA TO RG A



Summary for Subcatchment A: AREA TO SMA A

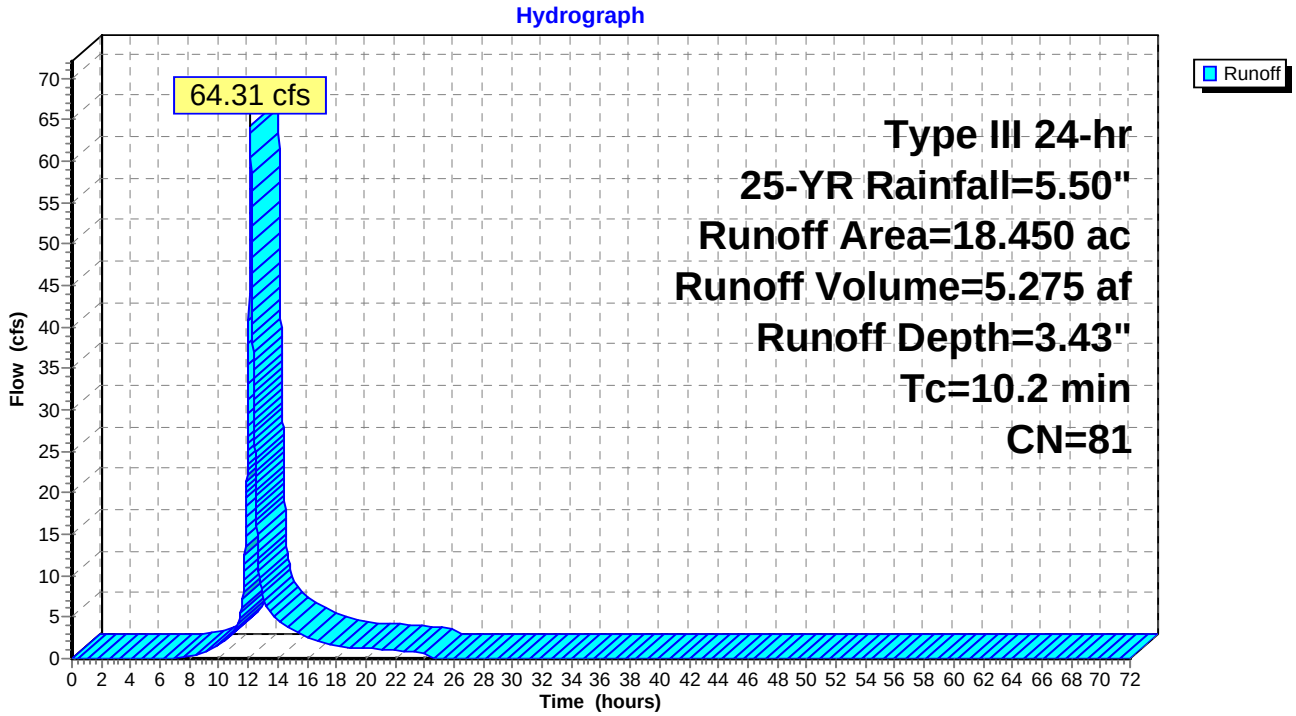
Runoff = 64.31 cfs @ 12.14 hrs, Volume= 5.275 af, Depth= 3.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
5.990	61	>75% Grass cover, Good, HSG B
5.610	98	Roofs, HSG B
2.160	98	Paved parking, HSG B
2.390	98	Roofs, HSG A
0.640	98	Paved parking, HSG A
1.660	39	>75% Grass cover, Good, HSG A
18.450	81	Weighted Average
7.650		41.46% Pervious Area
10.800		58.54% Impervious Area

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

Subcatchment A: AREA TO SMA A



Summary for Subcatchment B: AREA TO SMA B

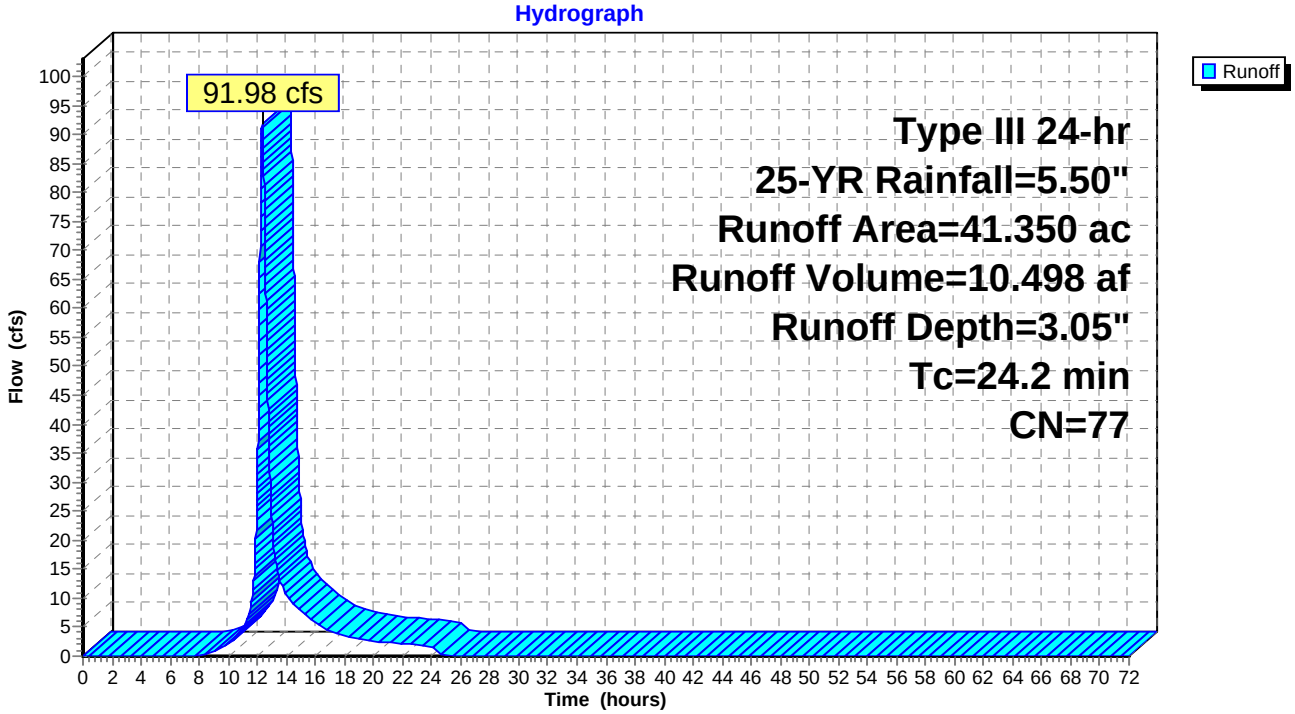
Runoff = 91.98 cfs @ 12.34 hrs, Volume= 10.498 af, Depth= 3.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
3.410	55	Woods, Good, HSG B
16.040	61	>75% Grass cover, Good, HSG B
6.370	98	Roofs, HSG B
7.890	98	Paved parking, HSG B
1.630	98	Roofs, HSG A
0.980	98	Paved parking, HSG A
0.310	39	>75% Grass cover, Good, HSG A
1.000	98	Water Surface, 0% imp, HSG B
3.720	68	1 acre lots, 20% imp, HSG B
41.350	77	Weighted Average
23.736		57.40% Pervious Area
17.614		42.60% Impervious Area

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

Subcatchment B: AREA TO SMA B



Summary for Subcatchment NW: DA NW

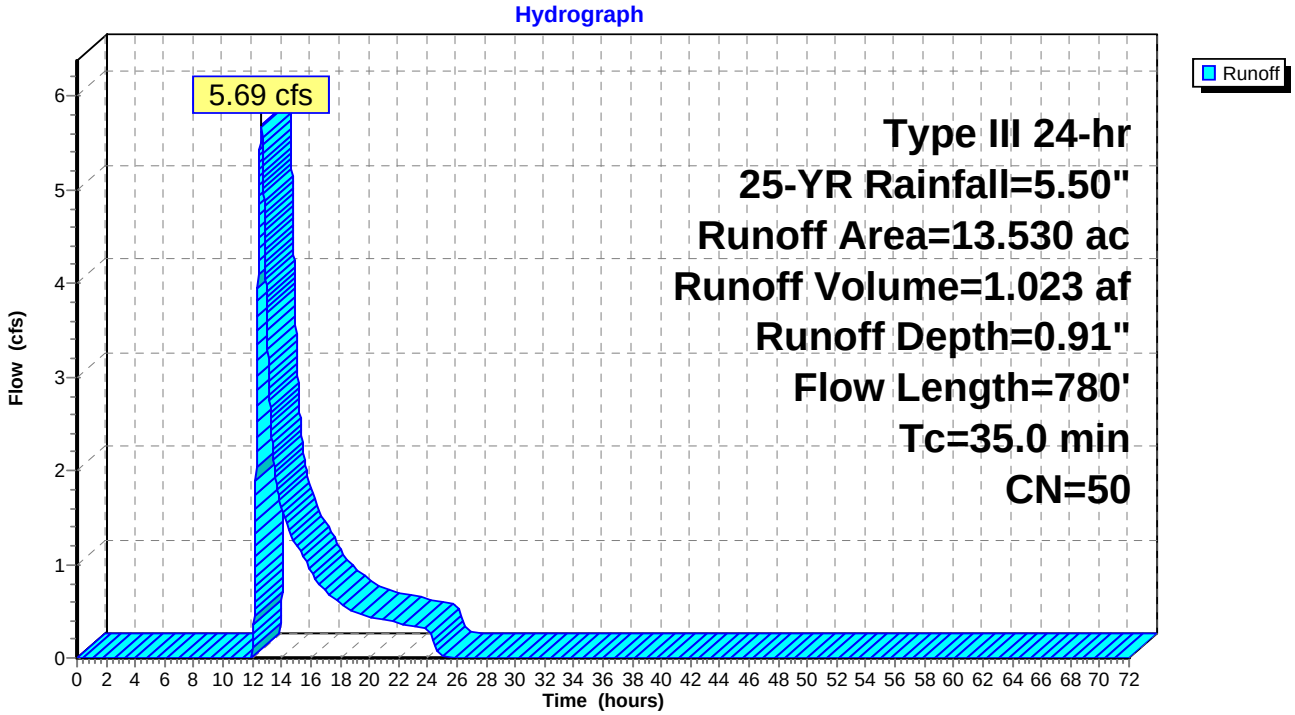
Runoff = 5.69 cfs @ 12.60 hrs, Volume= 1.023 af, Depth= 0.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
4.370	51	1 acre lots, 20% imp, HSG A
1.030	68	1 acre lots, 20% imp, HSG B
2.460	30	Woods, Good, HSG A
5.670	55	Woods, Good, HSG B
13.530	50	Weighted Average
12.450		92.02% Pervious Area
1.080		7.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	50	0.0080	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
23.2	730	0.0110	0.52		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
35.0	780	Total			

Subcatchment NW: DA NW



Summary for Subcatchment SW1: DA SW1

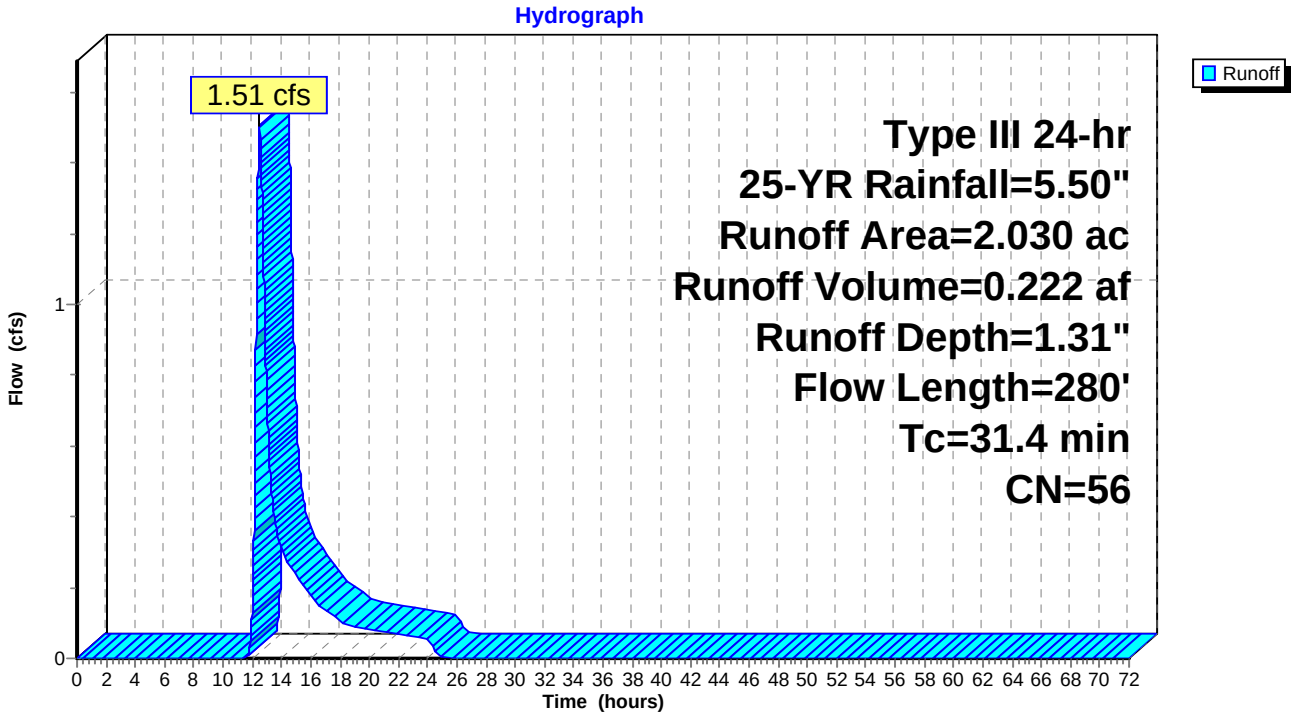
Runoff = 1.51 cfs @ 12.52 hrs, Volume= 0.222 af, Depth= 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
0.200	61	Pasture/grassland/range, Good, HSG B
1.830	55	Woods, Good, HSG B
2.030	56	Weighted Average
2.030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.5	50	0.0050	0.04		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
9.9	230	0.0060	0.39		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
31.4	280	Total			

Subcatchment SW1: DA SW1



Summary for Subcatchment SW2: DA SW2

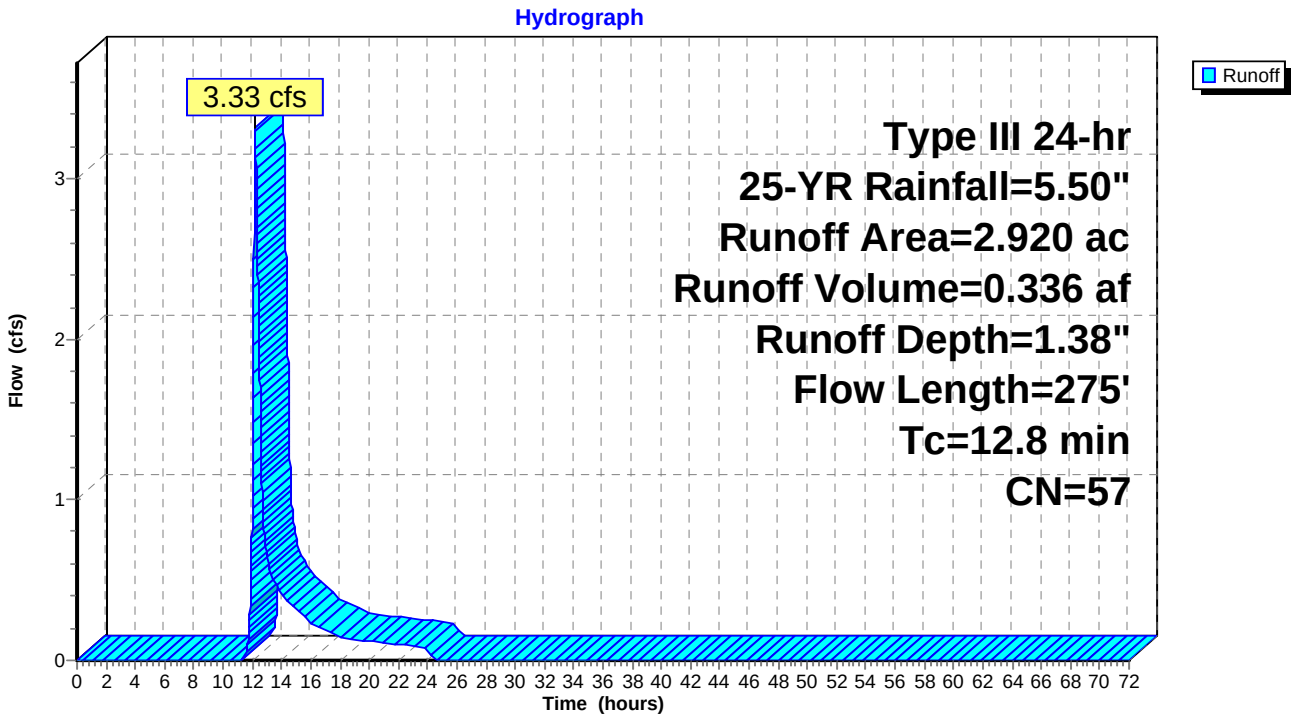
Runoff = 3.33 cfs @ 12.19 hrs, Volume= 0.336 af, Depth= 1.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
1.970	55	Woods, Good, HSG B
0.950	61	>75% Grass cover, Good, HSG B
2.920	57	Weighted Average
2.920		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.0400	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
6.6	225	0.0130	0.57		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.8	275	Total			

Subcatchment SW2: DA SW2

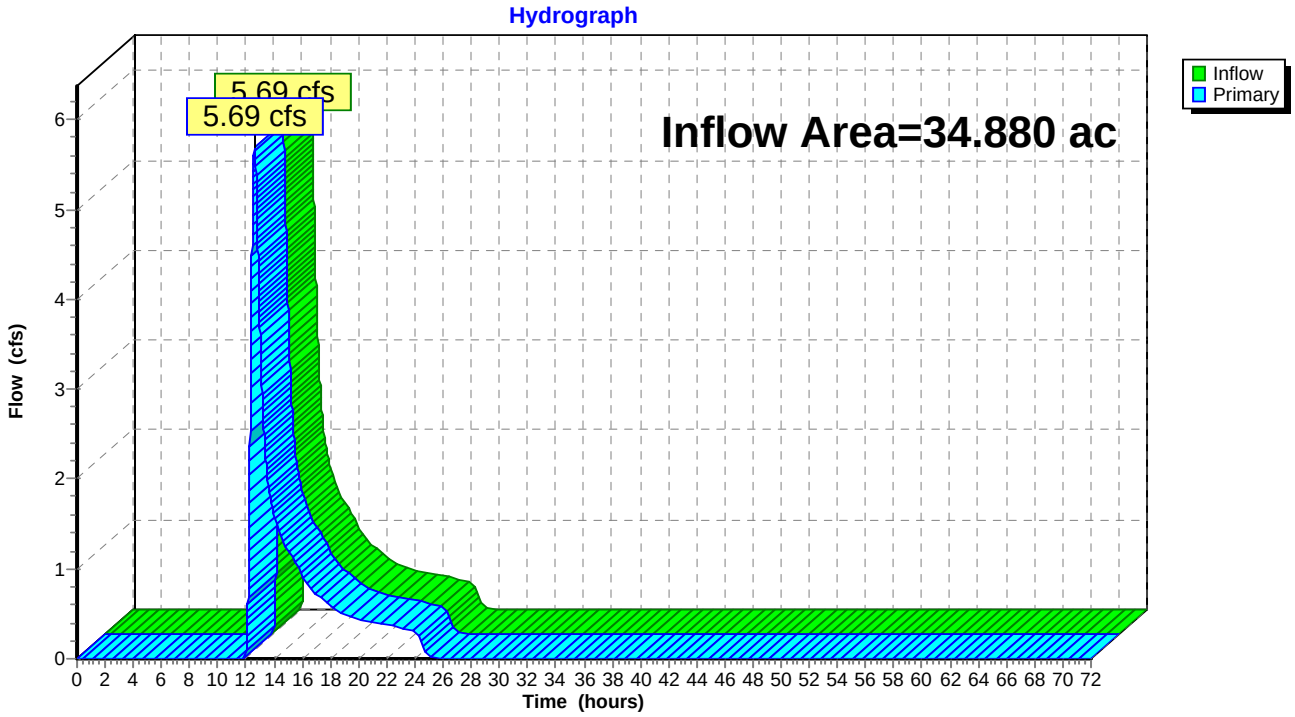


Summary for Pond POA NW: POA NW

Inflow Area = 34.880 ac, 35.49% Impervious, Inflow Depth = 0.35" for 25-YR event
Inflow = 5.69 cfs @ 12.60 hrs, Volume= 1.023 af
Primary = 5.69 cfs @ 12.60 hrs, Volume= 1.023 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Pond POA NW: POA NW

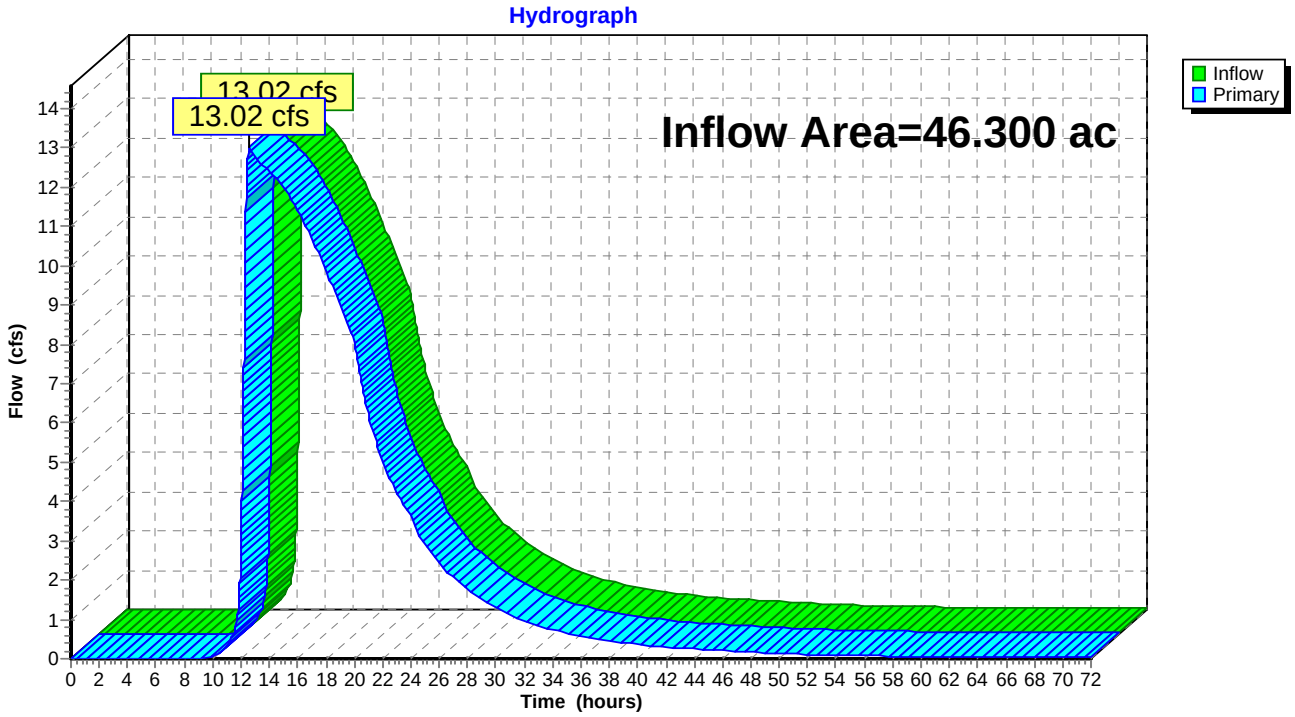


Summary for Pond POA SW: POA SW

Inflow Area = 46.300 ac, 38.04% Impervious, Inflow Depth > 2.84" for 25-YR event
Inflow = 13.02 cfs @ 12.59 hrs, Volume= 10.957 af
Primary = 13.02 cfs @ 12.59 hrs, Volume= 10.957 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Pond POA SW: POA SW



Summary for Pond RG A: RG A

Inflow Area = 2.900 ac, 17.24% Impervious, Inflow Depth = 2.08" for 25-YR event
Inflow = 7.12 cfs @ 12.08 hrs, Volume= 0.502 af
Outflow = 2.66 cfs @ 12.38 hrs, Volume= 0.502 af, Atten= 63%, Lag= 17.8 min
Discarded = 1.29 cfs @ 12.38 hrs, Volume= 0.425 af
Primary = 1.36 cfs @ 12.38 hrs, Volume= 0.076 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 171.56' @ 12.38 hrs Surf.Area= 10,891 sf Storage= 5,313 cf

Plug-Flow detention time= 31.2 min calculated for 0.502 af (100% of inflow)
Center-of-Mass det. time= 31.2 min (882.8 - 851.6)

Volume	Invert	Avail.Storage	Storage Description
#1	168.50'	324 cf	**RG FILTER MIX (Conic)** Listed below (Recalc) 3,240 cf Overall x 10.0% Voids
#2	170.50'	10,427 cf	**SURFACE STORAGE (Conic)** Listed below (Recalc)
		10,751 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
168.50	1,620	0	0	1,620
170.50	1,620	3,240	3,240	1,905

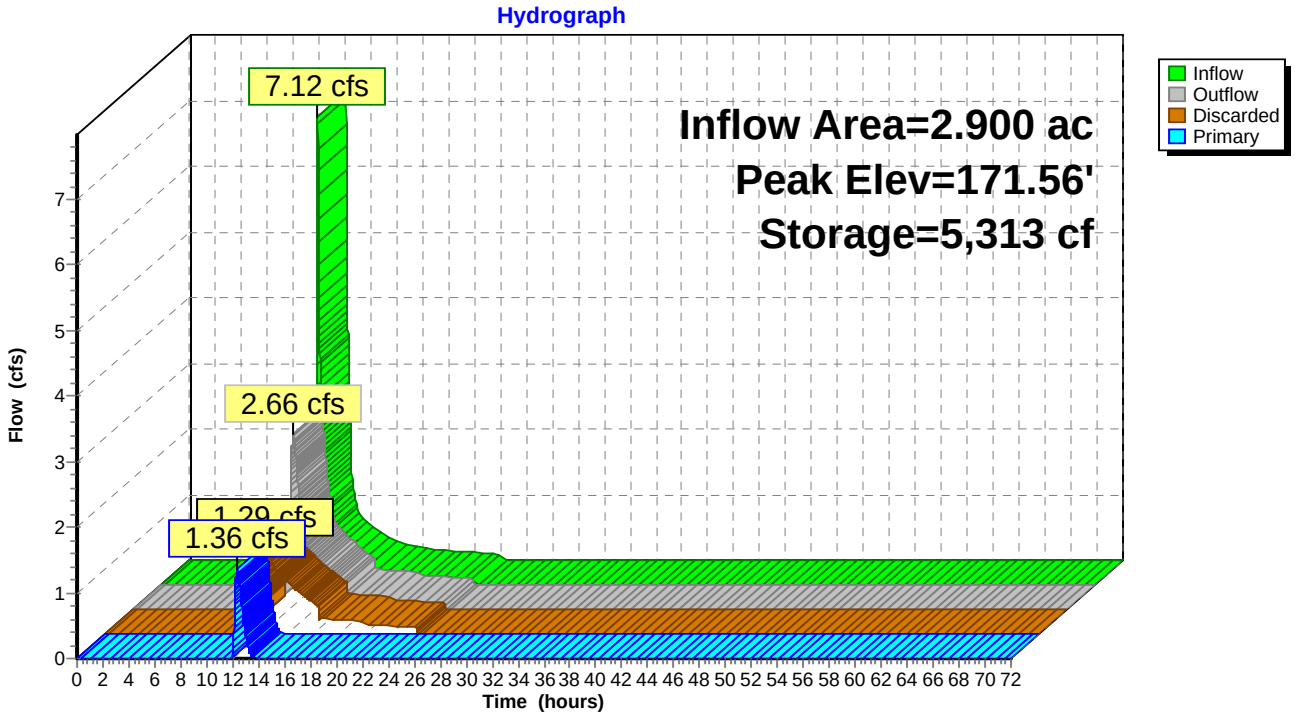
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
170.50	1,620	0	0	1,620
171.00	4,100	1,383	1,383	4,102
171.50	8,600	3,106	4,489	8,604
172.00	15,485	5,937	10,427	15,492

Device	Routing	Invert	Outlet Devices
#1	Primary	171.20'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600
#2	Discarded	168.50'	**5.000 in/hr Exfiltration over Wetted area** Phase-In= 0.01'

Discarded OutFlow Max=1.29 cfs @ 12.38 hrs HW=171.56' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 1.29 cfs)

Primary OutFlow Max=1.36 cfs @ 12.38 hrs HW=171.56' TW=160.55' (Dynamic Tailwater)
└**1=Orifice/Grate** (Orifice Controls 1.36 cfs @ 1.92 fps)

Pond RG A: RG A


Hydrograph
7.12 cfs
2.66 cfs
1.29 cfs
1.36 cfs
Inflow Area=2.900 ac
Peak Elev=171.56'
Storage=5,313 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)

Summary for Pond SMA A: SMA A

Inflow Area = 21.350 ac, 52.93% Impervious, Inflow Depth = 3.01" for 25-YR event
Inflow = 65.06 cfs @ 12.14 hrs, Volume= 5.352 af
Outflow = 5.70 cfs @ 13.49 hrs, Volume= 5.352 af, Atten= 91%, Lag= 81.1 min
Discarded = 5.70 cfs @ 13.49 hrs, Volume= 5.352 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 161.04' @ 13.49 hrs Surf.Area= 49,116 sf Storage= 106,189 cf
Flood Elev= 163.00' Surf.Area= 60,240 sf Storage= 214,172 cf

Plug-Flow detention time= 198.6 min calculated for 5.351 af (100% of inflow)
Center-of-Mass det. time= 198.6 min (1,016.7 - 818.0)

Volume	Invert	Avail.Storage	Storage Description
#1	158.00'	276,797 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

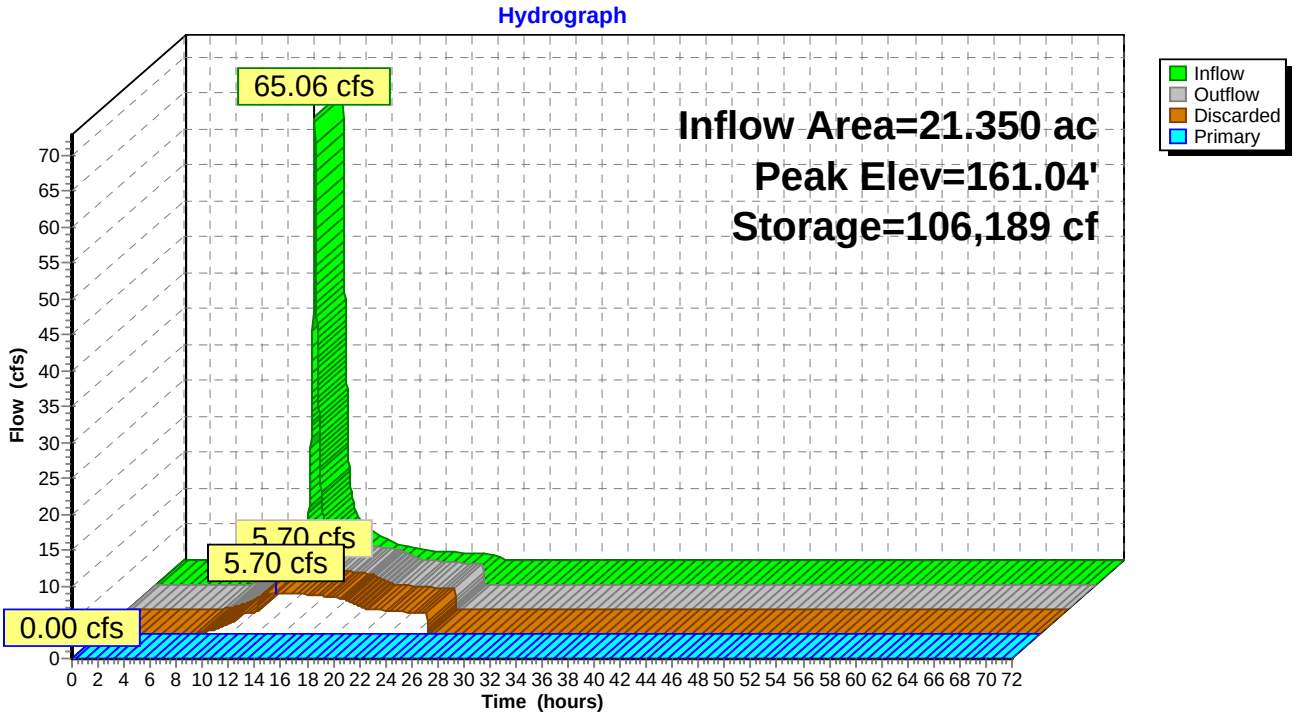
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
158.00	24,120	0	0	24,120
159.50	29,900	40,437	40,437	29,966
160.00	42,580	18,027	58,464	42,650
162.00	55,540	97,833	156,298	55,704
163.00	60,240	57,874	214,172	60,481
164.00	65,040	62,625	276,797	65,362

Device	Routing	Invert	Outlet Devices
#1	Primary	163.00'	**15.0' long x 50.0' 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) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	158.00'	**5.000 in/hr Exfiltration over Wetted area** Phase-In= 0.01'

Discarded OutFlow Max=5.70 cfs @ 13.49 hrs HW=161.04' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 5.70 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=158.00' TW=0.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond SMA A: SMA A



Summary for Pond SMA B: SMA B

Inflow Area = 41.350 ac, 42.60% Impervious, Inflow Depth = 3.05" for 25-YR event
Inflow = 91.98 cfs @ 12.34 hrs, Volume= 10.498 af
Outflow = 11.69 cfs @ 13.77 hrs, Volume= 10.399 af, Atten= 87%, Lag= 85.9 min
Primary = 11.69 cfs @ 13.77 hrs, Volume= 10.399 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Starting Elev= 159.50' Surf.Area= 43,830 sf Storage= 169,068 cf
Peak Elev= 163.26' @ 13.77 hrs Surf.Area= 80,174 sf Storage= 409,236 cf (240,169 cf above start)
Flood Elev= 165.00' Surf.Area= 114,390 sf Storage= 570,918 cf (401,850 cf above start)

Plug-Flow detention time= 662.0 min calculated for 6.518 af (62% of inflow)
Center-of-Mass det. time= 352.8 min (1,195.1 - 842.3)

Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	570,918 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

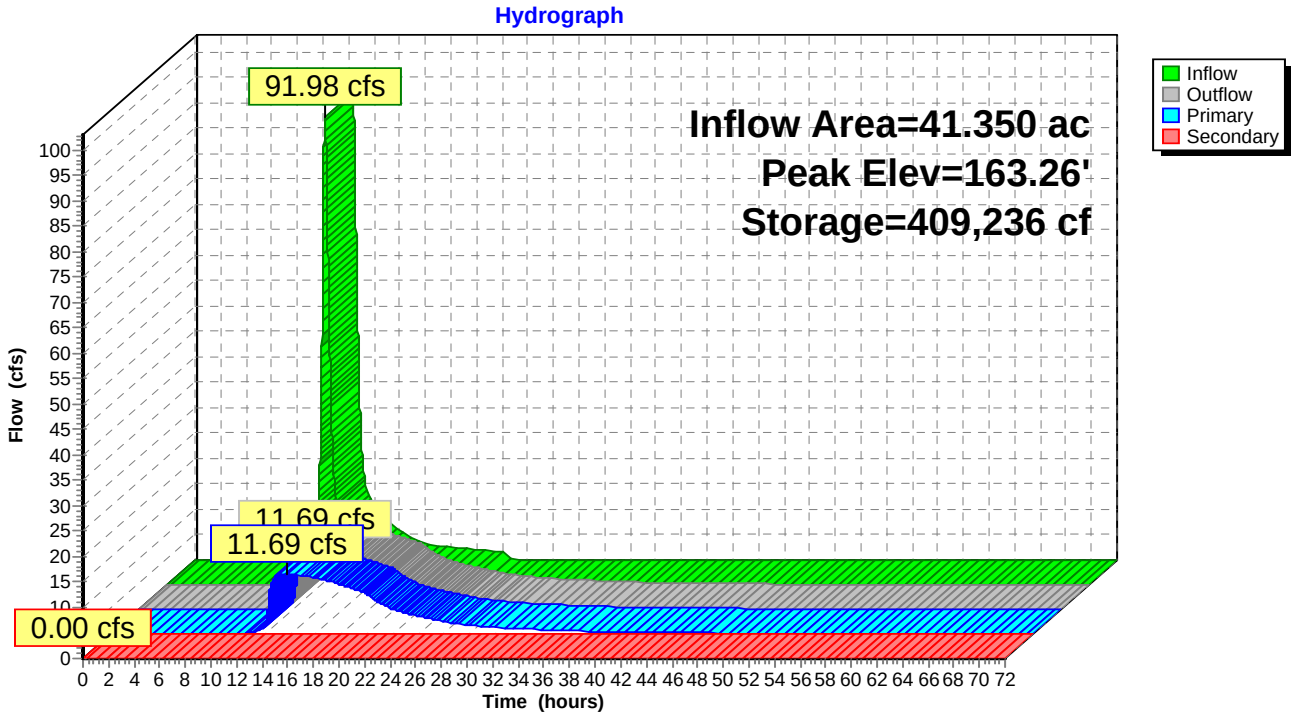
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
154.00	18,080	0	0
156.00	27,050	45,130	45,130
158.00	36,580	63,630	108,760
159.50	43,830	60,308	169,068
160.00	52,230	24,015	193,083
162.00	69,360	121,590	314,673
164.00	86,460	155,820	470,493
165.00	114,390	100,425	570,918

Device	Routing	Invert	Outlet Devices
#1	Primary	159.50'	**18.0" Round Culvert** L= 165.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.50' / 159.00' S= 0.0030 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Device 1	159.50'	**WEIR PLATE, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.50 1.50 4.00 Width (feet) 0.50 0.50 1.50 1.50
#3	Device 1	163.50'	**24.0" x 24.0" Horiz. RIM** C= 0.600 Limited to weir flow at low heads
#4	Secondary	164.60'	**20.0' long x 200.0' 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) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=11.69 cfs @ 13.77 hrs HW=163.26' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 11.69 cfs @ 6.61 fps)
  ├─**2=WEIR PLATE** (Passes 11.69 cfs of 23.12 cfs potential flow)
  └─**3=RIM** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=159.50' TW=0.00' (Dynamic Tailwater)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond SMA B: SMA B



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 61: AREA TO RG A Runoff Area=2.900 ac 17.24% Impervious Runoff Depth=0.37"
Tc=5.0 min CN=66 Runoff=0.82 cfs 0.089 af

Subcatchment A: AREA TO SMA A Runoff Area=18.450 ac 58.54% Impervious Runoff Depth=1.01"
Tc=10.2 min CN=81 Runoff=18.53 cfs 1.559 af

Subcatchment B: AREA TO SMA B Runoff Area=41.350 ac 42.60% Impervious Runoff Depth=0.80"
Tc=24.2 min CN=77 Runoff=22.60 cfs 2.770 af

Subcatchment NW: DA NW Runoff Area=13.530 ac 7.98% Impervious Runoff Depth=0.03"
Flow Length=780' Tc=35.0 min CN=50 Runoff=0.06 cfs 0.038 af

Subcatchment SW1: DA SW1 Runoff Area=2.030 ac 0.00% Impervious Runoff Depth=0.12"
Flow Length=280' Tc=31.4 min CN=56 Runoff=0.04 cfs 0.020 af

Subcatchment SW2: DA SW2 Runoff Area=2.920 ac 0.00% Impervious Runoff Depth=0.14"
Flow Length=275' Tc=12.8 min CN=57 Runoff=0.11 cfs 0.034 af

Pond POA NW: POA NW Inflow=0.06 cfs 0.038 af
Primary=0.06 cfs 0.038 af

Pond POA SW: POA SW Inflow=2.33 cfs 2.736 af
Primary=2.33 cfs 2.736 af

Pond RG A: RG A Peak Elev=170.56' Storage=422 cf Inflow=0.82 cfs 0.089 af
Discarded=0.43 cfs 0.089 af Primary=0.00 cfs 0.000 af Outflow=0.43 cfs 0.089 af

Pond SMA A: SMA A Peak Elev=158.81' Storage=20,791 cf Inflow=18.53 cfs 1.559 af
Discarded=3.15 cfs 1.559 af Primary=0.00 cfs 0.000 af Outflow=3.15 cfs 1.559 af

Pond SMA B: SMA B Peak Elev=160.74' Storage=233,927 cf Inflow=22.60 cfs 2.770 af
Primary=2.25 cfs 2.683 af Secondary=0.00 cfs 0.000 af Outflow=2.25 cfs 2.683 af

Total Runoff Area = 81.180 ac Runoff Volume = 4.510 af Average Runoff Depth = 0.67"
63.05% Pervious = 51.186 ac 36.95% Impervious = 29.994 ac

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 61: AREA TO RG A Runoff Area=2.900 ac 17.24% Impervious Runoff Depth=0.64"
Tc=5.0 min CN=66 Runoff=1.84 cfs 0.155 af

Subcatchment A: AREA TO SMA A Runoff Area=18.450 ac 58.54% Impervious Runoff Depth=1.47"
Tc=10.2 min CN=81 Runoff=27.36 cfs 2.259 af

Subcatchment B: AREA TO SMA B Runoff Area=41.350 ac 42.60% Impervious Runoff Depth=1.21"
Tc=24.2 min CN=77 Runoff=35.39 cfs 4.176 af

Subcatchment NW: DA NW Runoff Area=13.530 ac 7.98% Impervious Runoff Depth=0.13"
Flow Length=780' Tc=35.0 min CN=50 Runoff=0.25 cfs 0.145 af

Subcatchment SW1: DA SW1 Runoff Area=2.030 ac 0.00% Impervious Runoff Depth=0.28"
Flow Length=280' Tc=31.4 min CN=56 Runoff=0.18 cfs 0.047 af

Subcatchment SW2: DA SW2 Runoff Area=2.920 ac 0.00% Impervious Runoff Depth=0.31"
Flow Length=275' Tc=12.8 min CN=57 Runoff=0.41 cfs 0.075 af

Pond POA NW: POA NW Inflow=0.25 cfs 0.145 af
Primary=0.25 cfs 0.145 af

Pond POA SW: POA SW Inflow=4.27 cfs 4.207 af
Primary=4.27 cfs 4.207 af

Pond RG A: RG A Peak Elev=170.87' Storage=1,235 cf Inflow=1.84 cfs 0.155 af
Discarded=0.61 cfs 0.155 af Primary=0.00 cfs 0.000 af Outflow=0.61 cfs 0.155 af

Pond SMA A: SMA A Peak Elev=159.35' Storage=35,877 cf Inflow=27.36 cfs 2.259 af
Discarded=3.40 cfs 2.259 af Primary=0.00 cfs 0.000 af Outflow=3.40 cfs 2.259 af

Pond SMA B: SMA B Peak Elev=161.23' Storage=263,884 cf Inflow=35.39 cfs 4.176 af
Primary=4.09 cfs 4.085 af Secondary=0.00 cfs 0.000 af Outflow=4.09 cfs 4.085 af

Total Runoff Area = 81.180 ac Runoff Volume = 6.857 af Average Runoff Depth = 1.01"
63.05% Pervious = 51.186 ac 36.95% Impervious = 29.994 ac

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 61: AREA TO RG A Runoff Area=2.900 ac 17.24% Impervious Runoff Depth=1.53"
Tc=5.0 min CN=66 Runoff=5.10 cfs 0.369 af

Subcatchment A: AREA TO SMA A Runoff Area=18.450 ac 58.54% Impervious Runoff Depth=2.72"
Tc=10.2 min CN=81 Runoff=51.14 cfs 4.185 af

Subcatchment B: AREA TO SMA B Runoff Area=41.350 ac 42.60% Impervious Runoff Depth=2.37"
Tc=24.2 min CN=77 Runoff=71.47 cfs 8.181 af

Subcatchment NW: DA NW Runoff Area=13.530 ac 7.98% Impervious Runoff Depth=0.57"
Flow Length=780' Tc=35.0 min CN=50 Runoff=3.04 cfs 0.647 af

Subcatchment SW1: DA SW1 Runoff Area=2.030 ac 0.00% Impervious Runoff Depth=0.89"
Flow Length=280' Tc=31.4 min CN=56 Runoff=0.94 cfs 0.151 af

Subcatchment SW2: DA SW2 Runoff Area=2.920 ac 0.00% Impervious Runoff Depth=0.95"
Flow Length=275' Tc=12.8 min CN=57 Runoff=2.08 cfs 0.231 af

Pond POA NW: POA NW Inflow=3.04 cfs 0.647 af
Primary=3.04 cfs 0.647 af

Pond POA SW: POA SW Inflow=10.65 cfs 8.466 af
Primary=10.65 cfs 8.466 af

Pond RG A: RG A Peak Elev=171.40' Storage=4,010 cf Inflow=5.10 cfs 0.369 af
Discarded=1.10 cfs 0.343 af Primary=0.58 cfs 0.026 af Outflow=1.67 cfs 0.369 af

Pond SMA A: SMA A Peak Elev=160.44' Storage=77,684 cf Inflow=51.18 cfs 4.211 af
Discarded=5.25 cfs 4.211 af Primary=0.00 cfs 0.000 af Outflow=5.25 cfs 4.211 af

Pond SMA B: SMA B Peak Elev=162.49' Storage=350,001 cf Inflow=71.47 cfs 8.181 af
Primary=9.93 cfs 8.084 af Secondary=0.00 cfs 0.000 af Outflow=9.93 cfs 8.084 af

Total Runoff Area = 81.180 ac Runoff Volume = 13.763 af Average Runoff Depth = 2.03"
63.05% Pervious = 51.186 ac 36.95% Impervious = 29.994 ac

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 61: AREA TO RG A Runoff Area=2.900 ac 17.24% Impervious Runoff Depth=3.13"
Tc=5.0 min CN=66 Runoff=10.94 cfs 0.755 af

Subcatchment A: AREA TO SMA A Runoff Area=18.450 ac 58.54% Impervious Runoff Depth=4.71"
Tc=10.2 min CN=81 Runoff=87.64 cfs 7.245 af

Subcatchment B: AREA TO SMA B Runoff Area=41.350 ac 42.60% Impervious Runoff Depth=4.28"
Tc=24.2 min CN=77 Runoff=128.88 cfs 14.735 af

Subcatchment NW: DA NW Runoff Area=13.530 ac 7.98% Impervious Runoff Depth=1.61"
Flow Length=780' Tc=35.0 min CN=50 Runoff=11.69 cfs 1.817 af

Subcatchment SW1: DA SW1 Runoff Area=2.030 ac 0.00% Impervious Runoff Depth=2.15"
Flow Length=280' Tc=31.4 min CN=56 Runoff=2.66 cfs 0.364 af

Subcatchment SW2: DA SW2 Runoff Area=2.920 ac 0.00% Impervious Runoff Depth=2.25"
Flow Length=275' Tc=12.8 min CN=57 Runoff=5.82 cfs 0.547 af

Pond POA NW: POA NW Inflow=11.69 cfs 1.817 af
Primary=11.69 cfs 1.817 af

Pond POA SW: POA SW Inflow=17.53 cfs 15.542 af
Primary=17.53 cfs 15.542 af

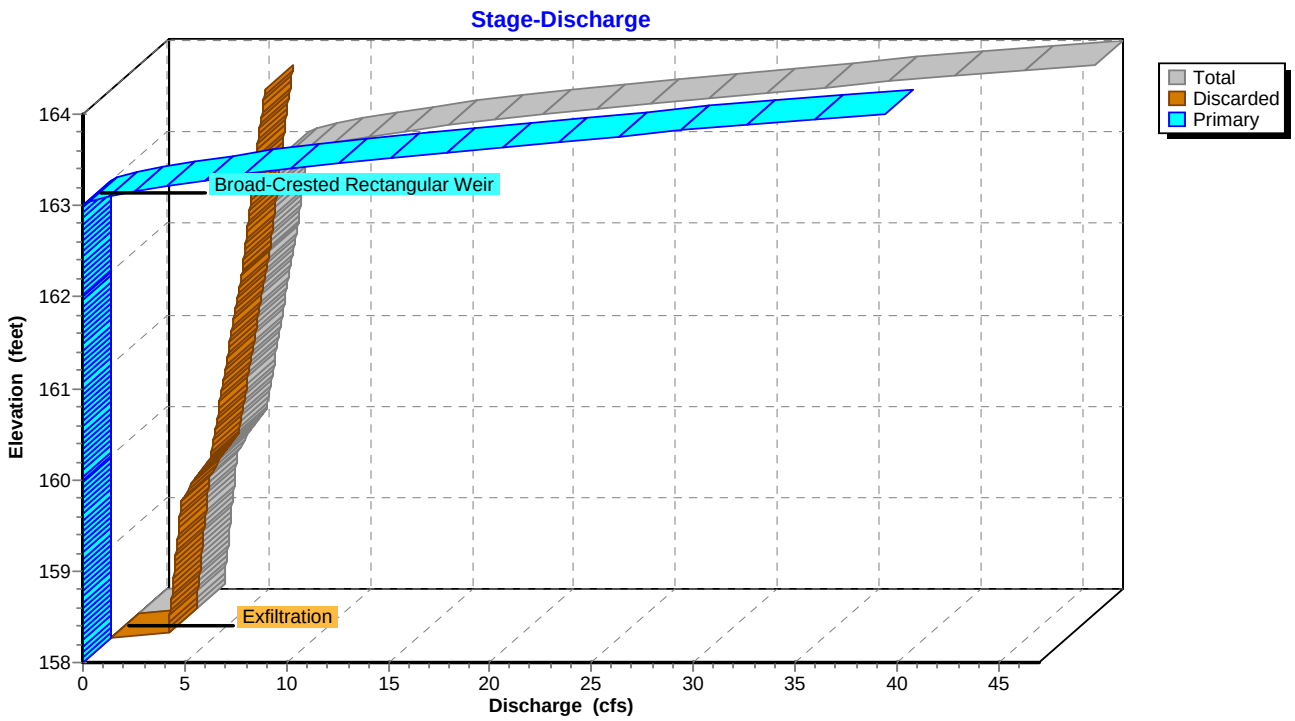
Pond RG A: RG A Peak Elev=171.79' Storage=7,801 cf Inflow=10.94 cfs 0.755 af
Discarded=1.65 cfs 0.564 af Primary=2.89 cfs 0.192 af Outflow=4.54 cfs 0.755 af

Pond SMA A: SMA A Peak Elev=162.11' Storage=162,225 cf Inflow=89.99 cfs 7.437 af
Discarded=6.50 cfs 7.437 af Primary=0.00 cfs 0.000 af Outflow=6.50 cfs 7.437 af

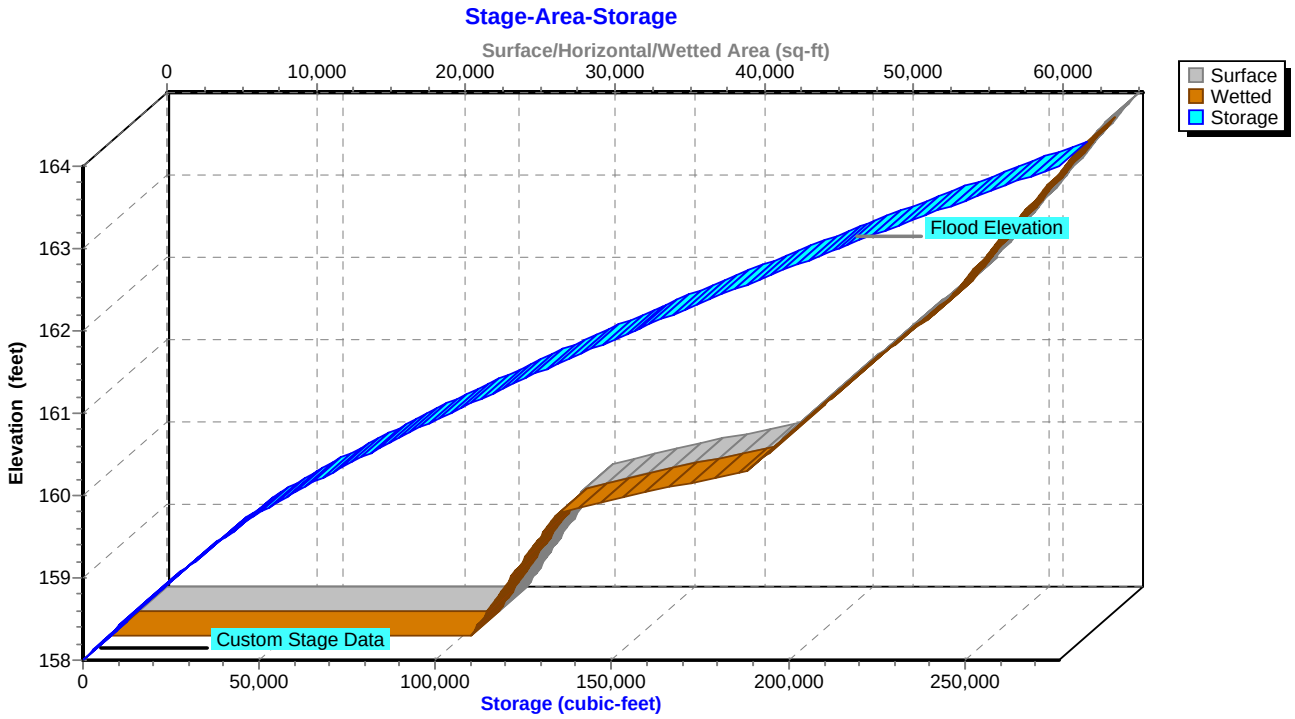
Pond SMA B: SMA B Peak Elev=164.56' Storage=523,350 cf Inflow=128.88 cfs 14.735 af
Primary=14.16 cfs 14.631 af Secondary=0.00 cfs 0.000 af Outflow=14.16 cfs 14.631 af

Total Runoff Area = 81.180 ac Runoff Volume = 25.463 af Average Runoff Depth = 3.76"
63.05% Pervious = 51.186 ac 36.95% Impervious = 29.994 ac

Pond SMA A: SMA A



Pond SMA A: SMA A



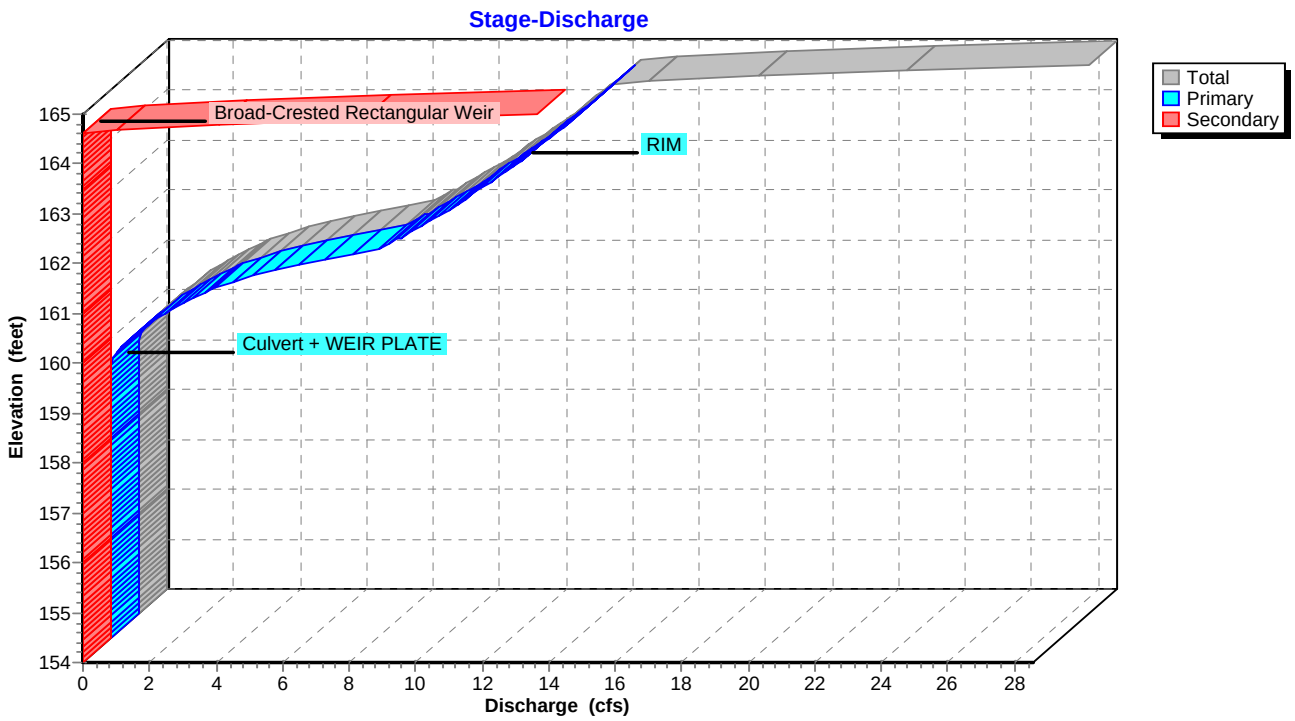
Stage-Discharge for Pond SMA A: SMA A

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
158.00	0.00	0.00	0.00
158.10	2.83	2.83	0.00
158.20	2.88	2.88	0.00
158.30	2.92	2.92	0.00
158.40	2.96	2.96	0.00
158.50	3.01	3.01	0.00
158.60	3.05	3.05	0.00
158.70	3.10	3.10	0.00
158.80	3.14	3.14	0.00
158.90	3.19	3.19	0.00
159.00	3.23	3.23	0.00
159.10	3.28	3.28	0.00
159.20	3.33	3.33	0.00
159.30	3.37	3.37	0.00
159.40	3.42	3.42	0.00
159.50	3.47	3.47	0.00
159.60	3.74	3.74	0.00
159.70	4.02	4.02	0.00
159.80	4.32	4.32	0.00
159.90	4.62	4.62	0.00
160.00	4.94	4.94	0.00
160.10	5.01	5.01	0.00
160.20	5.08	5.08	0.00
160.30	5.15	5.15	0.00
160.40	5.22	5.22	0.00
160.50	5.30	5.30	0.00
160.60	5.37	5.37	0.00
160.70	5.44	5.44	0.00
160.80	5.52	5.52	0.00
160.90	5.59	5.59	0.00
161.00	5.67	5.67	0.00
161.10	5.74	5.74	0.00
161.20	5.82	5.82	0.00
161.30	5.90	5.90	0.00
161.40	5.97	5.97	0.00
161.50	6.05	6.05	0.00
161.60	6.13	6.13	0.00
161.70	6.21	6.21	0.00
161.80	6.29	6.29	0.00
161.90	6.37	6.37	0.00
162.00	6.45	6.45	0.00
162.10	6.50	6.50	0.00
162.20	6.56	6.56	0.00
162.30	6.61	6.61	0.00
162.40	6.67	6.67	0.00
162.50	6.72	6.72	0.00
162.60	6.78	6.78	0.00
162.70	6.83	6.83	0.00
162.80	6.89	6.89	0.00
162.90	6.94	6.94	0.00
163.00	7.00	7.00	0.00
163.10	8.33	7.06	1.27
163.20	10.71	7.11	3.60
163.30	13.80	7.17	6.63
163.40	17.47	7.22	10.25
163.50	21.60	7.28	14.32
163.60	26.16	7.34	18.82
163.70	30.85	7.39	23.46
163.80	35.79	7.45	28.34
163.90	41.25	7.51	33.75
164.00	**47.02**	**7.57**	**39.45**

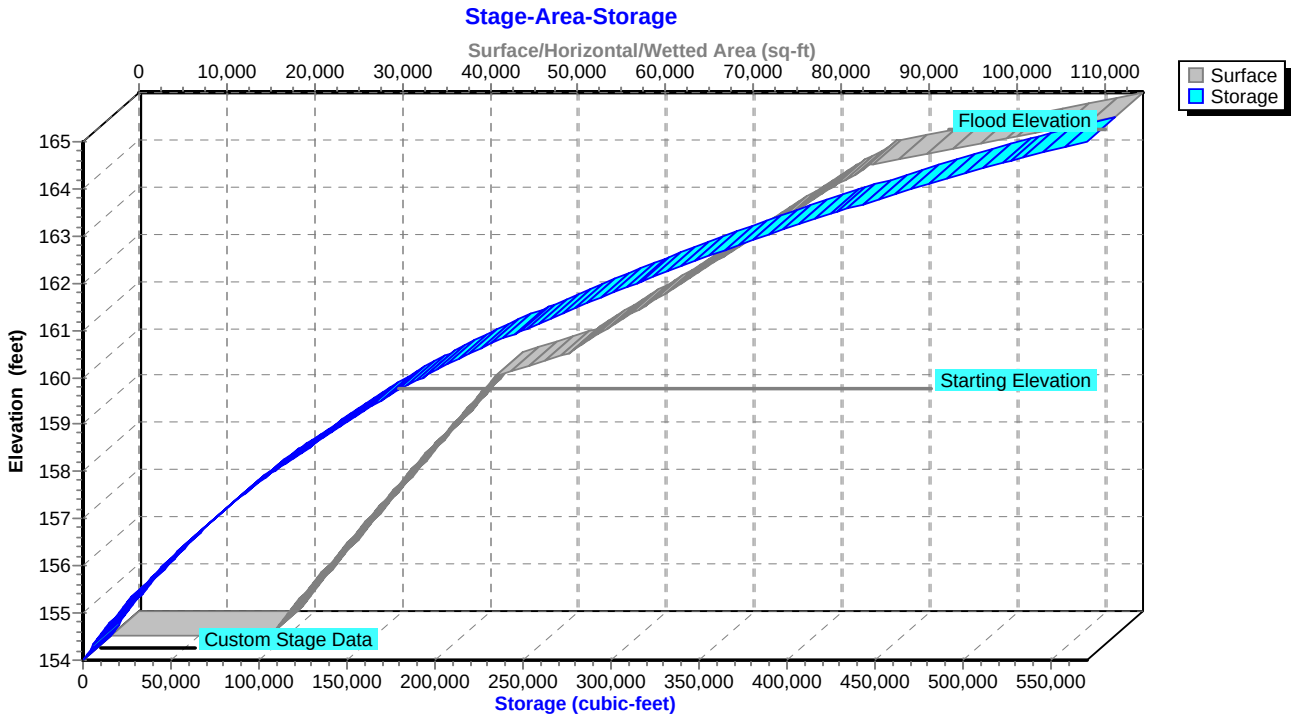
Stage-Area-Storage for Pond SMA A: SMA A

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
158.00	24,120	24,120	0
158.20	24,855	24,863	4,897
158.40	25,601	25,617	9,943
158.60	26,358	26,383	15,138
158.80	27,125	27,160	20,486
159.00	27,904	27,947	25,989
159.20	28,694	28,746	31,649
159.40	29,495	29,556	37,468
159.60	32,257	32,323	43,545
159.80	37,240	37,308	50,488
160.00	42,580	42,650	58,464
160.20	43,799	43,877	67,102
160.40	45,034	45,122	75,985
160.60	46,287	46,384	85,117
160.80	47,558	47,664	94,501
161.00	48,845	48,961	104,141
161.20	50,150	50,275	114,040
161.40	51,471	51,606	124,202
161.60	52,810	52,955	134,630
161.80	54,167	54,321	145,327
162.00	55,540	55,704	156,298
162.20	56,465	56,644	167,498
162.40	57,397	57,592	178,884
162.60	58,337	58,547	190,457
162.80	59,285	59,510	202,220
163.00	60,240	60,481	214,172
163.20	61,185	61,442	226,314
163.40	62,138	62,411	238,646
163.60	63,098	63,387	251,170
163.80	64,065	64,371	263,886
164.00	**65,040**	**65,362**	**276,797**

Pond SMA B: SMA B



Pond SMA B: SMA B



Stage-Discharge for Pond SMA B: SMA B

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
154.00	0.00	0.00	0.00
154.15	0.00	0.00	0.00
154.30	0.00	0.00	0.00
154.45	0.00	0.00	0.00
154.60	0.00	0.00	0.00
154.75	0.00	0.00	0.00
154.90	0.00	0.00	0.00
155.05	0.00	0.00	0.00
155.20	0.00	0.00	0.00
155.35	0.00	0.00	0.00
155.50	0.00	0.00	0.00
155.65	0.00	0.00	0.00
155.80	0.00	0.00	0.00
155.95	0.00	0.00	0.00
156.10	0.00	0.00	0.00
156.25	0.00	0.00	0.00
156.40	0.00	0.00	0.00
156.55	0.00	0.00	0.00
156.70	0.00	0.00	0.00
156.85	0.00	0.00	0.00
157.00	0.00	0.00	0.00
157.15	0.00	0.00	0.00
157.30	0.00	0.00	0.00
157.45	0.00	0.00	0.00
157.60	0.00	0.00	0.00
157.75	0.00	0.00	0.00
157.90	0.00	0.00	0.00
158.05	0.00	0.00	0.00
158.20	0.00	0.00	0.00
158.35	0.00	0.00	0.00
158.50	0.00	0.00	0.00
158.65	0.00	0.00	0.00
158.80	0.00	0.00	0.00
158.95	0.00	0.00	0.00
159.10	0.00	0.00	0.00
159.25	0.00	0.00	0.00
159.40	0.00	0.00	0.00
159.55	0.01	0.01	0.00
159.70	0.13	0.13	0.00
159.85	0.34	0.34	0.00
160.00	0.58	0.58	0.00
160.15	0.86	0.86	0.00
160.30	1.17	1.17	0.00
160.45	1.52	1.52	0.00
160.60	1.89	1.89	0.00
160.75	2.29	2.29	0.00
160.90	2.71	2.71	0.00
161.05	3.20	3.20	0.00
161.20	3.92	3.92	0.00
161.35	4.80	4.80	0.00
161.50	5.79	5.79	0.00
161.65	6.88	6.88	0.00
161.80	8.01	8.01	0.00
161.95	8.46	8.46	0.00
162.10	8.89	8.89	0.00
162.25	9.30	9.30	0.00
162.40	9.69	9.69	0.00
162.55	10.06	10.06	0.00
162.70	10.42	10.42	0.00
162.85	10.77	10.77	0.00
163.00	11.11	11.11	0.00
163.15	11.44	11.44	0.00
163.30	11.76	11.76	0.00
163.45	12.07	12.07	0.00
163.60	12.37	12.37	0.00
163.75	12.67	12.67	0.00
163.90	12.96	12.96	0.00
164.05	13.24	13.24	0.00
164.20	13.52	13.52	0.00
164.35	13.79	13.79	0.00
164.50	14.06	14.06	0.00
164.65	14.92	14.32	0.60
164.80	19.37	14.57	4.79
164.95	**25.99**	**14.83**	**11.16**

Stage-Area-Storage for Pond SMA B: SMA B

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
154.00	18,080	0
154.15	18,753	2,762
154.30	19,426	5,626
154.45	20,098	8,590
154.60	20,771	11,655
154.75	21,444	14,821
154.90	22,117	18,088
155.05	22,789	21,456
155.20	23,462	24,925
155.35	24,135	28,495
155.50	24,808	32,166
155.65	25,480	35,937
155.80	26,153	39,810
155.95	26,826	43,783
156.10	27,526	47,859
156.25	28,241	52,041
156.40	28,956	56,331
156.55	29,671	60,728
156.70	30,385	65,232
156.85	31,100	69,844
157.00	31,815	74,563
157.15	32,530	79,388
157.30	33,245	84,321
157.45	33,959	89,362
157.60	34,674	94,509
157.75	35,389	99,764
157.90	36,104	105,126
158.05	36,822	110,595
158.20	37,547	116,173
158.35	38,272	121,859
158.50	38,997	127,654
158.65	39,722	133,558
158.80	40,447	139,571
158.95	41,172	145,692
159.10	41,897	151,922
159.25	42,622	158,261
159.40	43,347	164,709
159.55	44,670	171,280
159.70	47,190	178,169
159.85	49,710	185,437
160.00	52,230	193,083
160.15	53,515	201,013
160.30	54,800	209,137
160.45	56,084	217,453
160.60	57,369	225,962
160.75	58,654	234,664
160.90	59,939	243,558
161.05	61,223	252,645
161.20	62,508	261,925
161.35	63,793	271,398
161.50	65,078	281,063
161.65	66,362	290,921
161.80	67,647	300,972
161.95	68,932	311,215
162.10	70,215	321,651
162.25	71,498	332,280
162.40	72,780	343,101
162.55	74,063	354,114
162.70	75,345	365,319
162.85	76,627	376,717
163.00	77,910	388,308
163.15	79,193	400,090
163.30	80,475	412,065
163.45	81,757	424,233
163.60	83,040	436,592
163.75	84,323	449,145
163.90	85,605	461,889
164.05	87,857	474,850
164.20	92,046	488,343
164.35	96,235	502,464
164.50	100,425	517,214
164.65	104,615	532,592
164.80	108,804	548,598
164.95	**112,993**	**565,233**

Events for Pond SMA A: SMA A

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1-YR	18.53	3.15	3.15	**0.00**	158.81	20,791
2-YR	27.36	3.40	3.40	0.00	159.35	35,877
10-YR	51.18	5.25	5.25	0.00	160.44	77,684
25-YR	65.06	5.70	5.70	0.00	161.04	106,189
100-YR	**89.99**	**6.50**	**6.50**	0.00	**162.11**	**162,225**

Events for Pond SMA B: SMA B

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Storage (cubic-feet)
1-YR	22.60	2.25	2.25	**0.00**	160.74	233,927
2-YR	35.39	4.09	4.09	0.00	161.23	263,884
10-YR	71.47	9.93	9.93	0.00	162.49	350,001
25-YR	91.98	11.69	11.69	0.00	163.26	409,236
100-YR	**128.88**	**14.16**	**14.16**	0.00	**164.56**	**523,350**

Events for Pond POA SW: POA SW

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1-YR	2.33	2.33	**0.00**	**0**
2-YR	4.27	4.27	0.00	0
10-YR	10.65	10.65	0.00	0
25-YR	13.02	13.02	0.00	0
100-YR	**17.53**	**17.53**	0.00	0

Events for Pond POA NW: POA NW

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1-YR	0.06	0.06	**0.00**	**0**
2-YR	0.25	0.25	0.00	0
10-YR	3.04	3.04	0.00	0
25-YR	5.69	5.69	0.00	0
100-YR	**11.69**	**11.69**	0.00	0

APPENDIX C

INDIVIDUAL DRAIN LINE SIZING

STORM DRAIN DESIGN

PROJECT:	NORTH MAPLE STREET, ENFIELD, CT
HSI JOB #:	5476
DESIGN METHOD:	RATIONAL METHOD
DESIGN STORM EVENT:	25-YR (PER TOWN OF ENFIELD STORMWATER REGULATIONS)
COMPUTED BY:	JNP
DATE:	6/2/2020

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
Three Congress Street Nashua, New Hampshire 03062-3301
Tel (603) 883-2057 www.hayner-swanson.com Fax (603) 883-5057

FROM PIPE INLET				TO PIPE OUTLET				SUBCATCHMENT AREA					PIPE SIZE & MATERIAL					PIPE CAPACITY						
LOCATION	RIM	INVERT	COVER	LOCATION	RIM	INVERT	COVER	ACRES (ACRES)	C	CA (ACRES)	ΣCA (ACRES)	Tc (MIN)	LENGTH (FT)	SLOPE (FT/FT)	DIA. (IN)	MATERIAL	n	I (in/hr)	Q_{DESIGN} (cfs)	Q_{FULL} (cfs)	V_{FULL} (fps)	T_{FLOW} (min)	Q CHECK:	
RD 46	169.5	165.65	2.60	DMH 45	169.3	165.50	2.55	0.86	0.90	0.77	0.77	5.0	15	0.010	15	PVC	0.012	6.7	5.19	7.01	5.71	0.0	OK	
DMH 45	169.3	165.25	2.55	DMH 43	169.2	164.63	3.07	-	-	0.00	0.00	5.0	154	0.004	18	RCP	0.012	6.7	0.00	7.20	4.07	0.6	OK	
RD 44	169.5	165.65	2.60	DMH 43	169.2	165.50	2.45	0.86	0.90	0.77	0.77	5.0	15	0.010	15	PVC	0.012	6.7	5.19	7.01	5.71	0.0	OK	TO SMA A
DMH 43	169.2	164.13	3.07	DMH 41	169.3	163.68	3.62	-	-	0.00	0.00	5.6	150	0.003	24	RCP	0.012	6.5	0.00	13.42	4.27	0.6	OK	
RD 42	169.5	165.08	3.17	DMH 41	169.3	164.90	3.15	1.14	0.90	1.03	1.03	5.0	15	0.012	15	PVC	0.012	6.7	6.87	7.68	6.26	0.0	OK	
DMH 41	169.3	163.58	3.72	EW 40	-	162.26	-	-	-	0.00	0.00	6.0	219	0.006	24	RCP	0.012	6.5	0.00	18.99	6.04	0.6	OK	
RD 65	172.6	168.44	2.91	DMH 64	172.5	168.35	2.90	0.86	0.90	0.77	0.77	5.0	6	0.015	15	PVC	0.012	6.7	5.16	8.58	7.00	0.0	OK	
DMH 64	172.5	167.50	3.00	DMH 62	172.5	167.03	3.47	-	-	0.00	0.77	5.0	154	0.003	24	HDPE	0.012	6.7	5.16	13.42	4.27	0.6	OK	
RD 63	172.6	168.44	2.91	DMH 62	172.5	168.35	2.90	0.86	0.90	0.77	0.77	5.0	6	0.015	15	PVC	0.012	6.7	5.16	8.58	7.00	0.0	OK	
DMH 62	172.5	166.93	3.57	DMH 59	172.4	166.48	3.92	-	-	0.00	1.54	5.6	150	0.003	24	HDPE	0.012	6.5	10.01	13.42	4.27	0.6	OK	
LCB 61	171.2	167.41	2.29	DMH 59	172.4	167.00	3.90	2.90	0.37	1.07	1.07	5.0	104	0.004	18	HDPE	0.012	6.7	7.17	7.20	4.07	0.4	OK	
RD 60	172.6	168.44	2.91	DMH 59	172.4	168.35	2.80	1.14	0.90	1.03	1.02	5.0	6	0.015	15	PVC	0.012	6.7	6.83	8.58	7.00	0.0	OK	
DMH 59	172.4	166.38	4.02	DMH 57	173.5	165.70	5.80	-	-	0.00	3.63	6.2	224	0.003	24	HDPE	0.012	6.4	23.23	13.42	4.27	0.9	NOT OK	TO SMA A
STUB 58	173.5	168.44	3.81	DMH 57	173.5	168.35	3.90	1.14	0.90	1.03	1.02	5.0	6	0.015	15	PVC	0.012	6.7	6.83	8.58	7.00	0.0	OK	
DMH 57	173.5	165.20	5.80	DMH 56	174.1	164.81	6.79	-	-	0.00	3.63	7.1	129	0.003	30	HDPE	0.012	6.2	22.51	24.34	4.96	0.4	OK	
DMH 56	174.3	164.71	7.09	DMH 55	171.6	163.90	5.20	-	-	0.00	3.63	7.4	269	0.003	30	HDPE	0.012	6.2	22.51	24.34	4.96	0.9	OK	
DMH 55	171.6	163.80	5.30	CB 54	169.0	163.03	3.47	-	-	0.00	3.63	8.3	256	0.003	30	HDPE	0.012	5.9	21.42	24.34	4.96	0.9	OK	
CB 54	169.0	162.43	3.57	DMH 52	169.8	162.03	4.77	4.10	0.30	1.23	4.86	9.2	132	0.003	36	HDPE	0.012	5.7	27.70	39.56	5.60	0.4	OK	
STUB 53	170.0	165.65	3.10	DMH 52	169.8	165.50	3.05	1.14	0.90	1.03	1.02	5.0	10	0.015	15	PVC	0.012	6.7	6.83	8.58	7.00	0.0	OK	
DMH 52	169.8	161.93	4.87	CB 51	167.4	161.66	2.74	-	-	0.00	5.88	9.5	89	0.003	36	HDPE	0.012	5.6	32.93	39.56	5.60	0.3	OK	
CB 51	167.4	161.56	2.84	EW 50	-	161.18	-	0.55	0.52	0.29	6.16	9.8	127	0.003	36	HDPE	0.012	5.6	34.50	39.56	5.60	0.4	OK	
DMH 37	174.3	168.66	4.14	DMH 36	176.5	167.42	7.58	2.10	0.35	0.74	0.73	20.9	247	0.005	18	HDPE	0.012	4.2	3.07	8.05	4.55	0.9	OK	
EW 36	176.5	172.02	3.23	DMH 36	176.5	170.93	4.32	6.40	0.28	1.79	1.79	20.9	48	0.028	15	HDPE	0.012	4.2	7.53	11.73	9.56	0.1	OK	
DMH 36	176.5	166.67	7.33	DMH 15	174.5	165.69	6.31	-	-	0.00	2.52	21.0	196	0.005	30	HDPE	0.012	4.2	10.58	31.42	6.40	0.5	OK	
RD 25	172.7	168.44	3.01	DMH 24	172.5	168.35	2.90	0.86	0.90	0.77	0.77	5.0	6	0.015	15	PVC	0.012	6.7	5.19	8.58	7.00	0.0	OK	
DMH 24	172.5	168.04	2.46	DMH 22	172.6	167.58	3.02	-	-	0.00	0.77	5.0	154	0.003	24	HDPE	0.012	6.7	5.16	13.42	4.27	0.6	OK	
RD 23	172.7	168.44	3.01	DMH 22	172.5	168.35	2.90	0.86	0.90	0.77	0.77	5.0	6	0.015	15	PVC	0.012	6.7	5.19	8.58	7.00	0.0	OK	
DMH 22	172.5	167.48	3.02	DMH 20	173.0	167.03	3.97	-	-	0.00	1.54	5.6	150	0.003	24	HDPE	0.012	6.5	10.01	13.42	4.27	0.6	OK	
RD 21	172.7	168.44	3.01	DMH 20	173.0	168.35	3.40	1.14	0.90	1.03	1.03	5.0	6	0.015	15	PVC	0.012	6.7	6.87	8.58	7.00	0.0	OK	
DMH 20	173.0	166.93	4.07	DMH 18	173.2	166.19	5.01	-	-	0.00	2.57	6.2	212	0.003	24	HDPE	0.012	6.4	16.45	13.42	4.27	0.8	NOT OK	
STUB 19	174.2	168.44	4.51	DMH 18	173.2	168.35	3.60	1.14	0.90	1.03	1.03	5.0	6	0.015	15	PVC	0.012	6.7	6.90	8.58	7.00	0.0	OK	
DMH 18	173.2	165.69	5.01	DMH 16	173.7	165.09	6.11	-	-	0.00	3.60	7.4	148	0.004	30	HDPE	0.012	6.2	22.32	28.10	5.72	0.4	OK	
RD 10	169.5	165.18	3.07	DMH 9	169.3	165.00	3.05	0.86	0.90	0.77	0.77	5.0	15	0.012	15	PVC	0.012	6.7	5.19	7.68	6.26	0.0	OK	
DMH 9	169.3	164.64	3.16	DMH 7	169.2	164.13	3.57	-	-	0.00	0.77	5.0	127	0.004	18	RCP	0.012	6.7	5.16	7.20	4.07	0.5	OK	
RD 8	169.5	165.18	3.07	DMH 7	169.2	165.00	2.95	0.86	0.90	0.77	0.77	5.0	15	0.012	15	PVC	0.012	6.7	5.19	7.68	6.26	0.0	OK	
DMH 7	169.2	163.63	3.57	DMH 5	169.3	163.18	4.12	-	-	0.00	1.54	5.6	150	0.003	24	RCP	0.012	6.5	10.01	13.42	4.27	0.6	OK	
RD 6	169.5	165.18	3.07	DMH 5	169.3	165.00	3.05	1.14	0.90	1.03	1.03	5.0	15	0.012	15	PVC	0.012	6.7	6.87	7.68	6.26	0.0	OK	
DMH 5	169.3	163.08	4.22	CB 4	168.3	161.86	4.44	-	-	0.00	2.57	6.0	202	0.006	24	RCP	0.012	6.5	16.71	18.99	6.04	0.6	OK	
CB 35	170.5	165.30	3.20	CB 33	169.5	165.00	2.50	1.50	0.30	0.45	0.45	5.0	98	0.003	24	HDPE	0.012	6.7	3.02	13.42	4.27	0.4	OK	TO SMA B
CB 34	169.6	165.62	2.73	CB 33	169.5	165.50	2.75	0.70	0.83	0.58	0.58	5.0	12	0.010	15	HDPE	0.012	6.7	3.89	7.01	5.71	0.0	OK	
CB 33	169.5	164.90	2.60	CB 31	170.5	164.63	3.87	0.45	0.20	0.09	1.12	5.3	90	0.003	24	HDPE	0.012	6.6	7.39	13.42	4.27	0.4	OK	
CB 31	170.5	164.53	3.97	CB 29	172.0	164.01	5.99	0.45	0.20	0.09	1.68	5.6	171	0.003	24	HDPE	0.012	6.5	10.92	13.42	4.27	0.7	OK	
CB 30	171.5	167.25	3.00	CB 29	172.0	167.13	3.62	0.25	0.83	0.21	0.20	5.0	12	0.010	15	HDPE	0.012	6.7	1.34	7.01	5.71	0.0	OK	
CB 29	172.0	163.91	6.09	CB 27	171.0	163.30	5.70	0.40	0.15	0.06	1.94	6.3	202	0.003	24	HDPE	0.012	6.4	12.42	13.42	4.27	0.8	OK	
CB 28	172.2	167.67	3.28	CB 27	171.0	166.75	3.00	0.15	0.90	0.14	0.14	5.0	92	0.010	15	HDPE	0.012	6.7	0.94	7.01	5.71	0.3	OK	
CB 27	171.0	163.20	5.80	DMH 26	173.4	162.88	8.52	1.30	0.58	0.75	2.83	7.1	106	0.003	24	HDPE	0.012	6.2	17.55	13.42	4.27	0.4	NOT OK	
DMH 26	173.4	165.97	5.43	DMH 16	173.7	165.09	6.61	-	-	0.00	2.83	7.4	146	0.006	24	HDPE	0.012	6.2	17.55	18.99	6.04	0.4	OK	
DMH 16	173.7	164.09	6.61	DMH 15	174.5	163.81	7.69	-	-	0.00	6.43	7.8	92	0.003	36	HDPE	0.012	6.1	39.22	39.56	5.60	0.3	OK	
DMH 15	174.5	163.71	7.79	DMH 14	171.9	162.95	5.95	-	-	0.00	8.95	21.5	253	0.003	36	HDPE	0.012	4.1	36.70	39.56	5.60	0.8	OK	
DMH 14	171.9	162.85	6.05	DMH 13	169.0	162.01	3.99	-	-	0.00	8.95	22.2	279	0.003	36	HDPE	0.012	4.0	35.80	39.56	5.60	0.8	OK	
DMH 13	169.0	161.91	4.09	CB 11	168.3	161.63	3.67	-	-	0.00	8.95	23.1	95	0.003	36	HDPE	0.012	3.9	34.91	39.56	5.60	0.3	OK	
STUB 12	169.0	164.50	3.00	CB 11	168.3	164.40	2.40	1.60	0.75	1.20	1.20	5.0	10	0.010	18	HDPE	0.012	6.7	8.04	11.38	6.44	0.0	OK	
CB 11	168.3	161.53	3.77	CB 4	168.3	160.94	4.36	0.36	0.30	0.11	10.30	23.4	168	0.0035	36	HDPE	0.012	3.9	40.17	42.73	6.04	0.5	OK	
STUB 4A	168.3	163.59	3.21	CB 4	168.3	163.49	3.31	1.14	0.90	1.03	1.03	5.0	10	0.010	18	PVC	0.012	6.7	6.90	11.38	6.44	0.0	OK	
CB 4	168.3	160.84	4.46	EW 3	-	160.19	-	-	-	0.00	13.90	23.8	108	0.006	36	RCP	0.012	3.9	54.21	55.94	7.91	0.2	OK	
CB 73	166.8	162.74	2.81	CB 72	166.5	162.47	2.78	0.73	0.90	0.66	0.65	5.0	54	0.005	15	HDPE	0.012	6.7	4.36	4.96	4.04	0.2	OK	
CB 72	166.5	162.22	2.78	CB 71	166.7	161.84	3.36	0.82	0.90	0.74	1.39	5.2	48	0.008	18	HDPE	0.012	6.6	9.17	10.18	5.76	0.1	OK	TO SMA B
CB 71	166.7	161.34	3.36	EW 70	-	160.25	-	0.68	0.90	0.61	2.00	5.3	219	0.005	24	HDPE	0.012	6.6	13.20	17.33	5.52	0.7	OK	

INDIVIDUAL DRAIN LINE DESIGN - DRAINAGE AREAS

DRAINAGE AREA	AREA (AC)	Cw	WOODS (AC)	OPEN (AC)	ROOF (AC)	PAVED (AC)
A	5.80	0.57		3.20		2.60
B	14.31	0.40		11.07	0.74	2.50
4	0.36	0.30		0.36		
4A	1.14	0.90			1.14	
6	1.14	0.90			1.14	
8	0.86	0.90			0.86	
10	0.86	0.90			0.86	
11	0.36	0.30		0.36		
STUB 12	1.60	0.75		0.40		1.20
17	0.20	0.30		0.20		
STUB 17A	1.14	0.90			1.14	
19	1.14	0.90			1.14	
21	0.86	0.90			0.86	
23	0.86	0.90			0.86	
27	1.30	0.58		0.70		0.60
28	0.14	0.90				0.14
29	0.40	0.15	0.20	0.20		
30	0.25	0.83		0.03		0.22
31	0.45	0.20	0.22	0.23		
32	0.60	0.78		0.07		0.53
33	0.45	0.20	0.22	0.23		
34	0.70	0.83		0.08		0.62
35	1.50	0.30	0.27	1.15		0.08
OFFSITE 2	6.40	0.28	2.00	4.00		0.40
OFFSITE 1	2.10	0.35	0.50	1.25		0.35
42	1.14	0.90			1.14	
44	0.86	0.90			0.86	
46	0.86	0.90			0.86	
51	0.55	0.52		0.35		0.20
STUB 53	1.14	0.90			1.14	
54	4.10	0.30		4.10		
STUB 58	1.14	0.90			1.14	
60	1.14	0.90			1.14	
61	2.90	0.37	0.45	1.95		0.50
63	0.86	0.90			0.86	
65	0.86	0.90			0.86	
71	0.73	0.90				0.73
72	0.82	0.90				0.82
73	0.68	0.90				0.68

Appendix B - Rainfall

RAINFALL – DURATION – FREQUENCY RELATIONSHIPS FOR CONNECTICUT

DURATION	RETURN FREQUENCY (Years)					
	2	**5**	**10**	**25**	**50**	**100**
Min	RAINFALL IN MM (INCHES)					
5	9.1(0.36)	11.4(0.45)	13.0(0.51)	15.2(0.60)	17.2(0.67)	18.5(0.73)
15	18.3(0.72)	22.6(0.89)	25.9(1.02)	30.5(1.20)	34.0(1.34)	37.6(1.48)
60	33.0(1.3)	43.2(1.7)	50.8(2.00)	58.4(2.30)	65.3(2.57)	71.1(2.80)
Hrs						
2	40.6(1.60)	54.6(2.15)	63.5(2.50)	72.4(2.85)	82.6(3.25)	91.4(3.60)
3	44.5(1.75)	61.0(2.40)	69.9(2.75)	82.6(3.25)	90.2(3.55)	101.6(4.00)
6	59.7(2.35)	74.9(2.95)	87.6(3.45)	101.6(4.00)	115.6(4.55)	127.0(5.00)
12	69.9(2.75)	90.2(3.55)	101.6(4.00)	123.2(4.85)	135.9(5.35)	152.4(6.00)
24	82.6(3.25)	106.7(4.20)	125.7(4.95)	146.1(5.75)	161.3(6.35)	177.8(7.00)
	24 HOUR RAINFALL BY COUNTY					
Fairfield	83.8(3.3)	109.2(4.3)	127.0(5.0)	144.8(5.7)	162.6(6.4)	182.9(7.2)
Hartford	81.3(3.2)	104.1(4.1)	119.4(4.7)	139.7(5.5)	157.5(6.2)	175.3(6.9)
Litchfield	81.3(3.2)	104.1(4.1)	119.4(4.7)	139.7(5.5)	157.5(6.2)	177.8(7.0)
Middlesex	83.8(3.3)	106.7(4.2)	127.0(5.0)	142.2(5.6)	160.0(6.3)	180.3(7.1)
New Haven	83.8(3.3)	106.7(4.2)	127.0(5.0)	142.2(5.6)	160.0(6.3)	180.3(7.1)
New London	86.4(3.4)	109.2(4.3)	127.0(5.0)	144.8(5.7)	160.0(6.3)	180.3(7.1)
Tolland	81.3(3.2)	104.1(4.1)	121.9(4.8)	139.7(5.5)	157.5(6.2)	175.3(6.9)
Windham	81.3(3.2)	106.7(4.2)	121.9(4.8)	139.7(5.5)	157.5(6.2)	175.3(6.9)

Sources:

1. "Rainfall Frequency Atlas of the United States", Technical Paper No. 40, U.S. Department of Commerce, Weather Bureau.
2. NOAA Technical Memorandum "NWS Hydro-35", June 1977, U.S. Department of Commerce, National Weather Service.

Table B-1

APPENDIX D

CT STORMWATER QUALITY MANUAL CALCULATIONS

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
Nashua, New Hampshire
Burlington, Massachusetts
www.hayner-swanson.com

JOB NO: 5476 SHEET: ____ OF ____
PROJECT: 113 NORTH MAPLE STREET, ENFIELD, CT
SUBJECT: WQV CALCS
BY: TEZ DATE: 6/1/20

STORMWATER MANAGEMENT AREA A (SMA-A):

$$WQV = \frac{(1'')(A)(R)}{12} = \frac{(1)(21.35)(0.527)}{12} = 0.938\ af = 40{,}843\ cf$$

A = 21.35 ac (11.3 ac IMP)
R = 0.05 + 0.009(i) ⇒ i = 53%
= 0.05 + 0.009(53)
= 0.527

WQV = 40,843 CF

1) SECONDARY TREATMENT → SEDIMENT FOREBAY

> REQUIRED VOLUME = 25% WQV = 10,211 CF
> PROVIDED VOLUME = 11,436 CF (OK)

2) PRIMARY TREATMENT → INFILTRATION BASIN

> WQV = 40,843 CF
> PROVIDED VOLUME = 214,172 CF (OK)
(BELOW 163.0)
(SEE APPENDIX B FOR STAGE STORAGE TABLE)

3) DESIGN NOTES:

> 5"/hr DESIGN INFILTRATION RATE
> BASIN COMPLETELY STORES & INFILTRATES UP TO AND INCLUDING 100-YR STORM
> 3+ FT OF SEPARATION FROM BOTTOM TO ESHWT (SEE GEOTECH REPORT TP-7 & TP8)

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
Nashua, New Hampshire
Burlington, Massachusetts
www.hayner-swanson.com

JOB NO: _____ SHEET: _____ OF _____
PROJECT: _____
SUBJECT: _____
BY: _____ DATE: _____

STORMWATER MANAGEMENT AREA B (SMA B)

$$WQV = \frac{(1'')(A)(R)}{12} = \frac{(1)(41.35)(0.437)}{12} = 1.506\ af = 65{,}594\ cf$$

A = 41.35 AC (17.61 AC IMP)

$$R = 0.05 + 0.009(i) \Rightarrow 43\%$$
$$= 0.05 + 0.009(43)$$
$$= 0.437$$

$$\boxed{WQV = 65{,}594\ cf}$$

1) SECONDARY TREATMENT → SEDIMENT FOREBAY

> REQUIRED VOLUME = 10% WQV = 6,559 CF
> PROVIDED VOLUME = 10,855 CF (OK)

2) PRIMARY TREATMENT → STORMWATER POND

> WQV = 65,594 CF
> PROVIDED PERMANENT POOL VOLUME = 169,068 CF (2.6 x WQV) (OK)
(BELOW 159.5)
(SEE APPENDIX B FOR STAGE STORAGE TABLE)

3) DESIGN NOTES:

> ESHOT @ 158.0±
> NO SIDE SLOPE INFILTRATION ASSUMED IN ANALYSIS
> FLOW PATH = 12:1 ± (3:1 MIN. REQUIRED)
> AVG POOL DEPTH = 4'

APPENDIX E

OUTLET PROTECTION CALCULATIONS

Outlet Protection		
Reference: ConnDOT Drainage Manual		
Job #:	5476	
Project:	Enfield	
Design by:	TEZ	
Date:	6/4/2020	
Structure:	EW 1	
Invert:	106.23	
A. Conditions:		
Pipe D_o =	1.50	ft
Q_{25}=	11.69	cfs
Q_F =	6.23	cfs
Q_{25}/Q_F =	188	%
d/D =	100	%
Tw =	1.50	ft
	Tw > Do/2	
B. Design Parameters		
Apron Length =	30	ft
Apron Width at Culvert Outlet =	5	ft
Apron Width at End of Apron =	16	ft
Median Stone =	3	in
Maximum Size of Stone =	4	in
Minimum Depth of Stone =	6	in

Outlet Protection		
Reference: ConnDOT Drainage Manual		
Job #:	5476	
Project:	Enfield	
Design by:	TEZ	
Date:	6/4/2020	
Structure:	EW 40	
Invert:	162.26	
A. Conditions:		
Pipe D_o =	2	ft
Q_{25}=	6.87	cfs
Q_F =	18.99	cfs
Q_{25}/Q_F =	36	%
d/D =	42	%
Tw =	0.84	ft
	Tw < Do/2	
B. Design Parameters		
Apron Length =	18	ft
Apron Width at Culvert Outlet =	6	ft
Apron Width at End of Apron =	24	ft
Median Stone =	2	in
Maximum Size of Stone =	3	in
Minimum Depth of Stone =	4	in

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
Nashua, New Hampshire
Burlington, Massachusetts
www.hayner-swanson.com

JOB NO: #5476 SHEET: 1 OF
PROJECT: Enfield
SUBJECT: Outlet Protection Calcs
BY: DATE: 6/5/20

EV 50

Bottom of Forebay = 158.0
Top of Forebay = 159.5
$\Delta = 1.5'$

$R_p = 3'$ (36" HDPE) $= S_p$

Inv = 161.18

$Q_{25} = 34.50$ CFS (From IDD)

$Q_{Full} = 39.56$ CFS (From IDD)

$T_w = 161.04$

Since Forebay depth $= 1.5' = 0.5(R_p) \Rightarrow$ Type '1' Scour Hole

$$d_{50} = \left[\frac{0.0125(R_p^2)}{T_w}\right]\left[\frac{Q}{R_p^{2.5}}\right]^{1.333}$$

$$d_{50} = \left[\frac{0.0125(3')^2}{161.04}\right]\left[\frac{34.50}{3^{2.5}}\right]^{1.333}$$

$d_{50} = 0.002$ FT → Less than 0.42 FT
↳ Use Modified Rip Rap

$C = 3S_p + 6F = 3(3) + 6(1.5) = 18$ FT

$B = 2S_p + 6F = 2(3) + 6(1.5) = 15$ FT

$F = 0.5R_p$ (Type 1) $= 0.5(3) = 1.5$ FT

Note: Dimensions shown for sediment forebays meet or exceed minimum Requirements for Pre formed Scour holes.

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
Nashua, New Hampshire
Burlington, Massachusetts
www.hayner-swanson.com

JOB NO: _____ SHEET: _____ OF _____
PROJECT: _____
SUBJECT: _____
BY: _____ DATE: _____

EW 3

Bottom Forebay = 156'
Top Berm Forebay = 159'
$\Delta H = 3'$

$R_p = 3'$ (36" HDPE) $= S_p$

$Inv = 160.19$

$Q_{25} = 54.21$ (from Idd)

$Q_{full} = 55.94$ (from Idd) $T_w = 163.26$

Since Forebay depth $= 3' = R_p \Rightarrow$ Type '2' Scour Hole

$$d_{50} = \left[\frac{(0.0082)(R_p^2)}{T_w}\right]\left[\frac{Q}{R_p^{2.5}}\right]^{1.333}$$

$$d_{50} = \left[\frac{(0.0082)(3^2)}{163.26}\right]\left[\frac{54.21}{3^{2.5}}\right]^{1.333}$$

$= 0.0024$ FT → Less than 0.42 FT
↳ Use Modified RipRap

$C = 3S_p + 6F = 3(3) + 6(3) = 27$ FT

$B = 2S_p + 6F = 2(3) + 6(3) = 24$ FT

$F = R_p$ (Type 2) $= 3$ FT

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
Nashua, New Hampshire
Burlington, Massachusetts
www.hayner-swanson.com

JOB NO: _____ SHEET: _____ OF _____
PROJECT: _____
SUBJECT: _____
BY: _____ DATE: _____

EV 70

Bottom Forebay = 156'
Top Berm Forebay = 159'
$\Delta H = 3'$

R_p = 24" HDPE (2') = S_p

Inv = 160.25'

Q_{25} = 13.20 (from I00) T_w = 163.26

Since Forebay depth = 3' > R_p ⇒ Type '2' Scour Hole

$$d_{50} = \left[\frac{(0.0082)(R_p^2)}{T_w}\right]\left[\frac{Q}{R_p^{2.5}}\right]^{1.333}$$

$$d_{50} = \left[\frac{(.0082)(2^2)}{163.26}\right]\left[\frac{13.20}{2^{2.5}}\right]^{1.333}$$

= 0.008 FT → less than 0.42 FT
↳ Use modified Rip Rap

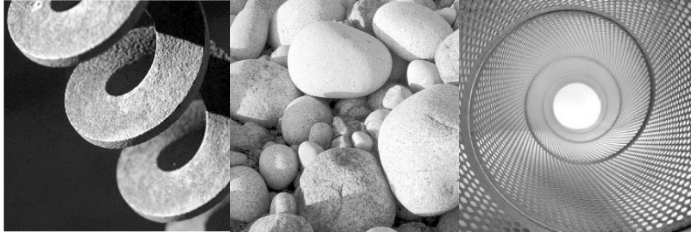
$C = 3S_p + 6F = 3(2) + 6(2) = 18$ FT

$B = 2S_p + 6F = 2(2) + 6(2) = 16$ FT

$F = R_p$ (Type 2) = 2 FT

APPENDIX F

GEOTECHNICAL ENGINEERING REPORT



GEI Consultants

Consulting
Engineers and
Scientists

Geotechnical Report

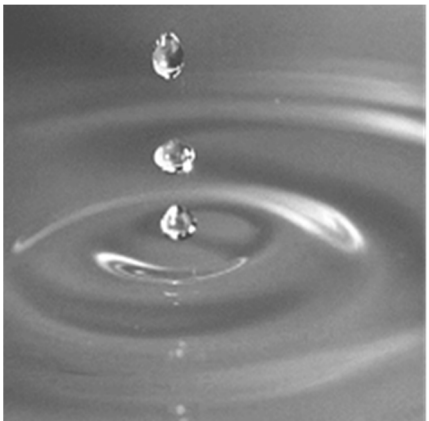
Industrial Development

113 North Maple Street
Enfield, Connecticut

Submitted to:
Winstanley Construction Management, LLC
300 George Street
New Haven, CT 06511

Submitted by:
GEI Consultants, Inc.
455 Winding Brook Drive, Suite 201
Glastonbury, CT 06033
860-368-5300

March 20, 2020
Project No. 2001141



Matthew Glunt, P.E.
Senior Geotechnical Engineer

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B Laboratory Test Results
C Infiltration Test Results
D Previous Geotechnical Investigation
E Shear Wave Velocity Testing Report
F Recommended Material Specifications

1. Introduction

1.1 Project Summary

We understand the proposed industrial development will consist of a 475,000-sf warehousing/distribution facility with appurtenant site features such as access roads, parking and outdoor storage areas, and storm water detention.

