UPPER CAPE YMCA

Application for a Proposed Development of Regional Impact

485 Brick Kiln Road
Falmouth, Massachusetts 02540

April 2024

Prepared for

YMCA Cape Cod
2245 Iyannough Road
West Barnstable, MA 02668

Prepared by

Green Seal Environmental, LLC
Moriarty, Beilan and Malloy, LLC
Ament Klauer, LLP
SV Design, LLC
BSC Group, INC.
Bowman Consulting Group, LTD
Tunison Environmental Consultants, LLC

Table of Contents

SECTION A

COVER LETTER

Green Seal Environmental, LLC
114 State Road, Bldg. B, Sagamore Beach, MA 02562
T: 508.888.6034 **F:** 508.888.1506
www.gseenv.com

MassDOT Certified

April 29, 2024

Jordan Velozo - Chief Regulatory Officer
CAPE COD COMMISSION
3225 Main Street
Barnstable, MA 02630

RE: Proposed Upper Cape YMCA
DRI Application Submittal

VIA FILE TRANSFER PORTAL

Ms. Velozo,

Green Seal Environmental, LLC, on behalf of YMCA Cape Cod, is pleased to present a Development of Regional Impact Application and supporting exhibits to the Cape Cod Commission (CCC) or review and comment. The YMCA team of attorneys, consultants, engineers and architects have prepared the DRI submittal to address each Technical Bulletin in CCC's Regional Policy Plan. Please note that we have hand delivered the check and labels as well as a flash drive the contains the entire submittal. We will also e-mail you Dropbox link that contains the submittal in its entirety.

We look forward to the review process with the Commission Staff and Members. Should you have and comments, questions or concerns, please feel free to reach me at 508-888-6034 (ex 22) or at s.clark@gseenv.com.

Respectfully submitted,

Stuart D. Clark, PE
Vice President of Engineering Services
Green Seal Environmental, LLC

Attachment as noted

CC: Stacie Peugh - YMCA CC President and CEO
Kimberly A. Bielan, J.D., Principal - Moriarty, Beilan and Malloy, LLC
Kevin P. Klauer, II - Ament Klauer, LLP
Jennifer Hocherman, AIA, LEED AP, Assistant Principal - SV Design, LLC
Jesse Harris, PLA – BSC Group, INC.
Philip Viveiros, Senior PM – Bowman Consulting Group, LTD
Garrett Tunison, PWS – Tunison Environmental Consultants, LLC

SECTION B

COMPLETED DRI APPLICATION FORM

Application Cover Sheet

CAPE COD COMMISSION

Cape Cod Commission
3225 Main Street, PO Box 226
Barnstable, MA 02630
Tel: (508) 362-3828 • Fax: (508) 362-3136

For Commission Use Only

Date Received:
Fee ($):
Check No:
File No:

A Type of Application (check all that apply)

- [x] Development of Regional Impact (DRI)
- [ ] DRI Scoping
- [ ] DRI Exemption
- [ ] Hardship Exemption
- [ ] Jurisdictional Determination
- [ ] Request for Joint MEPA/DRI Review
- [ ] Decision Extension
- [ ] Decision Modification

B Project Information

Project Name: Upper Cape YMCA

Total Site Acreage: 6.15 (+ 1.67 acres shared)

Project/Property Location: 487 Brick Kiln Road (Lot 2B & part of Lot 2A)

Zoning: Agricultural AA

Brief Project Description:
Include total square footage of proposed and existing development, gross floor area, number of lots existing or to be created, specific uses, description of existing conditions, as applicable (attach additional sheets if necessary).

The total area of the devlopment on Lot 2B is 5.4 acres. The remaing portion will be on Lot 2A, which is shared parking with the church, at 1.67 acres. The gross floor area of the proposed building is approximately 68,470 sq. ft. Please see the Executive Summary in Exhibit 2 for further details.

C Owner(s) of Record

List the following information for all involved parcels. Provide copies of each Deed and Purchase and Sale Agreement and/or evidence of leasehold interest, if applicable, for all involved parcels. Proof of ownership/legal rights for Applicant(s) to proceed with the proposed development must be documented prior to the Commission deeming any application complete. List the local, state, or federal agencies from which permits or other actions have been/will be filed (attach additional sheets if necessary).

Map/Parcel	Owner's Name	Lot & Plan	Land Court Certificate of Title #	Registry of Deeds Book/Page #
Parcel ID 26 01 019 02	Christ Lutheran Church of Falmouth	Lot 2B (see plan set)	N/A	Book 2491/Page 198

Local permits will be filed for in Falmouth with the Planning Board, Zoning Board of Appeals, Building Department, Health Department and Fire Department

There **ARE/ARE NOT** (circle one) court claims, pending or completed, involving this property (if yes, please attach relevant information).

Is there an existing CCC Decision for the Property? [ ] yes [x] no (if so, recording information for decision, please attach relevant information).

D Certification

I hereby certify that all information provided on this application form and in the required attachments is true and accurate to the best of my knowledge. I agree to notify the Cape Cod Commission of any changes on the information provided in this application, in writing, as soon as is practicable. I understand failure to provide the required information and any fees may result in a procedural denial of my project.
NOTE: For wireless communication facilities, a licensed carrier should be either an applicant or a co-applicant.

APPLICANT

Applicant(s) Name: Stacie Peugh, President & CEO Tel: 774-212-7633 Fax: 508-362-5379
Address: YMCA of Cape Cod - 100 Independence Drive, Suite 2, Hyannis, MA 02601
Signature: Stacie Peugh Date: 3/29/24

CO-APPLICANT

Co-Applicant(s) Name: Tel: Fax:
Address:
Signature: Date:

CONTACT

Contact: Stuart Clark, PE (Green Seal Environmental, LLC) Tel: 508-888-6034 (ex 22) Fax: s.clark@gseenv.com
Address: 114 State Rd. (Building B) Sagamore Beach, MA 02562
Signature: Date: 4.10.24

PROPERTY OWNER

Property Owner: Christ Lutheran Church of Falmouth Tel: 508 360 3194 Fax:
Address: 485 Brick Kiln Road, Falmouth, MA 02536
Signature: Date: 3-29-24

BILLABLE ENTITY

Name: Tel: Fax:
Address:

SECTION C

DRI APPLICATION FEE CALCULATIONS

Cape Cod Commission Development of Regional Impact

Application Fee Calculation for the Proposed

Upper Cape YMCA, Falmouth, MA

The following calculations are based on the Cape Cod Commission Enabling Regulations, Section 14 (Schedule of Fees as amended for Fiscal Year 2024, last revised on May 3, 2023, with revised fee schedule effective July 1, 2023).

Non-Residential Development:

Building	Gross Floor Area	Calculation
YMCA Building	68,470 sq. ft.	68,470 x $0.66 /sq. ft = $45,190.20
	Sub-Total	**$45,190.20**

Outdoor Space

Outdoor Space	Gross Area	Calculation
Outdoor Activity Areas (west side of YMCA building)	19,480 sq. ft.	19, 480 x $0.66/sq. ft. = $12,856.80
	Sub-Total	**$12,856.80**

<u>Total Application Fee: $59,554.44</u>

The Applicant is filing for a Reduction in Application Fee based on the following allowance in the Schedule of Fees – ***The Applicant provides documentation of non-profit status (10% reduction).*** Therefore, the *<u>Total Revised Application Fee</u>* calculation is:

$58,047 x 0.90 (90%) = **<u>$52,242.00</u>**

Please see the attached Non-Profit Status documentation

SECTION D

DRI EXHIBITS (1 THROUGH 27)

EXHIBIT 1

LIST OF EXHIBITS

Exhibit 1 - List of Exhibits

Upper Cape YMCA, Falmouth, MA
Cape Cod Commission – Development of Regional Impact Submission

Exhibit #	Exhibit Name	Exhibit Description
1	List of Exhibits	Provides an exhibit list within the DRI submittal.
2	Executive Summary	Provides a brief summary of the proposed project.
3	Architectural Summary	Provides a summary of Architectural details for the proposed YMCA Building.
4	RPP and Technical Bulletin Narrative	Provides a summary of how the proposed project will comply with the 2018 Regional Policy Plan and associated Technical Bulletins.
5	List of Required Permits	Provides list of the permits required to develop the proposed project.
6	CCC Application Fee Calculation	Presents a calculation and justification of appropriate fees to the CCC.
7	Property Purchase and Sale Agreement	Provides buyer contract.
8	Certified Abutters List	Provided by the Town of Falmouth Assessors Office.
9	Certification of Local Filing	Provides certification that the DRI document was filed with all required agencies (municipal, state, etc.). Complete.
10	MA Historical Commission	Presents a copy of the filing with the Massachusetts Historical Commission.
11	Renewable Energy Communication	Presents communication between proponent and renewable energy developer.
12	Falmouth Zoning Regulations	Presents copies of each Overlay District Ordinances.
13	Economic Impact Assessment	Provides details regarding the economic impacts associated with developing this project.
14	Town Communications	Presents an overview of meetings and communications with various Town Departments prior to the DRI submittal.
15	Traffic Impact Analysis Study	Provided a comprehensive analysis of traffic impacts and mitigation that will be provided as part of this project's development.
16	Wildlife Habitat Evaluation	Presents findings with respect to the on-site wildlife habitat evaluation conducted at the project site. This report also provides details for an invasive species eradication and restoration program to be undertaken on-site.
17	Open Space Narrative	Presents a limited evaluation on the property that will be provided as part of off-site open space mitigation.
18	Energy Conservation Measures	Provides an overview regarding how the development will incorporate energy conservation measures.

List of Exhibits, continued

Exhibit #	Exhibit Name	Exhibit Description
19	Outdoor Lighting Specifications	Provides manufacturer's details regarding the outdoor lighting fixtures proposed for the development.
20	Nitrogen Calculations and Phosphorus Narrative	Provides a nitrogen loading calculation for the proposed denitrifying septic system and stormwater system, and an impact analysis for phosphorus.
21	Wastewater Engineering Summary	Presents a summary of the proposed septic system components and its denitrifying technology.
22	Stormwater Report	Provides a summary of the proposed stormwater controls and presents HydroCAD™ calculations.
23	Landscape Maintenance Manual	Provides a Maintenance Plan for the proposed stormwater collection and treatment system.

Exhibit #	Plan Set Name	Plan Set Description: Name	Plan Set Description: Number
24	Civil Engineering Plans	Cover Sheet	G-001
		General Notes	G-002
		Existing Conditions Plan	V-101
		Soil Logs and Tree Information	V-601
		Material Layout Plan	C-101
		Material Layout Plan	C-102
		Zoning Compliance Plan	C-103
		Site Utilities Plan	C-104
		Grading Plan	C-105
		Grading Plan	C-106
		Stormwater Drainage Plan	C-107
		Stormwater Drainage Plan	C-108
		Sediment and Erosion Control Plan	C-109
		Profile Entrance Drive	C-301
		nitROE Wastewater Treatment Plant layout	C-401
		nitROE Treatment and Dosing Details	C-402
		Geomatrix Soil Absorption System Details and Layout	C-403
		Details	C-500
		Details	C-501
		Details	C-502
		Details	C-503
		Details	C-504
		Details	C-505
		Details	C-506
		Swept Path Analysis Plan	F-100

List of Exhibits, continued

Exhibit #	Plan Set Name	Plan Set Description	
24	Civil Engineering Plans	Lighting Plan	EL-100
25	Architectural Plans & Renderings	**Name**	**Number**
		Building Front Rendering	P1.0
		Building Sides Renderings	P1.1
		Building Layout – 1st Floor	A1.01
		Building Layout – 2nd Floor	A1.02
		Roof Top Solar System Layout (Plan View)	A1.03
		Elevations (South and North Sides)	A2.1
		Elevations (East Side)	A2.2
		Elevations (West Side)	A2.3
26	Landscape Architectural Plans	**Name**	**Number**
		Cover Sheet	L-000
		Overall Landscape Materials Plan	L-100
		Amenity Space Enlargement	L-101
		Entrance Area Enlargement	L-102
		Overall Landscape Planting Plan	L-200
		Planting Plan - Amenity Space Enlargement	L-201
		Planting Plan - Entrance Area Enlargement	L-202
		Landscape Details	L-300
		Landscape Details	L-301
		Landscape Details	L-302
		Landscape Details	L-303
		Landscape Details	L-304
27	Contextual Area Maps	**Name**	**Number**
		NHESP Priority Habitats Map	C-01
		Falmouth Zoning Map	C-02
		Falmouth Zoning Overlay Districts Map	C-03
		MassDEP Nitrogen Sensitive Areas Map	C-04
		MassGIS Open Space Map	C-05

EXHIBIT 2

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Proposed YMCA Development – Falmouth, MA

Project Description

The YMCA of Cape Cod (Applicant) proposes a development that will create a much-needed community center providing recreation, physical fitness, with medical offices and day-care services to the region in order to promote health, youth development, and social responsibility, and contribute to stronger, more cohesive Cape Cod communities.

The design rationale is to provide a convenient and accessible means to recreation and health care by creating a Community Activity Center that increases the network of YMCA facilities in the region while meeting the Cape Cod esthetic. The facility will include aquatics, wellness, teen/intergenerational, youth and family programs and services. The facility will also include space for the Community Health Center of Cape Cod, Inc. to help ensure that all people in the region will have access to programs and services that focus on health, prevention, and wellness, and reducing the incidence of chronic illness. The project also provides the regional population with a recreation option outside of downtown Falmouth but is in an ideal location close to population centers and cross-town roadways and is available to public transportation via the Cape Cod Regional Transportation Authority Dial-A-Ride Transportation (DART) system six days a week.

The proposed development includes construction of a single two-story commercial structure. The building has been designed to take into consideration the Cape Cod Commission Regional Policy Plan (RPP) and applicable Technical Bulletins as well as the Town of Falmouth Local Comprehensive Plan (LCP) and zoning regulations. The Applicant has endeavored to comply with contextual design guidelines by providing building element heights and roof types to create a rhythm that echoes traditional village patterns. Construction and facade materials have also been selected to reflect traditional Cape Cod aesthetics. Please refer to the Architectural Summary in **Exhibit 3** and Architectural Plans and Renderings in **Exhibit 25** for details.

The development will connect to a water main associated with a residential development abutting the western property line. The proposed development will also share parking with the abutting Christ Lutheran Church of Falmouth (CLCF) to the south. The parking area has been designed to occupy both parcels of land and provide an upgraded stormwater collection and treatment on the church property.

Location and Geography

The proposed development is planned on a newly created 6.15 acres parcel subdivided from the CLCF property (designated as Lot 2B). The CLCF address is 485 Brick Kiln Road in Falmouth. Additionally, the project will strategically utilize a shared parking scheme by redeveloping a portion of the CLCF parking lot via an access and utility easement. The combined area of Lot 2B and the easement area is 340,597 sq. ft., or 7.818 acres. The overall development area on both parcels is approximately 6.3 acres.

Lot 2B is pan-handled in shape with 150 feet of frontage along Brick Kiln Road. The development area is not located within protected areas as delineated in the 2018 RPP map viewer. However, both are located in the Falmouth Zoning Overlay Districts Map in Migration Area 1 and a Water Resource Protection District. The proposed development is adjacent to the Falmouth High School property along the school's west side. The project site is located approximately 1,800 feet north of Long Pond, a public drinking water supply.

Lot 2B is currently undeveloped consisting of a mixed pine-oak woodlands, which is typical of Cape Cod. The topography can be described as "pit and mound" with topographical highs and lows that are commonly associated with glacial outwash landforms. The easement area currently contains a gravel parking area, an asphalt paved parking area used by CLCF, and a woodland area.

According NRCS mapping, the site is underlain by Hinckley loamy sand that is categorized as excessively drained. Hinckley soils are typically formed in glacial outwash and consist of sand and gravel. On-site test pits excavated for the wastewater treatment system and stormwater system designs confirm the NRCS soil mapping.

Neighborhood

The YMCA site is abutted to the north and east sides Falmouth High School land; to the west by a residential development (Village at Brick Kiln), and to the south by CLCF and Brick Kiln Road. Directly across Brick Kiln Road is open space owned by the Town of Falmouth that serves as a natural protective buffer to Long Pond. The residential development to the west was approved through the state Chapter 40B process in 2021. The housing types in that development consist of single-family dwellings, and the general appearance of the residential units is consistent with the Cape Cod aesthetic.

The Falmouth Zoning Map indicates the proposed development is located within an Agricultural AA Zoning District. As noted above the proposed development is also regulated by two Zoning Overlay Districts: a Water Resources Protection District and a Migration Area 1. Migration Area 1 is an area where several mammals (white tailed deer, fox, coyote, etc.), and other animals (ground nesting birds, reptiles, amphibians, etc.) can migrate, browse, bed, shelter, etc.

Wetland Resources

The proposed project is not located within a wetland resource area or buffer zone as defined by the Massachusetts Wetland Protection Act or the Falmouth Wetland Bylaw.

Wildlife & Plant Habitat

The Applicant commissioned a Wildlife Habitat Evaluation to address the Cape Cod Commission's Wildlife and Plant Habitat Technical Bulletin. The evaluation was performed by Tunison Environmental Consultants, LLC (TEC) and involved multiple site visits. TEC's report is presented in **Exhibit 16** of the Applicant's DRI filing. Please note that TEC's evaluation identified a spotty cover of invasive species near the proposed development's central area and the northern end of the proposed development's access panhandle area. Also note that the TEC evaluation also included an invasive species eradication and ecological restoration plan.

Natural Heritage mapping indicates the proposed development does not contain estimated habitat for rare species nor is it in an Area Critical of Environmental Concern (ACEC). A review of MassGIS data indicates the proposed development does not contain BioMap2 Core Habitat and/or Critical Natural Landscapes.

MEPA

This proposed development does not trigger a MEPA review threshold as defined in the MEPA Regulations (section 301 CMR 11.03).

Site Design & Layout

The land area of the proposed development will be divided into the following general categories:

Area	Sq. Ft.	Acres	% Coverage
Grass Cover & Rain Gardens	113,648	2.292	29.32
Stone Fire Lane	16,596	0.381	4.87
Paved Parking, Roads & Walkways	101,696	2.335	29.87
Permeable Pavers	10,268	0.236	3.01
Building Roof	44,789	1.027	13.14
Open Space	53,600	1.547	19.79
Totals	**340,597**	**7.818**	**100.00**

Note: The land area includes both the area of the YMCA parcel (Lot 2B, 267,940 sq. ft.) and the shared parking easement on the CLCB parcel (72,657 sq. ft.)

Access for the YMCA will be provided by a 24-ft wide serpentine paved access drive emanating at Brick Kiln Road and terminating at the building. The access drive will have a sidewalk for pedestrian movement from the sidewalk on Brick Kiln. The existing driveway at CLCF will serve as access for the church and YMCA patrons will be discouraged from using this access point using appropriate signage.

As noted earlier, the proposed development will utilize a shared parking scheme. The parking field consists of four aisles between the church and YMCA building. Each aisle will have a 10-ft wide planted median strip. The shared parking goal is to have the first two aisles nearest the YMCA building dedicated to YMCA operations with the middle aisle serving as shared parking and the last aisle being dedicated to the church. A central walking path will bisect the parking field and provided a direct route from the church to the YMCA facility.

Brick Kiln Road is a town-maintained road. The CCC RPP Viewer Open Space Map indicates that Brick Kiln Road is a dedicated Bike Path Route. The MassDOT Complete Streets Funding Program (2022) states that a 10' wide bike path is planned for the north side of Brick Kiln Road at some point in the near future, which will cross both the proposed development and church access points.

The access point and future bike path will allow easy pedestrian, bicycle, and automobile traffic to migrate to and from the proposed development for nearby residential properties and places of note (e.g., Falmouth High School, Falmouth Center, and surrounding areas). The access will provide a unique sense of entry in accordance with 2018 RPP design guidelines by including village style streetscape signage and lighting. The proposed development entrances will support all the traffic to and from both the YMCA and CLCF.

The proposed design will also encourage pedestrian traffic via an interior sidewalk/crosswalk system. The sidewalk system will be augmented with planting areas and “Focal Point” rain gardens.

A 20-ft wide permeable stone fire lane is proposed along the sides and rear of the YMCA building. The fire lane will be supported by an open geogrid system that allows infiltration of rainwater and snowmelt but will support the weight of firefighting equipment. Utility interconnections will cross underground though the fire lane and the proposed parking area. The water service to the YMCA building will originate at a water service stub at the westerly abutting 40B residential development. Additional detailed information is provided in the narrative and exhibits of the DRI submittal.

Traffic

McMahon Associates conducted a Traffic Impact Analysis Study in the proposed development area that examined traffic to and from three nearby intersections and similar size YMCA facilities in Massachusetts. Refer to **Exhibit 15** of the DRI submittal for further details. Existing 2030 Build and No Build scenarios were modeled. McMahon concluded, “Based on the capacity analysis there would be no change to overall LOS at the signalized study area intersection at Brick Kiln Road at Gifford Street/Gifford Street Extension between the 2030 No Build and 2030 Build conditions. Overall, the proposed YMCA development is not expected to have a significant impact on the overall traffic operations within the study area.”

Utilities

Wastewater generation is estimated at 7,612 gallons per day (gpd) using historical water use records from two similar YMCA facilities and MA Title V guidelines. All collected sewage will be directed to an on-site innovative alternative septic system prior to subsurface disposal. Please refer to **Exhibit 21** Wastewater Engineering Summary in the DRI submittal for a comprehensive discussion of the wastewater treatment system and **Exhibit 24** for the Civil Engineering Drawings which provide layout and design details for the system.

All potable, irrigation, and fire suppression water will be provided by Falmouth's municipal system. Hydrants are planned for locations based on consultation with the Falmouth Fire Department. The water demand will closely mimic wastewater production and incidental water use.

Discussions with the Town of Falmouth Water Department coupled with existing flow data indicate the water system has adequate capacity to accommodate this development. The onsite water main will have two (2) fire hydrants located within 100-ft of the proposed building. Although not yet planned, the Applicant may install an on-site irrigation well on the property in the future to maintain landscaped areas with an estimated withdrawal rate of less than 1,000 gpd.

Stormwater runoff generated from the development's new impervious surfaces including driveways, sidewalks, and roof areas will be collected and treated in compliance with Massachusetts DEP Stormwater Handbook Vol. 2, Ch. 2 - Best Management Practices (BMPs). The Applicant intends on using low impact design (LID) rain garden BMPs as part of the stormwater collection and treatment system. Treated stormwater will be infiltrated in subsurface galleys. Roof runoff will also be infiltrated. Please see the Stormwater Report in **Exhibit 22** and the Civil Engineering Plans in **Exhibit 24** for more detailed information.

Swimming pool backwash water will be directed to a holding tank located on the east side of the proposed building and the water generated will be periodically removed for offsite treatment and disposal.

All other utility lines (electricity, emergency and, communications) will be installed underground in accordance with RPP Design guidelines.

Landscape

The proposed development landscape planting scheme utilizes drought tolerant, native species to reduce irrigation needs. All ornamental landscape beds will be irrigated during the plant establishment period. Some planting areas near the front of the building will have an irrigation system for growing season watering, as needed.

The "Focal Point" Rain Gardens will be planted with drought tolerant native specimen plants to enhance the aesthetic value of each garden in keeping with the natural environment in the site area. The plants were chosen for their flowering types, ability to uptake nutrients and pollutants, their growth height and ground cover area, and their ability to provide food and shade for browsing animals and birds. Well drained soils present on site makes these gardens a good choice to enhance the development with native plantings. Please see the Landscape Architectural Plans in **Exhibit 26** for design details and the Landscape Management Plan in **Exhibit 23** for maintenance details.

Lighting & Energy

The exterior of the building and parking areas will be equipped with low energy LED lights that will meet typical "dark sky" requirements. Low energy LED "wall packs" will provide emergency exit lighting as required by life safety design guidelines in the Massachusetts Comprehensive Fire Safety Code. The exception will be emergency lighting on the proposed standby emergency generator and wastewater treatment system controls in case a power failure or other emergency should occur. Please refer to the

Civil Engineering Plans in **Exhibit 24** for lighting layouts and **Exhibit 19** for Outdoor Lighting Specification Sheets within the DRI filing. Although fixtures have not yet been identified, building interior lighting will also be low energy LED lighting.

Employment

This project will provide construction employment for approximately 175 to 200 workers. It will also create 8 to 10 full-time and 80 part-time jobs for the facility and 15 full-time skilled medical jobs when complete. Please refer to the Economic Impact Assessment presented as **Exhibit 13** of the DRI filing for further detail.

Conclusion

The proposed YMCA development will create a much-needed non-profit recreational and physical fitness center with medical offices and drop off babysitting services for members to promote health, youth development and social responsibility, and contribute to stronger, more cohesive Cape Cod communities.

The facility will include aquatics, wellness, teen/intergenerational, youth and family programs and services. The facility will also include space for the Community Health Center of Cape Cod, Inc. to help ensure that all people in the region will have access to programs and services that focus on health, prevention, and wellness, and reducing the incidence of chronic illness.

EXHIBIT 3

ARCHITECTURAL SUMMARY

Falmouth YMCA Design Narrative

The Falmouth YMCA is a proposed new construction in Falmouth, MA. The building, site amenities, and the services it provides will be an asset to the community.

Falmouth YMCA Program Information

The Falmouth YMCA will be a full-service YMCA construction on two floors with a small basement. The program will include a large lobby, health care tenant spaces, a child watch (babysitting) room, an adventure room for older kids, an intergenerational gathering room, a community room, two pools and associated locker rooms, two exercise class studios, open fitness areas, an office suite, and all associated back-of-the-house mechanical, plumbing and electrical support spaces. Phase 2 will include a gymnasium, running track and additional fitness space.

The building is designed to allow for clear views of the entry from the driveway and all parking spaces. The entry is a 2-story glass façade allowing views into the dynamic interior space. The front overhang will utilize angled heavy timber columns for support and will have an organic shape with a wood underside. This contrast between wood and glass will create an eye-catching entry. This entry is placed between two gable-roofed masses. The two-story shingle form with a gable roof is a reoccurring theme on this building. There are four of these repeated masses that help to form the building. This modernized take on the local vernacular helps the building to feel at home in the community and within the neighborhood. Both natatoriums will have flat roofs which are not visible for the most part from the front parking lot. The natatorium face of the building orients towards the High School and will be screened with vegetation. This northern elevation will also be screened with metal perforated panels providing both glare resistance and visual interest along this façade.

Falmouth YMCA Exterior Materials

The exterior materials are designed to be a contemporary take on the local vernacular. Having an exterior design that fits in with the community is a top priority. The siding material shall be prefinished cementitious shingle with a gray color to match the hue of weathered wood. The canopy at the front of the building will have a wood underside and heavy timber angled posts which will be both support beams and architectural features. All windows will be fixed storefront and curtain wall glazing. All pitched roofs will be finished with asphalt shingles and all flat roofs will have white TPO (thermoplastic olefin) membrane roofing.

Along the main natatorium façade, the wall has upper storefront continuous windows with cementitious siding below and PVC trim. In front of this wall is a system of angled white square columns that sit proud of the siding façade and relate back to the angled nature of the front entrance wooden posts. Concrete bases for these columns will be at grade level and will not project above the ground level. Fixed to the front of the columns is a perforated metal screen system. The perforations will have a pattern meant to look like waves. The metal screen panels work to both eliminate glare on the water inside the natatorium but also to break up the visual length of the façade by creating an interesting yet unobtrusive visual. Examples of similar designs can be seen on the screen manufacturer's website listed below.

https://www.hendrickcorp.com/architectural/products/perforated-imaging/

EXHIBIT 4

RPP AND TECHNICAL BULLETIN NARRATIVE

Cape Cod Regional Policy Plan

Introduction

The ffollowing document has been prepared to explain how this project satisfies and/or takes into consideration the Goals and Objectives of the 2018 Cape Cod Regional Policy Plan (RPP) and applicable Technical Bulletins.

RPP Goals and Objectives Overview

The RPP adopts fourteen Goals, and various Objectives to meet those Goals, to guide and plan for the future of the region in a mfanner consistent with its vision and growth policy. The Goals and Objectives derive from the values and purposes of the Cape Cod Commission Act, preserving and enhancing the region's assets. Organized around the region's Natural, Built, and Community Systems, the Goals and Objectives form the structure upon which the region's planning efforts rely, serve as touchstones to guide implementation actions, and set the measures by which the regulatory review process takes place.

Fourteen Goals

The fourteen Goals identified within the RPP are organized in the following three categories:

1. Natural Systems,
2. Built Systems, and
3. Community Systems.

Proceeding Sections

The proceeding sections discuss the YMCA's proposed development and its applicability to and compliance with the fourteen Goals and Objectives of the RPP. In addition, this document considers the proposed development in light of the following Technical Bulletins:

▪ Capital Facilities and Infrastructure	▪ Housing
▪ Coastal Resiliency	▪ Open space
▪ Community Design	▪ Transportation
▪ Contextual Design	▪ Water Resources
▪ Cultural Heritage	▪ Wetland Resources
▪ Economy	▪ Wildlife and Plant Habitat

Natural Systems

Overview

The Natural Systems Goal and Objectives are designed to protect and restore the quality and function of the region's natural environment that provides clean water and healthy ecosystems upon which life depends. There are five Goals associated with Natural Systems

1. Water Resources
2. Ocean Resources
3. Wetland Resources
4. Wildlife and Plant Habitat
5. Open Space

The Methods the proposed development will use to meet these goals are discussed in the following sections.

Water Resources

Goal	Objective	Utilized Methods
To maintain a sustainable supply of high-quality untreated drinking water and protect, preserve, or restore the ecological integrity of Cape Cod's fresh and marine surface water resources.	Protect and preserve groundwater quality.	Groundwater will be protected and preserved through the use of innovative wastewater and stormwater treatment practices. Refer to **Exhibits 21 and 22** for details.
	Protect, preserve, and restore freshwater resources.	Freshwater resources will be protected and preserved using innovative wastewater and LID stormwater treatment practices including subsurface infiltration.
	Protect, preserve, and restore marine water resources.	This objective does not apply to the proposed development because it is not located on or near a marine environment.
	Manage and treat stormwater to protect and preserve water quality.	Stormwater will be managed to protect and preserve water quality through the use of LID stormwater treatment practices. Refer to **Exhibit 22** for details.
	Manage groundwater withdrawals and discharges to maintain hydrologic balance and protect surface and groundwater resources.	Although not presently planned, should an irrigation well be considered at the proposed development, the Applicant will meet this Objective by limiting the maximum water withdrawal to 1,000 gallons per day to maintain hydrologic balance and protect groundwater and surface water resources.

continued on next page,

Natural Systems, Continued

Ocean Resources

Goal	Objectives	Utilized Methods
To protect, preserve, or restore the quality and natural values and functions of ocean resources.	Locate development away from sensitive resource areas and habitats.	This objective does not apply to the proposed development because it is not located on or adjacent to the ocean.
	Preserve and protect ocean habitat and the species it supports.	Please see above.
	Protect significant human use areas and vistas.	Please see above.

Wetland Systems

Goal	Objectives	Project Response
To protect, preserve, or restore the quality and natural values and functions of inland and coastal wetlands and their buffers.	Protect wetlands and their buffers from vegetation and grade changes.	This objective does not apply to the proposed development because wetlands are not present on or adjacent to the site.
	Protect wetlands from changes in hydrology.	Please see above.
To protect, preserve, or restore the quality and natural values and functions of inland and coastal wetlands and their buffers.	Protect wetlands from stormwater discharges.	Please see above.
	Promote the restoration of degraded wetland resource areas.	Please see above.

Continued on next page,

Natural Systems, Continued

Wildlife and Plant Habitat

Goal	Objectives	Utilized Methods
To protect, preserve, or restore wildlife and plant habitat to maintain the region's natural diversity.	Maintain existing plant and wildlife populations and species diversity.	The development is designed to preserve important existing plant and wildlife populations, to the extent feasible. on-site and at an off-site mitigation property. Planting schedules within the development are proposed to enhance wildlife habitat. Refer to **Exhibits 16 and 26** for details.
	Restore degraded habitats through use of native plant communities.	The Applicant proposes invasive plant removal and restoration activities at the development, which will restore a partially degraded open space habitat.
	Protect and preserve rare species habitat, vernal pools, 350-foot buffers to vernal pools.	This Objective does not apply to the proposed development because rare species habitat is not present on the site, and no vernal pools were identified within 350 feet.
	Manage invasive species.	As noted above, the Applicant proposes invasive plant removal and restoration activities at the development, which will restore a partially degraded open space habitat. (**see Exhibit 16**)
	Promote best management practices to protect wildlife and plant habitat from the adverse impacts of development.	A wildlife migration corridor is proposed for the western border of the site to meet this objective

Continued on next page,

Natural Systems, Continued

Open Space

Goal	Objectives	Project Response
To conserve, preserve, or enhance a network of open space that contributes to the region's natural and community resources and systems.	Protect and preserve natural, cultural, and recreational resources.	The Applicant proposes to meet this Objective by permanently protecting the remaining on-site Open Space (approximately 1.23 acres). Refer to **Exhibit 17** for details.
	Maintain or increase the connectivity of open space.	This Objective will be met by permanently protecting the remaining on-site Open Space. The site Open Space is adjacent to Open Space on the Falmouth High School property to the north, which physically connects to the Long Pond Watershed Open Space. Refer to **Exhibit 17** for details.
	Protect or provide open space appropriate to context.	The Applicant is seeking a waiver of this requirement due to the financial hardship associated with off-site land purchase. We believe the community benefits of this development offset this requirement.

Built Systems

Overview

The Built Systems Goal and Objectives are designed to protect and enhance the built environment and infrastructure necessary to support the region and healthy activity centers. There are six Goals associated with Built Systems:

1. Community Design
2. Coastal Resiliency
3. Capital Facilities and Infrastructure
4. Transportation
5. Energy
6. Waste Management

Each of these Goals and associated Objectives are identified below and discussed in light of the proposed development.

Community Design

Goal	Objectives	Utilized Methods
To protect and enhance the unique character of the region's built and natural environment based on the local context.	Promote context sensitive building and site design	The Applicant will meet this Objective through the proposed development design. Refer to **Exhibits 3 and 25** for details.
	Minimize the amount of newly disturbed land and impervious surfaces.	The Applicant will meet this Objective by limiting, to the extent practicable, the disturbed area and new impervious surfaces for the proposed development. Utilities are proposed beneath impervious areas to help reduce the developed area. In addition, the proposed development includes partial redevelopment and upgrade of the adjacent church gravel parking area. Parking will be shared by the church and the YMCA reducing overall impacts.
	Avoid adverse visual impacts from infrastructure to scenic resources.	The Applicant will meet this Objective through the proposed development design, which sites the building as far away from Brick Kiln Road as is practicable. The Applicant has developed a significant landscaping plan, which will provide vegetative buffering. Brick Kiln Road is not designated as a scenic road, and the site is not located in an area of recognized scenic value.

Continued on next page,

Built Systems, Continued

Coastal Resiliency

Goal	Objectives	Utilized Methods
To prevent or minimize human suffering and loss of life and property or environmental damage resulting from storms, flooding, erosion, and relative sea level rise.	Minimize development in the floodplain	This Objective does not apply because the proposed development is not located in an area that would need significant planning regarding coastal resiliency other than meeting the Massachusetts Building Code for a wind velocity zone and installing utilities underground.
	Plan for sea level rise, erosion, and floods	This Objective does not apply because the proposed development is approximately 50 to 62 feet above mean seal level and not directly on the coast.
	Reduce vulnerability of built environment to coastal hazards	This Objective does not apply because the proposed development is not located in a flood zone.

Capital Facilities & Infrastructure

Goal	Objectives	Utilized Methods
To guide the development of capital facilities and infrastructure necessary to meet the region's needs while protecting regional resources.	Ensure capital facilities and infrastructure promote long-term sustainability and resiliency.	This objective does not apply to the proposed development because it is not considered a capital facility.
	Coordinate the siting of capital facilities and infrastructure to enhance the efficient provision of services and facilities that respond to the needs of the region	This objective does not apply to the proposed development because it is not considered a capital facility.

Continued on next page,

Built Systems, Continued

Transportation

Goal	Objectives	Utilized Methods
To provide and promote a safe, reliable, and multi-modal transportation system.	Improve safety and eliminate hazards for all users of Cape Cod's transportation system.	The Applicant will meet this Objective by proposing pedestrian and bicycle connections at the development to a planned future bike path along Brick Kiln Road. Refer to **Exhibit 15** for details.
	Provide and promote a balanced and efficient transportation system that includes healthy transportation options and appropriate connections for all users.	The Applicant will meet this Objective by proposing pedestrian and bicycle connections at the development to a planned bike path along Brick Kiln Road (Falmouth Complete Streets Prioritization Plan - 2022). In addition, the Applicant has provided a Transportation Demand Management Plan for review. Refer to **Exhibit 15** for details.
	Provide an efficient and reliable transportation system that will serve the current and future needs of the region and its people.	The Applicant will meet this objective because a mixed use is proposed for the development. The location and proposed improvements represent a responsible approach to development.

Continued on next page,

Built Systems, Continued

Energy

Goal	Objectives	Utilized Methods
To provide an adequate, reliable, and diverse supply of energy to serve the communities and economies of Cape Cod.	Support renewable energy development that is context sensitive.	The Applicant will meet this Objective by installing a solar voltaic system on the roof of the proposed building. Additionally, EV charging stations will be installed to promote the use of electric vehicles.
	Increase resiliency of energy generation and delivery.	The Applicant will meet this Objective by locating all utilities underground with the exception of the solar photovoltaic system point of energy production and a proposed standby backup emergency electricity generator for use if the utility-supplied electricity system fails.
	Minimize energy consumption through planning and design (energy efficiency and conservation measures).	The Applicant will meet this Objective by installing building equipment and materials that conserve energy and meet Massachusetts Energy Code requirements. Refer to **Exhibits 13 and 21** for further details.

Waste Management

Goal	Objectives	Utilized Methods
To promote a sustainable solid waste management system for the region that protects public health and safety, the environment and supports the economy.	To promote a sustainable solid waste management system for the region that protects public health, safety, and the environment and supports the economy.	The Applicant will meet this Objective by contracting with waste handling businesses that recycle waste and are compliant with the Massachusetts Waste Ban under 310 CMR 19.017.
	Support an integrated solid waste management system.	The Applicant will meet this Objective by contracting with waste handling businesses that recycle waste and are compliant with the Massachusetts Waste Ban under 310 CMR 19.017.

Community Systems

Overview

The Community Systems Goal and Objectives are designed to protect and enhance the linkages between society, the natural environment, and history vital to the way of life on Cape Cod by supporting development of amenities and life opportunities necessary to support vibrant and diverse communities. There are three Goals associated with Community Systems:

1. Cultural Heritage
2. Economy
3. Housing

Each of the Community Systems Goals and Objectives are identified below and compared to the proposed development.

Cultural Heritage

Goal	Objectives	Utilized Methods
To protect and preserve the significant cultural, historic, and archaeological values and resources of Cape Cod.	Protect and preserve forms, layouts, scale, massing, and key character defining features of historic resources, including traditional development patterns of villages and neighborhoods.	The Applicant will meet this Objective through the proposed development layout and design. Please note that the Massachusetts Historical Commission did not identify any historical features at the site.
	Protect and preserve archaeological resources and assets from alteration or relocation.	This Objective does not apply to the proposed development because the Massachusetts Historical Commission did not identify any archeological resources or assets on site. Refer to **Exhibit 10** for details.
	Preserve and enhance public access and rights to and along the shore.	This Objective does not apply to the proposed development because it is not located on or near a shore line.
	Protect and preserve traditional agricultural and maritime development and uses.	This Objective does not apply to the proposed development because there are no traditional agricultural or maritime features on-site.

Continued on next page,

Community Systems, Continued

Economy

Goal	Objectives	Utilized Methods
To promote a sustainable regional economy comprised of a broad range of businesses providing employment opportunities to a diverse workforce.	Protect and build on the Cape's competitive advantages.	The Applicant will meet these Objectives by creating year-round jobs that will contribute to the local economy. The proposed development will be a local and regional employer for on-site staff that will contribute (along with the facility itself) directly to the local economy (e.g., property management, health care providers, contractors, etc.). Please see the response to the Economy and Housing– Technical Bulletin in this document for further details. Also, refer to **Exhibit 13** for additional details.
	Use resources and infrastructure efficiently	
	Foster a balanced and diverse mix of business and industry.	
	Encourage industries that provide living wage jobs to a diverse workforce.	
	Expand economic activity and regional wealth through exports, value added, import substitution, and local ownership.	

Housing

Goal	Objectives	Utilized Methods
To promote the production of an adequate supply of ownership and rental housing that is safe, healthy, and attainable for people with different income levels and diverse needs.	Promote an increase in housing diversity and choice.	This Objective does not apply to the development because the Applicant does not propose housing on the property.
	Promote an increase in year-round housing supply	Please see above.
	Protect and improve existing housing stock.	Please see above.
	Increase housing affordability.	Please see above.

Capital Facilities & Infrastructure

Introduction

The Capital Facilities and Infrastructure Goal and Objectives are designed to construct or modify capital facilities and infrastructure to support other types of development within the region.

The Cape Cod Commission defines these types of infrastructure as “public facilities and services necessary to support development, including but not limited to roads, water, sewers, waste disposal, affordable housing, schools, police, and fire protection facilities.”

Accordingly, the proposed development *is not considered* a Capital Facility or Infrastructure development as further defined to include “components of the human built system necessary to support communities, protect regional resources, and encourage sustainable economic development including, but not limited to, roads and non-auto transportation structures, drinking water and wastewater distribution and treatment systems, waste disposal and management facilities, telecommunications lines and equipment, energy distribution and generation facilities, and coastal infrastructure”.

Objectives

There are two Objectives associated with the Capitol Facilities and Infrastructure Goal.

1. CAP_1 – Ensure capital facilities and infrastructure promote long-term sustainability and resiliency.
2. CAP_2 – coordinate siting of capital facilities and infrastructure to enhance the efficient provision of services and facilities that respond to the needs of the region.

CAP_1

The Methods under this Objective include:

- Co-locate Infrastructure or Locate Infrastructure Underground.
- Locate Infrastructure Outside of Flood-Prone or High-Hazard Areas.
- Support Compact Development Patterns.
- Project is consistent with the Regional Capital Infrastructure Plan.

Continued on next page,

Capital Facilities & Infrastructure, Continued

CAP_2

The Methods under this Objective include:

- Coordinate project construction with other planned or needed infrastructure projects.
- Improve the quality or availability of service.
- Use existing utility easements and/or rights of way.
- Provide site sharing or space for other providers or types of infrastructure.
- Encourages growth of industries appropriate to the diversification of the regional economy.

Compliance

Although the proposed development is not considered a Capital Facility, the following should be noted:

1. The proposed development (health and fitness facility with childcare and medical offices) does not put a significant burden on existing capital facilities., as is documented throughout this DRI Application.
2. Mitigation measures with respect to impacts to the roadway network have been provided in detail within the Transportation Bulletin section of this document as well as **Exhibit 15**.
3. The proposed development provides for innovative alternative wastewater treatment, shared water distribution, and LID stormwater control and treatment.

Coastal Resiliency

Introduction

The Coastal Resiliency Goal and Objectives are designed to prevent or minimize human suffering and loss of life and property or environmental damage resulting from storms, flooding, erosion, and relative sea level rise.

Objectives

There are three Objectives associated with the Coastal Resiliency goal.

1. Cr_1 = Minimize development within the floodplain.
2. Cr_2 = Plan for sea level rise, erosion, and floods.
3. Cr_3 = Reduce vulnerability of built environment to coastal hazards.

Methods

The applicability and materiality of these Goals and Objectives on a proposed development are determined on a case-by-case basis by the CCC considering a number of factors including the location, context (as defined by "Placetype"), scale, use, and other characteristics.

Compliance

The development is not proposed for areas requiring significant planning regarding coastal resiliency besides meeting the building code for a wind velocity zone and installing underground utilities.

The entire development is located outside of flood zones and is not located near a coastal bank. The lowest point of the subject parcel (southerly property section) is approximately 50 feet above mean sea level as noted earlier in this document. Refer to the Exiting Conditions Plan in **Exhibit 24** for details.

Community Design

Introduction

The Community Design Goal and Objectives are designed to protect and enhance the unique character of the region's built and natural environment based on the local context.

Objectives

There are three (3) Objectives associated with the Community Design goal.

1. Objective CD_1 – Promote context sensitive building and site design
2. Objective CD_2 - Minimize the amount of newly disturbed land and impervious surfaces
3. Objective CD_3 – Avoid adverse visual impacts from infrastructure to scenic resources.

CD_1 Methods

The Methods under this Objective include the following:

Method	Development Response
Relate siting of development to building and streetscape patterns.	The design fits well within the existing streetscape as it is a mixed professional and commercial (health and fitness) use with some residential use. The proposed building is set back approximately 600 feet from Brick Kiln Road so it will not significantly affect the streetscape.
Follow regional and local scale of development.	The scale of the development is adequate for its proposed use. The layout and scale are compliant with the zoning requirements that are set forth with the Falmouth Zoning Bylaws for the Agricultural AA Zone.
Use regionally appropriate forms and materials.	The building materials proposed will achieve proper contextual design and "Cape Cod Character". Refer to **Exhibits 3 and 25** for details.
Locate parking where it does not adversely impact the visual character of the area.	Parking is centrally located on site and is shared with the adjoining church. The location of the parking will not impact the visual character of the area, as it provides appropriate buffering to the street and residential areas. Refer to Exhibit 24 for details.
Ensure lighting protects "dark skies" and signage fits within community character.	All lighting will be dark skies compliant or equal. Refer to **Exhibits 19 and 24** for more details. Please note that the entrance signage proposed fits with the community character.

Continued on next page,

Community Design, Continued

CD_1 Emphasis by Placetype As noted, the proposed development is located within a Rural Development Area Placetype as follows.

Placetype Objective	Development Response
Rural Development Area - Limit development to small scale and areas that can be screened from view.	New development is proposed for the parcel of land labeled as Lot 2B. Partial redevelopment of the adjacent Lot 2A is also proposed. The development is sized to fit the property and is suitable as such. Screening by vegetation will result in little visibility from Brick Kiln Road.

CD_2 Methods The Methods under this Objective include the following.

Method	Development Response
Reuse and redevelop existing buildings, structures, and sites.	Lot 2A will undergo partial redevelopment and upgrade of its parking area, which will be and shared with the proposed development.
Cluster development.	This Method does not apply to the development because the Applicant proposes a single building (and 1 small support building) with appurtenances. It is of note, however, that the building will provide recreational and medical services, thus clustering uses together on one site.
Minimize total parking spaces to no more than what is required by zoning.	The amount of parking proposed complies with the requirements of the Falmouth Zoning Bylaw, and no additional parking is proposed. However, the Applicant, through Site Plan Review and Special Permit proceedings, will request reduced parking below these requirements. Please note that it will be up to the Falmouth Planning Board to make this determination.

Continued on next page,

Community Design, Continued

CD_2 Methods, continued

Method	Development Response
Develop multi-story buildings where appropriate.	The Applicant will use this method and proposes a multi-story building for the development.
Provide parking under or within buildings or in structures.	This method does not apply to the development because no parking, under or within buildings or structures is proposed due to: 1. Needing basements for on-site operations and storage, and 2. Zoning area height limitations.
Use permeable or pervious materials.	Permeable pavers and an exposed stone Fire Lane are proposed. Refer to **Exhibit 24** for details.
Maintain existing native vegetation and revegetate disturbed sites.	Natural vegetation will be predominantly maintained in the northern section of the development and along its western boundary. Based on topography, a clearing of approximately 0.90 acres will occur on Lot 2A and 5.53 acres on Lot 2B. In addition, it is the Applicant's intent to "balance" the site to reduce importation or exportation of soil materials. Refer to **Exhibit 24** for details.

CD_2 Emphasis by Placetype

As previously noted, the proposed Development is located in a Rural Development Area Placetype as follows.

Placetype Objective	Development Response
Rural development Area - Reuse and redevelopment encouraged. All development should be clustered, respect the surrounding landscape, and protect scenic resources	The proposed development will not reuse or redevelop existing structures or land area with the exception of the church parking area on Lot 2A. The proposed development is sited to limit its view from Brick Kiln Road.

Continued on next page,

Community Design, Continued

CD_3 Methods The Methods under this Objective include the following.

Method	Development Response
Reuse and redevelop existing buildings and structures and sites.	This Method does not apply to the development because there are no existing buildings.
Cluster development.	This Method does not apply to the development because only one significant building is proposed. A second small, support shed-type building is also proposed adjacent to the other building. It is of note, however, that the significant building will provide community and medical use, thus clustering uses together on one site.
Minimize total parking spaces to no more than what is required by zoning.	Total number of parking spaces is below the requirements of the Falmouth Zoning Bylaw and the Applicant is seeking a waiver as part of their Special Permit. Additionally, the parking field will be shared between the church and the YMCA as a mean of reducing impacts in terms of impervious area and number of spaces.
Develop multi-story buildings where appropriate.	The Applicant proposes a single, multi-story building and a small shed-type support building for the development.
Provide parking under or within buildings or in structures.	Parking under the structure is not feasible at this site due to the building having swimming pools as an integral part of the programming.
Use permeable or pervious materials.	The Applicant proposes a permeable exposed stone Fire Lane which will circumscribe the building. Additionally, activity yards as well as the front courtyard entrance will be constructed with permeable pavers.
Maintain existing native vegetation and revegetate disturbed sites.	The Applicant proposes to maintain existing native vegetation and will revegetate disturbed areas as noted on the development's site plans.

Continued on next page,

Community Design, Continued

CD_3 Emphasis by Placetype

The Emphasis for Rural Development Areas under this Objective is as follows.

Placetype Objective	Development Response
Rural Development Area - Avoid siting in open landscapes; minimize height to that of existing tree canopy.	The majority of the development will occur in areas that do not contain open landscapes. The maximum height of the proposed building will be approximately 35', which meets the maximum height allowed in the Falmouth Agricultural AA Zone. In addition, the Wildlife Habitat Evaluation (**Exhibit 16**) identified trees up to 60' tall in the development area, which exceeds the proposed building height by approximately 25 feet.

Cultural Heritage

Introduction

The Cultural Heritage Goal and Objectives are designed to protect and preserve the significant cultural, historic, and archaeological values and resources of Cape Cod.

Objectives

There are four Objectives associated with the Cultural Heritage Goal.

1. Objective CH_1 – Protect and preserve forms, layouts, scale, massing, and key character defining features of historic resources, including traditional development patterns of villages and neighborhoods.
2. Objective CH_2 – Protect and preserve archaeological resources and assets from alteration or relocation.
3. Objective CH_3 – Preserve and enhance public access and rights to and along the shore.
4. Objective CH_4 – Protect and preserve traditional agricultural and maritime development and uses.

Compliance

The applicability and materiality of these Goals and Objectives to a project will be determined on a case-by-case basis by the CCC considering a number of factors including the location, context (as defined by the Placetype), scale, use, and other characteristics of a project.

Continued on next page,

Cultural Heritage, Continued

CH_1 Methods The Methods under this Objective include the following.

Method	Development Response
Renovate, re-use and incorporate historic structures into new development proposals in a way that retains their original building materials, including the structural frame and exterior architectural trim.	This method does not apply to the proposed development based on project scope and location.
Design changes or alterations to historic structures to be reversible (as discussed in the Secretary of the Interior's Standards), so that they can be undone in the future without loss of significant historic materials and original architectural features.	Please see above.
Locate additions to historic structures on secondary facades and stepped back from the original structure to limit demolition of original materials and ensure that addition is secondary to the original building.	Please see above.
Site new development outside of cultural landscapes such as open farmlands or designed parks and gardens or locate at their periphery to preserve their unique character.	Please see above.

CH_1 Emphasis by Placetype As previously noted, the development is located in a "Rural Development Area" Placetype as follows.

Placetype Objective	Development Response
Natural - Preserve historic resources while also limiting new development.	This objective does not apply to the proposed development because no historic resources have been identified at the property by the Massachusetts Historical Commission. Refer to **Exhibit 10** for details.

Continued on next page,

Cultural Heritage, Continued

CH_2 Methods The Methods under this Objective include the following.

Method	Development Response
Site new development away from significant archaeological sites so they are not disturbed.	This method does not apply to the proposed development because no archaeological sites were identified on the site.
Place permanent Preservation Restrictions (PR) or Conservation Restrictions (CR) on significant archaeological sites to protect them in situ for the future.	This method does not apply to the proposed development because no archaeological sites were identified on the site.

CH_2 Emphasis by Placetype The Emphasis for Rural Development Areas under this Objective is as follows.

Placetype Objective	Development Response
Rural development Areas - Preserve significant archaeological sites in their entirety and protect them with permanent restrictions from development.	This method does not apply to the proposed development because no archaeological sites were identified on the property.

Continued on next page,

Cultural Heritage, Continued

CH_3 Methods

The Methods under this Objective include as follows.

Method	Development Response
Provide public access to the shoreline for any new coastal development without impairing the natural beneficial functions of natural resources.	The method does not apply to the proposed development because there is no nearby access to the shoreline.
Maintain and broaden existing physical and/or visual access to the coast wherever possible.	The method does not apply to the proposed development because there is no nearby access to the coast.
Restore historic public access to the shore, both physical and visual, wherever possible.	The method does not apply to the proposed development because there is no nearby historical access to the shore.
Protect existing access to the coast with permanent Conservation Restrictions or Easements.	The method does not apply to the proposed development because there is no nearby existing access to the coast.

CH_3 Emphasis by Placetype

The Emphasis for Rural Development Areas under this Objective is as follows.

Placetype Objective	Development Response
Rural Development Areas – Maintain existing public access routes and views to the shore; provide additional public access, if possible, without harming natural resources	The Objective does not apply to the proposed development because there is no nearby existing access or views to the shore.

Continued on next page,

Cultural Heritage, Continued

CH_4 Methods The Methods under this Objective include as follows.

Method	Development Response
Maintain or restore traditional industries that contribute to economic diversity and preserve historical traditions.	The method does not apply to the proposed development because the Applicant does not propose an industrial use.
Place Preservation Restrictions (PR) or Conservation Restrictions (CR) on farmlands that are noted in historic or cultural landscape inventories or listed on the National Register of Historic Places.	The method does not apply to the proposed development because there are no farmlands noted in historic or cultural inventories or listed on the National Register of Historic Places on the property.
If present, retain existing maritime industrial structures and allow for continued maritime industrial use on the project site.	The method does not apply to the proposed development because there are no historic maritime industrial structures at the property.
For improvements or expansion of existing maritime industrial buildings, retain their maritime industrial or water-dependent use.	The method does not apply to the proposed development because there are no historic maritime industrial structures at the development.
For new or expanded coastal development that is not maritime industrial, set aside land area for traditional maritime industries and public access to the water.	The method does not apply to the proposed development because the Applicant does not propose an industrial use.

CH_4 Emphasis by Placetype The Emphasis for Rural Development Areas under this Objective is as follows.

Placetype Objective	Development Response
Rural Development Areas – Retain existing agricultural uses and maritime industries that are compatible with natural resource protection, consider using Preservation Restrictions and Conservation restrictions to permanently protect their open landscapes.	This Method does not apply to the proposed development because there is no agriculture or maritime industry that exist on-site.

.

Economy

Introduction

The Economy Goal and Objectives are designed to promote a sustainable regional economy comprised of a broad range of businesses providing employment opportunities to a diverse workforce.

Objectives

There are five Objectives associated with the Economy Goal.

1. Objective EC_1 – Protect and build on the Cape's competitive advantages.
2. Objective EC_2 – Use resources and infrastructure efficiently
3. Objective EC_3 – Foster a balanced and diverse mix of business and industry.
4. Objective EC_4 – Support industries that provide living wage jobs to a diverse workforce.
5. Objective EC_5 – Expand economic activity and regional wealth through exports, value added, import substitution, and local ownership.

EC_1 Methods

The Methods under this include as follows.

Method	Development Response
Reinforce historic development patterns through community design.	The development is in an area of Agricultural zoning. The proposed development and surrounding areas are not significantly historic in nature.
Cluster development to preserve high-quality open space.	This Method does not apply to the development because the Applicant does not propose clustered lots.
Incorporate uses that promote walkability and/or use multiple modes of transportation.	The proposed Development includes a sidewalk system that connects to Brick Kiln Road and eventually a bike path planned by MassDOT for the same side of the road. These features help promote bicycle and pedestrian traffic to access the proposed development.
Improve the design and function of commercial roadway corridors.	Please see the Traffic Technical Bulletin section for further detail with respect to mitigation and proposed improvements.
Preserve historic structures or buildings, areas, and/or landscapes.	This Method does not apply to the development because historic structures or buildings, areas and /or landscapes do not exist on the property.

Continued on next page,

Economyy, Continued

EC_1 Methods, continued

Method	Development Response
Project proposes adaptive re-use, including re-use of historic structures.	This method does not apply to the proposed development because existing or historic structures are not present.
Preserve agricultural lands and operations.	Although the proposed development is located in a Falmouth Agricultural AA zone, no currently operating agricultural operations exist at the property. Therefore, this method does not apply.
Preserve or complement the continued operation of working waterfronts.	This Method does not apply to the proposed development because it is not near or within a shoreline area.
Preserve or expand public access to the coast and natural areas for passive recreation.	This is not applicablesince the development is not located on a coast or abutting areas of public open space
Preserve access to and the continued viability of working shell/fin fishing grounds.	This Method does not apply to the proposed development because it is not near or within a shoreline area where fishing occurs.
Restore and/or protect open space in Natural Areas.	See the Wildlife and Wetland sections of this narrative. Refer to **Exhibit 17** for more details.

EC_1 Emphasis by Placetype

The Emphasis for Rural Development Areas under this objective is as follows.

Placetype Objective	Development Response
Rural Development Areas – Cluster development at appropriate scale to preserve rural character; protect agriculture, cultural, and historic resources.	This Objective does not apply to the development because the Applicant proposes a single building with appurtenances.

Continued on next page,

Economy, Continued

EC_2 Methods The Methods under this Objective include the following.

Method	Development Response
Re-use or redevelop existing structures.	This Method does not apply to the development because the Applicant does not propose use or redevelopment of existing structures.
Includes infill and/or redevelopment.	This Method does not apply to the development because the Applicant does not propose infill and/or redevelopment.
Accessible by multiple modes of transportation.	The proposed development will be accessible by multiple modes of transportation including buses, automobiles, bicycles, and walking.
Includes mixed-use buildings and/or a mix of uses on site.	The proposed development includes a mixed-use building (professional healthcare, child care and athletic center) and shared parking for both the YMCA and the adjacent church.
Cluster development to reduce the cost of providing infrastructure.	This Method does not apply to the development because the Applicant does not propose cluster development.
Shares onsite infrastructure with proximate developments.	The proposed development will share infrastructure including a water supply service with the residential development under construction to the west and shared parking and access with the adjacent church.
Provides renewable energy generation onsite that serves uses on and proximate to the site.	The Applicant proposes on-site renewable solar energy generation.
Expands last-mile connections to open access telecommunication networks.	This Method does not apply to the development because it is not in a last mile of a telecommunication network.

Continued on next page,

Economy, Continued

EC_2 Methods, continued

Method	Development Response
Project underground new utilities to reduce storm outages.	The proposed development will substantially meet this Objective except at the point of electricity generation at a standby emergency generator and a roof-mounted photovoltaic array system. All other utilities are planned to be underground.
Project underground existing overhead utility infrastructure.	The Applicant proposes to locate public utilities underground.
Encourages extension or expansion of public transit.	Refer to the Transportation section of this document and **Exhibit 15** for details.
Avoids development of infrastructure in Natural Areas.	The proposed development will occupy approximately 80% of the land area to be used (Lot 2B and a portion of Lot 2A). The remainder of the property will not be developed and has the opportunity to be placed into a conservation restriction as part of the Open Space requirements.

EC_2 Emphasis by Placetype

The Emphasis for Rural Development Areas under this Objective is as follows.

Continued on next page	**Development Response**
Rural Development Areas – Cluster development on a portion of the site to protect resources, share infrastructure, and create a smaller development footprint.	This Objective does not apply to the development because the Applicant proposes a single building with appurtenances.

Continued on next page,

Economy, Continued

EC_3 Methods The Methods under this Objective include the following.

Method	Development Response
Provide employment opportunities in emerging industry clusters, including marine science and technology industries.	This project will provide construction jobs for up to 250 workers and will create multiple full-time skilled medical jobs, athletic training jobs and administrative jobs. The focus of this project is to provide a location for fitness and medical services for the Upper Cape region. Refer to **Exhibit 13** for details.
Support entrepreneurship and the development of new businesses, technologies and/or products.	This method is not applicable to the development because support of new businesses, technologies and/or products is not proposed.
Support artist and other creative occupations.	This method is not applicable to the development because support of artists and other creative occupations is not proposed.
Building design accommodates a range of uses.	The proposed development will be purpose-built for a range of uses as noted earlier in this document.

EC_4 Methods The Methods under this Objective include the following.

Method	Development Response
Create jobs, with an emphasis on year-round jobs.	The proposed development will utilize this Method and provide approx. 21 full time skilled fitness and medical professional jobs and 4 full time service jobs. Refer to **Exhibit 13** for details.
Create jobs, with an emphasis on jobs that pay above-average wages relative to similar occupations and industries in the region and relative to the region as a whole.	Skilled fitness and medical professional jobs will pay above average salaries as compared to local industries.
Provide employees with training for career advancement.	Prospective tenants and operators will provide employees with adequate training opportunities.
Provide employees with paid sick, vacation, medical and disability benefits.	See response presented above.
Provide affordable housing for employees (year-round and/or seasonal).	This Method will not be utilized by the development because affordable housing is not proposed.

Continued on next page,

Economy, Continued

EC_5 Methods, The Methods under this Objective include the following:

Method	Development Response
Project provides space for small local businesses.	The Applicant intends on utilizing this Methods by providing Community Health Service (CHS) space in the main building to operate a health clinic. CHS is a Cape Cod based small business.
Project enhances or supports research and development activities.	This Method does not apply to the development because the project purpose does not include direct support of local research and development activities.
Support businesses selling locally grown or produced products.	This Method does not apply to the development because project purpose does not include products; only services are proposed..
Support businesses that export goods.	This Method does not apply to the development because the project purpose does not include products.
Support businesses developing goods locally that were previously imported.	This Method does not apply to the development because the project purpose does not include products.
Support businesses that add value to local raw materials.	This Method does not apply to the development because the the project purpose does not include products.

Energy

Introduction

The Energy Goal and Objectives are designed to provide an adequate, reliable, and diverse supply of energy to serve the communities and economies of Cape Cod.

Objectives

There are three Objectives associated with the Energy Goal.

- Objective EN_1 – Support renewable energy development that is context-sensitive.
- Objective EN_2 – Increase resiliency of energy generation and delivery.
- Objective EN_3 – Minimize energy consumption through planning and design (energy efficiency and conservation measures).

EN_1 Methods

The Methods under this Objective include the following.

Method	Development Response
Enter into a "Green" power purchase agreement; and/or	This Method does not apply to the development because the Applicant does not propose to enter into a "Green" power purchase agreement. However, any power purchased on Cape Cod will contain a component of green energy as required by the Massachusetts Renewable Energy Portfolio Standard.
Incorporate on-site renewable energy generation or alternative energy use, including but not limited to: solar photovoltaic (PV), solar thermal, geothermal, solar carport, fuel cells, the use of biofuels	The Applicant proposes to generate electricity using a roof-mounted PV array system.

Continued on next page,

Energy, Continued

EN_2 Methods The Methods under this Objective include the following.

Method	Development Response
Protect infrastructure by locating utilities underground.	The Applicant proposes to locate all utilities underground except for the point of generation of a standby emergency generator and a roof-mounted PV array system.
Manage for peak demand and power outages by incorporating energy storage technology, including but not limited to storage batteries or technology, emergency backup generator.	The Applicant proposes to install and utilize a standby natural gas/propane powered emergency generator and the storage batteries that are part of a roof-mounted PV array system.

EN_3 Methods The Methods under this Objective includes the following:

Method	Development Response
• Design to earn LEED Certification • Design to earn Energy Star® Certification. – Incorporate building design elements, including but not limited to: ❖ Perform a pre-development or redevelopment energy audit, incorporate recommendations to maximum extent practicable. ❖ Combined Heating and Power (CHP) system. ❖ Passive heating/cooling/lighting, including building orientation/solar exposure. ❖ Energy efficient lighting. ❖ Building envelope conservation measures. ❖ Green roof. ❖ Building design meets "Stretch Code". ❖ Submetering per building unit.	Although the Applicant does not propose to meet the LEED standards, many of the standard requirements will be met, nonetheless. The Applicant does intend on meeting many of the Energy Star Standards.

Continued on next page,

Energy, Continued

EN_3 Methods, continued

Method	Development Response
➢ Incorporate site design elements, including but not limited to: ○ Electric vehicle charging stations. ○ Energy efficient lighting. ○ Shade over paved areas using vegetation or structures. ○ Provide open grid or permeable pavement. ➢ Incorporate operational elements, including but not limited to: ○ Green vehicles for automobile fleets.	The proposed development uses the listed site design elements and at least one energy operational element (a rooftop EV solar system to limit utility provided electricity).

Housing

Introduction

The Housing Goal and Objectives are designed to promote the production of an adequate supply of ownership and rental housing that is safe, healthy, and attainable for people with different income levels and diverse needs.

Objectives

There are four Objectives associated with the design Goal.

- Objective HOU_1 – Promote an increase in housing diversity and choice.
- Objective HOU_2 – Promote an increase in year-round housing supply.
- Objective HOU_3 – Protect and improve existing housing stock.
- Objective HOU_4 – Increase housing affordability.

HOU_1 Methods

The Methods under this Objective includes the following.

Method	Development Response
Create small-scale housing units.	This Method does not apply to the development because the Applicant does not propose housing on the site.
Create small lot residential development.	This Method does not apply to the development because the Applicant does not propose residential development on the site.
Redevelop existing buildings for mixed use residential and/or residential development.	Please see the above response.
Pursue infill development for housing, i.e., development of vacant or under-used parcels within previously built areas.	This Method does not apply to the development because the Applicant does not propose housing on the site.

Continued on next page,

Housing, Continued

HOU_1 Methods, continued

Method	Development Response
Create a variety of year-round housing types meeting a range of life stage and other social needs.	This Method does not apply to the development because the Applicant does not propose housing on the property.
Create seasonal workforce housing.	This Method does not apply to the development because the Applicant does not propose creating housing on the property.
Create multi-unit residential development with 100% rental units of 850 sq. ft. or less	This Method does not apply to the development because the Applicant does not propose residential development on the property.

HOU_2 Methods

The Methods under this Objective includes the following.

Method	Development Response
Create year-round rental and ownership housing units.	This Method does not apply to the development because the Applicant does not propose year-round rental or ownership housing on the property.

HOU_1 and HOU_2 Emphasis by Placetype

The Emphasis for Rural Development Areas under this objective is as follows.

Placetype Objective	Development Response
Rural Development Areas - Reuse and redevelopment are encouraged.	This Objective does not apply to the development because the Applicant does not propose reuse or redevelopment of housing.
All development should be clustered, respect the surrounding landscape, and protect scenic resources.	This Objective does not apply to the development because the Applicant does not propose clustered housing.
Preference is to direct affordable housing mitigation for development located in Rural Development Areas, provided under HOU4, outside of Rural Development Areas.	This Objective does not apply to the development because the Applicant does not propose affordable housing mitigation.

Continued on next page,

Housing, Continued

HOU_3 Methods The Methods under this Objective includes the following.

Method	Development Response
Improve the condition and habitability of existing dwelling units.	This Objective does not apply to the development because existing dwelling units are not present on the property.
Improve the safety of existing dwelling units.	Please see the above response.
Improve the accessibility or visit-ability of existing dwelling units.	Please see the above response.
Preserve or increase the number of net existing housing units in the region.	This Objective does not apply to the development because the Applicant does not propose increasing the number of existing housing units in the region.

HOU_4 Methods The Methods under this Objective includes the following:

Method	Development Response
Developments proposing ten (10) or more new residential lots and/or units must provide on-site 10% of the project's lots and/or units for year-round housing use as Affordable Housing and/or Workforce Housing.	This Objective does not apply to the development because the Applicant does not propose 10 or more new residential lots.
The Commission may, in its discretion, allow an Applicant to provide the required units or lots off-site, or make a monetary contribution equal to or greater in value than the on-site mitigation otherwise required.	This Objective does not apply to the development because the Applicant does not propose new residential lots.

Ocean Resources

Introduction	The Ocean Resources Goal and Objectives are designed to protect, preserve, or restore the quality and natural values and functions of ocean resources.
Objectives	There are three Objectives associated with technical bulletin: • Or_1 = Locate development away from sensitive resource areas and habitat • Or_2 = Preserve and protect ocean habitat and the species it supports • Or_3 = Protect significant human use areas and vistas
Compliance	This goal does not apply to the proposed development because of its location away from sensitive ocean resources, habitats, and vistas.

Open Space

Introduction

The Open Space Goal and Objectives are designed to conserve, preserve, or enhance a network of open space that contributes to the region's natural and community resources and systems.

Objectives

There are three Objectives associated with these design Goals. They are:

- Objective OS_1 – Protect and preserve natural, cultural, and recreational resources.
- Objective OS_2 – Maintain or increase the connectivity of open space.
- Objective OS_3 – Protect or provide open space appropriate to context.

OS_1 Methods

The Methods under this Objective includes the following.

Method	Development Response
Protect and preserve high value resources and minimize development footprint.	The development has been minimized to the extent practicable. Multi-story development and shared parking is proposed to reduce the development footprint. Based on the Wildlife Habitat Evaluation (**Exhibit 16**), MassGIS and the Cape Cod Commission Data Viewer, the subject property is not considered a high value resource area.
Protect lands suitable for future water supply sites.	This property is not intended to be the location for a future water supply site.
Preserve wildlife habitat and unfragmented blocks of open space.	The Applicant will maintain a connective corridor from Brick Kiln Road to the open space at the rear on the project site. Privacy fencing in this area will be segmented to allow for animal movement.

Continued on next page,

Open Space, Continued

OS1 Methods, continued

Method	Development Response
Preserve the region's agricultural lands and scenic vistas.	This Method does not as the project does not affect agricultural lands nor any scenic vistas.
Preserve open space that benefits natural and community systems.	As noted earlier in this document, approximately 1.23 acres at the proposed development will be preserved as open space as will any purchased/donated off-site mitigation property (Note that a waiver of this requirement is being proposed).
Provide and enhance recreational opportunities and access to open space.	The intent of the proposed development is to provide a recreational opportunity to Falmouth residents and nearby populations. As noted above a portion of the property will be preserved as open space.

OS_2 Methods The Methods under this Objective includes the following.

Method	Development Response
Protect open space contiguous to undeveloped lands or protected open space.	As noted earlier in this document this Method will be utilized by permanently protecting the remaining on-site open space that is contiguous with other undeveloped land.
Preserve wildlife corridors and opportunities for the movement of wildlife.	The Applicant will establish a wildlife migration corridor along the development's western boundary.
Establish, enhance, and connect greenways and recreational trails.	An existing trail located on the east side of the property will be integrated into the development with two new access points.

Continued on next page,

Open Space, Continued

OS_3 Methods The Methods under this Objective includes the following.

Method	Development Response
Projects must provide protected open space according to the ratio required by Placetype.	The Applicant is seeking a waiver of this requirement due to the financial hardship associated with off-site land purchase. We believe the community benefits of this development offset this requirement.
Depending on Placetype, the open space requirement can be met by one or a combination of three possible mechanisms: 1. protection of open space on the project site, 2. protection of high-quality land offsite, or by a 3. cash contribution for the purpose of open space protection within the town.	Please see the above response.
Where the following criteria are met, the amount of required open space may be reduced by up to 20%: • Where no sensitive resource areas are present, including BioMap2 Core Habitat or Critical Natural Landscapes, rare species habitat, wellhead protection areas, wetlands, waterbodies, vernal pools, floodplain, cultural or historic resources, beaches or dunes, agricultural lands or soils, • Higher quality open space is provided than what is impacted by the project, as determined by the number, value, and/or significance of the resources to be protected, and • The project is not located within a Natural Area or a Rural Development Area.	Please see the above response.

Continued on next page,

Open Space, Continued

OS_3 Methods, continued

Method	Development Response
• The required open space is calculated based on Area of Development Impact: – Rural development area 2:1	The Applicant is seeking a waiver of this requirement due to the finical hardship associated with off-site land purchase. We believe the community benefits of this development offset this requirement. Refer to Exhibit 17 for details.

Transportation

Introduction

The Transportation Goal and Objectives are designed to provide and promote a safe, reliable, and multi-modal transportation system.

Objectives

There are three Objectives associated with these design Goals. They are:

- Objective TR_1 – Improve safety and eliminate hazards for all users of Cape Cod's transportation system.
- Objective TR_2 – Provide and promote a balanced and efficient transportation system that includes healthy transportation options and appropriate connections for all users.
- Objective TR_3 – Provide an efficient and reliable transportation system that will serve the current and future needs of the region and its people.

TR_1 Methods

The Methods under this Objective includes the following.

Method	Development Response
Prepare an appropriate Transportation Impact Assessment (TIA).	A TIA has been prepared for the proposed development by McMahon Associates, which is based on CCC DRI and MassDOT requirements. Refer to **Exhibit 15** for further detail.
Apply good access management principles in site and driveway design.	Access management principles in site and driveway design have been applied to the proposed development. Two points of access are proposed: the existing access to the proposed church from Brick Kiln Road will be available and a new access at the end of the proposed development's "pan handle" at Brick Kiln Road.
Locate driveways to provide acceptable sight distance and locate signs, vegetation, lighting, and other fixed objects in manner that avoid creating sight distance obstructions.	The driveway locations for the proposed development provide adequate sight distance. The site design and landscaping are mindful of maintaining sight lines for access.
Provide safe pedestrian connections throughout the site and, where practical, to adjacent sites.	Pedestrian accommodation is being provided throughout the site. In addition, pedestrian and bicycle accommodations are also being provided from the site to a future bike path planned for Brick Kiln Road by MassDOT.

Continued on next page,

Transportation, Continued

TR_1 Methods, continued

Method	Development Response
For projects anticipated to generate 50 or more peak hour trips, present a detailed analysis of off-site safety impacts of the development at Study Area locations, and implement appropriate safety improvements.	A detailed safety assessment of Study Area intersections has been undertaken and is presented in detail in the TIA. Safety measures are proposed at locations within the study area where safety issues were identified. Refer to **Exhibit 15** for details.

TR_2 Methods

The Methods under this Objective includes the following.

Method	Development Response
Housing and Employment sites should implement Travel Transportation Demand Management (TDM) best practices.	A detailed TDM plan is proposed, the details are presented in the TIA and generally include best practices. Refer to **Exhibit 15** for details.
For employment sites, with 25 or more employees, develop and implement a site-specific TDM Plan.	A detailed TDM plan is proposed, the details are presented in the TIA and generally include best practices.
Where feasible provide appropriate rights-of-way along the street frontage and/or across the property to accommodate current and future pedestrian, bicycle, and transit needs.	The Applicant proposes an extensive system of pedestrian pathways on the site which will connect to the future planned bike path on Brick Kiln Road by MassDOT.
Where feasible and appropriate construct sidewalks, multi-use paths, and/or bicycle/pedestrian connections along or across the site with connections out to the existing pedestrian and bicycling network.	Please see above.

Continued on next page,

Transportation, Continued

TR_2 and Emphasis by Placetype

The Emphasis for Rural Development Areas under this Objective is as follows.

Placetype Objective	Development Response
Rural Development Areas - Implement TDM. Preserve the natural, scenic, and cultural resources. Improvements should be recommended where they enhance protection of, improve non-vehicular access to, and do not adversely impact these resources.	The Applicant proposes an extensive system of pedestrian pathways on the site which will connect to the future planned bike path on Brick Kiln Road by MassDOT.

TR_3 Methods

The Methods under this Objective includes the following.

Method	Development Response
Provide for full mitigation of congestion impacts on the transportation system through a combination of trip reduction measures, physical congestion mitigation, and, as appropriate, congestion mitigation payments commensurate with the development's congestion impact.	The Applicant is proposing a mitigation program that consists of physical, safety, and pedestrian/bicycle enhancements for the development.
For projects anticipated to generate 100 or more peak hour trips, provide a detailed analysis of off-site congestion impacts and of any proposed physical congestion mitigation.	The TIA for the development project includes a detailed analysis of off-site congestion impacts and considers mitigation initiatives. Refer to **Exhibit 15** for details.

Continued on next page,

Transportation, Continued

TR_3 Areas of Emphasis by Placetype

The Emphasis for Rural Development Areas under this objective is as follows.

Placetype Objective	Development Response
Rural Development Areas - Implement trip reduction measures and mitigate remaining congestion impacts through congestion mitigation payments. Physical improvements may be appropriate where they enhance compatible access to natural, scenic, and cultural resources and do not adversely impact these resources.	The Applicant proposes a comprehensive TDM plan as outlined in the TIA. In addition, the Applicant proposes safety and physical features that will enhance access to natural, scenic, and cultural resources in the development area. Such measures are not expected to adversely impact the same resources.

Water Resources

Introduction

The Water Resources Goal and Objectives are designed to maintain a sustainable supply of high-quality untreated drinking water and protect, preserve, or restore the ecological integrity of fresh and marine surface waters.

Objectives

There are five Objectives associated with these design Goals. They are:

- Objective WR_1 – Protect and preserve groundwater quality.
- Objective WR_2 – Protect, preserve, and restore fresh water resources.
- Objective WR_3 – Protect, preserve, and restore marine water resources.
- Objective WR_4 – Manage and treat stormwater to protect and preserve water quality.
- Objective WR_5 – Manage groundwater withdrawals and discharges to maintain hydrologic balance and protect surface and groundwater resources.

WR_1 Methods

The Methods under this Objective includes the following.

Method	Development Response
All DRIs must employ the following methods to meet Objective WR_1: • Project is limited to a maximum site-wide nitrogen loading concentration of 5 parts per million (ppm) except as provided below for Impaired Areas and Potential Public Water Supply Areas (PPWSA). • No adverse impacts on downgradient existing or proposed drinking water wells. • Septic systems and other sources of contamination are sited to avoid adversely impacting downgradient existing or proposed drinking water wells	The project does comply with this Method. Estimated loading is approximately 4.55 ppm for nitrogen. Refer to **Exhibit 20** for details. Also, no existing or proposed drinking water wells are downgradient of the development. However, Long Pond, a public drinking water surface water supply, is located approximately 1,800 feet south of the proposed development's property line. The proposed wastewater treatment plant's leaching facility is strategically located outside the DEP' Surface water Protection zone).

Continued on next page,

Water Resources, Continued

WR_1 Methods, continued

Method	Development Response
Additional Methods to meet Objective WR_1: • Utilize site design and operational best practices to preserve groundwater quality. • Review existing Environmental Site Assessment(s) as available for previously developed properties and incorporate findings into project design	The Applicant proposes to utilize an Innovative Alternative wastewater treatment system for the development that will be monitored to assure compliance as required by the permit that will be applied for through the MassDEP's Pilot Program, which will require wastewater sampling for compliance. Additionally, the project will utilize LID stormwater collection and treatment. In addition, this method does not apply to the proposed development because the majority of the site is undeveloped. The remaining portion has been a parking area since it was first developed in 1964.
For projects in an Impaired Area outside of other mapped water resource areas: • If proposed site-wide nitrogen loading concentration exceeds 5 ppm, demonstrate no adverse impact on ponds, wetlands, marine waters, public or private drinking water supply wells, and potential water supply wells.	Please note that the proposed development is not located in an impaired area; however, site-wide nitrogen loading has been calculated to be less than 5 mg/L. Therefore, there are no adverse impacts anticipated. Please see **Exhibit 20** for this calculation.
For projects in Potential Public Water Supply Areas: • Site wide nitrogen loading must be less than 1 ppm.	The proposed development is not located in a Potential Public Water Supply Area. Therefore, this Method does not apply.
All projects proposing private wastewater systems designed for flows greater than 2,000 gallons per day (gpd) and requiring greater treatment efficiency than specified by MassDEP permit or approval letter must: • enter into an Operation, Monitoring, and Compliance agreement with the Cape Cod Commission and local Board of Health.	The Applicant will enter in an agreement as required to meet the Method.

Continued on next page,

Water Resources, Continued

WR_1 Methods, continued

Method	Development Response
All wastewater treatment facility DRIs must: • Consistently achieve 5 ppm or lower total nitrogen in wastewater effluent or in groundwater at the property boundary.	This Method does not apply as the project purpose is not a wastewater treatment facility DRI.
Additional methods for wastewater treatment facility DRIs to meet Objective WR_1: • Utilize wastewater treatment facilities including private treatment facilities to protect and/or restore ground water quality provided that such facilities will not adversely impact water or other natural resources.	The Applicant proposes to utilize an Innovative Alternative wastewater treatment system (KleanTu® NitROE® System) for the development that will be monitored to assure compliance as required by the permit that will be applied for through the MassDEP's Pilot Program, which will require wastewater sampling for compliance. The proposed treatment system is currently approved in the Pilot Program.
All DRIs within Wellhead Protection Areas (WHPA) or Potential Public Water Supply Areas (PPWSA) (see WHPA and PPWSA layers in the RPP Data Viewer) must employ the following methods to meet Objective WR_1: • All development, construction, clearing, and staging occurs at least 400 feet from identified future well sites. • Projects with a high risk of contaminating groundwater, such as fleet storage, vehicle maintenance areas and loading docks, include a mechanical shut-off valve or other flow-arresting device in stormwater systems between the stormwater capture structures and the leaching structures.	This Method does not apply to the proposed development because the site is not within either a WHPA, PPWSA, there is no future well site within 400 feet of the development, and because no high-risk use is proposed.

Continued on next page,

Water Resources, Continued

WR_1 Methods, continued

Method	Development Response
Additional methods for wastewater treatment facility DRIs to meet Objective WR_1. • Do not use, treat, generate, handle, store or dispose of Hazardous Materials or Hazardous Wastes, except for Household Quantities by the following: ✓ Redevelopment projects reduce the quantity of hazardous materials on the project site from the prior use and adequately document that reduction. ✓ Permanently eliminate the same or greater quantity of Hazardous Materials or Wastes at another facility, project, or site within the same WHPA or PPWSA and adequately document that reduction.	The Applicant does not intend to utilize hazardous materials at the proposed development.
Does not discharge effluent from private wastewater treatment facilities, unless private wastewater treatment facilities remediate existing water quality problems in the water supply area.	The Applicant is pursuing approval to discharge sewage to a public (municipal) wastewater treatment facility. If not granted, the Applicant construct an on-site septic system in conformace with State Environmental Code (310 CMR 15.00) as required by current Massachusetts law. This system will include a nitrogen removal system as described elsewhere.
Non-residential development and redevelopment employs integrated pest management and/or biorational landscape management practices protective of water quality	The Applicant will employ this Method towards pest and biorational landscape management. Refer to **Exhibit 23** for details.
Roadway and parking area designs and materials minimize impervious surfaces.	The Applicant proposes the least number of parking spaces to comply with Falmouth Zoning Bylaws for the development. The Applicant intends to seek relief from the Falmouth Planning Board to further reduce the number of parking spaces and, therefore, reduce impermeable surfaces.

Continued on next page,

Water Resources, Continued

WR_2 Methods

All DRIs within a Freshwater Recharge Area (FWRA) must employ the following methods to meet Objective WR2.

Method	Development Response
New development prevents loading of nutrients and other contaminants to freshwater resources.	The Applicant proposes to utilize an innovative alternative method of sewage treatment currently in use under the MassDEP's pilot program (KleanTU® NitROE® system) and LID methods to treat stormwater prior to recharge. Refer to **Exhibits 20 and 21** for details.
Redevelopment maintains or reduces loading from nutrients and other contaminants to freshwater resources.	The Applicant proposes to reduce loading from nutrients and other contaminants by construction of an LID stormwater collection and treatment system on the portion of Lot 2A that will be redeveloped as to be part of the parking area.
Maintain or enhance vegetated buffer zones along shorelines to ponds and lakes.	This method does not apply to the proposed development because it is not located near the shoreline to ponds or lakes.

WR_2 Methods, Continued

Method	Development Response
Further Note: • All projects within a FWRA where wastewater disposal is proposed must maintain a 300-foot buffer to the high-water level of a freshwater pond unless they demonstrate that phosphorus transported by groundwater does not discharge into the pond or its tributaries.	The proposed development treated sewage discharge area is approximately 2,700' away from Long Pond, which is significantly more than 300 feet (hydrogeologically up gradient) from the high-water level of Long Pond, a surface drinking water supply. Refer to **Exhibit 20** for details.

Continued on next page

Water Resources, Continued

WR_2 Methods, Continued

Method	Development Response
• Discharges of wastewater effluent over 2,000 gallons per day proposed anywhere in the watershed to a freshwater pond must evaluate the impact of phosphorus transported by groundwater on the pond.	Phosphorus is a common element in treated sewage waste and will likely make its way to groundwater over time at the proposed development, which will discharge wastewater at a rate greater than 2,000 gallons per day. Treated sewage waste commonly contains phosphorus. The glacial materials that underlie the proposed development are well known to contain significant amounts of iron (as iron oxide – FeO, as demonstrated by yellow and orange colors in the materials), which binds to phosphorus as FeP (iron phosphide). According to Wilfert, et. al. (*The Relevance of Phosphorus and Iron Chemistry to the Recovery of Phosphorus from Wastewater: A Review*; Environ. Sci. Technol. 2015, 49, 16, 9400-8414), "The addition of iron is a convenient way for removing phosphorus from wastewater." Therefore, discharged phosphorus will bind to the iron it contacts. According to "Phosphorus in Ground Water Contaminant Plume Discharging to Ashumet Pond, Cape Cod, MA" (1999), phosphorus can desorb from iron once wastewater discharge has halted and the FeP is exposed to uncontaminated groundwater that is acidic, which is documented in the report. The principal author (Dennis LeBlanc, USGS) was investigating phosphorus concentrations in Ashumet pond from wastewater discharge from Joint Base Cape Cod (JBCC) over a 60-year period. However, the investigation did not consider the volume of wastewater discharged, which was far greater than the discharge volume from the proposed development.

Continued on next page

Water Resources, Continued

WR_2 Methods, Continued, Continued

Method	Development Response
	According to the JBCC web site (https://www.massnationalguard.org/JBCC/h-planning.html), "Upwards of 80,000 people at its peak lived and trained at Camp Edwards " (part of JBCC), which would have produced a vastly larger volume of waste water than the development proposes. Based on a review of the noted literature, it is expected that phosphorus will bind to the glacial materials at the proposed development and not migrate for a significant distance until such time that treated sewage is no longer discharged. Considering the small volume of wastewater that will be discharged per year versus the volume that was discharged from JBCC, the effects to Long Pond will likely be insignificant. Please see **Exhibit 20** for additional detail.

Continued on next page

Water Resources, Continued

WR3 Methods

All DRIs in a Marine Water Recharge Area (MWRA) where a critical nitrogen load has been determined through either a Total Maximum Daily Load or Massachusetts Estuaries Project (MEP) Technical Report must employ the following methods to meet Objective WR3.

Method	Development Response
Not add nitrogen to a MWRA watershed unless: • There is a MassDEP Watershed Permit or locally adopted nutrient management plan, deemed consistent with the 208 Plan by the Cape Cod Commission, in the sub-watershed in which the project is proposed, and the approved nutrient management plan calls for initiation of nutrient reduction actions or strategies sufficient to offset nutrient contribution(s) from the project within five years of project approval; or • the project is in an area with available sewer connections or is in a Placetype where nitrogen additions may be offset through a monetary contribution to address water quality problems in the affected surface waters.	This Method does not apply to the proposed development because it is not located in a MWRA watershed.
Further the goals of a local nitrogen management plan in areas subject to a MassDEP-approved wastewater or watershed permit.	Although not in a MWRA watershed, the Applicant proposes to manage nitrogen though the use of an innovative alternative septic system designed to remove nitrogen from wastewater and through LID designed stormwater system. These steps were taken in part to help address the concerns regarding nitrogen in the Falmouth Local Comprehensive Plan.
All DRIs in a MWRA where there are water quality problems that are scientifically documented, and a critical load has not been determined must employ the following methods to meet Objective WR3: • Maintain or reduce nitrogen loading relative to existing levels.	Please see the response above.

Continued on next page

Water Resources, Continued

WR3 Areas of Emphasis by Placetype

The Emphasis for Rural Development Areas under this objective is as follows.

Placetype Objective	Development Response
Rural Development Areas – • Sewer is generally not available in rural areas, therefore monetary N-offsets are not permitted.	The Applicant understands this Objective and has not planned for sewer service in the near future.

WR4 Methods

All DRIs, with the exception of redevelopment projects as discussed below, must employ the following methods to meet Objective WR4.

Method	Development Response
Provide a stormwater management system that prevents adverse impacts to water resources and other natural resources.	The Applicant has proposed a stormwater management system that prevents adverse impacts to water resources and other natural resources by the development. Refer to **Exhibit 22** for details.
Prevent discharge of untreated stormwater to marine and fresh surface water and natural wetlands by treating runoff from development, including areas located outside the jurisdiction of the Massachusetts Wetlands Protection Act.	The Applicant proposes to treat all development stormwater to meet this Method even though surface waters and wetlands are not in close proximity.
Provide storage and treatment capacity sufficient to store, treat, and infiltrate all runoff from parking areas and roadways onsite.	The Applicant proposes to provide storage, treatment, and subsurface infiltration of stormwater from parking areas and roadways at the development. Refer to **Exhibits 22 and 24** for details.

Continued on next page,

Water Resources, Continued

WR4 Methods, continued

Method	Development Response
Locate new infiltration to maintain a minimum two-foot separation between points of infiltration and the maximum high-water table.	The Applicant has provided design plans that meet this Method for the proposed development. Refer to **Exhibit 22** for details.
Design stormwater systems according to the Massachusetts Stormwater Handbook to: • Accommodate the 25-year 24-hour storm. • Remove at least 80% Total Suspended Solids (TSS). • Provide water quality treatment capacity for the first inch of stormwater runoff using biofiltration, bioretention, or other Treatment BMPs as detailed in the Stormwater Handbook. For redevelopment projects: • Reduce impervious area coverage and improve site conditions to enhance stormwater retention, water quality treatment, and recharge over existing conditions. • Include natural areas in stormwater system design.	The Applicant has provided a stormwater system design for the proposed development following Massachusetts Stormwater Handbook standards. Refer to **Exhibits 22 and 24** for details.

Continued on next page,

Water Resources, Continued

WR4 Methods, continued

Method	Development Response
Additional Methods to meet Objective WR4: • Manage and directly infiltrate roof runoff separately where site constraints limit capacity for water quality treatment, unless there is an identified rooftop water quality concern requiring additional treatment or management. • Design stormwater systems to remove at least 44% TSS prior to discharge into subsurface leaching facilities.	The Applicant has provided a stormwater system design that infiltrates rooftop stormwater directly into the subsurface at the development. Please note that infiltration will occur along with treated stormwater from other sources to limit additional disturbance at the development. Refer to **Exhibit 24** for details.

WR4 Areas of Emphasis by Placetype

The Emphasis for Rural Development Areas under this objective is as follows.

Placetype Objective	Development Response
Rural development Areas: • Prioritize protection of mature trees and wooded areas and utilize natural drainage features to manage stormwater. • Minimize construction footprint, land disturbance during and after construction, and impervious area creation to maintain natural filtration and recharge processes. • Use LID features that provide water quality treatment during storm events and environmental or recreational function at other times and optimize BMPs for nitrogen removal.	The Applicant has proposed protection to the "natural area" at the development. In addition, the development stormwater design utilizes LID techniques and will not discharge into natural areas, and the wastewater treatment system is an innovative alternative design. Based on the site and needs of the YMCA, there will be necessary clearing: • Leaving a natural area on-site contiguous with an undeveloped area on the High School property • Leaving all specimen trees outside of the development footprint • Utilizing LID stormwater technologies • Using two stories to reduce impervious areas • Providing a pervious fire access road • Septic provide for both nitrogen and phosphorous removal

Continued on next page

Water Resources, Continued

WR_5 Methods All DRIs must employ the following Methods to meet WR5.

Method	Development Response
Design water withdrawals and wastewater discharges in a manner that protects surface water and wetland habitat from groundwater pumping and, in the case of effluent disposal from water table mounding issues (e.g., breakout, flooding, water table separation).	Although not presently planned, if an irrigation well is considered, water withdrawal is limited on-site to a maximum of 1,000 gallons per day.
For projects proposing to withdraw >20,000 gallons of water per day from the site. Provide a groundwater study that demonstrates the project will not have adverse impacts on groundwater levels or adjacent surface waters and wetlands.	This Method does not apply to the development because >20,000 gallons of groundwater withdrawal per day is not proposed.

Wetland Resources

Introduction

The Wetland Resources Goal and Objectives are designed to maintain a sustainable supply of high-quality untreated drinking water and protect, preserve, or restore the ecological integrity of fresh and marine surface waters.

Objectives

There are five Objectives associated with these design Goals. They are:

- Objective WET_1 – Protect wetlands and their buffers from vegetation and grade changes.
- Objective WET_2 – Protect wetlands from changes in hydrology.
- Objective WET_3 – Protect wetlands from stormwater discharges.
- Objective WET_4 – Promote the restoration of degraded wetland resource areas.

WET_1 Methods

The Methods under this Objective includes the following.

Method	Development Response
Methods for all wetlands: Wetlands and their buffers must not be altered except in the limited circumstances identified in this Technical Bulletin and where the Applicant can show that there is a public benefit, there is no feasible alternative to alteration, and that the impacts from the alteration are minimized and mitigated. Upon the required showing, the Commission may permit alterations to wetlands and buffers and approve mitigation for the following purposes: • Where development currently exists, provided that such proposed additional alterations either reduce impacts to or improve the functions of the wetland resources. • Installation of new utility lines. • Water-dependent structures and uses. • Vista pruning and pedestrian access paths.	These Methods do not apply because no wetlands exist at the proposed development or in nearby areas.

Continued on next page,

Wetland Resources, Continued

WET1 Methods, continued

Method	Development Response
Provide vegetated, undisturbed buffer areas of at least 100 feet in width from the edge of coastal and inland wetlands including isolated wetlands, to protect their natural functions.	This Method does not apply because no wetlands exist at the proposed development or in nearby areas.
Development activity proximate to wetlands does not change the vegetation, grade, hydrology, sun exposure, or nutrient inputs to wetland or buffer areas.	This Method does not apply because no wetlands exist at the proposed development or in nearby areas.
Methods for coastal wetlands: • Protect beaches, barrier beaches, dunes, coastal banks, salt marshes, and land under water bodies from alteration. • Projects must not impact eelgrass unless no feasible alternative, there is a public benefit, and the impacts are minimized and appropriately mitigated. • Redevelopment or water-dependent development in proximity to coastal wetlands accommodates their natural migration. • For beach nourishment projects, the design must prioritize the natural functions of coastal resources and minimize impacts. • For maintenance dredging projects, maintain footprint and depth of existing navigation channels and basins. • Improvement dredging is not permitted except where it accomplishes a substantial public benefit and there is no feasible alternative. • For water-dependent projects, including aquaculture, avoid and minimize impacts to fish, shellfish, and crustaceans.	These Methods do not apply because no wetlands exist at the proposed development or in nearby areas.

Continued on next page,

Wetland Resources, Continued

WET_1 Areas of Emphasis by Placetype

The Emphasis for Rural Development Areas under this Objective is as follows.

Placetype Objective	Development Response
For all Placetypes: Permittable development activities within wetlands and buffer areas do not vary by Placetype. Development is not permitted within wetlands and buffer areas except where noted due to the specific water-dependent activity, the presence of existing development, installation of utility lines, or vista pruning or access paths.	This Objective does not apply because no wetlands exist at the proposed development or in nearby areas.

WET_2 Methods

The Methods under this Objective include the following.

Method	Development Response
Stormwater runoff from development activities does not alter wetland hydrology.	This Method does not apply because no wetlands exist at the proposed development or in nearby areas.
For projects proposing water withdrawals >20,000 gallons per day, water withdrawals in proximity to wetlands does not adversely impact wetlands.	This Method does not apply to the development because >20,000 gallons of groundwater withdrawal per day is not proposed and wetlands do not exist at the property.

WET_3 Methods

The Methods under this Objective include the following.

Method	Development Response
Projects should direct stormwater discharges away from wetlands and their 100-foot buffers.	This Method does not apply because no wetlands exist at the proposed development or in nearby areas.

Continued on next page,

Wetland Resources, Continued

WET_4 Methods The Methods under this Objective include the following.

Method	Development Response
Restore wetlands where wetland is shown to be degraded and the proposed restoration will improve the natural wetland functions, restore native vegetation, and/or improve habitat for native species.	This Method does not apply because no wetlands exist at the proposed development.
Remove structures from flood hazard areas wherever possible.	This Method does not apply because no flood hazards exist at the proposed development.
Remove invasive species from wetland resource areas where it will improve the natural functions of the wetland.	This Method does not apply because no wetlands exist at the proposed development or in nearby areas.
Remove structures from flood hazard areas wherever possible.	This Method does not apply because no flood hazards exist at the proposed development or in nearby areas.
Remove invasive species from wetland resource areas where it will improve the natural functions of the wetland.	This Method does not apply because no wetlands exist at the proposed development or in nearby areas.

Wildlife and Plant Habitat

Introduction

The Wildlife and Plant Habitat Goal and Objectives are designed to protect, preserve, or restore wildlife and plant habitat to maintain the region's natural diversity.

Objectives

There are five Objectives associated with these design Goals. They are:

- Objective WPH_1 – Maintain existing plant and wildlife populations and species diversity.
- Objective WPH_2 – Restore degraded habitats through use of native plant communities.
- Objective WPH_3 – Protect and preserve rare species habitat, vernal pools, 350-foot buffers to vernal pools.
- Objective WPH_4 – Manage invasive species.
- Objective WPH_5 – Promote best management practices to protect wildlife and plant habitat from the adverse impacts of development.

WPH_1 Methods

All DRI's must follow these Methods for all wetlands to the extent feasible.

Method	Development Response
Minimize clearing of vegetation and alteration of natural topography.	Based on the site and needs of the YMCA, there will be necessary clearing. Multi-story development and shared parking are proposed to reduce the development footprint.
Minimize fragmentation of wildlife and plant habitat and establish greenways/wildlife corridors to protect edge species and species that inhabit the interior forest.	A natural area will be preserved, contiguous with an undeveloped area on the High School property. Specimen trees outside of the development footprint will be preserved. The Applicant will establish a wildlife migration corridor along the development's western boundary.
Maximize the protection of large, contiguous unfragmented areas, and cluster development away from the most sensitive areas of the site.	Please see the above response.

Continued on next page,

Wildlife and Plant Habitat, Continued

WPH1 Methods, continued

Method	Development Response
Additional Methods: • Protect standing specimen trees. • Plant native vegetation as needed to enhance or restore wildlife habitat. • Provide opportunities for safe passage for wildlife through developments to maintain the integrity of wildlife corridors. • Development, including fencing, should not be constructed so as to interfere with identified wildlife migration corridors. • Avoid development in Key Sites as defined in the State Wildlife Action Plan, and BioMap2 Core Habitat and Critical Natural Landscapes as defined by the Massachusetts Natural Heritage and Endangered Species Program.	The Applicant proposes to protect the remaining specimen trees that are outside of the development area on-site, and to plant native vegetation in stormwater areas to enhance wildlife values. The Applicant also proposes to create an animal migration corridor that allows for migration to and from the natural areas to the north and south. Please note that the development is located in a wildlife migration corridor as identified on the Falmouth Overlay Districts Map, however, no Natural Heritage and Endangered Species Program (NHESP) BioMap2 Core Habitats or Critical Natural Landscapes occur on-site. The nearest of those locations are across Brick Kiln Road to the south of the development. Refer to **Exhibit 27** for details. Also note that the development is not within a Key Site as defined in the State Wildlife Action Plan.

WPH_1 Areas of Emphasis by Placetype

The Emphasis for Rural Development Areas under this Objective is as follows.

Placetype Objective	Development Response
Rural Development Areas – new clearing is minimized, does not conflict with rural character, preserves habitat connections.	The Applicant proposes to minimize clearing at the development to construct a facility that meets their needs without sacrificing planned community services and does not conflict with the Rural Development Area character. The remaining natural area on-site preserves habitat and connects to other nearby habitats.

Continued on next page,

Wildlife and Plant Habitat, Continued

WPH_2 Method The Method under this Objective includes the following.

Method	Development Response
Restore altered or degraded habitat areas where ecologically appropriate (for example, sandplain grasslands, pine barrens, etc.).	The proposed development is mostly new development with redevelopment of a previously developed area parking area. Therefore, clearing and alteration is necessary. Also, on-site invasive species eradication coupled with ecological restoration meets the intent of this Method.

WPH_3 Methods The Methods under this Objective includes the following.

Method	Development Response
Locate development outside of rare species habitat, wetlands, vernal pools and their buffers, and BioMap2 Core Habitat and Critical Natural Landscapes.	This Method is not applicable to the proposed development because the listed features do not exist on the site.
Where a project is located within mapped rare species habitat, demonstrate that impacts to rare species have been avoided. Comments from the Natural Heritage and Endangered Species Program may be used to support demonstration that the project does not adversely impact rare species or their habitats.	This Method is not applicable to the proposed development because the listed features do not exist on the site.
For projects adjacent to a vernal pool. • Locate development outside of certified or certifiable vernal pools. • Provide a 350-foot undisturbed buffer to the vernal pool. • Locate new stormwater discharges a minimum of 100 feet from vernal pools.	This Method is not applicable to the proposed development because no veral pool is present within 350 feet of the development.

Continued on next page,

Wildlife and Plant Habitat, Continued

WPH_4 Methods The Methods under this Objective include the following.

Method	Development Response
Where invasive species have been identified on a project site, provide an invasive species management plan that helps to prevent the spread of invasive species on the site.	The Applicant proposes to use this Method to meet the Objective. Refer to **Exhibit 16** for details.
Use Best Management Practices during construction to avoid introduction of invasive species.	The Applicant proposes to use this Method to meet the Objective. The plan in **Exhibit 16** will be refined prior to the start of construction.

WPH_5 Methods The Methods under this Objective include the following.

Method	Development Response
Use building envelopes to limit the extent of site alteration and disturbance to the minimum areas needed for the project.	The Applicant intends to use this Method to meet this Objective. The Applicant proposes to construct a building that encompasses the majority of their services with the exception of outdoor child and young adult activity areas.
Use erosion control barriers during construction to prevent gullying.	The Applicant intends to use this Method to meet this Objective. Erosion control barriers and other applicable methods to control siltation, runoff, vehicular tracking etc. will be employed.
Use fencing to protect plants and wildlife from harm during construction.	The Applicant intends to use this Method to meet this Objective. Temporary fencing is proposed during construction to protect plants and wildlife during construction.

Waste Management

Introduction

The Waste Management Goal and Objectives are designed to promote a sustainable solid waste management system for the region that protects public health, safety, and the environment and supports the economy.

Objectives

There are two Objectives associated with these design Goals. They are:

- Objective WM_1 – To reduce waste and waste disposal by promoting waste diversion and other "Zero Waste" initiatives.
- Objective WM_2 – Support an integrated solid waste management system.

WM_1 Methods

The Methods under this Objective includes the following.

Method	Development Response
Incorporate alternatives to disposal such as the productive re-use of materials, and resource recovery of useful materials.	The proposed development is new construction and limited reconstruction of a parking area. Accordingly, reuse of materials will be limited to existing parking lot gravel and the soil materials generated by excavation for development features.
Incorporate clean waste-to-energy initiatives such as anaerobic digestion.	The proposed development will comply with all Massachusetts solid waste requirements. However, the development will not produce enough organic waste to justify transfer to a clean waste to energy plant.
Create or expand opportunities to compost organic materials.	Please see the comment above.
Incorporate Industrial Ecology, which is co-locating businesses so that by-products from one or more processes are utilized as input to other processes.	The proposed development does not provide any opportunity to co-locate any business on-site that includes processing of materials.
For manufacturing facilities and operations: • Minimize packaging, • Reduce toxics in packaging, • Incorporate extended producer responsibility for reuse, recycling, and disposal manufactured products.	The proposed development does not propose any manufacturing.

Continued on next page,

Waste Management, Continued

WM1 Methods, continued

Method	Development Response
Develop or support local markets, infrastructure, technologies, jobs and firms in recycling, re-use, resource recovery and related material management efforts.	The proposed development will use this Method to meet the Objective. There are presently several alternatives (e.g., New Bedford Waste, Waste Management, etc.) that can be utilized by the development, especially during its construction phase.
Support municipal waste diversion facilities and encourage regional coordination between municipal facilities.	At present, there are few municipal waste diversion facilities in the proposed development area. Accordingly, the Applicant will likely contract with private sector waste diversion companies.
Support private waste diversion facilities and markets to support and supplement municipal waste facilities and operations.	The proposed development will support this Method to meet the Objective. The Applicant will contract private waste and recycling activities.
Reuse buildings and structures.	The proposed development does not include reuse of buildings and structures.

WM_2 Methods The Methods under this Objective includes the following.

Method	Development Response
For waste facilities, incorporate zero waste future technologies and initiatives to preserve existing disposal capacity to serve regional needs.	This is not applicable for this particular development.
Develop integrated facility partnerships – including between municipalities and businesses – to support integrated solid waste management systems.	The proposed development will utilize this Method to meet the Objective. The Applicant will support the local integrated solid waste management system during construction and operation.
Properly manage construction and demolition waste and recycling.	The proposed development will utilize this Method to meet the Objective. The Applicant will send all construction waste to a MassDEP Waste Ban approved C&D processor.

Continued on next page,

Waste Management, Continued

WM_2 Methods, continued

Method	Development Response
Use alternative methods to trucking to transport waste and recycling materials from Barnstable County, including rail and ship, in order to reserve roadway capacity.	This method does not apply to the proposed development because nearby shipping alternatives to trucking do not exist.
Support existing municipal waste facilities, and encourage regional coordination between municipal facilities	The proposed development will utilize this Method to meet the Objective. Waste from the development during operations will be sent to the local municipal waste facility.
Support private waste facilities and markets to support and supplement municipal waste facilities and operations	The proposed development will utilize this Method to meet the Objective. The Applicant will utilize private waste facilities and markets to support and supplement the local municipal waste facility and markets during the construction phase of the development.

EXHIBIT 5

LIST OF REQUIRED PERMITS

Green Seal Environmental, LLC
114 State Road, Bldg. B, Sagamore Beach, MA 02562

Upper Cape YMCA
Falmouth, MA

Cape Cod Commission
Development of Regional Impact Review

List of Required Federal, Regional, and Municipal Permits and Reviews

Authority	Department/Division/Program	Permit/Review
Cape Cod Commission	Regional Policy Plan	• Development of Regional Impact Review
Town of Falmouth	Planning Board	• Subdivision Approval Not Required Permit • Site Plan Review
Town of Falmouth	Zoning Board of Appeals	• Special Permit
Town of Falmouth	Building Department	• Building Permit • Electrical Permit • Plumbing Permit • Gas Fitting Permit • Sign Permit • In-Ground Swimming Pool permit
Town of Falmouth	Board of Health	• Innovative Alternative Septic System Approval
Town of Falmouth	Health Department	• Disposal Works Construction Permit • *Irrigation Well Permit
Town of Falmouth	Natural Resources Department	• Review for Wildlife Migration Corridor requirement
Town of Falmouth	Fire Department	• Liquid Propane Tank Permit • CO Alarm Installation Permit • Fire Sprinkler Installation Permit • Fire Alarm System Installation Permit
Town of Falmouth	DPW – Water Division	• Water Service Connection Permit
State of Massachusetts	Division of Conservation Services and Secretary of Energy and Environmental Affairs	• Conservation Restriction Review (Open Space)

* - Required if installing an irrigation well

EXHIBIT 6

CCC APPLICATION FEE CALCULATIONS

Cape Cod Commission Development of Regional Impact

Application Fee Calculation for the Proposed

Upper Cape YMCA, Falmouth, MA

The following calculations are based on the Cape Cod Commission Enabling Regulations, Section 14 (Schedule of Fees as amended for Fiscal Year 2024, last revised on May 3, 2023, with revised fee schedule effective July 1, 2023).

Non-Residential Development:

Building	Gross Floor Area	Calculation
YMCA Building	68,470 sq. ft.	68,470 x \$0.66 /sq. ft = \$45,190.20
	Sub-Total	**\$45,190.20**

Outdoor Space

Outdoor Space	Gross Area	Calculation
Outdoor Activity Areas (west side of YMCA building)	19,480 sq. ft.	19, 480 x \$0.66/sq. ft. = \$12,856.80
	Sub-Total	**\$12,856.80**

Total Application Fee: \$59,554.44

The Applicant is filing for a Reduction in Application Fee based on the following allowance in the Schedule of Fees – ***The Applicant provides documentation of non-profit status (10% reduction).*** Therefore, the *Total Revised Application Fee* calculation is:

\$58,047 x 0.90 (90%) = **\$52,242.00**

Please see the attached Non-Profit Status documentation

EXHIBIT 7

PROPERTY PURCHASE AND SALE AGREEMENT

BOOK 2491 PAGE 198 07780

The Corporation of the New England District of the Lutheran Church-Missouri Synod,

a corporation duly established under the laws of Connecticut
and having its usual place of business at 400 Wilbraham Road, Springfield,
Hampden County, Massachusetts

for ~~consideration paid~~ no consideration

grants to Christ Lutheran Church of Falmouth, with an address at 485 Brick Kiln Road, Falmouth, Massachusetts
with quitclaim covenants

the land in Falmouth, Barnstable County, Massachusetts being more particularly described on Schedule A attached hereto and made a part hereof.

No documentary stamps required.

In witness whereof, the said Corporation of the New England District of the Lutheran Church-Missouri Synod
has caused its corporate seal to be hereto affixed and these presents to be signed, acknowledged and delivered in its name and behalf by John M. Haffenreffer
its Treasurer hereto duly authorized, this Eighth
day of March in the year one thousand nine hundred and seventy-seven.

Signed and sealed in presence of

THE CORPORATION OF THE NEW ENGLAND DISTRICT OF THE LUTHERAN CHURCH-MISSOURI SYNOD

by John M. Haffenreffer

The Commonwealth of Massachusetts

Suffolk County ss. March 8, 1977

Then personally appeared the above named John M. Haffenreffer

and acknowledged the foregoing instrument to be the free act and deed of the Corporation of the New England District of the Lutheran Church-Missouri Synod

before me

Notary Public—Justice of the Peace

My commission expires June 4, 1982

CHAPTER 183 SEC. 6 AS AMENDED BY CHAPTER 497 OF 1969

Every deed presented for record shall contain or have endorsed upon it the full name, residence and post office address of the grantee and a recital of the amount of the full consideration thereof in dollars or the nature of the other consideration therefor, if not delivered for a specific monetary sum. The full consideration shall mean the total price for the conveyance without deduction for any liens or encumbrances assumed by the grantee or remaining thereon. All such endorsements and recitals shall be recorded as part of the deed. Failure to comply with this section shall not affect the validity of any deed. No register of deeds shall accept a deed for recording unless it is in compliance with the requirements of this section.

SCHEDULE A

A certain parcel of land situated in Falmouth, Barnstable County, Massachusetts, on the Northerly side of the Road leading from East Falmouth to West Falmouth, sometimes called the Brick Kiln Road, bounded and described as follows:

SOUTHWESTERLY by Brick Kiln Road, four hundred seventy-nine and 00/100 (479.00) feet;

NORTHWESTERLY by Lot 1, by several lines together measuring, one thousand one hundred seven and 70/100 (1107.70) feet);

NORTHEASTERLY by land now or formerly of Henry Nortlin, two hundred sixty-four and 17/100 (264.17) feet;

SOUTHEASTERLY by land now or formerly of Innocencio Gomes and land of Joseph Bishop, by several lines, together measuring one thousand three hundred forty-two and 67/100 (1342.67) feet;

Containing an area of 9.9 acres and being shown as Lot 2 on a plan entitled "Plan of Land of Antone C. Barboza, Falmouth, Mass. March, 1947, Scale 1" equals 100', Elmer W. Gifford, C.E." recorded with Barnstable Registry of Deeds in Plan Book 77, Page 105.

There is excepted from the foregoing that portion of the granted premises that has been taken by the Town of Falmouth for a public way known as Brick Kiln Road under an Order of Taking, dated March 29, 1961, recorded with Barnstable Registry of Deeds in Book 1109, Page 283.

For our title, see deed from Atlantic District of the Lutheran Church-Missouri Synod to us, dated January 15, 1973 recorded with Barnstable Registry of Deeds in Book 1937, Page 268.

The conveyance hereunder is subject to a certain mortgage executed by the Atlantic District of the Lutheran Church-Missouri Synod as mortgagor to the Bass River Savings Bank, South Yarmouth, Massachusetts as mortgagee, which mortgage is dated December 2, 1963 and on which mortgage there is now due and owing the principal sum of $13,488.55, and that the grantee hereby assumes and covenants to pay such mortgage debt and interest thereon.

RECORDED APR 11 1977

From the Office of:
Kevin P. Klauer II, Esquire
Ament Klauer LLP
39 Town Hall Square
Falmouth, MA 02540

AMENDED AND RESTATED PURCHASE AND SALE AGREEMENT

This amended and restated Purchase and Sale Agreement dated this ____ day of ______________, 2023, between Christ Lutheran Church of Falmouth, Inc. and Cape Cod Young Men's Christian Association, Inc. is intended to reiterate the terms of the Agreement between the parties dated January 31, 2020 (the, "Initial Agreement") it being understood that the Initial Agreement is terminated and replaced with the following as of the execution hereof:

1. PARTIES AND MAILING ADDRESSES

Christ Lutheran Church of Falmouth, Inc., with a mailing address of 485 Brick Kiln Road, Falmouth, Massachusetts 02540, hereinafter called the SELLER, agrees to SELL and

Cape Cod Young Men's Christian Association, Inc., with a mailing address of 2245 Iyannough Road, West Barnstable, Massachusetts 02668, hereinafter called the BUYER, agrees to BUY, upon the terms hereinafter set forth, the following described premises:

2. DESCRIPTION

Approximately 6.16 acres of vacant land located at 485 Brick Kiln Road, Falmouth, Massachusetts as shown on the plan appended as Exhibit A. Said property is a portion of that recorded and more properly described at the Barnstable County Registry of Deeds in Book 2491, Page 198 and shown as Parcel 2 on Plan Book 77, Page 105 (the "Premises").

3. BUILDINGS, STRUCTURES, IMPROVEMENTS, FIXTURES

Intentionally omitted.

4. TITLE DEED

The Premises is to be conveyed by a good and sufficient quitclaim deed running to the BUYER, or to the nominee designated by the BUYER by written notice to the SELLER at least seven days before the deed is to be delivered as herein provided, and said deed shall convey a good and clear record and marketable title thereto, free from encumbrances, except

(a) Provisions of existing building, environmental and zoning laws;
(b) Existing rights and obligations in party walls which are not the subject of written agreement;
(c) Such taxes for the then current year as are not due and payable on the date of the delivery of such deed;
(d) Any liens for municipal betterments; and
(e) Easements, restrictions and reservations of record, if any, so long as the same do not prohibit or materially interfere with the proposed use of said Premises for a YMCA facility.

5. PLANS

Intentionally omitted.

6. REGISTERED TITLE

Intentionally omitted.

7.	PURCHASE PRICE	The agreed purchase price for the Premises is Five Hundred Fifty Thousand Dollars ($550,000.00), of which $ 1,000.00 having been paid as a deposit with the Offer to Purchase $ 24,000.00 being paid at the time of this amendment and restatement of the Agreement $ 525,000.00 are to be paid at the time of delivery of the deed by MA attorney's IOLTA account check (this balance due to be net of the amounts of credits due against the purchase price as further set forth in Paragraph 39(b)ii and 39(b)iii herein) $ 550,000.00 TOTAL
8.	TIME FOR PERFORMANCE; DELIVERY OF DEED	Such deed is to be delivered at 2:00 PM on or before December 11, 2024 or before by mutual agreement of the parties, unless this agreement is earlier terminated according to the provisions of Paragraph 39 hereof, at the office of Ament Klauer LLP, located at 39 Town Hall Square, Falmouth, MA 02540, unless some other time and place are mutually agreed upon in writing. It is agreed that time is of the essence to this agreement.
9.	POSSESSION AND CONDITION OF PREMISES	Full possession of said Premises free of all tenants and occupants, except as herein provided, is to be delivered at the time of the closing, said Premises to be then (a) in the same condition as they now are, reasonable use and wear thereof excepted, and (b) in compliance with provisions of any instrument referred to in clause 4 hereof. The BUYER shall be entitled to personally enter said Premises prior to the delivery of the deed in order to determine whether the condition thereof complies with the terms of this clause.
10.	EXTENSION TO PERFECT TITLE OR MAKE PREMISES CONFORM	If the SELLER shall be unable to give title or to make conveyance, or to deliver possession of the Premises, all as herein stipulated, or if at the time of the delivery of the deed the Premises do not conform with the provisions hereof, then the SELLER shall use reasonable efforts to remove any defects in title, or to deliver possession as provided herein, or to make the said Premises conform to the provisions hereof, as the case may be, in which event the SELLER shall give written notice thereof to the BUYER at or before the time for pe1formance hereunder, and thereupon the time for pe1formance hereof shall be extended for a period of thirty (30) days. Reasonable efforts shall not require the seller to spend more than$ 2,750.00, exclusive of voluntary liens or IRS liens but inclusive of attorney's fees.
11.	FAILURE TO PERFECT TITLE OR MAKE PREMISES CONFORM, etc.	If at the expiration of the extended time the SELLER shall have failed so to remove any defects in title deliver possession, or make the Premises conform, as the case may be, all as herein agreed, or if at any time during the period of this agreement or any extension thereof, the holder of a mortgage on said Premises shall refuse to permit the insurance proceeds, if any, to be used for such purposes, then any payments made under this agreement shall be forthwith refunded and all other obligations of the parties hereto shall cease and this agreement shall be void without recourse to the parties hereto.

12.	BUYER'S ELECTION TO ACCEPT TITLE	The BUYER shall have the election, at either the original or any extended time for pe1formance, to accept such title as the SELLER can deliver to the said Premises in their then condition and to pay therefore the purchase price without deduction, in which case the SELLER shall convey such title, except that in the event of such conveyance in accord with the provisions of this clause, if the said Premises shall have been damaged by fire or casually insured against, then the SELLER shall, unless the SELLER has previously restored the Premises to their former condition, eitl1er (a) pay over or assign to the BUYER, on delivery of the deed, all amounts recovered or recoverable on account of such insurance, less any amounts reasonably expended by the SELLER for any partial restoration, or (b) If a holder of a mortgage on said Premises shall not permit the insurance proceeds or a part thereof to be used to restore the said Premises to their former condition or to be so paid over or assigned, give to the BUYER a credit against the purchase price, on delivery of the deed, equal to said amounts so recovered or recoverable and retained by the holder of the said mortgage less any amounts reasonably expended by the SELLER for any partial restoration
13.	ACCEPTANCE OF DEED	The acceptance and recording of the deed by the BUYER or his nominee as the case may be, shall be deemed to be a full pe1formance and discharge of every agreement and obligation herein contained or expressed, except such as are, by the terms hereof, to be performed after the delivery of said deed.
14.	USE OF MONEY TO CLEAR TITLE	To enable the SELLER to make conveyance as herein provided, the SELLER may at the time of delivery of the deed, use the purchase money or any portion thereof to clear the title of any or all encumbrances or interest, provided that all instruments so procured are recorded simultaneously with this delivery of said deed or in accordance with customary conveyancing practices in Barnstable County.
15.	INSURANCE	Until the delivery and recording of the deed, the SELLER shall maintain insurance on said Premises as follows: *Type of Insurance* — *Amount of Coverage* (a) Fire and Extended Coverage — *$ As presently insured
16.	ADJUSTMENTS	Taxes for the then current fiscal year shall be apportioned as of the day of pe1formance of this agreement and the net amount thereof shall be added to or deducted from, as the case may be, the purchase price payable by the BUYER at the time of delivery of the deed,
17.	ADJUSTMENT OF UNASSESSED AND ABATED TAXES	If the amount of said taxes is not known at the time of the delivery of the deed, they shall be apportioned on the basis of the taxes assessed for the preceding fiscal year, with a reapportionment as soon as the new tax rate and valuation can be ascertained; and, if the taxes which are to be apportioned shall thereafter be reduced by abatement, the amount of such abatement, less the reasonable cost of obtaining the same, shall be apportioned between the parties, provided that neither party shall be obligated to institute or prosecute proceedings for an abatement unless herein otherwise agreed.
18.	BROKER's FEE	Intentionally omitted.
19.	BROKER(S) WARRANTY	Intentionally omitted.

20. DEPOSIT

The $1,000 deposit paid by Buyer upon execution of the original agreement, and the $24,000 deposit paid herewith are the sole property of the Seller, not subject to refund in any circumstances. The Buyer expressly understands that the deposits which Buyer has paid as identified in paragraph 7, hereof, are non-refundable, will not be held in escrow by any party, and shall remain Seller's property even in the event of Buyer's termination of this agreement, whether pursuant to a contingency contained herein or otherwise. Should Buyer not terminate this agreement, at the time of the closing, the deposits paid pursuant to paragraph 7 hereof shall be a credit to Buyer against the purchase price due at closing as provided for in paragraph 7.

21. DEFAULT DAMAGES

If the BUYER shall fail to fulfill the BUYER's agreements herein, all deposits made hereunder by the BUYER shall be retained by the SELLER as liquidated damages which shall be SELLER's sole and exclusive remedy at law or in equity.

22. RELEASE BY HUSBAND OR WIFE

Intentionally omitted.

23. BROKER AS PARTY

Intentionally omitted.

24. LIABILITY OF TRUSTEE, SHAREHOLDER, BENEFICIARY, etc.

If the SELLER or BUYER executes this agreement in a representative or fiduciary capacity, only the principal or the estate represent shall be bound, and neither the SELLER or BUYER so executing, nor any shareholder or beneficiary of any trust, shall be personally liable for any obligation, express or implied hereunder.

25. WARRANTIES AND REPRESENTATIONS

The BUYER acknowledges that the he has not been influenced to enter into this transaction nor has he relied upon any warranties or representations not set forth or incorporated in this agreement or previously made in writing.
None made.

26. MORTGAGE CONTINGENCY CLAUSE

Intentionally omitted.

27. CONSTRUCTION OF AGREEMENT

This instrument, executed in multiple counterparts, is to be construed as a Massachusetts contract, is to take effect as a sealed instrument, sets forth the entire contract between the parties, is binding upon and ensures to the benefit of the parties hereto and their respective heirs, devisees, executors, administrators, successors and assigns, and may be cancelled, modified or amended only by a written instrument executed by both the SELLER and the BUYER. If two or more persons are named herein as BUYER their obligations hereunder shall be joint and several. The captions and marginal notes are used only as a matter of convenience and are not to be considered a part of this agreement or to be used in determining the intent of the parties to it.

28. LEAD PAINT LAW

Intentionally omitted.

29. SMOKE DETECTORS AND CARBON MONOXIDE ALARMS

Intentionally omitted.

30. Access. BUYER and their agents shall have the right to enter said Premises prior to the time specified for delivery of SELLER'S deed for the purpose of performing tests, taking measurements or showing said Premises to prospective contractors. Such right of access shall be exercised only after reasonable notice thereof to SELLER, it being agreed between the parties that at least 24 hours of prior written notice shall be reasonable notice and in the presence of Seller's agent.

BUYER may also enter upon the Premises within 24 hours prior to the closing for the purpose of inspecting the condition of the Premises. Buyer herein agrees to indemnify and hold Sel1er harmless from and against any and all claims of whatsoever nature arising from the Buyer's exercise of rights granted herein. This indemnity shall survive the delivery of the deed.

31. Notice: All notices required or permitted to be given hereunder shall be given in writing by registered or certified mail, proper postage prepaid, return receipt requested, and deposited with the United States Postal Service, or hand delivered, or sent by receipted facsimile transmission or email with read receipt confirmation, and shall be deemed given and effective when so mailed or hand delivered, or sent by receipted facsimile transmission or email with read receipt confirmation, evidenced by a transmission receipt evidencing a successfully completed transmission thereof, addressed to SELLER or BUYER's representative, as the case may be, at the following addresses:

In the case of BUYER:

Kevin P. Klauer II, Esq.
Ament Klauer LLP
39 Town Hall Square
Falmouth, MA 02540
Telephone: 508-540-6555
Facsimile: 508-457-1293
Email: kevin@amentklauer.com

In the case of SELLER:

Geoffrey S. Nickerson, Esq.
Oppenheim & Nickerson LLP
156 Locust Street
Falmouth, MA 02540
Tel. 508 548 8255
gsn@onllplaw.com

32. Affidavits and Certificates: At or before the closing, SELLER shall execute and deliver any and all customary documents and instruments reasonably required by BUYER'S counsel or Lender's counsel, including, without limitation, a closing statement; I.R.C. 1009-S Information Form; I.R.C. W-9 Forms; the standard form for mechanics' liens and parties-in-possession affidavit; a so-called "Non-Foreign Affidavit" for the purpose of establishing that the withholding requirements of I.R.C. Section 1445 do not apply to this transaction; and an affidavit to the best of the Seller's knowledge that there is no urea formaldehyde foam insulation ("UFFI") on said Premises.

33. Title and Practice Standards: Any matter or practice arising under or relating to this Agreement that is the subject of a Title Standard or Practice Standard or the Real Estate Bar Association of Massachusetts shall be governed by such standard to the extent applicable.

34. Errors and Omissions: If any errors or omissions are found to have occurred in any calculations or figures used in the settlement statement signed by the parties (or would have been included if not for any such error or omission) a notice thereof is given within sixty (60) days of the date of delivery of the deed to the party to be charged, then such party agrees to make payment to correct the error or omission.

35. Seller Representations: SELLER represents to Buyer that:

(a) SELLER has not received from any authority any written notices of noncompliance with applicable law affecting the Property that will not have been remedied in full by the Closing;

(b) This Agreement and its execution, delivery and performance by Seller have been duly authorized by all necessary action on behalf of SELLER; the Agreement is a valid and binding obligation of SELLER; and the sale of the Property, and the consummation of the transactions contemplated hereby; will not result in any violation or breach of any indenture or agreement to which SELLER is a party or by which SELLER or the Property is affected and bound;

(c) SELLER has received no written notice of any condemnation proceeding or declaration of taking or similar instrument filed against the Property and there is no litigation or proceeding pending or threatened which affects SELLER, the Property or the use thereof;

(d) SELLER has not received any written notice of any requirement of any insurance carrier requiring any modifications or work to be performed on the Property as a condition to the maintenance or renewal of any policies of insurance in respect to the Property;

(e) No person, firm or entity, has any rights in, or right to acquire the Property or any part thereof. There are no contracts or agreements, written or oral, affecting the ownership or operation of the Property;

(f) Neither Seller to the best of Seller's knowledge and without independent investigation or duty to conduct same: (i) except in compliance with applicable law, has ever caused, permitted or suffered to exist any Hazardous Material to be spilled, placed, held, located or disposed of on, the Premises except as substances used for ordinary household or commercial use, such as cleaning, etc., (ii) has ever used the Premises as a treatment, storage or disposal (whether permanent or temporary) site for an Hazardous Material, and (iii) has any actual knowledge, of any written notice of violation, lien or other notice has been issued or given by any governmental agency or authority with respect to the environmental condition of the property. For purposes of this paragraph the term "Hazardous Material" shall mean (y) oil, petroleum, hazardous waste, as that term is defined in the Comprehensive Environmental Response Compensation and Liability act of 1980, as amended, 42 U.S.C. 9601, or in any applicable state law or regulation All representations and warranties made by SELLER above or elsewhere in this Agreement shall be deemed to be made on the date of this Agreement and on the Closing Date, and it shall be a condition of Buyer's obligation to close that all warranties and representations made hereunder are true at all times prior to the Closing Date.

36. Actions Prior to Closing: From the date of this Agreement to the Closing Date, SELLER shall:

(a) Cooperate with Buyer in connection with the permitting for the property and consummation of the transaction;

(b) Continue to operate and manage the Property in a normal, prudent and customary fashion and commit no waste with respect thereto;

(c) Not make or grant consent to any material or structural alteration to the Property;

(d) Not execute, extend or alter any existing leases or tenancies on the subject property without the written consent of Buyer which may be withheld in Buyer's sole and absolute discretion

37. Documents to be Delivered at Closing: At the Closing, SELLER shall deliver the following documents to BUYER:

(a) The Quitclaim Deed;

(b) Certificate of Vote of the SELLER authorizing the transaction contemplated by the Agreement;

(c) Not applicable;

(d) An affidavit substantially in the form customarily required by title insurance companies operating in the Commonwealth of Massachusetts concerning parties in possession and mechanic's liens for the purpose of permitting such title insurance company to issue an owner's title policy without the standard exceptions for parties in possession and mechanic's liens; and

(e) All other instruments and documents customarily required to which BUYER may be entitled under any provision of this Agreement

38. Conditions to Closing:

I. The obligation of BUYER to consummate the transactions contemplated herein is subject to the satisfaction or waiver in writing by BUYER of each of the following conditions at or prior to the Closing:

(a) BUYER shall have obtained at BUYER'S expense, at regular rates, a standard ALTA's owner's title insurance policy issued by the Title Company, insuring title to the Property in the amount of the Purchase Price, subject to the standard printed exceptions, provided that such exceptions do no render title to the Premises unmarketable. BUYER shall not be required to obtain any affirmative coverage.

(b) There shall have been no material adverse change in the condition of the Property from such condition as of the date hereof, or in any of the fixtures or mechanical equipment included in the Property unless agreed to by the parties in writing

II. The obligation of SELLER to consummate the transactions contemplated herein is subject to the satisfaction or waiver in writing by SELLER of the following conditions at or prior to the Closing:

(a) Passage of Article 9, paragraph 2 of the Annual Town Meeting Warrant at the Town of Falmouth Annual Town Meeting in November 2023 (the "Zoning Amendment") , and subsequent approval of the Zoning Amendment by the Massachusetts Office of the Attorney General.

39. <u>The parties further acknowledge and agree as follows</u>:

(a) Buyer has undertaken such due diligence as Buyer deems reasonably necessary with respect to the Premises and is satisfied with the same, no representations or warranties of any kind with respect to the suitability of the Premises for any use or purpose having been made by the Seller to the Buyer in writing or verbally at any time;

(b) The parties acknowledge that since the initial Purchase and Sale agreement between the parties executed on January 31, 2020 Buyer has been undertaking to secure any and all necessary permits for the construction of its proposed development.

(c) In furtherance of such permitting, any further entry onto the Premises by Buyer, its agents, assignees, or licensees, shall only be undertaken with 48 hours' prior written notice to Seller (which may include email), provided that any professionals who access the Premises on Buyer's behalf shall have liability insurance in commercially reasonable amounts naming Seller and Buyer as additional insured. Buyer shall name Seller as an additional insured on the Buyer's liability insurance policy to cover any access by Buyer or licensees/invitees of Buyer, and Buyer shall further indemnify, defend and hold harmless Seller from and against any and all claims, causes of action or controversies in any way related to any party's exercise of this right of access. This indemnification and hold harmless obligation shall survive the delivery and recording of the deed from Buyer to Seller as contemplated herein. The parties further agree and acknowledge as follows:

i. For the first year after execution of the initial agreement, –Buyer has pursued potential wastewater permitting for the property in connection with the proposed development. During that year, Buyer paid Seller $20,000.00 in quarterly payments of $5,000.00, commencing on January 1, 2020, concluding on December 31, 2020.

ii. Buyer has paid Seller $20,000 in quarterly payments of $5,000 commencing January 1, 2021; Buyer has paid Seller $20,000 in quarterly payments of $5,000 commencing January 1, 2022. None of these payments shall be credited against the purchase price at closing, it being understood that all such payments have been made and are the sole property of the Seller. Buyer has continued to pay Seller quarterly payments of $5,000 commencing January 1, 2023 through December 31, 2023, none of these payments shall be credited against the purchase price at closing, it being understood that all such payments have been made and are the sole property of the Seller. As of the date of this agreement, through the closing the quarterly payments shall be increased to $7,500. In the event Buyer is unable to proceed with its proposed development after the execution hereof, due to Buyer's inability to secure permits therefor, Buyer shall provide Seller with written notice to terminate the transaction, at which point the transaction shall be deemed null and void without further recourse to either party, any deposits paid by Buyer and any quarterly payments made by Buyer hereunder shall remain the sole property of the Seller, not subject to refund under any circumstances;

iii. Quarterly Payments made under 39(b)(i) and 39(b)(ii) – it is agreed that any quarterly payments made hereunder shall be released to Seller and are deemed non-refundable. In the event Buyer proceeds to purchase the property, none of the quarterly payments made from the start of the agreement through the date of this Amendment shall be credited towards the purchase price at closing, and of the payments made following the date of this Amendment, only $2,500.00 of each quarterly payment shall be applied at closing as a credit to Buyer against the purchase price;

iv. If a division of the property in connection with Buyer's permitting results in real estate taxes being assessed for the newly created 6.l6 acre parcel, Buyer agrees to pay said additional real estate tax until the transaction is either terminated or it closes.

(d) Buyer contemplates developing an Approval Not Required plan (the, "ANR") dividing Seller's property, which includes the Premises, to further Buyer's acquisition and potential development thereof. Buyer shall submit to Seller drafts of the ANR, as well as drafts of all permit applications to regulatory Authorities to be filed by Buyer prior to filing for Seller's review and comment (the "Applications"). Such submission to Buyer shall be made not less than 10 days prior to filing any Applications. To the extent that any Application relates to the easement identified in paragraph 46 hereof, Seller shall have the right to approve or reject the terms of the Application in Seller's sole discretion.

(e) Upon recording of the deed, Seller shall grant to Buyer a right of first refusal to purchase the remaining Church property (Parcel 2 in Plan Book 77, Page 105) at 485 Brick Kiln Road, Falmouth, Massachusetts if the Church decides to sell such property, a copy of which is attached as Exhibit B. The right of first refusal shall be recorded at the Registry of Deeds. All costs associated with recording the right of first refusal and any plans related thereto shall be paid exclusively by the Buyer.

(f) Buyer shall share with Seller all utility plans as soon as reasonably practicable, such that Seller may identify whether the utilities to be installed by Buyer in connection with Buyer's development of the Premises may be installed in such a manner as to serve the structures on Seller's remaining property on Lot 2A. Any reasonable modifications proposed to Buyer's plans to create utility services which serve only the improvements on Lot 2A shall be undertaken and installed at the sole cost of Buyer within the Premises, it being understood that the Seller shall be responsible for the actual installation of utility services within Lot 2A, exclusive of the installation of utilities serving the easement area identified in paragraph 46 hereof, which shall be installed according to the terms of the easement attached hereto as Exhibit D.

40. Legal Counsel: The Parties hereby affirm and acknowledge that they have been given the opportunity to seek legal counsel prior to the execution of the Agreement and any attached Rider(s) and that they have ether done so or hereby waive the privilege.

41. Massachusetts Contract: This instrument, executed in triplicate, is to be construed as a Massachusetts contract, is to take effect as a sealed instrument, sets forth the entire contract between the parties, is binding upon and inures to the benefit of the parties hereto and their respective heirs, devisees, executors, administrators, successors and assigns, and may be canceled, modified or amended only by written instrument executed by both the SELLER and BUYER. If two or more persons are named herein as BUYER, their obligations hereunder shall be joint and several.

42. Limited Power of Attorney: BUYER and SELLER hereby authorize their respective attorneys (as the case may be) to execute on their behalf any extensions to the time for performance or to mortgage financing under this Agreement and any change of location and/or time for delivery of the deed. The BUYER and SELLER shall be able to rely upon the signature of said attorneys as binding unless they have actual knowledge before the execution or other consent to such extensions, that either party has disclaimed the authority granted herein to bind them. For purposes of this Agreement, facsimile or email signatures shall be construed as original.

43. Waiver: The excuse or waiver of the performance by a party of any obligation of the other party under this Agreement shall only be effective if evidenced by a written statement signed by the party so excusing or waiving. No delay in exercising any right or remedy shall constitute a waiver thereof, and no waiver by Seller or Buyer of the breach of any covenant of this Agreement shall be construed as a waiver of any preceding or succeeding breach of the same or any other covenant or condition of this Agreement.

44. Counterparts: This Agreement may be executed and delivered (including electronically as permitted by Massachusetts law) in one or more counterparts, and by the different parties hereto in separate counterparts, each of which when executed shall be deemed to be an original, but all of which taken together shall constitute one and the same agreement.

45. Recording: Seller and Buyer agree that neither party shall have the right to record this Agreement in any public office. Recordation of this Agreement shall void this Agreement.

46. Seller agrees to provide Buyer with an easement to use the rear portion of the Lot 2A for a combined parking lot for the intended YMCA and use by the Church as shown on the plan attached hereto as Exhibit C and as further described in the proposed easement agreement attached hereto as Exhibit D (the parties hereto acknowledge that the Agreement attached as Exhibit D is intended as a working draft and may be changed by agreement of the parties prior to the for closing). All costs associated with recording the easement and any plans related thereto shall be paid exclusively by the Buyer.

NOTICE: This is a legal document that created binding obligations. If not understood, consult an attorney.

SELLER: Christ Lutheran Church of Falmouth, Inc.

____
By: Linda Foster, President
Hereunto Duly Authorized

____
By: Deborah Toczylowski, Treasurer

BUYER: Cape Cod YMCA, Inc.

____
By: Stacie Peugh, President and CEO
Hereunto Duly Authorized

EXHIBIT A

NOTES

1. Owner of Record:
   Christ Lutheran Church of Falmouth
   485 Brick Kiln RD
   Falmouth, MA 02536
2. Deed Reference:
   – Book 2491, Page 198
   Banstable Registry of Deeds
3. Plan References:
   – Plan Book 77X, PAGE 105
   Barnstable Registry of Deeds
4. Horizontal datum is based upon Massachusetts Mainland State Plane Coordinate System, NAD83, in US Survey Feet.
5. Vertical Datum is based upon NAVD88, in US Survey Feet.
6. Underground utilities depicted hereon are based upon visible, above ground evidence and record information and are only approximate. Contractor is responsible for taking all necessary precautions before beginning any excavation. (Digsafe 1–888–344–7233)
7. Parcel and right of way lines were obtained from the Massachusetts Geographic Information System.
8. The site is located in FEMA Flood Zone X as shown on FIRM 25001C0728JK, effective July 17, 2014.

-EXHIBIT A-

REVISIONS

DATE	DESCRIPTION	INIT.

THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

RICHARD J. HOOD, PLS
PROFESSIONAL LAND SURVEYOR NO. 35031

Date

APPROVAL NOT REQUIRED PLAN
LOCATED AT
485 BRICK KILN ROAD FALMOUTH, MA
PREPARED FOR
YMCA OF CAPE COD

Green Seal Environmental, LLC
114 State Road, Building B
Sagamore Beach, MA 02562
Tel: (508) 888-6034
Fax: (508) 888-1506
www.gseenv.com

DRAWN BY: SDC DATE: 10/26/23
CHECKED BY: RJH SCALE: 1"=40'
JOB# YMCA–2020–0004 SHEET NO. 1 OF 1

EXHIBIT B

RIGHT OF FIRST REFUSAL
485 BRICK KILN ROAD, FALMOUTH, MA

Grantor:	Christ Lutheran Church of Falmouth, Inc., with a mailing address of 485 Brick Kiln Road, Falmouth, Massachusetts 02540
Grantee:	Cape Cod Young Men's Christian Association, Inc., with a mailing address of 2245 Iyannough Road, West Barnstable, Massachusetts 02668
Property Address:	485 Brick Kiln Road, Falmouth, MA 02540
Title Reference:	Lot 2A on a plan of land recorded at Barnstable Registry of Deeds in Plan Book ___, Page _____, being a portion of the premises described in a deed recorded at said Registry in Book 2491, Page 198 (the "Premises")

For consideration paid, the Grantor herein agrees that the Grantor will not sell all or any portion of any interest in and to the Premises unless:

1. Grantor has received a bona fide offer to purchase the same;

2. Grantor has given Grantee written notice (which shall be deemed to be duly given when mailed by registered mail addressed to Grantee at the address set forth above and with a copy of said notice sent registered mail to Kevin P. Klauer II, Esq., Ament Klauer LLP, 39 Town Hall Square Falmouth, MA 02540, or to such other address or addresses as Grantee may specify by written notice to Grantor at the address set forth above, or to such other addresses or addresses as Grantor may specify by written notice to Grantee) stating the terms and conditions of said bona fide offer and containing an offer by Grantor to sell the same to Grantee on the same terms and conditions as said bona fide offer (the, "Notice"); and

3. Grantee shall have fourteen (14) calendar days after the giving of the Notice, to mail or otherwise give Grantor written notice that Grantee elects to purchase the same in accordance with the terms identified in the Notice.

    a. In the event the Grantee elects to purchase, the Premises shall be conveyed by good and sufficient Quitclaim Deed conveying a good and clear record and marketable title thereto, and such deed shall be delivered and the consideration paid at the Barnstable County Registry of Deeds at Noon on the thirtieth (30^{th}) calendar day, or next business day, after the date of the giving of such notice of the election to purchase.

    b. In the event that the Grantee shall not give such notice of election to purchase within the time above specified, or in the event that the Grantee shall, after giving such notice, fail to complete such purchase as hereinabove provided, then the

Grantor shall be free thereafter to sell and convey the Premises or such part thereof covered by the offer to the offeror named in Grantor's notice (or such offeror's nominee) at a price not lower than that specified therein, but the Grantor shall not sell or convey the Premises or any part thereof to any other person or at any lower price without again offering the same to the Grantee.

c. If the Grantor shall make and record with the Barnstable County Registry of Deeds an affidavit (the "Affidavit") stating that:

i. A certain conveyance by them is made pursuant to a bona fide offer to purchase;

ii. They have given notice to Grantee in connection with such conveyance as required by the provisions of this right;

iii. They have not received written notice of election to purchase given by Grantee in accordance with the provisions of this right or that Grantee, having given notice of election to purchase has failed to complete the same in accordance with said provisions, as the case may be; and

iv. Such conveyance is made to the person named in such notice at a price not lower than that therein stated;

Then such Affidavit shall be conclusive evidence of compliance with the requirements of this right with respect to such conveyance in favor of the grantee therein and all persons claiming by, through or under such grantee. Upon the recording of a deed accompanied by the Affidavit, this agreement and the obligations of the parties according to the terms hereof shall be null and void, and of no further effect with respect to any further conveyance of the Premises or any portion thereof.

4. The provisions hereof shall not be construed to apply to bona fide mortgages of the Premises or any part thereof, or to sales or other proceedings for the foreclosure thereon; or to easements to any municipality or utility company required for the installation and/or maintenance of drainage, sewage, electric, gas, water and electric lines and appurtenance to and from the Premises.

5. Absent the execution and recording of a deed from the Grantor accompanied by the Affidavit as provided for above, a termination of the Grantee's rights herein executed by or on behalf of the Grantee or the successor in interest to the Grantee shall be conclusive evidence of the termination of this agreement and the obligations of the parties according to the terms hereof.

(The remainder of this page has been intentionally left blank)

Executed under seal as of the _______ day of ______________, 2023.

Grantor: Christ Lutheran Church of Falmouth, Inc.,

________________________________ ________________________________
By: By:

Grantee: Cape Cod Young Men's Christian Association, Inc.

________________________________ ____________________________________
By:

COMMONWEALTH OF MASSACHUSETTS

Barnstable, ss

On this ____ day of _______________, 2023, before me, the undersigned notary public, personally appeared _____________________________, proved to me through satisfactory evidence of identification, which was ___________________, to be the persons whose names are signed on the preceding or attached document, and acknowledged to me that they signed it voluntarily for its stated purpose on behalf of Christ Lutheran Church of Falmouth, Inc.

____
Notary Public:
My Commission Expires:

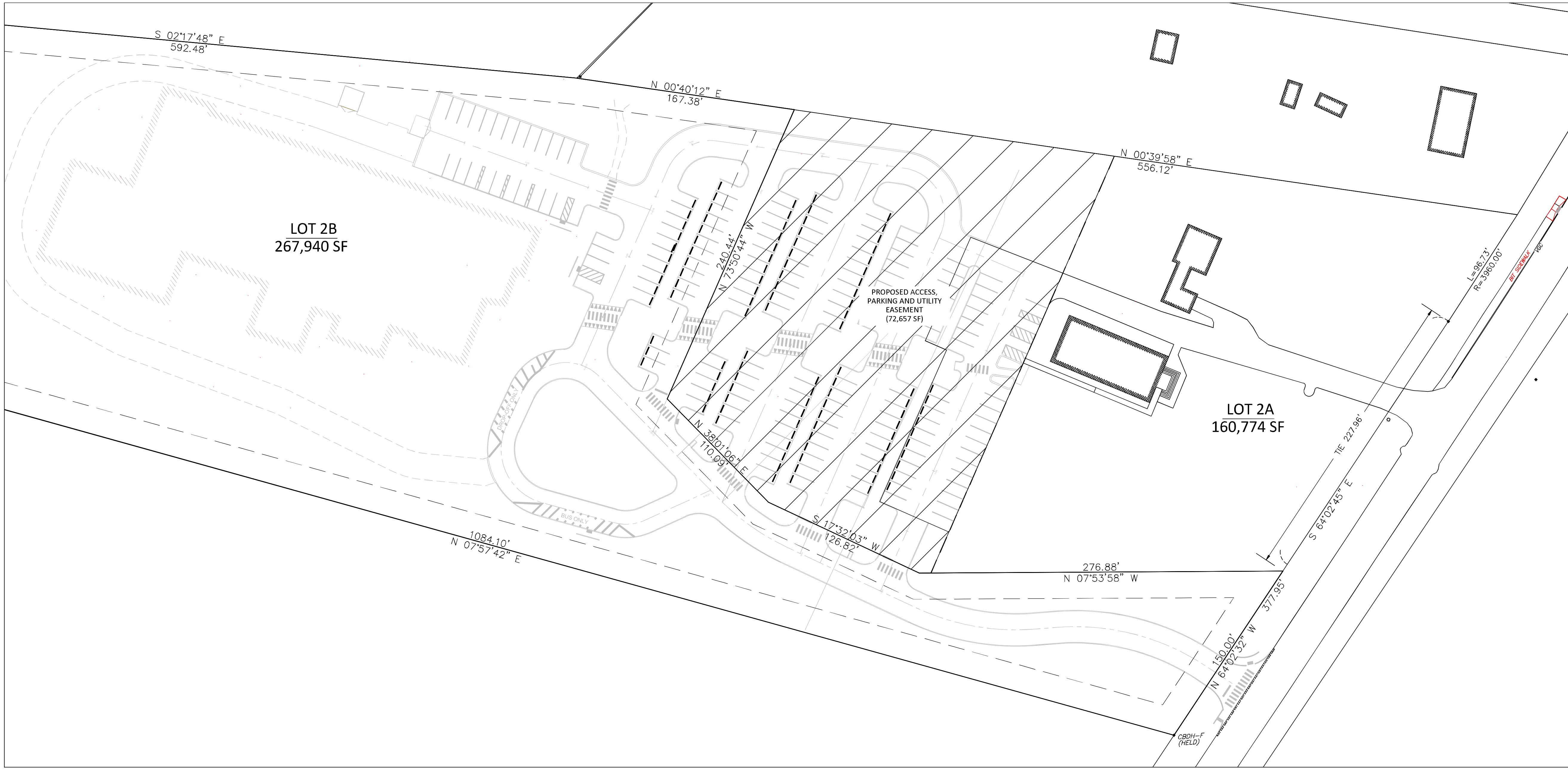
COMMONWEALTH OF MASSACHUSETTS

Barnstable, ss

On this ____ day of _______________, 2023, before me, the undersigned notary public, personally appeared _____________________________, proved to me through satisfactory evidence of identification, which was ___________________, to be the persons whose names are signed on the preceding or attached document, and acknowledged to me that they signed it voluntarily for its stated purpose on behalf of Cape Cod Young Men's Christian Association, Inc.

____
Notary Public:
My Commission Expires:

EXHIBIT C



LOCUS MAP

NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: (508) 888-6034
FAX: (508) 888-1506
WWW.GSEENV.COM

REVISIONS

NO.	DATE	COMMENT

NOT FOR CONSTRUCTION
FOR PERMITTING
PURPOSES ONLY

LOCUS:

487 BRICK KILN ROAD
WEST FALMOUTH, MA

PREPARED FOR:

YMCA OF CAPE COD

DRAWING TITLE:

EXHIBIT A
ACCESS, PARKING AND
UTILITY EASEMENT PLAN

CAD TECH: SDC

CHECKED BY:

ENGINEER: SDC

DATE: 06/06/23

STUART D. CLARK CIVIL No. 40697 REGISTERED PROFESSIONAL ENGINEER — COMMONWEALTH OF MASSACHUSETTS

SCALE:

SHEET:

ZONING INFORMATION

CURRENT ZONING DISTRICT: AGAA
OVERLAY DISTRICTS: WATER RESOURCE PROTECTION DISTRICT
GREAT SIPPEWISSET MARSH COASTAL POND
WILDLIFE MIGRATION AREA 1

DIMENSIONAL REQUIREMENTS	REQUIRED	LOT 2C	LOT 2D
MINIMUM LOT SIZE	80,000 SF	80,000 SF	80,000 SF
MINIMUM LOT WIDTH	200 LF	200 LF	200 LF
MINIMUM FRONTAGE	150 LF	150 LF	150 LF

THE PURPOSE OF THIS PLAN IS TO IDENTIFY THE AREA OF EASEMENT IN FAVOR OF THE YMCA OF CAPE COD

OWNER/APPLICANT:
CAPE COD YMCA
100 INDEPENDENCE DRIVE, SUITE 2
HYANNIS, MA 02601

DEED REFERENCE DOCUMENT #27069, BOOK 30132 PAGE 26 AND PLAN BOOK 49 PAGE 620 FOR A FULL DESCRIPTION OF LOT 25.

PLAN REFERENCE:
UNRECORDED "PLAN OF LAND FOR #485 BRICK KILN ROAD BY FALMOUTH ENGINEERING DATED NOVEMBER 12, 2018 AND ENDORSED BY THE FALMOUTH PLANNING BOARD ON DECEMBER 4, 2018

ASSESSORS REFERENCE:
MAP: 26 SECTION: 01 PARCEL: 019
LOTS: 002A AND 002B

EXHIBIT D

EASEMENT

Christ Lutheran Church of Falmouth, Inc., a nonprofit religious Massachusetts corporation having an address of 485 Brick Kiln Road, Falmouth, Massachusetts 02540, (the, "Grantor," which term shall include its grantees, successors and assigns) being the owner of the property shown as Lot 2A on a plan of land entitled "Approval Not Required Plan located at 485 Brick Kiln Road, Falmouth, MA prepared for YMCA of Cape Cod" dated ___________ 2023 and prepared by Green Seal Environmental LLC, said plan recorded at the Barnstable County Registry of Deeds in Plan Book ______, Page __, and being a portion of the property described in a deed recorded at said Registry in Book 2491, Page 198 (the "Grantor's Land"), and

For consideration paid of less than One Hundred Dollars,

hereby grants to Cape Cod Young Men's Christian Association, Inc., a Massachusetts nonprofit corporation with a mailing address of 2245 Iyannough Road, West Barnstable, Massachusetts 02668, (the "Grantee", which term shall include its its grantees, successors and assigns) as appurtenant to the property shown as Lot 2B on the aforementioned plan and being further described in a deed recorded at said Registry of Deeds in Book ________________, Page ___ (hereinafter "Grantee's Land"),

the perpetual non-exclusive right and easement, for the benefit of Grantee's Land, to install, maintain, improve, replace and use the parking area on Lot 2A, in common with Grantor, subject to certain restrictions set forth herein, being shown as the area labeled "Proposed Access, Parking and Utility Easement 72,657 SF" (the "Easement Area") on a plan of land entitled "EXHBIT A ACCESS, PARKING AND UTILITY EASEMENT PLAN" Locus 487 Brick Kiln Road, West Falmouth, MA prepared for YMCA of Cape Cod dated ___________ 2023 and prepared by Green Seal Environmental LLC, said plan recorded at the Barnstable County Registry of Deeds in Plan Book ______, Page __, (hereinafter the "Easement Plan") and for the Grantee's installation of drainage, utilities and the like, as necessary. This easement shall be permanent, irrevocable and shall run with the land in perpetuity between the properties despite any transfer in ownership.

For good and valuable consideration the receipt of which is hereby acknowledged, Grantee shall be exclusively responsible for perpetual maintenance of improvements made by the Grantee within the Easement Area, all of such maintenance to be at no cost to the Grantor.

Grantee acknowledges that the first two rows of parking spaces as shown on the Easement Plan which are closest to Grantor's facility (the "Grantor Parking") are for the sole and exclusive use of the Grantor, and Grantee's only access to the Grantor Parking shall be in the exercise of the obligations of the Grantee to complete construction and maintenance of the parking and appurtenances within the Easement Area as contemplated herein.

Grantee shall be responsible for the construction and perpetual maintenance of all improvements made by Grantee within the Easement Area made at the election of Grantee or as required by the Town of Falmouth and its agencies. This right and obligation of construction and maintenance shall include establishment of and payment for utilities (if any), as well as snow and ice removal consistent with reasonable commercial practices in Barnstable County, Massachusetts, as well as establishment and maintenance of drainage and landscaping. Grantee's installation and maintenance of landscaping within the Easement Area shall be undertaken with Grantor's reasonable input as to species of vegetation to be installed and maintained. Grantee, their successors in interest, assigns, agents, servants and employees, shall indemnify, defend and hold harmless Grantor and their respective successors in interest or assigns, of and from any claims, liability, suits, judgments, causes of action, claims or demands for damages, costs, loss of services, expenses, compensation, consequential damage, claims in law or equity, or any other thing whatsoever on account of or arising out of the Grantee's use of said Easement Area. Grantee shall name Grantor as an additional insured on all policies of insurance maintained by the Grantee in connection with the Grantee's use of the Grantee's Land, such policies of insurance to be issued by insurance companies licensed to operate in Barnstable County and such policies to be in commercially reasonable amounts as specified by the Grantor from time to time.

In consideration of the grant herein by the Grantor for the benefit of the Grantee, the Grantee expressly grants to the Grantor the perpetual non-exclusive right and easement, for the benefit of Grantor's Land, to pass and repass on foot and by vehicle over that portion of the Grantee's Land shown on the Easement Plan as "DRIVEWAY EASEMENT".

For Grantor's title to the servient estate, see deed recorded at Barnstable County Registry of Deeds in Book 2491, Page 198.

For Grantee's title to the dominant estate, see deed recorded at Barnstable County Registry of Deeds in Book ___________, Page ______.

(The remainder of this page shall be intentionally left blank)

Executed as a sealed instrument this _____ day of ______________, 20__.

GRANTOR:

Christ Lutheran Church of Falmouth, Inc.,

____
By:

COMMONWEALTH OF MASSACHUSETTS

Barnstable, ss.

On this _____ day of __________________, 20__, before me, the undersigned notary public, personally appeared __________________________, proven to me through satisfactory evidence of identification, which was _________________________, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that they signed it voluntarily for its stated purpose as ________________ of Christ Lutheran Church of Falmouth, Inc.

____
Notary Public:
My Commission Expires:

Executed as a sealed instrument this ____ day of ________________, 20____.

GRANTEE:

Cape Cod Young Men's Christian Association, Inc.

______________________________ ______________________________
David Botting, President Stephen Johannessen. Treasurer

COMMONWEALTH OF MASSACHUSETTS

Barnstable, ss.

On this _____ day of ____________________, 20___, before me, the undersigned notary public, personally appeared David Botting, proven to me through satisfactory evidence of identification, which was _________________________, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose in his capacity as President of Cape Cod Young Men's Christian Association, Inc.

____
Notary Public:
My Commission Expires:

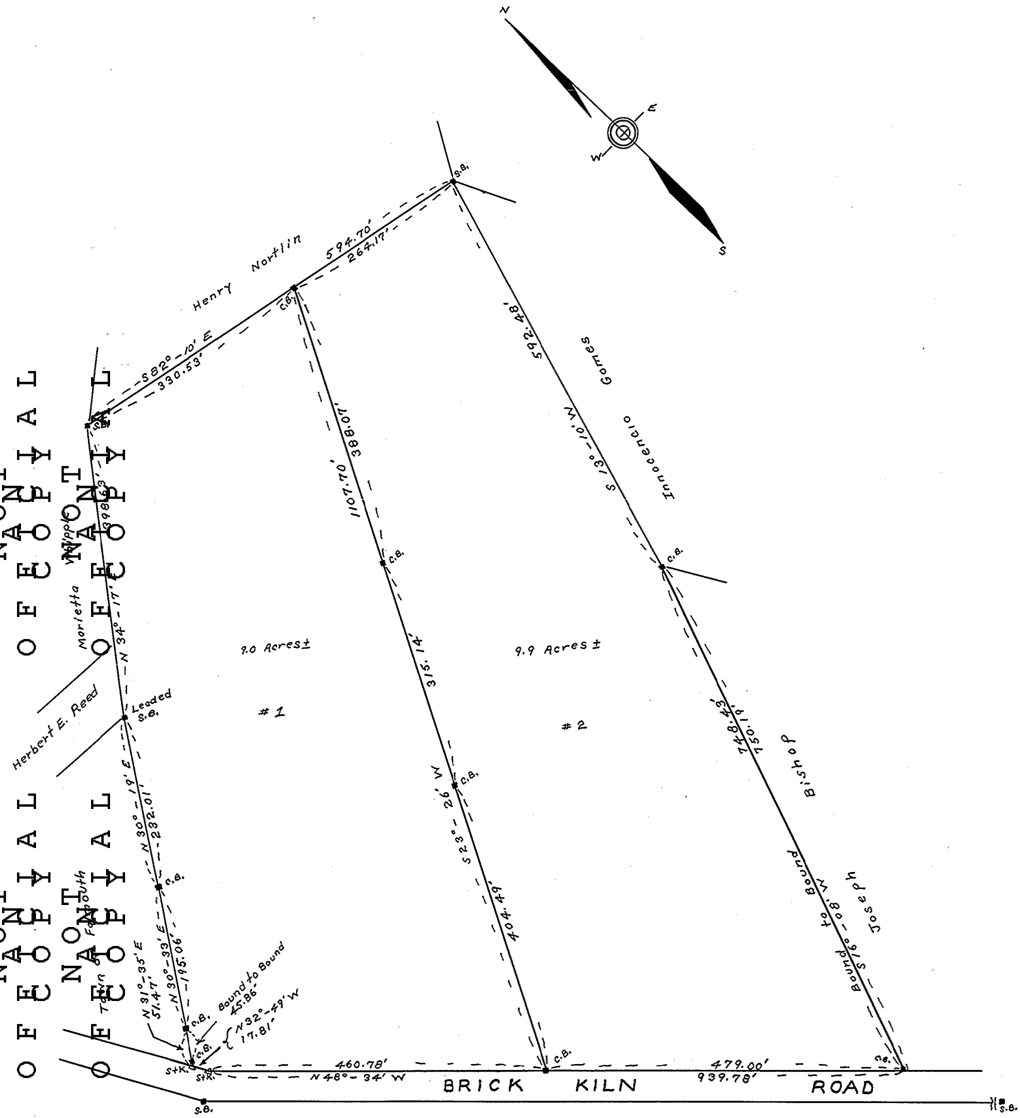
COMMONWEALTH OF MASSACHUSETTS

Barnstable, ss.

On this _____ day of ____________________, 20___, before me, the undersigned notary public, personally appeared Stephen Johannessen, proven to me through satisfactory evidence of identification, which was _________________________, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose in his capacity as Treasurer of Cape Cod Young Men's Christian Association, Inc.

____
Notary Public:
My Commission Expires:

11-105



PLAN OF LAND OF
ANTONE C. BARBOZA
FALMOUTH, MASS.
MARCH, 1947 ~ SCALE 1" = 100'

ELMER W. GIFFORD, C.E.
FALMOUTH, MASS.

Plan-Book 77 Page 105

C. D. 180. 15M-1-64-937171

AUG 25 1966

The Commonwealth of Massachusetts

KEVIN H. WHITE
Secretary of the Commonwealth
STATE HOUSE
BOSTON, MASS.

ARTICLES OF ORGANIZATION

We, Wendell P. Chamberlain, President, Arthur Greer, Jr., Treasurer,

Ruth T. Whitcomb, Clerk or Secretary, and the twenty-four directors

who signed page three,

being a majority of the directors (or officers having the power of directors)

of Cape Cod Young Men's Christian Association, Inc.

elected at its first meeting, in compliance with the requirements of General Laws, Chapter 180, Section 3, hereby certify that the following is a true copy of the agreement of association to form said corporation, with the names of the subscribers thereto:

We, whose names are hereto subscribed, do, by this agreement, associate ourselves with the intention of forming a corporation under the provisions of General Laws, Chapter 180.

The name by which the corporation shall be known is
Cape Cod Young Men's Christian Association, Inc. ✓

The location of the principal office of the corporation in Massachusetts is to be the Town or

City of Hyannis Street 365 Main Street

The purposes for which the corporation is formed are as follows:

(a) Toppromote acceptance of the Fatherhood of God and the Brotherhood of man among its members and constituents.

(b) To promote the physical, mental and spiritual welfare of persons.

(c) To emphasize reverence for God; responsibility for the common good; and the application of the Golden Rule in human relationships.

(d) To extend its privileges to all persons regardless of race, creed, color, national origin or religious belief.

LEAVE THIS SPACE BLANK FOR BINDING

(If seven days' notice is waived, fill in the following waiver.)

We hereby waive all the requirements of the General Laws of Massachusetts for notice of the first meeting for organization, and appoint 19th. day of May, 1966.

at 7:45 o'clock P. M., at the Hyannis Inn Motel, Hyannis, Massachusetts

as the time and place for holding such first meeting.

IN WITNESS WHEREOF we hereto sign our names, this 19th. day of May, 1966.

(Type or plainly print the name and address of each incorporator in space below.)

NAME	RESIDENCE Give Number and Street, City or Town
DONALD P. TULLOCH	MAIN STREET, BARNSTABLE, MASS
ANTHONY J. CASELLA	16 CARVER RD., WEST YARMOUTH, MASS.
WILLIAM F. O'BRIEN	COD LANE CHATHAM, MASS
Beatrice M. Whiting	BOX 383, WELLFLEET, MASS,
Ruth T. Whitcomb	Old County Rd. East Sandwich
ARTHUR W. GREER JR	1 MAYFLOWER LANE, SOUTH YARMOUTH
FREDERICK W. BODENSIEK	LOOMIS LANE, CENTERVILLE, MASS.
GEORGE K. KARRAS SR.	455 LONG POND DRIVE SO. YARMOUTH MASS
Marilyn J. Downey	12 Town Hall Avenue, So. Yarmouth, Mass
Wendell P. Chamberlain	Box 215 West Hyannisport, Mass.
[illegible] R. LYDEKER	[illegible] LANE WEST DENNIS MA[illegible]

And we further state that the first meeting of the subscribers to said agreement was held on the 19th. day of May in the year 19 66.

LEAVE THIS SPACE BLANK FOR BINDING

H. Heyworth Backus	Centerville	Wequaquet Lake
Grant Koch	Brewster (East)	Main Street
Rev. Peter Palches	Centerville	Box 373
Col. William Tow	Falmouth	Prospect Street
Paul Lorusso	Barnstable	Salten Point Road
~~Mrs. Robert~~ Beatrice M. Whiting,	Wellfleet	Box 383
Norman Beardsley	Sandwich (East)	
James Cosson	Wellfleet (South)	Box 213
~~Dr~~. Miriam Faries	Eastham	Box 314
John Eiler	Hyannis	33 Chase Street
Joseph P. Ryan	Hyannis	21 Sylvan Drive
John Raneo	Harwich	
~~Sheriff~~ Donald P. Tolloch	Barnstable	Main Street
~~Mrs~~. Ruth T. Whitcomb	Sandwich (East)	Box 117
Wendell P. Chamberlain	Hyannisport (West)	Box 215
Charles Cross	Hyannis	Old Town Road
Marilyn Downey	Yarmouth (South)	12 Town Hall Ave.
John Hinckley	Hyannis	49 Yarmouth Road
~~Kenneth~~ K. Lydecker	Dennis (West)	Box 867
John Kayajan	Sagamore	Coca-Cola Bottling Co.
William O'Brien	Chatham	Cod Lane
Richard R. Warren	Centerville	43 Hi-Ona-Hill Road
Fred Lawrence	Falmouth	Gifford Street
~~Dr~~. Harry Sobel	Hyannis	35 Winter Street
Frederick Bodensick	Centerville	Loomis Lane
Anthony Casella	Yarmouth (West)	16 Carter Road
Louis Cataldo	Hyannis	47 Cherry Street
Robert Donahue	Hyannis	18 Chase Street
Arthur W. Greer Jr.	Yarmouth (South)	1 Mayflower Lane
George K. Karras	Yarmouth (South)	455 Long Pond Drive
Richard Wills	Chatham	Oyster Bay Lane
John H. Clemence	Yarmouth (South)	29 Cranberry Lane
John T. Aylmer	Centerville	Fern Lane
Robert Burrill	Eastham	Fort Hill Road

The final day of the corporations fiscal year is September 30.

The date provided in the by-laws for the annual meeting is a weekday during the month of November.

The name, residence, and post office address of each of the officers of the corporation is as follows:

	NAME	CITY OR TOWN OF RESIDENCE (Actual place of domicile must be given)	POST OFFICE ADDRESS (HOME OR BUSINESS)
President	Wendell P. Chamberlain,	Hyannisport (West)	Green Dunes
Treasurer	Arthur W. Greer, Jr.	Yarmouth (South)	Mayflower Lane
Clerk / Secretary	Ruth T. Whitcomb	Sandwich (East)	R.R.#1, Old County Rd.

Directors (or officers having the power of directors)

See attached sheet numbered 3a.

LEAVE THIS SPACE BLANK FOR BINDING

We, being a majority of the directors of Cape Cod Young Men's Christian Association, Inc. (Name of Corporation)

do hereby certify that the provisions of sections eight and nine of Chapter 156 relative to the calling and holding of the first meeting of the corporation, and the election of a temporary clerk, the adoption of by-laws and the election of officers have been complied with.

IN WITNESS WHEREOF AND UNDER THE PENALTIES OF PERJURY, we hereto sign our names,

this 19th. day of May , 1966 .

(President, Treasurer, Clerk or Secretary, and majority of Directors or of Board, sign in space below.)

Wendell P. Chamberlain
Arthur W. Greer Jr.
Harry Sobel
Ruth T. Whitcomb
Donald P. Tulloch
George K. Karras
Louis Cataldo
John S. Ranis
Richard Wills
John Hinckley
Frederick V. Lawrence
William O'Brien
Anthony J. Casella
John F. Ayleen
Marilyn J. Downey
Norman J. Beardsley
Frederick W. Haswell
John H. Clemence
Joseph P. Ryan
Beatrice M. Whiting
Richard B. Warren
Miriam Farris
Robert J. Donahue
R. R. Lyden

7586

RECEIVED
$25 CK.
AUG 25 1966
CORPORATION DIVISION
SECRETARY'S OFFICE

THE COMMONWEALTH OF MASSACHUSETTS

ARTICLES OF ORGANIZATION

GENERAL LAWS, CHAPTER 180

I hereby certify that, upon an examination of the within-written articles of organization, duly submitted to me, it appears that the provisions of the General Laws relative to the organization of corporations have been complied with, and I hereby approve said articles and cause them to be recorded and filed when validated.

Kevin H. White

Secretary of the Commonwealth

CHARTER TO BE SENT TO

Robert J. Donahue, Esq.

436 Main Street

Hyannis, Massachusetts

CHARTER MAILED 9-6-66 DWS
DELIVERED

NOTIFICATION SENT TO

ENVIRONMENTAL • SURVEY • ENERGY • ENGINEERING

Est.

GREEN SEAL

1997

EXHIBIT 8

CERTIFIED ABUTTERS LIST

Town of Falmouth Assessing Department
59 Town Hall Square, Falmouth MA 02540
Telephone: 508-495-7380
Fax: 508-495-7384

REQUEST OF CERTIFIED ABUTTERS LIST

Name of person requesting abutters list: Gabriele - Ament Klauer LLP

Address of person requesting abutters list: 39 Town Hall Square
Falmouth, Ma 02540

Phone: 508-540-6555

Abutters to (subject property):
Map 26 Section 01 Parcel 019 Lot 002
Map______ Section______ Parcel______ Lot______
Map______ Section______ Parcel______ Lot______

Lot size of subject property: 9.66 acres

Location of subject property: 485 Brick Kiln Road

Check one:

______ Direct abutters (includes properties across street)

______ Direct abutters in local Historic District (includes properties across the street) within 100"

______ Immediate abutters (includes only properties with a common property line)

______ Immediate abutters plus churches and schools within 500'

✓ Properties within 300'

______ Properties within 300' or abutters abutter to abutter whichever is closest

______ Properties within 100'

______ Other (specify)______

Fee. $25.00 Total $25.00 #7639 (AMH)

EMAIL gbruce@amentklauer.com

485 BRICK KILN RD

CERTIFIED

Bruce Cabral
Assistant Assessor
Town of Falmouth, MA
March 20, 2024

474 BRICK KILN RD 26 05 071A 006
ANDERSON GREGORY K LUC: 101
474 BRICK KILN RD
FALMOUTH, MA 02540

475 BRICK KILN RD 26 01 018B 000
MEDEIROS AURORE J LUC: 101
MEDEIROS BRUCE
475 BRICK KILN RD
FALMOUTH, MA 02540-3009

7 ANDYS LN 26 05 071A 007
CARTON MYKEL ROBERT LUC: 101
7 ANDYS LN
FALMOUTH, MA 02540-3001

469 BRICK KILN RD 26 01 018A 000A
MILLER PAULA LUC: 101
MILLER JAY
175 CHESTER ST
NORTH FALMOUTH, MA 02556

485 BRICK KILN RD 26 01 019 002
CHRIST LUTHERAN CHURCH LUC: 961
OF FALMOUTH
485 BRICK KILN RD
E FALMOUTH, MA 02536

511 BRICK KILN RD 26 01 019A 000A
VILLAGE AT BRICK KILN LLC LUC: 130
1094 BLUE HILL AVE
MILTON, MA 02186

473 BRICK KILN RD 26 01 018C 000B
CONTRON BARTOLO LUC: 101
473 BRICK KILN RD
WEST FALMOUTH, MA 02540

513 BRICK KILN RD 26 01 019B 000B
DONNELLAN PATRICK C LUC: 101
DONNELLAN CELIA C
513 BRICK KILN RD
FALMOUTH, MA 02540-3009

466 BRICK KILN RD 26 05 071A 004
FALMOUTH HOUSING AUTHORITY LUC: 970
115 SCRANTON AVE
FALMOUTH, MA 02540-3560

1200 GIFFORD ST EXT 26 01 003 000
FALMOUTH TOWN OF LUC: 934
59 TOWN HALL SQ
FALMOUTH, MA 02540-2761

0 BRICK KILN RD OFF 26 02 022 000
FALMOUTH TOWN OF LUC: 932
CONSERVATION COMMISSION
59 TOWN HALL SQ
FALMOUTH, MA 02540-2761

0 BRICK KILN RD 26 05 070 000
FALMOUTH TOWN OF LUC: 930
59 TOWN HALL SQ
FALMOUTH, MA 02540-2761

470 BRICK KILN RD 26 05 071A 005
HOLMES TRUSTEE ROBERT W LUC: 101
HOLMES TRUSTEE DIANE M
61 OLD DANIELSON PIKE
FOSTER, RI 02825

485 BRICK KILN RD

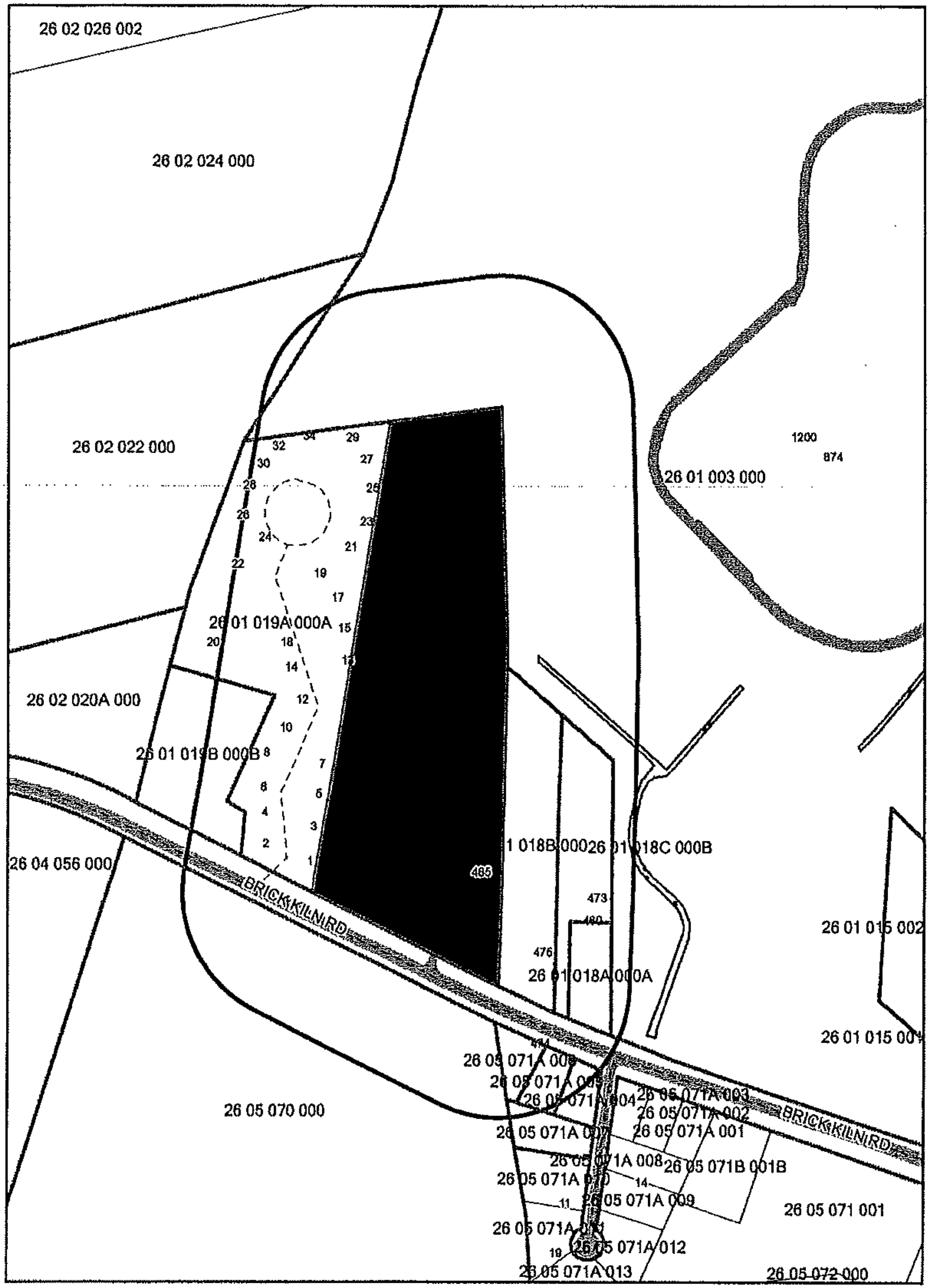


EXHIBIT 9

CERTIFICATION OF LOCAL FILING

Cape Cod Commission
Development of Regional Impact (DRI) Submittal
Upper Cape YMCA

Pursuant to the Cape Cod Commission filing requirements, the Applicant must provide certification that copies of the DRI submittal have been provided to local, state, or federal agencies or boards from which a permit or other actions have, will, or may need to be sought. The following table provides a summary. For the proposed development.

Required Local Permit/Review	Type of Permit	Local Entity Information
Falmouth Planning Board & DRI Liaison (1 Flash drive)	Special Permit/Site Plan Review	Falmouth Planning Dept./Planning Board/Zoning Board of Appeals Jed Cornock, Town Planner/DRI Liaison 59 Town Hall Square Falmouth Town Hall Falmouth, MA 02540
Falmouth Building Department (1 Flash drive)	Building, Electrical, Plumbing, Gas, Fire Alarm, Sign, Swimming Pool Construction Permits	Falmouth Building Department Gary Street, Building Commissioner/Zoning Enforcement Officer 59 Town Hall Square Falmouth Town Hall Falmouth, MA 02540
Falmouth Board of Health/Health Department (1 Flash drive)	IA Septic System Approval, Disposal Works Construction Permit, Irrigation Well Permit, Swimming Pool Licensing	Falmouth Board of Health/Health Department Scott McGann, Health Agent 59 Town Hall Square Falmouth Town Hall Falmouth, MA 02540
Falmouth Clerks Office (1 Flash drive)	Planning Board and Zoning Board of Appeals Decision Filings	Falmouth Clerks Office Michael Palmer, Town Clerk 59 Town Hall Square Falmouth Town Hall Falmouth, MA 02540
Falmouth Water Department (1 Flash drive)	Water Service Connection Permit	Falmouth Water Department Mathew Lanen, Acting Superintendent 416 Gifford Street Falmouth, MA 02540

Required Local Permit/Review	Type of Permit	Local Entity Information
Falmouth Fire Department (1 Flash drive)	Liquid Propane Tank, CO Alarm Installation, Fire Sprinkler Installation Permits	Falmouth Fire Rescue Department Timothy R. Smith, Fire Chief 399 Main Street Falmouth, MA 02540

“I certify that the DRI document prepared by Green Seal Environmental, LLC for the proposed development identified as Falmouth YMCA and developed by YMCA Cape Cod of West Barnstable, Massachusetts, was hand delivered (via cover letter and flash drive) to the following recipients on dates listed.” Signed under the pain and penalties of perjury on or before April 29 ,2024

Gregory C. Wirsen

Name____

Gregory C. Wirsen, Vice President

Company: Green Seal Environmental, Inc.

On behalf of YMCA Cape Cod

Est.
GREEN SEAL
1997
ENVIRONMENTAL • SURVEY • ENERGY • ENGINEERING

EXHIBIT 10

MA HISTORICAL COMMISSION

APPENDIX A
MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD
BOSTON, MASS. 02125
617-727-8470, FAX: 617-727-5128

PROJECT NOTIFICATION FORM

Project Name: Upper Cape YMCA

Location / Address: 487 Brick Kiln Rd

City / Town: Falmouth, MA 02540

Project Proponent

Name: YMCA of Cape Cod Attn: Stacie Peugh

Address: 2245 Iyannough Rd, West Barnstable, MA 02668

City/Town/Zip/Telephone: 774.212.7633

Agency license or funding for the project (list all licenses, permits, approvals, grants or other entitlements being sought from state and federal agencies).

Agency Name	Type of License or funding (specify)
	See Attachment 1

Project Description (narrative):
Construction of a 40,000 sf+/- YMCA facility with associated parking and utilities

Does the project include demolition? If so, specify nature of demolition and describe the building(s) which are proposed for demolition.

No

Does the project include rehabilitation of any existing buildings? If so, specify nature of rehabilitation and describe the building(s) which are proposed for rehabilitation.

No

Does the project include new construction? If so, describe (attach plans and elevations if necessary).

Yes. See attached plans existing conditions plan and concept

APPENDIX A (continued)

To the best of your knowledge, are any historic or archaeological properties known to exist within the project's area of potential impact? If so, specify.

No

What is the total acreage of the project area?

Woodland 6.5 acres		Productive Resources:	
Wetland ____ acres		Agriculture ____ acres	
Floodplain ____ acres		Forestry ____ acres	
Open space ____ acres		Mining/Extraction ____ acres	
Developed ____ acres		Total Project Acreage 6.5 acres	

What is the acreage of the proposed new construction? 2.6 acres

What is the present land use of the project area?

Undeveloped woodlands

Please attach a copy of the section of the USGS quadrangle map which clearly marks the project location.

This Project Notification Form has been submitted to the MHC in compliance with 950 CMR 71.00.

Signature of Person submitting this form: ____________ Date: 8/22/2022

Name: Green Seal Environmental, LLC Attn: Stuart Clark, PE

Address: 114 State Rd

City/Town/Zip: Sagamore Beach, MA 02562

Telephone: 508-888-6034 Ext: 22

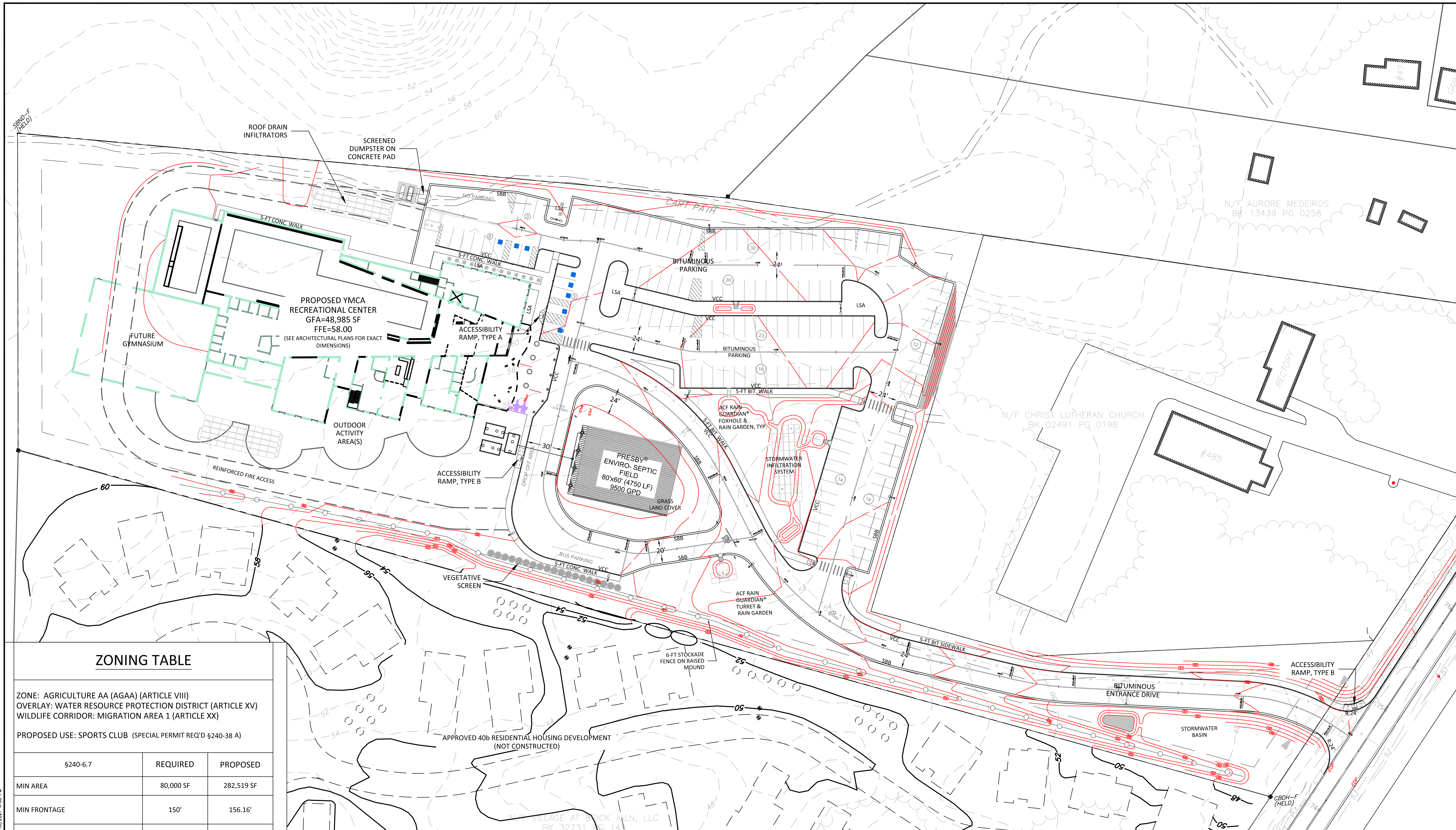
REGULATORY AUTHORITY

950 CMR 71.00: M.G.L. c. 9, §§ 26-27C as amended by St. 1988, c. 254.

PROJECT NOTIFICATION FORM
MASSACHUSEETTS HISTORICAL COMMISSION
ATTACHEMENT 1

Agency	Type of License or Funding
Falmouth Board of Health	Construction Works Permit Percolation Test Approval
Falmouth Planning Board	Site Plan Review with Special Permit for Private Club not conducted for profit (Agricultural district)
Falmouth Selectboard	Development Agreement
Falmouth Building Inspector	Building Permit
Falmouth DPW	Driveway Permit Water Service Application
Cape Cod Commission	Development of Regional Impact Development Agreement
USEPA	NPDES -Stormwater General Permit for Construction Activities

S:\CLIENTS\YMCA - CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAD\SITE PLAN (YMCA-2020)(R1).DWG 11/16/2021 4:36 PM



ZONING TABLE

ZONE: AGRICULTURE AA (AGAA) (ARTICLE VIII)
OVERLAY: WATER RESOURCE PROTECTION DISTRICT (ARTICLE XV)
WILDLIFE CORRIDOR: MIGRATION AREA 1 (ARTICLE XX)

PROPOSED USE: SPORTS CLUB (SPECIAL PERMIT REQ'D §240-38 A)

§240-6.7	REQUIRED	PROPOSED
MIN AREA	80,000 SF	282,519 SF
MIN FRONTAGE	150'	156.16'
FRONT YARD SETBACK	20'	147.9'
SIDE YARD SETBACK	20'	50.1'
REAR YARD SETBACK	20'	82'
MAX OVERALL COVERAGE	40%*	XX
MIN LANDSCAPE BUFFER	15'	27.9'
MAX BUILDING COVER	20%	XXX
MAXIMUM BUILDING HEIGHT	35'	<45'
MIN OPEN SPACE	20%	38%

* ANY USE THAT WILL RENDER IMPERVIOUS MORE THAN 15% OR 2,500 SQUARE FEET OF ANY LOT, WHICHEVER IS GREATER WILL REQUIRE A SYSTEM FOR GROUNDWATER RECHARGE MUST BE PROVIDED WHICH DOES NOT DEGRADE GROUNDWATER QUALITY AND A SPECIAL PERMIT FROM THE ZONING BOARD OF APPEALS

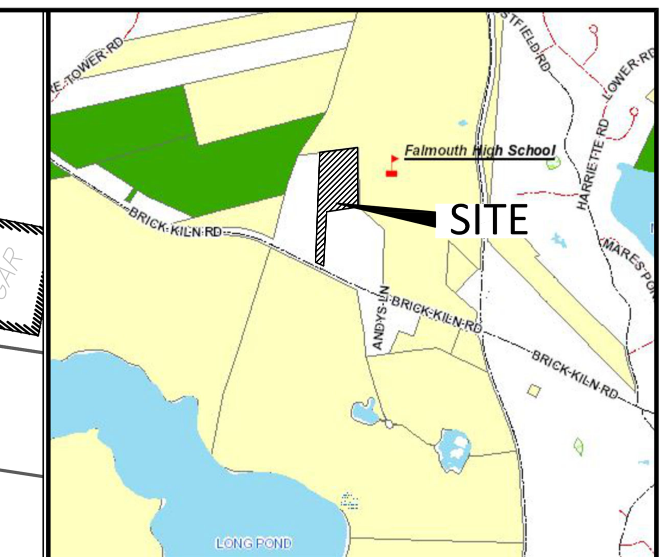
PARKING ANALYSIS

ZONE: AGAA

PROPOSED USE: SPORTS CLUB

§240-108	STANDARD	CALCULATION	REQUIRED	PROVIDED
SPORTS/HEALTH CLUB	1 PER 200 SF**	0.75x48,985 SF/ 200=	183 SPACES	140 SPACES
MAAB /ADA: 151-200 SPACES	6 REQUIRED 1 VAN	---	6 REQUIRED 1 VAN	8 SPACES 1 VAN

** §240-107 ALLOWS A 25% REDUCTION IN OFF-STREET PARKING BY RIGHT



LOCUS MAP
NOT TO SCALE

GREEN SEAL ENVIRONMENTAL, LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: (508) 888-6034
FAX: (508) 888-1506
WWW.GSEENV.COM

DIMENSIONS ARE AS INDICATED.

USE OF THIS PLAN CONSTITUTES ACCEPTANCE OF TERMS AND CONDITIONS SET FORTH IN ACCOMPANYING PROJECT DOCUMENTATION.

IT IS THE RESPONSIBILITY OF THE USER TO CONFIRM DISCREPANCIES WITH THE ENGINEER PRIOR TO USE.

REVISIONS

NO.	DATE	COMMENT

PURPOSE: SITE PLAN REVIEW

LOCUS: 485 BRICK KILN ROAD, WEST FALMOUTH, MA

PREPARED FOR: YMCA OF CAPE COD

DRAWING TITLE: SITE DEVELOPMENT PLAN

CAD TECH:	CHECKED BY:
SDC	LAB
ENGINEER: SDC	DATE: 09/07/21
DRAFT	SCALE: 1"=40'
	SHEET: C-3

Revisions	Issue Date:	Description	Issued To
	November 19, 2021	SCHEMATIC DESIGN	

EXTERIOR RENDERING

Scale:
Drawn By: Author
Checked By: Checker
Date: November 19, 2021
Project #: 11.6122.007

Falmouth YMCA
487 Brick Kiln Rd, Falmouth, MA

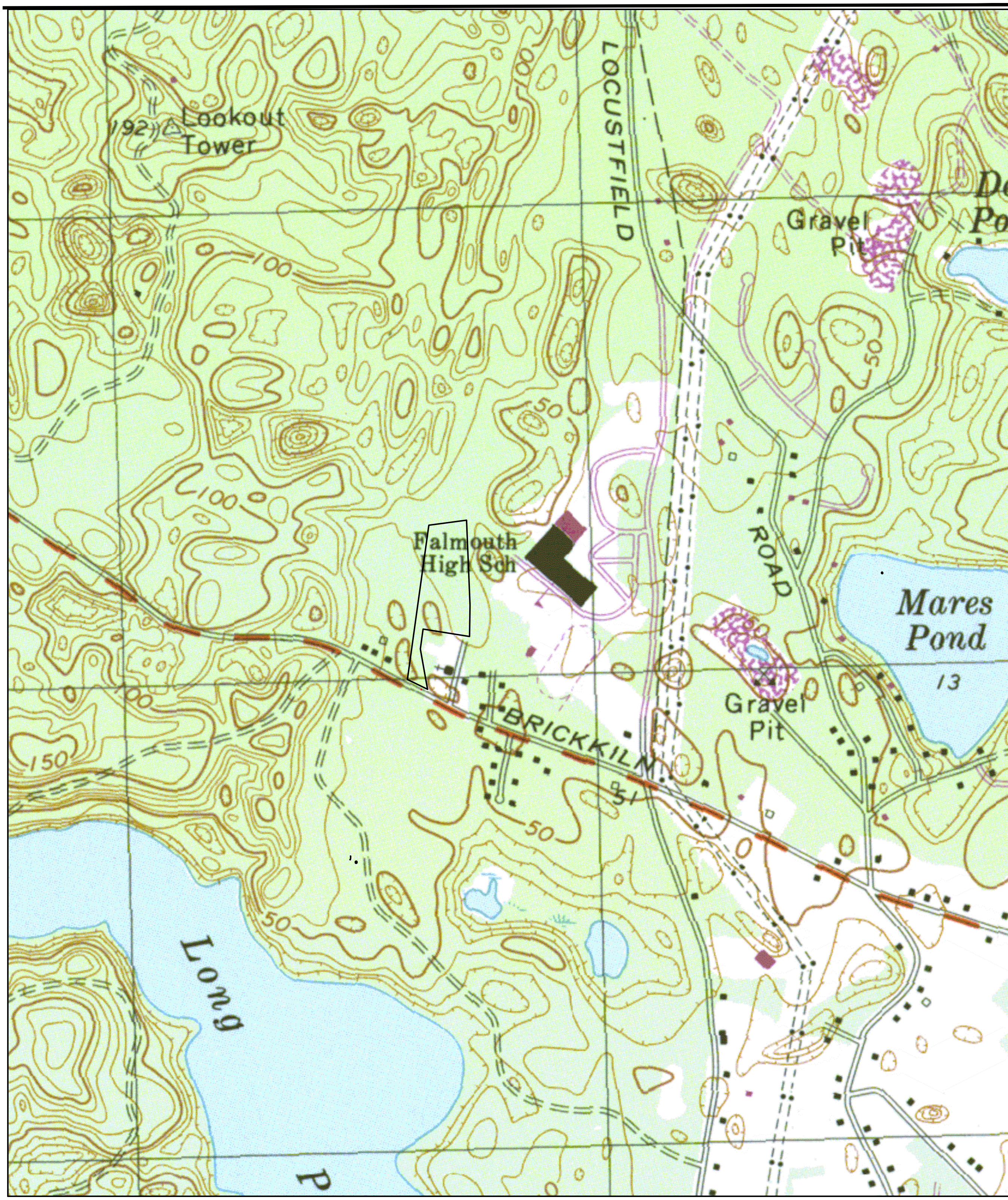
SV DESIGN 126 Dodge Street Beverly, MA 01915 www.svdesign.com t 978.927.3745

SV DESIGN

EXTERIOR RENDERING

P1.0


Upper Cape YMCA
Exisitng Conditions
Legend
Google Earth
©2022 Google
8.74 ft
N



USGS MAP

1"=1000'

ENVIRONMENTAL
Est.
GREEN
SEAL
1997
ENGINEERING
SURVEY
ENERGY

114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562

TEL: (508) 888-6034
FAX: (508) 888-1506
WWW.GSEENV.COM

YMCA - 2020 - 0004.2

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD
BOSTON, MASS. 02125

9590 9402 5324 9154 7664 73

2. Article Number *(Transfer from service label)*

7020 3160 0001 5037 1642

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Shirley Brown
☐ Agent
☐ Addressee

B. Received by *(Printed Name)*

C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
☐ Insured Mail Restricted Delivery (over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

---

7020 3160 0001 5037 1642

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

YMCA - 2020 - 0004.2

For delivery information, visit our website at *www.usps.com*®.

OFFICIAL USE

Certified Mail Fee
$

Extra Services & Fees *(check box, add fee as appropriate)*
☐ Return Receipt (hardcopy) $
☐ Return Receipt (electronic) $
☐ Certified Mail Restricted Delivery $
☐ Adult Signature Required $
☐ Adult Signature Restricted Delivery $

Postmark Here

USPS SAGAMORE BEACH, MA 02562 AUG 11 2022

Postage
$

Total Postage and Fees
$

Sent To
Massachusetts Historical Commission

Street and Apt. No., or PO Box No.
220 Morrissey Boulevard

City, State, ZIP+4®
Boston, MA 02125

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

Terry Bauer

From:	Parker, Caitriona @ SEC <Caitriona.Parker@sec.state.ma.us>
Sent:	Thursday, July 20, 2023 11:59 AM
To:	Terry Bauer
Subject:	Upper Cape YMCA Falmouth, MA MHC RC. #71952

Dear Mr. Bauer,

As per our phone conversation, the MHC issued a "No Comment" on 9/13/22 for the PNF Upper Cape YMCA Falmouth, MA MHC RC. #71952 dated 8/15/22.

"No Comment" means the MHC had no reason to comment on the project. Thus, per our FAQ page (https://www.sec.state.ma.us/mhc/mhcrevcom/revcomidx.htm):

"If, after review of the PNF submittal and MHC files, MHC determines that the project is unlikely to affect significant historic or archaeological resources, MHC review is complete. If the MHC does not respond within 30 days, the project may proceed as planned."

Best,

Cait

Caitriona Parker
TSD Intern
Massachusetts Historical Commission

EXHIBIT 11

RENEWABLE ENERGY COMMUNICATION

solectenergy
Power Your Tomorrow

October 10, 2023

Terry Bauer
Quality Control Manager & Sr. Project Manager
Green Seal Environment, LLC
114 State Road, Sagamore Beach, MA 02562

RE: Falmouth YMCA
Brick Kiln Road, Falmouth MA

Dear Mr. Bauer,

Thank you for contacting our organization regarding the opportunity for renewable energy at the new Falmouth YMCA building.

About Solect:

- Solect Energy opened in 2009 and we have approximately 100 employees
- We are based in Hopkinton, MA
- We are a full-service solar photovoltaic (PV), and energy storage project developer, installer and energy provider. We offer turnkey services and can engineer, procure, construct, and finance projects
- Total installations to date of over 750 projects totaling 120MW (mostly in MA) with many commercial and public non-profit organizations on Cape Cod, as well as other YMCA's in MA

After reviewing the architectural drawings provided, we are confident that a solution meeting the renewable energy needs of the Falmouth YMCA can be accomplished. Once the construction/building plans are available we will provide an in-depth analysis and solar design for your review. As with every PV project in MA, it will need to be approved by the utility (Eversource), and subject to any utility upgrades that they may require.

We look forward to working with you as your project progresses. We are highly optimistic that we can help the Falmouth YMCA with any of its renewable energy needs and we appreciate the opportunity to consult with you on any future endeavors.

Best regards,

DocuSigned by:
Scott Howe
42B4FAE5A8424F3...

Scott Howe
Executive Vice President & General Manager Business Development

EXHIBIT 12

FALMOUTH ZONING REGULATIONS

ARTICLE 6 USE TABLES

240 – 6.1 Agricultural Districts (AGAA, AGA, AGB)

240 – 6.1A Districts

(1) AGAA Agricultural AA
(2) AGA Agricultural A
(3) AGB Agricultural B

240 – 6.1B Use Table

N = Not allowed
SP-Z = Zoning Board of Appeals Special Permit
Y = Allowed by-right
SP-P = Planning Board Special Permit

Uses	Standards	AGAA	AGA	AGB
Residential Uses				
One-family detached house		Y	Y	Y
Community Service Uses				
Agricultural research institution		Y	Y	Y
Cemetery		Y	Y	Y
Child day-care center		Y	Y	Y
Group day-care home		Y	Y	Y
Library		Y	Y	Y
Museum		Y	Y	Y
Passenger station		Y	Y	Y
Religious institution	including a parish house or similar dwelling for the institution	Y	Y	Y
School		Y	Y	Y
Municipal Uses				
Beach		Y	Y	Y
Fire station		Y	Y	Y
Municipal recreation building		Y	Y	Y
Park and playground		Y	Y	Y
Town wharf and Town landing		Y	Y	Y
Water tower and reservoir		Y	Y	Y
Other Principal Uses				
Agriculture, horticulture, and floriculture, including farms, cranberry bogs, dairies, truck gardens, greenhouses, natural ice harvesting activities, and nurseries	Nurseries that are not "agricultural uses" as defined in G.L. c. 128, § 1A, shall be located on lots 2 acres or larger.	Y	Y	Y
Pier, float, and dock	shall be subject to approval by the Conservation Commission and Board of Selectmen as a common pier, float, or dock	Y	Y	Y

Uses	Standards	AGAA	AGA	AGB
Accessory Uses				
Accessory uses that are customarily incidental to any of the above listed use categories		Y	Y	Y
Boarders	1. maximum of 4 boarders allowed 2. dwelling unit shall be a single-family dwelling with a family resident on the premise	Y	Y	Y
Home occupation	(See § 240-9.5)	Y	Y	Y
Portable woodworking mill		Y	Y	Y
Roadside stand	principally for the sale of products of the land of the owner of the premises unless otherwise preempted by G.L. c. 40A, § 3	Y	Y	Y
Television or radio antenna	not exceeding 50 feet above ground level	Y	Y	Y
Wireless communication facility		Y	Y	Y
Special Permit Uses				
Accessory apartment	1. Purposes: The intent of the accessory apartment section is to: broaden the range of housing choice in Falmouth by increasing the number of small dwelling units available for rent; encourage greater diversity of population with particular attention to young adult citizens and to allow for “Aging in Place” for senior citizens; and promote more economic and energy efficient use of the town’s housing supply; this is meant all to maintain the appearance and character of the town’s single-family neighborhoods. 2. Definition: Accessory Apartment:. Notwithstanding Sections 240-10.1C(4), 240-11.2B(2), and 240-11.5A(2)f. this is an additional dwelling unit, subordinate in size and accessory to the principal dwelling unit on the lot, located in either the principal dwelling or an accessory structure on the lot. An accessory apartment shall be constructed so as to maintain the appearance and essential character of a single-family dwelling or accessory structure thereto located on the lot. 3. Requirements a) Only one accessory apartment shall be allowed per lot. b) The lot size shall be no less than 7500 square feet. c) Either the principal dwelling or accessory apartment must be owner-occupied for a period of 7 months in every calendar year, or owned by a nonprofit organization or government authority whose purpose is to provide affordable housing. d) Either the principal dwelling or accessory apartment may be rented, but not both, during the 5 months the owner occupant may be absent. Rental periods shall be not less than 6 months and weekly/monthly rentals (“summer rentals” so called) are expressly prohibited. Neither the principal building nor accessory apartment shall be used as commercial accommodations at any time. e) The accessory apartment shall have not more than 2 bedrooms and a maximum of 800 square feet of floor area, or 40 percent of the floor area of the principal dwelling, whichever is less. This shall be measured using the exterior side of the first floor outside wall, plus he following: finished attic space. f) The total number of bedrooms on the lot shall not exceed 4 where the lot contains less than 20.000 square feet.	SP-P	SP-P	SP-P

Uses	Standards	AGAA	AGA	AGB
	g) Whether allowed as of right or by special permit, for accessory apartments located on lots subject to the provisions of the Water Resource Protection Overlay District or Coastal Pond Overlay District, the total number of bedrooms shall not exceed one per 10,000 square feet of lot area, unless both the principal dwelling and accessory apartment are connected to the municipal sewer system, or to an on-site septic system with enhanced nitrogen removal, approved by the Board of Health. 4. Design Standards Accessory apartments, whether a part of new construction, reconstruction, alteration, or change to a single-family residence or accessory structure (attached) thereto, shall maintain the following standards: a) The architectural effect, as the result of the accessory apartment being constructed within the principal dwelling, shall be that of a single-family residence compatible with the surrounding neighborhood. b) The architectural effect, as the result of the accessory apartment being constructed within an accessory structure, shall be that of a garage or barn customarily incidental to a single-family residence compatible with the surrounding neighborhood. c) Parking for the accessory apartment shall be provided in a manner compatible with the surrounding neighborhood. 5. Procedures a) Accessory Apartment constructed within a single-family dwelling: Prior to the issuance of a building permit for an accessory apartment constructed within a single-family dwelling or accessory structure attached thereto, a site plan review (Design Review), pursuant to § 240-12.2, shall be conducted by the Planning Board, taking into account the design standards, requirements, and purposes of this accessory apartment section of the Use Table. The application for site plan review shall include the information contained in § 240-12.2D(3) unless waived by the Planning Board. b) Accessory Apartment constructed within, or as, a detached accessory structure (not attached to a single-family dwelling): In addition to the site plan review requirements above, an accessory apartment built within, or as, an accessory structure, not attached to a single-family dwelling, shall require a special permit from the Zoning Board of Appeals. In addition to the design standards, requirements, and purposes of this accessory apartment section of the Use Tables, the Board shall take into account the standards found in § 240-12.1E. 6. Enforcement a) Upon a written determination and notice by the Building Commissioner that the property owner has failed to comply with these provisions, the owner shall bring the accessory apartment into compliance within 90 days of the notice. Failing compliance, the property shall be restored to single-family dwelling status within 90 days of the failure determination, and shall comply with all State Building Code requirements and other local regulations or bylaws. 7. Monitoring a) An affidavit shall be submitted annually to the Building Commissioner, signed by the property owner, attesting that the principal dwelling or accessory apartment has been owner occupied for a period of 7 months and not otherwise rented as set forth in section 3.c) above. The Building Commissioner may allow a property owner to be absent during this 7-month period for cause, such as military assignment, work related issues, health issues, academic sabbatical, or a similar circumstance.			

Uses	Standards	AGAA	AGA	AGB
Accessory use	Only the following uses are included in this category. 1. outside parking of commercially registered vehicle exceeding a gross vehicle weight of more than 13,000 pounds; 2. garage space for more than two cars if: a) the lot is 30,000 square feet or less; or b) the footprint of the garage is more than 900 square feet, or 50% of the footprint of the principal structure, whichever is less; 3. home occupation (See § 240-9.5 for special permit requirements for home occupations); 4. motor home, travel trailer, or fifth-wheel trailer, not located within the minimum front, side, or rear yard setback requirements; 5. outside parking of more than one commercial light panel, delivery, or pickup truck, school bus, or tow truck; 6. temporary parking of school buses for 2 hours or less per day shall not require the issuance of special permit; 7. scientific research (See § 240-5.1E)	 1. SP-Z 2. SP-Z 3. SP-Z 4. SP-Z 5. SP-Z 6. SP-Z 7. SP-Z	 1. SP-Z 2. SP-Z 3. SP-Z 4. SP-Z 5. SP-Z 6. SP-Z 7. SP-Z	 1. SP-Z 2. SP-Z 3. SP-Z 4. SP-Z 5. SP-Z 6. SP-Z 7. SP-Z
Airport or landing strip or pad		SP-Z	SP-Z	SP-Z
Boat Storage	As a commercial operation under the following standards, in addition to the requirements of § 240-12.1: 1. The lot shall be a minimum of 2 acres. 2. The side and rear yard setbacks shall be a minimum of 50 feet. Lesser setbacks with a minimum of 30 feet may be allowed when a combination of landscaping and natural features provide visual screening as necessary and in proportion to the need to buffer from adjacent land uses. All allowed structures, fencing, and walls shall meet these setback standards. The dimensional requirements of ARTICLE 11, shall otherwise apply. 3. Sailboats shall be demasted and no boat on its cradle or other support system shall be higher than 18 feet at any point. 4. No structure or signs other than security fencing, one security dwelling which meets all other requirements of these districts, and boat supports shall be allowed. Stacking of boats higher than 18 feet shall be prohibited. 5. No activity such as cleaning, waxing, repairs, or painting shall be allowed. All activities shall be approved by the Board of Appeals. 6. The proposed site shall not be located within developed or established neighborhoods The proposed site shall have a common boundary of not less than 20 feet with an industrial or commercial use (a home occupation does not apply) nor be located directly across the street from the same so that if property lines were extended across the street, at least 20 feet of street center line would be common boundary. 7. This special permit shall not apply to property within the Watershed Resource Protection Overlay District.	SP-Z	SP-Z	SP-Z
Commercial accommodation	(See § 240-9.4)	SP-Z	SP-Z	SP-Z

Uses	Standards	AGAA	AGA	AGB
Commercial nursery	For a property where any portion of that property is currently in agricultural use for commercial nursery operations, a special permit may be granted to the owner to devote all or a portion of the lot(s) for storage of equipment and supplies, fabrication of subassemblies, and parking of wheeled equipment subject to the following findings and conditions. 1. The property shall not be located in the Water Resource Protection Overlay District. 2. These uses had previously been accessory to the commercial nursery operations. 3. The existing structures, parking, and storage areas, and other physical characteristics of the lot(s), are suitable for the proposed uses. 4. The lot(s)shall contain a minimum of 5 acres. 5. The front yard setback shall be a minimum of 75 feet and side yard and rear yard setbacks shall be a minimum of 50 feet, unless the Planning Board finds that a lesser existing setback is adequate to provide sufficient screening and buffer from the street or adjacent properties taking into account existing and potential land uses in the neighborhood. 6. The Planning Board shall determine that the activities, including traffic between the subject premises and an arterial roadway such as Route 28, Route 151, Thomas B. Landers Road, Sandwich Road, Old Barnstable Road, or Blacksmith Shop Road, will have no adverse impacts on a neighborhood predominantly residential in character, and that the construction, width, and grades of the adjacent street and any other street providing access between the subject premises and an arterial roadway shall be sufficient for safe travel to and from the site by the vehicles to be stored. 7. The Planning Board shall specify hours of operation, the type and number of vehicles, and the equipment or supplies to be stored. 8. Any extension, alteration, or change to the activities approved under this section shall only be allowed by the Planning Board, applying the requirements and standards of § 24-12.1 (special permit). Any such change, alteration, or extension shall not be substantially more detrimental to the neighborhood than the existing activities. 9. All reference to "lot(s)" in this section shall mean contiguous lots when more than one lot is considered.	SP-P	SP-P	SP-P
Common driveway		SP-P	SP-P	SP-P
Contractor yard	In addition to the requirements of § 240-12.1, the following requirements shall be met. 1. The lot shall be a minimum of 5 acres in AGAA districts and 3 acres in AGA Districts. 2. The front yard setback shall be a minimum of 75 feet in the AGAA District and 50 feet in the AGA District. The side and rear yard setbacks shall be a minimum of 30 feet. The Planning Board may require greater setbacks where needed to provide sufficient screening and buffer from the street or adjacent properties. 3. No contractor yard shall be permitted in a Water Resource Protection Overlay District. 4. For AGAA Districts the lot shall not be located within 500 feet of a Single Residence District, within 500 feet of either an existing dwelling or a dwelling where construction had commenced as of April 1, 2000. For AGA Districts, the lot shall not be located within 300 feet of a Single Residence District or within 300 feet of either an existing dwelling or a dwelling where construction had commenced as of April 1, 2000, except a dwelling occupied by the owner or operator of the contractor yard or a designee. 5. No contractor yard shall be permitted unless the Planning Board shall determine that operation of the contractor's yard, including traffic between the	SP-P	SP-P	N

Uses	Standards	AGAA	AGA	AGB
	contractor's yard and arterial roadways such as Route 28, Route 151, Thomas B. Landers Road, Sandwich Road, Old Barnstable Road, and Blacksmith Shop Road, will have no adverse impact on a neighborhood predominantly residential in character, and that the construction, width, and grades of the adjacent street and any other street providing access between the contractor's yard and any arterial roadway shall be sufficient for safe travel to and from the site by the vehicles to be stored. 6. The Planning Board shall specify hours of operation, the type and number of vehicles, equipment or supplies to be stored, what fabrication of subassemblies shall be allowed, if any, and what accessory activities, such as ordinary maintenance and minor repairs, shall be allowed. No activity such as major repair work, painting, or engine cleaning shall be allowed.			
Golf course		SP-Z	SP-Z	SP-Z
Private club not conducted for profit		SP-Z	SP-Z	SP-Z
Television or radio antenna subject to G.L. c. 409A, § 3	exceeding 50 feet above ground level	SP-Z	SP-Z	SP-Z
Wind Energy System	subject to the requirements of § 240-9.8	SP-Z	SP-Z	SP-Z

240 – 6.2 Business Districts (B-1, B-2, B-3, BR)

240 – 6.2A Districts

(1) B-1 Business 1
(2) B-2 Business 2
(3) B-3 Business 3
(4) BR Business Redevelopment

240 – 6.2B Use Table

N = Not allowed
Y = Allowed by-right
SP-Z = Zoning Board of Appeals Special Permit
SP-P = Planning Board Special Permit

Uses	Standards	B-1	B-2	B-3	BR
Residential Uses					
Single-family detached house		Y	Y	Y	Y
Semi-detached and two-family dwelling		Y	Y	Y	Y
Three-family dwelling		N	N	N	Y
Public or nonprofit housing for the elderly		Y	Y	Y	N
Community Service Uses					
Cemetery		Y	Y	Y	Y
Educational institution		Y	Y	Y	Y
Hospital		Y	Y	Y	N
Library		Y	Y	Y	Y
Museum		Y	Y	Y	Y
Philanthropic institution		Y	Y	Y	Y
Religious institution	including a parish house or similar dwelling for the institution	Y	Y	Y	Y

240 – 7.6 Water Resource Protection Overlay District

240 – 7.6A Overview

(1) – The purpose of the Water Resource Protection Overlay District (WRPOD) is to:

a. promote the health, safety, and general welfare of the community by ensuring an adequate quality and quantity of drinking water;
b. preserve and protect existing and potential sources of drinking water supplies;
c. conserve the natural resources of the town; and
d. prevent temporary and permanent contamination of the environment.

(2) DELINEATION OF THE WATER RESOURCE PROTECTION OVERLAY DISTRICT (WRPOD)

a. The WRPOD is an overlay district that shall apply to all new construction, reconstruction, or expansion of existing buildings, and new or expanded uses.
b. There are hereby delineated within the town certain water resource protection areas consisting of aquifers or recharge areas which are shown a map, at a scale of one inch to 1,500 feet, and entitled "Water Resource Protection District, Town of Falmouth," dated March 29, 2011. This map, as it may be amended from time to time by Town Meeting, is hereby made a part of the Zoning Bylaw and is on file in the office of the Town Clerk.
c. Applicable activities or uses which fall within the WRPOD must comply with the requirements of this district as well as with the underlying zoning.

(3) DEFINITIONS – For Definitions related to this section, see ARTICLE 3 – DEFINITIONS.

(4) BOUNDARY DISPUTES – If the location of the district boundary, as delineated on the Water Resource Protection Overlay District Map in relation to a particular parcel is in doubt or dispute, the burden of proof shall be on the property owner(s) of the land in question to show where the boundaries should properly be located. At the request of the owner(s), the Town may engage a professional engineer, hydrologist, geologist, or soil scientist to determine the boundaries of the district more accurately with respect to individual parcels of land and may charge the owner(s) for all or part of the cost of the investigation.

240 – 7.6B Uses

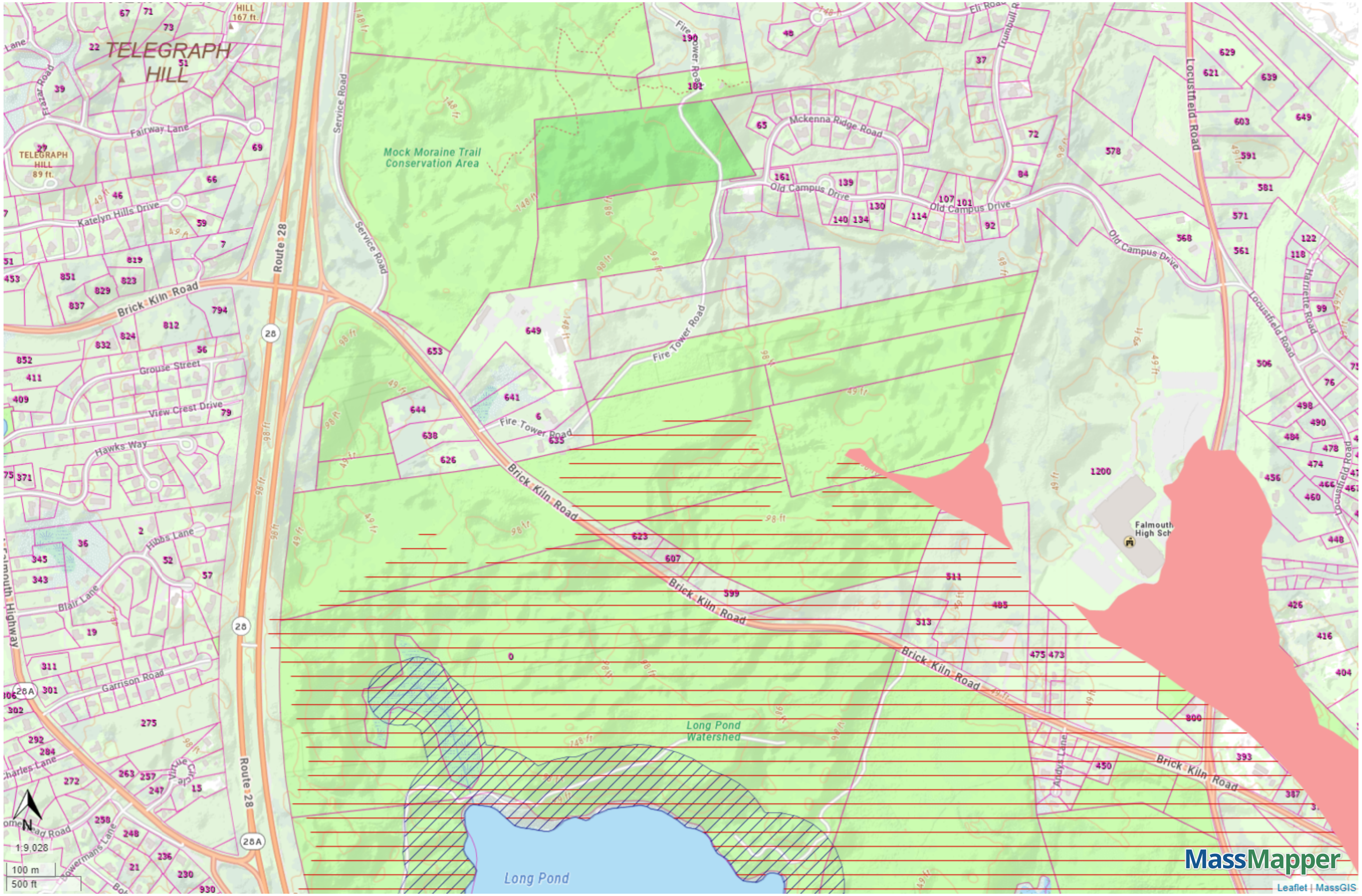
(1) UNDERLYING DISTRICT REQUIREMENTS – Applicable activities or uses which fall within the WRPOD must comply with the requirements of this district as well as with the underlying zoning. Uses prohibited in underlying zoning districts are prohibited in the WRPOD.

(2) ADDITIONAL PERMITS – All uses listed in the Use Table shall also obtain necessary permits, orders, or approvals required by federal, state, or local governments.

(3) USE TABLE – WATER RESOURCE PROTECTION OVERLAY DISTRICT

N = Not allowed — Y = Allowed by right
SP-Z **=** Zoning Board of Appeals special permit — SP-P = Planning Board special permit

Surface Water Protection Areas



Zone C

Zone B

Zone A

Property Tax Parcels

g. Written notice of any violations of this section shall be given by the Building Commissioner to the responsible person as soon as possible after detection of a violation or a continuing violation. Notice to the assessed owner of the property shall be deemed notice to the responsible person. A copy of the notice shall be submitted to the Board of Health, the Conservation Commission, the Public Works/Engineering Departments, the Building Commissioner, the Water Department and the Town Administrator. The notice shall:
   i. specify the requirement or restriction violated and the nature of the violation;
   ii. identify the actions necessary to remove or remedy the violations;
   iii. identify preventive measures required for avoiding future violations; and
   iv. establish a schedule of compliance.

h. The cost of containment, cleanup, or other curative measures shall be borne by the owner or operator of the premises. For situations that require remedial action to prevent adverse impact to the water resources within the WRPOD, the Building Commissioner or any agent shall order the owner and/or operator of the premises to remedy the violation. If the owner and/or operator does not comply with the order, the Town of Falmouth, the Board of Health, the Building Commissioner, or any of their agents, if lawfully authorized to enter upon the premises under the terms of the special permit or otherwise, may act to remedy the violation. The remediation cost shall be the responsibility of the owner and operator of the premises.

(5) DENSITY LIMITATIONS – The following density restrictions shall apply within the WRPOD:

a. minimum lot size: 80,000 square feet
b. minimum lot width: 200 feet
c. minimum lot frontage: 150 feet
d. maximum lot coverage by impervious surfaces: 20%

(6) SEWAGE FLOWS – Nonresidential uses shall not exceed 7.5 gallons sewage per day per 1,000 square feet of lot area. Estimated sewage flows shall be based on Title V of the State Environmental Code, 310 CMR 15.00. Maximum lot coverage by impervious surfaces shall not exceed 40%.