This report was prepared to address foundation and site preparation recommendations for the proposed development.

1.2 Scope of Services

Our scope of work included the following tasks:

- Reviewed site plans and building layout drawings.
- Engaged subcontractors to drill eighteen (18) borings to depths of 6 to 74 feet and excavate nine (9) test pits to depths of 8 to 9 feet.
- Observed soil samples recovered from the test borings, took groundwater level measurements, and prepared test boring logs.
- Observed soils removed from test pits, groundwater conditions, and prepared test pit logs.
- Conducted downhole infiltration testing within four (4) of the test pits.
- Engaged a testing laboratory to perform laboratory analyses on soil samples from the test borings.
- Developed recommendations for foundation design and construction.
- Prepared this *Geotechnical Report*.

1.3 Authorization

Our work was performed in general accordance with our proposal dated February 14, 2020.

1.4 Vertical Reference

Elevations referenced in this report and on the attached boring logs were estimated from the provided topographic survey, as referenced to NAVD 88 datum.

2. Site and Project Description

2.1 Site Description

The proposed development will encompass the 71.2-acre parcel, as bounded by North Maple Street to the east and Moody Road to the north.

The property slated for development is comprised predominantly of tilled agricultural land. Former residential and commercial properties and structures line the property along North Maple Street. The former Hawthorne's Agway near the southeast corner of the property still retains many of the former structures and appurtenances.

A topographic survey of the site conducted by Hayner/Swanson, Inc. (HSI) was provided to GEI. The property is generally level, sloping gently downward to the south and west. Current site grades range from approximate El. 176 along the eastern edge to El. 165 near the flagged wetland area just to the west of the site. From a brief review of available historical information, it does not appear that large grading operations (cuts and/or fills) have previously taken place on the property.

2.2 Proposed Construction

Preliminary site plans prepared by HSI were also provided to GEI. We understand the development is to consist of a 475,000-sf distribution facility split between two tenants with office space, truck and employee parking areas, loading docks, paved outdoor storage, and new entrances from North Maple Street and Moody Road. From the provided schematic design documents, we understand the building will be slab-on-grade with conventional shallow foundations, steel frame, and concrete tilt-up or precast panel walls. Storm water basins are shown on the west and southwest portions of the property.

A finished floor elevation of 173.5 ft. is shown on one of the provided site plans, though we understand this is subject to change. This will necessitate minor cuts along the east to northeast part of the development and fills of up to about 7 feet on the southwest corner.

3. Exploration Procedures

3.1 Test Borings

The boring locations were laid out on the site from the provided site plan using approximate measurements and a GPS-locator with horizontal accuracy on the order of 5 to 10 feet. Approximate boring locations relative to the site plan are shown on Figure 1.

Eighteen (18) soil test borings were conducted at the site between March 2 and March 5, 2020, by Seaboard Drilling, under subcontract to GEI, with a track-mounted drilling rig. The appropriate one-call utility locate service (CBYD) was contacted prior to our arrival. The borings were generally advanced to depths of 6 feet in the parking areas, 17 feet in the detention pond areas, and 22 feet in the building footprints, utilizing hollow-stem augering techniques. One boring (B-9) in the building footprint was advanced to sampler refusal at approximately 74 feet to assess the deeper portion of the soil profile. Soil test boring logs are attached in Appendix A.

Standard Penetration Testing (SPT) and split-spoon sampling was performed continuously through the upper 8 feet of the borings and at 5-foot intervals thereafter using an automatic 140-lb. hammer. Representative samples of the soils obtained by the sampler were classified by the on-site GEI engineer. The samples were placed in appropriately identified sealed glass jars and transported to our office for storage and laboratory assignment.

3.2 Test Pits

Nine (9) test pits were dug at the site on March 9, 2020, using an excavator to depths of about 8 to 9 feet each. These test pits were logged and photographed by a representative of GEI.

Test pit logs are attached in Appendix A.

3.3 In-place Permeability Testing

In-situ hydraulic conductivity was measured using a Guelph-model permeameter within four (4) of the test pits, located within the property as shown on Fig 1. Constant-head test procedures generally followed ASTM D5126 and manufacturer recommendations.

Estimations of in-place permeability from the test measurements are provided in Appendix C.

3.4 Previous Geotechnical Investigations

A geotechnical investigation was undertaken by others in March 2017 in support of a previous phase of this development. This work included six (6) test borings and one (1) temporary monitoring well within the current site development boundaries. This data is provided for reference in Appendix D.

3.5 Laboratory Testing

Laboratory testing was conducted on representative soil samples to confirm field identification of the soils and establish engineering characteristics for design. Tests performed by GeoTesting Express, under subcontract to GEI, included the following:

- Four (4) grain-size analyses with standard sieve set (ASTM D422)
- Four (4) natural moisture content (ASTM D2974)

Additional tests were conducted on materials recovered from the topsoil stratum, as follows:

- Three (3) percent organic matter (ASTM D2974)
- Three (3) grain-size analyses (ASTM D422)

Results of the laboratory testing program are attached in Appendix B. Laboratory testing results from previous investigations on the property are also provided in Appendix D.

4. Subsurface Conditions

4.1 Geologic Setting

The site lies near the eastern extent of the Connecticut River valley, underlain by stacked deposits of sand, silt, and basal sand and gravel. These deposits overlie a thin layer of glacial till and sandstone (Arkose) bedrock.

4.2 Subsurface Conditions

The generalized subsurface conditions at the site are described below, in order of increasing depth. The subsurface conditions between boring locations may differ. The nature and extent of variations between the sampling points will not become evident until construction.

Topsoil – Topsoil thickness in the cultivated areas, as measured in our borings and test pits, generally varied between 11 and 18 inches. These soils can be further characterized as a fibrous "rootmat" about 3 to 4 inches thick over tilled organic loamy sands. The tilled lower portion was characterized by laboratory testing as 1.9 to 3.0 percent organic by weight and containing between 23.7 and 46.7 percent silty fines.

Topsoil thickness in other, non-tillled portions of the site was measured as approximately 6 inches.

Test pit TP-4 near the low-lying wetland area encountered about 3 feet of dark brown to black organic soil with frequent roots.

It should be noted that the topsoil thickness will vary across the site. Organic soils are often plowed into naturally-occurring low areas to level agricultural fields. The thicker zones of organic soils, where they exist, will be difficult to discern until the upper topsoil layer is stripped.

Native Sand – Thick, stratified deposits of glacial outwash sands were encountered to termination depth of most borings. These soils typically varied with depth from orange-brown silty/loamy sand with about 10 to 15 percent fines near the surface to uniform sands with about 5 to 10 percent silty fines at depth. A seam of orange-gray silty sand with up to about 25 percent silty fines was commonly encountered at depths of about 6 feet to 15 feet. Sample observations indicate that this seam may act as somewhat of a restrictive layer for downward percolation of surface water.

Standard Penetration Test (SPT) N-values in the near-surface sands typically ranged from 4 to 8 blows/foot, indicating loose conditions, increasing to generally between 11 and 30 blows/foot at depth, indicating medium-dense conditions, with isolated zones of loose and dense conditions.

Glacial Till – Gravelly silts transitioning to dense glacial till soils were encountered at a depth of 64 feet in boring B-9. These soils were sampled as reddish-brown, gravelly silt to silty sand in a tight matrix. SPT N-values varied from 22 to 36 blows/foot, indicating medium-dense to dense conditions, before encountering sampler refusal at 74.3 feet. Similar glacial till soils were encountered at depths of 49 feet to 73 feet during the previous investigation.

4.3 Groundwater Conditions

Groundwater encountered during the investigations was mostly in the south to southwest portion of the site, with the shallowest readings adjacent to the wetland area (6.6 to 8.0 feet below grade), progressively deeper at locations emanating away to the south and west. The temporary monitoring well installed by others near the north stormwater basin was dry to a depth of 35 feet. However, at this location and at several others, damp to wet soils were encountered well above the free groundwater table. Temporary perched water conditions should be expected near the seam of orange-gray silty sand noted at depth within the borings.

Groundwater levels are subject to seasonal and weather-related variations. Groundwater measurements made at different times and different locations may be significantly different than the measurements taken as part of this investigation.

5. Design Recommendations

5.1 Foundation Design

The proposed structure may be supported on shallow foundations bearing on a subgrade consisting of native sands or compacted structural fill. We recommend that all footing subgrades be evaluated by a GEI representative prior to concrete placement.

The maximum allowable bearing pressures for the design of footings are:

Table 1: Allowable Bearing Pressure

Bearing Stratum	Net Allowable Bearing Pressure
Structural Fill or Native Sands	3,000 lb/ft^2

Minimum individual column footing and wall footing widths should be at least 36 and 18 inches, respectively. Exterior footings should bear at least 3½ feet below the adjacent exterior grade for frost protection. Interior footings should be founded at least 18 inches below the bottom of the floor slab. The tops of all footings should be at least 6 inches below the bottom of the overlying floor slab.

5.2 Floor Slab Design

The floor slab should bear on a minimum 6-inch thick layer of compacted crushed stone placed over a soil subgrade prepared in accordance with Section 6.1.

For design of slab-on-grade floors with an 6-inch crushed stone base, a modulus of subgrade reaction of 200 pounds per cubic inch (pci) is recommended for design. We recommend that contraction joints be incorporated between the slab-on-grade and the columns and perimeter walls of the proposed building to accommodate minor differential settlements.

To limit moisture infiltration into finished spaces, a 10-mil (min.) polyethylene vapor barrier should be placed beneath all moisture sensitive floor slabs. The vapor barrier should be sealed at the foundation walls, columns, and utility penetrations, and panels should be overlapped and joints sealed.

5.3 Settlement

5.3.1 Areal Load

We understand that up to 7 feet of fill will be placed to raise the building pad above current grade. With this volume of fill, some settlement of the underlying soils and within the fill itself can be expected. These settlements will concentrate in the upper sands and should be nearly complete by the time the building pad is topped out. Any time-dependent settlements that occur in the lower clays after the building pad is raised should be minor and not affect future performance of the facility.

5.3.2 Building Load

Assuming a maximum column load of approximately 300 kips, we estimate additional settlement due to building loads will be up to 1 inch, and differential settlement across similarly loaded bays will be ½ inch or less. Most settlements due to column loads will concentrate in the structural fill and upper sands and should occur during construction or soon after load placement. Settlement of exterior footings are expected to be of the same order as the interior column footings.

5.4 Seismic Design

5.4.1 Geophysical Seismic Field Testing

In March 2017, Hager-Richter Geoscience was retained by others to perform geophysical seismic field testing on the property.

Surface-based shear wave velocity measurements were collected using Multi-Channel Analysis of Surface Waves (MASW) method arrays. The MASW method measures the travel times of ambient (passive) vibrations to geophones mounted on the ground surface at incremental distances along an array. Shear wave velocity measurements were collected using the MASW method along four (4) profile lines on the site, as depicted in the report produced by Hager-Richter attached in Appendix E.

The weighted-average shear wave velocities within the upper 100 feet of the subsurface profile, $\bar{v}_{s100}$, at the locations tested were 1,056 and 1,534 feet per second.

5.4.2 Building Code Seismic Provisions

The 2018 edition of the Connecticut Building Code document mirrors the 2015 International Building Code, with exception of the revisions and supplemental information provided by state building officials.

The average shear wave velocities, $\bar{v}_{s100}$, measured at the site are consistent with **Site Class D** (Stiff Soil Profile), which is defined as a site with weighted-average $\bar{v}_s$ values between 600 and 1,200 feet/sec.

Soil conditions associated with Site Class E and Site Class F, including thick deposits of very soft, highly plastic, and/or highly organic clays, are not evident at the site. The soils below the foundation level at this site are not considered susceptible to liquefaction. Corresponding spectral response design parameters are as follows:

Table 2: Seismic Design Values

2018 Connecticut Building Code	
Site Class	D
S_S	0.175 g
S_1	0.065 g
S_{DS}	0.187 g
S_{D1}	0.103 g
PGA_M	0.137 g
Seismic Design Category	B

We calculated the spectral response parameters for the Site using general procedures outlined in Building Code Section 1613.3. Peak ground acceleration (PGA_M) is adjusted for Site Class effects, per ASCE 7-10 Section 11.8.3.

For a structure having a seismic use group classification of I, II, or III, both the S_{DS} and S_{D1} values obtained are consistent with **Seismic Design Category B** as defined in Section 1613.3.5 of the Connecticut Building Code.

5.5 Lateral Earth Pressures

Any earth retaining structures used on the project should be designed using the earth pressures shown in Table 3. Note that no factor of safety has not been applied to these values.

Below-grade walls that are restrained from movement by an upper level floor should be designed for at-rest earth pressures. Retaining walls free to rotate at the top should be designed for active earth pressures. We recommend that proposed loading docks be designed for active earth pressures. In addition to the lateral loads exerted by the soil against the walls, allowance should be included for lateral stresses imposed by any temporary or long-term surcharge loads, such as cars or trucks adjacent to the walls or adjacent footing loads.

Table 3: Wall Design Parameters

Parameter	Value
Total Unit Weight of Granular Backfill (γ)	120 pcf
Angle of Internal Friction (Φ)	34º
Cohesion (c)	0 psf
At-Rest Earth Pressure Coefficient, (K_o)	0.44
Active Earth Pressure Coefficient, (K_a)	0.28
Passive Earth Pressure Coefficient, (K_p)	3.00
Allowable coefficient of friction between rough concrete footing and granular bearing soil	0.50

We recommend limiting the passive pressure coefficient to 3.0 as shown above, due to the relatively high movement required to fully engage passive resistance. The minimum factors of safety for sliding and overturning under static loads should be 1.5 and 2.0, respectively.

The recommended wall design parameters do not consider the development of hydrostatic pressure behind the walls. As such, positive wall drainage must be provided for all earth retaining structures. These drainage systems can be constructed of open-graded washed stone isolated from the soil backfill with a geosynthetic filter fabric and drained by perforated pipe, or several wall drainage products made specifically for this application. Where backfill soils are not drained using an appropriately designed drainage system, the lateral soil pressure on proposed retaining walls must consider hydrostatic forces and submerged soil unit weight.

The earth pressures given in Table 3 assume placement and compaction of the backfill in accordance with recommendations elsewhere in this report. Compact backfill directly behind walls with light, hand-operated compactors. Heavy compactors and grading equipment should not be allowed to operate within 10 feet of the walls during backfilling to avoid developing excessive temporary or long-term lateral soil pressures.

5.6 Pavement Design

Soils similar to the native sands at the site, as well as any new structural fill, are generally considered to be well-suited to support of pavements, assuming the subgrade is prepared as recommended in this report.

The current site layout provided to GEI shows potential truck entrances from both Moody Road and North Maple Street. For areas subject to repeated, heavy traffic loads, we

recommend a heavy-duty asphaltic pavement or rigid concrete section. Areas such as employee parking areas that heavy trucks will not travel on may be designed as a light-duty asphaltic pavement. We recommend the following pavement sections for these areas:

Heavy-Duty Asphaltic Section
4.0 inches of bituminous concrete
- 1.5 inches wearing course (CTDOT M.04.03 Class 2 or Superpave HMA S0.5)
- 2.5 inches binder course (CTDOT M.04.03 Class 1 or Superpave HMA S1.0)

12 inches of processed aggregate base (CTDOT Form 817 M05.01)

Light-Duty Parking Area
3.0 inches bituminous concrete
- 1.5 inches wearing course (CTDOT M.04.03 Class 2 or Superpave HMA S0.5)
- 1.5 inches binder course (CTDOT M.04.03 Class 1 or Superpave HMA S1.0)

8 inches of processed aggregate base (CTDOT Form 817 M05.01)

Heavy-Duty Rigid Concrete Section
8 inches of 4,000-psi jointed concrete (CTDOT M.03.01 Portland Cement)
8 inches of processed aggregate base (CTDOT Form 817 M05.01)

Recommended pavement sections are based on AASHTO Guide for Design of Pavement Structures (1993) and ACI 330R. Pavement materials should conform with and be placed in accordance with the *Connecticut Department of Transportation (CTDOT) Standard Specifications for Road, Bridges, and Incidental Construction (Form 817), 2017.*

Rigid pavement sections should be designed and constructed in accordance with appropriate American Concrete Institute (ACI) recommendations and with the applicable specifications of the CTDOT Standard Specifications. An adequate number of smooth steel dowels should be provided at all expansion and contraction joints. All dowels should be coated and lubricated and affixed with metal or plastic caps. The size and spacing of dowels should conform to recommendations in ACI 330R. All joints should also be sealed with a flexible fuel resistant sealer to minimize surface water infiltration into the prepared base.

According to AASHTO design guidelines, the recommended pavement sections shown above are suitable for a 20-year design life. However, pavement maintenance such as sealing of cracks and localized patching due to normal weathering should be expected within the first 5 to 10 years of life.

5.7 Subsurface Drainage Design

Current site plans show storm water basins to the northwest and southwest of the facility. Based on the results of the borings and test pits, these stormwater features will be founded in moderately to highly permeable native sands, though the south basin will likely be founded in close proximity to the groundwater table, as measured at approximately 6.6 to 7.0 feet below current grade. The investigation program included in-place permeability testing within four test pits, the results of which are included in Appendix C.

From our review of the field and laboratory data, and our local experience with similar soils, we recommend assuming design infiltration rates as follows:

- **20.0 inches/hour** may be assumed for design of the north infiltration basin.
- **4.0 inches/hour** may be assumed for design of the south detention basin.
- Per CT DEEP regulations, a factor of safety of 2.0 should be applied to these values for storm water calculations.

5.8 Site Slopes

The project will include fill slopes on the periphery of the site and within the stormwater basins. We recommend that all cut and fill slopes on the project be constructed at grades no steeper than 2H:1V. Suitable erosion protection should be established as quickly as possible following construction of slopes.

6. Construction Considerations

6.1 Subgrade Preparation

6.1.1 General

Site preparation should include the removal of all unsuitable surface materials within the building and new pavement footprints. This should include surface vegetation, organic-laden topsoil (further details below), and any otherwise unstable surface or subsurface soils. All remaining structures on the property should be removed in their entirety and removed from the site in accordance with all regulatory requirements. Any foundation remnants from the former residence should be removed and the entire footprint backfilled to grade with Structural Fill. Alternatively, the foundation walls, if still in place, can be cut to at least 2 feet below the bottom of pavement subgrade elevation and left in place.

Although our investigations have not revealed such, we caution that there is potential for buried debris to be also present under the site.

Particular attention should be paid to development of the low-lying areas adjacent to the flagged wetlands. Soft, organic soils and sediments are often encountered in these areas that require removal prior to the start of fill placement. In particular, test pit TP-4 encountered about 3 feet of organic material that will require removal and replacement with Structural Fill under the proposed parking area. If necessary, Crushed Stone underlain by geotextile fabric or an 18-inch bridge lift of on-site fill may be used to facilitate subsequent filling of this area with Structural Fill.

6.1.2 Topsoil Management

The distribution and character of topsoil on the property is discussed in detail in Section 4.2. The upper fibrous “rootmat” within the topsoil stratum is not suitable for re-use. For cut/fill quantity estimates, we recommend assuming the upper 6 inches in cultivated areas and 12 inches in wooded areas must be stripped and not re-used elsewhere. Additional stripping thickness may be required in the wooded areas to completely remove root bulbs and deep roots greater than approximately 1 inch in diameter.

Subject to its performance during grading operations, our data indicates that the slightly organic, cultivated sandy soil below the upper 6 inches is likely suitable to be re-used elsewhere on the site, subject to the following conditions:

1. Our pavement recommendations assumed that well-drained native sands would effectively serve as a subbase for the pavement section (concrete and processed

aggregate base). The cultivated soil does not meet this criteria, as it contains elevated silt fines content. The use of cultivated soil as fill, either as-is or mixed, should be limited to at least 2 feet below pavement subgrades and 3 feet below floor slab subgrade.

2. Cultivated soils excavated from cut areas should either be used only as a base layer for deep fill areas or be mixed with native sands to form a composite Structural Fill. Note this material will likely be more difficult to work with during unfavorable weather patterns.
3. All soils remaining in place or re-used as fill should have a maximum organic content of 5.0 percent.

If this option is pursued, re-use of cultivated soil in structural areas will require close coordination with GEI to ensure that these materials are handled and prepared properly. As the work gets underway and surface conditions are better defined, we should also be engaged to review the above recommendations and possibly suggest modifications to better fit the conditions.

6.1.3 Grade Slabs and Pavements

Following the required stripping, excavation to rough grade, and before placing new fill to achieve design grades, the resulting subgrade should be firm, stable, and unyielding. Stabilization, where required, may consist of removing unsuitable material and replacement with compacted structural fill, or where unsuitable soils are relatively thin, drying and compacting in place.

Soil subgrades should be proof-rolled with at least four (4) passes of a minimum 10-ton vibratory roller in open areas, or a 1-ton vibratory roller or large plate compactor, such as Wacker DPU4545 or equivalent, in trenches. Proof-rolling in close proximity to groundwater, if encountered, may need to be accomplished without vibratory action to reduce the potential for disturbance to the subgrade.

In cut areas where the proof-rolled subgrade will directly support the grade slab or pavements, compaction should continue until the soil density 8 inches below the subgrade is at least 95 percent of the maximum dry density per ASTM D-1557.

6.1.4 Foundations

Footings should bear on a subgrade consisting of native sands or compacted structural fill. Bearing surfaces should be free of standing water, frost, and loose soil before placement of reinforcing steel and concrete.

We recommend that a GEI representative observe the final preparation of all subgrades prior to footing construction. Subgrade soils that require undercutting should be replaced with either compacted structural fill or crushed stone.

6.2 Excavation and Dewatering

Excavations can be accomplished with conventional earthmoving equipment. Excavations should be sloped or shored in accordance with the local, state, and federal regulations, including Occupational Safety and Health Agency (OSHA 29 CFR Part 1926) excavation trench safety standards.

At most locations, groundwater is relatively deep at the site and is not likely to impact grading operations. That said, site relief is very low, and maintaining proper site drainage during initial grading may become very difficult unless measures to control surface water are put in place before grading starts and maintained throughout. If required, particularly near the western low-lying wetland areas, we anticipate that dewatering can be accomplished with filtered sumps and pumps.

6.3 Freezing Conditions

The native sands and sands with gravel that will form the subgrades for grade slabs, footings, and pavements soils can be expected to have a low to moderate susceptibility to frost, depending on the proportion of silty fine material. Accordingly, we do not believe that special measures beyond the design and construction recommendations provided herein are required to guard against potential frost heave of subgrade soils.

That said, we recommend certain precautions for cold-weather earthwork. All subgrades should be free of frost before placement of concrete. Frost-susceptible soils that have frozen should be removed and replaced with compacted Structural Fill. The footing and the soil adjacent to the footing should be insulated until they are backfilled. Soil placed as fill should be free of frost, as should the ground on which it is placed.

If slabs-on-grade or footings are built and left exposed during the winter, precautions should be taken to prevent freezing of the underlying soil.

6.4 Backfilling and Compaction

Recommended specifications for gradation and compaction of backfill soils are provided in the attached recommended Material Specifications. We understand fill for the low areas of the site will be mined from on-site sources wherever possible.

Based on the boring results, suitable granular fill can be obtained from within the proposed stormwater basins and cut areas of the site. Native sands excavated from these areas can be re-used as Structural Fill or Ordinary Fill, provided they can meet the appropriate compaction requirements and do not contain deleterious materials.

Soils to be used as fill imported from off-site should also meet the attached gradation requirements. Fill placed within the building limits, within a 3-foot wide zone outside foundation walls, and under all pavements, slabs, and the outdoor storage area should meet the compaction requirements for Structural Fill. Backfill placed in areas that will not support structural or paved elements should meet the compaction requirements for Ordinary Fill. Proposed borrow materials that fall slightly outside of these specifications may also be suitable for use, subject to review and approval by GEI.

7. Closure

7.1 Follow-on Services

We recommend that GEI be kept on the project through the construction-phase for the following services:

- Review geotechnical-related contractor submittals and assist in developing responses to questions from the contractor (i.e. RFI's).
- Provide periodic site visits during construction to view subgrades and consult on geotechnical-related issues that occur.

7.2 Limitations

This report was prepared for the use of the project team, exclusively. Our recommendations are based on the project information provided to us at the time of this report and may require modification if there are any changes in the nature, design, or location of the proposed building. We cannot accept responsibility for designs based on our recommendations unless we are engaged to review the final plans and specifications to determine whether any changes in the project affect the validity of our recommendations, and whether our recommendations have been properly implemented in the design.

Our professional services for this project have been performed in accordance with generally accepted engineering practices. No warranty, expressed or implied, is made.

Figures

SOURCE:
1. CONCEPT PLAN PROVIDED BY HSI.

0 160 320
SCALE, FEET

Geotechnical Investigation
North Maple Street
Enfield, Connecticut

Wistanley Enterprises

GEI Consultants

BORING LOCATION PLAN

Project 20001141 | March 2020 | Fig. 2

\\gtb1v-fs01\gis\Projects\Winstanley\Enfield\BoringPlan.mxd

Appendix A

Boring and Test Pit Logs

BORING INFORMATION

LOCATION: See Plan.

GROUND SURFACE EL. (ft): 175 **DATE START/END:** 3/3/2020 - 3/3/2020

VERTICAL DATUM: **DRILLING COMPANY:** Seaboard Drilling, Inc.

TOTAL DEPTH (ft): 6.0 **DRILLER NAME:** Jeff Nitsch

LOGGED BY: Bosede Akereyeni **RIG TYPE:** Diedrich D-50 ATV

BORING B1

DRILLING INFORMATION

HAMMER TYPE: Automatic **CASING I.D./O.D.:** NA/ NA **CORE BARREL TYPE:** N/A

AUGER I.D./O.D.: 4.25 inch / 8.0125 inch **DRILL ROD O.D.:** NM **CORE BARREL I.D./O.D.** NA / NA

DRILLING METHOD: Hollow Stem Auger

WATER LEVEL DEPTHS (ft): Not encountered

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation
= Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 2	24/15	2-2-2-3		NATIVE SAND	12" TOPSOIL. S1: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, dark brown to brown, moist.
		S2	2 to 4	24/16	2-2-5-5			S2: Similar to S1, gray-brown, moist.
170	5	S3	4 to 6	24/16	7-6-8-8			S3A (0-7"): NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, gray-brown, moist. S3B (7-16"): NARROWLY GRADED SAND (SP); ~95% fine sand,~5% nonplastic fines, gray, moist.
								Planned Extent. Backfilled with drill cuttings.
	10							
160	15							
	20							

NOTES:

PROJECT NAME: 113 North Maple Street

CITY/STATE: Enfield, Connecticut

GEI PROJECT NUMBER: 2001141

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME NORTH MAPLE STREET.GPJ GEI DATA TEMPLATE 2013.GDT 3/20/20

BORING INFORMATION

LOCATION: See Plan.

GROUND SURFACE EL. (ft): 173.5 **DATE START/END:** 3/3/2020 - 3/3/2020

VERTICAL DATUM: **DRILLING COMPANY:** Seaboard Drilling, Inc.

TOTAL DEPTH (ft): 22.0 **DRILLER NAME:** Jeff Nitsch

LOGGED BY: Bosede Akereyeni **RIG TYPE:** Diedrich D-50 ATV

BORING B2

DRILLING INFORMATION

HAMMER TYPE: Automatic **CASING I.D./O.D.:** NA/ NA **CORE BARREL TYPE:** N/A

AUGER I.D./O.D.: 4.25 inch / 8.0125 inch **DRILL ROD O.D.:** NM **CORE BARREL I.D./O.D.** NA / NA

DRILLING METHOD: Hollow Stem Auger

WATER LEVEL DEPTHS (ft): Not encountered

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation
= Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 2	24/21	1-2-2-2		NATIVE SAND	12" TOPSOIL. S1: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, dark brown to light brown, moist
		S2	2 to 4	24/16	3-5-6-8			S2: NARROWLY GRADED SAND (SP); ~95% fine sand, ~5% nonplastic fines, light brown to gray-brown, moist.
170	5	S3	4 to 6	24/18	9-12-13-12			S3: WIDELY GRADED SAND WITH GRAVEL (SW); ~80% fine to coarse sand, ~15% fine to medium gravel, ~5% nonplastic fines, gray-brown to orange-brown, moist.
		S4	6 to 8	24/15	10-13-13-18			S4: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, gray-brown, moist. Finer with depth.
	10	S5	10 to 12	24/20	7-9-11-12			S5A(0-7"): NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, gray-orange, moist. Seams of brown low plasticity fines. S5B (7-20"): NARROWLY GRADED SAND (SP); ~95% fine sand, ~5% nonplastic fines, gray,moist.
160	15	S6	15 to 17	24/20	15-13-12-15			S6: SILTY SAND (SM); ~85% fine sand, ~15% nonplastic fines, gray, moist, orange striations.
	20	S7	20 to 22	24/20	18-24-23-26			S7: Similar to S6. Finer with depth, no striations.
150								Planned Extent. Backfilled with drill cuttings.

NOTES:

PROJECT NAME: 113 North Maple Street

CITY/STATE: Enfield, Connecticut

GEI PROJECT NUMBER: 2001141

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME NORTH MAPLE STREET.GPJ GEI DATA TEMPLATE 2013.GDT 3/20/20

BORING INFORMATION

LOCATION: See Plan.
GROUND SURFACE EL. (ft): 174
VERTICAL DATUM:
TOTAL DEPTH (ft): 22.0
LOGGED BY: Bosede Akereyeni
DATE START/END: 3/3/2020 - 3/3/2020
DRILLING COMPANY: Seaboard Drilling, Inc.
DRILLER NAME: Jeff Nitsch
RIG TYPE: Diedrich D-50 ATV

BORING B3

DRILLING INFORMATION

HAMMER TYPE: Automatic
AUGER I.D./O.D.: 4.25 inch / 8.0125 inch
DRILLING METHOD: Hollow Stem Auger
WATER LEVEL DEPTHS (ft): Not encountered
CASING I.D./O.D.: NA/ NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: N/A
CORE BARREL I.D./O.D. NA / NA

ABBREVIATIONS:
Pen. = Penetration Length
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RQD = Rock Quality Designation
= Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 2	24/20	2-3-3-4		NATIVE SAND	14" TOPSOIL. S1: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, dark brown to light brown, moist.
		S2	2 to 4	24/19	4-4-6-5			S2: Similar to S1, gray-brown, moist, contains striations.
170	5	S3	4 to 6	24/15	5-7-6-8			S3: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, gray to gray-orange, moist, with striations.
		S4	6 to 8	24/16	6-8-11-13			S4: Similar to S3.
	10	S5	10 to 12	24/19	5-8-9-10			S5: SILTY SAND (SM); ~85% fine sand, ~15% nonplastic fines, gray-orange, moist, thin seams of brown silt in bottom 4".
160	15	S6	15 to 17	24/20	9-10-11-10			S6: SILTY SAND (SM); ~85% fine sand, ~15% nonplastic fines, gray-orange, moist, with thin seams of brown silt in bottom 4".
	20	S7	20 to 22	24/20	6-6-7-8			S7: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, gray to gray-orange, moist.
								Planned Extent. Backfilled with drill cuttings.

NOTES:

PROJECT NAME: 113 North Maple Street
CITY/STATE: Enfield, Connecticut
GEI PROJECT NUMBER: 2001141

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME NORTH MAPLE STREET.GPJ GEI DATA TEMPLATE 2013.GDT 3/20/20

BORING INFORMATION

LOCATION: See Plan.
GROUND SURFACE EL. (ft): 172
VERTICAL DATUM:
TOTAL DEPTH (ft): 22.0
LOGGED BY: Bosede Akereyeni
DATE START/END: 3/3/2020 - 3/3/2020
DRILLING COMPANY: Seaboard Drilling, Inc.
DRILLER NAME: Jeff Nitsch
RIG TYPE: Diedrich D-50 ATV

BORING B4

DRILLING INFORMATION

HAMMER TYPE: Automatic
AUGER I.D./O.D.: 4.25 inch / 8.0125 inch
DRILLING METHOD: Hollow Stem Auger
WATER LEVEL DEPTHS (ft): Not encountered
CASING I.D./O.D.: NA/ NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: N/A
CORE BARREL I.D./O.D. NA / NA

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation
= Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
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Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 2	24/20	2-2-2-3		NATIVE SAND	12" TOPSOIL. S1: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, dark brown to brown, moist.
170		S2	2 to 4	24/17	3-3-3-5			S2: Similar to S1, gray to gray-orange, moist.
	5	S3	4 to 6	24/15	3-6-8-9			S3: NARROWLY GRADED SAND (SP); ~95% fine sand, ~5% nonplastic fines, orange to light brown, moist.
		S4	6 to 8	24/15	8-11-13-13			S4: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, gray, moist, with thin silt seam.
	10	S5	10 to 12	24/18	5-6-7-8			S5: Similar to S4, gray-brown, orange striations, thin silt seams, moist.
160								
	15	S6	15 to 17	24/21	5-7-6-7			S6: Similar to S4, gray-brown, moist, orange striations.
	20	S7	20 to 22	24/20	9-9-9-10			S7: SILTY SAND (SM); ~85% fine sand, ~15% low plasticity fines, gray-brown, moist, with thin seams of reddish-brown silt.
150								Planned Extent. Backfilled with drill cuttings.

NOTES:

PROJECT NAME: 113 North Maple Street
CITY/STATE: Enfield, Connecticut
GEI PROJECT NUMBER: 2001141

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME NORTH MAPLE STREET.GPJ GEI DATA TEMPLATE 2013.GDT 3/20/20

BORING INFORMATION

LOCATION: See Plan.

GROUND SURFACE EL. (ft): 172 **DATE START/END:** 3/3/2020 - 3/3/2020

VERTICAL DATUM: **DRILLING COMPANY:** Seaboard Drilling, Inc.

TOTAL DEPTH (ft): 22.0 **DRILLER NAME:** Jeff Nitsch

LOGGED BY: Bosede Akereyeni **RIG TYPE:** Diedrich D-50 ATV

BORING B5

DRILLING INFORMATION

HAMMER TYPE: Automatic **CASING I.D./O.D.:** NA/ NA **CORE BARREL TYPE:** N/A

AUGER I.D./O.D.: 4.25 inch / 8.0125 inch **DRILL ROD O.D.:** NM **CORE BARREL I.D./O.D.** NA / NA

DRILLING METHOD: Hollow Stem Auger

WATER LEVEL DEPTHS (ft): Not encountered

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation
= Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
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LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 2	24/17	1-3-6-4		NATIVE SAND	14" TOPSOIL. S1: SILTY SAND (SM); ~85% fine sand, ~15% nonplastic fines, dark brown to brown, moist.
170		S2	2 to 4	24/14	4-4-5-4			S2: TOP 7": Similar to S1. Bot 7": NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, light brown, moist.
	5	S3	4 to 6	24/17	3-3-7-11			S3: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, gray to gray-orange, moist. Coarsening with depth.
		S4	6 to 8	24/17	14-16-17-18			S4A(0-8"): WIDELY GRADED SAND (SW); ~85% fine to coarse sand, ~10% fine to coarse gravel up to 1", ~5% nonplastic fines, orange, dry to moist. . S4B(8-17"): Similar to S3.
	10	S5	10 to 12	24/18	7-10-11-13			S5: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand ~10% nonplastic fines, gray, moist, with orange striations.
160								
	15	S6	15 to 17	24/17	9-17-19-19			S6: SILTY SAND (SM); ~85% fine sand, ~15% nonplastic fines, gray, moist.
	20	S7	20 to 22	24/20	6-10-8-12			S7: Similar to S6, with thin seams of brown silt.
150								Planned Extent. Backfilled with drill cuttings.

NOTES:

PROJECT NAME: 113 North Maple Street

CITY/STATE: Enfield, Connecticut

GEI PROJECT NUMBER: 2001141

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME NORTH MAPLE STREET.GPJ GEI DATA TEMPLATE 2013.GDT 3/20/20

BORING INFORMATION

LOCATION: See Plan.

GROUND SURFACE EL. (ft): 169 **DATE START/END:** 3/3/2020 - 3/3/2020

VERTICAL DATUM: **DRILLING COMPANY:** Seaboard Drilling, Inc.

TOTAL DEPTH (ft): 17.0 **DRILLER NAME:** Jeff Nitsch

LOGGED BY: Bosede Akereyeni **RIG TYPE:** Diedrich D-50 ATV

BORING B6

DRILLING INFORMATION

HAMMER TYPE: Automatic **CASING I.D./O.D.:** NA/ NA **CORE BARREL TYPE:** N/A

AUGER I.D./O.D.: 4.25 inch / 8.0125 inch **DRILL ROD O.D.:** NM **CORE BARREL I.D./O.D.** NA / NA

DRILLING METHOD: Hollow Stem Auger

WATER LEVEL DEPTHS (ft): Not encountered

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation
= Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 2	24/19	2-3-4-2		NATIVE SAND	13" TOPSOIL. S1: NARROWLY GRADED SAND WITH SILT (SP-SM); ~80% fine sand, ~10% nonplastic fines, ~10% fine gravel, light brown, moist.
		S2	2 to 4	24/20	2-3-1-1			S2A(0-9"): SILTY SAND (SM); ~85% fine sand, ~15% nonplastic fines, yellowish brown, moist. S2B (9-20") SILTY SAND (SM); 76.1% fine to medium sand, 23.9% nonplastic fines, gray-brown, moist.
	5	S3	4 to 6	24/19	3-4-6-7			S3: NARROWLY GRADED SAND WITH SILT (SP-SM); ~80% fines sand, ~10% nonplastic fines, ~10% fine to medium gravel, gray and orange, moist.
		S4	6 to 8	24/21	7-8-10-11			S4: SILTY SAND (SM); 53.5% fine sand, 46.5% nonplastic fines, gray and orange, moist.
160								
	10	S5	10 to 12	24/21	10-10-15-20			S5: SILTY SAND (SM); ~75% fine sand, ~25% nonplastic fines, gray and orange, moist.
	15	S6	15 to 17	24/20	13-17-18-18			S6: Similar to S5
150								Planned Extent. Backfilled with drill cuttings.
	20							

NOTES:

PROJECT NAME: 113 North Maple Street

CITY/STATE: Enfield, Connecticut

GEI PROJECT NUMBER: 2001141

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME NORTH MAPLE STREET.GPJ GEI DATA TEMPLATE 2013.GDT 3/20/20

BORING INFORMATION

LOCATION: See Plan.

GROUND SURFACE EL. (ft): 169 **DATE START/END:** 3/2/2020 - 3/2/2020

VERTICAL DATUM: **DRILLING COMPANY:** Seaboard Drilling, Inc.

TOTAL DEPTH (ft): 6.0 **DRILLER NAME:** Jeff Nitsch

LOGGED BY: Bosede Akereyeni **RIG TYPE:** Diedrich D-50 ATV

BORING

B7

DRILLING INFORMATION

HAMMER TYPE: Automatic **CASING I.D./O.D.:** NA/ NA **CORE BARREL TYPE:** N/A

AUGER I.D./O.D.: 4.25 inch / 8.0125 inch **DRILL ROD O.D.:** NM **CORE BARREL I.D./O.D.** NA / NA

DRILLING METHOD: Hollow Stem Auger

WATER LEVEL DEPTHS (ft): Not encountered

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation
= Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 2	24/18	2-3-2-3		NATIVE SAND	13" TOPSOIL. S1: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, dark brown to gray, moist.
		S2	2 to 4	24/14	1-1-3-5			S2: NARROWLY GRADED SAND (SP); ~95% fine sand, ~5% nonplastic fines, gray-brown with orange, moist.
	5	S3	4 to 6	24/18	6-9-9-9			S3: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, gray-brown with orange, moist.
160	10							Planned Extent. Backfilled with drill cuttings.
	15							
150	20							

NOTES:

PROJECT NAME: 113 North Maple Street

CITY/STATE: Enfield, Connecticut

GEI PROJECT NUMBER: 2001141

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME NORTH MAPLE STREET.GPJ GEI DATA TEMPLATE 2013.GDT 3/20/20

BORING INFORMATION

LOCATION: See Plan.

GROUND SURFACE EL. (ft): 168 **DATE START/END:** 3/4/0202 - 3/4/2020

VERTICAL DATUM: **DRILLING COMPANY:** Seaboard Drilling, Inc.

TOTAL DEPTH (ft): 22.0 **DRILLER NAME:** Jeff Nitsch

LOGGED BY: Bosede Akereyeni **RIG TYPE:** Diedrich D-50 ATV

BORING

B8

DRILLING INFORMATION

HAMMER TYPE: Automatic **CASING I.D./O.D.:** NA/ NA **CORE BARREL TYPE:** N/A

AUGER I.D./O.D.: 4.25 inch / 8.0125 inch **DRILL ROD O.D.:** NM **CORE BARREL I.D./O.D.** NA / NA

DRILLING METHOD: Hollow Stem Auger

WATER LEVEL DEPTHS (ft): Not encountered

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation
= Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer

S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 2	24/23	1-2-2-3		NATIVE SAND	15" TOPSOIL. S1: SILTY SAND (SM); ~85% fine sand, ~15% nonplastic fines, brown to gray, moist.
		S2	2 to 4	24/20	3-4-7-6			S2: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, gray to gray-orange, dry to moist.
	5	S3	4 to 6	24/17	3-3-6-6			S3: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, gray-orange to gray, dry to moist.
		S4	6 to 8	24/16	8-7-8-8			S4: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, gray-orange, moist to damp within thin seams.
160								
	10	S5	10 to 12	24/20	6-11-13-13			S5: SILTY SAND (SM); ~85% fine sand, ~15% nonplastic fines, gray, moist.
	15	S6	15 to 17	24/19	9-10-11-14			S6: Similar to S5, gray, moist, with thin silt seams.
150								
	20	S7	20 to 22	24/20	8-7-10-10			S7: Similar to S5, gray with orange, moist to damp within thin seams.
								Planned Extent. Backfilled with drill cuttings.

NOTES:

PROJECT NAME: 113 North Maple Street

CITY/STATE: Enfield, Connecticut

GEI PROJECT NUMBER: 2001141

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME NORTH MAPLE STREET.GPJ GEI DATA TEMPLATE 2013.GDT 3/20/20

BORING INFORMATION

LOCATION: See Plan.

GROUND SURFACE EL. (ft): 169 **DATE START/END:** 3/5/2020 - 3/5/2020

VERTICAL DATUM: **DRILLING COMPANY:** Seaboard Drilling, Inc.

TOTAL DEPTH (ft): 74.3 **DRILLER NAME:** Jeff Nitsch

LOGGED BY: Bosede Akereyeni **RIG TYPE:** Diedrich D-50 ATV

BORING B9

DRILLING INFORMATION

HAMMER TYPE: Automatic **CASING I.D./O.D.:** 3 inch/ NA **CORE BARREL TYPE:** N/A

AUGER I.D./O.D.: NA / NA **DRILL ROD O.D.:** NM **CORE BARREL I.D./O.D.** NA / NA

DRILLING METHOD: Drive and Wash/Mud Rotary Wash

WATER LEVEL DEPTHS (ft): Wet sample @ 24 ft.

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 2	24/20	1-2-4-3		NATIVE SAND	14" TOPSOIL. S1: NARROWLY GRADED SAND WITH SILT (SP-SM); 89.6% fine to medium sand, 10.4% nonplastic fines, dark brown to light brown, moist to dry.
		S2	2 to 4	24/13	3-5-6-5			S2: NARROWLY GRADED SAND WITH SILT (SP-SM); ~ 90% fine sand, ~10% nonplastic fines, light brown to gray, moist.
	5	S3	4 to 6	24/11	4-8-10-12			S3: NARROWLY GRADED SAND (SP); ~95% fine sand, ~5% nonplastic fines, gray-brown with orange, moist.
		S4	6 to 8	24/13	13-17-19-22			S4: SILTY SAND (SM); ~85% fine sand, ~15% nonplastic fines, gray-brown, moist, with thin seams of brown silt.
160	10	S5	9 to 11	24/10	12-14-17-17			S5: Similar to S4.
	15	S6	14 to 16	24/10	10-14-14-14			S6: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, gray, moist to wet.
150	20	S7	19 to 21	24/7	10-14-14-14			S7: Similar to S6.

NOTES:

PROJECT NAME: 113 North Maple Street

CITY/STATE: Enfield, Connecticut

GEI PROJECT NUMBER: 2001141

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME NORTH MAPLE STREET.GPJ GEI DATA TEMPLATE 2013.GDT 3/20/20

LOCATION: See Plan.
GROUND SURFACE EL. (ft): 169 **DATE START/END:** 3/5/2020 - 3/5/2020
VERTICAL DATUM: **DRILLING COMPANY:** Seaboard Drilling, Inc.

BORING B9

Elev. (ft)	Depth (ft)	Sample No.	Sample Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
	25	S8	24 to 26	24/13	9-9-13-20		NATIVE SAND	S8: SILTY SAND (SM); ~75% fine sand, ~25% low plasticity fines, gray-brown with orange, wet, with thin seams of brown silt.
140	30	S9	29 to 31	24/10	13-14-15-13			S9: Similar to S8.
	35	S10	34 to 36	24/13	11-10-12-11			S10: Similar to S8.
130	40	S11	39 to 41	24/14	29-33-34-41			S11: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, gray-brown, wet.
	45	S12	44 to 46	24/9	13-14-18-19			S12: Similar to S11, gray-brown, wet.
120	50	S13	49 to 51	24/15	11-12-23-30			S13: Similar to S11, gray-brown with orange striations, wet, with thin seams of brown silt.
	55	S14	54 to 56	24/14	13-14-19-20			S14: SILTY SAND (SM): ~75% fine sand, ~25% low plasticity fines, gray-brown, wet.

NOTES:

PROJECT NAME: 113 North Maple Street
CITY/STATE: Enfield, Connecticut
GEI PROJECT NUMBER: 2001141

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME NORTH MAPLE STREET.GPJ GEI DATA TEMPLATE 2013.GDT 3/20/20

LOCATION: See Plan.
GROUND SURFACE EL. (ft): 169 **DATE START/END:** 3/5/2020 - 3/5/2020
VERTICAL DATUM: **DRILLING COMPANY:** Seaboard Drilling, Inc.

BORING B9

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
110	60	S15	59 to 61	24/6	17-19-20-16		NATIVE SAND	S15: NARROWLY GRADED SAND WITH SILT (SP-SM): ~90% fine sand, ~10% nonplastic fines, gray-brown, wet.
	65	S16	64 to 66	24/14	8-10-12-13		SILT	S16: SILT (ML); ~85% low to medium plasticity fines, ~10% fine to coarse sand, ~5% fine gravel, gray to reddish brown (bot 4"), wet. Coarse sand and gravel observed at bottom 4".
100	70	S17	69 to 71	24/17	14-17-19-17		GLACIAL TILL	S17: SILTY SAND WITH GRAVEL (SM); ~40% fine to coarse sand, ~30% low plasticity fines, ~30% fine to coarse gravel up to 1", reddish brown, moist, tight matrix.
	75	S18	74 to 74.3	4/2	100/4"	Spoon bounces after 15 blows.		S18: Poor recovery. Similar to S17. Sampler Refusal. Backfilled with drill cuttings.
90	80							
	85							

NOTES:

PROJECT NAME: 113 North Maple Street
CITY/STATE: Enfield, Connecticut
GEI PROJECT NUMBER: 2001141

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME NORTH MAPLE STREET.GPJ GEI DATA TEMPLATE 2013.GDT 3/20/20

BORING INFORMATION

LOCATION: See Plan.

GROUND SURFACE EL. (ft): 167 **DATE START/END:** 3/2/2020 - 3/2/2020

VERTICAL DATUM: **DRILLING COMPANY:** Seaboard Drilling, Inc.

TOTAL DEPTH (ft): 22.0 **DRILLER NAME:** Jeff Nitsch

LOGGED BY: Bosede Akereyeni **RIG TYPE:** Diedrich D-50 ATV

BORING B10

DRILLING INFORMATION

HAMMER TYPE: Automatic **CASING I.D./O.D.:** NA/ NA **CORE BARREL TYPE:** N/A

AUGER I.D./O.D.: 4.25 inch / 8.0125 inch **DRILL ROD O.D.:** NM **CORE BARREL I.D./O.D.** NA / NA

DRILLING METHOD: Hollow Stem Auger

WATER LEVEL DEPTHS (ft): ▽ 15.4 Measurement taken inside the augers.

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation
= Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 2	24/19	2-2-2-3		NATIVE SAND	11" TOPSOIL. S1: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, dark brown to gray-brown, moist.
		S2	2 to 4	24/19	3-3-3-6			S2: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, gray, moist.
	5	S3	4 to 6	24/20	3-5-7-7			S3: NARROWLY GRADED SAND (SP); ~90% fine sand, ~5% nonplastic fines, ~5% fine gravel, orange-gray to gray, moist.
160		S4	6 to 8	24/17	8-11-13-13			S4: NARROWLY GRADED SAND (SP); ~95% fine sand, ~5% nonplastic fines, gray. moist.
	10	S5	10 to 12	24/21	5-9-9-10			S5: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% low plasticity fines, gray, moist to damp at spoon tip.
	15	S6	15 to 17	24/19	5-8-8-10			S6: Similar to S5, orange- gray, wet.
150								
	20	S7	20 to 22	24/13	9-13-15-13			S7: Similar to S5, wet, gray.
								Planned Extent. Backfilled with drill cuttings.

NOTES:

PROJECT NAME: 113 North Maple Street

CITY/STATE: Enfield, Connecticut

GEI PROJECT NUMBER: 2001141

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME NORTH MAPLE STREET.GPJ GEI DATA TEMPLATE 2013.GDT 3/20/20

BORING INFORMATION

LOCATION: See Plan.

GROUND SURFACE EL. (ft): 165.5 **DATE START/END:** 3/2/2020 - 3/2/2020

VERTICAL DATUM: **DRILLING COMPANY:** Seaboard Drilling, Inc.

TOTAL DEPTH (ft): 6.0 **DRILLER NAME:** Jeff Nitsch

LOGGED BY: Bosede Akereyeni **RIG TYPE:** Diedrich D-50 ATV

BORING B11

DRILLING INFORMATION

HAMMER TYPE: Automatic **CASING I.D./O.D.:** NA/ NA **CORE BARREL TYPE:** N/A

AUGER I.D./O.D.: 4.25 inch / 8.0125 inch **DRILL ROD O.D.:** NM **CORE BARREL I.D./O.D.** NA / NA

DRILLING METHOD: Hollow Stem Auger

WATER LEVEL DEPTHS (ft): Not encountered

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation
= Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 2	24/17	1-2-3-6		NATIVE SAND	15" TOPSOIL. S1: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, orange- gray, moist.
		S2	2 to 4	24/20	5-4-3-7			S2: Similar to S1.
	5	S3	4 to 6	24/14	7-8-10-11			S3: Similar to S1, moist.
160								Planned Extent. Backfilled with drill cuttings.
	10							
	15							
150								
	20							

NOTES:

PROJECT NAME: 113 North Maple Street

CITY/STATE: Enfield, Connecticut

GEI PROJECT NUMBER: 2001141

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME NORTH MAPLE STREET.GPJ GEI DATA TEMPLATE 2013.GDT 3/20/20

BORING INFORMATION

LOCATION: See Plan.

GROUND SURFACE EL. (ft): 166 **DATE START/END:** 3/2/2020 - 3/2/2020

VERTICAL DATUM: **DRILLING COMPANY:** Seaboard Drilling, Inc.

TOTAL DEPTH (ft): 22.0 **DRILLER NAME:** Jeff Nitsch

LOGGED BY: Bosede Akereyeni **RIG TYPE:** Diedrich D-50 ATV

BORING B12

DRILLING INFORMATION

HAMMER TYPE: Automatic **CASING I.D./O.D.:** NA/ NA **CORE BARREL TYPE:** N/A

AUGER I.D./O.D.: 4.25 inch / 8.0125 inch **DRILL ROD O.D.:** NM **CORE BARREL I.D./O.D.** NA / NA

DRILLING METHOD: Hollow Stem Auger

WATER LEVEL DEPTHS (ft): ∇ 9.8 Measurement taken inside the augers.

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation
= Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 2	24/19	1-2-3-3		NATIVE SAND	12" TOPSOIL. S1: NARROWLY GRADED SAND (SP); ~95% fine sand, ~5% nonplastic fines, orange-brown, moist.
		S2	2 to 4	24/21	6-6-7-8			S2: Similar to S1B, gray-brown, moist, few thin seams of nonplastic fines.
	5	S3	4 to 6	24/15	7-11-12-16			S3: WIDELY GRADED SAND (SW); ~90% fine to coarse sand, ~5% fine gravel, ~5% nonplastic fines, orange-gray-brown, moist.
160		S4	6 to 8	24/14	12-14-15-15			S4: NARROWLY GRADED SAND (SP); ~95% fine sand, ~5% nonplastic fines, orange-gray-brown, moist.
	10	S5	10 to 12	24/16	5-7-9-10			S5: NARROWLY GRADED SAND (SP); ~95% fine sand, ~5% nonplastic fines, gray-brown, wet.
	15	S6	15 to 17	24/13	2-6-8-10			S6: NARROWLY GRADED SAND (SP); ~90% fine sand, ~5% nonplastic fines, ~5% medium gravel, gray-brown, wet.
150	20	S7	20 to 22	24/12	5-9-11-10			S7: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, brown, wet.
								Planned Extent. Backfilled with drill cuttings.

NOTES:

PROJECT NAME: 113 North Maple Street

CITY/STATE: Enfield, Connecticut

GEI PROJECT NUMBER: 2001141

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME NORTH MAPLE STREET.GPJ GEI DATA TEMPLATE 2013.GDT 3/20/20

BORING INFORMATION

LOCATION: See Plan.

GROUND SURFACE EL. (ft): 169.5 **DATE START/END:** 3/4/2020 - 3/4/2020

VERTICAL DATUM: **DRILLING COMPANY:** Seaboard Drilling, Inc.

TOTAL DEPTH (ft): 22.0 **DRILLER NAME:** Jeff Nitsch

LOGGED BY: Bosede Akereyeni **RIG TYPE:** Diedrich D-50 ATV

BORING B13

DRILLING INFORMATION

HAMMER TYPE: Automatic **CASING I.D./O.D.:** NA/ NA **CORE BARREL TYPE:** N/A

AUGER I.D./O.D.: 4.25 inch / 8.0125 inch **DRILL ROD O.D.:** NM **CORE BARREL I.D./O.D.** NA / NA

DRILLING METHOD: Hollow Stem Auger

WATER LEVEL DEPTHS (ft): Wet sample @ 20.3 ft

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation
= Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 2	24/20	1-2-2-3		NATIVE SAND	13" TOPSOIL. S1: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, brown to light brown, moist.
		S2	2 to 4	24/19	3-6-7-8			S2: NARROWLY GRADED SAND (SP); ~95% fine sand, ~5% nonplastic fines, gray brown to light brown, moist.
	5	S3	4 to 6	24/14	3-7-8-10			S3: Similar to S2, gray-brown, thin seam of gray silt near base.
		S4	6 to 8	24/16	9-8-9-11			S4: SILTY SAND (SM): ~85% fine sand, ~15% nonplastic fines, gray, moist to wet, finer with depth.
160	10	S5	10 to 12	24/16	5-6-8-10			S5: Similar to S4B, dry to moist, with thin seams of brown silt
	15	S6	15 to 17	24/16	5-8-11-14			S6: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, light brown to gray, with thin seams of brown silt.
150	20	S7	20 to 22	24/16	5-8-11-14			S7: Similar to S6, damp within brown silt seam at 3" to 11"
								Planned Extent. Backfilled with drill cuttings.

NOTES:

PROJECT NAME: 113 North Maple Street

CITY/STATE: Enfield, Connecticut

GEI PROJECT NUMBER: 2001141

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME NORTH MAPLE STREET.GPJ GEI DATA TEMPLATE 2013.GDT 3/20/20

BORING INFORMATION

LOCATION: See Plan.

GROUND SURFACE EL. (ft): 173 **DATE START/END:** 3/4/2020 - 3/4/2020

VERTICAL DATUM: **DRILLING COMPANY:** Seaboard Drilling, Inc.

TOTAL DEPTH (ft): 22.0 **DRILLER NAME:** Jeff Nitsch

LOGGED BY: Bosede Akereyeni **RIG TYPE:** Diedrich D-50 ATV

BORING B14

DRILLING INFORMATION

HAMMER TYPE: Automatic **CASING I.D./O.D.:** NA/ NA **CORE BARREL TYPE:** N/A

AUGER I.D./O.D.: 4.25 inch / 8.0125 inch **DRILL ROD O.D.:** NM **CORE BARREL I.D./O.D.** NA / NA

DRILLING METHOD: Hollow Stem Auger

WATER LEVEL DEPTHS (ft): Not encountered

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation
= Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer

S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 2	24/18	1-2-3-2		NATIVE SAND	12" TOPSOIL. S1: NARROWLY GRADED SAND WITH SILT (SP-SM): ~90% fine sand, ~10% nonplastic fines, dark brown to brown, moist.
170		S2	2 to 4	24/16	3-2-4-2			S2: Similar to S1, orange-brown. moist.
	5	S3	4 to 6	24/17	4-2-5-10			S3A(0-9"): NARROWLY GRADED SAND (SP); ~95% fine sand, ~5% nonplastic fine, orange-brown, moist. Finer with depth. S3B(9-17"): WIDELY GRADED SAND WITH SILT (SW-SM); ~80% fine to coarse sand, ~10% fine to medium gravel, ~10% nonplastic fines, gray-brown, moist.
		S4	6 to 8	24/18	10-9-14-18			S4A(0-10"): Similar to S3B. S4B(10-18"): SILTY SAND (SM); ~85% fine sand, ~15% low plasticity fines, orange-brown, moist, with thin seams of gray-brown silt.
	10	S5	10 to 12	24/16	6-8-10-11			S5: NARROWLY GRADED SAND (SP-SM); ~90% fine sand, ~10% nonplastic fines, gray, moist.
160								
	15	S6	15 to 17	24/19	5-7-7-10			S6: NARROWLY GRADED SAND (SP); ~95% fine sand, ~5% nonplastic fines, gray, moist to damp between 8" and 10".
	20	S7	20 to 22	24/17	7-7-10-11			S7: Similar to S6, moist.
150								Planned Extent. Backfilled with drill cuttings.

NOTES:

PROJECT NAME: 113 North Maple Street

CITY/STATE: Enfield, Connecticut

GEI PROJECT NUMBER: 2001141

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME NORTH MAPLE STREET.GPJ GEI DATA TEMPLATE 2013.GDT 3/20/20

BORING INFORMATION

LOCATION: See Plan.

GROUND SURFACE EL. (ft): 170 **DATE START/END:** 3/4/2020 - 3/4/2020

VERTICAL DATUM: **DRILLING COMPANY:** Seaboard Drilling, Inc.

TOTAL DEPTH (ft): 22.0 **DRILLER NAME:** Jeff Nitsch

LOGGED BY: Bosede Akereyeni **RIG TYPE:** Diedrich D-50 ATV

BORING B15

DRILLING INFORMATION

HAMMER TYPE: Automatic **CASING I.D./O.D.:** NA/ NA **CORE BARREL TYPE:** N/A

AUGER I.D./O.D.: 4.25 inch / 8.0125 inch **DRILL ROD O.D.:** NM **CORE BARREL I.D./O.D.** NA / NA

DRILLING METHOD: Hollow Stem Auger

WATER LEVEL DEPTHS (ft): Wet sample at 20 ft

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation
= Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 2	24/14	8-5-4-6		NATIVE SAND	6" TOPSOIL with crushed stone up to 1". S1: NARROWLY GRADED SAND WITH SILT (SP-SM): ~90% fine sand, ~10% nonplastic fines, dark brown to brown, moist.
		S2	2 to 4	24/14	4-4-7-5			S2: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, grayish light brown, moist.
	5	S3	4 to 6	24/13	6-5-5-7			S3: NARROWLY GRADED SAND (SP); ~95% fine sand, ~5% nonplastic fine, orange-brown, moist.
		S4	6 to 8	24/16	7-9-11-11			S4A(0-8"): Similar to S3. S4B(8-16"): Similar to S3, gray-brown-orange, moist.
160	10	S5	10 to 12	24/16	4-5-7-8			S5: Similar to S4, gray, dry to moist.
	15	S6	15 to 17	24/17	5-6-8-9			S6: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, gray, moist.
150	20	S7	20 to 22	24/13	5-6-7-7			S7: NARROWLY GRADED SAND (SP); ~95% fine sand, ~5% nonplastic fines, gray-brown, wet.
								Planned Extent. Backfilled with drill cuttings.

NOTES:

PROJECT NAME: 113 North Maple Street

CITY/STATE: Enfield, Connecticut

GEI PROJECT NUMBER: 2001141

GEI Consultants

BORING INFORMATION

LOCATION: See Plan.

GROUND SURFACE EL. (ft): 169 **DATE START/END:** 3/2/2020 - 3/2/2020

VERTICAL DATUM: **DRILLING COMPANY:** Seaboard Drilling, Inc.

TOTAL DEPTH (ft): 22.0 **DRILLER NAME:** Jeff Nitsch

LOGGED BY: Bosede Akereyeni **RIG TYPE:** Diedrich D-50 ATV

BORING B16

DRILLING INFORMATION

HAMMER TYPE: Automatic **CASING I.D./O.D.:** NA/ NA **CORE BARREL TYPE:** N/A

AUGER I.D./O.D.: 4.25 inch / 8.0125 inch **DRILL ROD O.D.:** NM **CORE BARREL I.D./O.D.** NA / NA

DRILLING METHOD: Hollow Stem Auger

WATER LEVEL DEPTHS (ft): ▼ 18.3 Measurement taken inside the augers.

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation
= Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 2	24/13	2-1-3-4		NATIVE SAND	12" of dark brown organic TOPSOIL. S1: NARROWLY GRADED SAND WITH SILT (SP-SM): ~90% fine sand, ~10% nonplastic fines, dark brown to brown, moist.
		S2	2 to 4	24/13	4-4-4-5			S2: Similar to S1, light brown, moist.
	5	S3	4 to 6	24/13	5-8-12-12			S3: NARROWLY GRADED SAND (SP); ~95% fine sand, ~5% nonplastic fines, light brown, moist.
		S4	6 to 8	24/16	10-12-14-17			S4: NARROWLY GRADED SAND (SP); ~95% fine sand, ~5% nonplastic fines, orange-brown to gray, moist.
160								
	10	S5	10 to 12	24/11	7-8-11-13			S5: Similar to S4B, moist,.
	15	S6	15 to 17	24/17	9-10-11-22			S6:Similar to S4B, light gray to gray, moist to wet at bottom 4".
150								
	20	S7	20 to 22	24/12	10-16-16-15			S7: NARROWLY GRADED SAND WITH SILT (SP-SM): ~90% fine sand, ~10% nonplastic fines, brown, wet.
								Planned Extent. Backfilled with drill cuttings.

NOTES:

PROJECT NAME: 113 North Maple Street

CITY/STATE: Enfield, Connecticut

GEI PROJECT NUMBER: 2001141

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME NORTH MAPLE STREET.GPJ GEI DATA TEMPLATE 2013.GDT 3/20/20

BORING INFORMATION

LOCATION: See Plan.

GROUND SURFACE EL. (ft): 165 **DATE START/END:** 3/2/2020 - 3/2/2020

VERTICAL DATUM: **DRILLING COMPANY:** Seaboard Drilling, Inc.

TOTAL DEPTH (ft): 17.0 **DRILLER NAME:** Jeff Nitsch

LOGGED BY: Bosede Akereyeni **RIG TYPE:** Diedrich D-50 ATV

BORING B17

DRILLING INFORMATION

HAMMER TYPE: Automatic **CASING I.D./O.D.:** NA/ NA **CORE BARREL TYPE:** N/A

AUGER I.D./O.D.: 4.25 inch / 8.0125 inch **DRILL ROD O.D.:** NM **CORE BARREL I.D./O.D.** NA / NA

DRILLING METHOD: Hollow Stem Auger

WATER LEVEL DEPTHS (ft): ▽ 6.6 Measurement taken inside the augers.

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation
= Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 2	24/18	1-2-2-2		NATIVE SAND	12" TOPSOIL. S1: SANDY SILT (ML): 57.1% nonplastic fines, 42.9% fine sand, orange-brown, moist.
		S2	2 to 4	24/19	2-6-6-3			S2A(0-8"): Similar to S1. S2B(8-13"): NARROWLY GRADED SAND (SP); ~95% fine sand, ~5% nonplastic fines, gray-brown, moist. S2C(13-19"): WIDELY GRADED SAND (SW); ~95% fine to medium sand, ~5% nonplastic fines, orange to gray- brown, moist.
160	5	S3	4 to 6	24/18	5-4-6-6			S3: NARROWLY GRADED SAND (SP); ~90% fine sand, ~5% nonplastic fines, ~5% fine gravel, orange-brown, moist, wet at 9".
		S4	6 to 8	24/11	2-5-6-7			S4: Similar to S3.
	10	S5	10 to 12	24/18	4-6-6-7			S5A(0-7"): WIDELY GRADED SAND (SW); ~95% fine sand, ~5% nonplastic fines, gray-brown, wet, slight organic staining and odor. S5B (7-18"): Similar to S4. Transition to gray sand at top 2".
150	15	S6	15 to 17	24/11	9-6-10-14			S6: WIDELY GRADED SAND (SW); ~95% fine to coarse sand, ~5% nonplastic fines, gray-brown with orange, wet.
	20							Planned Extent. Backfilled with drill cuttings.

NOTES:

PROJECT NAME: 113 North Maple Street

CITY/STATE: Enfield, Connecticut

GEI PROJECT NUMBER: 2001141

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME NORTH MAPLE STREET.GPJ GEI DATA TEMPLATE 2013.GDT 3/20/20

BORING INFORMATION

LOCATION: See Plan.

GROUND SURFACE EL. (ft): 169 **DATE START/END:** 3/4/2020 - 3/4/2020

VERTICAL DATUM: **DRILLING COMPANY:** Seaboard Drilling, Inc.

TOTAL DEPTH (ft): 22.0 **DRILLER NAME:** Jeff Nitsch

LOGGED BY: Bosede Akereyeni **RIG TYPE:** Diedrich D-50 ATV

BORING B18

DRILLING INFORMATION

HAMMER TYPE: Automatic **CASING I.D./O.D.:** NA/ NA **CORE BARREL TYPE:** N/A

AUGER I.D./O.D.: 4.25 inch / 8.0125 inch **DRILL ROD O.D.:** NM **CORE BARREL I.D./O.D.** NA / NA

DRILLING METHOD: Hollow Stem Auger

WATER LEVEL DEPTHS (ft): Wet sample at 20 ft

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation
= Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 2	24/22	2-1-1-2		NATIVE SAND	12" TOPSOIL. S1: SILTY SAND (SM): ~85% fine sand, ~15% nonplastic fines, dark brown to gray- brown, moist.
		S2	2 to 4	24/20	2-1-1-6			S2A(0-15"): Similar to S1, gray-orange, moist. S2B(15-20"): WIDELY GRADED SAND WITH SILT AND GRAVEL (SW-SM); ~75% fine to coarse sand, ~15% fine to coarse gravel, ~10% nonplastic fines, gray-orange, moist.
	5	S3	4 to 6	24/19	4-9-10-12			S3: NARROWLY GRADED SAND (SP); ~95% fine sand, ~5% nonplastic fines, brown, moist.
		S4	6 to 8	24/15	10-9-10-11			S4: WIDELY GRADED SAND WITH SILT AND GRAVEL (SW-SM); ~85% fine to medium sand, ~10% fine to coarse gravel, ~5% nonplastic fines, brown, moist.
160								
	10	S5	10 to 12	24/13	5-6-9-10			S5: NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% nonplastic fines, gray, moist.
	15	S6	15 to 17	24/17	7-7-10-12			S6: Similar to S5, gray-orange to gray.
150								
	20	S7	20 to 22	24/11	4-5-8-13			S7: Similar to S5, wet.
								Planned Extent. Backfilled with drill cuttings.

NOTES:

PROJECT NAME: 113 North Maple Street

CITY/STATE: Enfield, Connecticut

GEI PROJECT NUMBER: 2001141

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME NORTH MAPLE STREET.GPJ GEI DATA TEMPLATE 2013.GDT 3/20/20

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Winstanley Construction Mana	**TEST PIT LOG**	
	PROJECT: 113 North Maple St.	**PAGE**	**TP-1**
	CITY/STATE: Enfield, CT	1	
	GEI PROJECT NUMBER: 2001141		

GROUND SURFACE ELEVATION (FT):	172	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	8.0 FT
OBSERVED BY:	Bosede Akereyeni	**TOTAL LENGTH:**	7.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Dossen DX 140 LCR	**DATUM VERT. / HORZ.:**	
WEATHER:	45-69° F Sunny	**DATE START / END**	3/9/2020

DEPTH FT.	ANALYZED SAMPLE ID	SOIL DESCRIPTION
0		(0.0-1.0'): SILTY SAND (SM); ~85% fine sand, ~15% NP fines, dark brown, moist. TOPSOIL.
1 2 3 4 5 6 7 8		(1.0-8.0'): SILTY SAND (SM); ~85% fine sand, ~15% NP fines, gray to orange brown, moist.
9 10		Backfilled with excavated soil and tamped down with excavator bucket. Groundwater or soil mottling not encountered.
		Bottom of test pit at 8.0 feet.

NOTES:

IN. = INCHES	F=FINE	M=MEDIUM	NP= NON-PLASTIC	NM= NOT MEASURED
FT. = FEET	C=COARSE	LP=LOW PLASTICITY	MP=MEDIUM PLASTICITY	

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Winstanley Construction Manag	**TEST PIT LOG**	
	PROJECT: 113 North Maple St.	**PAGE**	**TP-1**
	CITY/STATE: Enfield, CT	2	
	GEI PROJECT NUMBER: 2001141		

GROUND SURFACE ELEVATION (FT):	172	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	8.0 FT
OBSERVED BY:	Bosede Akereyeni	**TOTAL LENGTH:**	7.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Dossen DX 140 LCR	**DATUM VERT. / HORZ.:**	
WEATHER:	45-69° F Sunny	**DATE START / END**	3/9/2020

Photographic Log

Bottom of test pit at 8.0 feet.

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Winstanley Construction Manag	**TEST PIT LOG**	
	PROJECT: 113 North Maple St.	**PAGE**	**TP-1**
	CITY/STATE: Enfield, CT	3	
	GEI PROJECT NUMBER: 2001141		

GROUND SURFACE ELEVATION (FT):	172	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	8.0 FT
OBSERVED BY:	Bosede Akereyeni	**TOTAL LENGTH:**	7.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Dossen DX 140 LCR	**DATUM VERT. / HORZ.:**	
WEATHER:	45-69° F Sunny	**DATE START / END**	3/9/2020

Photographic Log

Bottom of test pit at 8.0 feet.

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Winstanley Construction Mana	**TEST PIT LOG**	
	PROJECT: 113 North Maple St.	**PAGE**	**TP-2**
	CITY/STATE: Enfield, CT	1	
	GEI PROJECT NUMBER: 2001141		

GROUND SURFACE ELEVATION (FT):	172	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	8.0 FT
OBSERVED BY:	Bosede Akereyeni	**TOTAL LENGTH:**	7.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Dossen DX 140 LCR	**DATUM VERT. / HORZ.:**	
WEATHER:	45-69° F Sunny	**DATE START / END**	3/9/2020

DEPTH FT.	ANALYZED SAMPLE ID	SOIL DESCRIPTION
0		(0.0-15"): SILTY SAND (SM); ~85% fine sand, ~15% NP fines, dark brown, moist. TOPSOIL.
1 2 3 4		(1.3-4.0'): NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% NP fines, light brown to orange-brown, moist.
5 6 7 8		(4.0 - 8.0'): NARROWLY GRADED SAND with GRAVEL (SP): ~85% fine sand, ~10% fine to medium gravel, ~5% NP fines, gray-brown to orange-brown, moist.
9 10		Backfilled with excavated soil and tamped down with excavator bucket. Groundwater or soil mottling not encountered.
		Bottom of test pit at 8.0 feet.

NOTES:

IN. = INCHES	F=FINE	M=MEDIUM	NP= NON-PLASTIC	NM= NOT MEASURED
FT. = FEET	C=COARSE	LP=LOW PLASTICITY	MP=MEDIUM PLASTICITY	

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Winstanley Construction Manag	**TEST PIT LOG**	
	PROJECT: 113 North Maple St.	**PAGE**	**TP-2**
	CITY/STATE: Enfield, CT	2	
	GEI PROJECT NUMBER: 2001141		

GROUND SURFACE ELEVATION (FT):	172	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	8.0 FT
OBSERVED BY:	Bosede Akereyeni	**TOTAL LENGTH:**	7.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Dossen DX 140 LCR	**DATUM VERT. / HORZ.:**	
WEATHER:	45-69° F Sunny	**DATE START / END**	3/9/2020

Photographic Log

Bottom of test pit at 8.0 feet.

NOTES:

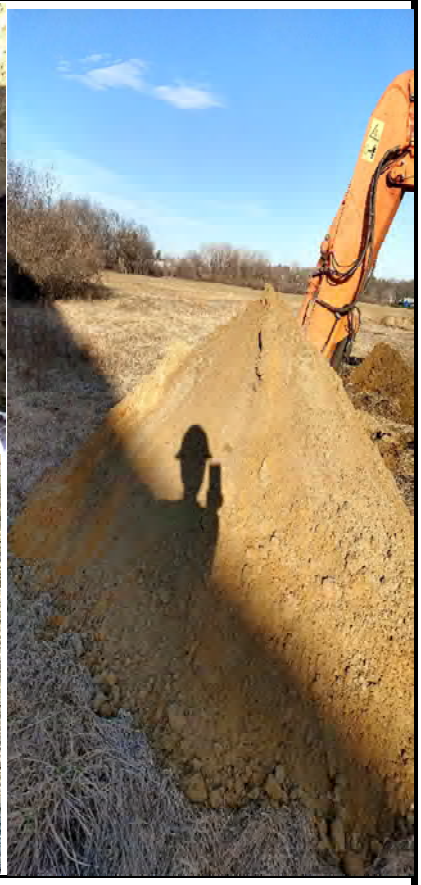
IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Winstanley Construction Mana	**TEST PIT LOG**	
	PROJECT: 113 North Maple St.	**PAGE**	**TP-2**
	CITY/STATE: Enfield, CT	3	
	GEI PROJECT NUMBER: 2001141		

GROUND SURFACE ELEVATION (FT):	172	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	8.0 FT
OBSERVED BY:	Bosede Akereyeni	**TOTAL LENGTH:**	7.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Dossen DX 140 LCR	**DATUM VERT. / HORZ.:**	
WEATHER:	45-69° F Sunny	**DATE START / END**	3/9/2020

Photographic Log



Bottom of test pit at 8.0 feet.

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Winstanley Construction Mana	**TEST PIT LOG**	
	PROJECT: 113 North Maple St.	**PAGE**	**TP-3**
	CITY/STATE: Enfield, CT	1	
	GEI PROJECT NUMBER: 2001141		

GROUND SURFACE ELEVATION (FT):	168.5	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	9.0 FT
OBSERVED BY:	Bosede Akereyeni	**TOTAL LENGTH:**	8.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Dossen DX 140 LCR	**DATUM VERT. / HORZ.:**	
WEATHER:	45-69° F Sunny	**DATE START / END**	3/9/2020

DEPTH FT.	ANALYZED SAMPLE ID	SOIL DESCRIPTION
0 1		(0.0-18"): NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% NP fines, dark brown, moist. TOPSOIL.
2 3		(1.5-3.0'): SILTY SAND (SM); ~85% fine sand, ~15% NP fines, light brown moist.
4		(3.0 - 5.0'): NARROWLY GRADED SAND: ~95% fine sand, ~5% NP fines, gray, moist.
5 6 7		(5.0-7.6'): NARROWLY GRADED SAND: ~95% fine sand, ~5% NP fines, brown, moist.
8 9		(7.6-9.0'): NARROWLY GRADED SAND: ~95% fine sand, ~5% NP fines, gray-brown, moist.
10		Backfilled with excavated soil and tamped down with excavator bucket. Groundwater or soil mottling not encountered.
		Bottom of test pit at 9.0 feet.

NOTES:

IN. = INCHES	F=FINE	M=MEDIUM	NP= NON-PLASTIC	NM= NOT MEASURED
FT. = FEET	C=COARSE	LP=LOW PLASTICITY	MP=MEDIUM PLASTICITY	

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Winstanley Construction Mana	**TEST PIT LOG**	
	PROJECT: 113 North Maple St.	**PAGE**	**TP-3**
	CITY/STATE: Enfield, CT	2	
	GEI PROJECT NUMBER: 2001141		

GROUND SURFACE ELEVATION (FT):	168.5	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	9.0 FT
OBSERVED BY:	Bosede Akereyeni	**TOTAL LENGTH:**	8.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Dossen DX 140 LCR	**DATUM VERT. / HORZ.:**	
WEATHER:	45-69° F Sunny	**DATE START / END**	3/9/2020

Photographic Log

Bottom of test pit at 9.0 feet.
Picture showing the soil strata and excavated soil at Test pit 3

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Winstanley Construction Mana	**TEST PIT LOG**	
	PROJECT: 113 North Maple St.	**PAGE**	**TP-3**
	CITY/STATE: Enfield, CT	3	
	GEI PROJECT NUMBER: 2001141		

GROUND SURFACE ELEVATION (FT):	168.5	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	9.0 FT
OBSERVED BY:	Bosede Akereyeni	**TOTAL LENGTH:**	8.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Dossen DX 140 LCR	**DATUM VERT. / HORZ.:**	
WEATHER:	45-69° F Sunny	**DATE START / END**	3/9/2020

Photographic Log

Bottom of test pit at 9.0 feet.
Picture showing the soil strata at Test pit 3

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants	GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Winstanley Construction Mana	**TEST PIT LOG**	
		PROJECT: 113 North Maple St.	**PAGE**	**TP-4**
		CITY/STATE: Enfield, CT	1	
		GEI PROJECT NUMBER: 2001141		

GROUND SURFACE ELEVATION (FT):	165	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	8.0 FT
OBSERVED BY:	Bosede Akereyeni	**TOTAL LENGTH:**	9.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Dossen DX 140 LCR	**DATUM VERT. / HORZ.:**	
WEATHER:	45-69° F Sunny	**DATE START / END**	3/9/2020

DEPTH FT.	ANALYZED SAMPLE ID	SOIL DESCRIPTION
0 1 2 3		(0.0-3.0'): ORGANIC SILTY SAND (SM); ~80% fine sand, ~20% NP fines, dark brown to black, moist, scattered to frequent organic matter.
4 5		(3.0-5.0'): NARROWLY GRADED SAND WITH SILT (SP-SM): ~90% fine sand, ~10% NP fines,orange-brown, moist.
		(5.0-5.5'): SILTY SAND: ~75% fine sand, ~15% NP-MP fines, brown, ~10% fine gravel, brown, damp to wet.
6 7 8		(5.5-8.0'): NARROWLY GRADED SAND WITH SILT (SP-SM): ~90% fine sand, ~10% NP fines, brown, damp to wet, potential soil mottling.
9 10		Backfilled with excavated soil and tamped down with excavator bucket. Potential soil mottling at 5.5 ft, groundwater infiltration observed at 8.0 ft.
		Bottom of test pit at 8.0 feet.

NOTES: Hole Caved in at 3 FT after excavation at 5 FT.

IN. = INCHES	F=FINE	M=MEDIUM	NP= NON-PLASTIC	NM= NOT MEASURED
FT. = FEET	C=COARSE	LP=LOW PLASTICITY	MP=MEDIUM PLASTICITY	

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Winstanley Construction Mana	**TEST PIT LOG**	
	PROJECT: 113 North Maple St.	**PAGE**	**TP-4**
	CITY/STATE: Enfield, CT	2	
	GEI PROJECT NUMBER: 2001141		

GROUND SURFACE ELEVATION (FT):	165	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	8.0 FT
OBSERVED BY:	Bosede Akereyeni	**TOTAL LENGTH:**	9.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Dossen DX 140 LCR	**DATUM VERT. / HORZ.:**	
WEATHER:	45-69° F Sunny	**DATE START / END**	3/9/2020

Photographic Log

Bottom of test pit at 8.0 feet.
Picture showing the soil strata at Test pit 4

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Winstanley Construction Mana	**TEST PIT LOG**	
	PROJECT: 113 North Maple St.	**PAGE**	**TP-4**
	CITY/STATE: Enfield, CT	3	
	GEI PROJECT NUMBER: 2001141		

GROUND SURFACE ELEVATION (FT):	165	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	8.0 FT
OBSERVED BY:	Bosede Akereyeni	**TOTAL LENGTH:**	9.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Dossen DX 140 LCR	**DATUM VERT. / HORZ.:**	
WEATHER:	45-69° F Sunny	**DATE START / END**	3/9/2020

Photographic Log

Bottom of test pit at 8.0 feet.

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Winstanley Construction Mana	**TEST PIT LOG**	
	PROJECT: 113 North Maple St.	**PAGE**	**TP-5**
	CITY/STATE: Enfield, CT	1	
	GEI PROJECT NUMBER: 2001141		

GROUND SURFACE ELEVATION (FT):	165.5	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	8.0 FT
OBSERVED BY:	Bosede Akereyeni	**TOTAL LENGTH:**	9.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Dossen DX 140 LCR	**DATUM VERT. / HORZ.:**	
WEATHER:	45-69° F Sunny	**DATE START / END**	3/9/2020

DEPTH FT.	ANALYZED SAMPLE ID	SOIL DESCRIPTION
0 1		(0-12"): NARROWLY GRADED SAND WITH SILT (SP-SM); ~80% fine sand, ~20% NP fines, dark brown, moist, contains organic matter. TOPSOIL.
		(1.0-1.5'): NAROWLY GRADED SAND (SP); ~95% fine sand, ~5% NP fines, brown to orange, moist.
2 3 4		(1.5-4.0'): NARROWLY GRADED SAND (SP); ~95% fine sand, ~5% NP fines, gray, moist.
5		(4.0-5.0'): SILTY SAND: ~85% fine sand, ~15% NP fines, orange-brown, moist.
6 7 8		(5.0-9.5'): NARROWLY GRADED SAND: ~95% fine sand, ~5% NP fines, gray-brown, moist to damp, soil mottling at 7.5 ft.
9 10		Backfilled with excavated soil and tamped down with excavator bucket. Soil mottling at 7.5 ft, groundwater not encountered.
		Bottom of test pit at 8.0 feet.

NOTES:

IN. = INCHES	F=FINE	M=MEDIUM	NP= NON-PLASTIC	NM= NOT MEASURED
FT. = FEET	C=COARSE	LP=LOW PLASTICITY	MP=MEDIUM PLASTICITY	

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Winstanley Construction Mana	**TEST PIT LOG**	
	PROJECT: 113 North Maple St.	**PAGE**	**TP-5**
	CITY/STATE: Enfield, CT	2	
	GEI PROJECT NUMBER: 2001141		

GROUND SURFACE ELEVATION (FT):	165.5	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	8.0 FT
OBSERVED BY:	Bosede Akereyeni	**TOTAL LENGTH:**	9.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Dossen DX 140 LCR	**DATUM VERT. / HORZ.:**	
WEATHER:	45-69° F Sunny	**DATE START / END**	3/9/2020

Photographic Log

Bottom of test pit at 8.0 feet.

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Winstanley Construction Mana	**TEST PIT LOG**	
	PROJECT: 113 North Maple St.	**PAGE**	**TP-5**
	CITY/STATE: Enfield, CT	3	
	GEI PROJECT NUMBER: 2001141		

GROUND SURFACE ELEVATION (FT):	165.5	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	8.0 FT
OBSERVED BY:	Bosede Akereyeni	**TOTAL LENGTH:**	9.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Dossen DX 140 LCR	**DATUM VERT. / HORZ.:**	
WEATHER:	45-69° F Sunny	**DATE START / END**	3/9/2020

Photographic Log

Bottom of test pit at 8.0 feet.

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Winstanley Construction Mana	**TEST PIT LOG**	
	PROJECT: 113 North Maple St.	**PAGE**	**TP-6**
	CITY/STATE: Enfield, CT	1	
	GEI PROJECT NUMBER: 2001141		

GROUND SURFACE ELEVATION (FT):	165	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	8.0 FT
OBSERVED BY:	Bosede Akereyeni	**TOTAL LENGTH:**	11.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Dossen DX 140 LCR	**DATUM VERT. / HORZ.:**	
WEATHER:	45-69° F Sunny	**DATE START / END**	3/9/2020

DEPTH FT.	ANALYZED SAMPLE ID	SOIL DESCRIPTION
0 1		(0-14"): SILTY SAND (SM); ~80% fine sand, ~20% NP fines, dark brown, moist, contains organic matter. TOPSOIL.
2		(1.2-2.0'): NARROWLY GRADED SAND (SP); ~95% fine sand, ~5% NP fines, light brown, moist.
3 4		(2.0-4.0'): SILTY SAND (SM); ~70% fine sand, ~30% NP fines, gray to orange, moist.
5 6		(4.0-7.0'): NARROWLY GRADED SAND: ~95% fine sand, ~5% NP fines, orange to light brown, moist to damp.
7 8		(7.0-8.0'):WIDELY GRADED SAND: ~95% fine to medium sand, ~5% NP fines, gray-brown, wet.
9 10		Backfilled with excavated soil and tamped down with excavator bucket. No discernible soil mottling, groundwater infiltration observed at 7.0 FT.
		Bottom of test pit at 8.0 feet.

NOTES:

IN. = INCHES	F=FINE	M=MEDIUM	NP= NON-PLASTIC	NM= NOT MEASURED
FT. = FEET	C=COARSE	LP=LOW PLASTICITY	MP=MEDIUM PLASTICITY	

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Winstanley Construction Mana	**TEST PIT LOG**	
	PROJECT: 113 North Maple St.	**PAGE**	**TP-6**
	CITY/STATE: Enfield, CT	2	
	GEI PROJECT NUMBER: 2001141		

GROUND SURFACE ELEVATION (FT):	165	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	8.0 FT
OBSERVED BY:	Bosede Akereyeni	**TOTAL LENGTH:**	11.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Dossen DX 140 LCR	**DATUM VERT. / HORZ.:**	
WEATHER:	45-69° F Sunny	**DATE START / END**	3/9/2020

Photographic Log

Bottom of test pit at 8.0 feet.

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Winstanley Construction Mana	**TEST PIT LOG**	
	PROJECT: 113 North Maple St.	**PAGE**	**TP-6**
	CITY/STATE: Enfield, CT	3	
	GEI PROJECT NUMBER: 2001141		

GROUND SURFACE ELEVATION (FT):	165	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	8.0 FT
OBSERVED BY:	Bosede Akereyeni	**TOTAL LENGTH:**	11.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Dossen DX 140 LCR	**DATUM VERT. / HORZ.:**	
WEATHER:	45-69° F Sunny	**DATE START / END**	3/9/2020

Photographic Log

Bottom of test pit at 8.0 feet.

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Winstanley Construction Mana	**TEST PIT LOG**	
	PROJECT: 113 North Maple St.	**PAGE**	**TP-7**
	CITY/STATE: Enfield, CT	1	
	GEI PROJECT NUMBER: 2001141		

GROUND SURFACE ELEVATION (FT):	168	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	8.0 FT
OBSERVED BY:	Bosede Akereyeni	**TOTAL LENGTH:**	12.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Dossen DX 140 LCR	**DATUM VERT. / HORZ.:**	
WEATHER:	45-69° F Sunny	**DATE START / END**	3/9/2020

DEPTH FT.	ANALYZED SAMPLE ID	SOIL DESCRIPTION
0 1		(0-12"): SILTY SAND (SM); ~80% fine sand, ~15% NP fines, ~5% coarse gravel, dark brown, moist. Contain organic matter. TOPSOIL.
2		(1.0-1.8'): SILTY SAND (SM); ~85% fine sand, ~15% NP fines, light brown, moist, scattered organic fibers.
3 4		(2.0-4.0'):NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% NP fines, gray, moist.
5 6		(4.0-6.0'): NARROWLY GRADED SAND: ~95% fine sand, ~5% NP fines, orange-brown, moist.
7 8		(6.0-8.0'): NARROWLY GRADED SAND: ~95% fine sand, ~5% NP fines, gray-brown, moist.
9 10		Backfilled with excavated soil and tamped down with excavator bucket. Soil mottling or groundwater not encountered.
		Bottom of test pit at 8.0 feet.

NOTES:

IN. = INCHES	F=FINE	M=MEDIUM	NP= NON-PLASTIC	NM= NOT MEASURED
FT. = FEET	C=COARSE	LP=LOW PLASTICITY	MP=MEDIUM PLASTICITY	

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Winstanley Construction Mana	**TEST PIT LOG**	
	PROJECT: 113 North Maple St.	**PAGE**	**TP-7**
	CITY/STATE: Enfield, CT	2	
	GEI PROJECT NUMBER: 2001141		

GROUND SURFACE ELEVATION (FT):	168	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	8.0 FT
OBSERVED BY:	Bosede Akereyeni	**TOTAL LENGTH:**	12.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Dossen DX 140 LCR	**DATUM VERT. / HORZ.:**	
WEATHER:	45-69° F Sunny	**DATE START / END**	3/9/2020

Photographic Log

Bottom of test pit at 8.0 feet.
Picture showing the soil strata at Test pit 7

NOTES:

IN. = INCHES NM= NOT MEASURED
FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Winstanley Construction Mana	**TEST PIT LOG**	
	PROJECT: 113 North Maple St.	**PAGE**	**TP-7**
	CITY/STATE: Enfield, CT	3	
	GEI PROJECT NUMBER: 2001141		

GROUND SURFACE ELEVATION (FT):	168	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	8.0 FT
OBSERVED BY:	Bosede Akereyeni	**TOTAL LENGTH:**	12.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Dossen DX 140 LCR	**DATUM VERT. / HORZ.:**	
WEATHER:	45-69° F Sunny	**DATE START / END**	3/9/2020

Photographic Log

Bottom of test pit at 8.0 feet.
Picture showing the soil strata and excavated soil at Test pit 7

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Winstanley Construction Mana	**TEST PIT LOG**	
	PROJECT: 113 North Maple St.	**PAGE**	**TP-8**
	CITY/STATE: Enfield, CT	1	
	GEI PROJECT NUMBER: 2001141		

GROUND SURFACE ELEVATION (FT):	169	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	9.0 FT
OBSERVED BY:	Bosede Akereyeni	**TOTAL LENGTH:**	10.0 FT
CHECKED BY:		**TOTAL WIDTH:**	5.0 FT
EQUIPMENT:	Dossen DX 140 LCR	**DATUM VERT. / HORZ.:**	
WEATHER:	45-69° F Sunny	**DATE START / END**	3/9/2020

DEPTH FT.	ANALYZED SAMPLE ID	SOIL DESCRIPTION
0 1		(0-12"): NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% NP fines, dark brown, moist. Contain organic matter. TOPSOIL.
2		(1.0-2.8'): NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% NP fines, brown, moist.
3 4		(2.8-4.0'): WIDELY GRADED SAND (SW); ~85% fine sand, ~10% fine to coarse gravel, ~5% NP fines, gray, moist.
5 6 7		(4.0-7.5'): NARROWLY GRADED SAND WITH SILT (SP-SM): ~90% fine sand, ~10% NP fines, gray-brown, moist.
8 9		(7.5-9.0'): NARROWLY GRADED SAND: ~95% fine sand, ~5% NP fines, gray-brown, moist.
10		Backfilled with excavated soil and tamped down with excavator bucket. Soil mottling or groundwater not encountered in the test pit.
		Bottom of test pit at 9.0 feet.

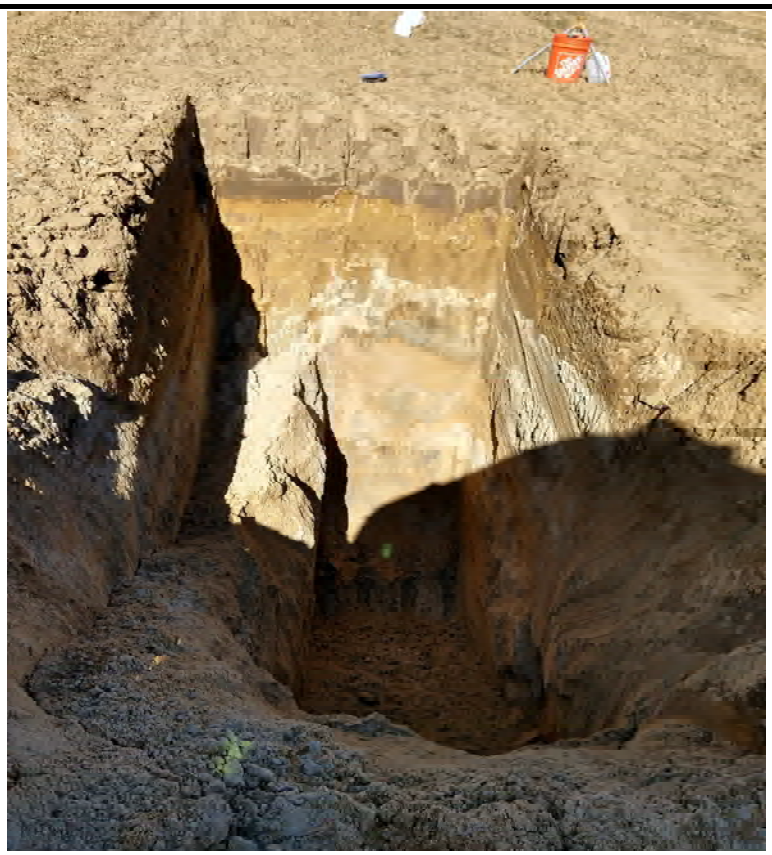
NOTES:

IN. = INCHES	F=FINE	M=MEDIUM	NP= NON-PLASTIC	NM= NOT MEASURED
FT. = FEET	C=COARSE	LP=LOW PLASTICITY	MP=MEDIUM PLASTICITY	

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Winstanley Construction Mana	**TEST PIT LOG**	
	PROJECT: 113 North Maple St.	**PAGE**	**TP-8**
	CITY/STATE: Enfield, CT	2	
	GEI PROJECT NUMBER: 2001141		

GROUND SURFACE ELEVATION (FT):	169	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	9.0 FT
OBSERVED BY:	Bosede Akereyeni	**TOTAL LENGTH:**	10.0 FT
CHECKED BY:		**TOTAL WIDTH:**	5.0 FT
EQUIPMENT:	Dossen DX 140 LCR	**DATUM VERT. / HORZ.:**	
WEATHER:	45-69° F Sunny	**DATE START / END**	3/9/2020

Photographic Log



Bottom of test pit at 9.0 feet.
Picture showing the soil strata at Test pit 8

NOTES:

IN. = INCHES NM= NOT MEASURED
FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Winstanley Construction Mana	**TEST PIT LOG**	
	PROJECT: 113 North Maple St.	**PAGE**	**TP-8**
	CITY/STATE: Enfield, CT	3	
	GEI PROJECT NUMBER: 2001141		

GROUND SURFACE ELEVATION (FT):	169	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	9.0 FT
OBSERVED BY:	Bosede Akereyeni	**TOTAL LENGTH:**	10.0 FT
CHECKED BY:		**TOTAL WIDTH:**	5.0 FT
EQUIPMENT:	Dossen DX 140 LCR	**DATUM VERT. / HORZ.:**	
WEATHER:	45-69° F Sunny	**DATE START / END**	3/9/2020

Photographic Log

Bottom of test pit at 9.0 feet.