(7) SEVERABILITY – A determination that any portion or provision of this WRPOD is invalid shall not invalidate any other portion or provision thereof, nor shall it invalidate any special permit previously issued thereunder.

240 – 7.7 Wildlife Corridor Overlay District

240 – 7.7A Purpose & Applicability

(1) PURPOSE – The purpose of this District is to establish and protect permanent and contiguous corridors and special areas for the feeding, breeding, and normal home range movement of wildlife through the defined habitat areas. This purpose is based on the following:

a. One of the purposes of zoning is the conservation of natural resources.
b. Wildlife is a valued natural resource in Falmouth.
c. The Commonwealth of Massachusetts has established the importance of protecting wildlife through numerous laws.

d. Falmouth has a significant stock of wildlife which moves through a large, defined area of Town.
e. Development under zoning can be designed to coexist with wildlife and important habitat areas.

(2) APPLICABILITY – All uses of land that are governed by a definitive subdivision plan, a special permit, or a site plan review application shall be subject to the requirements of § 240-7.7.

240 – 7.7B Procedure

(1) NATURAL RESOURCES DEPARTMENT REVIEW – Upon submittal to the reviewing board of plans for development, all plans subject to § 240-7.7 shall be referred to the Natural Resources Department. Within 35 days of this referral, the Natural Resources Department shall file a recommendation with the reviewing Board. This time may be extended at the request of the applicant. These recommendations shall be considered prior to the final decision of the reviewing Board, and all restrictions to the property added by the reviewing Board as a result shall be shown on a separate document to which reference is made on the final approved plan.

(2) WILDLIFE HABITAT PROTECTION – All areas on the plan set aside for protection of wildlife habitat shall be permanently conveyed in accordance with § 240- 9.7H. Ownership of open spaces shall be subject to a permanent conservation easement or restriction.

(3) COVENANT – No covenants, easements, or restrictions imposed by this section shall:

a. permit public access on private property;
b. use of the covenant to control density of development; or
c. cause any loss of lot coverage. (lot coverage shall be based on the total area of the property)

(4) STANDARDS – For those sites within Area 1, Deer Migration Areas, the following standards shall apply:

a. Subdivisions which total more than 5 acres in the AGA, AGB, SR-A, PU, and SR-B zoning districts and more than 20 acres in the AGAA and SR-AA zoning districts shall submit to the Planning Board a preliminary cluster subdivision plan. The Planning Board shall encourage the submittal of a cluster-type definitive subdivision in accordance with § 240–9.7 if it facilitates the purpose of § 240-7.7.
b. The applicant shall prepare a corridor plan. The proposed corridor shall be contiguous with any existing or potential corridors on abutting parcels. The plan shall meet the following requirements:
   i. The applicant's proposed corridor shall be subject to the approval of the reviewing Board under the 2 criteria listed below. If more than one corridor is proposed the reviewing Board may allow the applicant to choose either or both proposed corridors.

      - actual use for: migration, browsing, or bedding by white tailed deer; shelter or bedding by fox, coyote, or other large or medium size mammals which typically do not thrive in proximity to human habitation; nesting by quail, grouse, pheasants, or other ground nesting birds, which typically do not thrive in proximity to human habitation; egg deposition and/or migration of reptiles and amphibians.

- the presence of any rare, threatened, or endangered species as listed by the U.S. or Massachusetts Division of Fish and Wildlife.

ii. On any parcel on which there is inconclusive evidence of wildlife use, a corridor shall be established no wider than necessary to permit migration of white-tailed deer in order to maintain contiguity of such corridors within the overlay district. No corridor under this section shall exceed 300 feet in width. Within this constraint, no corridor shall be greater in area than is equivalent to the actual area of observed wildlife use of the parcel divided by the total area of the parcel.

iii. Any covenant or restriction under this section shall be coordinated with any restriction of record by the State Wetlands Act, Town Wetlands bylaw, State Natural Heritage Program or similar laws.

c. Fencing or any structural barrier to wildlife movement within corridors shall be prohibited.

d. The applicant shall ensure drainage from roadways be diverted away from depressed areas that may be used as shelter for wildlife.

e. Natural, native vegetation shall be encouraged or enhanced by the project. Disturbed areas shall be revegetated as rapidly as possible or within a time required by the reviewing Board.

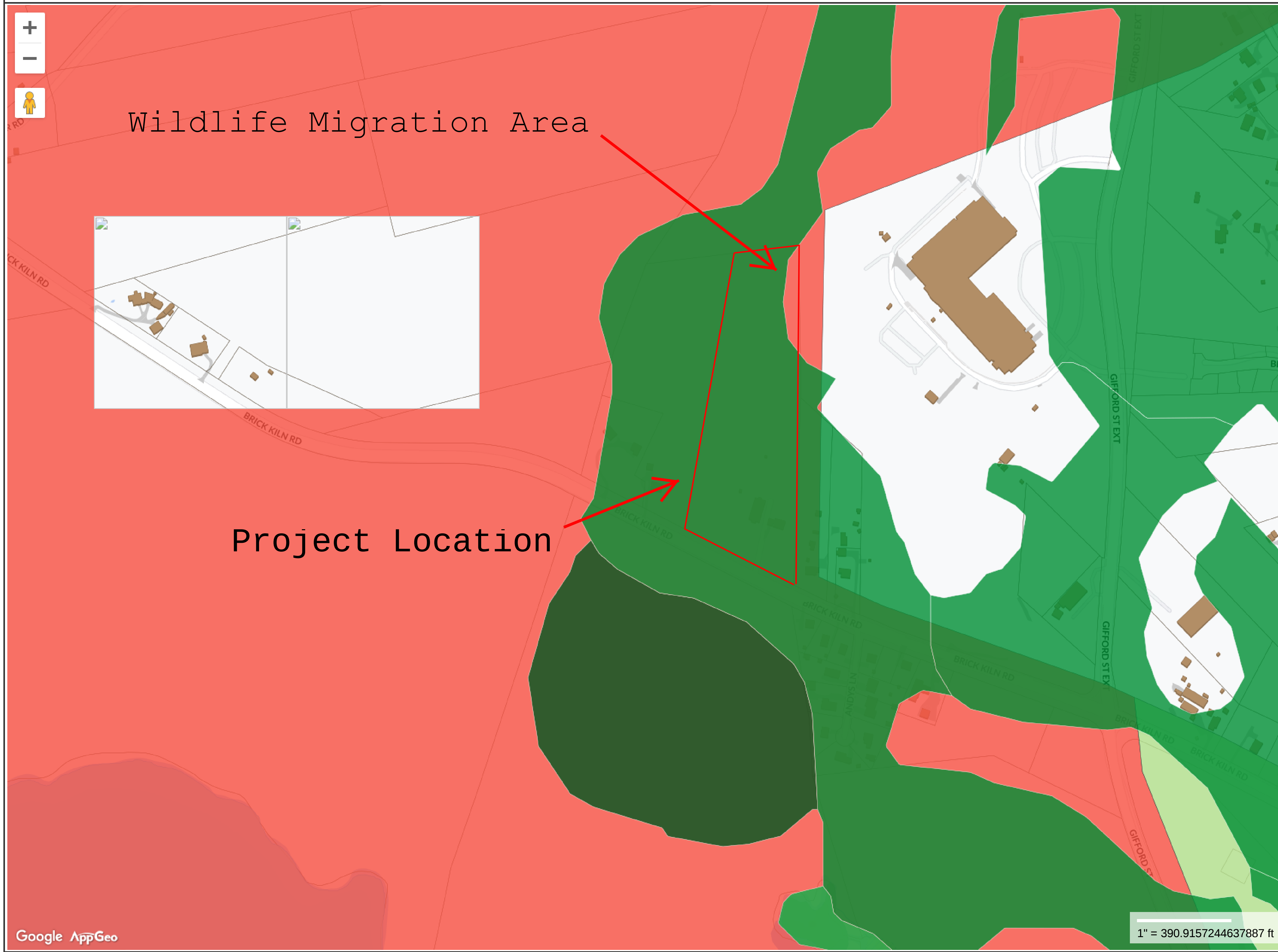
f. Dramatic changes in topography shall be discouraged and the footprint of disturbed areas shall be limited.

g. Natural native vegetation shall be reestablished and maintained or enhanced by the project. Areas disturbed during construction shall be revegetated as rapidly as possible after construction is completed or within such further time as permitted by the reviewing Board.

(5) ANNUAL REVIEW – Annual reports from the Natural Resources Department shall be filed with the reviewing board and the owner or owners of the subject property. These reports shall reevaluate the corridors and open space and make recommendations for any adjustments in vegetative plantings.

(6) SUBDIVISIONS – REDUCTION IN LOT SIZE – Subdivisions of land as specified in § 240 – 7.6B(4) may vary lot size by the approval of a special permit from the Planning Board from that required by the applicable zoning district. The lot variance shall be no more than 25% less than that required by § 240-11.2B, Minimum Lot Dimensions, so long as the total number of lots is not greater than the zoning district would allow under a conventional grid subdivision. The Planning Board shall make a finding that this special permit is necessary to effect the purpose of this District.

Wildlife Migration Corridors



MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

Town of Falmouth, MA makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Geometry updated 01/03/2023
Data updated 07/21/2022

Print map scale is approximate. Critical layout or measurement activities should not be done using this resource.

Map Theme Legends

Natural Resource Protection NHESP

- NHESP Certified Vernal Pools
- NHESP Potential Vernal Pools
- NHESP Priority Habitats of Rare Species
- NHESP Estimated Habitats of Rare Wildlife
- Areas of Critical Environmental Concern

Massachusetts DCR, Natural Heritage and Endangered Species Program

Prime Farm Land Soils

- ALL AREAS ARE PRIME FARMLAND
- FARMLAND OF STATEWIDE IMPORTANCE
- FARMLAND OF UNIQUE IMPORTANCE

MassGIS

State DEP Wetlands

- Shoreline
- Hydrologic Connection
- Mean Low Water Line
- Wetland Limit
- Closure Line
- Reservoir (with PWSID)
- Marsh/Bog
- Wooded Marsh
- Cranberry Bog
- Salt Marsh
- Tidal Flats
- Beach/Dune

MassDEP Wetlands

Wildlife Corridors

- FORAGING AREA 2
- MIGRATION AREA 1
- UNRESTRICTED

EXHIBIT 13

ECONOMIC IMPACT ASSESSMENT

Upper Cape YMCA
485 Brick Kiln Road
Falmouth MA

Economic Impact Assessment

Introduction

YMCA Cape Cod proposes to construct a new branch facility, which will be located on property at 485 Brick Kiln Road in Falmouth and will predominantly serve the Upper Cape Cod communities. The YMCA has deep roots in the Cape Cod community, having first formed its local chapter in the mid-1960s and developing its first branch in Barnstable in the 1980s.

The property where the development is proposed is part of a parcel of land that is approximately 9.66 acres in size and is currently owned by Christ Lutheran Church of Falmouth (CLCF). The existing CLCF buildings (a church building and a live-in rectory building) are also located on the property. YMCA has entered into a purchase and sale agreement with CLCF to purchase a 6.15-acre portion of the CLCF property for the purpose of developing a new branch facility.

The proposed development is in Falmouth's Agricultural AA Zoning District and is also within a Surface Water Protection District and Wildlife Migration Area. The proposed development will offer a wide range of services to the surrounding communities, including the following:

1. Two separate pool areas (one cool and one heated);
2. Fitness center;
3. Group exercise classes;
4. Member drop-off babysitting;
5. Spacious gymnasium with an overhead walking/running track;
6. Indoor activity centers for all ages;
7. Children's adventure area;
8. Outdoor activity areas; and
9. Community Wellness Center to be operated by the Community Health Center of Cape Cod.

These services are vital to the nearby community's health and wellness.

Project Summary

The YMCA building will have a footprint of 44,789 square feet (sq. ft.) and a total gross floor area of 64,565 sq. ft (including a partial second floor and a small basement area). The project will also include a second (support) building that will contain sewage treatment system controls and emergency generator controls, it will have a footprint and gross floor area of 192 sq. ft.

The development will also include two vehicle access areas (one which is existing and used by CLCF), sidewalks, LID stormwater controls, outdoor gathering spaces, a standby emergency generator and an innovative alternative sewage treatment system.

Upper Cape YMCA
485 Brick Kiln Road
Falmouth MA

The YMCA proposes to share a portion of the CLCF property for parking, which will serve both the church and the YMCA. The portion of shared CLCF property is 72,657 sq. ft., which will be designated as an access, parking, and utility easement.

The facility will also include space for the Community Health Center of Cape Cod, Inc. to help ensure that all people in the region will have access to programs and services that focus on health, prevention, and wellness, and reducing the incidence of chronic illness.

The proposed development is projected to break ground in 2024, and initial construction activities will occur over an 18-month period. A secondary construction period to build a gymnasium and complete the development will take place over a 10-month period. Please note that the YMCA is aware of the 5-year period that a DRI is viable without further review and approval from the Cape Cod Commission.

The development is projected to create 175 to 200 construction jobs over the period of construction. The construction jobs created will include trucking, heavy equipment operators, and multiple trade and professional jobs, including architects, engineers, surveyors, carpenters, electricians, and plumbers, to name a few, and purchases of materials from many local suppliers. YMCA estimates that 8 to 10 full-time jobs will also be created to operate the facility, as well as up to 80 part-time jobs for the same purpose. The Community Health Center is projected to create 15 full-time skilled medical jobs as well.

The average burdened wage during construction could be up to $46.71/hr. or higher and will provide an influx of revenue to neighboring businesses during this timeframe. Of the projected jobs, at least 75% of the labor will be provided by residents of the Massachusetts' South Coastal Region. The proposed development and continued operations will also support many general services for the life of the facility including clerical, management, fitness instructors and trainers, health professionals, janitorial services, general maintenance, landscaping and much more.

Project-Related Jobs

The project is projected to break ground in 2024 and continue into 2027 before it is complete. A total development cost is projected to be $22.5 million to $30 million. The development will create thousands of labor hours which equates to many full-time job equivalents through a two-plus year period of construction, with an average burdened wage rate of $46.71/hr. (U.S. Bureau of Labor Statistics, Employers Costs for Employee Compensation, Private Sector, New England Region, March 2023). Construction equipment operators and professional craftsmen can have a fully burdened wage rate of up to $120/hr., (private sector) and will also provide an influx of revenue to neighboring businesses during the construction period. This number of fulltime and part time, year-round jobs helps meet the stated goal for year round employment within the Regional Housing Market Analysis, Barnstable County, Massachusetts (Crane Associates, Inc., 2017).

Upper Cape YMCA
485 Brick Kiln Road
Falmouth MA

Stabilized Job Creation

Upon its completion, the development will create many jobs associated with the operations and maintenance of the property. Property management will consist of at least 3 full-time positions and 2 part-time positions performing day-to-day custodial maintenance and landscape management and over 80 part-time opportunities. The Community Health Center will provide 15 individuals, including 3 medical providers (Physician, Physician Assistant, Nurse Practitioner), 5 nursing staff, 2 administrative support members and 5 pharmacy staff. All full-time employees will be provided with competitive salaries and benefits packages. This stimulus will positively impact the Town of Falmouth and surrounding communities.

Member Volume

The proposed development will serve an estimated 800+ members per weekday based on McMahon's Traffic Impact Analysis Study (refer to **Exhibit 15** in the DRI submittal for details), which will consist of predominantly Upper Cape area residents.

Increased Tax Basis

The proposed development will include two phases of construction with permit fees going to the Town of Falmouth for Building, Electrical, Plumbing, Health, Water supply, etc. No net increase beyond sales taxes for materials and services are projected for the local, state, or federal governments due to the non-profit status of YMCA Cape Cod.

Summary

In summary, the construction of the proposed YMCA facility and long-term ongoing operations will provide an economic benefit to Falmouth and surrounding areas, and contribute towards reaching regional employment and housing goals.

EXHIBIT 14

TOWN COMMUNICATIONS PRIOR TO DRI SUBMITTAL

Falmouth Officials Outreach

Introduction	The current YMCA design is the result of numerous iterations beginning with concept plans, advancing to schematic plans and ending with design development plans suitable for permitting. The work was presented to town officials on several occasions as detailed below.
Town Planner	The Applicant met with the Planning Department on a few occasions to discuss the project and gather feedback. Both the former Town Planner as well as the current Town Planner indicated that they were in favor of this development and its community benefit.
Fire Department	The Falmouth Fire Department was consulted on two different occasions to discuss the design approach. The Fire Prevention Officer, Craig O'Malley, required we have two (2) FDC connections on the building with a fire hydrant located within 100-ft of the connections (See Sheet F-1 of the Plan Set). The department also provided turning radius for their equipment which was used in site design.
Department of Public Works -	GSE met with the Engineering Division on two occasions to discuss the various iterations and components of the site design. The Town Engineer James McLoughlin P.E. provided invaluable feedback on stormwater design and water connection design.
Board of Health	The project is proposing the use of an I/A treatment system ("NitROE" manufactured by Klean-Tu,) to treat sanitary wastewater from the proposed facility. The applicant presented the proposed system and layout at a Board of Health meeting. Although the meeting was informational only, the project was well received.
Marine & Environmental Services (MES)	Falmouth has designated MES's Natural Resources with review of sites in the Wildlife Corridors Overlay (zoning) District. The applicant met with the Deputy Director, Chuck Martinsen, to present the plans and garner input. As a result of this meeting the bus loop was shifted easterly to create a better opportunity for wildlife migration.

EXHIBIT 15

TRAFFIC IMPACT ANALYSIS STUDY

Traffic Impact Study

Proposed YMCA

485 Brick Kiln Road
Falmouth, Massachusetts

Prepared by
McMahon, a Bowman Company
350 Myles Standish Boulevard Ste 103
Taunton, MA

Prepared for
Cape Cod YMCA
October 2023

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

INTRODUCTION

McMahon, a Bowman Company has completed a review of the existing traffic operations and potential traffic impacts associated with the proposed Upper Cape YMCA recreational center (herein referred to as the "Project") to be located at 485 Brick Kiln Road, in the Town of Falmouth, Massachusetts. The purpose of this traffic impact study is to evaluate existing and projected traffic operations and safety conditions associated with the Project within the study area.

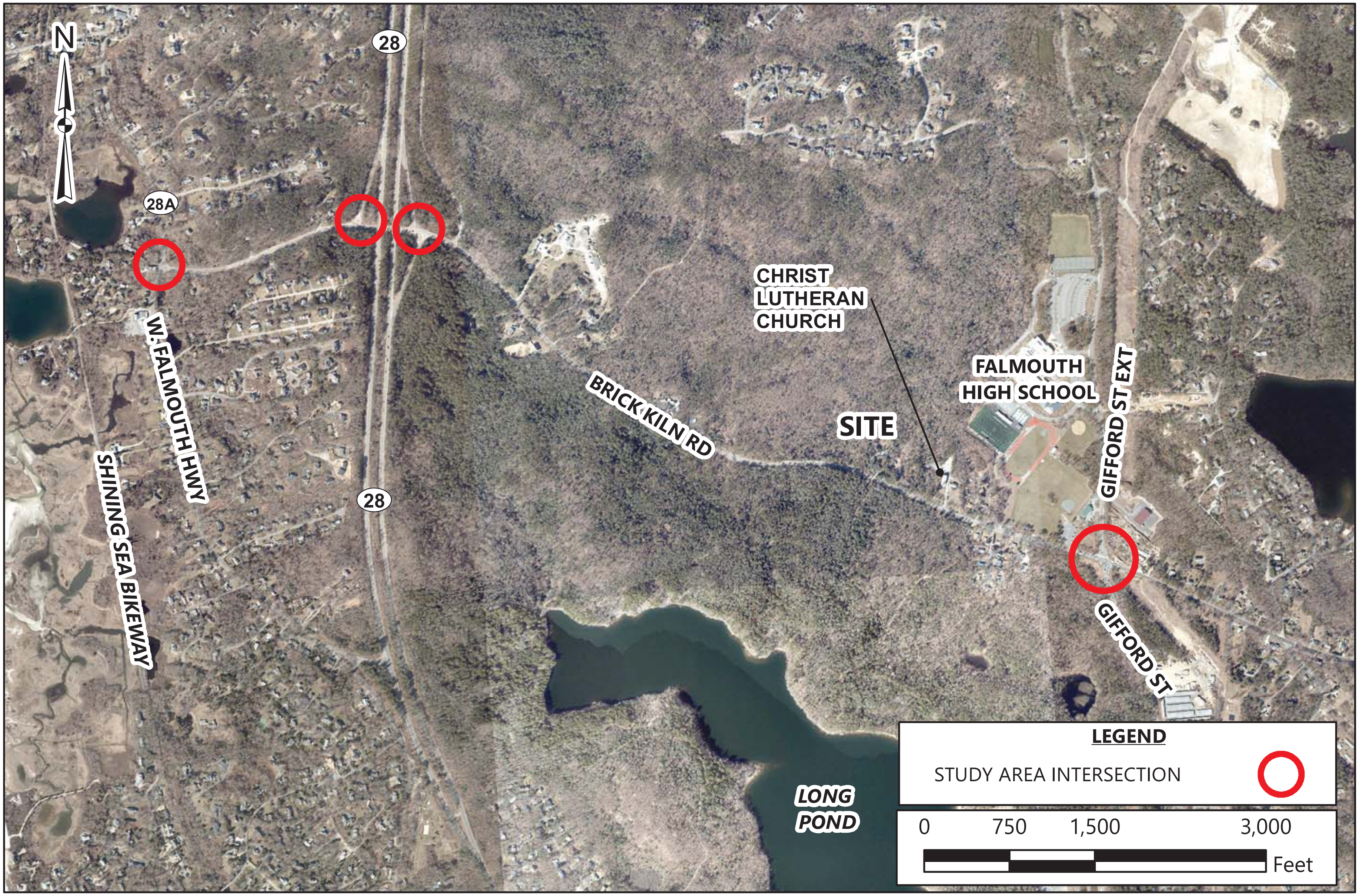
The assessment documented in this traffic impact study is based on a review of existing traffic volumes and the anticipated traffic generating characteristics of the Project. The study examines existing and projected traffic operations (both with and without the Project) in the vicinity of the Project site. The study area was selected in accordance with the Cape Cod Commission's (CCC) 2019 *Transportation Technical Bulletin,* and based on a review of the surrounding roadway network and estimated trip generating characteristics of the Project. McMahon submitted a Scoping Memorandum, dated May 9, 2023 to the CCC. The comment letter supplied by CCC on June 21, 2023 established parameters for the study area, traffic data collection and methodology that is presented in this reports. This study provides an analysis of traffic operations during the weekday morning and weekday afternoon peak hours, for both average traffic conditions and peak traffic conditions.

Project Description

The Project site, depicted in Figure 1, is bounded by Brick Kiln Road to the south, Falmouth High School and the Christ Lutheran Church to the east, residential properties to the west, and undeveloped land to the north.

As shown in the proposed Zoning Compliance Plan prepared by Green Seal Environmental, LLC dated February 24, 2023, the Project would include the construction of a two story YMCA recreational center. The footprint of the proposed building would be approximately 43,213 square feet (s.f.). Based on the floor plans prepared by SV Design and dated July 11, 2023, the gross square footage of the YMCA facilities would be approximately 64,565 s.f. between the two proposed stories. This gross square footage includes a future gymnasium space that will be constructed at a later date. The Zoning Compliance Plan and floor plan documents are provided in Appendix A of this report.

Parking for the proposed site would be shared with the Christ Lutheran Church. The proposed parking lot wil provide a total of 180 spaces, 34 of which would be dedicated for use by the church. This includes eight accessible spaces located adjacent to the proposed YMCA building, and 3 accessible spaces located adjacent to the existing Christ Lutheran Church. Access to the site will be provided via a full access driveway, located on the north side of Brick Kiln Road approximately 450 feet west of the existing driveway to the Christ Lutheran Church. Although the proposed parking lot would be shared with the existing Christ Lutheran Church, the existing church driveway would remain in place. The layout of the proposed parking area suggests that existing traffic associated with the Christ Lutheran Church would continue to use the existing church driveway, and would not utilize the proposed YMCA driveway.



McMAHON
a Bowman company

Figure 1
Site Location
Proposed YMCA Facility
Falmouth, MA

Study Methodology

This traffic impact study evaluates existing and projected traffic operations within the study area for the weekday morning and weekday afternoon peak hour traffic conditions for both average traffic conditions and peak traffic conditions.

The study was conducted in three steps. The first step consisted of an inventory of existing traffic conditions within the Project study area. As part of this inventory, traffic data was collected during the weekday morning and weekday afternoon peak periods. A field visit was conducted to document intersection and roadway geometries, posted speed limits, and available sight distance at the site driveway. Crash data for the study area intersections was obtained from the Massachusetts Department of Transportation (MassDOT) to determine if the study area has existing traffic safety deficiencies.

The second step of the study built upon the data collected in the first step to establish the basis for evaluating potential transportation impacts associated with the projected future conditions. During this second step, the projected traffic demands associated with planned future developments that could influence traffic volumes at the study area intersections were assessed. The 2023 Existing traffic volumes were forecasted to the future year 2030 to evaluate the 2030 No Build (without Project) conditions and the 2030 Build (with Project) conditions, consistent with MassDOT traffic study guidelines.

The third step of this study determined if measures were necessary to minimize potential traffic impacts and provide efficient access to the Project site.

Study Area

Based on a review of the anticipated traffic generating characteristics of the Project and a review of the adjacent roadways serving the Project site, in accordance with the CCC's *Transportation Technical Bulletin,* the following study area intersections were selected for analysis:

- Brick Kiln Road at Gifford Street/Gifford Street Extension (Signalized)
- Brick Kiln Road at Route 28 Northbound Ramps (Unsignalized)
- Brick Kiln Road at Route 28 Southbound Ramps (Unsignalized)
- Brick Kiln Road at West Falmouth Highway (Route 28A) (Unsignalized)
- Brick Kiln Road at Proposed Site Driveway

Additionally, the following roadway links were selected for analysis:

- Brick Kiln Road between Gifford Street and Proposed Site Driveway
- Brick Kiln Road between Route 28 Northbound Ramps and Proposed Site Driveway
- Brick Kiln Road between West Falmouth Highway (Route 28A) and Route 28 Southbound Ramps

The traffic impact study presented in this report documents existing and future traffic conditions for the study area intersections and roadway links noted above.

EXISTING CONDITIONS

An assessment of the potential traffic impacts associated with the Project requires an understanding of the existing traffic conditions within the study area. The existing conditions assessment included in this study consists of an inventory of intersection and roadway geometries, an inventory of traffic control devices, the collection of traffic volume data in the study area, and a review of recent crash data. The existing conditions in the vicinity of the Project site are summarized below.

Roadway Network

To assess the existing conditions of the surrounding roadway network, an inventory of the study area intersections and roadway geometries, and existing traffic control was conducted on Thursday, July 13, 2023. A summary of the existing roadway conditions within the study area is provided below.

<u>Brick Kiln Road</u>
In the vicinity of the Project site, Brick Kiln Road is classified as an urban minor arterial roadway under Town of Falmouth jurisdiction, providing access to residential and commercial land uses. Beginning at Fire Tower Road, located approximately 0.7 miles west of the Project site, and continuing west to West Falmouth Highway (Route 28A), Brick Kiln Road is under MassDOT jurisdiction. Brick Kiln Road provides an eleven-foot-wide travel lane with a three-foot-wide shoulder in each direction. A posted speed limit of 35 mph is present on Brick Kiln Road. A sidewalk measuring five feet in width is provided on the north side of the roadway, beginning at the Christ Lutheran Church driveway and continuing east. No on-street bicycle facilities are provided along Brick Kiln Road; however, Brick Kiln Road is identified as a designated bicycle route in the Cape Cod Regional Policy Plan (RPP).

<u>Gifford Street/Gifford Street Extension</u>
Gifford Street/Gifford Street Extension runs in a north-south direction, with Gifford Street extending south of Brick Kiln Road to Route 28, and Gifford Street Extension extending north of Brick Kiln Road and transitioning to Locustfield Road. Both segments of the roadway are classified as urban minor arterials under Town of Falmouth jurisdiction, providing access to residential, commercial, and industrial land uses. Gifford Street Extension also provides access to Falmouth High School. The roadway provides one twelve-foot-wide travel lane and a three-foot-wide shoulder in each direction. There is a sidewalk measuring five-feet in width provided on the east side of Gifford Street, and a sidewalk measuring five-feet in width provided on the west side of Gifford Street Extension. Gifford Street has a posted speed limit of 45 mph and Gifford Street Extension has a posted speed limit of 25 mph with a 20 mph school zone posted in the vicinity of Falmouth High School.

<u>Route 28</u>
Route 28 is classified as a principal arterial under MassDOT jurisdiction. Route 28 runs in the north-south direction through the Town of Falmouth, providing regional connections to Route 25 and US Route 6. Route 28 is a limited access highway, with two 14-foot wide travel lanes in both the northbound and southbound directions, separated by a vegetated median that measures approximately 85 feet in width. There are Route 28 Northbound on and off-ramps, and Route 28 Southbound off-ramp on Brick Kiln Road, located approximately one mile west of the Project Site. The Route 28 Northbound and Southbound off-ramps operate under stop-control at their intersections with Brick Kiln Road. The nearest Route 28 Southbound on-ramp in vicinity to the Project site is provided on West Falmouth Highway (Route 28A), approximately two miles from the project site.

West Falmouth Highway (Route 28A)
West Falmouth Highway (Route 28A) is classified as a minor arterial under MassDOT jurisdiction. The roadway runs in a north-south direction through the Town of Falmouth, running parallel to Route 28. The roadway generally provides access to residential and commercial land uses, and provides one 12-foot wide travel lane in each direction. There are no sidewalks, shoulders, or bike facilities provided along West Falmouth Highway (Route 28A); however, the Shining Sea Bikeway multi-use path runs parallel to the roadway to the west of the study area. Brick Kiln Road is under stop-control at the intersection with West Falmouth Highway (Route 28A). The posted speed limit on West Falmouth Highway (Route 28A) is 40 mph.

Signalized Intersections

Brick Kiln Road at Gifford Street/Gifford Street Extension
The intersection of Brick Kiln Road at Gifford Street/Gifford Street Extension is a signalized intersection with four approaches.

Each approach of the intersection consists of an exclusive left-turn lane and a shared through/right-turn lane. The intersection is controlled by an actuated, uncoordinated traffic signal consisting of four phases for vehicular traffic, including a protected left-turn phase for eastbound and westbound left-turns, a phase for eastbound and westbound traffic, a protected left-turn phase for northbound and southbound left turns, and a phase for northbound and southbound traffic. Pedestrian traffic is accommodated by a push-button activated exclusive pedestrian phase with crosswalks provided on the southbound and westbound approaches.

Public Transportation

The Cape Cod Regional Transit Authority (CCRTA) Sealine bus route provides service along Teaticket Highway. The closest bus stop along this route is located at the Clipper Ship Apartment development on Teaticket Highway, approximately 2.5 miles southeast of the Project site.

2023 Existing Traffic Volumes

Turning Movement Count Data
To assess peak hour traffic conditions, manual turning movement counts (TMCs) were conducted at the study area intersections during the weekday morning and weekday afternoon peak periods. Counts were conducted on Tuesday, July 25, 2023, during the weekday morning (7:00 AM to 9:00 AM) and weekday afternoon (4:00 PM to 6:00 PM) peak periods. Based on a review of the traffic data, the weekday morning peak hour for the study area occurs between 7:00 AM and 8:00 AM, and the weekday afternoon peak hour occurs between 4:00 PM and 5:00 PM. The results of the turning movement counts are tabulated by 15-minute periods and are provided in Appendix B of this report.

Automatic Traffic Recorder (ATR) Data
ATR data was obtained on Brick Kiln Road in the vicinity of the proposed site driveway for a 24-hour period on Tuesday, July 25, 2023. The ATR data is summarized in Table 1 below and provided in Appendix B. The ATR data is reflective of peak traffic conditions.

Table 1: ATR Summary

Roadway	Direction	ADT[1]	Morning Peak[2] (vph)	Afternoon Peak[3] (vph)	HV%[4]	Operating Speed[5]
Brick Kiln Road	Eastbound	4,200	300	350	3.0%	45
West of Christ Lutheran	Westbound	5,600	380	468	2.9%	46
Church Driveway	Combined	9,800	680	818	2.9%	

1 Average daily traffic volume in vehicles per day (vpd) collected on Tuesday, July 25, 2023.
2 Weekday morning peak hour volumes occurred between 8:00 AM - 9:00 AM.
3 Weekday afternoon peak hour volumes occurred between 3:00 PM - 4:00 PM.
4 Percent of heavy vehicles.
5 Based on 85th percentile vehicle speeds in mph.

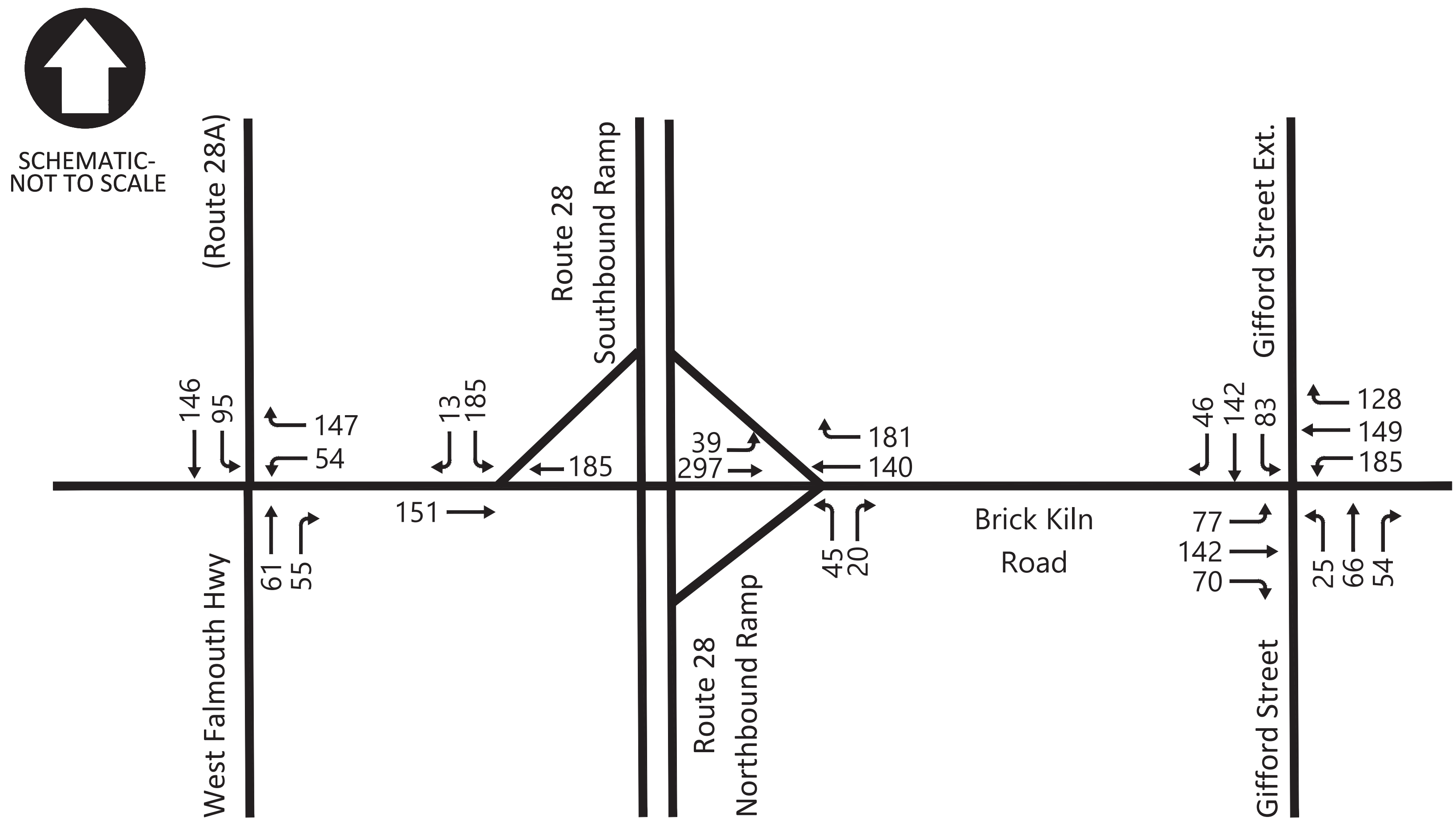
As shown in Table 1, the average daily traffic (ADT) on Brick Kiln Road in the vicinity of the proposed site driveway is 9,800 (4,200 eastbound vehicles and 5,600 westbound vehicles) vehicles per day (vpd) with approximately 3.0 percent of the eastbound traffic and 2.9 percent of the westbound traffic consisting of heavy vehicles. The 85th percentile speeds on Brick Kiln Road were measured to be 45 mph and 46 mph in the eastbound and westbound directions, respectively.

Seasonal Variation

Based on the CCC's *2019 Traffic Counting Report,* the month of July reflects peak summer conditions. Therefore, the traffic volumes collected in July 2023 are considered to reflect peak traffic conditions. To adjust to average traffic conditions, and account for traffic associated with Falmouth High School, both the seasonal adjustment factors presented in the CCC's *2019 Traffic Counting Report,* and historical TMCs were reviewed. TMCs were collected at the study area intersection of Brick Kiln Road at Gifford Street/Gifford Street Extension on Wednesday, February 15, 2023, while Falmouth High School was in session, as part of a traffic study completed for a nearby development. Based on a comparison of the February 2023 and July 2023 turning movement counts collected at this intersection, the average traffic conditions, reflecting off-peak season conditions while Falmouth High School is in session, are approximately 14% lower than the peak traffic conditions during the weekday morning peak hour and approximately 42% lower during the weekday afternoon peak hour. The seasonal adjustment data is provided in Appendix C of this report.

Existing Peak Hour Traffic Volumes

The average condition peak hour traffic volumes for 2023 Existing conditions are depicted in Figures 2 and 3 for the weekday morning and weekday afternoon peak hours, respectively. The peak traffic condition peak hour traffic volumes for 2023 Existing conditions are depicted in Figures 4 and 5 for the weekday morning and weekday afternoon peak hours, respectively.



McMAHON
a Bowman company

Figure 2
Average Condition 2023 Existing Traffic Volumes
Weekday Morning Peak Hour
Proposed YMCA Recreational Facility
Falmouth, MA

Q:\New England Region-McMahon\Dept\Analysis\Green Seal Environmental\Falmouth Y\Traffic\Graphics\Falmouth YMCA Volume Schematic.dwg 09/21/23

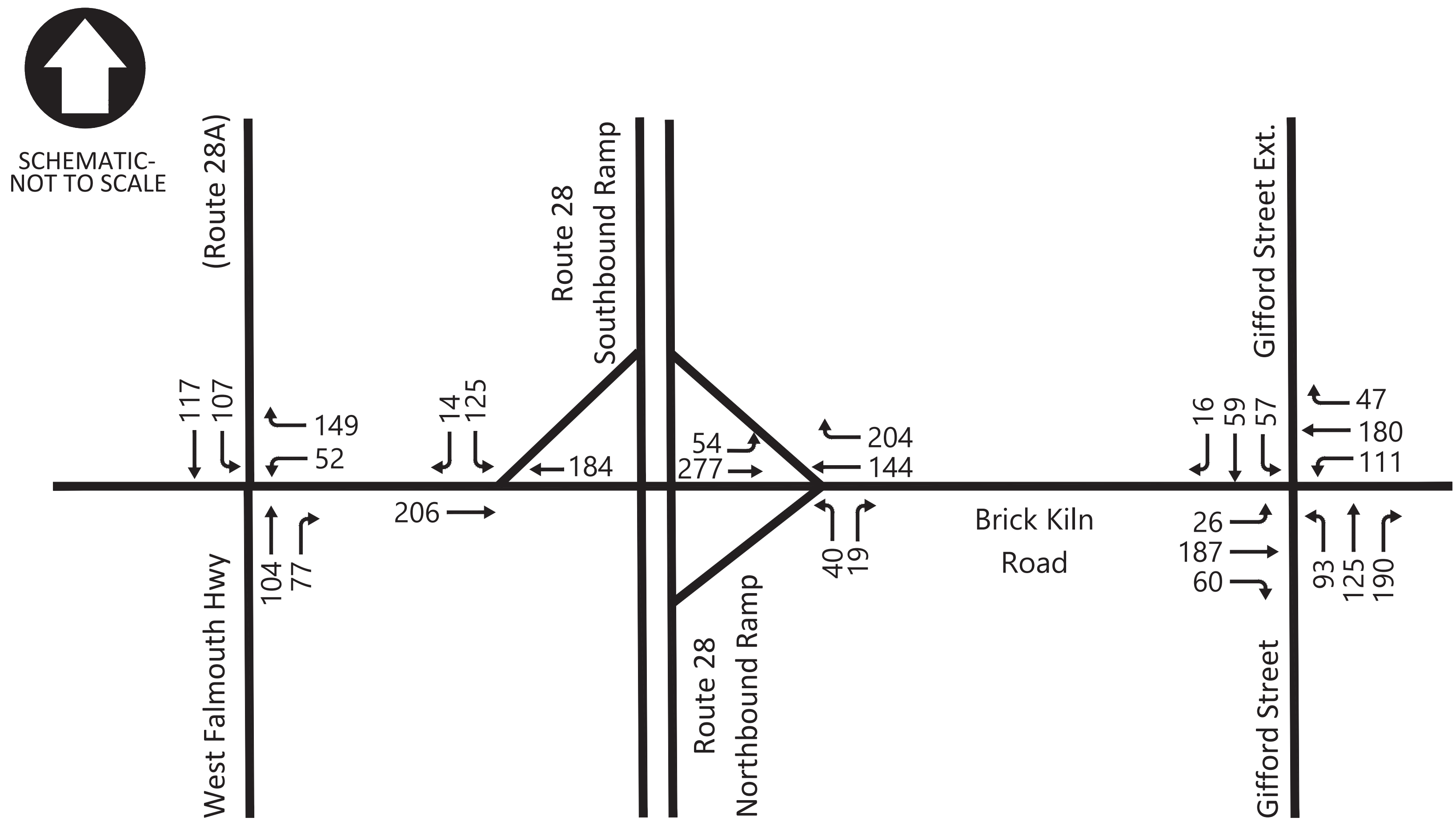


Figure 3
Average Condition 2023 Existing Traffic Volumes
Weekday Afternoon Peak Hour
Proposed YMCA Recreational Facility
Falmouth, MA

McMAHON
a Bowman company

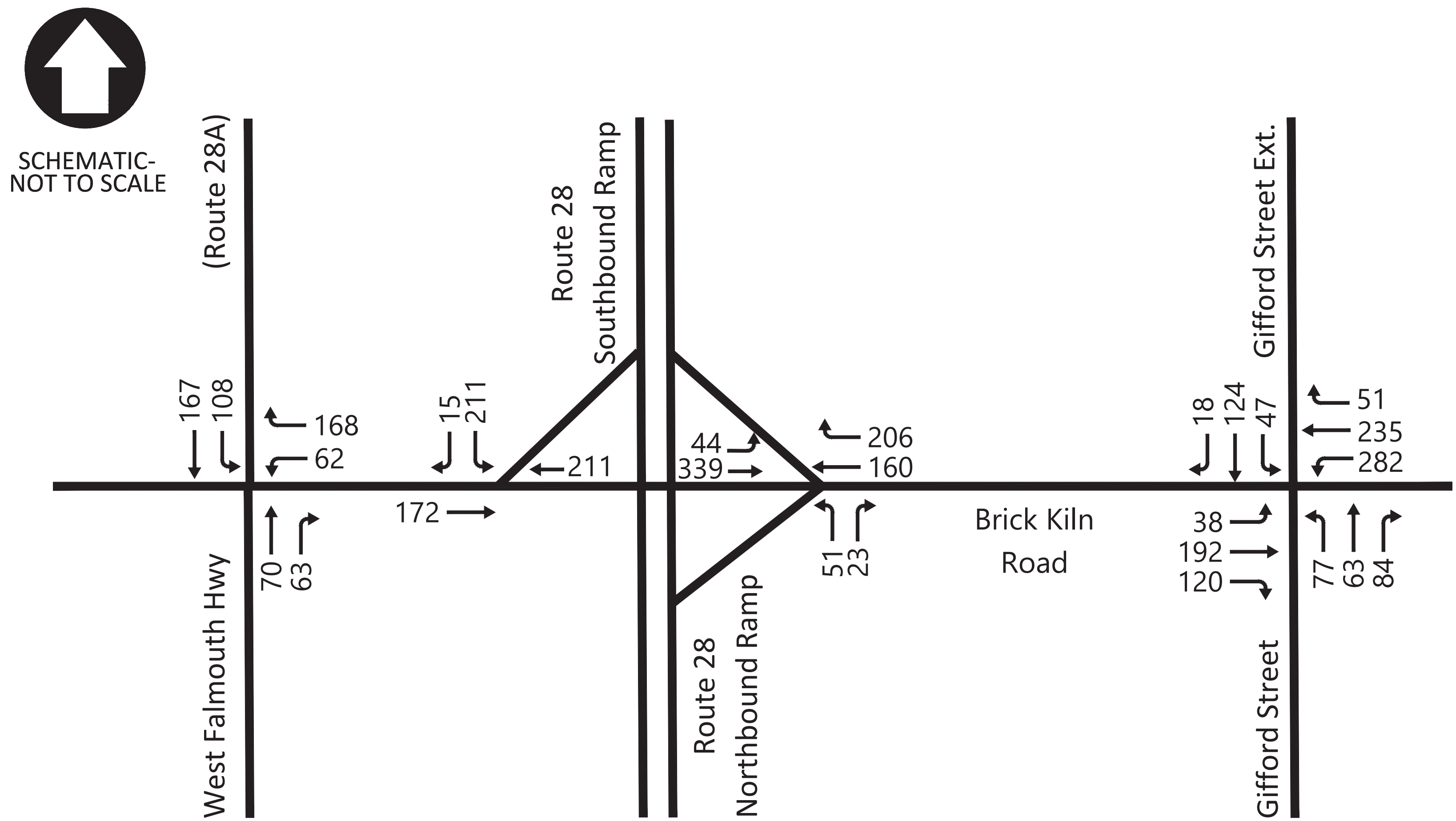


Figure 4
Peak Condition 2023 Existing Traffic Volumes
Weekday Morning Peak Hour
Proposed YMCA Recreational Facility
Falmouth, MA

McMAHON a Bowman company

Q:\New England Region-McMahon\Dept\Analysis\Green Seal Environmental\Falmouth Y\Traffic\Graphics\Falmouth YMCA Volume Schematic.dwg 09/21/23

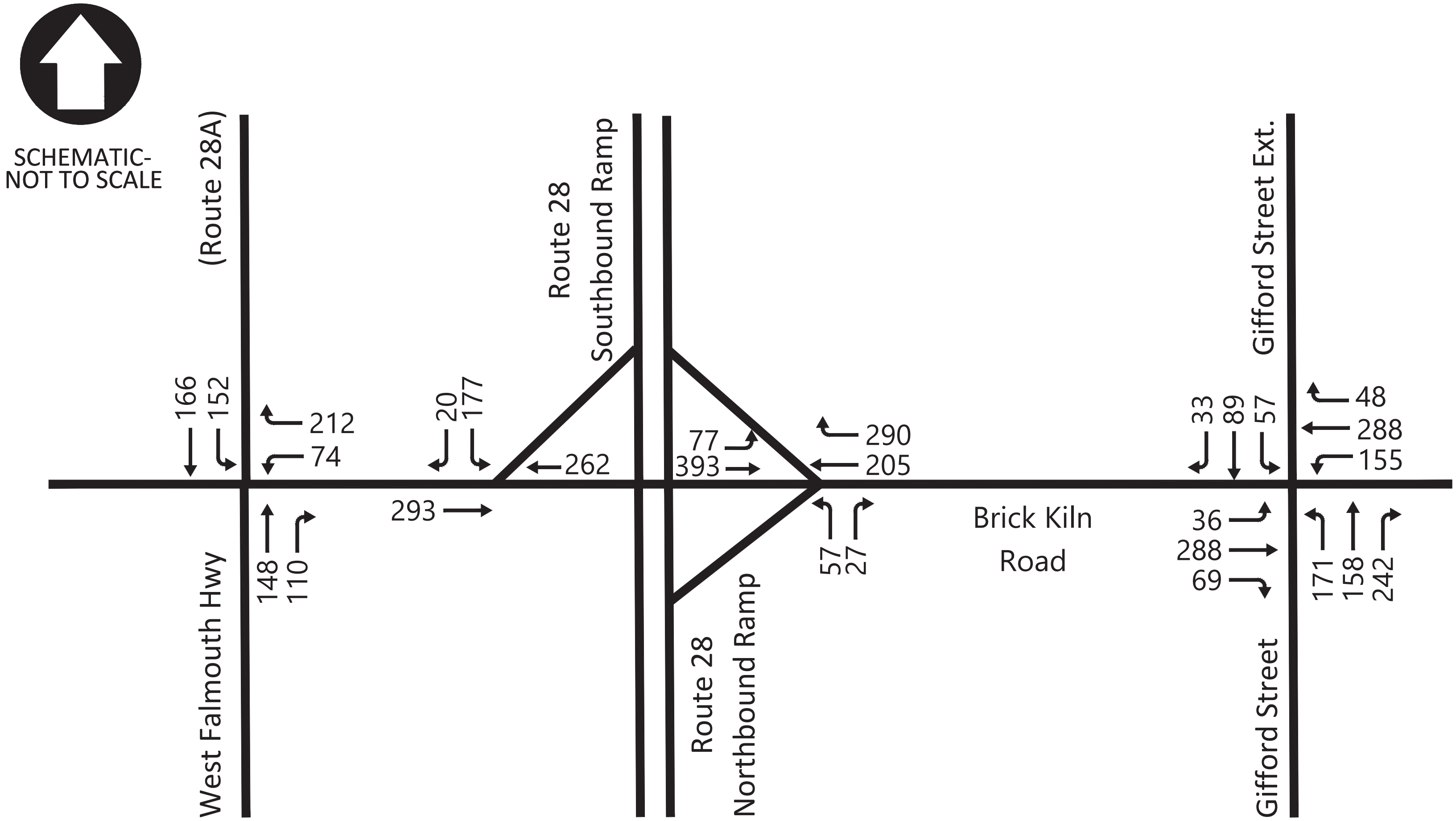


Figure 5
Peak Condition 2023 Existing Traffic Volumes
Weekday Afternoon Peak Hour
Proposed YMCA Recreational Facility
Falmouth, MA

McMAHON a Bowman company

Crash Summary

Crash data for the study area intersections was obtained from MassDOT for the most recent five-year period available. This includes complete yearly crash summaries from 2016 through 2020. A summary of the crash data is provided in Appendix D. Crash reports were requested from the Falmouth Police Department in August 2023 and again in October 2023, but have not yet been provided at the time of this study.

The crash rates at the study intersections were calculated to determine whether the crash frequencies at the study area intersections were unusually high given the travel demand. The intersection crash rate is expressed in crashes per million entering vehicles (MEV). The crash rate for each intersection was then compared to the average rate for signalized intersections statewide and within MassDOT District 5. For signalized intersections, the statewide and MassDOT District 5 average crash rate is 0.78 and 0.75 crashes per MEV respectively. For unsignalized intersections the statewide and MassDOT District 5 average crash rate is 0.57 crashes per MEV. Crash diagrams were prepared for study area intersections that were identified as high crash locations as part of the Highway Safety Improvement Program (HSIP), had crash rates above the statewide or District 5 averages, or experienced an average of three or more crashes per year.

<u>Brick Kiln Road at Gifford Street/Gifford Street Extension</u>
The signalized intersection of Brick Kiln Road at Gifford Street/Gifford Street Extension had a total of 16 reported crashes over the five-year period analyzed. The resulting crash rate of 0.37 crashes per MEV is below the statewide and District 5 averages, and the average number of crashes per year is 3.2. A majority of the reported crashes were angle and rear-end collisions. A total of 3 crashes resulted in personal injury, and the remaining 13 resulted in property damage only. A crash diagram for this intersection is provided in Appendix D.

<u>Brick Kiln Road at Route 28 Northbound Ramps</u>
The unsignalized intersection of Brick Kiln Road at the Route 28 Northbound Ramps had a total of five reported crashes over the five-year period analyzed (average of one reported crash per year). The resulting crash rate of 0.18 crashes per MEV is below the statewide and District 5 average crash rates. Three of the reported crashes were single vehicle collisions, one was an angle collision, and one was a collision with a bicycle.

<u>Brick Kiln Road at Route 28 Southbound Ramps</u>
The unsignalized intersection of Brick Kiln Road at the Route 28 Southbound off-ramp had one reported crash over the five-year period analyzed for a resulting crash rate of 0.05 crashes per MEV and an average of less than one reported crash per year. The reported crash was an angle collision, resulting in personal injury.

<u>Brick Kiln Road at West Falmouth Highway (Route 28A)</u>
The unsignalized intersection of Brick Kiln Road at West Falmouth Highway (Route 28A) had a total of five reported crashes over the five-year period analyzed (average of one reported crash per year). The resulting crash rate of 0.22 crashes per MEV is lower than the statewide and District 5 averages. Of the reported crashes, two were single vehicle collisions, one was an angle collision, one was a rear-end collision, and one was a collision with a bicycle. A total of two of the reported crashes resulted in personal injury, two resulted in property damage only, and one was reported as unknown severity.

FUTURE CONDITIONS

To establish future traffic demands on the study area roadways and intersections, the 2023 Existing traffic volumes were projected to the future-year 2030, by which time the Project would be anticipated to be built and occupied. Traffic volumes on the study area roadways in 2030 are considered to include all existing traffic, as well as new traffic resulting from general growth in the study area and from other planned development projects, independent of the Project. The potential background traffic growth, unrelated to the Project, was considered in the development of the 2030 No Build (without Project) peak hour traffic volumes. The estimated traffic increases associated with the Project were then added to the 2030 No Build volumes to reflect the 2030 Build (with Project) traffic conditions. A detailed description of the development of the 2030 No Build and 2030 Build traffic volume networks is presented below.

Future Roadway Improvements

Brick Kiln Road and Gifford Street have both been identified as potential bike routes as part of the Falmouth Bike Plan. As part of the MassDOT Complete Streets Funding Program, the Town is looking to construct a shared use path on the north side of Brick Kiln Road for the entirety of the roadway (approximately 3.3 miles) and on Gifford Street between Good Will Park Road and Falmouth High School (approximately 1.5 miles). The intersection of Brick Kiln Road at Gifford Street/Gifford Street Extension Traffic has also been identified by the Town for potential signal equipment improvements. These improvement projects are still in the preliminary planning stages. There are no planned roadway improvement projects in the vicinity of the Project site that would be anticipated to impact future traffic volumes or patterns at the time of this report.

Background Traffic Growth

Traffic growth is primarily a function of changes in motor vehicle use and expected land development within the area. To establish the rate at which traffic on the study area roadways can be anticipated to grow during the seven-year forecast period (2023 to 2030), both historic traffic growth and site-specific growth were reviewed.

<u>Historic Traffic Growth</u>
Background traffic growth accounts for changes in traffic volumes associated with general changes in population and other developments that are not known at this time. To determine historical trends in traffic volumes in the study area, McMahon referenced Figure 4 of the Cape Cod Commission *2019 Traffic Counting Report for Cape Cod Massachusetts*, that reports a 10-year average annual growth rate of 0.59 percent for the Upper Cape sub-region. To present a conservative approach and to be consistent with other traffic studies recently completed in Falmouth, a background growth rate of 1.0 percent per year, compounded annually, was established for the study area to grow the 2023 traffic volumes to future year 2030.

<u>Site-Specific Growth</u>
Based on coordination with the Town of Falmouth Planning Department, one planned development was identified which would be anticipated to impact traffic volumes within the study area. The development is proposed to be located at 511 Brick Kiln Road, located directly west of the proposed YMCA facility, and includes the construction of a 40B residential development. The development

would include 28 detached residential units with access provided by a full access driveway on the north side of Brick Kiln Road.

The trips associated with the proposed 40B development were estimated using Institute of Transportation Engineers' (ITE) publication, *Trip Generation Manual,* Land Use Code (LUC) 210 (Single-Family Detached Housing). The projected trips associated with the residential development were distributed through the study intersections based on a review of existing travel patterns and logical travel routes.

2030 No Build Traffic Volumes

The 2023 Existing peak hour traffic volumes were grown by 1.0 percent per year (compounded annually) over the seven-year study horizon (2023 to 2030) to establish the 2030 base future traffic volumes. The resulting average condition 2030 No Build peak hour traffic volumes are illustrated in Figures 6 and 7 for the weekday morning and weekday afternoon peak hours, respectively, and the peak condition 2030 No Build weekday morning and weekday afternoon peak hour traffic volumes are illustrated in Figure 8 and 9, respectively. The 2030 No Build traffic volumes are also documented in the traffic projection model presented in Appendix E of this report.

Q:\New England Region-McMahon\Dept\Analysis\Green Seal Environmental\Falmouth Y\Traffic\Graphics\Falmouth YMCA Volume Schematic.dwg 09/21/23

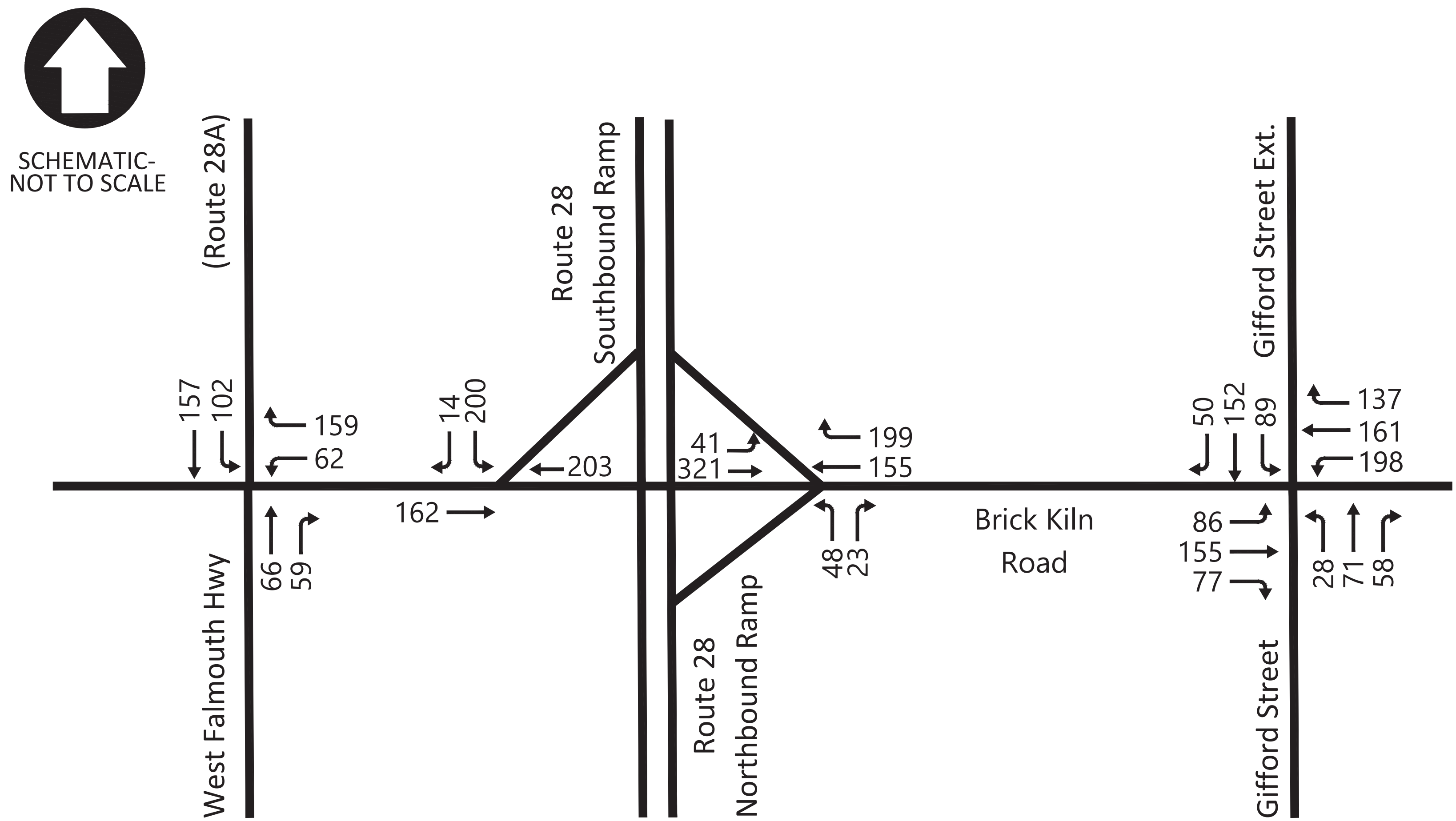
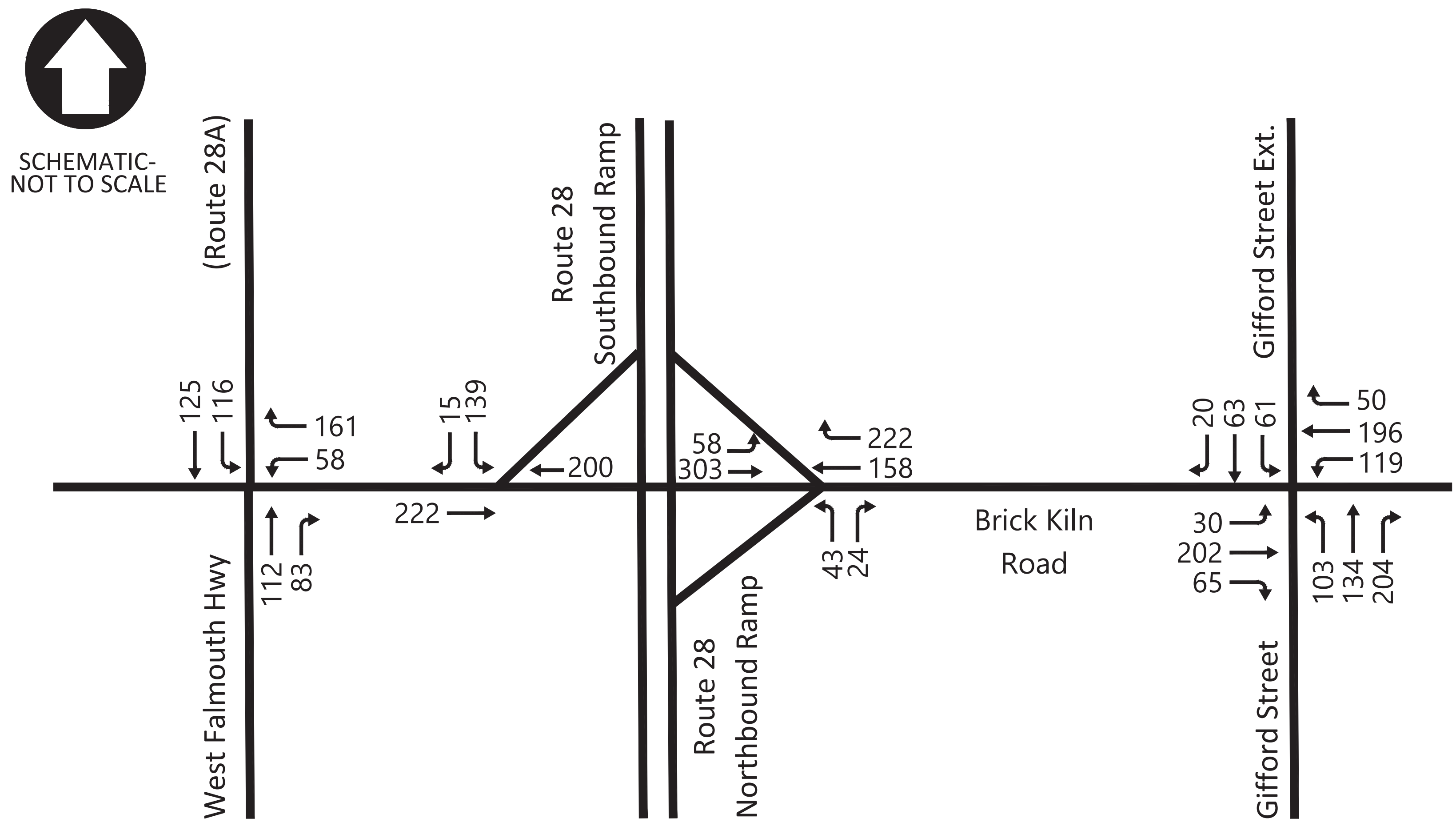


Figure 6
Average Condition 2030 No Build Traffic Volumes
Weekday Morning Peak Hour
Proposed YMCA Recreational Facility
Falmouth, MA

McMAHON a Bowman company

Q:\New England Region-McMahon\Dept\Analysis\Green Seal Environmental\Falmouth Y\Traffic\Graphics\Falmouth YMCA Volume Schematic.dwg 09/21/23



McMAHON a Bowman company

Figure 7
Average Condition 2030 No Build Traffic Volumes
Weekday Afternoon Peak Hour
Proposed YMCA Recreational Facility
Falmouth, MA

Q:\New England Region-McMahon\Dept\Analysis\Green Seal Environmental\Falmouth Y\Traffic\Graphics\Falmouth YMCA Volume Schematic.dwg 09/21/23

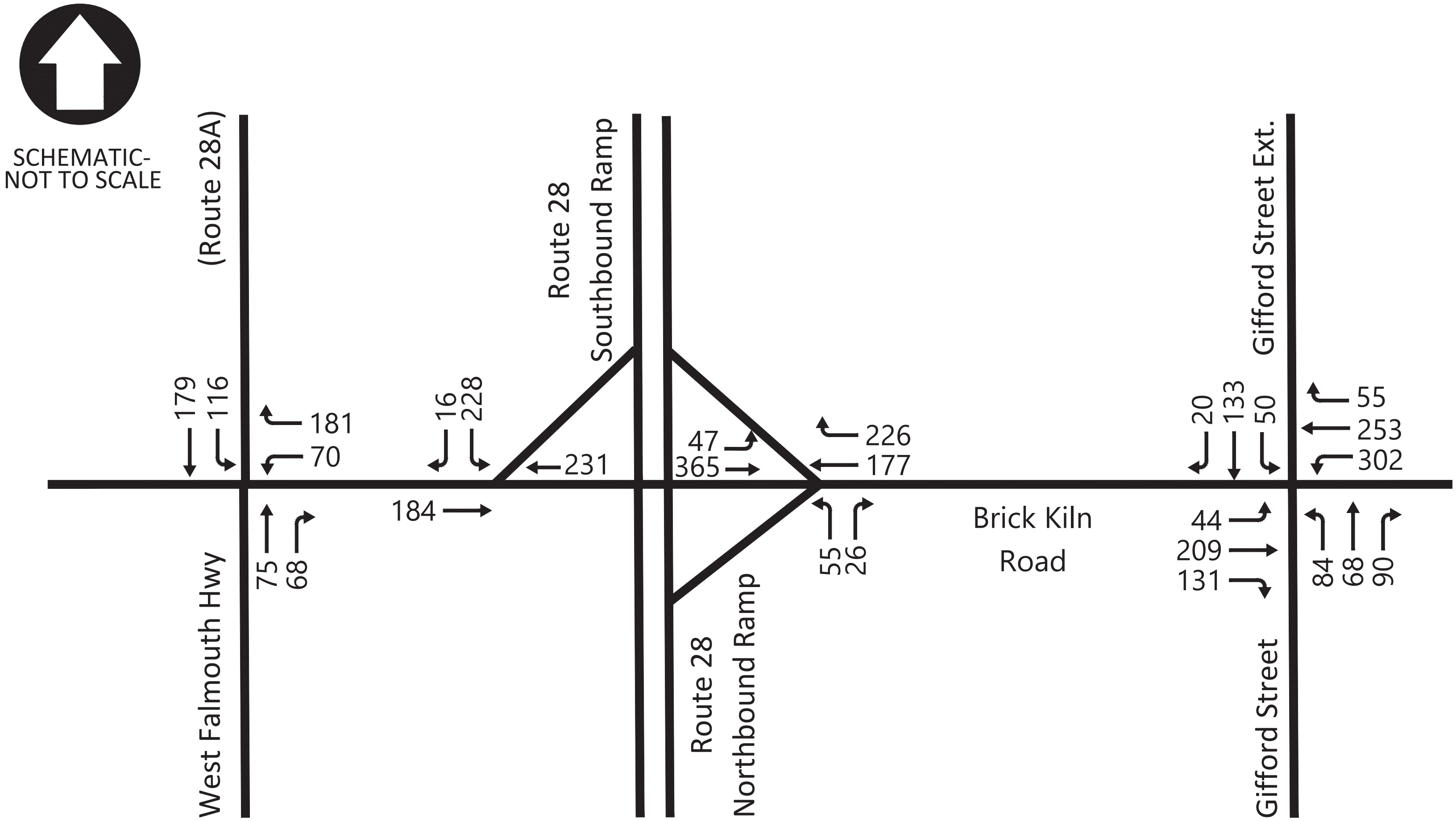
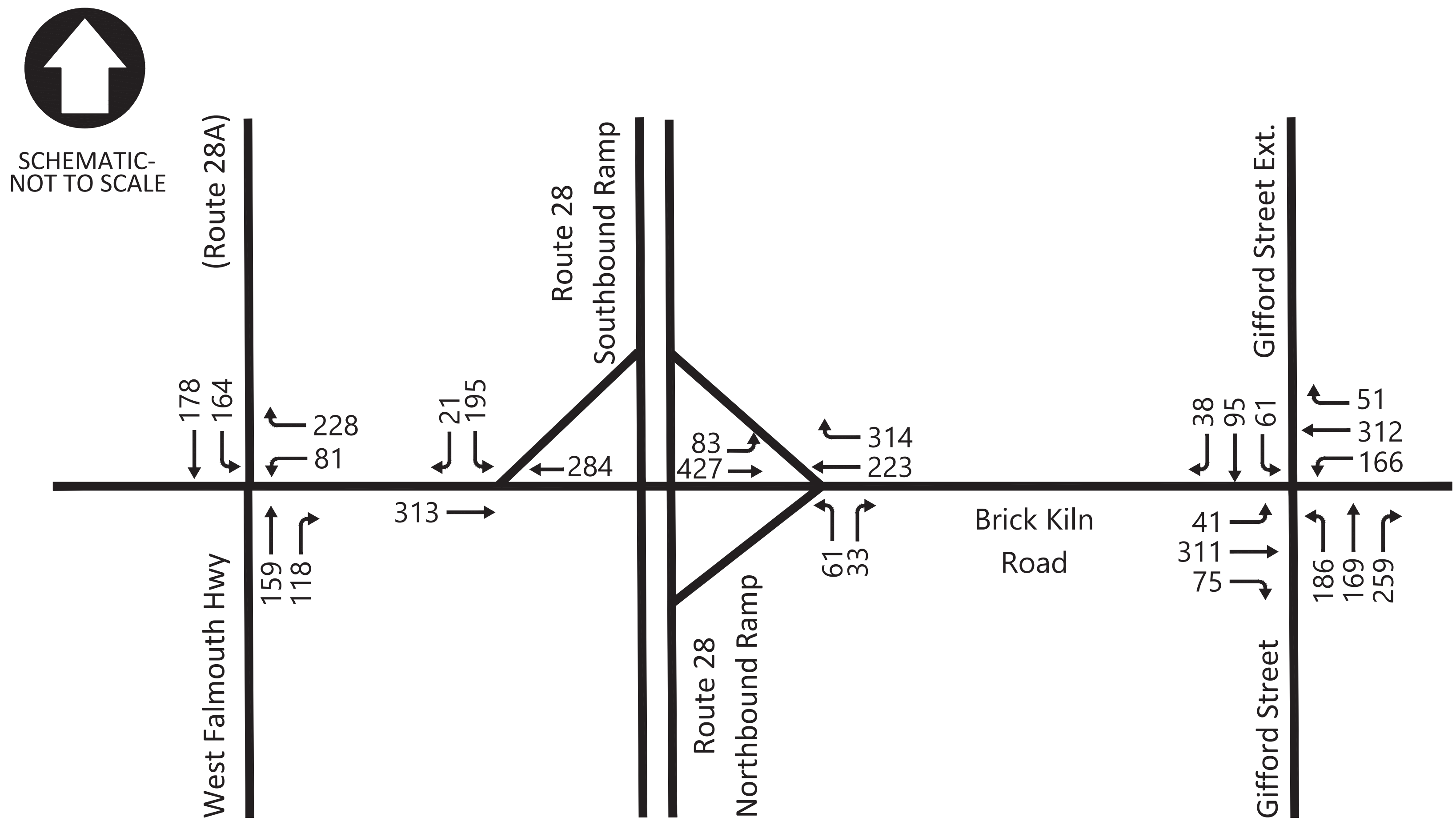


Figure 8
Peak Condition 2030 No Build Traffic Volumes
Weekday Morning Peak Hour
Proposed YMCA Recreational Facility
Falmouth, MA

McMAHON a Bowman company

Q:\New England Region-McMahon\Dept\Analysis\Green Seal Environmental\Falmouth Y\Traffic\Graphics\Falmouth YMCA Volume Schematic.dwg 09/21/23



McMAHON
a Bowman company

Figure 9
Peak Condition 2030 No Build Traffic Volumes
Weekday Afternoon Peak Hour
Proposed YMCA Recreational Facility
Falmouth, MA

Site-Generated Traffic

To estimate the number of vehicle trips associated with the Project, trip generation data was collected at the following three existing YMCA facilities in southeastern Massachusetts with similar amenities and programming to the proposed YMCA:

- West Barnstable YMCA, 2245 Iyannough Road, Barnstable, MA
- Old Colony YMCA, 61 East Grove Street, Middleboro, MA
- Stoico/FirstFed YMCA, 271 Sharps Lot Road, Swansea, MA

Driveway counts at these three facilities were collected for a seven-day period from Sunday, October 30 to Saturday, November 5, 2022 at the West Barnstable and Old Colony YMCAs and from Monday, November 14 to Sunday, November 20, 2022 at the Stoico/FirstFed YMCA. The data is provided in Appendix F of this report.

Based on the data collected for each of the three sites, a trip generation rate, expressed in trips per square footage, was established for each location. The square footage for the three locations was determined based on the gross square footage provided on the property card available for each YMCA. The trip generation rates determined from the driveway counts were compared to estimated trip generation rates using data compiled by the ITE. ITE is a national research organization of transportation professionals. Their publication, *Trip Generation Manual, 11th Edition*, provides traffic generation information for various land uses compiled from studies conducted by members nationwide. Vehicle trip estimates for the proposed facility were developed based on data presented in this publication for Land Use Code (LUC) 495, Recreational Community Center. These references establish vehicle trip rates based on actual traffic counts conducted at similar existing developments nationwide.

Average weekday daily and peak hour trip generation rates calculated from driveway counts at the three similar sites compared with estimated trip generation based on ITE LUC 495 are presented in Table 2 below.

Table 2: Weekday Trip Generation Rates

Facility	Size (s.f.)	Weekday Daily				Weekday Morning Peak Hour				Weekday Afternoon Peak Hour			
		In	Out	Total	Rate(1)	In	Out	Total	Rate(1)	In	Out	Total	Rate(1)
Swansea	36,988	351	348	699	18.9	25	12	37	1.0	40	30	70	1.9
Middleborough	44,379	741	742	1,483	33.4	89	51	140	3.1	108	83	191	4.3
West Barnstable	39,689	523	522	1,045	26.3	76	69	145	3.6	55	56	111	2.8
Average	**40,352**	**538**	**538**	**1,076**	**26.7**	**63**	**44**	**107**	**2.7**	**68**	**56**	**124**	**3.1**
ITE LUC 495 (2)					*28.8*				*1.9*				*3.2*

(1) Expressed in trips per 1,000 s.f.
(2) Based on ITE Land Use Code 495 (Recreational Community Center) average rate, expressed in trips per 1,000 s.f.

As shown in Table 2, the daily and afternoon peak hour trip generation rates based on data collected at the existing facilities is slightly lower to the ITE trip generation rates on an average weekday. The average weekday morning peak hour trip generation rate was found to be higher based on the existing facilities compared with ITE, while the average weekday afternoon peak hour trip generation rate of the existing facilities was found to be comparable to ITE data. The trip generation rates calculated based on the specific YMCA facilities located in the area of the proposed Project were determined to be appropriate to apply to the proposed Project.

To determine potential seasonal fluctuations in the trip generation estimates for the proposed site, the most recent usage data was provided by the West Barnstable YMCA facility. The usage data included monthly check-in information for the West Barnstable YMCA from January 2023 through June 2023. Based on the CCC's *2019 Traffic Counting Report,* January reflects an off-season month, while June reflects a peak season month. Based on a review of the data, the fluctuation in weekday usage at the West Barnstable YMCA between an off-peak and peak month was within 0.5 percent. Therefore, a seasonal adjustment was not applied to the trip generation estimates to determine average and peak trip generation estimates. The West Barnstable YMCA usage data is provided in Appendix F of this report.

The proposed YMCA would be anticipated to have similar operating hours to the West Barnstable YMCA facility, which currently operates Monday through Friday 5:30 AM to 8:30 PM, Saturday 7:30 AM to 3:30 PM, and Sunday 10:00 AM to 3:00 PM. Based on the usage data from the West Barnstable YMCA, the weekday peak times are between 10:00 AM and 11:00 AM, and 4:00 PM to 5:00 PM. It is anticipated that the peak times for the proposed YMCA facility would be similar.

The average trip generation rate calculated from the three YMCA facilities was applied to the proposed YMCA to estimate the number of vehicle trips associated with the Project. The gross square footage of the proposed YMCA facility was used to remain consistent with the methodology applied to establish the trip generation rates. The gross square footage of the proposed YMCA includes the future gymnasium space that would be constructed at a later date. A summary of the estimated new vehicles trips associated with the proposed YMCA is provided in Table 3.

Table 3: Trip Generation Summary

		Weekday Daily			Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
Description	**Size**	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Proposed YMCA	64,565 s.f.	861	861	1,722	101	71	172	109	90	199

(1) Based on average rate calculated from similar YMCA sites. Average rate applied to the gross square footage (64,565 s.f.) of the proposed site.

As shown in Table 3, the proposed YMCA facility is anticipated to generate approximately 1,722 vehicle trips (861 entering vehicles and 861 exiting vehicles) during a typical weekday, approximately 172 vehicle trips (101 entering and 71 exiting) during the weekday morning peak hour, and approximately 199 vehicle trips (109 entering and 90 exiting) during the weekday afternoon peak hour.

Project Trip Distribution and Assignment

The traffic projected to be generated by the Project was distributed onto the study area roadways and intersections based on existing travel patterns on the adjacent roadways and logical travel routes to and from the site. Although the proposed parking lot would be shared with the existing Christ Lutheran Church, the existing church driveway would remain in place. The layout of the proposed parking area suggests that existing traffic associated with the Christ Lutheran Church would continue to use the existing church driveway, and would not utilize the YMCA driveway.

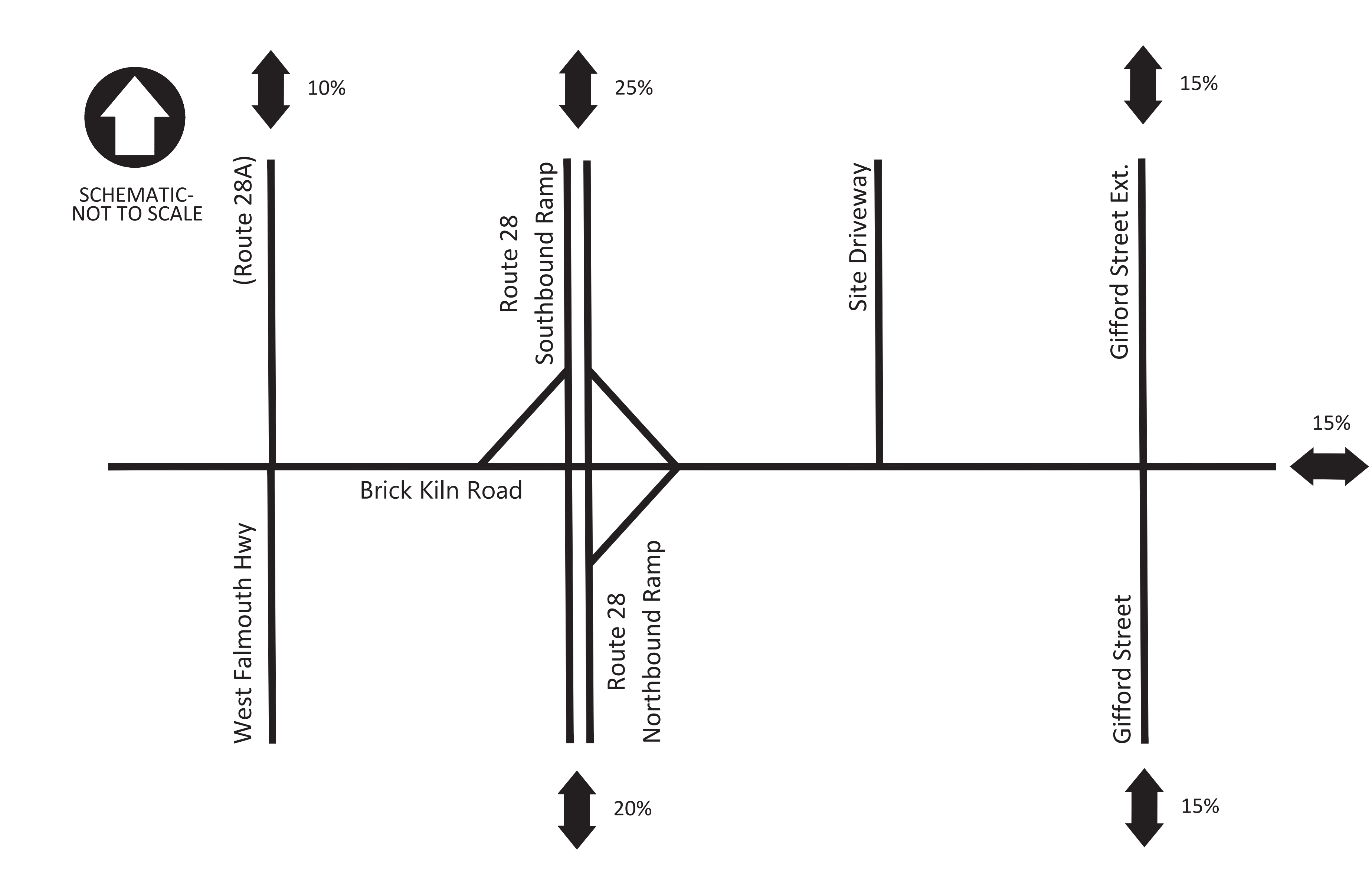
The resulting arrival and departure patterns are presented in Figure 10 and are documented in the traffic projection model located in Appendix E.

The Project-related traffic was then assigned to the surrounding roadway network based on the Project trip distribution patterns presented in Figure 10. The resulting distributed new Project trips are shown in Figures 11 and 12 for the weekday morning and weekday afternoon peak hours, respectively.

2030 Build Traffic Volumes

To establish the 2030 Build peak hour traffic volumes, the distributed Project trips were added to the 2030 No Build peak hour traffic volumes. The resulting average condition 2030 Build peak hour traffic volumes are illustrated in Figures 13 and 14 for the weekday morning and weekday afternoon peak hours, respectively, and the peak condition 2030 Build weekday morning and weekday afternoon peak hour traffic volumes are illustrated in Figure 15 and 16, respectively. The average and peak condition traffic volumes are documented in the traffic projection model presented in Appendix E.

Q:\New England Region-McMahon\Dept\Analysis\Green Seal Environmental\Falmouth Y\Traffic\Graphics\Falmouth YMCA Volume Schematic.dwg 09/21/23



McMAHON
a Bowman company

Figure 10
Directions of Arrival and Departure
Proposed YMCA Facility
Falmouth, MA

Q:\New England Region-McMahon\Dept\Analysis\Green Seal Environmental\Falmouth Y\Traffic\Graphics\Falmouth YMCA Volume Schematic.dwg 10/13/23

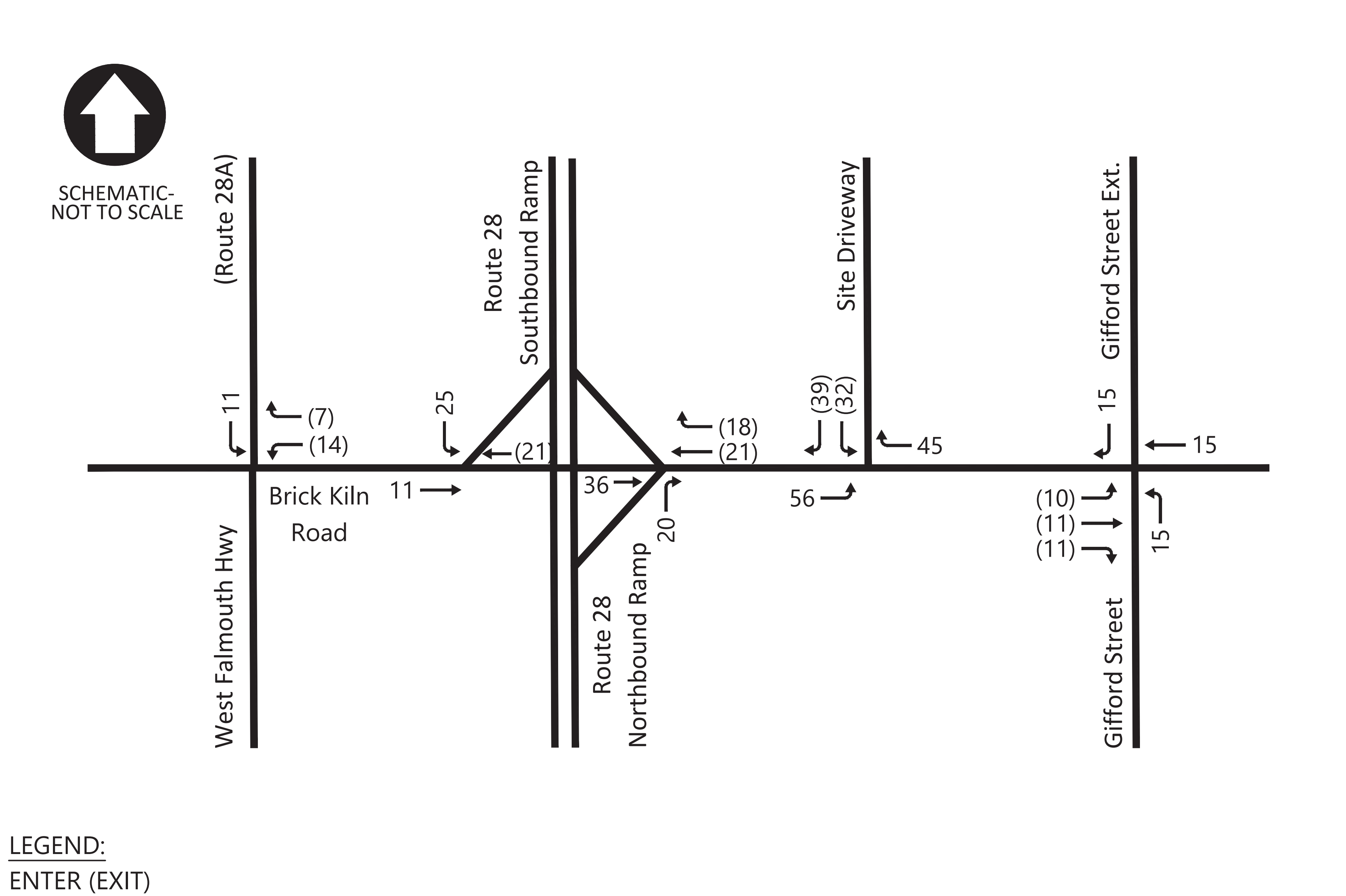
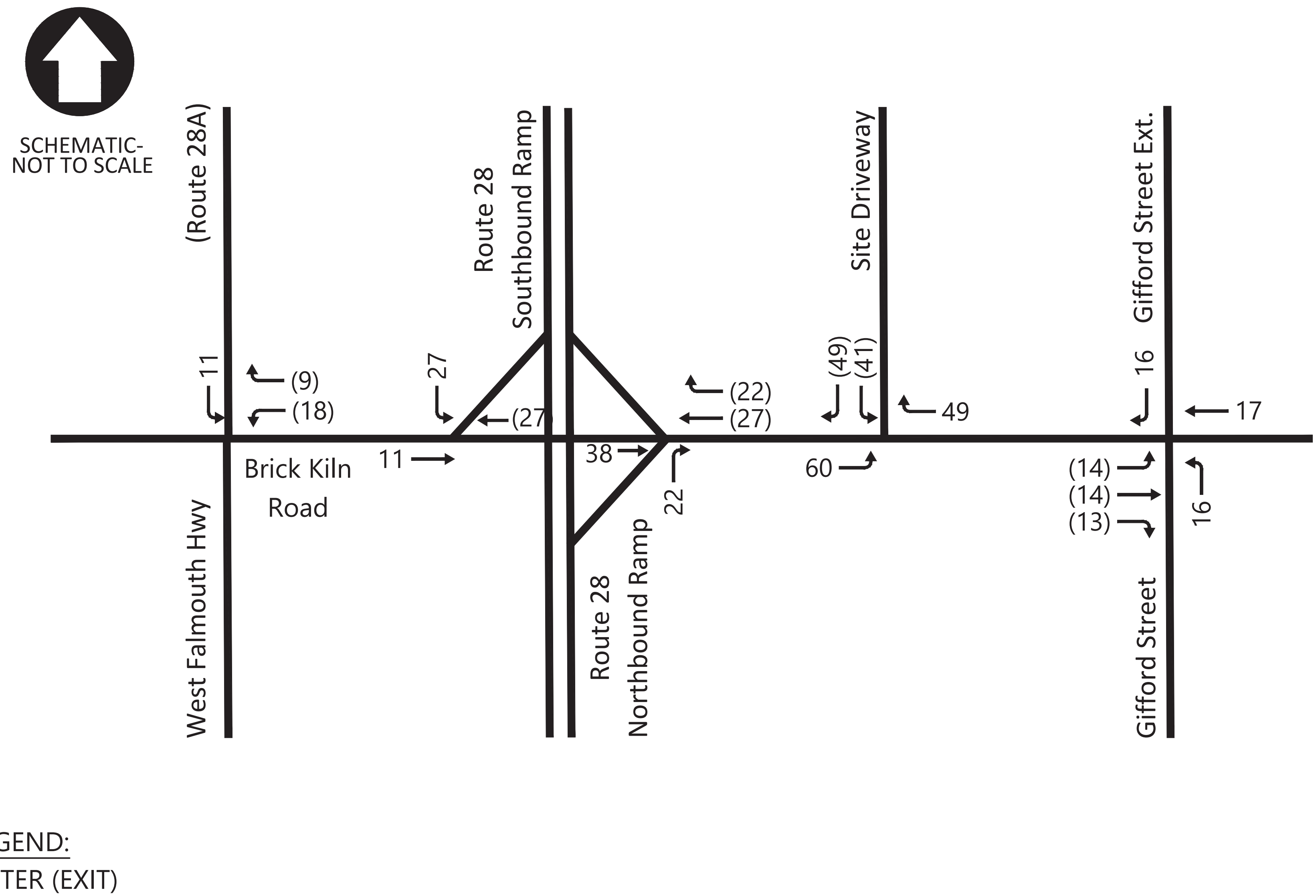


Figure 11
Weekday Morning Peak Hour
New Project Trips
Proposed YMCA Facility
Falmouth, MA

McMAHON a Bowman company

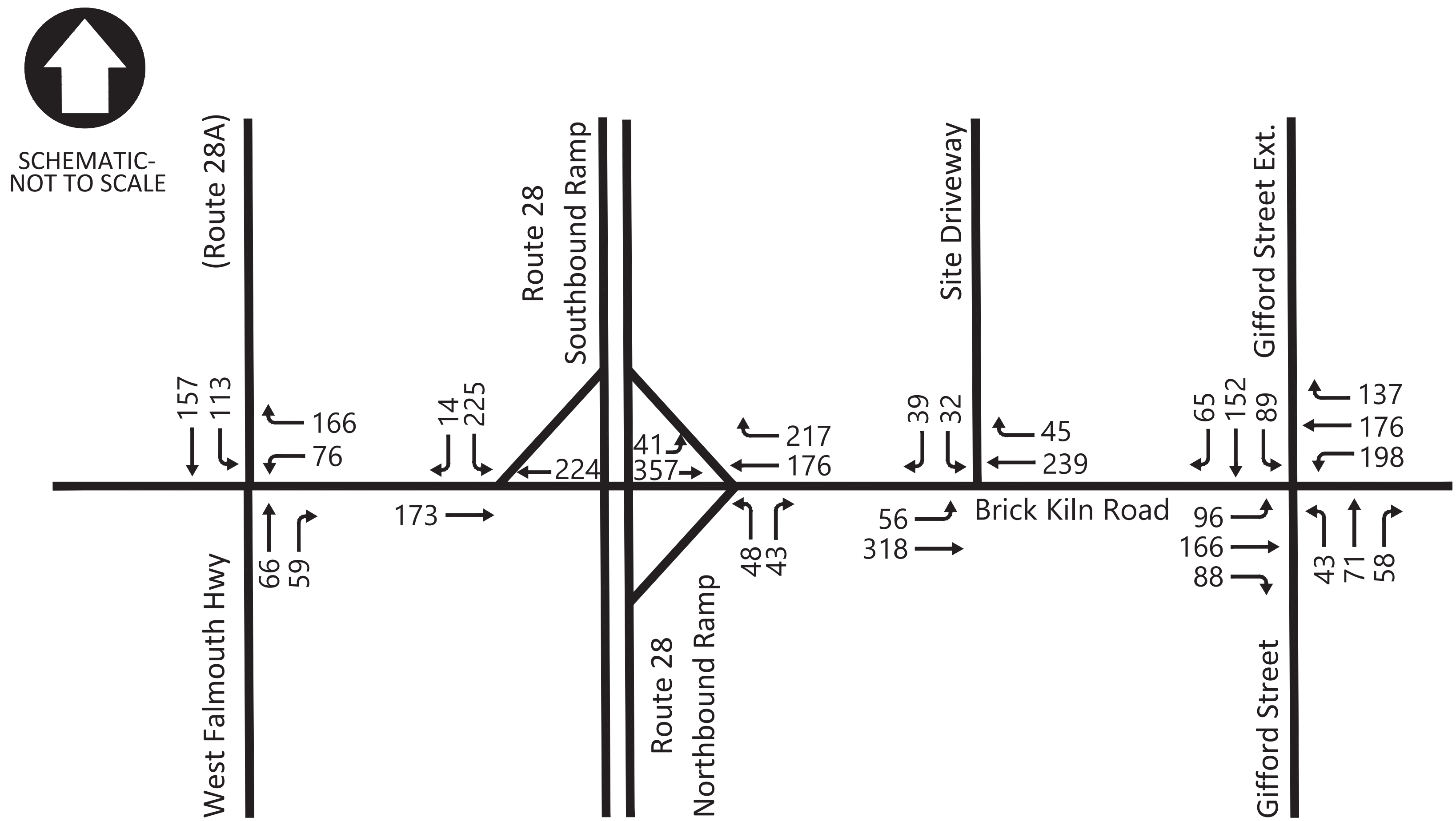
Q:\New England Region-McMahon\Dept\Analysis\Green Seal Environmental\Falmouth Y\Traffic\Graphics\Falmouth YMCA Volume Schematic.dwg 10/13/23



McMAHON a Bowman company

Figure 12
Weekday Afternoon Peak Hour
New Project Trips
Proposed YMCA Facility
Falmouth, MA

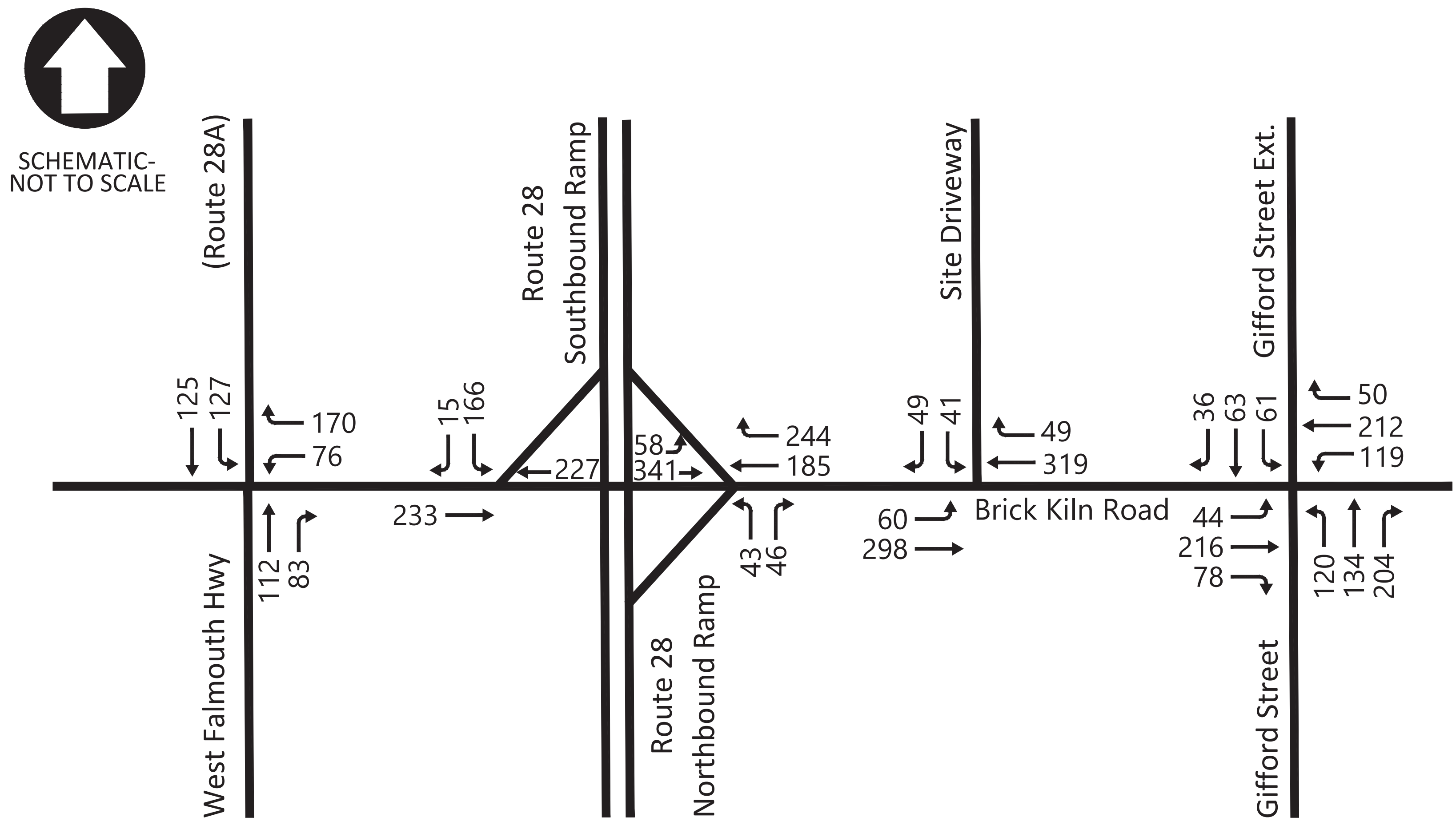
Q:\New England Region-McMahon\Dept\Analysis\Green Seal Environmental\Falmouth Y\Traffic\Graphics\Falmouth YMCA Volume Schematic.dwg 10/13/23



McMAHON
a Bowman company

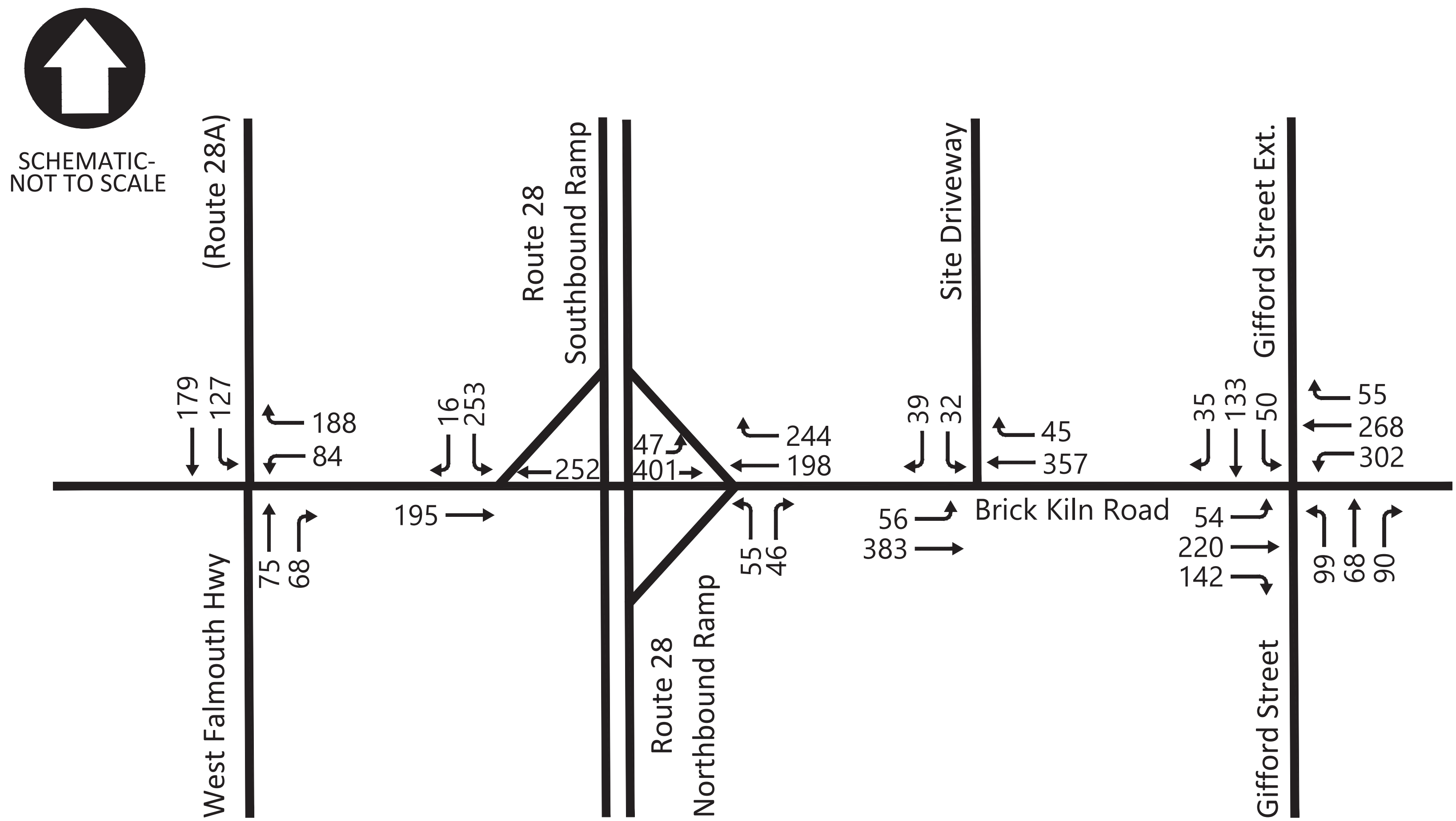
Figure 13
Average Condition 2030 Build Traffic Volumes
Weekday Morning Peak Hour
Proposed YMCA Recreational Facility
Falmouth, MA

Q:\New England Region-McMahon\Dept\Analysis\Green Seal Environmental\Falmouth Y\Traffic\Graphics\Falmouth YMCA Volume Schematic.dwg 10/13/23



McMAHON a Bowman company

Figure 14
Average Condition 2030 Build Traffic Volumes
Weekday Afternoon Peak Hour
Proposed YMCA Recreational Facility
Falmouth, MA



McMAHON
a Bowman company

Figure 15
Peak Condition 2030 Build Traffic Volumes
Weekday Morning Peak Hour
Proposed YMCA Recreational Facility
Falmouth, MA

Q:\New England Region-McMahon\Dept\Analysis\Green Seal Environmental\Falmouth Y\Traffic\Graphics\Falmouth YMCA Volume Schematic.dwg 10/13/23

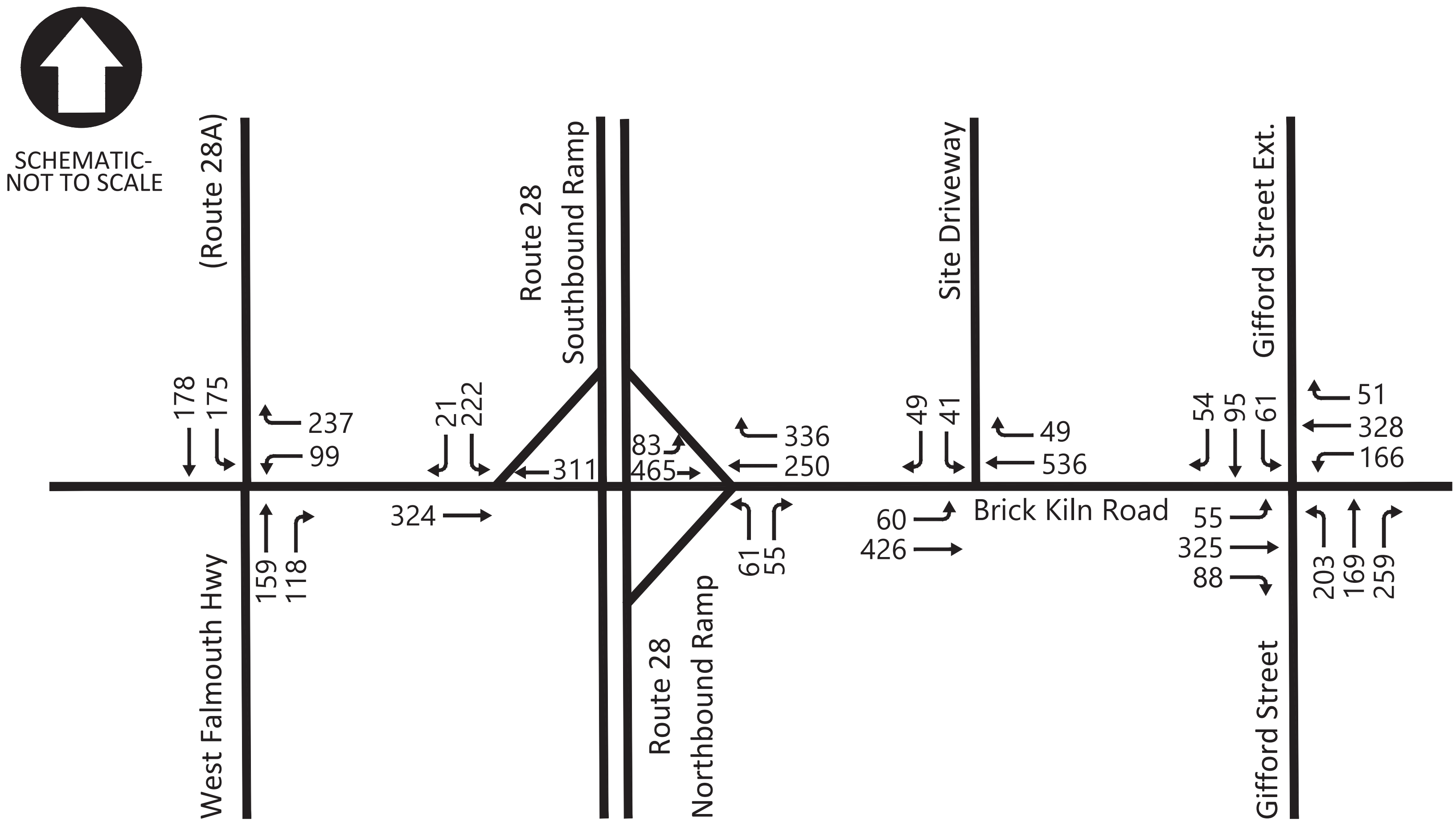


Figure 16
Peak Condition 2030 Build Traffic Volumes
Weekday Afternoon Peak Hour
Proposed YMCA Recreational Facility
Falmouth, MA

McMAHON a Bowman company

TRAFFIC OPERATIONS ANALYSIS

In previous sections of this report, the quantity of traffic at the study area intersections has been discussed. This section describes the overall quality of the traffic flow at the study area intersections and along roadway segments serving the Project site during the weekday morning and weekday afternoon peak hours. As a basis for this assessment, intersection capacity analysis was conducted using the Synchro capacity analysis software at the study area intersections under the 2023 Existing, 2030 No Build, and 2030 Build peak hour traffic conditions, for both average and peak conditions. The analysis is based on capacity analysis methodologies and procedures contained in the *Highway Capacity Manual, 6th Edition* (HCM), which is summarized in Appendix G. The roadway segments capacity analyses were conducted using the Highway Capacity Software (HCS) under the 2023 Existing, 2030 No Build, and 2030 Build peak hour traffic conditions, for both average and peak conditions. A discussion of the evaluation criteria and a summary of the results of the capacity analyses are presented below.

Level-of-Service Criteria

Average total vehicle delay is reported as level-of-service (LOS) on a scale of A to F. LOS A represents delays of 10 seconds or less and LOS F represents delays in excess of 50 seconds for unsignalized movements and in excess of 80 seconds for signalized movements. A detailed description of the LOS criteria is provided in Appendix G.

Intersection Capacity Analysis Results

Intersection capacity analyses was conducted using Synchro capacity analysis software for the study area intersections to evaluate the 2023 Existing, 2030 No Build, and 2030 Build traffic conditions during the weekday morning and weekday afternoon peak hours, for both the average and peak conditions. As mentioned previously, the peak hour traffic volumes utilized as part of this analysis are provided in the traffic projection model, attached in Appendix E.