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Winstanley Construction Mana	**TEST PIT LOG**	
	PROJECT: 113 North Maple St.	**PAGE**	**TP-9**
	CITY/STATE: Enfield, CT	1	
	GEI PROJECT NUMBER: 2001141		

GROUND SURFACE ELEVATION (FT):	170	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	8.5 FT
OBSERVED BY:	Bosede Akereyeni	**TOTAL LENGTH:**	9.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Dossen DX 140 LCR	**DATUM VERT. / HORZ.:**	
WEATHER:	45-69° F Sunny	**DATE START / END**	3/9/2020

DEPTH FT.	ANALYZED SAMPLE ID	SOIL DESCRIPTION
0 1		(0-12"): NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% NP fines, brown, moist. Contain organic matter. TOPSOIL.
2		(1.0-2.0'): NARROWLY GRADED SAND WITH SILT (SP-SM); ~90% fine sand, ~10% NP fines, gray-brown, moist.
3 4 5		(2.0-5.0'): NARROWLY GRADED SAND: ~95% fine sand, ~5% NP fines, gray-brown, moist.
6 7 8		(5.0 -8.5'): NARROWLY GRADED SAND (SP): ~95% fine sand, ~5% NP fines,orange-brown, moist.
9 10		Backfilled with excavated soil and tamped down with excavator bucket. Soil mottling or groundwater not encountered in the test pit.
		Bottom of test pit at 8.5 feet.

NOTES:

IN. = INCHES	F=FINE	M=MEDIUM	NP= NON-PLASTIC	NM= NOT MEASURED
FT. = FEET	C=COARSE	LP=LOW PLASTICITY	MP=MEDIUM PLASTICITY	

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Winstanley Construction Mana	**TEST PIT LOG**	
	PROJECT: 113 North Maple St.	**PAGE**	**TP-9**
	CITY/STATE: Enfield, CT	2	
	GEI PROJECT NUMBER: 2001141		

GROUND SURFACE ELEVATION (FT):	170	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	8.5 FT
OBSERVED BY:	Bosede Akereyeni	**TOTAL LENGTH:**	9.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Dossen DX 140 LCR	**DATUM VERT. / HORZ.:**	
WEATHER:	45-69° F Sunny	**DATE START / END**	3/9/2020

Photographic Log

Bottom of test pit at 8.5 feet.
Picture showing the soil strata at Test pit 9

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

Appendix B

Laboratory Test Results

Client:	GEI Consultants, Inc.				
Project:	Geotechnical Investigation				
Location:				Project No:	GTX-311449
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	03/11/20	Checked By:	emm
Depth :	---	Test Id:	548760		

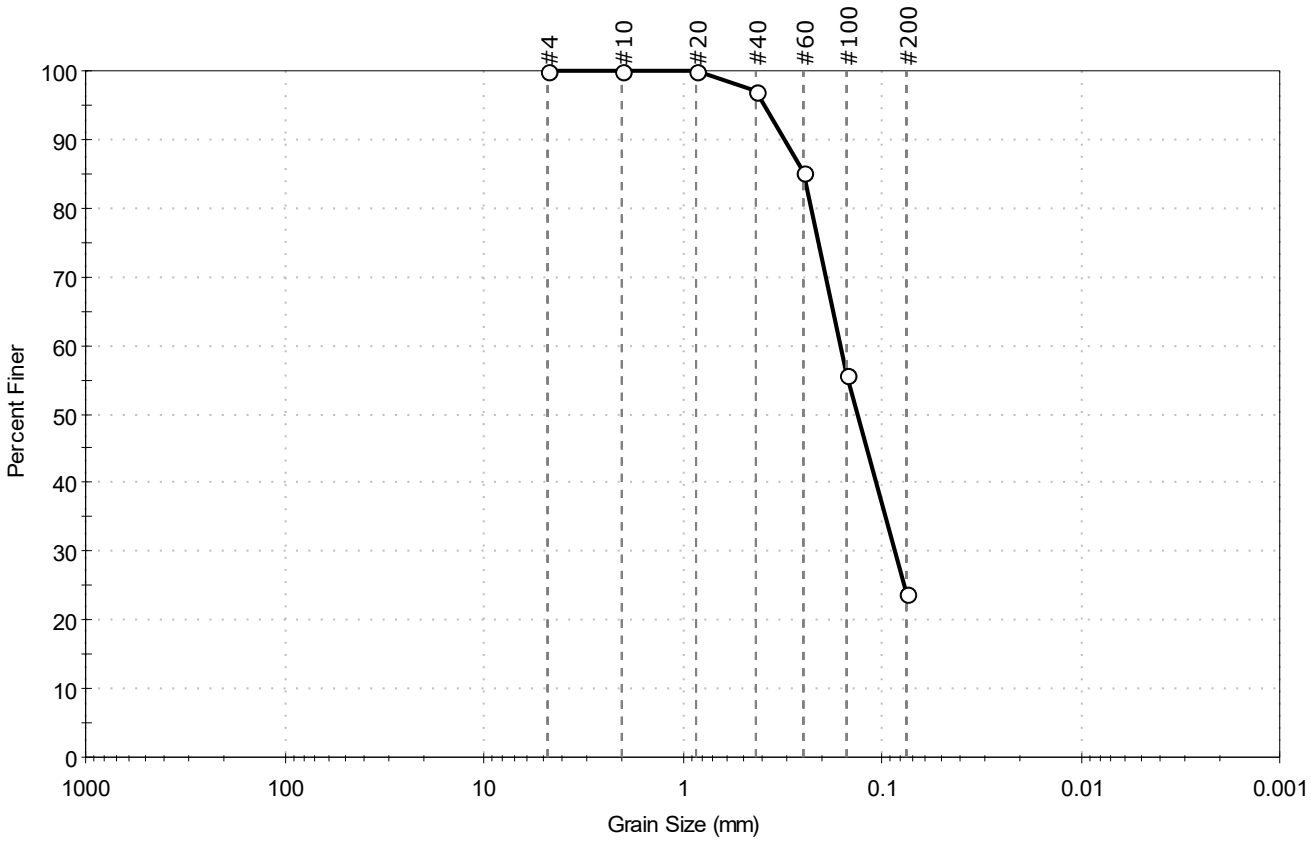
Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
B-6	S2B	2-4 ft	Moist, light yellowish brown silty sand	10.1
B-6	S4	6-8 ft	Moist, light brownish gray silty sand	12.0
B-9	S1	0-2 ft	Moist, brownish yellow sand with silt	5.7
B-17	S1	0-2 ft	Moist, brown sandy silt	21.6

Notes: Temperature of Drying : 110º Celsius

Client:	GEI Consultants, Inc.				
Project:	Geotechnical Investigation				
Location:				Project No:	GTX-311449
Boring ID:	B-6	Sample Type:	bag	Tested By:	ckg
Sample ID:	S2B	Test Date:	03/11/20	Checked By:	emm
Depth :	2-4 ft	Test Id:	548753		
Test Comment:	---				
Visual Description:	Moist, light yellowish brown silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.0	76.1	23.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	97		
#60	0.25	85		
#100	0.15	56		
#200	0.075	24		

Coefficients

D_{85} = 0.2491 mm D_{30} = 0.0857 mm

D_{60} = 0.1614 mm D_{15} = N/A

D_{50} = 0.1323 mm D_{10} = N/A

C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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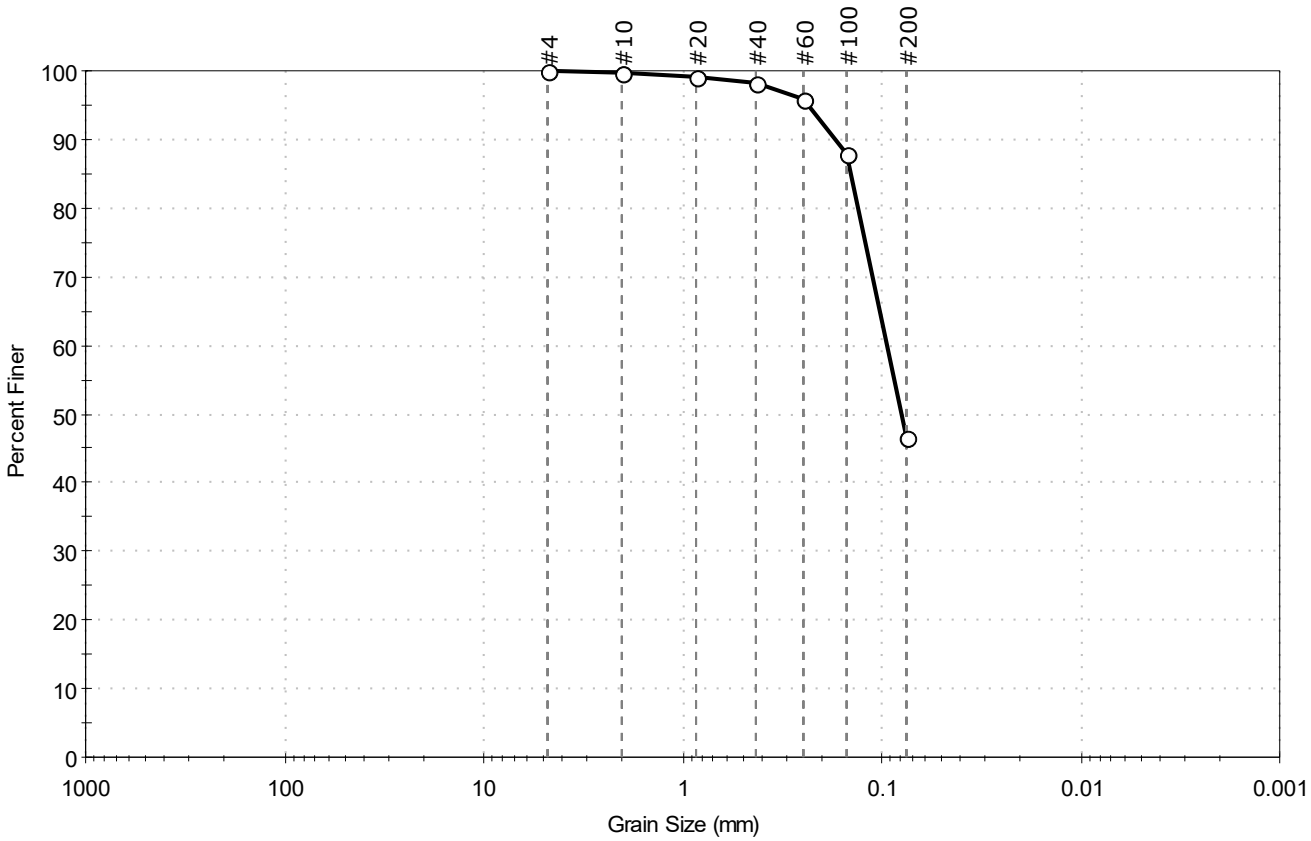
Client:	GEI Consultants, Inc.				
Project:	Geotechnical Investigation				
Location:				Project No:	GTX-311449
Boring ID:	B-6	Sample Type:	bag	Tested By:	ckg
Sample ID:	S4	Test Date:	03/11/20	Checked By:	emm
Depth :	6-8 ft	Test Id:	548754		
Test Comment:	---				
Visual Description:	Moist, light brownish gray silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.0	53.5	46.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	98		
#60	0.25	96		
#100	0.15	88		
#200	0.075	47		

Coefficients

D_{85} = 0.1426 mm D_{30} = N/A

D_{60} = 0.0939 mm D_{15} = N/A

D_{50} = 0.0795 mm D_{10} = N/A

C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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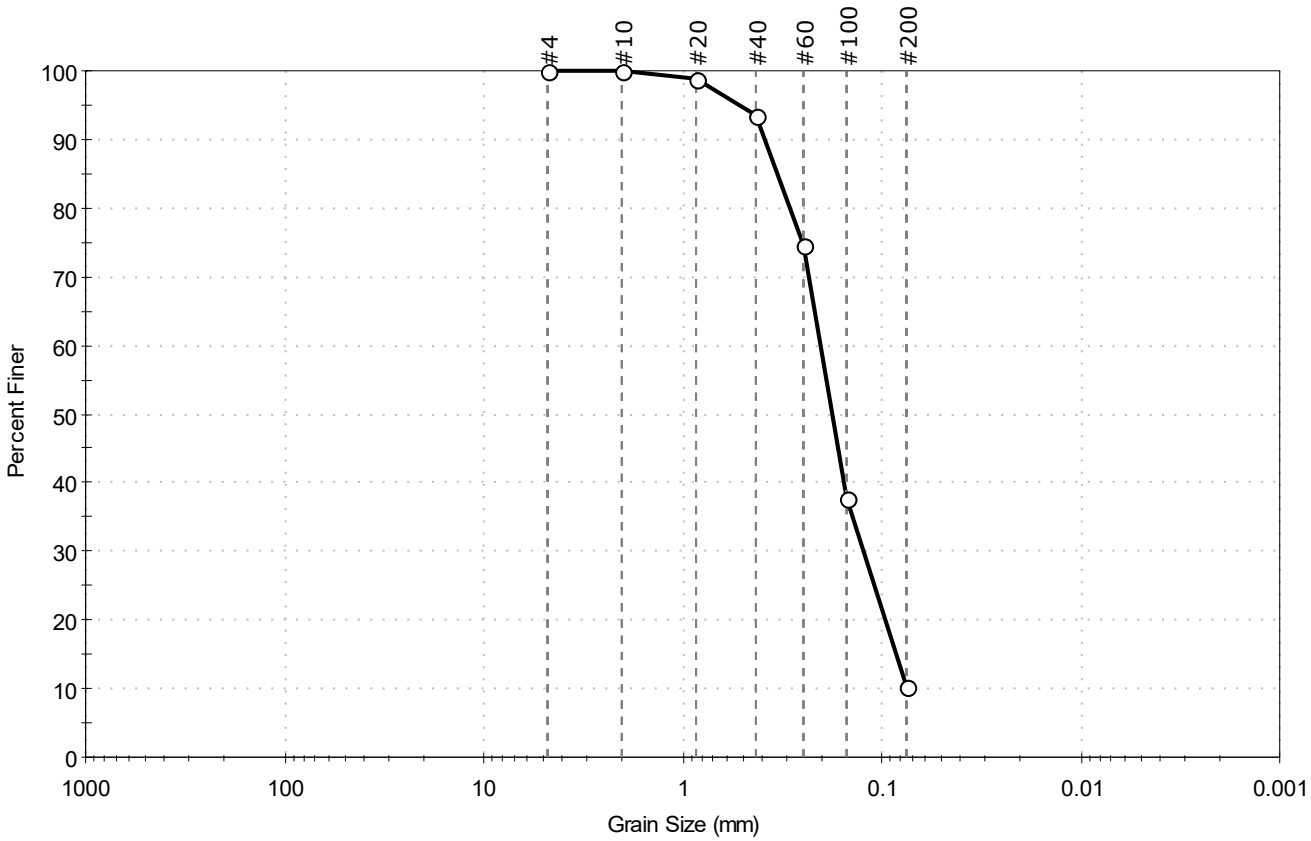
Client:	GEI Consultants, Inc.				
Project:	Geotechnical Investigation				
Location:				Project No:	GTX-311449
Boring ID:	B-9	Sample Type:	bag	Tested By:	ckg
Sample ID:	S1	Test Date:	03/11/20	Checked By:	emm
Depth :	0-2 ft	Test Id:	548755		
Test Comment:	---				
Visual Description:	Moist, brownish yellow sand with silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.0	89.6	10.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	94		
#60	0.25	75		
#100	0.15	38		
#200	0.075	10		

Coefficients

D_{85} = 0.3346 mm D_{30} = 0.1232 mm

D_{60} = 0.2041 mm D_{15} = 0.0843 mm

D_{50} = 0.1777 mm D_{10} = N/A

C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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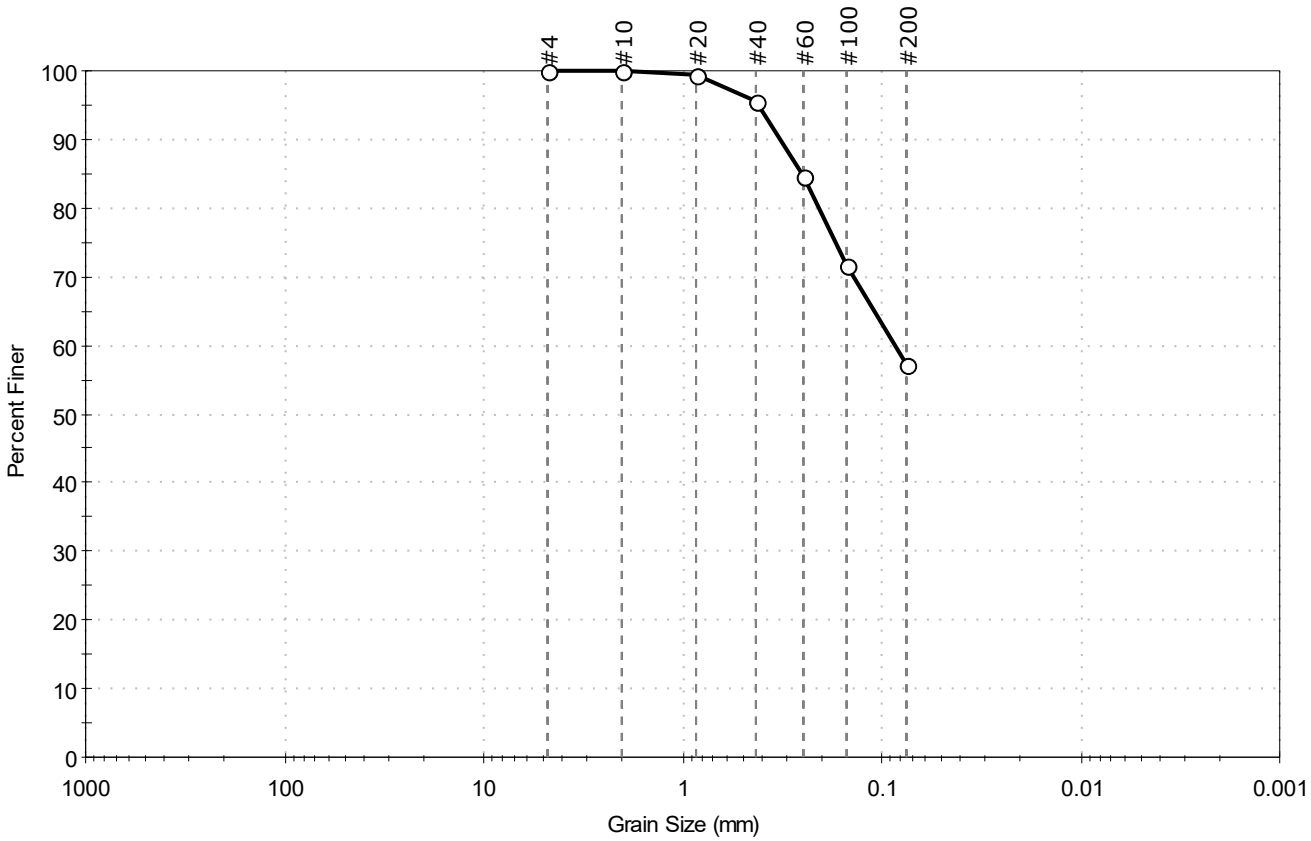
Client:	GEI Consultants, Inc.				
Project:	Geotechnical Investigation				
Location:				Project No:	GTX-311449
Boring ID:	B-17	Sample Type:	bag	Tested By:	ckg
Sample ID:	S1	Test Date:	03/11/20	Checked By:	emm
Depth :	0-2 ft	Test Id:	548756		
Test Comment:	---				
Visual Description:	Moist, brown sandy silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.0	42.9	57.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	96		
#60	0.25	85		
#100	0.15	72		
#200	0.075	57		

Coefficients

D_{85} = 0.2549 mm D_{30} = N/A

D_{60} = 0.0860 mm D_{15} = N/A

D_{50} = N/A D_{10} = N/A

C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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Client:	GEI Consultants, Inc.				
Project:	Geotechnical Investigation				
Location:				Project No:	GTX-311449
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	03/16/20	Checked By:	emm
Depth :	---	Test Id:	551281		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
B-3	Topsoil Sample	6-14 In	Moist, very dark grayish brown silty sand	10.3
B-11	Topsoil Sample	8-15 In	Moist, very dark grayish brown silty sand	16.9
B-18	Topsoil Sample	8-13 In	Moist, very dark grayish brown silty sand	15.6

Notes: Temperature of Drying : 110º Celsius

Client:	GEI Consultants, Inc.				
Project:	Geotechnical Investigation				
Location:				Project No:	GTX-311449
Boring ID:	---	Sample Type:	---	Tested By:	cam
Sample ID:	---	Test Date:	03/16/20	Checked By:	emm
Depth :	---	Test Id:	551284		

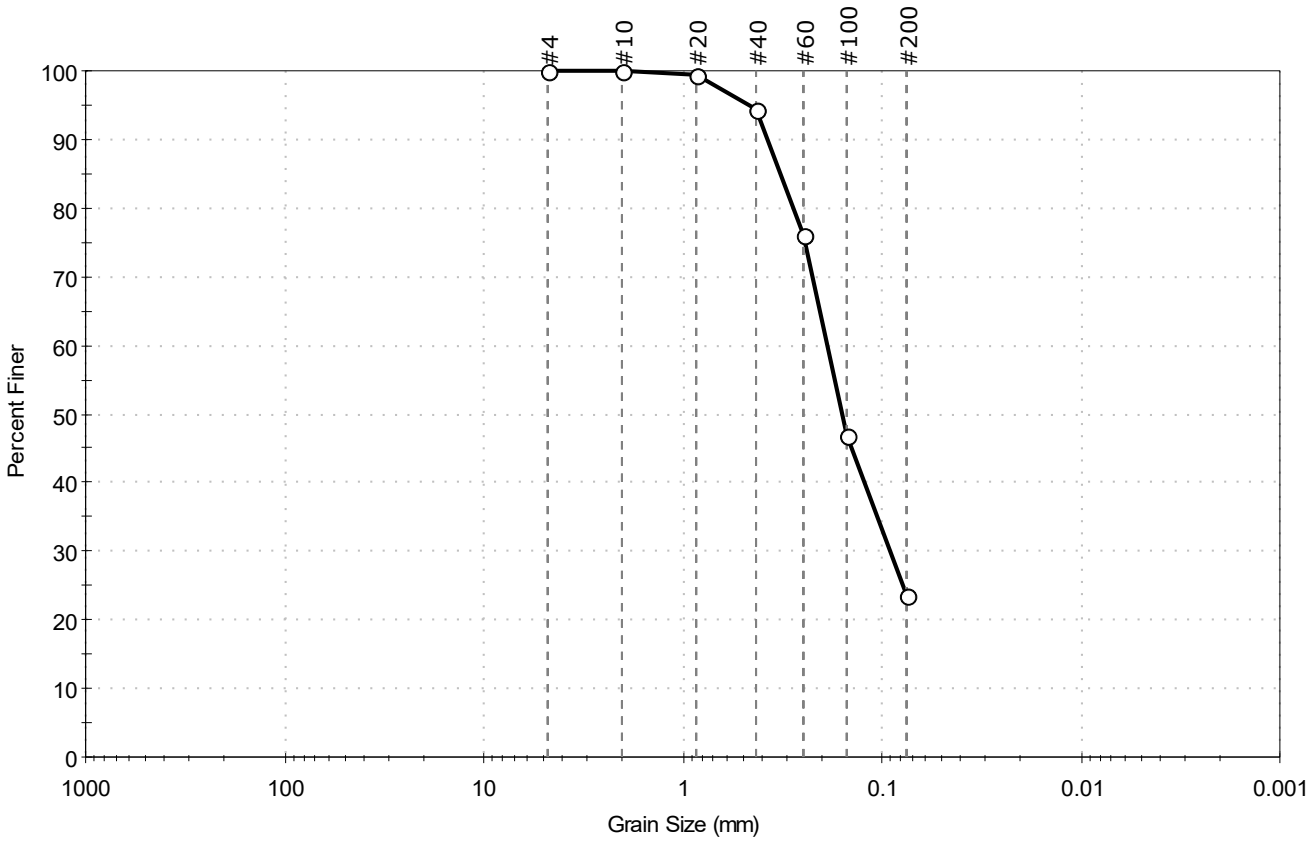
Moisture, Ash, and Organic Matter - ASTM D2974

Boring ID	Sample ID	Depth	Description	Moisture Content,%	Ash Content,%	Organic Matter,%
B-3	Topsoil Sample	6-14 In	Moist, very dark grayish brown silty sand	10	98.1	1.9
B-11	Topsoil Sample	8-15 In	Moist, very dark grayish brown silty sand	17	97.1	2.9
B-18	Topsoil Sample	8-13 In	Moist, very dark grayish brown silty sand	16	97.0	3.0

Notes: Moisture content determined by Method A and reported as a percentage of oven-dried mass; dried to a constant mass at temperature of 105º C
Ash content and organic matter determined by Method C; dried to constant mass at temperature 440º C

Client:	GEI Consultants, Inc.				
Project:	Geotechnical Investigation				
Location:				Project No:	GTX-311449
Boring ID:	B-3	Sample Type:	bag	Tested By:	ckg
Sample ID:	Topsoil Sample	Test Date:	03/18/20	Checked By:	emm
Depth :	6-14 In	Test Id:	551277		
Test Comment:	---				
Visual Description:	Moist, very dark grayish brown silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	76.3	23.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	94		
#60	0.25	76		
#100	0.15	47		
#200	0.075	24		

Coefficients

D_{85} = 0.3237 mm D_{30} = 0.0904 mm

D_{60} = 0.1883 mm D_{15} = N/A

D_{50} = 0.1581 mm D_{10} = N/A

C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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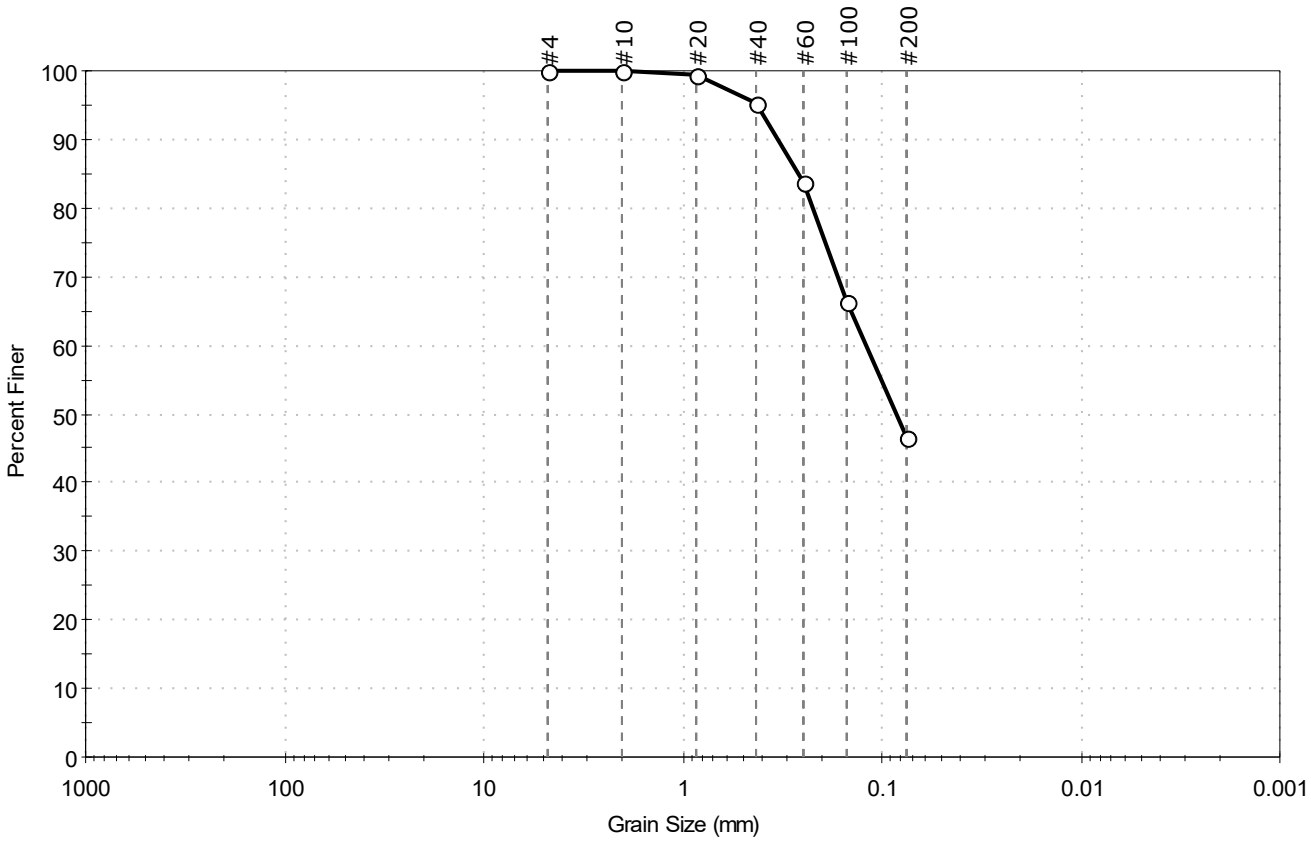
Client:	GEI Consultants, Inc.				
Project:	Geotechnical Investigation				
Location:				Project No:	GTX-311449
Boring ID:	B-11	Sample Type:	bag	Tested By:	ckg
Sample ID:	Topsoil Sample	Test Date:	03/18/20	Checked By:	emm
Depth :	8-15 In	Test Id:	551279		
Test Comment:	---				
Visual Description:	Moist, very dark grayish brown silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	53.3	46.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	95		
#60	0.25	84		
#100	0.15	66		
#200	0.075	47		

Coefficients

D_{85} = 0.2642 mm D_{30} = N/A

D_{60} = 0.1196 mm D_{15} = N/A

D_{50} = 0.0842 mm D_{10} = N/A

C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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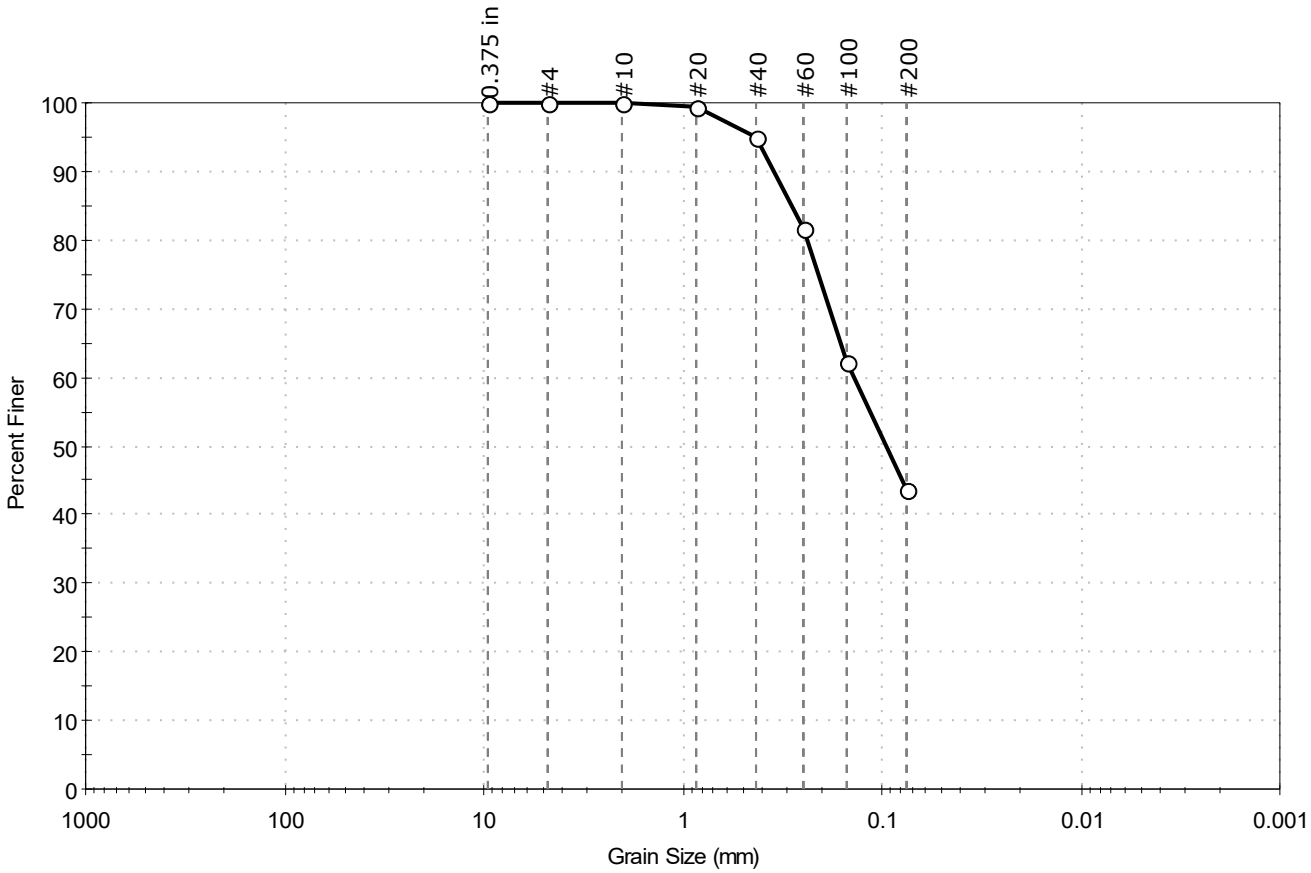
Client:	GEI Consultants, Inc.				
Project:	Geotechnical Investigation				
Location:				Project No:	GTX-311449
Boring ID:	B-18	Sample Type:	bag	Tested By:	ckg
Sample ID:	Topsoil Sample	Test Date:	03/18/20	Checked By:	emm
Depth :	8-13 In	Test Id:	551278		
Test Comment:	---				
Visual Description:	Moist, very dark grayish brown silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	56.3	43.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	95		
#60	0.25	82		
#100	0.15	62		
#200	0.075	44		

Coefficients

D_{85} = 0.2851 mm D_{30} = N/A

D_{60} = 0.1374 mm D_{15} = N/A

D_{50} = 0.0948 mm D_{10} = N/A

C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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Appendix C

Infiltration Test Results

GEI Consultants, Inc.
GEI Proj # 2001141
Guelph Permeameter Testing
Test Date 3/9/2020

Field Data TP-1

Reservoir Combined
Depth of Hole 8"
Bottom of Test Pit 4.0'
Receiving Matl. Silty Sand (SM), approx. 15% fines
GW Depth > 8.0 ft
GEI Rep. B. Akereyeni

Water Level in Well **5 cm**

Time (min)	Time Change (min)	Water Level in Res. (cm)	Change in Res. Water Level (cm)	Rate of Change (cm/min)
0.25		2.71		
0.5	0.25	4	1.29	5.16
0.75	0.25	5.2	1.2	4.8
1	0.25	6.3	1.1	4.4
1.25	0.25	7.2	0.9	3.6
1.5	0.25	8.2	1	4
1.75	0.25	9.1	0.9	3.6
2	0.25	9.9	0.8	3.2
2.25	0.25	10.8	0.9	3.6
2.5	0.25	11.8	1	4
2.75	0.25	12.5	0.7	2.8
3	0.25	13.5	1	4
3.25	0.25	14.2	0.7	2.8
3.5	0.25	15.1	0.9	3.6
3.75	0.25	15.8	0.7	2.8
4	0.25	16.3	0.5	2
4.25	0.25	17.4	1.1	4.4
4.5	0.25	18.3	0.9	3.6
4.75	0.25	19	0.7	2.8
5	0.25	19.9	0.9	3.6
5.25	0.25	20.6	0.7	2.8
5.5	0.25	21.3	0.7	2.8
	Steady Rate of Change, R_1 (cm/min)			**3.12**

Water Level in Well **10 cm**

Time (min)	Time Change (min)	Water Level in Res. (cm)	Change in Res. Water Level (cm)	Rate of Change (cm/min)
0.25		6.1		
0.5	0.25	8.5	2.4	9.6
0.75	0.25	10.6	2.1	8.4
1	0.25	13	2.4	9.6
1.25	0.25	14.9	1.9	7.6
1.5	0.25	16.7	1.8	7.2
1.75	0.25	18.8	2.1	8.4
2	0.25	20.6	1.8	7.2
2.25	0.25	22.3	1.7	6.8
2.5	0.25	24.1	1.8	7.2
2.75	0.25	26.2	2.1	8.4
3	0.25	27.7	1.5	6
3.25	0.25	29.7	2	8
3.5	0.25	31.3	1.6	6.4
3.75	0.25	33.1	1.8	7.2
4	0.25	35	1.9	7.6
4.25	0.25	36.4	1.4	5.6
4.5	0.25	38.1	1.7	6.8
4.75	0.25	39.8	1.7	6.8
5	0.25	41.4	1.6	6.4
5.25	0.25	43.1	1.7	6.8
5.5	0.25	44.8	1.7	6.8
5.75	0.25	46.4	1.6	6.4
6	0.25	47.9	1.5	6
6.25	0.25	49.9	2	8
6.5	0.25	51.4	1.5	6
6.75	0.25	52.6	1.2	4.8
7	0.25	53.9	1.3	5.2
7.25	0.25	55.5	1.6	6.4
7.5	0.25	57.3	1.8	7.2
7.75	0.25	58.9	1.6	6.4
8	0.25	60.2	1.3	5.2
8.25	0.25	61.9	1.7	6.8
8.5	0.25	63.5	1.6	6.4
8.75	0.25	65.1	1.6	6.4
9	0.25	66.6	1.5	6
9.25	0.25	68	1.4	5.6

Steady Rate of Change, R2 (cm/min) **6.11**

GEI Consultants, Inc. **Calc. by:** B. Akereyeni **Date:** 3/10/2020
GEI Proj # 2001141 **Check by:** M. Glunt **Date:** 3/19/2020
Guelph Permeameter Testing - TP-1

Single Head Method - Test 1

Test Data and Information

• Reservoir		-	Combined		
• Reservoir Cross-Sectional Area		-	35.22	cm^2	(Provided on Permeameter)
• Water Head Height	H_1	-	5	cm	
• Borehole Radius	a	-	3.2	cm	Assumed slightly larger than 3cm rad. hand auger
• Soil Texture-Structure Category		-	3		(Table 2: Medium and fine sands)
• Steady State Rate of Water Level Change	R_1	-	3.12	cm/min	(Obtained during testing)

Test Calculations and Results

• Microscopic Capillary Length Factor	α^*	-	0.12	cm^{-1}	(Table 2: Based on Soil Texture-Structure Category)
• Shape Factor	C_1	-	0.768		(Table 2: Based on Soil Texture-Structure Category)
• Volumetric Flow Rate	Q_1	-	1.8314	cm^3/sec	(Table 3: One Head, Combined Reservoir)
• Soil Saturated Hydraulic Conductivity	K_{fs}	-	3.169E-03	cm/sec	(Table 3: One Head, Combined Reservoir)
• Soil Matrix Flux Potential	Φ_m	-	2.641E-02	cm^2/sec	(Table 3: One Head, Combined Reservoir)

Single Head Method - Test 2

Test Data and Information

• Reservoir		-	Combined		
• Reservoir Cross-Sectional Area		-	35.22	cm^2	(Provided on Permeameter)
• Water Head Height	H_2	-	10	cm	
• Borehole Radius	a	-	3.2	cm	Assumed slightly larger than 3cm rad. hand auger
• Soil Texture-Structure Category		-	3		(Table 2: Medium and fine sands)
• Steady State Rate of Water Level Change	R_2	-	6.11	cm/min	(Obtained during testing)

Test Calculations and Results

• Microscopic Capillary Length Factor	α^*	-	0.12	cm^{-1}	(Table 2: Based on Soil Texture-Structure Category)
• Shape Factor	C_2	-	1.234		(Table 2: Based on Soil Texture-Structure Category)
• Volumetric Flow Rate	Q_2	-	3.589085714	cm^3/sec	(Table 3: One Head, Combined Reservoir)
• Soil Saturated Hydraulic Conductivity	K_{fs}	-	3.717E-03	cm/sec	(Table 3: One Head, Combined Reservoir)
• Soil Matrix Flux Potential	Φ_m	-	3.097E-02	cm^2/sec	(Table 3: One Head, Combined Reservoir)

Test Averages

• Soil Saturated Hydraulic Conductivity	K_{fs}	-	**3.443E-03**	cm/sec
			4.9	in/hour

GEI Consultants, Inc.
GEI Proj # 2001141
Guelph Permeameter Testing
Test Date 3/9/2020

Field Data TP-6

Reservoir Combined
Depth of Hole 8"
Bottom of Test Pit 4.0'
Receiving Matl. Sand (SP), approx. 5% fines
GW Depth 7.0 ft
GEI Rep. B. Akereyeni

Water Level in Well **5 cm**

Time (min)	Time Change (min)	Water Level in Res. (cm)	Change in Res. Water Level (cm)	Rate of Change (cm/min)
0.5		3.1		
1	0.50	3.2	0.1	0.2
1.5	0.50	3.4	0.2	0.4
2	0.50	3.6	0.2	0.4
2.5	0.50	4	0.4	0.8
3	0.50	4.2	0.2	0.4
3.5	0.50	4.4	0.2	0.4
4	0.50	4.7	0.3	0.6
4.5	0.50	4.9	0.2	0.4
5	0.50	5.1	0.2	0.4
5.5	0.50	5.5	0.4	0.8
6	0.50	5.7	0.2	0.4
6.5	0.50	5.9	0.2	0.4
7	0.50	6.1	0.2	0.4
7.5	0.50	6.3	0.2	0.4
8	0.50	6.5	0.2	0.4
8.5	0.50	6.7	0.2	0.4
9	0.50	6.9	0.2	0.4
9.5	0.50	7.2	0.3	0.6
10	0.50	7.3	0.1	0.2
10.5	0.50	7.5	0.2	0.4
11	0.50	7.8	0.3	0.6
	Steady Rate of Change, R_1 (cm/min)			**0.4**

Water Level in Well 10 cm

Time (min)	Time Change (min)	Water Level in Res. (cm)	Change in Res. Water Level (cm)	Rate of Change (cm/min)
0.5		15.6		
1	0.50	15.9	0.3	0.6
1.5	0.50	16.2	0.3	0.6
2	0.50	16.6	0.4	0.8
2.5	0.50	17	0.4	0.8
3	0.50	17.4	0.4	0.8
3.5	0.50	17.9	0.5	1
4	0.50	18.3	0.4	0.8
4.5	0.50	18.7	0.4	0.8
5	0.50	19.2	0.5	1
5.5	0.50	19.6	0.4	0.8
6	0.50	20	0.4	0.8
6.5	0.50	20.5	0.5	1
7	0.50	20.8	0.3	0.6
7.5	0.50	21.4	0.6	1.2
8	0.50	21.7	0.3	0.6
8.5	0.50	22.1	0.4	0.8
9	0.50	22.6	0.5	1
9.5	0.50	23	0.4	0.8
10	0.50	23.4	0.4	0.8
10.5	0.50	23.9	0.5	1

Steady Rate of Change, R2 (cm/min) 0.87

GEI Consultants, Inc. **Calc. by:** B. Akereyeni **Date:** 3/10/2020
GEI Proj # 2001141 **Check by:** M. Glunt **Date:** 3/20/2020
Guelph Permeameter Testing - TP-6

Single Head Method - Test 1

Test Data and Information

• Reservoir		-	Combined		
• Reservoir Cross-Sectional Area		-	35.22	cm^2	(Provided on Permeameter)
• Water Head Height	H_1	-	5	cm	
• Borehole Radius	a	-	3.2	cm	Assumed slightly larger than 3cm rad. hand auger
• Soil Texture-Structure Category		-	3		(Table 2: Medium and fine sands)
• Steady State Rate of Water Level Change	R_1	-	0.4	cm/min	(Obtained during testing)

Test Calculations and Results

• Microscopic Capillary Length Factor	α^*	-	0.12	cm^{-1}	(Table 2: Based on Soil Texture-Structure Category)
• Shape Factor	C_1	-	0.768		(Table 2: Based on Soil Texture-Structure Category)
• Volumetric Flow Rate	Q_1	-	0.2348	cm^3/sec	(Table 3: One Head, Combined Reservoir)
• Soil Saturated Hydraulic Conductivity	K_{fs}	-	4.063E-04	cm/sec	(Table 3: One Head, Combined Reservoir)
• Soil Matrix Flux Potential	Φ_m	-	3.386E-03	cm^2/sec	(Table 3: One Head, Combined Reservoir)

Single Head Method - Test 2

Test Data and Information

• Reservoir		-	Combined		
• Reservoir Cross-Sectional Area		-	35.22	cm^2	(Provided on Permeameter)
• Water Head Height	H_2	-	10	cm	
• Borehole Radius	a	-	3.2	cm	Assumed slightly larger than 3cm rad. hand auger
• Soil Texture-Structure Category		-	3		(Table 2: Medium and fine sands)
• Steady State Rate of Water Level Change	R_2	-	0.866666667	cm/min	(Obtained during testing)

Test Calculations and Results

• Microscopic Capillary Length Factor	α^*	-	0.12	cm^{-1}	(Table 2: Based on Soil Texture-Structure Category)
• Shape Factor	C_2	-	1.234		(Table 2: Based on Soil Texture-Structure Category)
• Volumetric Flow Rate	Q_2	-	0.508733333	cm^3/sec	(Table 3: One Head, Combined Reservoir)
• Soil Saturated Hydraulic Conductivity	K_{fs}	-	5.268E-04	cm/sec	(Table 3: One Head, Combined Reservoir)
• Soil Matrix Flux Potential	Φ_m	-	4.390E-03	cm^2/sec	(Table 3: One Head, Combined Reservoir)

Test Averages

• Soil Saturated Hydraulic Conductivity	K_{fs}	-	**4.665E-04**	cm/sec
			0.7	in/hour

GEI Consultants, Inc.
GEI Proj # 2001141
Guelph Permeameter Testing
Test Date 3/9/2020

Field Data TP-7

Reservoir Combined
Depth of Hole 9"
Bottom of Test Pit 4.0'
Receiving Matl. Sand (SP), approx. 5% fines
GW Depth > 8.0 ft
GEI Rep. B. Akereyeni

Water Level in Well **5 cm**

Time (min)	Time Change (min)	Water Level in Res. (cm)	Change in Res. Water Level (cm)	Rate of Change (cm/min)
0.25		13.2		
0.5	0.25	20.2	7	28
0.75	0.25	27.1	6.9	27.6
1	0.25	33	5.9	23.6
1.25	0.25	39.9	6.9	27.6
1.5	0.25	46	6.1	24.4
1.75	0.25	51	5	20
2	0.25	57	6	24
2.25	0.25	64	7	28
2.5	0.25	69	5	20
2.75	0.25	74.5	5.5	22
	Steady Rate of Change, R_1 (cm/min)			**23.33**

Water Level in Well 10 cm

Time (min)	Time Change	Water Level	Change in Res.	Rate of Change
0.1666		17		
0.333	0.17	26	9	54.08653846
0.5	0.17	33	7	41.91616766
0.6666	0.17	39	6	36.01440576
0.8333	0.17	45	6	35.99280144
1	0.17	52	7	41.99160168
1.1667	0.17	58.5	6.5	38.99220156
1.3334	0.17	63.5	5	29.9940012
1.5001	0.17	74	10.5	62.98740252

Steady Rate of Change, R2 (cm/min) 43.99

GEI Consultants, Inc. **Calc. by:** B. Akereyeni **Date:** 3/10/2020
GEI Proj # 2001141 **Check by:** M. Glunt **Date:** 3/20/2020
Guelph Permeameter Testing - TP-7

Single Head Method - Test 1

Test Data and Information

• Reservoir		-	Combined		
• Reservoir Cross-Sectional Area		-	35.22	cm^2	(Provided on Permeameter)
• Water Head Height	H_1	-	5	cm	
• Borehole Radius	a	-	3.2	cm	Assumed slightly larger than 3cm rad. hand auger
• Soil Texture-Structure Category		-	3		(Table 2: Medium and fine sands)
• Steady State Rate of Water Level Change	R_1	-	16.00	cm/min	(Obtained during testing)

Test Calculations and Results

• Microscopic Capillary Length Factor	α^*	-	0.12	cm^{-1}	(Table 2: Based on Soil Texture-Structure Category)
• Shape Factor	C_1	-	0.768		(Table 2: Based on Soil Texture-Structure Category)
• Volumetric Flow Rate	Q_1	-	9.3901	cm^3/sec	(Table 3: One Head, Combined Reservoir)
• Soil Saturated Hydraulic Conductivity	K_{fs}	-	1.625E-02	cm/sec	(Table 3: One Head, Combined Reservoir)
• Soil Matrix Flux Potential	Φ_m	-	1.354E-01	cm^2/sec	(Table 3: One Head, Combined Reservoir)

Single Head Method - Test 2

Test Data and Information

• Reservoir		-	Combined		
• Reservoir Cross-Sectional Area		-	35.22	cm^2	(Provided on Permeameter)
• Water Head Height	H_2	-	10	cm	
• Borehole Radius	a	-	3.2	cm	Assumed slightly larger than 3cm rad. hand auger
• Soil Texture-Structure Category		-	3		(Table 2: Medium and fine sands)
• Steady State Rate of Water Level Change	R_2	-	42.39	cm/min	(Obtained during testing)

Test Calculations and Results

• Microscopic Capillary Length Factor	α^*	-	0.12	cm^{-1}	(Table 2: Based on Soil Texture-Structure Category)
• Shape Factor	C_2	-	1.234		(Table 2: Based on Soil Texture-Structure Category)
• Volumetric Flow Rate	Q_2	-	24.88382324	cm^3/sec	(Table 3: One Head, Combined Reservoir)
• Soil Saturated Hydraulic Conductivity	K_{fs}	-	2.577E-02	cm/sec	(Table 3: One Head, Combined Reservoir)
• Soil Matrix Flux Potential	Φ_m	-	2.147E-01	cm^2/sec	(Table 3: One Head, Combined Reservoir)

Test Averages

• Soil Saturated Hydraulic Conductivity	K_{fs}	-	**2.101E-02**	cm/sec
			29.8	in/hour

GEI Consultants, Inc.
GEI Proj # 2001141
Guelph Permeameter Testing
Test Date 3/9/2020

Field Data TP-8

Reservoir Combined
Depth of Hole 8"
Bottom of Test Pit 4.0'
Receiving Matl. Sand with Silt (SP/SM), approx. 10% fines
GW Depth > 9.0 ft
GEI Rep. B. Akereyeni

Water Level in Well **5 cm**

Time (min)	Time Change (min)	Water Level in Res. (cm)	Change in Res. Water Level (cm)	Rate of Change (cm/min)
0.1666		4.4		
0.333	0.17	6.5	2.1	12.620
0.5	0.17	8.6	2.1	12.575
0.6666	0.17	10.5	1.9	11.405
0.8333	0.17	12.2	1.7	10.198
1	0.17	13.9	1.7	10.198
1.1667	0.17	15.4	1.5	8.998
1.3334	0.17	16.9	1.5	8.998
1.5001	0.17	18.4	1.5	8.998
1.6668	0.17	20	1.6	9.598
1.8335	0.17	21.3	1.3	7.798
2.0002	0.17	22.9	1.6	9.598
2.1669	0.17	24.1	1.2	7.199
2.3336	0.17	25.4	1.3	7.798
2.5003	0.17	26.7	1.3	7.798
2.667	0.17	27.9	1.2	7.199
2.8337	0.17	29.2	1.3	7.798
3.0004	0.17	30.4	1.2	7.199
3.1671	0.17	31.6	1.2	7.199
	Steady Rate of Change, R_1 (cm/min)			**7.598**

Water Level in Well **10 cm**

Time (min)	Time Change	11.5	Change in Res.	Rate of Change
0.1666		17.6		
0.333	0.17	23.9	6.3	37.861
0.5	0.17	29.9	6	35.928
0.6666	0.17	35.5	5.6	33.613
0.8333	0.17	40	4.5	26.995
1	0.17	45.5	5.5	32.993
1.1667	0.17	49.9	4.4	26.395
1.3334	0.17	54	4.1	24.595
1.5001	0.17	57.5	3.5	20.996
1.6668	0.17	60.6	3.1	18.596
1.8335	0.17	65.2	4.6	27.594
2.0002	0.17	68.6	3.4	20.396
2.1669	0.17	72.9	4.3	25.795
2.3336	0.17	75	2.1	12.597
	Steady Rate of Change, R2 (cm/min)			**23.995**

GEI Consultants, Inc. **Calc. by:** B. Akereyeni **Date:** 3/10/2020
GEI Proj # 2001141 **Check by:** M. Glunt **Date:** 3/20/2020
Guelph Permeameter Testing - TP-8

Single Head Method - Test 1

Test Data and Information

• Reservoir		-	Combined		
• Reservoir Cross-Sectional Area		-	35.22	cm^2	(Provided on Permeameter)
• Water Head Height	H_1	-	5	cm	
• Borehole Radius	a	-	3.2	cm	Assumed slightly larger than 3cm rad. hand auger
• Soil Texture-Structure Category		-	3		(Table 2: Medium and fine sands)
• Steady State Rate of Water Level Change	R_1	-	7.60	cm/min	(Obtained during testing)

Test Calculations and Results

• Microscopic Capillary Length Factor	α^*	-	0.12	cm^{-1}	(Table 2: Based on Soil Texture-Structure Category)
• Shape Factor	C_1	-	0.768		(Table 2: Based on Soil Texture-Structure Category)
• Volumetric Flow Rate	Q_1	-	4.4603	cm^3/sec	(Table 3: One Head, Combined Reservoir)
• Soil Saturated Hydraulic Conductivity	K_{fs}	-	7.718E-03	cm/sec	(Table 3: One Head, Combined Reservoir)
• Soil Matrix Flux Potential	Φ_m	-	6.432E-02	cm^2/sec	(Table 3: One Head, Combined Reservoir)

Single Head Method - Test 2

Test Data and Information

• Reservoir		-	Combined		
• Reservoir Cross-Sectional Area		-	35.22	cm^2	(Provided on Permeameter)
• Water Head Height	H_2	-	10	cm	
• Borehole Radius	a	-	3.2	cm	Assumed slightly larger than 3cm rad. hand auger
• Soil Texture-Structure Category		-	3		(Table 2: Medium and fine sands)
• Steady State Rate of Water Level Change	R_2	-	24.00	cm/min	(Obtained during testing)

Test Calculations and Results

• Microscopic Capillary Length Factor	α^*	-	0.12	cm^{-1}	(Table 2: Based on Soil Texture-Structure Category)
• Shape Factor	C_2	-	1.234		(Table 2: Based on Soil Texture-Structure Category)
• Volumetric Flow Rate	Q_2	-	14.08518296	cm^3/sec	(Table 3: One Head, Combined Reservoir)
• Soil Saturated Hydraulic Conductivity	K_{fs}	-	1.459E-02	cm/sec	(Table 3: One Head, Combined Reservoir)
• Soil Matrix Flux Potential	Φ_m	-	1.215E-01	cm^2/sec	(Table 3: One Head, Combined Reservoir)

Test Averages

• Soil Saturated Hydraulic Conductivity	K_{fs}	-	**1.115E-02**	cm/sec
			15.8	in/hour

Table 2

Soil Texture-Structure Category	α^*(cm^{-1})	Shape Factor
Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.	0.01	$C_1 = \left(\frac{H_2/a}{2.081 + 0.121\left(H_2/a\right)}\right)^{0.672}$
Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.	0.04	$C_1 = \left(\frac{H_1/a}{1.992 + 0.091\left(H_1/a\right)}\right)^{0.683}$ $C_2 = \left(\frac{H_2/a}{1.992 + 0.091\left(H_2/a\right)}\right)^{0.683}$
Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.	0.12	$C_1 = \left(\frac{H_1/a}{2.074 + 0.093\left(H_1/a\right)}\right)^{0.754}$ $C_2 = \left(\frac{H_2/a}{2.074 + 0.093\left(H_2/a\right)}\right)^{0.754}$
Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macro pores, etc.	0.36	$C_1 = \left(\frac{H_1/a}{2.074 + 0.093\left(H_1/a\right)}\right)^{0.754}$ $C_2 = \left(\frac{H_2/a}{2.074 + 0.093\left(H_2/a\right)}\right)^{0.754}$

Calculation formulas related to shape factor (C). Where H_1 is the first water head height (cm), H_2 is the second water head height (cm), a is borehole radius (cm) and α^* is microscopic capillary length factor which is decided according to the soil texture-structure category. For one-head method, only C_1 needs to be calculated while for two-head method, C_1 and C_2 are calculated (Zang et al., 1998).

Table 3

One Head, Combined Reservoir	$Q_1 = \bar{R}_1 \times 35.22$	$K_{fs} = \frac{C_1 \times Q_1}{2\pi H_1^2 + \pi a^2 C_1 + 2\pi\left(\frac{H_1}{a^*}\right)}$ $\Phi_m = \frac{C_1 \times Q_1}{(2\pi H_1^2 + \pi a^2 C_1)a^* + 2\pi H_1}$
One Head, Inner Reservoir	$Q_1 = \bar{R}_1 \times 2.16$	
Two Head, Combined Reservoir	$Q_1 = \bar{R}_1 \times 35.22$ $Q_2 = \bar{R}_2 \times 35.22$	$G_1 = \frac{H_2 C_1}{\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $G_2 = \frac{H_1 C_2}{\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $K_{fs} = G_2Q_2 - G_1Q_1$ $G_3 = \frac{(2H_2^2 + a^2C_2)C_1}{2\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $G_4 = \frac{(2H_1^2 + a^2C_1)C_2}{2\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $\Phi_m = G_3Q_1 - G_4Q_2$
Two Head, Inner Reservoir	$Q_1 = \bar{R}_1 \times 2.16$ $Q_2 = \bar{R}_2 \times 2.16$	

Calculation formulas related to one-head and two-head methods. Where R is steady-state rate of fall of water in reservoir (cm/s), K_{fs} is Soil saturated hydraulic conductivity (cm/s), Φ_m is Soil matric flux potential (cm^2/s), a^* is Macroscopic capillary length parameter (from Table 2), a is Borehole radius (cm), H_1 is the first head of water established in borehole (cm) , H_2 is the second head of water established in borehole (cm) and C is Shape factor (from Table 2).

Appendix D

Previous Geotechnical Investigation

TEST BORING REPORT

HALEY ALDRICH

Boring No. B1

Project	97 & 113 North Maple Street, Enfield, Connecticut
Client	Winstanley Construction Management, LLC as Agent For WE Acquisitions LLC
Contractor	New England Boring Contractors

File No.	130033-002
Sheet No.	1 of 3
Start	13 March 2017
Finish	15 March 2017
Driller	B. Manlea
H&A Rep.	B. Govoni
Elevation	167.5 (est.)
Datum	NGVD29
Location	See Plan

	Casing	Sampler	Barrel
Type	HW	S	--
Inside Diameter (in.)	4.0	1 3/8	--
Hammer Weight (lb)	300	140	-
Hammer Fall (in.)	24	30	-

Drilling Equipment and Procedures

Rig Make & Model: Track-mounted Mobile B57
Bit Type: Roller Bit
Drill Mud: Polymer
Casing: Driven to 20.0 ft
Hoist/Hammer: Winch Automatic Hammer
PID Make & Model: None

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	8 3 3 4	S1 18	0.0 2.0	167.0 0.5	SM	Loose tan silty SAND (SM), mps < 1.0mm, trace roots, no odor, dry, frozen	-	-	-	10	75	15				
					SP	-TOPSOIL-	-	-	-	5	95	-				
	6 5 4 4	S2 18	2.0 4.0		SP	Loose tan poorly-graded SAND (SP), mps 1.0mm, no structure, no odor, dry Loose tan to orange-brown poorly-graded SAND (SP), mps 1.0mm, some mottling, faint stratification, no odor, moist	-	-	-	10	90	-				
	3 5 9 13	S3 16	4.0 6.0	163.5 4.0	SM	Medium dense dark orange-brown silty SAND (SM), mps < 0.43mm, some mottling, moist	-	-	-	-	85	15				
5				162.0 5.5	SP	Medium dense orange-brown poorly-graded SAND (SP), mps 1.0mm, faint stratification, no odor, moist	-	-	-	10	90	-				
	16 19 22 26	S4 12	6.0 8.0		SP	Similar to S3, below 5.5 ft, except dense	-	-	-	10	90	-				
	11 14 17 17	S5 12	8.0 10.0		SP	Dense tan poorly-graded SAND (SP), mps < 1.0mm, stratified, no odor, moist	-	-	-	15	80	5				
10	14 20 20 20	S6 12	10.0 12.0		SP	Similar to S5	-	-	-	15	85	-				
	4 7 8 8	S7 10	14.0 16.0		SP	Medium dense gray-brown poorly-graded SAND (SP), mps 1.0mm, no structure, no odor, moist	-	-	-	10	90	-				
15																
	2 2 3 4	S8 20	19.0 21.0		SP	Loose brown poorly-graded SAND (SP), mps 0.84mm, no structure, no odor, wet	-	-	-	8	91	1				
20						-ALLUVIAL DEPOSITS-										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
Not Measured					

Sample ID

O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (ft)	79.6
Rock Cored (ft)	-
Samples	20S

Boring No. B1

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

HALEY ALDRICH

TEST BORING REPORT

Boring No. B1

File No. 130033-002

Sheet No. 2 of 3

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
25	11 14 17 14	S9 20	24.0 26.0		SM	Dense brown silty SAND (SM), mps 1.0mm, some stratification, no odor, wet	-	-	-	10	75	15				
30	7 9 9 12	S10 22	29.0 31.0		SM	Medium dense brown silty SAND (SM), mps 1.0mm, infrequent clay seams, stratified, some oxidation, no odor, wet	-	-	-	10	70	20				
35	6 8 8 10	S11 24	34.0 36.0		SM	Similar to S10	-	-	-	10	70	20				
40	9 14 11 19	S12 16	39.0 41.0		SP-SM	Medium dense brown to gray-brown poorly-graded SAND with silt (SP-SM), mps < 0.43mm, stratified, no odor, wet	-	-	-	-	90	10				
45	7 6 11 13	S13 24	44.0 46.0		SM	Medium dense brown silty SAND (SM), mps < 0.43mm, some stratification, infrequent clay seams, no odor, wet	-	-	-	-	85	15				
50	3 7 9 9	S14 24	49.0 51.0		SM	Medium dense brown silty SAND (SM), mps < 0.43mm, some stratification, infrequent clay seams, no odor, wet	-	-	-	-	85	15				
				114.0 53.5		-ALLUVIAL DEPOSITS-										
55	4 5 8 10	S15 24	54.0 56.0		MH/CL	Stiff brown SILT & CLAY (MH/CL), mps 0.43mm, infrequent sand seams, no odor, wet, trace fine sand -GLACIOFLUVIAL DEPOSITS-	-	-	-	-	10	90	S	M	M	L

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. B1

TEST BORING REPORT

HALEY ALDRICH

Boring No. B1

File No. 130033-002

Sheet No. 3 of 3

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
60	16 15 20 28	S16 22	59.0 61.0		SM	Dense olive-brown silty SAND (SM), mps < 0.43mm, faintly laminated, infrequent clay seams, no odor, wet	-	-	-	-	80	20				
65	8 10 9 13	S17 24	64.0 66.0		ML	Medium dense olive-brown sandy SILT (ML), mps < 0.43mm, some oxidation, faintly laminated, no odor, wet, trace clay	-	-	-	-	30	70				
70	10 12 18 18	S18 24	69.0 71.0		SM	Medium dense brown to red-brown silty SAND (SM), mps 1.0mm, faintly stratified, less structure with depth, no odor, wet	-	-	-	5	80	15				
				94.5 73.0		-GLACIOFLUVIAL DEPOSITS-										
75	14 19 29 57	S19 20	74.0 76.0		SM	Dense red-brown silty SAND (SM), mps 1.25 in., no structure, slightly bonded, wet	5	5	5	10	50	25				
						-GLACIAL TILL-										
	57 50/1"	S20 2	79.0 79.6	87.9 79.6	SM	Very dense brown silty SAND (SM), mps 1.25 in., no structure, slightly bonded, wet	5	5	10	10	50	20				
						BOTTOM OF EXPLORATION 79.6 FT										
						Note: Drill rig change below 69 ft. on 15 March 2017 to Diedrich D50 equipped with cat head hoist and safety hammer.										

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. B1

TEST BORING REPORT

HALEY ALDRICH

Boring No. B2

Project	97 & 113 North Maple Street, Enfield, Connecticut
Client	Winstanley Construction Management, LLC as Agent For WE Acquisitions LLC
Contractor	New England Boring Contractors

File No. 130033-002
Sheet No. 1 of 1
Start 16 March 2017
Finish 16 March 2017
Driller W. Hoeckele
H&A Rep. B. Govoni
Elevation 170.0 (est.)
Datum NGVD29
Location See Plan

	Casing	Sampler	Barrel
Type	HSA	S	--
Inside Diameter (in.)	2 1/4	1 3/8	--
Hammer Weight (lb)	-	140	-
Hammer Fall (in.)	-	30	-

Drilling Equipment and Procedures

Rig Make & Model: Track-mounted Diedrich D50
Bit Type: Cutting Head
Drill Mud: Polymer
Casing: HSA Spun
Hoist/Hammer: Cat-Head Safety Hammer
PID Make & Model: None

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	3 2 3 3	S1 18	0.0 2.0	168.8 1.3	SM	Loose dark brown silty SAND (SM), mps < 0.43mm, no structure, no odor, moist to dry, contains roots, top 6 in. frozen	-	-	-	-	80	20				
					SP-SM	-TOPSOIL-	-	-	-	-	90	10				
	2 3 4 3	S2 18	2.0 4.0		SP-SM	Loose orange-brown poorly-graded SAND with silt (SP-SM), mps < 0.43mm, no structure, no odor, dry, contains roots Loose orange-brown poorly-graded SAND with silt (SP-SM), mps < 0.43mm, no structure, no odor, dry, infrequent roots	-	-	-	-	90	10				
				166.0 4.0		-SUBSOIL-										
5	5 6 8 9	S3 22	5.0 7.0		SM	Medium dense orange-brown to light brown silty SAND (SM), mps 0.84mm, mottled, faint stratification, no odor, moist to dry	-	-	-	1	86	13				
	9 12 14 15	S4 18	7.0 9.0		SP	Medium dense light brown poorly-graded SAND (SP), mps 1.0mm, faint stratification, no odor, moist to dry	-	-	-	5	95	-				
10	7 6 6 7	S5 20	10.0 12.0		SM	Medium dense light brown silty SAND (SM), mps 1.0mm, frequent interbedded sand layers, moist Note: Possible perched water in silty seams.	-	-	-	5	80	15				
15	5 7 9 13	S6 22	15.0 17.0		SM	Similar to S5 Note: Wet seam at approximately 17.0 ft.	-	-	-	5	80	15				
20	9 15 16 18	S7 20	20.0 22.0		SM	Dense light brown silty SAND (SM), mps < 0.43mm, some mottling and laminations, no odor, moist	-	-	-	-	80	20				
				148.0 22.0		-ALLUVIAL DEPOSITS-										
						BOTTOM OF EXPLORATION 22.0 FT										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
Not Measured					

Sample ID

O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (ft) 22.0
Rock Cored (ft) -
Samples 7S

Boring No. B2

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

HALEY ALDRICH

Boring No. B3

Project	97 & 113 North Maple Street, Enfield, Connecticut
Client	Winstanley Construction Management, LLC as Agent For WE Acquisitions LLC
Contractor	New England Boring Contractors

File No. 130033-002
Sheet No. 1 of 1
Start 17 March 2017
Finish 17 March 2017
Driller W. Hoeckele
H&A Rep. B. Govoni
Elevation 168.0 (est.)
Datum NGVD29
Location See Plan

	Casing	Sampler	Barrel
Type	HSA	S	--
Inside Diameter (in.)	2 1/4	1 3/8	--
Hammer Weight (lb)	-	140	-
Hammer Fall (in.)	-	30	-

Drilling Equipment and Procedures

Rig Make & Model: Track-mounted Diedrich D50
Bit Type: Cutting Head
Drill Mud: Polymer
Casing: HSA Spun
Hoist/Hammer: Cat-Head Safety Hammer
PID Make & Model: None

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	3 3 3 2	S1 14	0.0 2.0	167.0	SM	Loose dark brown silty SAND (SM), mps < 0.43mm, no structure, no odor, moist to dry, contains roots, top 6 in. frozen	-	-	-	-	80	20				
				1.0	SP-SM	-TOPSOIL-	-	-	-	-	90	10				
	2 3 4 5	S2 14	2.0 4.0	165.5 2.5	SP	Loose orange-brown poorly-graded SAND with silt (SP-SM), mps < 0.43mm, no structure, no odor, dry -SUBSOIL- Loose orange-brown to tan poorly-graded SAND (SP), mps 1.0mm, mottled no odor, dry	-	-	-	5	90	5				
5	12 13 13 16	S3 24	5.0 7.0		SP-SM	Medium dense orange-brown to tan poorly-graded SAND with silt (SP-SM), mps 0.84mm, mottled, faint stratification, no odor, dry to moist	-	-	-	6	85	9				
	17 19 21 24	S4 18	7.0 9.0		SP	Dense orange-brown to tan poorly-graded SAND (SP), mps 1.0mm, stratified, no odor, moist	-	-	-	10	90	-				
10	8 12 12 14	S5 20	10.0 12.0		SP-SM	Medium dense light brown poorly-graded SAND with silt (SP-SM), mps 1.0mm, frequent silt seams, stratified, no odor, moist	-	-	-	10	80	10				
15	10 13 14 15	S6 20	15.0 17.0		SM	Medium dense light brown silty SAND (SM), mps < 0.43mm, frequent silt and clay seams, no odor, moist	-	-	-	-	85	15				
20	7 15 17 17	S7 22	20.0 22.0		SM	Dense brown silty SAND (SM), mps < 0.43mm, mottled, frequent clay seams, no odor, moist to wet	-	-	-	-	80	20				
				146.0 22.0		-ALLUVIAL DEPOSITS- BOTTOM OF EXPLORATION 22.0 FT										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
Not Measured					

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 22.0
Rock Cored (ft) -
Samples 7S

Boring No. B3

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

HALEY ALDRICH

Boring No. B4

Project	97 & 113 North Maple Street, Enfield, Connecticut
Client	Winstanley Construction Management, LLC as Agent For WE Acquisitions LLC
Contractor	New England Boring Contractors

File No. 130033-002
Sheet No. 1 of 2
Start 15 March 2017
Finish 16 March 2017
Driller W. Hoeckele
H&A Rep. B. Govoni
Elevation 176.0 (est.)
Datum NGVD29
Location See Plan

	Casing	Sampler	Barrel
Type	HW	S	--
Inside Diameter (in.)	4.0	1 3/8	--
Hammer Weight (lb)	300	140	-
Hammer Fall (in.)	24	30	-

Drilling Equipment and Procedures

Rig Make & Model: Track-mounted Diedrich D50
Bit Type: Roller Bit
Drill Mud: Polymer
Casing: Driven to 20.0 ft
Hoist/Hammer: Cat-Head Safety Hammer
PID Make & Model: None

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	2 2 2 4	S1 14	0.0 2.0	175.3 0.8		-TOPSOIL-										
					SM	Very loose tan to light brown silty SAND (SM), mps < 0.43mm, no structure, no odor, dry	-	-	-	-	90	10				
	5 4 5 6	S2 17	2.0 4.0		SM	Loose tan silty SAND (SM), mps 0.84mm, no structure, no odor, dry	-	-	-	4	72	24				
				172.0 4.0		-SUBSOIL-										
	6 11 12 14	S3 16	4.0 6.0		SP	Medium dense orange-brown to tan poorly-graded SAND (SP), mps 1.0mm, faint stratification, no odor, moist to dry	-	-	-	10	90	-				
5	14 15 18 18	S4 20	6.0 8.0		SP	Similar to S3, except dense	-	-	-	10	85	5				
	10 10 12 13	S5 14	9.0 11.0		SP-SM	Medium dense yellow-brown poorly-graded SAND with silt (SP-SM), mps 1.0mm, faint stratification, no odor, moist to wet Note: Wet soils due to drilling water.	-	-	-	10	80	10				
10																
	7 9 12 13	S6 10	14.0 16.0		SP-SM	Similar to S5, except wet	-	-	-	10	80	10				
15						-ALLUVIAL DEPOSITS-										
	11 14 15 18	S7 12	19.0 21.0		SP-SM	Medium dense yellow-brown poorly-graded SAND with silt (SP-SM), mps 1.0mm, faint stratification, no odor, wet	-	-	-	5	95	10				
20																

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
Not Measured					

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 54.3
Rock Cored (ft) -
Samples 14S

Boring No. B4

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

HALEY ALDRICH

TEST BORING REPORT

Boring No. B4

File No. 130033-002

Sheet No. 2 of 2

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
25	11 11 10 10	S8 14	24.0 26.0		SP	Medium dense brown poorly-graded SAND (SP), mps 1.0mm, no structure, no odor, wet	-	-	-	10	90	-				
30	7 8 9 10	S9 10	29.0 31.0		SP	Medium dense brown poorly-graded SAND (SP), mps 1.0mm, no structure, no odor, wet	-	-	-	15	85	-				
				144.0 32.0		-ALLUVIAL DEPOSITS-										
35	12 22 23 27	S10 13	34.0 36.0		SP	Dense brown poorly-graded SAND (SP), mps 2.0mm, no structure, no odor, wet	-	-	-	25	75	-				
40	25 30 27 27	S11 8	39.0 41.0		SM	Very dense brown silty SAND (SM), mps 1.0mm, contains infrequent clay and silt seams, no odor, wet	-	-	-	5	80	15				
45	10 19 21 21	S12 10	44.0 46.0		SM/ML	Dense brown silty SAND (SM), grading into sandy SILT (ML), mps < 1.0mm, stratified, laminated, no odor, wet	-	-	-	-	60	40				
							-	-	-	-	30	70				
				129.0 47.0		-GLACIOFLUVIAL DEPOSITS-										
50	30 30 32 45	S13 12	49.0 51.0		SM	Very dense red-brown silty SAND with gravel (SM), mps 1.25 in., slightly bonded, no odor, wet	5	10	5	20	40	20				
						-GLACIAL TILL-										
	75/4"	S14 4	54.0 54.3	121.7 54.3	SM	Similar to S13	5	10	5	20	40	20				
						BOTTOM OF EXPLORATION 54.3 FT										

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. B4

TEST BORING REPORT

HALEY ALDRICH

Boring No. B5

Project	97 & 113 North Maple Street, Enfield, Connecticut
Client	Winstanley Construction Management, LLC as Agent For WE Acquisitions LLC
Contractor	New England Boring Contractors

File No. 130033-002
Sheet No. 1 of 1
Start 16 March 2017
Finish 16 March 2017
Driller W. Hoeckele
H&A Rep. B. Govoni
Elevation 174.5 (est.)
Datum NGVD29
Location See Plan

	Casing	Sampler	Barrel
Type	HSA	S	--
Inside Diameter (in.)	2 1/4	1 3/8	--
Hammer Weight (lb)	-	140	-
Hammer Fall (in.)	-	30	-

Drilling Equipment and Procedures

Rig Make & Model: Track-mounted Diedrich D50
Bit Type: Cutting Head
Drill Mud: Polymer
Casing: HSA Spun
Hoist/Hammer: Cat-Head Safety Hammer
PID Make & Model: None

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	3 3 3 3	S1 19	0.0 2.0	173.5 1.0	SM	Loose brown silty SAND (SM), mps < 0.43mm, no structure, no odor, moist to dry	-	-	-	-	85	15				
				172.5 2.0	SP-SM	-TOPSOIL-	-	-	-	-	90	10				
	3 4 6 8	S2 16	2.0 4.0		SP	Loose yellow-brown poorly-graded SAND with silt (SP-SM), mps < 0.43mm, no structure, no odor, dry -SUBSOIL-	-	-	-	-	95	5				
5	7 9 10 11	S3 20	4.0 6.0		SP	Loose yellow-brown to tan poorly-graded SAND (SP), mps < 0.43mm, faint stratification, no odor, dry Similar to S2, except medium dense	-	-	-	-	95	5				
	11 11 12 14	S4 16	6.0 8.0		SP	Medium dense light brown poorly-graded SAND (SP), mps 1.0mm, faint stratification, no odor, dry	-	-	-	5	90	5				
10	7 8 9 9	S5 18	9.0 11.0		SP	Medium dense light brown to tan poorly-graded SAND (SP), mps 1.0mm, stratified, no odor, moist	-	-	-	10	90	-				
15	7 8 6 6	S6 20	14.0 16.0		SP	Similar to S5	-	-	-	5	95	-				
20	6 8 8 9	S7 20	19.0 21.0		SP-SM	Medium dense brown poorly-graded SAND with silt (SP-SM), mps 1.0mm, some mottling, no odor, moist	-	-	-	5	85	10				
				153.5 21.0		-ALLUVIAL DEPOSITS- BOTTOM OF EXPLORATION 21.0 FT										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
Not Measured					

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 21.0
Rock Cored (ft) -
Samples 7S

Boring No. B5

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

HALEY ALDRICH

Boring No. B6(OW)

Project	97 & 113 North Maple Street, Enfield, Connecticut
Client	Winstanley Construction Management, LLC as Agent For WE Acquisitions LLC
Contractor	New England Boring Contractors

File No. 130033-002
Sheet No. 1 of 2
Start 17 March 2017
Finish 17 March 2017
Driller W. Hoeckele
H&A Rep. B. Govoni
Elevation 169.0 (est.)
Datum NGVD29
Location See Plan

	Casing	Sampler	Barrel
Type	HSA	S	--
Inside Diameter (in.)	2 1/4	1 3/8	--
Hammer Weight (lb)	-	140	-
Hammer Fall (in.)	-	30	-

Drilling Equipment and Procedures

Rig Make & Model: Track-mounted Diedrich D50
Bit Type: Cutting Head
Drill Mud: Polymer
Casing: HSA Spun
Hoist/Hammer: Cat-Head Safety Hammer
PID Make & Model: None

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	6 4 3 3	S1 20	0.0 2.0		SM	Loose dark brown silty SAND (SM), mps < 0.43mm, no odor, dry, contains roots	-	-	-	-	85	15				
				167.3 1.8		-TOPSOIL-										
	4 8 6 6	S2 14	2.0 4.0		SP	Medium dense tan to light brown poorly-graded SAND (SP), mps < 1.0mm, faint stratification, no odor, dry	-	-	-	5	90	5				
5	3 5 8 12	S3 12	5.0 7.0		SP-SM	Medium dense light brown poorly-graded SAND with silt (SP-SM), mps 1.0mm, faint mottling, no odor, dry to moist	-	-	-	5	85	10				
	11 12 13 16	S4 20	7.0 9.0		SP-SM	Similar to S3	-	-	-	5	85	10				
10	8 13 17 22	S5 16	10.0 12.0		SP-SM	Medium dense light brown poorly-graded SAND with silt (SP-SM), mps < 0.43mm, faint stratification, no odor, dry to moist	-	-	-	-	90	10				
15	14 15 18 19	S6 18	15.0 17.0		SP-SM	Similar to S5, except dense	-	-	-	-	90	10				
				149.0 20.0		-ALLUVIAL DEPOSITS-										
20	13 15 16 23	S7 18	20.0 22.0		SM	Dense brown to orange-brown silty SAND (SM), mps < 0.43mm, stratified, infrequent crossbedding, no odor, moist Note: Possible perched water seam at 21.0 ft.	-	-	-	-	75	25				
25						-GLACIOFLUVIAL DEPOSITS-										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
Not Encountered					

Sample ID

O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (ft) 35.0
Rock Cored (ft) -
Samples 9S

Boring No. B6(OW)

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

HALEY ALDRICH

TEST BORING REPORT

Boring No. B6(OW)

File No. 130033-002

Sheet No. 2 of 2

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Well Diagram	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
25	9 13 13 18	S8 16	25.0 27.0			SM	Medium dense brown to orange-brown silty SAND, mps < 0.43mm, stratified, infrequent clay seams, no odor, moist	-	-	-	-	75	25				
	19 22 25 26	S9 20	27.0 29.0			SM	Dense brown silty SAND, mps < 0.43mm, frequent clay and silt seams, some mottling, moist to wet	-	-	-	-	75	25				
							Note: HSA advanced to 35.0 ft to install groundwater monitoring well.										
30																	
35					134.0 35.0		-GLACIOFLUVIAL DEPOSITS- BOTTOM OF EXPLORATION 35.0 FT										

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. B6(OW)

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

HALEY ALDRICH

Well No. B6(OW)
Boring No. B6(OW)

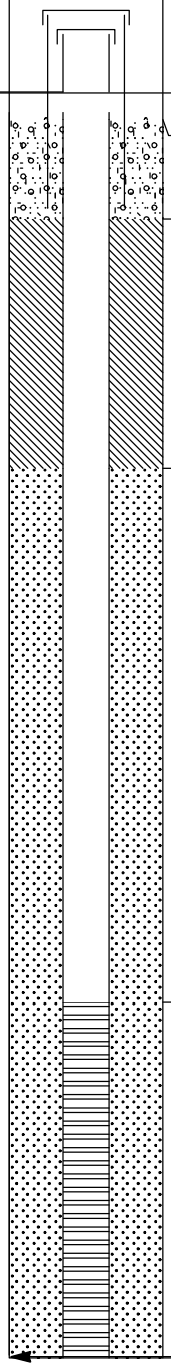
Project 97 & 113 North Maple Street
Location Enfield, Connecticut
Client Winstanley Construction Management, LLC as Agent For WE Acquisition, LLC
Contractor New England Boring Contractors
Driller W. Hoeckele
Initial Water Level (depth bgs) N/A

Well Diagram
- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

File No. 130033-002
Date Installed 17 Mar 2017
H&A Rep. B. Govoni
Location See Plan

Ground El. 169.0 (est.)
Datum NGVD29

SOIL/ROCK CONDITIONS	DEPTH (ft.)	GRAPHIC	WELL DETAILS	DEPTH (ft.)	ELEVATION (ft.)
				0.0	169.0
TOPSOIL	1.8			0.2	168.8
				3.0	166.0
ALLUVIAL DEPOSITS	20.0			10.0	159.0
				25.0	144.0
GLACIOFLUVIAL DEPOSITS	35.0			35.0	134.0



WELL CONSTRUCTION DETAILS

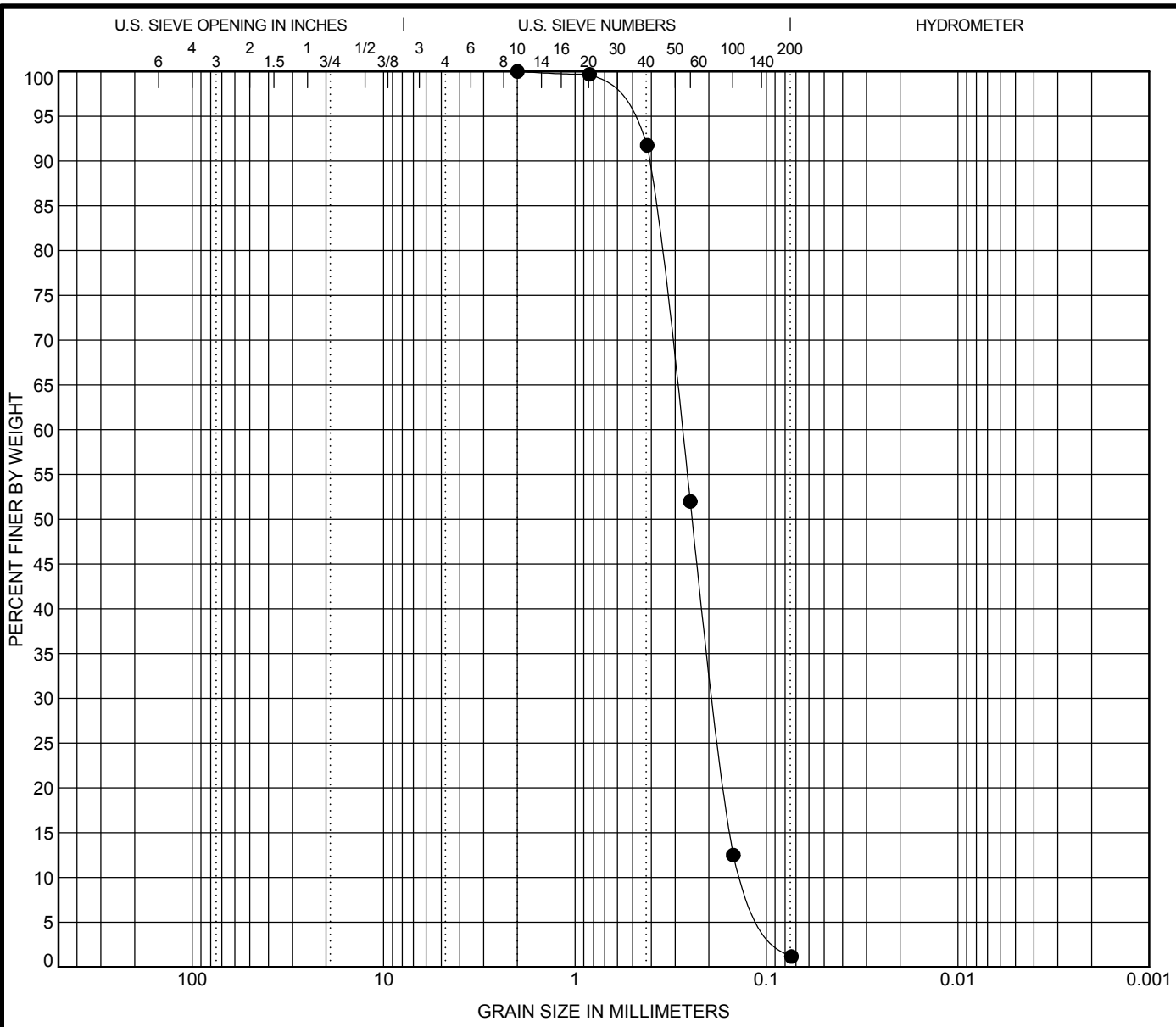
Type of protective cover: Padlock
Height of Guard Pipe above ground surface: 2.7 ft
Height of top of riser above ground surface: 2.5 ft
Type of protective casing: Guard Pipe
Length: 4.0 ft
Inside diameter: 4.0 in.
Depth of bottom of Guard Pipe: 1.3 ft
Type of riser pipe: Schedule 40 PVC
Inside diameter of riser pipe: 1.0 in.
Depth of bottom of riser pipe: 25.0 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Concrete	0.0	0.2
Bentonite	3.0	7.0
	-	-

Diameter of borehole: 2.3 in.
Depth to top of well screen: 25.0 ft
Type of screen: Machine slotted Sch 40 PVC
Screen gauge or size of openings: 0.010 in.
Diameter of screen: 1.0 in.
Type of Backfill around Screen: Filter Sand
Depth to bottom of well screen: 35 ft
Bottom of silt trap: 35.0 ft
Depth of bottom of borehole: 35.0 ft

COMMENTS:

HA-LIB09-BOS-HAR.GLB GW INSTALLATION REPORT-07-1 G:\130033_ENFIELD\002\GINT\130033-002_TB-LOGS.GPJ 21 Mar 17



	COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	% SILT	% CLAY
●		**0.0**	**0.0**	**0.0**	**8.2**	**90.6**	**1.2**	

	Expl. No.	Sample No.	Depth (ft.)	LL	PL	PI	Water Content (%)	Cc	Cu
●	**B1**	**S8**	**19-21**				**27.4**	**0.99**	**2.17**

	Sample Description
●	**Brown poorly-graded SAND (SP)**

Remarks:

HALEY ALDRICH
Rocky Hill, Connecticut

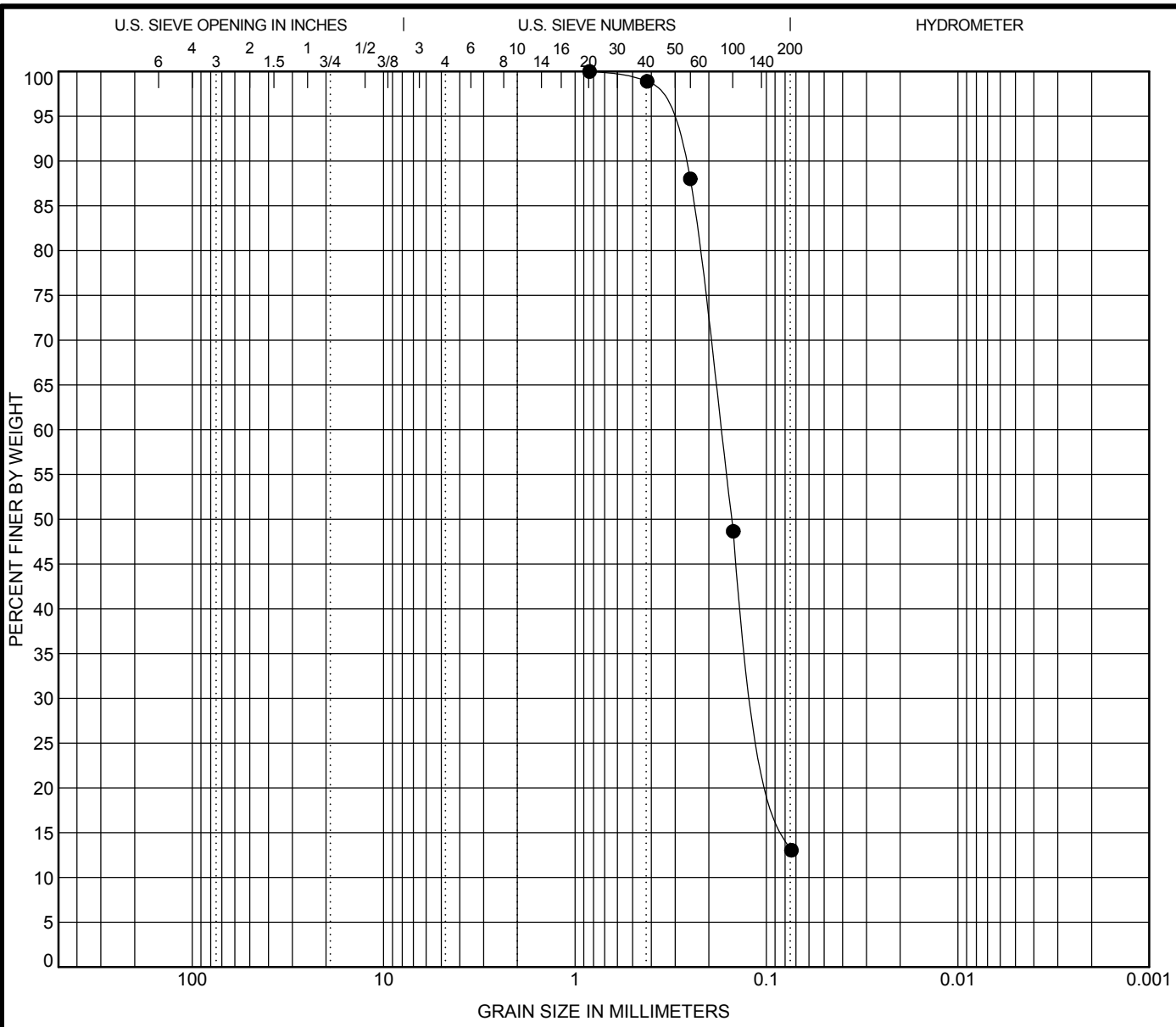
97 & 113 North Maple Street
Enfield, Connecticut

GRAIN SIZE DISTRIBUTION

Date: 3/17/2017

File No.: 130033-002

H&A SIEVE CLASSIC DESCRIPTION H&ALAB.GDT G:\130033_ENFIELD\002\GINT\130033-002_SIEVES.GPJ Mar 17, 17



	COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	% SILT	% CLAY
●		**0.0**	**0.0**	**0.0**	**1.1**	**85.9**	**13.0**	

	Expl. No.	Sample No.	Depth (ft.)	LL	PL	PI	Water Content (%)	Cc	Cu
●	**B2**	**S3**	**5-7**				**11.3**		

	Sample Description
●	**Light brown silty SAND (SM)**

Remarks:

HALEY ALDRICH
Rocky Hill, Connecticut

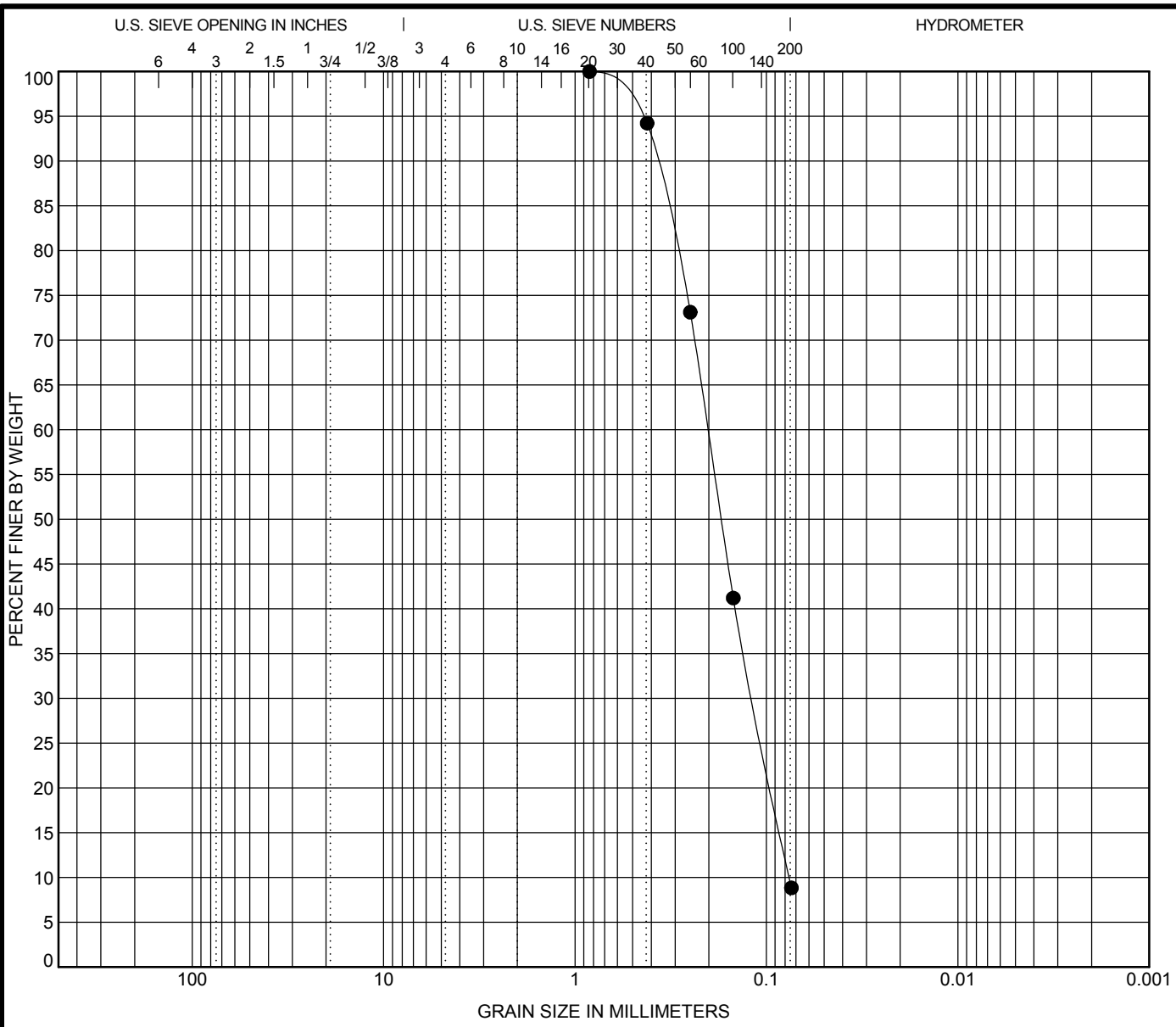
97 & 113 North Maple Street
Enfield, Connecticut

GRAIN SIZE DISTRIBUTION

Date: 3/17/2017

File No.: 130033-002

H&A SIEVE CLASSIC DESCRIPTION H&ALAB.GDT G:\130033_ENFIELD\002\GINT\130033-002_SIEVES.GPJ Mar 17, 17



	COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	% SILT	% CLAY
●		**0.0**	**0.0**	**0.0**	**5.8**	**85.4**	**8.8**	

	Expl. No.	Sample No.	Depth (ft.)	LL	PL	PI	Water Content (%)	Cc	Cu
●	**B3**	**S3**	**5-7**				**10.3**	**0.89**	**2.66**

	Sample Description
●	**Tan poorly-graded SAND with silt (SP-SM)**

Remarks:

HALEY ALDRICH
Rocky Hill, Connecticut

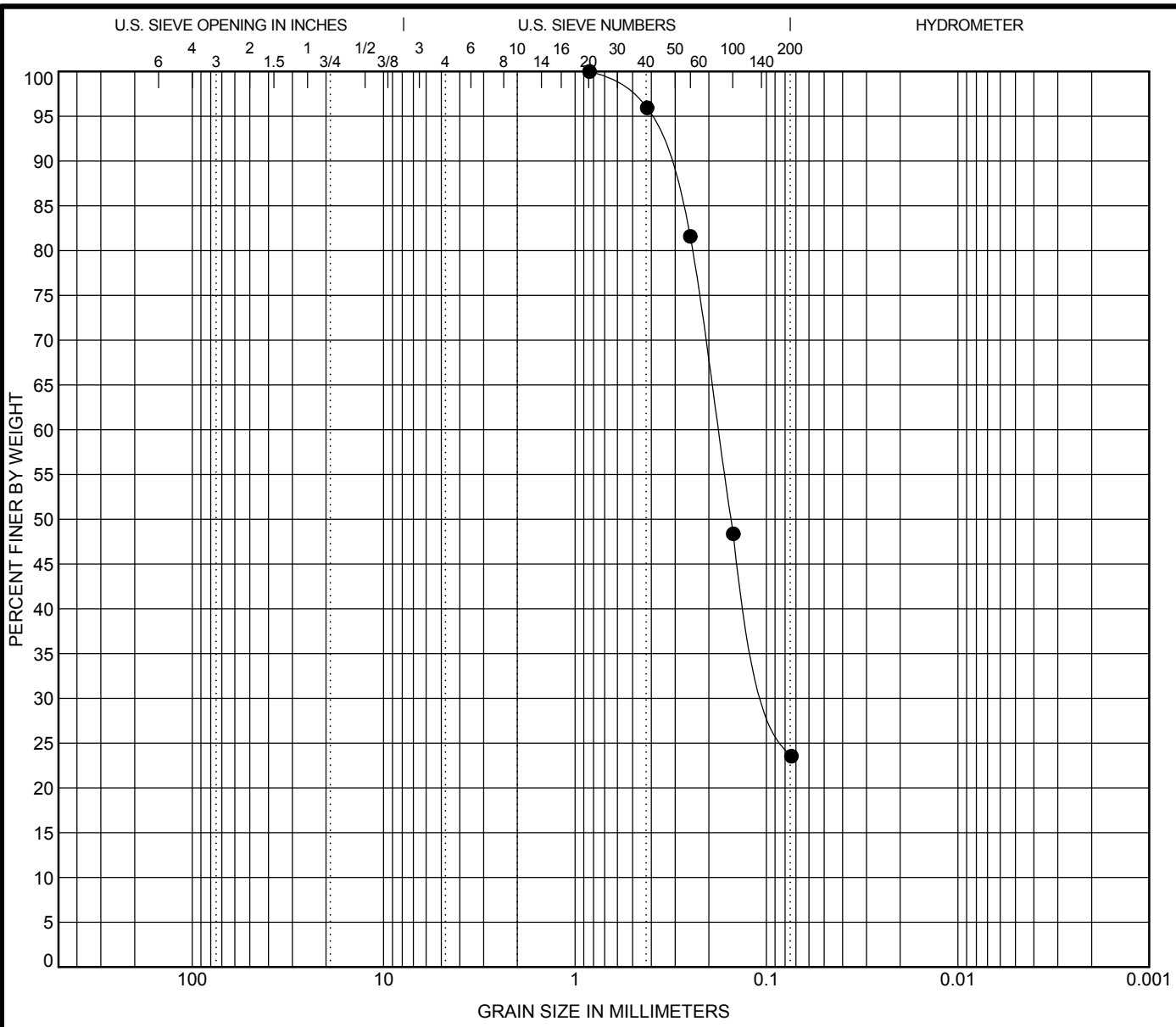
97 & 113 North Maple Street
Enfield, Connecticut

GRAIN SIZE DISTRIBUTION

Date: 3/17/2017

File No.: 130033-002

H&A SIEVE CLASSIC DESCRIPTION H&ALAB.GDT G:\130033_ENFIELD\002\GINT\130033-002_SIEVES.GPJ Mar 17, 17



	COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	% SILT	% CLAY
●		**0.0**	**0.0**	**0.0**	**4.1**	**72.4**	**23.5**	

	Expl. No.	Sample No.	Depth (ft.)	LL	PL	PI	Water Content (%)	Cc	Cu
●	**B4**	**S2**	**2-4**				**12.8**		

	Sample Description
●	**Tan silty SAND (SM)**

Remarks:

HALEY ALDRICH
Rocky Hill, Connecticut

97 & 113 North Maple Street
Enfield, Connecticut

GRAIN SIZE DISTRIBUTION

Date: 3/17/2017 File No.: 130033-002

H&A SIEVE CLASSIC DESCRIPTION H&ALAB.GDT G:\130033_ENFIELD\002\GINT\130033-002_SIEVES.GPJ Mar 17, 17

Appendix E

Shear Wave Velocity Testing Report

HAGER-RICHTER
GEOSCIENCE, INC.

SHEAR WAVE VELOCITY TESTING
PROPOSED DEVELOPMENT
97 AND 113 NORTH MAPLE STREET
ENFIELD, CONNECTICUT

Prepared for:

Haley & Aldrich, Inc.
100 Corporate Place, Suite 105
Rocky Hill, Connecticut 06067

Prepared by:

Hager-Richter Geoscience, Inc.
8 Industrial Way, Suite D10
Salem, New Hampshire 03079

File 17J34
March, 2017

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2. Equipment and Procedures. 2
3. Results and Discussion. 5
4. Limitations. 8

FIGURES

1. General Site Location
2. pVs Test Line Locations

APPENDIX

1. Draft Boring Log Provided by H&A

1. INTRODUCTION

Hager-Richter Geoscience, Inc. (Hager-Richter) conducted passive surface shear wave velocity testing at 97 and 113 North Maple Street in Enfield, Connecticut in March, 2017 for Haley & Aldrich, Inc., (H&A) of Rocky Hill, Connecticut. The geophysical testing was performed as part of a geotechnical investigation for the project site by H&A.

According to information provided by H&A, a proposed development is planned for the 97 and 113 North Maple Street Site. The general location of the site is shown in Figure 1. As part of a geotechnical investigation of the Site, H&A required site specific shear wave velocity information as a function of depth for soil and rock to a depth of 100 feet. A draft boring log provided by H&A indicates that the subsurface consists of sand, silt, and till to a depth of 75 feet where the boring reached refusal.

The site is roughly 45 acres in size and is currently farmland. The surface shear wave velocity testing was conducted using the passive shear wave seismic (pVs) method. Figure 2 is a Site Plan showing the locations of the four seismic testing lines specified by H&A.

Jeffrey Reid, P.G., and Bryan Carnahan, of Hager-Richter conducted the seismic testing on March 13, 2017. The project was coordinated with Ms. Katrina Perez Mejia, P.E., of H&A. Ms. Bonnie Govoni, also of H&A, was on site and specified the pVs line locations. Data analysis and interpretation were completed at the Hager-Richter offices. Original data and field notes will be retained in the Hager-Richter files for a minimum of three years.

2. EQUIPMENT AND PROCEDURES

2.1 Method

The passive shear wave seismic (pVs) method is a geophysical method to determine a shear-wave velocity profile at a single location by analyzing a particular type of seismic wave recorded on a multichannel record. The name pVs is derived from p for passive and Vs for velocity of shear waves. The pVs method, also called the Refraction Microtremor method, or ReMi™, uses Rayleigh waves, a particular kind of wave first described by Lord Rayleigh in 1885. Such waves are dispersive (meaning that the velocity is a function of the wavelength), and the amplitude of such waves decreases with depth. The velocity depends primarily on the shear wave velocities and layering of the subsurface material.

Rayleigh waves are a significant part of the ambient subsurface noise at most, if not all, sites. There are many sources of such noise, including, but not limited to, wind, pedestrian and vehicular traffic, surface and subway trains, and construction activities. Although such noise can be troublesome for most seismic methods, it is the source of signals for the pVs method, and the higher the noise level, the better the results for this method.

Low frequency (4.5 Hz) geophones are installed five feet apart along a straight line and connected to a seismograph. The ambient noise is recorded for 30 seconds two or three times, and examined to be sure that noise of sufficiently low frequency is present. If the noise is sufficient, then 10 to 15 such records are acquired. If the noise spectra do not reach sufficiently low frequencies, then one walks or runs along the testing line during data acquisition to add low frequency noise to the ambient noise. The surface waves used in the pVs method, considered noise in seismic refraction and seismic reflection surveys, are enhanced during data acquisition and processing for the pVs method. The seismic data are analyzed using SeisOpt® ReMi™, a commercially licensed software package developed by Optim, Inc. located at the University of Nevada at Reno. Results are normally presented as 1-D plots or in tabular form showing shear wave velocity as a function of depth for the center point of the seismic line.

2.2 Determination of Average Shear Wave Velocity for Building Code Purposes

The pVs method determines (a) the shear wave velocity at the mid point along a survey line for several layers, averaged over the length of the survey line, and (b) the average shear wave velocity V_{avg} for site classification for seismic design in accordance with building codes. Similar calculations can be performed with the results of the shear wave velocity survey. The average value V_{avg} is determined using the equation 16-44 of the IBC as follows:

$$V_{avg} = \left(\sum_{i=1}^{N} d_i\right) / \sum_{i=1}^{N} d_i / V_i$$

where d_i is thickness of layer i
V_i is shear wave velocity of layer i
N denotes the total number of layers

The Seismic Site Class, *based solely on average shear wave velocity*, is defined by the IBC as follows:

Site Class	Soil Profile Name	Soil Shear Wave Velocity (ft/s)
A	Hard rock	$V_s > 5000$
B	Rock	$2500 < V_s \leq 5000$
C	Very dense soil and soft rock	$1200 < V_s \leq 2500$
D	Stiff soil profile	$600 \leq V_s \leq 1200$
E	Soft soil profile	$V_s < 600$

Although the IBC provides other methods to determine the Site Class, such as standard penetration resistance (blow counts) and soil undrained shear strength, this report provides shear wave velocity data only. There is no consideration of other factors that may affect a site class such as liquefaction. The final determination of seismic site class should be made by the project engineer.

2.3 Equipment

We used a 48-channel digital seismograph (Geometrics Geode) coupled to 48 geophones to acquire the pVs data for the subject testing. We used 4.5-Hz frequency vertical geophones for the subject shear wave velocity testing.

2.4 Limitations of the Method

As with all physical measurements, there is experimental error in the velocities that are determined using the passive shear wave velocity method. For the pVs method, the accuracy of V_{avg} is stated by Optim, Inc. to be 5-15%.

The depth of investigation is a function of the noise spectrum, and long wave lengths (low frequencies) are required to determine velocity at large depths. Noise levels can be improved by a person running along the seismic spread during data acquisition.

2.5 Site Specific

The locations of the pVs test lines at the subject site are shown in Figure 2. The positions of the pVs testing lines were located using a Trimble Geo 7X CM GPS receiver coupled with a Zephyr-2 external antenna. The pVs data were acquired using 46 4.5Hz geophones and geophone spacings of 5 feet for all lines. The pVs method yields a simple vertical shear wave velocity profile for the mid point of each testing line. The seismic source for the pVs testing was ambient noise from nearby traffic and activity as well as thumping along the lines with a sledge hammer.

3. RESULTS AND DISCUSSION

The surface shear wave velocity testing was conducted using the passive shear wave seismic (pVs) method at four test locations specified by H&A and designated as Lines 1 through 4. Line 1 included two test locations (Line 1A and 1B). The test locations and center points for the velocity profiles are shown in Figure 2.

H&A provided a draft log for boring B-1 (see Appendix) that was drilled concurrently with the shear wave velocity testing. Additional borings are being drilled at the site. The locations of the borings are shown in Figure 2. Borings B-1 is approximately 55 feet south of pVs Test Line 4 and the stratigraphy generalized from the log consists of about sand and silty sand tot a depth of 73 feet where glacial till was encountered. Refusal was encountered at 79.6 feet where the boring was terminated.

The quality for the pVs data at the subject site is judged to be very good. The results of the pVs testing are reported in Table 1. For modeling purposes, the subsurface stratigraphy was divided into four or five discrete units. The velocity units do not necessarily correlate with specific lithologic units identified in the boring log provided by H&A. The layer thicknesses that provide the best statistical fit to the dispersion curve are used for the seismic lines. No attempt was made to "force" a specific model to the boring data.

The shear wave velocities for the individual stratigraphic modeled units are provided in Table 1 as well as the average values of the velocities of shear waves for the depth interval of 0-100 ft based on Equation 1 of the IBC , $Vs_{100.}$ The root mean square errors for the fit of the dispersion curves versus the measured data using the model velocities are also reported in Table 1 and vary between 1.2% and 3.1%.

TABLE 1: pVs TEST RESULTS

Geologic Unit *	Depth Interval (ft)	Vs** (ft/s)
pVs Test Line 1A		
Soft Loam and Sand	0 - 5	637
Sand	5 - 38	825
Silty Sand	38 - 56	1409
Till or Bedrock?	56+	2,356
Vs_{100} (ft/s)	1,261	
RMS	3.1%	
pVs Test Line 1B		
Soft Loam and Sand	0 - 3	516
Sand	3 - 16	753
Silty Sand	16 - 39	886
Silty Sand - More Dense	39 - 43	1,226
Till or Bedrock?	43+	2,529
Vs_{100} (ft/s)	1,338	
RMS	1.5%	
pVs Test Line 2		
Soft Loam and Sand	0 - 4	743
Sand	4 - 18	755
Silty Sand	18 - 24	785
Silty Sand - More Dense	24 - 60	808
Till or Bedrock?	60+	2,153
Vs_{100} (ft/s)	1,056	
RMS	1.7%	

pVs Test Line 3		
Soft Loam and Sand	0 - 19	687
Sand	19 - 33	945
Silty Sand - More Dense	33 - 36	1,692
Till/Bedrock?	36+	3,055
Vs_{100} (ft/s)	1,534	
RMS	1.2%	
pVs Test Line 4		
Soft Loam and Sand	0 - 5	556
Sand	5 - 50	908
Silty Sand - More Dense	56-80	1,827
Till/Bedrock?	80+	2,542
Vs_{100} (ft/s)	1,161	
RMS	2.4%	

* The description of stratigraphy is based on the one boring log (B1)provided by H&A and stratigraphy may vary across the site

** Shear wave velocity profile is determined for the mid point of the testing line

4. LIMITATIONS

This report was prepared for the exclusive use of Haley & Aldrich, Inc. (Client). No other party shall be entitled to rely on this Report or any information, documents, records, data, interpretations, advice or opinions given to Client by Hager-Richter Geoscience, Inc. (H-R) in the performance of its work. The Report relates solely to the specific project for which H-R has been retained and shall not be used or relied upon by Client or any third party for any variation or extension of this project, any other project or any other purpose without the express written permission of H-R. Any unpermitted use by Client or any third party shall be at Client's or such third party's own risk and without any liability to H-R.

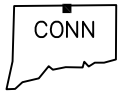
H-R has used reasonable care, skill, competence and judgment in the preparation of this Report consistent with professional standards for those providing similar services at the same time, in the same locale, and under like circumstances. Unless otherwise stated, the work performed by H-R should be understood to be exploratory and interpretational in character and any results, findings or recommendations contained in this Report or resulting from the work proposed may include decisions which are judgmental in nature and not necessarily based solely on pure science or engineering. It should be noted that our conclusions might be modified if subsurface conditions were better delineated with additional subsurface exploration including, but not limited to, test pits, soil borings with collection of soil and water samples, and laboratory testing.

Except as expressly provided in this limitations section, H-R makes no other representation or warranty of any kind whatsoever, oral or written, expressed or implied; and all implied warranties of merchantability and fitness for a particular purpose, are hereby disclaimed.

N

APPROXIMATE SCALE (feet)

0 1000 2000



LOCATION

NOTE:

Modified from Google Earth Pro aerial photograph.

Figure 1
General Site Location
Proposed Development
97 and 113 North Maple Street
Enfield, Connecticut

File 17J34	March, 2017

HAGER–RICHTER
Salem, NH | Fords, NJ

N

LEGEND

pVs TEST LINE WITH MIDPOINT

PROPOSED BORING

APPROXIMATE SCALE (feet)

0 500 1000

NOTE:

Modified from Google Earth Pro aerial photograph.

Figure 2
pVs Test Line Locations
Proposed Development
97 and 113 North Maple Street
Enfield, Connecticut

File 17J34	March, 2017

HAGER–RICHTER
Salem, NH | Fords, NJ

APPENDIX

Boring Log provided by Haley & Aldrich, Inc.

Appendix F

Recommended Material Specifications

Recommended Material Specifications
113 North Maple Street Development
Enfield, CT

The on-site native sand can be re-used as Structural Fill or Ordinary Fill, provided it can meet the appropriate compaction requirements and does not contain deleterious materials. Soils to be used as fill imported from off-site should also meet the gradation requirements given below.

Structural Fill

Structural Fill should consist of hard, durable sand and gravel. It should be free of clay, organic matter, surface coatings, and other deleterious materials. Soil finer than the No. 200 sieve (the "fines") should be nonplastic. Structural Fill shall meet the following gradation requirements:

Sieve Size	Percent Passing by Weight
3 inches	100
1 - ½ inch	55 – 100
No. 4	35 – 85
No. 16	20 – 65
No. 50	5 – 40
No. 200 (fines)	0 – 10

Structural Fill should be compacted in maximum 12-inch-thick, loose lifts to at least 95 percent of the maximum dry density determined in accordance with ASTM D1557 (Modified AASHTO Compaction). The moisture content should be held to within +/- 3 percent of optimum moisture content (as determined by ASTM D1557).

Ordinary Fill

Ordinary fill should consist of hard, durable sand and gravel, free of clay, organic matter, surface coatings, and other deleterious materials. Soil finer than the No. 200 sieve (the "fines") should be nonplastic. Ordinary Fill shall meet the following gradation requirements:

Sieve Size	Percent Passing by Weight
6 inches	100
3 inches	80 – 100
No. 4	20 – 100
No. 200 (fines)	0 – 20

Ordinary fill should be compacted in maximum 12-inch-thick, loose lifts to at least 92 percent of the maximum dry density determined in accordance with ASTM D1557 (Modified AASHTO Compaction). The moisture content should be held to within +/- 3 percent of optimum moisture content (as determined by ASTM D1557).

Crushed Stone

Crushed Stone should consist of a ¾-inch size durable crushed rock or durable crushed gravel stone and shall conform to the requirements of the ConnDOT Form 817, Section M.01.01, No. 6. Crushed stone should be compacted with at least four passes of a vibratory compactor.

Geotextile Fabric

Geotextile fabric should be a non-woven fabric, consisting of Mirafi 140N or an approved equivalent product.

EXHIBITS

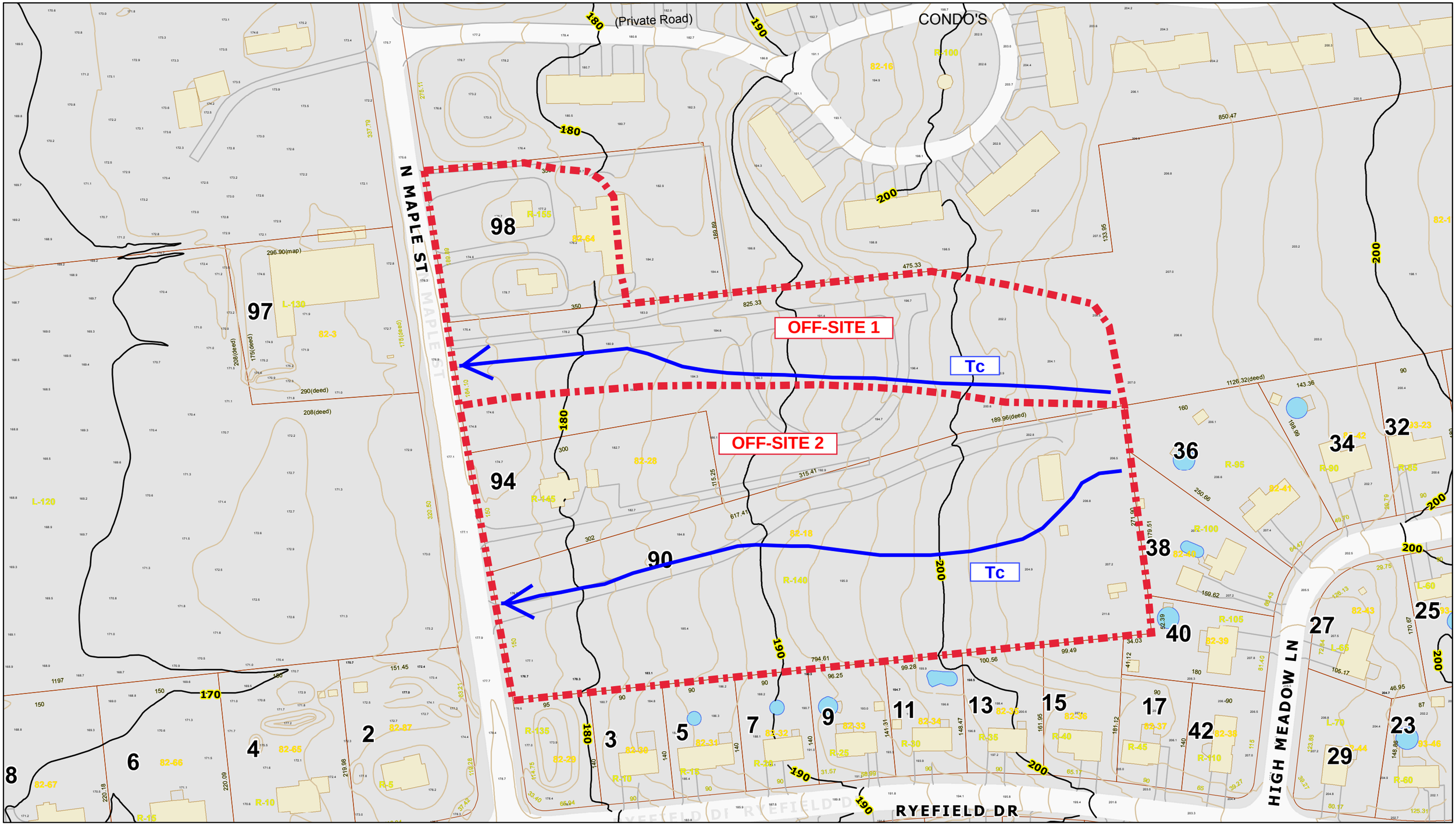


Figure 4: Off-Site Drainage Area Map

0 50 100 200 Feet

1 inch = 109 feet

N W E S

The Town of Enfield, CT shall assume no liability for any errors,omissions, or inaccuracies in the information provided regardless of how caused or any decision made or action taken or not taken by reader in reliance upon any information or data furnished hereunder.

ENFIELD

CONNECTICUT SUBREGIONAL BASINS AND SURFACE WATER FLOW DIRECTIONS

Explanation

Town Boundary

Subregional Watershed Boundary

4201 Subrg. Basin ID# - as designated by CTDEP

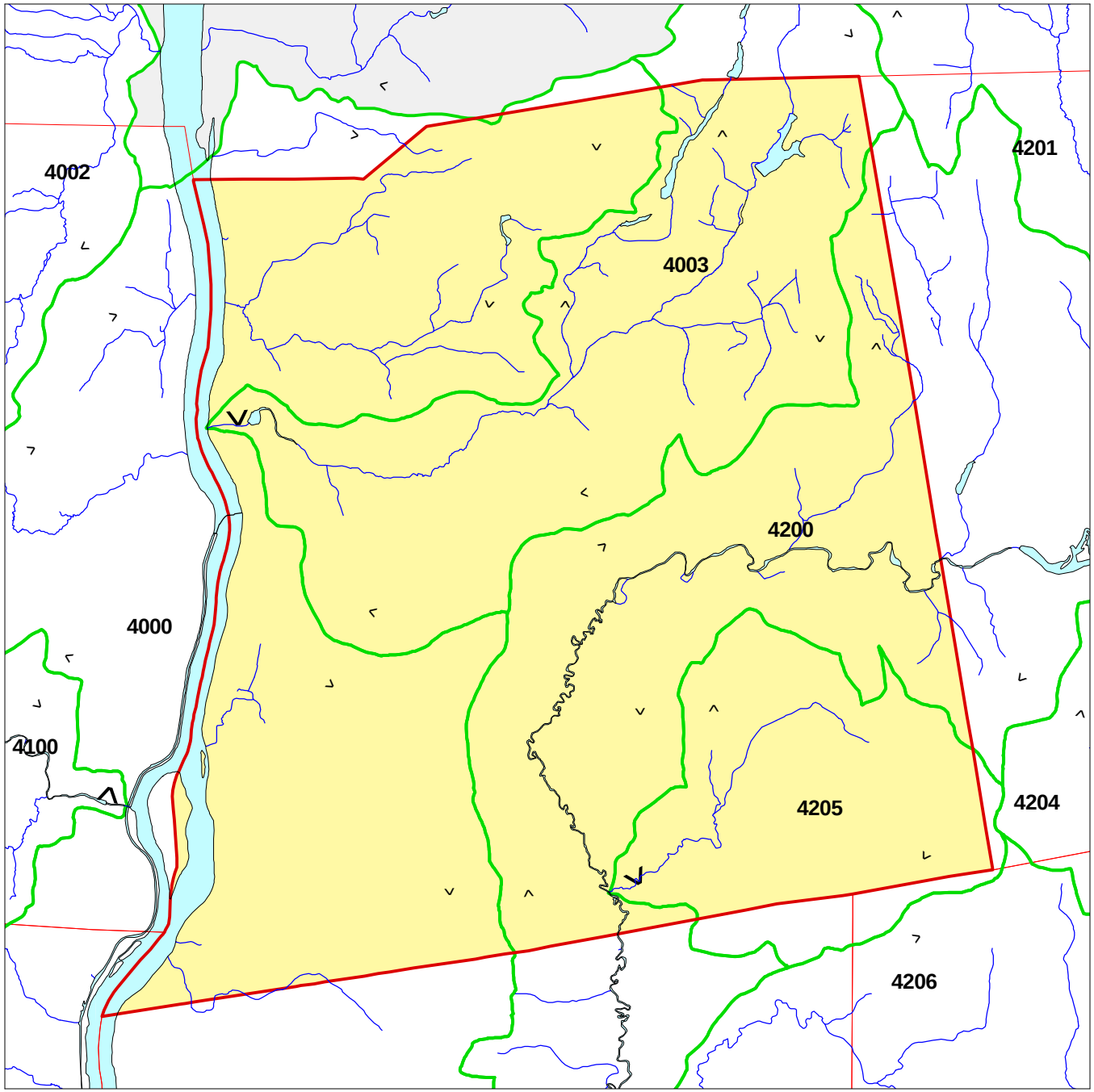
Watercourse Open Water

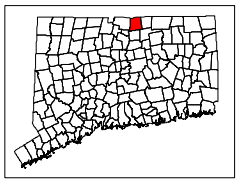
< Basin Outlet

< Surface Water Flow Direction

The table provides statistics for each subregional basin. Shown are the areas of the basin within the town, the percentage for that area, and the percent of the town covered by each basin.

Sbas_nc	AcresInTw	Percofbs	Percoftwn
0	4.63	0.0	0.0
4000	8043.42	7.8	36.7
4003	5844.14	78.7	26.7
4200	5335.18	13.9	24.4
4205	2681.93	84.8	12.2



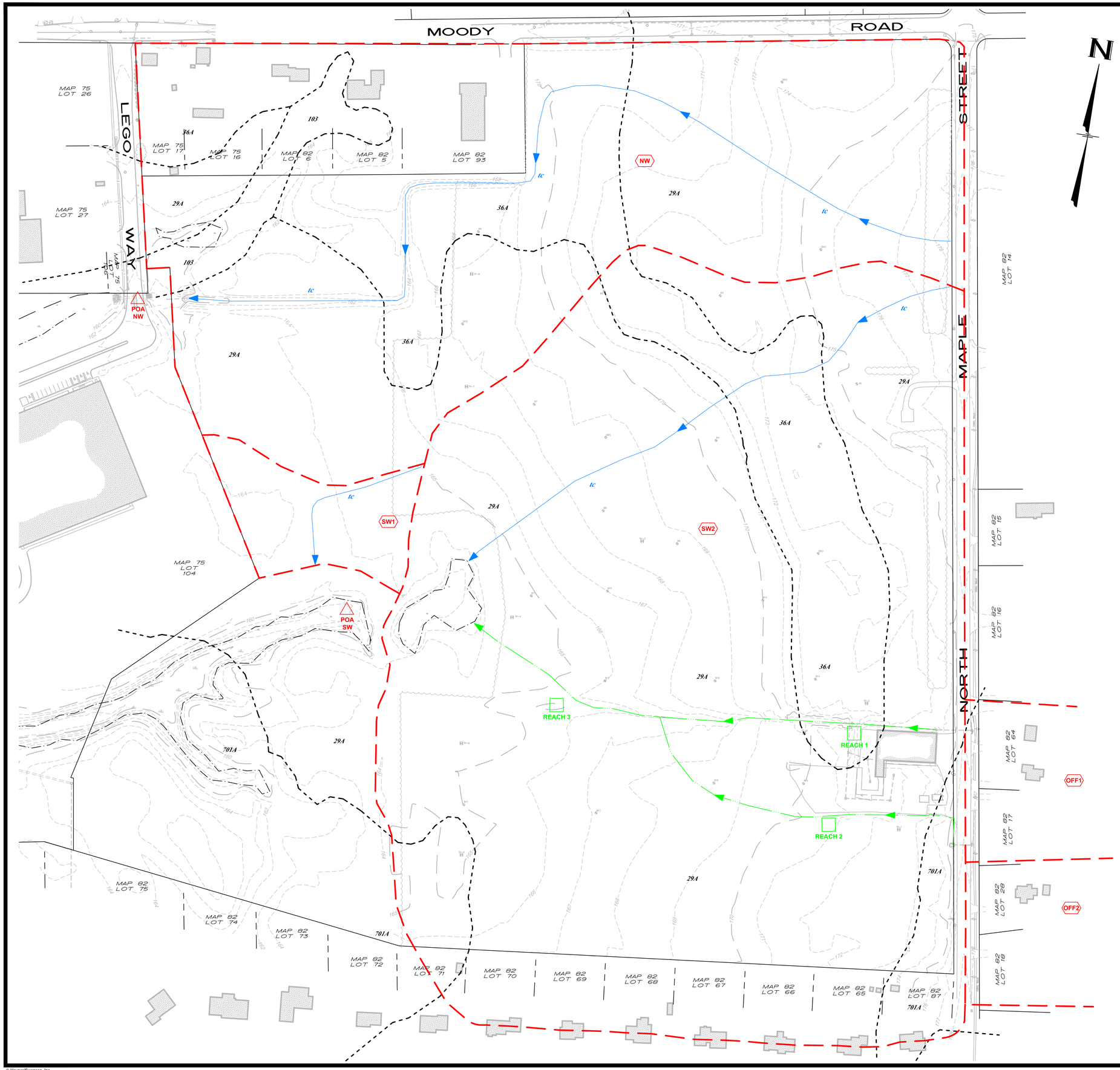


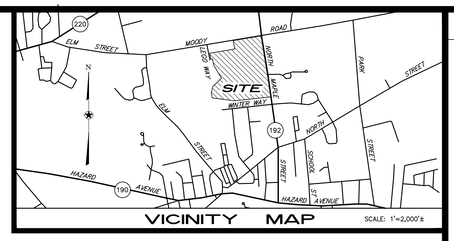
Town Area: 21909 Acres

Digital layers provided by the CTDEP.
Map composed by the NEMO project.
For educational purposes only.

1 0 1 Miles

The University of Connecticut, CES: November 01, 1999





VICINITY MAP SCALE: 1"=2,000'±

LEGEND

- tc — TIME OF CONCENTRATION LINE
- SUBCATCHMENT BOUNDARY
- 11 — SUBCATCHMENT IDENTIFIER
- POA — POINT OF ANALYSIS
- WETLAND FLAGGING LIMIT
- SOIL TYPE BOUNDARY
- 29A — SOIL TYPE

PRELIMINARY
NOT FOR CONSTRUCTION

PRE-DEVELOPED DRAINAGE AREA MAP
0 40 80 160 240 320 FEET
1" = 80'

PREPARED FOR/RECORD OWNER:
WE 113 NORTH MAPLE STREET, LLC
c/o WINSTANLEY ENTERPRISES, LLC 150 BAKER AVE. EXT. CONCORD, MA 01742 (978) 287-5000

FIGURE 5
PRE-DEVELOPMENT DRAINAGE AREA MAP
(MAP 82, LOTS 1, 2, 3 & 4)
PROPOSED AGELMARK DISTRIBUTION FACILITY
113 NORTH MAPLE STREET
ENFIELD, CONNECTICUT

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
3 Congress Street 131 Middlesex Turnpike
Nashua, NH 03062 Burlington, MA 01803
(603) 882-2616 (781) 272-2033
www.haynerswanson.com

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DWG: 5476SITE DAB | Field Book:

Scale 1" = 80'
Date 1 JUNE 2020
Project No. 5476
Sheet No. 1 OF 1

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MOODY ROAD

LEGO WAY

MAPLE STREET

NORTH

N

AGRI-MARK
260,500 SF

PROPOSED
1-STORY
BUILDING
501,500 SF

TENANT 'B'
241,000 SF

STORMWATER MANAGEMENT AREA 'A'

SEDIMENT FOREBAY

RAIN GARDEN 'A'

TREE CLEARING LIMIT (TYP)

STORMWATER MANAGEMENT AREA 'B'

POA NW

POA SW

SMA A

SMA B

RG A

OFF1

OFF2

MAP 75 LOT 26

MAP 75 LOT 27

MAP 75 LOT 17

MAP 75 LOT 16

MAP 82 LOT 6

MAP 82 LOT 5

MAP 82 LOT 93

MAP 82 LOT 14

MAP 82 LOT 15

MAP 82 LOT 16

MAP 82 LOT 64

MAP 82 LOT 17

MAP 82 LOT 28

MAP 82 LOT 18

MAP 75 LOT 104

MAP 82 LOT 75

MAP 82 LOT 74

MAP 82 LOT 73

MAP 82 LOT 72

MAP 82 LOT 71

MAP 82 LOT 70

MAP 82 LOT 69

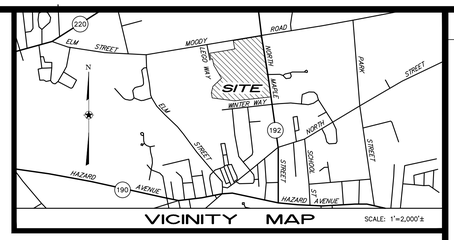
MAP 82 LOT 68

MAP 82 LOT 67

MAP 82 LOT 66

MAP 82 LOT 65

MAP 82 LOT 87



LEGEND

- TIME OF CONCENTRATION LINE
- SUBCATCHMENT BOUNDARY
- SUBCATCHMENT IDENTIFIER
- POINT OF ANALYSIS
- WETLAND FLAGGING LIMIT

PRELIMINARY
NOT FOR CONSTRUCTION

PREPARED FOR/RECORD OWNER:
WE 113 NORTH MAPLE STREET, LLC
c/o WINSTANLEY ENTERPRISES, LLC 150 BAKER AVE. EXT. CONCORD, MA 01742 (978) 287-5000

FIGURE 6
POST-DEVELOPMENT DRAINAGE AREA MAP
(MAP 82, LOTS 1, 2, 3 & 4)

PROPOSED AGRI-MARK DISTRIBUTION FACILITY
113 NORTH MAPLE STREET
ENFIELD, CONNECTICUT

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
3 Congress Street
Nashua NH 03062
(603) 882-2616
131 Middlesex Turnpike
Burlington, MA 01803
(781) 270-1501
www.haynerswanson.com

DRAWING LOCATION: J:\5000\5476\DWG\5476 SITE
DWG: 5476SITE DA61 | Field Book:

Scale 1" = 80'
Date 1 JUNE 2020
Project No. 5476
Sheet No. 1 OF 1

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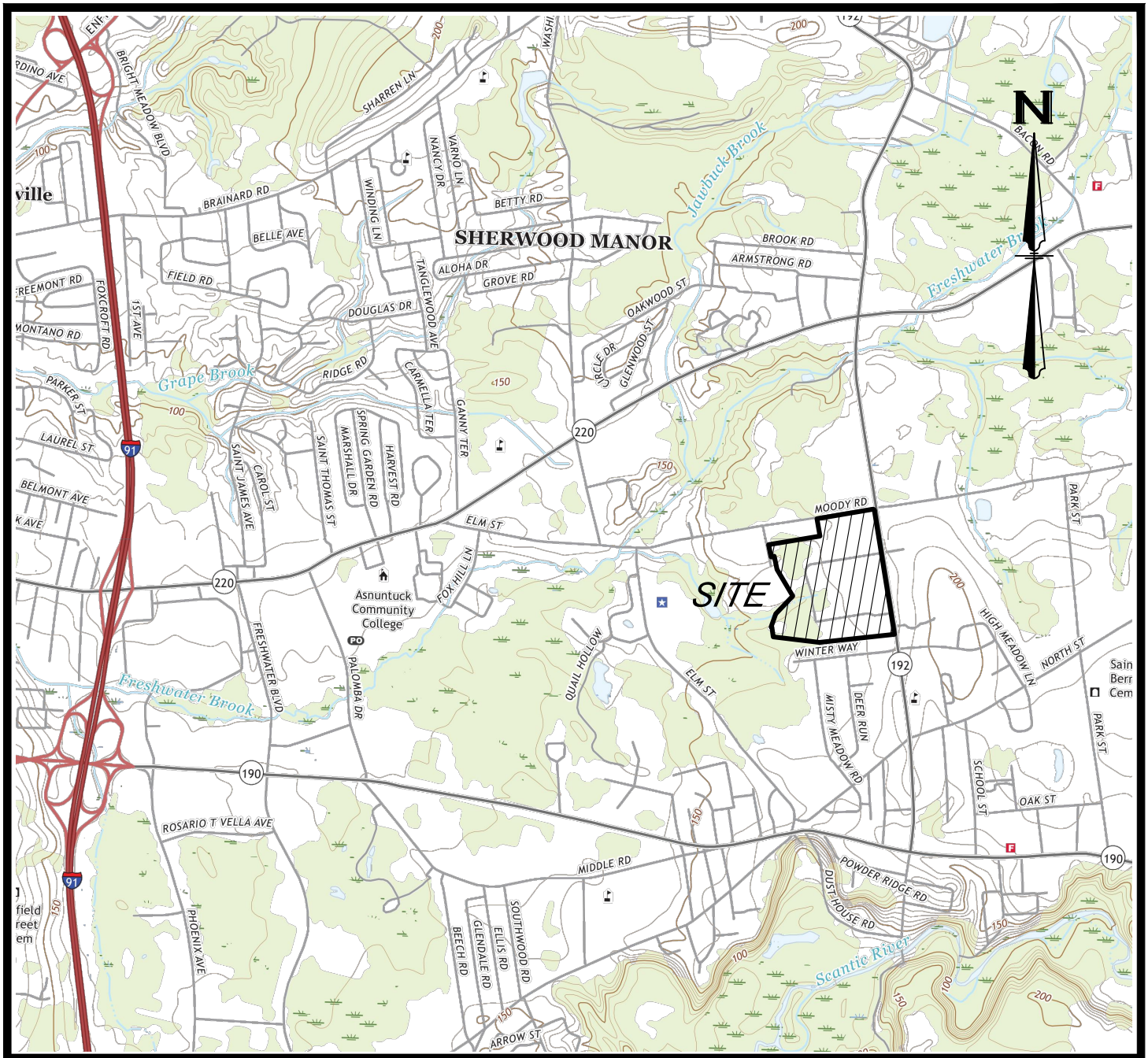

1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

BROAD BROOK, CT
QUAD MAP (2018)

SPRINGFIELD SOUTH, MA-CT
QUAD MAP (2015)

VICINITY PLAN

PROPOSED AGRI-MARK DISTRIBUTION FACILITY

113 NORTH MAPLE STREET

ENFIELD, CT

FIG. 1

PREPARED FOR:

WE 113 NORTH MAPLE STREET, LLC

c/o WINSTANLEY ENTERPRISES, LLC. 150 BAKER AVE. EXT. CONCORD, MA 01742

MAY 2020

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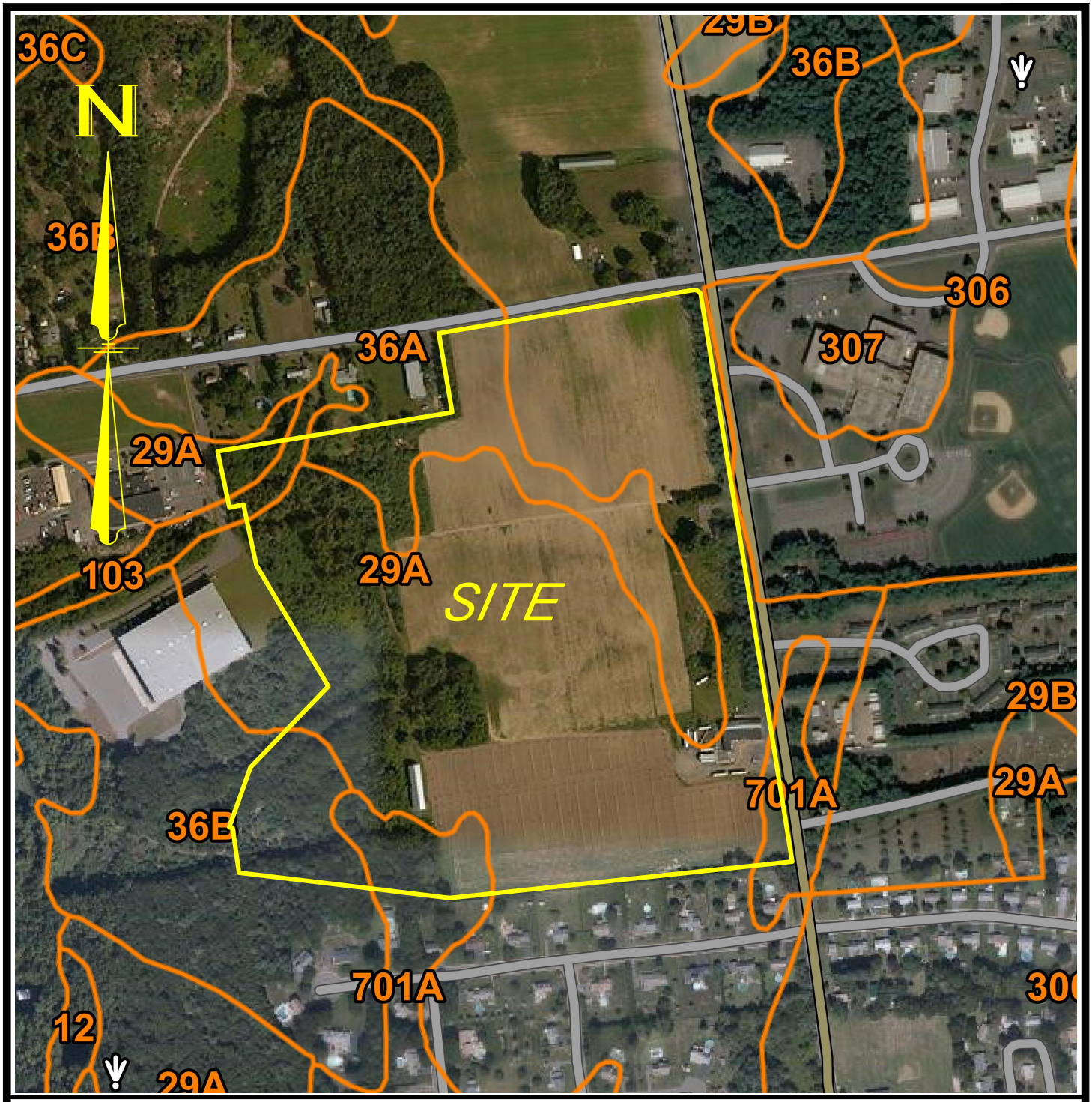
Drawing: 5476 SITE USGS

Location: J:\5000\5476\DWG\5476 SITE

5476
File Number



0 500 1,000 1,500 FEET

SOIL SURVEY STAFF, NATURAL RESOURCES CONSERVATION SERVICE, UNITED STATES DEPT. OF AGRICULTURE. WEB SOIL SURVEY. AVAILABLE ONLINE AT http://websoilsurvey.nrcs.usda.gov/ ACCESSED MAY 6, 2020

NRCS SOILS MAP

PROPOSED AGRI-MARK DISTRIBUTION FACILITY

113 NORTH MAPLE STREET

ENFIELD, CT

FIG. 2

PREPARED FOR:

WE 113 NORTH MAPLE STREET, LLC

c/o WINSTANLEY ENTERPRISES, LLC. 150 BAKER AVE. EXT. CONCORD, MA 01742

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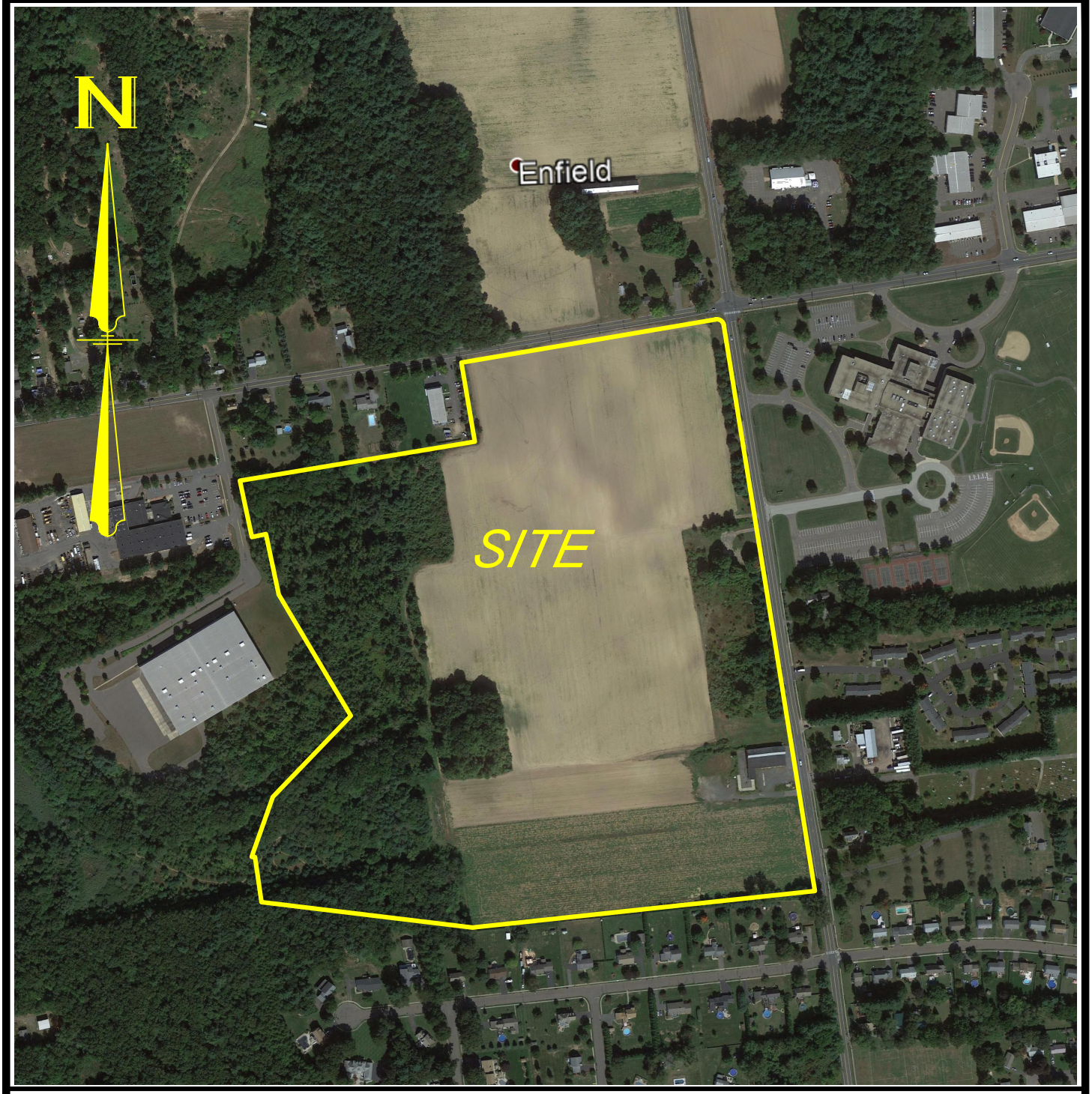
Drawing: 5476 SITE USGS

Location: J:\5000\5476\DWG\5476 SITE

5476

File Number



0 500 1,000 1,500 FEET

AERIAL DISPLAY PLAN

PROPOSED AGRI-MARK DISTRIBUTION FACILITY

113 NORTH MAPLE STREET

ENFIELD, CT

PREPARED FOR:

FIG. 3

WE 113 NORTH MAPLE STREET, LLC

c/o WINSTANLEY ENTERPRISES, LLC. 150 BAKER AVE. EXT. CONCORD, MA 01742

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Drawing: 5476 SITE USGS

Location: J:\5000\5476\DWG\5476 SITE

5476

File Number

0 500 1,000 1,500 FEET

TAX MAP

PROPOSED AGRI-MARK DISTRIBUTION FACILITY

113 NORTH MAPLE STREET

ENFIELD, CT

FIG. 4

PREPARED FOR:

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c/o WINSTANLEY ENTERPRISES, LLC. 150 BAKER AVE. EXT. CONCORD, MA 01742

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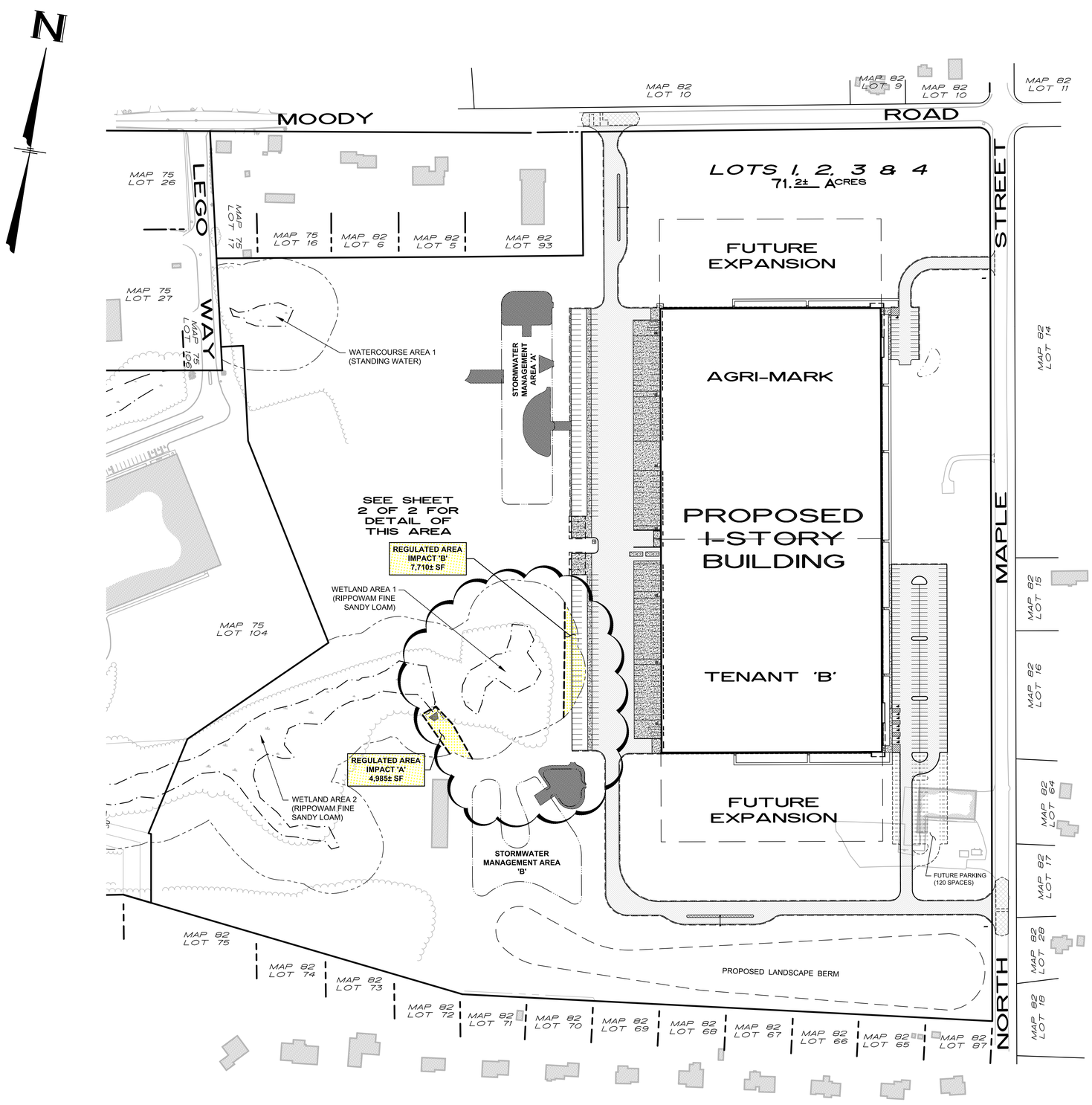
Drawing: 5476 SITE USGS

Location: J:\5000\5476\DWG\5476 SITE

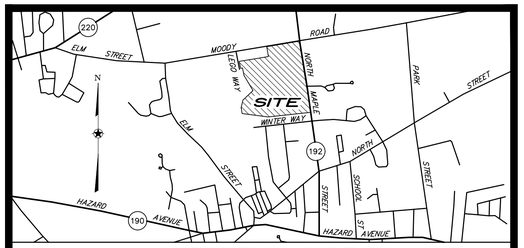
5476

File Number



LEGEND

- TREE LINE
- WETLAND FLAGGING LIMIT
- WL-18 WETLAND FLAGGING LOCATION □ IDENTIFIER
- REGULATED AREA LIMIT
- CONCRETE PAVEMENT
- PROPOSED FULL-DEPTH PAVEMENT
- RIPRAP / STONE
- REGULATED AREA IMPACT



VICINITY MAP SCALE: 1"=2,000'±

NOTES:

1. PURPOSE OF PLAN:
   TO SHOW 100 FT REGULATED AREA IMPACTS FOR THE PROPOSED BUILDING AND SITE IMPROVEMENTS.
2. LOT AREA: 71.2 ± ACRES
3. PRESENT ZONING: I-1 INDUSTRIAL 1 DISTRICT
4. THIS PARCEL IS LOCATED IN ZONE X, AREA OF MINIMAL FLOOD HAZARD, AS DETERMINED FROM THE FLOOD INSURANCE RATE MAP (FIRM), HARTFORD COUNTY, TOWN OF ENFIELD, CONNECTICUT, COMMUNITY PANEL No. 090028, MAPS 09003C0118F AND 09003C0231F, DATED: SEPTEMBER 26, 2008
5. OWNER OF RECORD:
   MAP 82, LOTS 1, 2, 3 & 4
   WE 113 NORTH MAPLE STREET, LLC
   c/o WINSTANLEY ENTERPRISES, LLC
   150 BAKER AVE. EXT.
   CONCORD, MA 01742
   BK 2664, PG 12
   BK 2673, PG 115

SUMMARY TABLE

DESCRIPTION	AREA (ACRES/SF±)
TOTAL SITE AREA	71.2± ACRES
TOTAL AREA OF WETLANDS	68,366 SF
TOTAL AREA OF WETLAND IMPACTS	0
TOTAL OF 'REGULATED AREA'	319,052 SF
TOTAL OF 'REGULATED AREA' IMPACTS	12,695 SF

No.	DATE	REVISION	BY

'REGULATED AREA' IMPACT PLAN
(MAP 82, LOTS 1, 2, 3 & 4)

PROPOSED AGRI-MARK DISTRIBUTION FACILITY

113 NORTH MAPLE STREET
ENFIELD, CONNECTICUT

PREPARED FOR/RECORD OWNER:

WE 113 NORTH MAPLE STREET, LLC

c/o WINSTANLEY ENTERPRISES, LLC 150 BAKER AVE. EXT. CONCORD, MA 01742 (978) 287-5000

120 0 120 240 360 480 FEET
0.5 0 0.5 1 METERS
SCALE: 1"=120 F□□
1"=36.576 M□□□

28 MAY 2020

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Civil Engineers/Land Surveyors
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131 Middlesex Turnpike, Burlington, MA 01803, (781) 203-1501
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FIELD BOOK: --	DRAWING NAME: 5476SITE-WB1	5476SITE	1 OF 2
DRAWING LOC: J:\5000\5476\DWG\5476 SITE		File Number	Sheet

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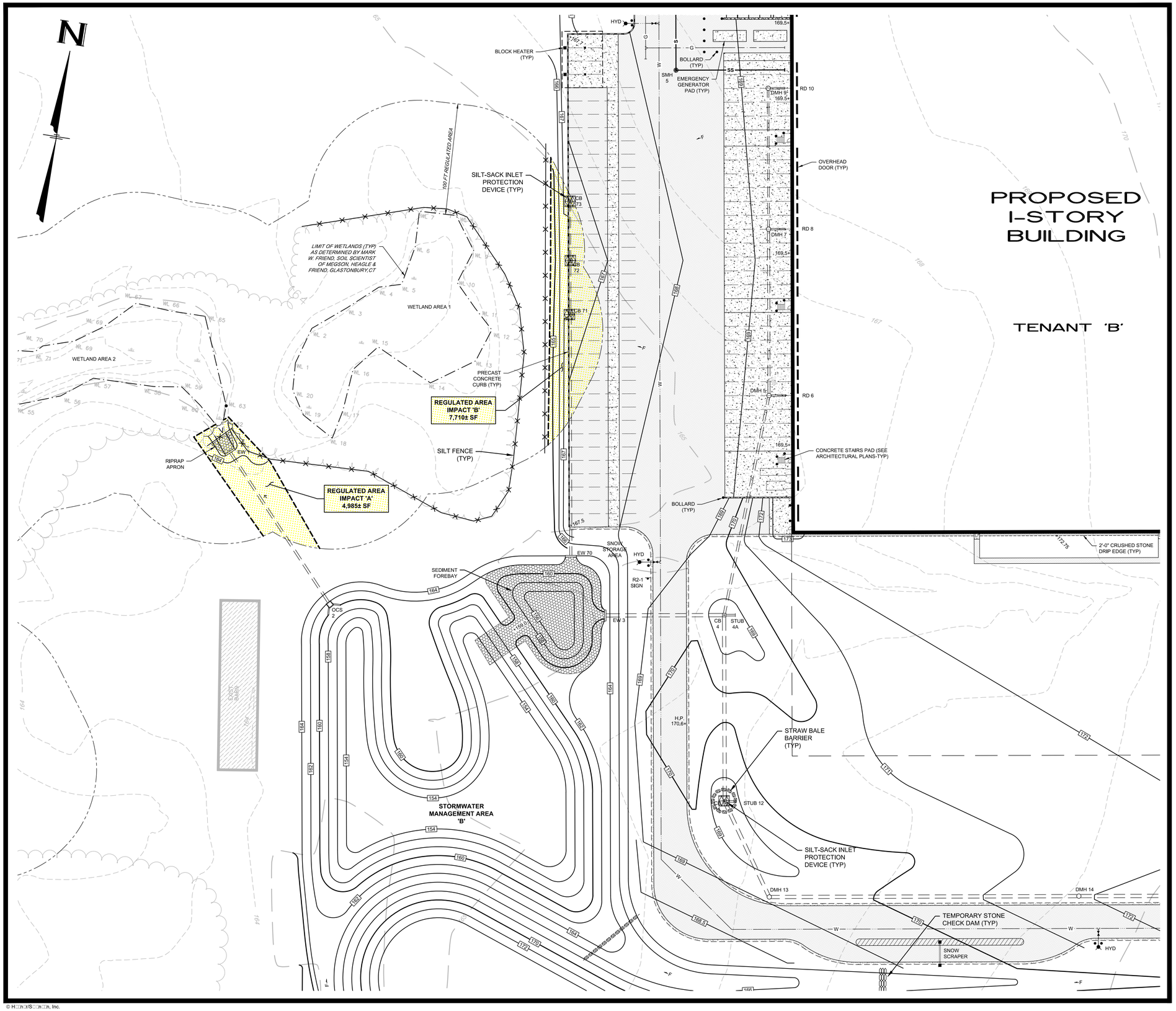

OWNER/APPLICANT
WE 113 NORTH MAPLE STREET, LLC
C/O WINSTANLEY ENTERPRISES, LLC
150 BAKER AVENUE, EXT.
CONCORD, MA 01742
ATTN: ADAM WINSTANLEY
978-287-5000

PROJECT ENGINEER
HAYNER/SWANSON, INC.
3 CONGRESS STREET
NASHUA, NH 03062
ATTN: PAUL F. HAYNER, JR., P.E.
603-882-2057

PROJECT SURVEYOR/SOIL SCIENTIST
MEGSON, HEAGLE & FRIEND
81 RANKIN ROAD
GLASTONBURY, CT 06033
ATTN: MARK W. FRIEND, P.E.
860-659-0587

ENVIRONMENTAL CONSULTANT
AECOM
500 ENTERPRISE DRIVE, SUITE 1A
ROCKY HILL, CT 06067
ATTN: DENNIS LOWRY
860-263-5800

PERMITTING CONSULTANT
GOOD EARTH ADVISORS
PO BOX 159
AVON, CT 06001
ATTN: VAL FERRO, AICP
860-559-4062

PROPOSED PLANT SPECIES TO BE INSTALLED IN THE STORMWATER MANAGEMENT AREAS

COMMON NAME	SCIENTIFIC NAME
Herbaceous Species	
Spike Rush	*Eleocharis palustris*
Swamp Aster	*Aster puniceus*
Joe-Pye-Weed	*Eupatoriadelphus maculatus*
Green Bulrush	*Scirpus atrovirens*
Soft Rush	*Juncus effusus*
Blue Vervain	*Verbena hastata*
Common Cattail	*Typha latifolia*
Cardinal Flower	*Lobelia cardinalis*
Soft-stem Bulrush	*Schoenoplectus tabernaemontani*
Grass-leaved Goldenrod	*Euthamia graminifolia*
Shrub Species	
Speckled Alder	*Alnus incana (rugosa)*
Sweet pepperbush	*Clethra alnifolia*
Silky dogwood	*Cornus amomum*
Spicebush	*Lindera benzoin*
Steeplebush	*Spiraea tomentosa*
Meadowsweet	*Spiraea latifolia*
Sweet Fern	*Comptonia peregrina*
Bayberry	*Morella (Myrica) pensylvanica*
Nannyberry	*Viburnum lentago*
Virginia Rose	*Rosa virginina*

NO.	DATE	REVISION	BY

'REGULATED AREA' IMPACT PLAN
(MAP 82, LOTS 1, 2, 3 & 4)

PROPOSED AGRI-MARK DISTRIBUTION FACILITY

113 NORTH MAPLE STREET
ENFIELD, CONNECTICUT

PREPARED FOR/RECORD OWNER:

WE 113 NORTH MAPLE STREET, LLC

c/o WINSTANLEY ENTERPRISES, LLC 150 BAKER AVE. EXT. CONCORD, MA 01742 (978) 287-5000

40 0 40 80 120 160 FEET
20 0 20 40 METERS
SCALE: 1"=40 F□t
1"=12.192 M□□□

28 MAY 2020

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Civil Engineers/Land Surveyors
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131 Middlesex Turnpike
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HSI

MAP 82, LOTS 1, 2, 3 & 4

SITE PLAN - SPR No.

PROPOSED AGRI-MARK DISTRIBUTION FACILITY

113 NORTH MAPLE STREET

ENFIELD, CONNECTICUT

PREPARED FOR/RECORD OWNER

WE 113 NORTH MAPLE STREET, LLC

c/o WINSTANLEY ENTERPRISES, LLC
150 BAKER AVE EXT.
CONCORD, MASSACHUSETTS 01742
(978) 287-5000
www.winent.com

VICINITY PLAN
SCALE: 1" = 2,000'

1 JUNE 2020

INDEX OF PLANS

SHEET No.	TITLE	
1 OF 22	MASTER SITE PLAN	1"= 100'
2 OF 22	ABUTTERS, NOTES AND LEGEND PLAN	
3-4 OF 22	EXISTING CONDITIONS PLAN	1"= 80'
5-6 OF 22	SITE GRADING & UTILITY PLAN	1"= 40'
7-8 OF 22	SITE LAYOUT PLAN	1"= 40'
9 OF 22	EROSION CONTROL PLAN - PHASE I	1" = 80'
10 OF 22	EROSION CONTROL PLAN - PHASE II	1" = 80'
11-13 OF 22	UTILITY PROFILES	1"= 40' H 1"= 4' V
14-17 OF 22	DETAIL SHEET - GENERAL SITE	
18 OF 22	DETAIL SHEET - EROSION CONTROL	
19-20 OF 22	LANDSCAPE PLAN	1"= 40'
21 OF 22	DETAIL SHEET - LANDSCAPE	
22 OF 22	PHOTOMETRIC SITE LIGHTING PLAN	1"= 80'

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Civil Engineers/Land Surveyors
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Nashua, NH 03062 *Burlington, MA 01803*
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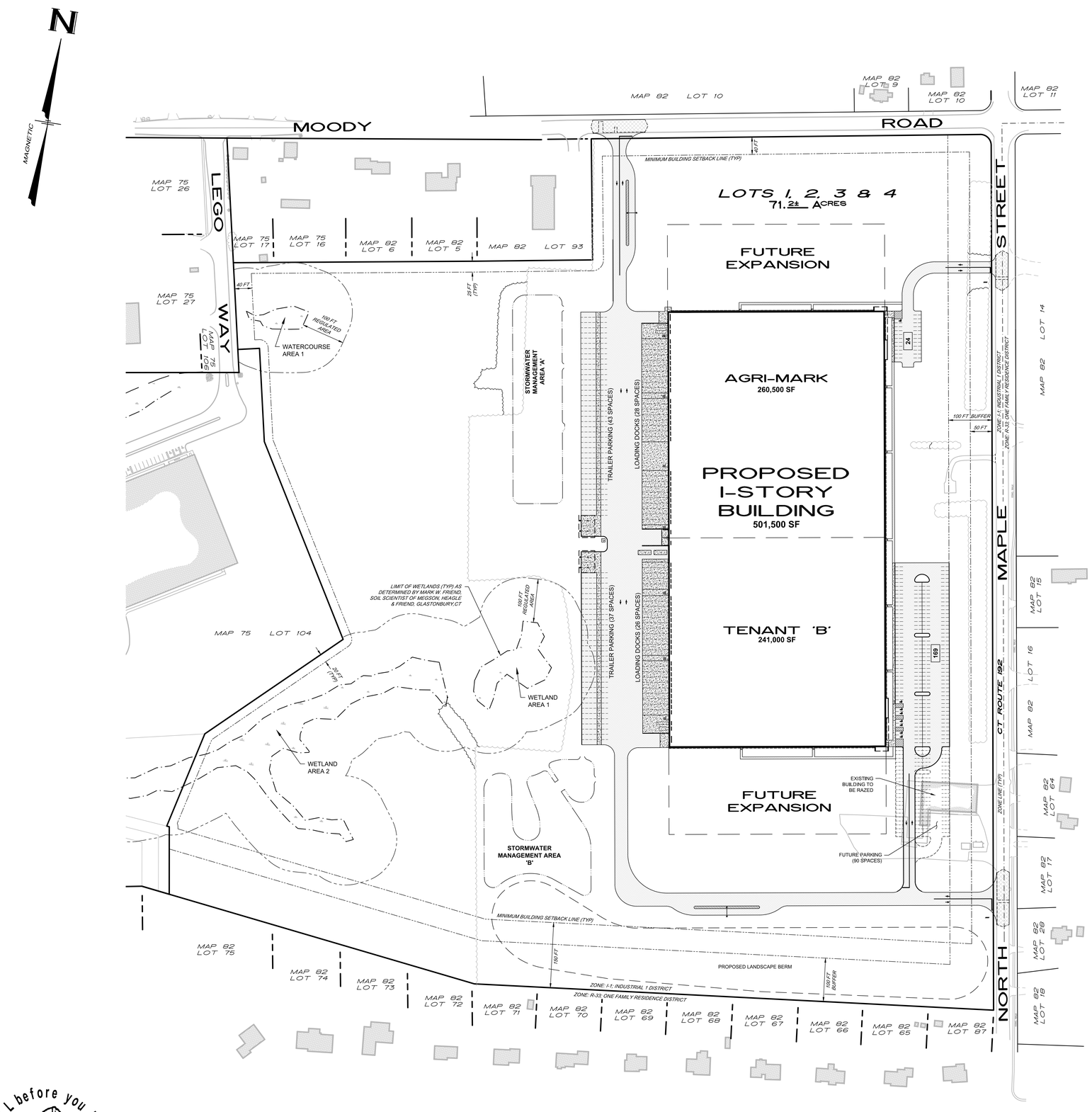

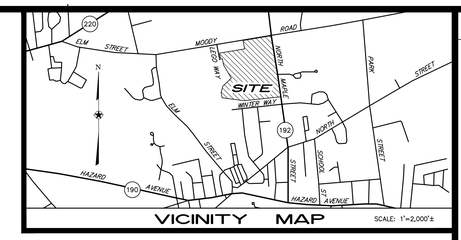

VICINITY MAP SCALE: 1"=2,000'±

NOTES:

1. TOTAL LOT AREA: 71.21 ACRES
2. PRESENT ZONING: I-1 INDUSTRIAL 1 DISTRICT

LOT REQUIREMENTS:	REQUIRED	PROPOSED
MINIMUM LOT AREA	40,000 SF	3,102,117 SF
MINIMUM LOT FRONTAGE	200 FT	2,925.8 FT
MINIMUM FRONT SETBACK	40 FT	240 FT
MINIMUM SIDE SETBACK	25 FT	209 FT
MINIMUM REAR SETBACK	20 FT	749 FT
MAXIMUM BUILDING HEIGHT	25 FT*	43 FT
MAXIMUM IMPERVIOUS SURFACE	66%	27%
MAXIMUM BUILDING COVERAGE	50%	16.2%

*REQUIRED SETBACKS SHALL BE INCREASED BY 1 FT FOR EACH ADDITIONAL FOOT OF BUILDING HEIGHT ABOVE 25 FT.

THIS SITE IS LOCATED IN THE LEVEL A AQUIFER PROTECTION AREA.

3. PURPOSE OF PLAN:
   TO SHOW PROPOSED 1-STORY 501,500 SF WAREHOUSE/DISTRIBUTION BUILDING ALONG WITH ACCOMPANYING SITE IMPROVEMENTS
4. PARKING:

REQUIRED:	1 SP/1,250 SF X 501,500 SF	= 401 SPACES
PROVIDED: (INCLUDES 8 HC VAN ACCESSIBLE SPACES)		= 193 SPACES
FUTURE (IF NEEDED):		= 90 SPACES
TOTAL PROVIDED:		= 283 SPACES

5. THE EXISTING BUILDINGS ARE CURRENTLY SERVICED BY:

SEWER:	TOWN OF ENFIELD
WATER:	HAZARDVILLE WATER COMPANY
POWER:	EVERSOURCE
GAS:	EVERSOURCE
TELECOMMUNICATIONS:	COX CABLE

6. THIS PARCEL IS NOT LOCATED IN A SPECIAL FLOOD HAZARD AREA ZONE AS DETERMINED FROM THE FLOOD INSURANCE RATE MAP (FIRM).
7. ON JUNE 16, 2020 THE TOWN OF ENFIELD INLAND WETLANDS AND WATERCOURSE AGENCY APPROVED THIS PLAN WITH CONDITIONS. A COPY OF THE APPROVAL LETTER IS ON FILE WITH THE TOWN OF ENFIELD PLANNING DEPARTMENT.
8. THE DEVELOPER SHALL NOTIFY THE TOWN ENGINEER'S OFFICE, 24 HOURS IN ADVANCE TO SCHEDULE INSPECTION OF SUB-BASE, GRAVEL, PAVEMENT, SIDEWALKS, DRAINAGE STRUCTURES AND PIPES, SANITARY SEWERS AND MANHOLES. TELEPHONE 8 A.M. – 4 P.M. AT 253-6363. PRIVATE SITES WILL BE INSPECTED FOR SANITARY SEWERS AND ANY IMPROVEMENT TO BE TURNED OVER TO THE TOWN.
9. ALL SITE WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE TOWN OF ENFIELD SPECIFICATIONS AS OUTLINED IN THE ENFIELD ZONING AND SITE PLAN REGULATIONS.
10. EROSION AND SEDIMENTATION CONTROLS SHALL BE INSTALLED IN ACCORDANCE WITH THE "EROSION AND SEDIMENT CONTROL HANDBOOK" PREPARED BY THE SOIL CONSERVATION SERVICE 2002.
11. ALL EXCAVATIONS WITHIN TOWN RIGHT-OF-WAY REQUIRES A STREET EXCAVATION PERMIT ISSUED BY THE ENGINEERING DEPARTMENT.
12. NO SITE IMPROVEMENTS SUCH AS DRAINAGE, SANITARY SEWERS, SIDEWALKS, EXCAVATIONS, FILLING, PAVEMENT OPERATIONS, ETC., SHALL COMMENCE UNTIL THE SITE ENGINEERING BOND, AS REQUIRED BY THE ENFIELD PLANNING AND ZONING COMMISSION IS POSTED WITH THE TOWN OF ENFIELD.
13. NO STUMPS TO BE BURIED ON SITE.
14. PRE-CONSTRUCTION CONFERENCE SHALL INCLUDE THE TOWN ENGINEER OR HIS AGENT. NOTIFICATION OF CONFERENCE SHALL BE 48 HOURS IN ADVANCE.
15. THE DEVELOPER SHALL HIRE A REGISTERED PROFESSIONAL ENGINEER TO INSPECT THE SITE DURING CONSTRUCTION. TO INSURE THE WORK IS CONSTRUCTED IN ACCORDANCE WITH THE APPROVED PLANS, THE ENGINEER WILL BE REQUIRED TO CERTIFY ON AN AS-BUILT PLAN THAT THE PROJECT WAS CONSTRUCTED IN ACCORDANCE WITH THE APPROVED PLANS AND ALL MATERIALS WERE PLACED IN ACCORDANCE WITH THE SITE PLANS AND SPECIFICATIONS, PRIOR TO RELEASE OF ANY BONDS.
16. OWNER OF RECORD:
    MAP 82, LOTS 1, 2, 3 & 4
    WE 113 NORTH MAPLE STREET, LLC
    c/o WINSTANLEY ENTERPRISES, LLC
    150 BAKER AVE. EXT.
    CONCORD, MA 01742
    BK 2664, PG 12
    BK 2673, PG 115

NOTE

SEE SHEET 2 OF 22 FOR ABUTTERS, NOTES AND LEGEND

CALL before you DIG
DIAL 811 OR 1-800-922-4455

▶ ZONING NOTE ◀

THE ZONING/BUILDING SETBACKS DEPICTED ON THIS PLAN ARE THOSE WE HAVE INTERPRETED FROM THE LATEST ZONING ORDINANCE OF THE MUNICIPALITY AND, AS SUCH, ARE ONLY OPINIONS EXPRESSED BY HAYNER/SWANSON, INC. THE FINAL INTERPRETATION OF THE ORDINANCE CAN ONLY BE MADE BY THE APPROPRIATE ZONING AUTHORITY. SINCE BUILDING ORIENTATION, PROPOSED USES, AND OTHER FACTORS CAN AFFECT THE SETBACKS, PRIOR TO ANY DEVELOPMENT OF THIS PROPERTY, THE BUILDER/OWNER MUST CONSULT WITH THE TOWN/CITY TO INSURE THE CORRECT APPLICATION OF THE ZONING ORDINANCE.

NO.	DATE	REVISION
1	7/21/20	

0 100 200 300 400 FEET
1" = 100'

PREPARED FOR/RECORD OWNER:
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c/o WINSTANLEY ENTERPRISES, LLC 150 BAKER AVE. EXT. CONCORD, MA 01742 (978) 287-5000

SPR No.
MASTER SITE PLAN
(MAP 82, LOTS 1, 2, 3 & 4)

PROPOSED AGRIMARK DISTRIBUTION FACILITY
113 NORTH MAPLE STREET
ENFIELD, CONNECTICUT

HSI Hayner/Swanson, Inc.
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133 Middlesex Turnpike
Burlington, MA 01803
(781) 272-2921
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DRAWING LOCATION: J:\5000\5476\DWG\5476 SITE
DWG: 5476SITE-F001
Field Book:

Scale 1" = 100'
Date 1 JUNE 2020
Project No. 5476
Sheet No. 1 OF 22

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ABUTTERS LIST

MAP	LOT NO.	NAME & ADDRESS
75	16	GARY L. WILCOX 48 MOODY ROAD ENFIELD, CT 06082 BK 2523, PG 417 USE: RESIDENTIAL ZONE: I-1 – INDUSTRIAL 1
75	17	RAYMOND S. GWOZDZ 44 MOODY ROAD ENFIELD, CT 06082 BK 652, PG 652 USE: RESIDENTIAL ZONE: I-1 – INDUSTRIAL 1
75	27	TOWN OF ENFIELD TOWN GARAGE 820 ENFIELD STREET ENFIELD, CT 06082 BK 345, PG 209 USE: STORAGE/WAREHOUSE ZONE: I-1 – INDUSTRIAL 1
75	104 & 106	ROCK RIDGE REALTY, LLC 33 SHAWS LANE WEST SPRINGFIELD, MA 01105 BK 2701, PG 274 USE: INDUSTRIAL ZONE: I-1 – INDUSTRIAL 1
82	5	WARREN T. & CATHERINE B. KESSLER 56 MOODY ROAD ENFIELD, CT 06082 BK 1507, PG 106 USE: RESIDENTIAL ZONE: I-1 – INDUSTRIAL 1
82	6	ELIZABETH LAPALME 50 MOODY ROAD ENFIELD, CT 06082 BK 2588, PG 197 USE: RESIDENTIAL ZONE: I-1 – INDUSTRIAL 1
82	9	JEANNE SMITH & JEANNE E. MCGUIRE 75 MOODY ROAD ENFIELD, CT 06082 BK 1272, PG 293 USE: RESIDENTIAL ZONE: I-1 – INDUSTRIAL 1
82	10	JEANNE SMITH 75 MOODY ROAD ENFIELD, CT 06082 BK 1272, PG 292 USE: TWO-FAMILY ZONE: I-1 – INDUSTRIAL 1
82	11	CONN LIGHT & POWER COMPANY P.O. BOX 270 HARTFORD, CT 06140-0270 BK 172, PG 509 USE: PUBLIC UTILITY ZONE: I-1 – INDUSTRIAL 1
82	14	TOWN OF ENFIELD FERMI HIGH SCHOOL 124 MAPLE STREET ENFIELD, CT 06082 BK 287, PG 382 USE: HIGH SCHOOL ZONE: R-33 – ONE FAMILY RESIDENCE
82	15	GERALD T. HAMILTON 9 WILLARD AVENUE ENFIELD, CT 06082 BK 2461, PG 81 USE: RESIDENTIAL ZONE: R-33 – ONE FAMILY RESIDENCE
82	16	MAPLE HEIGHTS ASSOCIATION, INC. C/O CHERYL BUTENAS, PRESIDENT 102 N. MAPLE STREET, UNIT #2B ENFIELD, CT 06082 USE: CONDOMINIUM ZONE: R-33 – ONE FAMILY RESIDENCE
82	16	MAPLE HEIGHTS ASSOCIATION, INC. C/O GERALD OUELLETTE, VICE PRESIDENT 102 N. MAPLE STREET, UNIT #14B ENFIELD, CT 06082 USE: CONDOMINIUM ZONE: R-33 – ONE FAMILY RESIDENCE
82	17	ISLAMIC CENTER OF CONN, INC. C/O MOHAMED HAIDARA P.O. BOX 624 WINDSOR, CT 06095 BK 490, PG 273 USE: VACANT LAND ZONE: R-33 – ONE FAMILY RESIDENCE
82	18	JESSE MARINAK 90 NORTH MAPLE STREET ENFIELD, CT 06082 BK 2613, PG 188 USE: RESIDENTIAL ZONE: R-33 – ONE FAMILY RESIDENCE
82	28	BARBARA CRABB 389 ELM STREET ENFIELD, CT 06082 BK 1909, PG 254 USE: RESIDENTIAL ZONE: R-33 – ONE FAMILY RESIDENCE
82	64	LELAND R. & JOANNE M. HAWTHORNE P.O. BOX 325 SOMERS, CT 06071 BK 1262, PG 23 USE: COMMERCIAL ZONE: R-33 – ONE FAMILY RESIDENCE
82	64	LELAND R. & JOANNE M. HAWTHORNE P.O. BOX 325 SOMERS, CT 06071 BK 1262, PG 23 USE: COMMERCIAL ZONE: R-33 – ONE FAMILY RESIDENCE
82	65	GARY R. & PATRICIA A LAFLAMME 4 WINTER WAY ENFIELD, CT 06082 BK 2517, PG 1145 USE: RESIDENTIAL ZONE: R-33 – ONE FAMILY RESIDENCE
82	66	JOHN J., Jr. & EVELYN MACALA 6 WINTER WAY ENFIELD, CT 06082 BK 1318, PG 246 USE: RESIDENTIAL ZONE: R-33 – ONE FAMILY RESIDENCE
82	67	MATHIEU J. & LISA ROGERS 8 WINTER WAY ENFIELD, CT 06082 BK 1241, PG 68 USE: RESIDENTIAL ZONE: R-33 – ONE FAMILY RESIDENCE
82	68	LEE S. & LOREN T. GARRITY 10 WINTER WAY ENFIELD, CT 06082 BK 595, PG 919 USE: RESIDENTIAL ZONE: R-33 – ONE FAMILY RESIDENCE
82	69	KAMLESH S. & RACHNA K. MISTRI 12 WINTER WAY ENFIELD, CT 06082 BK 1548, PG 272 USE: RESIDENTIAL ZONE: R-33 – ONE FAMILY RESIDENCE
82	70	KENNETH J. & CELESTE L. ESTVANIK 14 WINTER WAY ENFIELD, CT 06082 BK 606, PG 471 USE: RESIDENTIAL ZONE: R-33 – ONE FAMILY RESIDENCE
82	71	GARY J. & ANGELA R. CZARNECKI 16 WINTER WAY ENFIELD, CT 06082 BK 1285, PG 171 USE: RESIDENTIAL ZONE: R-33 – ONE FAMILY RESIDENCE
82	72	PETER T. & BARBARA FONTAINE 18 WINTER WAY ENFIELD, CT 06082 BK 1054, PG 215 USE: RESIDENTIAL ZONE: R-33 – ONE FAMILY RESIDENCE
82	73	CLAYTON A. & TERESA A. PIRIE 20 WINTER WAY ENFIELD, CT 06082 BK 2636, PG 1 USE: RESIDENTIAL ZONE: R-33 – ONE FAMILY RESIDENCE
82	74	LERORY P. & SHERYL M. CHAMPAGNE 22 WINTER WAY ENFIELD, CT 06082 BK 2671, PG 1092 USE: RESIDENTIAL ZONE: R-33 – ONE FAMILY RESIDENCE
82	75	MIGUEL & ANNE MARIE VILLA 24 WINTER WAY ENFIELD, CT 06082 BK 1604, PG 9 USE: RESIDENTIAL ZONE: R-33 – ONE FAMILY RESIDENCE
82	87	AL & KAREN L. SEVERINO 2 WINTER WAY ENFIELD, CT 06082 ZONE: R-33 – ONE FAMILY RESIDENCE
82	93	58 MOODY RD, LLC 58 MOODY ROAD ENFIELD, CT 06082 BK 1849, PG 21 USE: INDUSTRIAL ZONE: I-1 – INDUSTRIAL 1
82	93	58 MOODY RD, LLC 58 MOODY ROAD ENFIELD, CT 06082 BK 1849, PG 21 USE: INDUSTRIAL ZONE: I-1 – INDUSTRIAL 1

GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE APPLICABLE REGULATIONS AND STANDARDS OF THE TOWN OF ENFIELD AND SHALL BE BUILT IN A WORKMANLIKE MANNER IN ACCORDANCE WITH THE PLANS AND DETAILS. THE STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION, STATE OF CONNECTICUT, DEPARTMENT OF TRANSPORTATION, LATEST EDITION AND THE TOWN OF ENFIELD ENGINEERING DEPARTMENT, ENGINEERING TECHNICAL GUIDELINES & TYPICAL DETAILS, LATEST EDITION ARE HEREBY INCORPORATED BY REFERENCE.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATION, SIZE AND ELEVATION OF ALL EXISTING UTILITIES, SHOWN OR NOT SHOWN ON THESE PLANS, PRIOR TO THE START OF ANY CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES FOUND INTERFERING WITH THE PROPOSED CONSTRUCTION, AND APPROPRIATE REMEDIAL ACTION TAKEN BEFORE PROCEEDING WITH THE WORK.
3. THE CONTRACTOR IS RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION AND FOR CONDITIONS AT THE SITE. THESE PLANS, PREPARED BY HAYNER/SWANSON, INC., DO NOT EXTEND TO OR INCLUDE SYSTEMS PERTAINING TO THE SAFETY OF THE CONTRACTOR OR THEIR EMPLOYEES, AGENTS OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL PREPARE OR OBTAIN THE APPROPRIATE SAFETY SYSTEMS WHICH MAY BE REQUIRED BY THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) AND/OR LOCAL REGULATIONS.
4. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE HIMSELF/HERSELF WITH THE SITE AND ALL EXISTING CONDITIONS SURROUNDING IT AND THEREON.
5. THE CONTRACTOR SHALL NOTIFY CALL BEFORE YOU DIG 1-800-922-4455 A MINIMUM OF 72 HOURS PRIOR TO BEGINNING CONSTRUCTION. THE CONTRACTOR SHALL REPAIR, AT HIS/HER OWN EXPENSE, ANY UNDERGROUND CABLES OR UTILITIES DAMAGED BY HIS/HER OPERATIONS INCLUDING ANY DAMAGE DONE DRIVING HIS/HER EQUIPMENT OVER EXISTING UNDERGROUND CABLES OR UTILITIES.
6. FOR WORK WITHIN A PUBLIC STREET THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN TO THE TOWN OF ENFIELD ENGINEERING DEPARTMENT PRIOR TO CONSTRUCTION.
7. BLASTING, IF REQUIRED, SHALL BE PERFORMED BY A LICENSED BLASTING CONTRACTOR MEETING CTDOT AND TOWN OF ENFIELD REQUIREMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFICATION AND ALL COORDINATION WITH ALL AFFECTED UTILITIES PRIOR TO SCHEDULING BLASTING OPERATIONS.
8. THE CONTRACTOR SHALL PROVIDE A MINIMUM OF 6" TOPSOIL AND SEED OVER ALL DISTURBED UNPAVED AREAS UNLESS OTHERWISE SPECIFIED.
9. STUMPS SHALL BE DISPOSED OF OFF-SITE IN A LEGAL MANNER.
10. ALL PAVEMENT CUTTING SHALL BE COMPLETED BY SAW-CUTTING ONLY. THE CONTRACTOR SHALL ENSURE A SMOOTH TRANSITION BETWEEN EXISTING AND PROPOSED PAVEMENT.
11. CONSTRUCTION HOURS ARE MONDAY THRU SATURDAY, 7:00 AM TO 7:00 PM, WITH NO CONSTRUCTION OCCURRING ON SUNDAYS. BLASTING, IF ANY, SHALL BE LIMITED TO 7:00 AM TO 5:00 PM MONDAY THRU FRIDAY ONLY. BLASTING OR RAMMING ROCK IS PROHIBITED ON SATURDAYS AND SUNDAYS.
12. ALL SIGNS ARE SUBJECT TO THE REQUIREMENTS OF THE ENFIELD ZONING ORDINANCE AS DETERMINED DURING THE SIGN PERMIT APPLICATION PROCESS.
13. THE CONTRACTOR SHALL USE ONLY BENCHMARKS ESTABLISHED BY THE ENGINEER.
14. IT SHALL BE UNLAWFUL TO MODIFY, CHANGE OR ALTER IMPROVEMENTS AS SHOWN ON THESE PLANS WITHOUT RECEIVING APPROVAL FROM THE TOWN OF ENFIELD PLANNING AND ZONING COMMISSION.

SITE DEMOLITION NOTES:

1. THE CONTRACTOR IS RESPONSIBLE FOR THE DEMOLITION, REMOVAL, AND DISPOSAL IN A LOCATION APPROVED BY ALL GOVERNING AUTHORITIES, OF ALL STRUCTURES, PADS, WALLS, FOUNDATIONS, PARKING, DRIVES, DRAINAGE, STRUCTURES, UTILITIES, ETC., SUCH THAT THE IMPROVEMENTS SHOWN ON THE REMAINING PLANS CAN BE CONSTRUCTED. ALL FACILITIES TO BE REMOVED SHALL BE UNDERCUT TO SUITABLE MATERIAL AND BROUGHT TO GRADE WITH SUITABLE COMPACTED FILL MATERIAL PER THE GEOTECHNICAL SPECIFICATIONS.
2. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL DEBRIS FROM THE SITE AND DISPOSING THE DEBRIS IN A LAWFUL MANNER. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED FOR SITE DEMOLITION AND DISPOSAL.
3. THE CONTRACTOR SHALL COORDINATE WITH RESPECTIVE UTILITY COMPANIES PRIOR TO THE REMOVAL AND/OR RELOCATION OF UTILITIES. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANY CONCERNING PORTIONS OF WORK WHICH MAY BE PERFORMED BY THE UTILITY COMPANY'S FORCES AND ANY FEES WHICH ARE TO BE PAID TO THE UTILITY COMPANY FOR THEIR SERVICES. THE CONTRACTOR IS RESPONSIBLE FOR PAYING ALL FEES AND CHARGES.
4. THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN ON THIS PLAN HAVE BEEN DETERMINED FROM THE BEST INFORMATION AVAILABLE AND ARE GIVEN FOR THE CONVENIENCE OF THE CONTRACTOR. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THEIR ACCURACY. PRIOR TO THE START OF ANY DEMOLITION ACTIVITY, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES FOR ON SITE LOCATIONS OF EXISTING UTILITIES.
5. ALL EXISTING SEWERS, PIPING AND UTILITIES SHOWN ARE NOT TO BE INTERPRETED AS THE EXACT LOCATION, OR AS THE ONLY OBSTACLES THAT MAY OCCUR ON THE SITE. THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND PROCEED WITH CAUTION AROUND ANY ANTICIPATED FEATURES. THE CONTRACTOR SHALL GIVE NOTICE TO ALL UTILITY COMPANIES REGARDING DESTRUCTION AND REMOVAL OF ALL SERVICE LINES AND CAP ALL LINES BEFORE PROCEEDING WITH THE WORK.
6. ELECTRICAL, TELEPHONE, CABLE, WATER, FIBER OPTIC CABLE AND/OR GAS LINES NEEDING TO BE REMOVED OR RELOCATED SHALL BE COORDINATED WITH THE AFFECTED UTILITY COMPANY. ADEQUATE TIME SHALL BE PROVIDED FOR RELOCATION AND CLOSE COORDINATION WITH THE UTILITY COMPANY IS NECESSARY TO PROVIDE A SMOOTH TRANSITION IN UTILITY SERVICE. THE CONTRACTOR SHALL PAY CLOSE ATTENTION TO EXISTING UTILITIES WITHIN THE ROAD RIGHT OF WAY DURING CONSTRUCTION.
7. PRIOR TO SITE DEMOLITION OCCURRING, ALL APPROPRIATE EROSION CONTROL DEVICES ARE TO BE INSTALLED.
8. IF AN EXISTING WATER SUPPLY WELL IS FOUND ON THE PROPERTY IT SHALL BE LEGALLY ABANDONED BY A CONNECTICUT LICENSED WELL DRILLER. THE CONTRACTOR SHALL OBTAIN A WELL PERMIT FOR ABANDONMENT AND SUBMIT AN ABANDONMENT COMPLETION REPORT ONCE THE WORK IS FINISHED.

SITE GRADING NOTES:

1. EARTHWORK REFERENCE: GEOTECHNICAL REPORT, INDUSTRIAL DEVELOPMENT, 113 NORTH MAPLE STREET, ENFIELD, CONNECTICUT, SUBMITTED TO WINSTANLEY CONSTRUCTION MANAGEMENT, NEW HAVEN, CT, SUBMITTED BY GEI CONSULTANTS, INC., GLASTONBURY, CT DATED MARCH 20, 2020.
2. CLEARING AND GRUBBING LIMITS SHALL INCLUDE ONLY AREAS DISTURBED BY GRADING OPERATIONS. ALL STUMPS TO BE DISPOSED OF OFF-SITE IN A LEGAL MANNER.
3. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING PLAN ALIGNMENT AND GRADE AT COMPLETION OF CONSTRUCTION.
4. ALL DISTURBED AREAS SHALL BE LOAMED AND SEEDED IMMEDIATELY UPON BEING CONSTRUCTED.
5. ANY GRADED, UNPAVED, DISTURBED AREAS SHALL HAVE 6 INCHES OF TOPSOIL WITH SEED, MULCH, FERTILIZER AND WATER APPLIED UNTIL A HEALTHY STAND OF GRASS IS OBTAINED. THE CONTRACTOR SHOULD ACKNOWLEDGE THAT WORK IS NOT CONSIDERED COMPLETE UNTIL A HEALTHY STAND OF GRASS IS OBTAINED.
6. THE CONTRACTOR SHALL MAINTAIN AND PROTECT EXISTING VEGETATION IN THE SOUTHWEST CORNER OF THE PROPERTY. MINOR GRADING ADJUSTMENTS TO THE LANDSCAPE BERM MAY BE NEEDED TO ACHIEVE THIS.

SITE LAYOUT NOTES:

1. PRIOR TO COMMENCEMENT OF MAJOR CONSTRUCTION ACTIVITIES, THE ENGINEER SHALL PROVIDE THE CONTRACTOR WITH LAYOUT PLANS AND COORDINATE VALUES FOR STRATEGIC ELEMENTS OF THE SITE, INCLUDING THE FOLLOWING:
   - [A] BASE LINE CONTROLS FOR THE BUILDING AREA.
   - [B] PARKING LOT CORNERS AND MAJOR RADIUS POINTS.
   - [C] CATCH BASINS AND MANHOLE CENTERLINE POINTS.
2. LAYOUT OF THE PROPOSED IMPROVEMENTS INDICATED WITHIN THIS PROJECT SHALL BE CONDUCTED BY A LAND SURVEYOR LICENSED IN THE STATE OF CONNECTICUT. ALL MONUMENTATION TO BE SET OR AFFECTED BY THE PROJECT SHALL BE REMOVED AND RE-SET BY A LICENSED LAND SURVEYOR.
3. THE CONTRACTOR SHALL REFER TO THE ARCHITECTURAL PLANS FOR THE EXACT BUILDING DIMENSIONS AND DETAILS.
4. ALL DIMENSIONS ARE FROM FACE OF CURB OR OUTSIDE FACE OF BUILDING UNLESS NOTED OTHERWISE.
5. STAIR AND DOORWAY LOCATIONS AS SHOWN ARE FOR REFERENCE ONLY. REFER TO THE ARCHITECTURAL PLANS FOR EXACT LOCATIONS.
6. ALL PAVEMENT MARKINGS SHALL BE 4-INCH WHITE PAINT UNLESS NOTED OTHERWISE. 4-INCH YELLOW PAINT SHALL BE USED FOR ROADWAY CENTERLINES AND RESERVED PARKING SPACES.
7. ALL SIGNAGE SHALL BE IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), LATEST EDITION.

SANITARY SEWER NOTES:

1. ALL SEWER SHALL BE CONSTRUCTED IN ACCORDANCE WITH PLANS AND SPECIFICATIONS AND WITH THE REQUIREMENTS OF THE TOWN OF ENFIELD, CONNECTICUT SEWER USE ORDINANCES.
2. SEWER PIPE SHALL BE SOLID WALL-PVC UNLESS OTHERWISE REQUIRED BY THESE SPECIFICATIONS. SEWERS SHALL BE LOCATED AT LEAST 10 FEET HORIZONTALLY AND 18 INCHES VERTICALLY FROM WATER LINES.
3. WHENEVER SEWERS MUST CROSS WATER MAINS, SEWER SHALL BE CONSTRUCTED AS FOLLOWS:
   - [A] SEWER PIPE SHALL BE CLASS 52 DUCTILE IRON FOR A MINIMUM DISTANCE OF 9 FEET EACH SIDE OF THE CROSSING.
   - [B] JOINTS SHALL BE MECHANICAL TYPE WATER PRESSURE RATED WITH ZERO LEAKAGE WHEN TESTED AT 25 POUNDS PER SQUARE INCH FOR GRAVITY SEWERS AND 1-1/2 TIMES WORKING PRESSURE FOR FORCE MAINS. JOINTS SHALL NOT BE LOCATED WITHIN 9 FEET OF THE CROSSING.
   - [C] VERTICAL SEPARATION OF THE SEWER AND WATER MAIN SHALL NOT BE LESS THAN 18 INCHES.
4. THE SEWER CONNECTIONS SHALL BE INSPECTED BY AUTHORIZED TOWN OF ENFIELD PUBLIC WORKS AND ENGINEERING DEPARTMENT PERSONNEL BEFORE ANY BACKFILLING. INSPECTION HOURS ARE BETWEEN 9:00 AM AND 4:30 PM, MONDAY – FRIDAY, WITH AT LEAST 2 DAYS OF ADVANCE NOTICE.
5. THE SEWER SERVICE CONNECTION MANHOLE SHALL BE VACUUM TESTED AND THE PVC PIPING PRESSURE TESTED BY A THIRD PARTY WITH AUTHORIZED TOWN OF ENFIELD PUBLIC WORKS AND ENGINEERING DEPARTMENT PERSONNEL AS WITNESS.
6. NO FOUNDATION DRAINS OR ROOF DRAINS OR OTHER "NON-SANITARY DRAINS" SHALL BE CONNECTED TO THE MUNICIPAL SEWER.