The detailed Synchro capacity analysis worksheets for the 2023 Existing, 2030 No Build, and 2030 Build traffic conditions are presented in Appendix H , Appendix I, and Appendix J, respectively. The overall capacity analysis results for signalized intersection and critical stop-controlled approaches for unsignalized intersections are presented for the weekday morning and weekday afternoon peak hour in Table 4 for average conditions, and in Table 5 for the peak conditions. A detailed summary of the capacity analysis results is provided in Appendix K.

Table 4: Average Condition Capacity Analysis Results

Intersection	Approach/ Movement	Peak Hour	2023 Existing			2030 No Build			2030 Build		
			LOS[1]	Delay[2]	V/C[3]	LOS	Delay	V/C	LOS	Delay	V/C
Brick Kiln Road at Gifford Street/Gifford Street Ext.	Overall	AM	C	24.1	0.55	C	25.2	0.57	C	27.0	0.60
		PM	C	27.9	0.60	C	28.5	0.63	C	29.0	0.65
Brick Kiln Road at Route 28 NB Ramps	NB	AM	A	6.6	0.04	A	6.8	0.04	A	7.9	0.09
		PM	A	6.7	0.03	A	7.0	0.04	A	8.1	0.08
Brick Kiln Road at Route 28 SB Ramps	SB	AM	B	14.5	0.40	C	15.9	0.46	C	18.6	0.54
		PM	B	13.3	0.29	B	14.5	0.34	C	16.8	0.44
Brick Kiln Road at Route 28A	WB	AM	B	14.5	0.15	C	15.6	0.19	C	16.9	0.24
		PM	B	14.4	0.13	C	15.4	0.16	C	16.7	0.22
Brick Kiln Road at Site Driveway	SB	AM	-	-	-	-	-	-	B	14.1	0.16
		PM	-	-	-	-	-	-	C	16.0	0.23

1 Level-of-Service
2 Average vehicle delay, in seconds
3 Volume to capacity ratio
- Not Applicable

As shown in Table 4 above, under average conditions, the signalized intersection of Brick Kiln Road at Gifford Street/Gifford Street Extension operates at an overall LOS C during both the weekday morning and weekday afternoon peak hours. The signalized intersection is shown to continue to operate at an overall LOS C during both peak hours analyzed under both future 2030 No Build and 2030 Build conditions.

The northbound stop-controlled movement at the Route 28 Northbound ramps is shown to operate at LOS A under 2023 Existing, 2030 No Build, and 2030 Build conditions during both the weekday morning and weekday afternoon peak hours.

The southbound stop-controlled approach at the Route 28 Southbound off-ramp is shown to operate at a LOS B under 2023 Existing conditions during both the weekday morning and weekday afternoon peak hours. Under 2030 No Build conditions, the approach is shown to drop to LOS C during the weekday morning peak hour, and continue to operate at a LOS B during the weekday afternoon peak hour. Under 2030 Build conditions, the approach is shown to operate at LOS C during both the weekday morning and weekday afternoon peak hours.

The westbound stop-controlled approach at the unsignalized intersection of Brick Kiln Road at West Falmouth Highway (Route 28A) is shown to operate at LOS B during both the weekday morning and weekday afternoon peak hours. Under 2030 No Build conditions, the approach is shown to drop from LOS B to LOS C during both peak hours. The approach is anticipated to continue to operate at LOS C during both peak hours under 2030 Build conditions.

Under 2030 Build conditions, the proposed site driveway is shown to operate at LOS B during weekday morning peak hour and LOS C during the weekday afternoon peak hour.

Table 5: Peak Condition Capacity Analysis Results

Intersection	Approach/ Movement	Peak Hour	2023 Existing LOS[1]	Delay[2]	V/C[3]	2030 No Build LOS	Delay	V/C	2030 Build LOS	Delay	V/C
Brick Kiln Road at Gifford Street/Gifford Street Ext.	Overall	AM	C	26.0	0.64	C	27.9	0.67	C	30.1	0.72
		PM	C	32.6	0.74	D	35.2	0.78	D	36.5	0.79
Brick Kiln Road at Route 28 NB Ramps	NB	AM	A	6.8	0.05	A	6.9	0.05	A	8.0	0.10
		PM	A	7.0	0.05	A	7.4	0.07	A	8.6	0.12
Brick Kiln Road at Route 28 SB Ramps	SB	AM	C	17.0	0.49	C	19.5	0.56	C	24.1	0.66
		PM	C	21.4	0.54	D	26.8	0.64	E	38.5	0.77
Brick Kiln Road at Route 28A	WB	AM	C	16.4	0.20	C	18.0	0.24	C	19.8	0.31
		PM	C	21.3	0.27	C	24.4	0.33	D	28.5	0.43
Brick Kiln Road at Site Driveway	SB	AM	-	-	-	-	-	-	C	17.4	0.21
		PM	-	-	-	-	-	-	D	27.1	0.38

1 Level-of-Service
2 Average vehicle delay, in seconds
3 Volume to capacity ratio
- Not Applicable

As shown in Table 5, the capacity analysis results of the peak conditions are shown to be similar to the average conditions overall. Under peak conditions, the signalized intersection of Brick Kiln Road at Gifford Street/Gifford Street Extension operates at an overall LOS C during both the weekday morning and weekday afternoon peak hours. Under 2030 No Build conditions, the signalized intersection is shown to continue to operate at an overall LOS C during the weekday morning peak hour and is shown to drop to LOS D during the weekday afternoon peak hour. Under 2030 Build conditions, the signal is shown to continue to operate at an overall LOS C and D during the weekday morning and weekday afternoon peak hours, respectively.

Under peak conditions, the northbound stop-controlled movement at the Route 28 Northbound ramps is shown to operate at LOS A under 2023 Existing, 2030 No Build, and 2030 Build conditions during both the weekday morning and weekday afternoon peak hours.

The southbound stop-controlled approach at the Route 28 Southbound off-ramp is shown to operate at a LOS C under 2023 Existing conditions during both the weekday morning and weekday afternoon peak hours. Under 2030 No Build conditions, the approach is shown to continue to operate at a LOS C during the weekday morning peak hour, and drop to LOS D during the weekday afternoon peak hour. Under 2030 Build conditions, the approach is still shown to operate at LOS C during the weekday morning peak hour, while worsening to a LOS E during the weekday afternoon peak hour.

The westbound stop-controlled approach at the unsignalized intersection of Brick Kiln Road at West Falmouth Highway (Route 28A) is shown to operate at LOS C during both the weekday morning and weekday afternoon peak hours under both 2023 Existing and 2030 No Build conditions. Under 2030 Build conditions, the approach is shown to continue to operate at LOS C during the weekday morning peak hour, and is anticipated to worsen to a LOS D during the weekday afternoon peak hour.

Under 2030 Build conditions, the proposed site driveway is shown to operate at LOS C during weekday morning peak hour and LOS D during the weekday afternoon peak hour.

Roadway Segment Capacity Analysis Results

Roadway segment capacity analyses were conducted using HCS capacity analysis software for the key roadway segments within the study area to evaluate the 2023 Existing, 2030 No Build, and 2030 Build traffic conditions during the weekday morning and weekday afternoon peak hours, for both the average and peak conditions.

The detailed HCS capacity analysis worksheets for the 2023 Existing, 2030 No Build, and 2030 Build traffic conditions are presented in Appendix H. The detailed HCS capacity analysis worksheets for the 2023 Existing, 2030 No Build, and 2030 Build traffic conditions are presented in Appendix L , Appendix M, and Appendix N, respectively.

Table 6: Roadway Segment Capacity Analysis Results

	Peak	2023 Existing			2030 No Build			2030 Build		
Segment	**Hour**	**LOS(1)**	**Density(2)**	**V/C(3)**	**LOS**	**Density**	**V/C**	**LOS**	**Density**	**V/C**
Brick Kiln Road										
Between Gifford Street/	AM Peak	A	8.4%	0.18	A	9.2%	0.19	A	10.2%	0.21
Gifford Street Ext.	AM Average	A	6.3%	0.13	A	6.9%	0.15	A	7.9%	0.17
and Site Driveway	PM Peak	A	11.0%	0.23	B	11.9%	0.25	B	13.1%	0.28
	PM Average	A	7.0%	0.15	A	7.7%	0.16	A	8.8%	0.19
Between Route 28	AM Peak	A	9.0%	0.19	A	9.9%	0.21	B	11.1%	0.23
Northbound Ramps and	AM Average	A	7.9%	0.17	A	8.7%	0.18	A	9.9%	0.21
Site Driveway	PM Peak	B	11.4%	0.24	B	12.4%	0.26	B	13.0%	0.28
	PM Average	A	8.0%	0.17	A	8.8%	0.19	A	10.2%	0.21
Between West Falmouth	AM Peak	A	5.0%	0.11	A	5.7%	0.11	A	5.8%	0.12
Highway (Route 28A) and	AM Average	A	4.3%	0.09	A	4.8%	0.10	A	5.1%	0.11
Route 28 Southbound Ramps	PM Peak	A	6.8%	0.14	A	7.3%	0.16	A	7.8%	0.17
	PM Average	A	4.8%	0.10	A	5.2%	0.11	A	5.7%	0.12

(1) Level-of-Service
(2) Density (passenger cars/mile/lane)
(3) Volume to capacity ratio

As shown in Table 6, the roadway segments within the study area that would be anticipated to service site related traffic currently operate at a LOS B or better during both peak hours analyzed under the average and peak conditions. The roadway segments are anticipated to continue to operate at the same LOS under both 2030 No Build and 2030 Build conditions.

Site Access and Circulation

Access to the proposed site would be provided via a full-access site driveway on the north side of Brick Kiln Road. The site driveway would be located approximately 450 feet west of the existing driveway to the Christ Lutheran Church.

Parking for the proposed site would be shared with the Christ Lutheran Church. The proposed parking lot would provide a total of 180 spaces, 34 of which would be dedicated for use by the church. This includes eight handicap accessible spaces located adjacent to the proposed YMCA building, and three handicap accessible spaces located adjacent to the existing Christ Lutheran Church. Although the proposed parking lot would be shared with the existing Christ Lutheran Church, the existing church driveway would remain in place. The layout of the proposed parking area suggests that existing traffic associated with the Christ Lutheran Church would continue to use the existing church driveway, and would not utilize the proposed YMCA driveway.

A sidewalk would be provided along the eastern side of the site driveway, that would connect to an internal sidewalk network that would provide access to the parking aisles and YMCA entrance. A pedestrian path would also be provided through the proposed parking lot connecting the Christ Lutheran Church to the YMCA entrance, with raised crosswalks provided through the parking aisles.

Sight Distance

A field review of the available sight distance was conducted at the proposed site driveway location on Brick Kiln Road. The American Association of State Highway and Transportation Officials (AASHTO) publication, *A Policy on Geometric Design, 2018 Edition*, defines minimum and recommended sight distances at intersections.

The minimum sight distance is based on the required stopping sight distance (SSD) for vehicles traveling along the main road. The recommended sight distance allows vehicles to enter the main street traffic flow without requiring the mainline traffic to slow to less than 70% of their speed and is referred to as intersection sight distance (ISD). According to AASHTO, "If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient time to anticipate and avoid collisions."

Table 7 summarizes the SSD requirements for the site driveway and Table 8 summarizes the recommended ISD. Both sight distance evaluations are based on the measured 85th percentile speed on Brick Kiln Road.

Table 7: Stopping Sight Distance Evaluation

Site Driveway Location	Approaching	Speed Limit (mph)	85th % Speed (mph)	SSD[1] Required (ft)	SSD Measured (ft)	Meets Required SSD?
Project Site Driveway at	Eastbound	35	45	360	500	Yes
Brick Kiln Road	Westbound	35	46	375	>500	Yes

1 Intersection sight distance (see AASHTO equations 9-1 and 9-2) for the 85th percentile speed.

Table 8: Intersection Sight Distance Evaluation

Site Driveway Location	Looking	Speed Limit (mph)	85th % Speed (mph)	ISD[2] Recommended (ft)	ISD Measured (ft)	Meets Recommended ISD?
Project Site Driveway at Brick Kiln Road	Left (East)	35	46	440	>500	Yes
	Right (West)	35	45	500	>500	Yes

1 Intersection sight distance (see AASHTO equations 9-1 and 9-2) for the 85th percentile speed.

As shown in Table 7 and Table 8, the available sight distances for the Project site driveway on Brick Kiln Road exceed the minimum SSD requirements and ISD recommendations for the 85th percentile speeds of 46 mph westbound and 45 mph eastbound on Brick Kiln Road. Based on this review, the location of the Project site driveway would allow for efficient access to and from the site. It is recommended that existing and proposed vegetation be maintained and plantings in the vicinity of the sight lines remain below 2.5 feet in height.

TRANSPORTATION DEMAND MANAGEMENT

To encourage the use of alternative modes of transportation to/from the Project site, and reduce single occupancy vehicle trips to/from the Project site, the following transportation demand management (TDM) measures will be considered;

- Establishing an on-site Transportation coordinator
- Incentivizing the use of transportation modes other than a single-occupancy vehicle
- Staggering employee shifts and scheduling large events outside of peak traffic periods
- Providing compressed work weeks
- Posting of carpool brochures on-site and online
- Providing flexible work hours for ridesharers
- Prioritizing parking for employee carpools
- Providing bicycle racks on site
- Providing showers and changing facilities for pedestrians and bicyclists
- Potentially coordinate with the CCRTA to provide a formal stop at the site along the Sealine bus route and/or the Bourne Run bus route to promote transit use for employees
- Posting of transit schedules and other CCRTA services (such as SmartDART) on-site and online
- Subsidizing transit passes
- Providing on-site services such as an employee lunch room
- Enrolling in the MassRIDES employer program

CONCLUSION

The Project, located at 485 Brick Kiln Road in Falmouth, Massachusetts, includes the construction of a 64,565 s.f. Upper Cape YMCA recreational center. This includes the future construction of a gymnasium that would be developed at a later date.

The proposed site would be accessed via a full access driveway on the north side of Brick Kiln Road, approximately 450 feet west of the existing driveway to the Christ Lutheran Church. Parking for the proposed site would be shared with the Christ Lutheran Church; however the layout of the proposed parking area suggests that existing traffic associated with the Christ Lutheran Church would continue to use the existing church driveway, and would not utilize the proposed YMCA driveway. A total of 180 spaces would be provided in the shared parking lot, 34 of which would be dedicated for use by the church. This includes eight handicap accessible spaces located adjacent to the proposed YMCA building, and three handicap accessible spaces located adjacent to the existing Christ Lutheran Church.

Trip generation estimates for the proposed YMCA were developed based on data collected at three existing YMCA facilities in southeastern Massachusetts with similar amenities and programming. Based on the data collected, the Project is estimated to generate approximately 1,722 vehicle trips (861 entering vehicles and 861 exiting vehicles) during a typical weekday, approximately 172 vehicle trips (101 entering and 71 exiting) during the weekday morning peak hour, and approximately 199 vehicle trips (1090 entering and 901 exiting) during the weekday afternoon peak hour.

The AASHTO minimum stopping sight distance and recommended intersection sight distance are exceeded at the Project site driveway approach at Brick Kiln Road.

The Project site driveway is anticipated to operate at a LOS C or better during both peak hours analyzed under average conditions, and at a LOS D or better during both peak hours under the peak conditions. Based on the capacity analysis there would be no change in overall LOS at the signalized study area intersection of Brick Kiln Road at Gifford Street/Gifford Street Extension between the 2030 No Build and 2030 Build conditions. Overall, the proposed YMCA development is not expected to have a significant impact on the overall traffic operations within the study area.

Appendix for Traffic Impact Study

Proposed YMCA

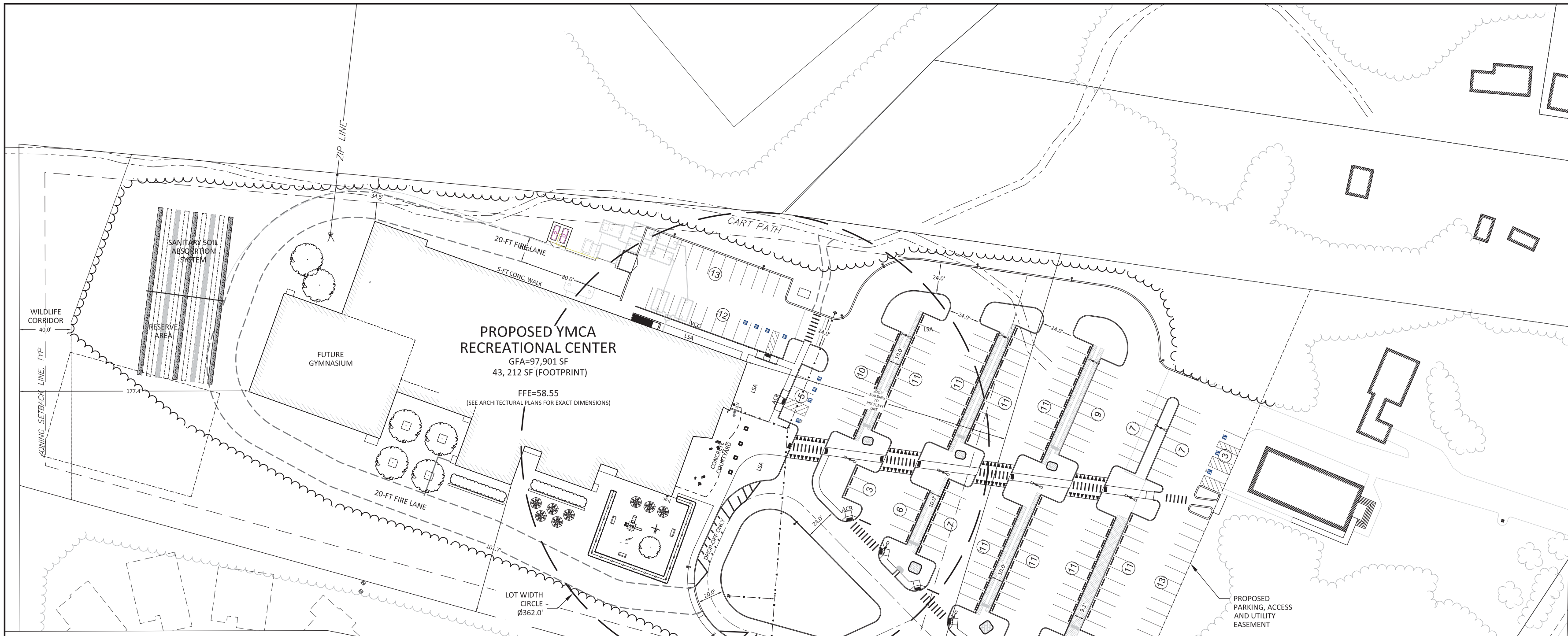
485 Brick Kiln Road
Falmouth, Massachusetts

Prepared by
McMahon, a Bowman Company
350 Myles Standish Boulevard Ste 103
Taunton, MA

Prepared for
Cape Cod YMCA
October 2023

APPENDIX A
Site Plan Documents

LOCUS MAP
NOT TO SCALE



GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: (508) 888-6034
FAX: (508) 888-1506
WWW.GSEENV.COM

DIMENSIONS ARE AS INDICATED.

USE OF THIS PLAN CONSTITUTES ACCEPTANCE OF TERMS AND CONDITIONS SET FORTH IN ACCOMPANYING PROJECT DOCUMENTATION.

IT IS THE RESPONSIBILITY OF THE USER TO CONFIRM DISCREPANCIES WITH THE ENGINEER PRIOR TO USE.

REVISIONS

NO.	DATE	COMMENT
1	2/24/23	ISSUED FOR REVIEW

NOT FOR CONSTRUCTION FOR PERMITTING PURPOSES ONLY

PURPOSE:
SPECIAL PERMIT WITH SITE PLAN REVIEW

LOCUS:
487 BRICK KILN ROAD
WEST FALMOUTH, MA

PREPARED FOR:
YMCA OF CAPE COD

DRAWING TITLE:
ZONING COMPLIANCE PLAN

CAD TECH: SDC	CHECKED BY: LAB
ENGINEER: SDC	DATE: 2/24/23
DRAFT	SCALE: 1"=40'
	SHEET: C-3

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

ZONING TABLE

ZONE: AGRICULTURE AA (AGAA) (ARTICLE VIII)
OVERLAY: WATER RESOURCE PROTECTION OVERLAY DISTRICT (§240-7.7)
WILDLIFE CORRIDOR: MIGRATION AREA 1 (§240-7.8)
PROPOSED USE: PRIVATE CLUB NOT CONDUCTED FOR PROFIT
(ZBA SPECIAL PERMIT REQ'D §240-6.1B)

§240-6.7	REQUIRED	PROPOSED
MIN AREA	80,000 SF	282,519 SF
MIN FRONTAGE	150'	156.16'
MIN LOT WIDTH	200'	362'
FRONT YARD SETBACK	20'	209.3'
SIDE YARD SETBACK	20'	34.5'
REAR YARD SETBACK	20'	177.4'
MAX LOT COVERAGE BY IMPERVIOUS SURFACES WITHOUT SPECIAL PERMIT (WRPOD §240-7.2.5B(4)	20%	37.9%
MAX LOT COVERAGE (STRUCTURES)	20%	15.3%
MAX LOT COVERAGE WITH SPECIAL PERMIT* (STRUCTURES/PAVING/PARKING)	40%	37.9%
MIN LANDSCAPE BUFFER	15'	26.8'
MAXIMUM BUILDING HEIGHT	35'	35'
MIN OPEN SPACE	20%	38%

* PER WRPOD §240-7.6B- ANY USE THAT WILL RENDER IMPERVIOUS MORE THAN 15% OR 2,500 SQUARE FEET OF ANY LOT, WHICHEVER IS GREATER, SHALL REQUIRE A SPECIAL PERMIT SUBJECT TO THE FOLLOWING:

1. A SYSTEM FOR GROUNDWATER RECHARGE SHALL BE PROVIDED THAT DOES NOT DEGRADE GROUNDWATER QUALITY.
2. FOR NONRESIDENTIAL USES, RECHARGE SHALL BE BY STORMWATER INFILTRATION BASINS OR SIMILAR SYSTEMS COVERED WITH NATURAL VEGETATION. DRY WELLS SHALL BE USED ONLY WHERE OTHER METHODS ARE INFEASIBLE.
3. FOR ALL NONRESIDENTIAL USES, ALL BASINS AND WELLS SHALL HAVE OIL, GREASE, AND SEDIMENTATION TRAPS TO REMOVE CONTAMINATION.
4. ANY AND ALL RECHARGE AREAS SHALL BE PERMANENTLY MAINTAINED BY THE OWNER. ACCORDING TO ESTABLISHED BEST MANAGEMENT PRACTICES.

ZONING CONSTRAINTS
ZONE: AGAA

PROPOSED USE: PRIVATE CLUB NOT CONDUCTED FOR PROFIT (ALLOWED BY SPECIAL PERMIT)

ISSUE	BY-LAW SECTION	REQUIRED	PROVIDED
INTERIOR PARKING ISLANDS	LANDSCAPE REQUIREMENTS§ 240-119G	40 SF/STALL=3600 SF	>20K
RESIDENTIAL BUFFER	LANDSCAPE REQUIREMENTS§ 240-119I	YES	YES
IMPERVIOUS AREA	WATER RESOURCE PROTECTION DISTRICT §240-72.5A	MAX 40%	37.9%
MAX LOT COVERAGE (STRUCTURE)	DIMENSIONAL REGULATIONS §240-69A	MAX 20%	15.3%
WILDLIFE CORRIDOR	WILDLIFE CORRIDOR §240-94	YES	YES
NONRESIDENTIAL SEPTIC HYDRAULIC LOADING	WATER RESOURCE PROTECTION DISTRICT §240-72.5A	7.5 GPD/1000 SF	27 GPD*

* §240-72.5A USES A 7.5 GPD HYDRAULIC LOADING RATE AT STANDARD SEPTIC EFFLUENT OF 250 mg/l TSS AND BOD. THE APPLICANT IS PROPOSING I/A TREATMENT SYSTEM WHICH WILL ACHIEVE 30 mg/l TSS & BOD. EXTRAPOLATING, ONE GETS A MAXIMUM EQUIVALENT HYDRAULIC LOADING RATE OF 62.5 GPD/1000 SF

IMPERVIOUS AREA CALCULATION
YMCA LOT SIZE= 282,519 CHURCH LOT SIZE=146,200 SF

	YMCA	CHURCH
WALKS	9,419 SF	1,097 SF
ACCESS DRIVE/PARKING	54,452 SF	44,950 SF
BUILDING(S)	43,334 SF	4,845 SF (EX)
TOTALS	107,205 SF	50,892 SF
PERCENT IMPERVIOUS COVER (STRUCTURES)	15.3%	3.3%
PERCENT IMPERVIOUS COVER (STRUCTURES/PAVING/PARKING)	37.9%	34.8%

PARKING ANALYSIS
ZONE: AGAA

PROPOSED USE: SPORTS CLUB

§240-108	STANDARD	CALCULATION	REQUIRED	PROPOSED ON-SITE***	PROPOSED SHARED	TOTAL (ON SITE & SHARED)	DEDICATED CHURCH
SPORTS/HEALTH CLUB	1 PER 200 SF OF BUILDING AREA*	43,213 SF/ 200=216	216 SPACE (162 SPACES)**	90 SPACES	60 SPACES	150 SPACES***	34 SPACES
MAAB /ADA: 151-200 SPACES	6 REQUIRED 1 VAN	---	---	7 SPACES 1 VAN			

* §240-13 DEFINES BUILDING AREA AS:
THE AGGREGATE OF THE MAXIMUM HORIZONTAL CROSS-SECTION AREA OF THE BUILDING ON A LOT EXCLUDING CORNICES, EAVES, GUTTERS OR CHIMNEYS PROJECTING NOT MORE THAN 24 INCHES, STEPS, ONE-STORY OPEN PORCHES AND BALCONIES AND TERRACES, BUT INCLUDING ACCESSORY BUILDINGS

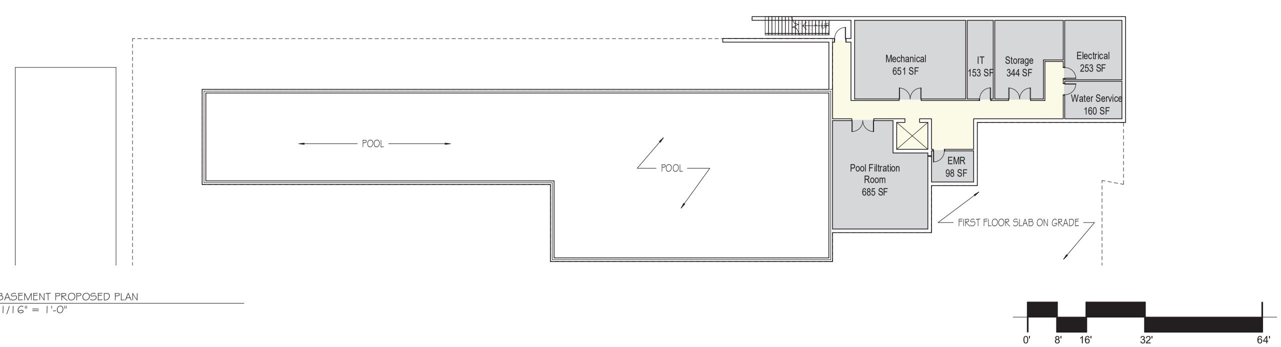
**§240-14.1F(2)- ALLOWS A 25% REDUCTION IN OFF-STREET PARKING BY RIGHT

***§240-14.1F(3)(B) ALLOWS A FURTHER REDUCTION IN OFF-STREET PARKING BY SPECIAL PERMIT
§240-14.11F(7) REQUIRES ONE BICYCLE RACK PER 120 PARKING SPACES

S:\CLIENTS\YMCA - CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAD\DD SITE PLANS 10.14.22.DWG 4/26/2023 12:12 PM

AREAS:	
BASEMENT GROSS AREA:	3,355 SF
FLOOR 1 GROSS AREA:	43,755 SF
FLOOR 2 GROSS AREA:	21,360 SF
TOTAL GROSS AREA:	68,470 SF

1 FLOOR 1 PROPOSED PLAN WITH PHASES
1/16" = 1'-0"



2 BASEMENT PROPOSED PLAN
1/16" = 1'-0"

PHASED FLOOR PLAN - LEVEL 1

Revisions		
Issue Date:	Description	Issued To
	SCHEMATIC DESIGN	July 11, 2023

Scale: 1/16" = 1'-0"
Drawn By: Author
Checked By: Checker
Date: July 11, 2023
Project #: 11.6122.007

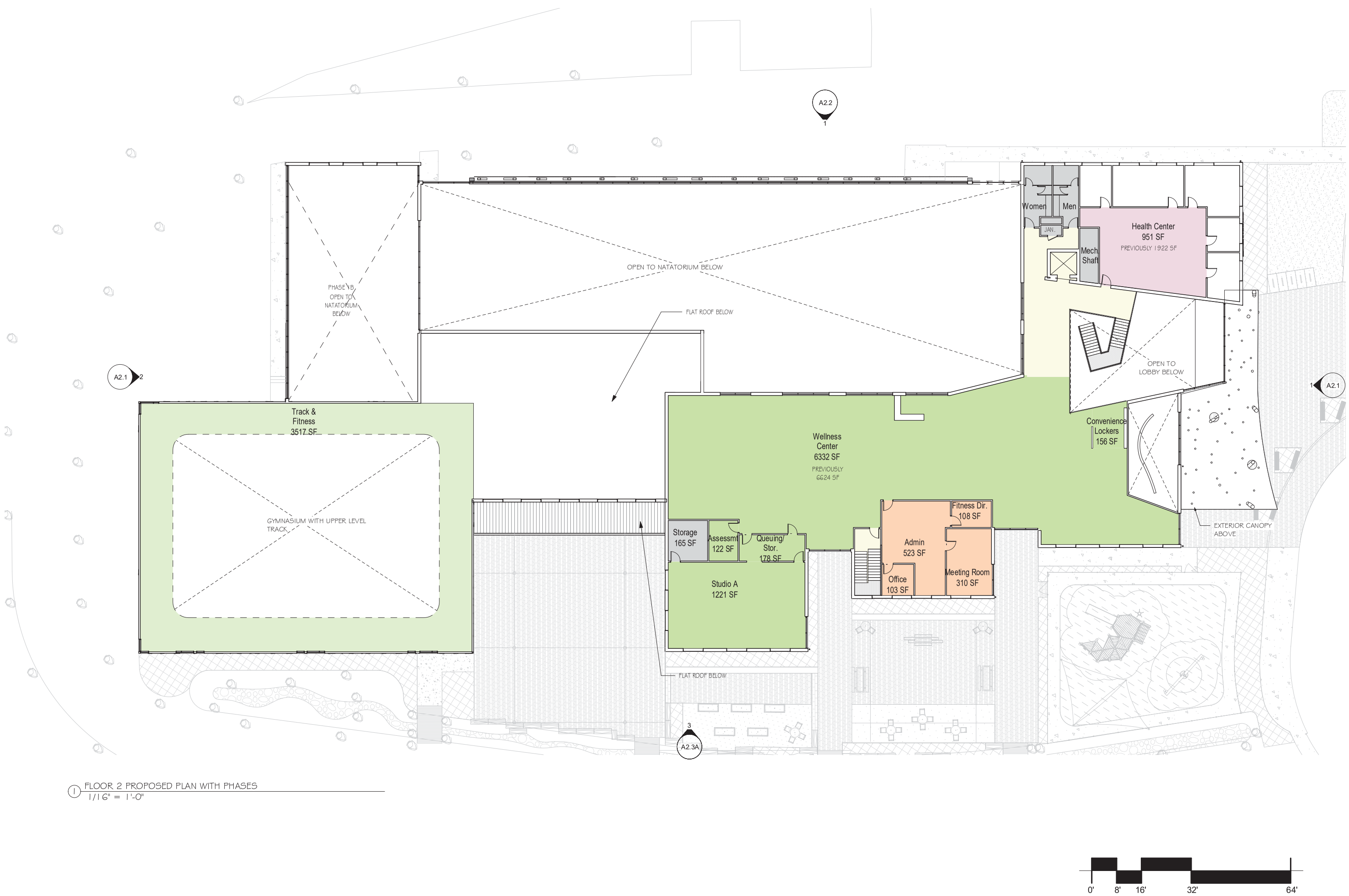
Falmouth YMCA
487 Brick Kiln Rd, Falmouth, MA

SV DESIGN 126 Dodge Street Beverly, MA 01915 www.svdesign.com t 978.927.3745

SV DESIGN

PHASED FLOOR PLAN - LEVEL 1

A1.01



1 FLOOR 2 PROPOSED PLAN WITH PHASES
1/16" = 1'-0"

PHASED FLOOR PLAN - LEVEL 2

Scale: 1/16" = 1'-0"
Drawn By: Author
Date: July 11, 2023
Checked By: Checker
Project #: 11.6122.007

Revisions

Issue Date:	Description	Issued To
	SCHEMATIC DESIGN	July 11, 2023

Falmouth YMCA
487 Brick Kiln Rd, Falmouth, MA

SV DESIGN 126 Dodge Street Beverly, MA 01915 www.svdesign.com t 978.927.3745

SV DESIGN

PHASED FLOOR PLAN - LEVEL 2

A1.02

APPENDIX B

Traffic Count Data

NE TRAFFIC COUNTS

Blhx9E`lk nt sg+L @
Knb`shmm09Aqhbj JhkmQc
Knb`shmm19V .N Bgqhr sKt sgdq mBgt qbg
Cqhudv`x
Sdbg9DL
K`shst cd930-476/ 68
Knmf hst cd9,6/ -500437

6.13.1/ 12	6.13.1/ 12		6.14.1/ 12		6.15.1/ 12		6.16.1/ 12		6.17.1/ 12		V ddj c`x @udq f d		6.18.1/ 12		6.2/ .1/ 12	
Shl d	D`rs	V drs	D`rs	V drs	D`rs	V drs	D`rs	V drs	D`rs	V drs	D`rs	V drs	D`rs	V drs	D`rs	V drs
019 / @L	)	)	8	05	)	)	)	)	)	)	8	05	)	)	)	)
09 /	)	)	5	0	)	)	)	)	)	)	5	0	)	)	)	)
19 /	)	)	1	3	)	)	)	)	)	)	1	3	)	)	)	)
29 /	)	)	3	01	)	)	)	)	)	)	3	01	)	)	)	)
39 /	)	)	6	21	)	)	)	)	)	)	6	21	)	)	)	)
49 /	)	)	25	75	)	)	)	)	)	)	25	75	)	)	)	)
59 /	)	)	74	074	)	)	)	)	)	)	74	074	)	)	)	)
69 /	)	)	1/ 4	158	)	)	)	)	)	)	1/ 4	158	)	)	)	)
79 /	)	)	136	205	)	)	)	)	)	)	136	205	)	)	)	)
89 /	)	)	2/ /	27/	)	)	)	)	)	)	2/ /	27/	)	)	)	)
0/ 9 /	)	)	165	3/ 5	)	)	)	)	)	)	165	3/ 5	)	)	)	)
009 /	)	)	242	312	)	)	)	)	)	)	242	312	)	)	)	)
019 / OL	)	)	210	347	)	)	)	)	)	)	210	347	)	)	)	)
09 /	)	)	2/ 5	274	)	)	)	)	)	)	2/ 5	274	)	)	)	)
19 /	)	)	266	281	)	)	)	)	)	)	266	281	)	)	)	)
29 /	)	)	24/	357	)	)	)	)	)	)	24/	357	)	)	)	)
39 /	)	)	213	320	)	)	)	)	)	)	213	320	)	)	)	)
49 /	)	)	132	330	)	)	)	)	)	)	132	330	)	)	)	)
59 /	)	)	080	20/	)	)	)	)	)	)	080	20/	)	)	)	)
69 /	)	)	076	133	)	)	)	)	)	)	076	133	)	)	)	)
79 /	)	)	051	018	)	)	)	)	)	)	051	018	)	)	)	)
89 /	)	)	76	82	)	)	)	)	)	)	76	82	)	)	)	)
0/ 9 /	)	)	45	51	)	)	)	)	)	)	45	51	)	)	)	)
009 /	)	)	14	10	)	)	)	)	)	)	14	10	)	)	)	)
Sns`k	/	/	3048	4453	/	/	/	/	/	/	3048	4453	/	/	/	/
C`x	/		8612		/		/		/		8612		/		/	
@L Od`j			009 /	009 /							009 /	009 /				
Unkl d			242	312							242	312				
OL Od`j			19 /	29 /							19 /	29 /				
Unkl d			266	357							266	357				
Bnl a Sns`k	/		8612		/		/		/		8612		/		/	
@CS	@CS98+612		@@CS98+612													

Bhsx9E`kk ntsg+L@
Knb`shnm09Aqhbj JhkmQc
Knb`shnm19V .N Bgqhrs Kt sgdq`m
Bgt qbg Cqhudv`x
Sdbg9DL
K`shst cd930-476/68
Knmfhst cd9,6/-500437

Chqdbshnm9D`rs

6.14.1/12 Shl d	Lnsnq Bxbkdr	B`qr % Sq`hkdqr	1 @wkd Knmf	At rdr	1 @wkd 5 Shqd	2 @wkd Rhmfkd	3 @wkd Rhmfkd	; 4 @wk Cntakd	4 @wkd Cntakd	=5 @wk Cntakd	; 5 @wk Lt kh	5 @wkd Lt kh	=5 @wk Lt kh	Snsk
019/ @L	/	5	2	/	/	/	/	/	/	/	/	/	/	8
09/	/	5	/	/	/	/	/	/	/	/	/	/	/	5
19/	/	1	/	/	/	/	/	/	/	/	/	/	/	1
29/	/	3	/	/	/	/	/	/	/	/	/	/	/	3
39/	/	5	/	/	/	/	/	0	/	/	/	/	/	6
49/	1	05	01	0	2	0	/	/	0	/	/	/	/	25
59/	/	36	14	5	1	1	/	0	1	/	/	/	/	74
69/	3	018	43	/	8	0	/	4	2	/	/	/	/	1/4
79/	1	06/	38	1	05	/	/	2	4	/	/	/	/	136
89/	0	122	28	3	07	0	/	0	1	0	/	/	/	2//
0/9/	2	1//	40	3	0/	0	/	2	3	/	/	/	/	165
009/	2	144	55	2	03	1	/	4	3	0	/	/	/	242
019/ OL	1	134	41	0	02	2	/	0	3	/	/	/	/	210
09/	3	102	60	4	0/	0	/	0	0	/	/	/	/	2/5
19/	2	166	52	3	02	2	/	4	7	0	/	/	/	266
29/	1	151	61	0	0/	0	/	1	/	/	/	/	/	24/
39/	2	14/	40	0	04	/	/	2	/	0	/	/	/	213
49/	/	088	26	/	5	0	/	/	/	/	/	/	/	132
59/	/	043	17	0	7	/	/	/	/	/	/	/	/	080
69/	2	041	16	1	2	/	/	/	/	/	/	/	/	076
79/	0	020	16	/	1	/	/	/	0	/	/	/	/	051
89/	2	55	02	/	3	/	/	0	/	/	/	/	/	76
0/9/	0	38	4	/	/	0	/	/	/	/	/	/	/	45
009/	/	1/	4	/	/	/	/	/	/	/	/	/	/	14
Sns`k	26	2/81	64/	24	045	07	/	21	24	3	/	/	/	3048
Odqbdms	/-8$	63-2$	07-/$	/-7$	2-7$	/-3$	/-/$	/-7$	/-7$	/-0$	/-/$	/-/$	/-/$	
@L Od`j	69/	009/	009/	59/	89/	59/		69/	79/	89/				009/
	3	144	55	5	07	1	)	4	4	0	)	)	)	242
OL Od`j	09/	19/	29/	09/	39/	019/ OL		19/	19/	19/				19/
	3	166	61	4	04	2	)	4	7	0	)	)	)	266
Fq`mc Sns`k	26	2/81	64/	24	045	07	/	21	24	3	/	/	/	3048
Odqbdms	/-8$	63-2$	07-/$	/-7$	2-7$	/-3$	/-/$	/-7$	/-7$	/-0$	/-/$	/-/$	/-/$	

Bhsx9E`kl nt sg+L @
Knb`shmm09Achbj JhmQc
Knb`shmm19V .N BgdrsKt sgdd`m
Bgt qbg Cqhudv `x
Sdbg9DL
K`shst cd930-476/ 68
Knmf hst cd9,6/ -500437

NE TRAFFIC COUNTS

Chqdbshnm9V dr s

6.14.1/ 12 Shl d	L nsnq Bxbkdr	B`q % Sq hkdq	1 @wkd Knmf	At r dr	1 @wkd 5 Shqd	2 @wkd Rhmf kd	3 @wkd Rhmf kd	; 4 @wk Cnt akd	4 @wkd Cnt akd	=5 @wk Cnt akd	; 5 @wk L t ksh	5 @wkd L t ksh	=5 @wk L t ksh	Sns`k
019/ @L	/	03	1	/	/	/	/	/	/	/	/	/	/	05
09/	/	0	/	/	/	/	/	/	/	/	/	/	/	0
19/	/	2	0	/	/	/	/	/	/	/	/	/	/	3
29/	/	0/	0	/	0	/	/	/	/	/	/	/	/	01
39/	/	12	3	/	3	/	/	/	0	/	/	/	/	21
49/	/	37	11	/	04	0	/	/	/	/	/	/	/	75
59/	2	0/ 5	32	2	12	2	/	0	2	/	/	/	/	074
69/	/	070	52	2	06	/	/	1	2	/	/	/	/	158
79/	/	1/ 7	58	0	17	0	/	2	5	/	/	/	/	205
89/	/	147	67	1	20	0	/	5	3	/	/	/	/	27/
0/ 9/	3	172	73	1	08	0	/	5	6	/	/	/	/	3/ 5
009/	/	182	81	2	13	2	/	3	2	0	/	/	/	312
019/ OL	0	2/ /	0/ 4	7	22	2	/	2	4	/	/	/	/	347
09/	0	156	62	8	13	1	/	8	/	/	/	/	/	274
19/	1	165	65	1	14	0	/	5	3	/	/	/	/	281
29/	3	213	83	2	2/	1	/	5	4	/	/	/	/	357
39/	3	208	55	2	23	1	/	1	0	/	/	/	/	320
49/	1	205	78	2	2/	/	/	0	/	/	/	/	/	330
59/	1	117	50	/	07	/	/	0	/	/	/	/	/	20/
69/	/	074	32	/	04	/	/	0	/	/	/	/	/	133
79/	0	0/ 1	11	/	1	/	/	1	/	/	/	/	/	018
89/	/	68	8	/	4	/	/	/	/	/	/	/	/	82
0/ 9/	/	3/	06	/	3	0	/	/	/	/	/	/	/	51
009/	/	06	3	/	/	/	/	/	/	/	/	/	/	10
Sns`k	13	2770	0007	31	271	10	/	42	31	0	/	/	/	4453
Oddpdms	/ -3$	58-7$	1/ -0$	/ -7$	5-8$	/ -3$	/ -/ $	0-/ $	/ -7$	/ -/ $	/ -/ $	/ -/ $	/ -/ $	
@L Od`j	0/ 9/	009/	009/	59/	89/	59/		89/	0/ 9/	009/				009/
	3	182	81	2	20	2	)	5	6	0	)	)	)	312
OL Od`j	29/	29/	019/ OL	09/	39/	019/ OL		09/	019/ OL					29/
	3	213	0/ 4	8	23	2	)	8	4	)	)	)	)	357
F q`mc Sns`k	13	2770	0007	31	271	10	/	42	31	0	/	/	/	4453
Oddpdms	/ -3$	58-7$	1/ -0$	/ -7$	5-8$	/ -3$	/ -/ $	0-/ $	/ -7$	/ -/ $	/ -/ $	/ -/ $	/ -/ $	

NE TRAFFIC COUNTS

Bhsx9E`kl nt sg+L @
Knb`shmm09Acqbj JhmQc
Knb`shmm19V .N BgqrsKtsgdq`m
Bgt qbg Cqhudv`x
Sdbg9DL
K`shst cd930-476/ 68
Knmfhst cd9,6/ -500437

Chqdbshnm9Bnl ahmdc

6.14.1/ 12 Shl d	L nsnq Bxbkdr	B`q % Sq`hkdq	1 @wkd Knmf	At rdr	1 @wkd 5 Shqd	2 @wkd Rhmfkd	3 @wkd Rhmfkd	; 4 @wk Cnt akd	4 @wkd Cnt akd	=5 @wk Cnt akd	; 5 @wk L t kh	5 @wkd L t kh	=5 @wk L t kh	Sns`k
019 / @L	/	1/	4	/	/	/	/	/	/	/	/	/	/	14
09 /	/	6	/	/	/	/	/	/	/	/	/	/	/	6
19 /	/	4	0	/	/	/	/	/	/	/	/	/	/	5
29 /	/	03	0	/	0	/	/	/	/	/	/	/	/	05
39 /	/	18	3	/	3	/	/	0	0	/	/	/	/	28
49 /	1	53	23	0	07	1	/	/	0	/	/	/	/	011
59 /	2	042	57	8	14	4	/	1	4	/	/	/	/	16/
69 /	3	20/	006	2	15	0	/	6	5	/	/	/	/	363
79 /	1	267	007	2	33	0	/	5	00	/	/	/	/	452
89 /	0	380	006	5	38	1	/	6	5	0	/	/	/	57/
0/ 9 /	6	372	024	5	18	1	/	8	00	/	/	/	/	571
009 /	2	437	047	5	27	4	/	8	6	1	/	/	/	665
019 / OL	2	434	046	8	35	5	/	3	8	/	/	/	/	668
09 /	4	37/	033	03	23	2	/	0/	0	/	/	/	/	580
19 /	4	442	028	5	27	3	/	00	01	0	/	/	/	658
29 /	5	475	055	3	3/	2	/	7	4	/	/	/	/	707
39 /	6	458	006	3	38	1	/	4	0	0	/	/	/	644
49 /	1	404	015	2	25	0	/	0	/	/	/	/	/	573
59 /	1	271	78	0	15	/	/	0	/	/	/	/	/	4/ 0
69 /	2	226	6/	1	07	/	/	0	/	/	/	/	/	320
79 /	1	122	38	/	3	/	/	1	0	/	/	/	/	180
89 /	2	034	11	/	8	/	/	0	/	/	/	/	/	07/
0/ 9 /	0	78	11	/	3	1	/	/	/	/	/	/	/	007
009 /	/	26	8	/	/	/	/	/	/	/	/	/	/	35
Sns`k	50	5862	0757	66	427	28	/	74	66	4	/	/	/	8612
Odqbdms	/ -5$	60-6$	08-1$	/ -7$	4-4$	/ -3$	/ -/ $	/ -8$	/ -7$	/ -0$	/ -/ $	/ -/ $	/ -/ $	
@L Od`j	0/ 9 /	009 /	009 /	59 /	89 /	59 /		0/ 9 /	79 /	009 /				009 /
	6	437	047	8	38	4	)	8	00	1	)	)	)	665
OL Od`j	39 /	29 /	29 /	09 /	39 /	019 / OL		19 /	19 /	19 /				29 /
	6	475	055	03	38	5	)	00	01	0	)	)	)	707
Fq`mc Sns`k	50	5862	0757	66	427	28	/	74	66	4	/	/	/	8612
Odqbdms	/ -5$	60-6$	08-1$	/ -7$	4-4$	/ -3$	/ -/ $	/ -8$	/ -7$	/ -0$	/ -/ $	/ -/ $	/ -/ $	

Chqdbshm9D`rs

6.14.1/ 12 Sh d	/ , 24 L OG	= 24 , 3/ L OG	= 3/ , 34 L OG	= 34 , 4/ L OG	= 4/ , 44 L OG	= 44 , 5/ L OG	= 5/ , 54 L OG	= 54 , 6/ L OG	= 6/ , 64 L OG	= 64 , 7/ L OG	= 7/ , 74 L OG	= 74 , 8/ L OG	= 8/ L OG	Sns`k
019 / @L	/	/	3	3	0	/	/	/	/	/	/	/	/	8
09 /	/	1	1	/	1	/	/	/	/	/	/	/	/	5
19 /	0	0	/	/	/	/	/	/	/	/	/	/	/	1
29 /	/	1	0	/	0	/	/	/	/	/	/	/	/	3
39 /	/	/	4	0	0	/	/	/	/	/	/	/	/	6
49 /	/	6	8	05	2	0	/	/	/	/	/	/	/	25
59 /	6	04	3/	07	4	/	/	/	/	/	/	/	/	74
69 /	2	4/	0/ 5	31	3	/	/	/	/	/	/	/	/	1/ 4
79 /	00	61	003	32	6	/	/	/	/	/	/	/	/	136
89 /	45	004	00/	08	/	/	/	/	/	/	/	/	/	2/ /
0/ 9 /	30	055	47	8	1	/	/	/	/	/	/	/	/	165
009 /	77	048	87	5	1	/	/	/	/	/	/	/	/	242
019 / OL	05	001	044	18	6	1	/	/	/	/	/	/	/	210
09 /	23	021	0/ 8	18	/	/	0	0	/	/	/	/	/	2/ 5
19 /	63	056	003	1/	1	/	/	/	/	/	/	/	/	266
29 /	06	83	073	40	3	/	/	/	/	/	/	/	/	24/
39 /	07	76	044	48	3	0	/	/	/	/	/	/	/	213
49 /	0/	50	005	37	6	0	/	/	/	/	/	/	/	132
59 /	7	41	74	28	6	/	/	/	/	/	/	/	/	080
69 /	3	36	8/	32	2	/	/	/	/	/	/	/	/	076
79 /	3	4/	64	2/	2	/	/	/	/	/	/	/	/	051
89 /	0	04	24	2/	2	1	0	/	/	/	/	/	/	76
0/ 9 /	/	00	10	04	6	/	1	/	/	/	/	/	/	45
009 /	/	1	7	6	4	1	0	/	/	/	/	/	/	14
Sns`k	282	0308	0583	447	7/	8	4	0	/	/	/	/	/	3048
Fq mc Sns`k	282	0308	0583	447	7/	8	4	0	/	/	/	/	/	3048
Rs`sr			Odqbdmshkd	04sg	4/ sg	74sg	84sg							
			Roddc	25	30	34	37							
			L d`mRoddc '@udq`f d(	28-3										
			0/ L OG O`bd Roddc	24,33										
			Mt l adqhmO`bd	2/ 7/										
			OdqbdmshmO`bd	63-0$										
			Mt l adq= 34 L OG	542										
			Odqbdms= 34 L OG	04-6$										

Blsx9E` lk nt sg+L @
Knb` shnm09Aqbj JhkmQc
Knb` shnm19V .N BgqhrsKt sgdq mBgt qbg
Cqhudv ` x
Sdbg9DL
K` shst cd930-476/ 68
Knmf hst cd9,6/ -500437

Chqdbshnm9V dr s

6.14.1/ 12	Shl d / , 24 L OG	= 24 , 3/ L OG	= 3/ , 34 L OG	= 34 , 4/ L OG	= 4/ , 44 L OG	= 44 , 5/ L OG	= 5/ , 54 L OG	= 54 , 6/ L OG	= 6/ , 64 L OG	= 64 , 7/ L OG	= 7/ , 74 L OG	= 74 , 8/ L OG	= 8/ L OG	Sns` k
019 / @L	/	1	5	3	3	/	/	/	/	/	/	/	/	05
09 /	/	/	0	/	/	/	/	/	/	/	/	/	/	0
19 /	/	/	2	/	0	/	/	/	/	/	/	/	/	3
29 /	/	1	4	2	1	/	/	/	/	/	/	/	/	01
39 /	/	1	00	02	2	2	/	/	/	/	/	/	/	21
49 /	0	0/	22	18	0/	2	/	/	/	/	/	/	/	75
59 /	5	14	57	56	06	1	/	/	/	/	/	/	/	074
69 /	01	54	0/ 8	53	08	/	/	/	/	/	/	/	/	158
79 /	0/	84	041	35	8	3	/	/	/	/	/	/	/	205
89 /	08	013	060	46	5	2	/	/	/	/	/	/	/	27/
0/ 9 /	40	05/	034	33	5	/	/	/	/	/	/	/	/	3/ 5
009 /	18	072	041	35	0/	1	0	/	/	/	/	/	/	312
019 / OL	17	055	082	46	03	/	/	/	/	/	/	/	/	347
09 /	14	005	077	37	5	1	/	/	/	/	/	/	/	274
19 /	11	008	073	42	0/	2	0	/	/	/	/	/	/	281
29 /	3/	040	1/ 7	51	4	1	/	/	/	/	/	/	/	357
39 /	10	018	087	66	4	0	/	/	/	/	/	/	/	320
49 /	11	001	080	82	10	1	/	/	/	/	/	/	/	330
59 /	6	55	061	46	5	1	/	/	/	/	/	/	/	20/
69 /	7	60	0/ /	45	8	/	/	/	/	/	/	/	/	133
79 /	8	30	37	14	3	0	/	/	/	0	/	/	/	018
89 /	00	21	18	06	3	/	/	/	/	/	/	/	/	82
0/ 9 /	0	15	02	04	3	1	/	0	/	/	/	/	/	51
009 /	/	6	3	3	3	0	/	0	/	/	/	/	/	10
Sns` k	211	06/ 3	1273	826	068	22	1	1	/	0	/	/	/	4453
F q` mc Sns` k	211	06/ 3	1273	826	068	22	1	1	/	0	/	/	/	4453
Rs` sr			Oddpdmshkd	04sg	4/ sg	74sg	84sg							
			Roddc	26	30	35	38							
			L d` mRoddc '@udq` f d(	3/ -7										
			0/ L OG O` bd Roddc	24,33										
			Mt l adqhmO` bd	3/ 30										
			OddpdmshmO` bd	61-5$										
			Mt l adq= 34 L OG	0043										
			Oddpdms= 34 L OG	1/ -6$										

Blsx9E`lk nt sg+L @
Knb`shmm09Acbj JhkmQc
Knb`shmm19V .N Bgqhrs Kt sgdq mBgt qbg
Cqhudv`x
Sdbg9DL
K`shst cd930-476/ 68
Knmf hst cd9,6/ -500437

Chqdbshnm9Bnl ahmdc

6.14.1/ 12 Shl d	/ , 24 L OG	= 24 , 3/ L OG	= 3/ , 34 L OG	= 34 , 4/ L OG	= 4/ , 44 L OG	= 44 , 5/ L OG	= 5/ , 54 L OG	= 54 , 6/ L OG	= 6/ , 64 L OG	= 64 , 7/ L OG	= 7/ , 74 L OG	= 74 , 8/ L OG	= 8/ L OG	Sns`k
019/ @L	/	1	0/	7	4	/	/	/	/	/	/	/	/	14
09/	/	1	2	/	1	/	/	/	/	/	/	/	/	6
19/	0	0	2	/	0	/	/	/	/	/	/	/	/	5
29/	/	3	5	2	2	/	/	/	/	/	/	/	/	05
39/	/	1	05	03	3	2	/	/	/	/	/	/	/	28
49/	0	06	31	34	02	3	/	/	/	/	/	/	/	011
59/	02	3/	0/ 7	74	11	1	/	/	/	/	/	/	/	16/
69/	04	004	104	0/ 5	12	/	/	/	/	/	/	/	/	363
79/	10	056	155	78	05	3	/	/	/	/	/	/	/	452
89/	64	128	170	65	5	2	/	/	/	/	/	/	/	57/
0/ 9/	81	215	1/ 2	42	7	/	/	/	/	/	/	/	/	571
009/	006	231	14/	41	01	1	0	/	/	/	/	/	/	665
019/ OL	33	167	237	75	10	1	/	/	/	/	/	/	/	668
09/	48	137	186	66	5	1	0	0	/	/	/	/	/	580
19/	85	175	187	62	01	2	0	/	/	/	/	/	/	658
29/	46	134	281	002	8	1	/	/	/	/	/	/	/	707
39/	28	105	242	025	8	1	/	/	/	/	/	/	/	644
49/	21	062	2/ 6	030	17	2	/	/	/	/	/	/	/	573
59/	04	007	146	85	02	1	/	/	/	/	/	/	/	4/ 0
69/	01	007	08/	88	01	/	/	/	/	/	/	/	/	320
79/	02	80	012	44	6	0	/	/	/	0	/	/	/	180
89/	01	36	53	36	6	1	0	/	/	/	/	/	/	07/
0/ 9/	0	26	23	2/	00	1	1	0	/	/	/	/	/	007
009/	/	8	01	00	8	2	0	0	/	/	/	/	/	35
Sns`k	604	2012	3/ 67	0384	148	31	6	2	/	0	/	/	/	8612
Fqmc Sns`k	604	2012	3/ 67	0384	148	31	6	2	/	0	/	/	/	8612
Rs`sr			Odqbdmshkd	04sg	4/ sg	74sg	84sg							
			Roddc	26	30	35	38							
			L d`mRoddc '@udq`f d(	3/ -1										
			0/ L OG O`bd Roddc	24,33										
			Mtl adqhmO`bd	6010										
			Odqbdmshm O`bd	62-1$										
			Mtl adq= 34 L OG	07/ 6										
			Odqbdms= 34 L OG	07-5$										

NE TRAFFIC COUNTS

NE Traffic Counts
(413) 579-8366
emayboroda@netrafficcounts.com
www.netrafficcounts.com

CLIENT	Bowman	STREET 1	Brick Kiln Road
CITY/TOWN	Falmouth, MA	STREET 2	West Falmouth Highway (Route 28A)
WEATHER	Sunny	DATE	07/25/2023
INTERSECTION #	1		

Passenger Cars & Heavy Vehicles Combined

	West Falmouth Highway (Route 28A) - Northbound			West Falmouth Highway (Route 28A) - Southbound			Brick Kiln Road - Westbound		
Start Time	U-Turn	Thru	Right	U-Turn	Left	Thru	U-Turn	Left	Right
7:00 AM	0	4	12	0	14	24	0	8	12
7:15 AM	0	5	12	0	16	27	0	6	30
7:30 AM	0	4	9	0	20	34	0	10	26
7:45 AM	0	15	13	0	26	32	0	12	37
8:00 AM	0	14	15	0	29	33	0	9	38
8:15 AM	0	17	19	0	20	45	0	17	36
8:30 AM	0	13	14	0	28	40	0	16	41
8:45 AM	0	26	15	0	31	49	0	20	53
2:00 PM	0	36	19	0	37	47	0	18	45
2:15 PM	0	36	22	0	30	50	0	21	44
2:30 PM	0	30	22	0	47	38	1	11	45
2:45 PM	0	23	17	0	38	31	0	7	5
3:00 PM	0	33	17	0	40	46	0	15	58
3:15 PM	0	24	28	0	33	35	0	18	56
3:30 PM	0	39	30	0	40	30	0	14	49
3:45 PM	0	26	27	0	49	37	0	19	52
4:00 PM	0	43	26	0	32	50	0	23	57
4:15 PM	0	40	27	0	31	49	0	18	54
4:30 PM	0	33	19	0	39	58	0	13	47
4:45 PM	0	30	27	0	29	46	0	20	60
5:00 PM	0	21	31	0	29	61	0	25	42
5:15 PM	0	24	33	0	29	60	0	16	67
5:30 PM	0	29	17	1	28	51	0	11	50
5:45 PM	0	21	11	0	19	42	0	15	62

AM PEAK HOURS	West Falmouth Highway (Route 28A) - Northbound			West Falmouth Highway (Route 28A) - Southbound			Brick Kiln Road - Westbound		
8:00 AM	U-Turn	Thru	Right	U-Turn	Left	Thru	U-Turn	Left	Right
	0	70	63	0	108	167	0	62	168
PHF		0.81			0.86			0.79	
HV%	0.0%	0.0%	1.6%	0.0%	3.7%	1.8%	0.0%	4.8%	2.4%

PM PEAK HOURS	West Falmouth Highway (Route 28A) - Northbound			West Falmouth Highway (Route 28A) - Southbound			Brick Kiln Road - Westbound		
4:00 PM	U-Turn	Thru	Right	U-Turn	Left	Thru	U-Turn	Left	Right
	0	146	99	0	131	203	0	74	218
PHF		0.89			0.86			0.91	
HV%	0.0%	0.0%	3.0%	0.0%	0.8%	1.0%	0.0%	0.0%	0.0%

NE Traffic Counts
(413) 579-8366
emayboroda@netrafficcounts.com
www.netrafficcounts.com

CLIENT	Bowman	STREET 1	Brick Kiln Road
CITY/TOWN	Falmouth, MA	STREET 2	West Falmouth Highway (Route 28A)
WEATHER	Sunny	DATE	07/25/2023
INTERSECTION #	1		

Heavy Vehicles

	West Falmouth Highway (Route 28A) - Northbound			West Falmouth Highway (Route 28A) - Southbound			Brick Kiln Road - Westbound		
Start Time	U-Turn	Thru	Right	U-Turn	Left	Thru	U-Turn	Left	Right
7:00 AM	**0**	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	2	2	0	0	0
7:45 AM	0	1	0	0	1	1	0	4	0
8:00 AM	0	0	1	0	0	0	0	1	0
8:15 AM	0	0	0	0	0	1	0	0	2
8:30 AM	0	0	0	0	2	0	0	1	1
8:45 AM	0	0	0	0	2	2	0	1	1
2:00 PM	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	3	0	0	0	0
2:30 PM	0	0	1	0	0	1	0	0	0
2:45 PM	0	0	1	0	2	0	0	0	0
3:00 PM	0	1	0	0	0	0	0	1	1
3:15 PM	0	0	2	0	1	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	1	0
4:00 PM	0	0	1	0	0	1	0	0	0
4:15 PM	0	0	1	0	0	0	0	0	0
4:30 PM	0	0	0	0	1	1	0	0	0
4:45 PM	0	0	1	0	0	0	0	0	0
5:00 PM	0	0	1	0	1	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	1	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0

AM PEAK HOURS	West Falmouth Highway (Route 28A) - Northbound			West Falmouth Highway (Route 28A) - Southbound			Brick Kiln Road - Westbound		
8:00 AM	U-Turn	Thru	Right	U-Turn	Left	Thru	U-Turn	Left	Right
	0	0	1	0	4	3	0	3	4

PM PEAK HOURS	West Falmouth Highway (Route 28A) - Northbound			West Falmouth Highway (Route 28A) - Southbound			Brick Kiln Road - Westbound		
4:00 PM	U-Turn	Thru	Right	U-Turn	Left	Thru	U-Turn	Left	Right
	0	0	3	0	1	2	0	0	0

NE TRAFFIC COUNTS

NE Traffic Counts
(413) 579-8366
emayboroda@netrafficcounts.com
www.netrafficcounts.com

CLIENT	Bowman		STREET 1	Brick Kiln Road
CITY/TOWN	Falmouth, MA		STREET 2	West Falmouth Highway (Route 28A)
WEATHER	Sunny		DATE	07/25/2023
INTERSECTION #	1			

Pedestrians and Bicycles

	West Falmouth Highway (Route 28A) - Northbound			West Falmouth Highway (Route 28A) - Southbound			Brick Kiln Road - Westbound		
Start Time	Peds	Thru	Right	Peds	Left	Thru	Peds	Left	Right
7:00 AM	0	1	0	0	0	2	0	0	0
7:15 AM	0	0	0	0	1	1	0	0	0
7:30 AM	0	0	2	0	0	0	0	0	0
7:45 AM	0	2	0	0	0	0	0	0	0
8:00 AM	0	2	0	0	0	0	0	0	0
8:15 AM	0	0	1	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	1	0	0	0
8:45 AM	0	0	1	0	0	0	0	1	0
2:00 PM	0	0	1	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0
3:15 PM	0	1	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	1	0	0	1	0	0	0
4:00 PM	0	0	0	0	0	1	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	3
5:30 PM	0	0	0	0	1	0	0	1	0
5:45 PM	0	0	0	0	0	0	0	0	0

AM PEAK HOURS	West Falmouth Highway (Route 28A) - Northbound			West Falmouth Highway (Route 28A) - Southbound			Brick Kiln Road - Westbound		
8:00 AM	Peds	Thru	Right	Peds	Left	Thru	Peds	Left	Right
	0	2	2	0	0	1	0	1	0

PM PEAK HOURS	West Falmouth Highway (Route 28A) - Northbound			West Falmouth Highway (Route 28A) - Southbound			Brick Kiln Road - Westbound		
4:00 PM	Peds	Thru	Right	Peds	Left	Thru	Peds	Left	Right
	0	0	0	0	0	1	0	0	0

NE TRAFFIC COUNTS

NE Traffic Counts
(413) 579-8366
emayboroda@netrafficcounts.com
www.netrafficcounts.com

CLIENT	Bowman	**STREET 1**	Brick Kiln Road
CITY/TOWN	Falmouth, MA	**STREET 2**	Route 28 Southbound off-ramp
WEATHER	Sunny	**DATE**	07/25/2023
INTERSECTION #	2		

Passenger Cars & Heavy Vehicles Combined

	Route 28 Southbound off-ramp - Southbound			Brick Kiln Road - Westbound			Brick Kiln Road - Eastbound		
Start Time	**U-Turn**	**Left**	**Right**	**U-Turn**	**Thru**	**Right**	**U-Turn**	**Left**	**Thru**
7:00 AM	0	41	2	0	19	0	0	0	29
7:15 AM	0	45	3	0	32	0	0	0	28
7:30 AM	0	55	9	0	26	0	0	0	29
7:45 AM	0	65	3	0	49	0	0	0	40
8:00 AM	0	43	1	0	44	0	0	0	45
8:15 AM	0	51	4	0	49	0	0	0	38
8:30 AM	0	51	4	0	49	0	0	0	42
8:45 AM	0	66	6	0	67	0	0	0	47
2:00 PM	0	52	4	0	63	0	0	0	56
2:15 PM	0	35	2	0	64	0	0	0	52
2:30 PM	0	69	2	0	69	0	0	0	69
2:45 PM	0	55	4	0	60	0	0	0	53
3:00 PM	0	40	6	0	65	0	0	0	56
3:15 PM	0	55	5	0	71	0	0	0	57
3:30 PM	0	42	4	0	60	0	0	0	71
3:45 PM	0	56	7	0	59	0	0	0	84
4:00 PM	0	41	5	0	77	0	0	0	56
4:15 PM	0	38	4	0	65	0	0	0	57
4:30 PM	0	59	5	0	62	0	0	0	58
4:45 PM	0	54	5	0	69	0	0	0	56
5:00 PM	0	51	12	0	54	0	0	0	62
5:15 PM	0	45	6	0	80	0	0	0	62
5:30 PM	0	39	3	0	57	0	0	0	45
5:45 PM	0	36	12	0	66	0	0	0	30

AM PEAK HOURS	Route 28 Southbound off-ramp - Southbound			Brick Kiln Road - Westbound			Brick Kiln Road - Eastbound		
8:00 AM	**U-Turn**	**Left**	**Right**	**U-Turn**	**Thru**	**Right**	**U-Turn**	**Left**	**Thru**
	0	211	15	0	209	0	0	0	172
PHF		0.78			0.78			0.91	
HV%	0.0%	0.0%	20.0%	0.0%	1.9%	0.0%	0.0%	0.0%	6.4%

PM PEAK HOURS	Route 28 Southbound off-ramp - Southbound			Brick Kiln Road - Westbound			Brick Kiln Road - Eastbound		
3:15 PM	**U-Turn**	**Left**	**Right**	**U-Turn**	**Thru**	**Right**	**U-Turn**	**Left**	**Thru**
	0	194	21	0	267	0	0	0	268
PHF		0.85			0.87			0.80	
HV%	0.0%	1.0%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	3.7%

NE TRAFFIC COUNTS

NE Traffic Counts
(413) 579-8366
emayboroda@netrafficcounts.com
www.netrafficcounts.com

CLIENT	Bowman	STREET 1	Brick Kiln Road
CITY/TOWN	Falmouth, MA	STREET 2	Route 28 Southbound off-ramp
WEATHER	Sunny	DATE	07/25/2023
INTERSECTION #	2		

Heavy Vehicles

	Route 28 Southbound off-ramp - Southbound			Brick Kiln Road - Westbound			Brick Kiln Road - Eastbound		
Start Time	U-Turn	Left	Right	U-Turn	Thru	Right	U-Turn	Left	Thru
7:00 AM	0	2	0	0	1	0	0	0	0
7:15 AM	0	0	1	0	0	0	0	0	0
7:30 AM	0	2	0	0	0	0	0	0	2
7:45 AM	0	2	1	0	2	0	0	0	1
8:00 AM	0	3	1	0	2	0	0	0	1
8:15 AM	0	4	1	0	1	0	0	0	1
8:30 AM	0	8	1	0	1	0	0	0	3
8:45 AM	0	4	0	0	0	0	0	0	6
2:00 PM	0	1	0	0	0	0	0	0	0
2:15 PM	0	1	1	0	0	0	0	0	5
2:30 PM	0	7	0	0	0	0	0	0	1
2:45 PM	0	3	0	0	0	0	0	0	3
3:00 PM	0	0	1	0	1	0	0	0	3
3:15 PM	0	1	0	0	0	0	0	0	5
3:30 PM	0	0	0	0	0	0	0	0	3
3:45 PM	0	0	0	0	1	0	0	0	2
4:00 PM	0	1	0	0	0	0	0	0	0
4:15 PM	0	2	0	0	0	0	0	0	2
4:30 PM	0	0	0	0	0	0	0	0	1
4:45 PM	0	1	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0

AM PEAK HOURS	Route 28 Southbound off-ramp - Southbound			Brick Kiln Road - Westbound			Brick Kiln Road - Eastbound		
8:00 AM	U-Turn	Left	Right	U-Turn	Thru	Right	U-Turn	Left	Thru
	0	19	3	0	4	0	0	0	11

PM PEAK HOURS	Route 28 Southbound off-ramp - Southbound			Brick Kiln Road - Westbound			Brick Kiln Road - Eastbound		
3:15 PM	U-Turn	Left	Right	U-Turn	Thru	Right	U-Turn	Left	Thru
	0	2	0	0	1	0	0	0	10

NE Traffic Counts
(413) 579-8366
emayboroda@netrafficcounts.com
www.netrafficcounts.com

CLIENT	Bowman	STREET 1	Brick Kiln Road
CITY/TOWN	Falmouth, MA	STREET 2	Route 28 Southbound off-ramp
WEATHER	Sunny	DATE	07/25/2023
INTERSECTION #	2		

Pedestrians and Bicycles

	Route 28 Southbound off-ramp - Southbound			Brick Kiln Road - Westbound			Brick Kiln Road - Eastbound		
Start Time	Peds	Left	Right	Peds	Thru	Right	Peds	Left	Thru
7:00 AM	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	2
8:00 AM	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	1	0	0	0	0
8:45 AM	0	0	0	0	1	0	0	0	1
2:00 PM	0	0	0	0	0	0	0	0	1
2:15 PM	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	1	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	1
4:00 PM	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	3	0	0	0	0
5:30 PM	0	0	0	0	1	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0

AM PEAK HOURS	Route 28 Southbound off-ramp - Southbound			Brick Kiln Road - Westbound			Brick Kiln Road - Eastbound		
8:00 AM	Peds	Left	Right	Peds	Thru	Right	Peds	Left	Thru
	0	0	0	0	2	0	0	0	2

PM PEAK HOURS	Route 28 Southbound off-ramp - Southbound			Brick Kiln Road - Westbound			Brick Kiln Road - Eastbound		
3:15 PM	Peds	Left	Right	Peds	Thru	Right	Peds	Left	Thru
	0	0	0	0	0	0	0	0	1

NE TRAFFIC COUNTS

NE Traffic Counts
(413) 579-8366
emayboroda@netrafficcounts.com
www.netrafficcounts.com

CLIENT	Bowman	STREET 1	Brick Kiln Road
CITY/TOWN	Falmouth, MA	STREET 2	Route 28 Southbound off-ramp
WEATHER	Sunny	DATE	07/25/2023
INTERSECTION #	3		

Passenger Cars & Heavy Vehicles Combined

	Route 28 Northbound Off Ramp - Northbound				Route 28 Northbound On Ramp - Southbound				Brick Kiln Road - Westbound				Brick Kiln Road - Eastbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	5	0	1	0	0	0	0	0	0	15	37	0	17	56	0
7:15 AM	0	9	0	3	0	0	0	0	0	0	23	60	0	6	67	0
7:30 AM	0	4	0	3	0	0	0	0	0	0	21	51	0	5	79	0
7:45 AM	0	11	0	3	0	0	0	0	0	0	37	48	0	9	92	0
8:00 AM	0	10	0	7	0	0	0	0	0	0	35	48	0	11	78	0
8:15 AM	0	5	0	6	0	0	0	0	0	0	43	43	0	14	73	0
8:30 AM	0	19	0	3	0	0	0	0	0	0	30	58	0	14	80	0
8:45 AM	0	17	0	7	0	0	0	0	0	0	52	57	0	5	106	0
2:00 PM	0	13	0	7	0	0	0	0	0	0	51	49	0	9	99	0
2:15 PM	0	11	0	4	0	0	0	0	0	0	54	61	0	14	75	0
2:30 PM	0	14	0	5	0	0	0	0	0	0	36	70	0	15	123	0
2:45 PM	0	7	0	6	0	0	0	0	0	0	50	72	0	13	98	0
3:00 PM	0	16	0	6	0	0	0	0	0	0	49	73	0	14	82	0
3:15 PM	0	19	0	4	0	0	0	0	0	0	53	79	0	17	94	0
3:30 PM	0	13	0	6	0	0	0	0	0	0	48	81	0	20	90	0
3:45 PM	0	11	0	5	0	0	0	0	0	0	50	63	0	20	120	0
4:00 PM	0	19	0	6	0	0	0	0	0	0	56	71	0	18	81	0
4:15 PM	0	14	0	10	0	0	0	0	0	0	51	75	0	19	102	0
4:30 PM	0	23	0	5	0	0	0	0	0	0	39	66	0	14	105	0
4:45 PM	0	14	0	5	0	0	0	0	0	0	55	74	0	16	94	0
5:00 PM	0	8	0	6	0	0	0	0	0	0	48	75	0	21	94	0
5:15 PM	0	19	0	7	0	0	0	0	0	0	59	69	0	23	84	0
5:30 PM	0	19	0	2	0	0	0	0	0	0	39	75	0	19	65	0
5:45 PM	0	18	0	5	0	0	0	0	0	0	48	51	0	4	59	0

AM PEAK HOURS	Route 28 Northbound Off Ramp - Northbound				Route 28 Northbound On Ramp - Southbound				Brick Kiln Road - Westbound				Brick Kiln Road - Eastbound			
8:00 AM	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	51	0	23	0	0	0	0	0	0	160	206	0	44	337	0
PHF	0.77				0.00				0.84				0.86			
HV%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	5.8%	0.0%	6.8%	0.0%	0.0%

PM PEAK HOURS	Route 28 Northbound Off Ramp - Northbound				Route 28 Northbound On Ramp - Southbound				Brick Kiln Road - Westbound				Brick Kiln Road - Eastbound			
3:30 PM	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	57	0	27	0	0	0	0	0	0	205	290	0	77	393	0
PHF	0.84				0.00				0.96				0.84			
HV%	0.0%	1.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.6%	0.0%	3.9%	0.0%	0.0%

NE TRAFFIC COUNTS

NE Traffic Counts
(413) 579-8366
emayboroda@netrafficcounts.com
www.netrafficcounts.com

CLIENT	Bowman	STREET 1	Brick Kiln Road
CITY/TOWN	Falmouth, MA	STREET 2	Route 28 Southbound off-ramp
WEATHER	Sunny	DATE	07/25/2023
INTERSECTION #	3		

Heavy Vehicles

	Route 28 Northbound Off Ramp - Northbound				Route 28 Northbound On Ramp - Southbound				Brick Kiln Road - Westbound				Brick Kiln Road - Eastbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	1	2	0	0	2	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	3	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	3	1	0	0	1	0
8:00 AM	0	1	1	0	0	0	0	0	0	0	0	1	0	1	3	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	1	4	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	1	4	0	0	8	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	5	0	1	4	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	1	3	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	8	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	6	0	1	5	0
3:00 PM	0	0	1	0	0	0	0	0	0	0	0	4	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	5	0	1	2	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
3:45 PM	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	4	0	0	1	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOURS	Route 28 Northbound Off Ramp - Northbound				Route 28 Northbound On Ramp - Southbound				Brick Kiln Road - Westbound				Brick Kiln Road - Eastbound			
8:00 AM	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	1	1	0	0	0	0	0	0	0	1	12	0	3	19	0

PM PEAK HOURS	Route 28 Northbound Off Ramp - Northbound				Route 28 Northbound On Ramp - Southbound				Brick Kiln Road - Westbound				Brick Kiln Road - Eastbound			
3:30 PM	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	1	1	0	0	0	0	0	0	0	0	25	0	3	10	0

NE TRAFFIC COUNTS

NE Traffic Counts
(413) 579-8366
emayboroda@netrafficcounts.com
www.netrafficcounts.com

CLIENT	Bowman	STREET 1	Brick Kiln Road
CITY/TOWN	Falmouth, MA	STREET 2	Route 28 Southbound off-ramp
WEATHER	Sunny	DATE	07/25/2023
INTERSECTION #	3		

Pedestrians and Bicycles

	Route 28 Northbound Off Ramp - Northbound				Route 28 Northbound On Ramp - Southbound				Brick Kiln Road - Westbound				Brick Kiln Road - Eastbound			
Start Time	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOURS 8:00 AM	Route 28 Northbound Off Ramp - Northbound				Route 28 Northbound On Ramp - Southbound				Brick Kiln Road - Westbound				Brick Kiln Road - Eastbound			
	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right
	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0

PM PEAK HOURS 3:30 PM	Route 28 Northbound Off Ramp - Northbound				Route 28 Northbound On Ramp - Southbound				Brick Kiln Road - Westbound				Brick Kiln Road - Eastbound			
	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

NE Traffic Counts
(413) 579-8366
emayboroda@netrafficcounts.com
www.netrafficcounts.com

CLIENT	Bowman	STREET 1	Brick Kiln Road
CITY/TOWN	Falmouth, MA	STREET 2	Gifford S
WEATHER	Sunny	DATE	07/25/2023
INTERSECTION #	4		

Passenger Cars & Heavy Vehicles Combined

	Gifford St - Northbound				Gifford Street Ext - Southbound				Brick Kiln Road - Westbound				Brick Kiln Road - Eastbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	9	4	13	0	4	15	2	0	28	38	9	0	2	30	22
7:15 AM	0	10	15	20	0	3	15	5	0	35	70	10	0	1	51	13
7:30 AM	0	16	11	17	0	12	21	5	0	50	52	19	0	9	42	25
7:45 AM	0	12	9	12	0	11	33	4	0	68	64	32	0	10	51	26
8:00 AM	0	11	18	22	0	20	31	2	0	63	63	12	0	9	49	32
8:15 AM	0	15	8	13	0	10	41	3	0	69	59	11	0	5	53	23
8:30 AM	0	20	22	24	0	7	26	4	0	65	57	15	0	9	38	24
8:45 AM	0	31	15	25	0	10	26	9	0	85	56	13	0	15	52	41
2:00 PM	0	29	28	40	0	14	21	12	0	57	58	13	0	4	60	23
2:15 PM	0	26	33	43	0	14	23	5	0	44	77	15	0	11	58	25
2:30 PM	0	26	24	45	0	11	19	4	0	39	67	17	0	10	73	26
2:45 PM	0	30	27	53	0	14	28	14	0	56	71	16	0	4	70	24
3:00 PM	0	46	24	47	0	17	19	11	0	42	80	17	0	6	60	28
3:15 PM	0	32	31	61	0	9	22	10	0	45	68	17	0	10	70	28
3:30 PM	0	48	41	56	0	14	19	6	0	34	67	9	0	12	60	13
3:45 PM	0	39	37	50	0	19	27	9	0	50	78	17	0	9	79	21
4:00 PM	0	42	32	77	0	14	26	9	0	38	72	10	0	7	70	17
4:15 PM	0	42	48	59	0	10	17	9	0	33	71	12	0	8	79	18
4:30 PM	0	31	24	46	0	16	10	5	0	32	58	12	0	6	82	20
4:45 PM	0	49	36	61	0	10	20	6	0	43	66	6	0	6	68	27
5:00 PM	0	38	24	54	0	9	21	6	0	28	76	10	0	10	70	19
5:15 PM	0	35	35	53	0	14	13	13	0	33	74	9	0	12	57	20
5:30 PM	0	48	33	48	0	8	17	12	0	33	63	11	0	4	50	17
5:45 PM	0	37	22	37	0	11	17	8	0	29	50	16	0	8	49	14

AM PEAK HOURS	Gifford St - Northbound				Gifford Street Ext - Southbound				Brick Kiln Road - Westbound				Brick Kiln Road - Eastbound			
8:00 AM	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	77	63	84	0	47	124	18	0	282	235	51	0	38	192	120
PHF	0.79				0.88				0.92				0.81			
HV%	0.0%	6.5%	7.9%	6.0%	0.0%	6.4%	0.8%	27.8%	0.0%	0.4%	0.9%	2.0%	0.0%	13.2%	3.6%	4.2%

PM PEAK HOURS	Gifford St - Northbound				Gifford Street Ext - Southbound				Brick Kiln Road - Westbound				Brick Kiln Road - Eastbound			
3:30 PM	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	171	158	242	0	57	89	33	0	155	288	48	0	36	288	69
PHF	0.95				0.81				0.85				0.90			
HV%	0.0%	7.6%	1.9%	3.3%	0.0%	0.0%	12.4%	9.1%	0.0%	2.6%	2.4%	4.2%	0.0%	2.8%	2.1%	5.8%

NE TRAFFIC COUNTS

NE Traffic Counts
(413) 579-8366
emayboroda@netrafficcounts.com
www.netrafficcounts.com

CLIENT	Bowman	STREET 1	Brick Kiln Road
CITY/TOWN	Falmouth, MA	STREET 2	Gifford S
WEATHER	Sunny	DATE	07/25/2023
INTERSECTION #	4		

Heavy Vehicles

	Gifford St - Northbound				Gifford Street Ext - Southbound				Brick Kiln Road - Westbound				Brick Kiln Road - Eastbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	1	1	0	0	1	1	0	0	0	1	0	0	0	0	1
7:15 AM	0	0	1	1	0	0	1	0	0	0	0	0	0	0	4	0
7:30 AM	0	1	0	1	0	1	1	0	0	1	1	0	0	1	2	2
7:45 AM	0	1	0	1	0	0	0	1	0	0	0	3	0	0	3	1
8:00 AM	0	0	2	3	0	2	0	1	0	0	0	0	0	1	2	2
8:15 AM	0	0	1	1	0	0	0	2	0	0	1	0	0	2	3	0
8:30 AM	0	2	0	0	0	0	0	2	0	0	0	0	0	1	1	3
8:45 AM	0	3	2	1	0	1	1	0	0	1	1	1	0	1	1	0
2:00 PM	0	0	1	0	0	0	2	0	0	0	1	0	0	0	2	1
2:15 PM	0	1	2	1	0	0	1	0	0	0	0	1	0	0	1	0
2:30 PM	0	0	0	0	0	0	3	0	0	0	1	0	0	4	1	3
2:45 PM	0	1	0	0	0	0	1	3	0	1	0	0	0	0	2	2
3:00 PM	0	5	0	0	0	0	1	0	0	1	2	0	0	1	1	0
3:15 PM	0	0	1	1	0	0	3	0	0	1	2	0	0	0	0	1
3:30 PM	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0
3:45 PM	0	1	1	2	0	0	3	0	0	1	0	0	0	0	1	0
4:00 PM	0	3	1	1	0	0	3	0	0	0	1	1	0	0	0	0
4:15 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	1
4:30 PM	0	2	0	1	0	0	0	0	0	0	2	0	0	0	1	0
4:45 PM	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	0	1	0	1	0	0	0	0	0	0	1	0	0	0	3	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
5:45 PM	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOURS	Gifford St - Northbound				Gifford Street Ext - Southbound				Brick Kiln Road - Westbound				Brick Kiln Road - Eastbound			
8:00 AM	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	5	5	5	0	3	1	5	0	1	2	1	0	5	7	5

PM PEAK HOURS	Gifford St - Northbound				Gifford Street Ext - Southbound				Brick Kiln Road - Westbound				Brick Kiln Road - Eastbound			
3:30 PM	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	13	3	8	0	0	11	3	0	4	7	2	0	1	6	4

NE TRAFFIC COUNTS

NE Traffic Counts
(413) 579-8366
emayboroda@netrafficcounts.com
www.netrafficcounts.com

CLIENT	Bowman	STREET 1	Brick Kiln Road
CITY/TOWN	Falmouth, MA	STREET 2	Gifford S
WEATHER	Sunny	DATE	07/25/2023
INTERSECTION #	4		

Pedestrians and Bicycles

	Gifford St - Northbound				Gifford Street Ext - Southbound				Brick Kiln Road - Westbound				Brick Kiln Road - Eastbound			
Start Time	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right
7:00 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	3	1	0	1	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
5:30 PM	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0
5:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOURS	Gifford St - Northbound				Gifford Street Ext - Southbound				Brick Kiln Road - Westbound				Brick Kiln Road - Eastbound			
8:00 AM	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right
	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0

PM PEAK HOURS	Gifford St - Northbound				Gifford Street Ext - Southbound				Brick Kiln Road - Westbound				Brick Kiln Road - Eastbound			
3:30 PM	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right
	0	0	0	1	0	3	1	0	1	0	0	0	0	0	0	0

Transportation Data Corporation
Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N/S: Gifford Street
E/W: Brick Kiln Road
City, State: Falmouth, MA
Client: McM/S. Tagar

File Name : 05676C
Site Code : Y2307411
Start Date : 2/15/2023
Page No : 1

Groups Printed- Cars & Peds - Trucks & Buses - Bikes by Direction

	Gifford Street Extension From North				Brick Kiln Road From East				Gifford Street From South				Brick Kiln Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	15	22	32	0	73	38	23	0	13	22	7	0	14	33	41	0	333
07:15 AM	20	40	38	0	35	39	32	0	8	21	3	0	13	37	27	0	313
07:30 AM	4	28	3	0	11	33	58	0	15	8	7	0	20	28	5	0	220
07:45 AM	7	52	10	0	9	39	72	0	18	15	8	0	23	44	4	0	301
Total	46	142	83	0	128	149	185	0	54	66	25	0	70	142	77	0	1167
08:00 AM	2	30	6	0	9	46	52	0	22	11	18	0	20	39	4	0	259
08:15 AM	4	18	5	0	12	40	49	0	17	19	16	0	18	45	4	0	247
08:30 AM	2	24	11	0	6	48	66	0	25	9	15	0	18	28	4	0	256
08:45 AM	3	26	8	0	8	40	73	0	19	9	14	0	22	46	3	0	271
Total	11	98	30	0	35	174	240	0	83	48	63	0	78	158	15	0	1033
Grand Total	57	240	113	0	163	323	425	0	137	114	88	0	148	300	92	0	2200
Apprch %	13.9	58.5	27.6	0	17.9	35.5	46.7	0	40.4	33.6	26	0	27.4	55.6	17	0	
Total %	2.6	10.9	5.1	0	7.4	14.7	19.3	0	6.2	5.2	4	0	6.7	13.6	4.2	0	
Cars & Peds	53	228	101	0	157	312	413	0	137	109	80	0	143	280	88	0	2101
% Cars & Peds	93	95	89.4	0	96.3	96.6	97.2	0	100	95.6	90.9	0	96.6	93.3	95.7	0	95.5
Trucks & Buses	4	11	12	0	6	11	12	0	0	5	8	0	5	20	4	0	98
% Trucks & Buses	7	4.6	10.6	0	3.7	3.4	2.8	0	0	4.4	9.1	0	3.4	6.7	4.3	0	4.5
Bikes by Direction	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Bikes by Direction	0	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Gifford Street Extension From North					Brick Kiln Road From East					Gifford Street From South					Brick Kiln Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	15	22	32	0	69	**73**	38	23	0	**134**	13	**22**	7	0	**42**	14	33	**41**	0	**88**	**333**
07:15 AM	**20**	40	**38**	0	**98**	35	**39**	32	0	106	8	21	3	0	32	13	37	27	0	77	313
07:30 AM	4	28	3	0	35	11	33	58	0	102	15	8	7	0	30	20	28	5	0	53	220
07:45 AM	7	**52**	10	0	69	9	39	**72**	0	120	**18**	15	**8**	0	41	**23**	**44**	4	0	71	301
Total Volume	46	142	83	0	271	128	149	185	0	462	54	66	25	0	145	70	142	77	0	289	1167
% App. Total	17	52.4	30.6	0		27.7	32.3	40	0		37.2	45.5	17.2	0		24.2	49.1	26.6	0		
PHF	.575	.683	.546	.000	.691	.438	.955	.642	.000	.862	.750	.750	.781	.000	.863	.761	.807	.470	.000	.821	.876
Cars & Peds	42	133	73	0	248	122	148	177	0	447	54	65	25	0	144	69	129	73	0	271	1110
% Cars & Peds	91.3	93.7	88.0	0	91.5	95.3	99.3	95.7	0	96.8	100	98.5	100	0	99.3	98.6	90.8	94.8	0	93.8	95.1
Trucks & Buses	4	8	10	0	22	6	1	8	0	15	0	1	0	0	1	1	13	4	0	18	56
% Trucks & Buses	8.7	5.6	12.0	0	8.1	4.7	0.7	4.3	0	3.2	0	1.5	0	0	0.7	1.4	9.2	5.2	0	6.2	4.8
Bikes by Direction	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Bikes by Direction	0	0.7	0	0	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1

Transportation Data Corporation
Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N/S: Gifford Street
E/W: Brick Kiln Road
City, State: Falmouth, MA
Client: McM/S. Tagar

File Name : 05676C
Site Code : Y2307411
Start Date : 2/15/2023
Page No : 1

Groups Printed- Cars & Peds

	Gifford Street Extension From North				Brick Kiln Road From East				Gifford Street From South				Brick Kiln Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	11	19	22	0	68	38	22	0	13	22	7	0	14	29	38	0	303
07:15 AM	20	39	38	0	35	38	32	0	8	21	3	0	13	32	27	0	306
07:30 AM	4	25	3	0	10	33	55	0	15	8	7	0	20	27	4	0	211
07:45 AM	7	50	10	0	9	39	68	0	18	14	8	0	22	41	4	0	290
Total	42	133	73	0	122	148	177	0	54	65	25	0	69	129	73	0	1110
08:00 AM	2	29	5	0	9	46	51	0	22	11	16	0	19	37	4	0	251
08:15 AM	4	17	5	0	12	38	49	0	17	16	12	0	18	44	4	0	236
08:30 AM	2	23	10	0	6	44	66	0	25	9	15	0	16	27	4	0	247
08:45 AM	3	26	8	0	8	36	70	0	19	8	12	0	21	43	3	0	257
Total	11	95	28	0	35	164	236	0	83	44	55	0	74	151	15	0	991
Grand Total	53	228	101	0	157	312	413	0	137	109	80	0	143	280	88	0	2101
Apprch %	13.9	59.7	26.4	0	17.8	35.4	46.8	0	42	33.4	24.5	0	28	54.8	17.2	0	
Total %	2.5	10.9	4.8	0	7.5	14.9	19.7	0	6.5	5.2	3.8	0	6.8	13.3	4.2	0	

	Gifford Street Extension From North					Brick Kiln Road From East					Gifford Street From South					Brick Kiln Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	11	19	22	0	52	**68**	38	22	0	**128**	13	**22**	7	0	**42**	14	29	**38**	0	**81**	303
07:15 AM	**20**	39	**38**	0	**97**	35	38	32	0	105	8	21	3	0	32	13	32	27	0	72	**306**
07:30 AM	4	25	3	0	32	10	33	55	0	98	15	8	7	0	30	20	27	4	0	51	211
07:45 AM	7	**50**	10	0	67	9	**39**	**68**	0	116	**18**	14	**8**	0	40	**22**	**41**	4	0	67	290
Total Volume	42	133	73	0	248	122	148	177	0	447	54	65	25	0	144	69	129	73	0	271	1110
% App. Total	16.9	53.6	29.4	0		27.3	33.1	39.6	0		37.5	45.1	17.4	0		25.5	47.6	26.9	0		
PHF	.525	.665	.480	.000	.639	.449	.949	.651	.000	.873	.750	.739	.781	.000	.857	.784	.787	.480	.000	.836	.907

Transportation Data Corporation
Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N/S: Gifford Street
E/W: Brick Kiln Road
City, State: Falmouth, MA
Client: McM/S. Tagar

File Name : 05676C
Site Code : Y2307411
Start Date : 2/15/2023
Page No : 1

Groups Printed- Trucks & Buses

	Gifford Street Extension From North				Brick Kiln Road From East				Gifford Street From South				Brick Kiln Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	4	3	10	0	5	0	1	0	0	0	0	0	0	4	3	0	30
07:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	5	0	0	6
07:30 AM	0	3	0	0	1	0	3	0	0	0	0	0	0	1	1	0	9
07:45 AM	0	2	0	0	0	0	4	0	0	1	0	0	1	3	0	0	11
Total	4	8	10	0	6	1	8	0	0	1	0	0	1	13	4	0	56
08:00 AM	0	1	1	0	0	0	1	0	0	0	2	0	1	2	0	0	8
08:15 AM	0	1	0	0	0	2	0	0	0	3	4	0	0	1	0	0	11
08:30 AM	0	1	1	0	0	4	0	0	0	0	0	0	2	1	0	0	9
08:45 AM	0	0	0	0	0	4	3	0	0	1	2	0	1	3	0	0	14
Total	0	3	2	0	0	10	4	0	0	4	8	0	4	7	0	0	42
Grand Total	4	11	12	0	6	11	12	0	0	5	8	0	5	20	4	0	98
Apprch %	14.8	40.7	44.4	0	20.7	37.9	41.4	0	0	38.5	61.5	0	17.2	69	13.8	0	
Total %	4.1	11.2	12.2	0	6.1	11.2	12.2	0	0	5.1	8.2	0	5.1	20.4	4.1	0	

	Gifford Street Extension From North					Brick Kiln Road From East					Gifford Street From South					Brick Kiln Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	**4**	**3**	**10**	0	**17**	**5**	0	1	0	**6**	0	0	0	0	0	0	4	**3**	0	**7**	**30**
07:15 AM	0	0	0	0	0	0	**1**	0	0	1	0	0	0	0	0	0	**5**	0	0	5	6
07:30 AM	0	3	0	0	3	1	0	3	0	4	0	0	0	0	0	0	1	1	0	2	9
07:45 AM	0	2	0	0	2	0	0	**4**	0	4	0	**1**	0	0	**1**	**1**	3	0	0	4	11
Total Volume	4	8	10	0	22	6	1	8	0	15	0	1	0	0	1	1	13	4	0	18	56
% App. Total	18.2	36.4	45.5	0		40	6.7	53.3	0		0	100	0	0		5.6	72.2	22.2	0		
PHF	.250	.667	.250	.000	.324	.300	.250	.500	.000	.625	.000	.250	.000	.000	.250	.250	.650	.333	.000	.643	.467

Transportation Data Corporation
Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N/S: Gifford Street
E/W: Brick Kiln Road
City, State: Falmouth, MA
Client: McM/S. Tagar

File Name : 05676C
Site Code : Y2307411
Start Date : 2/15/2023
Page No : 1

Groups Printed- Bikes by Direction

	Gifford Street Extension From North				Brick Kiln Road From East				Gifford Street From South				Brick Kiln Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Apprch %	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total %	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

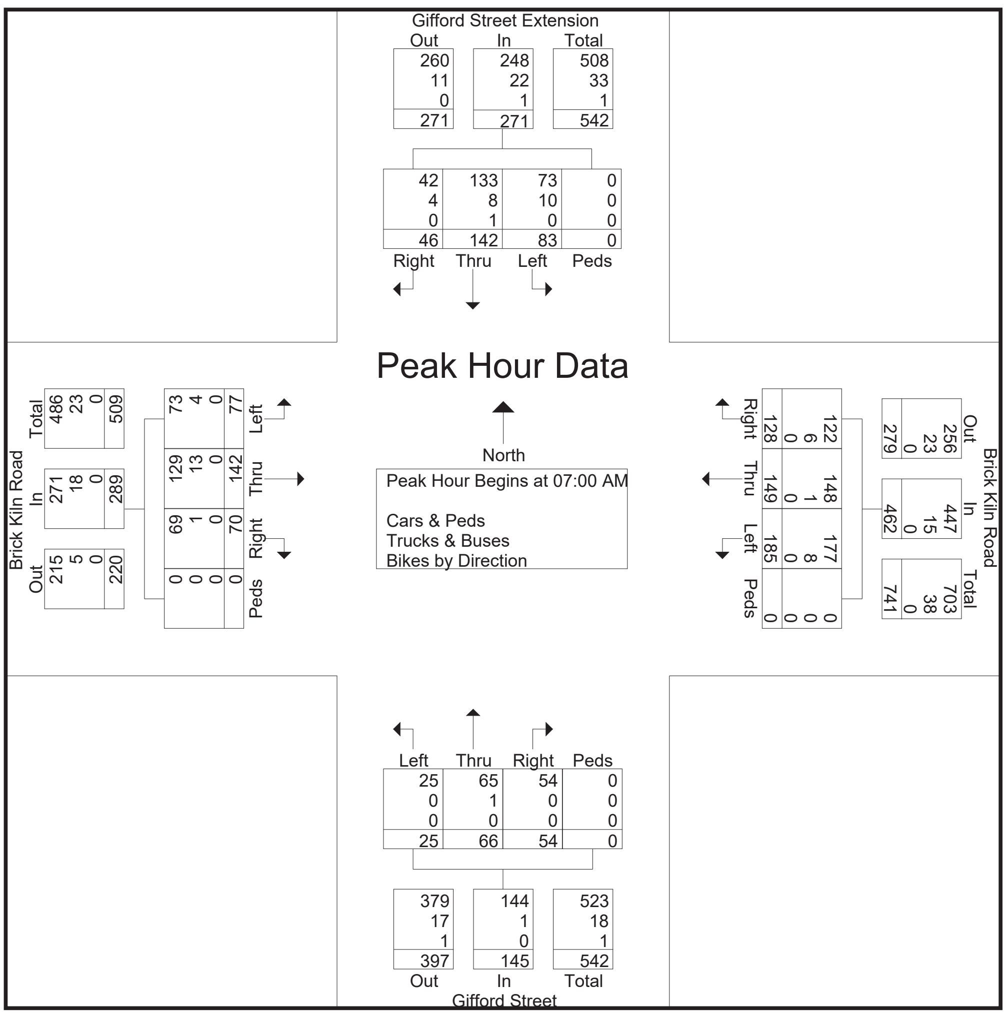
	Gifford Street Extension From North					Brick Kiln Road From East					Gifford Street From South					Brick Kiln Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% App. Total	0	100	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250

Transportation Data Corporation
Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N/S: Gifford Street
E/W: Brick Kiln Road
City, State: Falmouth, MA
Client: McM/S. Tagar

File Name : 05676C
Site Code : Y2307411
Start Date : 2/15/2023

	Gifford Street Extension From North					Brick Kiln Road From East					Gifford Street From South					Brick Kiln Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	15	22	32	0	69	**73**	38	23	0	**134**	13	**22**	7	0	**42**	14	33	**41**	0	**88**	**333**
07:15 AM	**20**	40	**38**	0	**98**	35	**39**	32	0	106	8	21	3	0	32	13	37	27	0	77	313
07:30 AM	4	28	3	0	35	11	33	58	0	102	15	8	7	0	30	20	28	5	0	53	220
07:45 AM	7	**52**	10	0	69	9	39	**72**	0	120	**18**	15	**8**	0	41	**23**	**44**	4	0	71	301
Total Volume	46	142	83	0	271	128	149	185	0	462	54	66	25	0	145	70	142	77	0	289	1167
% App. Total	17	52.4	30.6	0		27.7	32.3	40	0		37.2	45.5	17.2	0		24.2	49.1	26.6	0		
PHF	.575	.683	.546	.000	.691	.438	.955	.642	.000	.862	.750	.750	.781	.000	.863	.761	.807	.470	.000	.821	.876
Cars & Peds	42	133	73	0	248	122	148	177	0	447	54	65	25	0	144	69	129	73	0	271	1110
% Cars & Peds	91.3	93.7	88.0	0	91.5	95.3	99.3	95.7	0	96.8	100	98.5	100	0	99.3	98.6	90.8	94.8	0	93.8	95.1
Trucks & Buses	4	8	10	0	22	6	1	8	0	15	0	1	0	0	1	1	13	4	0	18	56
% Trucks & Buses	8.7	5.6	12.0	0	8.1	4.7	0.7	4.3	0	3.2	0	1.5	0	0	0.7	1.4	9.2	5.2	0	6.2	4.8
Bikes by Direction	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Bikes by Direction	0	0.7	0	0	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1



Transportation Data Corporation
Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N/S: Gifford Street
E/W: Brick Kiln Road
City, State: Falmouth, MA
Client: McM/S. Tagar

File Name : 05676CC
Site Code : Y2307411
Start Date : 2/15/2023
Page No : 1

Groups Printed- Cars & Peds - Trucks & Buses - Bikes by Direction

	Gifford Street Extension From North				Brick Kiln Road From East				Gifford Street From South				Brick Kiln Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	5	17	12	0	14	41	26	0	40	30	21	0	16	49	5	0	276
04:15 PM	2	12	19	0	9	38	33	0	62	27	24	0	11	46	5	0	288
04:30 PM	5	13	12	0	11	49	30	0	42	32	24	0	15	38	6	0	277
04:45 PM	4	17	14	0	13	52	22	0	46	36	24	0	18	54	10	0	310
Total	16	59	57	0	47	180	111	0	190	125	93	0	60	187	26	0	1151
05:00 PM	11	16	20	0	10	54	18	0	44	15	21	0	12	48	4	0	273
05:15 PM	3	10	6	0	7	37	18	0	45	29	18	0	9	52	7	0	241
05:30 PM	3	15	4	1	7	33	18	0	37	22	15	0	8	51	3	0	217
05:45 PM	1	11	8	0	11	31	12	0	23	23	21	0	14	40	1	0	196
Total	18	52	38	1	35	155	66	0	149	89	75	0	43	191	15	0	927
Grand Total	34	111	95	1	82	335	177	0	339	214	168	0	103	378	41	0	2078
Apprch %	14.1	46.1	39.4	0.4	13.8	56.4	29.8	0	47	29.7	23.3	0	19.7	72.4	7.9	0	
Total %	1.6	5.3	4.6	0	3.9	16.1	8.5	0	16.3	10.3	8.1	0	5	18.2	2	0	
Cars & Peds	34	108	95	1	80	330	175	0	337	214	167	0	103	375	40	0	2059
% Cars & Peds	100	97.3	100	100	97.6	98.5	98.9	0	99.4	100	99.4	0	100	99.2	97.6	0	99.1
Trucks & Buses	0	3	0	0	2	5	2	0	2	0	1	0	0	3	1	0	19
% Trucks & Buses	0	2.7	0	0	2.4	1.5	1.1	0	0.6	0	0.6	0	0	0.8	2.4	0	0.9
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Gifford Street Extension From North					Brick Kiln Road From East					Gifford Street From South					Brick Kiln Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	**5**	**17**	12	0	34	**14**	41	26	0	81	40	30	21	0	91	16	49	5	0	70	276
04:15 PM	2	12	**19**	0	33	9	38	**33**	0	80	**62**	27	**24**	0	**113**	11	46	5	0	62	288
04:30 PM	5	13	12	0	30	11	49	30	0	**90**	42	32	24	0	98	15	38	6	0	59	277
04:45 PM	4	17	14	0	**35**	13	**52**	22	0	87	46	**36**	24	0	106	**18**	**54**	**10**	0	**82**	**310**
Total Volume	16	59	57	0	132	47	180	111	0	338	190	125	93	0	408	60	187	26	0	273	1151
% App. Total	12.1	44.7	43.2	0		13.9	53.3	32.8	0		46.6	30.6	22.8	0		22	68.5	9.5	0		
PHF	.800	.868	.750	.000	.943	.839	.865	.841	.000	.939	.766	.868	.969	.000	.903	.833	.866	.650	.000	.832	.928
Cars & Peds	16	56	57	0	129	46	177	109	0	332	189	125	92	0	406	60	185	25	0	270	1137
% Cars & Peds	100	94.9	100	0	97.7	97.9	98.3	98.2	0	98.2	99.5	100	98.9	0	99.5	100	98.9	96.2	0	98.9	98.8
Trucks & Buses	0	3	0	0	3	1	3	2	0	6	1	0	1	0	2	0	2	1	0	3	14
% Trucks & Buses	0	5.1	0	0	2.3	2.1	1.7	1.8	0	1.8	0.5	0	1.1	0	0.5	0	1.1	3.8	0	1.1	1.2
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Transportation Data Corporation
Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N/S: Gifford Street
E/W: Brick Kiln Road
City, State: Falmouth, MA
Client: McM/S. Tagar

File Name : 05676CC
Site Code : Y2307411
Start Date : 2/15/2023
Page No : 1

Groups Printed- Cars & Peds

	Gifford Street Extension From North				Brick Kiln Road From East				Gifford Street From South				Brick Kiln Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	5	16	12	0	13	41	25	0	40	30	20	0	16	49	4	0	271
04:15 PM	2	10	19	0	9	37	33	0	61	27	24	0	11	45	5	0	283
04:30 PM	5	13	12	0	11	48	29	0	42	32	24	0	15	37	6	0	274
04:45 PM	4	17	14	0	13	51	22	0	46	36	24	0	18	54	10	0	309
Total	16	56	57	0	46	177	109	0	189	125	92	0	60	185	25	0	1137
05:00 PM	11	16	20	0	10	54	18	0	43	15	21	0	12	48	4	0	272
05:15 PM	3	10	6	0	7	36	18	0	45	29	18	0	9	52	7	0	240
05:30 PM	3	15	4	1	6	32	18	0	37	22	15	0	8	50	3	0	214
05:45 PM	1	11	8	0	11	31	12	0	23	23	21	0	14	40	1	0	196
Total	18	52	38	1	34	153	66	0	148	89	75	0	43	190	15	0	922
Grand Total	34	108	95	1	80	330	175	0	337	214	167	0	103	375	40	0	2059
Apprch %	14.3	45.4	39.9	0.4	13.7	56.4	29.9	0	46.9	29.8	23.3	0	19.9	72.4	7.7	0	
Total %	1.7	5.2	4.6	0	3.9	16	8.5	0	16.4	10.4	8.1	0	5	18.2	1.9	0	

	Gifford Street Extension From North					Brick Kiln Road From East					Gifford Street From South					Brick Kiln Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	2	10	19	0	31	9	37	**33**	0	79	**61**	27	**24**	0	**112**	11	45	5	0	61	283
04:30 PM	5	13	12	0	30	11	48	29	0	**88**	42	32	24	0	98	15	37	6	0	58	274
04:45 PM	4	**17**	14	0	35	**13**	51	22	0	86	46	**36**	24	0	106	**18**	**54**	**10**	0	**82**	**309**
05:00 PM	**11**	16	**20**	0	**47**	10	**54**	18	0	82	43	15	21	0	79	12	48	4	0	64	272
Total Volume	22	56	65	0	143	43	190	102	0	335	192	110	93	0	395	56	184	25	0	265	1138
% App. Total	15.4	39.2	45.5	0		12.8	56.7	30.4	0		48.6	27.8	23.5	0		21.1	69.4	9.4	0		
PHF	.500	.824	.813	.000	.761	.827	.880	.773	.000	.952	.787	.764	.969	.000	.882	.778	.852	.625	.000	.808	.921

Transportation Data Corporation
Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N/S: Gifford Street
E/W: Brick Kiln Road
City, State: Falmouth, MA
Client: McM/S. Tagar

File Name : 05676CC
Site Code : Y2307411
Start Date : 2/15/2023

Groups Printed- Trucks & Buses

	Gifford Street Extension From North				Brick Kiln Road From East				Gifford Street From South				Brick Kiln Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	1	0	0	1	0	1	0	0	0	1	0	0	0	1	0	5
04:15 PM	0	2	0	0	0	1	0	0	1	0	0	0	0	1	0	0	5
04:30 PM	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	3
04:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	3	0	0	1	3	2	0	1	0	1	0	0	2	1	0	14
05:00 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	3
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	2	0	0	1	0	0	0	0	1	0	0	5
Grand Total	0	3	0	0	2	5	2	0	2	0	1	0	0	3	1	0	19
Apprch %	0	100	0	0	22.2	55.6	22.2	0	66.7	0	33.3	0	0	75	25	0	
Total %	0	15.8	0	0	10.5	26.3	10.5	0	10.5	0	5.3	0	0	15.8	5.3	0	

	Gifford Street Extension From North					Brick Kiln Road From East					Gifford Street From South					Brick Kiln Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	1	0	0	1	**1**	0	**1**	0	**2**	0	0	**1**	0	**1**	0	0	**1**	0	**1**	**5**
04:15 PM	0	**2**	0	0	**2**	0	**1**	0	0	1	**1**	0	0	0	1	0	**1**	0	0	1	5
04:30 PM	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	0	1	0	0	1	3
04:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	3	0	0	3	1	3	2	0	6	1	0	1	0	2	0	2	1	0	3	14
% App. Total	0	100	0	0		16.7	50	33.3	0		50	0	50	0		0	66.7	33.3	0		
PHF	.000	.375	.000	.000	.375	.250	.750	.500	.000	.750	.250	.000	.250	.000	.500	.000	.500	.250	.000	.750	.700

Transportation Data Corporation
Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N/S: Gifford Street
E/W: Brick Kiln Road
City, State: Falmouth, MA
Client: McM/S. Tagar