WATER NOTES:

1. REFERENCE: HAZARDVILLE WATER COMPANY SPECIFICATIONS FOR INSTALLATION OF ALL WATER LINES.
2. ALL PORTABLE WATER PIPE AND MATERIALS SHALL BE INSTALLED IN CONFORMANCE WITH THE HAZARDVILLE WATER COMPANY SPECIFICATIONS, LATEST EDITION.
3. ALL SPRINKLER AND DOMESTIC LEADS TO BUILDING SHALL END 5'-0" OUTSIDE THE FACE OF BUILDING WALL, UNLESS NOTED, AND SHALL BE PROVIDED WITH A TEMPORARY PLUG AT END (FOR OTHERS TO REMOVE AND EXTEND AS NECESSARY).
4. DIMENSIONS SHOWN ARE TO CENTERLINE OF PIPE OF FITTING.
5. THRUST BLOCKS AND MEGALUG RESTRAINTS SHALL BE PROVIDED AT ALL VERTICAL AND HORIZONTAL BENDS, TEES, AND FIRE HYDRANTS.
6. MINIMUM COVER ON ALL WATER LINES IS 5'-6".
7. CONTRACTOR SHALL MAINTAIN A 5'-0" HORIZONTAL AND 12" VERTICAL SEPARATION BETWEEN WATER SERVICE AND UTILITIES OTHER THAN SANITARY SEWER.
8. INSPECTIONS ON WATER SERVICE INSTALLATION DURING CONSTRUCTION IS THE RESPONSIBILITY OF THE SITE CONTRACTOR AND SHALL BE COORDINATED WITH HAZARDVILLE WATER COMPANY. ALL INSPECTION FEES SHALL BE PAID BY THE CONTRACTOR.
9. CONTRACTOR SHALL HAVE BACTERIOLOGICAL AND PRESSURE TESTING PERFORMED. CONTRACTOR SHALL GIVE HAZARDVILLE WATER COMPANY A COPY OF RESULTS. HAZARDVILLE WATER COMPANY SHALL BE ON-SITE TO WITNESS TEST.
10. ALL PIPE, VALVES, MISCELLANEOUS MATERIALS AND INSTALLATION SHALL CONFORM WITH HAZARDVILLE WATER COMPANY SPECIFICATIONS.
11. ALL FIRE HYDRANTS, VALVES, FITTINGS, PIPES, ETC. SHALL BE IN ACCORDANCE WITH HAZARDVILLE WATER COMPANY REQUIREMENTS.
12. METALLIC TAPE OR DETECTOR WIRE SHALL BE INSTALLED IN THE SAME TRENCH WITH ALL NONMETALLIC PIPE SUCH THAT THE PIPE MAY BE LOCATED WITH ELECTRONIC LOCATING EQUIPMENT. DETECTOR WIRE OR METALLIC TAPE SHALL BE INSTALLED APPROXIMATELY 12" TO 18" BELOW GRADE DIRECTLY ABOVE THE TOP OF THE PIPE. DETECTOR WIRE SHALL BE 14 - GAUGE SOLID COPPER, SIMPLEX BW3001, OR EQUAL. METALLIC TAPE SHALL BE 2" MINIMUM METALIZED TAPE, GRIFFOLYN COMPANY, INC. TERRATAPE OR EQUAL.
13. CONTRACTOR SHALL ENSURE ALL WATER VALVES ARE IN A FULLY-OPEN POSITION UPON COMPLETION OF PROJECT.
14. CONTRACTOR SHALL COORDINATE ALL WATER INTERRUPTIONS WITH THE HAZARDVILLE WATER COMPANY AND AFFECTED PROPERTY OWNERS.

DRAINAGE NOTES:

1. DRAINAGE CONSTRUCTION SHALL CONFORM TO THE TYPICAL SECTIONS AND DETAILS SHOWN ON THE PLANS, AND SHALL MEET THE REQUIREMENTS AND SPECIFICATIONS OF THE TOWN OF ENFIELD, CONNECTICUT.
2. REINFORCED CONCRETE PIPE (RCP) SHALL BE CLASS IV (3000 D), WALL "B", MEETING THE REQUIREMENTS OF ARTICLE M.08.01 CONN.DOT, STANDARD SPECIFICATIONS FOR ROADS, BRIDGES, AND INCIDENTAL CONSTRUCTION, FORM 816, LATEST EDITION. DRAINAGE PIPE SHALL BE FURNISHED AND INSTALLED WITH FLEXIBLE GASKETS CONFORMING TO ASTM C-443.
3. HIGH DENSITY POLYETHELENE PIPE (HDPE): HDPE PIPE SHALL BE HP STORM AS MANUFACTURED BY ADS WITH ADAPTERS, IF NECESSARY, FOR PIPE TO MANHOLE BOOTED JOINTS. THE PIPE SHALL CONFORM TO ASTM F2881 AND AASHTO M330 STANDARDS. ALL JOINTS SHALL BE WATER TIGHT INCLUDING THE PIPE JOINTS AT ALL MANHOLE AND CATCH BASIN STRUCTURES.
4. P.V.C. (POLY VINYL CHLORIDE) PIPE AND FITTINGS SHALL BE USED FOR ROOF DRAIN CONNECTIONS. ALL P.V.C. PIPE AND FITTINGS SHALL CONFORM TO THE MOST RECENT REQUIREMENTS OF ASTM SPECIFICATIONS FOR TYPE PSM POLY VINYL CHLORIDE (P.V.C.) SEWER PIPE AND FITTINGS, DESIGNATION D-3034 AND ASTM SPECIFICATIONS FOR SEWER PIPE. ALL P.V.C. PIPE SHALL BE TYPE SDR-35 AND SHALL HAVE ELASTOMERIC GASKET JOINTS CONFORMING TO DESIGNATION D-3212

POWER NOTES:

1. ALL POWER RELATED WORK SHALL COMPLY WITH EVERSOURCE STANDARDS AND SPECIFICATIONS.

GAS NOTES:

1. PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL COORDINATE THE EXACT SIZE AND LOCATION OF THE NATURAL GAS MAIN AND SERVICES WITH EVERSOURCE.

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LEGEND

- EXISTING GROUND CONTOUR
- EXISTING SPOT ELEVATION
- PROPOSED GRADE
- PROPOSED SPOT GRADE
- STORM DRAIN & CATCH BASIN
- STORM DRAIN & MANHOLE
- STORM DRAIN & HEADWALL
- STORM DRAIN & END SECTION
- SANITARY SEWER & MANHOLE
- WATER MAIN & HYDRANT
- WATER MAIN & GATE VALVE
- GAS LINE & GATE VALVE
- UTILITY POLE WITH GUY SUPPORT
- STREET LIGHT
- OVERHEAD ELECTRIC & TELEPHONE
- UNDERGROUND ELEC/TEL & MANHOLES
- SIGN
- TREE LINE
- WETLAND FLAGGING LIMIT
- REGULATED AREA LIMIT
- CHAINLINK FENCE
- PRECAST CONCRETE CURB
- STORMWATER RUNOFF DIRECTION
- HANDICAP PARKING SPACE
- PARKING SPACE COUNT
- PAVEMENT SAWCUT
- REINFORCED CONCRETE
- REINFORCED CONCRETE CURB AND SIDEWALK
- PROPOSED FULL-DEPTH PAVEMENT
- PROPOSED PAVEMENT OVERLAY
- RIPRAP / STONE
- REGULATED AREA IMPACT
- LIMIT OF WORK
- RETAINING WALL
- CONIFEROUS TREE
- DECIDUOUS TREE
- SHRUBS

NO.	DATE	REVISION	BY

PREPARED FOR/RECORD OWNER:
WE 113 NORTH MAPLE STREET, LLC
c/o WINSTANLEY ENTERPRISES, LLC 150 BAKER AVE. EXT. CONCORD, MA 01742 (978) 287-5000

SPR No.
ABUTTERS, NOTES AND LEGEND PLAN
(MAP 82, LOTS 1, 2, 3 & 4)
PROPOSED AGILMARK DISTRIBUTION FACILITY
113 NORTH MAPLE STREET
ENFIELD, CONNECTICUT

HSI Hayner/Swanson, Inc.
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DRAWING LOCATION: J:\5000\5476\DWG\5476 SITE
DWG: 5476SITE-FQ01 | Field Book:

Scale: NO SCALE
Date: 1 JUNE 2020
Project No. 5476
Sheet No. 2 OF 22

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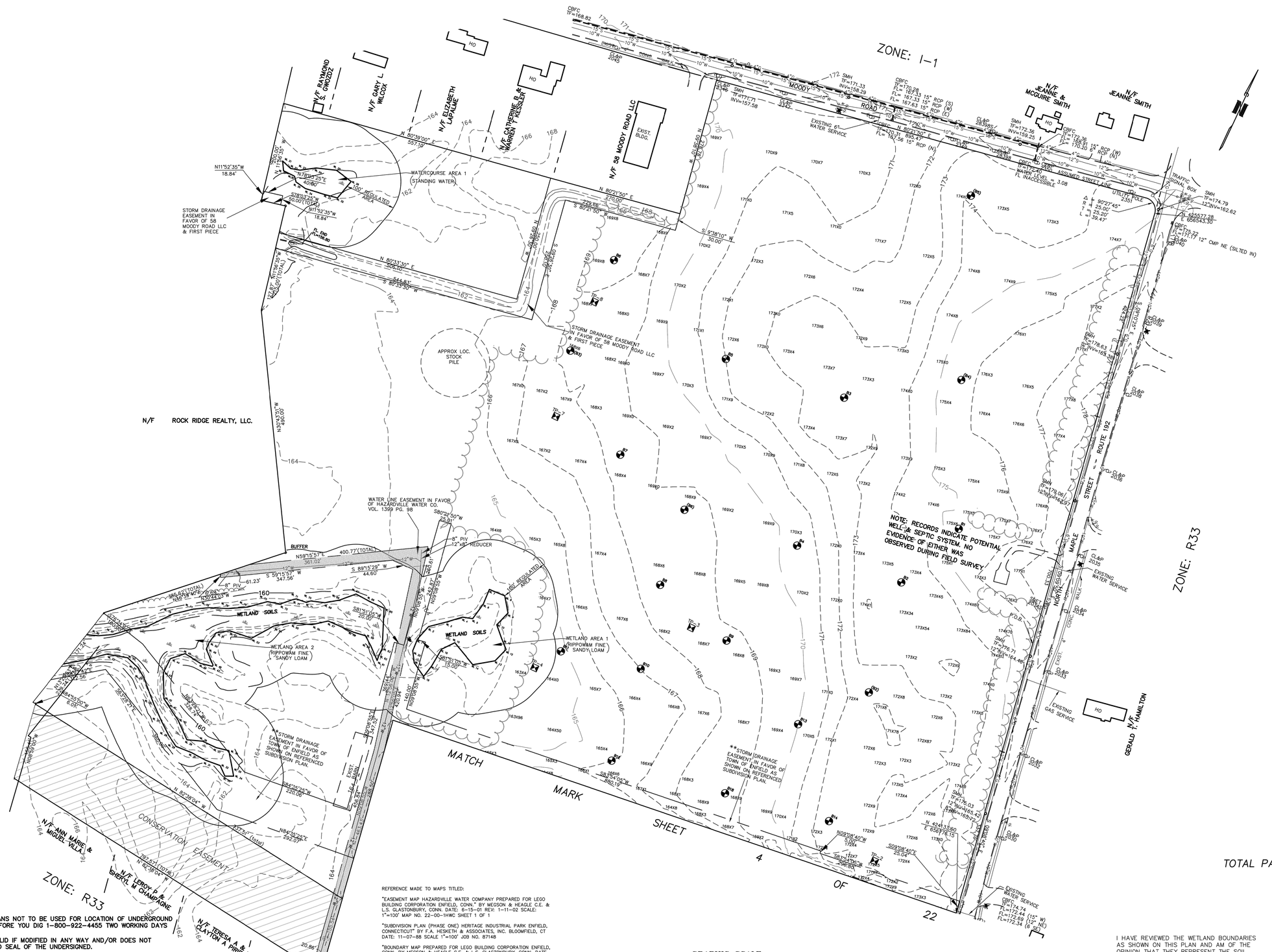

WARNING: THESE PLANS NOT TO BE USED FOR LOCATION OF UNDERGROUND UTILITIES – CALL BEFORE YOU DIG 1-800-922-4455 TWO WORKING DAYS BEFORE YOU DIG.

THIS MAP IS NOT VALID IF MODIFIED IN ANY WAY AND/OR DOES NOT BEAR THE EMBOSSED SEAL OF THE UNDERSIGNED.

TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON. THIS SURVEY WAS PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTION 20–300b–1 THROUGH 20–300b–20 AND THE "STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC., ON SEPTEMBER 26, 1996.
TYPE OF SURVEY: PROPERTY/BOUNDARY SURVEY
BOUNDARY DETERMINATION CATEGORY: RESURVEY
CLASS OF ACCURACY: A–2

JOHN L. HEAGLE L.S. # 9396

REFERENCE MADE TO MAPS TITLED:

"EASEMENT MAP HAZARDVILLE WATER COMPANY PREPARED FOR LEGO BUILDING CORPORATION ENFIELD, CONN." BY MEGSON & HEAGLE C.E. & L.S. GLASTONBURY, CONN. DATE: 6-15-01 REV: 1-11-02 SCALE: 1"=100' MAP NO. 22-00-1HWC SHEET 1 OF 1

"SUBDIVISION PLAN (PHASE ONE) HERITAGE INDUSTRIAL PARK ENFIELD, CONNECTICUT" BY F.A. HESKETH & ASSOCIATES, INC. BLOOMFIELD, CT DATE: 11-07-88 SCALE 1"=100' JOB NO. 87148

"BOUNDARY MAP PREPARED FOR LEGO BUILDING CORPORATION ENFIELD, CONN. BY MEGSON & HEAGLE C.E. & L.S. GLASTONBURY, CONN. DATE 8-4-93 SCALE 1"=100' JOB NO. 135-93-1

"CERTIFICATION PLAN LEGO WAY RESUBDIVISION PREPARED FOR LEGO BUILDING CORPORATION ENFIELD, CONN." BY MEGSON & HEAGLE C.E. & L.S. GLASTONBURY, CONN. DATE: 3-16-05 SCALE: 1"=100' MAP NO. 22-00-1LFC SHEET 1 OF 1

EARTHWORK REFERENCE: GEOTECHNICAL REPORT, INDUSTRIAL DEVELOPMENT,113 NORTH MAPLE STREET, ENFIELD, CONNECTICUT, SUBMITTED TO WINSTANLEY CONSTRUCTION MANAGMENT, NEW HAVEN, CT, SUBMITTED BY GEI CONSULTANTS, INC., GLASTONBURY, CT DATED MARCH 20, 2020.

"LOT LINE MERGER PLAN PREPARED FOR WE 113 NORTH MAPLE STREET, LLC. ENFIELD, CONN." BY MEGSON, HEAGLE & FRIEND C.E & L.S. GLASTONBURY, CONN DATE 5-26-20 SCALE 1"=100' MAP NO. 14-20-1PM SHEET 1 OF 1

SURVEY NOTES

EXISTING EASEMENTS APPURTENANT TO PROPERTY ARE SHOWN ON REFERENCED MAPS.

TOPOGRAPHY & CONTOURS FROM COMBINATION AERIAL & GROUND SURVEY

NO FIELD LOCATION OF BORINGS DEPICTED WAS CONDUCTED. LOCATIONS SHOWN ARE APPROXIMATE AS TAKEN FROM REFERENCED GEOTECHNICAL REPORT.

VERTICAL DATUM NGVD 29

NOTE: THE PROPERTY WITHIN SURVEY BOUNDARIES IS ZONED I-1. ZONE BOUNDARIES OF SURROUNDING PROPERTIES ARE EITHER ALONG ROAD CENTERLINES OR THE SUBJECT PROPERTY BOUNDARY WHERE NO ROAD FRONTAGE EXIST.

HORIZONTAL DATUM NAD 27

EXISTING STRUCTURES SHOWN ON ABBUTTING PROPERTIES ARE SHOWN AS DEPICTED ON THE ENFIELD GIS WEBSITE. NO FIELD VERIFICATIONS OF THESE STRUCTURES WAS MADE.

THE UNDISTURBED UPLAND SOILS ON THE SITE CONSIST OF AGAWAM FINE SANDY LOAM AND THE WINDSOR LOAMY SAND SERIES.

LEGEND

SANITARY MANHOLE	SMH
UTILITY POLE	
WATER GATE	W.G.
FIRE HYDRANT	
CATCH BASIN	
UGND POWER	—P—
UGND TELEPHONE	—T—
GAS	—G—
SEWER	—S—
WATER MAIN	—W—
SPOT ELEVATION	168x9
EXISTING TREE LINE	
TEST PIT	TP-5
BORING	B18

TOTAL PARCEL AREA = 3,102,117
= 71.21 AC

I HAVE REVIEWED THE WETLAND BOUNDARIES AS SHOWN ON THIS PLAN AND AM OF THE OPINION THAT THEY REPRESENT THE SOIL BOUNDARIES MARKED BY ME IN THE FIELD.

MARK W. FRIEND
SOIL SCIENTIST

NO.	DATE	REVISION	BY

PREPARED FOR/RECORD OWNER:
WE 113 NORTH MAPLE STREET, LLC
c/o WINSTANLEY ENTERPRISES, LLC 150 BAKER AVE. EXT. CONCORD, MA 01742 (978) 287-5000

SPR No.
EXISTING CONDITIONS PLAN
(MAP 82, LOTS 1, 2, 3 & 4)

PROPOSED AGEWARK DISTRIBUTION FACILITY
113 NORTH MAPLE STREET
ENFIELD, CONNECTICUT

MEGSON, HEAGLE & FRIEND
CIVIL ENGINEERS & LAND SURVEYORS
61 RANKIN ROAD
GLASTONBURY, CONN. 06033
PHONE (860)-659-0587

DRAWING LOCATION: J:\2020\5476\DWG\5476 SITE
DWG: 5476SITE-EC41 Field Book:

Scale 1" = 80'
Date 1 JUNE 2020
Project No. 5476
Sheet No. 3 OF 22

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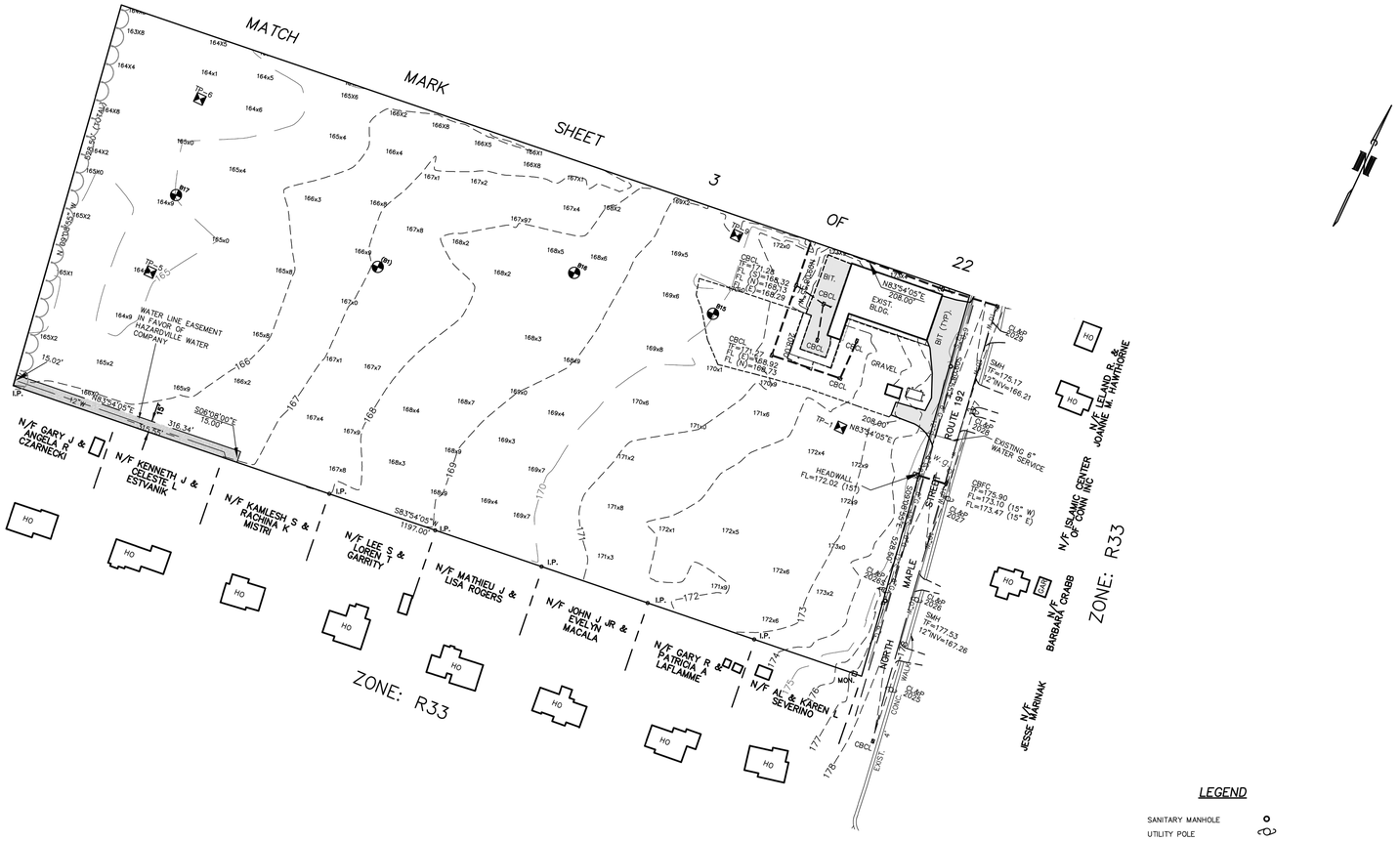

GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

LEGEND

SANITARY MANHOLE	
UTILITY POLE	
WATER GATE	W.G.
FIRE HYDRANT	
CATCH BASIN	
EXISTING MONUMENT	MON.
EXISTING IRON PIN	I.P.
GAS	G
SEWER	S
WATER MAIN	W
SPOT ELEVATION	166x97
TEST PIT	TP-5
BORING	B18

WARNING: THESE PLANS NOT TO BE USED FOR LOCATION OF UNDERGROUND UTILITIES – CALL BEFORE YOU DIG 1-800-922-4455 TWO WORKING DAYS BEFORE YOU DIG.

THIS MAP IS NOT VALID IF MODIFIED IN ANY WAY AND/OR DOES NOT BEAR THE EMBOSSED SEAL OF THE UNDERSIGNED.

TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON. THIS SURVEY WAS PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTION 20-300b-1 THROUGH 20-300b-20 AND THE "STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC., ON SEPTEMBER 26, 1996.
TYPE OF SURVEY: PROPERTY/BOUNDARY SURVEY
BOUNDARY DETERMINATION CATEGORY: RESURVEY
CLASS OF ACCURACY: A-2

JOHN L. HEAGLE L.S. # 9396

I HAVE REVIEWED THE WETLAND BOUNDARIES AS SHOWN ON THIS PLAN AND AM OF THE OPINION THAT THEY REPRESENT THE SOIL BOUNDARIES MARKED BY ME IN THE FIELD.

MARK W. FRIEND
SOIL SCIENTIST

NO.	DATE	REVISION	BY

PREPARED FOR/RECORD OWNER:
WE 113 NORTH MAPLE STREET, LLC
c/o WINSTANLEY ENTERPRISES, LLC 150 BAKER AVE. EXT. CONCORD, MA 01742 (978) 287-5000

SPR No.
EXISTING CONDITIONS PLAN
(MAP 82, LOTS 1, 2, 3 & 4)

PROPOSED AGE-MARK DISTRIBUTION FACILITY
113 NORTH MAPLE STREET
ENFIELD, CONNECTICUT

MEGSON, HEAGLE & FRIEND
CIVIL ENGINEERS & LAND SURVEYORS
81 RANKIN ROAD
GLASTONBURY, CONN. 06033
PHONE (860)-659-0587

DRAWING LOCATION: J:\2020\5476\DWG\5476.SITE
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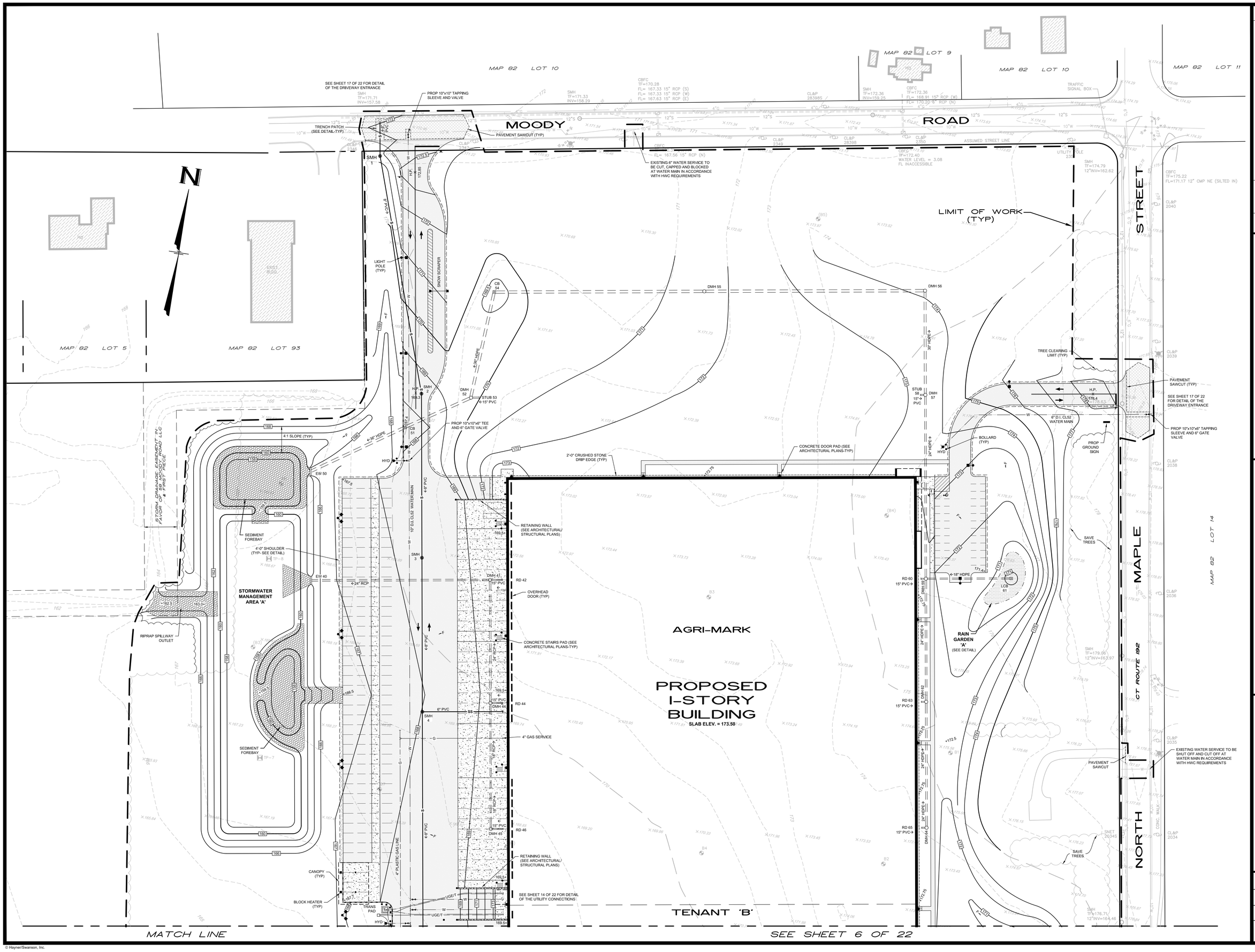

No.	DATE	REVISION

PREPARED FOR/RECORD OWNER:
WE 113 NORTH MAPLE STREET, LLC
c/o WINSTANLEY ENTERPRISES, LLC 150 BAKER AVE. EXT. CONCORD, MA 01742 (978) 287-5000

SPR No.
SITE GRADING & UTILITY PLAN
(MAP 82, LOTS 1, 2, 3 & 4)
PROPOSED AGRIMARK DISTRIBUTION FACILITY
113 NORTH MAPLE STREET
ENFIELD, CONNECTICUT

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
3 Congress Street
Nashua, NH 03062
(603) 883-2057
131 Middlesex Turnpike
Burlington, MA 01803
(781) 272-2147
www.haynerswanson.com
DRAWING LOCATION: J:\5000\5476\DWG\5476 SITE.DWG: 5476SITE-FG4
Field Book:

Scale 1" = 40'
Date 1 JUNE 2020
Project No. 5476
Sheet No. 5 OF 22

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MATCH LINE

SEE SHEET 5 OF 22

PROPOSED
1-STORY
BUILDING
SLAB ELEV. = 173.50

TENANT 'B'

REGULATED AREA IMPACT 'B' 7,710± SF

REGULATED AREA IMPACT 'A' 4,985± SF

WETLAND AREA 1

WETLAND AREA 2

WETLAND SOILS

LIMIT OF WETLANDS (TYP) AS DETERMINED BY MARK W. FRIEND, SOIL SCIENTIST OF MEGSON, HEAGLE & FRIEND, GLASTONBURY,CT

WATER LINE EASEMENT IN FAVOR OF HAZARDVILLE WATER CO. (VOL. 1399 PG 98)

100 FT REGULATED AREA

STORMWATER MANAGEMENT AREA 'B'

** STORM DRAINAGE EASEMENT IN FAVOR OF TOWN OF ENFIELD AS SHOWN ON REFERENCED SUBDIVISION PLAN

CONSERVATION EASEMENT

LIMIT OF WORK (TYP)

STREET

MAPLE

CT ROUTE 192

NORTH

N

MAP 82 LOT 72

MAP 82 LOT 71

MAP 82 LOT 70

MAP 82 LOT 69

MAP 82 LOT 68

MAP 82 LOT 67

MAP 82 LOT 66

MAP 82 LOT 65

MAP 82 LOT 87

MAP 82 LOT 18

MAP 82 LOT 28

MAP 82 LOT 17

MAP 82 LOT 16

MAP 82 LOT 15

MAP 82 LOT 64

PREPARED FOR/RECORD OWNER:
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c/o WINSTANLEY ENTERPRISES, LLC 150 BAKER AVE. EXT. CONCORD, MA 01742 (978) 287-5000

SPR No.
SITE GRADING & UTILITY PLAN
(MAP 82, LOTS 1, 2, 3 & 4)
PROPOSED AGELMARK DISTRIBUTION FACILITY
113 NORTH MAPLE STREET
ENFIELD, CONNECTICUT

NO.	DATE	REVISION

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
3 Congress Street 131 Middlesex Turnpike
Nashua, NH 03062 Burlington, MA 01803
(603) 882-2616 (781) 272-2033
www.haynerswanson.com

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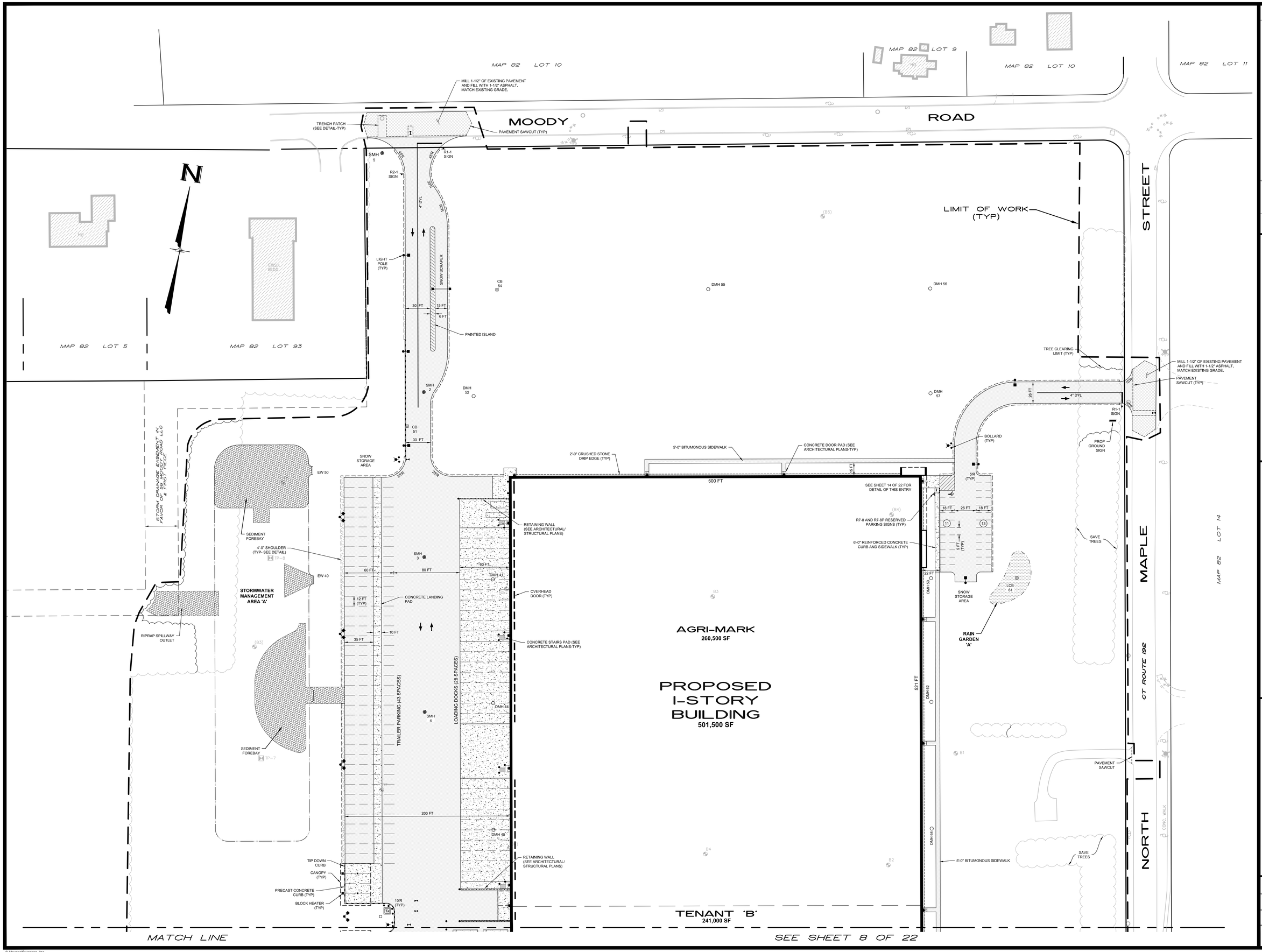

No.	DATE	REVISION

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SPR No.
SITE LAYOUT PLAN
(MAP 82, LOTS 1, 2, 3 & 4)
PROPOSED AGRIMARK DISTRIBUTION FACILITY
113 NORTH MAPLE STREET
ENFIELD, CONNECTICUT

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
131 Middlesex Turnpike
Burlington, MA 01803
(781) 272-2021
3 Congress Street
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(603) 883-2057
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Date 1 JUNE 2020
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Sheet No. 7 OF 22

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MATCH LINE

SEE SHEET 7 OF 22

PROPOSED
1-STORY
BUILDING
501,500 SF

TENANT 'B'
241,000 SF

TRAILER PARKING (37 SPACES)

LOADING DOCKS (26 SPACES)

REGULATED AREA
IMPACT 'B'
7,710± SF

REGULATED AREA
IMPACT 'A'
4,985± SF

STORMWATER
MANAGEMENT AREA
'B'

MAPLE STREET

CT ROUTE 192

NORTH

MAP 82 LOT 72

MAP 82 LOT 71

MAP 82 LOT 70

MAP 82 LOT 69

MAP 82 LOT 68

MAP 82 LOT 67

MAP 82 LOT 66

MAP 82 LOT 65

MAP 82 LOT 87

MAP 82 LOT 18

MAP 82 LOT 28

MAP 82 LOT 64

MAP 82 LOT 17

MAP 82 LOT 16

MAP 82 LOT 15

LIMIT OF WORK
(TYP)

CONSERVATION EASEMENT

WATER LINE
EASEMENT IN FAVOR
OF HAZARDVILLE
WATER COMPANY

" STORM DRAINAGE
EASEMENT IN FAVOR
OF TOWN OF
ENFIELD AS SHOWN
ON REFERENCED
SUBDIVISION PLAN

SNOW STORAGE AREA

SNOW SCRAPER

2'-0" SHOULDER
(TYP- SEE DETAIL)

PROP
GROUND
SIGN

PAVEMENT SAWCUT
(TYP)

TRENCH PATCH
(SEE DETAIL-TYP)

MILL 1-1/2" OF EXISTING
PAVEMENT AND FILL WITH
1-1/2" ASPHALT,
MATCH EXISTING GRADE.

PRECAST CONCRETE
CURB (TYP)

STOP BAR

4" DYL

R1-1
SIGN

R2-1
SIGN

TELECOM.
MANHOLE

POWER VAULT

POWER
PANEL

SEDIMENT
FOREBAY

TREE CLEARING
LIMIT (TYP)

RIPRAP
APRON

100 FT REGULATED AREA

LIMIT OF WETLANDS (TYP)
AS DETERMINED BY MARK
W. FRIEND, SOIL SCIENTIST
OF MEGSON, HEAGLE &
FRIEND, GLASTONBURY,CT

WETLAND SOILS

PRECAST CONCRETE
CURB (TYP)

BLOCK HEATER
(TYP)

BOLLARD
(TYP)

EMERGENCY
GENERATOR
PAD (TYP)

OVERHEAD
DOOR (TYP)

CONCRETE LANDING
PAD

CONCRETE STAIRS PAD (SEE
ARCHITECTURAL PLANS-TYP)

BOLLARD
(TYP)

500 FT

2'-0" CRUSHED STONE
DRIP EDGE (TYP)

CONCRETE DOOR PAD (SEE
ARCHITECTURAL PLANS-TYP)

5'-0" BITUMONOUS SIDEWALK

6'-0" REINFORCED CONCRETE
CURB AND SIDEWALK (TYP)

R7-8 AND R7-8P RESERVED
PARKING SIGNS (TYP)

SEE SHEET 14 OF 22 FOR
DETAIL OF THIS ENTRY

5'-0" BITUMONOUS SIDEWALK

SNOW STORAGE AREA

LIGHT
POLE
(TYP)

SAVE
TREES

EXIST.
BLDG.

TARP
SHED

CONC.

RISER POLE
(BY UTILITY
COMPANY)

492 FT

62 FT (TYP)

100 FT

N

PREPARED FOR/RECORD OWNER:
WE 113 NORTH MAPLE STREET, LLC
c/o WINSTANLEY ENTERPRISES, LLC 150 BAKER AVE. EXT. CONCORD, MA 01742 (978) 287-5000

PROPOSED AGLIMARK DISTRIBUTION FACILITY
113 NORTH MAPLE STREET
ENFIELD, CONNECTICUT

SPR No.
SITE LAYOUT PLAN
(MAP 82, LOTS 1, 2, 3 & 4)

NO.	DATE	REVISION
40	1/1/1	

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3 Congress Street
Nashua, NH 03062
(603) 882-2616
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Scale
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Date
1 JUNE 2020

Project No.
5476

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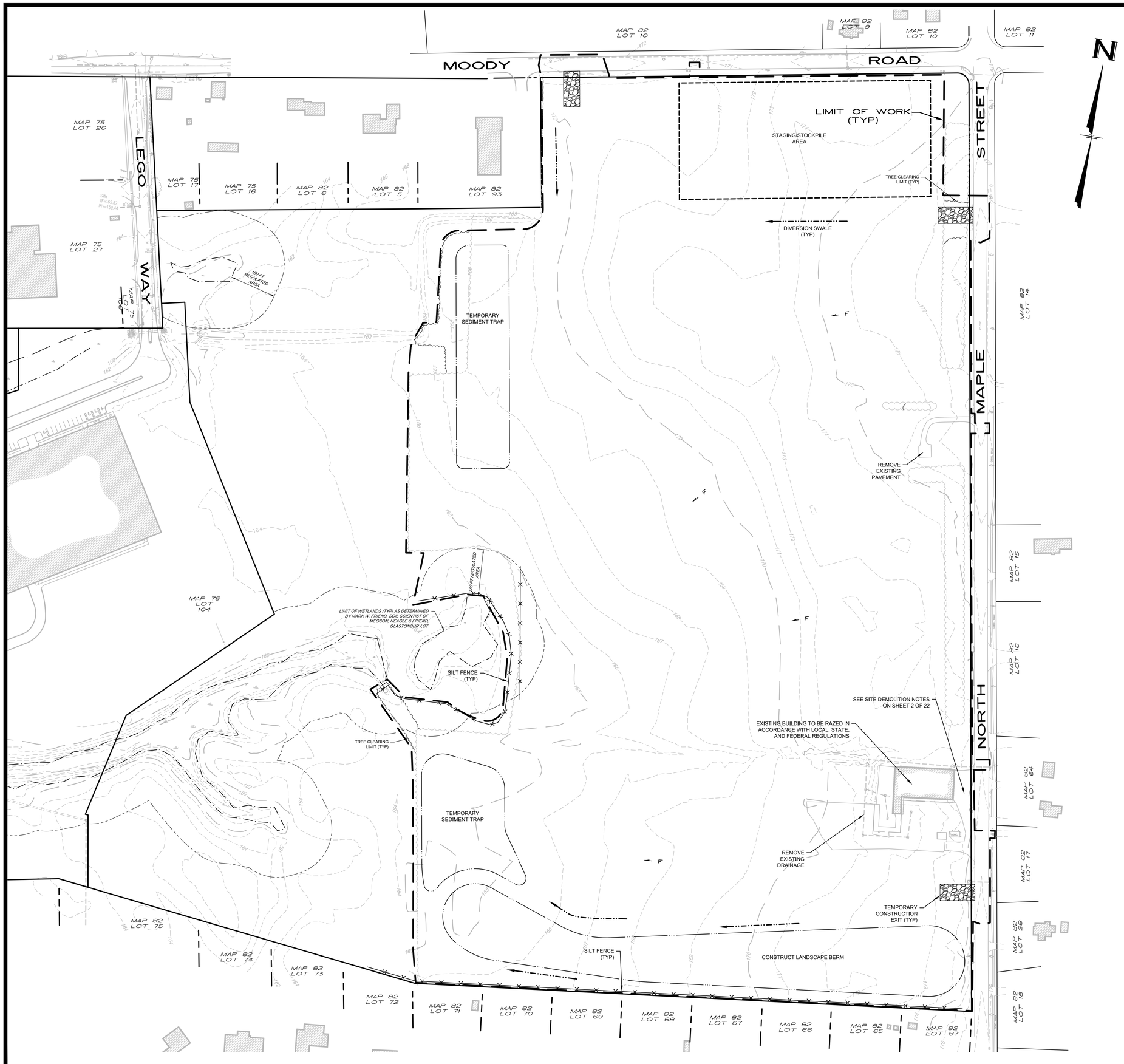

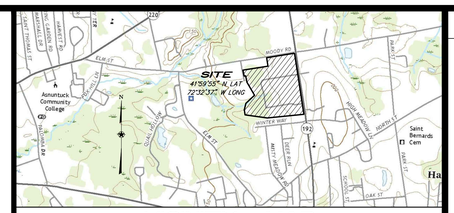

GENERAL NOTES: (PHASE I)

1. ALL CONTRACTORS AND SUBCONTRACTORS INVOLVED WITH STORMWATER POLLUTION CONTROL SHALL OBTAIN A COPY OF THE STORMWATER POLLUTION CONTROL PLAN (SPCP) AND NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) CONSTRUCTION GENERAL PERMIT (CGP) AND BECOME FAMILIAR WITH THEIR CONTENTS.
2. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES AS REQUIRED BY THE SPCP. ADDITIONAL BEST MANAGEMENT PRACTICES SHALL BE IMPLEMENTED AS DICTATED BY SITE CONDITIONS AT NO ADDITIONAL COST OF OWNER THROUGHOUT ALL PHASES OF CONSTRUCTION.
3. BEST MANAGEMENT PRACTICES (BMP'S) AND CONTROLS SHALL CONFORM TO FEDERAL, STATE, OR LOCAL REQUIREMENTS OR MANUAL OF PRACTICE, AS APPLICABLE. CONTRACTOR SHALL IMPLEMENT ADDITIONAL CONTROLS AS DIRECTED BY PERMITTING AGENCY OR OWNER.
4. EARTH MATERIAL STOCKPILE AREAS AS SHOWN ARE APPROXIMATE AND SUBJECT TO CHANGE. STOCKPILE AREAS SHALL BE SURROUNDED BY SILT FENCE AND RE-SEEDED IF THEY ARE LEFT UNTOUCHED FOR MORE THAN TEN (10) DAYS.

CONSTRUCTION SEQUENCE (PHASE I)

1. CONSTRUCT TEMPORARY CONSTRUCTION EXITS AND PREPARE TEMPORARY STAGING/STOCKPILE AREA.
2. INSTALL SILT FENCES AS SHOWN ON THE PLAN.
3. CLEAN & GRUB SITE ACCORDING TO PLAN. CUT AND DISPOSE OF ANY DEBRIS PRODUCED DURING THE CLEARING AND GRUBBING ACTIVITY.
4. PERFORM BUILDING AND SITE DEMOLITION.
5. CONSTRUCT TEMPORARY SEDIMENT TRAPS AND DIVERSION DITCHES PRIOR TO COMMENCING EARTHWORK.
6. STRIP/STOCKPILE TOPSOIL
7. CONSTRUCT LANDSCAPE BERM. LOAM AND SEED IMMEDIATELY AFTER BEING CONSTRUCTED.
8. PERFORM SITE GRADING OF LOADING AND PARKING AREAS. ALL SLOPES SHALL BE LOAMED AND SEEDED WITHIN 72 HOURS OF ACHIEVING FINISH GRADE.

LEGEND

- EXISTING GROUND CONTOUR
- WETLAND FLAGGING LIMIT
- LIMIT OF WORK
- TEMPORARY SEDIMENT BASIN
- SILT FENCE
- ORANGE CONSTRUCTION FENCE
- SILT-SACK INLET PROTECTION DEVICES
- TEMPORARY GRAVEL CONSTRUCTION EXIT
- STABILIZATION MATTING (BIODEGRADABLE)
- STRAW BALE BARRIER
- TEMPORARY STONE CHECK DAM
- RUNOFF DIRECTION
- DIVERSION DIRECTION

NOTE
SEE DETAIL SHEET 16 OF 22 FOR EROSION CONTROL DETAILS AND ADDITIONAL NOTES

NOTE
THE CONTRACTOR SHALL TAKE MEASURES TO ENSURE THAT MOODY ROAD AND NORTH MAPLE STREET ARE KEPT FREE OF MUD, DIRT AND DEBRIS DURING CONSTRUCTION ACTIVITY.

NO.	DATE	REVISION
80	1/1/1	

0 80 160 240 320 FEET
1" = 80'

PREPARED FOR/RECORD OWNER:
WE 113 NORTH MAPLE STREET, LLC
c/o WINSTANLEY ENTERPRISES, LLC 150 BAKER AVE. EXT. CONCORD, MA 01742 (978) 287-5000

SPR No.
EROSION CONTROL PLAN - PHASE I
(MAP 82, LOTS 1, 2, 3 & 4)

PROPOSED AGEWMARK DISTRIBUTION FACILITY
113 NORTH MAPLE STREET
ENFIELD, CONNECTICUT

HSI Haynes/Swanson, Inc.
Civil Engineers/Land Surveyors
3 Congress Street
Nashua, NH 03062
(603) 882-2087
131 Middlesex Turnpike
Burlington, MA 01803
(781) 201-2501
www.haynes-swanson.com

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DWG: 5476SITE-ER01
Field Book:

Scale
1" = 80'

Date
1 JUNE 2020

Project No.
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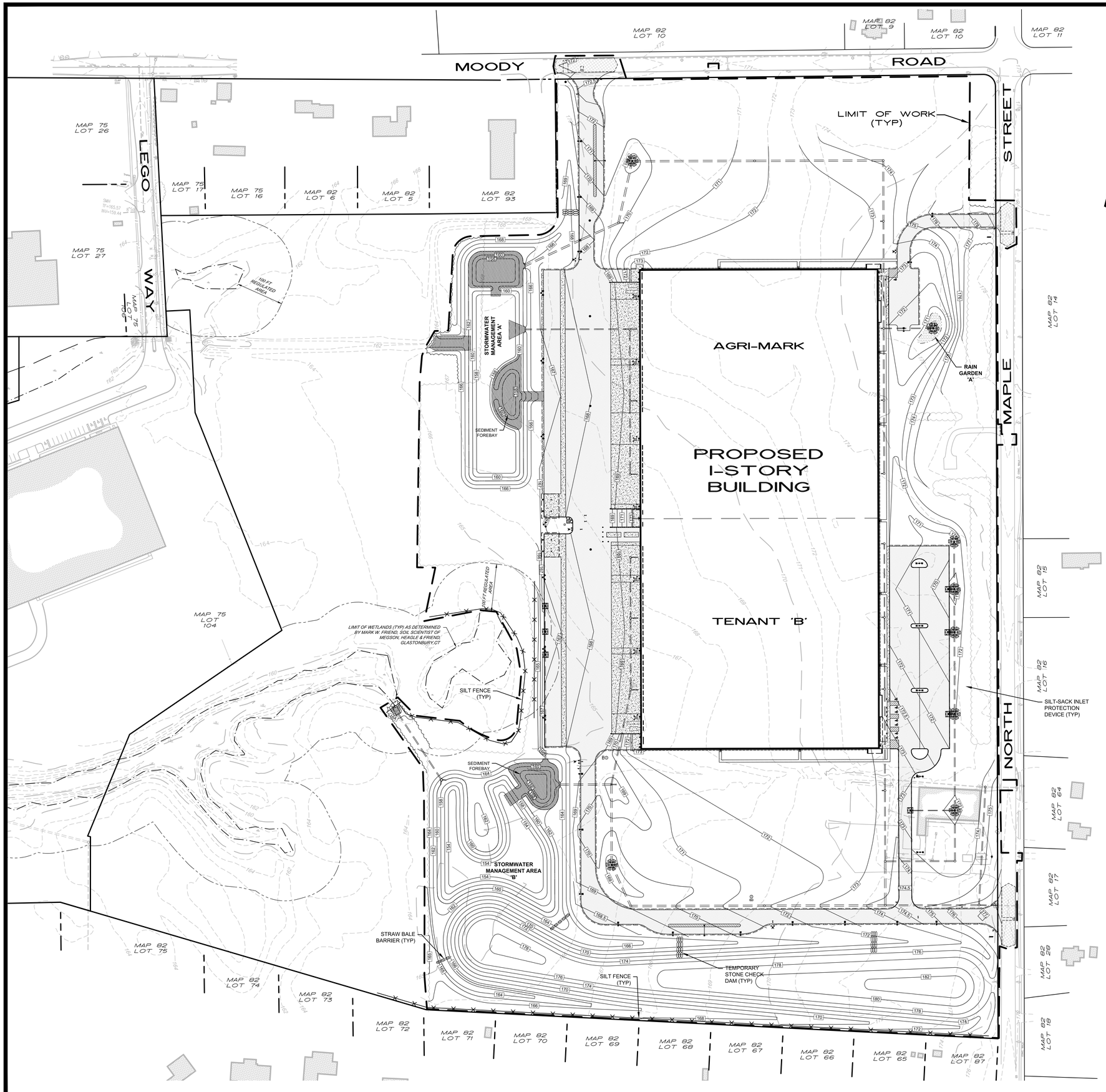

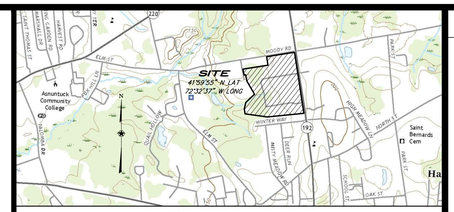

GENERAL NOTES: (PHASE II)

1. ALL MEASURES STATED ON THIS EROSION CONTROL PLAN, AND IN THE STORMWATER POLLUTION CONTROL PLAN, SHALL BE MAINTAINED IN FULLY FUNCTIONAL CONDITION UNTIL NO LONGER REQUIRED FOR A COMPLETE PHASE OF WORK OR FINAL STABILIZATION OF THE SITE. ALL EROSION CONTROL MEASURES SHALL BE CHECKED BY A QUALIFIED PERSON IN ACCORDANCE WITH THE CONTRACT DOCUMENTS OR THE APPLICABLE PERMIT, WHICHEVER IS MORE STRINGENT.
2. SILT FENCE SHALL BE REPAIRED TO THEIR ORIGINAL CONDITIONS IF DAMAGED. SEDIMENT SHALL BE REMOVED FROM SILT FENCES WHEN IT REACHED ONE-QUARTER THE HEIGHT OF THE SILT FENCE.
3. INLET PROTECTION DEVICES AND BARRIERS SHALL BE REPAIRED OR REPLACED IF THEY SHOW SIGNS OF UNDERMINING OR DETERIORATION.
4. ALL SEEDED AREAS SHALL BE CHECK REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHOULD BE FERTILIZED, WATERED AND RESEEDED AS NEEDED.
5. THE CONSTRUCTION EXIT SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOW OF MUD ONTO PUBLIC RIGHT-OF WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING OF THE CONSTRUCTION EXIT AS CONDITIONS DEMAND.

CONSTRUCTION SEQUENCE (PHASE II)

1. INSTALL INLET PROTECTION AROUND ALL STORM DRAIN STRUCTURES. INSTALLATION OF UNDERGROUND UTILITIES AND CATCH BASINS SHALL BE PROTECTED FROM SEDIMENT IN ACCORDANCE WITH THE 'SILTSACK DETAIL'. THE CONTROL SHALL REMAIN UNTIL THE SITE IS SUFFICIENTLY STABLIZIED.
2. ALL SWALES AND DRAINAGE WAYS SHALL BE STABILIZED PRIOR TO DIRECTING STORMWATER RUNOFF TO THEM.
3. AS THE BUILDING IS COMPLETED, ALL DISTURBED AREAS SHALL BE PERMANENTLY STABILIZED.
4. NO PORTION OF THE PROJECT SHALL BE LEFT DISTURBED AND UNSTABILIZED FOR A PERIOD OF GREATER THAN 45 DAYS. ALL DISTURBED AREAS SHALL BE PERMANENTLY STABILIZED PRIOR TO WINTER CONDITIONS. STABILIZATION SHALL BE DEFINED AS 70% VEGETATIVE GROWTH BY NOVEMBER 1st OR INSTALLATION OF EROSION CONTROL MATTING.
5. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURED:
   - A. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED.
   - B. A MINIMUM OF 85 PERCENT VEGETATED GROWTH HAS BEEN ESTABLISHED.
   - C. A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED
   - D. OR, EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
6. ALL DRIVEWAYS AND PARKING LOTS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
7. FINAL PAVING OF DRIVEWAYS AND PARKING LOTS.
8. SITE LANDSCAPING ALONG WITH PERMANENT SEEDING OR ALL DISTURBED AREAS.
9. REMOVE ANY TEMPORARY EROSION CONTROL MEASURES NOT NEEDED.

LEGEND

- 100 — EXISTING GROUND CONTOUR
- 100 — PROPOSED GRADE
- WETLAND FLAGGING LIMIT
- LIMIT OF WORK
- SILT FENCE
- ORANGE CONSTRUCTION FENCE
- SILT-SACK INLET PROTECTION DEVICES
- TEMPORARY GRAVEL CONSTRUCTION EXIT
- STABILIZATION MATTING (BIODEGRADABLE)
- STRAW BALE BARRIER
- TEMPORARY STONE CHECK DAM
- RUNOFF DIRECTION

NOTE
SEE DETAIL SHEET 16 OF 22 FOR EROSION CONTROL DETAILS AND ADDITIONAL NOTES

NOTE
THE CONTRACTOR SHALL TAKE MEASURES TO ENSURE THAT MOODY ROAD AND NORTH MAPLE STREET ARE KEPT FREE OF MUD, DIRT AND DEBRIS DURING CONSTRUCTION ACTIVITY

NO.	DATE	REVISION
80	0	80 160 240 320 FEET

PREPARED FOR/RECORD OWNER:
WE 113 NORTH MAPLE STREET, LLC
c/o WINSTANLEY ENTERPRISES, LLC 150 BAKER AVE. EXT. CONCORD, MA 01742 (978) 287-5000

SPR No.
EROSION CONTROL PLAN - PHASE II
(MAP 82, LOTS 1, 2, 3 & 4)
PROPOSED AGRIMARK DISTRIBUTION FACILITY
113 NORTH MAPLE STREET
ENFIELD, CONNECTICUT

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
3 Congress Street
Nashua NH 03062
(603) 883-2057
131 Middlesex Turnpike
Burlington MA 01803
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DRAWING LOCATION: J:\5000\5476\DWG\5476 SITE
DWG. 5476SITE-DR01
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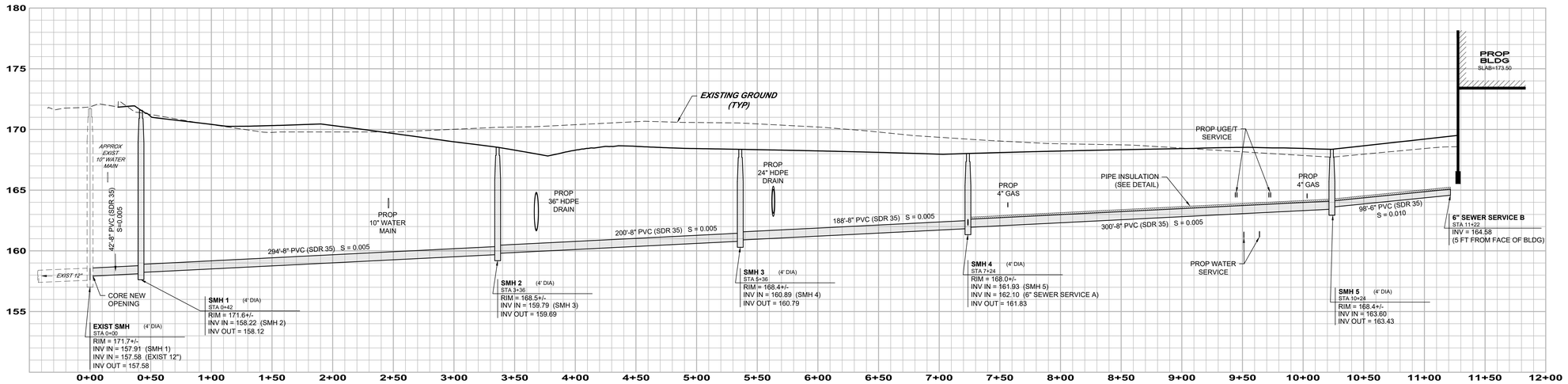
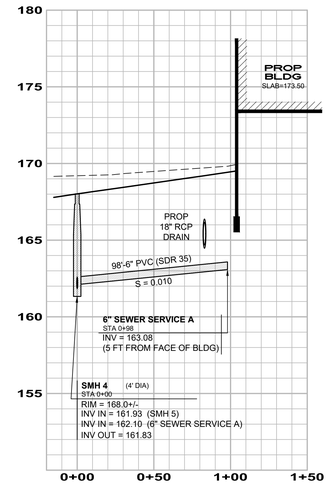
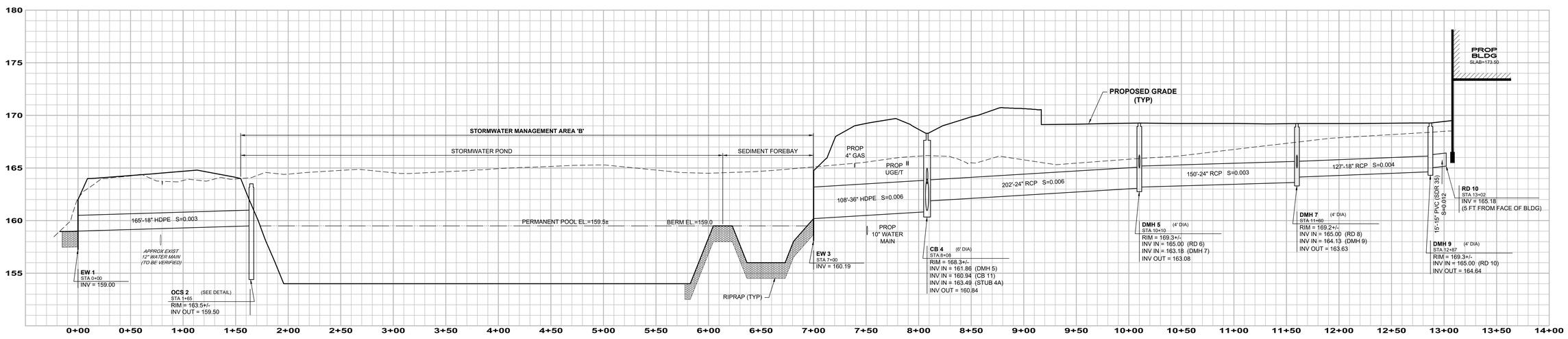


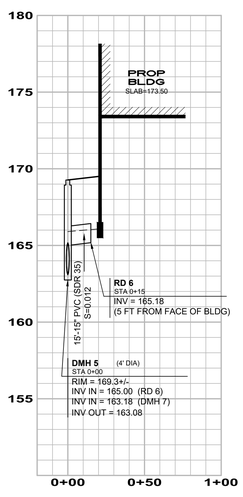
SANITARY SEWER



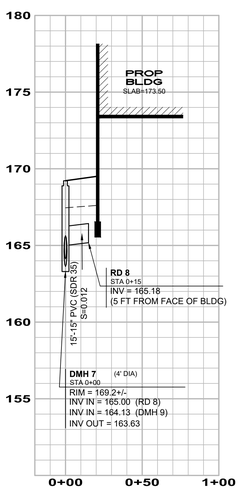
SEWER SERVICE



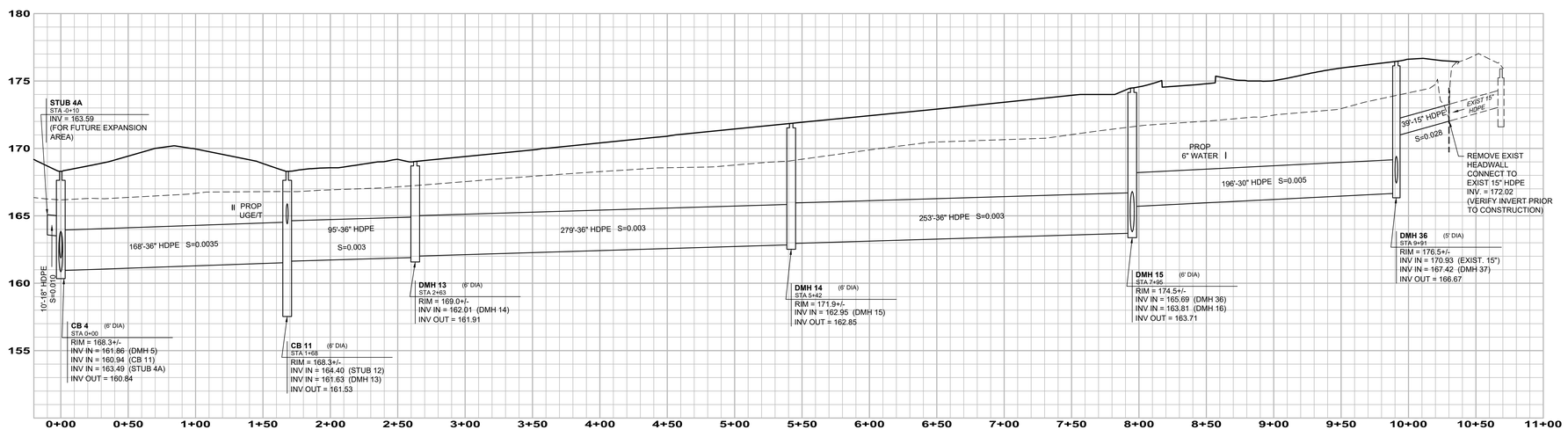
EW 1-RD 10



DMH 5-RD 6



DMH 7-RD 8



DMH 4 - DMH 36

NOTES

1. STRUCTURE DIAMETERS AS SHOWN ON DRAINAGE PROFILES ARE CONSIDERED TO BE MINIMUM INSIDE DIMENSIONS. ALL STRUCTURES SHALL BE A MINIMUM INSIDE DIAMETER OF 48" UNLESS OTHERWISE INDICATED. LARGER STRUCTURES MAY BE NECESSARY DUE TO ALIGNMENT AND/OR PIPE SIZES. STRUCTURE MANUFACTURER SHALL DETERMINE FINAL SIZE.
2. PIPE LENGTHS ARE MEASURED FROM CENTERLINE OF STRUCTURE TO CENTERLINE OF STRUCTURE.
3. EXTERIOR FOUNDATION WALLS AND FOOTINGS AS SHOWN ARE APPROXIMATE.
4. SEE PLUMBING PLANS FOR A DETAIL OF THE ROOF DRAIN PIPE/STORM DRAIN DROP CONNECTION.

NO.	DATE	REVISION

PREPARED FOR/RECORD OWNER:
WE 113 NORTH MAPLE STREET, LLC
c/o WINSTANLEY ENTERPRISES, LLC 150 BAKER AVE. EXT. CONCORD, MA 01742 (978) 287-5000

PROPOSED AGEMARK DISTRIBUTION FACILITY
113 NORTH MAPLE STREET
ENFIELD, CONNECTICUT

SPR No.
UTILITY PROFILES
(MAP 82, LOTS 1, 2, 3 & 4)

HSI Haynes/Swanson, Inc.
Civil Engineers/Land Surveyors
3 Congress Street 131 Middlesex Turnpike
Nashua NH 03062 Burlington, MA 01803
(603) 883-2057 (781) 272-5501
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5476

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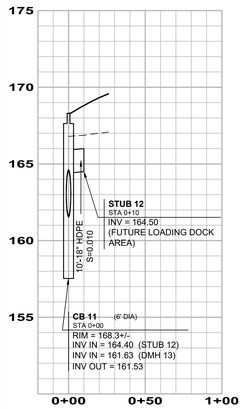
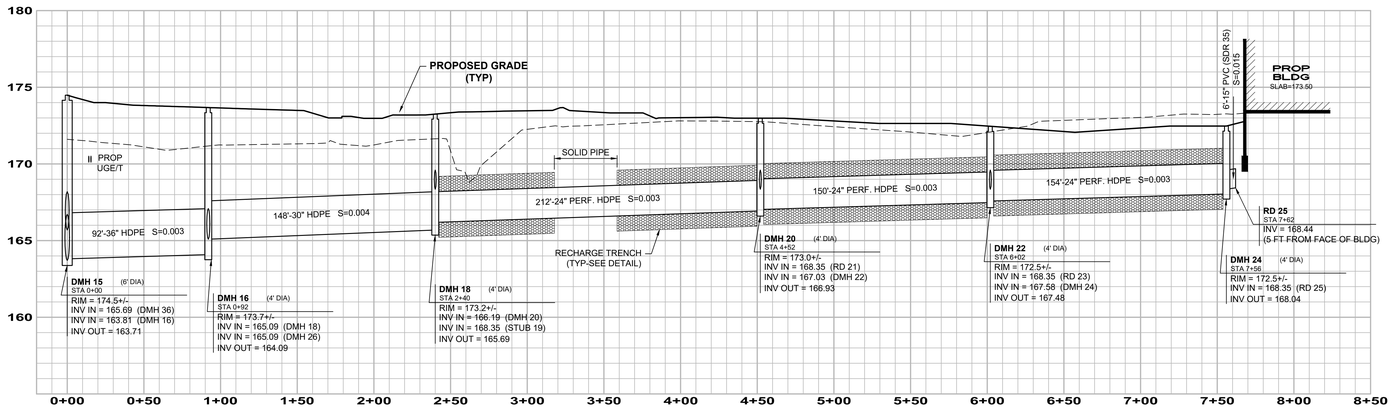


LCB11-STUB 12



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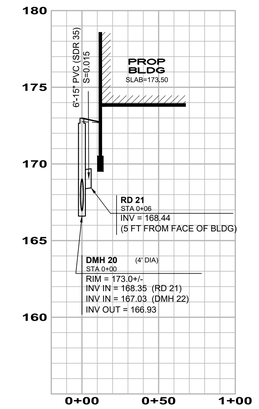

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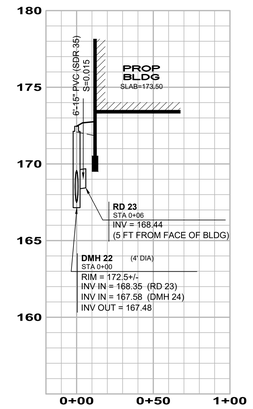
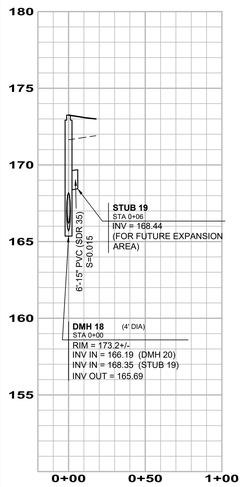


DMH 22-RD 23



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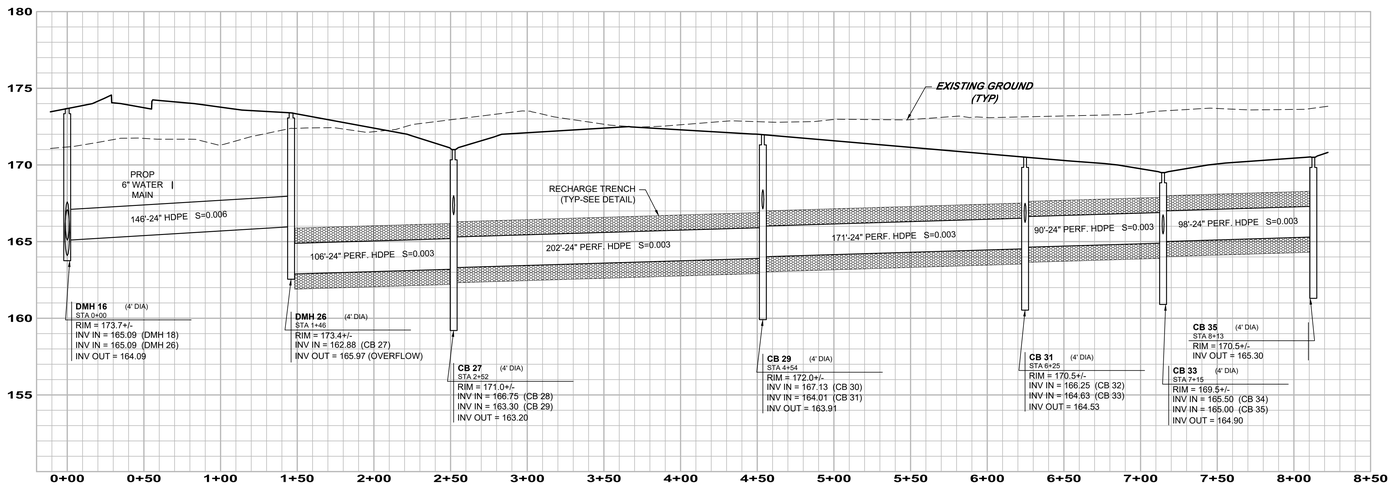
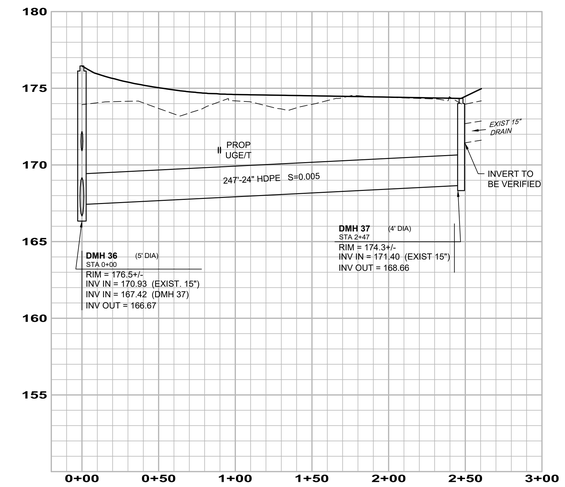
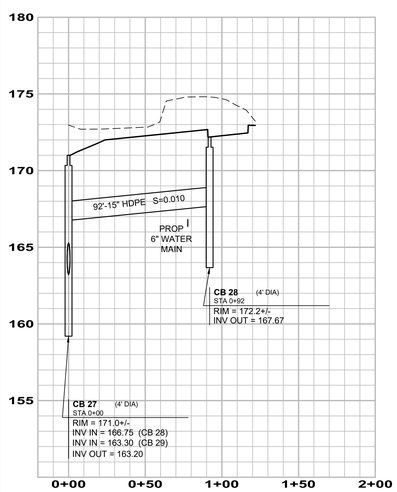


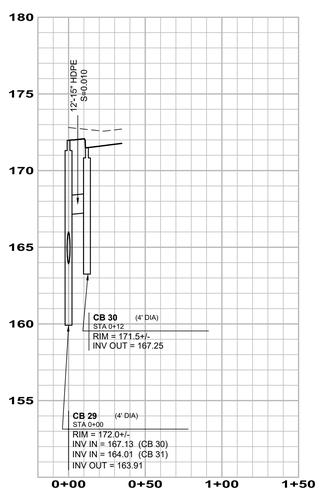
DMH 16-DMH 35



DMH 36-DMH 37



CB 27-CB 28



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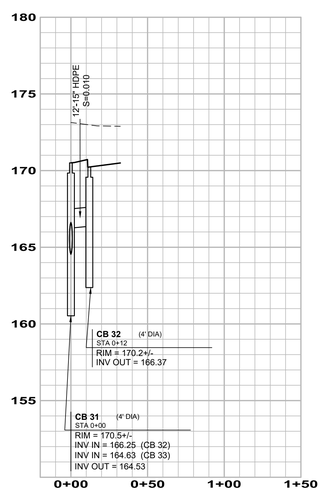
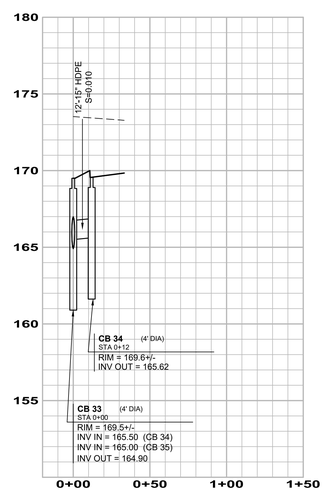
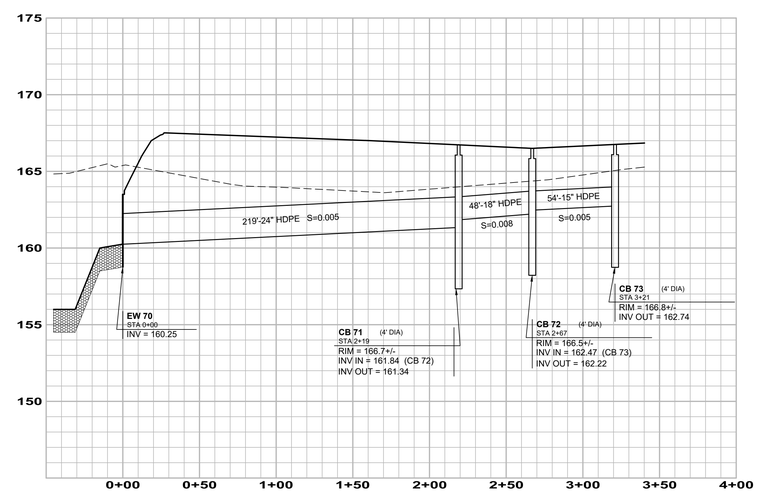


CB 31- CB 32



CB 33-CB 34



EW 70-CB 73

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DRAWING LOCATION: J:\2020\5476\DWG\5476 SITE
DWG: 5476SITE-FP41
Field Book:

Scale
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1 JUNE 2020

Project No.
5476

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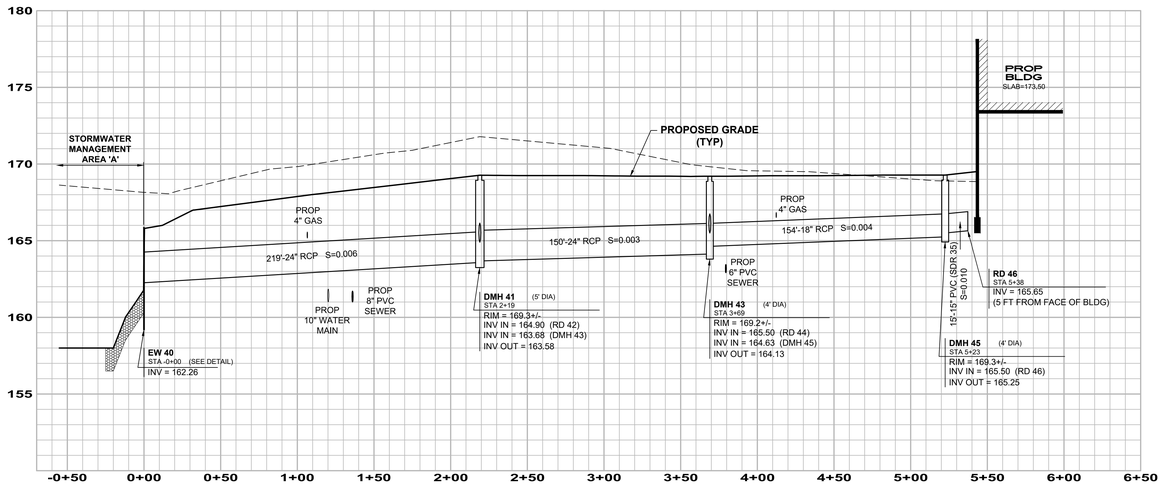

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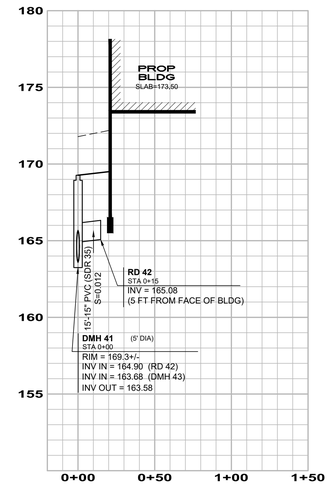

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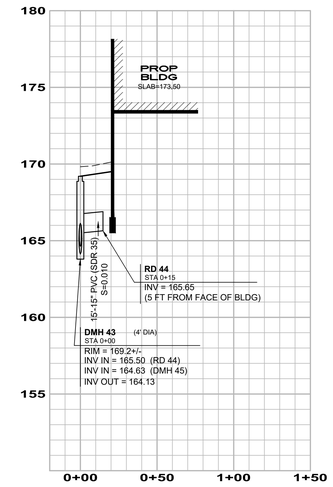

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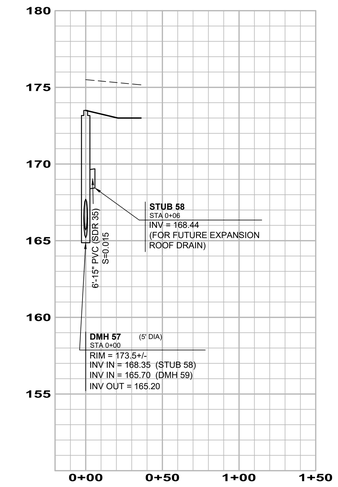

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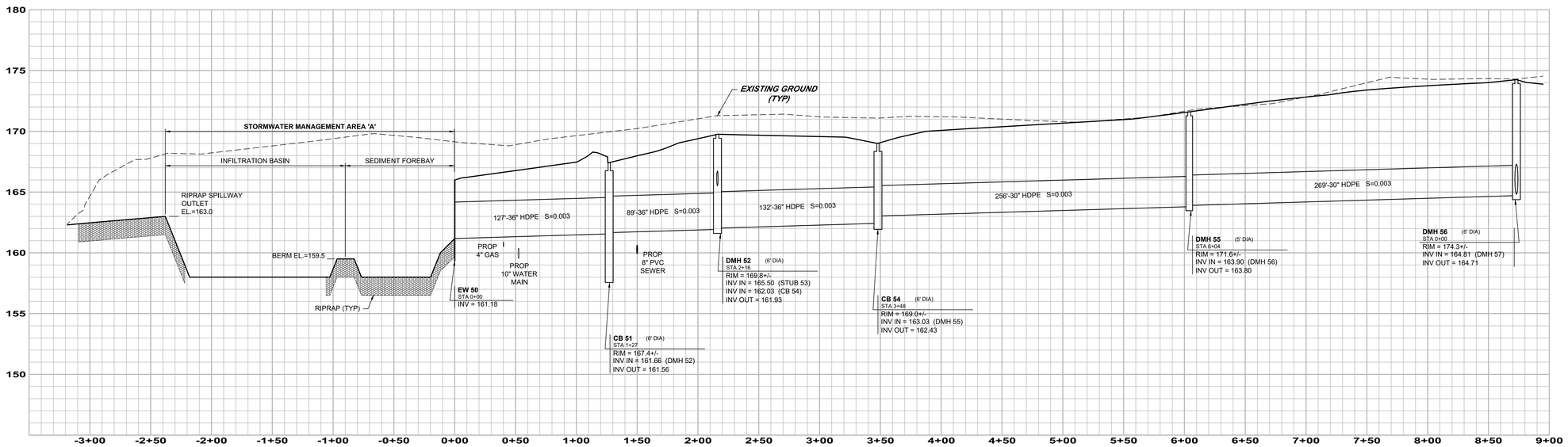

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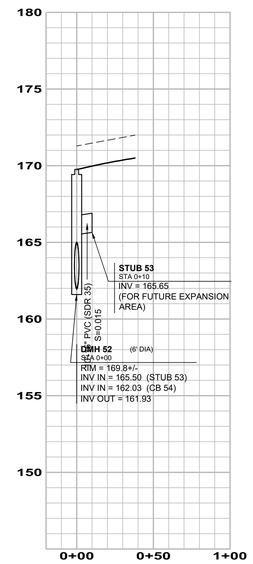

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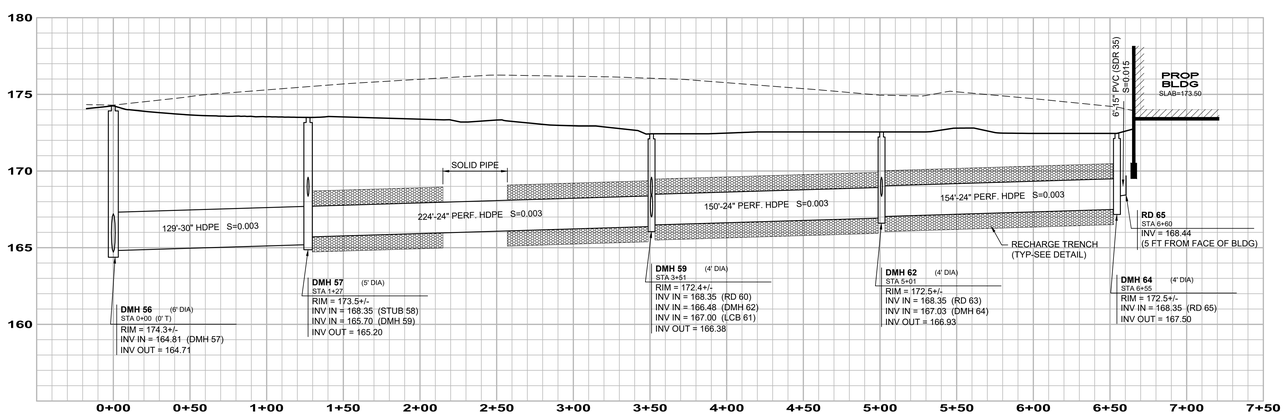

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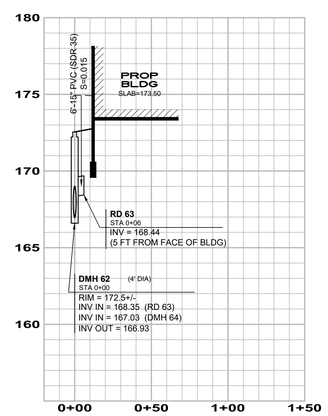
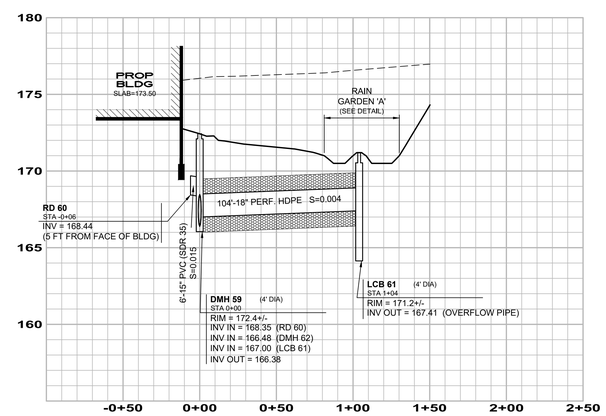


DMH 62-RD 63



DMH 59-LCB 61

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WE 113 NORTH MAPLE STREET, LLC
c/o WINSTANLEY ENTERPRISES, LLC 150 BAKER AVE. EXT. CONCORD, MA 01742 (978) 287-5000

SPR No.
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DWG: 5476SITE-FP41
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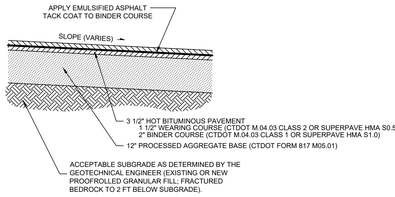

LIGHT DUTY TYPICAL PAVEMENT SECTION

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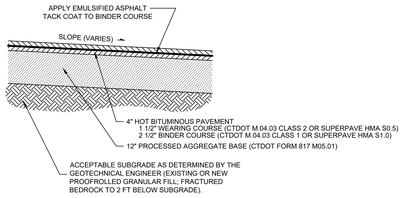

HEAVY DUTY TYPICAL PAVEMENT SECTION

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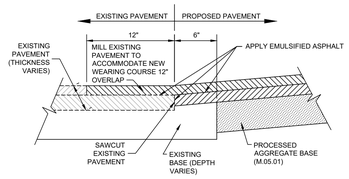

SAWCUT PAVEMENT DETAIL

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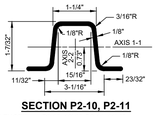
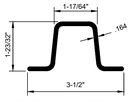


SECTION P2-10, P2-11

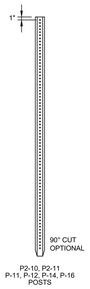
LENGTH: P2-10, 10'-0", P2-11, 11'-0"
WEIGHT PER LINEAR FOOT: 3.00 LBS
HOLES: 3/8" DIA. 1" C-C FULL LENGTH
STEEL: SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASTM A-5761 (GRADE 1070-1080).
FINISH: SHALL BE PAINTED WITH TWO COATS OF BAKED ON OR AIR DRIED. PAINT OF WEATHER RESISTANT QUALITY. ALL FABRICATION SHALL BE COMPLETE BEFORE PAINTING. PAINT SHALL BE SUBJECT TO THE APPROVAL OF THE ARCHITECT.



SECTION P-11 THRU P-16

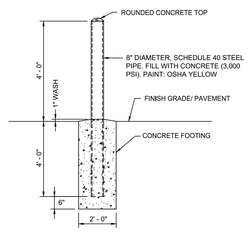
LENGTH: P-11', 11'-0", P-12', 12'-0", P-14, 14'-0", P-16, 16'-0"
WEIGHT PER LINEAR FOOT: 3.00 LBS
STEEL: SAME AS FOR P2-10, P2-11
FINISH: SAME AS FOR P2-10, P2-11

DIMENSIONS SHOWN ARE NOMINAL.
ALTERNATE SECTIONS MUST BE APPROVED PRIOR TO USE.



TRAFFIC SIGN SUPPORT DETAIL

NOT TO SCALE



BOLLARD DETAIL

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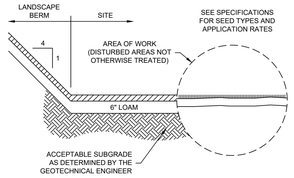
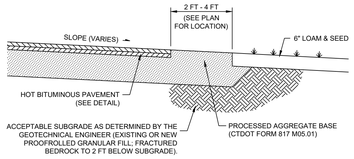


LOAM AND SEED DETAIL

NOT TO SCALE



GRAVEL SHOULDER DETAIL

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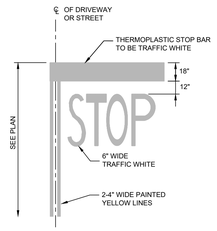

STOP BAR DETAIL

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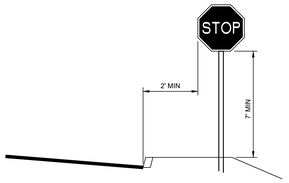
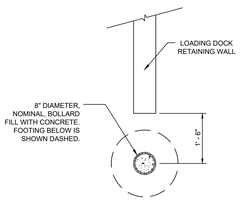


STOP SIGN LOCATION DETAIL

NOT TO SCALE

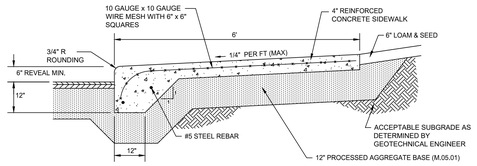
SIGN LEGEND

	IDENTIFICATION NUMBER	SIZE WIDTH/HEIGHT
TEXT SEE MUTCD FOR TEXT DIMENSIONS	TEXT DIMENSIONS	
STOP	R1-1	30"/30"
	SEE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS	
SPEED LIMIT 20	R2-1 (20)	24"/30"
	SEE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS	
RESERVED PARKING	R7-8	12"/18"
	SEE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS	
VAN ACCESSIBLE	R7-8P	18"/9"
	SEE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS	



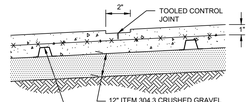
BOLLARD LOCATION DETAIL

NOT TO SCALE



REINFORCED CONCRETE SIDEWALK AND CURB DETAIL

NOT TO SCALE

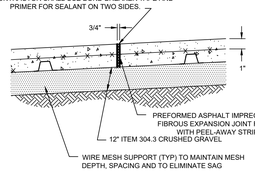


THE CONTRACTOR SHALL PROVIDE TOOLED CONTROL JOINTS @ 5'-0" O/C PROVIDE FULL DEPTH EXPANSION JOINT @ 20'-0" O/C AND AT ALL SIDEWALK INTERSECTIONS, T's, L's AND CORNERS. DO NOT USE PRE-FORMED KEY COLD JOINTS. JOINTS SHALL ALSO LINE UP WITH BOTH SIDES OF T SLAB INTERSECTIONS.

CONCRETE CONTROL JOINT DETAIL (SIDEWALK)

NOT TO SCALE

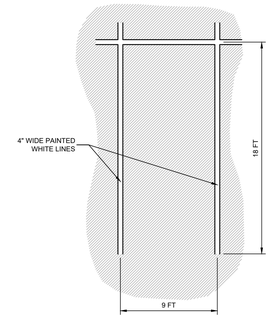
SEALANT JOINT: THE CONTRACTOR SHALL FURNISH AND INSTALL PEEL-AWAY STRIP AT TOP OF SLAB PLACEMENT. THE CONTRACTOR SHALL USE BOND BREAKER TAPE AND PRIMER FOR SEALANT ON TWO SIDES.



THE CONTRACTOR SHALL RUN THE WIRE MESH THROUGH THE FULL DEPTH EXPANSION JOINT.

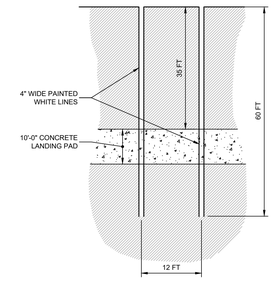
CONCRETE EXPANSION JOINT DETAIL (SIDEWALK)

NOT TO SCALE



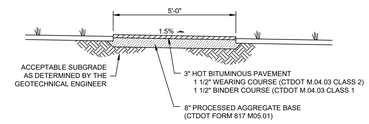
TYPICAL AUTOMOBILE PARKING STALL DETAIL

NOT TO SCALE



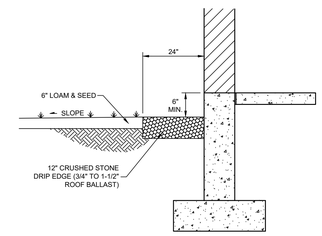
TYPICAL TRAILER PARKING STALL DETAIL

NOT TO SCALE



TYPICAL SECTION BITUMINOUS SIDEWALK

NOT TO SCALE

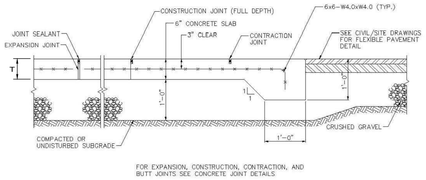


CRUSHED STONE DRIP EDGE DETAIL

NOT TO SCALE

NOTE:

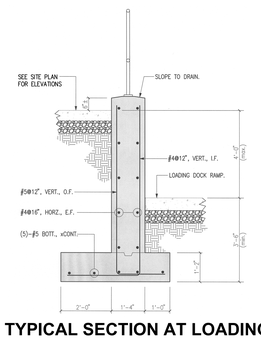
1. PLACE RIGID PAVEMENT CONSTRUCTION JOINTS AT END OF CONCRETE PLACEMENTS AND AT LOCATIONS WHERE PLACEMENT OPERATIONS ARE STOPPED FOR MORE THAN 1/2 HOUR. CONSTRUCTION JOINTS CAN BE PLACED AT ANY OF THE CONTRACTION JOINT LOCATIONS SHOWN ON THE SLAB PLAN.
2. TYPICAL JOINT SPACING SHALL BE AS SHOWN. HOWEVER ADJUST SPACING SO THAT JOINTS COINCIDE WITH ALL DRAINAGE STRUCTURES, (ALL CB'S & ALL DMH'S).
3. JOINTS FOR COMPACTOR SLAB SHALL BE SIMILAR AND CONTRACTION JOINTS SHALL ALSO BE PLACES AT A MAXIMUM SPACING OF 10'-0" ON CENTER.



FOR EXPANSION, CONSTRUCTION, CONTRACTION, AND BUTT JOINTS SEE CONCRETE JOINT DETAILS

TYPICAL SECTION - CONCRETE APRON

NOT TO SCALE

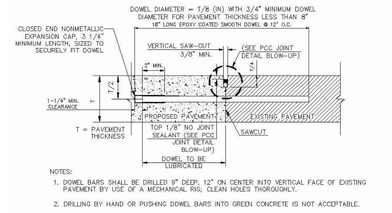


TYPICAL SECTION AT LOADING DOCK RETAINING WALL

NOT TO SCALE

NOTE

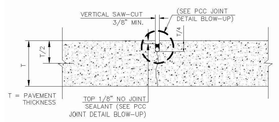
THE CONCRETE LOADING APRON, JOINTING METHODS AND RETAINING WALL DETAILS ARE FOR SCHEMATIC PURPOSES ONLY. THE CONTRACTOR SHALL REFER TO THE ARCHITECTURAL AND STRUCTURAL PLANS FOR THE FINAL DESIGN INCLUDING EXACT SIZES, DIMENSIONS AND DETAILS.



NOTES:

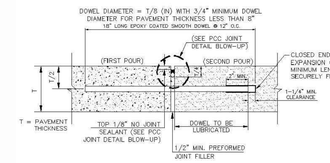
1. DOWEL BARS SHALL BE DRILLED 9" DEEP, 12" ON CENTER INTO VERTICAL FACE OF EXISTING PAVEMENT BY USE OF A MECHANICAL RIG, CLEAN HOLES THOROUGHLY.
2. DRILLING BY HAND OR PUSHING DOWEL BARS INTO GREEN CONCRETE IS NOT ACCEPTABLE.
3. COMPLETELY FILL HOLE WITH EPOXY GROUT AND INSERT DOWEL WITH EXPANSION CAPS SHOWN IN DETAIL. INSTALL EXPANSION CAPS ON THE FREE END OF THE DOWELS.
4. DOWELS SHALL BE ALIGNED PERPENDICULAR TO THE JOINT.
5. DRILLING, CLEANING, AND GROUTING SHALL BE PERFORMED PER THE EPOXY MANUFACTURER'S REQUIREMENTS FOR THIS SPECIFIC APPLICATION.
6. FOR EPOXY GROUT, THE HOLE DIAMETER SHALL BE NOT MORE THAN 1/8" LARGER THAN THE DOWEL DIAMETER OR AS DIRECTED BY THE EPOXY MANUFACTURER.
7. FOR CEMENT-BASED GROUT, THE HOLE DIAMETER SHALL BE ATLEAST 1/4" LARGER AND NOT MORE THAN 3/8" LARGER THAN THE DOWEL DIAMETER OR AS DIRECTED BY THE EPOXY MANUFACTURER.

BUTT JOINT



NOTE:
1. REFERENCE SLAB PLAN FOR JOINT SPACING.

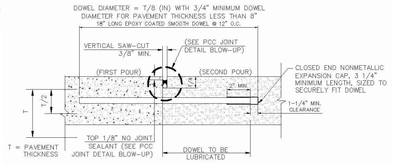
CONTRACTION JOINT



NOTES:

1. DOWELS SHALL BE SUPPORTED BY AN APPROVED DEVICE, DRILLING BY HAND OR PUSHING DOWEL BARS INTO GREEN CONCRETE IS NOT ACCEPTABLE.
2. REFERENCE SLAB PLAN FOR JOINT SPACING.

TRANSVERSE EXPANSION JOINT

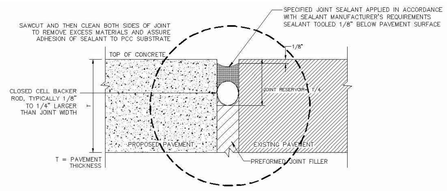


NOTE:
1. DOWELS SHALL BE SUPPORTED BY AN APPROVED DEVICE, DRILLING BY HAND OR PUSHING DOWEL BARS INTO GREEN CONCRETE IS NOT ACCEPTABLE.

CONSTRUCTION JOINT

CONCRETE JOINT DETAIL

NOT TO SCALE



NOTES:

1. ASSURE SAW JOINTS ARE CLEAN AND DRY PRIOR TO THE APPLICATION OF THE JOINT SEALANT.
2. INSTALL CLOSED CELL BACKER ROD AFTER JOINTS HAVE BEEN CLEANED AND DRIED IN ACCORDANCE WITH SEALANT MANUFACTURER'S REQUIREMENTS.
3. INSTALL BACKER ROD AT CONSISTENT AND UNIFORM DEPTH.
4. JOINT SEALANT APPLICATION SHALL BE IN STRICT COMPLIANCE WITH SEALANT MANUFACTURER'S REQUIREMENTS.