File Name : 05676CC
Site Code : Y2307411
Start Date : 2/15/2023
Page No : 1

Groups Printed- Bikes by Direction

	Gifford Street Extension From North				Brick Kiln Road From East				Gifford Street From South				Brick Kiln Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total %																	

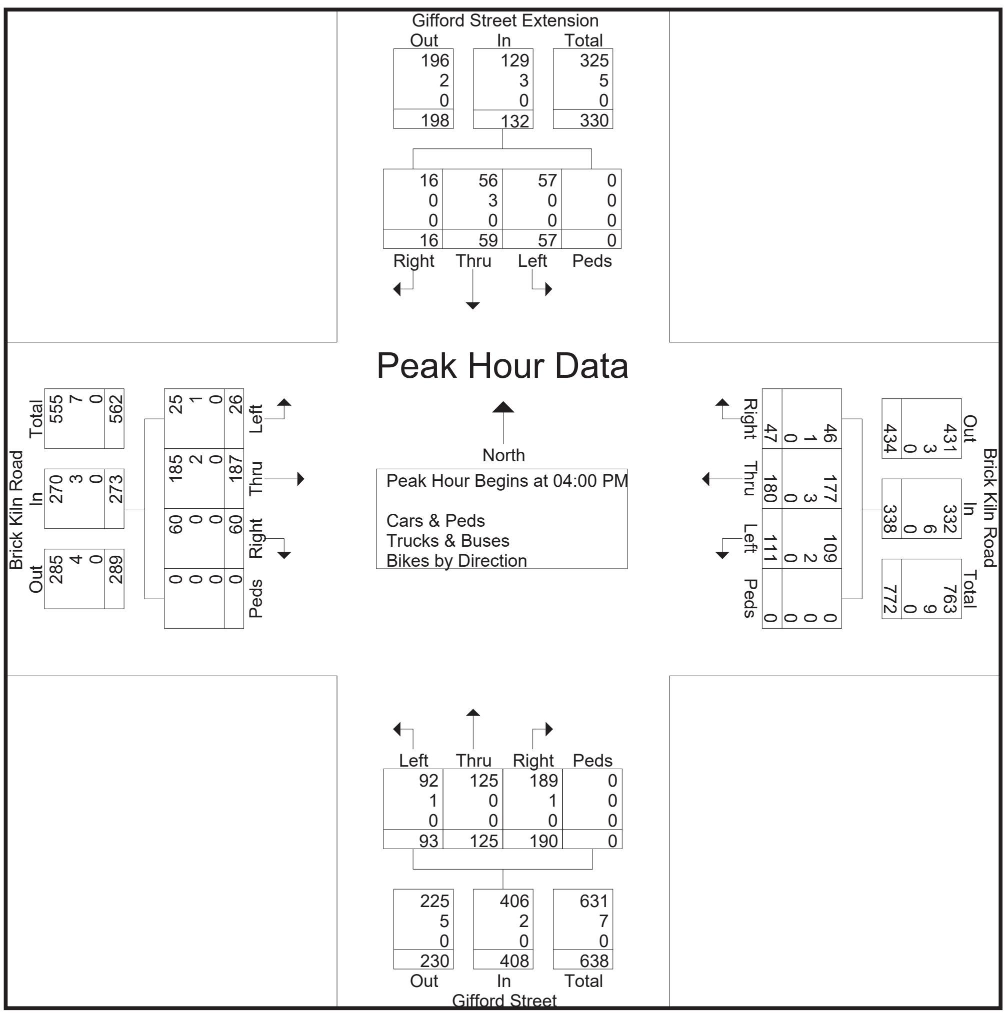
	Gifford Street Extension From North					Brick Kiln Road From East					Gifford Street From South					Brick Kiln Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Transportation Data Corporation
Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N/S: Gifford Street
E/W: Brick Kiln Road
City, State: Falmouth, MA
Client: McM/S. Tagar

File Name : 05676CC
Site Code : Y2307411
Start Date : 2/15/2023
Page No : 1

	Gifford Street Extension From North					Brick Kiln Road From East					Gifford Street From South					Brick Kiln Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	**5**	**17**	12	0	34	**14**	41	26	0	81	40	30	21	0	91	16	49	5	0	70	276
04:15 PM	2	12	**19**	0	33	9	38	**33**	0	80	**62**	27	**24**	0	**113**	11	46	5	0	62	288
04:30 PM	5	13	12	0	30	11	49	30	0	**90**	42	32	24	0	98	15	38	6	0	59	277
04:45 PM	4	17	14	0	**35**	13	**52**	22	0	87	46	**36**	24	0	106	**18**	**54**	**10**	0	**82**	**310**
Total Volume	16	59	57	0	132	47	180	111	0	338	190	125	93	0	408	60	187	26	0	273	1151
% App. Total	12.1	44.7	43.2	0		13.9	53.3	32.8	0		46.6	30.6	22.8	0		22	68.5	9.5	0		
PHF	.800	.868	.750	.000	.943	.839	.865	.841	.000	.939	.766	.868	.969	.000	.903	.833	.866	.650	.000	.832	.928
Cars & Peds	16	56	57	0	129	46	177	109	0	332	189	125	92	0	406	60	185	25	0	270	1137
% Cars & Peds	100	94.9	100	0	97.7	97.9	98.3	98.2	0	98.2	99.5	100	98.9	0	99.5	100	98.9	96.2	0	98.9	98.8
Trucks & Buses	0	3	0	0	3	1	3	2	0	6	1	0	1	0	2	0	2	1	0	3	14
% Trucks & Buses	0	5.1	0	0	2.3	2.1	1.7	1.8	0	1.8	0.5	0	1.1	0	0.5	0	1.1	3.8	0	1.1	1.2
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



APPENDIX C
Seasonal Adjustment Data

SEASONAL ADJUSTMENT CALCULATIONS
Brick Kiln Road at Gifford Street

	Date Collected	AM Peak Hr Volumes (vph)	PM Peak Hr Volumes (vph)	AM Adjustment	PM Adjustment
Non Summer Count	Wednesday, February 15, 2023	1,167	1,151	1.14	1.42
Summer Count	Tuesday, July 25, 2023	1,331	1,634		

Table 5: Monthly Adjustment Factors for Cape Cod

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2011*	1.26	1.25	1.20	1.06	0.96	0.89	0.76	0.76	0.92	0.99	1.08	1.14
2010	1.26	1.25	1.19	1.08	0.95	0.88	0.77	0.76	0.93	1.00	1.08	1.15
2009	1.26	1.25	1.19	1.08	0.95	0.88	0.77	0.76	0.93	1.00	1.08	1.15
2008	1.21	1.25	1.19	1.08	0.96	0.89	0.78	0.76	0.93	1.00	1.07	1.14
2007	1.25	1.21	1.17	1.06	0.96	0.86	0.78	0.79	0.93	1.00	1.08	1.14
2006	1.26	1.20	1.18	1.04	0.96	0.86	0.78	0.79	0.93	0.99	1.07	1.12
2005	1.27	1.23	1.18	1.06	0.96	0.85	0.77	0.78	0.93	0.99	1.08	1.15
2004	1.27	1.23	1.18	1.06	0.96	0.85	0.77	0.78	0.93	0.99	1.08	1.15
2003	1.29	1.23	1.16	1.06	0.99	0.87	0.79	0.77	0.95	0.99	1.07	1.14
2002	1.30	1.24	1.16	1.06	0.98	0.86	0.79	0.78	0.93	0.97	1.08	1.14
2001	1.34	1.27	1.18	1.06	0.97	0.86	0.78	0.78	0.94	0.97	1.08	1.13
2000	1.37	1.28	1.20	1.07	0.96	0.87	0.77	0.78	0.93	0.97	1.09	1.14
1999	1.37	1.29	1.23	1.09	0.96	0.87	0.76	0.77	0.94	0.99	1.10	1.15
1998	1.39	1.27	1.23	1.11	0.95	0.87	0.76	0.76	0.93	0.99	1.10	1.16
1997	1.38	1.29	1.22	1.10	0.96	0.86	0.76	0.75	0.92	0.99	1.10	1.19
1996	1.41	1.30	1.22	1.07	0.96	0.86	0.75	0.75	0.91	0.99	1.10	1.19
1995	1.36	1.33	1.24	1.07	0.97	0.86	0.75	0.75	0.90	0.99	1.10	1.19
1994	1.35	1.31	1.25	1.06	0.93	0.86	0.73	0.74	0.89	0.97	1.09	1.15
1993	1.35	1.30	1.24	1.07	0.92	0.85	0.75	0.75	0.90	0.99	1.10	1.17
1992	1.37	1.32	1.29	1.08	0.94	0.87	0.75	0.76	0.90	1.01	1.14	1.21
1991	1.39	1.30	1.22	1.08	0.94	0.87	0.76	0.77	0.95	1.02	1.12	1.20
1990	1.31	1.26	1.16	1.06	0.96	0.85	0.73	0.74	0.94	0.99	1.10	1.22
1989	1.37	1.38	1.25	1.13	0.99	0.89	0.72	0.73	0.94	1.03	1.15	1.17
1988	1.38	1.30	1.21	1.10	0.99	0.83	0.72	0.73	0.91	1.02	1.11	1.15
1987	1.40	1.39	1.23	1.10	0.94	0.85	0.71	0.73	0.96	1.02	1.18	1.25
1986	1.35	1.31	1.21	1.09	1.05	0.84	0.73	0.75	0.96	1.04	1.17	1.22
1985	1.31	1.26	1.17	1.07	0.96	0.92	0.84	0.83	0.97	0.97	1.14	1.16
1984	1.55	1.36	1.46	1.12	1.03	0.85	0.73	0.73	0.94	1.07	1.14	1.24
1983	1.53	1.51	1.30	1.15	0.98	0.82	0.65	0.66	0.87	1.07	1.23	1.30

Source: Massachusetts Highway Department / Mass DOT
*2011 is the last year that MassDOT has supplied monthly adjustment factors

APPENDIX D

Crash Summary and Diagrams

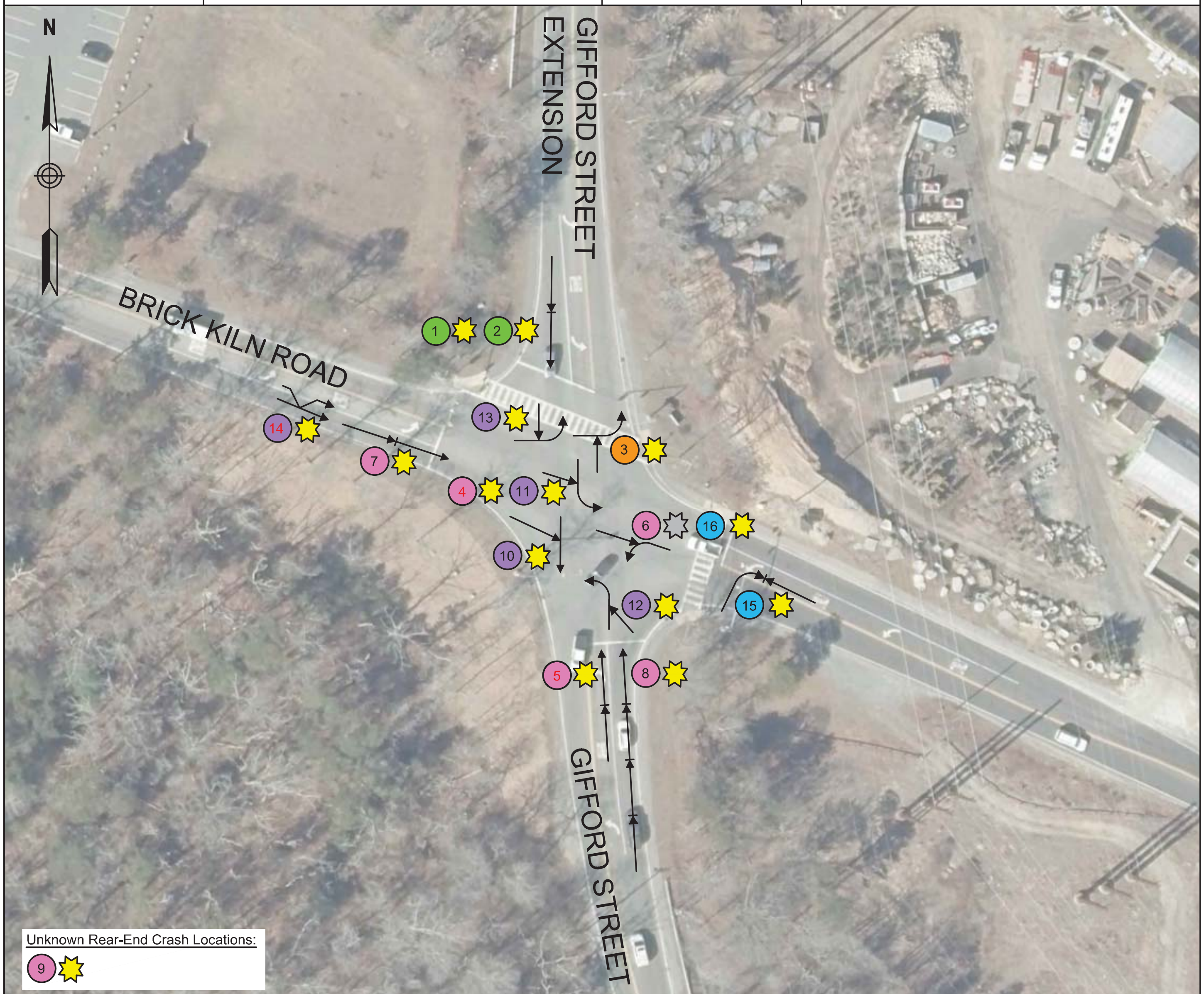
CRASH ANALYSIS

Proposed YMCA
Falmouth, MA

	Brick Kiln Road at Gifford Street/ Giffford Street Ext.	Brick Kiln Road at Route 28 Northbound Ramps	Brick Kiln Road at Route 28 Southbound Off-Ramp	Brick Kiln Road at W. Falmouth Hwy (Route 28A)
Year				
2016	2	2	0	0
2017	1	1	1	2
2018	6	0	0	1
2019	5	2	0	2
2020	2	0	0	0
Total	16	5	1	5
Type				
Angle	7	1	1	1
Rear-end	6	0	0	1
Sideswipe	1	0	0	0
Head-on	1	0	0	0
Pedestrian	0	0	0	0
Bicycle	0	1	0	1
Single Vehicle	0	3	0	2
Other	0	0	0	0
Unknown	0	0	0	0
Total	15	5	1	5
Severity				
Property Damage	13	2	0	2
Personal Injury	3	3	1	2
Fatality	0	0	0	0
Unknown	0	0	0	1
Total	16	5	1	5
Weather				
Clear	12	3	0	3
Cloudy	3	1	1	0
Rain	1	0	0	1
Snow	0	1	0	1
Sleet	0	0	0	0
Fog	0	0	0	0
Other	0	0	0	0
Unknown	0	0	0	0
Total	16	5	1	5
Road Surface				
Dry	15	4	0	3
Wet	1	0	1	1
Ice	0	0	0	0
Snow	0	1	0	1
Slush	0	0	0	0
Dirt, oil, gravel	0	0	0	0
Other	0	0	0	0
Unknown	0	0	0	0
Total	16	5	1	5
Time				
7:00 AM to 9:00 AM	3	3	0	1
9:00 AM to 4:00 PM	10	0	0	1
4:00 PM to 6:00 PM	1	1	0	1
6:00 PM to 7:00 AM	2	1	1	2
Total	**16**	5	**1**	**5**
Crash Rate	0.37	0.18	0.05	0.22
State Average	0.78	0.57	0.57	0.57
District 5 Average	0.75	0.57	0.57	0.57

Source: MassDOT

COLLISION DIAGRAM			
LOCATION	Intersection of Brick Kiln Road at Gifford Street		
TOWN	Falmouth	STATE	Massachusetts
START SEGMENT	N/A	END SEGMENT	N/A



COLLISION DIAGRAM (5 YEAR TOTALS)					
PDO	INJURY CRASHES	FATAL CRASHES	TOTAL	NIGHT CRASHES	WET CRASHES
13	3	0	16	1	1

LEGEND					
Injury Crash No. #	PD Crash No. #	Subject Fatal Crash		Fixed Object	
Head On		Angle		Rear End	
Sideswipe		Left Turn		Coll. w/ Animal	
Coll. w/ Ped.		Coll. w/ Bicycle		Night Coll.	Daylight Coll.
2016 Crash	2017 Crash	2018 Crash	2019 Crash	2020 Crash	

CRASH DIAGRAM 1 OF 1 2016 - 2020	PROPOSED YMCA FALMOUTH, MA	McMAHON a Bowman company

CRASH DATA SUMMARY TABLE

Brick Kiln Road at Gifford Street

2016 - 2020

Crash Diagram	Crash Number	Crash Date	Crash Severity	Crash Time	Light Conditions	Manner of Collision	Road Surface	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Travel Directions (All Vehicles)	Weather Conditions
1	4201763	4/26/2016	Property damage only (none injured)	2:17 PM	Daylight	Rear-end	Wet	V1: Travelling straight ahead / V2: Slowing or stopped in traffic / V3: Slowing or stopped in traffic	V1: S / V2: S / V3: S	Cloudy/Rain
2	4258493	9/20/2016	Property damage only (none injured)	9:58 AM	Daylight	Rear-end	Dry	V1: Slowing or stopped in traffic / V2: Turning right	V1: S / V2: S	Cloudy
3	4464290	11/1/2017	Property damage only (none injured)	7:23 AM	Daylight	Angle	Dry	V1: Turning left / V2: Travelling straight ahead	V1: E / V2: N	Clear
4	4491852	1/2/2018	Non-fatal injury	6:57 AM	Daylight	Angle	Dry	V1: Travelling straight ahead / V2: Turning left	V1: E / V2: S	Clear
5	4532383	4/23/2018	Non-fatal injury	5:17 PM	Daylight	Rear-end	Dry	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1: N / V2: N	Clear
6	4569487	5/9/2018	Property damage only (none injured)	9:12 PM	Dark - lighted roadway	Angle	Dry	V1: Turning left / V2: Travelling straight ahead	V1: W / V2: E	Cloudy
7	4599394	8/17/2018	Property damage only (none injured)	3:27 PM	Daylight	Rear-end	Dry	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic	V1: E / V2: E	Clear
8	4599432	9/4/2018	Property damage only (none injured)	2:06 PM	Daylight	Rear-end	Dry	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic / V3: Slowing or stopped in traffic / V4: Travelling straight ahead	V1: N / V2: N / V3: N / V4: N	Clear
9	4639929	11/30/2018	Property damage only (none injured)	2:08 PM	Daylight	Rear-end	Dry	V1: Backing / V2: Travelling straight ahead	V1: E / V2: S	Clear
10	4695010	3/6/2019	Property damage only (none injured)	2:18 PM	Daylight	Angle	Dry	V1: Travelling straight ahead / V2: Entering traffic lane	V1: S / V2: E	Clear
11	4695011	3/7/2019	Property damage only (none injured)	1:19 PM	Daylight	Angle	Dry	V1: Travelling straight ahead / V2: Travelling straight ahead	V1: S / V2: E	Clear
12	4695022	3/19/2019	Property damage only (none injured)	2:16 PM	Daylight	Angle	Dry	V1: Travelling straight ahead / V2: Turning left	V1: N / V2: N	Clear
13	4703242	5/9/2019	Property damage only (none injured)	2:15 PM	Daylight	Angle	Dry	V2: Turning left / V1: Travelling straight ahead	V2: E / V1: S	Clear
14	4778989	11/7/2019	Non-fatal injury	12:21 PM	Daylight	Sideswipe	Dry	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic	V1: E / V2: E	Cloudy
15	4830480	3/9/2020	Property damage only (none injured)	7:46 AM	Daylight	Head-on	Dry	V1: Turning right / V2: Travelling straight ahead	V1: N / V2: W	Clear
16	4900027	11/1/2020	Property damage only (none injured)	8:38 AM	Daylight	Angle	Dry	V1: Travelling straight ahead / V2: Turning left	V1: E / V2: W	Clear

APPENDIX E

Traffic Projection Model

TRAFFIC PROJECTION MODEL

Falmouth YMCA
Weekday Morning Peak Hour - Average Conditions
Falmouth, MA

Intersection	Dir.	Turn	2023 Balanced Volumes	Background Growth 7 yrs (at 1% per year)	511 Brick Kiln Rd Development PERCENT ENTER	511 Brick Kiln Rd Development Trips ENTER	511 Brick Kiln Rd Development PERCENT EXIT	511 Brick Kiln Rd Development Trips EXIT	2030 No-Build Volumes	New Project PERCENT ENTER	New Project Trips ENTER	New Project PERCENT EXIT	New Project Trips EXIT	New Project Trips TOTAL	2030 Build Volumes
Brick Kiln Road at	WB	L	54	4		0	20%	4	62		0	20%	14	14	76
Route 28A		R	147	11		0	10%	1	159		0	10%	7	7	166
	NB	T	61	5		0		0	66		0		0	0	66
		R	55	4		0		0	59		0		0	0	59
	SB	L	95	7	10%	0		0	102	10%	11		0	11	113
		T	146	11		0		0	157		0		0	0	157
Brick Kiln Road at	EB	T	151	11	10%	0		0	162	10%	11		0	11	173
Route 28 SB Ramps	WB	T	185	13		0	30%	5	203		0	30%	21	21	224
	SB	L	185	13	25%	2		0	200	25%	25		0	25	225
		R	13	1		0		0	14		0		0	0	14
Brick Kiln Road at	EB	L	39	2		0		0	41		0		0	0	41
Route 28 NB Ramps		T	297	22	35%	2		0	321	35%	36		0	36	357
	WB	T	140	10		0	30%	5	155		0	30%	21	21	176
		R	181	13		0	25%	5	199		0	25%	18	18	217
	NB	L	45	3		0		0	48		0		0	0	48
		R	20	2	20%	1		0	23	20%	20		0	20	43
Brick Kiln Road at	EB	L	0	0		0		0	0	55%	56		0	56	56
Site Driveway		T	289	21		0	45%	8	318		0		0	0	318
	WB	T	220	16	45%	3		0	239		0		0	0	239
		R	0	0		0		0	0	45%	45		0	45	45
	SB	L	0	0		0		0	0		0	45%	32	32	32
		R	0	0		0		0	0		0	55%	39	39	39
Brick Kiln Road at	EB	L	77	6		0	15%	3	86		0	15%	10	10	96
Gifford Street/Gifford Street		T	142	10		0	15%	3	155		0	15%	11	11	166
Extension		R	70	5		0	15%	2	77		0	15%	11	11	88
	WB	L	185	13		0		0	198		0		0	0	198
		T	149	11	15%	1		0	161	15%	15		0	15	176
		R	128	9		0		0	137		0		0	0	137
	NB	L	25	2	15%	1		0	28	15%	15		0	15	43
		T	66	5		0		0	71		0		0	0	71
		R	54	4		0		0	58		0		0	0	58
	SB	L	83	6		0		0	89		0		0	0	89
		T	142	10		0		0	152		0		0	0	152
		R	46	3	15%	1		0	50	15%	15		0	15	65

Peak Hour: 8:00 - 9:00 AM

TRAFFIC PROJECTION MODEL

Falmouth YMCA
Weekday Afternoon Peak Hour - Average Conditions
Falmouth, MA

Intersection	Dir.	Turn	2023 Balanced Volumes	Background Growth 7 yrs (at 0.5% per year)	511 Brick Kiln Rd Development PERCENT ENTER	511 Brick Kiln Rd Development Trips ENTER	511 Brick Kiln Rd Development PERCENT EXIT	511 Brick Kiln Rd Development Trips EXIT	2030 No-Build Volumes	New Project PERCENT ENTER	New Project Trips ENTER	New Project PERCENT EXIT	New Project Trips EXIT	New Project Trips TOTAL	2030 Build Volumes
Brick Kiln Road at	WB	L	52	4		0	20%	2	58		0	20%	18	18	76
Route 28A		R	149	11		0	10%	1	161		0	10%	9	9	170
	NB	T	104	8		0		0	112		0		0	0	112
		R	77	6		0		0	83		0		0	0	83
	SB	L	107	8	10%	1		0	116	10%	11		0	11	127
		T	117	8		0		0	125		0		0	0	125
Brick Kiln Road at	EB	T	206	15	10%	1		0	222	10%	11		0	11	233
Route 28 SB Ramps	WB	T	184	13		0	30%	3	200		0	30%	27	27	227
	SB	L	125	9	25%	5		0	139	25%	27		0	27	166
		R	14	1		0		0	15		0		0	0	15
Brick Kiln Road at	EB	L	54	4		0		0	58		0		0	0	58
Route 28 NB Ramps		T	277	20	35%	6		0	303	35%	38		0	38	341
	WB	T	144	11		0	30%	3	158		0	30%	27	27	185
		R	204	15		0	25%	3	222		0	25%	22	22	244
	NB	L	40	3		0		0	43		0		0	0	43
		R	19	1	20%	4		0	24	20%	22		0	22	46
Brick Kiln Road at	EB	L	0	0		0		0	0	55%	60		0	60	60
Site Driveway		T	273	20		0	45%	5	298		0		0	0	298
	WB	T	289	21	45%	9		0	319		0		0	0	319
		R	0	0		0		0	0	45%	49		0	49	49
	SB	L	0	0		0		0	0		0	45%	41	41	41
		R	0	0		0		0	0		0	55%	49	49	49
Brick Kiln Road at	EB	L	26	2		0	15%	2	30		0	15%	14	14	44
Gifford Street/Gifford Street		T	187	13		0	15%	2	202		0	15%	14	14	216
Extension		R	60	4		0	15%	1	65		0	15%	13	13	78
	WB	L	111	8		0		0	119		0		0	0	119
		T	180	13	15%	3		0	196	15%	16		0	16	212
		R	47	3		0		0	50		0		0	0	50
	NB	L	93	7	15%	3		0	103	15%	17		0	17	120
		T	125	9		0		0	134		0		0	0	134
		R	190	14		0		0	204		0		0	0	204
	SB	L	57	4		0		0	61		0		0	0	61
		T	59	4		0		0	63		0		0	0	63
		R	16	1	15%	3		0	20	15%	16		0	16	36

Peak Hour: 3:30 - 4:30 PM

TRAFFIC PROJECTION MODEL

Falmouth YMCA
Weekday Morning Peak Hour - Peak Conditions
Falmouth, MA

Intersection	Dir.	Turn	2023 Existing Volumes	Balancing	2023 Balanced Volumes	Background Growth 7 yrs (at 1% per year)	511 Brick Kiln Rd Development PERCENT ENTER	511 Brick Kiln Rd Development Trips ENTER	511 Brick Kiln Rd Development PERCENT EXIT	511 Brick Kiln Rd Development Trips EXIT	2030 No-Build Volumes	New Project PERCENT ENTER	New Project Trips ENTER	New Project PERCENT EXIT	New Project Trips EXIT
Brick Kiln Road at	WB	L	62		62	4		0	20%	4	70		0	20%	14
Route 28A		R	168		168	12		0	10%	1	181		0	10%	7
	NB	T	70		70	5		0		0	75		0		0
		R	63		63	5		0		0	68		0		0
	SB	L	108		108	8	10%	0		0	116	10%	11		0
		T	167		167	12		0		0	179		0		0
Brick Kiln Road at	EB	T	172		172	12	10%	0		0	184	10%	11		0
Route 28 SB Ramps	WB	T	209	2	211	15		0	30%	5	231		0	30%	21
	SB	L	211		211	15	25%	2		0	228	25%	25		0
		R	15		15	1		0		0	16		0		0
Brick Kiln Road at	EB	L	44		44	3		0		0	47		0		0
Route 28 NB Ramps		T	337	2	339	24	35%	2		0	365	35%	36		0
	WB	T	160		160	12		0	30%	5	177		0	30%	21
		R	206		206	15		0	25%	5	226		0	25%	18
	NB	L	51		51	4		0		0	55		0		0
		R	23		23	2	20%	1		0	26	20%	20		0
Brick Kiln Road at	EB	L	0		0	0		0		0	0	55%	56		0
Site Driveway		T	350		350	25		0	45%	8	383		0		0
	WB	T	330		330	24	45%	3		0	357		0		0
		R	0		0	0		0		0	0	45%	45		0
	SB	L	0		0	0		0		0	0		0	45%	32
		R	0		0	0		0		0	0		0	55%	39
Brick Kiln Road at	EB	L	38		38	3		0	15%	3	44		0	15%	10
Gifford Street/Gifford Street		T	192		192	14		0	15%	3	209		0	15%	11
Extension		R	120		120	9		0	15%	2	131		0	15%	11
	WB	L	282		282	20		0		0	302		0		0
		T	235		235	17	15%	1		0	253	15%	15		0
		R	51		51	4		0		0	55		0		0
	NB	L	77		77	6	15%	1		0	84	15%	15		0
		T	63		63	5		0		0	68		0		0
		R	84		84	6		0		0	90		0		0
	SB	L	47		47	3		0		0	50		0		0
		T	124		124	9		0		0	133		0		0
		R	18		18	1	15%	1		0	20	15%	15		0

Peak Hour: 8:00 - 9:00 AM

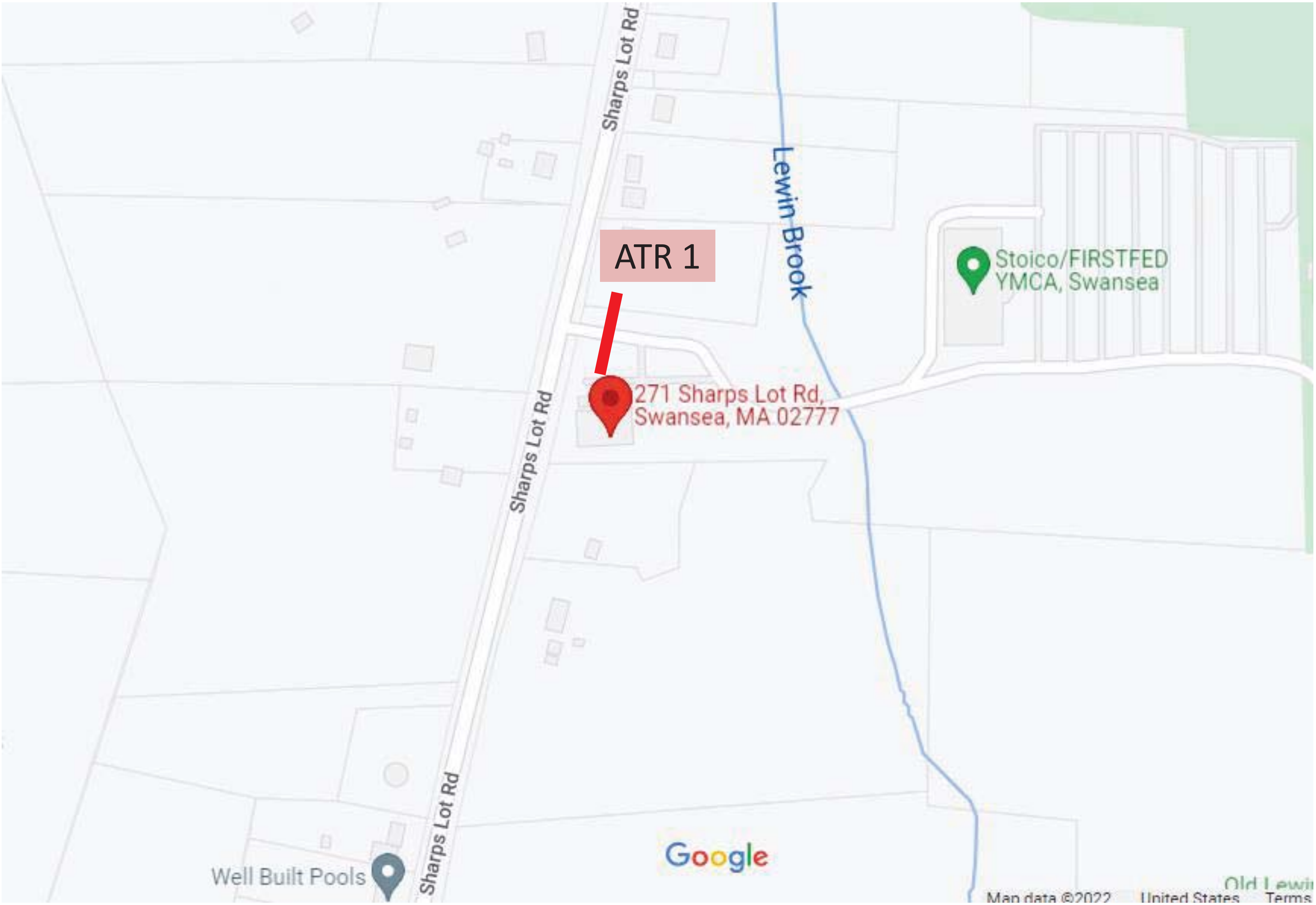
TRAFFIC PROJECTION MODEL

Falmouth YMCA
Weekday Afternoon Peak Hour - Peak Conditions
Falmouth, MA

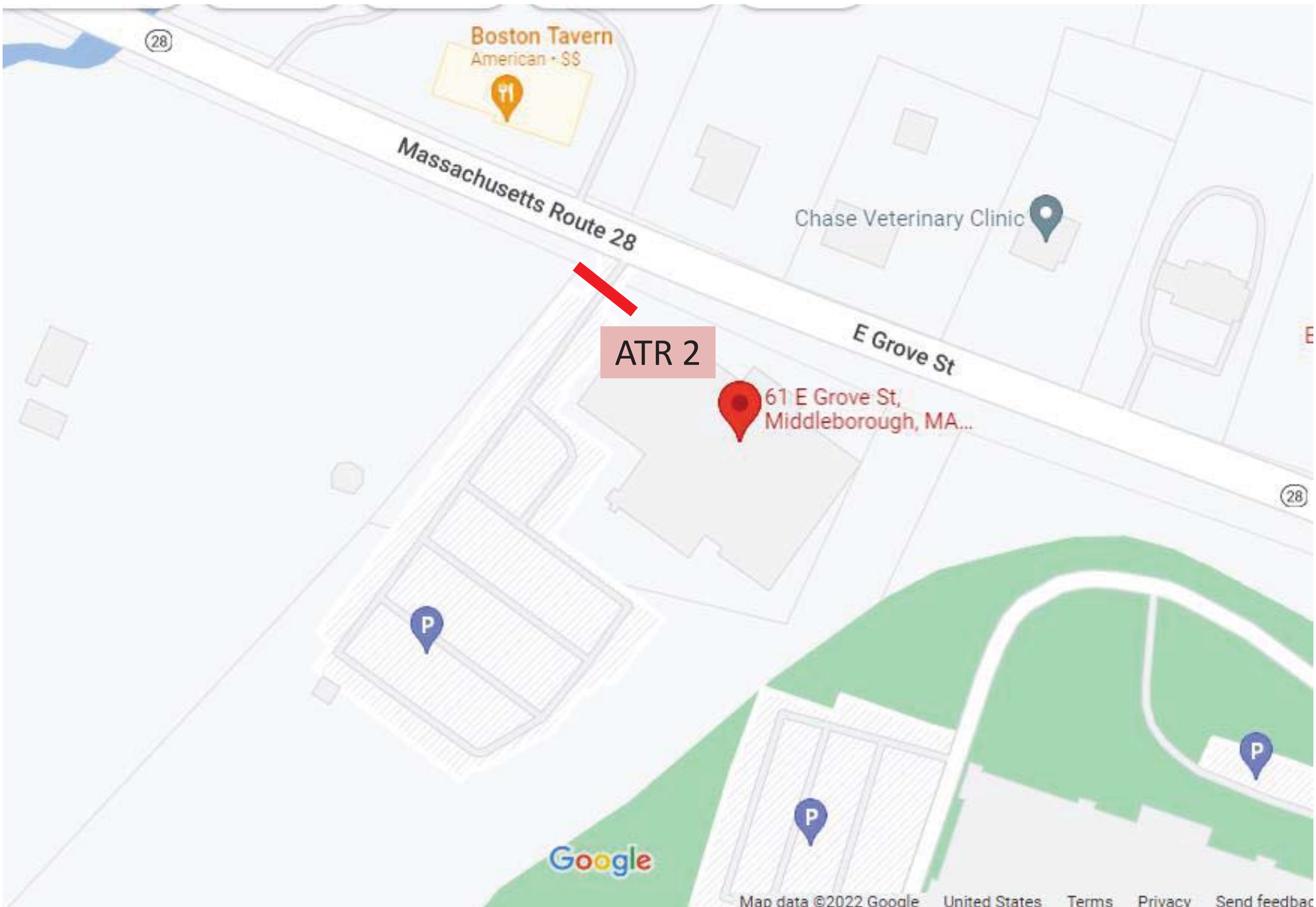
Intersection	Dir.	Turn	2023 Existing Volumes	Balancing	2023 Balanced Volumes	Background Growth 7 yrs (at 1% per year)	511 Brick Kiln Rd Development PERCENT ENTER	511 Brick Kiln Rd Development Trips ENTER	511 Brick Kiln Rd Development PERCENT EXIT	511 Brick Kiln Rd Development Trips EXIT	2030 No-Build Volumes	New Project PERCENT ENTER	New Project Trips ENTER	New Project PERCENT EXIT	New Project Trips EXIT
Brick Kiln Road at	WB	L	74		74	5		0	20%	2	81		0	20%	18
Route 28A		R	212		212	15		0	10%	1	228		0	10%	9
	NB	T	148		148	11		0		0	159		0		0
		R	110		110	8		0		0	118		0		0
	SB	L	152		152	11	10%	1		0	164	10%	11		0
		T	166		166	12		0		0	178		0		0
Brick Kiln Road at	EB	T	268	25	293	19	10%	1		0	313	10%	11		0
Route 28 SB Ramps	WB	T	261	1	262	19		0	30%	3	284		0	30%	27
	SB	L	177		177	13	25%	5		0	195	25%	27		0
		R	20		20	1		0		0	21		0		0
Brick Kiln Road at	EB	L	77		77	6		0		0	83		0		0
Route 28 NB Ramps		T	393		393	28	35%	6		0	427	35%	38		0
	WB	T	205		205	15		0	30%	3	223		0	30%	27
		R	290		290	21		0	25%	3	314		0	25%	22
	NB	L	57		57	4		0		0	61		0		0
		R	27		27	2	20%	4		0	33	20%	22		0
Brick Kiln Road at	EB	L	0		0	0		0		0	0	55%	60		0
Site Driveway		T	393		393	28		0	45%	5	426		0		0
	WB	T	492		492	35	45%	9		0	536		0		0
		R	0		0	0		0		0	0	45%	49		0
	SB	L	0		0	0		0		0	0		0	45%	41
		R	0		0	0		0		0	0		0	55%	49
Brick Kiln Road at	EB	L	36		36	3		0	15%	2	41		0	15%	14
Gifford Street/Gifford Street		T	288		288	21		0	15%	2	311		0	15%	14
Extension		R	69		69	5		0	15%	1	75		0	15%	13
	WB	L	155		155	11		0		0	166		0		0
		T	288		288	21	15%	3		0	312	15%	16		0
		R	48		48	3		0		0	51		0		0
	NB	L	171		171	12	15%	3		0	186	15%	17		0
		T	158		158	11		0		0	169		0		0
		R	242		242	17		0		0	259		0		0
	SB	L	57		57	4		0		0	61		0		0
		T	89		89	6		0		0	95		0		0
		R	33		33	2	15%	3		0	38	15%	16		0

Peak Hour: 3:30 - 4:30 PM

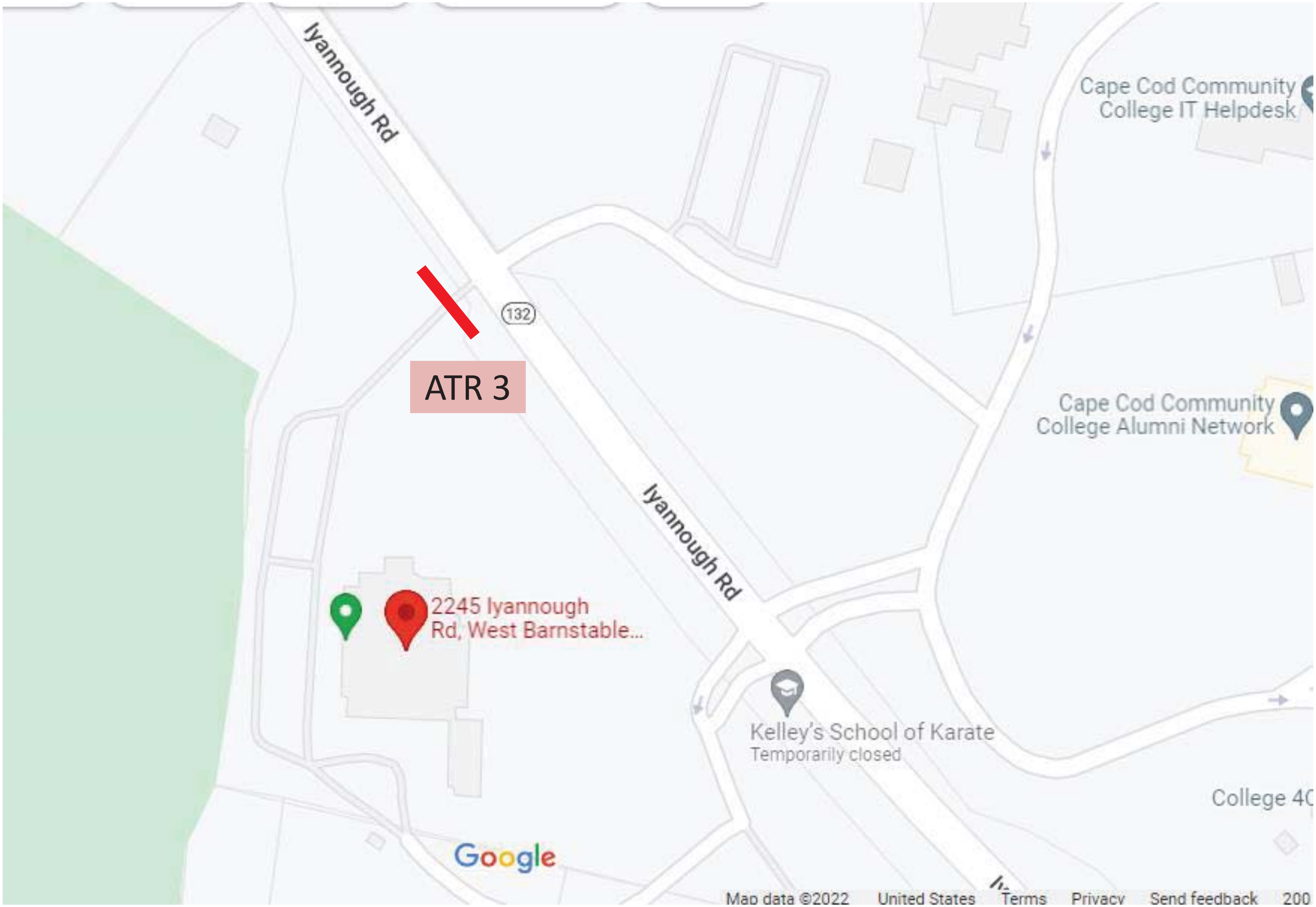
APPENDIX F
Trip Generation Methodology



BOSTON TRAFFIC DATA	BTD ID: 1093_3_MM	Swansea, MA	# of TMC's: 00	Client: McMahon Associates, Inc.
		Collected on Nov 14 to Nov 20, 2022	# of ATR's: 01	Contact: Michael Pompili



BOSTON TRAFFIC DATA	BTD ID: 1093_3_MM	Middleborough, MA	# of TMC's: 00	Client: McMahon Associates, Inc.
		Collected on Oct 30 to Nov 5, 2022	# of ATR's: 03	Contact: Michael Pompili



BOSTON TRAFFIC DATA	BTD ID: 1093_3_MM	Barnstable, MA	# of TMC's: 00	Client: McMahon Associates, Inc.
		Collected on Oct 30 to Nov 5, 2022	# of ATR's: 03	Contact: Michael Pompili

Volume Report

Job 1093_3_MM_ATR 1
Area Swansea, MA
Location Stoico/Firstfed YMCA, 271 Sharps Lot Road

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Monday, November 14, 2022

Time	In Bike	In Motorcycle	In Automobile	In Bus	In Single-Unit Truck	In Multi-Unit Truck	In Total Volume	Out Bike	Out Motorcycle	Out Automobile	Out Bus	Out Single-Unit Truck	Out Multi-Unit Truck	Out Total Volume
0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0415	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0430	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0445	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0500	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0515	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0530	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0545	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0600	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0615	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0630	0	0	2	0	0	0	2	0	0	0	0	0	0	0
0645	0	0	2	0	0	0	2	0	0	0	0	0	0	0
0700	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0715	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0730	0	0	3	0	0	0	3	0	0	1	0	0	0	1
0745	0	0	0	0	1	0	1	0	0	0	0	0	0	0
0800	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0815	0	0	4	0	0	0	4	0	0	1	0	0	0	1
0830	0	0	6	0	0	0	6	0	0	2	0	1	0	3
0845	0	0	7	0	0	0	7	0	0	7	1	0	0	8
0900	0	0	8	0	0	0	8	0	0	1	0	0	0	1
0915	0	0	6	0	0	0	6	0	0	1	0	0	0	1
0930	0	0	3	0	0	0	3	0	0	1	0	0	0	1
0945	0	0	22	1	0	0	23	0	0	2	0	0	0	2
1000	0	0	2	0	0	0	2	0	0	7	0	0	0	7
1015	0	0	6	0	0	0	6	0	0	5	0	0	0	5
1030	0	0	7	0	0	0	7	0	0	3	0	0	0	3
1045	0	0	17	0	0	0	17	0	0	6	0	0	0	6
1100	0	0	8	0	0	0	8	0	0	15	0	0	0	15
1115	0	0	3	0	0	0	3	0	0	6	0	0	0	6
1130	0	0	2	0	0	0	2	0	0	1	0	0	0	1
1145	0	0	16	0	0	0	16	0	0	5	0	0	0	5
1200	0	0	3	1	0	0	4	0	0	16	0	0	0	16
1215	0	0	3	0	0	0	3	0	0	5	1	0	0	6
1230	0	0	4	0	0	0	4	0	0	3	0	0	0	3
1245	0	0	3	0	0	0	3	0	0	2	0	0	0	2
1300	0	0	2	0	0	0	2	0	0	8	0	0	0	8
1315	0	0	4	0	0	0	4	0	0	19	0	0	0	19
1330	0	0	2	0	0	0	2	0	0	4	0	0	0	4
1345	0	0	0	0	0	0	0	0	0	2	0	0	0	2
1400	0	0	1	0	0	0	1	0	0	4	0	0	0	4
1415	0	0	6	0	0	0	6	0	0	2	0	0	0	2
1430	0	0	5	0	0	0	5	0	0	2	0	0	0	2
1445	0	0	3	0	0	0	3	0	0	5	0	0	0	5
1500	0	0	4	0	0	0	4	0	0	6	1	0	0	7
1515	0	0	3	0	0	0	3	0	0	12	0	0	0	12
1530	0	0	2	0	0	0	2	0	0	6	0	0	0	6
1545	0	0	3	0	0	0	3	0	0	4	0	0	0	4
1600	0	0	4	0	0	0	4	0	0	0	0	0	0	0
1615	0	0	5	0	0	0	5	0	0	4	0	0	0	4
1630	0	0	10	0	0	0	10	0	0	10	0	0	0	10
1645	0	0	17	0	0	0	17	0	0	9	0	0	0	9
1700	0	0	15	1	0	0	16	0	0	7	1	0	0	8
1715	0	0	10	0	0	0	10	0	0	4	0	0	0	4
1730	0	0	13	0	0	0	13	0	0	10	0	0	0	10
1745	0	0	13	0	0	0	13	0	0	18	0	0	0	18
1800	0	0	12	0	0	0	12	0	0	5	0	0	0	5
1815	0	0	19	0	0	0	19	0	0	14	0	0	0	14
1830	0	0	18	0	0	0	18	0	0	10	0	0	0	10
1845	0	0	0	0	0	0	0	0	0	15	0	0	0	15
1900	0	0	1	0	0	0	1	0	0	3	0	0	0	3
1915	0	0	7	0	0	0	7	0	0	23	0	0	0	23
1930	0	0	12	0	0	0	12	0	0	12	0	0	0	12
1945	0	0	5	0	0	0	5	0	0	6	0	0	0	6
2000	0	0	1	0	0	0	1	0	0	3	0	0	0	3
2015	0	0	14	0	0	0	14	0	0	0	0	0	0	0
2030	0	0	3	0	0	0	3	0	0	20	0	0	0	20
2045	0	0	7	0	0	0	7	0	0	10	0	0	0	10
2100	0	0	10	0	0	0	10	0	0	14	0	0	0	14
2115	0	0	1	0	0	0	1	0	0	6	0	0	0	6
2130	0	0	0	0	0	0	0	0	0	4	0	0	0	4
2145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2245	0	0	0	0	0	0	0	0	0	1	0	0	0	1
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**371**	**3**	**1**	**0**	**375**	**0**	**0**	**372**	**4**	**1**	**0**	**377**

Volume Report

Job 1093_3_MM_ATR 1
Area Swansea, MA
Location Stoico/Firstfed YMCA, 271 Sharps Lot Road

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Tuesday, November 15, 2022

Time	In Bike	In Motorcycle	In Automobile	In Bus	In Single-Unit Truck	In Multi-Unit Truck	In Total Volume	Out Bike	Out Motorcycle	Out Automobile	Out Bus	Out Single-Unit Truck	Out Multi-Unit Truck	Out Total Volume
0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0415	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0430	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0445	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0500	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0515	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0530	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0545	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0600	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0615	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0630	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0645	0	0	6	0	0	0	6	0	0	0	0	0	0	0
0700	0	0	3	0	0	0	3	0	0	1	0	0	0	1
0715	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0730	0	0	2	0	0	0	2	0	0	2	0	0	0	2
0745	0	0	1	0	0	0	1	0	0	5	0	0	0	5
0800	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0815	0	0	7	0	0	0	7	0	0	1	0	0	0	1
0830	0	0	6	0	0	0	6	0	0	1	0	0	0	1
0845	0	0	16	0	0	0	16	0	0	7	1	0	0	8
0900	0	0	15	0	0	0	15	0	0	2	0	0	0	2
0915	0	0	6	0	0	0	6	0	0	0	0	0	0	0
0930	0	0	7	0	0	0	7	0	0	2	0	0	0	2
0945	0	0	5	0	0	0	5	0	0	2	0	0	0	2
1000	0	0	11	0	0	0	11	0	0	12	0	0	0	12
1015	0	0	2	0	0	0	2	0	0	9	0	0	0	9
1030	0	0	9	0	0	0	9	0	0	4	0	0	0	4
1045	0	0	24	0	0	0	24	0	0	4	0	0	0	4
1100	0	0	16	0	0	0	16	0	0	16	1	0	0	17
1115	0	0	4	0	0	0	4	0	0	1	0	0	0	1
1130	0	0	2	0	1	0	3	0	0	8	0	0	0	8
1145	0	0	3	0	0	0	3	0	0	3	0	1	0	4
1200	0	0	1	0	0	0	1	0	0	19	0	0	0	19
1215	0	0	1	0	0	0	1	0	0	7	0	0	0	7
1230	0	0	7	0	0	0	7	0	0	7	0	0	0	7
1245	0	0	1	0	0	0	1	0	0	1	0	0	0	1
1300	0	0	3	0	0	0	3	0	0	3	0	0	0	3
1315	0	0	3	0	1	0	4	0	0	6	0	0	0	6
1330	0	0	3	0	0	0	3	0	0	10	0	0	0	10
1345	0	0	0	0	0	0	0	0	0	6	0	0	0	6
1400	0	0	3	0	0	0	3	0	0	5	0	0	0	5
1415	0	0	5	0	1	0	6	0	0	3	0	0	0	3
1430	0	0	1	0	0	0	1	0	0	1	0	0	0	1
1445	0	0	3	0	0	0	3	0	0	3	0	0	0	3
1500	0	0	3	0	0	0	3	0	0	6	1	0	0	7
1515	0	0	4	0	0	0	4	0	0	12	0	0	0	12
1530	0	0	7	0	0	0	7	0	0	2	0	0	0	2
1545	0	0	4	0	0	0	4	0	0	5	0	0	0	5
1600	0	0	5	0	0	0	5	0	0	2	0	0	0	2
1615	0	0	2	0	0	0	2	0	0	3	0	0	0	3
1630	0	0	4	0	0	0	4	0	0	3	0	0	0	3
1645	0	0	8	0	0	0	8	0	0	6	0	0	0	6
1700	0	0	12	1	0	0	13	0	0	6	1	0	0	7
1715	0	0	13	0	0	0	13	0	0	14	0	0	0	14
1730	0	0	10	0	0	0	10	0	0	6	0	0	0	6
1745	0	0	8	0	0	0	8	0	0	9	0	0	0	9
1800	0	0	10	0	0	0	10	0	0	6	0	0	0	6
1815	0	0	16	0	0	0	16	0	0	12	0	0	0	12
1830	0	0	1	0	0	0	1	0	0	1	0	0	0	1
1845	0	0	15	0	0	0	15	0	0	5	0	0	0	5
1900	0	0	5	0	0	0	5	0	0	16	0	0	0	16
1915	0	0	4	0	0	0	4	0	0	17	0	0	0	17
1930	0	0	3	0	0	0	3	0	0	6	0	0	0	6
1945	0	0	3	0	0	0	3	0	0	6	0	0	0	6
2000	0	0	1	0	0	0	1	0	0	7	0	0	0	7
2015	0	0	0	0	0	0	0	0	0	2	0	0	0	2
2030	0	0	8	0	0	0	8	0	0	1	0	0	0	1
2045	0	0	3	0	0	0	3	0	0	11	0	0	0	11
2100	0	0	6	0	0	0	6	0	0	3	0	0	0	3
2115	0	0	0	0	0	0	0	0	0	10	0	0	0	10
2130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2230	0	0	0	0	0	0	0	0	0	1	0	0	0	1
2245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**334**	**1**	**3**	**0**	**338**	**0**	**0**	**329**	**4**	**1**	**0**	**334**

Volume Report

Job 1093_3_MM_ATR 1
Area Swansea, MA
Location Stoico/Firstfed YMCA, 271 Sharps Lot Road

Wednesday, November 16, 2022

Time	In Bike	In Motorcycle	In Automobile	In Bus	In Single-Unit Truck	In Multi-Unit Truck	In Total Volume	Out Bike	Out Motorcycle	Out Automobile	Out Bus	Out Single-Unit Truck	Out Multi-Unit Truck	Out Total Volume
0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0330	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0345	0	0	0	0	0	0	0	0	0	1	0	0	0	1
0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0415	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0430	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0445	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0500	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0515	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0530	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0545	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0600	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0615	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0630	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0645	0	0	7	0	0	0	7	0	0	1	0	0	0	1
0700	0	0	4	0	0	0	4	0	0	0	0	0	0	0
0715	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0730	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0745	0	0	1	0	0	0	1	0	0	2	0	0	0	2
0800	0	0	3	0	0	0	3	0	0	5	0	0	0	5
0815	0	0	7	0	0	0	7	0	0	1	0	0	0	1
0830	0	0	4	0	0	0	4	0	0	2	0	0	0	2
0845	0	0	7	0	0	0	7	0	0	6	1	0	0	7
0900	0	0	9	0	0	0	9	0	0	2	0	0	0	2
0915	0	0	4	0	0	0	4	0	0	1	0	0	0	1
0930	0	0	2	1	0	0	3	0	0	1	0	0	0	1
0945	0	0	13	0	0	0	13	0	0	1	1	0	0	2
1000	0	0	11	0	0	0	11	0	0	8	0	0	0	8
1015	0	0	3	0	0	0	3	0	0	4	0	0	0	4
1030	0	0	4	0	0	0	4	0	0	4	0	0	0	4
1045	0	0	20	0	0	0	20	0	0	3	0	0	0	3
1100	0	0	20	0	1	0	21	0	0	18	0	0	0	18
1115	0	0	19	0	0	0	19	0	0	2	0	0	0	2
1130	0	0	30	0	0	0	30	0	0	27	0	0	0	27
1145	0	0	20	0	1	0	21	0	0	25	0	0	0	25
1200	0	0	10	1	0	0	11	0	0	39	1	1	0	41
1215	0	0	9	0	0	0	9	0	0	15	0	0	0	15
1230	0	0	5	0	0	0	5	0	0	13	0	0	0	13
1245	0	0	5	0	0	0	5	0	0	6	0	1	0	7
1300	0	0	5	0	0	0	5	0	0	3	0	0	0	3
1315	0	0	3	0	0	0	3	0	0	1	0	0	0	1
1330	0	0	3	0	0	0	3	0	0	4	0	0	0	4
1345	0	0	8	0	0	0	8	0	0	9	0	0	0	9
1400	0	0	1	0	0	0	1	0	0	12	0	0	0	12
1415	0	0	3	0	0	0	3	0	0	4	0	0	0	4
1430	0	0	1	0	0	0	1	0	0	2	0	0	0	2
1445	0	0	2	0	0	0	2	0	0	1	0	0	0	1
1500	0	0	3	0	0	0	3	0	0	5	0	0	0	5
1515	0	0	4	0	0	0	4	0	0	11	0	0	0	11
1530	0	0	1	0	0	0	1	0	0	2	0	0	0	2
1545	0	0	7	0	0	0	7	0	0	5	0	0	0	5
1600	0	0	1	0	0	0	1	0	0	3	0	0	0	3
1615	0	0	4	0	0	0	4	0	0	2	0	0	0	2
1630	0	0	2	0	0	0	2	0	0	5	0	0	0	5
1645	0	0	12	0	0	0	12	0	0	11	0	0	0	11
1700	0	0	7	1	0	0	8	0	0	7	1	0	0	8
1715	0	0	10	0	0	0	10	0	0	5	0	0	0	5
1730	0	0	14	0	0	0	14	0	0	6	0	0	0	6
1745	0	0	8	0	0	0	8	0	0	4	0	0	0	4
1800	0	0	8	0	0	0	8	0	0	7	0	0	0	7
1815	0	0	7	0	0	0	7	0	0	3	0	0	0	3
1830	0	0	5	0	0	0	5	0	0	21	0	0	0	21
1845	0	0	3	0	0	0	3	0	0	6	0	0	0	6
1900	0	0	4	0	0	0	4	0	0	7	0	0	0	7
1915	0	0	3	0	0	0	3	0	0	10	0	0	0	10
1930	0	0	10	0	0	0	10	0	0	3	0	0	0	3
1945	0	0	1	0	0	0	1	0	0	6	0	0	0	6
2000	0	0	2	0	0	0	2	0	0	2	0	0	0	2
2015	0	0	2	0	0	0	2	0	0	1	0	0	0	1
2030	0	0	3	0	0	0	3	0	0	4	0	0	0	4
2045	0	0	9	0	0	0	9	0	0	7	0	0	0	7
2100	0	0	2	0	0	0	2	0	0	10	0	0	0	10
2115	0	0	6	0	0	0	6	0	0	1	0	0	0	1
2130	0	0	9	0	0	0	9	0	0	10	0	0	0	10
2145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2245	0	0	0	0	0	0	0	0	0	1	0	0	0	1
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**394**	**3**	**2**	**0**	**399**	**0**	**0**	**388**	**4**	**2**	**0**	**394**

Volume Report

Job 1093_3_MM_ATR 1
Area Swansea, MA
Location Stoico/Firstfed YMCA, 271 Sharps Lot Road

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequests@BostonTrafficData.com
www.BostonTrafficData.com

Thursday, November 17, 2022

Time	In Bike	In Motorcycle	In Automobile	In Bus	In Single-Unit Truck	In Multi-Unit Truck	In Total Volume	Out Bike	Out Motorcycle	Out Automobile	Out Bus	Out Single-Unit Truck	Out Multi-Unit Truck	Out Total Volume
0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0415	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0430	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0445	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0500	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0515	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0530	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0545	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0600	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0615	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0630	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0645	0	0	9	0	0	0	9	0	0	0	0	0	0	0
0700	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0715	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0730	0	0	2	0	0	0	2	0	0	1	0	0	0	1
0745	0	0	2	0	0	0	2	0	0	5	0	0	0	5
0800	0	0	2	0	0	0	2	0	0	1	0	0	0	1
0815	0	0	6	0	0	0	6	0	0	0	0	0	0	0
0830	0	0	5	0	0	0	5	0	0	1	0	0	0	1
0845	0	0	10	0	0	0	10	0	0	8	1	0	0	9
0900	0	0	16	0	0	1	17	0	0	1	0	0	0	1
0915	0	0	5	0	0	0	5	0	0	1	0	0	1	2
0930	0	0	5	0	0	0	5	0	0	2	0	0	0	2
0945	0	0	10	0	0	0	10	0	0	3	0	0	0	3
1000	0	0	6	0	1	0	7	0	0	15	0	0	1	16
1015	0	1	3	0	0	0	4	0	0	2	0	0	0	2
1030	0	0	2	0	0	0	2	0	0	2	0	0	0	2
1045	0	0	16	0	0	0	16	0	0	1	0	0	0	1
1100	0	0	17	0	0	0	17	0	0	8	0	0	0	8
1115	0	0	3	0	0	0	3	0	0	4	0	0	0	4
1130	0	0	3	0	0	0	3	0	1	6	0	0	0	7
1145	0	0	2	0	0	0	2	0	0	7	0	0	0	7
1200	0	0	1	0	0	0	1	0	0	8	0	0	0	8
1215	0	0	5	0	0	0	5	0	0	10	0	0	0	10
1230	0	0	1	0	0	0	1	0	0	7	0	0	0	7
1245	0	0	3	0	0	0	3	0	0	1	0	0	0	1
1300	0	0	4	0	0	0	4	0	0	6	0	0	0	6
1315	0	0	0	0	0	0	0	0	0	8	0	0	0	8
1330	0	0	3	0	0	0	3	0	0	10	0	0	0	10
1345	0	0	0	0	0	0	0	0	0	3	0	0	0	3
1400	0	0	0	0	0	0	0	0	0	1	0	0	0	1
1415	0	0	3	0	0	0	3	0	0	6	0	0	0	6
1430	0	0	3	0	0	0	3	0	0	1	0	0	0	1
1445	0	0	2	0	0	0	2	0	0	1	0	0	0	1
1500	0	0	3	0	0	0	3	0	0	5	0	0	0	5
1515	0	0	4	0	0	0	4	0	0	9	1	0	0	10
1530	0	0	3	0	0	0	3	0	0	6	0	0	0	6
1545	0	0	8	0	0	0	8	0	0	2	0	0	0	2
1600	0	0	6	0	0	0	6	0	0	4	0	0	0	4
1615	0	0	2	0	0	0	2	0	0	5	0	0	0	5
1630	0	0	6	0	0	0	6	0	0	3	0	0	0	3
1645	0	0	8	0	0	0	8	0	0	8	0	0	0	8
1700	0	0	8	1	0	0	9	0	0	9	1	0	0	10
1715	0	0	4	0	0	0	4	0	0	2	0	0	0	2
1730	0	0	11	0	1	0	12	0	0	5	0	1	0	6
1745	0	0	14	0	0	0	14	0	0	8	0	0	0	8
1800	0	0	6	0	0	0	6	0	0	12	0	0	0	12
1815	0	0	15	0	0	0	15	0	0	3	0	0	0	3
1830	0	0	6	0	0	0	6	0	0	11	0	0	0	11
1845	0	0	13	0	0	0	13	0	0	10	0	0	0	10
1900	0	0	8	0	0	0	8	0	0	17	0	0	0	17
1915	0	0	7	0	0	0	7	0	0	11	0	0	0	11
1930	0	0	1	0	0	0	1	0	0	3	0	0	0	3
1945	0	0	4	0	0	0	4	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	6	0	0	0	6
2015	0	0	4	0	0	0	4	0	0	3	0	0	0	3
2030	0	0	3	0	0	0	3	0	0	7	0	0	0	7
2045	0	0	11	0	0	0	11	0	0	5	0	0	0	5
2100	0	0	1	0	0	0	1	0	0	17	0	0	0	17
2115	0	0	3	0	0	0	3	0	0	0	0	0	0	0
2130	0	0	1	0	0	0	1	0	0	6	0	0	0	6
2145	0	0	0	0	0	0	0	0	0	2	0	0	0	2
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2230	0	0	0	0	0	0	0	0	0	1	0	0	0	1
2245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**1**	**311**	**1**	**2**	**1**	**316**	**0**	**1**	**310**	**3**	**1**	**2**	**317**

Volume Report

Job 1093_3_MM_ATR 1
Area Swansea, MA
Location Stoico/Firstfed YMCA, 271 Sharps Lot Road

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Friday, November 18, 2022

Time	In Bike	In Motorcycle	In Automobile	In Bus	In Single-Unit Truck	In Multi-Unit Truck	In Total Volume	Out Bike	Out Motorcycle	Out Automobile	Out Bus	Out Single-Unit Truck	Out Multi-Unit Truck	Out Total Volume
0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0415	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0430	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0445	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0500	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0515	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0530	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0545	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0600	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0615	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0630	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0645	0	0	4	0	0	0	4	0	0	0	0	0	0	0
0700	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0715	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0730	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0745	0	0	1	0	0	0	1	0	0	1	0	0	0	1
0800	0	0	3	0	0	0	3	0	0	3	0	0	0	3
0815	0	0	4	0	0	0	4	0	0	0	0	0	0	0
0830	0	0	11	0	0	0	11	0	0	0	0	0	0	0
0845	0	0	13	0	0	0	13	0	0	9	1	0	0	10
0900	0	0	8	0	0	0	8	0	0	0	0	0	0	0
0915	0	0	2	0	0	0	2	0	0	2	0	0	0	2
0930	0	0	10	0	0	0	10	0	0	1	0	0	0	1
0945	0	0	19	1	0	0	20	0	0	6	1	0	0	7
1000	0	0	3	0	0	0	3	0	0	3	0	0	0	3
1015	0	0	6	0	0	0	6	0	0	4	0	0	0	4
1030	0	0	6	0	0	0	6	0	0	4	0	0	0	4
1045	0	0	19	0	0	0	19	0	0	13	0	0	0	13
1100	0	0	8	0	0	0	8	0	0	16	0	0	0	16
1115	0	0	6	0	0	0	6	0	0	3	0	0	0	3
1130	0	0	1	0	0	0	1	0	0	0	0	0	0	0
1145	0	0	2	0	1	0	3	0	0	3	0	0	0	3
1200	0	0	1	0	0	0	1	0	0	10	0	1	0	11
1215	0	0	2	1	0	0	3	0	0	8	0	0	0	8
1230	0	0	3	0	0	0	3	0	0	2	1	0	0	3
1245	0	0	3	0	0	0	3	0	0	6	0	0	0	6
1300	0	0	1	0	0	0	1	0	0	7	0	0	0	7
1315	0	0	2	0	0	0	2	0	0	3	0	0	0	3
1330	0	0	1	0	0	0	1	0	0	8	0	0	0	8
1345	0	0	0	0	0	0	0	0	0	4	0	0	0	4
1400	0	0	3	0	0	0	3	0	0	4	0	0	0	4
1415	0	0	4	0	0	0	4	0	0	1	0	0	0	1
1430	0	0	5	0	0	0	5	0	0	6	0	0	0	6
1445	0	0	1	0	0	0	1	0	0	1	0	0	0	1
1500	0	0	1	0	0	0	1	0	0	8	1	0	0	9
1515	0	0	3	0	0	0	3	0	0	11	0	0	0	11
1530	0	0	4	0	0	0	4	0	0	5	0	0	0	5
1545	0	0	6	0	0	0	6	0	0	4	0	0	0	4
1600	0	0	3	0	0	0	3	0	0	2	0	0	0	2
1615	0	0	5	0	0	0	5	0	0	3	0	0	0	3
1630	0	0	5	0	0	0	5	0	0	2	0	0	0	2
1645	0	0	0	1	0	0	1	0	0	3	0	0	0	3
1700	0	0	1	0	0	0	1	0	0	4	1	0	0	5
1715	0	0	3	0	0	0	3	0	0	1	0	0	0	1
1730	0	0	6	0	0	0	6	0	0	4	0	0	0	4
1745	0	0	6	0	0	0	6	0	0	2	0	0	0	2
1800	0	0	10	0	0	0	10	0	0	11	0	0	0	11
1815	0	0	5	0	0	0	5	0	0	8	0	0	0	8
1830	0	0	5	0	0	0	5	0	0	4	0	0	0	4
1845	0	0	5	0	0	0	5	0	0	5	0	0	0	5
1900	0	0	5	0	0	0	5	0	0	12	0	0	0	12
1915	0	0	1	0	0	0	1	0	0	5	0	0	0	5
1930	0	0	2	0	0	0	2	0	0	2	0	0	0	2
1945	0	0	3	0	0	0	3	0	0	3	0	0	0	3
2000	0	0	2	0	0	0	2	0	0	5	0	0	0	5
2015	0	0	1	0	0	0	1	0	0	1	0	0	0	1
2030	0	0	0	0	0	0	0	0	0	4	0	0	0	4
2045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2130	0	0	0	0	0	0	0	0	0	1	0	0	0	1
2145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**237**	**3**	**1**	**0**	**241**	**0**	**0**	**238**	**5**	**1**	**0**	**244**

Volume Report

Job 1093_3_MM_ATR 1
Area Swansea, MA
Location Stoico/Firstfed YMCA, 271 Sharps Lot Road

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequests@BostonTrafficData.com
www.BostonTrafficData.com

Saturday, November 19, 2022

Time	In Bike	In Motorcycle	In Automobile	In Bus	In Single-Unit Truck	In Multi-Unit Truck	In Total Volume	Out Bike	Out Motorcycle	Out Automobile	Out Bus	Out Single-Unit Truck	Out Multi-Unit Truck	Out Total Volume
0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0415	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0430	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0445	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0500	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0515	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0530	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0545	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0600	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0615	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0630	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0645	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0700	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0715	0	0	0	0	0	0	0	0	0	1	0	0	0	1
0730	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0745	0	0	2	0	0	0	2	0	0	0	0	0	0	0
0800	0	0	3	0	0	0	3	0	0	0	0	0	0	0
0815	0	0	6	0	0	0	6	0	0	0	0	0	0	0
0830	0	0	4	0	0	0	4	0	0	1	0	0	0	1
0845	0	0	13	0	0	0	13	0	0	0	0	0	0	0
0900	0	0	7	0	0	0	7	0	0	0	0	0	0	0
0915	0	0	8	0	0	0	8	0	0	4	0	0	0	4
0930	0	0	5	0	0	0	5	0	0	5	0	0	0	5
0945	0	0	4	0	0	0	4	0	0	3	0	0	0	3
1000	0	0	7	0	0	0	7	0	0	16	0	0	0	16
1015	0	0	3	0	0	0	3	0	0	9	0	0	0	9
1030	0	0	2	0	0	0	2	0	0	3	0	0	0	3
1045	0	0	6	0	0	0	6	0	0	5	0	0	0	5
1100	0	0	8	0	0	0	8	0	0	3	0	0	0	3
1115	0	0	16	0	0	0	16	0	0	9	0	0	0	9
1130	0	0	2	0	0	0	2	0	0	4	0	0	0	4
1145	0	0	4	0	0	0	4	0	0	2	0	0	0	2
1200	0	0	4	0	0	0	4	0	0	5	0	0	0	5
1215	0	0	3	0	0	0	3	0	0	5	0	0	0	5
1230	0	0	1	0	0	0	1	0	0	12	0	0	0	12
1245	0	0	4	0	0	0	4	0	0	9	0	0	0	9
1300	0	0	2	0	0	0	2	0	0	5	0	0	0	5
1315	0	0	3	0	0	0	3	0	0	3	0	0	0	3
1330	0	0	4	0	0	0	4	0	0	6	0	0	0	6
1345	0	0	3	0	0	0	3	0	0	7	0	0	0	7
1400	0	0	0	0	0	0	0	0	0	2	0	0	0	2
1415	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1430	0	0	1	0	0	0	1	0	0	0	0	0	0	0
1445	0	0	2	0	0	0	2	0	0	3	0	0	0	3
1500	0	0	1	0	0	0	1	0	0	3	0	0	0	3
1515	0	0	2	0	0	0	2	0	0	1	0	0	0	1
1530	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1545	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1615	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1630	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1645	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1715	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1730	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1745	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1815	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1830	0	0	1	0	0	0	1	0	0	1	0	0	0	1
1845	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1900	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1915	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1930	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1945	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2145	0	0	1	0	0	0	1	0	0	0	0	0	0	0
2200	0	0	0	0	0	0	0	0	0	1	0	0	0	1
2215	0	0	1	0	0	0	1	0	0	0	0	0	0	0
2230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**133**	**0**	**0**	**0**	**133**	**0**	**0**	**128**	**0**	**0**	**0**	**128**

Volume Report

Job 1093_3_MM_ATR 1
Area Swansea, MA
Location Stoico/Firstfed YMCA, 271 Sharps Lot Road

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequests@BostonTrafficData.com
www.BostonTrafficData.com

Sunday, November 20, 2022

Time	In Bike	In Motorcycle	In Automobile	In Bus	In Single-Unit Truck	In Multi-Unit Truck	In Total Volume	Out Bike	Out Motorcycle	Out Automobile	Out Bus	Out Single-Unit Truck	Out Multi-Unit Truck	Out Total Volume
0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0245	0	0	0	0	1	0	1	0	0	0	0	0	0	0
0300	0	0	0	0	0	0	0	0	0	0	0	1	0	1
0315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0415	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0430	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0445	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0500	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0515	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0530	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0545	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0600	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0615	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0630	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0645	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0700	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0715	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0730	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0745	0	0	3	0	0	0	3	0	0	0	0	0	0	0
0800	0	0	4	0	0	0	4	0	0	0	0	0	0	0
0815	0	0	6	0	0	0	6	0	0	1	0	0	0	1
0830	0	0	2	0	0	0	2	0	0	0	0	0	0	0
0845	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0900	0	0	5	0	0	0	5	0	0	1	0	0	0	1
0915	0	0	16	0	0	0	16	0	0	6	0	0	0	6
0930	0	0	9	0	0	0	9	0	0	3	0	0	0	3
0945	0	0	13	0	0	0	13	0	0	2	0	0	0	2
1000	0	0	7	0	0	0	7	0	0	1	0	0	0	1
1015	0	0	11	0	0	0	11	0	0	12	0	0	0	12
1030	0	0	9	0	0	0	9	0	0	4	0	0	0	4
1045	0	0	7	0	0	0	7	0	0	3	0	0	0	3
1100	0	0	8	0	0	0	8	0	0	9	0	0	0	9
1115	0	0	6	0	0	0	6	0	0	15	0	0	0	15
1130	0	0	4	0	0	0	4	0	0	1	0	0	0	1
1145	0	0	6	0	0	0	6	0	0	4	0	0	0	4
1200	0	0	4	0	0	0	4	0	0	8	0	0	0	8
1215	0	0	8	0	0	0	8	0	0	4	0	0	0	4
1230	0	0	1	0	0	0	1	0	0	15	0	0	0	15
1245	0	0	3	0	0	0	3	0	0	7	0	0	0	7
1300	0	0	1	0	0	0	1	0	0	19	0	0	0	19
1315	0	0	1	0	0	0	1	0	0	0	0	0	0	0
1330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1345	0	0	0	0	0	0	0	0	0	12	0	0	0	12
1400	0	0	1	0	0	0	1	0	0	8	0	0	0	8
1415	0	0	1	0	0	0	1	0	0	1	0	0	0	1
1430	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1445	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1515	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1530	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1545	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1615	0	0	2	0	0	0	2	0	0	1	0	0	0	1
1630	0	0	0	0	0	0	0	0	0	1	0	0	0	1
1645	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1715	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1730	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1745	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1815	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1830	0	0	1	0	0	0	1	0	0	1	0	0	0	1
1845	0	0	1	0	0	0	1	0	0	1	0	0	0	1
1900	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1915	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1930	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1945	0	0	1	0	0	0	1	0	0	1	0	0	0	1
2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**142**	**0**	**1**	**0**	**143**	**0**	**0**	**141**	**0**	**1**	**0**	**142**

Volume Report

Job 1093_3_MM_ATR 2
Area Middleborough, MA
Location Old Colony YMCA, 61 East Grove Street

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Sunday, October 30, 2022

Time	In Bike	In Motorcycle	In Automobile	In Bus	In Single-Unit Truck	In Multi-Unit Truck	In Total Volume	Out Bike	Out Motorcycle	Out Automobile	Out Bus	Out Single-Unit Truck	Out Multi-Unit Truck	Out Total Volume
0000	0	0	0	0	0	0	0	0	0	1	0	0	0	1
0015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0415	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0430	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0445	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0500	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0515	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0530	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0545	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0600	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0615	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0630	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0645	0	0	4	0	0	0	4	0	0	1	0	0	0	1
0700	0	0	6	0	0	0	6	0	0	0	0	0	0	0
0715	0	0	6	0	0	0	6	0	0	0	0	0	0	0
0730	0	0	3	0	0	0	3	0	0	0	0	0	0	0
0745	0	0	8	0	0	0	8	0	0	7	0	0	0	7
0800	0	0	9	0	0	0	9	0	0	5	0	0	0	5
0815	0	0	5	0	0	0	5	0	0	8	0	0	0	8
0830	0	0	4	0	0	0	4	0	0	5	0	0	0	5
0845	0	0	8	0	0	0	8	0	0	2	0	0	0	2
0900	0	0	19	0	0	0	19	0	0	3	0	0	0	3
0915	0	0	18	0	0	0	18	0	0	5	0	0	0	5
0930	0	0	18	0	0	0	18	0	0	5	0	0	0	5
0945	0	0	12	0	0	0	12	0	0	5	0	0	0	5
1000	0	0	17	0	0	0	17	0	0	12	0	0	0	12
1015	0	0	12	0	0	0	12	0	0	24	0	0	0	24
1030	0	0	10	0	0	0	10	0	0	10	0	0	0	10
1045	0	0	15	0	0	0	15	0	0	13	0	0	0	13
1100	0	0	10	0	0	0	10	0	0	13	0	0	0	13
1115	0	0	8	0	0	0	8	0	0	17	0	0	0	17
1130	0	0	6	0	0	0	6	0	0	15	0	0	0	15
1145	1	0	7	0	0	0	8	0	0	12	0	0	0	12
1200	0	0	2	0	0	0	2	0	0	6	0	0	0	6
1215	0	0	9	0	0	0	9	1	0	11	0	0	0	12
1230	0	0	9	0	0	0	9	0	0	8	0	0	0	8
1245	0	0	6	0	0	0	6	0	0	12	0	0	0	12
1300	0	0	3	0	0	0	3	0	0	4	0	0	0	4
1315	0	0	8	0	0	0	8	0	0	7	0	0	0	7
1330	0	0	10	0	0	0	10	0	0	11	0	0	0	11
1345	0	0	10	0	0	0	10	0	0	5	0	0	0	5
1400	0	0	33	0	1	0	34	0	0	6	0	0	0	6
1415	0	0	23	0	0	0	23	0	0	6	0	0	0	6
1430	0	0	11	0	0	0	11	0	0	7	0	0	0	7
1445	0	0	11	0	0	0	11	0	0	7	0	0	0	7
1500	0	0	5	0	0	0	5	0	0	12	0	0	0	12
1515	0	0	2	0	0	0	2	0	0	2	0	0	0	2
1530	0	0	1	0	0	0	1	0	0	0	0	0	0	0
1545	0	0	4	0	0	0	4	0	0	4	0	0	0	4
1600	0	0	2	0	0	0	2	0	0	2	0	0	0	2
1615	0	0	1	0	0	0	1	0	0	0	0	0	0	0
1630	0	0	1	0	0	0	1	0	0	4	0	0	0	4
1645	0	0	2	0	0	0	2	0	0	22	0	0	0	22
1700	0	0	3	0	0	0	3	0	0	24	0	0	0	24
1715	0	0	1	0	0	0	1	0	0	16	0	0	0	16
1730	0	0	0	0	0	0	0	0	0	10	0	0	0	10
1745	0	0	2	0	0	0	2	0	0	9	0	0	0	9
1800	0	0	1	0	0	0	1	0	0	5	0	1	0	6
1815	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1830	0	0	0	0	0	0	0	0	0	4	0	0	0	4
1845	0	0	2	0	0	0	2	0	0	1	0	0	0	1
1900	0	0	0	0	0	0	0	0	0	1	0	0	0	1
1915	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1930	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1945	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2045	0	0	0	0	0	0	0	0	0	1	0	0	0	1
2100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**1**	**0**	**369**	**0**	**1**	**0**	**371**	**1**	**0**	**370**	**0**	**1**	**0**	**372**

Volume Report

Job 1093_3_MM_ATR 2
Area Middleborough, MA
Location Old Colony YMCA, 61 East Grove Street

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Monday, October 31, 2022

Time	In Bike	In Motorcycle	In Automobile	In Bus	In Single-Unit Truck	In Multi-Unit Truck	In Total Volume	Out Bike	Out Motorcycle	Out Automobile	Out Bus	Out Single-Unit Truck	Out Multi-Unit Truck	Out Total Volume
0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0415	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0430	0	0	2	0	0	0	2	0	0	0	0	0	0	0
0445	0	0	10	0	1	0	11	0	0	0	0	0	0	0
0500	0	0	8	0	0	0	8	0	0	0	0	0	0	0
0515	0	0	4	0	0	0	4	0	0	1	0	0	0	1
0530	0	0	4	0	0	0	4	0	0	5	0	1	0	6
0545	0	0	3	0	0	0	3	0	0	3	0	0	0	3
0600	0	0	4	0	0	0	4	0	0	4	0	0	0	4
0615	0	0	5	0	0	0	5	0	0	4	0	0	0	4
0630	0	0	4	0	0	0	4	0	0	8	0	0	0	8
0645	0	0	12	0	0	0	12	0	0	7	0	0	0	7
0700	0	0	11	0	0	0	11	0	0	8	0	0	0	8
0715	0	0	14	0	0	0	14	0	0	6	0	0	0	6
0730	0	0	11	0	0	0	11	0	0	8	0	0	0	8
0745	0	0	15	0	0	0	15	0	0	10	0	0	0	10
0800	0	0	28	0	0	0	28	0	0	7	1	0	0	8
0815	0	0	16	0	0	0	16	0	0	15	0	0	0	15
0830	0	0	22	0	0	0	22	0	0	14	0	0	0	14
0845	1	0	41	0	0	0	42	0	0	12	0	0	0	12
0900	0	0	33	1	0	0	34	0	0	27	0	0	0	27
0915	0	0	12	1	0	0	13	0	0	15	1	0	0	16
0930	0	0	11	0	0	0	11	0	0	7	0	0	0	7
0945	0	0	8	0	0	0	8	0	0	5	0	0	0	5
1000	0	0	11	1	0	0	12	0	0	24	1	0	0	25
1015	0	0	19	0	0	0	19	1	0	32	0	0	0	33
1030	0	0	13	0	0	0	13	0	0	21	0	0	0	21
1045	0	0	13	0	0	0	13	0	0	5	0	0	0	5
1100	0	0	8	1	0	0	9	0	0	11	1	0	0	12
1115	0	0	4	0	0	0	4	0	0	15	0	0	0	15
1130	0	0	5	0	0	0	5	0	0	27	0	0	0	27
1145	0	0	3	0	0	0	3	0	0	8	0	0	0	8
1200	0	0	5	0	0	0	5	0	0	7	0	0	0	7
1215	0	0	10	0	0	0	10	1	0	7	0	0	0	8
1230	0	0	4	0	0	0	4	0	0	9	0	0	0	9
1245	0	0	15	0	0	0	15	0	0	12	0	0	0	12
1300	0	0	4	0	0	0	4	0	0	7	0	0	0	7
1315	0	0	3	0	0	0	3	0	0	5	0	0	0	5
1330	0	0	4	0	0	0	4	0	0	3	0	0	0	3
1345	0	0	4	0	0	0	4	0	0	2	0	0	0	2
1400	0	0	8	0	0	0	8	0	0	10	0	0	0	10
1415	0	0	10	0	0	0	10	0	0	11	1	0	0	12
1430	0	0	9	1	0	0	10	0	0	8	1	0	0	9
1445	0	0	11	0	0	0	11	0	0	4	0	0	0	4
1500	0	0	9	0	0	0	9	0	0	10	0	0	0	10
1515	0	0	11	0	0	0	11	0	0	13	0	0	0	13
1530	0	0	10	0	0	0	10	0	0	9	0	0	0	9
1545	0	0	11	1	0	0	12	0	0	10	0	0	0	10
1600	0	0	20	0	0	0	20	0	0	16	0	0	0	16
1615	0	0	8	0	0	0	8	0	0	16	0	0	0	16
1630	0	0	17	0	0	0	17	0	0	18	0	0	0	18
1645	0	0	27	0	0	0	27	0	0	16	0	0	0	16
1700	0	0	14	0	0	0	14	0	0	16	0	0	0	16
1715	0	0	11	0	0	0	11	0	0	9	0	0	0	9
1730	0	0	7	0	0	0	7	0	0	13	0	0	0	13
1745	0	0	2	0	0	0	2	0	0	7	0	0	0	7
1800	0	0	7	0	0	0	7	0	0	12	0	0	0	12
1815	0	0	2	0	0	0	2	0	0	3	0	0	0	3
1830	0	0	14	0	0	0	14	0	0	14	0	0	0	14
1845	0	0	8	0	0	0	8	0	0	14	0	0	0	14
1900	0	0	4	0	0	0	4	0	0	6	0	0	0	6
1915	0	0	4	0	0	0	4	0	0	1	0	0	0	1
1930	0	0	11	0	0	0	11	0	0	6	0	0	0	6
1945	0	0	4	0	0	0	4	0	0	7	0	0	0	7
2000	0	0	3	0	0	0	3	0	0	7	0	0	0	7
2015	0	0	1	0	0	0	1	0	0	4	0	0	0	4
2030	0	0	5	0	0	0	5	0	0	5	0	0	0	5
2045	0	0	5	0	0	0	5	0	0	6	0	0	0	6
2100	0	0	1	0	0	0	1	0	0	10	0	0	0	10
2115	0	0	0	0	0	0	0	0	0	2	0	0	0	2
2130	0	0	0	0	0	0	0	0	0	6	0	0	0	6
2145	0	0	0	0	0	0	0	0	0	6	0	0	0	6
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2230	0	0	0	0	0	0	0	0	0	2	0	0	0	2
2245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**1**	**0**	**657**	**6**	**1**	**0**	**665**	**2**	**0**	**658**	**6**	**1**	**0**	**667**

Volume Report

Job 1093_3_MM_ATR 2
Area Middleborough, MA
Location Old Colony YMCA, 61 East Grove Street

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequests@BostonTrafficData.com
www.BostonTrafficData.com

Tuesday, November 1, 2022

Time	In Bike	In Motorcycle	In Automobile	In Bus	In Single-Unit Truck	In Multi-Unit Truck	In Total Volume	Out Bike	Out Motorcycle	Out Automobile	Out Bus	Out Single-Unit Truck	Out Multi-Unit Truck	Out Total Volume
0000	0	0	0	0	0	0	0	0	0	1	0	0	0	1
0015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0415	0	0	1	0	0	0	1	0	0	1	0	0	0	1
0430	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0445	0	0	5	0	0	0	5	0	0	0	0	0	0	0
0500	0	0	18	0	0	0	18	0	0	0	0	0	0	0
0515	0	0	10	0	0	0	10	0	0	2	0	0	0	2
0530	0	0	2	0	0	0	2	0	0	1	0	0	0	1
0545	0	0	4	0	0	0	4	0	0	5	0	0	0	5
0600	0	0	5	0	0	0	5	0	0	4	0	0	0	4
0615	0	0	5	0	0	0	5	0	0	10	0	0	0	10
0630	0	0	2	0	0	0	2	0	0	9	0	0	0	9
0645	0	0	16	0	0	0	16	0	0	13	0	0	0	13
0700	0	0	10	0	0	0	10	0	0	9	0	0	0	9
0715	0	0	11	0	0	0	11	0	0	7	0	0	0	7
0730	0	0	8	0	0	0	8	0	0	7	0	0	0	7
0745	0	0	16	0	0	0	16	0	0	11	0	0	0	11
0800	0	0	14	0	0	0	14	0	0	10	1	0	0	11
0815	0	0	15	0	0	0	15	0	0	11	0	0	0	11
0830	0	0	18	0	0	0	18	0	0	9	0	0	0	9
0845	0	0	37	0	0	0	37	0	0	14	0	0	0	14
0900	0	0	36	0	0	0	36	0	0	16	0	0	0	16
0915	0	0	8	1	0	0	9	0	0	12	0	0	0	12
0930	0	0	12	0	0	0	12	1	0	3	0	0	0	4
0945	0	0	7	0	0	0	7	0	0	6	0	0	0	6
1000	0	0	13	0	0	0	13	0	0	16	0	0	0	16
1015	0	0	22	0	0	0	22	0	0	37	0	0	0	37
1030	0	0	5	0	0	0	5	0	0	5	0	0	0	5
1045	0	0	11	0	0	0	11	0	0	12	0	0	0	12
1100	0	0	8	1	1	0	10	0	0	8	1	0	0	9
1115	0	0	11	0	0	0	11	0	0	12	0	0	0	12
1130	0	0	5	0	0	0	5	0	0	19	0	1	0	20
1145	0	0	7	0	0	0	7	0	0	21	0	0	0	21
1200	0	0	8	0	0	0	8	0	0	16	0	0	0	16
1215	0	0	10	0	0	0	10	0	0	6	0	0	0	6
1230	0	0	7	0	0	0	7	0	0	5	0	0	0	5
1245	0	0	9	0	0	0	9	0	0	9	0	0	0	9
1300	0	0	13	0	1	0	14	0	0	14	0	1	0	15
1315	0	0	5	0	0	0	5	0	0	11	0	0	0	11
1330	0	0	6	0	0	0	6	0	0	6	0	0	0	6
1345	0	0	7	0	1	0	8	0	0	4	0	0	0	4
1400	0	0	6	0	0	0	6	0	0	3	0	0	0	3
1415	0	0	8	0	0	0	8	0	0	6	1	1	0	8
1430	0	0	10	0	0	0	10	0	0	5	0	0	0	5
1445	0	0	13	0	0	0	13	0	0	11	0	0	0	11
1500	0	0	9	1	0	0	10	0	0	11	0	0	0	11
1515	0	0	11	0	0	0	11	0	0	13	1	0	0	14
1530	0	0	15	0	0	0	15	0	0	12	0	0	0	12
1545	0	0	11	1	0	0	12	0	0	11	0	0	0	11
1600	0	0	17	0	0	0	17	0	0	12	0	0	0	12
1615	1	0	16	0	0	0	17	0	0	18	0	0	0	18
1630	0	0	17	0	0	0	17	0	0	13	0	0	0	13
1645	0	0	42	0	0	0	42	0	0	25	0	0	0	25
1700	0	0	26	0	0	0	26	0	0	26	0	0	0	26
1715	0	0	19	0	0	0	19	0	0	14	0	0	0	14
1730	0	0	9	0	0	0	9	0	0	12	0	0	0	12
1745	0	0	19	0	0	0	19	0	0	23	0	0	0	23
1800	0	0	21	0	0	0	21	0	0	25	0	0	0	25
1815	0	0	20	0	0	0	20	0	0	10	0	0	0	10
1830	0	0	10	0	0	0	10	0	0	16	0	0	0	16
1845	0	0	15	0	0	0	15	0	0	6	0	0	0	6
1900	0	0	10	0	0	0	10	0	0	22	0	0	0	22
1915	0	0	8	0	0	0	8	0	0	11	0	0	0	11
1930	0	0	11	0	0	0	11	0	0	20	0	0	0	20
1945	0	0	10	0	0	0	10	0	0	13	0	0	0	13
2000	0	0	3	0	0	0	3	0	0	20	0	0	0	20
2015	0	0	0	0	0	0	0	0	0	10	0	0	0	10
2030	0	0	2	0	0	0	2	0	0	14	0	0	0	14
2045	0	0	2	0	0	0	2	0	0	14	0	0	0	14
2100	0	0	0	0	0	0	0	0	0	10	0	0	0	10
2115	0	0	0	0	0	0	0	0	0	1	0	0	0	1
2130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**1**	**0**	**768**	**4**	**3**	**0**	**776**	**1**	**0**	**769**	**4**	**3**	**0**	**777**

Volume Report

Job 1093_3_MM_ATR 2
Area Middleborough, MA
Location Old Colony YMCA, 61 East Grove Street

Wednesday, November 2, 2022

Time	In Bike	In Motorcycle	In Automobile	In Bus	In Single-Unit Truck	In Multi-Unit Truck	In Total Volume	Out Bike	Out Motorcycle	Out Automobile	Out Bus	Out Single-Unit Truck	Out Multi-Unit Truck	Out Total Volume
0000	0	0	0	0	0	0	0	0	0	1	0	0	0	1
0015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0200	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0400	0	0	0	0	0	0	0	0	0	1	0	0	0	1
0415	0	0	1	0	0	0	1	0	0	1	0	0	0	1
0430	0	0	2	0	0	0	2	0	0	0	0	0	0	0
0445	0	0	10	0	0	0	10	0	0	0	0	0	0	0
0500	0	0	15	0	0	0	15	0	0	0	0	0	0	0
0515	0	0	5	0	0	0	5	0	0	0	0	0	0	0
0530	0	0	1	0	0	0	1	0	0	5	0	0	0	5
0545	0	0	7	0	0	0	7	0	0	3	0	0	0	3
0600	0	0	5	0	0	0	5	0	0	5	0	0	0	5
0615	0	0	2	0	0	0	2	0	0	15	0	0	0	15
0630	0	0	5	0	0	0	5	0	0	9	0	0	0	9
0645	0	0	15	0	0	0	15	0	0	8	0	0	0	8
0700	0	0	15	0	0	0	15	0	0	4	0	0	0	4
0715	0	0	11	0	0	0	11	0	0	6	0	0	0	6
0730	0	0	11	0	0	0	11	0	0	11	0	0	0	11
0745	0	0	21	0	0	0	21	0	0	9	0	0	0	9
0800	0	0	17	0	0	0	17	0	0	23	0	0	0	23
0815	0	0	19	0	0	0	19	0	0	11	1	0	0	12
0830	0	0	25	0	0	0	25	0	0	9	0	0	0	9
0845	1	0	29	0	0	0	30	0	0	6	0	0	0	6
0900	0	0	35	0	0	0	35	0	0	22	0	0	0	22
0915	0	0	9	2	0	0	11	0	0	16	1	0	0	17
0930	0	0	7	0	0	0	7	0	0	9	0	0	0	9
0945	0	0	6	0	0	0	6	0	0	8	0	0	0	8
1000	0	0	5	1	0	0	6	0	0	16	1	0	0	17
1015	0	0	16	0	0	0	16	0	1	20	0	0	0	21
1030	0	0	15	0	0	0	15	0	0	22	0	0	0	22
1045	0	0	9	0	0	0	9	0	0	11	0	0	0	11
1100	0	0	6	1	0	0	7	0	0	7	0	0	0	7
1115	0	0	12	0	0	0	12	0	0	10	1	0	0	11
1130	0	0	9	0	0	0	9	0	0	9	0	0	0	9
1145	0	0	6	0	0	0	6	1	0	20	0	0	0	21
1200	1	0	3	0	0	0	4	1	0	14	0	0	0	15
1215	0	0	3	0	0	0	3	0	0	9	0	0	0	9
1230	0	0	3	0	0	0	3	0	0	10	0	0	0	10
1245	0	0	8	0	0	0	8	0	0	5	0	0	0	5
1300	0	0	11	0	0	0	11	0	0	6	0	0	0	6
1315	0	0	5	0	0	0	5	0	0	7	0	0	0	7
1330	0	0	7	0	0	0	7	0	0	5	0	0	0	5
1345	0	0	7	0	0	0	7	0	0	7	0	0	0	7
1400	0	0	4	0	0	0	4	0	0	5	1	0	0	6
1415	0	0	8	0	0	0	8	0	0	11	0	0	0	11
1430	0	0	3	0	0	0	3	0	0	13	0	0	0	13
1445	0	0	5	0	0	0	5	0	0	2	0	0	0	2
1500	0	0	9	1	0	0	10	0	0	8	1	0	0	9
1515	0	0	13	0	0	0	13	0	0	9	0	0	0	9
1530	0	0	14	0	0	0	14	0	0	9	0	0	0	9
1545	0	0	17	1	0	0	18	0	0	11	0	0	0	11
1600	0	0	14	0	0	0	14	0	0	14	0	0	0	14
1615	0	0	31	0	0	0	31	0	0	18	0	0	0	18
1630	0	0	21	0	0	0	21	0	0	12	0	0	0	12
1645	0	0	41	0	0	0	41	0	0	32	0	0	0	32
1700	0	0	28	0	0	0	28	0	0	20	0	0	0	20
1715	0	0	19	0	0	0	19	0	0	16	0	0	0	16
1730	0	0	15	0	0	0	15	0	0	11	0	0	0	11
1745	0	0	15	0	0	0	15	0	0	16	0	0	0	16
1800	0	0	16	0	0	0	16	0	0	39	0	0	0	39
1815	0	0	15	0	0	0	15	0	0	13	0	0	0	13
1830	0	0	7	0	0	0	7	0	0	23	0	0	0	23
1845	0	0	22	0	0	0	22	0	0	13	0	0	0	13
1900	0	0	12	0	0	0	12	0	0	21	0	0	0	21
1915	0	0	4	0	0	0	4	0	0	7	0	0	0	7
1930	0	0	5	0	0	0	5	0	0	15	0	0	0	15
1945	0	0	16	0	0	0	16	0	0	6	0	0	0	6
2000	0	0	5	0	0	0	5	0	0	24	0	0	0	24
2015	0	0	0	0	0	0	0	0	0	5	0	0	0	5
2030	0	0	2	0	0	0	2	0	0	2	0	0	0	2
2045	0	0	1	0	0	0	1	0	0	5	0	0	0	5
2100	0	0	0	0	0	0	0	0	0	14	0	0	0	14
2115	0	0	0	0	0	0	0	0	0	3	0	0	0	3
2130	0	0	0	0	0	0	0	0	0	2	0	0	0	2
2145	0	0	1	0	0	0	1	0	0	2	0	0	0	2
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2215	0	0	0	0	0	0	0	0	0	2	0	0	0	2
2230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**2**	**0**	**762**	**6**	**0**	**0**	**770**	**2**	**1**	**763**	**6**	**0**	**0**	**772**

Volume Report

Job 1093_3_MM_ATR 2
Area Middleborough, MA
Location Old Colony YMCA, 61 East Grove Street

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Thursday, November 3, 2022

Time	In Bike	In Motorcycle	In Automobile	In Bus	In Single-Unit Truck	In Multi-Unit Truck	In Total Volume	Out Bike	Out Motorcycle	Out Automobile	Out Bus	Out Single-Unit Truck	Out Multi-Unit Truck	Out Total Volume
0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0100	0	0	0	0	0	0	0	0	0	1	0	0	0	1
0115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0415	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0430	0	0	2	0	0	0	2	0	0	0	0	0	0	0
0445	0	0	13	0	0	0	13	0	0	0	0	0	0	0
0500	0	0	13	0	0	0	13	0	0	0	0	0	0	0
0515	0	0	5	0	0	0	5	0	0	0	0	0	0	0
0530	0	0	6	0	0	0	6	0	0	0	0	0	0	0
0545	0	0	4	0	0	0	4	0	0	6	0	0	0	6
0600	0	0	6	0	0	0	6	0	0	5	0	0	0	5
0615	0	0	4	0	0	0	4	0	0	12	0	0	0	12
0630	0	0	5	0	0	0	5	0	0	8	0	0	0	8
0645	0	0	15	0	0	0	15	0	0	10	0	0	0	10
0700	0	0	9	0	0	0	9	0	0	5	0	0	0	5
0715	0	0	12	0	0	0	12	0	0	14	0	0	0	14
0730	0	0	7	0	0	0	7	0	0	10	0	0	0	10
0745	0	0	10	0	0	0	10	0	0	9	0	0	0	9
0800	0	0	16	0	0	0	16	0	0	9	0	0	0	9
0815	0	0	18	0	0	0	18	0	0	17	1	0	0	18
0830	0	0	25	0	0	0	25	0	0	16	0	0	0	16
0845	0	0	33	0	0	0	33	0	0	14	0	0	0	14
0900	0	0	41	1	0	0	42	0	0	12	0	0	0	12
0915	0	0	11	0	0	0	11	0	0	9	0	0	0	9
0930	0	0	12	0	0	0	12	0	0	7	0	0	0	7
0945	0	0	12	0	0	0	12	0	0	10	0	0	0	10
1000	0	0	15	0	0	0	15	0	0	11	0	0	0	11
1015	0	0	21	0	0	0	21	0	0	26	0	0	0	26
1030	0	0	6	0	0	0	6	0	0	13	0	0	0	13
1045	0	0	8	0	1	0	9	0	0	10	0	1	0	11
1100	0	0	7	1	0	0	8	0	0	15	1	0	0	16
1115	0	0	5	0	0	0	5	0	0	16	0	0	0	16
1130	0	0	6	0	0	0	6	0	0	24	0	0	0	24
1145	0	0	12	0	0	0	12	0	0	18	0	0	0	18
1200	0	0	7	0	0	0	7	0	0	11	0	0	0	11
1215	0	0	7	0	0	0	7	0	0	7	0	0	0	7
1230	0	0	6	0	0	0	6	0	0	4	0	0	0	4
1245	0	0	7	0	0	0	7	0	0	12	0	0	0	12
1300	0	0	3	0	0	0	3	0	0	7	0	0	0	7
1315	0	0	5	0	0	0	5	0	0	6	0	0	0	6
1330	0	0	6	0	0	0	6	0	0	8	0	0	0	8
1345	0	0	2	0	0	0	2	0	0	2	0	0	0	2
1400	0	0	7	0	0	0	7	0	0	9	0	0	0	9
1415	0	0	4	0	0	0	4	0	0	4	1	0	0	5
1430	1	0	9	0	0	0	10	0	0	6	0	0	0	6
1445	0	0	8	0	0	0	8	0	0	3	0	1	0	4
1500	0	0	5	1	1	0	7	0	0	9	1	0	0	10
1515	0	0	11	0	0	0	11	0	0	10	0	1	0	11
1530	0	0	8	0	0	0	8	0	0	6	0	0	0	6
1545	0	0	12	1	0	0	13	0	0	9	0	0	0	9
1600	0	0	20	0	0	0	20	0	0	10	0	0	0	10
1615	0	0	18	0	0	0	18	0	0	11	0	0	0	11
1630	0	0	22	0	0	0	22	0	0	16	0	0	0	16
1645	0	0	35	0	0	0	35	0	0	17	0	0	0	17
1700	0	0	27	0	0	0	27	0	0	41	0	0	0	41
1715	0	0	15	0	0	0	15	0	0	11	0	0	0	11
1730	0	0	9	0	0	0	9	0	0	20	0	0	0	20
1745	0	0	3	0	0	0	3	0	0	20	0	0	0	20
1800	0	0	6	0	0	0	6	0	0	19	0	0	0	19
1815	0	0	8	0	0	0	8	0	0	8	0	0	0	8
1830	0	0	6	0	0	0	6	0	0	10	0	0	0	10
1845	0	0	6	0	0	0	6	0	0	8	0	0	0	8
1900	0	0	11	0	0	0	11	0	0	4	0	0	0	4
1915	0	0	4	0	0	0	4	0	0	9	0	0	0	9
1930	0	0	1	0	0	0	1	0	0	3	0	0	0	3
1945	1	0	5	0	0	0	6	0	0	1	0	0	0	1
2000	0	0	4	0	0	0	4	0	0	12	0	0	0	12
2015	0	0	2	0	0	0	2	0	0	9	0	0	0	9
2030	0	0	0	0	0	0	0	0	0	6	0	0	0	6
2045	0	0	0	0	0	0	0	0	0	3	0	0	0	3
2100	0	0	0	0	0	0	0	0	0	11	0	0	0	11
2115	0	0	0	0	0	0	0	0	0	2	0	0	0	2
2130	0	0	1	0	0	0	1	0	0	0	0	0	0	0
2145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**2**	**0**	**669**	**4**	**2**	**0**	**677**	**0**	**0**	**671**	**4**	**3**	**0**	**678**

Volume Report

Job 1093_3_MM_ATR 2
Area Middleborough, MA
Location Old Colony YMCA, 61 East Grove Street

Friday, November 4, 2022

Time	In Bike	In Motorcycle	In Automobile	In Bus	In Single-Unit Truck	In Multi-Unit Truck	In Total Volume	Out Bike	Out Motorcycle	Out Automobile	Out Bus	Out Single-Unit Truck	Out Multi-Unit Truck	Out Total Volume
0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0045	0	0	0	0	0	0	0	0	0	1	0	0	0	1
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0415	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0430	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0445	0	0	10	0	0	0	10	0	0	0	0	0	0	0
0500	0	0	14	0	0	0	14	0	0	0	0	0	0	0
0515	0	0	10	0	0	0	10	0	0	0	0	0	0	0
0530	0	0	4	0	0	0	4	0	0	3	0	0	0	3
0545	0	0	3	0	0	0	3	0	0	7	0	0	0	7
0600	0	0	4	0	0	0	4	0	0	5	0	0	0	5
0615	0	0	7	0	0	0	7	0	0	9	0	0	0	9
0630	0	0	5	0	0	0	5	0	0	5	0	0	0	5
0645	0	0	11	0	0	0	11	0	0	7	0	0	0	7
0700	0	0	6	0	0	0	6	0	0	11	0	0	0	11
0715	0	0	8	0	0	0	8	0	0	12	0	0	0	12
0730	0	0	11	0	0	0	11	0	0	7	0	0	0	7
0745	0	0	23	0	0	0	23	0	0	9	0	0	0	9
0800	0	0	13	0	0	0	13	0	0	9	1	0	0	10
0815	0	0	14	0	0	0	14	0	0	11	0	0	0	11
0830	0	0	28	0	0	0	28	0	0	10	0	0	0	10
0845	0	0	20	1	0	0	21	0	0	12	1	0	0	13
0900	0	0	31	1	0	0	32	0	0	18	0	0	0	18
0915	0	0	14	0	0	0	14	0	0	6	0	0	0	6
0930	0	0	13	0	0	0	13	0	0	12	0	0	0	12
0945	0	0	12	0	0	0	12	0	0	5	0	0	0	5
1000	0	0	8	0	0	0	8	0	0	12	0	0	0	12
1015	0	0	11	1	0	0	12	0	0	20	0	0	0	20
1030	0	0	7	0	0	0	7	0	0	18	1	0	0	19
1045	0	0	6	0	0	0	6	0	0	9	0	0	0	9
1100	0	0	11	1	0	0	12	0	0	13	1	0	0	14
1115	0	0	8	0	0	0	8	0	0	12	0	0	0	12
1130	0	0	11	0	0	0	11	0	0	12	0	0	0	12
1145	0	0	12	0	0	0	12	0	0	11	0	0	0	11
1200	0	0	5	0	0	0	5	0	0	9	0	0	0	9
1215	0	0	10	0	0	0	10	0	0	16	0	0	0	16
1230	0	0	6	0	0	0	6	0	0	13	0	0	0	13
1245	2	0	10	0	0	0	12	0	0	9	0	0	0	9
1300	0	0	5	0	0	0	5	0	0	9	0	0	0	9
1315	0	0	4	0	0	0	4	0	0	11	0	0	0	11
1330	0	0	5	0	0	0	5	0	0	7	0	0	0	7
1345	0	0	6	0	0	0	6	0	0	7	0	0	0	7
1400	0	0	6	0	0	0	6	0	0	6	1	0	0	7
1415	0	0	8	0	0	0	8	2	0	13	0	0	0	15
1430	0	0	7	0	0	0	7	0	0	4	0	0	0	4
1445	0	0	7	0	0	0	7	0	0	12	0	0	0	12
1500	0	0	4	1	0	0	5	0	0	8	1	0	0	9
1515	1	0	6	0	0	0	7	0	0	8	0	0	0	8
1530	1	0	9	0	0	0	10	1	0	8	0	0	0	9
1545	0	0	9	1	0	0	10	0	0	11	0	0	0	11
1600	0	0	19	0	0	0	19	0	0	11	0	0	0	11
1615	0	0	22	0	0	0	22	0	0	17	0	0	0	17
1630	0	0	19	0	0	0	19	0	0	17	0	0	0	17
1645	0	0	15	0	0	0	15	0	0	8	0	0	0	8
1700	0	0	11	0	0	0	11	0	0	20	0	0	0	20
1715	0	0	20	0	0	0	20	0	0	12	0	0	0	12
1730	0	0	14	0	0	0	14	0	0	13	0	0	0	13
1745	0	0	20	0	0	0	20	0	0	9	0	0	0	9
1800	0	0	11	0	0	0	11	0	0	20	0	0	0	20
1815	0	0	8	0	0	0	8	0	0	9	0	0	0	9
1830	0	0	4	0	0	0	4	0	0	6	0	0	0	6
1845	0	0	3	0	0	0	3	0	0	8	0	0	0	8
1900	0	0	5	0	0	0	5	0	0	11	0	0	0	11
1915	0	0	11	0	0	0	11	0	0	5	0	0	0	5
1930	0	0	8	0	0	0	8	0	0	20	0	0	0	20
1945	0	0	9	0	0	0	9	0	0	7	0	0	0	7
2000	0	0	4	0	0	0	4	0	0	13	0	0	0	13
2015	0	0	5	0	0	0	5	0	0	3	0	0	0	3
2030	0	0	1	0	0	0	1	0	0	12	0	0	0	12
2045	0	0	3	0	0	0	3	0	0	7	0	0	0	7
2100	0	0	2	0	0	0	2	0	0	7	0	0	0	7
2115	0	0	0	0	0	0	0	1	0	6	0	0	0	7
2130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2200	0	0	1	0	0	0	1	0	0	0	0	0	0	0
2215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2300	0	0	0	0	0	0	0	0	0	2	0	0	0	2
2315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2330	0	0	1	0	0	0	1	0	0	1	0	0	0	1
2345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**4**	**0**	**659**	**6**	**0**	**0**	**669**	**4**	**0**	**661**	**6**	**0**	**0**	**671**