PCC JOINT DETAIL BLOW-UP (TYP) (EXPANSION JOINT)

NO.	DATE	REVISION	BY

PREPARED FOR/RECORD OWNER:
WE 113 NORTH MAPLE STREET, LLC
c/o WINSTANLEY ENTERPRISES, LLC 150 BAKER AVE. EXT. CONCORD, MA 01742 (978) 287-5000

SPR No.
DETAIL SHEET - GENERAL SITE
(MAP 82, LOTS 1, 2, 3 & 4)

PROPOSED AGRI-MARK DISTRIBUTION FACILITY
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DRAWING LOCATION: J:\5000\5476\DWG\5476 SITE
SWC: 5476(SITE-DET1)
Field Book:

Scale: AS SHOWN
Date: 1 JUNE 2020
Project No. 5476
Sheet No. 14 OF 22

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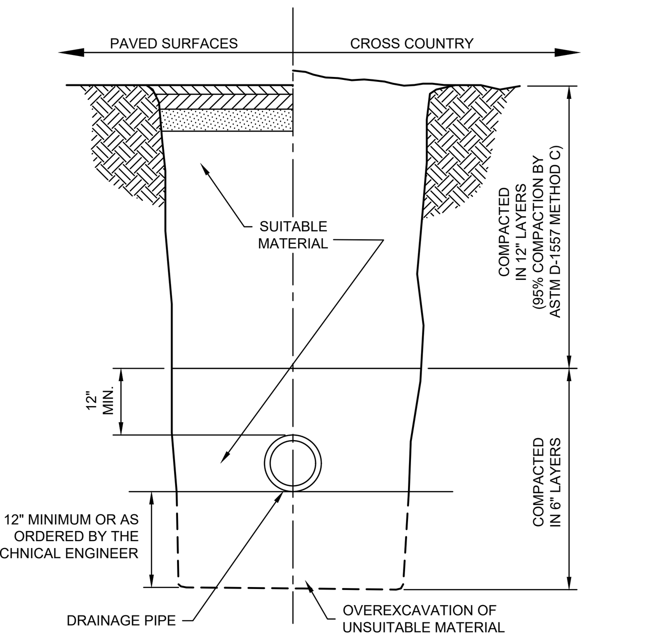
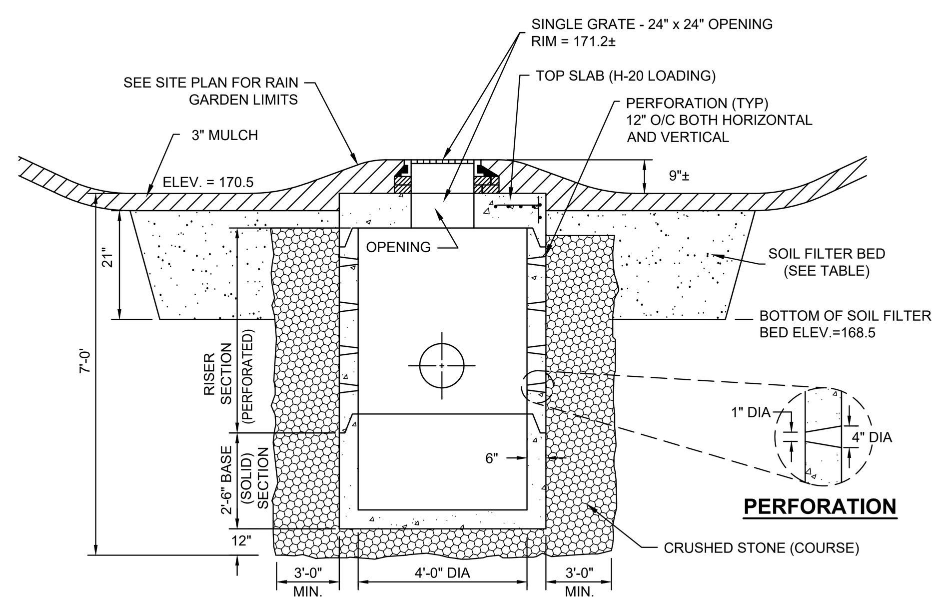


TYPICAL DRAINAGE TRENCH SECTION

NOT TO SCALE



RAIN GARDEN MATERIAL TABLE FOR BIORETENTION FILTER MEDIA			
COMPONENT MATERIAL	PERCENT OF MIXTURE BY VOLUME	GRADATION OF MATERIAL: SIEVE No.	PERCENT BY WEIGHT PASSING STANDARD SIEVE
FILTER MEDIA OPTION A			
ASTM C-33 CONCRETE SAND	50 TO 55		
LOAMY SAND TOPSOIL, WITH FINES AS INDICATED	20 TO 30	200	15 to 25
MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH, WITH FINES AS INDICATED	20 TO 30	200	< 5
FILTER MEDIA OPTION B			
MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH, WITH FINES AS INDICATED	20 TO 30	200	< 5
LOAMY COARSE SAND	70 TO 80	10	85 to 100
		20	70 to 100
		60	15 to 40
		200	8 to 15

RAIN GARDEN NOTES:

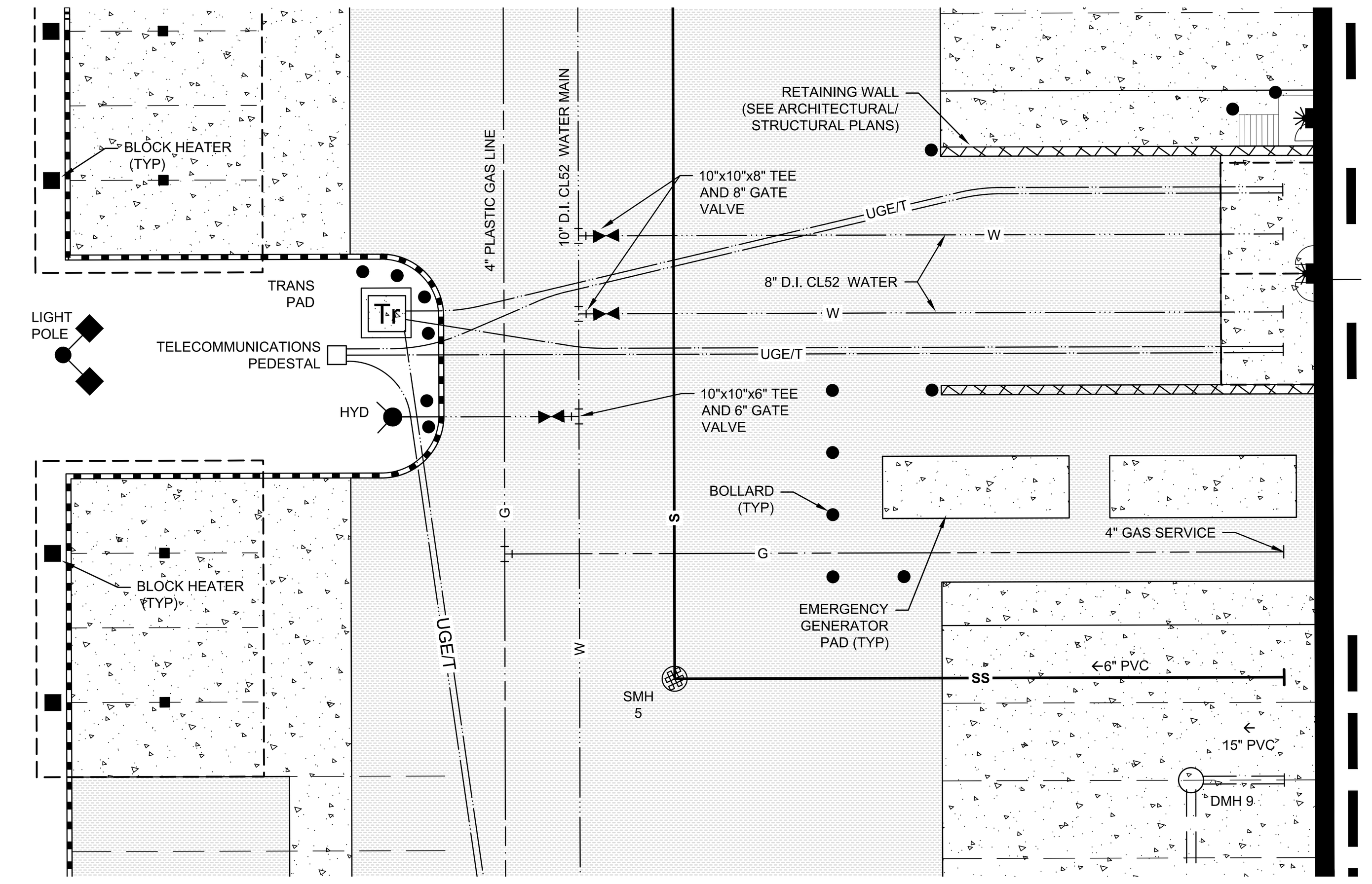
1. DO NOT PLACE THE RAIN GARDENS INTO SERVICE UNTIL THE BMP HAS BEEN PLANTED AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
2. DO NOT DISCHARGE SEDIMENT-LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF, WATER FROM EXCAVATIONS) TO THE RAIN GARDEN DURING ANY STAGE OF CONSTRUCTION.
3. DO NOT EXPOSE SOIL SURFACE WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION COMPONENTS OF THE SYSTEM.
4. IF FINE MATERIAL THAT WOULD PERCH THE WATER TABLE IS ENCOUNTERED DURING THE CONSTRUCTION OF RAIN GARDEN, THE UNSUITABLE MATERIAL SHALL BE REMOVED AND REPLACED WITH COARSE GRAVEL

LEACHING CATCH BASIN NOTES

1. BASE SHALL BE SOLID. SEDIMENT SHALL BE REMOVED ON A REGULAR SCHEDULED BASIS BY OWNER.
2. LOCATION OF DRAIN LINE OPENINGS VARY, CORE TO JOB SPECIFICATIONS (SEE DRAIN PROFILES).
3. STRUCTURE DESIGN AND REINFORCEMENT SHALL CONFORM TO ASTM C478 AND A185. CONCRETE SHALL BE 4000PSI MINIMUM.

LEACHING CATCH BASIN (LCB 61)/RAIN GARDEN DETAIL

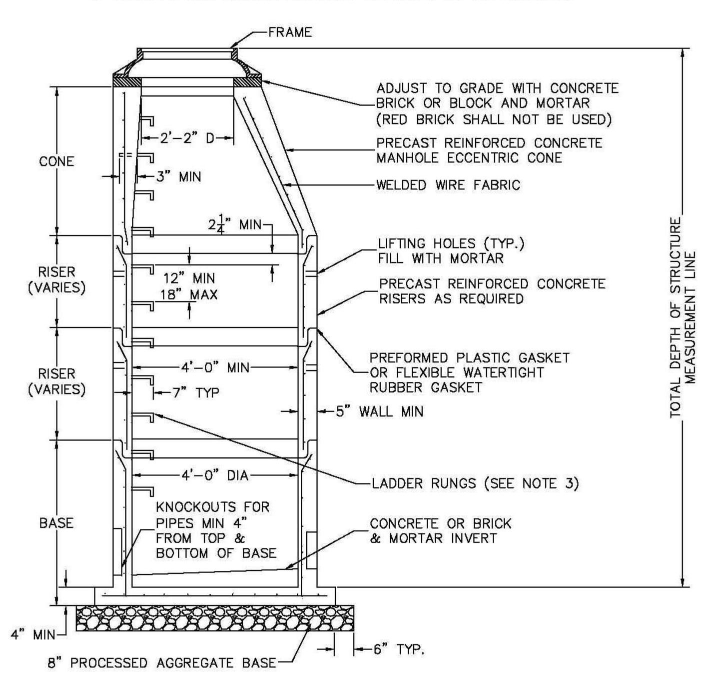
NOT TO SCALE



UTILITY SERVICE CONNECTIONS DETAIL

SCALE: 1" = 20'

NOTES:
1. ENDS OF PIPES SHALL EXTEND TO AND BE CUT FLUSH WITH INSIDE FACE OF MANHOLE. APPLY MORTAR TO CUT EDGE OF PIPE TO COVER REINFORCING.
2. RED BRICK IS NOT TO BE USED.
3. LADDER RUNGS SHALL BE INSTALLED IN ALL MANHOLES WHEN THE DEPTH OF THE STRUCTURE FROM THE TOP OF FRAME TO THE LOWEST FLOW LINE EXCEEDS 4 FEET. RUNGS SHALL CONFORM TO FORM 816 SECTION M08.02.5.
4. ANY OVER EXCAVATION SHALL BE REPLACED WITH PROCESSED AGGREGATE BASE, MEDIUM GRADATION, OR ¾" STONE.
5. ALL PRECAST CONCRETE PRODUCTS MUST HAVE THE CASTING DATE CLEARLY LABELED ON EACH PRODUCT. NO PRECAST CONCRETE PRODUCT SHALL BE DELIVERED TO THE SITE WITHIN THE 7 DAY PERIOD FOLLOWING THE CASTING DATE.
6. ALL WEAKENED OR KNOCKOUT AREAS THAT ARE NOT USED SHALL BE BRICKED AND MORTARED TO MAINTAIN DESIGN WALL THICKNESS.
7. THE JOINTS OF PRECAST CONCRETE MANHOLES SHALL BE WRAPPED WITH GEOTEXTILE COVERING AT LEAST 12 INCHES ON BOTH SIDES OF THE JOINT.
8. MANHOLE FRAME AND COVER TO BE SET TO FINISHED GRADE. ASPHALT SHIMS TO BE PLACED BEFORE WINTER IF PAVING HAS NOT BEEN COMPLETED.
9. BACKFILL WITH SUITABLE MATERIAL APPROVED BY THE ENGINEER.

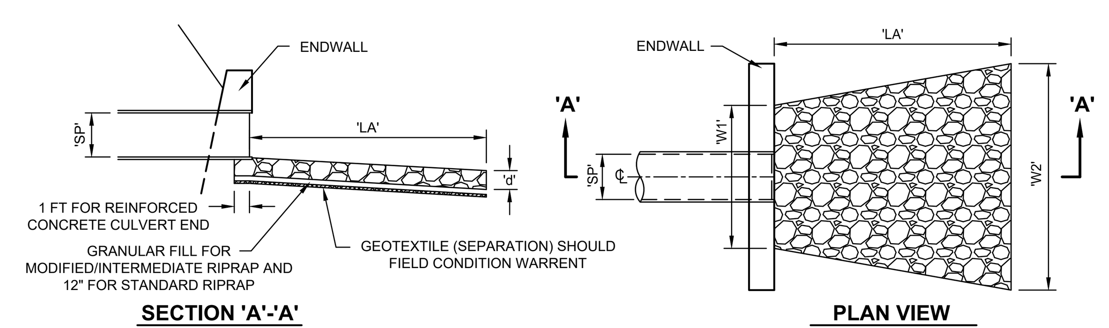


DRAIN MANHOLE DETAIL

NOT TO SCALE

RIPRAP OUTLET PROTECTION SPECIFICATION TABLE

LOCATION	SP	LA	W1	W2	d
EW 1	18"	30'	3'	20'	18" MODIFIED RIPRAP (CTDOT FORM 816M.12.022.3)
EW 40	24"	18'	6'	24'	18" MODIFIED RIPRAP (CTDOT FORM 816M.12.022.3)

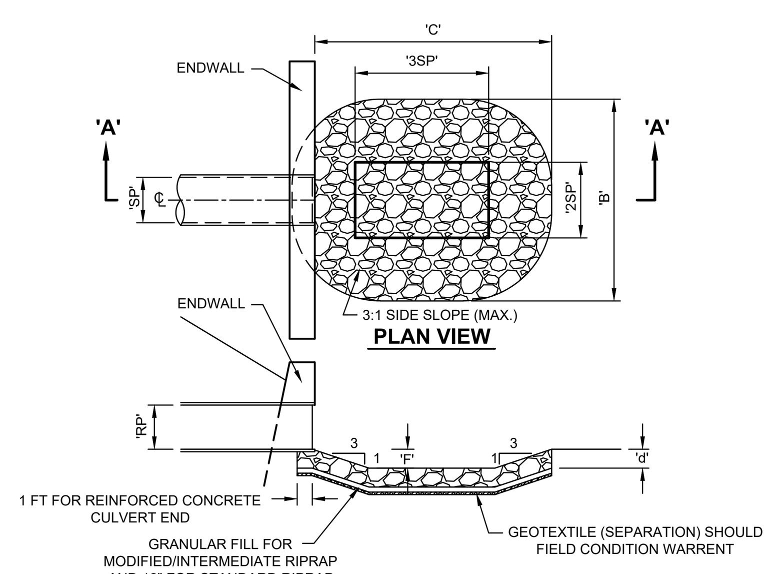


RIPRAP APRON AT ENDWALL/ OUTLET DETAIL

(CT DOT DRAINAGE MANUAL FIGURE 11-13)
NOT TO SCALE

RIPRAP OUTLET PROTECTION SPECIFICATION TABLE

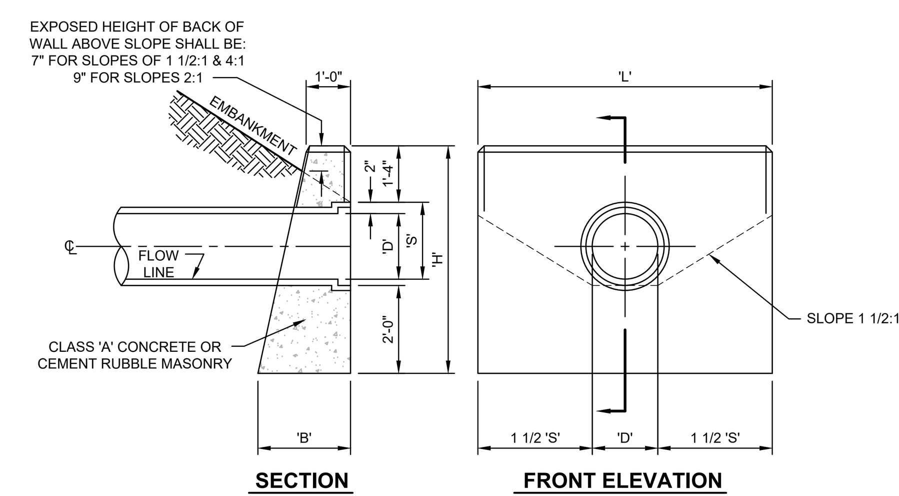
LOCATION	SP	B	C	2SP	3SP	F	d
EW 3	36"	15'	18'	6'	9'	1.5'	18" MODIFIED RIPRAP (CTDOT FORM 816 M.12.02.3)
EW 40	36"	24'	27'	6'	9'	3'	18" MODIFIED RIPRAP (CTDOT FORM 816 M.12.02.3)
EW 70	24"	16'	18'	4'	6'	2'	18" MODIFIED RIPRAP (CTDOT FORM 816 M.12.02.3)



RIPRAP DETAIL AT ENDWALL/ OUTLET DETAIL

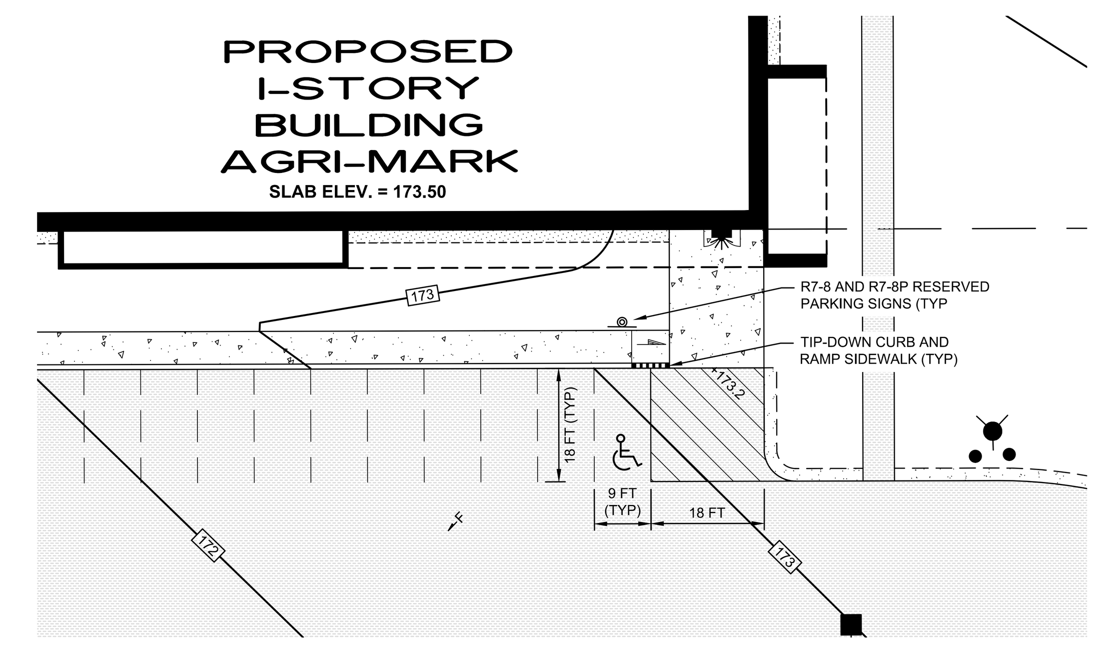
(CT DOT DRAINAGE MANUAL FIGURE 11-15)
NOT TO SCALE

DIMENSIONS AND QUANTITIES FOR ONE ENDWALL BASED ON S = D + 2"						
D	S	H	L	BATTER	B	VOL.
18"	1'-8"	5'-0"	6'-6"	2 1/2"	2'-0 1/2"	1.83
24"	2'-2"	5'-6"	8'-6"	2 1/2"	2'-1 3/4"	2.72



STANDARD ENDWALL DETAIL

(CT DOT DRAINAGE SHEETHW-506_01)
NOT TO SCALE

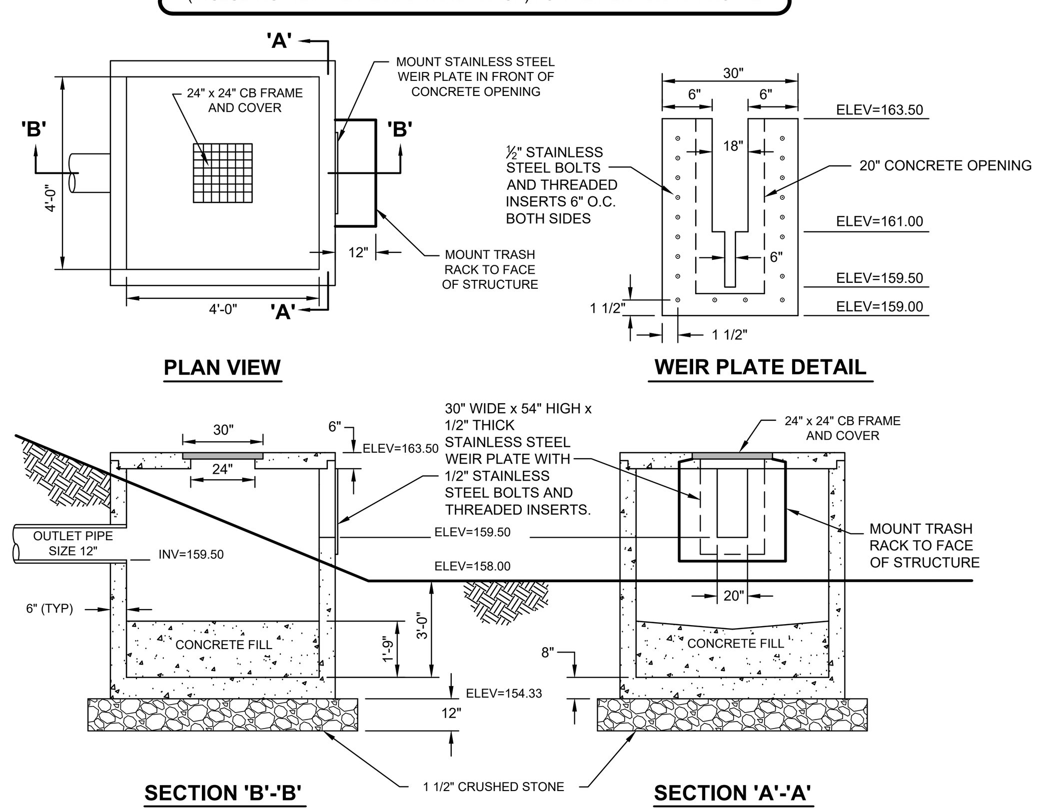


RESERVED PARKING AREA DETAIL - AGRI-MARK

SCALE: 1" = 20'

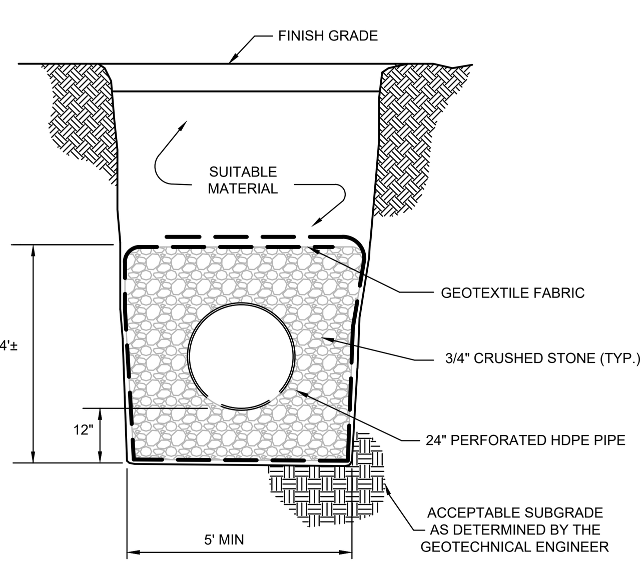
NOTE

PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER SHOP DRAWINGS OF THE OUTLET CONTROL STRUCTURE (INCLUDING WEIR PLATE AND TRASH RACK) FOR REVIEW AND APPROVAL



STORMWATER MANAGEMENT AREA 'B' OUTLET CONTROL STRUCTURE (OCS 2) DETAIL

NOT TO SCALE



TYPICAL RECHARGE (DRAINAGE) TRENCH SECTION

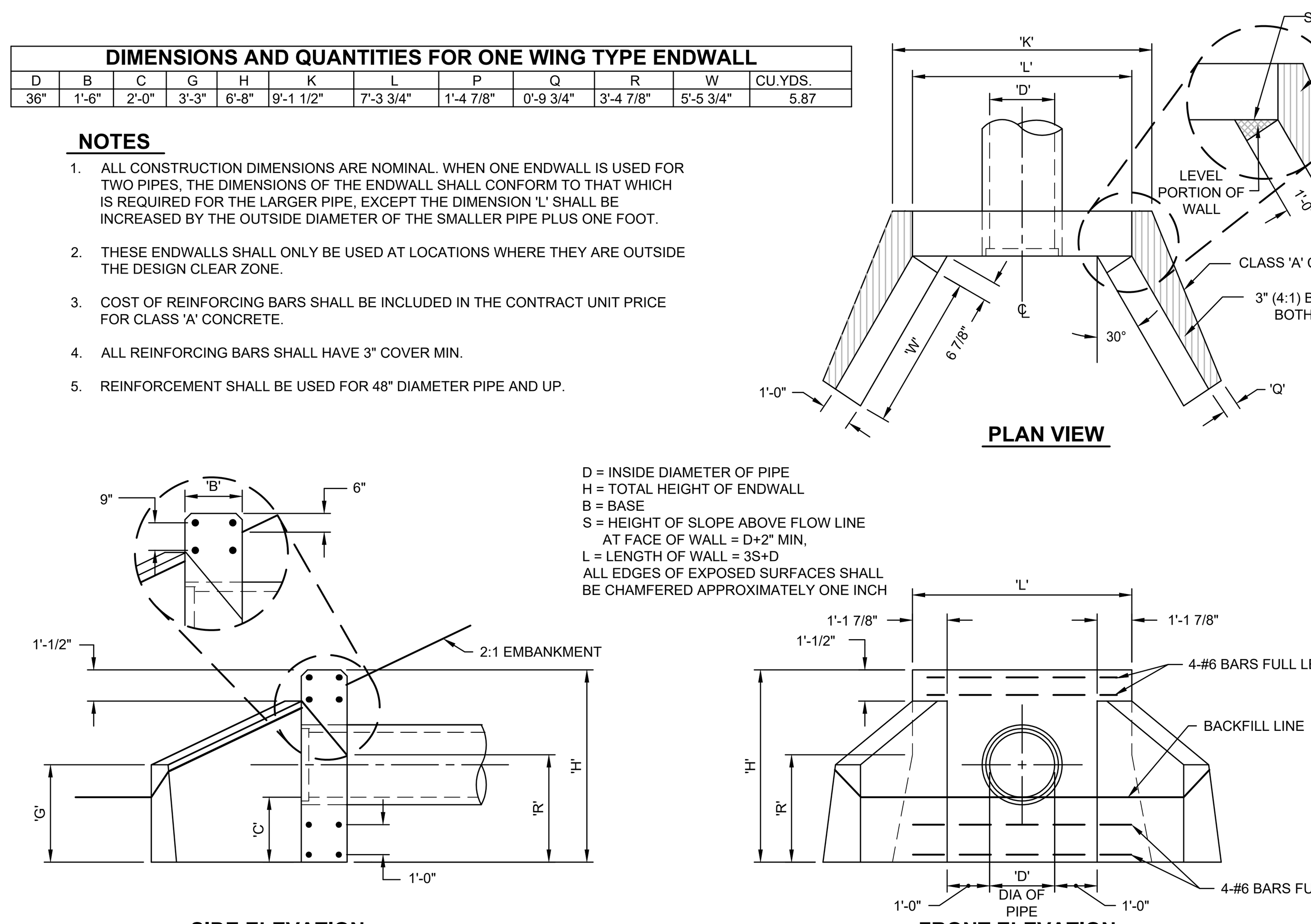
NOT TO SCALE

DIMENSIONS AND QUANTITIES FOR ONE WING TYPE ENDWALL											
D	B	C	G	H	K	L	P	Q	R	W	CU.YDS.
36"	1'-6"	2'-0"	3'-3"	6'-8"	9'-1 1/2"	7'-3 3/4"	1'-4 7/8"	0'-9 3/4"	3'-4 7/8"	5'-5 3/4"	5.87

NOTES

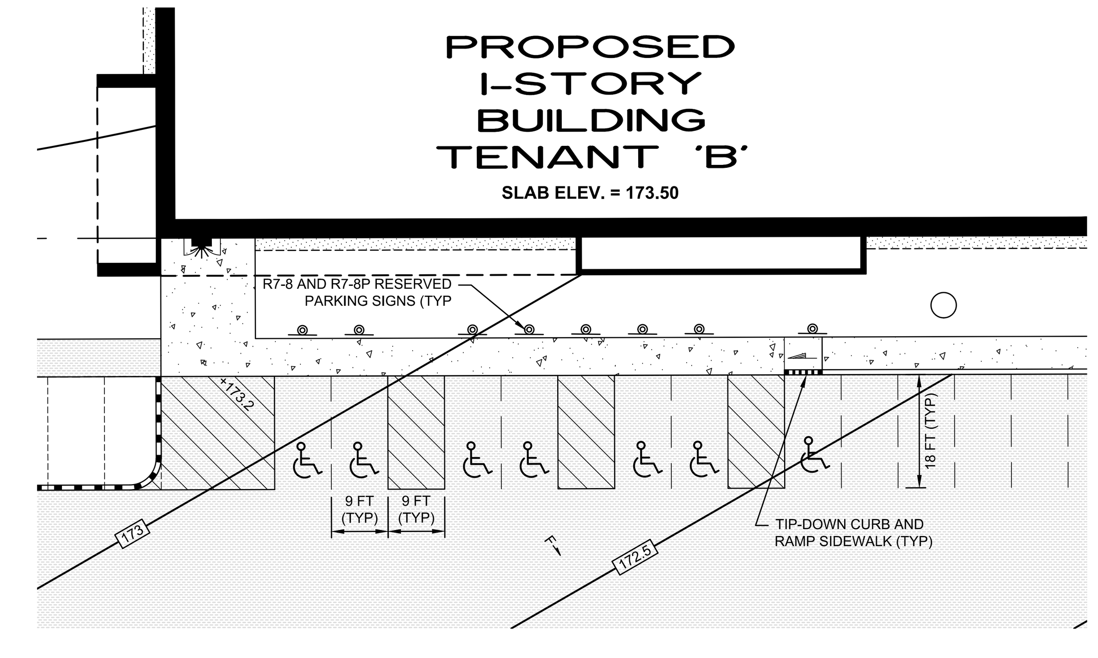
1. ALL CONSTRUCTION DIMENSIONS ARE NOMINAL. WHEN ONE ENDWALL IS USED FOR TWO PIPES, THE DIMENSIONS OF THE ENDWALL SHALL CONFORM TO THAT WHICH IS REQUIRED FOR THE LARGER PIPE, EXCEPT THE DIMENSION 'L' SHALL BE INCREASED BY THE OUTSIDE DIAMETER OF THE SMALLER PIPE PLUS ONE FOOT.
2. THESE ENDWALLS SHALL ONLY BE USED AT LOCATIONS WHERE THEY ARE OUTSIDE THE DESIGN CLEAR ZONE.
3. COST OF REINFORCING BARS SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR CLASS 'A' CONCRETE.
4. ALL REINFORCING BARS SHALL HAVE 3" COVER MIN.
5. REINFORCEMENT SHALL BE USED FOR 48" DIAMETER PIPE AND UP.

D = INSIDE DIAMETER OF PIPE
H = TOTAL HEIGHT OF ENDWALL
B = BASE
S = HEIGHT OF SLOPE ABOVE FLOW LINE AT FACE OF WALL = D+2" MIN,
L = LENGTH OF WALL = 3S+D
ALL EDGES OF EXPOSED SURFACES SHALL BE CHAMFERED APPROXIMATELY ONE INCH



STANDARD WING TYPE ENDWALL DETAIL

(CT DOT STANDARD SHEET HW-506_01)
NOT TO SCALE



RESERVED PARKING AREA DETAIL - TENANT 'B'

SCALE: 1" = 20'

No.	DATE	REVISION	BY

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WE 113 NORTH MAPLE STREET, LLC
c/o WINSTANLEY ENTERPRISES, LLC 150 BAKER AVE. EXT. CONCORD, MA 01742 (978) 287-5000

SPR No.
DETAIL SHEET - GENERAL SITE
(MAP 82, LOTS 1, 2, 3 & 4)
PROPOSED AGRI-MARK DISTRIBUTION FACILITY
113 NORTH MAPLE STREET
ENFIELD, CONNECTICUT

HSI Hayner/Swanson, Inc.
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3 Congress Street Nashua, NH 03062 (603) 883-2057
131 Middlesex Turnpike Burlington, MA 01803 (781) 203-1501
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DRAWING LOCATION: J:\5000\5476\DWG\5476 SITE
DWG: 5476SITE–DET1
Field Book:

Scale: AS SHOWN
Date: 1 JUNE 2020
Project No.: 5476
Sheet No.: 15 OF 22

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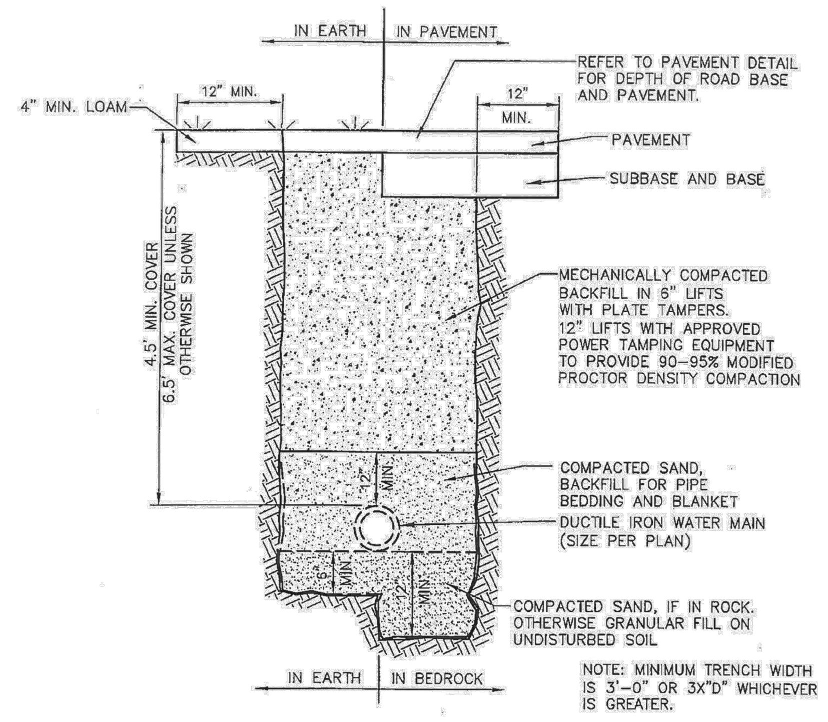


TYPICAL WATER PIPE TRENCH DETAIL

NOT TO SCALE

TABLE OF DIMENSIONS

BENDS		B	C	D	E	F	BENDS		B	C	D	E	F
6"	11-1/4°	8"	15"	12"	24"	12"	6"	45°	8"	30"	12"	24"	14"
6"	22-1/2°	"	19"	"	"	13"	6"	90°	"	30"	"	"	27"
8"	11-1/4°	"	20"	"	"	12"	8"	45°	"	30"	"	"	24"
8"	22-1/2°	"	22"	"	"	17"	8"	90°	"	38"	"	"	36"
12"	11-1/4°	"	30"	"	"	15"	12"	45°	"	40"	"	"	40"
12"	22-1/2°	"	35"	"	"	25"	12"	90°	"	60"	"	"	52"

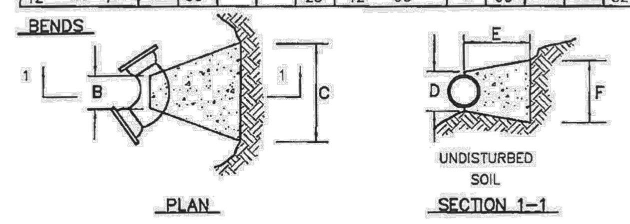
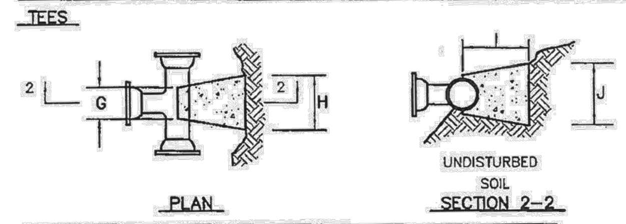


TABLE OF DIMENSIONS

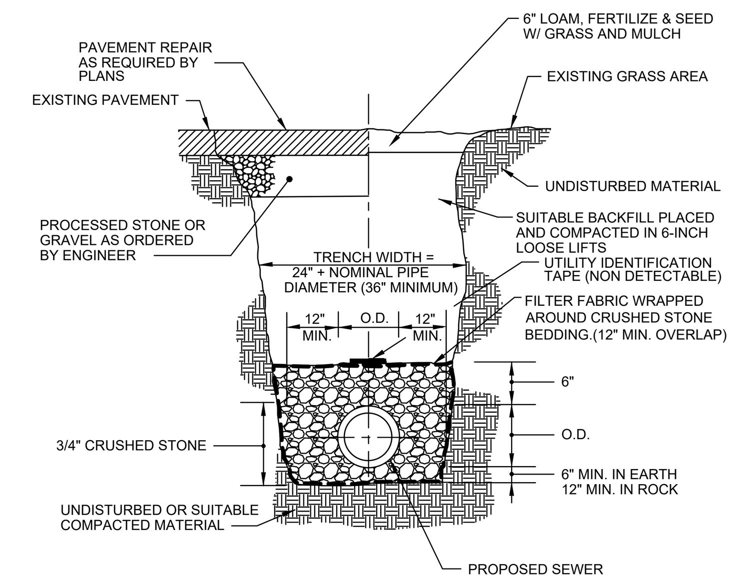
TEES	G	H	I	J	TEES	G	H	I	J
6"x 6"x 6"	12"	24"	24"	18"	12"x 12"x 6"	12"	24"	24"	18"
8"x 8"x 6"	"	"	"	"	12"x 12"x 8"	"	"	"	24"
8"x 8"x 8"	"	"	"	24"	12"x 12"x 12"	"	36"	"	36"



NOTES:
1. PROVIDE BLOCKS FOR TAPPING SLEEVES, DEAD ENDS, GATE VALVES, AND VERTICAL BENDS (SAME SIZE AS REQUIRED FOR TEES).
2. CONCRETE SHALL NOT BE PLACED AGAINST PIPE BEYOND FITTING.

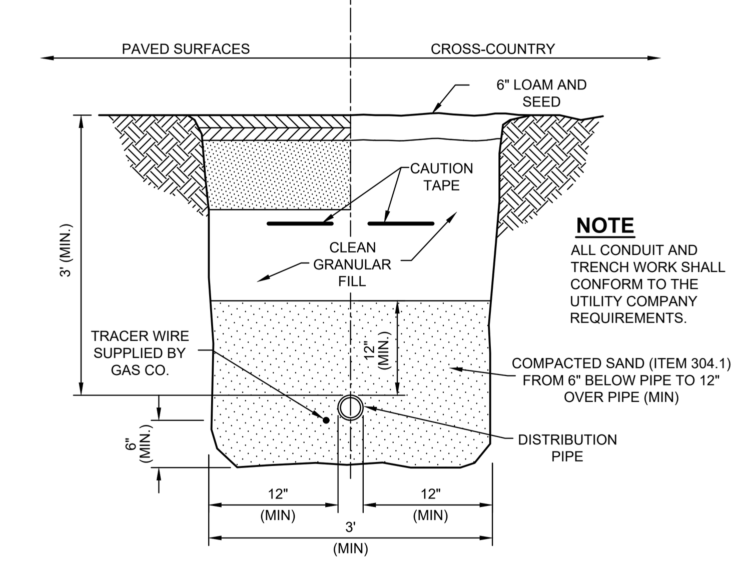
CONCRETE THRUST BLOCK DETAILS

NOT TO SCALE



SEWER TRENCH DETAIL

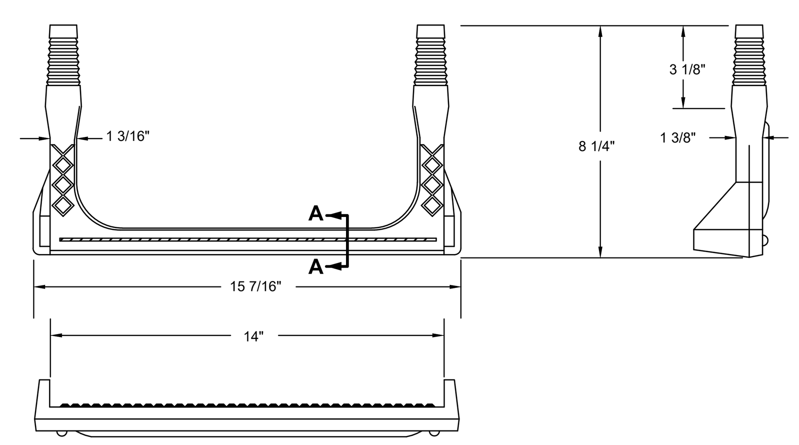
NOT TO SCALE



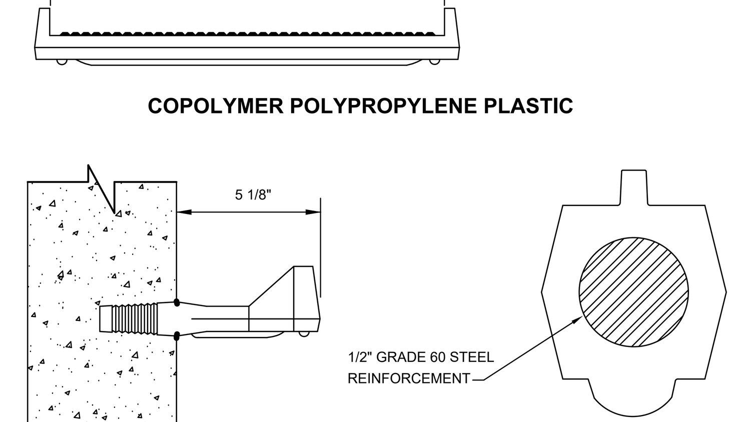
NOTE
ALL CONDUIT AND TRENCH WORK SHALL CONFORM TO THE UTILITY COMPANY REQUIREMENTS.

GAS MAIN TRENCH SECTION

NOT TO SCALE



COPOLYMER POLYPROPYLENE PLASTIC

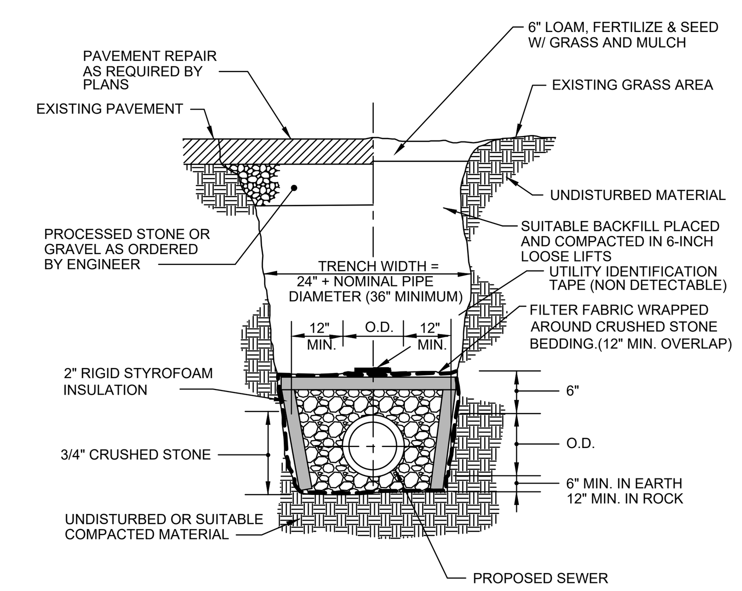


SECTION A-A

PLASTIC MANHOLE STEP

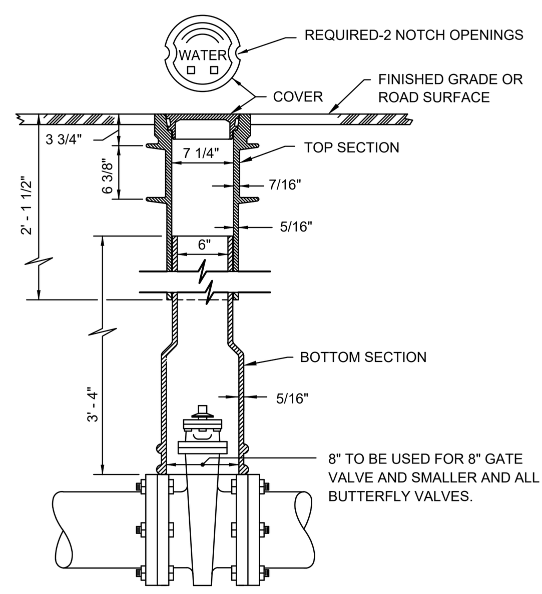
(FOR INSTALLATION IN PRE-CAST CONCRETE)

NOT TO SCALE



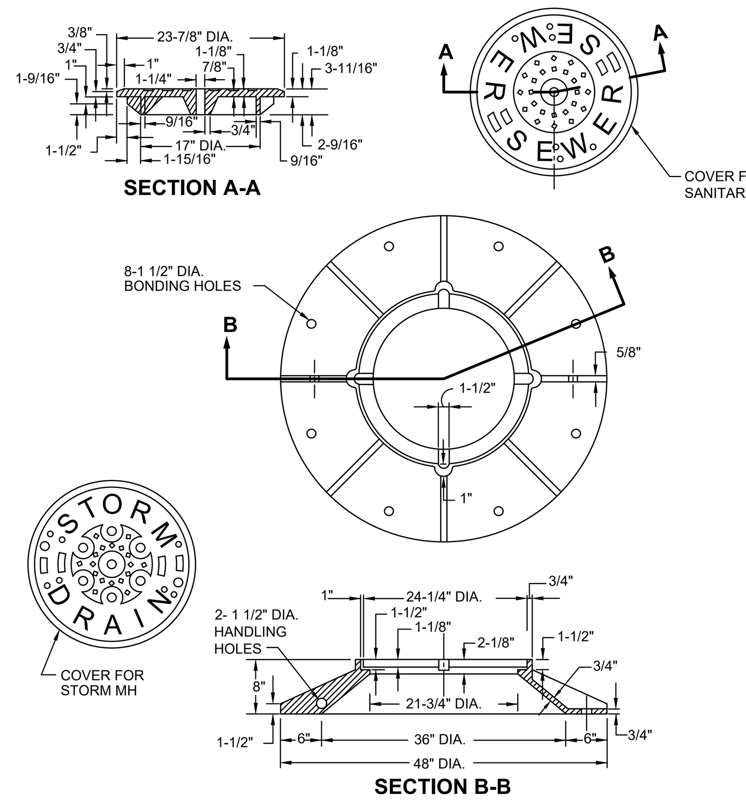
SEWER PIPE INSULATION DETAIL

NOT TO SCALE



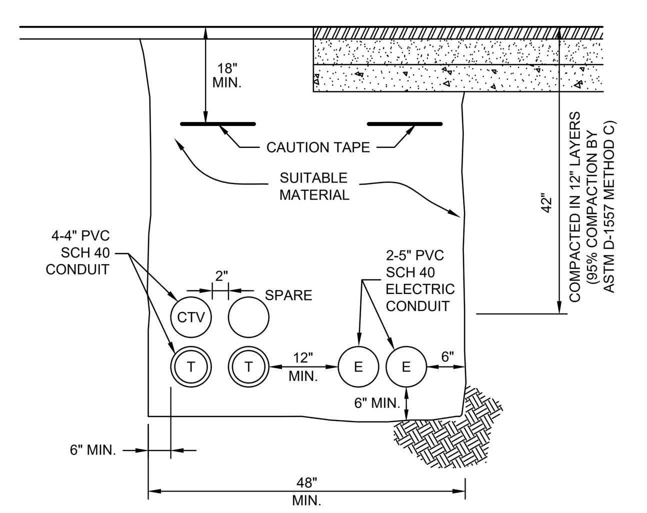
STANDARD GATE BOX DETAIL

NOT TO SCALE



STANDARD FRAME AND COVER

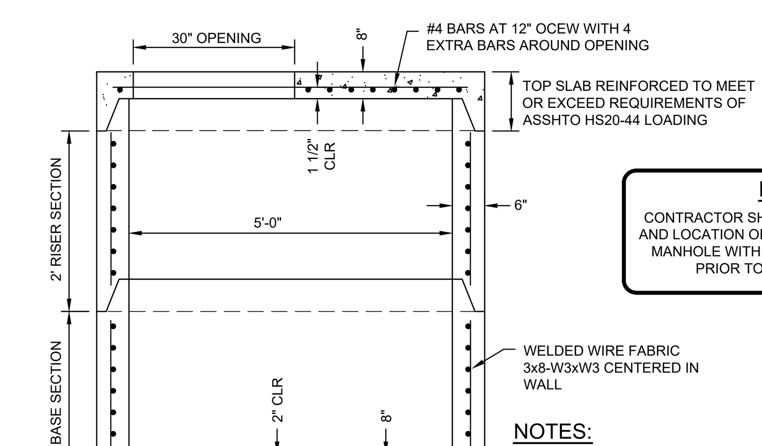
NOT TO SCALE



NOTE:
ALL CONDUIT AND TRENCH WORK SHALL CONFORM TO THEIR RESPECTIVE UTILITY COMPANY REQUIREMENTS

TYPICAL UTILITY TRENCH

NOT TO SCALE

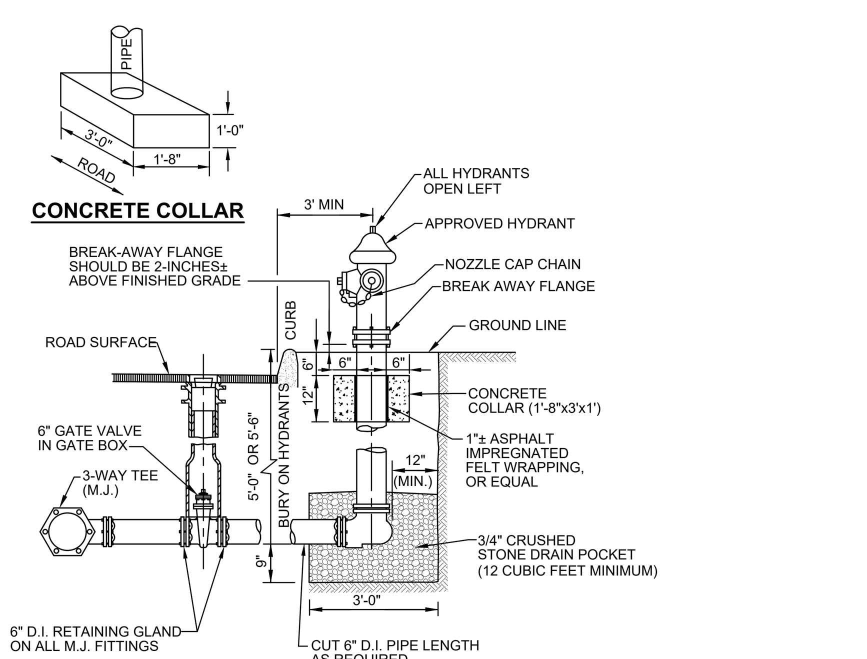


NOTE
CONTRACTOR SHALL VERIFY EXACT SIZE AND LOCATION OF TELECOMMUNICATIONS MANHOLE WITH THE UTILITY COMPANY PRIOR TO CONSTRUCTION

NOTES:
1. MANUFACTURED TO MEET OR EXCEED REQUIREMENTS OF ASTM C-478 & ASSHTO M-199 SPECIFICATIONS.
2. CIRCUMFERENTIAL REINFORCEMENT SHALL CONFORM TO ASTM A-185. TOP/BOTTOM STEEL SHALL CONFORM TO ASTM A-615 GRADE 60 DEFORMED BARS. BOTH PLACED PER ASTM C-478 (8.1, 8.3 8.4).
3. CONCRETE: 4,000 PSI MINIMUM AT 28 DAYS, PER ASTM C-478 (6.1). CEMENT TO BE PER ASTM C-150.
4. BUTYL RUBBER JOINT SEALANT PER ASTM C-990 & AASHTO M-198.
5. BITUMINOUS ASPHALT COATING (IF REQUIRED) TO BE SHOP APPLIED

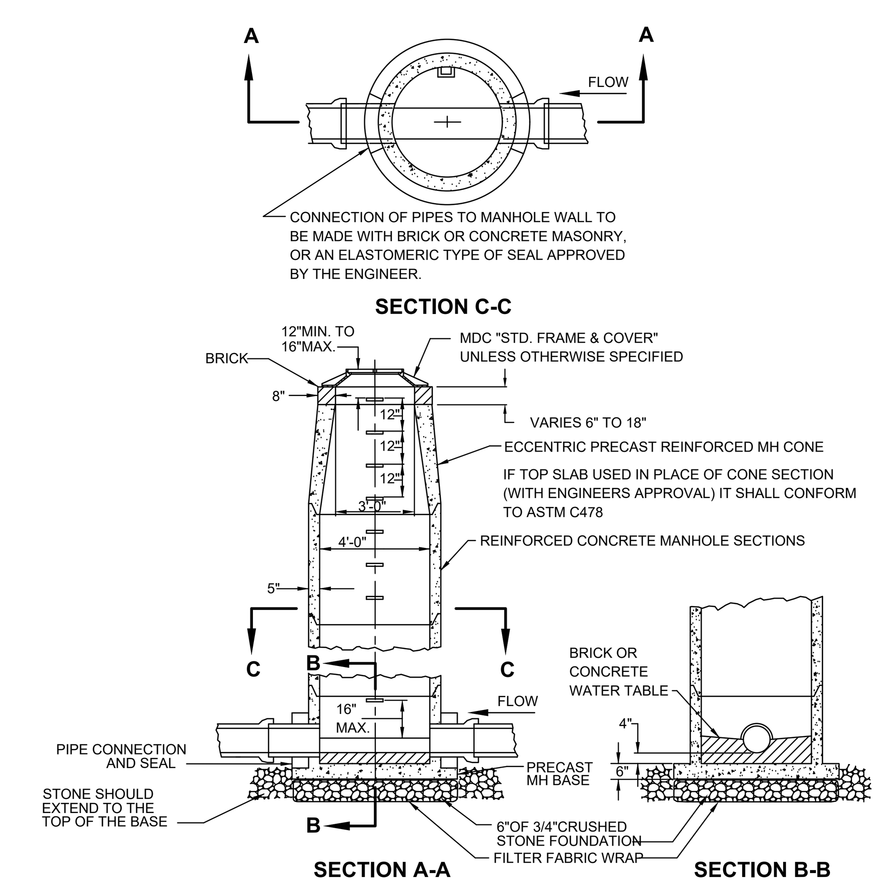
TELECOMMUNICATIONS MANHOLE DETAIL

NOT TO SCALE



FIRE HYDRANT ASSEMBLY DETAIL

NOT TO SCALE



MAXIMUM SIZE OF PIPE TO BE INSTALLED IN A TYPE II MANHOLE TO BE 18"

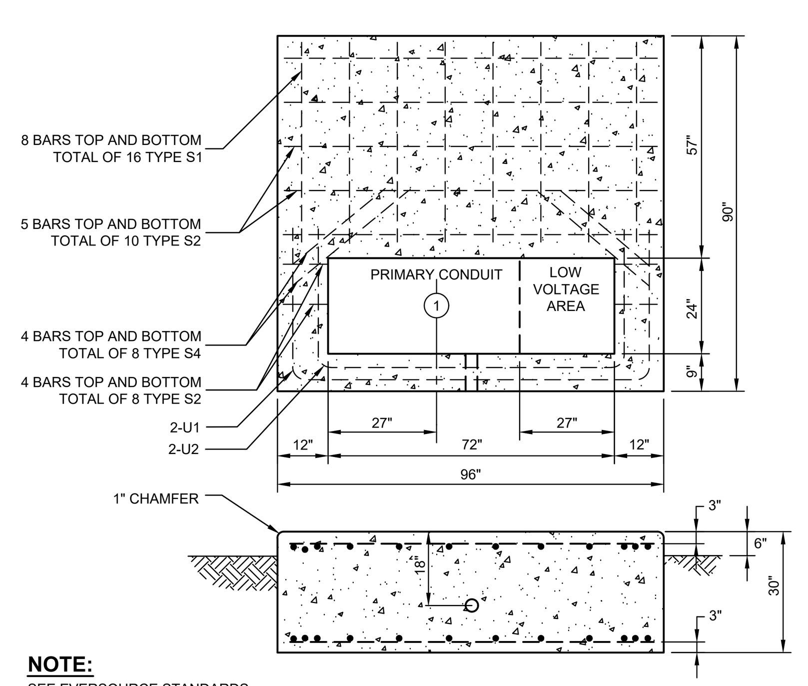
MAXIMUM DEPTH OF R.C. PIPE MANHOLES WITH 5" THICK WALL IS 30 FT.

BUTYL RUBBER GASKETS USED FOR JOINTS SHALL CONFORM TO ASTM SPEC. C433

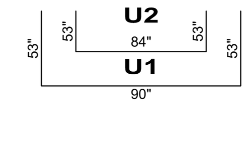
ALL PRECAST MANHOLE BASES SHALL COMPLY WITH THE "MINIMUM REQUIREMENTS FOR 48" DIAMETER PRECAST MANHOLE BASE"

TYPE II MANHOLE TYPICAL PRECAST MANHOLE

NOT TO SCALE



NOTE:
SEE EVERSOURCE STANDARDS AND DETAILS FOR NOTES AND ADDITIONAL DETAIL.

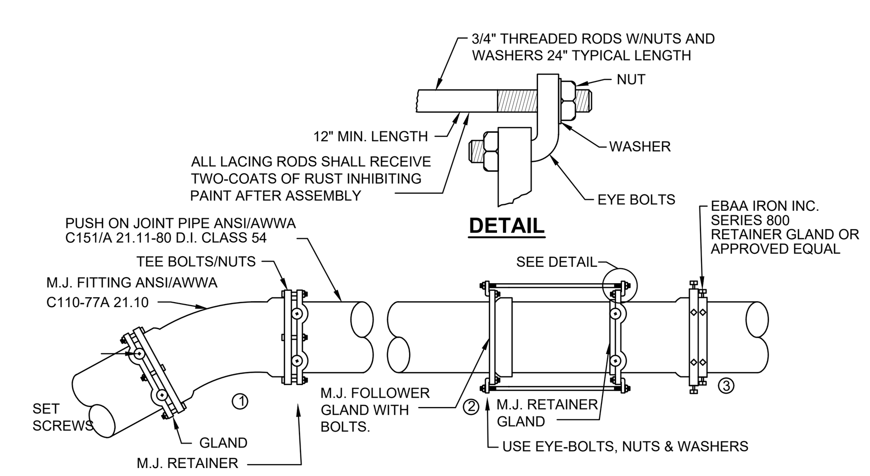


NOTE
CONTRACTOR SHALL VERIFY EXACT SIZE AND LOCATION OF TRANSFORMER PAD WITH THE UTILITY COMPANY PRIOR TO CONSTRUCTION

REINFORCING SCHEDULE			
TYPE	NO.	LENGTH	TOTAL
S1	16	4'-6"	72'-0"
S2	10	7'-6"	75'-0"
S3	8	0'-6"	4'-0"
S4	8	2'-0"	16'-0"
CONC VOLUME=4.44 CY TOP SECTION ONLY			

750 KVA TRANSFORMER PAD

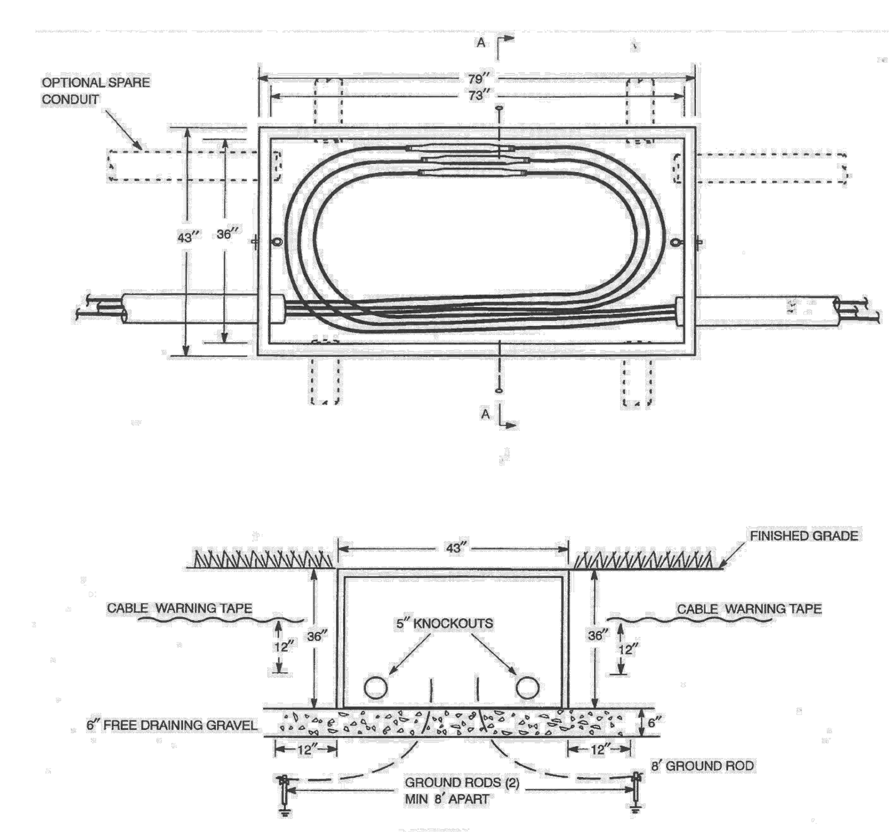
NOT TO SCALE



THRUST RESTRAINT-RESTRAINED JOINT METHODS
① MECHANICAL JOINT RETAINER GLANDS
② PUSH-ON JOINT RESTRAINT USING MECHANICAL JOINT RETAINER GLANDS AND LACING
③ PUSH-ON JOINT RETAINER GLANDS

TYPICAL RESTRAINED JOINTS

NOT TO SCALE



POWER VAULT DETAIL

NOT TO SCALE

Notes
1. Install polymer concrete vault. Vault is rated for occasional vehicular traffic, however, do not install in roadway applications. Vault shall be used to splice one three-phase cable, maximum #4/0 Al.
2. The excavation shall be carried to a minimum depth of 6" below the bottom and 12" beyond the edge.
3. Install two 8' galvanized steel ground rods adjacent to the vault and ground per DTR 78.151. Provide #6 Cu bond for communications companies.

No.	DATE	REVISION	BY

PREPARED FOR/RECORD OWNER:
WE 113 NORTH MAPLE STREET, LLC
c/o WINSTANLEY ENTERPRISES, LLC 150 BAKER AVE. EXT. CONCORD, MA 01742 (978) 287-5000

SPR No.
DETAIL SHEET - GENERAL SITE
(MAP 82, LOTS 1, 2, 3 & 4)
PROPOSED AGRI-MARK DISTRIBUTION FACILITY
113 NORTH MAPLE STREET
ENFIELD, CONNECTICUT

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
3 Congress Street Nashua, NH 03062 (603) 883-2057
131 Middlesex Turnpike Burlington, MA 01803 (781) 203-1501
www.hayner-swanson.com

DRAWING LOCATION: J:\5000\5476\DWG\5476 SITE
DWG: 5476SITE-DET1
Field Book:

Scale AS SHOWN
Date 1 JUNE 2020
Project No. 5476
Sheet No. 16 OF 22

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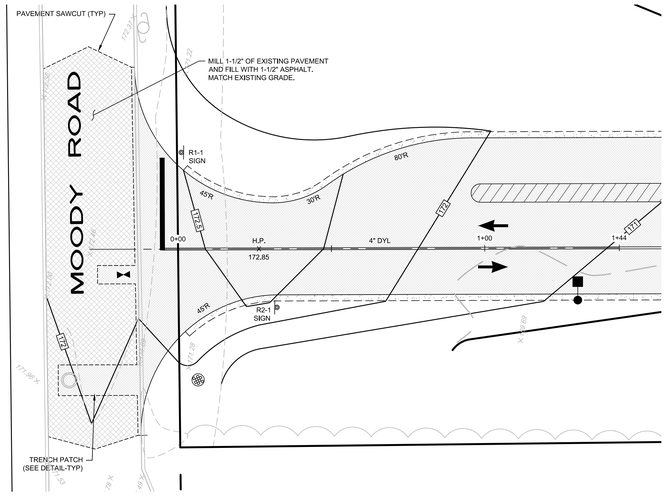
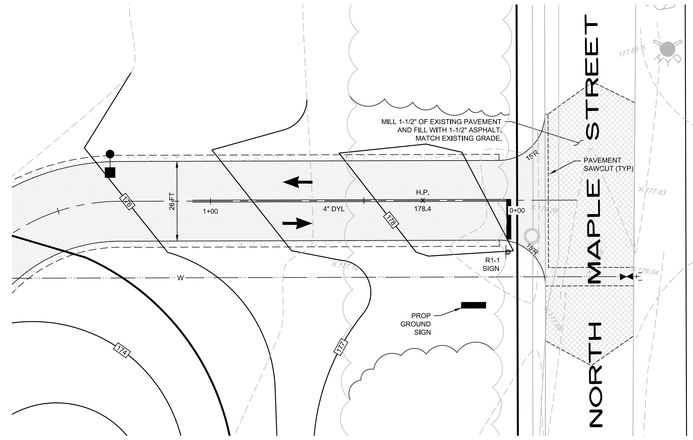
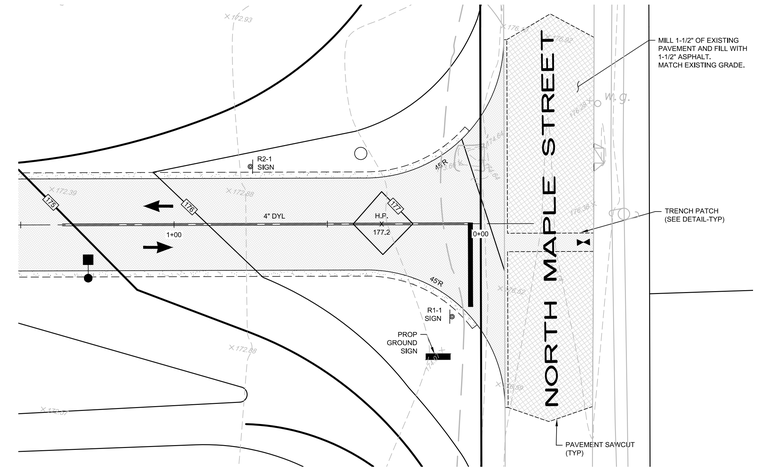
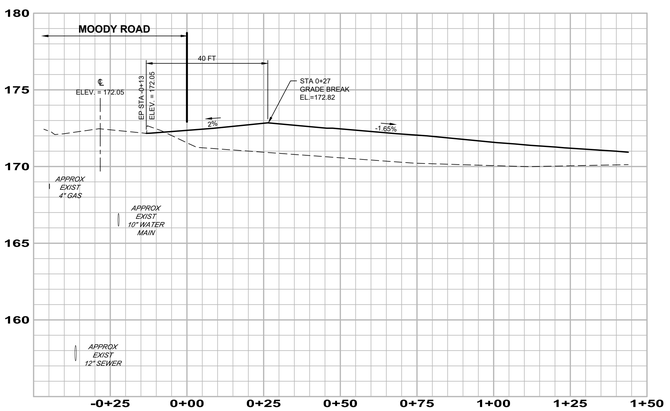


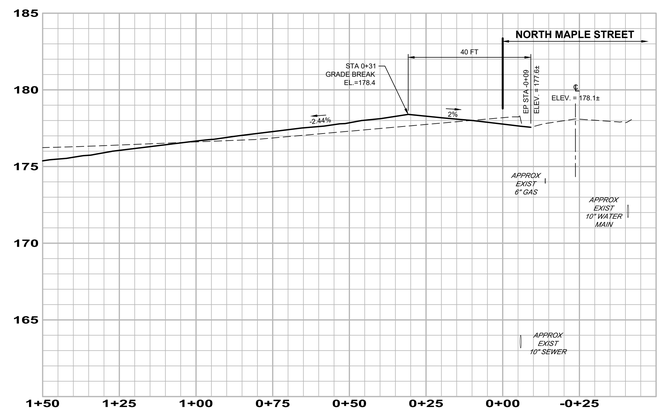






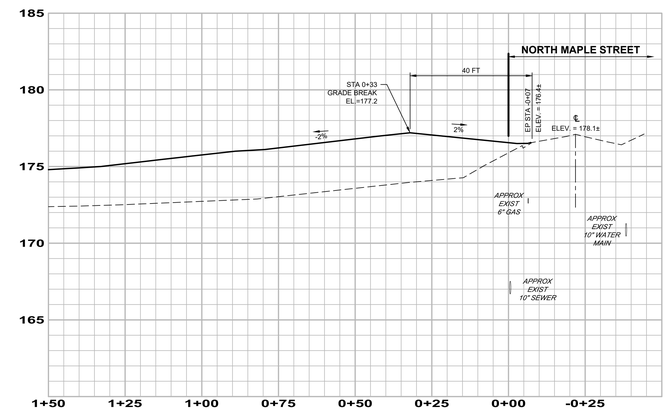
MOODY ROAD DRIVEWAY

Horizontal Scale: 1" = 20'
Vertical Scale: 1" = 4'



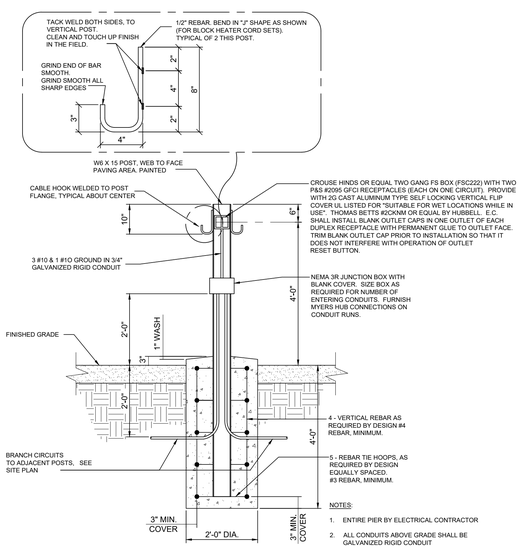
NORTH MAPLE STREET DRIVEWAY NORTH

Horizontal Scale: 1" = 20'
Vertical Scale: 1" = 4'



NORTH MAPLE STREET DRIVEWAY SOUTH

Horizontal Scale: 1" = 20'
Vertical Scale: 1" = 4'

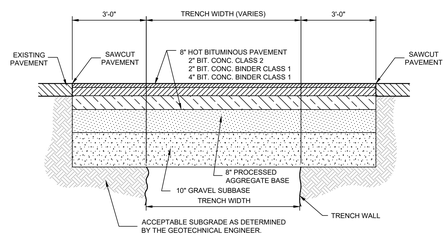


NOTES:

1. ENTIRE PIER BY ELECTRICAL CONTRACTOR
2. ALL CONDUITS ABOVE GRADE SHALL BE GALVANIZED RIGID CONDUIT

FREE STANDING BLOCK HEATER DETAIL

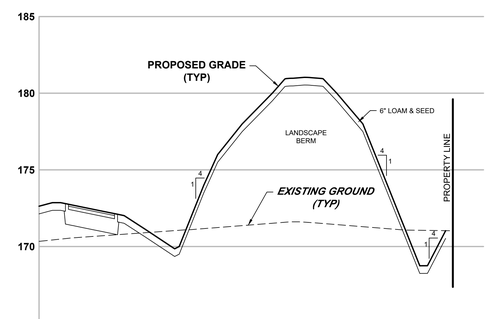
NOT TO SCALE



NOTE:
THE BINDER COURSE SHALL BE PLACED IMMEDIATELY AFTER THE TRENCH CONSTRUCTION, AND ALLOWED TO STAND FOR A MINIMUM OF 90 DAYS. A LEVELING COURSE SHALL BE APPLIED OVER THE TRENCH AFTER 90 DAYS AND THE DISTURBED AREA OVERLAYED TO THE LIMITS SHOWN ON THE PLANS.

TRENCH PATCH DETAIL

NOT TO SCALE



CROSS SECTION 'A'-'A'

HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE: 1" = 4'

NO.	DATE	REVISION	BY

PREPARED FOR/RECORD OWNER:
WE 113 NORTH MAPLE STREET, LLC
c/o WINSTANLEY ENTERPRISES, LLC 150 BAKER AVE. EXT. CONCORD, MA 01742 (978) 287-5000

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DRAWING LOCATION: J:\2020\5476\DWG\5476 SITE
DWG: 5476SITE-DETT
Field Book:

Scale
AS SHOWN

Date
1 JUNE 2020

Project No.
5476

Sheet No.
17 OF 22

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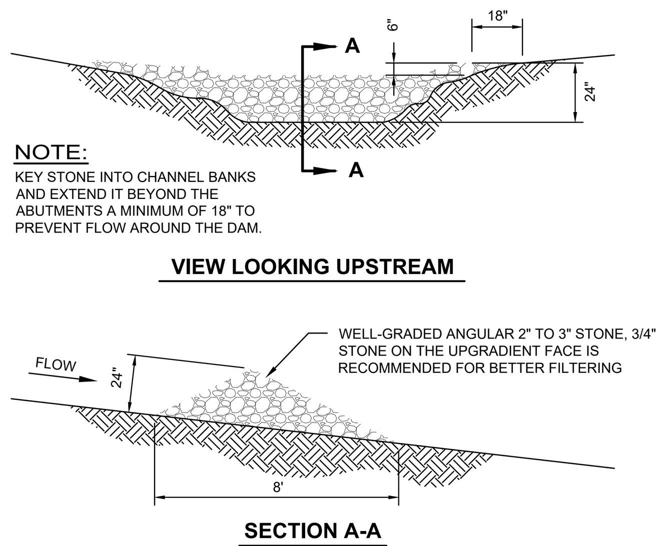
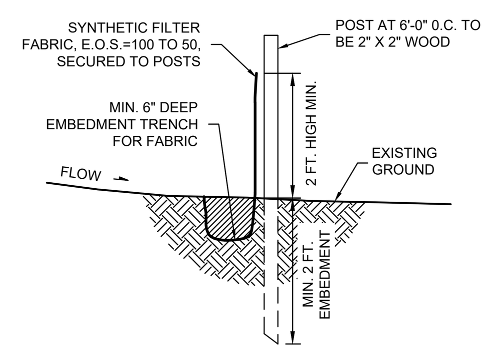


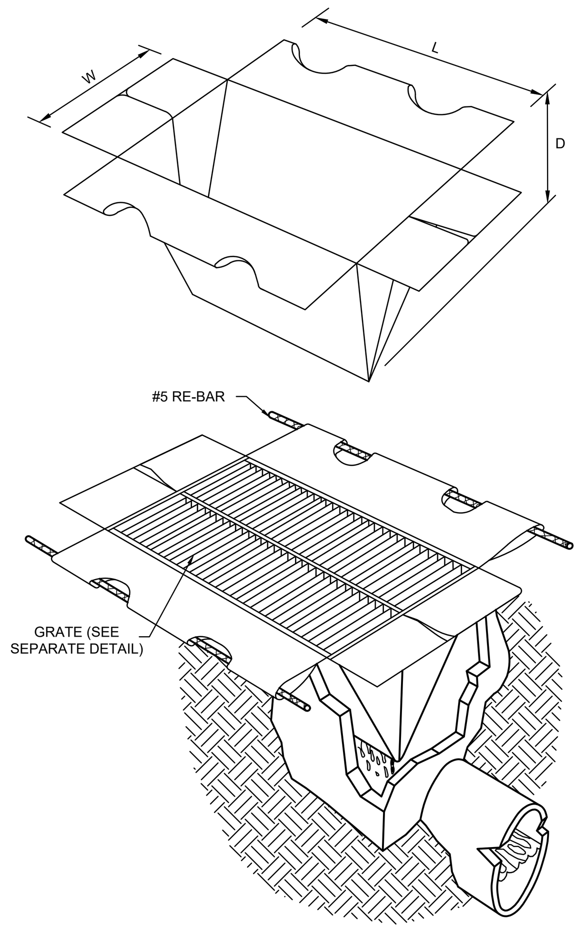
TEMPORARY STONE CHECK DAM TYPICAL SECTION

NOT TO SCALE



SILT FENCE DETAIL

NOT TO SCALE



SILTSAK® NOTES:

1.0 THE SILTSAK® SHALL BE MANUFACTURED FROM WOVEN POLYPROPYLENE AND SEWN BY A DOUBLE NEEDLE MACHINE, USING A HIGH STRENGTH NYLON THREAD.

2.0 THE SILTSAK® SEAMS SHALL HAVE A CERTIFIED AVERAGE WIDE WIDTH STRENGTH PER ASTM D-4884 STANDARDS AS FOLLOWS:

SILTSAK® STYLE	***TEST METHOD***	***TEST METHOD***
REGULAR FLOW	ASTM D-4884	165.O LBS/IN
HI-FLOW	ASTM D-4884	114.6 LBS/IN

3.0 THE SILTSAK® WILL BE MANUFACTURED TO FIT THE OPENING OF THE CATCH BASIN OR DROP INLET. THE SILTSAK® WILL HAVE THE FOLLOWING FEATURES: TWO DUMP STRAPS ATTACHED AT THE BOTTOM TO FACILITATE THE EMPTYING OF THE SILTSAK®; THE SILTSAK® SHALL HAVE LIFTING LOOPS AS AN INTEGRAL PART OF THE SYSTEM TO BE USED TO LIFT THE SILTSAK® FROM THE BASIN; THE SILTSAK® SHALL HAVE A RESTRAINT CORD APPROXIMATELY HALFWAY UP THE SACK TO KEEP THE SIDES AWAY FROM THE CATCH BASIN WALLS, THIS YELLOW CORD IS ALSO A VISIBLE MEANS OF INDICATING WHEN THE SACK SHOULD BE EMPTIED, CLEANED, AND PLACED BACK INTO THE BASIN.

4.0 THE GEOTEXTILE FABRIC SHALL BE WOVEN POLYPROPYLENE FABRIC WITH THE FOLLOWING PROPERTIES:

SILTSAK® REGULAR FLOW

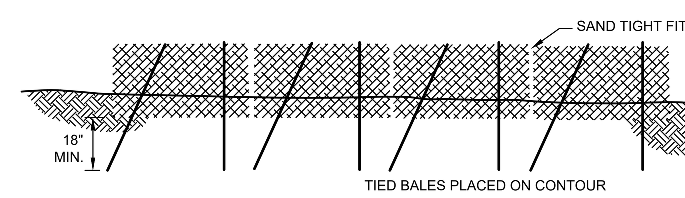
PROPERTY	***TEST METHOD***	***TEST RESULT***
GRAB TENSILE	ASTM D-4632	300 LBS
GRAB ELONGATION	ASTM D-4631	20%
PUNCTURE	ASTM D-4833	120 LBS
MULLEN BURST	ASTM D-3786	800 PSI
TRAPEZOID TEAR	ASTM D-4533	120 LBS
UV RESISTANCE	ASTM D-4355	80%
APPARENT OPENING	ASTM D-4751	40 US SIEVE
FLOW RATE	ASTM D-4491	40 GAL/MIN/FT2
PERMITTIVITY	ASTM D-4491	0.55 SEC

OR **SILTSAK® HI-FLOW**

PROPERTY	***TEST METHOD***	***TEST RESULT***
GRAB TENSILE	ASTM D-4632	265 LBS
GRAB ELONGATION	ASTM D-4632	20%
PUNCTURE	ASTM D-4833	135 LBS
MULLEN BURST	ASTM D-3786	420 PSI
TRAPEZOID TEAR	ASTM D-4533	45 LBS
UV RESISTANCE	ASTM D-4355	90%
APPARENT OPENING	ASTM D-4751	20 US SIEVE
FLOW RATE	ASTM D-4491	200 GAL/MIN/FT2
PERMITTIVITY	ASTM D-4491	1.5 SEC

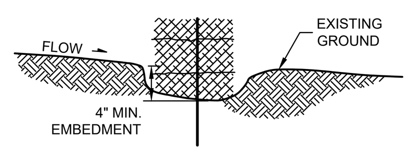
SILTSAK® DETAIL

NOT TO SCALE



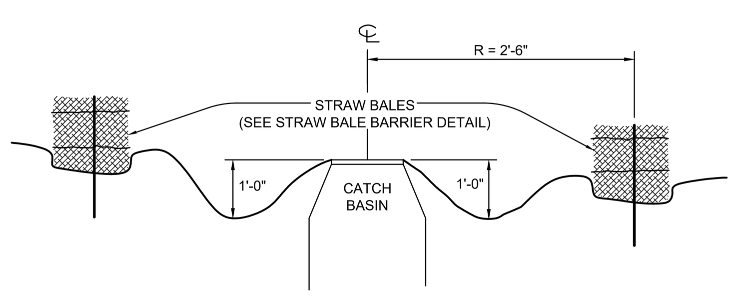
NOTES:

1. 2 STAKES PER BALE TO BE N0. 4 REBAR, STEEL PIPE, OR 2" X 2" WOOD.
2. ANGLE FIRST STAKE TOWARD PREVIOUSLY LAID BALE.
3. CONSTRUCTION SPECIFICATIONS AND MAINTENANCE REQUIREMENTS SHOWN IN NHDES STORMWATER MANUAL VOLUME 3.



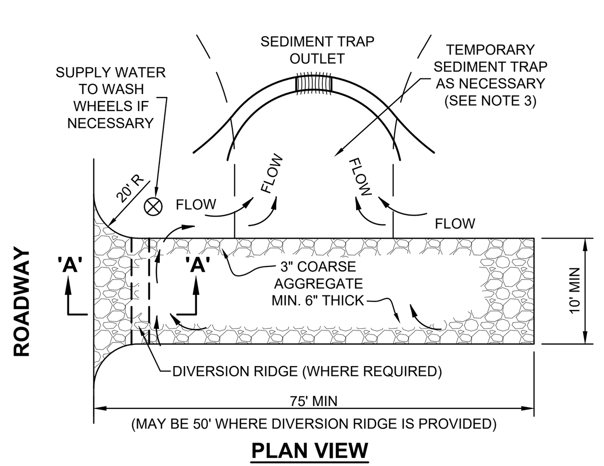
STRAW BALE BARRIER DETAIL

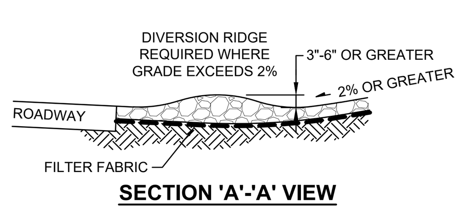
NOT TO SCALE



SEDIMENTATION CONTROL AT CATCH BASINS

NOT TO SCALE





NOTES:

1. THE EXIT SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO EXITING THE SITE ONTO A PUBLIC RIGHT-OF-WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.

TEMPORARY GRAVEL CONSTRUCTION EXIT

NOT TO SCALE

GENERAL NOTES

1. ALL SOIL EROSION AND SEDIMENT CONTROL WORK SHALL BE PERFORMED IN ACCORDANCE WITH STANDARDS AND SPECIFICATIONS THEREOF IN "CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL", LATEST EDITION, THE TOWN OF ENFIELD ENGINEERING DEPARTMENT STANDARDS AND STATE OF CONNECTICUT DOT FORM 817.
2. THE CONTRACTOR SHALL OBTAIN A COPY OF REGISTRATION UNDER THE CT DEEP GENERAL PERMIT FOR THE DISCHARGE OF STORMWATER AND DEWATERING WASTEWATERS FROM CONSTRUCTION ACTIVITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.
3. ANY ADDITIONAL SEDIMENT/EROSION CONTROL MEASURES DEEMED NECESSARY BY THE TOWN ENGINEERING OR THE INLAND WETLANDS AND WATERCOURSES AGENCY OR ITS DESIGNATE DURING THE CONSTRUCTION OF ANY SITE IMPROVEMENT SHALL BE IMPLEMENTED BY THE DEVELOPER. IN ADDITION, THE DEVELOPER SHALL BE RESPONSIBLE FOR THE MAINTENANCE/REPAIR/REPLACEMENT FOR ALL SEDIMENT/EROSION CONTROL MEASURES UNTIL ALL DISTURBED AREAS HAVE BEEN STABILIZED TO THE SATISFACTION OF THE TOWN ENGINEER AND THE CONSERVATION COMMISSION, OR ITS DESIGNATE.
4. REFERENCE IS MADE TO THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL (DEEP BULLETIN 34).
5. THE WORK AREA SHALL BE GRADED, SHAPED AND OTHERWISE DRAINED IN SUCH A MANNER AS TO MINIMIZE SOIL EROSION, SILTATION OF DRAINAGE CHANNELS, DAMAGE TO EXISTING VEGETATION, AND DAMAGE TO PROPERTY OUTSIDE THE LIMITS OF THE WORK AREA. SILT FENCES, HAY BALES, STABILIZATION MATTING, DUST CONTROL AND/OR SEDIMENT TRAPS WILL BE NECESSARY TO ACCOMPLISH THIS END.
6. THE DEVELOPER (CONTRACTOR) SHALL PRACTICE EFFECTIVE DUST CONTROL PER THE SOIL CONSERVATION SERVICE HANDBOOK DURING CONSTRUCTION AND UNTIL ALL AREAS ARE STABILIZED OR SURFACE TREATED. THE DEVELOPER (CONTRACTOR) SHALL BE RESPONSIBLE FOR THE CLEANING OF NEARBY STREETS, AS ORDERED BY THE TOWN, OF ANY DEBRIS FROM THESE CONSTRUCTION ACTIVITIES.
7. SOIL STABILIZATION SHALL BE COMPLETED WITHIN FIVE (5) DAYS OF CLEARING OR INACTIVITY IN CONSTRUCTION.
8. ACCUMULATED SEDIMENT SHALL BE REMOVED AS REQUIRED TO KEEP SILT FENCE FUNCTIONAL. IN ALL CASES, DEPOSITS SHALL BE REMOVED WHEN THE ACCUMULATED SEDIMENT HAS REACHED ONE-QUARTER ABOVE THE GROUND HEIGHT OF THE FENCE.
9. THE CONTRACTOR/DEVELOPER SHALL NOTIFY THE TOWN ENGINEER AND/OR IWWA AGENT AT LEAST TWO WORKING DAYS BEFORE THE FOLLOWING:
   A. START OF CONSTRUCTION
   B. COMPLETION OF CLEARING LIMIT DEMARCATION
   C. INSTALLATION OF E&S MEASURES
   D. COMPLETION OF SITE CLEARING
   E. COMPLETION OF ROUGH GRADING
   F. CLOSE OF CONSTRUCTION SEASON
   G. COMPLETION OF ALL LANDSCAPING
   H. PRIOR TO REMOVAL OF CONSTRUCTION E&S CONTROL SYSTEM
10. THE CONTRACTOR SHALL OBTAIN A COPY OF THE STORM WATER POLLUTION CONTROL PLAN (SPCP). THE ENTIRE CONTENTS OF THE STORM WATER POLLUTION CONTROL PLAN SHALL BE RETAINED ON-SITE FOR THE DURATION OF THE CONTRACT AND BE MADE AVAILABLE TO LOCAL, STATE AND FEDERAL CODE ENFORCEMENT PERSONNEL.
11. ALL CONTRACTORS AND SUBCONTRACTORS INVOLVED WITH THE PROJECT SHALL OBTAIN A COPY OF THE STORM WATER POLLUTION CONTROL PLAN (SPCP) AND THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL (DEEP BULLETIN 34).
12. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES AS REQUIRED BY THE (SPCP). ADDITIONAL BEST MANAGEMENT PRACTICES SHALL BE IMPLEMENTED AS DICTATED BY CONDITIONS AT NO ADDITIONAL COST OF OWNER THROUGHOUT ALL PHASES OF CONSTRUCTION.
13. BEST MANAGEMENT PRACTICE (BMP'S) AND CONTROLS SHALL CONFORM TO FEDERAL, STATE OR LOCAL REQUIREMENTS OR MANUAL OF PRACTICE, AS APPLICABLE. CONTRACTOR SHALL IMPLEMENT ADDITIONAL CONTROLS AS DIRECTED BY PERMITTING AGENCY OR OWNER.
14. TEMPORARY FUEL STORAGE FACILITIES ARE PROHIBITED ON ANY PORTION OF THIS PROJECT.
15. ALL MEASURES STATED ON THIS EROSION AND SEDIMENT CONTROL PLAN, AND IN THE STORM WATER POLLUTION CONTROL PLAN, SHALL BE MAINTAINED IN FULLY FUNCTIONAL CONDITION UNTIL NO LONGER REQUIRED FOR A COMPLETED PHASE OF WORK OR FINAL STABILIZATION OF THE SITE. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE CHECKED BY A QUALIFIED PERSON IN ACCORDANCE WITH THE CONTRACT DOCUMENTS OR THE APPLICABLE PERMIT, WHICHEVER IS MORE STRINGENT, AND REPAIRED IN ACCORDANCE WITH SAID REGULATIONS.

SITE MAINTENANCE/INSPECTION NOTES

1. THE CONTRACTOR SHALL INSPECT ALL CONTROL MEASURES AT LEAST ONCE A WEEK AND WITHIN TWELVE (12) HOURS OF THE END OF A STORM WITH RAINFALL AMOUNT GREATER THAN 0.5 INCHES. THE INSPECTIONS WILL VERIFY THAT THE STRUCTURAL BMPS DESCRIBED IN THE PLANS ARE IN GOOD CONDITION AND ARE MINIMIZING EROSION. A MAINTENANCE INSPECTION REPORT WILL BE MADE WITH EACH INSPECTION. COMPLETED INSPECTION FORMS SHALL BE KEPT ON-SITE FOR THE DURATION OF THE PROJECT. FOLLOWING CONSTRUCTION, THE COMPLETED FORMS SHALL BE RETAINED AT THE CONTRACTOR'S OFFICE FOR A MINIMUM OF ONE YEAR.
2. INLET PROTECTION DEVICES AND BARRIERS SHALL BE REPAIRED OR REPLACED IF THEY SHOW SIGNS OF UNDERMINING OR DETERIORATION.
3. ALL SEEDED AREAS SHALL BE CHECKED REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHOULD BE FERTILIZED, WATERED AND RESEEDED AS NEEDED.
4. SILT FENCE SHALL BE REPAIRED TO THEIR ORIGINAL CONDITIONS IF DAMAGED. SEDIMENT SHALL BE REMOVED FROM THE SILT FENCES WHEN IT REACHES ONE-QUARTER THE HEIGHT OF THE SILT FENCE.
5. THE CONSTRUCTION ENTRANCES SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOW OF MUD ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING OF THE CONSTRUCTION ENTRANCES AS CONDITIONS DEMAND.
6. A WEEKLY INSPECTION REPORT SHALL BE COMPLETED BY THE CONTRACTOR AND PROVIDED TO THE OWNER.
7. TREATMENT OF NON-STORM WATER DISCHARGES SUCH AS WATER FROM THE WATER LINE FLUSHINGS OR GROUNDWATER FROM DEWATERING EXCAVATIONS. SUCH FLOWS SHOULD BE DIRECTED TO A TEMPORARY SEDIMENTATION BASIN OR STORM WATER MANAGEMENT AREA.

GOOD HOUSEKEEPING PRACTICES

1. THE CONTRACTOR SHALL EMPLOY MEASURES AND PRACTICES TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS TO STORM AND WATER RUNOFF. THE CONTRACTOR SHALL PAY SPECIAL ATTENTION TO THE HANDLING, USE AND DISPOSAL OF MATERIALS SUCH AS PETROLEUM PRODUCTS, FERTILIZERS AND PAINTS TO ENSURE THAT THE RISK ASSOCIATED WITH THE USE OF THESE PRODUCTS IS MINIMIZED. THE FOLLOWING "GOOD HOUSEKEEPING" PRACTICES SHALL BE FOLLOWED DURING CONSTRUCTION OF THE PROJECT:
   A. AN EFFORT SHALL BE MADE TO STORE ONLY ENOUGH PRODUCT REQUIRED TO DO THE JOB.
   B. ALL MATERIALS STORED ON-SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR APPROPRIATE CONTAINERS AND, IF POSSIBLE, UNDER A ROOF OR OTHER ENCLOSURE.
   C. PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS WITH THEIR MANUFACTURER'S LABELS.
   D. WHENEVER POSSIBLE, ALL OF A PRODUCT SHALL BE USED BEFORE DISPOSING OF THE CONTAINER.
   E. MANUFACTURERS' RECOMMENDATIONS FOR PROPER USE AND DISPOSAL SHALL BE FOLLOWED.
   F. THE CONTRACTOR SHALL INSPECT DAILY TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS.

POST CONSTRUCTION

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF ALL TEMPORARY AND PERMANENT CONTROLS THROUGHOUT THE DURATION OF THIS CONTRACT AND UNTIL THE ROADS ARE ACCEPTED BY THE TOWN AND/OR DEVELOPER, MAINTENANCE PRACTICES SHALL INCLUDE, BUT ARE NOT LIMITED TO:
   A. CLEANING OF CATCH BASINS TWICE PER YEAR OR MORE FREQUENTLY AS DICTATED BY QUARTERLY INSPECTIONS.
   B. CLEANING OF SEDIMENTATION AND DEBRIS FROM STORM WATER MANAGEMENT AREA PLUNGE POOLS TWICE PER YEAR OR MORE FREQUENTLY AS DICTATED BY MONTHLY INSPECTIONS.
   C. IMPLEMENTATION OF OTHER MAINTENANCE OR REPAIR ACTIVITIES AS DEEMED NECESSARY BASED UPON WEEKLY INSPECTIONS.
   D. REMOVAL OF BUILT UP SEDIMENT IN PERMANENT CONTROLS SUCH AS GRASS SWALES, SEDIMENT FOREBAYS AND STORMWATER MANAGEMENT AREAS.
   E. SWEEP PAVED AREAS REGULARLY TO MINIMIZE SEDIMENT ACCUMULATION. FREQUENCY WILL VARY SEASONALLY ACCORDING TO SEDIMENT ACCUMULATION ON PAVED SURFACES (E.G. MORE FREQUENT SWEEPING DURING THE WINTER AND SPRING).

EROSION CONTROL NOTES

1. LOAM AND MATERIAL STOCKPILE AREAS AS SHOWN ARE APPROXIMATE AND SUBJECT TO CHANGE. STOCKPILE AREAS SHALL BE SURROUNDED BY SILT FENCE AND RE-SEEDED IF THEY ARE LEFT UNTOUCHED FOR MORE THAN FIVE (5) DAYS.
2. STRIPPED TOPSOIL SHALL BE STOCKPILED, WITHOUT COMPACTION, AND STABILIZED AGAINST EROSION IN ACCORDANCE WITH "TEMPORARY STABILIZATION OF DISTURBED AREAS", AS OUTLINED IN NOTE NO. 3.
3. TEMPORARY STABILIZATION OF DISTURBED AREAS:

   SEED BED PREPARATION: 10-10-10 FERTILIZATION TO BE SPREAD AT THE RATE OF 7 LBS. PER 1,000 SF AND AGRICULTURAL LIMESTONE AT A RATE OF 90 LBS. PER 1,000 SF AND INCORPORATED INTO THE SOIL. THE SOIL, FERTILIZER AND LIMESTONE SHALL BE TILLED TO PREPARE FOR SEEDING.

   A. SEED MIXTURE: USE ANY OF THE FOLLOWING:

SPECIES	**RATE PER 1,000 SF**	**DEPTH**	**SEEDING DATES**
WINTER RYE	2.5 LBS.	1"	08/15 TO 09/15
OATS	2.5 LBS.	1"	04/15 TO 10/15
ANNUAL RYE GRASS	1.0 LBS.	0.25"	08/15 TO 09/15

   B. MULCHING: MULCH SHOULD BE USED ON HIGHLY ERODIBLE AREAS AND WHERE CONSERVATION OF MOISTURE WILL FACILITATE PLANT ESTABLISHMENT AS FOLLOWS:

TYPE	**RATE PER 1,000 SF**	**USE & COMMENTS**
HAY OR STRAW	70 TO 90 LBS	MAY BE USED WITH PLANTINGS, MUST BE ANCHORED TO BE USED ALONE
WOOD CHIPS OR BARK MULCH	460 TO 920 LBS	USED WITH TREE AND SHRUB PLANTINGS
FIBROUS MATTING	AS RECOMMENDED BY MANUFACTURER	MUST BE BIODEGRADABLE. USE IN SLOPE AREAS AND AREAS DIFFICULT TO VEGETATE.
CRUSHED STONE 1/4" TO 1 ½" DIA	SPREAD TO GREATER THAN ½" THICKNESS	USE IN SPECIFIC AREAS AS SHOWN ON PLAN OR AS NEEDED.