Volume Report

Job 1093_3_MM_ATR 2
Area Middleborough, MA
Location Old Colony YMCA, 61 East Grove Street

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Saturday, November 5, 2022

Time	In Bike	In Motorcycle	In Automobile	In Bus	In Single-Unit Truck	In Multi-Unit Truck	In Total Volume	Out Bike	Out Motorcycle	Out Automobile	Out Bus	Out Single-Unit Truck	Out Multi-Unit Truck	Out Total Volume
0000	0	0	0	0	0	0	0	0	0	1	0	0	0	1
0015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0415	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0430	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0445	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0500	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0515	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0530	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0545	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0600	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0615	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0630	0	0	1	0	0	0	1	0	0	1	0	0	0	1
0645	0	0	22	0	0	0	22	0	0	2	0	0	0	2
0700	0	0	13	0	0	0	13	0	0	1	0	0	0	1
0715	0	0	3	0	0	0	3	0	0	0	0	0	0	0
0730	0	0	6	0	0	0	6	0	0	0	0	0	0	0
0745	0	0	11	0	0	0	11	0	0	3	0	0	0	3
0800	0	0	10	0	0	0	10	0	0	7	0	0	0	7
0815	1	0	5	0	0	0	6	0	0	8	0	0	0	8
0830	0	0	2	0	0	0	2	0	0	11	0	0	0	11
0845	0	0	18	0	0	0	18	0	0	9	0	0	0	9
0900	0	0	24	0	0	0	24	0	0	12	0	0	0	12
0915	0	0	11	0	0	0	11	0	0	6	0	0	0	6
0930	0	0	9	0	0	0	9	0	0	14	0	0	0	14
0945	0	0	23	0	0	0	23	0	0	15	0	0	0	15
1000	0	0	5	0	0	0	5	0	0	6	0	0	0	6
1015	0	0	8	0	0	0	8	0	0	18	0	0	0	18
1030	0	0	9	0	0	0	9	0	0	8	0	0	0	8
1045	0	0	15	0	0	0	15	0	0	24	0	0	0	24
1100	0	0	8	0	0	0	8	0	0	12	0	0	0	12
1115	1	0	9	0	0	0	10	0	0	5	0	0	0	5
1130	0	0	10	0	0	0	10	0	0	7	0	0	0	7
1145	0	0	10	0	0	0	10	0	0	16	0	0	0	16
1200	0	0	8	0	0	0	8	1	0	9	0	0	0	10
1215	0	0	9	0	0	0	9	1	0	10	0	0	0	11
1230	0	0	7	0	0	0	7	0	0	10	0	0	0	10
1245	0	0	5	0	0	0	5	0	0	14	0	0	0	14
1300	0	0	6	0	0	0	6	0	0	10	0	0	0	10
1315	0	0	7	0	0	0	7	0	0	4	0	0	0	4
1330	0	0	4	0	0	0	4	0	0	13	0	0	0	13
1345	0	0	3	0	0	0	3	0	0	2	0	0	0	2
1400	0	0	3	0	0	0	3	0	0	6	0	0	0	6
1415	0	0	4	0	0	0	4	0	0	8	0	0	0	8
1430	0	0	1	0	0	0	1	0	0	2	0	0	0	2
1445	0	0	3	0	0	0	3	0	0	7	0	0	0	7
1500	0	0	2	0	0	0	2	0	0	15	0	0	0	15
1515	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1530	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1545	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1615	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1630	0	0	1	0	0	0	1	0	0	1	0	0	0	1
1645	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1715	0	0	2	0	0	0	2	0	0	2	0	0	0	2
1730	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1745	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1815	0	0	1	0	0	0	1	0	0	1	0	0	0	1
1830	0	0	2	0	0	0	2	0	0	1	0	0	0	1
1845	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1900	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1915	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1930	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1945	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2045	0	0	0	0	0	0	0	0	0	1	0	0	0	1
2100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2215	0	0	1	0	0	0	1	0	0	1	0	0	0	1
2230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2245	0	0	1	0	0	0	1	0	0	1	0	0	0	1
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**2**	**0**	**302**	**0**	**0**	**0**	**304**	**2**	**0**	**304**	**0**	**0**	**0**	**306**

Volume Report

Job 1093_3_MM_ATR 3
Area Barnstable, MA
Location West Barnstable YMCA, 2245 Iyannough Road

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Sunday, October 30, 2022

Time	In Bike	In Motorcycle	In Automobile	In Bus	In Single-Unit Truck	In Multi-Unit Truck	In Total Volume	Out Bike	Out Motorcycle	Out Automobile	Out Bus	Out Single-Unit Truck	Out Multi-Unit Truck	Out Total Volume
0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0100	0	0	0	0	0	0	0	0	0	1	0	0	0	1
0115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0415	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0430	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0445	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0500	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0515	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0530	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0545	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0600	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0615	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0630	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0645	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0700	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0715	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0730	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0745	0	0	1	0	0	0	1	0	0	1	0	0	0	1
0800	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0815	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0830	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0845	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0900	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0915	0	0	2	0	0	0	2	0	0	0	0	0	0	0
0930	2	0	1	0	0	0	3	0	0	0	0	0	0	0
0945	0	0	8	0	0	0	8	0	0	0	0	0	0	0
1000	0	0	9	0	0	0	9	0	0	0	0	0	0	0
1015	0	0	1	0	0	0	1	0	0	1	0	0	0	1
1030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	0	0	2	0	0	0	2	0	0	7	0	0	0	7
1115	0	0	0	0	0	0	0	0	0	6	0	0	0	6
1130	0	0	5	0	0	0	5	0	0	3	0	0	0	3
1145	0	0	0	0	0	0	0	0	0	1	0	0	0	1
1200	0	0	3	0	0	0	3	0	0	4	0	0	0	4
1215	0	0	1	0	0	0	1	0	0	5	0	0	0	5
1230	0	0	5	0	0	0	5	0	0	3	0	0	0	3
1245	0	0	3	0	0	0	3	0	0	2	0	0	0	2
1300	0	0	4	0	0	0	4	0	0	5	0	0	0	5
1315	0	0	0	0	0	0	0	0	0	1	0	0	0	1
1330	0	0	0	0	0	0	0	0	0	1	0	0	0	1
1345	0	0	3	0	0	0	3	0	0	2	0	0	0	2
1400	0	0	3	0	0	0	3	0	0	1	0	0	0	1
1415	0	0	3	0	0	0	3	0	0	3	0	0	0	3
1430	0	0	0	0	0	0	0	0	0	1	0	0	0	1
1445	0	0	0	0	0	0	0	0	0	3	0	0	0	3
1500	0	0	3	0	0	0	3	0	0	9	0	0	0	9
1515	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1530	0	0	0	0	0	0	0	0	0	1	0	0	0	1
1545	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	1	0	0	0	1	0	0	1	0	0	0	1
1615	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1630	0	0	2	0	0	0	2	0	0	1	0	0	0	1
1645	0	0	0	0	0	0	0	0	0	2	0	0	0	2
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1715	1	0	1	0	0	0	2	1	0	0	0	0	0	1
1730	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1745	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1815	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1830	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1845	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1900	0	0	0	0	0	0	0	0	0	1	0	0	0	1
1915	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1930	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1945	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**3**	**0**	**61**	**0**	**0**	**0**	**64**	**1**	**0**	**66**	**0**	**0**	**0**	**67**

Volume Report

Job 1093_3_MM_ATR 3
Area Barnstable, MA
Location West Barnstable YMCA, 2245 Iyannough Road

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequests@BostonTrafficData.com
www.BostonTrafficData.com

Monday, October 31, 2022

Time	In Bike	In Motorcycle	In Automobile	In Bus	In Single-Unit Truck	In Multi-Unit Truck	In Total Volume	Out Bike	Out Motorcycle	Out Automobile	Out Bus	Out Single-Unit Truck	Out Multi-Unit Truck	Out Total Volume
0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0415	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0430	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0445	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0500	0	0	1	0	0	0	1	0	0	1	0	0	0	1
0515	0	0	4	0	1	0	5	0	0	0	0	0	0	0
0530	0	0	9	0	0	0	9	0	0	0	0	0	0	0
0545	0	0	5	0	0	0	5	0	0	1	0	0	0	1
0600	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0615	0	0	9	0	0	0	9	0	0	2	0	0	0	2
0630	0	0	7	0	0	0	7	0	0	2	0	0	0	2
0645	0	0	11	0	0	0	11	0	0	7	0	0	0	7
0700	0	0	3	2	0	0	5	0	0	7	1	0	0	8
0715	0	0	12	1	0	0	13	0	0	4	2	0	0	6
0730	0	0	14	0	0	0	14	0	0	8	0	0	0	8
0745	0	0	24	0	0	0	24	0	0	16	0	0	0	16
0800	0	0	17	1	0	0	18	0	0	22	0	0	0	22
0815	0	0	12	0	0	0	12	0	0	20	1	0	0	21
0830	0	0	12	2	0	0	14	0	0	13	1	0	0	14
0845	0	0	17	0	0	0	17	0	0	10	1	0	0	11
0900	0	0	18	0	0	0	18	0	0	17	0	0	0	17
0915	0	0	10	0	0	0	10	0	0	11	0	0	0	11
0930	0	0	2	0	0	0	2	0	0	5	0	0	0	5
0945	0	0	7	0	0	0	7	0	0	2	0	0	0	2
1000	0	0	20	0	0	0	20	0	0	7	0	0	0	7
1015	0	0	15	0	0	0	15	0	0	19	0	0	0	19
1030	1	0	14	0	0	0	15	0	0	11	0	0	0	11
1045	0	0	4	0	0	0	4	0	0	3	0	0	0	3
1100	0	0	4	0	1	0	5	0	0	5	0	1	0	6
1115	0	0	8	0	0	0	8	0	0	5	0	0	0	5
1130	0	0	5	0	1	0	6	0	0	24	0	1	0	25
1145	0	0	7	0	0	0	7	0	0	19	0	0	0	19
1200	0	0	5	0	0	0	5	0	0	11	0	0	0	11
1215	0	0	4	0	0	0	4	0	0	2	0	0	0	2
1230	0	0	5	0	0	0	5	0	0	7	0	0	0	7
1245	0	0	4	2	0	0	6	0	0	5	2	0	0	7
1300	0	0	1	0	0	0	1	0	0	7	0	0	0	7
1315	0	0	2	0	0	0	2	0	0	1	0	0	0	1
1330	0	0	1	0	0	0	1	0	0	1	0	0	0	1
1345	0	0	0	0	1	0	1	0	0	3	0	0	0	3
1400	0	0	0	0	0	0	0	0	0	1	0	1	0	2
1415	0	0	5	0	0	0	5	0	0	2	0	0	0	2
1430	0	0	8	0	0	0	8	0	0	8	0	0	0	8
1445	0	0	9	2	0	0	11	0	0	6	1	0	0	7
1500	0	0	5	0	0	0	5	0	0	10	1	0	0	11
1515	0	0	13	2	0	0	15	0	0	16	1	0	0	17
1530	0	0	11	1	1	0	13	0	0	6	2	1	0	9
1545	0	0	11	1	0	0	12	0	0	8	1	0	0	9
1600	0	0	10	2	0	0	12	0	0	8	1	0	0	9
1615	0	0	15	2	0	0	17	0	0	11	2	0	0	13
1630	0	0	4	0	0	0	4	0	0	16	1	0	0	17
1645	0	0	6	0	0	0	6	0	0	5	0	0	0	5
1700	0	0	9	0	0	0	9	0	0	10	0	0	0	10
1715	0	0	6	0	0	0	6	0	0	13	0	0	0	13
1730	0	0	6	0	0	0	6	0	0	3	0	0	0	3
1745	0	0	1	0	0	0	1	0	0	2	0	0	0	2
1800	0	0	4	0	0	0	4	0	0	8	0	0	0	8
1815	0	0	4	0	0	0	4	0	0	5	0	0	0	5
1830	0	0	0	0	0	0	0	0	0	5	0	0	0	5
1845	0	0	1	0	0	0	1	0	0	2	0	0	0	2
1900	0	0	1	0	0	0	1	0	0	1	0	0	0	1
1915	0	0	1	0	0	0	1	0	0	3	0	0	0	3
1930	0	0	2	0	0	0	2	0	0	4	0	0	0	4
1945	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	2	0	0	0	2
2015	0	0	1	0	0	0	1	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	4	0	0	0	4
2045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**1**	**0**	**427**	**18**	**5**	**0**	**451**	**0**	**0**	**437**	**18**	**4**	**0**	**459**

Volume Report

Job 1093_3_MM_ATR 3
Area Barnstable, MA
Location West Barnstable YMCA, 2245 Iyannough Road

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Tuesday, November 1, 2022

Time	In Bike	In Motorcycle	In Automobile	In Bus	In Single-Unit Truck	In Multi-Unit Truck	In Total Volume	Out Bike	Out Motorcycle	Out Automobile	Out Bus	Out Single-Unit Truck	Out Multi-Unit Truck	Out Total Volume
0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0015	0	0	0	0	0	0	0	0	0	1	0	0	0	1
0030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0415	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0430	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0445	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0500	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0515	0	0	4	0	0	0	4	0	0	0	0	0	0	0
0530	0	0	2	0	0	0	2	0	0	0	0	0	0	0
0545	0	0	2	0	0	0	2	0	0	0	0	0	0	0
0600	0	0	4	0	0	0	4	0	0	0	0	0	0	0
0615	0	0	17	0	0	0	17	0	0	3	0	0	0	3
0630	0	0	7	0	0	0	7	0	0	3	0	0	0	3
0645	0	0	10	0	0	0	10	0	0	2	0	0	0	2
0700	0	0	3	1	0	0	4	0	0	1	1	0	0	2
0715	0	0	10	1	0	0	11	0	0	7	1	0	0	8
0730	0	0	11	0	0	0	11	0	0	13	0	0	0	13
0745	0	0	26	0	0	0	26	0	0	18	0	0	0	18
0800	0	0	20	1	0	0	21	0	0	31	1	0	0	32
0815	0	0	9	0	0	0	9	0	0	6	0	0	0	6
0830	0	0	15	1	0	0	16	0	0	8	1	0	0	9
0845	0	0	22	1	0	0	23	0	0	12	1	0	0	13
0900	0	0	27	0	0	0	27	0	0	18	0	0	0	18
0915	0	0	12	0	0	0	12	0	0	9	0	0	0	9
0930	0	0	3	0	0	0	3	0	0	6	0	0	0	6
0945	0	0	5	0	0	0	5	0	0	4	0	0	0	4
1000	0	0	15	0	0	0	15	0	0	8	0	0	0	8
1015	0	0	3	0	0	0	3	0	0	15	0	0	0	15
1030	0	0	6	0	0	0	6	0	0	7	0	0	0	7
1045	0	0	6	0	0	0	6	0	0	8	0	0	0	8
1100	0	0	6	0	0	0	6	0	0	3	0	0	0	3
1115	0	0	5	0	0	0	5	0	0	2	0	0	0	2
1130	1	0	8	0	1	0	10	0	0	16	0	1	0	17
1145	0	0	2	0	0	0	2	0	0	7	0	0	0	7
1200	0	0	5	0	0	0	5	0	0	10	0	0	0	10
1215	0	0	4	0	0	0	4	0	0	6	0	0	0	6
1230	0	0	5	1	0	0	6	0	0	7	0	0	0	7
1245	0	0	10	0	0	0	10	0	0	10	1	0	0	11
1300	0	0	6	1	0	0	7	0	0	8	1	0	0	9
1315	0	0	5	0	0	0	5	0	0	6	0	0	0	6
1330	0	0	4	0	0	0	4	0	0	6	0	0	0	6
1345	0	0	4	0	0	0	4	1	0	7	0	0	0	8
1400	0	0	1	0	0	0	1	0	0	5	0	0	0	5
1415	0	0	3	0	0	0	3	0	0	4	0	0	0	4
1430	0	0	9	0	0	0	9	0	0	6	0	0	0	6
1445	0	0	13	2	0	0	15	0	0	8	2	0	0	10
1500	0	0	11	0	0	0	11	0	0	15	0	0	0	15
1515	0	0	25	2	0	0	27	0	0	16	2	0	0	18
1530	0	0	4	1	0	0	5	0	0	9	1	0	0	10
1545	0	0	11	1	0	0	12	0	0	8	1	0	0	9
1600	0	0	10	1	0	0	11	0	0	12	1	0	0	13
1615	0	0	14	2	1	0	17	0	0	14	2	1	0	17
1630	0	0	14	0	0	0	14	0	0	13	0	0	0	13
1645	0	0	31	1	0	0	32	0	0	18	1	0	0	19
1700	0	0	12	0	0	0	12	0	0	15	0	0	0	15
1715	0	0	12	0	0	0	12	0	0	19	0	0	0	19
1730	0	0	11	0	0	0	11	0	0	13	0	0	0	13
1745	0	0	21	0	0	0	21	0	0	12	0	0	0	12
1800	0	0	7	1	0	0	8	0	0	30	1	0	0	31
1815	0	0	8	0	0	0	8	0	0	3	0	0	0	3
1830	0	0	4	0	0	0	4	0	0	7	0	0	0	7
1845	0	0	10	0	0	0	10	0	0	3	0	0	0	3
1900	0	0	2	0	0	0	2	0	0	17	0	0	0	17
1915	0	0	4	0	0	0	4	0	0	11	0	0	0	11
1930	0	0	1	0	0	0	1	0	0	1	0	0	0	1
1945	0	0	6	0	0	0	6	0	0	2	0	0	0	2
2000	0	0	2	0	0	0	2	0	0	12	0	0	0	12
2015	0	0	1	0	0	0	1	0	0	6	0	0	0	6
2030	0	0	1	0	0	0	1	0	0	8	0	0	0	8
2045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**1**	**0**	**553**	**18**	**2**	**0**	**574**	**1**	**0**	**555**	**18**	**2**	**0**	**576**

Volume Report

Job 1093_3_MM_ATR 3
Area Barnstable, MA
Location West Barnstable YMCA, 2245 Iyannough Road

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequests@BostonTrafficData.com
www.BostonTrafficData.com

Wednesday, November 2, 2022

Time	In Bike	In Motorcycle	In Automobile	In Bus	In Single-Unit Truck	In Multi-Unit Truck	In Total Volume	Out Bike	Out Motorcycle	Out Automobile	Out Bus	Out Single-Unit Truck	Out Multi-Unit Truck	Out Total Volume
0000	0	0	0	0	0	0	0	0	0	1	0	0	0	1
0015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0415	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0430	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0445	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0500	0	0	1	0	0	0	1	0	0	1	0	0	0	1
0515	0	0	4	0	0	0	4	0	0	0	0	0	0	0
0530	0	0	10	0	0	0	10	0	0	0	0	0	0	0
0545	0	0	7	0	0	0	7	0	0	0	0	0	0	0
0600	0	0	2	0	0	0	2	0	0	0	0	0	0	0
0615	0	0	2	0	0	0	2	0	0	2	0	0	0	2
0630	0	0	8	0	0	0	8	0	0	1	0	0	0	1
0645	0	0	14	0	0	0	14	0	0	6	0	0	0	6
0700	0	0	7	0	0	0	7	0	0	10	0	0	0	10
0715	0	0	5	1	0	0	6	0	0	3	1	0	0	4
0730	0	0	10	0	0	0	10	0	0	5	0	0	0	5
0745	0	0	30	0	0	0	30	0	0	16	0	0	0	16
0800	0	0	23	1	0	0	24	0	0	29	1	0	0	30
0815	0	0	14	0	0	0	14	0	0	16	0	0	0	16
0830	0	0	16	1	1	0	18	0	0	6	1	1	0	8
0845	0	0	24	0	0	0	24	0	0	13	0	0	0	13
0900	0	0	20	0	0	0	20	0	0	23	0	0	0	23
0915	0	0	13	0	1	0	14	0	0	14	0	1	0	15
0930	0	0	1	0	0	0	1	0	0	13	0	0	0	13
0945	0	0	2	0	0	0	2	0	0	7	0	0	0	7
1000	0	0	14	0	0	0	14	0	0	4	0	0	0	4
1015	0	0	25	0	0	0	25	0	0	16	0	0	0	16
1030	0	0	14	0	0	0	14	0	0	4	0	0	0	4
1045	0	0	6	0	0	0	6	0	0	6	0	0	0	6
1100	0	0	4	1	0	0	5	0	0	3	0	0	0	3
1115	0	0	4	0	0	0	4	0	0	4	1	0	0	5
1130	0	0	8	1	0	0	9	0	0	28	0	0	0	28
1145	0	0	9	0	0	0	9	0	0	17	1	0	0	18
1200	1	0	0	2	0	0	3	0	0	7	2	0	0	9
1215	0	0	5	0	0	0	5	0	0	6	0	0	0	6
1230	0	0	8	3	0	0	11	0	0	6	3	0	0	9
1245	0	0	5	1	0	0	6	0	0	6	1	0	0	7
1300	0	0	1	1	0	0	2	0	0	10	1	0	0	11
1315	0	0	2	0	0	0	2	0	0	5	0	0	0	5
1330	0	0	3	0	0	0	3	0	0	2	0	0	0	2
1345	0	0	2	0	0	0	2	1	0	2	0	0	0	3
1400	0	0	7	0	0	0	7	0	0	3	0	0	0	3
1415	0	0	4	0	1	0	5	0	0	10	0	1	0	11
1430	0	0	4	0	0	0	4	0	0	3	0	0	0	3
1445	0	0	17	1	0	0	18	0	0	10	0	0	0	10
1500	0	0	10	0	0	0	10	0	0	16	1	0	0	17
1515	0	0	19	1	0	0	20	0	0	23	1	0	0	24
1530	0	0	3	0	0	0	3	0	0	4	0	0	0	4
1545	0	0	10	0	0	0	10	0	0	8	0	0	0	8
1600	0	0	8	0	0	0	8	0	0	8	0	0	0	8
1615	0	0	8	0	0	0	8	0	0	8	0	0	0	8
1630	0	0	12	1	0	0	13	0	0	7	0	0	0	7
1645	0	0	14	0	0	0	14	0	0	16	1	0	0	17
1700	0	0	14	0	0	0	14	0	0	11	0	0	0	11
1715	0	0	7	0	0	0	7	0	0	16	0	0	0	16
1730	0	0	6	0	0	0	6	0	0	6	0	0	0	6
1745	0	0	9	0	0	0	9	0	0	6	0	0	0	6
1800	1	0	2	0	0	0	3	0	0	13	0	0	0	13
1815	0	0	2	0	0	0	2	0	0	4	0	0	0	4
1830	0	0	0	0	0	0	0	0	0	8	0	0	0	8
1845	0	0	3	0	0	0	3	0	0	2	0	0	0	2
1900	0	0	5	0	0	0	5	0	0	4	0	0	0	4
1915	0	0	2	0	0	0	2	0	0	6	0	0	0	6
1930	0	0	3	0	0	0	3	0	0	3	0	0	0	3
1945	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	1	0	1	0	2
2015	0	0	0	0	0	0	0	0	0	1	0	0	0	1
2030	0	0	2	0	0	0	2	0	0	6	0	0	0	6
2045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**2**	**0**	**494**	**15**	**3**	**0**	**514**	**1**	**0**	**495**	**15**	**4**	**0**	**515**

Volume Report

Job 1093_3_MM_ATR 3
Area Barnstable, MA
Location West Barnstable YMCA, 2245 Iyannough Road

Thursday, November 3, 2022

Time	In Bike	In Motorcycle	In Automobile	In Bus	In Single-Unit Truck	In Multi-Unit Truck	In Total Volume	Out Bike	Out Motorcycle	Out Automobile	Out Bus	Out Single-Unit Truck	Out Multi-Unit Truck	Out Total Volume
0000	0	0	0	0	0	0	0	0	0	1	0	0	0	1
0015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0415	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0430	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0445	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0500	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0515	0	0	3	0	0	0	3	0	0	0	0	0	0	0
0530	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0545	0	0	2	0	0	0	2	0	0	0	0	0	0	0
0600	0	0	6	0	0	0	6	0	0	0	0	0	0	0
0615	0	0	17	0	0	0	17	0	0	3	0	0	0	3
0630	0	0	7	0	0	0	7	0	0	1	0	0	0	1
0645	0	0	10	0	0	0	10	0	0	2	0	0	0	2
0700	0	0	2	0	0	0	2	0	0	2	0	0	0	2
0715	0	0	13	1	0	0	14	0	0	5	1	0	0	6
0730	0	0	13	0	0	0	13	0	0	16	0	0	0	16
0745	0	0	22	0	0	0	22	0	0	18	0	0	0	18
0800	0	0	22	1	0	0	23	0	0	29	1	0	0	30
0815	0	0	14	0	0	0	14	0	0	15	0	0	0	15
0830	0	0	9	1	1	0	11	0	0	7	0	1	0	8
0845	0	0	24	1	0	0	25	0	0	8	2	0	0	10
0900	0	0	19	0	0	0	19	0	0	22	0	0	0	22
0915	0	0	14	0	0	0	14	0	0	16	0	0	0	16
0930	0	0	7	0	0	0	7	0	0	8	0	0	0	8
0945	0	0	10	0	0	0	10	0	0	7	0	0	0	7
1000	0	0	5	0	0	0	5	0	0	2	0	0	0	2
1015	0	0	5	0	0	0	5	0	0	10	0	0	0	10
1030	0	0	8	0	0	0	8	0	0	12	0	0	0	12
1045	0	0	1	0	0	0	1	0	0	5	0	0	0	5
1100	0	0	5	0	0	0	5	0	0	4	0	0	0	4
1115	0	0	2	0	0	0	2	0	0	6	0	0	0	6
1130	0	0	2	0	0	0	2	0	0	9	0	0	0	9
1145	0	0	12	0	0	0	12	0	0	8	0	0	0	8
1200	0	1	13	1	0	0	15	0	0	19	1	0	0	20
1215	0	0	4	0	0	0	4	0	0	7	0	0	0	7
1230	0	0	8	1	0	0	9	0	0	4	0	0	0	4
1245	0	0	6	1	0	0	7	0	0	5	2	0	0	7
1300	0	0	5	0	0	0	5	0	0	10	0	0	0	10
1315	0	0	5	0	0	0	5	0	0	2	0	0	0	2
1330	0	0	4	0	1	0	5	0	1	3	0	0	0	4
1345	0	0	4	0	0	0	4	0	0	2	0	1	0	3
1400	0	0	7	0	0	0	7	0	0	3	0	1	0	4
1415	0	0	4	0	0	0	4	0	0	3	0	0	0	3
1430	0	0	4	1	0	0	5	0	0	3	1	0	0	4
1445	0	0	15	1	0	0	16	0	0	9	1	0	0	10
1500	0	0	8	0	0	0	8	0	0	11	0	0	0	11
1515	0	0	4	1	0	0	5	0	0	2	1	0	0	3
1530	0	0	8	1	0	0	9	0	0	13	1	0	0	14
1545	0	0	7	1	0	0	8	0	0	8	1	0	0	9
1600	0	0	7	1	0	0	8	0	0	11	1	0	0	12
1615	0	1	13	1	0	0	15	0	0	9	1	0	0	10
1630	0	0	11	0	0	0	11	0	0	12	0	0	0	12
1645	0	0	11	1	0	0	12	0	0	8	1	0	0	9
1700	0	0	14	2	0	0	16	0	1	8	2	0	0	11
1715	0	1	5	1	0	0	7	0	1	18	1	0	0	20
1730	0	1	4	0	0	0	5	0	0	8	0	0	0	8
1745	0	0	6	0	0	0	6	0	0	14	0	0	0	14
1800	0	0	3	0	0	0	3	0	1	6	0	0	0	7
1815	0	0	8	0	0	0	8	0	0	5	0	0	0	5
1830	0	0	2	0	0	0	2	0	0	4	0	0	0	4
1845	0	0	3	0	0	0	3	0	0	5	0	0	0	5
1900	0	0	2	0	0	0	2	0	0	6	0	0	0	6
1915	0	0	0	0	0	0	0	0	0	4	0	0	0	4
1930	0	0	1	0	0	0	1	0	0	1	0	0	0	1
1945	0	0	1	0	0	0	1	0	0	1	0	0	0	1
2000	0	0	1	0	0	0	1	0	0	4	0	0	0	4
2015	0	0	0	0	0	0	0	0	0	3	0	0	0	3
2030	0	0	1	0	0	0	1	0	0	3	0	0	0	3
2045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2100	0	0	0	0	0	0	0	0	0	1	0	0	0	1
2115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**4**	**456**	**18**	**2**	**0**	**480**	**0**	**4**	**451**	**18**	**3**	**0**	**476**

Volume Report

Job 1093_3_MM_ATR 3
Area Barnstable, MA
Location West Barnstable YMCA, 2245 Iyannough Road

Friday, November 4, 2022

Time	In Bike	In Motorcycle	In Automobile	In Bus	In Single-Unit Truck	In Multi-Unit Truck	In Total Volume	Out Bike	Out Motorcycle	Out Automobile	Out Bus	Out Single-Unit Truck	Out Multi-Unit Truck	Out Total Volume
0000	0	0	0	0	0	0	0	0	0	1	0	0	0	1
0015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0415	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0430	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0445	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0500	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0515	0	0	5	0	0	0	5	0	0	0	0	0	0	0
0530	0	0	8	0	0	0	8	0	0	0	0	0	0	0
0545	0	0	4	0	0	0	4	0	0	0	0	0	0	0
0600	0	0	7	0	0	0	7	0	0	1	0	0	0	1
0615	0	0	8	0	0	0	8	0	0	2	0	0	0	2
0630	0	0	6	0	0	0	6	0	0	1	0	0	0	1
0645	0	0	15	0	0	0	15	0	0	7	0	0	0	7
0700	0	0	3	0	0	0	3	0	0	5	0	0	0	5
0715	0	0	6	1	0	0	7	0	0	3	1	0	0	4
0730	0	0	14	0	0	0	14	0	0	15	0	0	0	15
0745	0	0	21	0	0	0	21	0	0	15	0	0	0	15
0800	0	0	20	2	0	0	22	0	0	23	2	0	0	25
0815	0	0	21	0	0	0	21	0	0	15	0	0	0	15
0830	0	0	12	1	0	0	13	0	0	7	0	0	0	7
0845	0	0	28	0	1	0	29	0	0	10	1	0	0	11
0900	0	0	20	0	0	0	20	0	0	19	0	1	0	20
0915	0	0	11	0	0	0	11	0	0	13	0	0	0	13
0930	0	0	6	0	0	0	6	0	0	13	0	0	0	13
0945	0	0	4	0	0	0	4	0	0	7	0	0	0	7
1000	0	0	1	0	0	0	1	0	0	19	0	0	0	19
1015	0	0	3	0	0	0	3	0	0	5	0	0	0	5
1030	0	0	8	0	0	0	8	0	0	7	0	0	0	7
1045	0	0	7	0	0	0	7	0	0	5	0	0	0	5
1100	0	0	8	0	0	0	8	0	0	3	0	0	0	3
1115	0	0	6	0	0	0	6	0	0	2	0	0	0	2
1130	0	0	11	0	1	0	12	0	0	11	0	1	0	12
1145	0	0	12	0	0	0	12	0	0	10	0	0	0	10
1200	1	0	11	1	1	0	14	0	0	18	1	1	0	20
1215	0	0	11	0	0	0	11	0	0	15	0	0	0	15
1230	0	0	6	1	0	0	7	0	0	6	1	0	0	7
1245	0	0	3	0	0	0	3	0	0	6	0	0	0	6
1300	0	0	6	0	0	0	6	0	0	8	0	0	0	8
1315	0	0	3	0	0	0	3	0	0	10	0	0	0	10
1330	0	0	2	0	0	0	2	0	0	5	0	0	0	5
1345	0	0	3	0	0	0	3	0	0	4	0	0	0	4
1400	0	0	1	0	0	0	1	0	0	7	0	0	0	7
1415	0	0	3	0	0	0	3	0	0	1	0	0	0	1
1430	0	0	7	1	0	0	8	1	0	4	1	0	0	6
1445	0	0	12	1	0	0	13	0	0	8	1	0	0	9
1500	0	0	5	0	0	0	5	0	0	15	0	0	0	15
1515	0	0	5	1	0	0	6	0	0	4	1	0	0	5
1530	0	0	6	1	0	0	7	0	0	6	1	0	0	7
1545	0	0	8	1	0	0	9	0	0	5	1	0	0	6
1600	0	0	12	1	0	0	13	0	0	7	1	0	0	8
1615	0	0	9	2	0	0	11	0	0	11	2	0	0	13
1630	0	0	12	0	0	0	12	0	0	11	0	0	0	11
1645	0	0	12	0	0	0	12	0	0	11	0	0	0	11
1700	0	0	10	0	0	0	10	0	0	14	0	0	0	14
1715	0	0	7	1	0	0	8	0	0	14	1	0	0	15
1730	0	0	5	0	0	0	5	0	0	13	0	0	0	13
1745	0	0	6	0	0	0	6	0	0	5	0	0	0	5
1800	0	0	2	0	0	0	2	0	0	5	0	0	0	5
1815	0	0	4	0	0	0	4	0	0	5	0	0	0	5
1830	0	0	3	0	0	0	3	0	0	6	0	0	0	6
1845	0	0	2	0	0	0	2	0	0	1	0	0	0	1
1900	0	0	1	0	0	0	1	0	0	3	0	0	0	3
1915	0	0	1	0	0	0	1	0	0	1	0	0	0	1
1930	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1945	0	0	1	0	0	0	1	0	0	2	0	0	0	2
2000	0	0	3	0	0	0	3	0	0	2	0	0	0	2
2015	0	0	6	0	0	0	6	0	0	7	0	0	0	7
2030	0	0	0	0	0	0	0	0	0	7	0	0	0	7
2045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2345	0	0	1	0	0	0	1	0	0	1	0	0	0	1
Total	**1**	**0**	**465**	**15**	**3**	**0**	**484**	**1**	**0**	**467**	**15**	**3**	**0**	**486**

Volume Report

Job 1093_3_MM_ATR 3
Area Barnstable, MA
Location West Barnstable YMCA, 2245 Iyannough Road

Saturday, November 5, 2022

Time	In Bike	In Motorcycle	In Automobile	In Bus	In Single-Unit Truck	In Multi-Unit Truck	In Total Volume	Out Bike	Out Motorcycle	Out Automobile	Out Bus	Out Single-Unit Truck	Out Multi-Unit Truck	Out Total Volume
0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0200	0	0	1	0	0	0	1	0	0	1	0	0	0	1
0215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0415	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0430	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0445	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0500	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0515	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0530	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0545	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0600	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0615	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0630	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0645	0	0	2	0	0	0	2	0	0	1	0	0	0	1
0700	0	0	1	0	0	0	1	0	0	0	0	0	0	0
0715	0	0	22	0	0	0	22	0	0	0	0	0	0	0
0730	0	0	17	0	0	0	17	0	0	0	0	0	0	0
0745	0	0	1	0	0	0	1	0	0	1	0	0	0	1
0800	0	0	3	0	0	0	3	0	0	0	0	0	0	0
0815	0	0	3	0	0	0	3	0	0	1	0	0	0	1
0830	0	0	6	0	0	0	6	0	0	14	0	0	0	14
0845	0	0	5	0	0	0	5	0	0	14	0	0	0	14
0900	0	0	0	0	0	0	0	0	0	6	0	0	0	6
0915	0	1	5	0	0	0	6	0	0	5	0	0	0	5
0930	0	0	4	1	0	0	5	0	0	5	0	0	0	5
0945	0	0	5	0	0	0	5	0	0	10	1	0	0	11
1000	0	0	2	0	0	0	2	0	0	3	0	0	0	3
1015	0	0	6	0	0	0	6	0	0	5	0	0	0	5
1030	0	0	10	0	0	0	10	0	0	6	0	0	0	6
1045	0	0	3	0	0	0	3	0	0	6	0	0	0	6
1100	0	0	2	0	0	0	2	0	0	1	0	0	0	1
1115	0	0	7	0	0	0	7	0	0	5	0	0	0	5
1130	0	0	2	0	0	0	2	0	0	13	0	0	0	13
1145	0	0	4	0	0	0	4	0	0	2	0	0	0	2
1200	0	0	3	0	0	0	3	0	0	0	0	0	0	0
1215	0	0	5	0	0	0	5	0	0	1	0	0	0	1
1230	0	0	1	0	0	0	1	0	0	3	0	0	0	3
1245	0	0	6	0	0	0	6	0	0	5	0	0	0	5
1300	0	0	1	0	0	0	1	0	0	9	0	0	0	9
1315	0	0	4	0	0	0	4	0	1	1	0	0	0	2
1330	0	0	1	0	0	0	1	0	0	1	0	0	0	1
1345	0	0	0	0	0	0	0	0	0	6	0	0	0	6
1400	0	0	1	0	0	0	1	0	0	2	0	0	0	2
1415	0	0	2	0	0	0	2	0	0	2	0	0	0	2
1430	0	0	0	0	0	0	0	0	0	1	0	0	0	1
1445	0	0	1	0	0	0	1	0	0	2	0	0	0	2
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1515	0	0	1	0	0	0	1	0	0	3	0	0	0	3
1530	0	0	2	0	0	0	2	0	0	3	0	0	0	3
1545	0	0	2	0	0	0	2	0	0	2	0	0	0	2
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1615	0	0	2	0	0	0	2	0	0	0	0	0	0	0
1630	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1645	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	1	0	0	0	1
1715	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1730	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1745	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1800	0	0	2	0	0	0	2	0	0	2	0	0	0	2
1815	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1830	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1845	0	0	1	0	0	0	1	0	0	1	0	0	0	1
1900	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1915	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1930	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1945	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2145	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2215	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2230	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2245	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2315	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**1**	**146**	**1**	**0**	**0**	**148**	**0**	**1**	**144**	**1**	**0**	**0**	**146**

West Barnstable YMCA -
Summary of Usage Data

Date	Weekday Average		
	In	Out	Total
Jan-23	310	310	619
Feb-23	303	303	607
Mar-23	314	314	627
Apr-23	309	309	618
May-23	313	313	626
Jun-23	311	311	622

January to June Comparison
Weekday- 0.42%

APPENDIX G
Highway Capacity Manual Methodologies

CAPACITY/LEVEL-OF-SERVICE ANALYSES METHODOLOGY

The detailed capacity/level-of-service analysis contained in this traffic impact study was performed in accordance with the standard techniques contained in the *Highway Capacity Manual*.(1) By definition, capacity represents "the maximum rate of flow that can reasonably be expected to pass a point on a uniform section of a lane or roadway under prevailing roadway, traffic, and control conditions." The level of functioning of an intersection or a uniform section of a lane or roadway can be expressed in terms of levels of service. Level of service (LOS) is defined as "a qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers". Such measures include "speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety."

At unsignalized intersections, a methodology for evaluating the relative functioning of intersections controlled by stop or yield signs has been developed, and is based on several assumptions, including:

- Major street flows are not affected by the minor (stop-sign controlled) street movements.
- Left turns from the major street to the minor street are influenced only by opposing major street through flow.
- Minor street left turns are impeded by all major street traffic plus opposing minor street traffic.
- Minor street through traffic is impeded by all major street traffic.
- Minor street right turns are impeded only by the major street traffic coming from the left.

The concept of stop-controlled or yield-controlled intersection analysis is based on the estimate of average total delay on minor streets. The methodology of analysis relies on three elements: the size and distribution of gaps in the major traffic stream, the usefulness of these gaps to the minor stream drivers, and the relative priority of the various traffic streams at the intersection. The results of the analysis provide an estimate of average total delay for the various critical movements at the unsignalized intersections. Correlation between average total delay and the respective levels of service are provided for unsignalized intersections as follows:

---

(1) *Transportation Research Board, Highway Capacity Manual, 6th Edition, published by the Transportation Research Board, Washington, DC, 2016.*

Unsignalized Intersections

Level of Service	**Control Delay Per Vehicle (seconds)**
A	0 – 10
B	>10 – 15
C	>15 – 25
D	>25 – 35
E	>35 – 50
F	> 50

At signalized intersections, an additional element must be considered: time allocation. Level of service is based on the average control delay per vehicle for various movements within the intersection. Volume/capacity relationships also affect the operations of signalized intersections. Thus, both volume/capacity and delay must be considered to evaluate the overall operation of a signalized intersection. Correlation between average delay per vehicle and the respective levels of service are provided for signalized intersections as follows:

Signalized Intersections

Level of Service	**Control Delay Per Vehicle (seconds)**
A	≤10
B	>10 – 20
C	>20 – 35
D	>35 – 55
E	>55 – 80
F	> 80

APPENDIX H

2023 Existing Synchro Capacity/Level-of-Service Analysis

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	142	70	185	149	128	25	66	54	83	142	46
Future Volume (vph)	77	142	70	185	149	128	25	66	54	83	142	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	165		0	112		0	90		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			90			70			70		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			30			25	
Link Distance (ft)		484			960			717			886	
Travel Time (s)		9.4			18.7			16.3			24.2	
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.81	0.81	0.81	0.92	0.92	0.92	0.79	0.79	0.79	0.88	0.88	0.88
Heavy Vehicles (%)	13%	4%	4%	1%	1%	2%	6%	8%	6%	6%	1%	28%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	95	261	0	201	301	0	32	152	0	94	213	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		1	6		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	24.0		10.0	24.0		10.0	24.0		10.0	24.0	
Total Split (s)	20.0	41.0		20.0	41.0		20.0	41.0		20.0	41.0	
Total Split (%)	13.9%	28.5%		13.9%	28.5%		13.9%	28.5%		13.9%	28.5%	
Maximum Green (s)	15.0	35.0		15.0	35.0		15.0	35.0		15.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max		None	Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	44.8	35.3		49.7	37.7		21.3	13.4		27.4	20.5	
Actuated g/C Ratio	0.49	0.39		0.55	0.41		0.23	0.15		0.30	0.23	
v/c Ratio	0.19	0.38		0.33	0.41		0.10	0.57		0.28	0.55	
Control Delay	11.4	22.7		12.0	20.5		22.8	38.8		24.8	37.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	11.4	22.7		12.0	20.5		22.8	38.8		24.8	37.5	
LOS	B	C		B	C		C	D		C	D	
Approach Delay		19.7			17.1			36.0			33.6	
Approach LOS		B			B			D			C	
Queue Length 50th (ft)	23	100		53	109		13	67		39	110	
Queue Length 95th (ft)	49	174		106	212		30	115		76	190	
Internal Link Dist (ft)		404			880			637			806	

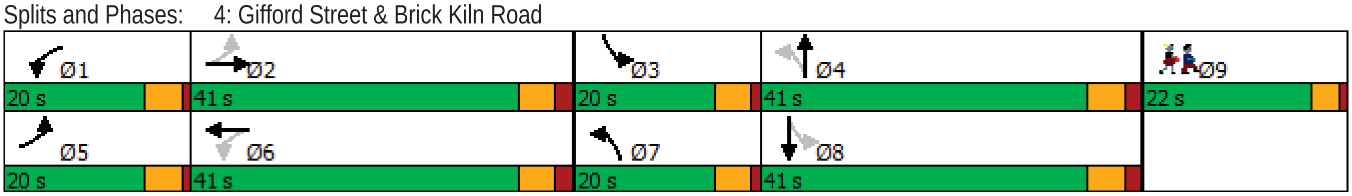
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	15%
Maximum Green (s)	18.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			165			112			90		
Base Capacity (vph)	615	684		679	739		443	658		407	663	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.15	0.38		0.30	0.41		0.07	0.23		0.23	0.32	

Intersection Summary

Area Type: Other
Cycle Length: 144
Actuated Cycle Length: 91
Natural Cycle: 90
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 24.1 Intersection LOS: C
Intersection Capacity Utilization 54.8% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 4: Gifford Street & Brick Kiln Road



Lane Group	Ø9
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	54	0	147	0	61	55	95	146	0
Future Vol, veh/h	0	0	0	54	0	147	0	61	55	95	146	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	40	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	79	79	79	81	81	81	86	86	86
Heavy Vehicles, %	2	2	2	5	2	2	0	0	2	4	2	2
Mvmt Flow	0	0	0	68	0	186	0	75	68	110	170	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	592	533	170	499	499	109	170	0	0	143	0	0
Stage 1	390	390	-	109	109	-	-	-	-	-	-	-
Stage 2	202	143	-	390	390	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.15	6.52	6.22	4.1	-	-	4.14	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.15	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.15	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.545	4.018	3.318	2.2	-	-	2.236	-	-
Pot Cap-1 Maneuver	418	453	874	477	473	945	1420	-	-	1427	-	-
Stage 1	634	608	-	889	805	-	-	-	-	-	-	-
Stage 2	800	779	-	628	608	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	314	414	874	446	433	945	1420	-	-	1427	-	-
Mov Cap-2 Maneuver	314	414	-	446	433	-	-	-	-	-	-	-
Stage 1	634	556	-	889	805	-	-	-	-	-	-	-
Stage 2	642	779	-	575	556	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	11	0	3
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1420	-	-	-	446	945	1427	-	-
HCM Lane V/C Ratio	-	-	-	-	0.153	0.197	0.077	-	-
HCM Control Delay (s)	0	-	-	0	14.5	9.7	7.7	0	-
HCM Lane LOS	A	-	-	A	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.5	0.7	0.3	-	-

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	151	185	0	185	13
Future Vol, veh/h	0	151	185	0	185	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	78	78	78	78
Heavy Vehicles, %	2	6	2	2	9	20
Mvmt Flow	0	166	237	0	237	17

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	403	237
Stage 1	-	-	-	-	237	-
Stage 2	-	-	-	-	166	-
Critical Hdwy	-	-	-	-	6.49	6.4
Critical Hdwy Stg 1	-	-	-	-	5.49	-
Critical Hdwy Stg 2	-	-	-	-	5.49	-
Follow-up Hdwy	-	-	-	-	3.581	3.48
Pot Cap-1 Maneuver	0	-	-	0	590	760
Stage 1	0	-	-	0	786	-
Stage 2	0	-	-	0	847	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	590	760
Mov Cap-2 Maneuver	-	-	-	-	590	-
Stage 1	-	-	-	-	786	-
Stage 2	-	-	-	-	847	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	14.5
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	631
HCM Lane V/C Ratio	-	-	0.402
HCM Control Delay (s)	-	-	14.5
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	1.9

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	39	297	0	0	140	181	45	0	20	0	0	0
Future Vol, veh/h	39	297	0	0	140	181	45	0	20	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	84	84	84	77	77	77	92	92	92
Heavy Vehicles, %	7	6	0	0	1	6	2	0	0	2	2	2
Mvmt Flow	45	345	0	0	167	215	58	0	26	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	167	0	-	-	-	0	602	602	345
Stage 1	-	-	-	-	-	-	435	435	-
Stage 2	-	-	-	-	-	-	167	167	-
Critical Hdwy	4.17	-	-	-	-	-	6.42	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.5	-
Follow-up Hdwy	2.263	-	-	-	-	-	3.518	4	3.3
Pot Cap-1 Maneuver	1381	-	0	0	-	-	463	416	702
Stage 1	-	-	0	0	-	-	653	584	-
Stage 2	-	-	0	0	-	-	863	764	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1381	-	-	-	-	-	444	0	702
Mov Cap-2 Maneuver	-	-	-	-	-	-	444	0	-
Stage 1	-	-	-	-	-	-	627	0	-
Stage 2	-	-	-	-	-	-	863	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.9	0	6.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	2282	1381	-	-	-
HCM Lane V/C Ratio	0.037	0.033	-	-	-
HCM Control Delay (s)	6.6	7.7	0	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	0.1	-	-	-

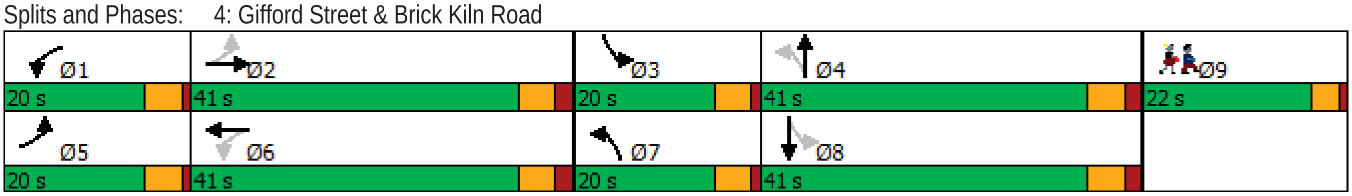
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	187	60	111	180	47	93	125	190	57	59	16
Future Volume (vph)	26	187	60	111	180	47	93	125	190	57	59	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	165		0	112		0	90		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			90			70			70		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			40			25	
Link Distance (ft)		484			960			717			886	
Travel Time (s)		9.4			18.7			12.2			24.2	
Confl. Peds. (#/hr)									1	1		
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.90	0.90	0.90	0.85	0.85	0.85	0.95	0.95	0.95	0.81	0.81	0.81
Heavy Vehicles (%)	0%	1%	1%	1%	1%	4%	3%	1%	2%	0%	7%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	275	0	131	267	0	98	332	0	70	93	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		1	6		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	24.0		10.0	24.0		10.0	24.0		10.0	24.0	
Total Split (s)	20.0	41.0		20.0	41.0		20.0	41.0		20.0	41.0	
Total Split (%)	13.9%	28.5%		13.9%	28.5%		13.9%	28.5%		13.9%	28.5%	
Maximum Green (s)	15.0	35.0		15.0	35.0		15.0	35.0		15.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max		None	Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	43.5	35.9		51.4	44.2		31.0	22.2		26.2	19.2	
Actuated g/C Ratio	0.46	0.38		0.54	0.46		0.32	0.23		0.27	0.20	
v/c Ratio	0.05	0.40		0.24	0.32		0.24	0.77		0.25	0.26	
Control Delay	14.5	26.7		14.8	21.6		21.6	42.5		22.1	31.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	14.5	26.7		14.8	21.6		21.6	42.5		22.1	31.1	
LOS	B	C		B	C		C	D		C	C	
Approach Delay		25.5			19.4			37.8			27.3	
Approach LOS		C			B			D			C	
Queue Length 50th (ft)	8	121		40	111		39	165		28	43	
Queue Length 95th (ft)	28	241		85	201		77	281		52	80	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	15%
Maximum Green (s)	18.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		404			880			637			806	
Turn Bay Length (ft)	200			165			112			90		
Base Capacity (vph)	711	688		614	843		474	662		417	657	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.04	0.40		0.21	0.32		0.21	0.50		0.17	0.14	

Intersection Summary	
Area Type: Other	
Cycle Length: 144	
Actuated Cycle Length: 95.5	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 27.9	Intersection LOS: C
Intersection Capacity Utilization 60.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 4: Gifford Street & Brick Kiln Road



Lane Group	Ø9
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	52	0	149	0	104	77	107	117	0
Future Vol, veh/h	0	0	0	52	0	149	0	104	77	107	117	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	40	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	89	89	89	93	93	93	92	92	92
Heavy Vehicles, %	2	2	2	1	2	0	0	0	2	0	1	2
Mvmt Flow	0	0	0	58	0	167	0	112	83	116	127	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	596	554	127	513	513	154	127	0	0	195	0	0
Stage 1	359	359	-	154	154	-	-	-	-	-	-	-
Stage 2	237	195	-	359	359	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.11	6.52	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.11	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.11	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.509	4.018	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	415	440	923	473	465	897	1472	-	-	1390	-	-
Stage 1	659	627	-	851	770	-	-	-	-	-	-	-
Stage 2	766	739	-	661	627	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	314	400	923	440	423	897	1472	-	-	1390	-	-
Mov Cap-2 Maneuver	314	400	-	440	423	-	-	-	-	-	-	-
Stage 1	659	571	-	851	770	-	-	-	-	-	-	-
Stage 2	623	739	-	602	571	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	11.1	0	3.7
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1472	-	-	-	440	897	1390	-	-
HCM Lane V/C Ratio	-	-	-	-	0.133	0.187	0.084	-	-
HCM Control Delay (s)	0	-	-	0	14.4	9.9	7.8	0	-
HCM Lane LOS	A	-	-	A	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.5	0.7	0.3	-	-

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	206	184	0	125	14
Future Vol, veh/h	0	206	184	0	125	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	80	80	85	85	78	78
Heavy Vehicles, %	2	3	1	0	2	0
Mvmt Flow	0	258	216	0	160	18

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	474	216
Stage 1	-	-	-	-	216	-
Stage 2	-	-	-	-	258	-
Critical Hdwy	-	-	-	-	6.42	6.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	-	-	3.518	3.3
Pot Cap-1 Maneuver	0	-	-	0	549	829
Stage 1	0	-	-	0	820	-
Stage 2	0	-	-	0	785	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	549	829
Mov Cap-2 Maneuver	-	-	-	-	549	-
Stage 1	-	-	-	-	820	-
Stage 2	-	-	-	-	785	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13.3
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	610
HCM Lane V/C Ratio	-	-	0.292
HCM Control Delay (s)	-	-	13.3
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	1.2

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	54	277	0	0	144	204	40	0	19	0	0	0
Future Vol, veh/h	54	277	0	0	144	204	40	0	19	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	96	96	96	84	84	84	92	92	92
Heavy Vehicles, %	1	1	0	0	0	2	2	0	0	2	2	2
Mvmt Flow	64	330	0	0	150	213	48	0	23	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	150	0	-	-	-	0	608	608	330
Stage 1	-	-	-	-	-	-	458	458	-
Stage 2	-	-	-	-	-	-	150	150	-
Critical Hdwy	4.11	-	-	-	-	-	6.42	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.5	-
Follow-up Hdwy	2.209	-	-	-	-	-	3.518	4	3.3
Pot Cap-1 Maneuver	1437	-	0	0	-	-	459	413	716
Stage 1	-	-	0	0	-	-	637	570	-
Stage 2	-	-	0	0	-	-	878	777	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1437	-	-	-	-	-	434	0	716
Mov Cap-2 Maneuver	-	-	-	-	-	-	434	0	-
Stage 1	-	-	-	-	-	-	602	0	-
Stage 2	-	-	-	-	-	-	878	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.2	0	6.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	2223	1437	-	-	-
HCM Lane V/C Ratio	0.032	0.045	-	-	-
HCM Control Delay (s)	6.7	7.6	0	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	0.1	-	-	-

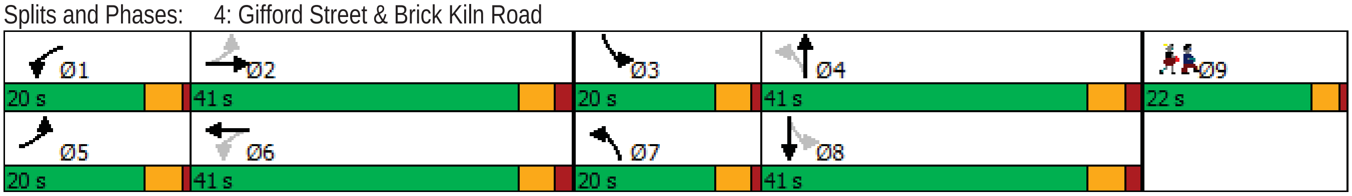
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	192	120	282	235	51	77	63	84	47	124	18
Future Volume (vph)	38	192	120	282	235	51	77	63	84	47	124	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	165		0	112		0	90		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			90			70			70		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			30			25	
Link Distance (ft)		484			960			717			886	
Travel Time (s)		9.4			18.7			16.3			24.2	
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.81	0.81	0.81	0.92	0.92	0.92	0.79	0.79	0.79	0.88	0.88	0.88
Heavy Vehicles (%)	13%	4%	4%	1%	1%	2%	6%	8%	6%	6%	1%	28%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	385	0	307	310	0	97	186	0	53	161	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		1	6		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	24.0		10.0	24.0		10.0	24.0		10.0	24.0	
Total Split (s)	20.0	41.0		20.0	41.0		20.0	41.0		20.0	41.0	
Total Split (%)	13.9%	28.5%		13.9%	28.5%		13.9%	28.5%		13.9%	28.5%	
Maximum Green (s)	15.0	35.0		15.0	35.0		15.0	35.0		15.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max		None	Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	43.0	35.1		56.2	45.6		27.6	18.3		22.3	13.7	
Actuated g/C Ratio	0.45	0.37		0.59	0.48		0.29	0.19		0.23	0.14	
v/c Ratio	0.10	0.60		0.56	0.36		0.30	0.54		0.17	0.62	
Control Delay	11.3	29.0		15.2	19.3		26.2	33.6		24.4	48.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	11.3	29.0		15.2	19.3		26.2	33.6		24.4	48.5	
LOS	B	C		B	B		C	C		C	D	
Approach Delay		27.1			17.3			31.1			42.5	
Approach LOS		C			B			C			D	
Queue Length 50th (ft)	11	176		86	117		43	80		23	90	
Queue Length 95th (ft)	29	267		165	220		70	126		48	156	
Internal Link Dist (ft)		404			880			637			806	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	15%
Maximum Green (s)	18.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			165			112			90		
Base Capacity (vph)	613	644		547	872		390	624		432	655	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.08	0.60		0.56	0.36		0.25	0.30		0.12	0.25	

Intersection Summary	
Area Type: Other	
Cycle Length: 144	
Actuated Cycle Length: 95.8	
Natural Cycle: 100	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 26.0	Intersection LOS: C
Intersection Capacity Utilization 64.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 4: Gifford Street & Brick Kiln Road



Lane Group	Ø9
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	62	0	168	0	70	63	108	167	0
Future Vol, veh/h	0	0	0	62	0	168	0	70	63	108	167	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	40	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	79	79	79	81	81	81	86	86	86
Heavy Vehicles, %	2	2	2	5	2	2	0	0	2	4	2	2
Mvmt Flow	0	0	0	78	0	213	0	86	78	126	194	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	678	610	194	571	571	125	194	0	0	164	0	0
Stage 1	446	446	-	125	125	-	-	-	-	-	-	-
Stage 2	232	164	-	446	446	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.15	6.52	6.22	4.1	-	-	4.14	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.15	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.15	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.545	4.018	3.318	2.2	-	-	2.236	-	-
Pot Cap-1 Maneuver	366	409	847	427	431	926	1391	-	-	1402	-	-
Stage 1	591	574	-	872	792	-	-	-	-	-	-	-
Stage 2	771	762	-	586	574	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	260	368	847	394	387	926	1391	-	-	1402	-	-
Mov Cap-2 Maneuver	260	368	-	394	387	-	-	-	-	-	-	-
Stage 1	591	516	-	872	792	-	-	-	-	-	-	-
Stage 2	594	762	-	527	516	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	11.7	0	3.1
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1391	-	-	-	394	926	1402	-	-
HCM Lane V/C Ratio	-	-	-	-	0.199	0.23	0.09	-	-
HCM Control Delay (s)	0	-	-	0	16.4	10	7.8	0	-
HCM Lane LOS	A	-	-	A	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.7	0.9	0.3	-	-

Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		Y	
Traffic Vol, veh/h	0	172	211	0	211	15
Future Vol, veh/h	0	172	211	0	211	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	78	78	78	78
Heavy Vehicles, %	2	6	2	2	9	20
Mvmt Flow	0	189	271	0	271	19

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	460	271
Stage 1	-	-	-	-	271	-
Stage 2	-	-	-	-	189	-
Critical Hdwy	-	-	-	-	6.49	6.4
Critical Hdwy Stg 1	-	-	-	-	5.49	-
Critical Hdwy Stg 2	-	-	-	-	5.49	-
Follow-up Hdwy	-	-	-	-	3.581	3.48
Pot Cap-1 Maneuver	0	-	-	0	547	726
Stage 1	0	-	-	0	759	-
Stage 2	0	-	-	0	827	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	547	726
Mov Cap-2 Maneuver	-	-	-	-	547	-
Stage 1	-	-	-	-	759	-
Stage 2	-	-	-	-	827	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	17
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	586
HCM Lane V/C Ratio	-	-	0.494
HCM Control Delay (s)	-	-	17
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	2.7

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	44	339	0	0	160	206	51	0	23	0	0	0
Future Vol, veh/h	44	339	0	0	160	206	51	0	23	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	84	84	84	77	77	77	92	92	92
Heavy Vehicles, %	7	6	0	0	1	6	2	0	0	2	2	2
Mvmt Flow	51	394	0	0	190	245	66	0	30	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	190	0	-	-	-	0	686	686	394
Stage 1	-	-	-	-	-	-	496	496	-
Stage 2	-	-	-	-	-	-	190	190	-
Critical Hdwy	4.17	-	-	-	-	-	6.42	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.5	-
Follow-up Hdwy	2.263	-	-	-	-	-	3.518	4	3.3
Pot Cap-1 Maneuver	1354	-	0	0	-	-	413	373	659
Stage 1	-	-	0	0	-	-	612	549	-
Stage 2	-	-	0	0	-	-	842	747	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1354	-	-	-	-	-	393	0	659
Mov Cap-2 Maneuver	-	-	-	-	-	-	393	0	-
Stage 1	-	-	-	-	-	-	583	0	-
Stage 2	-	-	-	-	-	-	842	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.9	0	6.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	2120	1354	-	-	-
HCM Lane V/C Ratio	0.045	0.038	-	-	-
HCM Control Delay (s)	6.8	7.8	0	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	0.1	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	288	69	155	288	48	171	158	242	57	89	33
Future Volume (vph)	36	288	69	155	288	48	171	158	242	57	89	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	165		0	112		0	90		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			90			70			70		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			40			25	
Link Distance (ft)		484			960			717			886	
Travel Time (s)		9.4			18.7			12.2			24.2	
Confl. Peds. (#/hr)									1	1		
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.90	0.90	0.90	0.85	0.85	0.85	0.95	0.95	0.95	0.81	0.81	0.81
Heavy Vehicles (%)	0%	1%	1%	1%	1%	4%	3%	1%	2%	0%	7%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	40	397	0	182	395	0	180	421	0	70	151	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		1	6		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	24.0		10.0	24.0		10.0	24.0		10.0	24.0	
Total Split (s)	20.0	41.0		20.0	41.0		20.0	41.0		20.0	41.0	
Total Split (%)	13.9%	28.5%		13.9%	28.5%		13.9%	28.5%		13.9%	28.5%	
Maximum Green (s)	15.0	35.0		15.0	35.0		15.0	35.0		15.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max		None	Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	43.5	35.6		53.6	45.6		42.8	31.6		33.1	24.1	
Actuated g/C Ratio	0.41	0.33		0.50	0.43		0.40	0.30		0.31	0.23	
v/c Ratio	0.10	0.65		0.44	0.50		0.38	0.79		0.27	0.38	
Control Delay	17.2	38.1		20.2	28.6		23.2	43.1		22.4	34.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	17.2	38.1		20.2	28.6		23.2	43.1		22.4	34.9	
LOS	B	D		C	C		C	D		C	C	
Approach Delay		36.2			25.9			37.1			30.9	
Approach LOS		D			C			D			C	
Queue Length 50th (ft)	15	246		75	227		80	243		29	80	
Queue Length 95th (ft)	36	380		116	320		134	#410		53	129	

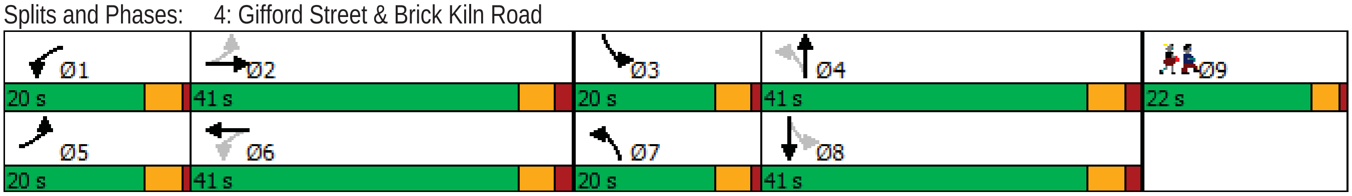
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	15%
Maximum Green (s)	18.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		404			880			637			806	
Turn Bay Length (ft)	200			165			112			90		
Base Capacity (vph)	558	614		450	786		495	592		382	582	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.07	0.65		0.40	0.50		0.36	0.71		0.18	0.26	

Intersection Summary

Area Type: Other
Cycle Length: 144
Actuated Cycle Length: 106.7
Natural Cycle: 90
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 32.6 Intersection LOS: C
Intersection Capacity Utilization 73.7% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Gifford Street & Brick Kiln Road



Lane Group	Ø9
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	74	0	212	0	148	110	152	166	0
Future Vol, veh/h	0	0	0	74	0	212	0	148	110	152	166	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	40	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	89	89	89	93	93	93	92	92	92
Heavy Vehicles, %	2	2	2	1	2	0	0	0	2	0	1	2
Mvmt Flow	0	0	0	83	0	238	0	159	118	165	180	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	847	787	180	728	728	218	180	0	0	277	0	0
Stage 1	510	510	-	218	218	-	-	-	-	-	-	-
Stage 2	337	277	-	510	510	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.11	6.52	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.11	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.11	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.509	4.018	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	282	324	863	340	350	827	1408	-	-	1298	-	-
Stage 1	546	538	-	787	723	-	-	-	-	-	-	-
Stage 2	677	681	-	548	538	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	179	278	863	303	301	827	1408	-	-	1298	-	-
Mov Cap-2 Maneuver	179	278	-	303	301	-	-	-	-	-	-	-
Stage 1	546	462	-	787	723	-	-	-	-	-	-	-
Stage 2	482	681	-	471	462	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	13.7	0	3.9
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1408	-	-	-	303	827	1298	-	-
HCM Lane V/C Ratio	-	-	-	-	0.274	0.288	0.127	-	-
HCM Control Delay (s)	0	-	-	0	21.3	11.1	8.2	0	-
HCM Lane LOS	A	-	-	A	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	1.1	1.2	0.4	-	-

Intersection						
Int Delay, s/veh	5.8					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	293	262	0	177	20
Future Vol, veh/h	0	293	262	0	177	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	80	80	85	85	78	78
Heavy Vehicles, %	2	3	1	0	2	0
Mvmt Flow	0	366	308	0	227	26

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	674	308
Stage 1	-	-	-	-	308	-
Stage 2	-	-	-	-	366	-
Critical Hdwy	-	-	-	-	6.42	6.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	-	-	3.518	3.3
Pot Cap-1 Maneuver	0	-	-	0	420	737
Stage 1	0	-	-	0	745	-
Stage 2	0	-	-	0	702	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	420	737
Mov Cap-2 Maneuver	-	-	-	-	420	-
Stage 1	-	-	-	-	745	-
Stage 2	-	-	-	-	702	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	21.4
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	467
HCM Lane V/C Ratio	-	-	0.541
HCM Control Delay (s)	-	-	21.4
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	3.2

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	77	393	0	0	205	290	57	0	27	0	0	0
Future Vol, veh/h	77	393	0	0	205	290	57	0	27	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	96	96	96	84	84	84	92	92	92
Heavy Vehicles, %	1	1	0	0	0	2	2	0	0	2	2	2
Mvmt Flow	92	468	0	0	214	302	68	0	32	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	214	0	-	-	-	0	866	866	468
Stage 1	-	-	-	-	-	-	652	652	-
Stage 2	-	-	-	-	-	-	214	214	-
Critical Hdwy	4.11	-	-	-	-	-	6.42	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.5	-
Follow-up Hdwy	2.209	-	-	-	-	-	3.518	4	3.3
Pot Cap-1 Maneuver	1362	-	0	0	-	-	324	293	599
Stage 1	-	-	0	0	-	-	518	467	-
Stage 2	-	-	0	0	-	-	822	729	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1362	-	-	-	-	-	295	0	599
Mov Cap-2 Maneuver	-	-	-	-	-	-	295	0	-
Stage 1	-	-	-	-	-	-	471	0	-
Stage 2	-	-	-	-	-	-	822	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.3	0	7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	1864	1362	-	-	-
HCM Lane V/C Ratio	0.054	0.067	-	-	-
HCM Control Delay (s)	7	7.8	0	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.2	0.2	-	-	-

APPENDIX I

2023 No Build Synchro Capacity/Level-of-Service Analysis

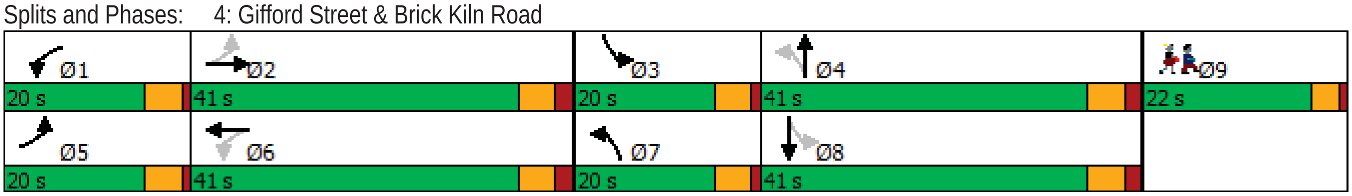
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	155	77	198	161	137	28	71	58	89	152	50
Future Volume (vph)	86	155	77	198	161	137	28	71	58	89	152	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	165		0	112		0	90		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			90			70			70		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			30			25	
Link Distance (ft)		484			960			717			886	
Travel Time (s)		9.4			18.7			16.3			24.2	
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.81	0.81	0.81	0.92	0.92	0.92	0.79	0.79	0.79	0.88	0.88	0.88
Heavy Vehicles (%)	13%	4%	4%	1%	1%	2%	6%	8%	6%	6%	1%	28%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	106	286	0	215	324	0	35	163	0	101	230	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		1	6		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	24.0		10.0	24.0		10.0	24.0		10.0	24.0	
Total Split (s)	20.0	41.0		20.0	41.0		20.0	41.0		20.0	41.0	
Total Split (%)	13.9%	28.5%		13.9%	28.5%		13.9%	28.5%		13.9%	28.5%	
Maximum Green (s)	15.0	35.0		15.0	35.0		15.0	35.0		15.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max		None	Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	45.3	35.3		50.2	37.8		22.3	14.3		28.7	21.6	
Actuated g/C Ratio	0.49	0.38		0.54	0.41		0.24	0.15		0.31	0.23	
v/c Ratio	0.22	0.43		0.37	0.45		0.11	0.59		0.30	0.57	
Control Delay	12.2	24.4		12.9	22.2		22.8	39.7		25.0	38.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	12.2	24.4		12.9	22.2		22.8	39.7		25.0	38.2	
LOS	B	C		B	C		C	D		C	D	
Approach Delay		21.1			18.5			36.7			34.2	
Approach LOS		C			B			D			C	
Queue Length 50th (ft)	27	117		59	124		14	74		42	122	
Queue Length 95th (ft)	56	196		118	241		32	124		80	206	
Internal Link Dist (ft)		404			880			637			806	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	15%
Maximum Green (s)	18.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			165			112			90		
Base Capacity (vph)	584	671		645	727		445	647		405	651	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.18	0.43		0.33	0.45		0.08	0.25		0.25	0.35	

Intersection Summary	
Area Type: Other	
Cycle Length: 144	
Actuated Cycle Length: 92.7	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 25.2	Intersection LOS: C
Intersection Capacity Utilization 57.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 4: Gifford Street & Brick Kiln Road



Lane Group	Ø9
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	62	0	159	0	66	59	102	157	0
Future Vol, veh/h	0	0	0	62	0	159	0	66	59	102	157	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	40	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	79	79	79	81	81	81	86	86	86
Heavy Vehicles, %	2	2	2	5	2	2	0	0	2	4	2	2
Mvmt Flow	0	0	0	78	0	201	0	81	73	119	183	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	639	575	183	539	539	118	183	0	0	154	0	0
Stage 1	421	421	-	118	118	-	-	-	-	-	-	-
Stage 2	218	154	-	421	421	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.15	6.52	6.22	4.1	-	-	4.14	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.15	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.15	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.545	4.018	3.318	2.2	-	-	2.236	-	-
Pot Cap-1 Maneuver	389	429	859	449	449	934	1404	-	-	1414	-	-
Stage 1	610	589	-	879	798	-	-	-	-	-	-	-
Stage 2	784	770	-	604	589	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	283	389	859	417	407	934	1404	-	-	1414	-	-
Mov Cap-2 Maneuver	283	389	-	417	407	-	-	-	-	-	-	-
Stage 1	610	534	-	879	798	-	-	-	-	-	-	-
Stage 2	615	770	-	547	534	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	11.5	0	3.1
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1404	-	-	-	417	934	1414	-	-
HCM Lane V/C Ratio	-	-	-	-	0.188	0.215	0.084	-	-
HCM Control Delay (s)	0	-	-	0	15.6	9.9	7.8	0	-
HCM Lane LOS	A	-	-	A	C	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.7	0.8	0.3	-	-

Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		Y	
Traffic Vol, veh/h	0	162	203	0	200	14
Future Vol, veh/h	0	162	203	0	200	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	78	78	78	78
Heavy Vehicles, %	2	6	2	2	9	20
Mvmt Flow	0	178	260	0	256	18

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	438	260
Stage 1	-	-	-	-	260	-
Stage 2	-	-	-	-	178	-
Critical Hdwy	-	-	-	-	6.49	6.4
Critical Hdwy Stg 1	-	-	-	-	5.49	-
Critical Hdwy Stg 2	-	-	-	-	5.49	-
Follow-up Hdwy	-	-	-	-	3.581	3.48
Pot Cap-1 Maneuver	0	-	-	0	563	737
Stage 1	0	-	-	0	767	-
Stage 2	0	-	-	0	836	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	563	737
Mov Cap-2 Maneuver	-	-	-	-	563	-
Stage 1	-	-	-	-	767	-
Stage 2	-	-	-	-	836	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	15.9
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	602
HCM Lane V/C Ratio	-	-	0.456
HCM Control Delay (s)	-	-	15.9
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	2.4

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	41	321	0	0	155	199	48	0	23	0	0	0
Future Vol, veh/h	41	321	0	0	155	199	48	0	23	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	84	84	84	77	77	77	92	92	92
Heavy Vehicles, %	7	6	0	0	1	6	2	0	0	2	2	2
Mvmt Flow	48	373	0	0	185	237	62	0	30	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	185	0	-	-	-	0	654	654	373
Stage 1	-	-	-	-	-	-	469	469	-
Stage 2	-	-	-	-	-	-	185	185	-
Critical Hdwy	4.17	-	-	-	-	-	6.42	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.5	-
Follow-up Hdwy	2.263	-	-	-	-	-	3.518	4	3.3
Pot Cap-1 Maneuver	1360	-	0	0	-	-	431	389	678
Stage 1	-	-	0	0	-	-	630	564	-
Stage 2	-	-	0	0	-	-	847	751	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1360	-	-	-	-	-	412	0	678
Mov Cap-2 Maneuver	-	-	-	-	-	-	412	0	-
Stage 1	-	-	-	-	-	-	602	0	-
Stage 2	-	-	-	-	-	-	847	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.9	0	6.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	2093	1360	-	-	-
HCM Lane V/C Ratio	0.044	0.035	-	-	-
HCM Control Delay (s)	6.8	7.7	0	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	0.1	-	-	-

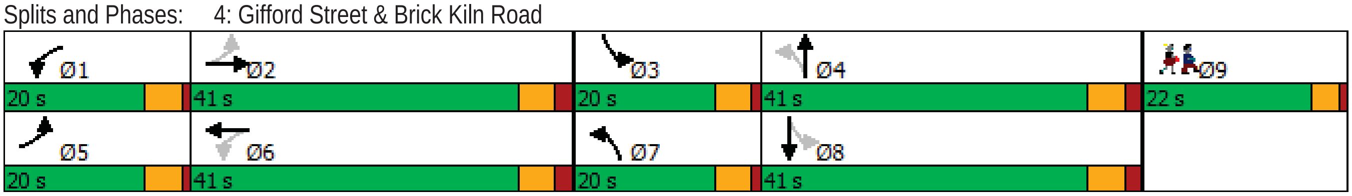
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	209	131	302	253	55	84	68	90	50	133	20
Future Volume (vph)	44	209	131	302	253	55	84	68	90	50	133	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	165		0	112		0	90		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			90			70			70		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			30			25	
Link Distance (ft)		484			960			717			886	
Travel Time (s)		9.4			18.7			16.3			24.2	
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.81	0.81	0.81	0.92	0.92	0.92	0.79	0.79	0.79	0.88	0.88	0.88
Heavy Vehicles (%)	13%	4%	4%	1%	1%	2%	6%	8%	6%	6%	1%	28%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	54	420	0	328	335	0	106	200	0	57	174	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		1	6		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	24.0		10.0	24.0		10.0	24.0		10.0	24.0	
Total Split (s)	20.0	41.0		20.0	41.0		20.0	41.0		20.0	41.0	
Total Split (%)	13.9%	28.5%		13.9%	28.5%		13.9%	28.5%		13.9%	28.5%	
Maximum Green (s)	15.0	35.0		15.0	35.0		15.0	35.0		15.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max		None	Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	43.3	35.1		56.2	45.4		29.2	19.5		23.2	14.5	
Actuated g/C Ratio	0.45	0.36		0.58	0.47		0.30	0.20		0.24	0.15	
v/c Ratio	0.12	0.66		0.65	0.39		0.32	0.55		0.18	0.64	
Control Delay	12.0	31.8		18.5	20.8		26.3	34.3		24.3	49.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	12.0	31.8		18.5	20.8		26.3	34.3		24.3	49.5	
LOS	B	C		B	C		C	C		C	D	
Approach Delay		29.6			19.6			31.5			43.2	
Approach LOS		C			B			C			D	
Queue Length 50th (ft)	13	203		97	133		47	89		25	99	
Queue Length 95th (ft)	33	304		185	249		75	137		51	168	
Internal Link Dist (ft)		404			880			637			806	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	15%
Maximum Green (s)	18.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			165			112			90		
Base Capacity (vph)	597	636		507	857		386	616		435	645	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.09	0.66		0.65	0.39		0.27	0.32		0.13	0.27	

Intersection Summary	
Area Type: Other	
Cycle Length: 144	
Actuated Cycle Length: 97.1	
Natural Cycle: 100	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 27.9	Intersection LOS: C
Intersection Capacity Utilization 67.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 4: Gifford Street & Brick Kiln Road



Lane Group	Ø9
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	70	0	181	0	75	68	116	179	0
Future Vol, veh/h	0	0	0	70	0	181	0	75	68	116	179	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	40	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	79	79	79	81	81	81	86	86	86
Heavy Vehicles, %	2	2	2	5	2	2	0	0	2	4	2	2
Mvmt Flow	0	0	0	89	0	229	0	93	84	135	208	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	728	655	208	613	613	135	208	0	0	177	0	0
Stage 1	478	478	-	135	135	-	-	-	-	-	-	-
Stage 2	250	177	-	478	478	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.15	6.52	6.22	4.1	-	-	4.14	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.15	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.15	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.545	4.018	3.318	2.2	-	-	2.236	-	-
Pot Cap-1 Maneuver	339	386	832	400	408	914	1375	-	-	1387	-	-
Stage 1	568	556	-	861	785	-	-	-	-	-	-	-
Stage 2	754	753	-	563	556	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	233	344	832	366	363	914	1375	-	-	1387	-	-
Mov Cap-2 Maneuver	233	344	-	366	363	-	-	-	-	-	-	-
Stage 1	568	495	-	861	785	-	-	-	-	-	-	-
Stage 2	565	753	-	501	495	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	12.4	0	3.1
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1375	-	-	-	366	914	1387	-	-
HCM Lane V/C Ratio	-	-	-	-	0.242	0.251	0.097	-	-
HCM Control Delay (s)	0	-	-	0	18	10.3	7.9	0	-
HCM Lane LOS	A	-	-	A	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.9	1	0.3	-	-

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		Y	
Traffic Vol, veh/h	0	184	231	0	228	16
Future Vol, veh/h	0	184	231	0	228	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	78	78	78	78
Heavy Vehicles, %	2	6	2	2	9	20
Mvmt Flow	0	202	296	0	292	21

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	498	296
Stage 1	-	-	-	-	296	-
Stage 2	-	-	-	-	202	-
Critical Hdwy	-	-	-	-	6.49	6.4
Critical Hdwy Stg 1	-	-	-	-	5.49	-
Critical Hdwy Stg 2	-	-	-	-	5.49	-
Follow-up Hdwy	-	-	-	-	3.581	3.48
Pot Cap-1 Maneuver	0	-	-	0	519	703
Stage 1	0	-	-	0	739	-
Stage 2	0	-	-	0	815	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	519	703
Mov Cap-2 Maneuver	-	-	-	-	519	-
Stage 1	-	-	-	-	739	-
Stage 2	-	-	-	-	815	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	19.5
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	555
HCM Lane V/C Ratio	-	-	0.564
HCM Control Delay (s)	-	-	19.5
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	3.5

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	47	365	0	0	177	226	54	0	26	0	0	0
Future Vol, veh/h	47	365	0	0	177	226	54	0	26	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	84	84	84	77	77	77	92	92	92
Heavy Vehicles, %	7	6	0	0	1	6	2	0	0	2	2	2
Mvmt Flow	55	424	0	0	211	269	70	0	34	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	211	0	-	-	-	0	745	745	424
Stage 1	-	-	-	-	-	-	534	534	-
Stage 2	-	-	-	-	-	-	211	211	-
Critical Hdwy	4.17	-	-	-	-	-	6.42	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.5	-
Follow-up Hdwy	2.263	-	-	-	-	-	3.518	4	3.3
Pot Cap-1 Maneuver	1330	-	0	0	-	-	382	345	634
Stage 1	-	-	0	0	-	-	588	528	-
Stage 2	-	-	0	0	-	-	824	731	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1330	-	-	-	-	-	361	0	634
Mov Cap-2 Maneuver	-	-	-	-	-	-	361	0	-
Stage 1	-	-	-	-	-	-	556	0	-
Stage 2	-	-	-	-	-	-	824	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.9	0	6.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	1951	1330	-	-	-
HCM Lane V/C Ratio	0.053	0.041	-	-	-
HCM Control Delay (s)	6.9	7.8	0	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.2	0.1	-	-	-

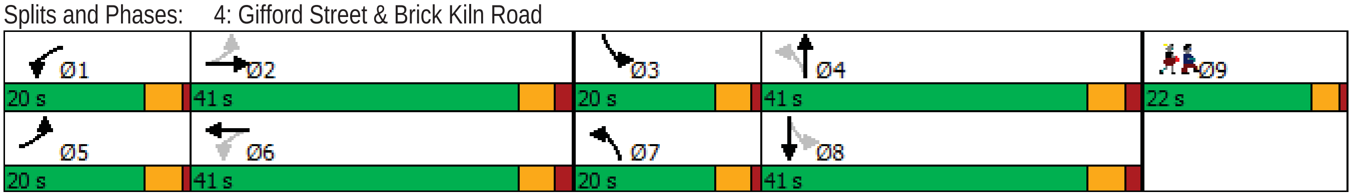
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	202	65	119	196	50	103	134	204	61	63	20
Future Volume (vph)	30	202	65	119	196	50	103	134	204	61	63	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	165		0	112		0	90		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			90			70			70		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			40			25	
Link Distance (ft)		484			960			717			886	
Travel Time (s)		9.4			18.7			12.2			24.2	
Confl. Peds. (#/hr)									1	1		
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.90	0.90	0.90	0.85	0.85	0.85	0.95	0.95	0.95	0.81	0.81	0.81
Heavy Vehicles (%)	0%	1%	1%	1%	1%	4%	3%	1%	2%	0%	7%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	296	0	140	290	0	108	356	0	75	103	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		1	6		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	24.0		10.0	24.0		10.0	24.0		10.0	24.0	
Total Split (s)	20.0	41.0		20.0	41.0		20.0	41.0		20.0	41.0	
Total Split (%)	13.9%	28.5%		13.9%	28.5%		13.9%	28.5%		13.9%	28.5%	
Maximum Green (s)	15.0	35.0		15.0	35.0		15.0	35.0		15.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max		None	Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	43.4	35.7		51.8	44.3		34.9	25.7		30.2	21.0	
Actuated g/C Ratio	0.44	0.36		0.52	0.45		0.35	0.26		0.30	0.21	
v/c Ratio	0.06	0.45		0.27	0.36		0.24	0.76		0.27	0.28	
Control Delay	15.5	29.2		16.2	23.5		21.4	41.0		22.2	30.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	15.5	29.2		16.2	23.5		21.4	41.0		22.2	30.6	
LOS	B	C		B	C		C	D		C	C	
Approach Delay		27.8			21.1			36.4			27.0	
Approach LOS		C			C			D			C	
Queue Length 50th (ft)	10	140		46	130		44	185		30	48	
Queue Length 95th (ft)	31	269		92	226		84	309		55	88	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	15%
Maximum Green (s)	18.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		404			880			637			806	
Turn Bay Length (ft)	200			165			112			90		
Base Capacity (vph)	673	657		568	811		511	634		403	628	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.05	0.45		0.25	0.36		0.21	0.56		0.19	0.16	

Intersection Summary	
Area Type: Other	
Cycle Length: 144	
Actuated Cycle Length: 99.4	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 28.5	Intersection LOS: C
Intersection Capacity Utilization 63.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 4: Gifford Street & Brick Kiln Road



Lane Group	Ø9
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	58	0	161	0	112	83	116	125	0
Future Vol, veh/h	0	0	0	58	0	161	0	112	83	116	125	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	40	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	89	89	89	93	93	93	92	92	92
Heavy Vehicles, %	2	2	2	1	2	0	0	0	2	0	1	2
Mvmt Flow	0	0	0	65	0	181	0	120	89	126	136	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	643	597	136	553	553	165	136	0	0	209	0	0
Stage 1	388	388	-	165	165	-	-	-	-	-	-	-
Stage 2	255	209	-	388	388	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.11	6.52	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.11	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.11	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.509	4.018	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	386	416	913	445	441	885	1461	-	-	1374	-	-
Stage 1	636	609	-	839	762	-	-	-	-	-	-	-
Stage 2	749	729	-	638	609	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	284	375	913	411	397	885	1461	-	-	1374	-	-
Mov Cap-2 Maneuver	284	375	-	411	397	-	-	-	-	-	-	-
Stage 1	636	549	-	839	762	-	-	-	-	-	-	-
Stage 2	596	729	-	575	549	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	11.5	0	3.8
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1461	-	-	-	411	885	1374	-	-
HCM Lane V/C Ratio	-	-	-	-	0.159	0.204	0.092	-	-
HCM Control Delay (s)	0	-	-	0	15.4	10.1	7.9	0	-
HCM Lane LOS	A	-	-	A	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.6	0.8	0.3	-	-

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	222	200	0	139	15
Future Vol, veh/h	0	222	200	0	139	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	80	80	85	85	78	78
Heavy Vehicles, %	2	3	1	0	2	0
Mvmt Flow	0	278	235	0	178	19

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	513	235
Stage 1	-	-	-	-	235	-
Stage 2	-	-	-	-	278	-
Critical Hdwy	-	-	-	-	6.42	6.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	-	-	3.518	3.3
Pot Cap-1 Maneuver	0	-	-	0	521	809
Stage 1	0	-	-	0	804	-
Stage 2	0	-	-	0	769	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	521	809
Mov Cap-2 Maneuver	-	-	-	-	521	-
Stage 1	-	-	-	-	804	-
Stage 2	-	-	-	-	769	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	14.5
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	577
HCM Lane V/C Ratio	-	-	0.342
HCM Control Delay (s)	-	-	14.5
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	1.5

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	58	303	0	0	158	222	43	0	24	0	0	0
Future Vol, veh/h	58	303	0	0	158	222	43	0	24	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	96	96	96	84	84	84	92	92	92
Heavy Vehicles, %	1	1	0	0	0	2	2	0	0	2	2	2
Mvmt Flow	69	361	0	0	165	231	51	0	29	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	165	0	-	-	-	0	664	664	361
Stage 1	-	-	-	-	-	-	499	499	-
Stage 2	-	-	-	-	-	-	165	165	-
Critical Hdwy	4.11	-	-	-	-	-	6.42	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.5	-
Follow-up Hdwy	2.209	-	-	-	-	-	3.518	4	3.3
Pot Cap-1 Maneuver	1419	-	0	0	-	-	426	384	688
Stage 1	-	-	0	0	-	-	610	547	-
Stage 2	-	-	0	0	-	-	864	766	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1419	-	-	-	-	-	400	0	688
Mov Cap-2 Maneuver	-	-	-	-	-	-	400	0	-
Stage 1	-	-	-	-	-	-	573	0	-
Stage 2	-	-	-	-	-	-	864	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.2	0	7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	1921	1419	-	-	-
HCM Lane V/C Ratio	0.042	0.049	-	-	-
HCM Control Delay (s)	7	7.7	0	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	0.2	-	-	-

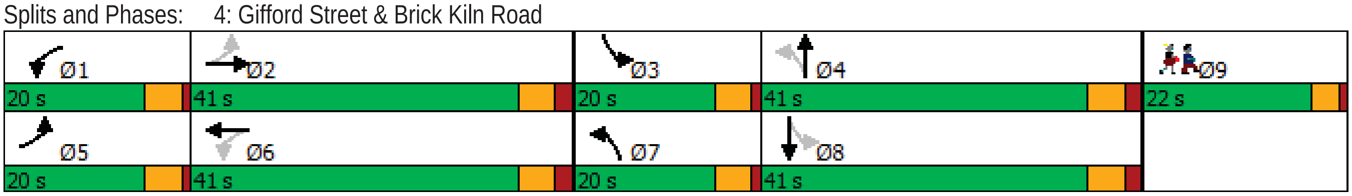
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	311	75	166	312	51	186	169	259	61	95	38
Future Volume (vph)	41	311	75	166	312	51	186	169	259	61	95	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	165		0	112		0	90		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			90			70			70		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			40			25	
Link Distance (ft)		484			960			717			886	
Travel Time (s)		9.4			18.7			12.2			24.2	
Confl. Peds. (#/hr)									1	1		
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.90	0.90	0.90	0.85	0.85	0.85	0.95	0.95	0.95	0.81	0.81	0.81
Heavy Vehicles (%)	0%	1%	1%	1%	1%	4%	3%	1%	2%	0%	7%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	46	429	0	195	427	0	196	451	0	75	164	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		1	6		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	24.0		10.0	24.0		10.0	24.0		10.0	24.0	
Total Split (s)	20.0	41.0		20.0	41.0		20.0	41.0		20.0	41.0	
Total Split (%)	13.9%	28.5%		13.9%	28.5%		13.9%	28.5%		13.9%	28.5%	
Maximum Green (s)	15.0	35.0		15.0	35.0		15.0	35.0		15.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max		None	Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	43.2	35.2		54.3	43.6		46.7	35.2		37.1	27.8	
Actuated g/C Ratio	0.39	0.32		0.49	0.39		0.42	0.32		0.33	0.25	
v/c Ratio	0.13	0.74		0.53	0.59		0.40	0.80		0.29	0.37	
Control Delay	17.7	43.4		22.9	32.8		23.6	44.1		22.9	34.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	17.7	43.4		22.9	32.8		23.6	44.1		22.9	34.9	
LOS	B	D		C	C		C	D		C	C	
Approach Delay		40.9			29.7			37.9			31.1	
Approach LOS		D			C			D			C	
Queue Length 50th (ft)	17	280		81	254		90	276		32	91	
Queue Length 95th (ft)	40	#427		125	354		145	#465		56	139	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	15%
Maximum Green (s)	18.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		404			880			637			806	
Turn Bay Length (ft)	200			165			112			90		
Base Capacity (vph)	487	583		392	722		505	565		372	553	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.09	0.74		0.50	0.59		0.39	0.80		0.20	0.30	

Intersection Summary	
Area Type: Other	
Cycle Length: 144	
Actuated Cycle Length: 111.2	
Natural Cycle: 100	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 35.2	Intersection LOS: D
Intersection Capacity Utilization 77.5%	ICU Level of Service D
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 4: Gifford Street & Brick Kiln Road



Lane Group	Ø9
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	81	0	228	0	159	118	164	178	0
Future Vol, veh/h	0	0	0	81	0	228	0	159	118	164	178	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	40	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	89	89	89	93	93	93	92	92	92
Heavy Vehicles, %	2	2	2	1	2	0	0	0	2	0	1	2
Mvmt Flow	0	0	0	91	0	256	0	171	127	178	193	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	912	847	193	784	784	235	193	0	0	298	0	0
Stage 1	549	549	-	235	235	-	-	-	-	-	-	-
Stage 2	363	298	-	549	549	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.11	6.52	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.11	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.11	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.509	4.018	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	255	299	849	312	325	809	1392	-	-	1275	-	-
Stage 1	520	516	-	770	710	-	-	-	-	-	-	-
Stage 2	656	667	-	522	516	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	154	252	849	275	274	809	1392	-	-	1275	-	-
Mov Cap-2 Maneuver	154	252	-	275	274	-	-	-	-	-	-	-
Stage 1	520	436	-	770	710	-	-	-	-	-	-	-
Stage 2	448	667	-	441	436	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	14.9	0	4
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1392	-	-	-	275	809	1275	-	-
HCM Lane V/C Ratio	-	-	-	-	0.331	0.317	0.14	-	-
HCM Control Delay (s)	0	-	-	0	24.4	11.5	8.3	0	-
HCM Lane LOS	A	-	-	A	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	1.4	1.4	0.5	-	-

Intersection	
Int Delay, s/veh	7.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		Y	
Traffic Vol, veh/h	0	313	284	0	195	21
Future Vol, veh/h	0	313	284	0	195	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	80	80	85	85	78	78
Heavy Vehicles, %	2	3	1	0	2	0
Mvmt Flow	0	391	334	0	250	27

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	725	334
Stage 1	-	-	-	-	334	-
Stage 2	-	-	-	-	391	-
Critical Hdwy	-	-	-	-	6.42	6.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	-	-	3.518	3.3
Pot Cap-1 Maneuver	0	-	-	0	392	712
Stage 1	0	-	-	0	725	-
Stage 2	0	-	-	0	683	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	392	712
Mov Cap-2 Maneuver	-	-	-	-	392	-
Stage 1	-	-	-	-	725	-
Stage 2	-	-	-	-	683	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	26.8
HCM LOS			D

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	434
HCM Lane V/C Ratio	-	-	0.638
HCM Control Delay (s)	-	-	26.8
HCM Lane LOS	-	-	D
HCM 95th %tile Q(veh)	-	-	4.3

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	83	427	0	0	223	314	61	0	33	0	0	0
Future Vol, veh/h	83	427	0	0	223	314	61	0	33	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	96	96	96	84	84	84	92	92	92
Heavy Vehicles, %	1	1	0	0	0	2	2	0	0	2	2	2
Mvmt Flow	99	508	0	0	232	327	73	0	39	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	232	0	-	-	-	0	938	938	508
Stage 1	-	-	-	-	-	-	706	706	-
Stage 2	-	-	-	-	-	-	232	232	-
Critical Hdwy	4.11	-	-	-	-	-	6.42	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.5	-
Follow-up Hdwy	2.209	-	-	-	-	-	3.518	4	3.3
Pot Cap-1 Maneuver	1342	-	0	0	-	-	293	266	569
Stage 1	-	-	0	0	-	-	489	442	-
Stage 2	-	-	0	0	-	-	807	716	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1342	-	-	-	-	-	263	0	569
Mov Cap-2 Maneuver	-	-	-	-	-	-	263	0	-
Stage 1	-	-	-	-	-	-	439	0	-
Stage 2	-	-	-	-	-	-	807	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.3	0	7.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	1621	1342	-	-	-
HCM Lane V/C Ratio	0.069	0.074	-	-	-
HCM Control Delay (s)	7.4	7.9	0	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.2	0.2	-	-	-

APPENDIX J

2030 Build Synchro Capacity/Level-of-Service Analysis

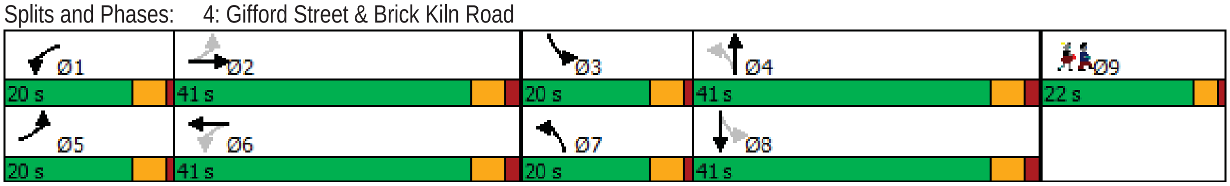
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	166	88	198	176	137	43	71	58	89	152	65
Future Volume (vph)	96	166	88	198	176	137	43	71	58	89	152	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	165		0	112		0	90		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			90			70			70		
Satd. Flow (prot)	1597	1732	0	1787	1749	0	1703	1655	0	1703	1653	0
Flt Permitted	0.465			0.434			0.501			0.507		
Satd. Flow (perm)	782	1732	0	816	1749	0	898	1655	0	909	1653	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			26			27			14	
Link Speed (mph)		35			35			30			25	
Link Distance (ft)		484			960			717			886	
Travel Time (s)		9.4			18.7			16.3			24.2	
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.81	0.81	0.81	0.92	0.92	0.92	0.79	0.79	0.79	0.88	0.88	0.88
Heavy Vehicles (%)	13%	4%	4%	1%	1%	2%	6%	8%	6%	6%	1%	28%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	119	314	0	215	340	0	54	163	0	101	247	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		1	6		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	24.0		10.0	24.0		10.0	24.0		10.0	24.0	
Total Split (s)	20.0	41.0		20.0	41.0		20.0	41.0		20.0	41.0	
Total Split (%)	13.9%	28.5%		13.9%	28.5%		13.9%	28.5%		13.9%	28.5%	
Maximum Green (s)	15.0	35.0		15.0	35.0		15.0	35.0		15.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max		None	Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	46.1	35.4		50.1	37.4		25.8	16.9		29.8	21.0	
Actuated g/C Ratio	0.48	0.37		0.52	0.39		0.27	0.18		0.31	0.22	
v/c Ratio	0.26	0.48		0.39	0.49		0.18	0.52		0.28	0.66	
Control Delay	13.7	27.0		14.5	25.1		22.8	36.1		24.1	43.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	13.7	27.0		14.5	25.1		22.8	36.1		24.1	43.0	
LOS	B	C		B	C		C	D		C	D	
Approach Delay		23.4			21.0			32.8			37.5	
Approach LOS		C			C			C			D	
Queue Length 50th (ft)	33	138		63	141		22	75		42	134	
Queue Length 95th (ft)	67	228		128	277		43	123		80	224	
Internal Link Dist (ft)		404			880			637			806	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	15%
Maximum Green (s)	18.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			165			112			90		
Base Capacity (vph)	546	652		600	699		426	629		432	620	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.22	0.48		0.36	0.49		0.13	0.26		0.23	0.40	

Intersection Summary	
Area Type: Other	
Cycle Length: 144	
Actuated Cycle Length: 95.7	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 27.0	Intersection LOS: C
Intersection Capacity Utilization 59.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 4: Gifford Street & Brick Kiln Road



Lane Group	Ø9
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Intersection	
Int Delay, s/veh	6.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	76	0	166	0	66	59	113	157	0
Future Vol, veh/h	0	0	0	76	0	166	0	66	59	113	157	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	40	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	79	79	79	81	81	81	86	86	86
Heavy Vehicles, %	2	2	2	5	2	2	0	0	2	4	2	2
Mvmt Flow	0	0	0	96	0	210	0	81	73	131	183	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	668	599	183	563	563	118	183	0	0	154	0	0
Stage 1	445	445	-	118	118	-	-	-	-	-	-	-
Stage 2	223	154	-	445	445	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.15	6.52	6.22	4.1	-	-	4.14	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.15	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.15	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.545	4.018	3.318	2.2	-	-	2.236	-	-
Pot Cap-1 Maneuver	372	415	859	432	435	934	1404	-	-	1414	-	-
Stage 1	592	575	-	879	798	-	-	-	-	-	-	-
Stage 2	780	770	-	586	575	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	266	372	859	398	390	934	1404	-	-	1414	-	-
Mov Cap-2 Maneuver	266	372	-	398	390	-	-	-	-	-	-	-
Stage 1	592	516	-	879	798	-	-	-	-	-	-	-
Stage 2	605	770	-	526	516	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	12.2	0	3.3
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1404	-	-	-	398	934	1414	-	-
HCM Lane V/C Ratio	-	-	-	-	0.242	0.225	0.093	-	-
HCM Control Delay (s)	0	-	-	0	16.9	10	7.8	0	-
HCM Lane LOS	A	-	-	A	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.9	0.9	0.3	-	-

Intersection	
Int Delay, s/veh	7.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		Y	
Traffic Vol, veh/h	0	173	224	0	225	14
Future Vol, veh/h	0	173	224	0	225	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	78	78	78	78
Heavy Vehicles, %	2	6	2	2	9	20
Mvmt Flow	0	190	287	0	288	18

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	477	287
Stage 1	-	-	-	-	287	-
Stage 2	-	-	-	-	190	-
Critical Hdwy	-	-	-	-	6.49	6.4
Critical Hdwy Stg 1	-	-	-	-	5.49	-
Critical Hdwy Stg 2	-	-	-	-	5.49	-
Follow-up Hdwy	-	-	-	-	3.581	3.48
Pot Cap-1 Maneuver	0	-	-	0	534	711
Stage 1	0	-	-	0	746	-
Stage 2	0	-	-	0	826	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	534	711
Mov Cap-2 Maneuver	-	-	-	-	534	-
Stage 1	-	-	-	-	746	-
Stage 2	-	-	-	-	826	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	18.6
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	567
HCM Lane V/C Ratio	-	-	0.54
HCM Control Delay (s)	-	-	18.6
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	3.2

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	41	357	0	0	176	217	48	0	43	0	0	0
Future Vol, veh/h	41	357	0	0	176	217	48	0	43	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	84	84	84	77	77	77	92	92	92
Heavy Vehicles, %	7	6	0	0	1	6	2	0	0	2	2	2
Mvmt Flow	48	415	0	0	210	258	62	0	56	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	210	0	-	-	-	0	721	721	415
Stage 1	-	-	-	-	-	-	511	511	-
Stage 2	-	-	-	-	-	-	210	210	-
Critical Hdwy	4.17	-	-	-	-	-	6.42	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.5	-
Follow-up Hdwy	2.263	-	-	-	-	-	3.518	4	3.3
Pot Cap-1 Maneuver	1331	-	0	0	-	-	394	356	642
Stage 1	-	-	0	0	-	-	602	540	-
Stage 2	-	-	0	0	-	-	825	732	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1331	-	-	-	-	-	375	0	642
Mov Cap-2 Maneuver	-	-	-	-	-	-	375	0	-
Stage 1	-	-	-	-	-	-	574	0	-
Stage 2	-	-	-	-	-	-	825	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.8	0	7.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	1359	1331	-	-	-
HCM Lane V/C Ratio	0.087	0.036	-	-	-
HCM Control Delay (s)	7.9	7.8	0	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.3	0.1	-	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	56	318	239	45	32	39
Future Vol, veh/h	56	318	239	45	32	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	81	81	92	92	92	92
Heavy Vehicles, %	0	4	1	0	0	0
Mvmt Flow	69	393	260	49	35	42

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	309	0	-	0	816	285
Stage 1	-	-	-	-	285	-
Stage 2	-	-	-	-	531	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1263	-	-	-	349	759
Stage 1	-	-	-	-	768	-
Stage 2	-	-	-	-	594	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1263	-	-	-	325	759
Mov Cap-2 Maneuver	-	-	-	-	325	-
Stage 1	-	-	-	-	714	-
Stage 2	-	-	-	-	594	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	14.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1263	-	-	-	474
HCM Lane V/C Ratio	0.055	-	-	-	0.163
HCM Control Delay (s)	8	0	-	-	14.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	220	142	302	268	55	99	68	90	50	133	35
Future Volume (vph)	54	220	142	302	268	55	99	68	90	50	133	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	165		0	112		0	90		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			90			70			70		
Satd. Flow (prot)	1597	1719	0	1787	1829	0	1703	1625	0	1703	1718	0
Flt Permitted	0.551			0.252			0.373			0.632		
Satd. Flow (perm)	926	1719	0	474	1829	0	669	1625	0	1133	1718	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			7			44			9	
Link Speed (mph)		35			35			30			25	
Link Distance (ft)		484			960			717			886	
Travel Time (s)		9.4			18.7			16.3			24.2	
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.81	0.81	0.81	0.92	0.92	0.92	0.79	0.79	0.79	0.88	0.88	0.88
Heavy Vehicles (%)	13%	4%	4%	1%	1%	2%	6%	8%	6%	6%	1%	28%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	447	0	328	351	0	125	200	0	57	191	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		1	6		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	24.0		10.0	24.0		10.0	24.0		10.0	24.0	
Total Split (s)	20.0	41.0		20.0	41.0		20.0	41.0		20.0	41.0	
Total Split (%)	13.9%	28.5%		13.9%	28.5%		13.9%	28.5%		13.9%	28.5%	
Maximum Green (s)	15.0	35.0		15.0	35.0		15.0	35.0		15.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max		None	Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	43.8	35.2		56.2	44.9		32.4	21.8		24.5	15.8	
Actuated g/C Ratio	0.44	0.35		0.56	0.45		0.33	0.22		0.25	0.16	
v/c Ratio	0.15	0.72		0.70	0.42		0.37	0.51		0.18	0.68	
Control Delay	13.1	35.8		22.7	22.9		26.5	32.2		23.7	50.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	13.1	35.8		22.7	22.9		26.5	32.2		23.7	50.6	
LOS	B	D		C	C		C	C		C	D	
Approach Delay		32.8			22.8			30.0			44.4	
Approach LOS		C			C			C			D	
Queue Length 50th (ft)	18	232		104	150		56	89		25	110	
Queue Length 95th (ft)	42	342		#213	278		85	136		50	183	
Internal Link Dist (ft)		404			880			637			806	

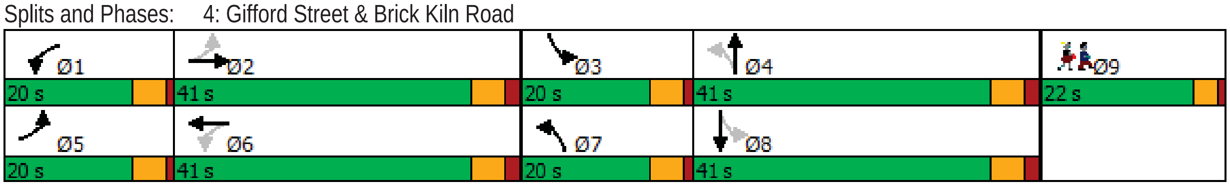
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	15%
Maximum Green (s)	18.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			165			112			90		
Base Capacity (vph)	578	621		466	830		379	602		444	612	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.12	0.72		0.70	0.42		0.33	0.33		0.13	0.31	

Intersection Summary

Area Type: Other
Cycle Length: 144
Actuated Cycle Length: 99.5
Natural Cycle: 100
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 30.1 Intersection LOS: C
Intersection Capacity Utilization 69.9% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Gifford Street & Brick Kiln Road



Lane Group	Ø9
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	84	0	188	0	75	68	127	179	0
Future Vol, veh/h	0	0	0	84	0	188	0	75	68	127	179	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	40	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	79	79	79	81	81	81	86	86	86
Heavy Vehicles, %	2	2	2	5	2	2	0	0	2	4	2	2
Mvmt Flow	0	0	0	106	0	238	0	93	84	148	208	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	758	681	208	639	639	135	208	0	0	177	0	0
Stage 1	504	504	-	135	135	-	-	-	-	-	-	-
Stage 2	254	177	-	504	504	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.15	6.52	6.22	4.1	-	-	4.14	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.15	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.15	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.545	4.018	3.318	2.2	-	-	2.236	-	-
Pot Cap-1 Maneuver	324	373	832	385	394	914	1375	-	-	1387	-	-
Stage 1	550	541	-	861	785	-	-	-	-	-	-	-
Stage 2	750	753	-	545	541	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	217	328	832	349	346	914	1375	-	-	1387	-	-
Mov Cap-2 Maneuver	217	328	-	349	346	-	-	-	-	-	-	-
Stage 1	550	476	-	861	785	-	-	-	-	-	-	-
Stage 2	555	753	-	479	476	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	13.2	0	3.3
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1375	-	-	-	349	914	1387	-	-
HCM Lane V/C Ratio	-	-	-	-	0.305	0.26	0.106	-	-
HCM Control Delay (s)	0	-	-	0	19.8	10.3	7.9	0	-
HCM Lane LOS	A	-	-	A	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	1.3	1	0.4	-	-

Intersection	
Int Delay, s/veh	9.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	195	252	0	253	16
Future Vol, veh/h	0	195	252	0	253	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	78	78	78	78
Heavy Vehicles, %	2	6	2	2	9	20
Mvmt Flow	0	214	323	0	324	21

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	537	323
Stage 1	-	-	-	-	323	-
Stage 2	-	-	-	-	214	-
Critical Hdwy	-	-	-	-	6.49	6.4
Critical Hdwy Stg 1	-	-	-	-	5.49	-
Critical Hdwy Stg 2	-	-	-	-	5.49	-
Follow-up Hdwy	-	-	-	-	3.581	3.48
Pot Cap-1 Maneuver	0	-	-	0	493	678
Stage 1	0	-	-	0	718	-
Stage 2	0	-	-	0	805	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	493	678
Mov Cap-2 Maneuver	-	-	-	-	493	-
Stage 1	-	-	-	-	718	-
Stage 2	-	-	-	-	805	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	24.1
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	524
HCM Lane V/C Ratio	-	-	0.658
HCM Control Delay (s)	-	-	24.1
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	4.8

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	47	401	0	0	198	244	55	0	46	0	0	0
Future Vol, veh/h	47	401	0	0	198	244	55	0	46	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	84	84	84	77	77	77	92	92	92
Heavy Vehicles, %	7	6	0	0	1	6	2	0	0	2	2	2
Mvmt Flow	55	466	0	0	236	290	71	0	60	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	236	0	-	-	-	0	812	812	466
Stage 1	-	-	-	-	-	-	576	576	-
Stage 2	-	-	-	-	-	-	236	236	-
Critical Hdwy	4.17	-	-	-	-	-	6.42	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.5	-
Follow-up Hdwy	2.263	-	-	-	-	-	3.518	4	3.3
Pot Cap-1 Maneuver	1302	-	0	0	-	-	348	315	601
Stage 1	-	-	0	0	-	-	562	505	-
Stage 2	-	-	0	0	-	-	803	713	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1302	-	-	-	-	-	328	0	601
Mov Cap-2 Maneuver	-	-	-	-	-	-	328	0	-
Stage 1	-	-	-	-	-	-	530	0	-
Stage 2	-	-	-	-	-	-	803	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.8	0	8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	1320	1302	-	-	-
HCM Lane V/C Ratio	0.099	0.042	-	-	-
HCM Control Delay (s)	8	7.9	0	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.3	0.1	-	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	56	383	357	45	32	39
Future Vol, veh/h	56	383	357	45	32	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	81	81	92	92	92	92
Heavy Vehicles, %	0	4	1	0	0	0
Mvmt Flow	69	473	388	49	35	42

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	437	0	-	0	1024	413
Stage 1	-	-	-	-	413	-
Stage 2	-	-	-	-	611	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1134	-	-	-	263	643
Stage 1	-	-	-	-	672	-
Stage 2	-	-	-	-	546	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1134	-	-	-	241	643
Mov Cap-2 Maneuver	-	-	-	-	241	-
Stage 1	-	-	-	-	616	-
Stage 2	-	-	-	-	546	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	17.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1134	-	-	-	367
HCM Lane V/C Ratio	0.061	-	-	-	0.21
HCM Control Delay (s)	8.4	0	-	-	17.4
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.8

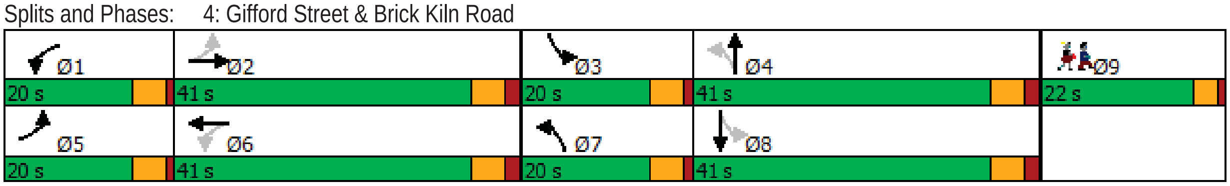
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	216	78	119	212	50	120	134	204	61	63	36
Future Volume (vph)	44	216	78	119	212	50	120	134	204	61	63	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	165		0	112		0	90		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			90			70			70		
Satd. Flow (prot)	1805	1806	0	1787	1816	0	1752	1677	0	1805	1707	0
Flt Permitted	0.543			0.388			0.569			0.334		
Satd. Flow (perm)	1032	1806	0	730	1816	0	1050	1677	0	634	1707	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			8			50			19	
Link Speed (mph)		35			35			40			25	
Link Distance (ft)		484			960			717			886	
Travel Time (s)		9.4			18.7			12.2			24.2	
Confl. Peds. (#/hr)									1	1		
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.90	0.90	0.90	0.85	0.85	0.85	0.95	0.95	0.95	0.81	0.81	0.81
Heavy Vehicles (%)	0%	1%	1%	1%	1%	4%	3%	1%	2%	0%	7%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	327	0	140	308	0	126	356	0	75	122	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		1	6		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	24.0		10.0	24.0		10.0	24.0		10.0	24.0	
Total Split (s)	20.0	41.0		20.0	41.0		20.0	41.0		20.0	41.0	
Total Split (%)	13.9%	28.5%		13.9%	28.5%		13.9%	28.5%		13.9%	28.5%	
Maximum Green (s)	15.0	35.0		15.0	35.0		15.0	35.0		15.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max		None	Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	43.8	35.7		50.9	41.4		35.8	25.9		29.6	20.4	
Actuated g/C Ratio	0.44	0.36		0.51	0.42		0.36	0.26		0.30	0.21	
v/c Ratio	0.10	0.50		0.29	0.41		0.28	0.75		0.26	0.33	
Control Delay	15.6	30.3		16.4	25.7		21.9	40.8		22.2	30.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	15.6	30.3		16.4	25.7		21.9	40.8		22.2	30.5	
LOS	B	C		B	C		C	D		C	C	
Approach Delay		28.4			22.8			35.8			27.3	
Approach LOS		C			C			D			C	
Queue Length 50th (ft)	15	159		46	141		52	185		30	55	
Queue Length 95th (ft)	42	300		92	244		96	309		55	99	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	15%
Maximum Green (s)	18.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		404			880			637			806	
Turn Bay Length (ft)	200			165			112			90		
Base Capacity (vph)	646	655		543	760		500	633		409	624	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.08	0.50		0.26	0.41		0.25	0.56		0.18	0.20	

Intersection Summary	
Area Type: Other	
Cycle Length: 144	
Actuated Cycle Length: 99.5	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 29.0	Intersection LOS: C
Intersection Capacity Utilization 64.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 4: Gifford Street & Brick Kiln Road



Lane Group	Ø9
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	76	0	170	0	112	83	127	125	0
Future Vol, veh/h	0	0	0	76	0	170	0	112	83	127	125	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	40	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	89	89	89	93	93	93	92	92	92
Heavy Vehicles, %	2	2	2	1	2	0	0	0	2	0	1	2
Mvmt Flow	0	0	0	85	0	191	0	120	89	138	136	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	672	621	136	577	577	165	136	0	0	209	0	0
Stage 1	412	412	-	165	165	-	-	-	-	-	-	-
Stage 2	260	209	-	412	412	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.11	6.52	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.11	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.11	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.509	4.018	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	370	403	913	429	427	885	1461	-	-	1374	-	-
Stage 1	617	594	-	839	762	-	-	-	-	-	-	-
Stage 2	745	729	-	619	594	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	266	359	913	393	380	885	1461	-	-	1374	-	-
Mov Cap-2 Maneuver	266	359	-	393	380	-	-	-	-	-	-	-
Stage 1	617	529	-	839	762	-	-	-	-	-	-	-
Stage 2	584	729	-	552	529	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	12.2	0	4
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1461	-	-	-	393	885	1374	-	-
HCM Lane V/C Ratio	-	-	-	-	0.217	0.216	0.1	-	-
HCM Control Delay (s)	0	-	-	0	16.7	10.2	7.9	0	-
HCM Lane LOS	A	-	-	A	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.8	0.8	0.3	-	-

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		Y	
Traffic Vol, veh/h	0	233	227	0	166	15
Future Vol, veh/h	0	233	227	0	166	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	80	80	85	85	78	78
Heavy Vehicles, %	2	3	1	0	2	0
Mvmt Flow	0	291	267	0	213	19

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	558	267
Stage 1	-	-	-	-	267	-
Stage 2	-	-	-	-	291	-
Critical Hdwy	-	-	-	-	6.42	6.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	-	-	3.518	3.3
Pot Cap-1 Maneuver	0	-	-	0	491	777
Stage 1	0	-	-	0	778	-
Stage 2	0	-	-	0	759	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	491	777
Mov Cap-2 Maneuver	-	-	-	-	491	-
Stage 1	-	-	-	-	778	-
Stage 2	-	-	-	-	759	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	16.8
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	535
HCM Lane V/C Ratio	-	-	0.434
HCM Control Delay (s)	-	-	16.8
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	2.2

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	58	341	0	0	185	244	43	0	46	0	0	0
Future Vol, veh/h	58	341	0	0	185	244	43	0	46	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	96	96	96	84	84	84	92	92	92
Heavy Vehicles, %	1	1	0	0	0	2	2	0	0	2	2	2
Mvmt Flow	69	406	0	0	193	254	51	0	55	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	193	0	-	-	-	0	737	737	406
Stage 1	-	-	-	-	-	-	544	544	-
Stage 2	-	-	-	-	-	-	193	193	-
Critical Hdwy	4.11	-	-	-	-	-	6.42	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.5	-
Follow-up Hdwy	2.209	-	-	-	-	-	3.518	4	3.3
Pot Cap-1 Maneuver	1386	-	0	0	-	-	386	348	649
Stage 1	-	-	0	0	-	-	582	522	-
Stage 2	-	-	0	0	-	-	840	745	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1386	-	-	-	-	-	361	0	649
Mov Cap-2 Maneuver	-	-	-	-	-	-	361	0	-
Stage 1	-	-	-	-	-	-	545	0	-
Stage 2	-	-	-	-	-	-	840	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.1	0	8.1
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	1256	1386	-	-	-
HCM Lane V/C Ratio	0.084	0.05	-	-	-
HCM Control Delay (s)	8.1	7.7	0	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.3	0.2	-	-	-

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	60	298	319	49	41	49
Future Vol, veh/h	60	298	319	49	41	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	85	85	92	92
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	67	331	375	58	45	53

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	433	0	-	0	869	404
Stage 1	-	-	-	-	404	-
Stage 2	-	-	-	-	465	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1137	-	-	-	325	651
Stage 1	-	-	-	-	679	-
Stage 2	-	-	-	-	636	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1137	-	-	-	302	651
Mov Cap-2 Maneuver	-	-	-	-	302	-
Stage 1	-	-	-	-	630	-
Stage 2	-	-	-	-	636	-

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	16
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1137	-	-	-	426
HCM Lane V/C Ratio	0.059	-	-	-	0.23
HCM Control Delay (s)	8.4	0	-	-	16
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	325	88	166	328	51	203	169	259	61	95	54
Future Volume (vph)	55	325	88	166	328	51	203	169	259	61	95	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	165		0	112		0	90		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			90			70			70		
Satd. Flow (prot)	1805	1821	0	1787	1836	0	1752	1677	0	1805	1706	0
Flt Permitted	0.361			0.192			0.476			0.265		
Satd. Flow (perm)	686	1821	0	361	1836	0	878	1677	0	503	1706	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			5			51			19	
Link Speed (mph)		35			35			40			25	
Link Distance (ft)		484			960			717			886	
Travel Time (s)		9.4			18.7			12.2			24.2	
Confl. Peds. (#/hr)									1	1		
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.90	0.90	0.90	0.85	0.85	0.85	0.95	0.95	0.95	0.81	0.81	0.81
Heavy Vehicles (%)	0%	1%	1%	1%	1%	4%	3%	1%	2%	0%	7%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	61	459	0	195	446	0	214	451	0	75	184	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		1	6		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	24.0		10.0	24.0		10.0	24.0		10.0	24.0	
Total Split (s)	20.0	41.0		20.0	41.0		20.0	41.0		20.0	41.0	
Total Split (%)	13.9%	28.5%		13.9%	28.5%		13.9%	28.5%		13.9%	28.5%	
Maximum Green (s)	15.0	35.0		15.0	35.0		15.0	35.0		15.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max		None	Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	43.8	35.2		54.3	43.1		46.8	35.2		36.6	27.4	
Actuated g/C Ratio	0.39	0.32		0.49	0.39		0.42	0.32		0.33	0.25	
v/c Ratio	0.18	0.79		0.57	0.62		0.45	0.80		0.29	0.42	
Control Delay	18.2	46.5		24.1	34.2		24.5	44.1		22.9	35.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	18.2	46.5		24.1	34.2		24.5	44.1		22.9	35.3	
LOS	B	D		C	C		C	D		C	D	
Approach Delay		43.2			31.1			37.8			31.7	
Approach LOS		D			C			D			C	
Queue Length 50th (ft)	23	306		81	270		100	276		32	102	
Queue Length 95th (ft)	49	#493		125	377		158	#465		56	151	

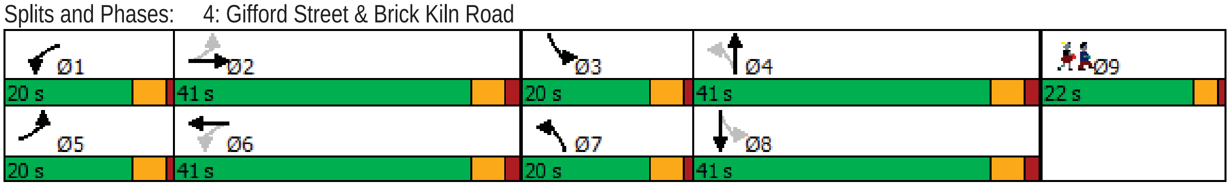
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	15%
Maximum Green (s)	18.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		404			880			637			806	
Turn Bay Length (ft)	200			165			112			90		
Base Capacity (vph)	467	582		369	715		487	565		372	553	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.13	0.79		0.53	0.62		0.44	0.80		0.20	0.33	

Intersection Summary	
Area Type: Other	
Cycle Length: 144	
Actuated Cycle Length: 111.2	
Natural Cycle: 100	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 36.3	Intersection LOS: D
Intersection Capacity Utilization 79.0%	ICU Level of Service D
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Gifford Street & Brick Kiln Road



Lane Group	Ø9
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Intersection	
Int Delay, s/veh	7.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	99	0	237	0	159	118	175	178	0
Future Vol, veh/h	0	0	0	99	0	237	0	159	118	175	178	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	40	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	89	89	89	93	93	93	92	92	92
Heavy Vehicles, %	2	2	2	1	2	0	0	0	2	0	1	2
Mvmt Flow	0	0	0	111	0	266	0	171	127	190	193	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	941	871	193	808	808	235	193	0	0	298	0	0
Stage 1	573	573	-	235	235	-	-	-	-	-	-	-
Stage 2	368	298	-	573	573	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.11	6.52	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.11	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.11	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.509	4.018	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	243	289	849	301	315	809	1392	-	-	1275	-	-
Stage 1	505	504	-	770	710	-	-	-	-	-	-	-
Stage 2	652	667	-	506	504	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	142	241	849	262	262	809	1392	-	-	1275	-	-
Mov Cap-2 Maneuver	142	241	-	262	262	-	-	-	-	-	-	-
Stage 1	505	420	-	770	710	-	-	-	-	-	-	-
Stage 2	437	667	-	421	420	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	16.6	0	4.1
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1392	-	-	-	262	809	1275	-	-
HCM Lane V/C Ratio	-	-	-	-	0.425	0.329	0.149	-	-
HCM Control Delay (s)	0	-	-	0	28.5	11.6	8.3	0	-
HCM Lane LOS	A	-	-	A	D	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	2	1.4	0.5	-	-

Intersection						
Int Delay, s/veh	11.1					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	324	311	0	222	21
Future Vol, veh/h	0	324	311	0	222	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	80	80	85	85	78	78
Heavy Vehicles, %	2	3	1	0	2	0
Mvmt Flow	0	405	366	0	285	27

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	771	366
Stage 1	-	-	-	-	366	-
Stage 2	-	-	-	-	405	-
Critical Hdwy	-	-	-	-	6.42	6.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	-	-	3.518	3.3
Pot Cap-1 Maneuver	0	-	-	0	368	684
Stage 1	0	-	-	0	702	-
Stage 2	0	-	-	0	673	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	368	684
Mov Cap-2 Maneuver	-	-	-	-	368	-
Stage 1	-	-	-	-	702	-
Stage 2	-	-	-	-	673	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	38.5
HCM LOS			E

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	403
HCM Lane V/C Ratio	-	-	0.773
HCM Control Delay (s)	-	-	38.5
HCM Lane LOS	-	-	E
HCM 95th %tile Q(veh)	-	-	6.5

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	83	465	0	0	250	336	61	0	55	0	0	0
Future Vol, veh/h	83	465	0	0	250	336	61	0	55	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	96	96	96	84	84	84	92	92	92
Heavy Vehicles, %	1	1	0	0	0	2	2	0	0	2	2	2
Mvmt Flow	99	554	0	0	260	350	73	0	65	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	260	0	-	-	-	0	1012	1012	554
Stage 1	-	-	-	-	-	-	752	752	-
Stage 2	-	-	-	-	-	-	260	260	-
Critical Hdwy	4.11	-	-	-	-	-	6.42	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.5	-
Follow-up Hdwy	2.209	-	-	-	-	-	3.518	4	3.3
Pot Cap-1 Maneuver	1310	-	0	0	-	-	265	241	536
Stage 1	-	-	0	0	-	-	466	421	-
Stage 2	-	-	0	0	-	-	783	697	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1310	-	-	-	-	-	236	0	536
Mov Cap-2 Maneuver	-	-	-	-	-	-	236	0	-
Stage 1	-	-	-	-	-	-	415	0	-
Stage 2	-	-	-	-	-	-	783	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.2	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	1130	1310	-	-	-
HCM Lane V/C Ratio	0.122	0.075	-	-	-
HCM Control Delay (s)	8.6	8	0	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.4	0.2	-	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	60	426	536	49	41	49
Future Vol, veh/h	60	426	536	49	41	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	85	85	92	92
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	67	473	631	58	45	53

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	689	0	-	0	1267	660
Stage 1	-	-	-	-	660	-
Stage 2	-	-	-	-	607	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	915	-	-	-	188	467
Stage 1	-	-	-	-	518	-
Stage 2	-	-	-	-	548	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	915	-	-	-	169	467
Mov Cap-2 Maneuver	-	-	-	-	169	-
Stage 1	-	-	-	-	467	-
Stage 2	-	-	-	-	548	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	27.1
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	915	-	-	-	259
HCM Lane V/C Ratio	0.073	-	-	-	0.378
HCM Control Delay (s)	9.2	0	-	-	27.1
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0.2	-	-	-	1.7

APPENDIX K

Capacity Analysis Summary

CAPACITY ANALYSIS SUMMARY

Peak Conditions Weekday Morning Peak Hour
Proposed YMCA
Falmouth, MA

			2023 Existing			2030 No Build			2030 Build		
Intersection	**Movement**		**LOS**[1]	**Delay**[2]	**V/C**[3]	**LOS**	**Delay**	**V/C**	**LOS**	**Delay**	**V/C**
Brick Kiln Road at	EB	L	B	11.3	0.10	B	12.0	0.12	B	13.1	0.15
Gifford Street/Gifford Street Ext.		TR	C	29.0	0.60	C	31.8	0.66	D	35.8	0.72
	WB	L	B	15.2	0.56	B	18.5	0.65	C	22.7	0.70
		TR	B	19.3	0.36	C	20.8	0.39	C	22.9	0.42
	NB	L	C	26.2	0.30	C	26.3	0.32	C	26.5	0.37
		TR	C	33.6	0.54	C	34.3	0.55	C	32.2	0.51
	SB	L	C	24.4	0.17	C	24.3	0.18	C	23.7	0.18
		TR	D	48.5	0.62	D	49.5	0.64	D	50.6	0.68
	Overall		*C*	*26.0*	*0.64*	*C*	*27.9*	*0.67*	*C*	*30.1*	*0.72*
Brick Kiln Road at	EB	LT	A	0.9	0.04	A	0.9	0.04	A	0.8	0.04
Route 28 NB Ramps	WB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	NB	LTR	A	6.8	0.05	A	6.9	0.05	A	8.0	0.10
Brick Kiln Road at	EB	T	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Route 28 SB Ramps	WB	T	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB	LR	C	17.0	0.49	C	19.5	0.56	C	24.1	0.66
Brick Kiln Road at	EB	LTR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Route 28A	WB	LT	C	16.4	0.20	C	18.0	0.24	C	19.8	0.31
		R	B	10.0	0.23	B	10.3	0.25	B	10.3	0.26
	NB	LTR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB	LTR	A	3.1	0.09	A	3.1	0.10	A	3.3	0.11
Brick Kiln Road at	EB	LT	-	-	-	-	-	-	A	1.1	0.06
Proposed Site Driveway	WB	TR	-	-	-	-	-	-	A	0.0	0.00
	SB	LR	-	-	-	-	-	-	C	17.4	0.21

1 Level-of-Service
2 Average vehicle delay, in seconds
3 Volume to capacity ratio
\- Not Applicable

QUEUE SUMMARY

Peak Conditions Weekday Morning Peak Hour
Proposed YMCA
Falmouth, MA

Intersection	Movement		2023 Existing 50th Queue[1]	2023 Existing 95th Queue[2]	2030 No Build 50th Queue	2030 No Build 95th Queue	2030 Build 50th Queue	2030 Build 95th Queue
Brick Kiln Road at	EB	L	11	29	13	33	18	42
Gifford Street/Gifford Street Ext.		TR	176	267	203	304	232	342
	WB	L	86	165	97	185	104	213
		TR	117	220	133	249	150	278
	NB	L	43	70	47	75	56	85
		TR	80	126	89	137	89	136
	SB	L	23	48	25	51	25	50
		TR	90	156	99	168	110	183
Brick Kiln Road at	EB	LT	-	3	-	3	-	3
Route 28 NB Ramps	WB	TR	-	0	-	0	-	0
	NB	LTR	-	3	-	5	-	8
Brick Kiln Road at	EB	T	-	0	-	0	-	0
Route 28 SB Ramps	WB	T	-	0	-	0	-	0
	SB	LR	-	68	-	88	-	120
Brick Kiln Road at	EB	LTR	-	0	-	0	-	0
Route 28A	WB	LT	-	18	-	23	-	33
		R	-	23	-	25	-	25
	NB	LTR	-	0	-	0	-	0
	SB	LTR	-	8	-	8	-	10
Brick Kiln Road at	EB	LT	-	-	-	-	-	5
Site Driveway	WB	TR	-	-	-	-	-	0
	SB	LR	-	-	-	-	-	20

1 50th percentile queue length, in feet
2 95th percentile queue length, in feet
- Not Applicable

CAPACITY ANALYSIS SUMMARY

Peak Conditions Weekday Afternoon Peak Hour
Proposed YMCA
Falmouth, MA

			2023 Existing			2030 No Build			2030 Build		
Intersection	**Movement**		**LOS[1]**	**Delay[2]**	**V/C[3]**	**LOS**	**Delay**	**V/C**	**LOS**	**Delay**	**V/C**
Brick Kiln Road at	EB	L	B	17.2	0.10	B	17.7	0.13	B	18.2	0.18
Gifford Street/Gifford Street Ext.		TR	D	38.1	0.65	D	43.4	0.74	D	46.5	0.79
	WB	L	C	20.2	0.44	C	22.9	0.53	C	24.2	0.57
		TR	C	28.6	0.50	C	32.8	0.59	C	34.3	0.63
	NB	L	C	23.2	0.38	C	23.6	0.40	C	24.5	0.45
		TR	D	43.1	0.79	D	44.1	0.80	D	44.1	0.80
	SB	L	C	22.4	0.27	C	22.9	0.29	C	22.9	0.29
		TR	C	34.9	0.38	C	34.9	0.37	D	35.3	0.42
	Overall		*C*	*32.6*	*0.74*	*D*	*35.2*	*0.78*	*D*	*36.5*	*0.79*
Brick Kiln Road at	EB	LT	A	1.3	0.07	A	1.3	0.07	A	1.2	0.08
Route 28 NB Ramps	WB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	NB	LTR	A	7.0	0.05	A	7.4	0.07	A	8.6	0.12
Brick Kiln Road at	EB	T	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Route 28 SB Ramps	WB	T	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB	LR	C	21.4	0.54	D	26.8	0.64	E	38.5	0.77
Brick Kiln Road at	EB	LTR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Route 28A	WB	LT	C	21.3	0.27	C	24.4	0.33	D	28.5	0.43
		R	B	11.1	0.29	B	11.5	0.32	B	11.6	0.33
	NB	LTR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB	LTR	A	3.9	0.13	A	4.0	0.14	A	4.1	0.15
Brick Kiln Road at	EB	LT	-	-	-	-	-	-	A	1.1	0.07
Proposed Site Driveway	WB	TR	-	-	-	-	-	-	A	0.0	0.00
	SB	LR	-	-	-	-	-	-	D	27.1	0.38

1 Level-of-Service
2 Average vehicle delay, in seconds
3 Volume to capacity ratio
- Not Applicable

QUEUE SUMMARY

Peak Conditions Weekday Afternoon Peak Hour
Proposed YMCA
Falmouth, MA

Intersection	Movement		2023 Existing 50th Queue[1]	2023 Existing 95th Queue[2]	2030 No Build 50th Queue	2030 No Build 95th Queue	2030 Build 50th Queue	2030 Build 95th Queue
Brick Kiln Road at	EB	L	15	36	17	40	23	49
Gifford Street/Gifford Street Ext.		TR	246	380	280	427	306	493
	WB	L	75	116	81	125	81	125
		TR	227	320	254	354	270	377
	NB	L	80	134	90	145	100	158
		TR	243	410	276	465	276	465
	SB	L	29	53	32	56	32	56
		TR	80	129	91	139	102	151
Brick Kiln Road at	EB	LT	-	5	-	5	-	5
Route 28 NB Ramps	WB	TR	-	0	-	0	-	0
	NB	LTR	-	5	-	5	-	10
Brick Kiln Road at	EB	T	-	0	-	0	-	0
Route 28 SB Ramps	WB	T	-	0	-	0	-	0
	SB	LR	-	80	-	108	-	165
Brick Kiln Road at	EB	LTR	-	0	-	0	-	0
Route 28A	WB	LT	-	28	-	35	-	50
		R	-	30	-	35	-	35
	NB	LTR	-	0	-	0	-	0
	SB	LTR	-	10	-	13	-	13
Brick Kiln Road at	EB	LT	-	-	-	-	-	5
Site Driveway	WB	TR	-	-	-	-	-	0
	SB	LR	-	-	-	-	-	43

1 50th percentile queue length, in feet
2 95th percentile queue length, in feet
- Not Applicable

CAPACITY ANALYSIS SUMMARY

Average Conditions Weekday Morning Peak Hour
Proposed YMCA
Falmouth, MA

			2023 Existing			2030 No Build			2030 Build		
Intersection	**Movement**		**LOS[1]**	**Delay[2]**	**V/C[3]**	**LOS**	**Delay**	**V/C**	**LOS**	**Delay**	**V/C**
Brick Kiln Road at	EB	L	B	11.4	0.19	B	12.2	0.22	B	13.7	0.26
Gifford Street/Gifford Street Ext.		TR	C	22.7	0.38	C	24.4	0.43	C	27.0	0.48
	WB	L	B	12.0	0.33	B	12.9	0.37	B	14.5	0.39
		TR	C	20.5	0.41	C	22.2	0.45	C	25.1	0.49
	NB	L	C	22.8	0.10	C	22.8	0.11	C	22.8	0.18
		TR	D	38.8	0.57	D	39.7	0.59	D	36.1	0.52
	SB	L	C	24.8	0.28	C	25.0	0.30	C	24.1	0.28
		TR	D	37.5	0.55	D	38.2	0.57	D	43.0	0.66
	Overall		*C*	*24.1*	*0.55*	*C*	*25.2*	*0.57*	*C*	*27.0*	*0.60*
Brick Kiln Road at	EB	LT	A	0.9	0.03	A	0.9	0.04	A	0.8	0.04
Route 28 NB Ramps	WB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	NB	LTR	A	6.6	0.04	A	6.8	0.04	A	7.9	0.09
Brick Kiln Road at	EB	T	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Route 28 SB Ramps	WB	T	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB	LR	B	14.5	0.40	C	15.9	0.46	C	18.6	0.54
Brick Kiln Road at	EB	LTR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Route 28A	WB	LT	B	14.5	0.15	C	15.6	0.19	C	16.9	0.24
		R	A	9.7	0.20	A	9.9	0.22	B	10.0	0.23
	NB	LTR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB	LTR	A	3.0	0.08	A	3.1	0.08	A	3.3	0.09
Brick Kiln Road at	EB	LT	-	-	-	-	-	-	A	1.2	0.06
Site Driveway	WB	TR	-	-	-	-	-	-	A	0.0	0.00
	SB	LR	-	-	-	-	-	-	B	14.1	0.16

1 Level-of-Service
2 Average vehicle delay, in seconds
3 Volume to capacity ratio
\- Not Applicable

QUEUE SUMMARY

Average Conditions Weekday Morning Peak Hour
Proposed YMCA
Falmouth, MA

Intersection	Movement		2023 Existing		2030 No Build		2030 Build	
			50th Queue[1]	95th Queue[2]	50th Queue	95th Queue	50th Queue	95th Queue
Brick Kiln Road at	EB	L	23	49	27	56	33	67
Gifford Street/Gifford Street Ext.		TR	100	174	117	196	138	228
	WB	L	53	106	59	118	63	128
		TR	109	212	124	241	141	277
	NB	L	13	30	14	32	22	43
		TR	67	115	74	124	75	123
	SB	L	39	76	42	80	42	80
		TR	110	190	122	206	134	224
Brick Kiln Road at	EB	LT	-	3	-	3	-	3
Route 28 NB Ramps	WB	TR	-	0	-	0	-	0
	NB	LTR	-	3	-	3	-	8
Brick Kiln Road at	EB	T	-	0	-	0	-	0
Route 28 SB Ramps	WB	T	-	0	-	0	-	0
	SB	LR	-	48	-	60	-	80
Brick Kiln Road at	EB	LTR	-	0	-	0	-	0
Route 28A	WB	LT	-	13	-	18	-	23
		R	-	18	-	20	-	23
	NB	LTR	-	0	-	0	-	0
	SB	LTR	-	8	-	8	-	8
Brick Kiln Road at	EB	LT	-	-	-	-	-	5
Site Driveway	WB	TR	-	-	-	-	-	0
	SB	LR	-	-	-	-	-	15

1 50th percentile queue length, in feet
2 95th percentile queue length, in feet
- Not Applicable

CAPACITY ANALYSIS SUMMARY

Average Conditons Weekday Afternoon Peak Hour
Proposed YMCA
Falmouth, MA

			2023 Existing			2030 No Build			2030 Build		
Intersection	**Movement**		**LOS[1]**	**Delay[2]**	**V/C[3]**	**LOS**	**Delay**	**V/C**	**LOS**	**Delay**	**V/C**
Brick Kiln Road at	EB	L	B	14.5	0.05	B	15.5	0.06	B	15.6	0.09
Gifford Street/Gifford Street Ext.		TR	C	26.7	0.40	C	29.2	0.45	C	30.3	0.50
	WB	L	B	14.8	0.24	B	16.2	0.27	B	16.4	0.29
		TR	C	21.6	0.32	C	23.5	0.36	C	25.7	0.41
	NB	L	C	21.6	0.24	C	21.4	0.24	C	21.9	0.28
		TR	D	42.5	0.77	D	41.0	0.76	D	40.8	0.75
	SB	L	C	22.1	0.25	C	22.2	0.27	C	22.1	0.26
		TR	C	31.1	0.26	C	30.6	0.28	C	30.5	0.33
	Overall		*C*	*27.9*	*0.60*	*C*	*28.5*	*0.63*	*C*	*29.0*	*0.65*
Brick Kiln Road at	EB	LT	A	1.2	0.05	A	1.2	0.05	A	1.1	0.05
Route 28 NB Ramps	WB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	NB	LTR	A	6.7	0.03	A	7.0	0.04	A	8.1	0.08
Brick Kiln Road at	EB	T	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Route 28 SB Ramps	WB	T	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB	LR	B	13.3	0.29	B	14.5	0.34	C	16.8	0.44
Brick Kiln Road at	EB	LTR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Route 28A	WB	LT	B	14.4	0.13	C	15.4	0.16	C	16.7	0.22
		R	A	9.9	0.19	B	10.1	0.20	B	10.2	0.22
	NB	LTR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB	LTR	A	3.7	0.08	A	3.8	0.09	A	7.9	0.10
Brick Kiln Road at	EB	LT	-	-	-	-	-	-	A	1.4	0.06
Site Driveway	WB	TR	-	-	-	-	-	-	A	0.0	0.00
	SB	LR	-	-	-	-	-	-	C	16.0	0.23

1 Level-of-Service
2 Average vehicle delay, in seconds
3 Volume to capacity ratio
\- Not Applicable

QUEUE SUMMARY

Average Conditions Weekday Afternoon Peak Hour
Proposed YMCA
Falmouth, MA

			2023 Existing		2030 No Build		2030 Build	
Intersection	**Movement**		**50th Queue[1]**	**95th Queue[2]**	**50th Queue**	**95th Queue**	**50th Queue**	**95th Queue**
Brick Kiln Road at	EB	L	8	28	10	31	15	42
Gifford Street/Gifford Street Ext.		TR	121	241	140	269	159	300
	WB	L	40	85	46	92	46	92
		TR	111	201	130	226	141	244
	NB	L	39	77	44	84	52	96
		TR	165	281	185	309	185	309
	SB	L	28	52	30	55	30	55
		TR	43	80	48	88	55	99
Brick Kiln Road at	EB	LT	-	3	-	5	-	5
Route 28 NB Ramps	WB	TR	-	0	-	0	-	0
	NB	LTR	-	3	-	3	-	8
Brick Kiln Road at	EB	T	-	0	-	0	-	0
Route 28 SB Ramps	WB	T	-	0	-	0	-	0
	SB	LR	-	30	-	38	-	55
Brick Kiln Road at	EB	LTR	-	0	-	0	-	0
Route 28A	WB	LT	-	13	-	15	-	20
		R	-	18	-	20	-	20
	NB	LTR	-	0	-	0	-	0
	SB	LTR	-	8	-	8	-	8
Brick Kiln Road at	EB	LT	-	-	-	-	-	5
Site Driveway	WB	TR	-	-	-	-	-	0
	SB	LR	-	-	-	-	-	23

1 50th percentile queue length, in feet
2 95th percentile queue length, in feet
\- Not Applicable

HCS CAPACITY ANALYSIS SUMMARY (PEAK)

Weekday Morning Peak Hour
YMCA Facility
Falmouth, MA

	2023 Existing			2030 No Build			2030 Build		
Segment	**LOS[1]**	**Density[2]**	**V/C[3]**	**LOS**	**Density**	**V/C**	**LOS**	**Density**	**V/C**
Brick Kiln Road									
Between Gifford St/Gifford St Ext. and Site Driveway	A	8.4%	0.18	A	9.2%	0.19	A	10.2%	0.21
Between Route 28 Northbound Ramps and Proposed Site Driveway	A	9.0%	0.19	A	9.9%	0.21	B	11.1%	0.23
Between West Falmouth Highway (Route 28A) and Route 28 Southbound Ramps	A	5.0%	0.11	A	5.7%	0.11	A	5.8%	0.12

(1) Level-of-Service
(2) Density (passenger cars/mile/lane)
(3) Volume to capacity ratio

HCS CAPACITY ANALYSIS SUMMARY (PEAK)

Weekday Afternoon Peak Hour
YMCA Facility
Falmouth, MA

	2023 Existing			2030 No Build			2030 Build		
Segment	**LOS[1]**	**Density[2]**	**V/C[3]**	**LOS**	**Density**	**V/C**	**LOS**	**Density**	**V/C**
Brick Kiln Road									
Between Gifford St/Gifford St Ext. and Site Driveway	A	11.0%	0.23	B	11.9%	0.25	B	13.1%	0.28
Between Route 28 Northbound Ramps and Proposed Site Driveway	B	11.4%	0.24	B	12.4%	0.26	B	13.0%	0.28
Between West Falmouth Highway (Route 28A) and Route 28 Southbound Ramps	A	6.8	0.14	A	7.3	0.16	A	7.8	0.17

(1) Level-of-Service
(2) Density (passenger cars/mile/lane)
(3) Volume to capacity ratio

HCS CAPACITY ANALYSIS SUMMARY (AVERAGE)

Weekday Morning Peak Hour
YMCA Facility
Falmouth, MA

	2023 Existing			2030 No Build			2030 Build		
Segment	**LOS(1)**	**Density(2)**	**V/C(3)**	**LOS**	**Density**	**V/C**	**LOS**	**Density**	**V/C**
Brick Kiln Road									
Between Gifford St/Gifford St Ext. and Site Driveway	A	6.3%	0.13	A	6.9%	0.15	A	7.9%	0.17
Between Route 28 Northbound Ramps and Proposed Site Driveway	A	7.9%	0.17	A	8.7%	0.18	A	9.9%	0.21
Between West Falmouth Highway (Route 28A) and Route 28 Southbound Ramps	A	4.3%	0.09	A	4.8%	0.10	A	5.1%	0.11

(1) Level-of-Service
(2) Density (passenger cars/mile/lane)
(3) Volume to capacity ratio

HCS CAPACITY ANALYSIS SUMMARY (AVERAGE)

Weekday Afternoon Peak Hour
YMCA Facility
Falmouth, MA

	2023 Existing			2030 No Build			2030 Build		
Segment	**LOS(1)**	**Density(2)**	**V/C(3)**	**LOS**	**Density**	**V/C**	**LOS**	**Density**	**V/C**
Brick Kiln Road									
Between Gifford St/Gifford St Ext. and Site Driveway	A	7.0%	0.15	A	7.7%	0.16	A	8.8%	0.19
Between Route 28 Northbound Ramps and Proposed Site Driveway	A	8.0%	0.17	A	8.8%	0.19	A	10.2%	0.21
Between West Falmouth Highway (Route 28A) and Route 28 Southbound Ramps	A	4.8%	0.10	A	5.2%	0.11	A	5.7%	0.12

(1) Level-of-Service
(2) Density (passenger cars/mile/lane)
(3) Volume to capacity ratio

APPENDIX L

2023 Existing HCS Capacity/Level-of-Service Analysis

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2023 Existing
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday AM - Average Conditions
Project Description	Brick Kiln between Site DW & Gifford St	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	509	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	276
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.13

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	6.3
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2023 Existing
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday AM - Average Conditions
Project Description	Brick Kiln between Site DW & Rte 28 NB Ramps	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	638	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	346
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.17

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	7.9
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2023 Existing
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday AM - Average Conditions
Project Description	Brick Kiln between Rte 28 SB Ramp and Rte 28A	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	351	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	190
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.09

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	4.3
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2023 Existing
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday PM - Average Conditions
Project Description	Brick Kiln between Site DW & Gifford St	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	562	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	305
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.15

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	7.0
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2023 Existing
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday PM - Average Conditions
Project Description	Brick Kiln between Site DW & Rte 28 NB Ramps	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	644	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	350
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.17

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	8.0
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2023 Existing
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday PM - Average Conditions
Project Description	Brick Kiln between Rte 28 SB Ramp and Rte 28A	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	385	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	209
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.10

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	4.8
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2023 Existing
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday AM - Peak Conditions
Project Description	Brick Kiln between Site DW & Gifford St	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	680	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	369
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.18

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	8.4
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2023 Existing
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday AM- Peak Conditions
Project Description	Brick Kiln between Site DW & Rte 28 NB Ramps	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	728	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	395
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.19

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	9.0
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2023 Existing
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday AM - Peak Conditions
Project Description	Brick Kiln between Rte 28 SB Ramp and Rte 28A	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	401	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	218
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.11

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	5.0
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2023 Existing
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday PM - Peak Conditions
Project Description	Brick Kiln between Site DW & Gifford St	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	885	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	480
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.23

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	11.0
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2023 Existing
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday PM- Peak Conditions
Project Description	Brick Kiln between Site DW & Rte 28 NB Ramps	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	915	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	496
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.24

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	11.4
Total Ramp Density Adjustment	-	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2023 Existing
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday PM - Peak Conditions
Project Description	Brick Kiln between Rte 28 SB Ramp and Rte 28A	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	548	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	298
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.14

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	6.8
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

APPENDIX M

2030 No Build HCS Capacity/Level-of-Service Analysis

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2030 No Build
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday AM - Average Conditions
Project Description	Brick Kiln between Site DW & Gifford St	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	557	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	302
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.15

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	6.9
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2030 No Build
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday AM - Average Conditions
Project Description	Brick Kiln between Site DW & Rte 28 NB Ramps	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	698	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	379
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.18

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	8.7
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2030 No Build
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday AM - Average Conditions
Project Description	Brick Kiln between Rte 28 SB Ramp and Rte 28A	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	382	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	208
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.10

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	4.8
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2030 No Build
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday PM - Average Conditions
Project Description	Brick Kiln between Site DW & Gifford St	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	617	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	335
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.16

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	7.7
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2030 No Build
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday PM - Average Conditions
Project Description	Brick Kiln between Site DW & Rte 28 NB Ramps	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	707	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	384
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.19

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	8.8
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2030 No Build
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday PM - Average Conditions
Project Description	Brick Kiln between Rte 28 SB Ramp and Rte 28A	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	418	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	227
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.11

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	5.2
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2030 No Build
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday AM - Peak Conditions
Project Description	Brick Kiln between Site DW & Gifford St	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	740	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	402
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.19

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	9.2
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2030 No Build
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday AM- Peak Conditions
Project Description	Brick Kiln between Site DW & Rte 28 NB Ramps	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	794	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	431
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.21

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	9.9
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2030 No Build
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday AM - Peak Conditions
Project Description	Brick Kiln between Rte 28 SB Ramp and Rte 28A	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	435	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	236
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.11

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	5.4
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2030 No Build
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday PM - Peak Conditions
Project Description	Brick Kiln between Site DW & Gifford St	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	962	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	522
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.25

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	11.9
Total Ramp Density Adjustment	-	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2023 No Build
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday PM- Peak Conditions
Project Description	Brick Kiln between Site DW & Rte 28 NB Ramps	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	997	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	541
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.26

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	12.4
Total Ramp Density Adjustment	-	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2030 No Build
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday PM - Peak Conditions
Project Description	Brick Kiln between Rte 28 SB Ramp and Rte 28A	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	591	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	321
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.16

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	7.3
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

APPENDIX N

2030 Build HCS Capacity/Level-of-Service Analysis

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2030 Build
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday AM - Average Conditions
Project Description	Brick Kiln between Site DW & Gifford St	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	634	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	344
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.17

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	7.9
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2030 Build
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday AM - Average Conditions
Project Description	Brick Kiln between Site DW & Rte 28 NB Ramps	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	794	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	431
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.21

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	9.9
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2030 Build
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday AM - Average Conditions
Project Description	Brick Kiln between Rte 28 SB Ramp and Rte 28A	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	413	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	224
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.11

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	5.1
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2030 Build
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday PM - Average Conditions
Project Description	Brick Kiln between Site DW & Gifford St	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	707	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	384
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.19

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	8.8
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2030 Build
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday PM - Average Conditions
Project Description	Brick Kiln between Site DW & Rte 28 NB Ramps	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	818	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	444
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.21

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	10.2
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2030 Build
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday PM - Average Conditions
Project Description	Brick Kiln between Rte 28 SB Ramp and Rte 28A	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	456	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	248
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.12

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	5.7
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2030 Build
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday AM - Peak Conditions
Project Description	Brick Kiln between Site DW & Gifford St	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	817	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	444
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.21

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	10.2
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information			
Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2030 Build
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday AM- Peak Conditions
Project Description	Brick Kiln between Site DW & Rte 28 NB Ramps	Units	U.S. Customary

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity			
Demand Volume (V), veh/h	890	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	483
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.23

Speed and Density			
Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	11.1
Total Ramp Density Adjustment	-	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2030 Build
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday AM - Peak Conditions
Project Description	Brick Kiln between Rte 28 SB Ramp and Rte 28A	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	466	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	253
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.12

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	5.8
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2030 Build
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday PM - Peak Conditions
Project Description	Brick Kiln between Site DW & Gifford St	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	1053	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	572
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.28

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	13.1
Total Ramp Density Adjustment	-	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2030 Build
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday PM- Peak Conditions
Project Description	Brick Kiln between Site DW & Rte 28 NB Ramps	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	1051	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	570
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.28

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	13.0
Total Ramp Density Adjustment	-	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

HCS Basic Freeway Report

Project Information

Analyst	EKB	Date	9/20/2023
Agency	McMahon	Analysis Year	2030 No Build
Jurisdiction	Town of Falmouth	Time Analyzed	Weekday PM - Peak Conditions
Project Description	Brick Kiln between Rte 28 SB Ramp and Rte 28A	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	-	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	46.0
Right-Side Lateral Clearance, ft	-		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Final Capacity Adjustment Factor (CAF)	0.939
Proportion of CAVs in Traffic Stream	0	Capacity Adj. Factor for CAVs, CAF_{CAV}	1.000

Demand and Capacity

Demand Volume (V), veh/h	629	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	342
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Initial Adjusted Capacity (c_{adj}), pc/h/ln	2066
Tractor-Trailers (TT), %	-	Final Adjusted Capacity (c_{adj}), pc/h/ln	2066
Passenger Car Equivalent (E_T)	2.00	Volume-to-Capacity Ratio (v/c)	0.17

Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	43.7
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D), pc/mi/ln	7.8
Total Ramp Density Adjustment	-	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	43.7		

EXHIBIT 16

WILDLIFE HABITAT EVALUATION

Tunison Environmental Consultants, LLC

Wildlife Habitat Evaluation for Upper Cape YMCA Facility at 485 Brick Kiln Road in West Falmouth, Massachusetts

Prepared for:

YMCA Cape Cod
100 Independence Drive, Suite 2
Hyannis, Massachusetts 02601

Prepared by:

Tunison Environmental Consultants, LLC
P.O. Box 992, 11 South Park Avenue
Plymouth, Massachusetts 02362

April 26, 2023

TEC#: 2204-003

Tunison Environmental Consultants, LLC

TABLE OF CONTENTS

Attachments

1.0 Introduction

This wildlife habitat evaluation has been performed under the Cape Cod Commission's Wildlife and Plant Technical Bulletin under the Objectives of the Regional Policy Plan for a Development of Regional Impact (DRI) project review. The site has been visited three times on December 9, 11 and 12, 2022. Wildlife observations were made during each trip that have been included in this assessment as were the sites vegetation and soils. No rare species have been mapped by the MA Natural Heritage & Endangered Species Program (NHESP) habitat polygons (Estimated or Priority Habitats -August 2017). Additionally, no rare species were identified during any site visits.

2.0 Existing Conditions

The site is located on 6.16 ac. at 485 Brick Kiln Road (identified as Map 19, Lot 2B by the Falmouth Assessor's Office) in West Falmouth, Massachusetts (refer to Figure 1, Site Locus). The property is bound by mixed forested upland to the north; Patty's Way, mixed forested upland and Falmouth High school to the east; the Christ Lutheran Church and Brick Kiln Road to the south; and a site that is currently under construction for the Village at Brick Kiln, LLC to the west at 511 Brick Kiln Road. This residential subdivision is a 40B housing development that consists of 32 houses with small yards, stormwater management system, utilities and an access drive (Josiah Path).

The site generally slopes from north to south and east to west with a few rolling hills. No wetlands exist on the site which consists of forested upland that is a mix deciduous and mixed forest that predominantly contains dense shrub and vine layers (refer to Attachment 1, Site Photographs, Photos 8 and 9). The parcel is partially disturbed with some debris and numerous invasive plants in the southern and southwestern portions of the site. There are a few areas of disturbed soils in the southern portion of the site that appear to have been for percolation testing in the site. The eastern 1/3 of the site appears to be disturbed as this is the area where almost all of the invasive plants were found on the site.

2.1 Invasive Plant Species

The site contains eight identified invasive plant species (refer to Attachment 2, Site Plant List) including: 1) Japanese Barberry (*Berberis thunbergii*); 2) Multiflora Rose (*Rosa multiflora*); 3) Oriental Bittersweet (*Celastrus orbiculatus*); 4) Eastern Burning Bush (*Euonymus atropurpureus*); 5) Tartarian Honeysuckle (*Lonicera tatarica*); 6) Glossy Buckthorn (*Frangula alnus*); 7) Autumn Olive

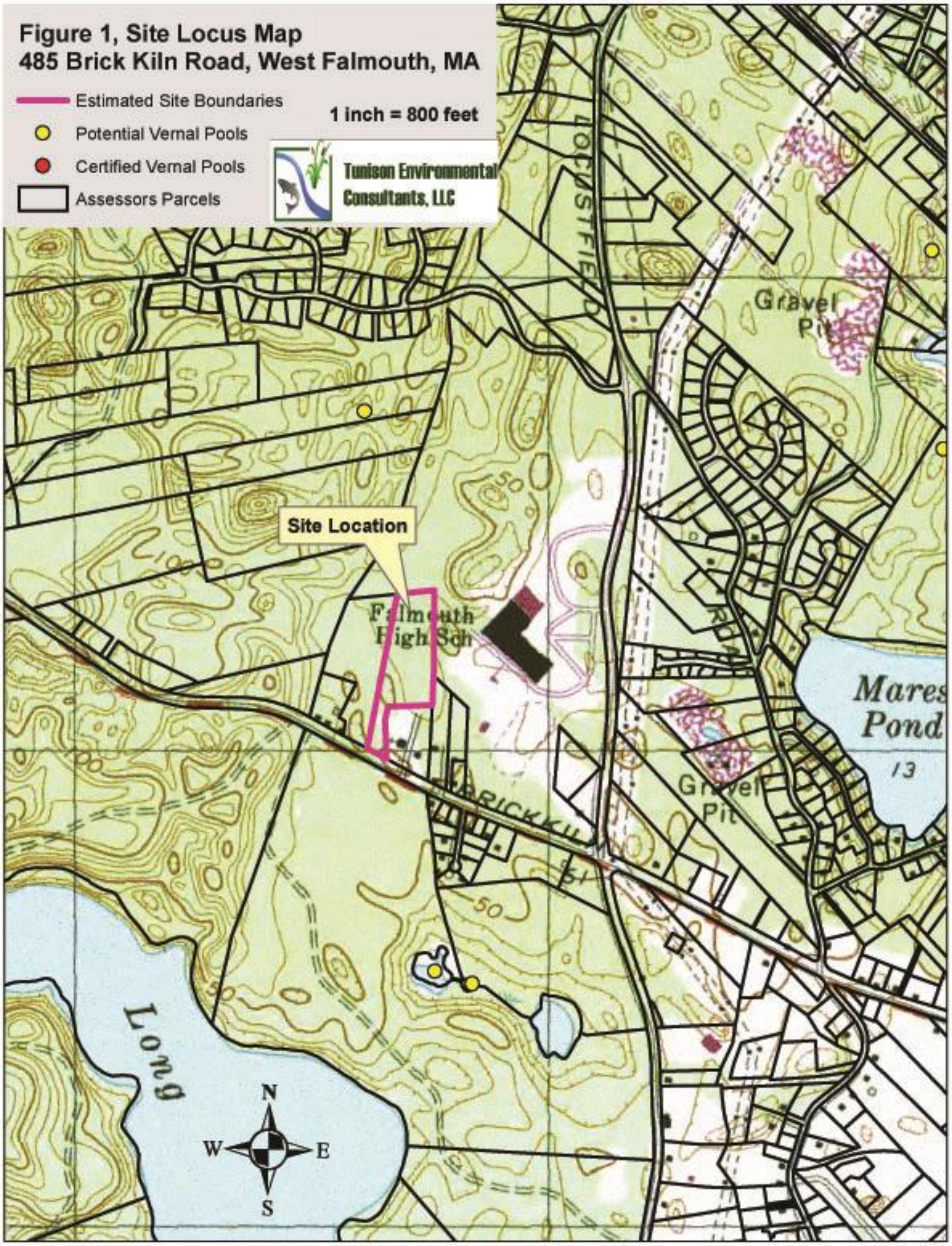


Figure 1, Site Locus Map
485 Brick Kiln Road, West Falmouth, MA
Estimated Site Boundaries
Potential Vernal Pools
Certified Vernal Pools
Assessors Parcels
1 inch = 800 feet
Tunison Environmental Consultants, LLC
Site Location
Falmouth High Sch
Gravel Pit
Gravel Pit
Mares Pond
13
Long
BRICKKILN
50
50
N
S
E
W

(*Elaeagnus umbellata*); and 8) Black Locust (*Robinia pseudoacacia*). Three of these invasive plant species were mapped (refer to Attachment 3, Invasive Plant Species Map) and the remaining five invasive plant species were not mapped as there were only one to eight plants per species identified on the site that were all in the same area of the southern ¼ to 1/3 of the site. The Glossy buckthorns were mostly along the church parking lot just on or off the site with the Tartarian Honeysuckle, Autumn Olive, Japanese Barberry, and Multiflora Rose occurring between the eastern portion of the church parking lot and Brick Kiln Road. The Oriental Bittersweet, Eastern Burning Bush and the Black Locust were dense enough to map. The Oriental Bittersweet is the most extensive invasive plant on the site.

The eight invasive plants listed above are described below in detail in Sections 2.1.1 through 2.1.8. Information provided below for each plant species was acquired from publications (such as factsheets, invasive plant books or booklets) and websites from the Plant Conservation Alliance's Alien Plant Working Group, Penn State University, University of Connecticut, National Park Service, The Nature Conservancy, the NRCS, U.S. Fish and Wildlife Plant Data Base (online) and the Massachusetts Natural Heritage Program.

Invasive plants become established and can often dominate landscapes causing over $120 billion dollars in damages in the U.S. alone each year. The plants typically have very few native or natural enemies and as a result often thrive in our local environments. They are spread by: 1) animals though their waste, on their skin, fur or feathers; 2) by treads on shoes, tires, tracked vehicles, or other machinery; 3) being transported down streams, other waterways, water bodies, or coastal waters; 4) airborne seeds; 5) peoples clothes; 6) yard or construction debris; 7) soils containing seed banks; or even by 8) landscapers or being supplied by plant nurseries. Invasive plants alter natural habitats often reducing the numbers and diversities of native plants and animals. This can be detrimental to our natural environment and significantly alter ecosystems.

2.1.1 Japanese Barberry

Japanese Barberry is a deciduous shrub that was introduced to the United States from Eurasia and has spread throughout much of the Country. Seeds are spread mainly by mammals and birds. They can change the soil's pH and the natural nutrient cycling systems that take place in our natural environments. These plants are most often found in pastures, wastelands, landscaped areas, forest interiors, and sometimes along roadsides.

Japanese Barberry bushes are compact and spiny with large thorns (0.25 to 1 inch in length). These shrubs grow from 3 ft. to 9 ft. in height and have yellowish inner-bark. Leaves of Japanese Barberry have alternate and smooth margin leaves with small yellow flowers with 6 pedals growing alone or in umbels with single spines. Their fruit is bright red that often persist after leave off into the winter. Japanese Barberry leaf-out earlier and retain their leaves longer than many native shrubs which gives them a competitive edge over native plants. Only one plant of this species was found in the eastern 1/3 of the site so there was less than 1% coverage of this plant.

2.1.2 Multiflora Rose

Multiflora Rose is a large deciduous, woody shrub that was introduced in 1866 from rootstock sent from Japan for ornamental roses. Its use was promoted in the 1930's for use in erosion control and "live fences" for livestock. It occurs along roadsides, paths, in disturbed lands or wastelands, adjacent to and within fields, forest edges and light gaps in forest areas. Most of these plants develop from seeds in the soil and are often spread by wildlife that feed on the rose fruits which are called, "hips". They can also form new plants when long branches touch the ground and get covered with dirt which start to grow roots. They can be dispersed over long distances and seeds can remain viable for up to 10 to 20 years in the soil.

These rose bushes are thorny with arching brown (mature stems) to greenish and/or reddish stems. The leaves are divided into five to eleven sharply toothed leaflets with a pair of fringed bracts at the base of each leaf stalk. Beginning in May or June this rose has abundant small (about an inch across) white to pinkish showy flowers. Small rose hips develop in summer, become leathery in the fall, and remain on the plant through winter. These roses can grow up to 10 feet high and 10 feet wide. The closest relatives to this rose are the Scott Rose (*Rosa spinosissima*) and the Memorial Rose (*Rosa wichuraiana*) which are not present on the site. A few Multiflora Rose bushes were observed along the southern portion of the site between Brick Kiln Road and the eastern portion of the church parking lot at less than 1% coverage of this shrub.

2.1.3 Oriental Bittersweet

Oriental Bittersweet is a deciduous woody vine that was introduced to the United States in the mid-1800's and has spread throughout much of the Country. This species grows around the trunks, stems and stalks of surrounding vegetation and chokes them out. They can change the natural nutrient cycling systems that take place in our natural environments. These plants can be found along roadsides, trails, fields, wastelands, landscaped areas, sand dunes, and forest interiors.

Oriental Bittersweet looks similar to native American Bittersweet (*Celastrus scandens*) but it can be distinguished by their leaves and fruit. Oriental Bittersweet has fruit and flowers located within the leaf axils along the length of the stem. Their fruit ripen in the fall and have yellow capsules. American Bittersweet only has fruit and flowers in terminal clusters. Their fruit also ripen in the fall as do Oriental Bittersweet but their capsules are orange. Leaves are used as the most distinguishable feature to tell the difference between Oriental Bittersweet and American Bittersweet through out there life cycle (seedling to maturity). The best time and way to identify the difference between these two species is to observe them at leaf out when two sides of the leaf of the Oriental Bittersweet are folded against each other (conduplicate) and tightly packed in the bud when they emerge in the spring. The leaves of the American Bittersweet have leaf margins rolled in like a scroll (involute) and are not as tightly packed in the bud. An additional method to distinguish the leaves, although not as reliable, is to use the ratio of length-to-width of the leaves which is often greatest for American Bittersweet (90% chance) when it is equal to or greater than 2. If the ratio is less than or equal to 1.4, it is likely (90% chance) Oriental Bittersweet.

This invasive plant species was the most dominant at the site. It was observed from Brick Kiln Road to an area just north of the eastern portion of the church parking lot. It ranged from approximately 1% to 10% coverage.

2.1.4 Eastern Burning Bush

Eastern or Winged Burning Bush is a deciduous shrub that can grow to 20 feet in height. Leaves are opposite, typically less than 3 inches long, smooth, rounded and tapered at the tip. The leaves are dark green during most of the growing season and turn bright red in the fall. Their stems or young branches contain four protruding ridges that occur at approximately 90° angles which are a mix of some green but mostly brown in color. The flowers of Eastern Burning Bush occur in late May and early June and are small, have four pedals, and are greenish yellow in color. Their fruit are bright red and occur from September to October. This plant was introduced to the United States during the mid-nineteenth century from eastern Asia and has been used as an ornamental shrub or sometimes as a hedge row until recently.

Eastern Burning Bushes are located in the southern 1/3 of the site between Brick Kiln Road and an area just north of the eastern portion of the church parking lot. This invasive plant species wasn't dominant but occurring sparsely with an approximate 1% to 5% coverage in the above referenced areas where it was found.

2.1.5 Tartarian Honeysuckle

Tartarian Honeysuckle is a round deciduous shrub that was introduced to the United States in 1845 from China and has spread throughout much of the Country. Seeds are spread mainly by mammals and birds. They can rapidly overtake an area creating a dense shrub layer that crowds or shades out native plants by blocking sun light, depleting soil moisture, and nutrients. They can change the soil's pH, possibly releasing toxic chemicals and the natural nutrient cycling systems that take place in our natural environments preventing native plants from growing in the vicinity of this honeysuckle. These plants are most often found along forest edges, abandoned fields, in pastures, wastelands, landscaped areas, along roadsides, and in other open upland areas.

Tartarian Honeysuckle bushes grow from multiple stems and are dense and twiggy branches that are upright with overreaching tips. These shrubs grow from 6 ft. to15 ft. in height with equal width. Their bark is light and often ashy grey which peels off in vertical strips. Leaves of Tartarian Honeysuckle have opposite, simple ovate shaped leaves that are approximately 1.5 in. to 2.5 in. long and 1 in. to 1.5 in. wide. The color of their leaves is blue-green and they leaf out in early spring. This shrub's flowers are small, white, pink, or rose-red blossoms that are approximately 0.75 in. long and borne in pairs. They flower in May. Their fruit is bright red that colors in July and August with berries that are approximately 0.25 in. in diameter.

Only a few Tartarian Honeysuckle bushes are located in the southern 1/3 of the site as they aren't a dominant species with coverage less than 1%.

2.1.6 Glossy Buckthorn

Glossy Buckthorn is a tall deciduous shrub or small tree that can reach heights of 20 to 25 feet and have a trunk up to 10 inches in diameter. It often grows with a few to several stems occurring from the base that are spreading with loosely branched crowns. Leaves are thin and glossy with an oval or elliptical shape (not toothed). The upper leaf surface is shiny while the lower leaf surface can be hairy or smooth. Their bark is gray to brown with prominent elongated and light colored lenticels. The fruit is small in size and range in color from green to red to blackish.

This plant was introduced in Wisconsin in 1849 as an ornamental plant to be used in a hedgerow where it spread across Canada and the northern

United States. It grows in wetlands and uplands, along roadsides and trails, in old fields, and in woodlands. Only a few Glossy Buckthorns are present on the site. Once these plants become established and produce fruit, they infiltrate into the naturally vegetated areas very quickly and are difficult to remove once in large numbers.
Approximately fifteen to twenty Glossy Buckthorn plants were observed on the site in the western portion of the site.

2.1.7 Autumn Olive

Autumn Olive is a large deciduous shrub that was introduced to the United States in 1830 from Asia and was widely planted as an ornamental and in clusters as a windbreak. This plant originated in China, Korea, and Japan where it is considered to be a native species. Each shrub can produce up to 200,000 seeds per year that are spread mainly by birds. They can rapidly overtake an area creating a dense shrub layer that crowds or shades out native plants by blocking sun light and depleting soil moisture. Their nitrogen-fixing root nodules allow these plants to grow just about anywhere, even areas with little nutrients. These plants are most often found along woodland edges, in abandoned fields, pastures, wastelands, and along roadsides.

Autumn Olive is a deciduous shrub that can grow to 20 feet in height. Leaves are alternate and egg or lance-shaped and smooth margined. The leaves are dull green on the upper surface and often silvery with brownish scales on the underside. The stems and buds are often silvery to rusty colored with scales. Autumn Olive have dense clusters of pale yellow flowers that occur in June and July. Small reddish brown to pink fruit dotted with brown or silvery scales are produced in August through October. This plant is found throughout much of the Country.

Only one of these shrubs was observed in the southern portion of the site so this plant wasn't dominant and had coverage of less than 1%.

2.1.8 Black Locust

Black Locust is a medium sized deciduous tree that is originally from the southeastern (southern Appalachia) and central (Ozarks) United States and some areas of Europe. It has spread north throughout the northeastern and northern central United States. Black Locust was used in construction projects since their root systems are great for stabilizing soils. Seedlings and sprouts of this tree can grow rapidly and can be identified by their long paired thorns. They can rapidly overtake an area creating a dense tree layer that crowds or shades out native plants by blocking sun light and depleting soil moisture. This tree produces many seeds that seldom germinate but they spread from root suckering. Their nitrogen-fixing root nodules allow these plants to grow just about anywhere, even areas with little nutrients. They grow best in well drained soils with full sunlight. These trees are most often found along woodland edges, in abandoned fields, pastures, wastelands, and along roadsides.

The Black Locust typically grows between 40 to 50 feet tall but can grow from 70 to 100 feet in height. This tree grows relatively upright with a somewhat narrow crown that is widest at the top. Its bark can be a dark greyish brown to a greenish brown to a yellowish brown with distinctive thick rope-like ridges with furrows interlaced. The trunk is long and straight and its branches are often upright to irregular. Leaves are alternate along the stem with smaller oval or elliptical leaflets. Leaves are 6 to 14 inches long and include 7 to 19 leaflets. The leaflets are dark dull green to bluish green above and yellow below. This tree produces clusters of pea-like flowers that are creamy white in color with a yellow patch on the uppermost petal and are very fragrant. Its flower clusters are 4 to 8 inches long that occur in late May through early June for approximately one week. This tree's fruit consists of flat long smooth pods that is approximately 2 to 4 inches in length which mature in October and persist as a dried brown fruit. Each pod contains 4 to 8 seeds.

This species was observed on the southern and southwestern 1/3 of the site. They ranged from 5% to 40% coverage and were only dominant on in a few small pockets of trees.

3.0 Habitat Evaluation

The area established for the wildlife habitat evaluation only included the site as no significant wildlife habitat existed to the east, south or west of the site and only a narrow area of habitat exists to the north of the site where the back edge or 40+ ft. of the site will be preserved in its natural state as part of the project.

3.1 Cover Type Analysis

A cover type analysis was performed on an area encompassing the approximately 6.49 acres of the site and potential habitat for local wildlife (refer to Attachments 1, 4, and 5). The site area consisted of 2 cover types that include Deciduous Forested Upland and Mixed Forested Upland (refer to Attachment 1, Photographs and Attachment 4, Cover Type Map). These cover types were identified and observed in the field and delineated by aerial photographic analysis and field observations. Characterization of each cover type was determined by walking the site, identifying major changes in vegetation cover and locating an area for a sample plot analysis within a cover type that accurately represents each particular cover type. Once a representative area is located a standard circular sample plot was established. One sample plot was used for the Deciduous Forested Upland since it was only approximately 1/3 of the site area and three sample plots were established for the Mixed Forested Cover Type to evaluate any slight changes in the dominant plant communities or other wildlife habitat features such as snags and logs.

The cover type analysis was based on a standard observation plot developed to measure plant abundance for each vegetative layer. The vegetative layers identified were herbaceous (ground cover measuring 1 to 3 feet in height), a vine layer (vine species that are found growing on other vegetation or surrounding objects and not acting as herbs or shrubs growing only on the ground with roots mainly buried), shrub (woody vegetation measuring 3 to 20 feet in height), sapling (woody vegetation over 20 feet in height with a diameter at breast height of 0.4 to 5 inches), and tree (woody plants with a diameter a breast height of 5 inches or greater and over 20 feet tall). Each vegetation layer was observed in a circular plot within a specified radius developed for each layer. Plot observations occurred in a 5 foot circular radius for ground cover, a 15 foot radius for shrubs, a 15 foot radius for saplings, and a 30 foot radius for trees. Additional observations such as the size and number of snags were identified within a 50 foot radius. Information on each cover type is provided in Attachment 1, Site Photographs; Attachment 2, Site Plant List Attachment 4, Cover Type Map and Attachment 5, Wildlife Habitat Evaluation Field Data Forms.

These standard protocols as described above were used to determine the age class of the stands of trees located on the subject property. Trees were evaluated for their Diameter-at-Breast-Height (DBH) in three (Forested Swamp, Deciduous Forested Upland, and Mixed Forested Upland) of the four cover types. The trees that were evaluated in each of the three cover types analyzed were measured and recorded in an area that was from the center of each cover types sample plot to a radius of approximately 50 ft. A standard number of trees (twenty trees per sample area) were identified that would be measured by DBH which was established at 4-½ ft. high along the tree trunk from the surface of the ground. Two tape measures were used to determine the DBH of each tree. The tape used to measure proper height to evaluate the DBH was in inches and feet. The second tape used to determine the DBH was a Forestry Suppliers (Model 343D) English Steel Diameter Tape.

The tree trunks were vertically measured from the ground up and in areas were the soil was sloped, two vertical measurements were taken from each, one from the lower side and one from the upper side of the slope and their midpoint was determined to establish the 4-½ ft. elevation on the tree trunk. The hook of the tree diameter tape measure was then inserted into the bark of the tree to hold the tape measure in place. The vertical measuring tape was then anchored to a belt buckle and both hands were used to feed the tape around the trunk of the tree. The tree species and its DBH was then recorded at each sample plot.

Snags, tree cavities, and downed trees and stumps were evaluated in each forested cover type in an area of approximately 1 sq. acre around each cover types sample plot (located in the center of the sq. acre).

3.1.1 Mixed Forested Upland

Mixed Forested Upland is the most predominant cover type on the site (consists of approximately three-fourths of the site) and it occurs throughout most of the site. Dominant vegetation consisted of Eastern Teaberry (*Gaultheria procumbens*), Black Huckleberry (*Gaylussacia baccata*) and Sheep Laurel (*Kalmia angustifolia*) in the herbaceous layer; Common Greenbrier (*Smilax rotundifolia*) in the vine layer; Sassafras (*Sassafras albidum*), Eastern White Pine (*Pinus strobus*), Pitch Pine (*Pinus rigida*), Nannyberry (*Viburnam lentago*), Maleberry (*Lyonia ligustrina*) and Black Huckleberry in the shrub layer; Sassafras, Eastern White Pine in the sapling layer; and Red Maple (*Acer rubrum*), Pin Oak (*Quercus palustris*), Eastern White Pine, Pitch Pine (*Pinus rigida*), Black Locust (*Robinia psuedoacacia*), Northern White Oak (*Quercus alba*) and Northern Red Oak (*Quercus rubra*) in the tree layer. Patches of Tree Club Moss (*Lycopodium obscurum*) were also observed in the herbaceous layer but no significant or dominant patches occurred within our sample plot areas. Common Yew (*Taxus baccata*) was also identified as dominant in the sapling layer but only in Sample Plot 1 in the southern portion of the site. The Common Yew stand at this location is likely due to being planted in the past as a house did exist at 511 Brick Kiln Road prior to the current construction at the site.

The shrub and vine layers were dense throughout this cover type and even denser in the Deciduous Forested Upland cover type. Where ever we could view the surface of the ground, we looked for small mammal burrows but none were observed. No bird nests were found except for a small clump of vine strands with a couple of leaf stems mixed in which may have been a bird nest at one point but the small patch of natural material wasn't in the form of a nest so we couldn't analyze it to determine if it was a bird nest or which species may have utilized this natural material.

Thirty-seven snags were observed within this cover type that were identified within 75 to 100 ft. from the center of Sample Plots 1, 2 and 4. The majority of the snags and logs in this cover type were at Sample Plot 4 and the next highest numbers came from Sample Plot 3 with only one snag and one log at Sample Plot 1. The snags ranged in diameter from 4 to 13 in. DBH with the majority between 9 and 11 in. DBH. These snags ranged from 10 to 60 ft. tall with an average around 40 to 45 ft. tall. There were approximately 30 to 35 tree cavities in the snags that were mostly 1 to 2 in. in diameter. A few may have been 2.5 to 2.75 in. in diameter. Twenty-four logs were observed ranging from 3.5 to 12 in. in diameter and 8 to 55 ft. in length. There were many dead trees within the central portion of the site which appeared to have died out at roughly the same time. Recent stress to the site's trees was also observed from wind damage as more than twenty trees have had their canopies broken off in wind storms over approximately the last year.

Wildlife observations consisted of visual sightings of American Crows (*Corvus brchyrhnchos*), Northern Cardinals (*Cardinalis cardinalis*), a Red Squirrel (*Tamiasciurus hudsonicus*), and scat from a White-tailed Deer (*Odocoileus virginianus*). No other animals were observed during our three site visits. The absences of birds and small mammals may have been a result of the strong winds that occurring during our site visits.

The ground was covered with 2 to 2.5 in. of duff consisting of mixed oak leaves and some pine needles. Soils consisted of an approximately 1 in. deep fibric "Oi" Horizon of 7.5YR 4/6, 10YR 2/1 or 10YR 2/2 that was underlain by an approximately 1 to 2 in. deep "A" Horizon of 10YR 2/1 fine sandy loam. The "B" Horizons consisted of an approximately 4 to 6 in. deep "B1" Horizon of 10YR 4/4 to 10YR 4/6 loamy sand which was underlain by an approximately 5 to 20+ in. "B2" Horizon of 10YR 6/6 to 10YR 6/8. Soil mapped from websoil consist of Hinckley Loamy Sand, 3 to 8 percent slopes in the area of the Mixed Forested Upland cover type (refer to Attachment 6, NRCS Soil Report).

3.1.2 Deciduous Forested Upland

Deciduous Forested Upland occurs mostly in the central portion of the site. Dominant vegetation consisted of Common Greenbrier in the vine layer; Pin Oak, Nannyberry, Black Huckleberry and Maleberry in the shrub layer; and Pin Oak in the tree layer.

Fifteen snags were observed within this cover type ranging from 5.5 to 13 in. DBH and 10 to 60 ft. in height. Several tree hollows ranging from 1 to 2 in. diameter were observed. Seven logs ranging from 4 to 13 in. in diameter with an estimated length of 18 to 60 ft. long were observed within 100 ft. of the center of the sample plot.

Wildlife observations consisted of visual sightings of American Crows (*Corvus brchyrhnchos*), Northern Cardinals (*Cardinalis cardinalis*), a Red Squirrel (*Tamiasciurus hudsonicus*), and scat from a White-tailed Deer (*Odocoileus virginianus*). No other animals were observed during our three site visits. The absence of birds and small mammals may have been a result of the strong winds that occurring during our site visits.

The ground was covered with 3 in. of duff consisting of mixed oak leaves and some pine needles. Soils consisted of an approximately 1 in. deep fibric "Oi" Horizon of 10YR 2/2 that was underlain by an approximately 1 in. deep "A" Horizon of 10YR 2/1 fine sandy loam. The "B" Horizons consisted of an approximately 4 in. deep "B1" Horizon of 10YR 4/4 loamy sand which was underlain by an approximately 5 in. "B2" Horizon of 10YR 6/6. A "B3" Horizon existed at this sample plot consisting of 13+ in. of 10YR 4/6 loamy sand. Soil mapped from Websoils consist of Hinckley Loamy Sand, 3 to 8 percent slopes in the area of the Deciduous Forested Upland cover type (refer to Attachment 6, NRCS Soil Report).

3.2 Specimen Tree Analysis

Tree species and diameters were evaluated at the site and the ages of the trees and percentages for both hardwoods and softwoods were roughly estimated. Average growth rates for our region for each tree species identified below in Table 1 were calculated estimates. The trees on the site range from approximately 4 to 95+ years old with a DBH ranging from 1.9 to 22 in. DBH. The trees that were quantified to be 1.9 in. to 10 in. DBH (4 to 40 yrs. old) comprised approximately 47% to 52% of the trees on the site. The next largest group of trees on the site was 10 in. to 13 in. DBH that ranged from approximately 30 to 70 yrs. old and were at approximately 40% to 45% of the trees on the site. The smallest group of trees on the site were the trees with DBH's ranging from approximately 13 in. to 22 in. that were estimated at 70 to 99+ yrs. old and represented approximately 1% to 2% of the trees on the site.

Table 1	Specimen Trees Identified on the Site	
Species	**DBH (in inches)**	**Approximate Age (years)**
Pin Oak(*Quercus palustris*)*	13	67
Pin Oak(*Quercus palustris*)*	14	71
Pin Oak(*Quercus palustris*)*	12	62
Pin Oak(*Quercus palustris*)*	14	71
Pin Oak(*Quercus palustris*)*	15	75
Pin Oak(*Quercus palustris*)*	14	71
Pin Oak(*Quercus palustris*)*	14	71
Pin Oak(*Quercus palustris*)*	12	62
Northern White Oak (*Quercus alba*)*	14	71
Pin Oak(*Quercus palustris*)	16	80
Pin Oak(*Quercus palustris*)	12	62
Pin Oak(*Quercus palustris*)	12	62
Pin Oak(*Quercus palustris*)	15	75
Pin Oak(*Quercus palustris*)	14	71
Pin Oak(*Quercus palustris*)	16	80
Pin Oak(*Quercus palustris*)	13	67
Pin Oak(*Quercus palustris*)	14	71
Pin Oak(*Quercus palustris*)	16	80
Pin Oak(*Quercus palustris*)	13	67
Pin Oak(*Quercus palustris*)	14	81
Pin Oak(*Quercus palustris*)	15	75
Pin Oak(*Quercus palustris*)	13	67
Pin Oak(*Quercus palustris*)	13	67
Pin Oak(*Quercus palustris*)	15	75
Pin Oak(*Quercus palustris*)	13	67
Pin Oak(*Quercus palustris*)	15	75
Pin Oak(*Quercus palustris*)	14	71
Pin Oak(*Quercus palustris*)	13	67
Pin Oak(*Quercus palustris*)	13	67
Pin Oak(*Quercus palustris*)	12	62
Pin Oak(*Quercus palustris*)	15	75
Pin Oak(*Quercus palustris*)	14	71
Pin Oak(*Quercus palustris*)	13	67
Pin Oak(*Quercus palustris*)	17	89
Pin Oak(*Quercus palustris*)	16	80
Pin Oak(*Quercus palustris*)	14	71
Pin Oak(*Quercus palustris*)	13	67
Pin Oak(*Quercus palustris*)	14	71
Pin Oak(*Quercus palustris*)	18	94
Pin Oak(*Quercus palustris*)	14	71
Pin Oak(*Quercus palustris*)	19	101
Pin Oak(*Quercus palustris*)	13	67
Pin Oak(*Quercus palustris*)	14	71

Pin Oak(*Quercus palustris*)	14	71
Pin Oak(*Quercus palustris*)	15	75
Pin Oak(*Quercus palustris*)	14	71
Pin Oak(*Quercus palustris*)	15	75
Pin Oak(*Quercus palustris*)	13	67
Pin Oak(*Quercus palustris*)	13	67
Pin Oak(*Quercus palustris*)	13	67
Pin Oak(*Quercus palustris*)	12	62
Pin Oak(*Quercus palustris*)	14	71
Pin Oak(*Quercus palustris*)	13	67
Pin Oak(*Quercus palustris*)	14	71
Pin Oak(*Quercus palustris*)	12	62
Pin Oak(*Quercus palustris*)	13	67
Pin Oak(*Quercus palustris*)	13	67
Pin Oak(*Quercus palustris*)	13	67
Pin Oak(*Quercus palustris*)	13	67
Pin Oak(*Quercus palustris*)	16	80
Pin Oak(*Quercus palustris*)	15	75
Pin Oak(*Quercus palustris*)	15	75
Pin Oak(*Quercus palustris*)	12	62
Pin Oak(*Quercus palustris*)	13	67
Pin Oak(*Quercus palustris*)	13	67
Pin Oak(*Quercus palustris*)	13	67
Pin Oak(*Quercus palustris*)	14	71
Pin Oak(*Quercus palustris*)	14	71
Pin Oak(*Quercus palustris*)	15	75
Pin Oak(*Quercus palustris*)	14	71
Pin Oak(*Quercus palustris*)	14	71
Pin Oak(*Quercus palustris*)	16	80
Pin Oak(*Quercus palustris*)	14	71
Pin Oak(*Quercus palustris*)	14	71
Pin Oak(*Quercus palustris*)	13	67
Pin Oak(*Quercus palustris*)	13	67
Pin Oak(*Quercus palustris*)	15	75
Pin Oak(*Quercus palustris*)	13	67
Pin Oak(*Quercus palustris*)	16	80
Pin Oak(*Quercus palustris*)	15	75
Pin Oak(*Quercus palustris*)	15	75
Pin Oak(*Quercus palustris*)	14	71
Pin Oak(*Quercus palustris*)	14	71
Pin Oak(*Quercus palustris*)	12	61
Pin Oak(*Quercus palustris*)	13	67
Pin Oak(*Quercus palustris*)	14	71
Pin Oak(*Quercus palustris*)	15	75
Pin Oak(*Quercus palustris*)	14	71

Pin Oak(*Quercus palustris*)	13	67
Pin Oak(*Quercus palustris*)	14	71
Pin Oak(*Quercus palustris*)	14	71
Pin Oak(*Quercus palustris*)	12	61
Pin Oak(*Quercus palustris*)	12	61
Pin Oak(*Quercus palustris*)	17	89
Pin Oak(*Quercus palustris*)	12	69
Pin Oak(*Quercus palustris*)	15	75
Pin Oak(*Quercus palustris*)	15	75
Pin Oak(*Quercus palustris*)	12	61
Pin Oak(*Quercus palustris*)	16	80
Northern White Oak (*Quercus alba*)	13	75
Northern White Oak (*Quercus alba*)	13	75
Eastern White Pine (*Pinus strobus*)	24	99
Red Maple (*Acer rubrum*)	16	44
Red Maple (*Acer rubrum*)	13	32
Red Maple (*Acer rubrum*)	14	37
Red Maple (*Acer rubrum*)	15	40
Red Maple (*Acer rubrum*)	15	40
Red Maple (*Acer rubrum*)	13	32
* Indicates tree is to remain and not be disturbed by the project.		

4.0 Proposed Project

The proposed project, known as Upper Cape YMCA, an approximately 43, 334 sq. ft. recreational facility, will consist of: 1) a daycare; 2) cold and warm water pools; 3) a healthcare center; 4) a wellness center; 5) community rooms; 6) adventure area; and 7) a future gymnasium. The site structures include; 1) the 43,334 sq. ft. building; 2) 5 ft. wide sidewalks that run along the access drive, to the parking lots and along the building; 3) 150 parking spaces; 4) a 7,612 gpd wastewater treatment system; 5) a Low Impact Development/Design (LID) stormwater management system that will cleanse and infiltrate roof and paved surface drainage; and 6) preserve approximately 40 to 45 ft. of the rear area or northern edge of the property as natural open space.

The site will also be serviced by Town water and a standby diesel fuel oil powered emergency generator that will provide electricity to the facility should the power fail. No disturbances to wetlands or rare species habitat will occur as a result of the project as they do not exist on the site based upon available MassGIS data. No environmental resource areas were identified on the site except that it is within an Outstanding Resource Water and a Local Landscape on the MA Fish & Wildlife, Natural Heritage & Endangered Species Program BioMap3. No other environmental resource area data layers occurred on the site. The closest core habitat area occurs on the opposite side of Brick Kiln Road to the south.

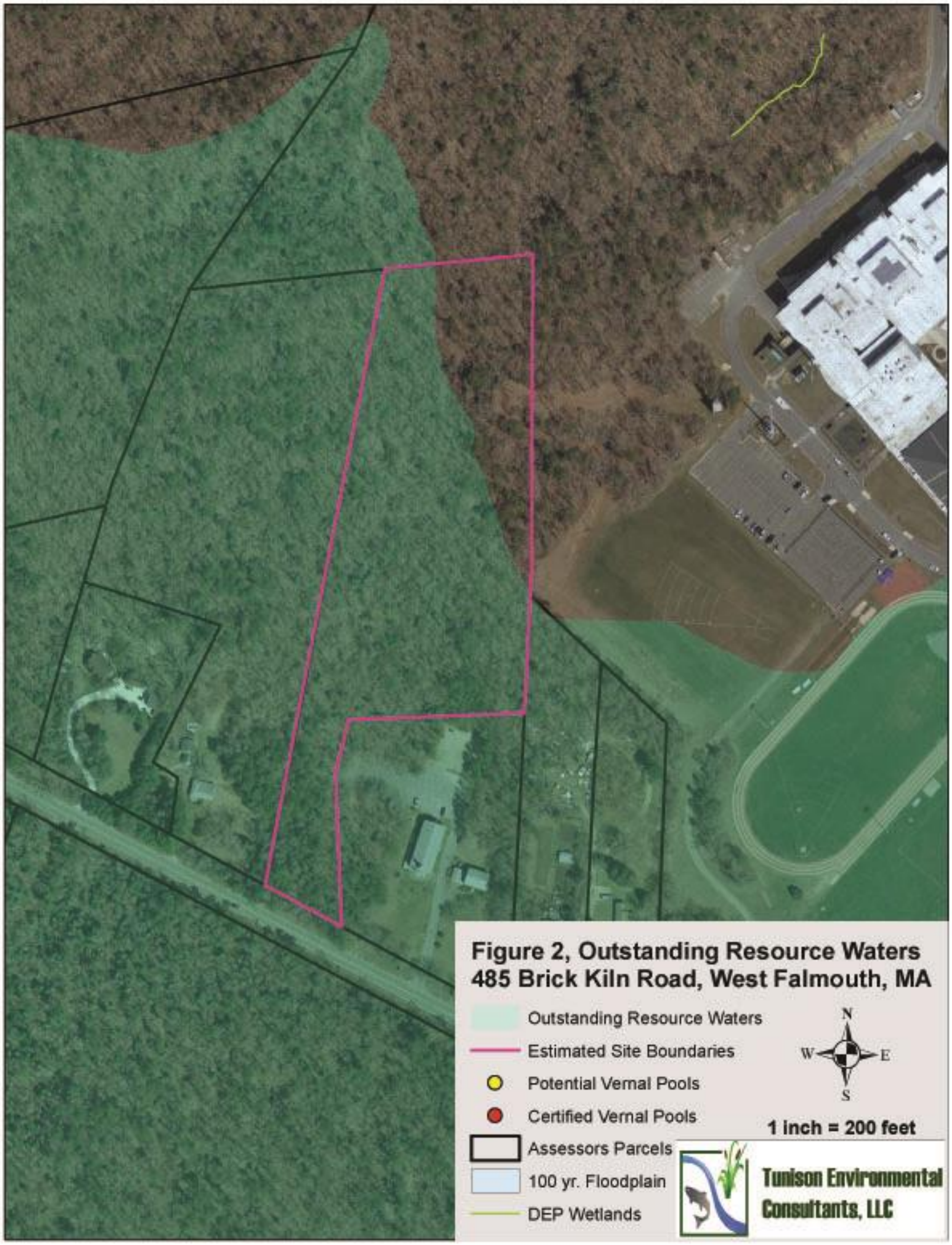


Figure 2, Outstanding Resource Waters
485 Brick Kiln Road, West Falmouth, MA
Outstanding Resource Waters
Estimated Site Boundaries
Potential Vernal Pools
Certified Vernal Pools
Assessors Parcels
100 yr. Floodplain
DEP Wetlands
N
W
E
S
1 inch = 200 feet
Tunison Environmental Consultants, LLC


Figure 3, BioMap3 - Local Landscapes
485 Brick Kiln Road, West Falmouth, MA
Estimated Site Boundaries
BM3 Local Landscapes
Potential Vernal Pools
Certified Vernal Pools
Assessors Parcels
DEP Wetlands
N
W
E
S
1 inch = 200 feet
Tunison Environmental Consultants, LLC

4.1 Objective WPH1

As stated above, no wetland resource areas exist on or adjacent to the site. Under "Additional Methods" of the Cape Cod Commission Regional Policy Plan, Wildlife and Plant Habitat 1, Objective (WPH1), all specimen trees greater than 12" DBH for hardwoods and 18" DBH for softwoods have been identified and located on the site. The specimen trees within the footprint of the project have been provided above in Table 1. These trees and ecological restoration will not be provided for on the site as there isn't any room for mitigation other than the 40+ ft. wide area in the northern portion of the site that is naturally vegetated open space. The proposed project will not impact wildlife movement or migratory pathways as the areas to the south, west and east area currently developed or under construction and provide little to no habitat. An old deer trail does exist on the site but it appears to be disconnected from any adjacent habitat areas as it ends at the edge of the current 40B construction site. A highly worn game trail is located approximately 100 ft. west of the proposed project. This trail contained numerous piles of fresh scat that appeared to be from White-tailed Deer. Evidence of the deer feeding on Common Greenbrier and several other shrubs was observed along the trail as well as several bedding sites located within a stand of Eastern White Pines just north of the trail and along a fork in the trail that went in a northwesterly direction from the main trail. No fencing is currently proposed at the site.

4.2 Objective WPH2

Cape Cod Commission Regional Policy Plan, Objective WPH2 is to restore degraded habitat areas with native plant communities. No areas outside of the project area or "limit of work" contain degraded habitat so no onsite habitat or ecological restoration is proposed. YMCA Cape Cod, based on Cape Cod Commission criteria for an adequate DRI, presumes that the proposed facility will have to acquire off-site land as part of the project. Objective WPH3 is not applicable to this site.

4.3 Objective WPH3

Please note that this objective is not applicable to this site.

4.4 Objective WPH4

The project proposes to remove the existing invasive plant species prior to general clearing of the site. The plants branches and trunks will be removed prior to general clearing to avoid seed dispersal and the any shrubs and trees that contain seeds will be cut and bagged in contractor's bags to be disposed of offsite with a waste hauler that will take the slash to an incinerator. The large trunks/logs from the Black Locust trees can be cut and used as wood chips or fire wood, etc. as long as the branches and any seeds are disposed of properly. The basal areas of each invasive plant can be marked in the field with fluorescent paint or flagging to be removed of singularly and disposed of offsite as well. Any construction equipment tires or tracks and shoes/boots can be brushed clean or washed in a decontamination area over a large tarp to ensure any seeds, flowers, or fine roots are properly collected and contained to avoid site and offsite contamination before and after work. Any clothing can be brushed, vacuumed or cleaned with a lint-roller prior to site personnel that were working with the invasive plant species leaving the site. All brushes, vacuums, and lint roller sheets must be disposed of in contractor's bags or trash bags and disposed of properly to avoid future contamination of invasive plants.

4.5 Objective WPH5

The proposed project is promoting best management practices to protect wildlife by limiting construction activity to the proposed silt fencing and straw wattle sediment controls that will delineate the boundaries of the construction footprint. These sediment controls will help filter sediment and keep it from leaving the site construction area. The proposed LID stormwater management system will limit nutrients, chemicals and sediment from leaving the site through surface flow or groundwater with the proposed cleansing and infiltration of stormwater. A 40+ wide portion of the northern end of the property will remain natural which is the closest area to existing natural habitat that is adjacent to the site. The other areas adjacent to the site to the east, south and west currently do not contain any significant habitat areas.

5.0 Project Mitigation

Mitigation consisting of removing site invasive plants while protecting site operations from spreading invasive plant seeds and protecting the northern or back 40+ ft. of the site have been proposed. Life histories of each invasive plant species observed on and adjacent to the site have been included above in Section 2.1 above. These life histories explain how the invasive plant species would likely dominate each area where they occur and possibly dominate the entire site if left undisturbed and they are allow to proliferate.

Attachment 1

Site Photographs

Photo 1. Sample Plot #1, note Black Locust trees in the southern portion of the site.

Photo 2. Soil sample taken from Sample Plot #1.

Photo 3. Sample Plot #2 in the southern half of the site.

Photo 4. Soil sample taken at Sample Plot #2.

Photo 5. Sample Plot #3 in the northern half of the site.

Photo 6. Sample Plot #6 at the northern end of the site.

Photo 7. Numerous snags of dead Pin Oaks in the northern half of the site.

Photo 8. Dense deciduous vegetation in the western area of the site.

Photo 9. Dense shrubs and vines in the northwestern portion of the site.

Photo 10. Snag with numerous hollow cavities in the central portion of the site.

Photo 11. Another snag with multiple hollows in the northern portion of the site.

Photo 12. A snag in the southern central portion of the site.

Photo 13. Large logs in the eastern portion of the site.

Photo 14. Deer bedding area north of site in forested upland along a deer trail.

Attachment 2

Site Plant List

Attachment 1

List of Plants Observed in Field

The following species were observed growing on site. They are listed classified relative to their affinity for wetland habitats. Classifications are based upon the U.S. Army Corps of Engineers, NWPL-National Wetland Plant List, Northcentral and Northeast 2016 Regional Wetland Plant List. This publication does not list all plants that grow in New England. “NL” which represents “not listed” or listed as “NA” which indicates “no agreement” indicates species not listed in the publication. Plant species listed as “NL” or “NA” below should be considered upland (UPL) plants since they are not included in the 2016 National Wetland Plant List for the Northcentral and Northeast Region.

In certain cases, plants may have been identified only on the family or genus level. In these cases, the indicator status, SESW (wetland) or SESU (upland), is listed by the most typical status of the genus or based upon characteristics of the plant as observed in the field.

Not withstanding classifications, it must be emphasized that individual plants of almost any species may be found in almost any habitat. It is not uncommon to find individual plants of OBL species growing in uplands or individual plants of UPL species growing in wetlands. For this reason, the total vegetation best serves as an indicator of wetlands rather than any individual species.

INDICATOR CATEGORIES AS DEFINED BY THE U.S. Army Corps of Engineers:

OBL: Obligate Wetland (OBL). Occur almost always (estimated probability > 99%) under natural conditions in wetlands.

FACW: Facultative Wetland (FACW). Usually occur in wetlands (estimated probability 67%-99%) but occasionally found in non-wetlands.

FAC: Facultative (FAC). Equally likely to occur in wetlands or non-wetlands (estimated probability 34%-66%).

FACU: Facultative Upland (FACU). Usually occur in non-wetlands (estimated probability 67%-99%), but occasionally found in wetlands (estimated probability 1%-33%).

UPL: Obligate Upland (UPL). Occur in wetlands in another region, but occur almost always (estimated probability >99%) under natural conditions in non-wetlands in the region specified.

HABIT: The plant characteristics and life forms assigned to each species.

A: Annual	GL: Grasslike	Q: Quillwort
B: Biennial	H: Partly woody	S: Shrub
C: Clubmoss	HS: Half shrub	- : Saprophytic
E: Emergent	H2: Horsetail	Z: Submerged
@: Epiphytic	I: Introduced	$: Succulent
F: Forb	N: Native	T: Tree
/: Floating	P: Perennial	V: Herbaceous Vine
F3: Fern	+: Parasitic	W: Waterfern
G: Grass	P3: Pepperwort	WV: Woody Vine

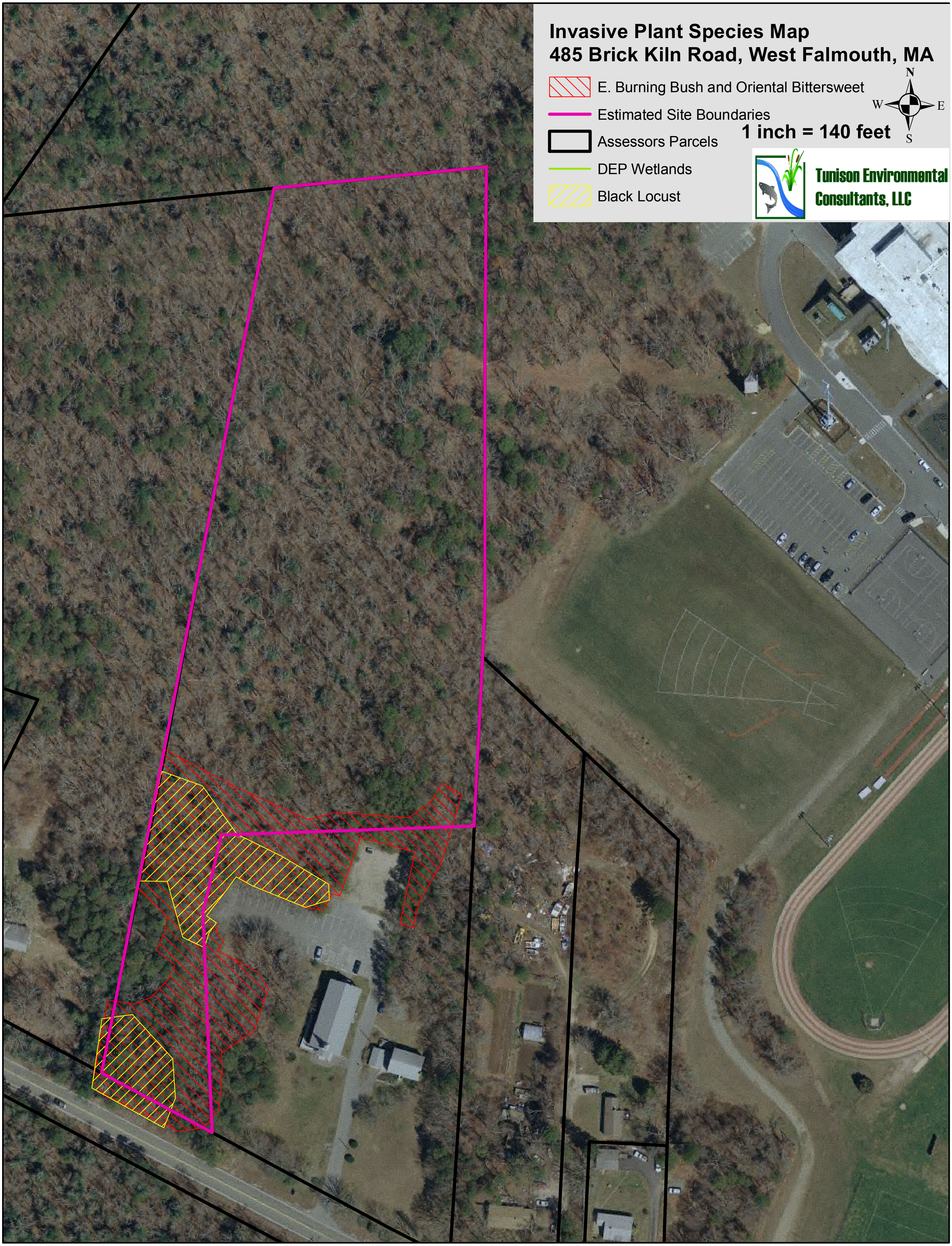
Plant List for 485 Brick Kiln in West Falmouth, MA

Scientific Name	Common Name	MA Ind	Habit
Acer rubrum	MAPLE, RED	FAC	NT
Ambrosia artemisiifolia	RAGWEED, ANNUAL	FACU	ANF
Berberis thunbergii	BARBERRY, JAPANESE	FACU	IS
Betula populifolia	BIRCH, GRAY	FAC	NT
Carex digitalis	SEDGE, SLENDER WOOD	UPL	PNGL
Celastrus orbiculata	BITTER-SWEET ORIENTAL OR ASIAN	UPL*	IWV
Chimaphila maculata	PIPSISSEWA, STRIPED	SESU	PNS
Clethra alnifolia	PEPPER-BUSH, COAST OR SWEET	FAC	NS
Dennstaedtia punctilobula	FERN, HAYSCENTED	UPL	F3
Euonymus atropurpureus	BURNING-BUSH, EASTERN WAHOO OR	FACU	NST
Fagus grandifolia	BEECH, AMERICAN	FACU	NT
Frangula alnus	BUCKTHORN, FALSE GLOSSY	FAC	IS
Gaultheria procumbens	TEABERRY, EASTERN	FACU	PNS
Gaylussacia baccata	HUCKLEBERRY, BLACK	FACU	NS
Gramineae (Upland)	GRASSES, UPLAND	SESU	G
Ilex glabra	INK-BERRY	FACW	NS
Ilex opaca	HOLLY, AMERICAN	FACU	NTS
Ilex verticillata	WINTERBERRY, COMMON	FACW	NST
Juniperus virginiana	CEDAR, EASTERN RED	FACU	NT
Kalmia angustifolia	SHEEP-LAUREL	FAC	NS
Lonicera tatarica	HONEYSUCKLE, TWINSISTERS OR TARTARIAN	FACU*	IS
Lycopodium obscurum	CLUBMOSS, TREE	FACU	PNC
Lycopodium tristachyum	CEDAR, GROUND	FACU	PNC
Lyonia ligustrina	MALEBERRY	FACW	NS
Maianthemum canadense	LILY-OF-THE-VALLEY, WILD-OR FALSE	FACU	PNF
Mitchella repens	PARTRIDGE-BERRY	FACU	PNF
Musci	MOSSES	NL	
Morella pensylvanica	BAYBERRY, NORTHERN	FAC	NS
Nyssa sylvatica	TUPELO, BLACK	FAC	NT
Parthenocissus quinquefolia	CREEPER, VIRGINIA	FACU	NWV
Pinus rigida	PINE, PITCH	FACU	NT
Pinus strobus	PINE, EASTERN WHITE	FACU	NT
Populus tremula	ASPEN, QUAKING	FACU	IT

Scientific Name	Common Name	MA Ind	Habit
Prunus serotina	CHERRY, BLACK	FACU	NT
Pteridium aquilinum	FERN, BRACKEN	FACU	PNF3
Quercus alba	OAK, NORTHERN WHITE	FACU-	NT
Quercus palustris	OAK, PIN	FACW	NT
Quercus rubra	OAK, NORTHERN RED	FACU	NT
Robinia pseudoacacia	LOCUST, BLACK	FACU	NT
Rosa multiflora	ROSE, MULTIFLORA OR RAMBLER	FACU	IS
Rubus allegheniensis	BLACKBERRY, ALLEGHENY	FACU	NS
Rubus alumnus	BLACKBERRY, OLD FEILD	FACU	NS
Rubus flagellaris	DEWBERRY, WHIPLASH	FACU	NS
Sassafras albidum	SASSAFRAS	FACU	NT
Smilax glauca	BRIER, SAW	FACU	NWV
Smilax rotundifolia	GREENBRIER, COMMON OR HORSE	FAC	NWV
Solanum dulcamara	NIGHTSHADE, CLIMBING	FAC	PIF
Solidago canadensis	GOLDEN-ROD, CANADIAN	FACU	PNF
Solidago rugosa	GOLDEN-ROD, WRINKLED-LEAF	FAC	PNF
Symphyotrichum ericoides	ASTER, WHITE HEATH AMERICAN	FACU	PNF
Taraxacum officinale	DANDELION, COMMON	FACU	PIF
Toxicodendron radicans	IVY, EASTERN POISON	FAC	NWVS
Trientalis borealis	STARFLOWER, MAYSTAR OR AMERICAN	FAC	PNF
Ulmus americana	ELM, AMERICAN	FACW	NT
Vaccinium angustifolium	BLUEBERRY, LOWBUSH, LATE	FACU	NS
Vaccinium corymbosum	BLUEBERRY, HIGHBUSH	FACW	NS
Viburnum dentatum	ARROW-WOOD, SOUTHERN	FAC	NTS
Viburnam lentago	NANNY-BERRY OR WILD RASIN	FAC	NTS
Vitis riparia	GRAPE, RIVER-BANK	FAC	NWV

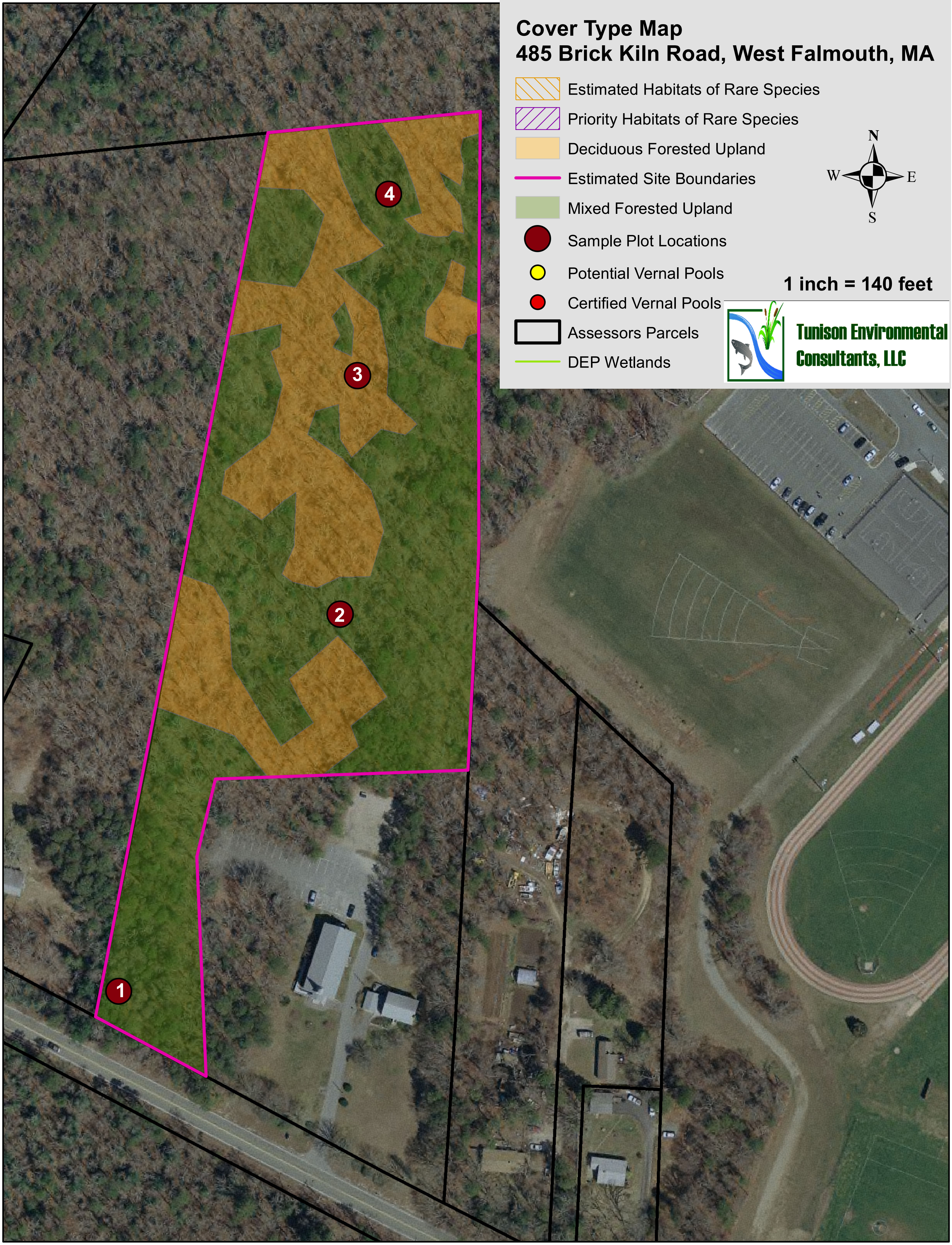
Attachment 3

Invasive Plant Species Map


Invasive Plant Species Map
485 Brick Kiln Road, West Falmouth, MA
E. Burning Bush and Oriental Bittersweet
Estimated Site Boundaries
Assessors Parcels
DEP Wetlands
Black Locust
N
W
E
S
1 inch = 140 feet
Tunison Environmental
Consultants, LLC

Attachment 4

Cover Type Map


Cover Type Map
485 Brick Kiln Road, West Falmouth, MA
Estimated Habitats of Rare Species
Priority Habitats of Rare Species
Deciduous Forested Upland
Estimated Site Boundaries
Mixed Forested Upland
Sample Plot Locations
Potential Vernal Pools
Certified Vernal Pools
Assessors Parcels
DEP Wetlands
N
W
E
S
1 inch = 140 feet
Tunison Environmental Consultants, LLC
1
2
3
4

Attachment 5

Wildlife Habitat Evaluation

Field Data Forms

Wildlife Habitat Evaluation
Field Data Form
(For each wetland type or upland floodplain/riverfront area)

Project Name: 485 Brick Kiln Road **Location:** West Falmouth, Massachusetts

Assessment Area (number/name): # 1: Mixed Forested Upland (Sample Plot #1)

Date(s) of site visit(s) and data collection: December 06, 2022

Date this form was completed: December 27, 2022

Person completing form: Garrett M. Tunison, PWS, Tunison Environmental Consultants, LLC

"The information on this data sheet is based on my observations unless otherwise indicated"

Signature: ______________________

SITE DESCRIPTION

System: ______________________
Subsystem: ______________________
Class: ______________________
Soils
Soil Survey Unit: 245B-Hinkley loamy sand, 3-8% slopes
Drainage Class: Excessively drained
Texture (upper part): Loamy sand
Depth: 65 inches
Depth to Water Table More than 80 inches

Hydrology/Water Regime:
- ☐ Permanently flooded
- ☐ Intermittently exposed
- ☐ Semi-permanently flooded
- ☐ Seasonally flooded
- ☐ Saturated
- ☐ Temporarily flooded
- ☐ Intermittently flooded
- ☐ Artificially flooded

Plants

%Cover: 79% **Trees (>20')** 20.5% **Shrubs (<20')** 38% **Woody Vines** 0% **Mosses**
38% **Herbaceous** 0% **Aquatics (submergent, floating & floating leafed)**

Plant Lists (species that comprise 10% or more of the vegetative cover in each strata; "*" designates a dominant plant species for the strata):

Strata	Plant Species	Strata	Plant Species
*Herb- Upland Grasses	38%		
*Shrub- Nannyberry	20.5%		
*Vine- Common Greenbrier	38%		
*Tree- Black Locust	20.5%		
*Tree- Pitch Pine	20.5%		
*Tree- Red Maple	38%		

IMPORTANT HABITAT FEATURES

If the following habitat characteristics are present, describe & quantify them on the back of this sheet

Wildlife Food

Important Wetland/Aquatic Food Plants (smartweeds, pondweeds, wild rice, bulrush, wild celery)

☐ Abundant ☐ Present ☑ Absent

Important Upland/Wetland Food Plants (hard mast and fruit/berry producers)

☐ Abundant ☑ Present ☐ Absent

Shrub thickets or streambeds with abundant earthworms (American woodcock)

☐ Present ☑ Absent

Shrub and/or herbaceous vegetation suitable for veery nesting ☐ Present ☑ Absent

Number of trees (live or dead) > 30" DBH: 0

Number (or density) of Standing Dead Trees (potential for cavities):

0 6-12" dbh 0 12-18" dbh 0 18-24" dbh 0 >24" dbh

Number of Tree Cavities in trunks or limbs of:

0 6-12" diameter (tree swallow, saw whet owl, screech owl, bluebird, other songbirds)
0 12-18" diameter (hooded merganser, wood duck, common goldeneye, mink)
0 >18" diameter (hooded merganser, wood duck, common goldeneye, common merganser, barred owl, mink, raccoon, fisher)

Small mammal burrows ☐ Abundant ☐ Present ☑ Absent

Cover/Perches/Basking/Denning Habitat

☐ Dense herbaceous cover (voles, small mammals, amphibians & reptiles)
☐ Large woody debris on the ground (small mammals, mink, amphibians & reptiles)
☐ Rocks, crevices, logs, tree roots or hummocks under water's surface (turtles, snakes, frogs)
☐ Rocks, crevices, fallen logs, overhanging branches or hummocks at, or within 1m above the water's surface (turtles, snakes, frogs, wading birds, wood duck, mink, raccoon)
☐ Rock piles, crevices or hollow logs suitable for:
☐ otter ☐ mink ☐ porcupine ☐ bear ☐ bobcat ☐ turkey vulture
☐ Live or dead standing vegetation overhanging water or offering good visibility of open water (osprey, kingfisher, flycatchers, cedar waxwings)

Depressions that may serve as seasonal (vernal/autumnal) pools: ☐ present ☑ absent

Standing water present at least part of the growing season, suitable for use by:

☐ breeding amphibians ☐ non-breeding amphibians (foraging, rehydration)
☐ spotted turtle ☐ foraging waterfowl

Sphagnum hummocks or mats, moss covered logs or saturated logs, overhanging or directly adjacent to pools of standing water in spring (four-toed salamander): ☐ present ☑ absent

Project Name: 485 Brick Kiln Road Assessment Area: # 1: Mixed Forested Upland Plot 1

IMPORTANT HABITAT FEATURES (*If present, describe & quantify them on the back of this sheet*)

Medium to large (> 6"), flat rocks within a stream (cover for stream salamanders and nesting habitat for spring & two-lined salamanders) ☐ present ☑ absent