4. PRIOR TO CONSTRUCTION OF ANY PUBLIC IMPROVEMENTS A STONE CONSTRUCTION ENTRANCE/EXIT PAD OF AT LEAST 50 FEET IN LENGTH, WITH THE FIRST 20 FEET PAVED WITH BITUMINOUS CONCRETE, THE ENTIRE WIDTH OF THE PROPOSED NEW ROAD, SHALL BE INSTALLED AT THE INTERSECTION OF THE NEW ROAD AND ENTRANCE PAD SHALL BE MAINTAINED UNTIL THE PAVING OF THE ROAD. SEE THE DETAIL ON SEDIMENTATION AND EROSION CONTROL DETAILS PLAN.
5. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:"
   - BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED.
   - A MINIMUM OF 85 PERCENT VEGETATED GROWTH HAS BEEN ESTABLISHED.
   - A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED.
   - OR, EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
6. THE CONTRACT SHALL MAINTAIN A MINIMUM OF 150 FEET OF SILT FENCE, 40 HAY/STRAW BALES AND 2 ROLLS OF STABILIZATION MATTING AS CONTINGENCY PROVISIONS.
7. SITE LOCATION:
   41° 59' 55" N LATITUDE, 72° 32' 37" W LONGITUDE (PER GOOGLE EARTH)
8. TOTAL AREA OF DISTURBED SOILS: 2,237,900± SF

WASTE MANAGEMENT NOTES

1. ALL WASTE OR DISCARDED BUILDING MATERIALS SHALL BE STOCKPILED IN THE WASTE BUILDING MATERIAL STORAGE AREA AS SHOWN ON THE PLANS. ALL SUCH MATERIAL SHALL BE REMOVED FROM THE SITE AT THE COMPLETION OF CONSTRUCTION OF THE BUILDING AND DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS, ORDINANCES AND LAWS. NO SUCH MATERIAL SHALL BE BURIED OR OTHERWISE LEFT ON SITE.
2. ALL LITTER SHALL BE COLLECTED FROM THE SITE AT THE END OF THE WORKING DAY AND STORED IN METAL CONTAINERS WITH LIDS OR REMOVED FROM THE SITE.
3. ALL SEDIMENT RETAINED BY SILT FENCE OR OTHER EROSION CONTROLS SHALL BE REMOVED FROM THE SILT FENCE OR EROSION CONTROL AND BURIED ON-SITE IN AN AREA OUTSIDE OF THE 100 FOOT UPLAND REVIEW AREA.
4. ALL WASTE MATERIAL, INCLUDING WASTE WATER AND CONCRETE TRUCK WASHOUT WATER, SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS, ORDINANCES AND LAWS.
5. CONCRETE TRUCK WASHOUT IS PERMITTED IN DESIGNATED AREAS ONLY.
6. A SIGN SHALL BE INSTALLED ADJACENT TO EACH WASHOUT AREA TO INFORM CONCRETE EQUIPMENT OPERATORS TO UTILIZE THE PROPER FACILITY.
7. CONCRETE WASHOUT MATERIALS MUST BE CONTAINED WHERE WASTE CONCRETE CAN SOLIDIFY IN PLACE AND EXCESS WATER CAN SAFELY EVAPORATE.
8. TEMPORARY WASHOUT AREAS SHOULD HAVE A TEMPORARY PIT OR BERMED AREA LARGE ENOUGH TO CONTAIN ALL LIQUID AND WASTE CONCRETE MATERIALS FROM WASHOUT.

WINTER CONDITION NOTES

1. ALL PROPOSED POST-DEVELOPMENT VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE PLACEMENT OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOR OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
2. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.
3. AFTER NOVEMBER 15TH, INCOMPLETE ROAD OR PARKING SURFACES SHALL BE PROTECTED WITH A MINIMUM OF 3-INCHES OF PROCESSED AGGREGATE.

No.	DATE	REVISION	BY

PREPARED FOR/RECORD OWNER:
WE 113 NORTH MAPLE STREET, LLC
c/o WINSTANLEY ENTERPRISES, LLC 150 BAKER AVE. EXT. CONCORD, MA 01742 (978) 287-5000

SPR No.
DETAIL SHEET - EROSION CONTROL
(MAP 82, LOTS 1, 2, 3 & 4)
PROPOSED AGRI-MARK DISTRIBUTION FACILITY
113 NORTH MAPLE STREET
ENFIELD, CONNECTICUT

HSI Hayner/Swanson, Inc.
Civil Engineers/Land Surveyors
3 Congress Street Nashua, NH 03062 (603) 883-2057
131 Middlesex Turnpike Burlington, MA 01803 (781) 203-1501
www.hayner-swanson.com

DRAWING LOCATION: J:\5000\5476\DWG\5476 SITE
DWG: 5476SITE-DET1
Field Book:

Scale: AS SHOWN
Date: 1 JUNE 2020
Project No. 5476
Sheet No. 18 OF 22

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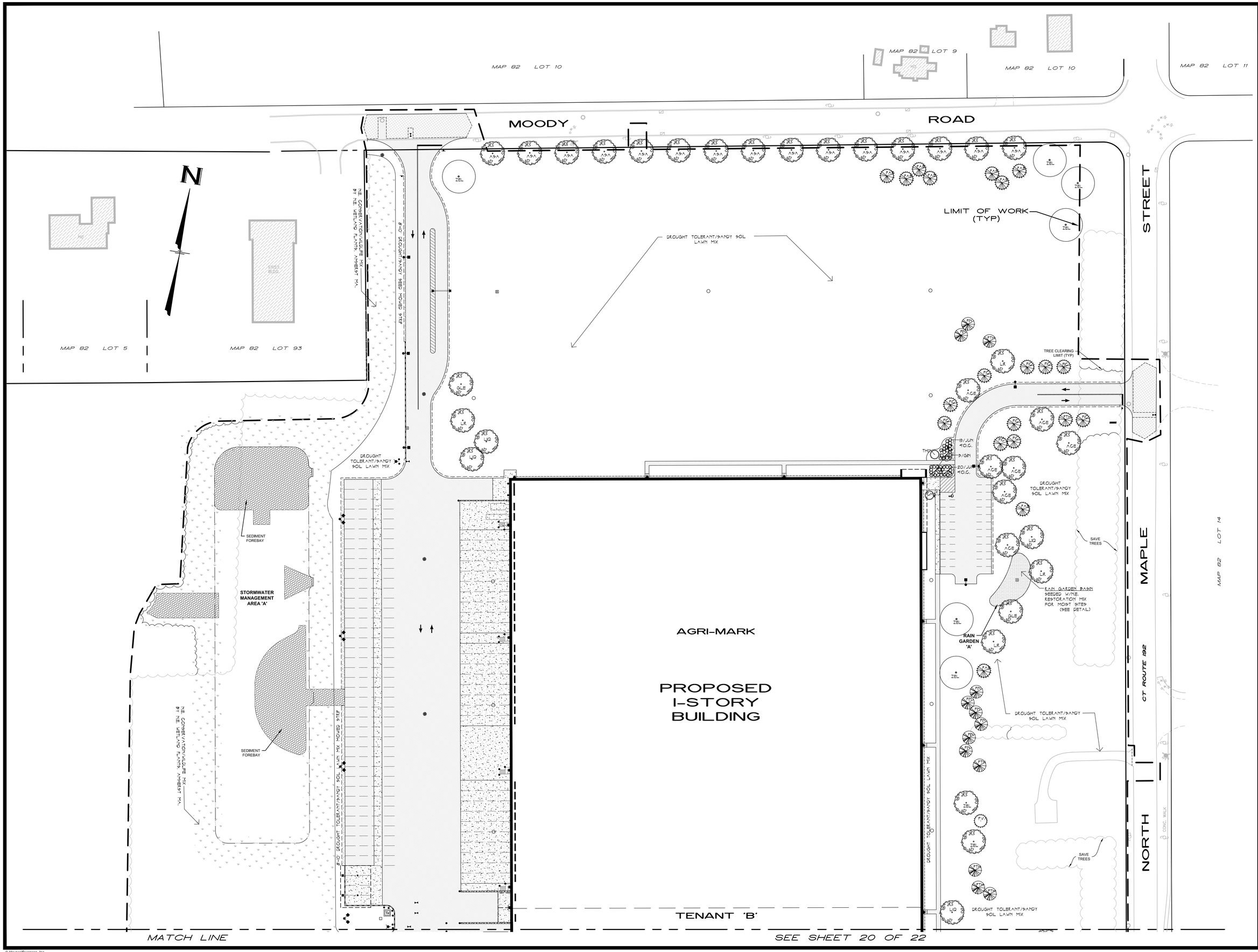

NO.	DATE	REVISION

PREPARED FOR/RECORD OWNER:
WE 113 NORTH MAPLE STREET, LLC
c/o WINSTANLEY ENTERPRISES, LLC 150 BAKER AVE. EXT. CONCORD, MA 01742 (978) 287-5000

SPR No.
LANDSCAPE PLAN
(MAP 82, LOTS 1, 2, 3 & 4)
PROPOSED AGRIMARK DISTRIBUTION FACILITY
113 NORTH MAPLE STREET
ENFIELD, CONNECTICUT

PREPARED BY:
BLACKWATER DESIGN
PHONE (603) 447-1100 FAX (603) 447-3006
Land Planning • Landscape Architecture
85 First Lane - Webster, NH 03303

DRAWING LOCATION: J:\5000\5476\DWG\5476 SITE
DWG: 5476SITE-LS41 Field Book:

Scale
1" = 40'

Date
1 JUNE 2020

Project No.
5476

Sheet No.
19 OF 22

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MATCH LINE

SEE SHEET 19 OF 22

PROPOSED
1-STORY
BUILDING

TENANT 'B'

LIMIT OF WETLANDS (TYP)
AS DETERMINED BY MARK
W. FRIEND, SOIL SCIENTIST
OF MECSON, INGALLS &
FRIEND, GLASTONBURY, CT

WETLAND SOILS

TREE CLEARING
LIMIT (TYP)

SEDIMENT
FOREBAY

NE CONSERVATION/WILDLIFE MIX
BY NE WETLAND PLANTS, AMHERST MA.

STORMWATER
MANAGEMENT AREA
'B'

8'-10' DROUGHT TOLERANT/SANDY SOIL LAWN MIX MOWED STRIP

DROUGHT TOLERANT/SANDY
SOIL LAWN MIX

BARK
MULCH
BED

SAVE
TREES

LAWN
SEED

EXIST.
BLDG.

CONC.

CT ROUTE 192

MAPLE

STREET

NORTH

CONC. WALK

RIDGE LINE

SEED BERM WITH NE
CONSERVATION/WILDLIFE MIX
BY NE WETLAND PLANTS,
AMHERST MA.

SEE SITE GRADING NOTE
No. 6 ON SHEET 2 OF 22
REGARDING THIS AREA

LAWN SEED
STARTS AT POLE

LIMIT OF WORK
(TYP)

MAP 82 LOT 72
MAP 82 LOT 71
MAP 82 LOT 70
MAP 82 LOT 69
MAP 82 LOT 68
MAP 82 LOT 67
MAP 82 LOT 66
MAP 82 LOT 65
MAP 82 LOT 87
MAP 82 LOT 18
MAP 82 LOT 28
MAP 82 LOT 17
MAP 82 LOT 64
MAP 82 LOT 16
MAP 82 LOT 15

NO.	DATE	REVISION
40	7/1/20	

0 40 80 120 160 FEET

PREPARED FOR/RECORD OWNER:
WE 113 NORTH MAPLE STREET, LLC
c/o WINSTANLEY ENTERPRISES, LLC 150 BAKER AVE. EXT. CONCORD, MA 01742 (978) 287-5000

SPR No.
LANDSCAPE PLAN
(MAP 82, LOTS 1, 2, 3 & 4)
PROPOSED AGEMARK DISTRIBUTION FACILITY
113 NORTH MAPLE STREET
ENFIELD, CONNECTICUT

PREPARED BY :
BLACKWATER DESIGN
PHONE (603) 436-4100 FAX (603) 436-4606
Landscape Planning - Landscape Architecture
85 First Lane - Webster, NH 03303

DRAWING LOCATION: J:\2020\5476\DWG\5476 SITE
DWG: 5476SITE-LS01 Field Book:

Scale
1" = 40'

Date
1 JUNE 2020

Project No.
5476

Sheet No.
20 OF 22

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General Specifications

1. The contractor shall at his expense furnish all the materials, supplies, machinery, equipment, tool, superintendent, labor, insurance, & other accessories and services necessary to complete the said project within the unit costs stated within the bid price.
2. The work to be done under this contract is as shown and described on the drawings. Each bidder shall make a careful examination of the plans and specifications (the plan shall dictate quantities) and acquaint himself with all conditions before making his proposal. He will be held responsible for errors in his proposal resulting from his failure to make such an examination. All bidders shall visit the site and inform themselves of all conditions.
3. The bids shall be based on materials and equipment complying with the drawings and the specifications. The contractor shall be responsible under this contract price, for furnishing and installing materials confirming to the bid items. Under no circumstances may a species `hybrid' be substituted or size changed without written consent of the landscape architect.
4. The contractor shall be responsible for the protection of such existing utilities as water mains, sewer systems, gas mains, electrical conduits, telephone lines and any other utilities and if any damage or destruction may occur to these utilities, he shall be responsible for their repair and/or replacement at his expense.
5. The contractor shall make payment for all damages to buildings, structures, trees, shrubs and/or any other property outside the construction area or located within those limits but not designated for removal or reconstructed providing such damage shall result from accident caused by negligence for which the contractor shall be legally liable.
6. If additional labor and/or materials is requested or required, the contractor shall submit a price to the owner. If the owner approves the price he shall prepare a change order for approval and signature. The contractor shall not proceed without a written authorization from the owner for the additional work. If the contractor proceeds with the additional work without this authorization he shall forfeit any claim for additional compensation.
7. The landscape architect shall reserve the right to inspect the project work at any time deemed necessary to Insure that the specifications and plans and any other contract documents are being followed.
8. The L.A. shall have the right to reject any plant on-site based upon condition, size, or incorrect species or hybrid. LA must be contacted prior to install, to inspect materials delivered to the site, and to insure that soil amendments, bark mulch, roof ballust, etc. are to the written specifications.
9. All seeded areas shall receive a minimum 6" topsoil blanket (by site contractor) w/site preparation, raking and general clean up prior to application. Operations shall include a preemergence type herbicide, 12 -25 -12 granular fertilizer @ 10 lbs./1000 sf., and pelletized limestone @ 25 1bs. /1000 s/f power raked into the top 2" of soil prior to hydro-seeding. Ratios & application rates may change based upon the required soil analysis.
10. Contractor is responsible for establishing a thick, weed free lawn. Seed shall be spread @ 4lbs./1000. Lawn germination shall be 95% free of noxious weeds for acceptance. Define differences in seed mixes (if applicable) with irrigation flagging until 2nd mowing. Site review by LA is required.
11. Review of the installed irrigation system by the designer is required prior to release of final payment.
12. Hydroseeding operations shall be a one part process with a paper fiber mulch; a tackifier shall be applied on all slopes greater than 3:1, Excelsor Drainage mat shall be applied to all 2:1 slopes and drainage swales per plan.
13. Contractor shall maintain, from acceptance date, the lawn areas through the first mowing. Contractor is not responsible for the first mowing.
14. All plant materials shall be installed in accordance with A.L.C.C. Trees and shrubs shall have appropriate soil mixtures, fertilizer and soil retention granules.
15. If the soil conditions are extremely sandy, all trees shall have a 6" layer of compacted topsoil (verify with Landscape Architect) placed in the base of the plant pit as a moisture retention layer. The plant pit sidewalls shall be over excavated by an additional 12" beyond the normal outside radius of the hole. A topsoil planting mixture shall be used to backfill as per spec # 22.
16. Landscape architect shall have the right to reject and have ground removed any plant material not of proper size or of weak quality, ie. thin, no lower branching, etc. Contractor must submit shipping lists (billing invoices) for verification, prior to installation.
17. All plant material shall be guaranteed for a period of one (1) year from date of installation. Any material which dies or does not show a healthy appearance within this time shall be replaced at the contractors expense; with same warranty requirements as the original. Warranty does not cover loss due mechanical damage, Ie. snow storage. Contractor should protect susceptable species from insect infestation. Use a liquid systemic application on birch, etc.
18. Plant beds and saucers vary in dia. (refer to dwg). Trees and shrubs shall receive a 4" (settled) covering of pine/hemlock bark mulch; saucer diameters per drawing & details. Deciduous trees shall have a 6' dia. saucer (typ.), evergreen trees shall have a saucer 2' min. beyond it's outter branches. All edges shall have a 'V' groove.
19. All B&B material which are encased in wire baskets shall have the wires cut loose and the top third removed prior to backfill operation.
20. If road base is encountered in any plant bed areas, ie. parking islands, it shall be removed and suitable amended soil installed per drawings and specifications.
21. Soil planting mixture shall be a 6%-10% organic topsoil, amended with 10% wood ash, 10%%% manure, & 30%%% peatmoss or incorporate a dehydrated compost material. If planting in sand, gravel or other well drained soils, a 50% peatmoss to excavated soil. Other soil amendments shall include; Agriform tablets, Hydro-Gel or equal, and Roots growth enhancer to all trees and shrubs listed, per manufacturers specifications. All plant material pits will receive a min. 20%%% in volume mix of a compost soil amendment. Submittal required. 'Roots' STEP 1 can be substituted for the individual supplements. Install per manufacturer's specs.
22. Landscape contractor shall not be responsible for topsoil spreading but shall coordinate with the site contractor adherence to the mound grades, plant bed soil depths and soil type per dwgs & spec. Landscape contractor shall power rake-out for seed.
23. Landscape contractor shall provide a soil analysis of the topsoil planting mixture. Analysis to show soil classification (min. sandy loam) and nutrients.
24. Contractor shall protect all B&B materials left above grade prior to installation from drying out. All plants shall be stored, covered in mulch, and irrigated until planted. Any plant left on the ground and whose outter ball surface drys out, shall be rejected by the landscape architect. Plants stored in shade and off pavement.
25. Plan dictates, contractor shall alert Landscape Architect if any discrepancies exist between the plan, the material list, and as-built site conditions.
26. Installer shall notify landscape architect prior to planting, to review plant locations and bedline configurations. If contractor installs without the placement approval of the L.A., said architect shall have the right to relocate any installed plants at the contractor's expense.
27. Installer shall notify landscape architect prior to plant installation to review all materials. Any plants of poor condition, improper size, or species will be rejected.
28. Upon one year review, contractor shall straighten any trees that have shifted. Any weak or bare spots in lawn shall be reseeded.
29. All bedlines shall have a deep 'V' groove to define lawn to mulch edge. No 'Beehive" mounding of mulch is allowed, also keep mulch away from base of perennials.
30. Do not plant materials too close to the edge of bedlines. Refer to drawings for center of plant to bedline. At a minimum no outter branching of a shrub or perennial shall be closer than two feet from the bedlines. If the as-built does not comply contractor shall adjust the plant location or bedline at his expense.
31. Seed mixes include: Sandy Soil Lawn Mix by: deercreekseed.com; New England Wetland Plants, Amherst, Ma. refer to planting plan for designations.
32. Any items not completed to the specifications will be required at contractors expense prior to final approvals. Contractor is to bid the work according to the specifications and not to what they may do under their standard practices. Special attention will be payed to soils, amendments, guy stakes, bedline & saucer configurations, seed mixtures, etc.
33. Certain designated foundation edging is rood ballust (washed rounds, non-crushed, natural) Size of stone is a range of 3/4"-1.5"dia. placed to a depth of 3", upon placement apply a coating of granular Preen (preemergent).
34. Any questions concerning this drawing shall be directed to Joseph Hochrein c/o Blackwater Design, 85 Frost Lane, Webster, NH 03303, 603-648-2541.

MATERIAL BID LIST:

12/ACE	ACER RUBRUM (RED/SWAMP MAPLE)	2.5"-3"CAL.
19/ASA	ACER SACCHARUM (GREEN MOUNTAIN SUGAR MAPLE)	2.5"-3"CAL.
7/CAR	CARPINUS BETULUS (EUROPEAN HORNBEAM)	2.5"-3"CAL.
2/CCA	CARPINUS CAROLINIANA (PALISADE AMERICAN HORNBEAM)	2"-2.5"CAL.
4/CEL	CELTIS OCCIDENTALIS (HACKBERRY)	2.5"-3"CAL.
1/CHA	CHAMAECYPARIS OBTUSA (GRACILIS HINOKI FALSECYPRESS)	8'-10'BB
3/GIN	GINKGO BILOBA FASTIGIATA (COLUMAR GINKGO TREE)	2.5"-3"CAL.
10/GLE	GLEDITSIA I.E. (SHADEMASTER HONEYLOCUST)	2.5"-3"CAL.
39/JUN	JUNIPERUS CHINENSIS (GREEN SARGENT JUNIPER)	#3GAL.
9/LIR	LIRIODENDRON TULIPIFERA (TULIP TREE)	2.5"-3"CAL.
11/LIQ	LIQUIDAMBER STYRACIFLUA (AMERICAN SWEETGUM)	2.5"-3"CAL.
14/PAB	PICEA ABIES (NORWAY SPRUCE)	7'-8'BB
12/PIC	PICEA OMORIKA (SERBIAN SPRUCE)	7'-8'BB
38/PIN	PINUS STROBUS (EASTERN WHITE PINE)	5'-6'BB
14/PLE	PINUS LEUCODERMIS (BOSNIAN PINE)	6'-7'BB
8/PRI	PINUS RIGIDA (PITCH PINE)	6'-7'BB
5/PTH	PINUS THUNBERGIANA (JAPANESE BLACK PINE)	6'-7'BB
4/PVA	PINUS FLEXILIS (VANDERWOLF'S PYRAMIDAL LIMBER PINE)	6'-7'BB
1/THU	THUJA PLICATA ('EXCELSA' WESTERN ARBORVITAE)	10'-12'BB
12/ZEL	ZELKOVA SERRTA (GREEN VASE ZELKOVA)	2.5"-3"CAL.

SEED MIXTURES:
NEW ENGLAND CONSERVATION/WILDLIFE MIX BY N.E. WETLAND PLANTS, AMHERST, MA.

RAIN GARDEN NEW ENGLAND RESTORATION MIX FOR MOIST SITES.

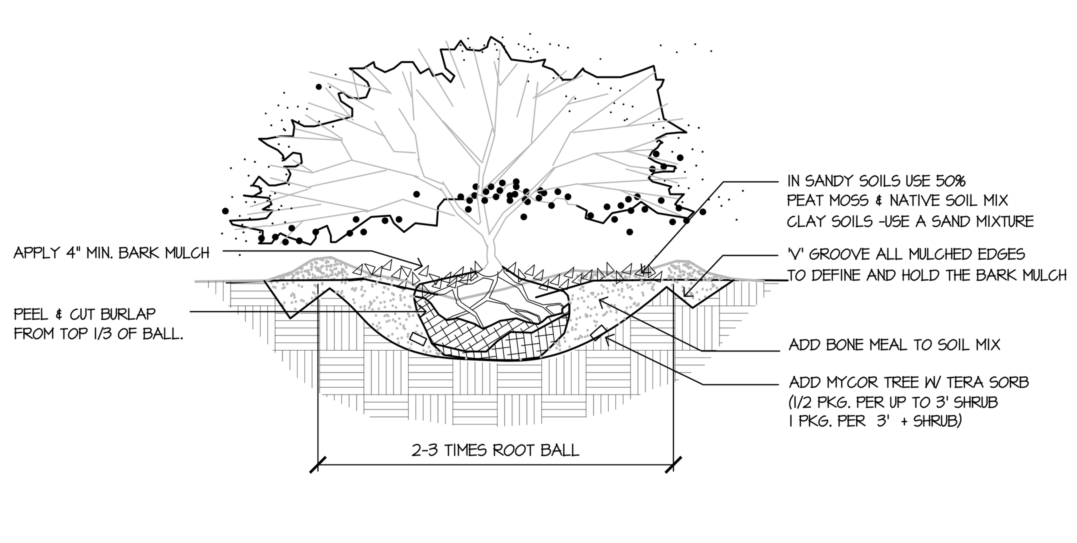
GENERAL LAWN SEED DROUGHT TOLERANT/SANDY SOIL LAWN MIX .I.E. WWW.DEERCREEK.SEED.COM

MISCELLANEOUS:
PREMIUM BLEND PINE/SPRUCE BARK MULCH IN ALL SHRUB BEDS AND TREE SAUCERS.

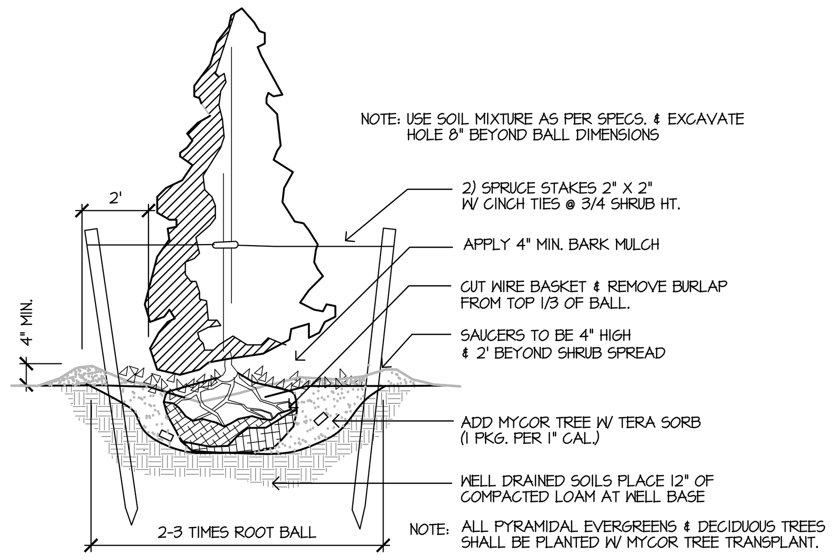
PLANT CATALOG REFERENCE: MILLICAN NURSERY, CHICHESTER, N.H. 6030435-6660
WWW.MNIPLANTS.COM

PROPOSED PLANT SPECIES TO BE INSTALLED IN THE STORMWATER MANAGEMENT AREAS

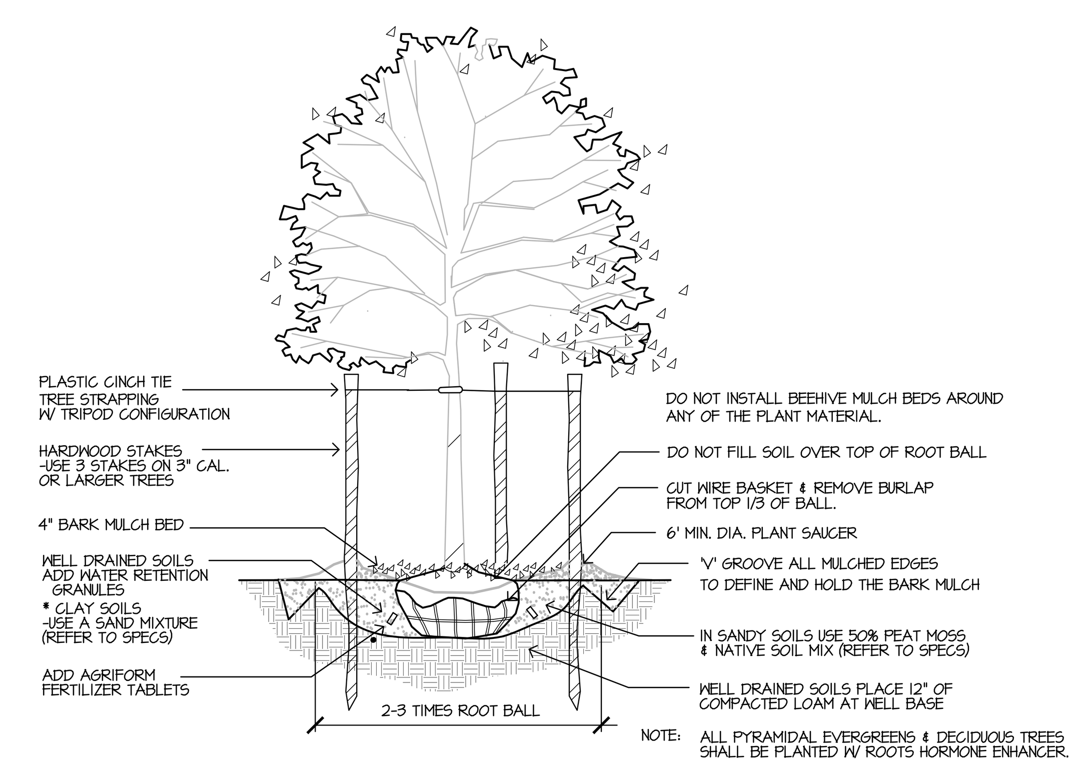
COMMON NAME	SCIENTIFIC NAME
Herbaceous Species	
Spike Rush	*Eleocharis palustris*
Swamp Aster	*Aster puniceus*
Joe-Pye-Weed	*Eupatoriadelphus maculatus*
Green Bulrush	*Scirpus atrovirens*
Soft Rush	*Juncus effusus*
Blue Vervain	*Verbena hastata*
Common Cattail	*Typha latifolia*
Cardinal Flower	*Lobelia cardinalis*
Soft-stem Bulrush	*Schoenoplectus tabernaemontani*
Grass-leaved Goldenrod	*Euthamia graminifolia*
Shrub Species	
Speckled Alder	*Alnus incana (rugosa)*
Sweet pepperbush	*Clethra alnifolia*
Silky dogwood	*Cornus amomum*
Spicebush	*Lindera benzoin*
Steeplebush	*Spiraea tomentosa*
Meadowsweet	*Spiraea latifolia*
Sweet Fern	*Comptonia peregrina*
Bayberry	*Morella (Myrica) pensylvanica*
Nannyberry	*Viburnum lentago*
Virginia Rose	*Rosa virginina*



B&B SHRUB PLANTING
NOT TO SCALE



PYRAMIDAL EVERGREEN TREE PLANTING
NOT TO SCALE



TREE PLANTING 2" + CAL.
NOT TO SCALE

NO.	DATE	REVISION	BY

PREPARED FOR/RECORD OWNER:
WE 113 NORTH MAPLE STREET, LLC
c/o WINSTANLEY ENTERPRISES, LLC 150 BAKER AVE. EXT. CONCORD, MA 01742 (978) 287-5000

SPR No.
DETAIL SHEET - LANDSCAPE
(MAP 82, LOTS 1, 2, 3 & 4)
PROPOSED AGRI-MARK DISTRIBUTION FACILITY
113 NORTH MAPLE STREET
ENFIELD, CONNECTICUT

PREPARED BY :
BLACKWATER DESIGN
PHONE (603) 648 - 6500 FAX (603) 648 - 6506
Land Planning - Landscape Architecture
85 Frost Lane - Webster, NH 03303

DRAWING LOCATION: J:\5000\5476\DWG\5476 SITE
DWG: 5476SITE-LS41
Field Book:

Scale: NO SCALE
Date: 1 JUNE 2020
Project No. 5476
Sheet No. 21 OF 22

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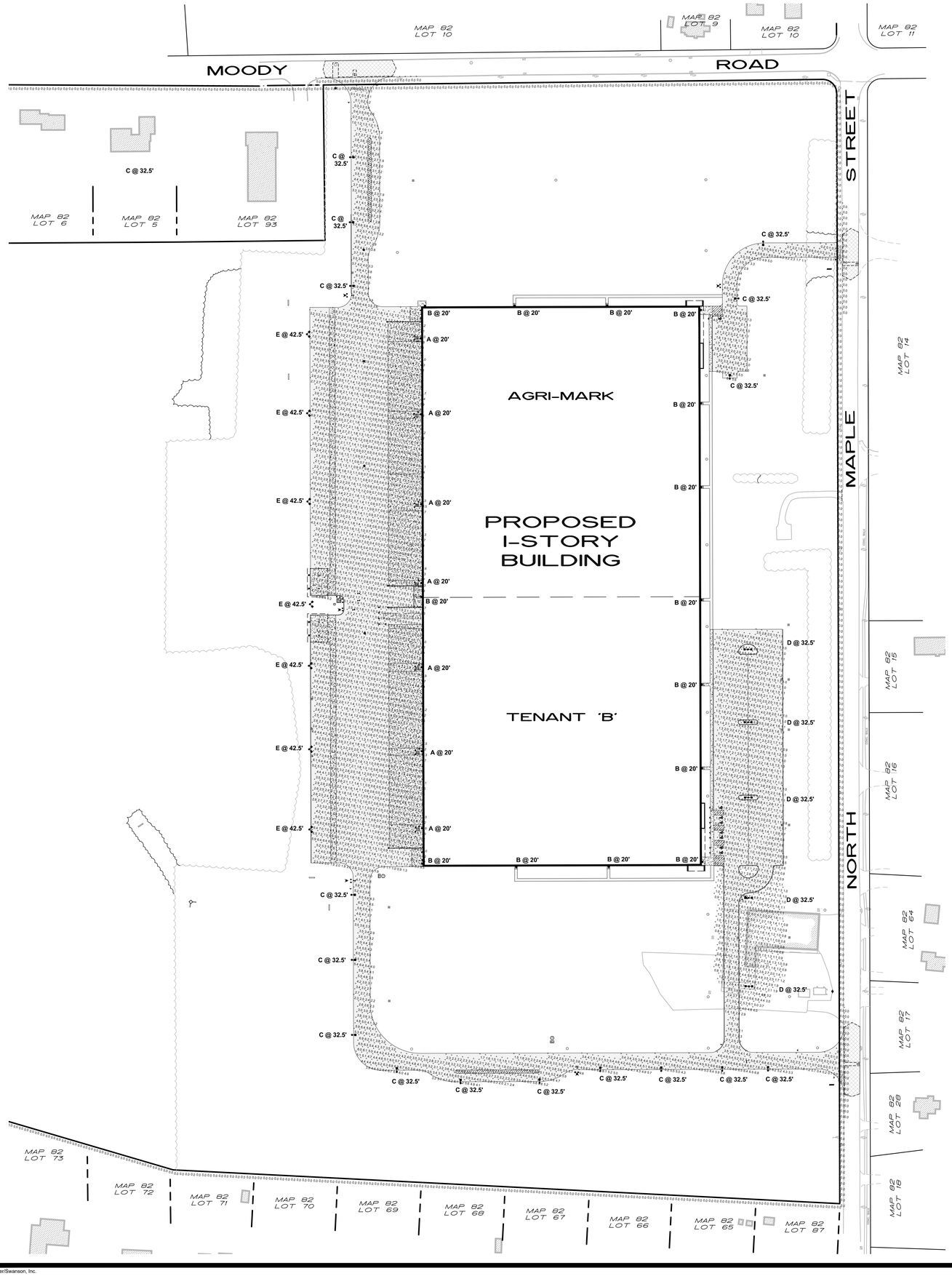


ThinkLite®
ReThink. ReLite.

TECHNICAL PRODUCT SHEET

TL LED Shoe Box 150W Type 3 Distribution

At 180 lumens per watt, ThinkLite LED fixtures are the most efficient in the industry, and therefore use the least amount of energy compared to all other LEDs in the marketplace. They are easy to install and eliminate all ballast and driver maintenance issues permanently.

ThinkLite fixtures are compatible with all kinds of motion sensors, photo sensors and wireless controls. With industry leading efficacy and CRI of 93+, it serves a great solution for all types of outdoor applications.

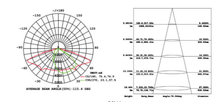
FEATURES

- Reduced energy consumption by 70%
- 15kVA inbuilt surge protection
- Vibration and impact resistant
- Longer lifespan (70,000 hours) / 10 year warranty
- IP67
- No harmful UV rays
- Instant on /off
- Dimmable 0-10V
- Photo sensors optional

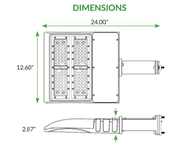
CERTIFICATIONS

UL RoHS ISO CE FC lighting facts

LUMINOUS INTENSITY DISTRIBUTION



DIMENSIONS



SPECIFICATIONS

Input Voltage:	100/277V and 200/480V
Input Frequency:	50Hz - 60Hz
Lumen Efficacy:	180 LM/W
Wattage & Light Output (Photopic)	150W: 24,000 Lumens
Visible Factor:	1.5X
Power Factor:	>0.99
Fixture Color Options:	Brown / Black / Gray / White
Mounting Style:	Direct Mounting, Flood Mounting, Adjusting Fitter Mounting, Yoke Mounting
Kelvin Options:	2100K - 7000K
Beam Angles/Spread:	120°
CRI:	93+
Lumen Depreciation:	5% at 70,000 hours
Operating Temperature:	-30°F to 170°F
Lens Cover:	Industrial Grade Polycarbonate (Shatter Proof)
Body Material:	High-Pressure Die-Casting Aluminum

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V3.20

www.ThinkLite.com | +1.617.500.6689 | inquiry@ThinkLite.com

Schedule

Symbol	Label	QTY	Catalog Number	Number Lamps	Filename	Lumens per Lamp	Lumen Multiplier	LLF	Wattage	Efficiency
	A	7	TL LED 150W Pole Lamp Type 4	1	TL LED 150W Pole Lamp Type 4.ies	29472	1	0.9	150.14	100%
	B	14	TL LED WP 80W	1	TL LED Wall Pack 80W.ies	9415	1	0.9	79.873	100%
	C	17	TL LED 230W Pole Lamp Type 4	1	TL LED 230W Pole Lamp Type 4.ies	41871	1	0.9	230.01	100%
	D	5	TL LED 150W Pole Lamp Type 4	1	TL LED 150W Pole Lamp Type 4.ies	29472	1	0.9	300.28	100%
	E	7	TL LED 230W Pole Lamp Type 4	1	TL LED 230W Pole Lamp Type 4.ies	41871	1	0.9	460.02	100%

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Main Parking Lot	+	2.7 fc	14.6 fc	0.0 fc	N/A	N/A
NE Drive - Road Edge	+	0.0 fc	0.0 fc	0.0 fc	N/A	N/A
NW Drive - Road Edge	+	0.0 fc	0.0 fc	0.0 fc	N/A	N/A
Property Line	◇	0.0 fc	0.1 fc	0.0 fc	N/A	N/A
SE Drive - Road Edge	+	0.0 fc	0.0 fc	0.0 fc	N/A	N/A
Small Parking Lot	◇	3.2 fc	6.4 fc	0.0 fc	N/A	N/A

NOTE

THIS PLAN IS TO BE USED FOR PHOTOMETRIC PURPOSES ONLY. SEE SITE ELECTRICAL PLANS FOR POLE BASE AND CONDUIT INFORMATION.

No.	DATE	REVISION
80	1/1/1	

0 80 160 240 320 FEET

PREPARED FOR/RECORD OWNER:
WE 113 NORTH MAPLE STREET, LLC
c/o WINSTANLEY ENTERPRISES, LLC 150 BAKER AVE. EXT. CONCORD, MA 01742 (978) 287-5000

SPR No.
PHOTOMETRIC SITE LIGHTING PLAN
(MAP 82, LOTS 1, 2, 3 & 4)
PROPOSED AGRI-MARK DISTRIBUTION FACILITY
113 NORTH MAPLE STREET
ENFIELD, CONNECTICUT

ThinkLite® ReThink. ReLite.

DRAWING LOCATION: J:\5000\5476\DWG\5476 SITE
JWC: 5476SITE-SL81 | Field Book:

Scale 1" = 80'

Date 1 JUNE 2020

Project No. 5476

Sheet No. 22 OF 22

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Record & Return to:
Douglas S. Pelham,Esq.
Cohn Birnbaum & Shea, P.C.
100 Pearl Street, 12th Floor
Hartford, CT 06103

QUIT CLAIM DEED

To All People to whom these Presents shall come, Greeting:

KNOW YE, THAT, JARMOC FARMS LLC, a Connecticut limited liability company, having a principal place of business in the Town of Enfield, County of Hartford, and State of Connecticut ("Grantor"), for consideration paid, hereby grants to **WE 113 NORTH MAPLE STREET LLC,** a Delaware limited liability company, having its principal place of business in the Town of Concord, County of Middlesex and Commonwealth of Massachusetts, ("Grantee"), with QUIT CLAIM COVENANTS,

Two certain pieces or parcels of land consisting of 56.71 acres, more or less, situated in the Town of Enfield, County of Hartford and State of Connecticut, known as North Maple Street and 113 North Maple Street. Said pieces or parcels being more particularly described as follows:

Two certain pieces or parcels of land located in the Town of Enfield, County of Hartford and State of Connecticut shown as "Parcel B Area." ("FIRST PIECE") and "N/F LEGO Building Corporation" ("SECOND PIECE") on a certain map entitled "SUBDIVISION MAP LEGO WAY RESUBDIVISION PREPARED FOR LEGO BUILDING CORPORATION ENFIELD, CONN. CK. BY: MWF DRW. BY: AES DATE: 10-27-04 Rev. 2-9-05 SCALE: 1"=100' SHEET 2 OF 3 MAP NO. 22-00-1S MEGSON & HEAGLE CIVIL ENGINEERS & LAND SURVEYORS 81 RANKIN ROAD GLASTONBURY, CONN 06033 PHONE (860)-659-0587," which map is on file in the Office of the Enfield Town Clerk.

Said FIRST PIECE is conveyed together with the following:

Reservation of the right to discharge storm and surface waters in Quit-Claim Deed from Lego Building Corporation to the Town of Enfield dated March 23, 2005 and recorded in Volume 1996 at Page 90 of the Enfield Land Records.

Non-exclusive rights, privileges and easements granted by the Town of Enfield in a Drainage Easement dated March 30, 2005 and recorded in Volume 1996 at Page 95 of the Enfield Land Records.

Reservation of non-exclusive rights, privileges and easements described in a Limited Warranty Deed dated March 31, 2005 and recorded in Volume 1996 at Page 102 of the Enfield Land Records.

Said parcels are conveyed subject to building, building line and zoning restrictions and to any and all provisions of an ordinance, municipal regulation or public or private law, as shown on said map, and to any easements as of record may appear.

Said premises are further subject to real estate taxes due the Town of Enfield on the Grand List of October 1, 2016, and thereafter, which the Grantee herein assumes and agrees to pay as part consideration for this deed.

Being the same premises conveyed to the Grantor herein by Warrantee Deed of LEGO BUILDING CORPORATION dated May 5, 2005 and recorded in Volume 2012 at Page 1 of the Enfield Land Records.

In Witness Whereof, I/We have hereunto set my hand and seal this **20th** day of April, 2017.

Witnessed By:

Charles T. Alfano Jr.

Joanne N. Monsoni's

JARMOC FARMS LLC

By: Stephen M. Jarmoc
Its Member

STATE OF CONNECTICUT)

} ss Suffield April 20, 2017

COUNTY OF HARTFORD)

Personally Appeared **Stephen M. Jarmoc,** duly authorized Member of Jarmoc Farms LLC, as aforesaid signer of the foregoing Instrument, and acknowledged the same to be his free act and deed as such Member and the free act and deed of said Limited Liability Company, before me.

Charles T. Alfano, Jr.
Commissioner of Superior Court

Grantees Mailing Address:
c/o Winstanley Enterprises LLC
150 Baker Avenue Extension, Suite 303
Concord, MA 01742

INSTR # 2018000983
VOL 2673 PG 115 08/04/2017 10:25:12 AM
RECORDED IN ENFIELD CT
SUZANNE F. OLECHNICKI TOWN CLERK
TOWN CONVEYANCE TAX RECEIVED $2,375.00
STATE CONVEYANCE TAX RECEIVED $11,875.00

When recorded return to:
Cohn Birnbaum & Shea P.C.
100 Pearl Street, 12th Floor
Hartford, CT 06103
Attn: Douglas S. Pelham, Esq.

STATUTORY FORM WARRANTY DEED

KNOW ALL PERSONS BY THESE PRESENTS THAT:

LELAND R. HAWTHORNE II aka LELAND R. HAWTHORNE and JOANNE M. HAWTHORNE, both of the Town of Somers, County of Tolland and State of Connecticut, (the "Grantor"), for consideration paid, grants to WE 113 NORTH MAPLE STREET LLC, a Delaware limited liability company, with an address of 150 Baker Avenue Ext., Suite 303, Concord, MA 01742 (the "Grantee") that certain piece or parcel of land, with the improvements thereon and appurtenances thereto, commonly known as 0 Maple Street, Enfield, Connecticut and 97 Maple Street, Enfield, Connecticut and more particularly described in **Schedule A** attached hereto and made a part hereof.

The above premises are conveyed subject to the following:

1. Any and all provisions of any ordinance, municipal regulation or public or private law.

2. Any assessments or pending assessments whether or not a lien or liens have been filed.

3. The matters set forth on **Schedule B** attached hereto and made a part hereof .

4. Taxes due the Town of Enfield on the Grand List of October 1, 2016 and subsequent years, which taxes the Grantee, by acceptance of this deed, agrees to assume and pay as part consideration for this deed.

TO HAVE AND TO HOLD the above granted and bargained property, with the improvements thereon and appurtenances thereto, unto the Grantee, its successors and assigns forever, to its and their own proper use and behoof. And the Grantor does hereby covenant with the said Grantee, its successors and assigns, to warrant and defend the same to the Grantee, its successors and/or assigns against the claims of any person except as hereinabove set forth.

(Signatures on following page)

IN WITNESS WHEREOF, the Grantor has caused this Statutory Form Warranty Deed to be executed as of August 3, 2017.

Witnessed by:
As to both signatures:

Steven M. Ford

Leland R. Hawthorne, II aka
Leland R. Hawthorne

Douglas S Pelham

Joanne M. Hawthorne

STATE OF CONNECTICUT)
) ss:
COUNTY OF)

On this 3rd day of August, 2017 before me, the undersigned officer, personally appeared Leland R. Hawthorne, II aka Leland R. Hawthorne and Joanne M. Hawthorne known to me (or satisfactorily proven) to be the persons whose names are subscribed to the within instrument and acknowledged that they executed the same as their free act and deed, and for the purposes therein contained.

In witness whereof, I hereunto set my hand.

Steven M. Ford
Commissioner of the Superior Court

EXHIBIT A

LEGAL DESCRIPTION

First Piece:

That certain piece or parcel of land, with any buildings or improvements thereon, situated on the west side of Maple Street in the Town of Enfield, County of Hartford and State of Connecticut, being more particularly bounded and described as follows:

Beginning at a point in the west line of Maple Street, at the southeasterly corner of the premises herein described, which point is 401.30 feet south of a Connecticut Highway Department marker placed in said west line of Maple Street;

Thence running North 84° 57' West along land now or formerly of William P. Hass, 1197 feet to a point;

Thence running North 2° East along land now or formerly of William P. Haas, 528.50 feet to a point;

Thence running South 84° 57' East along land now or formerly of William P. Haas, 989 feet to a point;

Thence running South 2° West along land now or formerly of Leland Hawthorne, 208 feet to a point;

Thence running South 84° 57' East along land now or formerly of Leland Hawthorne, 208 feet to a point in the west line of Maple Street;

Thence running South 2° West along the west line of Maple Street, 320.50 feet to the point and place of beginning.

Second Piece:

Situated on the west side of Maple Street in said Town of Enfield and bounded and described as follows: Containing one (1) acre more or less, with warehouse thereon, and being bounded and described as follows:

Northerly: by land now or formerly of L. B. Hass Inc. 208 feet;

Easterly: by the highway, 208 feet;

Southerly: by land now or formerly of Clarissa Hawthorne,

Westerly: by land now or formerly of Clarissa Hawthorne, 208 feet.

SCHEDULE B

1. Water Line Easement in favor of Hazardville Water Company dated June 5, 2001 and recorded in Volume 1379 at Page 283 of the Enfield Land Records (affects First Piece only).

TOWN OF ENFIELD

ENFIELD INLAND WETLAND AND WATERCOURSES AGENCY
DPN # 2020-05-22- 10 Hazard Avenue aka 50 Hazard Avenue- Brookside Plaza Renovations (Burlington Coat Factory)
STAFF REPORT
June 11, 2020

BACKGROUND

Determination of Permit Need for proposed renovations to Brookside Plaza for a +/- 6,300 square-foot back-of-house space and a loading dock at the rear of the existing Walgreens and adjacent spaces.

The project proposes minor utility and drainage modifications to accommodate the building improvements. The stormwater memo states that the project has been designed to allow for a zero net increase of impervious surfaces by replacing paved areas with landscape islands, maintaining groundwater recharge, water quality, and runoff rates.

The proposed renovations are located within wetlands soils on the adopted Town of Enfield Official Wetlands map. However, the current conditions at the proposed expansion area are primarily impervious surfaces. The proposed renovations will not take place in a functional wetland.

Please review applicant narrative and stormwater memo.

Per Section 2 Definitions, all areas within 100 feet of the boundary of such wetlands and watercourses are considered a **regulated activity area**.

RESOLUTION

MOTION TO NOT REQUIRE A WETLAND'S PERMIT FOR- DPN # 2020-05-22- 10 Hazard Avenue aka 50 Hazard Avenue- Determination of Permit Need for renovations at Brookside Plaza for a +/- 6,300 square-foot back-of-house space and a loading dock at the rear of the existing Walgreens and adjacent spaces within the 100-foot upland review area and wetland soils as delineated by the Town of Enfield Official Wetlands map; Equity One (Northeast Portfolio) c/o Michael Lai, Owner; Regency Centers c/o Michael Lai Represented by Nate Kirschner-Langan; Map 056 / Lot 0022; Business Regional (BR) Zone.

REFERENCE PLANS

1/9 "Inland Wetlands & Watercourses Agency Determination Submission Burlington Coat Factory Expansion at Brookside Plaza," 50 Hazard Avenue, Enfield, Connecticut 06082; Cover Sheet with Location Map, Civil Drawing Index, and List of Abutting Property Owners within 200'; Title and

Department of Development Services
Building/Community & Economic Development/Planning & Zoning
820 Enfield Street
Enfield, Connecticut 06082

Telephone (860) 253-6355
Fax (860) 253-6310

www.enfield-ct.gov

Contact Information Owner, Architect, Land Surveyor, Civil Engineer, and Landscape Architect; Scale 1'' = 1000'; Prepared by Langan CT Inc., 555 Long Warf Drive, New Haven, CT 06511. Prepared for Equity One (Northeast Portfolio), LLC, C/O Michael Lai, 28 Church Lane, Suite 200, Westport CT 06880. Dated May 22, 2020.

2/9 "Partial Boundary and Topographic Survey" – Scale 1''= 30'; Dated May 11, 2020.

3/9 "General Notes and Master Legend" – Scale: None; Dated May 22, 2020

4/9 "Overall Site Plan" – Scale: 1''= 60'; Dated May 22, 2020

5/9 "Site Plan" – Scale: 1'' = 20'; Dated May 22, 2020

6/9 "Site Details" – Scale: None; Dated May 22, 2020

7/9 "Grading, Drainage, Utility, and Erosion Control Plan" – Scale: 1'' = 20'; Dated May 22, 2020

8/9 "Grading, Drainage, Utility, and Erosion Control Details I" Scale: None; Dated May 22, 2020

9/9 "Grading, Drainage, Utility, and Erosion Controls Details II" Scale: None; Dated May 22, 2020

DATED this day 11th day of June 2020.

Department of Development Services
Building/Community & Economic Development/Planning & Zoning
820 Enfield Street
Enfield, Connecticut 06082

Telephone (860) 253-6355
Fax (860) 253-6310

www.enfield-ct.gov

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TOWN OF ENFIELD

Inland Wetlands & Watercourses Agency

Planning Division • 820 Enfield Street Enfield, CT 06082
Telephone: 860-253-6355 Website: www.enfield-ct.gov

Permit Application for Inland Wetlands & Watercourses Activity

Application For: ☐ Permit ☐ Extension ☐ Agent Approval ☑ Other Determination of Permit Need
☐ Modification (Existing Permit/ Application #'s): _____

Staff Use Only			
~~IW #:~~ DPN#	2020-05-22	View Permit #:	TC-20-5
IWWA Regulation Section:			

PLEASE REVIEW LAND USE APPLICATION GUIDE FOR INSTRUCTIONS

Property Address: 50 Hazard Avenue **Map #:** 56 **Lot #:** 22

Zone(s): Business Regional **Size of Parcel:** ±1,494,000 SF **Account #:** 001000020005

Current Use: Regional Shopping Center

Project Name: Brookside Plaza Expansion (Burlington Coat Factory)

Summary Description:

The project proposes the renovation and expansion of a portion of the main retail strip at Brookside Plaza. The +/- 6,300 SF expansion will take place in the back of house area roughly behind the current Walgreens, replacing existing asphalt pavement. The existing loading dock and trash compactor will be shifted to the east. To accommodate the loading dock relocation, the landscape island will be reformed. Existing drinage patterns will be maintained and there will be no net increase in impervious coverage.

Applicant's Name: Regency Centers c/o Michael Lai

Applicant's Address: 28 Church Lane, Suite 200, Westport, CT 06880

Contact #: (203) 635-5570 **Email:** MichaelLai@regencycenters.com

Applicant's Representative: Nate Kirschner - Langan

Representative Address: 555 Long Wharf Drive, 9th Floor, New Haven, CT 06511

Contact #: (860) 398-0196 **Email:** nkirschner@langan.com

Does Applicant own the Property? ☑ Yes (Attach Copy of DEED)
☐ No (Provide Information Below)

Check No. 418 $75.00

TOWN OF ENFIELD

Owner's Name: Equity One (Northeast Portfolio) c/o Michael Lai

Owner's Contact #: 203-635-5570

Owner's Address: 28 Church Lane, Suite 200, Westport, CT

Owner's Email: MichaelLai@regencycenters.com

Project Information:

Septic: ☐ Yes ☑ No

Public Sewer: ☑ Yes ☐ No

Well Water: ☐ Yes ☑ No

Public Water: ☑ Yes ☐ No

Outdoor Storage: ☐ Yes ☑ No

Design District: ☐ Yes ☑ No

Do wetlands and watercourses affect this application? ☐ Yes ☑ No

Is the property within a Level A or Level B Aquifer Protection Area? ☐ Yes ☑ No

Does this application include any regulated activity in a floodplain ☐ Yes ☑ No

(If yes, you will need to also submit a Flood Hazard Development Permit application to the Planning & Zoning Commission)

What is the total lot acreage? ±34.3 AC (±1,494,000 SF)

What is the length of the property frontage? (List by Street) Hazard Avenue: ±1,700 LF, Freshwater Boulevard: ±775 LF, Rosario T Vella Avenue: ±1,635 LF, Phoenix Avenue: ±1,015 LF

Name the abutting street(s): Hazard Avenue, Freshwater Boulevard, Rosario T Vella Avenue, Phoenix Avenue

What are the existing land uses and zoning districts for abutting properties or across the street(s)?

North Use: Retail/Restaurant, Zone: BR

East Use: Retail/Restaurant, Zone: BR

South Use: Vacant Land, Zone: IP

West Use: Hotel/Restaurant, Zone: BR

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Environmental History:

Is any portion of the property located within 500 feet of an adjoining municipality? ☐ Yes ☑ No

Name Municipalities: n/a

Area of wetlands located on the property: 0 Square Feet

Area of wetlands to be impacted: 0 Square Feet

Watercourses located on the property: ☐ Yes ☑ No

Name and type of watercourses: n/a

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Are proposed activities located within the 100-Year floodplain? ☐ Yes ☑ No

Are proposed activities located within a floodway? ☐ Yes ☑ No

Are there slopes with grades in excess of 15% located on the property? ☐ Yes ☑ No

Is any portion of the project located within a public water supply aquifer or watershed area? ☐ Yes ☑ No

Phase I: Land Records reviewed for environmental hazards? ☑ Yes ☐ No

Phase II: Environmental Hazards Identified? ☐ Yes ☑ No

If yes, please list the environmental conditions found: n/a

TOWN OF ENFIELD

Phase 3: Is there a remediation plan? ☐ Yes ☑ No

If yes, please describe the remediation plan: n/a

Are there environmental restrictions on the property? ☐ Yes ☑ No

If yes, please list environmental restrictions: n/a

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☑ **COMPLETE & SUBMIT:**

INLAND WETLANDS & WATERCOURSES APPLICATION CHECKLIST

☑ **COMPLETE & SUBMIT:**

STATE OF CONNECTICUT INLAND & WETLANDS WATERCOURSE ACTIVITY REPORTING FORM

TOWN OF ENFIELD

The applicant understands that this application is to be considered complete only when all information and documents required by the Agency have been submitted. The undersigned warrants the truth of all statements contained herein and in all supporting documents according to the best of his/her knowledge and belief. Permission is granted to the Town of Enfield, Inland Wetlands & Watercourses Agency, and its agent(s) to walk the land, at reasonable times, and perform those tests necessary to properly review the application, both before and after a final decision has been issued.

☑ **I have reviewed and acknowledge the Land Use Application Guide for further instructions on how to complete my application.**

Applicant Signature: Lai **Date:** 05/19/2020

Print Name: Michael Lai

Owner's Signature: Lai **Date:** 05/19/2020

Print Name: Michael Lai

Subscribed and sworn to before me 19 **day of** May **, 20** 20.

Notary Public **My Commission Expires:** December 11/2026

XHERSI RAKIPAJ
Notary Public, Commonwealth of Massachusetts
My Commission Expires December 11, 2026

For Office Use	
Application #:	**Date Submitted:**
DEP Form Submitted Date:	

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TOWN OF ENFIELD

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Enfield Inland Wetlands and Watercourses Agency Application Checklist

	Documents Required
☑	All plans including revised plans must be submitted to the Department **25 days prior** to a Board or Commission meeting. Plans will be reviewed, circulated, and commented by appropriate Departments.
☑	An original of the completed application form and site plan and fourteen (14) full size copies of the set of site plans and any report. (5 Copies per Correspondence with Town)
☑	**Fourteen (14) copies** of 24 X 36 plans are to be submitted in complete sets- stapled and map folded. Part II of the DEEP Reporting Form completed. (5 Copies per Correspondence with Town)
☑	**Four (4) copies** of all reports required are to be submitted. i.e. Drainage, stormwater, soils, etc.
☑	Application Fee
☐	If any portion of the project is located within a public water supply aquifer or watershed areas Public Act No. 06-53 of the CT G.S. requires the following: 1. Written notice including Project Notification Form (PNF) to the involved Water Company within seven (7) days of submittal of any application, petition, request, or plan to the Town of Enfield. 2. Notice to the Water Company by the applicant is to be by certified mail, return receipt requested. The PNF and Level A Aquifer Protection Area mapping can be obtained from the Town of Enfield Planning Department as well as online.
☑	Pre and post development storm water drainage calculation, with drainage area map. N/A
☐	Report on soil types and characteristics from Professional Soil Scientist who delineated wetlands. Report shall include a minimum of one (1) field soil profile for each wetland soil type within project area. Profile shall be presented in data sheet format. As needed as mapped. N/A
	The applicant must certify whether any portion of the property is within 500 feet of an adjoining municipality, whether streets from an adjoining municipality will be used for entering or exiting the site, whether sewer or water drainage will flow through or impact and adjoin municipality or whether water run-off will impact streets or adjoining municipal or private property within an adjoining municipality. If the project falls within any of the above mentioned definition, then a letter must be sent by certified mail to the adjoining municipality. ▪ If the project falls within any of the above mentioned definitions, then a letter must be sent by certified mail to the adjoining municipalities Inland Wetland Agency along with a copy of the application and site plan being submitted to this Agency. Evidence of submission shall be submitted to the Enfield IWWA.
☐	For proposed wetland impacts, a wetland assessment report from a soil scientist or other qualified individual. N/A

TOWN OF ENFIELD

	Site Plan Requirements
☑	Signed and Sealed by appropriate design professional (Surveyor, Engineer, Architect, and Landscape Architect) registered in the State of Connecticut.
☑	Property boundaries, north arrow, name of project, date and type of drawing, subsequent dates of revision with description, names and addresses of engineers and surveyors (when appropriate), location map, property owner(s) and adjacent property owners.
☑	Existing and proposed topography, structures, utilities, roadways and buildings. Plan/profile sheet shall be included for roads and all off road pipelines.
☑	Soil types as mapped by the National Resource Conservation Service.
☑	Wetlands located on adjacent properties, within approximately 100-feet of subject property.
☑	Alternatives considered and rejected to be either shown on a site plan or explained in narrative form.
☑	Soil and Erosion Control Measures including narrative, per 2002 CT E&S Control Guidelines at a minimum.
☐	Wetlands boundaries delineated by a Professional Soil Scientist whose signatures are required on the site plan. GIS Delineation Shown
☑	Limit of Upland Review Areas.
☐	Cuts and fill volumes indicating source and type of fill, destination of removed fill, expect for single-family homes or similar. N/A
☐	Limits of woody vegetation clearing. N/A
☐	Well locations and setbacks from septic system and drainage swales.
☐	Septic system locations including reserve areas, existing and proposed grading, spot grades and setbacks from wetland areas.
☑	Storm water drainage systems.
☑	All existing and proposed pipe sizes, length and inverts.
☐	Test pit and soil profile locations.
☑	Acreage of wetlands/watercourses on the site and the acreages presented separately of wetland, watercourses or upland review areas to be altered.
☑	Boundaries of 100-year floodplain or floodway as determined by FEMA.

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TOWN OF ENFIELD

	Detail Sheet
☑	Erosion and sediment control details along with a sequence plan.
☐	Test pit logs.
☑	Details of all proposed site improvements (i.e. drainage structures, pipes, footing drains, curtain drains, dewatering, cross section of septic system or sewer connection, cross section of detention, retention, or sediment basins, etc.).
☐	Construction sequence specifications.
	Public Hearing (If Required)
☐	Notice to immediate abutters by certified mail not less that twenty-one **(21) days prior** to the start of the public hearing.
☐	A copy of the abutter's letter and proof of mailing notification is to be provided to the Planning Office **5 days prior** to the scheduled public hearing. (If applicable).
☐	Deadline to post public hearing sign(s) is **10 days prior** to the scheduled meeting at which the application will be discussed.
	▪ THE ENFIELD IWWA AND/OR THE PLANNING OFFICE MAY REQUEST ADDITIONAL INFORMATION DURING THE PERMIT PROCESS AS NECESSARY.
	Additional Information
	▪ The Planning Department requires an electronic submission of all documents received in CD Format or on a USB drive.
	▪ When multiple Commissions are involved the applicant must meet all conditions of approvals including final plan(s) revisions to obtain the appropriate signature of approval prior to applying to any other Land Use Commission.

RECEIVED
ENFIELD PLANNING DEPT
2020 MAY 22 PM 2:16

LANGAN

Memorandum

555 Long Wharf Drive New Haven, CT 06511 T: 203.562.5771 F: 203.789.6142

To: Inland Wetlands & Watercourses Agency - Town of Enfield

From: David Gagnon – Langan
Nathan Kirschner - Langan

Cc'd: Michael Lai - Regency Centers

Date: 22 May 2020

Re: Project Narrative
Brookside Plaza Renovations (Burlington Coat Factory)
50 Hazard Avenue
Enfield, Connecticut 06082
Langan Project No.: 140161110

RECEIVED
ENFIELD PLANNING DEPT.
2020 MAY 22 PM 2:32

General

This memorandum has been prepared in support of proposed renovations to Brookside Plaza, located at 50 Hazard Avenue in Enfield, Connecticut. The project proposes the re-tenanting of the Walgreens space to a Burlington Coat Factory with an expansion to the rear of the building and a relocated loading dock.

The subject property is bound by Hazard Avenue to the north, Freshwater Boulevard to the east, Rosario T Vella Avenue to the south, and Phoenix Avenue to the west. The subject property is ±34 acres and is in the Business Regional (BR) District. The proposed use will remain retail. Through correspondence with town staff, it is understood that the proposed renovations will require a site plan modification. In addition, a submission to the Inland Wetlands & Watercourses agency is required for a wetlands determination.

The current development area is primarily paved surfaces servicing the back of house and loading areas behind the main retail strip.

Project Description

The project proposes the addition of ±6,300 square-feet of back-of-house space and a loading dock at the rear of the existing Walgreens and adjacent spaces. The project proposes minor utility and drainage modifications to accommodate the building improvements. The existing landscape islands in the loading area will be re-formed to allow for truck access. There is no net increase in impervious surface and the drainage patterns will be maintained to the extent feasible in the proposed condition. Additionally, there is no change proposed to the existing parking count.

Site alternates were reviewed prior to the submission of this application, including an 11,000 square-foot expansion with a new loading dock loading dock parallel to the building. It was determined the current application was the most efficient use of space and was the least impactful to the existing plaza.

If you have any questions, or if you need additional information, please feel free to contact David Gagnon or Nate Kirschner at (203) 562-5771.

DPN#2020-05-22

LANGAN

TRANSMITTAL

555 Long Wharf Drive New Haven, CT 06511 T: 203.562.5771 F: 203.789.6142

To:

Jennifer Pacacha, Assistant Town Planner
Town of Enfield
820 Enfield Street
Enfield, CT 06082

Phone No:

(860)253-6355

Date:

05/22/2019

Project No.

140161110

Re:

P&Z & IWWA Submission
50 Hazard Avenue
Enfield, CT 06082

Via:

☐ Fed Ex: ☐ Priority ☐ Standard ☐ 2-Day
☐ 1st Class Mail ☒ Hand Delivery

Items:

☒ Prints ☐ Letter ☒ Other
☐ Sepia ☒ Drawings ☐ Reports
☒ Other Flash Drive

Copies:	Dwg. No.:	Description:
5		IWWA Submission Plan Set (Full Size), dated 05/22/2019
2		IWWA Application & Checklist
2		DEEP IWWA Activity Reporting Form
1		Application Fee
2		Stormwater Memo
2		Wetlands Memo
2		Project Narrative
2		Property Deed
1		Flash Drive

☐ For Your Information ☒ For Your Use ☐ As Requested By:
☐ For Review and Comment ☐ For Approval ☐ Other:

Remarks:

Jenner, please find the above-referenced materials related to the proposed Burlington Coat Factory at Brookside Plaza. We are requesting a Wetlands Determination. Should you have any questions or need any additional information please don't hesitate to contact me at (413)265-9182 or dtgagnon@langan.com.

From: David Gagnon

Copies To:

Michael Lai – Regency Centers

LANGAN

Memorandum

Langan CT, Inc.
555 Long Wharf Drive New Haven, CT 06511 T: 203.562.5771 F: 203.789.6142

To: Inland Wetlands & Watercourses Agency

From: Nathan Kirschner – Langan

Info: Regency Centers

Date: 22 May 2020

Re: Wetlands Determination Request
Brookside Plaza Renovation – Burlington Coat Factory
50 Hazard Avenue
Enfield, Connecticut
Langan Project No.: 140161110

This memorandum has been prepared to request a wetlands determination in support of the proposed renovation and expansion to Brookside Plaza at 50 Hazard Avenue in Enfield Connecticut. A portion of the existing main retail strip will be converted to a Burlington Coat Factory replacing the existing Walgreen's.

As part of the renovation about ±6,300 square-feet will be added to the rear of the building and the existing loading dock relocated to the east. The project proposes minor utility and drainage modifications to accommodate the building improvements. The existing landscape islands in the loading area will be reformed to allow efficient truck access. As part of this project, there will be no net increase in impervious surfaces and the drainage patterns maintained to the extent feasible.

According to the Town of Enfield Official Wetlands Map and Town GIS mapping the Brookfield Plaza parking field is located within Wetlands Soils. The proposed expansion is entirely within the existing service and truck loading area. Based on our visual field observations, we could not identify evidence of wetlands soils within a 100-foot buffer of the development. The town GIS mapping and photos of the development area have been attached. It appears the town mapping is currently inaccurate in this particular area. It is the opinion of this office that this development in not located within the 100-foot upland review and will have no adverse impact on the wetlands within the town.

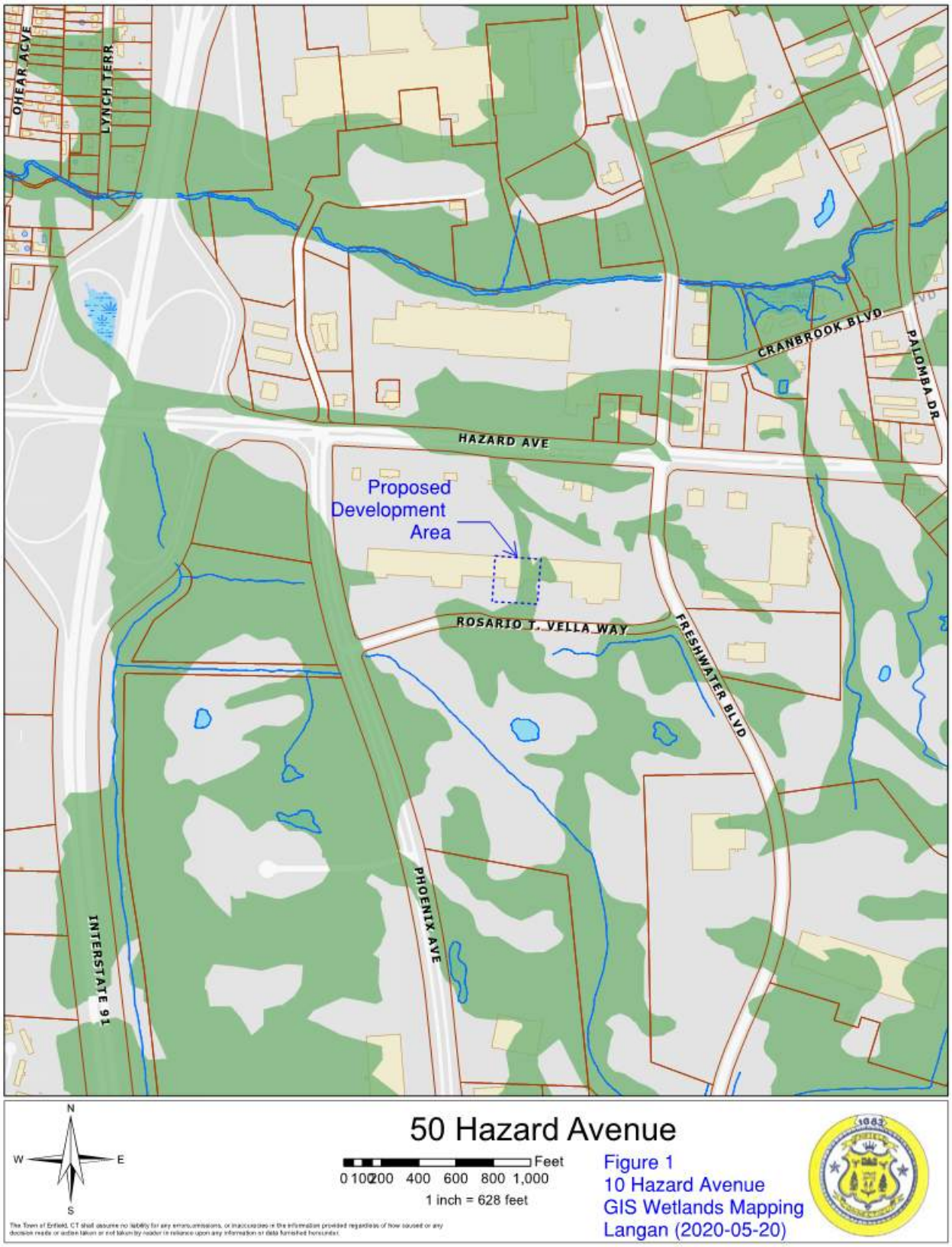
If you have any questions, or if you need additional information, please feel free to contact Nate Kirschner at nkirschner@langan.com or (203) 562-5771.

Photo 1: Development Area Looking North

Photo 2: Development Area Looking North

Photo 3: Development Area Looking West

Photo 4: Development Area Looking East


OHEAR ACVE
LYNCH TERR
CRANBROOK BLVD
PALOMBA DR.
HAZARD AVE
Proposed Development Area
ROSARIO J. VELLA WAY
FRESHWATER BLVD
PHOENIX AVE
INTERSTATE 91
N
W
E
S
50 Hazard Avenue
Feet
0 100 200 400 600 800 1,000
1 inch = 628 feet
Figure 1
10 Hazard Avenue
GIS Wetlands Mapping
Langan (2020-05-20)

Connecticut Department of
ENERGY & ENVIRONMENTAL PROTECTION

GIS CODE #: ___ ___ ___ ___ ___ ___ ___ ___ ___
For DEEP Use Only

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

Statewide Inland Wetlands & Watercourses Activity Reporting Form

Please complete and mail this form in accordance with the instructions on pages 2 and 3 to:
DEEP Land & Water Resources Division, Inland Wetlands Management Program, 79 Elm Street, 3rd Floor, Hartford, CT 06106
Incomplete or incomprehensible forms will be mailed back to the inland wetlands agency.

PART I: Must Be Completed By The Inland Wetlands Agency

1. DATE ACTION WAS TAKEN: year: _____ month: _____
2. ACTION TAKEN (see instructions, only use one code): _____
3. WAS A PUBLIC HEARING HELD (check one)? yes ☐ no ☐
4. NAME OF AGENCY OFFICIAL VERIFYING AND COMPLETING THIS FORM:
   (print name) _____ (signature) _____

PART II: To Be Completed By The Inland Wetlands Agency Or The Applicant

5. TOWN IN WHICH THE ACTION IS OCCURRING (print name): Enfield, CT
   does this project cross municipal boundaries (check one)? yes ☐ no ☑
   if yes, list the other town(s) in which the action is occurring (print name(s)): _____, _____
6. LOCATION (see instructions for information): USGS quad name: Broad Brook or number: 23
   subregional drainage basin number: 4003
7. NAME OF APPLICANT, VIOLATOR OR PETITIONER (print name): Regency Centers c/o Michael Lai
8. NAME & ADDRESS / LOCATION OF PROJECT SITE (print information): Brookside Plaza, 50 Hazard Avenue
   briefly describe the action/project/activity (check and print information): temporary ☐ permanent ☑ description: Construction of a Burlington Coat Factory building addition in the existing loading area, with associated site improvements.
9. ACTIVITY *PURPOSE* CODE (see instructions, only use one code): D
10. ACTIVITY *TYPE* CODE(S) (see instructions for codes): 2, 9, 10, 12
11. WETLAND / WATERCOURSE AREA ALTERED (must provide acres or linear feet):
    wetlands: 0 acres open water body: 0 acres stream: 0 linear feet
12. UPLAND AREA ALTERED (must provide acres): ±1.5 acres
13. AREA OF WETLANDS / WATERCOURSES RESTORED, ENHANCED OR CREATED (must provide acres): 0 acres

PART III: To Be Completed By The DEEP

DATE RECEIVED: DATE RETURNED TO DEEP:

FORM COMPLETED: YES NO FORM CORRECTED / COMPLETED: YES NO

LANGAN

Memorandum

Langan CT, Inc.
555 Long Wharf Drive New Haven, CT 06511 T: 203.562.5771 F: 203.789.6142

To: Town of Enfield Planning and Zoning Commission

From: Langan
Nathan Kirschner
Brian Phillips, P.E.

Date: 22 May 2020

Re: Stormwater Management Memo
Burlington Coat Factory Expansion at Brookside Plaza
50 Hazard Avenue
Enfield, Connecticut
Langan Project Number: 140161110

This memorandum addresses stormwater management design for the proposed Burlington Coat Factory Expansion at Brookside Plaza located on 50 Hazard Avenue (Route 190) in Enfield, Connecticut. Brookside Plaza totals about ±34.3 acres, however, this analysis is restricted to the project limit of disturbance of development or about ±1.5 acres.

The proposed project includes the construction of a single story ±3,100 square-foot building expansion with associated utility infrastructure, drainage, landscaping, loading dock and drive-way revisions necessary to incorporate the expansion into the existing loading area. The development will occur within the existing Brookside Plaza loading area and will result in a net reduction in impervious surfaces.

The Brookside Plaza property is located in the Freshwater Brook Subregional Drainage Basin. Under existing conditions, site drainage within the project limits flows overland and is captured by a series of catch basins which ultimately discharge to a town-owned storm drainage network.

In the proposed condition, drainage patterns have been largely maintained and the existing drainage network has been utilized. The project has been designed to allow for a zero net increase of impervious surfaces by replacing paved areas with landscape islands, maintaining groundwater recharge, water quality, and runoff rates.

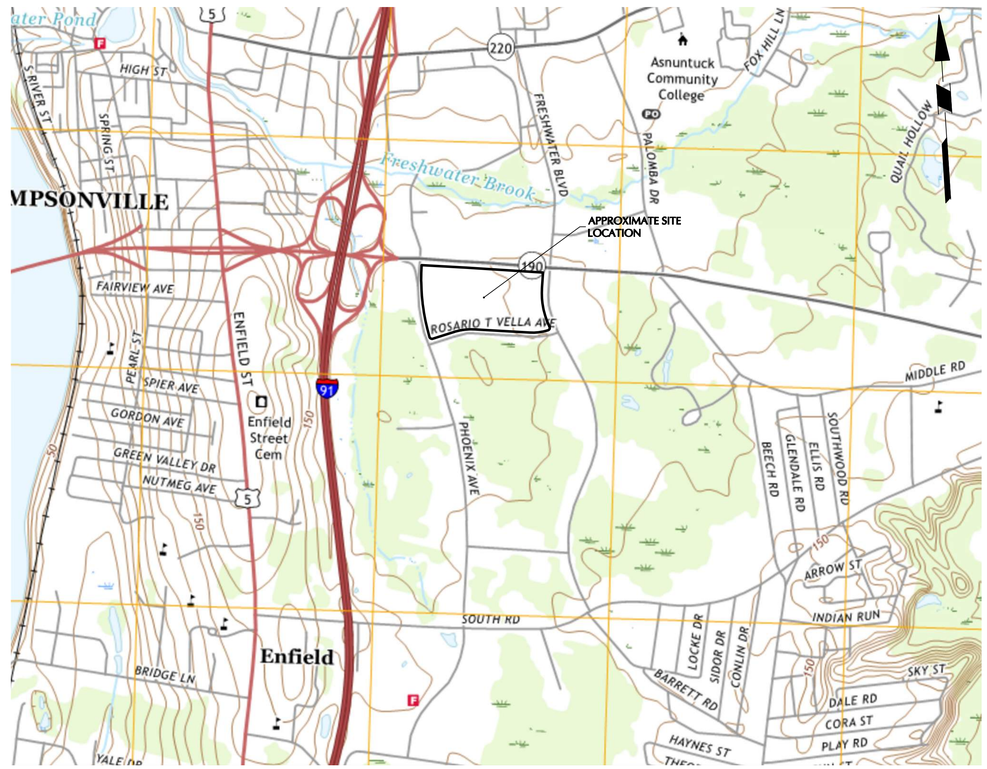
The proposed stormwater management system has been designed to maintain existing flow patterns and utilize the existing stormwater conveyance system on-site. The development will maintain peak flow rates, water quality, ground water recharge, and previous sufaces. We believe that the proposed stormwater system, as designed, will effectively manage stormwater runoff.

INLAND WETLANDS & WATERCOURSES AGENCY DETERMINATION SUBMISSION
BURLINGTON COAT FACTORY EXPANSION AT BROOKSIDE PLAZA

50 HAZARD AVENUE
MAP 56, LOT 22
TOWN OF ENFIELD, HARTFORD COUNTY, CONNECTICUT

CIVIL DRAWING INDEX

SHEET NUMBER	SHEET NAME	DRAWING TITLE	DATE	LAST REVISED
1	CS001	COVER SHEET	5/22/2020	
2	VT401	PARTIAL BOUNDARY & TOPOGRAPHIC SURVEY	5/11/2020	
3	CS002	GENERAL NOTES & MASTER LEGEND	5/22/2020	
4	CS100	OVERALL SITE PLAN	5/22/2020	
5	CS101	SITE PLAN	5/22/2020	
6	CS501	SITE DETAILS	5/22/2020	
7	CG101	GRADING, DRAINAGE, UTILITY, AND EROSION CONTROL PLAN	5/22/2020	
8	CG501	GRADING, DRAINAGE, UTILITY, AND EROSION CONTROL DETAILS I	5/22/2020	
9	CG502	GRADING, DRAINAGE, UTILITY, AND EROSION CONTROL DETAILS II	5/22/2020	



MAP REFERENCE: USGS BROAD BROOK QUADRANGLE MAP 2018 (7.5-MINUTE SERIES)

LOCATION MAP

SCALE: 1" = 1000'

ABUTTING PROPERTY OWNERS WITHIN 200'

MAP	LOT	PROPERTY OWNER	PROPERTY LOCATION
45	1	JPMCC 2006-LDP7 CENTRO	9 HAZARD AVE
		1601 WASHINGTON AVE, SUITE 700	
		MIAMI BEACH, FL 33139	
45	8	PARAMOUNT COMMONS AT ENFIELD LLC	25 HAZARD AVE
		1195 RT 70, SUITE 2000	
		LAKEWOOD, NJ 08701	
45	10	G+R PROPERTIES LLC	7 HAZARD AVE
		1111 ELM ST	
		WEST SPRINGFIELD, MA 01089	
45	12	ENFIELD LODGING LLC	20 PHOENIX AVE
		PO BOX 480	
		BUFFALO, NY 14201	
45	13	TOWN OF ENFIELD	PHOENIX AVE
		820 ENFIELD ST	
		ENFIELD, CT 06082	
45	75	JPMCC 2006-LDP7 CENTRO	94 ELM ST
		1601 WASHINGTON AVE, SUITE 700	
		MIAMI BEACH, FL 33139	
46	35	TOWN OF ENFIELD	SOUTH RD
		820 ENFIELD ST	
		ENFIELD, CT 06082	
56	1	GMRI INC	41 HAZARD AVE
		PO BOX 695019	
		ORLANDO, FL 32869	
56	2	LEO BHW LTD LLC	39 HAZARD AVE
		2475 ALBANY AVE, SUITE 205	
		WEST HARTFORD, CT 06117	
56	4	FRESHWATER BOULEVARD RLTY LLC	95 FRESHWATER BLVD
		2694 BOSTON RD	
		WILBRAHAM, MA 01095	
56	21	TOWN OF ENFIELD	FRESHWATER BLVD
		820 ENFIELD ST	
		ENFIELD, CT 06082	
56	24	SKT FRESHWATER LLC	135 FRESHWATER BLVD
		342 NORTH MAIN ST, SUITE 200	
		WEST HARTFORD, CT 06107	
56	26	ENFIELD STATION LLC	54 HAZARD AVE
		11501 NORTH LAKE DR	
		CINCINNATI, OH 45249	

RELEASE DATES

DATE	ISSUED FOR
5/22/2020	IWWA DETERMINATION SUBMISSION

OWNER/DEVELOPER
EQUITY ONE (NORTHEAST PORTFOLIO), LLC
C/O MICHAEL LAI
28 CHURCH LANE, SUITE 200
WESTPORT, CONNECTICUT 06880
(203) 635-5570

ARCHITECT
SARGENTI
8 PENN CENTER
1628 JFK BOULEVARD
PHILADELPHIA, PA 19103
(215) 482-1950

LAND SURVEYOR, CIVIL ENGINEER,
& LANDSCAPE ARCHITECT
LANGAN CT, INC.
C/O NATHAN KIRSCHNER
555 LONG WHARF DRIVE
NEW HAVEN, CT 06511
(203) 562-5771

LANGAN

LANGAN

PROJECT No. 140161101

NOTES

1. THIS SURVEY HAS BEEN PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTIONS 20–300b–1 THROUGH 20–300b–20 AND THE "STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1996.
   a. THIS SURVEY IS A PROPERTY SURVEY CONFORMING TO A HORIZONTAL ACCURACY OF A–2 AND A TOPOGRAPHIC SURVEY CONFORMING TO A T–2 ACCURACY. THE BOUNDARY DETERMINATION IS A RESURVEY. THE PURPOSE OF THIS SURVEY IS TO PROVIDE A BOUNDARY OPINION AND DEPICT SITE FEATURES FOR FUTURE SITE DEVELOPMENT.

2. THIS SURVEY IS BASED UPON EXISTING PHYSICAL CONDITIONS FOUND AT THE SUBJECT SITE, DEED INFORMATION AND THE FOLLOWING REFERENCES:

   A. MAP TITLED "ALTA/ACSM LAND TITLE SURVEY, PROPERTY SURVEY, PREPARED FOR EQUITY ONE (NORTHEAST PORTFOLIO), INC, 10 HAZARD AVE. (CONN. ROUTE 190), ENFIELD, CONNECTICUT", SCALE: 1"=60', DATED: 06–22–15, LAST REVISED: 03–09–2016, BY: F.A. HESKETH & ASSOCIATES, INC

3. THE MERIDIAN OF THIS SURVEY IS REFERENCED TO CONNECTICUT STATE PLANE COORDINATE SYSTEM NAD 83 (EPOCH 2011). POSITION WAS DETERMINED BY GLOBAL NAVIGATION SATELLITE SYSTEMS (GNSS) AS PROVIDED BY HXGN SMARTNET CONTINUOUSLY OPERATED REFERENCE STATIONS (CORS).

4. ELEVATIONS SHOWN ARE REFERENCED TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) (GEOID 12B) AS DETERMINED BY GNSS

5. PLANIMETRIC AND TOPOGRAPHIC INFORMATION SHOWN HEREON HAS BEEN OBTAINED FROM GROUND SURVEYS BY LANGAN CT, INC. FIELD WORK COMPLETED DURING THE MONTH OF MAY 2020.

6. AS PER THE NATIONAL FLOOD INSURANCE PROGRAM FIRM MAP ENTITLED "HARTFORD COUNTY, CONNECTICUT PANEL 227 OF 675, MAP NUMBER 09003C0227F, EFFECTIVE DATE SEPTEMBER 26, 2008" THE PROJECT AREA IS IN ZONE X (UNSHADED).

7. UNLESS SPECIFICALLY NOTED HEREON, STORM AND SANITARY SEWER INFORMATION (INCLUDING PIPE INVERT, PIPE MATERIAL, AND PIPE SIZE) WAS OBSERVED AND MEASURED AT FIELD LOCATED STRUCTURES (MANHOLES/CATCH BASINS, ETC). CONDITIONS CAN VARY FROM THOSE ENCOUNTERED AT THE TIMES WHEN AND LOCATIONS WHERE DATA IS OBTAINED. DESPITE MEETING THE REQUIRED STANDARD OF CARE, THE SURVEYOR CANNOT, AND DOES NOT WARRANT THAT PIPE MATERIAL AND/OR PIPE SIZE THROUGHOUT THE PIPE RUN ARE THE SAME AS THOSE OBSERVED AT EACH STRUCTURE, OR THAT THE PIPE RUN IS STRAIGHT BETWEEN THE LOCATED STRUCTURES.

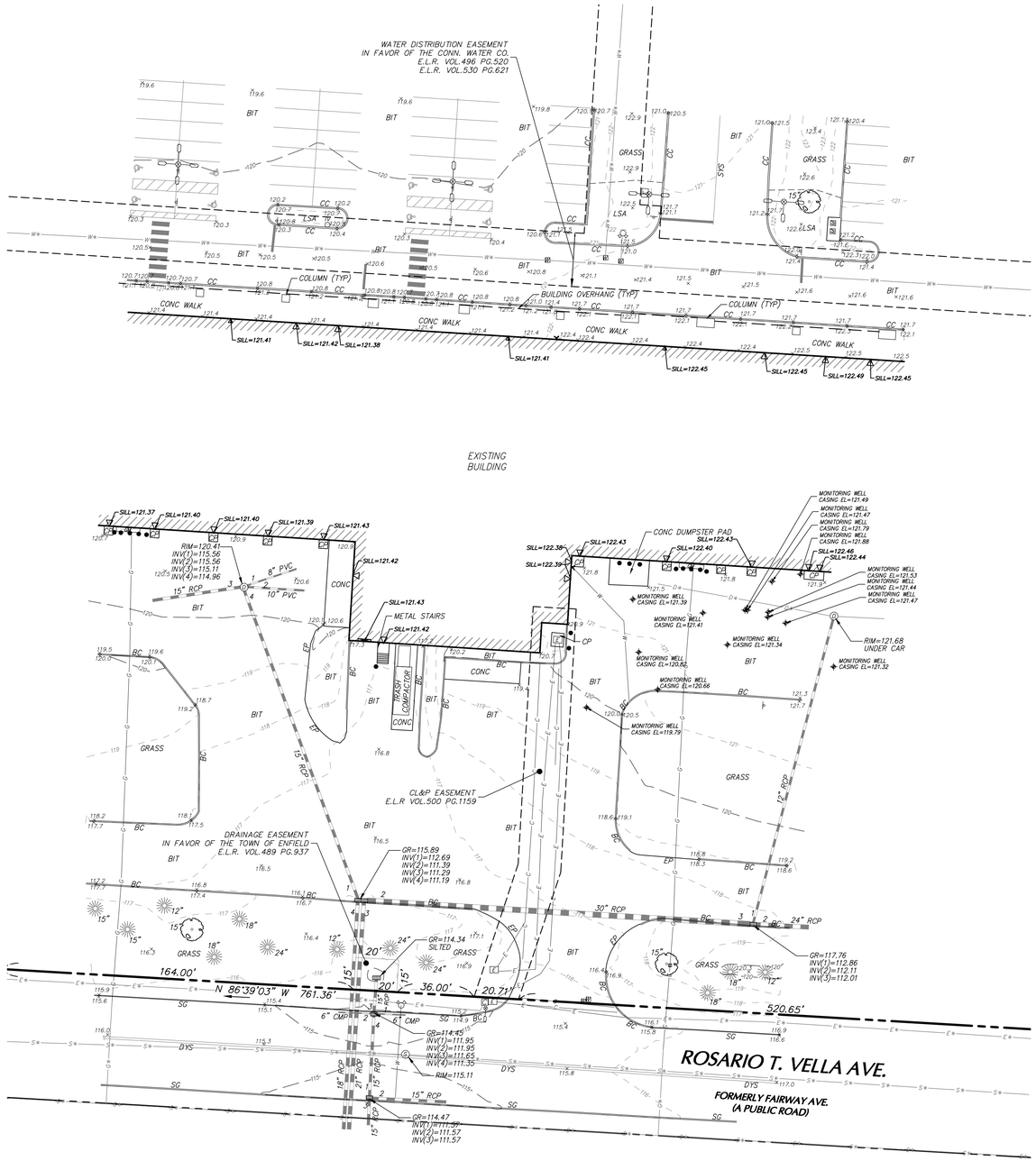
8. ADDITIONAL UTILITY (WATER, GAS, ELECTRIC ETC.) DATA MAY BE SHOWN FROM FIELD LOCATED SURFACE MARKINGS (BY OTHERS), EXISTING STRUCTURES, AND/OR FROM EXISTING DRAWINGS.

9. UNLESS SPECIFICALLY NOTED HEREON, THE SURVEYOR HAS NOT EXCAVATED TO PHYSICALLY LOCATE THE UNDERGROUND UTILITIES. THE SURVEYOR MAKES NO GUARANTEES THAT THE SHOWN UNDERGROUND UTILITIES ARE EITHER IN SERVICE, ABANDONED OR SUITABLE FOR USE, NOR ARE IN THE EXACT LOCATION OR CONFIGURATION INDICATED HEREON.

10. ALL BUILDINGS AND STRUCTURES WERE LOCATED AND MEASURED AT GROUND LEVEL. THE SURVEYOR MAKES NO DETERMINATIONS OR GUARANTEES AS TO THE ABSENCE, EXISTENCE OR LOCATION OF UNDERGROUND STRUCTURES, FOUNDATIONS, FOOTINGS, PROJECTIONS, WALLS, TANKS, SEPTIC SYSTEMS, ETC. NO TEST PITS, EXCAVATIONS OR GROUND PENETRATING RADAR WERE PERFORMED AS PART OF THIS SURVEY.

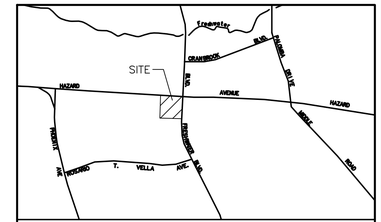
11. PRIOR TO ANY DESIGN OR CONSTRUCTION, THE PROPER UTILITY AGENCIES MUST BE CONTACTED FOR VERIFICATION OF UTILITY TYPE AND FOR FIELD LOCATIONS.

12. THIS SURVEY IS NOT VALID WITHOUT THE EMBOSSED OR INKED SEAL OF THE PROFESSIONAL.



LEGEND (NOT SHOWN TO SCALE)

- BOLLARD
- DOOR
- DOUBLE DOOR
- HANDICAP SYMBOL
- MAILBOX
- MONITORING WELL
- SIGN
- TREE
- CATCH BASIN
- CLEANOUT
- ELECTRIC BOX
- ELECTRIC METER
- FIRE HYDRANT
- GAS METER
- GAS VALVE
- LIGHT POLE
- MANHOLE (TYPE AS LABELED)
- IRRIGATION VALVE
- POWER POLE
- STANDPIPE
- WATER VALVE
- X 262.3 — SPOT ELEVATION
- BIT — BITUMINOUS
- CONC — CONCRETE
- CP — CONCRETE PAD
- LSA — LANDSCAPED AREA
- BOH — BUILDING OVERHANG
- BW — BOTTOM OF WALL
- EP — EDGE OF PAVEMENT
- BC — BITUMINOUS CURB
- CC — CONCRETE CURB
- GC — GRANITE CURB
- SG — SLOPED GRANITE CURB
- SYS — SINGLE YELLOW STRIPE
- DYS — DOUBLE YELLOW STRIPE
- EASEMENT LINE
- PROPERTY LINE
- RIGHT–OF–WAY LINE
- 322 — CONTOUR LINE
- FM — SANITARY FORCE MAIN
- CATV — CABLE TV MARK OUT LINE
- D — DRAINAGE MARK OUT LINE
- E — ELECTRIC MARK OUT LINE
- T — COMMUNICATION MARK OUT LINE
- G — GAS MARK OUT LINE
- S — SANITARY SEWER MARK OUT LINE
- W — WATER MARK OUT LINE
- ST — STEAM MARK OUT LINE
- UNK — UNKNOWN MARK OUT LINE
- R* — REFERENCE UTILITY LINE (TYPE AS NOTED) – PLOTTED FROM EXISTING MAPPING



PROJECT LOCATION MAP
SCALE: 1" = 1000'
SOURCE: CONNECTICUT DEPARTMENT OF TRANSPORTATION

CT NAD 83

STATE OF CONNECTICUT — ANDREW G. IVES — NO. 70286 — LICENSED — LAND SURVEYOR

SCALE: 1 INCH = 30 FEET

Date	Description	No.

REVISIONS

"TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON."

5/11/2020

ANDREW G. IVES — DATE SIGNED
PROFESSIONAL LAND SURVEYOR
CT STATE LIC. NO. 70286

LANGAN
L□n□□n CT, Inc.
555 L□n□ Wh□rf Dri□□
N□□ H□□n, CT 06511
T: 203.562.5771 F: 203.789.6142 □□□.□n□□n.c□□

Project
BROOKSIDE PLAZA
10-38 HAZARD AVE.
ENFIELD — CONNECTICUT

Drawing Title
PARTIAL BOUNDARY & TOPOGRAPHIC SURVEY

Project No. 140161101
Date MAY 11, 2020
Drawn By JRL
Checked By AGI
Drawing No. VT401
Sheet 1 of 1

LANGAN
PROJECT NO. 140161101

GENERAL NOTES

1. ALL TOPOGRAPHIC, PROPERTY LINE, AND UTILITY INFORMATION TAKEN FROM PLANS ENTITLED "PARTIAL BOUNDARY & TOPOGRAPHIC SURVEY," PREPARED BY LANGAN, DATED 05/11/2020, AND "ALTA/ACSM LAND TITLE SURVEY," PREPARED BY F. A. HESKETH & ASSOCIATES, INC., DATED 06/22/2015 AND LAST REVISED 03/09/2016.
2. ALL PROPOSED DISTURBANCE IS NOT LOCATED WITHIN THE AQUIFER PROTECTION AREA.
3. ALL PROPOSED DISTURBANCE IS WITHIN ZONE X (UNSHADED) – AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD.
4. PROPOSED SITE WORK IMPROVEMENTS SHALL CONFORM TO THE STANDARD DETAILS AND/OR SPECIFICATIONS OF THE TOWN OF ENFIELD. IN THE ABSENCE OF LOCAL STANDARDS, SITE WORK SHALL CONFORM TO THE REQUIREMENTS OF CONNECTICUT DEPARTMENT OF TRANSPORTATION.
5. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING TOWN OF ENFIELD WATER POLLUTION CONTROL PLANT (860–253–5246, LEAVE MESSAGE IF NO ANSWER) 24 HOURS IN ADVANCE OF ANY INSPECTIONS.
6. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING CALL BEFORE YOU DIG (800–922–4455, 811, WWW.CBYD.COM), EXCAVATION TEST HOLES, PERFORMING TEST BORINGS, AND PERFORMING WHATEVER ADDITIONAL INVESTIGATION NECESSARY TO PROTECT AND MAINTAIN ALL EXISTING UTILITIES TO REMAIN THROUGHOUT THE CONSTRUCTION PERIOD. ANY CONFLICTS BETWEEN EXISTING UTILITIES AND PROPOSED UTILITIES DISCOVERED DURING CONSTRUCTION SHALL BE PROMPTLY REPORTED TO THE PROJECT ENGINEER.
7. SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS, DIMENSIONS AND DETAILS OF ALL DOORS AND WALLS ASSOCIATED WITH THE BUILDING.
8. ALL IMPROVEMENTS CONSTRUCTED IN THE STATE RIGHT–OF–WAY SHALL COMPLY WITH THE CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARDS.
9. ALL IMPROVEMENTS CONSTRUCTED IN THE TOWN PUBLIC RIGHT–OF–WAY SHALL COMPLY WITH THE TOWN OF ENFIELD STANDARDS.
10. FOR AREAS OUTSIDE THE PROPERTY LINES, REPAIR AND/OR REPLACE ALL DAMAGE DONE TO EXISTING ELEMENTS (SIDEWALKS, PAVING, LANDSCAPING, ETC) AS REQUIRED BY OWNER AND/OR GOVERNING AUTHORITY.
11. CONTRACTOR TO REPAIR/REPLACE ANY EXISTING SIDEWALK THAT IS DAMAGED PRIOR TO OR DURING CONSTRUCTION.
12. ALL SIGNS AND PAVEMENT MARKINGS SHALL CONFORM TO THE LATEST EDITION OF THE MUTCD AND CONNECTICUT DEPARTMENT OF TRANSPORTATION REGULATIONS.
13. ALL RADII ARE 5.0' EXCEPT WHERE NOTED.
14. CONTRACTOR SHALL PREVENT DUST, SEDIMENT AND DEBRIS FROM EXITING THE SITE AND SHALL BE RESPONSIBLE FOR CLEANUP, REPAIRS AND CORRECTIVE ACTION IF SUCH OCCURS. ADJOINING STREETS AND PROPERTIES TO BE KEPT FREE OF DEBRIS RESULTING FROM DEMOLITION AND SHALL BE CLEANED ON A DAILY BASIS OR AS NEEDED.
15. DUST CONTROL TREATMENTS SHALL BE APPLIED AS NECESSARY TO CONTROL AND REDUCE THE AMOUNT OF DUST WHICH MAY CAUSE OFF–SITE DAMAGE, BE A HEALTH HAZARD TO HUMANS, WILDLIFE AND PLANT LIFE, OR POSE A HAZARD TO TRAFFIC SAFETY.
16. ABBREVIATIONS:
    - ARCH. = ARCHITECTURAL
    - CONC. = CONCRETE
    - EX. = EXISTING
    - RCP = REINFORCED CONCRETE PIPE
    - LF = LINEAR FEET
    - CB = CATCH BASIN
    - CCB = CURB CATCH BASIN
    - TC = TOP OF CURB
    - BC = BOTTOM OF CURB
    - CO = CLEAN OUT
    - TF = TOP OF FRAME
    - INV = INVERT
    - PVC = POLYVINYL CHLORIDE PIPE
    - LA = LANDSCAPED AREA
    - TYP = TYPICAL
    - HP = HIGHPOINT
    - CLCB = CURBLESS CATCH BASIN
    - MH = MANHOLE
    - RL = ROOF LEADER
17. DOMESTIC AND FIRE PROTECTION WATER SERVICE, ELECTRICAL, TELECOM AND GAS SERVICE. CONTRACTOR SHALL COORDINATE INSTALLATION OF UTILITIES IN SUCH A MANNER AS TO AVOID CONFLICTS AND TO ENSURE PROPER DEPTHS ARE ACHIEVED AS WELL AS COORDINATING WITH THE UTILITY COMPANIES AS TO LOCATION OF AND SCHEDULING OF CONNECTIONS TO THEIR FACILITIES.
18. ALL SIDEWALKS SHALL SLOPE AWAY FROM BUILDING.
19. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PAVEMENT REPAIRS REQUIRED AS A RESULT OF ANY UTILITY WORK.

GENERAL SITE NOTES

1. ALL TOPOGRAPHIC, PROPERTY LINE, AND UTILITY INFORMATION TAKEN FROM PLANS ENTITLED "PARTIAL BOUNDARY & TOPOGRAPHIC SURVEY," PREPARED BY LANGAN, DATED 05/11/2020, AND "ALTA/ACSM LAND TITLE SURVEY," PREPARED BY F. A. HESKETH & ASSOCIATES, INC., DATED 06/22/2015 AND LAST REVISED 03/09/2016.
2. THESE PLANS REPRESENT THE OVERALL SITEWORK IMPROVEMENTS REQUIRED FOR PROJECT CONSTRUCTION. THE CONTRACTOR SHALL FURNISH, INSTALL, TEST AND COMPLETE ALL WORK TO THE SATISFACTION OF THE ENGINEER AND OWNER IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR MEANS AND METHODS OF CONSTRUCTION; AS SUCH, THESE PLANS DO NOT COMPLETELY REPRESENT, NOR ARE THEY INTENDED TO REPRESENT, ALL SPECIFIC INSTRUCTIONS REQUIRED FOR SITEWORK CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONSTRUCT ALL IMPROVEMENTS DEPICTED ON THESE PLANS IN ACCORDANCE WITH ALL APPLICABLE RULES, REGULATIONS AND LAWS IN EFFECT AT THE TIME OF CONSTRUCTION.
3. THE CONTRACTOR SHALL ACCEPT THE SITE AS IS. THE CONTRACTOR SHALL ASSESS CONDITIONS, AND THE KIND, QUALITY AND QUANTITY OF WORK REQUIRED. THE OWNER MAKES NO GUARANTEE IN REGARD TO THE ACCURACY OF ANY AVAILABLE INFORMATION WHICH WAS OBTAINED DURING INVESTIGATIONS. THE CONTRACTOR SHALL MAKE A THOROUGH SITE INSPECTION IN ORDER TO FIELD CHECK EXISTING SITE CONDITIONS, CORRELATE CONDITIONS WITH THE DRAWINGS AND RESOLVE ANY POSSIBLE CONSTRUCTION CONFLICTS WITH THE OWNER AND ENGINEER PRIOR TO COMMENCEMENT OF WORK. THE CONTRACTOR SHALL MAKE ADDITIONAL TOPOGRAPHIC SURVEYS HE DEEMS NECESSARY, PROVIDED THEY ARE COORDINATED WITH THE OWNER. ANY CONDITIONS DETERMINED BY THE CONTRACTOR THAT DIFFER FROM THE INFORMATION SHOWN ON THE DRAWINGS THAT ARE NOT BROUGHT TO THE ATTENTION OF THE OWNER AND ENGINEER PRIOR TO THE START OF WORK SHALL NOT BE CONSIDERED GROUNDS FOR ADDITIONAL PAYMENT OR CHANGES TO THE CONTRACT DURATION, OR ANY OTHER CLAIMS AGAINST THE OWNER OR OWNER'S ENGINEER.
4. THE CONTRACTOR SHALL, WHEN THEY DEEM NECESSARY, PROVIDE WRITTEN REQUESTS FOR INFORMATION (RFIS) TO THE OWNER AND ENGINEER PRIOR TO THE CONSTRUCTION OF ANY SPECIFIC SITEWORK ITEM. THE (RFI) SHALL BE IN A FORM ACCEPTABLE TO OWNER AND ENGINEER AND SHALL ALLOW FOR A MINIMUM OF TWO WORK DAYS OR ADDITIONAL REASONABLE TIME FOR A WRITTEN REPLY. RFIS SHALL BE NUMBERED CONSECUTIVELY BY DATE SUBMITTED. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR SITEWORK ITEMS CONSTRUCTED DIFFERENTLY THAN INTENDED OR AS DEPICTED ON THE PLANS.
5. INFORMATION RELATED TO ELEVATIONS AND PROPOSED UTILITIES (SUCH AS ROADWAY GRADES, INVERT ELEVATIONS, RIM ELEVATIONS, GRATE ELEVATIONS, BUILDING FINISHED FLOOR ELEVATIONS, ETC.) MAY BE FOUND IN MORE THAN ONE LOCATION IN THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL SUFFICIENTLY REVIEW ALL PLANS, PROFILES AND ANY OTHER INFORMATION IN THE CONTRACT DOCUMENTS FOR CONSISTENCY PRIOR TO CONSTRUCTION. ANY INCONSISTENCIES OR DISCREPANCIES THAT ARE FOUND BY THE CONTRACTOR OR HIS ASSIGNS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER AND ENGINEER IN WRITING, IN THE FORMAT OF AN RFI PRIOR TO CONSTRUCTION.
6. THERE ARE ADDITIONAL NOTES, SPECIFICATIONS AND REQUIREMENTS CONTAINED THROUGHOUT THE PLAN SET AS WELL AS REFERENCES TO SPECIFICATIONS FROM APPLICABLE GOVERNING AUTHORITIES AND INDUSTRY STANDARDS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN, REVIEW AND ADHERE TO ALL THESE DOCUMENTS.
7. THE PROPERTY OWNER AND/OR HIS/HER AGENTS MUST MAINTAIN (REPAIR/REPLACE), WHEN NECESSARY, THE SILTATION CONTROL UNTIL ALL DEVELOPMENT ACTIVITY IS COMPLETED AND ALL DISTURBED AREAS ARE PERMANENTLY STABILIZED.
8. HANDICAP PARKING SHALL COMPLY WITH THE CT STATE BUILDING CODE REQUIREMENTS AS OF OCTOBER 2018 OR LAST REVISED.
9. SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS, DIMENSIONS, AND DETAILS OF ALL DOORS, STAIRS, RAMPS, SIDEWALKS, CONCRETE PADS, WALLS, CANOPIES, EXTERIOR COLUMNS AND BOLLARDS ASSOCIATED WITH THE BUILDING.

STANDARD TOWN NOTES

1. THE DEVELOPER OF A SUBDIVISION SHALL NOTIFY THE TOWN ENGINEER'S OFFICE 24 HOURS IN ADVANCE TO SCHEDULE INSPECTION OF SUB–BASE, GRAVEL, PAVEMENT, SIDEWALKS, DRAINAGE STRUCTURES AND PIPES, SANITARY SEWERS, AND MANHOLES. TELEPHONE 8 AM – 4 PM AT 253–6366. PRIVATE SITES WILL BE INSPECTED FOR SANITARY SEWERS AND ANY IMPROVEMENT TO BE TURNED OVER TO THE TOWN.
2. ALL SITE WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE TOWN OF ENFIELD SPECIFICATIONS AS OUTLINED IN SUBDIVISION REGULATIONS.
3. EROSION AND SEDIMENTATION CONTROLS SHALL BE INSTALLED IN ACCORDANCE WITH THE "EROSION AND SEDIMENT CONTROL HANDBOOK" PREPARED BY THE SOIL CONSERVATION SERVICE 2002.
4. ALL EXCAVATIONS WITHIN TOWN RIGHT–OF–WAY REQUIRE A STREET EXCAVATION PERMIT ISSUED BY THE ENGINEERING DEPARTMENT.
5. NO SITE IMPROVEMENTS SUCH AS DRAINAGE, SANITARY SEWERS, SIDEWALKS, EXCAVATIONS, FILLING, PAVEMENT OPTIONS, ETC., SHALL COMMENCE UNTIL THE SITE ENGINEERING BOND, AS REQUIRED BY THE ENFIELD PLANNING AND ZONING COMMISSION IS POSTED WITH THE TOWN OF ENFIELD.
6. NO STUMPS TO BE BURIED ON SITE.
7. PRE–CONSTRUCTION CONFERENCE FOR CONSTRUCTION OF A SUBDIVISION ONLY, SHALL INCLUDE THE TOWN ENGINEER OR HIS AGENT. NOTIFICATION OF CONFERENCE SHALL BE 48 HOURS IN ADVANCE.
8. THE DEVELOPER SHALL HIRE A REGISTERED PROFESSIONAL ENGINEER TO INSPECT THE SITE DURING CONSTRUCTION. TO ENSURE THE WORK IS CONSTRUCTED IN ACCORDANCE WITH THE APPROVED PLANS, THE ENGINEER WILL BE REQUIRED TO CERTIFY ON AN AS–BUILT PLAN THAT THE PROJECT WAS CONSTRUCTED IN ACCORDANCE WITH THE APPROVED PLANS AND ALL MATERIALS WERE PLACED IN ACCORDANCE WITH THE SITE PLANS AND SPECIFICATIONS, PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY.

CONTRACTOR NOTES

1. THE WORK TO BE PERFORMED IS AS SHOWN ON THE DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR MEANS AND METHODS OF CONSTRUCTION; AS SUCH, THESE PLANS MAY NOT COMPLETELY REPRESENT ALL SPECIFIC DETAILS OF INSTALLATION REQUIRED FOR CONSTRUCTION. CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL IMPROVEMENTS REQUIRED TO ACHIEVE CONSTRUCTION DEPICTED ON THESE PLANS.
2. THE CONTRACTOR SHALL PROVIDE WRITTEN REQUESTS FOR INFORMATION TO THE OWNER AND OWNER'S ENGINEER PRIOR TO THE CONSTRUCTION OF ANY SPECIFIC SITEWORK ITEM IF ANY SITEWORK ITEM DEPICTED ON THE PLANS WARRANTS ADDITIONAL ENGINEERING INFORMATION REQUIRED FOR CONSTRUCTION AND IS NOT RELATED TO MEANS AND METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SITEWORK ITEMS INSTALLED DIFFERENTLY THAN INTENDED AS DEPICTED ON THE PLANS IN THE ABSENCE OF SUBMITTING AND RECEIVING REVIEWS AND/OR DIRECTION ON WRITTEN REQUESTS FOR INFORMATION.
3. THE CONTRACTOR SHALL ACCEPT THE SITE AS IS. THE CONTRACTOR SHALL MAKE AND SHALL BE DEEMED TO HAVE MADE A THOROUGH SITE INSPECTION IN ORDER TO FIELD CHECK EXISTING SITE CONDITIONS, CORRELATE CONDITIONS WITH THE DRAWINGS AND RESOLVE ANY POSSIBLE CONSTRUCTION CONFLICTS WITH THE OWNER AND OWNER'S ENGINEER PRIOR TO COMMENCEMENT OF WORK. THIS INCLUDES A TOPOGRAPHIC SURVEY OF ANY AREAS THE CONTRACTOR REQUIRES ADDITIONAL TOPOGRAPHIC INFORMATION. ANY CONDITIONS THAT DIFFER FROM THE EXISTING CONDITIONS SHOWN ON THE DRAWINGS THAT ARE NOT BROUGHT TO THE ATTENTION OF THE OWNER AND OWNER'S ENGINEER PRIOR TO THE START OF WORK SHALL NOT BE CONSIDERED GROUNDS FOR A CHANGE ORDER.
4. IT IS SPECIFICALLY NOTED THAT INFORMATION RELATED TO ELEVATIONS AND PROPOSED UTILITIES (SUCH AS ROADWAY GRADES, INVERT ELEVATIONS, RIM ELEVATIONS, GRATE ELEVATIONS, BUILDING FINISHED FLOOR ELEVATIONS, ETC.) MAY BE FOUND IN MORE THAN ONE LOCATION ON THE DRAWINGS. CONTRACTOR SHALL REVIEW ALL PLANS, PROFILES AND ANY INFORMATION/DATA TABLES FOR CONSISTENCY PRIOR TO CONSTRUCTION. ANY INCONSISTENCIES OR DISCREPANCIES THAT ARE FOUND SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE OWNER'S ENGINEER IN WRITING REQUESTING CLARIFICATION PRIOR TO CONSTRUCTION.
5. CONTRACTOR SHALL NOTE THAT THERE ARE ADDITIONAL NOTES, SPECIFICATIONS AND REQUIREMENTS CONTAINED ON SHEETS THROUGHOUT THE PLAN SET AND AVAILABLE REFERENCES TO SPECIFICATIONS FROM APPLICABLE GOVERNING AUTHORITIES AND INDUSTRY STANDARDS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN, REVIEW AND ADHERE TO ALL APPLICABLE REQUIREMENTS.
6. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED UPON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CONTACT "CALL BEFORE YOU DIG" @ 1–800–922–4455 FOR THE LOCATION AND MARKING OF ALL EXISTING UTILITIES PRIOR TO ANY EXCAVATION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
7. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, UTILITY LOCATIONS, AND INVERTS PRIOR TO CONSTRUCTION. ANY CONDITIONS FOUND TO DIFFER FROM THOSE SHOWN BY THE DRAWINGS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER.
8. CONTRACTOR SHALL REFER TO MEP AND ARCHITECTURAL PLANS AND SPECIFICATIONS FOR ACTUAL LOCATIONS OF ALL UTILITY ENTRANCES TO INCLUDE SANITARY SEWER LATERALS, DOMESTIC AND FIRE PROTECTION WATER SERVICE, ELECTRICAL, GAS, FIBER OPTIC, AND TELEPHONE SERVICE, ROOF DRAINS, AND ALL OTHER UTILITIES. CONTRACTOR SHALL COORDINATE INSTALLATION OF UTILITIES IN SUCH A MANNER AS TO AVOID CONFLICTS AND TO ENSURE PROPER DEPTHS ARE ACHIEVED AS WELL AS COORDINATING WITH THE REGULATORY AGENCY AS TO LOCATION OF AND SCHEDULING OF CONNECTIONS TO THEIR FACILITIES.
9. SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS, DIMENSIONS, AND DETAILS OF ALL DOORS, STAIRS, RAMPS, SIDEWALKS, CONCRETE PADS, WALLS, CANOPIES, EXTERIOR COLUMNS AND BOLLARDS ASSOCIATED WITH THE BUILDING.
10. THE CONTRACTOR SHALL VISIT THE SITE AND VERIFY THE ELEVATION AND LOCATION OF ALL UTILITIES BY VARIOUS MEANS PRIOR TO BEGINNING ANY EXCAVATION. TEST PITS SHALL BE DUG AT ALL LOCATIONS WHERE THE PROPOSED SANITARY AND STORM PIPING WILL CROSS EXISTING UTILITIES AND THE HORIZONTAL AND VERTICAL LOCATIONS OF THE UTILITIES SHALL BE DETERMINED. THE CONTRACTOR SHALL CONTACT THE CIVIL ENGINEER IN THE EVENT OF ANY DISCOVERED OR UNFORESEEN CONFLICTS SO THAT AN APPROPRIATE MODIFICATION CAN BE MADE.
11. CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE TOWN OF ENFIELD TO SECURE CONSTRUCTION PERMITS AND FOR PAYMENT OF FEES FOR STREET CUTS AND CONNECTIONS TO EXISTING UTILITIES.
12. THESE PLANS DETAIL SITE INSTALLED PIPES UP TO 5' FROM THE BUILDING FACE. REFER TO ARCHITECTURAL, STRUCTURAL AND MEP DRAWINGS FOR BUILDING CONNECTIONS. SITE CONTRACTOR SHALL SUPPLY AND INSTALL PIPE ADAPTERS AS NECESSARY AT BUILDING CONNECTION POINT OR AT EXISTING UTILITY OR PIPE CONNECTION POINT.
13. THE CONTRACTOR SHALL ENSURE THAT ALL UTILITY PROVIDERS AND GOVERNING AUTHORITY STANDARDS FOR MATERIALS AND CONSTRUCTION METHODS ARE MET. THE CONTRACTOR SHALL PERFORM PROPER COORDINATION WITH THE RESPECTIVE UTILITY PROVIDER.
14. THE CONTRACTOR SHALL RESTORE ANY UTILITY STRUCTURE, PIPE, UTILITY, PAVEMENT, CURBS, SIDEWALKS, DRAINAGE STRUCTURE, SWALE OR LANDSCAPED AREAS DISTURBED DURING CONSTRUCTION, TO THEIR ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE OWNER, TOWN OF ENFIELD AND STATE OF CONNECTICUT.

ACCESSIBILITY NOTES

1. WALKWAYS ALONG ACCESSIBLE ROUTES NOT TO EXCEED 5% RUNNING SLOPE OR 2% CROSS SLOPE.
2. ALL ADA PARKING SPACES AND PASSENGER LOADING ZONES SHALL NOT EXCEED 2% IN ANY DIRECTION.
3. ALL ADA EGRESSES SHALL BE FLUSH WITH ADJOINING MATERIAL UNLESS NOTED OTHERWISE.
4. ALL RAMPS SHALL NOT EXCEED 1:12 RUNNING SLOPE AND 2% CROSS SLOPE.

LEGEND

	EXISTING	PROPOSED
PROPERTY LINE		
ZONE BOUNDARY LINE		
SAWCUT LINE		
WETLAND LIMITS LINE		
100' WETLAND BUFFER LINE		
LANDSCAPE BUFFER LINE		
FRONT YARD SETBACK LINE		
SOIL BOUNDARY LINE		
BUILDING LINE		
CANOPY		
CURB LINE		
DOOR LOCATION		
TRAFFIC SIGN		
SIGN DESIGNATION		A
PARKING SPACE COUNT		9
LIGHT POLE		
CONCRETE SIDEWALK/PAD		
SANITARY SEWER LINE		
WATER LINE	W*	UW
GAS LINE	G*	UG
UNDERGROUND TELECOM		UT
UNDERGROUND ELECTRIC	E*	UE
TRANSFORMER		T
GATE VALVE	WG	
GAS METER		
UTILITY POLE		
SANITARY/STORM MANHOLE		
SANITARY CLEANOUT		
STORM PIPE		
CURBLESS CATCH BASIN		
CATCH BASIN		
CONTOUR	137	139
SPOT ELEVATION	X 139.67	X 138.79
LIMIT OF DISTURBANCE		LOD
SILT FENCE		
CONSTRUCTION FENCE		
TEMPORARY STOCKPILE		
HAYBALES		
INLET PROTECTION		
ANTI–TRACK PAD		

GRADING & DRAINAGE NOTES

1. ALL PROPOSED STORM DRAINAGE PIPING TO UTILIZE WATER–TIGHT JOINTS.
2. LOCATIONS AND ELEVATIONS OF ROOF LEADERS SHOULD BE COORDINATED WITH ARCHITECTURAL & MEP DRAWINGS PRIOR TO CONSTRUCTION.
3. CLEANOUTS SHALL BE PROVIDED FLUSH TO GRADE AT ALL LOCATIONS OF ROOF DRAIN INTERSECTIONS, BENDS AND UPSTREAM ENDS.
4. ALL REQUIRED STORM LATERALS SERVICING THE BUILDINGS SHALL BE COORDINATED AND CONSTRUCTED TO WITHIN FIVE FEET OF EACH BUILDING LATERAL ENTRANCE LOCATION AT THE INVERTS NOTED. ANY NECESSARY EXTENSIONS, RELOCATIONS, OR CORRECTIONS WITHIN FIVE FEET OF THE BUILDING NECESSARY TO COMPLETE CONNECTION OF LATERALS TO THE BUILDINGS SHALL BE MADE BY THE BUILDING CONTRACTOR.
5. CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE APPROPRIATE SIZES OF THE DRAINAGE STRUCTURES (CATCH BASINS, MANHOLES, YARD DRAINS, ETC.) TO ACCOMMODATE THE PIPING SHOWN.
6. STORM DRAINAGE PIPING INSTALLATION SHALL COMMENCE AT THE FURTHEST DOWNSTREAM POINT AND PROCEED UPSTREAM "IN THE DRY".
7. CONTRACTOR SHALL CONNECT ALL NEW ROOF DRAINS TO THE DRAINAGE SYSTEM. LOCATIONS AND ELEVATIONS OF ROOF LEADERS SHOULD BE COORDINATED WITH MEP AND ARCHITECTURAL DRAWINGS PRIOR TO CONSTRUCTION.
8. THE CONTRACTOR WILL BE REQUIRED TO CLEAN THE ENTIRE DRAINAGE SYSTEM OF ALL DEBRIS AND OBSTRUCTIONS BOTH DURING CONSTRUCTION AND AT THE END OF CONSTRUCTION PRIOR TO ACCEPTANCE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO, REMOVAL OF ALL FORMWORK FROM STRUCTURES, CONCRETE AND MORTAR DROPPINGS, CONSTRUCTION DEBRIS, AND DIRT. THE SYSTEM SHALL BE THOROUGHLY FLUSHED CLEAN AND THE CONTRACTOR SHALL FURNISH ALL NECESSARY HOSE, PUMPS, PIPE, AND OTHER EQUIPMENT THAT MAY BE REQUIRED FOR THIS PURPOSE. NO DEBRIS SHALL BE FLUSHED INTO EXISTING STORM DRAINS, WETLANDS, OR WATERCOURSES; ALL DEBRIS SHALL BE REMOVED FROM THE SYSTEM AND DISPOSED OF IN ACCORDANCE WITH ALL GOVERNING AGENCIES.
9. ALL MANHOLE COVERS, GRATES, INLETS, AND RIMS TO REMAIN SHALL BE ADJUSTED TO PROPOSED GRADE.
10. CONTRACTOR TO PROVIDE ALL FITTINGS AND BENDS NECESSARY TO ACCOMPLISH WORK.
11. WALL DRAINS SHALL CONNECT TO STORM DRAINAGE SYSTEM AS SHOWN ON WALL DESIGN DRAWINGS.

UTILITY NOTES

1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED UPON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CONTACT "CALL–BEFORE–YOU–DIG" @ 1–800–922–4455 FOR THE LOCATION AND MARKING OF ALL EXISTING UTILITIES PRIOR TO ANY EXCAVATION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
2. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, UTILITY LOCATIONS, AND INVERTS PRIOR TO CONSTRUCTION. ANY CONDITIONS FOUND TO DIFFER FROM THOSE SHOWN BY THE DRAWINGS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER.
3. CONTRACTOR SHALL REFER TO ARCHITECTURAL AND MEP PLANS AND SPECIFICATIONS FOR ACTUAL LOCATIONS OF ALL UTILITY ENTRANCES TO INCLUDE SANITARY SEWER LATERALS, DOMESTIC AND FIRE PROTECTION WATER SERVICE, ELECTRICAL, TELEPHONE AND GAS SERVICE, AND ALL OTHER UTILITIES. CONTRACTOR SHALL COORDINATE INSTALLATION OF UTILITIES IN SUCH A MANNER AS TO AVOID CONFLICTS AND TO ENSURE PROPER DEPTHS ARE ACHIEVED AS WELL AS COORDINATING WITH THE REGULATORY AGENCY AS TO LOCATION OF AND SCHEDULING OF CONNECTIONS TO THEIR FACILITIES.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING UTILITY COMPANIES 72 HOURS PRIOR TO BEGINNING OF EXCAVATION.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PAVEMENT REPAIRS REQUIRED AS A RESULT OF ANY UTILITY WORK.
6. LOCATION OF SITE UTILITIES SHALL BE VERIFIED BY GENERAL CONTRACTOR THE PROPER UTILITY COMPANY PROVIDING SERVICE.
7. GENERAL CONTRACTOR WILL BE RESPONSIBLE FOR ALL TAP AND TIE–IN FEES REQUIRED, AS WELL AS COST OF UNDERGROUND SERVICE CONNECTIONS TO THE BUILDING.
8. DIMENSIONS SHOWN ARE TO THE CENTERLINE OF PIPE OR FITTING.
9. ALL TRENCHING, PIPE LAYING, AND BACKFILLING SHALL BE IN ACCORDANCE WITH FEDERAL OSHA REGULATIONS.
10. GENERAL CONTRACTOR SHALL HAVE APPROVAL OF ALL GOVERNING AGENCIES HAVING JURISDICTION OVER THE SYSTEM PRIOR TO INSTALLATION.

ELECTRIC, TELEPHONE, & GAS:

11. CONTRACTOR TO COORDINATE GAS MAIN, ELECTRIC, AND TELEPHONE INSTALLATION WITH THE APPROPRIATE UTILITY COMPANIES.
12. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 30 INCHES OF COVER FOR ALL UNDERGROUND ELECTRIC, TELEPHONE AND GAS UTILITIES.

WATER & SANITARY:

13. ALL SANITARY SEWER PIPE TO BE PUSH–JOINT POLYVINYL CHLORIDE (PVC) PIPE SDR–35. ALL JOINTS BETWEEN PVC PIPE SECTIONS AND BETWEEN PIPE AND PRECAST MANHOLES SHALL HAVE WATER–TIGHT RUBBER GASKET CONNECTIONS. ALL PVC PIPES AND FITTINGS SHALL COMPLY WITH ASTM D3034–93. ALL MAINS SHALL BE TESTED FOR LEAKAGE IN ACCORDANCE WITH THE LOW PRESSURE AIR TEST METHOD.
14. WHERE THE SANITARY SEWER LINE PASSES LESS THAN 18" BELOW THE WATER LINE, PROVIDE CONCRETE ENCASEMENT. THE LENGTH OF THE ENCASEMENT TO BE INCREASED TO THE NEAREST JOINT.
15. WHERE THE SANITARY SEWER LINE PASSES ABOVE THE WATER LINES, ENCASE SEWER IN 6" THICK CONCRETE FOR A DISTANCE OF 10 FEET ON EACH SIDE OF THE CROSSING, OR SUBSTITUTE RUBBER GASKETED PRESSURE PIPE FOR THE PIPE BEING USED FOR THE SAME DISTANCE.
16. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 4.5 FEET OF COVER FOR ALL WATER DISTRIBUTION PIPING.
17. ALL NEW WATER LINES SHALL BE PRESSURE TESTED AND LEAKAGE TESTED IN ACCORDANCE WITH THE LATEST EDITION OF AWWA STANDARD C600.
18. ALL NEW WATER MAINS SHALL BE DISINFECTED IN ACCORDANCE WITH AWWA STANDARD C651.
19. GRAVITY PIPING SHALL BE INSTALLED FROM DOWNSTREAM TO UPSTREAM, "IN THE DRY". THE CONTRACTOR IS ENCOURAGED TO BEGIN WORK AT THE MOST DOWNSTREAM POINT IN THE SYSTEM, ESPECIALLY WHEN THE NEW WORK WILL CONNECT TO AN EXISTING UTILITY DOWNSTREAM. IF THE CONTRACTOR CHOOSES NOT TO START AT THE FURTHEST DOWNSTREAM LOCATION, THEN HE IS RESPONSIBLE FOR VERIFYING THE EXACT LOCATION, ELEVATION, AND INVERT OF THE EXISTING UTILITY PRIOR TO STARTING ANY WORK AND VERIFYING THAT THE EXISTING LOCATION AND INVERT ALLOWS FOR THE CONSTRUCTION OF THE PROPOSED SYSTEM AS DESIGNED.

DEMOLITION NOTES

GENERAL:

1. THE CONTRACTOR SHALL INSPECT THE SITE THOROUGHLY AND FIELD–VERIFY THE LOCATION AND DEPTH OF ALL EXISTING UTILITIES. SOME UNDERGROUND UTILITIES MAY BE LOCATED DIFFERENTLY THAN SHOWN ON THIS PLAN. IN ADDITION, THERE MAY BE EXISTING UNDERGROUND UTILITIES PRESENT THAT ARE NOT SHOWN ON THIS PLAN. ALL CONTRACTORS USING THESE PLANS FOR DEMOLITION OR CONSTRUCTION SHALL CONFIRM ALL UTILITIES IN THE FIELD TO ESTABLISH LOCATIONS, SIZES, MATERIALS, AND ELEVATIONS. ANY DISCREPANCIES SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER AND THE CONSTRUCTION MANAGER.
2. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING "CALL BEFORE YOU DIG," EXCAVATING THE HOLES, AND PREPARING ANY ADDITIONAL RESEARCH OR INVESTIGATIONS REQUIRED IN ORDER TO ENSURE THAT PROPOSED UTILITIES TO REMAIN ARE PROTECTED FROM DAMAGE DURING DEMOLITION. ANY DAMAGE TO EXISTING UTILITIES TO REMAIN IS REQUIRED TO BE REPAIRED BY THE CONTRACTOR.
3. THE CONTRACTOR SHALL NOTIFY AND OBTAIN ALL SHUTOFFS FOR ALL APPLICABLE UTILITIES PRIOR TO THE COMMENCEMENT OF DEMOLITION.
4. THE CONTRACTOR SHALL LOCATE/CONFIRM ALL DRAINAGE INFRASTRUCTURE AND MAINTAIN ADEQUATE STORM DRAINAGE THROUGHOUT CONSTRUCTION.
5. THE CONTRACTOR SHALL FIELD LOCATE AND PROPERLY DISCONNECT APPROPRIATE LATERALS TO LIVE MAINS PRIOR TO DEMOLITION AND IN ACCORDANCE WITH UTILITY COMPANY STANDARDS.
6. THE CONTRACTOR SHALL MAINTAIN THE SAFETY AND PROTECTION OF BOTH PEDESTRIANS AND MOTORISTS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO TAKE ALL NECESSARY PRECAUTIONARY AND PROTECTIVE MEASURES, INCLUDING SIGNS, LIGHTS, BARRIERS, FENCING AND TRAFFIC FLAGMEN.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY DEMOLITION ASSOCIATED PERMITS.
8. CONTRACTOR TO PROTECT AND MAINTAIN ALL UTILITIES TO REMAIN UNTIL TEMPORARY OR PERMANENT NEW LINES ARE INSTALLED.

DEMOLITION:

9. THE CONTRACTOR SHALL REMOVE AND LEGALLY DISPOSE OF ALL STRUCTURES WITHIN THE PROJECT LIMITS INDICATED TO BE REMOVED.
10. THE CONTRACTOR SHALL INCLUDE IN HIS BID ALL TEMPORARY FACILITIES AND SERVICES NECESSARY TO SATISFY FEDERAL, STATE, & LOCAL REQUIREMENTS INCLUDING BUT NOT LIMITED TO BRACING, SHORING, PAVEMENT REPAIR, FENCING, PEDESTRIAN AND VEHICLE ACCESS, CONCRETE PADS, ETC.

CURB TRANSITION NOTES

1. CURB RADII ARE 5' UNLESS OTHERWISE NOTED.
2. PROVIDE 4' MINIMUM TRANSITION PIECE WHERE CURBING HEIGHT VARIES.

Date	Description	No.
REVISIONS		

LANGAN

Langan CT, Inc.
555 Long Wharf Drive
New Haven, CT 06511

T: 203.562.5771 F: 203.789.6142 www.langan.com

Project
BURLINGTON COAT FACTORY EXPANSION AT BROOKSIDE PLAZA
50 HAZARD AVENUE
ENFIELD CONNECTICUT

Drawing Title
GENERAL NOTES & MASTER LEGEND

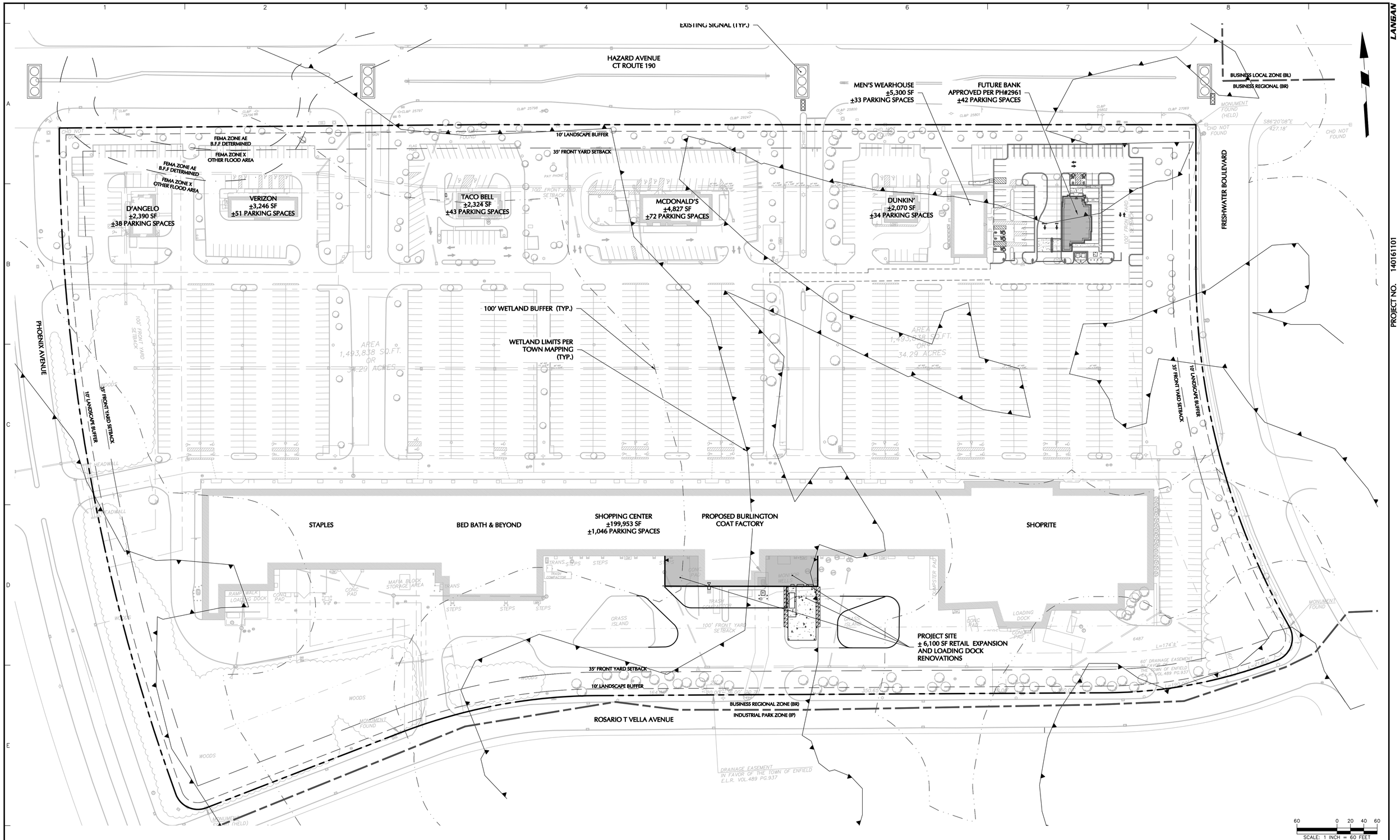
Project No. 140161101
Date 5/22/2020
Drawn By IJAB
Checked By TSO

Drawing No. CS002

Sheet 3 of 9

PROJECT NO. 140161101

LANGAN



Date	Description	No.
	REVISIONS	

STATE OF CONNECTICUT
TIMOTHY S. ODONNELL
No. 25760
LICENSED
PROFESSIONAL ENGINEER

LANGAN

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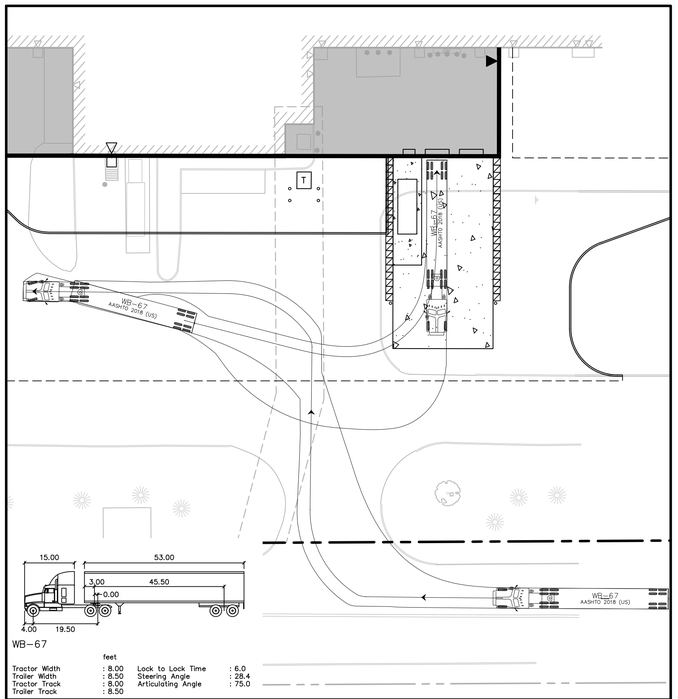
Project
BURLINGTON COAT FACTORY EXPANSION AT BROOKSIDE PLAZA
50 HAZARD AVENUE
ENFIELD CONNECTICUT

Drawing Title
OVERALL SITE PLAN

Project No. 140161101
Date 5/22/2020
Drawn By IJAB
Checked By TSO

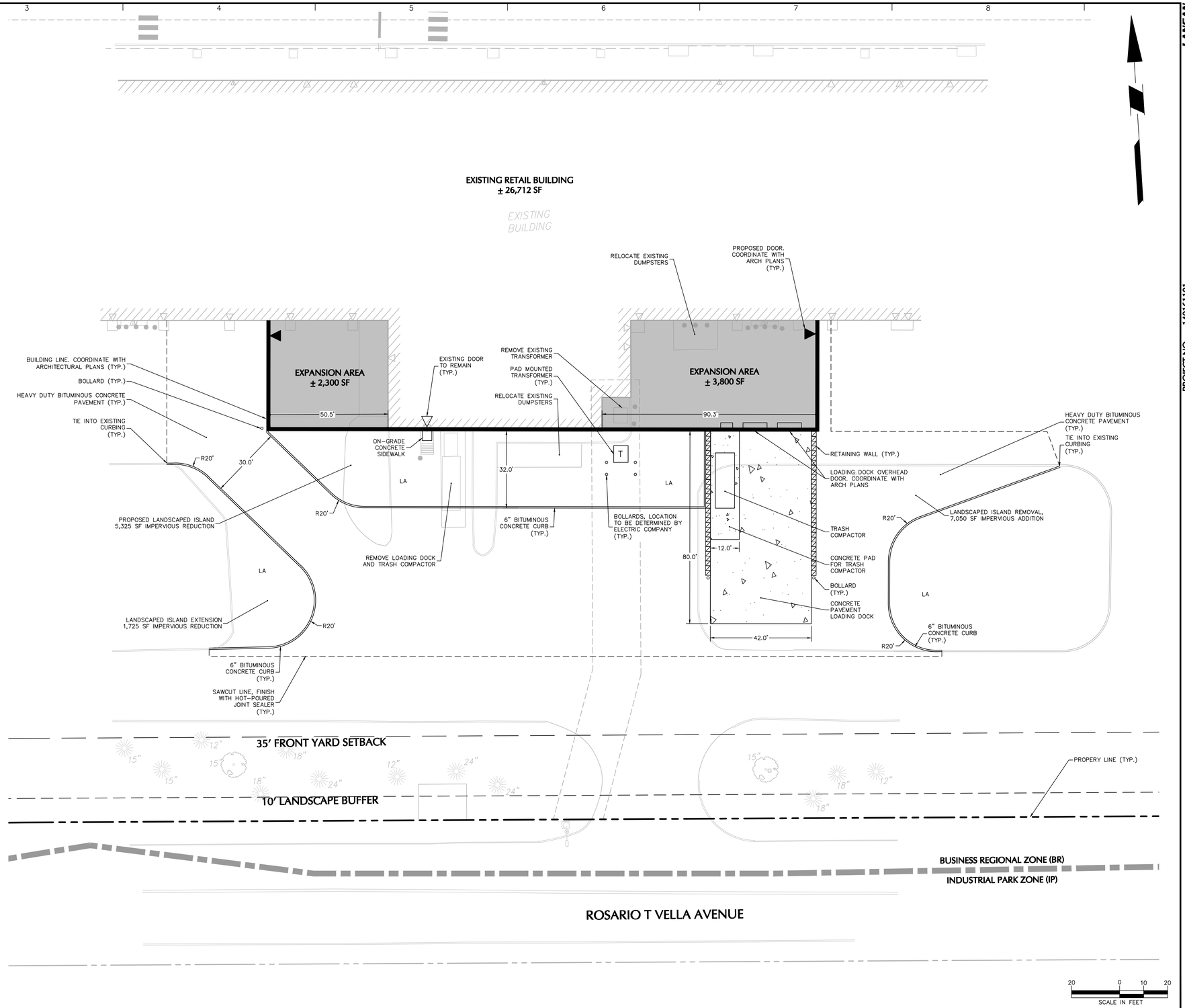
Drawing No. CS100
Sheet 4 of 9

LANGAN
PROJECT NO. 140161101



WB-67 TRUCK TURNING MANEUVER

1"=30'



Date	Description	No.
REVISIONS		

STATE OF CONNECTICUT
ANTHONY S. ONOFRIO
No. 25760
LICENSED
PROFESSIONAL ENGINEER

LANGAN

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Project
BURLINGTON COAT FACTORY EXPANSION AT BROOKSIDE PLAZA
50 HAZARD AVENUE
ENFIELD CONNECTICUT

Drawing Title
SITE PLAN

Project No. 140161101
Date 5/22/2020
Drawn By BP
Checked By TSO

Drawing No. CS101
Sheet 5 of 9

LANGAN
PROJECT NO. 140161101

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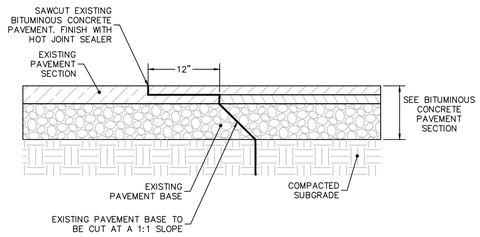
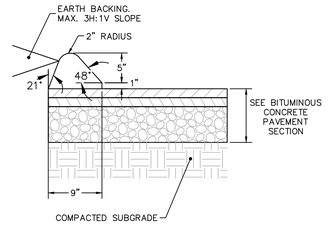


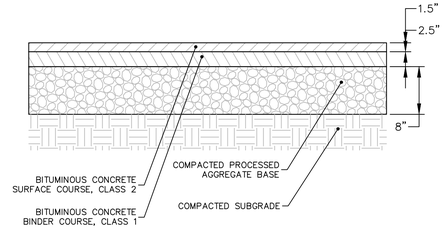
NOTES:
1. CONTRACTOR TO INSTALL TACK COAT ON ALL BUTT EDGES OF EXISTING PAVEMENT

1 SAWCUT PAVEMENT SECTION
N.T.S



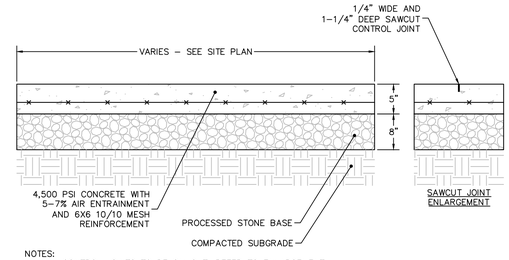
NOTES:
1. PROVIDE NOTCHED SEAT IN CURB AT LOCATIONS OF INTEGRAL BITUMINOUS CONCRETE SIDEWALK AND CURB

2 6" BITUMINOUS CONCRETE CURB
N.T.S



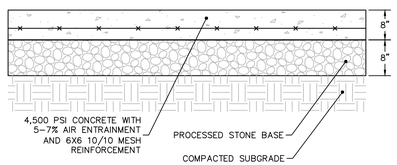
NOTES:
1. PROVIDE BITUMINOUS CONCRETE PAVEMENT AS INDICATED ON THE SITE PLAN.
2. BITUMINOUS CONCRETE SHALL CONFORM TO CT D.O.T. SPECIFICATIONS, FORM 817 SECTION 4.06, LATEST REVISION
3. PROCESSED AGGREGATE SHALL CONFORM TO CT D.O.T. SPECIFICATIONS, FORM 817 SECTION 3.04, LATEST REVISION

3 BITUMINOUS CONCRETE PAVEMENT SECTION - HEAVY DUTY
N.T.S



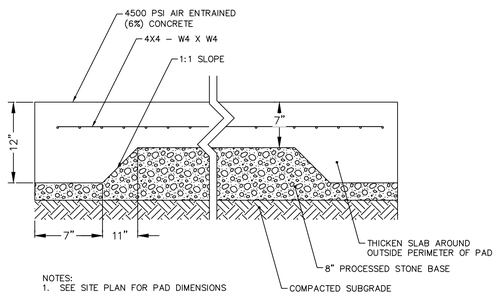
NOTES:
1. ALL CONTROL JOINTS TO BE SAWCUT, REFER TO ENLARGEMENT
2. SIDEWALKS TO COMPLY WITH CITY STANDARDS WHERE APPLICABLE.
3. EXPANSION AND CONTROL JOINTS SHALL BE INSTALLED PER LAYOUT AND DIMENSIONING PLANS. IF NOT SPECIFICALLY DETAILED MAXIMUM SPACING OF JOINTS SHALL BE AS FOLLOWS:
   EXPANSION – 20 FT.
   CONTROL – 5 FT.
4. CONTROL JOINTS SHALL BE SPACED EQUAL TO THE WIDTH BUT SHALL NOT EXCEED 6 FT. CARE SHALL BE TAKEN TO ASSURE UNIFORM GRADE, FREE OF SAGS AND SHORT GRADE CHANGES.
5. SURFACE TEXTURE SHALL BE A LIGHT BROOMING, TRANSVERSE TO THE LENGTH OF THE WALK.
6. CONTRACTOR TO PROVIDE 10'x10' MOCKUP SHOWING EXPANSION JOINTS, SAWCUT JOINTS, AND BROOM FINISH PRIOR TO INSTALLATION

4 ON-GRADE CONCRETE SIDEWALK
N.T.S



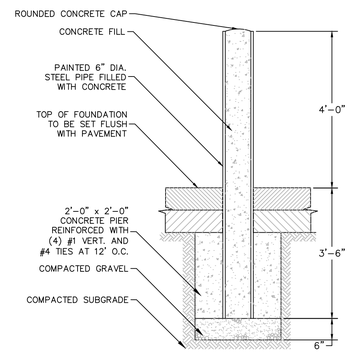
NOTES:
1. PRIOR TO ANY PAVING ACTIVITIES, THE SUBGRADE OR SUBBASE SHALL BE PROOF ROLLED.
2. PRIOR TO INSTALLATION OF PAVEMENT, THE SUBGRADE SHOULD BE SURFACE COMPACTED WITH A MINIMUM OF 4 PASSES WITH A VIBRATORY ROLLER HAVING A MINIMUM STATIC WEIGHT OF 10-TONS.
3. ANY SOFT AREAS SHALL BE REMOVED AND REPLACED WITH CLEAN, GRANULAR, FREE-DRAINING SOIL.
4. FILL SHALL BE PLACED IN LOOSE LIFTS NOT TO EXCEED 12-INCHES AND SHALL BE COMPACTED TO AT LEAST 95% OF ITS MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-1557.
5. TRANSVERSE AND LONGITUDINAL CONTROL JOINTS SHALL BE SAW CUT AT 15 FT MAXIMUM SPACING.
6. DOWEL BARS SHALL BE PLACED AT ALL JOINTS.
7. SURFACE TEXTURE SHALL BE A MEDIUM BROOM FINISH.

4 CONCRETE PAVEMENT
N.T.S



NOTES:
1. SEE SITE PLAN FOR PAD DIMENSIONS

4 CONCRETE PAD
N.T.S



NOTES:
1. PAINT PRIME AND FINISH COATS TO BE COMPATIBLE WITH EXTERIOR METAL SURFACES. COLOR SHALL BE PROVIDED OWNER/ARCHITECT

5 BOLLARD
N.T.S

Date	Description	No.
REVISIONS		

STATE OF CONNECTICUT TIMOTHY S. ONDRICK No. 25760 LICENSED PROFESSIONAL ENGINEER

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Project
BURLINGTON COAT FACTORY EXPANSION AT BROOKSIDE PLAZA
50 HAZARD AVENUE
ENFIELD CONNECTICUT

Drawing Title
SITE DETAILS

Project No. 140161101
Date 5/22/2020
Drawn By BP
Checked By TSO

Drawing No. CS501

Sheet 6 of 9

LANGAN

PROJECT NO. 140161101

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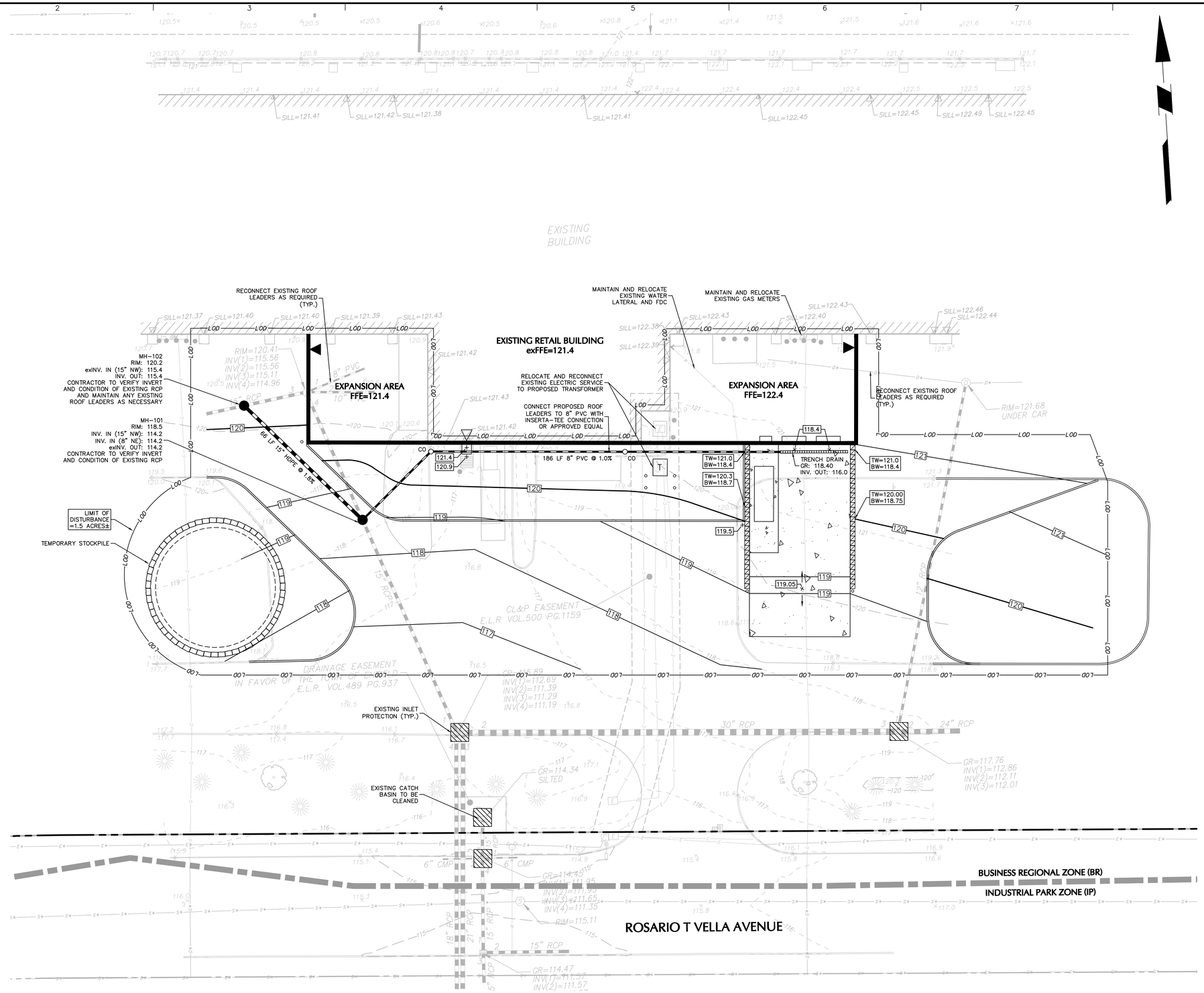

Date	Description	No.
	REVISIONS	

STATE OF CONNECTICUT
TIMOTHY S. ONDECK
No. 25760
LICENSED
PROFESSIONAL ENGINEER

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Project
BURLINGTON COAT FACTORY EXPANSION AT BROOKSIDE PLAZA
50 HAZARD AVENUE
ENFIELD CONNECTICUT

Drawing Title
GRADING, DRAINAGE, UTILITY, AND EROSION CONTROL PLAN

Project No. 140161101
Date 5/22/2020
Drawn By BP
Checked By TSO

Drawing No. CG101
Sheet 7 of 9

LANGAN
PROJECT NO. 140161101

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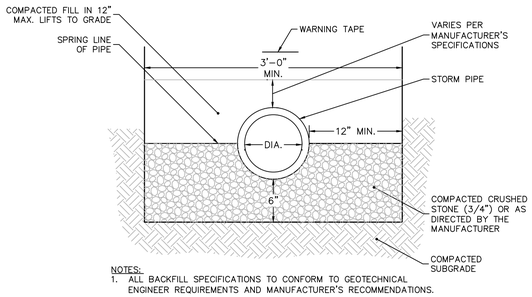
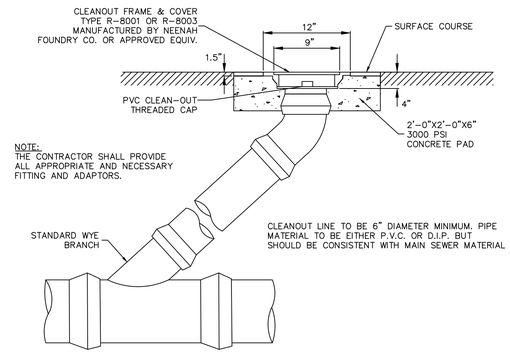
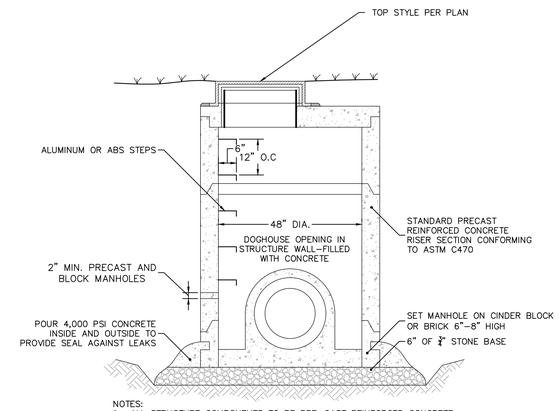


NOTES:
1. ALL BACKFILL SPECIFICATIONS TO CONFORM TO GEOTECHNICAL ENGINEER REQUIREMENTS AND MANUFACTURER'S RECOMMENDATIONS.

1 STORM PIPE BEDDING
N.T.S

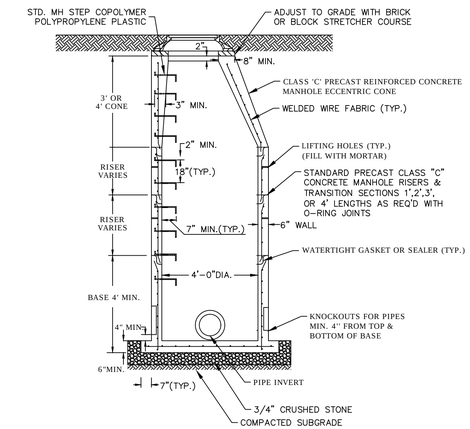


2 STORM CLEANOUT
N.T.S



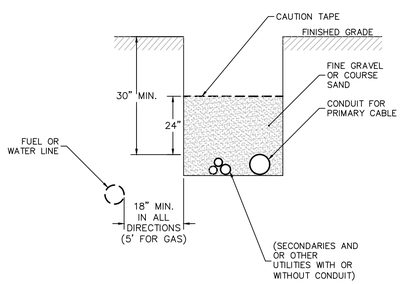
NOTES:
1. ALL STRUCTURE COMPONENTS TO BE PRE-CAST REINFORCED CONCRETE, ABLE TO WITHSTAND THE APPLIED EARTH LOADS WITH AN HS-20 TRUCK LOAD.
2. ALL JOINTS TO BE MORTARED.
3. STRUCTURE SHALL CONFORM TO ASTM C478.

3 DOGHOUSE STRUCTURE
N.T.S



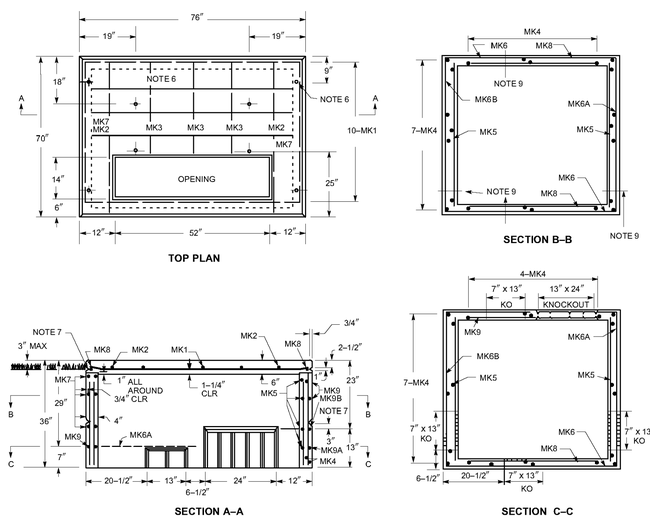
NOTES:
1. DIAMETER OF MANHOLE SHALL BE REVIEWED BY THE CONTRACTOR TO DETERMINE A LEGEND OF STANDARD MANHOLE DIMENSIONS WITH RESPECT TO PROPOSED PIPE SIZES, NUMBER AND GEOMETRY. OVER SIZE MANHOLES SHALL BE INSTALLED IF MINIMUM 6" WALL DIMENSION BETWEEN PIPES IS NOT PROVIDED.
2. MANHOLES SHALL BE STANDARD PRECAST CONCRETE UNITS AND SHALL BE DESIGNED AND CONSTRUCTED BY THE MANUFACTURER TO SUPPORT TRUCK H-20 LOADING.

4 STORM MANHOLE
N.T.S



NOTES:
1. ALL DIRECT-BURIED CABLES SHALL BE INSTALLED AT A DEPTH OF AT LEAST 30 INCHES IN THE FOLLOWING ORDER:
   A. ENSURE THAT THE BOTTOM OF THE TRENCH IS WELL-TAMPED AND FREE OF ROCKS.
   B. INSTALL THE CONDUIT, GLUING ALL COUPLINGS.
   C. INSTALL SECONDARIES AND OTHER UTILITY CABLES OR CONDUITS LARGER THAN 2 INCHES IN MAXIMUM DIAMETER.
   D. BACKFILL WITH 12 INCHES CLEAN FILL NOT TO CONTAIN STONES LARGER THAN 2 INCHES IN MAXIMUM DIAMETER.
   E. INSTALL CABLE WARNING TAPE 12 INCHES OVER THE CONDUIT.
   F. FILL IN THE REMAINDER OF THE TRENCH WITH NATIVE BACKFILL.
2. THE TRENCH SHALL BE BACKFILLED IMMEDIATELY FOLLOWING PLACEMENT OF THE CONDUIT.
3. 1/4-INCH NYLON ROPE AND PLASTIC CONDUIT PLUG TO BE SUPPLIED AND INSTALLED BY CONTRACTOR.

3 ELECTRICAL UTILITY TRENCH
N.T.S



NOTES:
1. CONTRACTOR TO COORDINATE PAD SPECIFICATIONS WITH UTILITY PROVIDER.

4 TRANSFORMER PAD
N.T.S

Date	Description	No.
	REVISIONS	

STATE OF CONNECTICUT · BRIGHT'S ORDER · No. 25760 · LICENSED PROFESSIONAL ENGINEER

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Project: BURLINGTON COAT FACTORY EXPANSION AT BROOKSIDE PLAZA
50 HAZARD AVENUE
ENFIELD CONNECTICUT

Drawing Title: GRADING, DRAINAGE, UTILITY, AND EROSION CONTROL DETAILS I

Project No. 140161101
Date 5/22/2020
Drawn By BP
Checked By TSO

Drawing No. CG501

Sheet 8 of 9

LANGAN
PROJECT NO. 140161101

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SOIL EROSION-SEDIMENT CONTROL NOTES

PROPOSED DEVELOPMENT

1. CONSTRUCTION WILL INCLUDE EARTHWORK, CURBING, PAVING, UTILITY INSTALLATION, LANDSCAPING AND BUILDING CONSTRUCTION. ALL DEMOLITION DEBRIS AND SOIL REMOVAL RELATED TO CONSTRUCTION SHALL BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH APPLICABLE STATE AND LOCAL LAWS GOVERNING SUCH ACTIVITIES.
2. THE DETAILED EROSION AND SEDIMENT CONTROL MEASURES ARE SHOWN ON DRAWING CE101. THE PROPOSED MEASURES HAVE BEEN DESIGNED TO PREVENT THE MIGRATION OF SOIL SEDIMENT FROM THE SITE.

SOIL EROSION AND SEDIMENT CONTROL NOTES

1. CONTRACTOR SHALL BE RESPONSIBLE FOR PHASING OF SOIL AND SEDIMENT CONTROL PRACTICES TO ENSURE SOIL AND SEDIMENT ARE PREVENTED FROM LEAVING THE DEVELOPMENT AREA THROUGHOUT DEMOLITION & CONSTRUCTION.
2. THE SOIL AND SEDIMENT CONTROL PRACTICES MUST BE INSTALLED IN ACCORDANCE WITH THE LOCAL GOVERNING AUTHORITY AND THE CONNECTICUT COUNCIL ON SOIL AND WATER CONSERVATION AND THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL.
3. EROSION AND SEDIMENT CONTROL DEVICES MUST BE INSTALLED PRIOR TO START OF DEMOLITION AND CONSTRUCTION AND DISTURBANCE OF SITE CONTRIBUTORY DRAINAGE AREAS. THE OWNER OR ITS CONTRACTOR SHALL INSPECT, REPAIR AND REMOVE ALL SEDIMENT AND EROSION CONTROL DEVICES, AS INDICATED HEREIN. ALL EARTH CHANGES SHALL BE DESIGNED, CONSTRUCTED, AND COMPLETED IN SUCH A MANNER SO THAT THE EXPOSED AREA OF ANY DISTURBED LAND SHALL BE LIMITED TO THE SHORTEST POSSIBLE PERIOD OF TIME.
4. DISPOSAL OF COLLECTED SEDIMENT SHALL BE MADE TO AREA DESIGNATED BY THE OWNER'S SOIL ENGINEER.
5. FILTER FABRIC/SILT FENCE WILL BE INSTALLED ALONG THE TOE OF ALL CRITICAL CUT AND FILL SLOPES.
6. ALL TOPSOIL NOT TO BE USED FOR FINAL GRADING/LANDSCAPED AREAS SHALL BE REMOVED FROM THE SITE IMMEDIATELY, IN ACCORDANCE WITH APPLICABLE STATE AND LOCAL LAW. ALL TOPSOIL TO BE USED IN LANDSCAPED AREAS SHALL BE STORED/STOCKPILED IN ACCORDANCE WITH APPLICABLE STATE AND LOCAL LAW STANDARDS.
7. ALL AREAS WITHIN 500 FEET OF AN INHABITED DWELLING SHALL BE WETTED AS NECESSARY TO PROVIDE DUST CONTROL.
8. PAVEMENT BASE COURSE MUST BE PLACED IN ALL NEW ROADWAY AREAS UPON COMPLETION OF FINE GRADING.
9. THE CONTRACTOR IS RESPONSIBLE FOR ALL PAVED ROADWAYS, ON AND OFF-SITE, WHICH MUST BE KEPT FREE OF SITE GENERATED SEDIMENT AT ALL TIMES. DUST SHALL BE CONTROLLED BY SPRINKLING OR OTHER APPROVED METHOD.
10. ALL STORM DRAINAGE OUTLETS MUST BE STABILIZED, AS REQUIRED, BEFORE THE DISCHARGE POINTS BECOME OPERATIONAL.
11. SILT FENCES AND BARRIERS MUST BE CLEANED OR REPLACED PERIODICALLY TO REMOVE BUILT-UP SILT.
12. SEDIMENT TRAPS MUST BE CLEANED WHEN CAPACITY HAS BEEN REDUCED BY AN AVERAGE OF 2'-0" OVER ITS TOTAL AREA OR TO 70% OF ITS DESIGN VOLUMES, WHICHEVER OCCURS FIRST.
13. ALL EROSION AND SEDIMENT CONTROL DEVICES MUST BE INSPECTED ON A DAILY BASIS AND CLEANED IMMEDIATELY AFTER EACH STORM.
14. ANY TEMPORARY OR PERMANENT FACILITY DESIGNED FOR THE CONVEYANCE OF WATER AROUND, THROUGH, OR FROM THE EARTH CHANGE AREA SHALL BE DESIGNED TO LIMIT THE WATER FLOW TO A NON-EROSIVE VELOCITY.
15. THE CONTRACTOR SHALL CORRECT ANY OMISSIONS, ERRORS, OR FIELD OPERATIONS IMMEDIATELY AND IN ACCORDANCE WITH THE GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL.
16. ANY CONVEYANCE OF THIS PROJECT PRIOR TO ITS COMPLETION WILL TRANSFER FULL RESPONSIBILITY FOR COMPLIANCE WITH THE CERTIFIED PLAN TO ANY SUBSEQUENT OWNERS.
17. SOIL EROSION AND SEDIMENT CONTROLS MUST BE INSPECTED BY THE ZONING ENFORCEMENT OFFICER BEFORE WORK MAY COMMENCE.
18. THE PROPERTY OWNER AND/OR HIS/HER AGENTS MUST MAINTAIN (REPAIR/REPLACE), WHEN NECESSARY, THE SILTATION CONTROL UNTIL ALL DEVELOPMENT ACTIVITY IS COMPLETED AND ALL DISTURBED AREAS ARE PERMANENTLY STABILIZED.

TEMPORARY STABILIZATION

SEDIMENT DISPOSAL AREAS AND TOPSOIL STOCKPILES NOT SCHEDULED FOR CONSTRUCTION ACTIVITIES WITHIN THIRTY (30) DAYS OF DISTURBANCE SHALL BE STABILIZED AS FOLLOWS:

A. SOIL AMENDMENTS AS NECESSARY.

B. ANNUAL RYE GRASS SEEDING APPLIED AT A RATE OF NOT LESS THAN 1 LB. PER 1,000 SF.

C. MULCH ALL NEWLY SEEDED AREAS WITHIN 80 LBS. OF SALT HAY OR SMALL GRAIN STRAW PER 1,000 SF.

D. WHEN DISTURBED AREAS ARE SCHEDULED FOR IMMEDIATE LANDSCAPING THEY MAY BE MULCHED AND SEEDED PER ITEM C ABOVE.

PERMANENT STABILIZATION

REFER TO PLANS FOR PERMANENT STABILIZATION METHODS + PROPOSED SEED MIXES.

A. PERMANENT VEGETATION IS TO BE SEEDED OR SODDED ON ALL DISTURBED LAND AREAS WITHIN SEVEN (7) DAYS AFTER FINAL GRADING. MULCH AS NECESSARY FOR SEED PROTECTION AND ESTABLISHMENT. AMEND SOIL AS NEEDED PRIOR TO PERMANENT SEEDING. WHEN IT IS NOT POSSIBLE TO PERMANENTLY STABILIZE A DISTURBED AREA AFTER COMPLETION OF AN EARTH CHANGE OR WHEN SIGNIFICANT EARTH CHANGE ACTIVITY CEASES, TEMPORARY SOIL EROSION CONTROL MEASURES SHALL BE IMPLEMENTED. ALL TEMPORARY SOIL EROSION CONTROL MEASURES SHALL BE MAINTAINED UNTIL PERMANENT SOIL EROSION CONTROL MEASURES SHALL BE IMPLEMENTED. ALL DISTURBED AREAS, STOCKPILES OF FILL OR EXCAVATED MATERIAL SHALL BE STABILIZED IN SUCH A MANNER AS NOT TO CAUSE UNREASONABLE HAZARD TO PERSONS OR PROPERTY.

B. MATERIALS SPECIFICATION: LAWN + MEADOW AREAS

(i) ANY SOIL HAVING A pH OF FOUR OR LESS CONTAINING IRON SULFIDES SHALL BE COVERED WITH A MINIMUM OF TWELVE INCHES OF SOIL HAVING A pH OF FIVE OR MORE PRIOR TO SEED BED PREPARATION.

C. MULCHING SHALL BE DONE AT THE RATE OF SEVENTY TO NINETY POUNDS (70-90 LBS) PER 1,000 SQUARE FEET WITH UNROTTED SALT HAY.

D. LIQUID MULCH BINDERS MUST BE USED TO ANCHOR SALT HAY, HAY OR STRAY MULCHES.

(i) APPLICATIONS SHOULD BE HEAVIER AT EDGES WHERE WIND CATCHES THE MULCH IN VALLEYS AND AT CREATED BANKS. REMAINDER OF AREA SHOULD BE UNIFORM IN APPEARANCE.

(ii) USE ONE OF THE FOLLOWING: SYNTHETIC OR ORGANIC BINDERS, BINDERS SUCH AS CURASOL DCA-70, PETRO SET, TERRA TACH, HYDRO MULCH AND AEROSPRAY MAY BE USED AT RATES RECOMMENDED BY THE MANUFACTURER OF ANCHOR MULCH MATERIALS. BINDERS CONTAINING PETROLEUM PRODUCTS SHALL NOT BE USED.

NOTE: ALL NAMES GIVEN ABOVE ARE REGISTERED TRADE NAMES. THIS DOES NOT CONSTITUTE A RECOMMENDATION OF THESE TO THE EXCLUSION OF OTHER PRODUCTS.

D. FILL MATERIAL SHALL BE FREE FROM DEBRIS, PERISHABLE OR COMBUSTIBLE MATERIAL AND FROZEN OR WET EARTH OR STONES LARGER THAN THREE INCHES IN MAXIMUM DIMENSION.

E. CONSTRUCTION AREAS SHALL BE PERIODICALLY SPRAYED WITH WATER UNTIL THE SURFACE IS WET TO CONTROL THE GENERATION OF DUST.

F. ALL REVISIONS AFTER APPROVAL HAS BEEN GRANTED SHALL BE FORWARDED TO THE APPROPRIATE DISTRICT FOR REVIEW.

G. THE LOCAL GOVERNING AUTHORITY SHALL RECEIVE WRITTEN NOTIFICATION SEVENTY TWO HOURS BEFORE THE START OF ANY CONSTRUCTION.

H. SEEDBED PREPARATION:

(i) TOPSOIL SHOULD BE A MINIMUM OF SIX INCHES DEEP (LIGHTLY COMPACTED) BEFORE SEEDING.

(ii) TOPSOIL SHALL BE TESTED PRIOR TO SEEDING.

(iii) WORK SOIL AMENDMENTS INTO SOIL AS NECESSARY AS NEARLY AS PRACTICAL TO A DEPTH OF FOUR INCHES WITH A DISC, SPRINGTOOTH HARROW OR OTHER SUITABLE EQUIPMENT. THE FINAL HARROWING OR DISCING OPERATION SHOULD BE ON THE GENERAL CONTOUR. CONTINUE ALL CLAY OR SILTY SOIL AND COARSE SANDS SHOULD BE ROLLED TO FIRM THE SEED BED WHEREVER FEASIBLE.

(iv) REMOVE FROM THE SURFACE ALL STONES ONE INCH OR LARGER IN ANY DIMENSION. REMOVE ALL OTHER DEBRIS, SUCH AS WIRE, CABLE, TREE ROOTS, PIECES OF CONCRETE, CLODS, LUMPS, OR OTHER UNSUITABLE MATERIAL.

(v) INSPECT SEED BED JUST BEFORE SEEDING. IF TRAFFIC HAS LEFT SOIL COMPACT, THE AREA MUST BE RETILLED AND FIRMED AS ABOVE.

CONTINGENCY SOIL EROSION AND SEDIMENT CONTROL NARRATIVE

19. THE GENERAL CONTRACTOR WILL DESIGNATE PERSONNEL FOR 24 HOUR EMERGENCY RESPONSE IN THE EVENT OF SEVERE WEATHER AND INCREASED POTENTIAL FOR SEVERE EROSION.
20. THE GENERAL CONTRACTOR IS REQUIRED TO MAINTAIN ON SITE OR HAVE THE ABILITY TO RETRIEVE WITHIN 12 HOURS THE FOLLOWING MATERIALS IN THE EVENT THAT THERE ARE DEFICIENCIES IN THE SESC MEASURES:

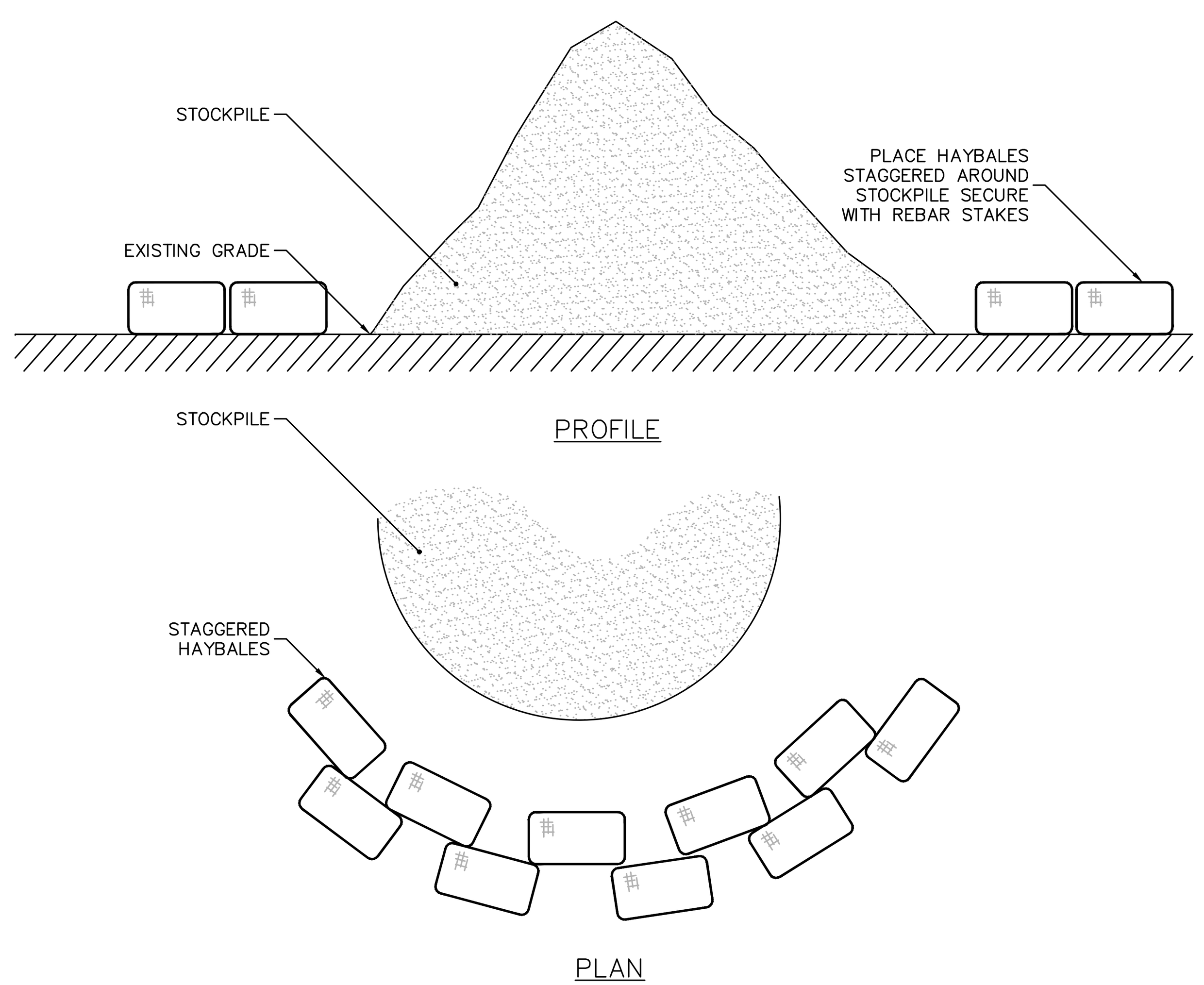
A. 25% OF THE INSTALLED LENGTH OF SILT FENCE

B. EQUIVALENT TONNAGE OF STONE FOR STABILIZATION OF 2 STABILIZATION ENTRANCES. STONE COULD BE USED FOR SLOPE REPAIRS, ENERGY DISSIPATER ENHANCEMENTS, ETC.

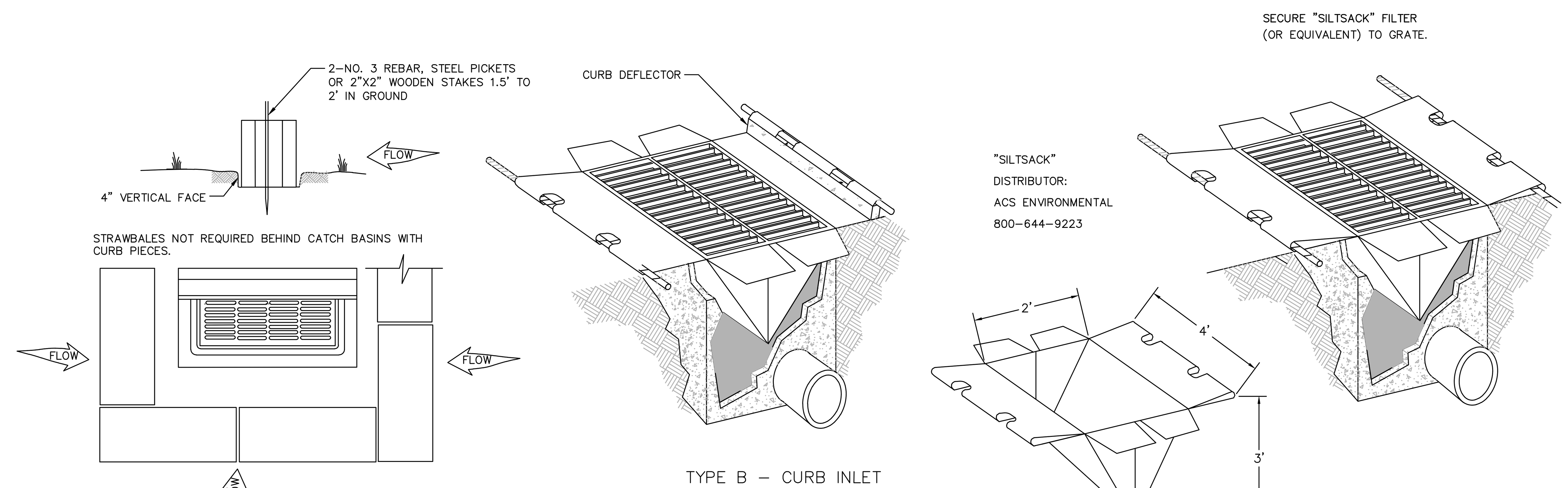
C. HEAVY EQUIPMENT CAPABLE OF TRENCHING/EXCAVATING LARGE AREAS TO DIVERT AND CONTROL RUNOFF IN A CONTROLLED MANNER.

D. HAVE DESIGNATED A HYDRO-SEED CONTRACTOR CAPABLE OF RESPONDING TO THE SITE WITHIN 12 HOURS

21. ANY STUMP GRINDINGS OR WOOD CHIPS GENERATED ON-SITE SHOULD BE RETAINED FOR USE TO BACK UP SILT FENCES.



1 **TEMPORARY STOCKPILE**
N.T.S



NOTES:
1. CONTRACTOR IS TO CLEAN INLET FILTER WHEN RESTRAINT CORD IS NO LONGER VISIBLE AS PER MANUFACTURER'S SPECIFICATIONS.
2. CONTRACTOR TO REMOVE FILTER JUST PRIOR TO PAVING.

2 **INLET PROTECTION**
N.T.S

Date	Description	No.
REVISIONS		

LANGAN

Langan CT, Inc.
555 Long Wharf Drive
New Haven, CT 06511
T: 203.562.5771 F: 203.789.6142

Project
BURLINGTON COAT FACTORY EXPANSION AT BROOKSIDE PLAZA
50 HAZARD AVENUE
ENFIELD CONNECTICUT

Drawing Title
GRADING, DRAINAGE, UTILITY, AND EROSION CONTROL DETAILS II

Project No. 140161101
Date 5/22/2020
Drawn By BP
Checked By TSO

Drawing No. CG502
Sheet 9 of 9

LANGAN PROJECT NO. 140161101

01/17/2006 $285,000.00 State Conveyance Tax Received
$71,250.00 Town Conveyance Tax Received

AFTER RECORDING RETURN TO:

William S. Wilson, Esq.
Greenberg Traurig, LLP
One International Place
Boston, MA 02110

SPECIAL WARRANTY DEED

KNOW ALL MEN BY THESE PRESENTS:

THAT, GATEWAY CONNECTICUT PROPERTIES, INC., a California corporation ("Grantor"), for and in consideration of the sum of Ten and No/100 Dollars ($10.00) and other good and valuable consideration in hand paid to Grantor by EQUITY ONE (BROOKSIDE) LLC, a Massachusetts limited liability company ("Grantee"), whose mailing address is 1600 N.E. Miami Gardens Drive, North Miami Beach, FL 33179, the receipt and sufficiency of such consideration being hereby acknowledged, has GRANTED, SOLD AND CONVEYED, and by these presents does hereby GIVE, GRANT, SELL, BARGAIN AND CONVEY unto Grantee that certain real property being more particularly described in Exhibit A attached hereto and made a part hereof for all purposes, together with all improvements, structures and fixtures situated thereon (collectively, the "Property"); subject, however, to those matters more particularly described in Exhibit B attached hereto and made a part hereof for all purposes (collectively, the "Permitted Exceptions").

TO HAVE AND TO HOLD the Property, together with all and singular the rights, and appurtenances thereto in anywise belonging, unto Grantee, its successors and assigns forever, subject to the Permitted Exceptions; and Grantor does, for itself, its successors and assigns, covenant with Grantee and its successors and assigns, that the Property is free from all encumbrances made or suffered by Grantee, except for the Permitted Exceptions; and Grantor does hereby bind itself and its successors to WARRANT AND FOREVER DEFEND all and singular the Property, subject to the Permitted Exceptions, unto Grantee, its successors and assigns, against the claims and demands made or suffered by Grantor, except as aforesaid, but not otherwise.

[SIGNATURE PAGE TO FOLLOW]

12th IN WITNESS WHEREOF, this instrument has been executed under seal as of this day of January, 2006.

GRANTOR:

GATEWAY CONNECTICUT PROPERTIES, INC., a California corporation

By: _____
Name: EARL W. BUEHNER
Title: VICE PRESIDENT, ASST. SECRETARY & ASST. TREASURER

STATE OF CALIFORNIA)
) ss.
COUNTY OF LOS ANGELES)

On January 11, 2006, before me, the undersigned, Notary Public in and for said State and County, personally appeared Earl W. Buehner, personally known to me (~~or proved to me on the basis of satisfactory evidence~~) to be the person(~~s~~) whose name(~~s~~) is/~~are~~ subscribed to the within instrument and acknowledged to me that he/~~she/they~~ executed the same in his/~~her/their~~ authorized capacity(~~ies~~), and that by his/~~her/their~~ signature(~~s~~) on the instrument the person(~~s~~), or the entity(~~ies~~) upon behalf of which the person(~~s~~) acted, executed the instrument.

WITNESS my hand and official seal.

Shirley T. Sarkisian
Notary Public

SHIRLEY T. SARKISIAN
Commission # 1583982
Notary Public - California
Los Angeles County
My Comm. Expires Jun 28, 2009

EXHIBIT A

LEGAL DESCRIPTION

All that certain piece or parcel of land, with the improvements thereon and appurtenances thereto, situated in the Town of Enfield, County of Hartford and State of Connecticut, shown on a certain map or plan entitled "Enfield Development Agency Plan of Development", Enfield Memorial Industrial Park, Enfield, Connecticut dated March, 1974, revised June 12, 1981, November 12, 1981, August 30, 1982, November 2, 1982, and October 28, 1983, Scale 1" = 100', Sheet 6 of 7, which map is on file in the Enfield Town Clerk's Office, said parcel being more particularly bounded and described as follows:

Beginning at a concrete monument marking the intersection of the east street line of Phoenix Avenue and the south street line of Hazard Avenue, said monument also marking the northwest corner of the property herein described; thence S 86° 47' 28" E, a distance of 628.97 feet and S 86° 20' 08" E, a distance of 1,070.20 feet along the south street line of Hazard Avenue to a concrete monument marking the intersection with the west street line of Freshwater Boulevard; thence along the west street line of Freshwater Boulevard S 3° 39' 52" W, a distance of 219.77 feet to a concrete monument marking a point of curvature to the left, a central angle of 29° 27' 32.8", a radius of 1,080.00 feet and a length of arc of 555.29 feet to a concrete monument marking a return curve to the right, a central angle of 98° 07' 31", a radius of 35.00 feet and a length of arc of 59.94 feet to a concrete monument marking a point of compound curve to the right along the north street line of Fairway Road, a central angle of 21° 00' 57.8", a radius of 713.92 feet and a length of arc of 261.86 feet to a concrete monument marking the point of tangency; thence continuing along the north street line N 86° 39' 03.4" W, a distance of 761.36 feet to a concrete monument marking a point of curve to the left, a central angle of 20° 50' 35.5", a radius of 830.00 feet and a length of arc of 301.94 feet to a concrete monument marking a point of tangency; thence S 72° 30' 21.1" W, a distance of 310.13 feet to a concrete monument marking a return curve to the right with Phoenix Avenue, a central angle of 91° 17' 20", a radius of 35.00 feet and a length of arc of 55.76 feet to a concrete monument marking a point of compound curve in the east street line of Phoenix Avenue; thence continuing in the east street line of Phoenix Avenue on a curve to the right, a central angle of 19° 54' 17", a radius of 2,925.00 feet and a length of arc of 1,016.16 feet to the point or place of beginning.

EXHIBIT B

PERMITTED EXCEPTIONS

1. Real estate taxes and all general and special assessments for 2006 and subsequent calendar years.

2. Rights of tenants under written leases.

3. Local, state and federal laws, ordinances or governmental regulations, including, but not limited to, building and zoning laws, ordinances and regulations, now or hereafter in effect relating to the Property.

4. Matters which would be disclosed by that certain Survey dated December 8, 2005 prepared by Daylor Consulting Group Inc. titled "#10, 28 and 38 Hazard Avenue, Brookside Plaza in Enfield, Connecticut."

5. Sanitary sewer, drainage easements, covenants, and agreements set forth in a Special Warranty Deed from the Town of Enfield and the Enfield Development Agency to Richard D. Bronson and Allan Hutensky dated July 10, 1984 and recorded in Volume 489 at Page 937 of the Enfield Land Records; as affected by a Partial Release of Sanitary Sewer Easement dated July 8, 1986 and recorded in Volume 523 at Page 435 of the said Land Records; as further affected by a Certificate of Occupancy issued by the Enfield Development Agency dated March 25, 1987 and recorded in Volume 542 at Page 507 of the said Land Records.

6. Terms and provisions of a Lease wherein Richard D. Bronson and Allan Hutensky are the Landlord and First National Supermarkets, Inc. is the Tenant, a Notice of which is dated November 28, 1984 and recorded in Volume 495 at Page 44 of the Enfield Land Records; amended by virtue of a First Amendment to Lease dated January 25, 1985 and recorded in Volume 496 at Page 467 of the said Land Records; as affected by a Commencement Date Agreement dated October 3, 1985 and recorded in Volume 507 at Page 779 of the said Land Records; as assigned to, and assumed by, Shaw's Supermarkets, Inc. by virtue of an Assignment of Lease and Assumption Agreement dated October 8, 1986 and recorded in Volume 1011 at Page 316 of said Land Records.

7. Terms and provisions of a Lease wherein Richard D. Bronson and Allan Hutensky are the Landlord and the Stop & Shop Companies, Inc. is the Tenant, a Notice of which is dated December 4, 1984 and recorded in Volume 496 at Page 1 of the Enfield Land Records; as affected by a Commencement Date Agreement dated February 14, 1986 and recorded in Volume 513 at Page 611 of the said Land Records.

8. Water Main Easement in favor of The Connecticut Water Company dated November 13, 1984 and recorded in Volume 496 at Page 250 of the Enfield Land Records.

9. Easement in favor of The Connecticut Light and Power Company dated May 24, 1985 and recorded in Volume 500 at Page 1159 of the Enfield Land Records.

10. Terms and provisions of a Lease wherein Richard D. Bronson and Allan Hutensky are the Lessors and McDonald's Corporation is the Lessee, a Memorandum of which is dated July 10, 1985 and recorded in Volume 503 at Page 65 of the Enfield Land Records; as affected by a Covenant Not to Compete dated July 18, 1985 and recorded in Volume 503 at Page 75 of the said Land Records.

11. Terms and provisions of a Lease wherein Richard D. Bronson and Allan Hutensky are the Lessors and Dunkin' Donuts of Connecticut, Inc. is the Lessee, a Notice of which is dated December 10, 1985 and recorded in Volume 514 at Page 650 of the Enfield Land Records.

12. Easement in favor of The Connecticut Light and Power Company dated March 27, 1986 and recorded in Volume 515 at Page 635 of the Enfield Land Records.

13. Terms and provisions of a Lease wherein Richard D. Bronson and Allan Hutensky, d/b/a Bronson & Hutensky, are the Landlord and Marshalls of Enfield, CT., Inc. is the Tenant, a Notice of which is dated April 21, 1986 and recorded in Volume 517 at Page 25 of the Enfield Land Records.

14. Water Main Easement in favor of The Connecticut Water Company dated August 22, 1986 and recorded in Volume 530 at Page 621 of the Enfield Land Records.

15. Terms and provisions of a Lease wherein Richard D. Bronson and Allan Hutensky are the Landlord and D'Angelo Inc. is the Tenant recorded on November 24, 1986 in Volume 532 at Page 867 of the Enfield Land Records. See also Notice of Lease dated December 30, 1986 and recorded in Volume 538 at Page 129 of the said Land Records. See also Assignment of Lease from D'Angelo Inc. to Delops, Inc. dated December 1, 1993 and recorded in Volume 833 at Page 2 of the said Land Records.

16. Easement in favor of The Connecticut Light and Power Company dated November 25, 1986 and recorded in Volume 533 at Page 357 of the Enfield Land Records.

17. Water Main Easement in favor of The Connecticut Water Company dated February 19, 1987 and recorded in Volume 542 at Page 1013 of the Enfield Land Records.

18. Terms and provisions of a Lease wherein Brookside Associates is the Landlord and Taco Bell Corp. is the Tenant, a Memorandum of which is dated September 2, 1987 and recorded in Volume 558 at Page 1114 of the Enfield Land Records; as affected by a Subordination, Non-Disturbance and Attornment Agreement by and between Maine State Retirement System and Taco Bell Corp. dated June 1, 1987 and recorded in Volume 558 at Page 1109 of the said Land Records.

19. Terms and provisions of a Lease wherein Brookside Associates is the Landlord and Springfield Food Systems, Inc. is the Tenant, a Notice of which is dated February 1, 1988 and recorded in Volume 568 at Page 851 of the Enfield Land Records. Said leasehold interest is affected by the following:

a) Contingent Assignment of Lease by and between Springfield Food System, Inc. and KFC Corporation dated July 15, 1987 and recorded in Volume 568 at Page 880 of the said Land Records;

b) Open-End Leasehold Mortgage Deed, Assignment of Rents, Security Agreement and Fixture Filing from Springfield Food System, Inc. to CBL Capital Corporation dated April 5, 1994 and recorded in Volume 858 at Page 1 of the said Land Records; assigned to Citicorp Leasing, Inc. by virtue of an Assignment of Open-End Leasehold Mortgage Deed, Assignment of Rents, Security Agreement and Fixture Filing dated July 21, 1998 and recorded in Volume 1138 at Page 241 of the said Land Records; modified by virtue of a Modification of Open-End Leasehold Mortgage Deed, Assignment of Rents, Security Agreement and Fixture Filing dated July 20, 1998 and recorded in Volume 1138 at Page 246 of the said Land Records; further modified by virtue of a Modification of Open-End Leasehold Mortgage Deed, Assignment of Rents, Security Agreement and Fixture Filing dated September 11, 2002 and recorded in Volume 1574 at Page 29 of the said Land Records; further modified by virtue of a Third Modification of Open-End Leasehold Mortgage Deed, Assignment of Rents, Security Agreement and Fixture Filing dated April 20, 2005 and recorded in Volume 2038 at Page 30 of the said Land Records;

c) UCC Financing Statement wherein Springfield Food System, Inc. is the Debtor and CBL Capital Corporation is the Secured Party recorded on April 11, 1994 in Volume 858 at Page 30 of the Enfield Land Records; continued by virtue of a UCC Continuation recorded on February 1, 1999 in Volume 1183 at Page 215 of the said Land Records; as further continued by virtue of a UCC Financing Statement Amendment recorded on April 5, 2004 in Volume 1844 at Page 312 of the said Land Records.

20. Letter of Understanding Between Pizza Hut of America, Inc. and Brookside Associates dated December 21, 1989 and recorded in Volume 607 at Page 579 of the Enfield Land Records. See also Assignment and Assumption of Lease Agreement by and between Pizza Hut of America, Inc. and Mita Enterprises, LLC dated March 3, 1999 and recorded in Volume 1198 at Page 342 of the said Land Records. See also Financing Statement wherein Mita Enterprises, LLC is the Debtor and Tricon Capital Corp. is the Secured Party (assigned within the document to Chase Bank of Texas, National Association, as Collateral Agent) recorded in Volume 1199 at Page 1 of the said Land Records; as continued by virtue of a UCC Financing Statement Amendment recorded on October 15, 2003 in Volume 1771 at Page 196 of the said Land Records; as amended by virtue of a UCC Financing Statement Amendment recorded on November 25, 2003 in Volume 1792 at Page 329 of the said Land Records.

21. Terms and provisions set forth in Standard Agreement for Construction and Installation of Public Improvements and Utilities and Related Improvements by and between the Town of Enfield and Brookside Plaza Associates recorded in Volume 614 at Page 334 of the Enfield Land Records.

22. Electric Distribution Easement in favor of The Connecticut Light and Power Company dated June 11, 1993 and recorded in Volume 788 at Page 127 of the Enfield Land Records.

23. Terms and provisions of a Lease wherein Maine State Retirement System is the Landlord and Staples, Inc. is the Tenant, a Memorandum of which is dated June 18, 1993 and recorded in Volume 793 at Page 347 of the Enfield Land Records.

24. Terms and provisions of a Lease wherein Maine State Retirement System is the Landlord and Pier I Imports (U.S.), Inc. is the Tenant, a Memorandum of which is dated August 1, 1994 and recorded in Volume 889 at Page 157 of the Enfield Land Records.

25. Terms and provisions of a Lease wherein Gateway Connecticut Properties, Inc. is the Landlord and The Big Party Corporation is the Tenant, a Notice of which was recorded on August 15, 1996 and recorded in Volume 1001 at Page 102 of the Enfield Land Records.

26. Easement in favor of the Town of Enfield dated March 13, 1991 and recorded in Volume 683 at Page 167 of the Enfield Land Records; as affected by a Consent of Lender by Allstate Life Insurance Company dated April 3, 1991 and recorded in Volume 683 at Page 166 of the said Land Records.

27. (a) All other matters of record affecting the Property insofar as the same are now in force and applicable; and (b) all matters which would be disclosed by an accurate survey and/or any interest in real property which would be disclosed by inspection of the Property.

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RECORDED IN
ENFIELD LAND RECORDS
2006 JAN 17 PM 1:16
SUZANNE F. OLECHNICKI
TOWN CLERK

DOC # 0606499