Flat rocks and logs on banks or within exposed portions of streambeds (cover for stream salamanders and nesting habitat for dusky salamanders) ☐ present ☑ absent

Underwater banks of fine silt and/or clay (beaver, muskrat, otter) ☐ present ☑ absent

Undercut or overhanging banks (small mammals, mink, weasels) ☐ present ☑ absent

Vertical sandy banks (bank swallow, kingfisher) ☐ present ☑ absent

Areas of ice-free open water in winter: ☐ present ☑ absent

Mud flats ☐ present ☑ absent

Exposed areas of well-drained, sandy soil suitable for turtle nesting ☐ present ☑ absent

WILDLIFE DENS/NESTS (*If present, describe & quantify them on the back of this sheet*)

Turtle nesting sites: ☐ present ☑ absent

Bank swallow colony: ☐ present ☑ absent

Nest(s) present of: ☐ Bald Eagle ☐ Osprey ☐ Great Blue Heron

Den(s) present of: ☐ Otter ☐ Mink ☐ Beaver

Project area is within:

- ☐ 100' of beaver, mink or otter den, bank swallow colony or turtle nesting area
- ☐ 200' of Great blue heron or osprey nest(s)
- ☐ 1400' of a bald eagle nest

EMERGENT WETLANDS (*If present, describe & quantify them on the back of this sheet*)

Emergent wetland vegetation at least seasonally flooded during the growing season (wood duck, green heron, black-crowned night heron, King rail, Virginia rail, Coot)

- **Flooded > 5 cm** ☐ present ☑ absent
- **Flooded > 25 cm (pied-billed grebe)** ☐ present ☑ absent

Persistent emergent wetland vegetation at least seasonally flooded during the growing season (mallard, American bittern, sora, common snipe, red-winged blackbird, swamp sparrow, marsh wren)

- **Flooded > 5 cm** ☐ present ☑ absent
- **Flooded > 25 cm (least bittern, common moorhen)** ☐ present ☑ absent

Cattail emergent wetland vegetation at least seasonally flooded during the growing season

- **Flooded > 5 cm (marsh wren)** ☐ present ☑ absent
- **Flooded > 25 cm (least bittern, common moorhen)** ☐ present ☑ absent

Fine-leafed emergent wetland vegetation (grasses and sedges) at least seasonally flooded during the growing season (common snipe, spotted sandpiper, sedge wren)

- **Flooded > 5 cm** ☐ present ☑ absent
- **Flooded > 25 cm (least bittern, common moorhen)** ☐ present ☑ absent

Project Name: 485 Brick Kiln Road Assessment Area: # 1: Mixed Forested Upland Plot 1

LANDSCAPE CONTEXT

Habitat Continuity (*If present, describe the landscape context on the back of this sheet and its importance for area-sensitive species)*

Is the assessment area part of an emergent marsh at least 1.0 acres in size? ☐ yes ☑ no
(marsh and waterbirds) 2.0 acres in size? ☐ yes ☑ no
5.0 acres in size? ☐ yes ☑ no
10.0 acres in size? ☐ yes ☑ no

Is the assessment area part of a wetland complex at least 2.5 acres in size? ☐ yes ☑ no
(turtles, frogs, waterfowl, mammals) 5.0 acres in size? ☐ yes ☑ no
10.0 acres in size? ☐ yes ☑ no
25.0 acres in size? ☐ yes ☑ no

Is the assessment area part of contiguous forested habitat at least
(forest interior nesting birds) 50 acres in size? ☑ yes ☐ no
100 acres in size? ☐ yes ☑ no
250 acres in size? ☐ yes ☑ no
500 acres in size? ☐ yes ☑ no

Connectivity with adjoining natural habitats

- ☐ No direct connections to adjacent areas of wildlife habitat (little connectivity function)
- ☑ Connectors numerous or assessment area is imbedded in a large area of natural habitat (limited connectivity function)
- ☐ Assessment area contributes to a limited number of connectors to adjacent areas of habitat (somewhat important for connectivity function)
- ☐ Assessment area serves as *part of* a sole connector to adjacent areas of habitat (important for connectivity function)
- ☐ Assessment area serves as *only* connector to adjacent areas of habitat (very important for connectivity function)

HABITAT DEGRADATION (Describe degradation and wildlife habitat impacts on back of the sheet)

- ☐ Evidence of significant chemical contamination
- ☐ Evidence of significant levels of dumping
- ☐ Evidence of significant erosion or sedimentation problems
- ☑ Significant invasion of exotic plants (e.g. purple loosestrife, *Phragmites*, glossy buckthorn)
- ☑ Disturbance from roads or highways
- ☑ Other human disturbance

Project Name: 485 Brick Kiln Road

Assessment Area: # 1: Mixed Forested Upland Plot 1

Wildlife Habitat Evaluation
Field Data Form
(For each wetland type or upland floodplain/riverfront area)

Project Name: 485 Brick Kiln Road **Location:** West Falmouth, Massachusetts

Assessment Area (number/name): # 1: Mixed Forested Upland (Sample Plot #2)

Date(s) of site visit(s) and data collection: December 06, 2022

Date this form was completed: December 27, 2022

Person completing form: Garrett M. Tunison, PWS, Tunison Environmental Consultants, LLC

"The information on this data sheet is based on my observations unless otherwise indicated"

Signature: ______________________

SITE DESCRIPTION

System: ______________

Subsystem: ______________

Class: ______________

Soils

- **Soil Survey Unit:** 245B-Hinkley loamy sand, 3-8% slopes
- **Drainage Class:** Excessively drained
- **Texture (upper part):** Loamy sand
- **Depth:** 65 inches
- **Depth to Water Table** More than 80 inches

Hydrology/Water Regime:

- ☐ Permanently flooded
- ☐ Intermittently exposed
- ☐ Semi-permanently flooded
- ☐ Seasonally flooded
- ☐ Saturated
- ☐ Temporarily flooded
- ☐ Intermittently flooded
- ☐ Artificially flooded

Plants

%Cover: 79% **Trees (>20')** 41% **Shrubs (<20')** 0% **Woody Vines** 0% **Mosses**

58.5% **Herbaceous** 0% **Aquatics (submergent, floating & floating leafed)**

Plant Lists (species that comprise 10% or more of the vegetative cover in each strata; "*" designates a dominant plant species for the strata):

Strata	Plant Species	Strata	Plant Species
*Herb- Eastern Teaberry	20.5%		
*Herb- Sheep Laurel	38%		
*Shrub- Nannyberry	20.5%		
*Shrub- Black Huckleberry	20.5%		
*Tree- Pin Oak	20.5%		
*Tree- Red Maple	20.5%		
*Tree- Eastern White Pine	38%		

IMPORTANT HABITAT FEATURES

If the following habitat characteristics are present, describe & quantify them on the back of this sheet

Wildlife Food

Important Wetland/Aquatic Food Plants (smartweeds, pondweeds, wild rice, bulrush, wild celery)

☐ Abundant ☐ Present ☑ Absent

Important Upland/Wetland Food Plants (hard mast and fruit/berry producers)

☐ Abundant ☑ Present ☐ Absent

Shrub thickets or streambeds with abundant earthworms (American woodcock)

☐ Present ☑ Absent

Shrub and/or herbaceous vegetation suitable for veery nesting ☐ Present ☑ Absent

Number of trees (live or dead) > 30" DBH: 0

Number (or density) of Standing Dead Trees (potential for cavities):

4 6-12" dbh 0 12-18" dbh 0 18-24" dbh 0 >24" dbh

Number of Tree Cavities in trunks or limbs of:

1 6-12" diameter (tree swallow, saw whet owl, screech owl, bluebird, other songbirds)

0 12-18" diameter (hooded merganser, wood duck, common goldeneye, mink)

0 >18" diameter (hooded merganser, wood duck, common goldeneye, common merganser, barred owl, mink, raccoon, fisher)

Small mammal burrows ☐ Abundant ☐ Present ☑ Absent

Cover/Perches/Basking/Denning Habitat

☐ Dense herbaceous cover (voles, small mammals, amphibians & reptiles)

☐ Large woody debris on the ground (small mammals, mink, amphibians & reptiles)

☐ Rocks, crevices, logs, tree roots or hummocks under water's surface (turtles, snakes, frogs)

☐ Rocks, crevices, fallen logs, overhanging branches or hummocks at, or within 1m above the water's surface (turtles, snakes, frogs, wading birds, wood duck, mink, raccoon)

☐ Rock piles, crevices or hollow logs suitable for:

☐ otter ☐ mink ☐ porcupine ☐ bear ☐ bobcat ☐ turkey vulture

☐ Live or dead standing vegetation overhanging water or offering good visibility of open water (osprey, kingfisher, flycatchers, cedar waxwings)

Depressions that may serve as seasonal (vernal/autumnal) pools: ☐ present ☑ absent

Standing water present at least part of the growing season, suitable for use by:

☐ breeding amphibians ☐ non-breeding amphibians (foraging, rehydration)

☐ spotted turtle ☐ foraging waterfowl

Sphagnum hummocks or mats, moss covered logs or saturated logs, overhanging or directly adjacent to pools of standing water in spring (four-toed salamander): ☐ present ☑ absent

Project Name: 485 Brick Kiln Road

Assessment Area: # 1: Mixed Forested Upland Plot 2

IMPORTANT HABITAT FEATURES (*If present, describe & quantify them on the back of this sheet)*

Medium to large (> 6"), flat rocks within a stream (cover for stream salamanders and nesting habitat for spring & two-lined salamanders) ☐ present ☑ absent

Flat rocks and logs on banks or within exposed portions of streambeds (cover for stream salamanders and nesting habitat for dusky salamanders) ☐ present ☑ absent

Underwater banks of fine silt and/or clay (beaver, muskrat, otter) ☐ present ☑ absent

Undercut or overhanging banks (small mammals, mink, weasels) ☐ present ☑ absent

Vertical sandy banks (bank swallow, kingfisher) ☐ present ☑ absent

Areas of ice-free open water in winter: ☐ present ☑ absent

Mud flats ☐ present ☑ absent

Exposed areas of well-drained, sandy soil suitable for turtle nesting ☐ present ☑ absent

WILDLIFE DENS/NESTS (*If present, describe & quantify them on the back of this sheet)*

Turtle nesting sites: ☐ present ☑ absent

Bank swallow colony: ☐ present ☑ absent

Nest(s) present of: ☐ Bald Eagle ☐ Osprey ☐ Great Blue Heron

Den(s) present of: ☐ Otter ☐ Mink ☐ Beaver

Project area is within:

- ☐ 100' of beaver, mink or otter den, bank swallow colony or turtle nesting area
- ☐ 200' of Great blue heron or osprey nest(s)
- ☐ 1400' of a bald eagle nest

EMERGENT WETLANDS (*If present, describe & quantify them on the back of this sheet)*

Emergent wetland vegetation at least seasonally flooded during the growing season (wood duck, green heron, black-crowned night heron, King rail, Virginia rail, Coot)

Flooded > 5 cm ☐ present ☑ absent

Flooded > 25 cm (pied-billed grebe) ☐ present ☑ absent

<u>Persistent</u> emergent wetland vegetation at least seasonally flooded during the growing season (mallard, American bittern, sora, common snipe, red-winged blackbird, swamp sparrow, marsh wren)

Flooded > 5 cm ☐ present ☑ absent

Flooded > 25 cm (least bittern, common moorhen) ☐ present ☑ absent

<u>Cattail</u> emergent wetland vegetation at least seasonally flooded during the growing season

Flooded > 5 cm (marsh wren) ☐ present ☑ absent

Flooded > 25 cm (least bittern, common moorhen) ☐ present ☑ absent

<u>Fine-leafed</u> emergent wetland vegetation (grasses and sedges) at least seasonally flooded during the growing season (common snipe, spotted sandpiper, sedge wren)

Flooded > 5 cm ☐ present ☑ absent

Flooded > 25 cm (least bittern, common moorhen) ☐ present ☑ absent

Project Name: 485 Brick Kiln Road Assessment Area: # 1: Mixed Forested Upland Plot 2

LANDSCAPE CONTEXT

Habitat Continuity (*If present, describe the landscape context on the back of this sheet and its importance for area-sensitive species)*

Is the assessment area part of an emergent marsh at least (marsh and waterbirds)

1.0 acres in size?	☐ yes	☑ no
2.0 acres in size?	☐ yes	☑ no
5.0 acres in size?	☐ yes	☑ no
10.0 acres in size?	☐ yes	☑ no

Is the assessment area part of a wetland complex at least (turtles, frogs, waterfowl, mammals)

2.5 acres in size?	☐ yes	☑ no
5.0 acres in size?	☐ yes	☑ no
10.0 acres in size?	☐ yes	☑ no
25.0 acres in size?	☐ yes	☑ no

Is the assessment area part of contiguous forested habitat at least (forest interior nesting birds)

50 acres in size?	☑ yes	☐ no
100 acres in size?	☐ yes	☑ no
250 acres in size?	☐ yes	☑ no
500 acres in size?	☐ yes	☑ no

Connectivity with adjoining natural habitats

- ☐ No direct connections to adjacent areas of wildlife habitat (little connectivity function)
- ☑ Connectors numerous or assessment area is imbedded in a large area of natural habitat (limited connectivity function)
- ☐ Assessment area contributes to a limited number of connectors to adjacent areas of habitat (somewhat important for connectivity function)
- ☐ Assessment area serves as *part of* a sole connector to adjacent areas of habitat (important for connectivity function)
- ☐ Assessment area serves as *only* connector to adjacent areas of habitat (very important for connectivity function)

HABITAT DEGRADATION (Describe degradation and wildlife habitat impacts on back of the sheet)

- ☐ Evidence of significant chemical contamination
- ☐ Evidence of significant levels of dumping
- ☐ Evidence of significant erosion or sedimentation problems
- ☐ Significant invasion of exotic plants (e.g. purple loosestrife, *Phragmites*, glossy buckthorn)
- ☐ Disturbance from roads or highways
- ☑ Other human disturbance

Project Name: 485 Brick Kiln Road

Assessment Area: # 1: Mixed Forested Upland Plot 2

Wildlife Habitat Evaluation
Field Data Form

(For each wetland type or upland floodplain/riverfront area)

Project Name: 485 Brick Kiln Road **Location:** West Falmouth, Massachusetts

Assessment Area (number/name): # 1: Mixed Forested Upland (Sample Plot #4)

Date(s) of site visit(s) and data collection: December 12, 2022

Date this form was completed: December 27, 2022

Person completing form: Garrett M. Tunison, PWS, Tunison Environmental Consultants, LLC

"The information on this data sheet is based on my observations unless otherwise indicated"

Signature: ______________________

SITE DESCRIPTION

System: ______________________

Subsystem: ______________________

Class: ______________________

Soils

- **Soil Survey Unit:** 245B-Hinkley loamy sand, 3-8% slopes
- **Drainage Class:** Excessively drained
- **Texture (upper part):** Loamy sand
- **Depth:** 65 inches
- **Depth to Water Table** More than 80 inches

Hydrology/Water Regime:

- ☐ Permanently flooded
- ☐ Intermittently exposed
- ☐ Semi-permanently flooded
- ☐ Seasonally flooded
- ☐ Saturated
- ☐ Temporarily flooded
- ☐ Intermittently flooded
- ☐ Artificially flooded

Plants

%Cover: 79% **Trees (>20')** 10.5% **Shrubs (<20')** 38% **Woody Vines** 0% **Mosses**

20.5% **Herbaceous** 0% **Aquatics (submergent, floating & floating leafed)**

Plant Lists (species that comprise 10% or more of the vegetative cover in each strata; "*" designates a dominant plant species for the strata):

Strata	Plant Species	Strata	Plant Species
*Herb- Black Huckleberry	20.5%		
*Vine- Common Greenbrier	38%		
*Shrub- Maleberry	10.5%		
*Tree- Pin Oak	20.5%		
*Tree- Pitch Pine	20.5%		
*Tree- Northern White Oak	38%		

IMPORTANT HABITAT FEATURES

If the following habitat characteristics are present, describe & quantify them on the back of this sheet

Wildlife Food

Important Wetland/Aquatic Food Plants (smartweeds, pondweeds, wild rice, bulrush, wild celery)

☐ Abundant ☐ Present ☑ Absent

Important Upland/Wetland Food Plants (hard mast and fruit/berry producers)

☐ Abundant ☑ Present ☐ Absent

Shrub thickets or streambeds with abundant earthworms (American woodcock)

☐ Present ☑ Absent

Shrub and/or herbaceous vegetation suitable for veery nesting ☐ Present ☑ Absent

Number of trees (live or dead) > 30" DBH: 0

Number (or density) of Standing Dead Trees (potential for cavities):

26 6-12" dbh 3 12-18" dbh 0 18-24" dbh 0 >24" dbh

Number of Tree Cavities in trunks or limbs of:

8 6-12" diameter (tree swallow, saw whet owl, screech owl, bluebird, other songbirds)
5 12-18" diameter (hooded merganser, wood duck, common goldeneye, mink)
0 >18" diameter (hooded merganser, wood duck, common goldeneye, common merganser, barred owl, mink, raccoon, fisher)

Small mammal burrows ☐ Abundant ☐ Present ☑ Absent

Cover/Perches/Basking/Denning Habitat

☑ Dense herbaceous cover (voles, small mammals, amphibians & reptiles)
☑ Large woody debris on the ground (small mammals, mink, amphibians & reptiles)
☐ Rocks, crevices, logs, tree roots or hummocks under water's surface (turtles, snakes, frogs)
☐ Rocks, crevices, fallen logs, overhanging branches or hummocks at, or within 1m above the water's surface (turtles, snakes, frogs, wading birds, wood duck, mink, raccoon)
☐ Rock piles, crevices or hollow logs suitable for:
☐ otter ☐ mink ☐ porcupine ☐ bear ☐ bobcat ☐ turkey vulture
☐ Live or dead standing vegetation overhanging water or offering good visibility of open water (osprey, kingfisher, flycatchers, cedar waxwings)

Depressions that may serve as seasonal (vernal/autumnal) pools: ☐ present ☑ absent

Standing water present at least part of the growing season, suitable for use by:

☐ breeding amphibians ☐ non-breeding amphibians (foraging, rehydration)
☐ spotted turtle ☐ foraging waterfowl

Sphagnum hummocks or mats, moss covered logs or saturated logs, overhanging or directly adjacent to pools of standing water in spring (four-toed salamander): ☐ present ☑ absent

Project Name: 485 Brick Kiln Road Assessment Area: # 1: Mixed Forested Upland Plot 4

IMPORTANT HABITAT FEATURES (*If present, describe & quantify them on the back of this sheet)*

Medium to large (> 6"), flat rocks within a stream (cover for stream salamanders and nesting habitat for spring & two-lined salamanders)	☐ present	☑ absent
Flat rocks and logs on banks or within exposed portions of streambeds (cover for stream salamanders and nesting habitat for dusky salamanders)	☐ present	☑ absent
Underwater banks of fine silt and/or clay (beaver, muskrat, otter)	☐ present	☑ absent
Undercut or overhanging banks (small mammals, mink, weasels)	☐ present	☑ absent
Vertical sandy banks (bank swallow, kingfisher)	☐ present	☑ absent
Areas of ice-free open water in winter:	☐ present	☑ absent
Mud flats	☐ present	☑ absent
Exposed areas of well-drained, sandy soil suitable for turtle nesting	☐ present	☑ absent

WILDLIFE DENS/NESTS (*If present, describe & quantify them on the back of this sheet)*

Turtle nesting sites:	☐ present	☑ absent	
Bank swallow colony:	☐ present	☑ absent	
Nest(s) present of:	☐ Bald Eagle	☐ Osprey	☐ Great Blue Heron
Den(s) present of:	☐ Otter	☐ Mink	☐ Beaver

Project area is within:

☐ 100' of beaver, mink or otter den, bank swallow colony or turtle nesting area
☐ 200' of Great blue heron or osprey nest(s)
☐ 1400' of a bald eagle nest

EMERGENT WETLANDS (*If present, describe & quantify them on the back of this sheet)*

Emergent wetland vegetation at least seasonally flooded during the growing season (wood duck, green heron, black-crowned night heron, King rail, Virginia rail, Coot)

Flooded > 5 cm	☐ present	☑ absent
Flooded > 25 cm (pied-billed grebe)	☐ present	☑ absent

<u>Persistent</u> emergent wetland vegetation at least seasonally flooded during the growing season (mallard, American bittern, sora, common snipe, red-winged blackbird, swamp sparrow, marsh wren)

Flooded > 5 cm	☐ present	☑ absent
Flooded > 25 cm (least bittern, common moorhen)	☐ present	☑ absent

<u>Cattail</u> emergent wetland vegetation at least seasonally flooded during the growing season

Flooded > 5 cm (marsh wren)	☐ present	☑ absent
Flooded > 25 cm (least bittern, common moorhen)	☐ present	☑ absent

<u>Fine-leafed</u> emergent wetland vegetation (grasses and sedges) at least seasonally flooded during the growing season (common snipe, spotted sandpiper, sedge wren)

Flooded > 5 cm	☐ present	☑ absent
Flooded > 25 cm (least bittern, common moorhen)	☐ present	☑ absent

Project Name: 485 Brick Kiln Road Assessment Area: # 1: Mixed Forested Upland Plot 4

LANDSCAPE CONTEXT

Habitat Continuity ***(If present, describe the landscape context on the back of this sheet and its importance for area-sensitive species)***

Is the assessment area part of an emergent marsh at least	1.0 acres in size?	☐ yes	☑ no
(marsh and waterbirds)	2.0 acres in size?	☐ yes	☑ no
	5.0 acres in size?	☐ yes	☑ no
	10.0 acres in size?	☐ yes	☑ no
Is the assessment area part of a wetland complex at least	2.5 acres in size?	☐ yes	☑ no
(turtles, frogs, waterfowl, mammals)	5.0 acres in size?	☐ yes	☑ no
	10.0 acres in size?	☐ yes	☑ no
	25.0 acres in size?	☐ yes	☑ no
Is the assessment area part of contiguous forested habitat at least			
(forest interior nesting birds)	50 acres in size?	☑ yes	☐ no
	100 acres in size?	☐ yes	☑ no
	250 acres in size?	☐ yes	☑ no
	500 acres in size?	☐ yes	☑ no

Connectivity with adjoining natural habitats

- ☐ No direct connections to adjacent areas of wildlife habitat (little connectivity function)
- ☑ Connectors numerous or assessment area is imbedded in a large area of natural habitat (limited connectivity function)
- ☐ Assessment area contributes to a limited number of connectors to adjacent areas of habitat (somewhat important for connectivity function)
- ☐ Assessment area serves as *part of* a sole connector to adjacent areas of habitat (important for connectivity function)
- ☐ Assessment area serves as *only* connector to adjacent areas of habitat (very important for connectivity function)

HABITAT DEGRADATION (Describe degradation and wildlife habitat impacts on back of the sheet)

- ☐ Evidence of significant chemical contamination
- ☐ Evidence of significant levels of dumping
- ☐ Evidence of significant erosion or sedimentation problems
- ☐ Significant invasion of exotic plants (e.g. purple loosestrife, *Phragmites*, glossy buckthorn)
- ☐ Disturbance from roads or highways
- ☑ Other human disturbance

Project Name: 485 Brick Kiln Road

Assessment Area: # 1: Mixed Forested Upland Plot 4

Wildlife Habitat Evaluation
Field Data Form
(For each wetland type or upland floodplain/riverfront area)

Project Name: 485 Brick Kiln Road **Location:** West Falmouth, Massachusetts

Assessment Area (number/name): # 2: Deciduous Forested Upland (Sample Plot #3)

Date(s) of site visit(s) and data collection: December 12, 2022

Date this form was completed: December 27, 2022

Person completing form: Garrett M. Tunison, PWS, Tunison Environmental Consultants, LLC

"The information on this data sheet is based on my observations unless otherwise indicated"

Signature: ____________________

SITE DESCRIPTION

System: ____________________

Subsystem: ____________________

Class: ____________________

Soils

- **Soil Survey Unit:** 245B-Hinkley loamy sand, 3-8% slopes
- **Drainage Class:** Excessively drained
- **Texture (upper part):** Loamy sand
- **Depth:** 65 inches
- **Depth to Water Table** More than 80 inches

Hydrology/Water Regime:

- ☐ Permanently flooded
- ☐ Intermittently exposed
- ☐ Semi-permanently flooded
- ☐ Seasonally flooded
- ☐ Saturated
- ☐ Temporarily flooded
- ☐ Intermittently flooded
- ☐ Artificially flooded

Plants

%Cover: 38% **Trees (>20')** 96.5% **Shrubs (<20')** 10.5% **Woody Vines** 0% **Mosses**

20.5% **Herbaceous** 0% **Aquatics (submergent, floating & floating leafed)**

Plant Lists (species that comprise 10% or more of the vegetative cover in each strata; "*" designates a dominant plant species for the strata):

Strata	Plant Species	Strata	Plant Species
Herb- Tree Club Moss	3%		
*Vine- Common Greenbrier	10.5%		
*Shrub- Nannyberry	10.5%		
*Shrub- Black Huckleberry	38%		
*Shrub- Maleberry	38%		
*Tree- Pin Oak	38%		

IMPORTANT HABITAT FEATURES

If the following habitat characteristics are present, describe & quantify them on the back of this sheet

Wildlife Food

Important Wetland/Aquatic Food Plants (smartweeds, pondweeds, wild rice, bulrush, wild celery)

☐ Abundant ☐ Present ☑ Absent

Important Upland/Wetland Food Plants (hard mast and fruit/berry producers)

☐ Abundant ☑ Present ☐ Absent

Shrub thickets or streambeds with abundant earthworms (American woodcock)

☐ Present ☑ Absent

Shrub and/or herbaceous vegetation suitable for veery nesting ☐ Present ☑ Absent

Number of trees (live or dead) > 30" DBH: 0

Number (or density) of Standing Dead Trees (potential for cavities):

13 6-12" dbh 1 12-18" dbh 0 18-24" dbh 0 >24" dbh

Number of Tree Cavities in trunks or limbs of:

1 6-12" diameter (tree swallow, saw whet owl, screech owl, bluebird, other songbirds)

0 12-18" diameter (hooded merganser, wood duck, common goldeneye, mink)

0 >18" diameter (hooded merganser, wood duck, common goldeneye, common merganser, barred owl, mink, raccoon, fisher)

Small mammal burrows ☐ Abundant ☐ Present ☑ Absent

Cover/Perches/Basking/Denning Habitat

☑ Dense herbaceous cover (voles, small mammals, amphibians & reptiles)

☑ Large woody debris on the ground (small mammals, mink, amphibians & reptiles)

☐ Rocks, crevices, logs, tree roots or hummocks under water's surface (turtles, snakes, frogs)

☐ Rocks, crevices, fallen logs, overhanging branches or hummocks at, or within 1m above the water's surface (turtles, snakes, frogs, wading birds, wood duck, mink, raccoon)

☐ Rock piles, crevices or hollow logs suitable for:

☐ otter ☐ mink ☐ porcupine ☐ bear ☐ bobcat ☐ turkey vulture

☐ Live or dead standing vegetation overhanging water or offering good visibility of open water (osprey, kingfisher, flycatchers, cedar waxwings)

Depressions that may serve as seasonal (vernal/autumnal) pools: ☐ present ☑ absent

Standing water present at least part of the growing season, suitable for use by:

☐ breeding amphibians ☐ non-breeding amphibians (foraging, rehydration)

☐ spotted turtle ☐ foraging waterfowl

Sphagnum hummocks or mats, moss covered logs or saturated logs, overhanging or directly adjacent to pools of standing water in spring (four-toed salamander): ☐ present ☑ absent

Project Name: 485 Brick Kiln Road Assessment Area: # 2: Deciduous Forested Upland P13

IMPORTANT HABITAT FEATURES (*If present, describe & quantify them on the back of this sheet)*

Medium to large (> 6"), flat rocks within a stream (cover for stream salamanders and nesting habitat for spring & two-lined salamanders)	☐ present	☑ absent
Flat rocks and logs on banks or within exposed portions of streambeds (cover for stream salamanders and nesting habitat for dusky salamanders)	☐ present	☑ absent
Underwater banks of fine silt and/or clay (beaver, muskrat, otter)	☐ present	☑ absent
Undercut or overhanging banks (small mammals, mink, weasels)	☐ present	☑ absent
Vertical sandy banks (bank swallow, kingfisher)	☐ present	☑ absent
Areas of ice-free open water in winter:	☐ present	☑ absent
Mud flats	☐ present	☑ absent
Exposed areas of well-drained, sandy soil suitable for turtle nesting	☐ present	☑ absent

WILDLIFE DENS/NESTS (*If present, describe & quantify them on the back of this sheet)*

Turtle nesting sites:	☐ present	☑ absent	
Bank swallow colony:	☐ present	☑ absent	
Nest(s) present of:	☐ Bald Eagle	☐ Osprey	☐ Great Blue Heron
Den(s) present of:	☐ Otter	☐ Mink	☐ Beaver

Project area is within:

- ☐ 100' of beaver, mink or otter den, bank swallow colony or turtle nesting area
- ☐ 200' of Great blue heron or osprey nest(s)
- ☐ 1400' of a bald eagle nest

EMERGENT WETLANDS (*If present, describe & quantify them on the back of this sheet)*

Emergent wetland vegetation at least seasonally flooded during the growing season (wood duck, green heron, black-crowned night heron, King rail, Virginia rail, Coot)

Flooded > 5 cm	☐ present	☑ absent
Flooded > 25 cm (pied-billed grebe)	☐ present	☑ absent

<u>Persistent</u> emergent wetland vegetation at least seasonally flooded during the growing season (mallard, American bittern, sora, common snipe, red-winged blackbird, swamp sparrow, marsh wren)

Flooded > 5 cm	☐ present	☑ absent
Flooded > 25 cm (least bittern, common moorhen)	☐ present	☑ absent

<u>Cattail</u> emergent wetland vegetation at least seasonally flooded during the growing season

Flooded > 5 cm (marsh wren)	☐ present	☑ absent
Flooded > 25 cm (least bittern, common moorhen)	☐ present	☑ absent

<u>Fine-leafed</u> emergent wetland vegetation (grasses and sedges) at least seasonally flooded during the growing season (common snipe, spotted sandpiper, sedge wren)

Flooded > 5 cm	☐ present	☑ absent
Flooded > 25 cm (least bittern, common moorhen)	☐ present	☑ absent

Project Name: 485 Brick Kiln Road Assessment Area: # 2: Deciduous Forested Upland P13

LANDSCAPE CONTEXT

Habitat Continuity (*If present, describe the landscape context on the back of this sheet and its importance for area-sensitive species)*

Is the assessment area part of an emergent marsh at least (marsh and waterbirds)

- 1.0 acres in size? ☐ yes ☑ no
- 2.0 acres in size? ☐ yes ☑ no
- 5.0 acres in size? ☐ yes ☑ no
- 10.0 acres in size? ☐ yes ☑ no

Is the assessment area part of a wetland complex at least (turtles, frogs, waterfowl, mammals)

- 2.5 acres in size? ☐ yes ☑ no
- 5.0 acres in size? ☐ yes ☑ no
- 10.0 acres in size? ☐ yes ☑ no
- 25.0 acres in size? ☐ yes ☑ no

Is the assessment area part of contiguous forested habitat at least (forest interior nesting birds)

- 50 acres in size? ☑ yes ☐ no
- 100 acres in size? ☐ yes ☑ no
- 250 acres in size? ☐ yes ☑ no
- 500 acres in size? ☐ yes ☑ no

Connectivity with adjoining natural habitats

- ☐ No direct connections to adjacent areas of wildlife habitat (little connectivity function)
- ☑ Connectors numerous or assessment area is imbedded in a large area of natural habitat (limited connectivity function)
- ☐ Assessment area contributes to a limited number of connectors to adjacent areas of habitat (somewhat important for connectivity function)
- ☐ Assessment area serves as *part of* a sole connector to adjacent areas of habitat (important for connectivity function)
- ☐ Assessment area serves as *only* connector to adjacent areas of habitat (very important for connectivity function)

HABITAT DEGRADATION (Describe degradation and wildlife habitat impacts on back of the sheet)

- ☐ Evidence of significant chemical contamination
- ☐ Evidence of significant levels of dumping
- ☐ Evidence of significant erosion or sedimentation problems
- ☐ Significant invasion of exotic plants (e.g. purple loosestrife, *Phragmites*, glossy buckthorn)
- ☐ Disturbance from roads or highways
- ☑ Other human disturbance

Project Name: 485 Brick Kiln Road

Assessment Area: # 2: Deciduous Forested Upland Pl3

Attachment 6

NRCS Soil Report

United States Department of Agriculture

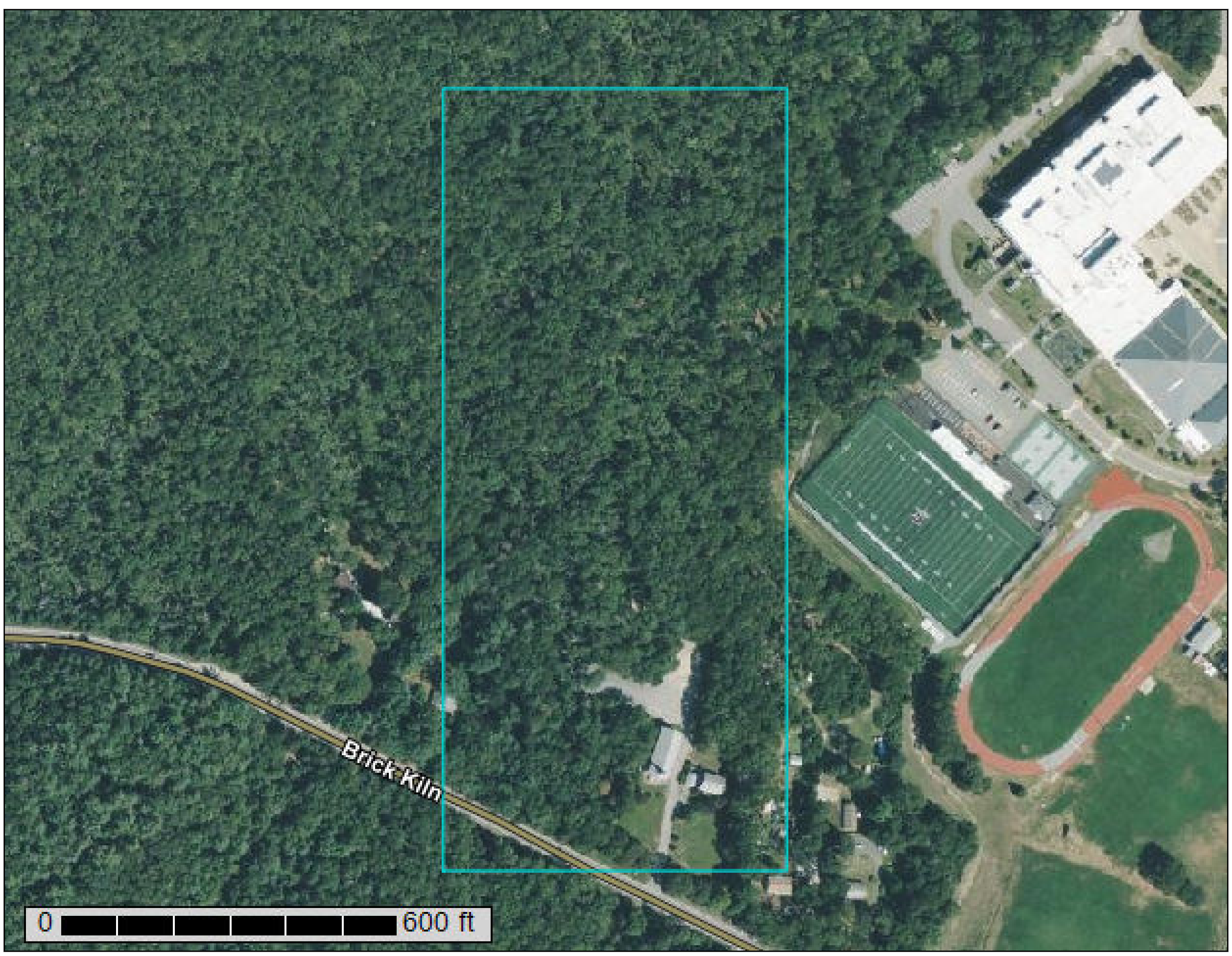
NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for

Barnstable County, Massachusetts



January 26, 2023

Preface

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

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

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

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

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

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

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

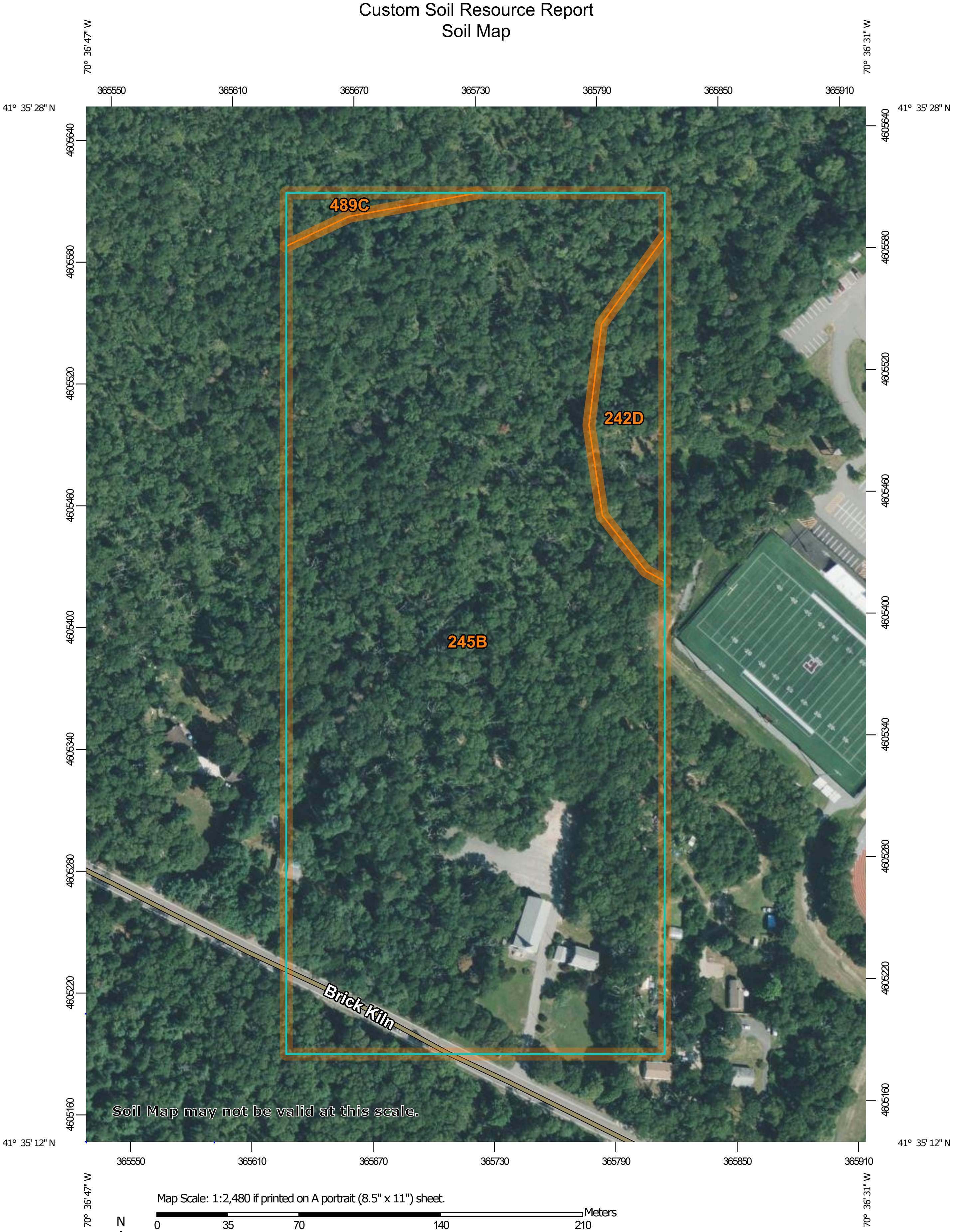
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

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

Soil Map



Map Scale: 1:2,480 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 35, 70, 140, 210

Feet: 0, 100, 200, 400, 600

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Barnstable County, Massachusetts
Survey Area Data: Version 19, Sep 9, 2022

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

Date(s) aerial images were photographed: Sep 5, 2020—Sep 7, 2020

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
242D	Hinckley loamy sand, 15 to 35 percent slopes	1.1	5.6%
245B	Hinckley loamy sand, 3 to 8 percent slopes	18.3	93.2%
489C	Barnstable-Plymouth complex, rolling, very bouldery	0.2	1.2%
Totals for Area of Interest		**19.7**	**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.

Barnstable County, Massachusetts

242D—Hinckley loamy sand, 15 to 35 percent slopes

Map Unit Setting

National map unit symbol: 2svmd
Elevation: 0 to 860 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: Not prime farmland

Map Unit Composition

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

Description of Hinckley

Setting

Landform: Outwash deltas, outwash terraces, moraines, eskers, kames, outwash plains, kame terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Crest, nose slope, side slope, head slope, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very 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
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A

Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Windsor

Percent of map unit: 10 percent
Landform: Moraines, eskers, kames, outwash deltas, outwash terraces, outwash plains, kame terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, crest, side slope, head slope, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Merrimac

Percent of map unit: 3 percent
Landform: Kame terraces, outwash plains, outwash terraces, moraines, eskers, kames
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, crest, head slope, nose slope, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Sudbury

Percent of map unit: 2 percent
Landform: Outwash deltas, outwash plains, kame terraces, outwash terraces, moraines
Landform position (two-dimensional): Backslope, footslope, toeslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: No

245B—Hinckley loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2svm8
Elevation: 0 to 1,430 feet
Mean annual precipitation: 36 to 53 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

Hinckley and similar soils: 85 percent
Minor components: 15 percent

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

Description of Hinckley

Setting

Landform: Outwash deltas, outwash terraces, kames, kame terraces, moraines, eskers, outwash plains
Landform position (two-dimensional): Summit, backslope, footslope, shoulder
Landform position (three-dimensional): Nose slope, side slope, base slope, crest, riser, tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very 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
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Windsor

Percent of map unit: 8 percent
Landform: Outwash deltas, outwash terraces, moraines, eskers, kames, outwash plains, kame terraces
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Nose slope, side slope, base slope, crest, riser, tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Sudbury

Percent of map unit: 5 percent
Landform: Outwash deltas, outwash terraces, moraines, outwash plains, kame terraces
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope, base slope, head slope, tread
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: No

Agawam

Percent of map unit: 2 percent
Landform: Outwash deltas, outwash terraces, moraines, eskers, kames, outwash plains, kame terraces
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Nose slope, side slope, base slope, crest, riser, tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

489C—Barnstable-Plymouth complex, rolling, very bouldery

Map Unit Setting

National map unit symbol: 98q0
Elevation: 0 to 1,000 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 160 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Barnstable and similar soils: 40 percent
Plymouth and similar soils: 30 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Barnstable

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable loamy ablation till over reworked sandy glaciofluvial deposits; loamy ablation till over reworked sandy outwash

Typical profile

H1 - 0 to 1 inches: sandy loam

H2 - 1 to 23 inches: sandy loam
H3 - 23 to 64 inches: coarse sand

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 2.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F149BY011MA - Well Drained Till Uplands
Hydric soil rating: No

Description of Plymouth

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loose sandy glaciofluvial deposits and/or loose sandy ablation till

Typical profile

H1 - 0 to 3 inches: loamy coarse sand
H2 - 3 to 29 inches: gravelly loamy coarse sand
H3 - 29 to 64 inches: gravelly coarse sand

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F149BY005MA - Dry Outwash
Hydric soil rating: No

Minor Components

Carver

Percent of map unit: 15 percent
Hydric soil rating: No

Nantucket

Percent of map unit: 15 percent
Hydric soil rating: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Attachment 7

Conceptual Layout Plan

TOTAL PARCEL AREA =267,940 SF (6.15 AC)
OPEN SPACE/NATURAL AREA = 51,716 SF (1.19 AC)
PERCENT OPEN SPACE = 19.3%

LOCUS MAP
NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: (508) 888-6034
FAX: (508) 888-1506
WWW.GSEENV.COM

DIMENSIONS ARE AS INDICATED.

USE OF THIS PLAN CONSTITUTES ACCEPTANCE OF TERMS AND CONDITIONS SET FORTH IN ACCOMPANYING PROJECT DOCUMENTATION.

IT IS THE RESPONSIBILITY OF THE USER TO CONFIRM DISCREPANCIES WITH THE ENGINEER PRIOR TO USE.

REVISIONS

NO.	DATE	COMMENT

NOT FOR CONSTRUCTION
FOR PERMITTING
PURPOSES ONLY

PURPOSE:
SPECIAL PERMIT WITH
SITE PLAN REVIEW

LOCUS:
487 BRICK KILN ROAD
WEST FALMOUTH, MA

PREPARED FOR:
YMCA OF
CAPE COD

DRAWING TITLE:
OPEN SPACE PLAN

CAD TECH:	CHECKED BY:
SDC	JDO
ENGINEER: SDC	DATE: 4/25/24
	SCALE: 1"=50'
	SHEET: OS-1

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

S:\CLIENTS\YMCA - CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAD\XREF\LINEWORK-OPEN SPACE.DWG 4/24/2024 9:25 AM

EXHIBIT 17

OPEN SPACE NARRATIVE

Kimberly A. Bielan
Direct Dial: (781) 817-4607
kbielan@mbmllc.com
Admitted in MA & RI

Proposed YMCA, Falmouth, MA
485 Brick Kiln Road, Falmouth, Massachusetts 02540

OPEN SPACE NARRATIVE

The project is proposed to be located on the land formerly known and numbered as 485 Brick Kiln Road, Falmouth, which is comprised of approximately 9.84 acres. The property identified as 485 Brick Kiln Road formerly comprised one parcel, but has been divided so as to create two distinct parcels: Lot 2B, consisting of approximately 6.16 acres, upon which the project will principally be sited ("Property"), and Lot 2A, consisting of approximately 3.69 acres, upon which the Christ Lutheran Church of Falmouth is located and ancillary components of the project (to wit, shared parking and a secondary access drive) will be located ("Church Property").

It is the Applicant's position that the Property and the Church Property are properly classified as being located with the Rural Development Area Placetype. Pursuant to the Commission's Open Space Technical Bulletin, projects located in the Rural Development Area Placetype are typically required to provide open space mitigation at a ratio of 2 parts Open Space to 1 part development (2:1). Where the total area of disturbance, including the land located on the Church Property, consists of 5.7 acres, the total open space mitigation required is approximately 11.4 acres.

For the reasons set forth at length herein, the Applicant respectfully requests a waiver from the strict requirements of the Open Space Technical Bulletin. The Applicant is a non-profit organization, which is wholly dependent upon donations to develop the proposed Upper Cape YMCA facility. More specifically, the Upper Cape YMCA facility is being funded – one hundred percent (100%) – by community donations. Given the significant land costs in the area immediately adjacent to the Property, and in Falmouth generally, the requirement to acquire additional land at this time threatens the Applicant's ability to pursue the project in its entirety. Where the Applicant's project will provide substantial community benefit, and the project satisfies the objectives of the Commission's Technical Bulletins at large, a waiver from the open space mitigation requirements is appropriate. While the Applicant is continuing to work with the town of Falmouth to identify land to be preserved in perpetuity, for conservation and/or community benefit, a requirement that the Applicant do so as a precondition to its ability to move forward at this stage is onerous and justifies a waiver in this instance.

Present Site Conditions

The Property has not previously been disturbed, and there is a variety of tree species located on site (e.g., pin oak, northern white oak, red maple, pitch pine, and eastern white pine). The Property appears particularly appropriate for development, as: there has been no NHESP priority habitat or rare species identified; no BioMap Core Habitat identified; the Property is located at a significant distance from wetlands, vernal pools and other wetland resource areas; and the Property is not in, or adjacent to, flood zones.

The site located directly west of the Property, with an address of 511 Brick Kiln Road, is currently being developed by Village at Brick Kiln, LLC pursuant to a Comprehensive Permit issued under G.L. c. 40B. Once that development is completed, there will be twenty-eight (28) single-family residential units, seven (7) of which are “affordable.” The Comprehensive Permit references the proposed development of the Property and the proximity to the Upper Cape YMCA facility as a benefit to the new homes. In addition, the Property is located adjacent to open space belonging to Falmouth High School.

Proposed Site Conditions

As has been discussed in great detail in the materials submitted in support of this Application, the Applicant proposes to construct a mixed-use, community-centered building, to include the Upper Cape YMCA and Community Health Center. The project consists of a single, multi-story building, which will be set back considerably from Brick Kiln Road. The Applicant proposes myriad site improvements, including significant landscaping. The Applicant proposes the maintenance of a wildlife corridor along the Property’s westernmost property boundary and 1.23 acres of on-site open space, as shown on the Open Space Plan appended hereto as **Attachment A**, a significant portion of which is adjacent to Falmouth High School property.

Efforts Undertaken to Date

The Applicant has been engaged in a years-long effort to identify properties that may be appropriate to either purchase or make subject to a conservation and/or recreation restriction so as to satisfy the open space mitigation requirements associated with the project. Specifically, the Applicant has worked with the 300 Committee, a private, non-profit land trust located in Falmouth, and its Land Acquisition Committee to identify prospective properties. The 300 Committee identified, *inter alia*, the properties located at 473 and 475 Brick Kiln Road, which are located adjacent to the Property but already developed, and certain land of Peterson Development Corp., which is not currently interested in selling, as potential sites. In addition, the Applicant has been engaged in fulsome discussions with the town of Falmouth, including but not limited to the Falmouth School Committee, to identify land that could be made subject to conservation and/or recreation restriction. The Applicant continues to explore discussions with Falmouth to try to develop a plan that would enable open space to be dedicated to the project (in recognition of the significant public community benefit that will inure as a result of the development of the Upper Cape YMCA), without the Applicant having to incur the significant expense associated with purchasing properties at market rate.

Proposed Mitigation & Waiver Request

As noted above, pursuant to the Open Space Technical Bulletin, due to the Property's location in the Rural Development Area Placetype, strict compliance with the Commission's RPP requires 2:1 mitigation, or approximately 11.4 acres. With the proposed on-site open space of 1.23 acres, the Applicant, a non-profit organization, would be required to provide more than 10 acres of open space mitigation.[1] The Applicant respectfully requests a waiver from the requirements of the RPP.

As set forth in the Cape Cod Regional Policy Plan, eff. Feb. 22, 2019, the Commission is empowered to "waive full and literal compliance or consistency with any specific RPP goal or objective applicable to a project … ." In assessing whether a waiver should be granted, the Commission may take into consideration any hardship demonstrated by the applicant, which would render literal compliance impracticable, including whether enforcement "would result in substantial hardship, financial or otherwise, to the project applicant … ."

In support of the Applicant's request for a waiver from the strict requirements of the Open Space Technical Bulletin, the Applicant states as follows:

- **The requested waiver will not result in substantial detriment to, or derogation from, the purposes and values intended to be protected or promoted by such goal or objective.**

  As the Commission is well-aware, the objectives of the Open Space Technical Bulletin include the following:

  > Objective OS1 – Protect and preserve natural, cultural, and recreational resources;
  >
  > Objective OS2 – Maintain or increase the connectivity of open space; and
  >
  > Objective OS3 – Protect or provide open space appropriate to context.

  Although the Applicant proposes a waiver of the open space mitigation requirement, its project will nonetheless promote the purposes and values intended to be protected by the Open Space Technical Bulletin, as follows:

  - The Upper Cape YMCA proposes to create substantial recreational resources for the Upper Cape community, both by and through its new facility and its proximity to neighboring properties. The YMCA is founded on promoting community well-being. The Upper Cape YMCA will provide, among other things, initiatives that promote health, well-being and fitness to service adults; provide sports and recreation for

[1] The Applicant notes an apparent discrepancy in the Open Space Technical Bulletin relative to whether open space must be provided on-site for properties located in a Rural Development Area Placetype. On OS-8, the Technical Bulletin states that a project proponent shall "provide high-quality open space onsite, or in a Natural Area offsite." (Open Space Technical Bulletin, OS-8). On OS-18, the Technical Bulletin states that, "[i]n Natural Areas and Rural Development Areas, onsite open space is required ... ." (*Id.*, OS-18).

children; and promote water safety and swimming. The Applicant's health-based initiatives are fulfilled by providing on-site recreational facilities, including an indoor gym and swimming pool, and outdoor space, including a field and area for group fitness classes.

- The Property was expressly chosen due, in large part, to its proximity to the neighboring Falmouth High School and associated town facilities. The Applicant intends to install a pedestrian path, which will facilitate the Property's connectivity with the neighboring town property and encourage recreational opportunities between the two sites. The proximity of the Upper Cape YMCA to municipal property, including the newly installed football field, will undoubtedly preserve community systems and encourage dynamic engagement of the Upper Cape's residents between the sites.

- The project has been designed to minimize the development footprint, by concentrating the requisite parking and building toward the front of the Property. In addition, the Applicant proposes to utilize parking on the adjacent Church Property in order to minimize the disturbance on the Property and maintain 1.23 acres of on-site open space. The on-site open space is adjacent to undeveloped land located to the northeast of the Property.

- The project has been designed so as to create a wildlife corridor that will allow animals to travel in a north-south direction, to and from Brick Kiln Road to the undeveloped land located to the northeast of the Property.

- In addition to the numerous manners in which the project will promote the goals of the Open Space Technical Bulletin, it is equally important to note that the project will not detract from the objectives thereof. The Property is not suitable for future water supply, has not been used for agricultural purposes, and is not a scenic vista.

- The Applicant proposes that the 1.23 acres of on-site open space be subject to a permanent conservation restriction, to ensure that the land is preserved in perpetuity to serve the objectives of the Open Space Technical Bulletin.

▪ **The intent of the goal or objective will be met through some alternate approach, including appropriate mitigation.**

For the reasons set forth above, the project, as proposed by the Applicant, will satisfy the goals and objectives of the Open Space Technical Bulletin, as it will ensure that the Property is used for recreational purposes (indeed, that is one of the principal objectives for the Upper Cape YMCA) and connected to municipal property that is also used for community recreation.

- **The waiver is necessary to fulfill, protect or promote the creation of community space, which promotes other compelling regional purposes, goals, or objectives identified in the Act or RPP, which could not be achieved without such waiver.**

  As provided in greater detail below, the waiver of strict compliance with the Technical Bulletin is necessary due to the hardship facing the Applicant, which is a non-profit organization. The Applicant will confer distinct benefits to the community and to the citizens of Barnstable County, by advancing recreational, cultural and educational values. The development of the Upper Cape YMCA facility will provide myriad benefits to the community, including family-based programming, wellness center, and the inclusion of a medical facility. As a non-profit organization, the Applicant is dependent upon donations to develop the proposed Upper Cape YMCA facility (as noted above, the project is being funded in its totality through donations) and to ensure that it is in a position to provide programming to the citizens of Falmouth and Barnstable County, generally. The dedication of a disproportionate amount of these funds to purchase off-site land would necessarily impact the development of the project and feasibility of same on the go-forward, as it would impact operating expenses into the future.

  While the Applicant acknowledges that the Commission's regulations have since been revised, it does observe that the Commission waived the open space requirements completely when the Applicant received relief from the Commission for an addition to its property in Barnstable. In connection with that decision, the Commission concluded that, "[d]ue to a demonstrated financial hardship, the YMCA is not required to provide open space mitigation." A copy of the 2006 decision is appended hereto as **Attachment B**.

Relative to the hardship that would inure to the Applicant in the absence of a waiver, the Applicant further provides as follows:

- **Without the requested relief, full and literal enforcement would result in substantial financial hardship to the Applicant.**

  As set forth above, the Applicant is a non-profit organization, which is dependent upon donations to develop the proposed Upper Cape YMCA facility.

  The initial capital campaign for the Upper Cape YMCA facility aimed to raise $20 million, which was increased to $35 million in 2022 as a result of increased construction and associated costs. This figure does not take into account the impact of inflation since 2022. One of the prospective general contractors provided a cost estimate, in March 2023, which estimated an increase in construction costs of approximately eight percent (8%) at that time. Such construction costs have only increased in the year since the Applicant obtained this cost estimate.

  Any further increase of project expense, including if the Applicant were required to purchase land that is currently selling at a premium (the Applicant has obtained an opinion that the estimated value of land suitable for open space is currently $80,000/acre to $125,000/acre), would likely have an impact on the viability of the project. If the Applicant were required to provide 10 acres of open space mitigation, the estimated cost would be $800,000 to $1,250,000.00.

Allowing the Applicant to eliminate its required open space mitigation will enable it to not have to raise additional, significant funds through fundraising efforts, and any such monies can be devoted to ensuring other components of the project come to fruition, including the numerous programs that will benefit the community and ensure the project is successful in its mission.

- **The hardship is specific to this Applicant and this project.**
  The hardship is specific to this Applicant, as it is a non-profit organization with significant community ties, and to the proposed Property, which is located in the Rural Development Area Placetype. Despite being located in a Rural Development Area, the Property was chosen due to its connectivity with Falmouth High School, which is located adjacent to the Property and will afford pedestrian access for local high school students. The Applicant undertook significant due diligence to identify a property on which to develop the Upper Cape YMCA and identified the Property given its unique characteristics and proximity to municipal facilities. It is unlikely that another applicant or project would be tied to a specific property, with the objective of promoting a general community benefit, in the same manner that the Applicant is tied to this Property.

- **The requested waiver is the minimum relief necessary to address the hardship.** The Applicant recognizes the importance of maintaining open space, but respectfully submits that a waiver of the open space mitigation is the minimum relief necessary in order to address the financial hardship that would be imposed upon the Applicant if it were required to purchase land in the town of Falmouth. Notwithstanding the foregoing, the Applicant notes that it is maintaining 1.23 acres of open space on site, which will be made subject to a conservation restriction, and is continuing to work with community members in an effort to identify land that could be purchased or made subject to conservation and/or recreational restrictions. In particular, the Applicant continues to be engaged in conversation with the 300 Committee, "whose mission is to permanently preserve and protect open space in Falmouth through acquisition, education, and stewardship," to identify private properties in the immediate location of the Property that may be appropriate for donation. In addition, the Applicant has had public meetings with the Falmouth School Committee and is otherwise working with the town of Falmouth to identify neighboring properties that may be appropriately restricted to promote the objectives of the Open Space Technical Bulletin. Relative to same, any proposal would necessarily be joint (requiring the town of Falmouth be a party thereto) and require approval at Town Meeting.

Falmouth Zoning Code

The Applicant thought it important to note, for the Commission's benefit, that the Property is located within the Town of Falmouth's Wildlife Corridor Overlay District. To that end, the plans associated with the project will be referred to Falmouth's Natural Resources Department for review. The Falmouth Zoning Bylaw imposes certain requirements upon properties sited within the Overlay District, including the designation, and permanent restriction, of land for habitat protection. The Applicant is required to provide a wildlife corridor on the Property, consistent with the Falmouth Zoning Bylaw, and to otherwise comply with the applicable provisions of the section. A copy of Falmouth Zoning Bylaw § 240-7.8 is appended hereto as **Attachment C**.

CONCLUSION

In light of the foregoing, the Applicant respectfully requests a waiver of the open space mitigation requirements contained in the Open Space Technical Bulletin. For the reasons set forth herein, the Upper Cape YMCA will promote the objectives of the Technical Bulletin by creating new recreational opportunities for the residents of the Town of Falmouth and Barnstable County, at large. The Applicant welcomes the opportunity to discuss this request in more detail with the Commission.

Thank you for your attention to this matter.

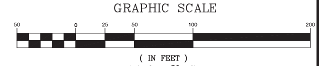
Sincerely,

MORIARTY BIELAN & MALLOY LLC

Kimberly A. Bielan

ATTACHMENT A

TOTAL PARCEL AREA =267,940 SF (6.15 AC)
OPEN SPACE/NATURAL AREA = 53,600 SF (1.23 AC)
PERCENT OPEN SPACE = 20%



LOCUS MAP
NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: (508) 888-6034
FAX: (508) 888-1506
WWW.GSEENV.COM

DIMENSIONS ARE AS INDICATED.

USE OF THIS PLAN CONSTITUTES ACCEPTANCE OF TERMS AND CONDITIONS SET FORTH IN ACCOMPANYING PROJECT DOCUMENTATION.

IT IS THE RESPONSIBILITY OF THE USER TO CONFIRM DISCREPANCIES WITH THE ENGINEER PRIOR TO USE.

REVISIONS

NO.	DATE	COMMENT

NOT FOR CONSTRUCTION
FOR PERMITTING
PURPOSES ONLY

PURPOSE:
SPECIAL PERMIT WITH SITE PLAN REVIEW

LOCUS:
487 BRICK KILN ROAD
WEST FALMOUTH, MA

PREPARED FOR:
YMCA OF CAPE COD

DRAWING TITLE:
OPEN SPACE PLAN

CAD TECH:	CHECKED BY:
SDC	JDO
ENGINEER: SDC	DATE: 4/25/24
	SCALE: 1"=50'
	SHEET: OS-1

S:\CLIENTS\YMCA - CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAD\WIP\LINEWORK-OPEN SPACE.DWG 4/24/2024 10:02 AM

ATTACHMENT B

CAPE COD COMMISSION

3225 MAIN STREET
P.O. BOX 226
BARNSTABLE, MA 02630
(508) 362-3828
FAX (508) 362-3136
E-mail: frontdesk@capecodcommission.org

DATE:	April 20, 2006
TO:	Young Men's Christian Association of Cape Cod PO Box 188 West Barnstable, MA 02669
FROM:	Cape Cod Commission
RE:	Hardship Exemption/Project of Community Benefit Cape Cod Commission Act, Section 23
Applicant:	Young Men's Christian Association of Cape Cod
PROJECT#	HDEX/06001
PROJECT:	Young Men's Christian Association of Cape Cod
BOOK/PAGE	Book 4284/Page 41 Book 8271/Page 279 Book 6242/Page 323

DECISION OF THE CAPE COD COMMISSION

SUMMARY

The Cape Cod Commission (Commission) hereby approves with conditions the Hardship Exemption application of the Young Men's Christian Association of Cape Cod (YMCA) and the Town of Barnstable pursuant to Section 23 of the Cape Cod Commission Act (Act), c.716 of the Acts of 1989, as amended. The decision is rendered pursuant to a vote of the Commission on April 20, 2006.

PROJECT DESCRIPTION

The YMCA is proposing to construct an 18,563 square foot addition onto the existing 23,131 square-foot structure for a total of 41,694 square feet to address programmatic deficiencies in services offered to its members. The proposed expansion includes child-watch and childcare program space, a health/wellness center, adult locker/shower areas, and a new entrance, reception area and parking facilities. These improvements will bring the facility into compliance with the

Americans with Disabilities Act. The YMCA is also providing new stormwater and wastewater facilities, as well as an enlarged parking facility.

PROCEDURAL HISTORY

The applicants submitted an application for review as a Project of Community Benefit through a DRI Hardship Exemption application dated January 19, 2006 that was deemed complete on February 2, 2006. A duly noticed public hearing was conducted by the Commission pursuant to Section 5 of the Act by an authorized subcommittee of the Commission on February 27, 2006. At the February 27, 2006 public hearing the subcommittee recommended to the full Commission that the project be granted a Hardship Exemption as a Project of Community Benefit and to approve a decision subject to conditions. At the April 6, 2006 public meeting the subcommittee met to review the draft decision. At the final public hearing before the full Commission on April 20, 2006 the Commission voted ____ to approve the Hardship Exemption, subject to conditions.

MATERIALS SUBMITTED FOR THE RECORD

From the applicant:

- Letter from Barnstable YMCA regarding employment and hazardous materials information dated January 8, 2006
- Hardship Exemption application dated January 19, 2006
- Memorandum from Nutter, McClennen and Fish regarding POCB/Hardship Exemption application dated January 20, 2006
- Memorandum from Nutter, McClennen and Fish regarding fee waiver request dated January 30, 2006
- Email from Coastal Engineering to Commission staff regarding "area of impact" dated February 3, 2006
- Memorandum from Nutter, McClennen and Fish regarding MHC filing and Hardship Exemption application dated February 10, 2006
- Memorandum from Nutter, McClennen and Fish regarding landscaping, MHC and hazardous materials dated February 16, 2006
- Memorandum from Nutter, McClennen and Fish regarding traffic information dated February 17, 2006
- Memorandum from Nutter, McClennen and Fish regarding elevations dated February 24, 2006
- Memorandum from Nutter, McClennen and Fish regarding lighting cuts dated February 27, 2006
- Supporting documents from Nutter, McClennen and Fish submitted to subcommittee dated February 27, 2006
- Memorandum from Nutter, McClennen and Fish regarding Massachusetts Historical Commission dated March 22, 2006
- Letter from Ms. Joanie Sutherland, YMCA Chief Executive Office outlining financial hardship of redevelopment dated March 27, 2006
- Memorandum from Nutter, McClennen and Fish regarding TDM program dated March 29, 2006
- Nitrogen loading calculations from Coastal Engineering dated March 30, 2006

- Memorandum from Nutter, McClennen and Fish regarding nitrogen loading calculations and traffic information dated March 30, 2006
- Memorandum from Rizzo Associates regarding sight line distance evaluation dated March 30, 2006

From Cape Cod Commission staff:
- Memorandum from Andrea Adams to Greg Smith regarding hazardous materials dated January 26, 2006
- Letter of completeness of application from Commission staff to Nutter, McClennen and Fish dated February 2, 2006
- E-mail from Paul Ruchinkas to Greg Smith regarding affordable housing dated February 21, 2006
- Staff report dated February 27, 2006

From state and local officials:
- Letter of support from Town of Barnstable Growth Management Department dated February 26, 2006
- Letter from Massachusetts Historical Commission regarding completion of staff review dated March 14, 2006

From the public:
- Letter from Mark Whirtenen dated February 27, 2006

The application and notices of public hearings relative thereto, the Commission staff notes, exhibits and correspondence, the transcript and minutes of meetings and hearings and all written submissions received in the course of our proceedings are incorporated into the record by reference.

JURISDICTION

The YMCA project qualifies as a Development of Regional Impact (DRI) under Section 3(e) (ii) of the DRI Enabling Regulations Governing Review of Developments of Regional Impact as "any private health, recreational or educational development that exceeds the criteria: addition to an existing building that result in an increase greater than 10,000 square feet of gross floor area."

FINDINGS

The Commission has considered the application of the YMCA and the Town of Barnstable for a DRI hardship exemption and based on consideration of such application and upon the information presented at the public hearing and submitted for the record, makes the following findings pursuant to the 2002 Regional Policy Plan and Section 23 of the Act:

General

G1 The proposed project consists of the redevelopment of the existing YMCA structure by building an 18,563 square foot addition to the existing building to address programmatic deficiencies in that building as well as bring the structure into compliance with the Americans with Disabilities Act.

G2 As the first substantive public hearing was conducted on February 27, 2006, the project is being reviewed under the 2002 Regional Policy Plan.

G3 The proposed project is located within a Certified Growth Area according to the Barnstable Local Comprehensive Plan.

G4 The project does not lie within a District of Critical Planning Concern (DCPC).

G5 According to a letter submitted by the Barnstable Growth Management Department on February 26, 2006, the project is consistent with the Town of Barnstable's Local Comprehensive Plan

G6 The redevelopment project is consistent with all applicable municipal by-laws.

G7 The redevelopment project will be constructed in accordance with the following plans:

1. Site Development Plans SD1-SD8 prepared by Coastal Engineering dated March 30, 2006
2. Planting plan prepared by Hammer Design dated February 16, 2006
3. Building elevations and floor plans prepared by Shuskey Architects dated July 15, 2005
4. Lighting specifications identified as Kim Lighting and referenced in a memorandum from Nutter, McClennen and Fish dated February 27, 2006

G8 The Commission finds that the project is a Project of Community Benefit as defined by Section 1 (c) of the Enabling Regulations. The YMCA confers distinct benefits to the community and to the citizens of Barnstable County by advancing recreational, cultural and educational values. Benefits to the community and Barnstable County include without limitation: Summer Day Camp program, High Flight program, Team Works program, Teen Nights and Dances, Outdoor School program, and the Earth Services Corps program.

G9 The applicants have shown that fully complying with the requirements of the RPP would create a financial hardship. The Commission further finds that a literal enforcement of the provisions of the Act would involve a financial hardship to the applicants. Partial relief from the Minimum Performance Standards in the area of Open Space may be granted without substantial detriment to the public good and without nullifying or substantially derogating from the intent or purposes of the Act.

G10 According to a letter submitted by Ms. Joanie Sutherland, Chief Executive Officer of the YMCA, the YMCA is a private, non-profit organization that is heavily reliant on fundraising. According to the information submitted and the testimony provided, the entire cost of the expansion is being fundraised by philanthropic donations. Full compliance with all applicable minimum performance standards would require scaling back on programs and services that would result in diminished community benefit.

G11 At the February 27, 2006 public hearing, the subcommittee found that the proposed redevelopment project improvements were both needed and would be of benefit to the community, and full compliance with the Minimum Performance Standards would constitute a hardship by diminishing the community benefits to be conferred.

Transportation

T1 The YMCA proposes to renovate and expand the existing YMCA facility located on Route 132 in Barnstable, which is a Regional Roadway as defined in the 2002 RPP.

T2 MPS 4.1.1.7 requires all DRIs access/egress locations with public ways to meet Massachusetts Highway Departments (MHD) and American Association of State Highway Transportation Officials (AASHTO) standards for safe stopping sight distance. Based on the field observations the stopping sight distances are adequate based on AASHTO and MHD standards.

T3 MPS 4.1.3.2 requires all new driveways on regional roads to operate at Level of Service C or better as defined in the Highway Capacity Manual. The proposed facility will utilize existing driveways; therefore this MPS does not apply.

T4 Regardless of project size, DRIs are required to reduce site-generated traffic by 25 percent (MPS 4.1.2.1) based on the net increase in traffic generated by the development. Appropriate strategies to reduce automobile travel may include car/van pooling programs, public transportation, enhancing bicycle and pedestrian access to the site, donation of vacant developable land and/or a monetary commitment to alternatives to automobile transportation. The YMCA has agreed to the employee trip reduction plan as outlined in condition T1.

Water Resources

WR1 The project is located outside of any current Public Water Supply Protection areas. A private well located on the abutting Conservatory Property is no longer in service and public water is utilized for both properties.

WR2 The project is located within the Marine Water Recharge Area to Barnstable Harbor. Preliminary assessments completed by the Massachusetts Estuaries technical team indicate that the system is currently not impaired.

WR3 The proposed addition to the YMCA has the potential to impact regional water resources due to activities associated with wastewater and stormwater flows.

WR4 There will be a significant increase in the design flow for wastewater based on an increase in the locker room area. The design flow overestimates the water use by approximately 40 percent. This is substantiated by a comparison of the existing Title V design flows and existing water use records. Wastewater will be disposed of in a traditional Title V design septic system without the addition of a denitrifying system. The YMCA agrees to connect to town sewer as soon as the extension main becomes available in this area.

WR5 Nitrogen loading calculations performed by Coastal Engineering dated March 30, 2006 for the project show a slight increase in nitrogen loading. However it remains below 10 parts per million which is consistent with the findings for a project in a designated Growth/Activity Center according to MPS 3.2.1 provided that there are no adverse impacts to water resources. Based on the location outside of a public water supply area or impaired marine water recharge area there are no anticipated adverse impacts.

WR6 Stormwater will be disposed of onsite. Clean roof runoff will directly infiltrate via an abandoned leaching area, with an overflow provided to a depressed wooded area. Stormwater from paved surfaces will flow through a series of connected catch basins to a vegetated retention area equipped with a subsurface overflow area. The design calls for a shallow retention area with plantings.

Community Character/Heritage Preservation

CC1 The Massachusetts Historical Commission (MHC) reviewed the proposed redevelopment project and, in a letter dated March 14, 2006 determined that the proposed project "appears to meet the Secretary of the Interior's Standards." Therefore, the project is consistent with the minimum performance standards requiring archaeological resources be maintained and enhanced (MPS 6.1.3).

CC2 The project is located in the Kings Highway Historic District and the project has received an approval from the Old King's Highway District Committee in a Certificate of Appropriateness dated August 24, 2005.

CC3 The proposed project includes the expansion of the current building in previously disturbed areas of the site. The project consists of one and two-story additions with the majority of the additional floor area concentrated to the west side of the existing building in a new two-story expansion. The addition will be screened from the street (Route 132) by the existing vegetation and existing building, which is consistent with MPS 6.2.4 that requires that the character of the street in historic districts be retained.

CC4 The building incorporates variety in both the building height and façade to be consistent with the mass and scale of the existing building and the character of the region. Traditional building materials are selected throughout, with wood shingles on the exterior of the upper levels and painted clapboards on the lower levels. The entry incorporates a gable-end roof that is consistent with the existing building and will be finished with architectural shingles. The remainder of the addition will use a flat roof that will be used for roof-top equipment. Therefore, the proposed design is consistent with the minimum performance standards that require elements of the area's character to be maintained (MPS 6.2.4) and variation in the height and façade of structures with a footprint greater than 10,000 square feet (MPS 6.2.5).

CC5 MPS 6.2.10 requires that development and redevelopment conform to the Cape Cod Commission's exterior lighting design standards and submission requirements, Technical Bulletin 95-001. A February 27, 2006 Memo and attachments from Nutter, McClennen & Fish provided manufacturer's information on some proposed exterior lights. The luminaires shown in the 2/27/06 manufacturer's technical cuts indicate these fixtures will be consistent with Technical Bulletin 95-001 standards 2.1 to 2.4. No foot-candle information was provided, and it is not clear from the information that was submitted if an on-building mounted, recessed or landscape fixtures will be used.

Natural Resources/Open Space

NR1 Area The project site is located mostly outside of mapped Significant Natural Resource (SNRA), though a small portion is located in SNRA. The majority of the proposed site development is located in previously disturbed areas on the project site, and development located in naturally vegetated areas is clustered adjacent to the existing development, consistent with MPS 2.5.1.1. The one exception is the new fire access road located on the eastern part of the site which functions as a wooded buffer between Route 132 and the YMCA buildings. The installation of this road in this location appears to require considerable grading, which may significantly impact the buffer from the road.

NR2 The applicants did not provide a natural resources inventory, as required by MPS 2.4.1.1. However, given the previously developed nature of the site the Commission finds the requirement of a natural resource inventory would create a financial hardship to the YMCA, especially given the fact that the site of the expansion is previously developed. Therefore, the Commission finds that: i) the applicants have met their burden of showing that a hardship exists; ii) literal enforcement of the minimum performance standards would be a hardship for the applicants; iii) relieving the requirement of MPS 2.4.1.1 to allow for the waiver of the natural resource inventory of the previously developed site is the minimum relief required to alleviate the hardship, and iv) the relief does not nullify or substantially derogate from the intent of the Act nor will it result in a detriment to the public good. Plans provided do not indicate the presence of wetlands within 100 feet of proposed development, consistent with MPS 2.3.1.2. With the exception of the fire road, development is clustered and minimizes impacts to existing naturally vegetated areas, consistent with MPSs 2.4.1.2 and 2.4.1.3. Adverse impacts to regionally significant wildlife and plant habitat are not anticipated from this project.

NR3 Due to a demonstrated financial hardship, the YMCA is not required to provide open space mitigation.

Hazardous Materials

HW1 Maps produced for the 2002 RPP indicate the project site is not within an existing Wellhead Protection Area or a Potential Public Water Supply Area.

HW2 MPS 4.3.1.1. requires *"reasonable efforts to minimize...hazardous waste generation through source reduction, reuse, material substitution, employee education and recycling."* This standard applies to a project's construction and post-construction phases. The YMCA was advised to conduct a facility audit and to design a source reduction program to reduce the YMCAs overall use of hazardous materials.

HW3 MPS 4.3.1.2 requires *"compliance with Massachusetts Hazardous Waste Regulations, 310 CMR 30.00."* This standard applies to a project's construction and post-construction phases. According to a February 16, 2006 letter from Nutter, McClennen & Fish, as well as Commission staff knowledge, the YMCA generates wastes that cannot be disposed of in general trash including pool chemicals, fluorescent bulbs, used computers. The applicant was advised to develop protocols to manage any regulated wastes.

CONCLUSION

Based on the findings above, the Cape Cod Commission hereby concludes:

1) that the probable benefits of the proposed redevelopment outweigh the probable detriments; and
2) the applicants demonstrated that the proposed project is a Project of Community Benefit as defined under section 1(c) of the DRI Enabling Regulations, as noted in Finding G8. The applicants have a financial hardship, as noted in Finding G9. Desirable relief may be granted to the applicants without substantial detriment to the public good and without nullifying or substantially derogating from the intent or purpose of the Act. The Commission grants the minimum relief necessary to address the hardship and the relief granted relates directly to the nature of the identified hardship.

The Cape Cod Commission hereby approves with conditions the Hardship Exemption application of the YMCA and the Town of Barnstable pursuant to Section 23 of the Cape Cod Commission Act, c. 716 of the Acts of 1989, as amended, for the YMCA redevelopment project located in Barnstable, MA., provided the following conditions are met:

CONDITIONS

General

G1 All work shall be constructed in a manner consistent with the following plans:

1. Site Development Plans SD1-SD8 prepared by Coastal Engineering dated March 30, 2006
2. Planting plan prepared by Hammer Design dated February 16, 2006
3. Building elevations and floor plans prepared by Shuskey Architects dated July 15, 2005
4. Lighting specifications identified as Kim Lighting and referenced in a memorandum from Nutter, McClennen and Fish dated February 27, 2006

Any deviation during construction from the approved plans, including but not limited to changes in the building design, building location, lighting, landscaping or other site work shall require approval by the Cape Cod Commission through a modification process, pursuant to Section 12 of the Commission's Enabling Regulations. The applicants shall submit to the Commission any additional information deemed necessary to evaluate any proposed modifications to the approval process.

G2 This Project of Community Benefit DRI Hardship Exemption decision is valid for 7 years and local development permits may be issued pursuant hereto for a period of 7 years from the date of the written decision.

G3 Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this decision.

G4 The applicants shall obtain all necessary state and local permits for the proposed project.

G5 No development work, as the term "development" is defined in the Act, shall be undertaken until all appeal periods have elapsed or, if such an appeal has been filed, until all judicial proceedings have been completed.

G6 The applicants shall forward to the Commission, forthwith, copies of any and all permits and approvals issued in relation to this project and issued subsequent to this decision. A copy of final plans approved by the Barnstable Site Plan Review Committee shall be submitted to the Commission upon receipt of local approvals.

G7 Prior to the issuance of a building permit for any phase of construction, the YMCA shall submit final plans as approved by local boards for review by Commission staff to determine their consistency with this decision and/or information submitted as part of the DRI review. If the final plans approved by local boards is inconsistent with this decision and/or supporting information, then they shall be reviewed subject to the Cape Cod Commission's Enabling Regulations, Modifications to Approved DRI's, as amended, which are in effect at the time of this review.

G8 Prior to issuance of a building permit for any phase of construction, the YMCA shall obtain a Preliminary Certificate of Compliance from the Commission that states that all conditions in this decision pertaining to issuance of a building permit for such phase have been met.

G9 Prior to receiving a temporary or final Certificate of Occupancy from the Town of Barnstable, the YMCA shall obtain a Final Certificate of Compliance from the Commission.

G10 The expansion/addition area shall not be open for business to the public until a Final Certificate of Compliance is received from the Cape Cod Commission.

G11 The applicant shall notify Commission staff of the intent to seek a Preliminary or Final Certificate of Compliance at least thirty (30) days to the anticipated date of receipt of such Certificate. Such notification shall include a list of key contact(s) and phone numbers for questions that may arise during the Commission's compliance review. Commission staff shall complete an inspection under this condition within seven (7) business days of such notification and inform the applicant in writing of any deficiencies and corrections needed. The YMCA understands that the Commission has no obligation to issue either a Preliminary or a Final Certificate of Compliance unless all conditions are complied with or secured consistent with this decision. The YMCA agrees to allow Cape Cod Commission staff to enter onto the property that is the subject of this decision for the purpose of determining whether the conditions contained in the decision are met.

G12 The YMCA shall be responsible for providing proof of recording of the decision prior to issuance of a Final Certificate of Compliance.

G13 The YMCA shall demonstrate that a copy of this decision has been provided to the general contractor prior to the start of construction.

Transportation

T1 The YMCA has agreed to and shall implement the following employee trip reduction plan:

- The YMCA will post and provide access to public transportation including: the B-Bus, the Breeze and the Plymouth/Brockton Bus Lines. In addition, the YMCA will coordinate for onsite scheduled transportation with the Barnstable Villager and RTA Breeze-Yellow line.
- The YMCA will market these measures to members and employees through bulletin boards, news letters, brochures and the YMCA Cape Cod website. In addition, links to related transportation schedules and the Cape Cod Commission transportation information center (www.gocapecod.org) will also be provided on the YMCA website.
- Access to the YMCA facility with sidewalks from Route 132 as shown on the site plan.
- Bicycle racks to accommodate both employees and members.
- Preferential parking areas for employees that carpool.
- Post information regarding carpooling and public transportation options on bulletin boards and in staff newsletters.
- Provide onsite services in a staff lunchroom, including a microwave, refrigerator and prepared food vending.
- Emergency travel program and taxi service access will be available, as appropriate.
- An onsite human resource specialist will serve as the transportation coordinator.
- The YMCA will distribute information regarding the TDM programs in the employee information packets that are available at quarterly staff orientation/staff development sessions. Updates will be provided as appropriate.
- The YMCA will provide flexible work schedules, as appropriate, for employees that car/van or bus pool when possible.

Water Resources

WR1 As reflected in the submitted plans, the stormwater design shall be modified to apply low impact development guidelines. Stormwater will be disposed of onsite and the design is consistent with MPS 2.1.3.2 and 2.1.3.3. Essential components of this design shall be to separate the stormwater to discharge to several smaller areas including tree boxes within the parking area, or other perimeter infiltration areas, provide drainage via vegetated swales along the roadside, and to modify the retention basin to blend into the landscape and serve as a functional landscape element, with substantive plantings and no perimeter fence. Plantings to be placed shall be of a type and height subject to staff approval.

Community Character/Heritage Preservation

CC1 All exterior lighting for the project shall conform to the requirements of MPS 6.2.10 and Technical Bulletin 95-001. Should conditions arise during project construction that require adjustments to site exterior lighting fixtures, including substitutions of fixture heads, the applicant shall obtain approval from Commission staff prior to their installation and/or use consistent with Section 12 of the Commission's *Enabling Regulations*. Modifications to the project's exterior lighting design made during construction that are in accordance with the Commission-approved lighting information shall be considered as Minor Modifications #1 and may be approved by Commission staff.

CC2 Prior to issuance of a Final Certificate of Compliance by the Commission, and prior to issuance of a Certificate of Use and Occupancy at the local level, Commission staff shall conduct a site visit to verify conformance of the exterior lighting design with MPS 6.2.10, Technical Bulletin 95-001 and EXLC1 of this decision. No Final Certificate shall be issued until Commission staff issues a written assessment of the exterior lighting design to the applicants indicating that it is consistent with MPS 6.2.10, Technical Bulletin 95-001 and EXLC1.

Hazardous Materials

HW1 Prior to issuance of a Preliminary Certificate of Compliance by the Commission, the YMCA shall submit for the file evidence that the building has been surveyed for the presence of asbestos-containing materials, PCB-containing devices, mercury-containing devices, lead-based paint.

HW2 Prior to issuance of a Final Certificate of Compliance by the Commission, and prior to issuance of a Certificate of Use and Occupancy at the local level, the YMCA shall submit for Commission staff review and approval a program to handle, store and dispose of any regulated wastes, including but not limited to used pool chemicals, used fluorescent bulbs, used electronic equipment, used computers, used televisions, and any other Universal or hazardous wastes generated on site. A Final Certificate of Compliance may not be issued until Commission staff issues a written approval of the management program.

The Cape Cod Commission hereby approves with conditions the Hardship Exemption/Project of Community Benefit application of the YMCA and the Town of Barnstable pursuant to Section 23 of the Cape Cod Commission Act, c. 716 of the Acts of 1989, as amended, for the YMCA project located in Barnstable, MA

Alan Platt, Chair
Cape Cod Commission

4/20/06
Date

COMMONWEALTH OF MASSACHUSETTS

Barnstable, ss 4/20, 2006

Before me, the undersigned notary public, personally appeared Alan Platt, in his/her capacity as Chairman of the Cape Cod Commission, whose name is signed on the preceding document, and such person acknowledged to me that he/she signed such document voluntarily for its stated purpose. The identity of such person was proved to me through satisfactory evidence of identification, which was [ ] photographic identification with signature issued by a federal or state governmental agency, [ ] oath or affirmation of a credible witness, or [✓] personal knowledge of the undersigned.

Gail P. Harley
Notary Public

My Commission Expires: 10/13/11

ATTACHMENT C

TOWN OF FALMOUTH
MASSACHUSETTS

ZONING BYLAW

TOWN CODE CHAPTER 240
ARTICLES 1 – 14

NOVEMBER 2022

240 – 7.8 Wildlife Corridor Overlay District

240 – 7.8A Purpose & Applicability

(1) PURPOSE – The purpose of this District is to establish and protect permanent and contiguous corridors and special areas for the feeding, breeding, and normal home range movement of wildlife through the defined habitat areas. This purpose is based on the following:

a. One of the purposes of zoning is the conservation of natural resources.
b. Wildlife is a valued natural resource in Falmouth.
c. The Commonwealth of Massachusetts has established the importance of protecting wildlife through numerous laws.
d. Falmouth has a significant stock of wildlife which moves through a large, defined area of Town.
e. Development under zoning can be designed to coexist with wildlife and important habitat areas.

(2) APPLICABILITY – All uses of land that are governed by a definitive subdivision plan, a special permit, or a site plan review application shall be subject to the requirements of § 240-7.8.

240 – 7.8B Procedure

(1) NATURAL RESOURCES DEPARTMENT REVIEW – Upon submittal to the reviewing board of plans for development, all plans subject to § 240-7.8 shall be referred to the Natural Resources Department. Within 35 days of this referral, the Natural Resources Department shall file a recommendation with the reviewing Board. This time may be extended at the request of the applicant. These recommendations shall be considered prior to the final decision of the reviewing Board, and all restrictions to the property added by the reviewing Board as a result shall be shown on a separate document to which reference is made on the final approved plan.

(2) WILDLIFE HABITAT PROTECTION – All areas on the plan set aside for protection of wildlife habitat shall be permanently conveyed in accordance with § 240- 9.7H. Ownership of open spaces shall be subject to a permanent conservation easement or restriction.

(3) COVENANT – No covenants, easements, or restrictions imposed by this section shall:

a. permit public access on private property;
b. use of the covenant to control density of development; or
c. cause any loss of lot coverage. (lot coverage shall be based on the total area of the property)

(4) STANDARDS – For those sites within Area 1, Deer Migration Areas, the following standards shall apply:

a. Subdivisions which total more than 5 acres in the AGA, AGB, SR-A, PU, and SR-B zoning districts and more than 20 acres in the AGAA and SR-AA zoning districts shall submit to the Planning Board a preliminary cluster subdivision plan. The Planning Board shall encourage the submittal of a cluster-type definitive subdivision in accordance with § 240–9.7 if it facilitates the purpose of § 240-7.8.
b. The applicant shall prepare a corridor plan. The proposed corridor shall be contiguous with any existing or potential corridors on abutting parcels. The plan shall meet the following requirements:

i. The applicant's proposed corridor shall be subject to the approval of the reviewing Board under the 2 criteria listed below. If more than one corridor is proposed the reviewing Board may allow the applicant to choose either or both proposed corridors.

- actual use for: migration, browsing, or bedding by white tailed deer; shelter or bedding by fox, coyote, or other large or medium size mammals which typically do not thrive in proximity to human habitation; nesting by quail, grouse, pheasants, or other ground nesting birds, which typically do not thrive in proximity to human habitation; egg deposition and/or migration of reptiles and amphibians.
- the presence of any rare, threatened, or endangered species as listed by the U.S. or Massachusetts Division of Fish and Wildlife.

ii. On any parcel on which there is inconclusive evidence of wildlife use, a corridor shall be established no wider than necessary to permit migration of white-tailed deer in order to maintain contiguity of such corridors within the overlay district. No corridor under this section shall exceed 300 feet in width. Within this constraint, no corridor shall be greater in area than is equivalent to the actual area of observed wildlife use of the parcel divided by the total area of the parcel.

iii. Any covenant or restriction under this section shall be coordinated with any restriction of record by the State Wetlands Act, Town Wetlands bylaw, State Natural Heritage Program or similar laws.

c. Fencing or any structural barrier to wildlife movement within corridors shall be prohibited.

d. The applicant shall ensure drainage from roadways be diverted away from depressed areas that may be used as shelter for wildlife.

e. Natural, native vegetation shall be encouraged or enhanced by the project. Disturbed areas shall be revegetated as rapidly as possible or within a time required by the reviewing Board.

f. Dramatic changes in topography shall be discouraged and the footprint of disturbed areas shall be limited.

g. Natural native vegetation shall be reestablished and maintained or enhanced by the project. Areas disturbed during construction shall be revegetated as rapidly as possible after construction is completed or within such further time as permitted by the reviewing Board.

(5) ANNUAL REVIEW – Annual reports from the Natural Resources Department shall be filed with the reviewing board and the owner(s) the subject property. The reports shall reevaluate the corridors and open space and make recommendations for any changes in vegetative plantings.

(6) SUBDIVISIONS – REDUCTION IN LOT SIZE – Subdivisions of land as specified in § 240 – 7.8B(4) may vary lot size by the approval of a special permit from the Planning Board from that required by the applicable zoning district. The lot variance shall be no more than 25% less than that required by § 240-11.2B, Minimum Lot Dimensions, so long as the total number of lots is not greater than the zoning district would allow under a conventional grid subdivision. The Planning Board shall make a finding that this special permit is necessary to effect the purpose of this District.

EXHIBIT 18

ENERGY CONSERVATION MEASURES

DESIGN

Falmouth YMCA Energy Efficiency Design Narrative

The Falmouth YMCA is a proposed new construction in Falmouth, MA. The building and site will have energy efficiency features as described below.

Falmouth YMCA Energy Efficiency Site Features

The parking area and sidewalks at the YMCA building will be shared with the abutting First Lutheran Church and have:

- 18 electric vehicle charging stations.
- Dark Sky type lighting (light pole fixtures that are fully shielded with no light emitting above the horizontal plane).
- Low energy use LED lighting fixtures (light poles, bollard lights, entrance portico light fixtures and wall packs), and
- A standby, energy efficient, propane gas-fired emergency generator to run critical facility systems when grid power is unavailable (e.g., emergency lighting, fire alarm and fire suppression systems, elevator, HVAC, waste water treatment system equipment).

Falmouth YMCA Energy Efficiency Building Features

The Building Envelope will have the following features:

- Provide a comprehensive, continuous air barrier with air-sealing of the envelope. This includes sealing at exterior sheathing seams, cracks, and gaps; around windows and doors; and around miscellaneous envelope penetrations (pipes, vents, ducts, lighting, etc.).
- Install a continuous layer of rigid foam insulation to exterior walls to eliminate thermal bridging and as part of a Thermoplastic (TPO) membrane roofing system on flat roof sections of the building.
- Install insulation with minimal gaps and to be aligned with air barriers.
- Exceed code minimum insulation values where possible.
- Install energy efficient storefront windows.
- Install moisture resistant weather wrap that is integrated with flashing at the exterior of envelope for a water drainage plane.
- Solar panels are to be placed on the flat roof sections of the building. Exact size of array to be coordinated with mechanical equipment to maximize panel array.
- Finish materials to be chosen with long life cycles and ease of cleaning without harsh chemicals. A priority will be given to finish materials with a high recycled content.

Heating, Cooling and Mechanical Ventilation:

- Install a high efficiency HVAC system including energy recovery ventilators.
- Locate ducts within the insulation envelope.
- Properly sized equipment and ductwork for efficient air distribution.
- Install programmable or smart thermostats accessible only to YMCA staff.
- Efficient equipment for hot water and HVAC.

Water Management:

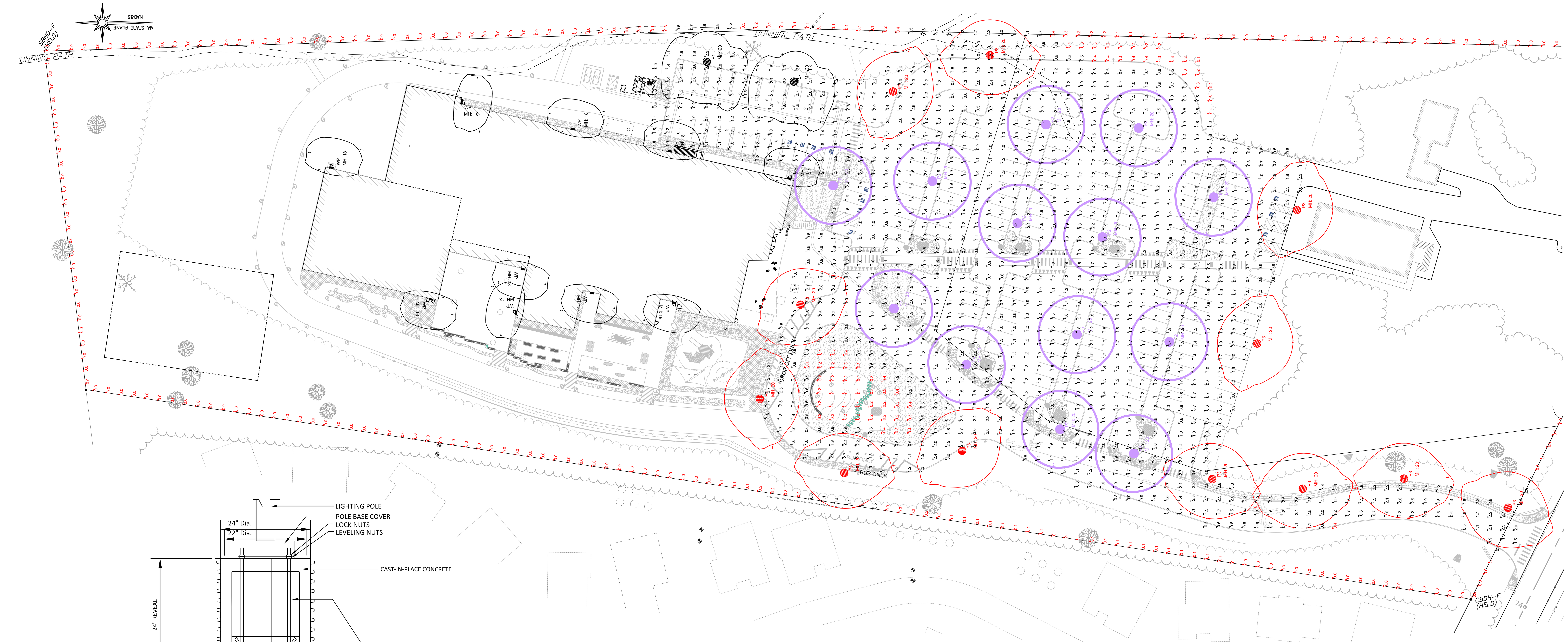
- Provide proper grading around the foundation to shed water away from structure.
- Locate roof drain leaders to properly divert roof runoff away from structure and into a subsurface drainage system.
- Provide a moisture resistant barrier at the building foundation.
- Install code mandated water conservation type plumbing fixtures.

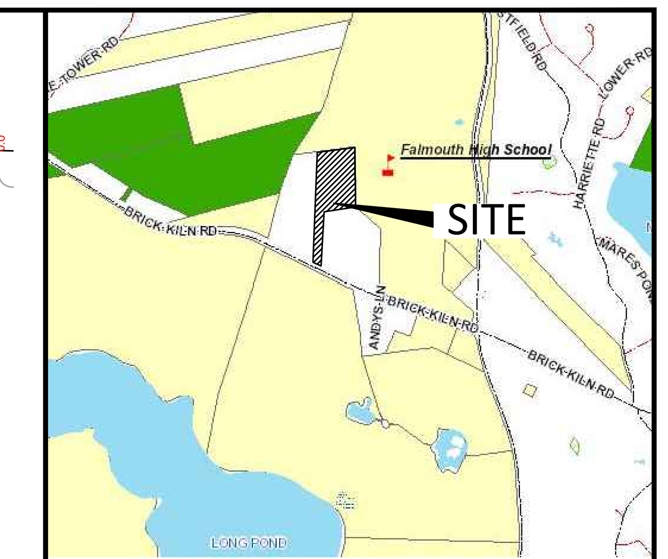
Interior Lighting, Appliances, and Other Equipment:

- LED fixtures and bulbs.
- ENERGY STAR qualified appliances.
- Motion detection room light switches.

EXHIBIT 19

OUTDOOR LIGHTING SPECIFICATIONS





LOCUS MAP
NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

DIMENSIONS ARE AS INDICATED.

USE OF THIS PLAN CONSTITUTES ACCEPTANCE OF TERMS AND CONDITIONS SET FORTH IN ACCOMPANYING PROJECT DOCUMENTATION.

IT IS THE RESPONSIBILITY OF THE USER TO CONFIRM DISCREPANCIES WITH THE ENGINEER PRIOR TO USE.

REVISIONS

NO.	DATE	COMMENT
1	8/16/23	ISSUED FOR PERMITTING

NOT FOR CONSTRUCTION
FOR PERMITTING
PURPOSES ONLY

PURPOSE:
SPECIAL PERMIT WITH SITE PLAN REVIEW

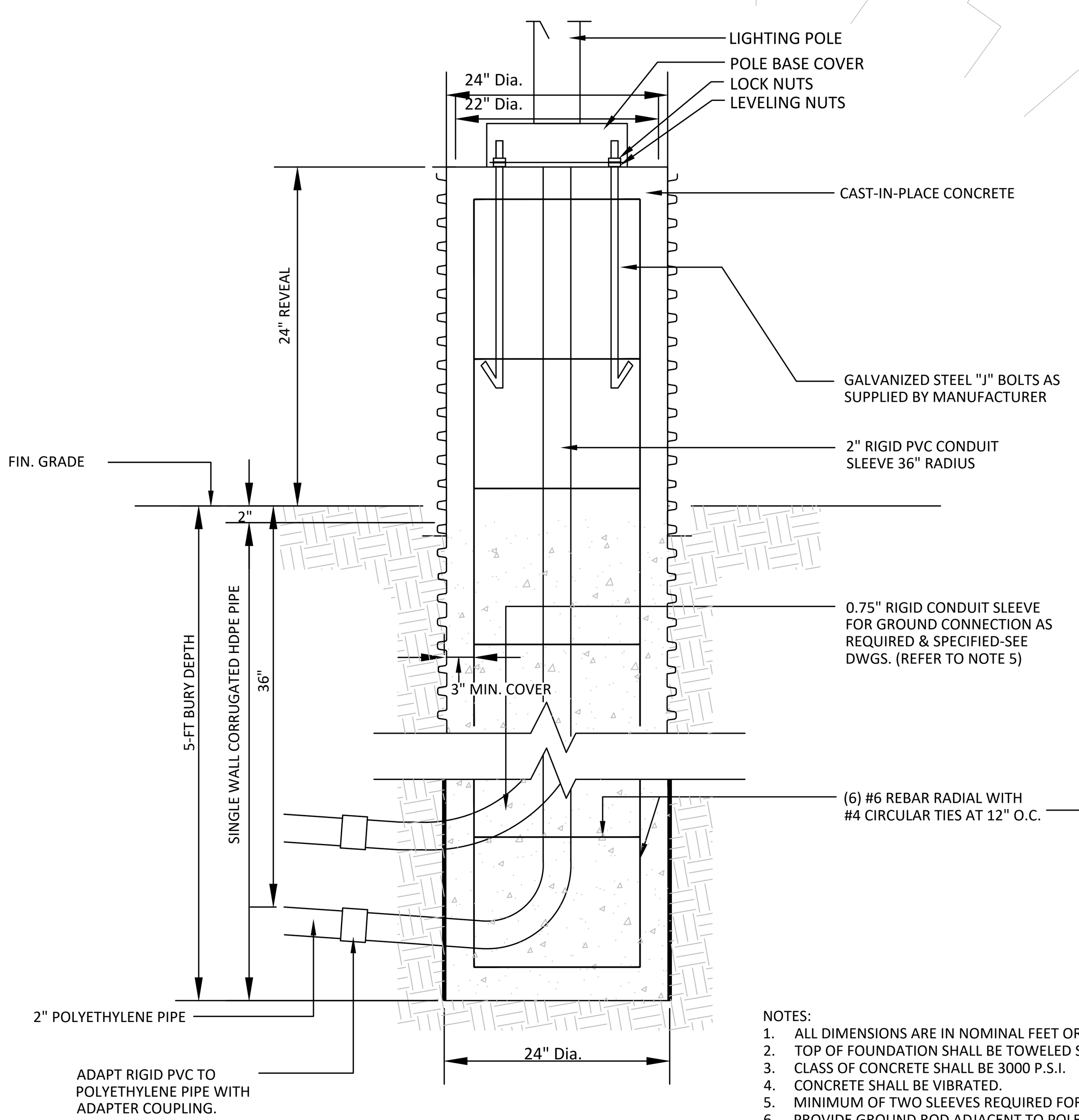
LOCUS:
487 BRICK KILN ROAD
WEST FALMOUTH, MA

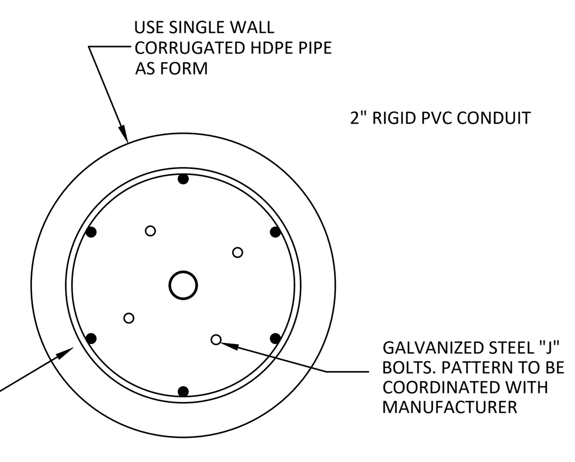
PREPARED FOR:
YMCA
CAPE COD

DRAWING TITLE:
LIGHTING PLAN

CAD TECH: SDC
CHECKED BY: JDO
ENGINEER: SDC
DATE: 8/16/23
SCALE: 1"=30'
SHEET: EL-100

COMMONWEALTH OF MASSACHUSETTS
STUART D. CLARK
CIVIL
No. 40697
REGISTERED PROFESSIONAL ENGINEER

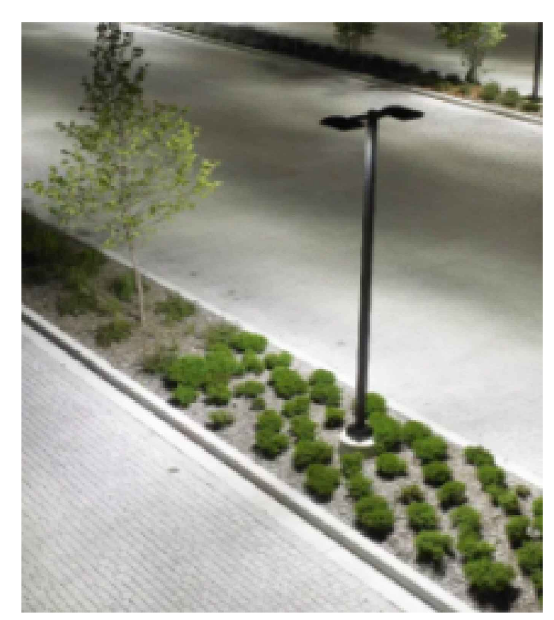




TOP VIEW

NOTES:
1. ALL DIMENSIONS ARE IN NOMINAL FEET OR INCHES
2. TOP OF FOUNDATION SHALL BE TOWELED SMOOTH & LEVEL.
3. CLASS OF CONCRETE SHALL BE 3000 P.S.I.
4. CONCRETE SHALL BE VIBRATED.
5. MINIMUM OF TWO SLEEVES REQUIRED FOR EACH CONC. FOUNDATION UNLESS OTHERWISE SHOWN.
6. PROVIDE GROUND ROD ADJACENT TO POLES IN ACCORDANCE WITH NEC CODE.
7. CONTRACTOR TO VERIFY OPENING SIZE IN POLE BASE PLATE PRIOR TO SETTING CONDUIT SLEEVES.
8. PRECAST CONCRETE BASES MAY BE SUBSTITUTED.

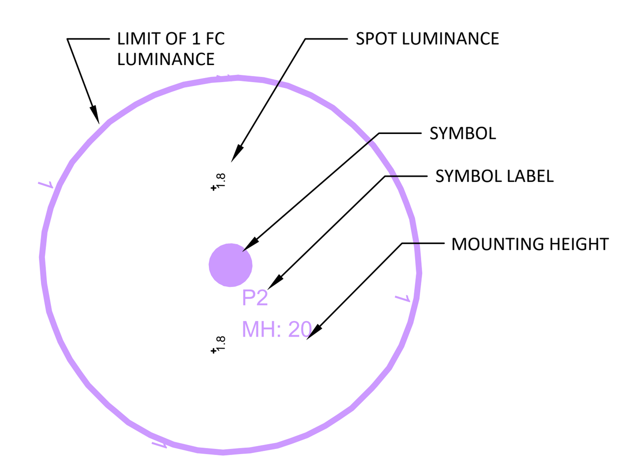
LIGHT POLE BASE DETAIL
SCALE: NTS



LIGHT STANDARD IMAGE
SCALE: NTS

WALLPACK IMAGE
SCALE: NTS

BOLLARD IMAGE
SCALE: NTS



MH = MOUNTING HEIGHT
SYMBOL LEGEND
SCALE: NTS

Luminaire Schedule

Symbol	Qty	Label	Arrangement	Lum. Lumens	LLF	Description	Lum. Watts	Total Watts
	13	P2	Single	10405	0.900	ARE-EDR-5M-x-8L-E-UL-x- 350mA-x	90	1170
	2	P1	Single	9891	0.900	ARE-EDR-4M-x-8L-E-UL-x- 350mA-x	90	180
	12	P3	Single	9891	0.900	ARE-EDR-2M-x-8L-E-UL-x- 350mA-x	90	1080
	2	WP	Single	4270	0.900	XSPW-B-xx-2ME-4L-40K-UL	31	62

Calculation Summary

Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
PL	Illuminance	Fc	0.15	2.7	0.0	N.A.	N.A.
Site	Illuminance	Fc	1.43	3.5	0.1	14.30	35.00
Parking-Drive	Illuminance	Fc	1.48	3.0	0.5	2.96	6.00

S:\CLIENTS\YMCA – CAPE COD\YMCA–2020–0004 (FALMOUTH)\CAD\00 SITE PLANS.DWG 8/16/2023 2:13 PM

C-AR-A-SAL Series
LED Area Light | Field Selectable CCT & Wattage
Replaces up to 1000W PSMH

CCT SELECTABLE, MULTIPLE MOUNTING OPTIONS AND EXCEPTIONAL PERFORMANCE
Illuminate your outdoor spaces with our innovative LED Area Light, a versatile lighting solution that offers advanced features and exceptional performance. Tailored to meet your specific lighting needs, this cutting-edge fixture provides CCT selectability, three mounting options (sold separately), and impressive outputs ranging from 11,300 lumens all the way up to 46,600 lumens.
With field selectable wattage options and the added assurance of cULus Listing and a standard 5-year warranty, it's the perfect choice for a wide range of applications.

PRODUCT SPECIFICATIONS
OVERVIEW

- Initial Delivered Lumens: Up to 23,200 Lumens **(S22L),** Up to 30,700 Lumens **(S30L),** Up to 46,600 Lumens **(S45L)**
- CRI: ≥ 70
- CCT: Field selectable: 3000K, 4000K or 5000K
- Max Input Power: 150W **(S22L),** 200W **(S30L),** 300W **(S45L)**
- Dimmable: 0-10V dimming to 10%
- Operating Temperature Range: -40°F to 104°F (-40°C to 40°C)
- Estimated L_{70} Lifetime @ 25°C: > 100,000 hours
- Power Factor: > 0.9 at full load
- Total Harmonic Distortion: < 20% at full load
- Limited Warranty: 5 Years*
- Replaces 400W PSMH **(S22L & S30L),** 1000W MH **(S45L)**

FEATURES	RECOMMENDED USE	INPUT VOLTAGE
• Includes 7-pin receptacle which complies with ANSI C136.41 standards (7-pin receptacle supports classic 3-pin standard photocells, as well as "smart" photocells for more advanced control strategies) • 3 mounting options • Shorting cap included • FCC Part 15, Subpart B, Class B limits for conducted and radiated emissions	• General Area Lighting • Parking Areas • Perimeter Lighting	• Universal (120V - 277V)

CERTIFICATIONS:

CA RESIDENTS WARNING: Cancer and Reproductive Harm – www.p65warnings.ca.gov

C-AR-A-SAL Series

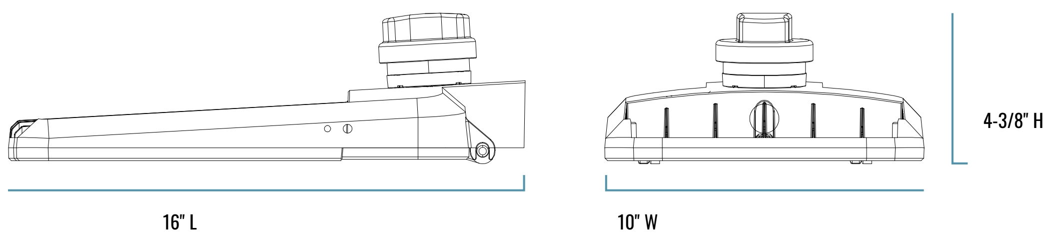
ORDERING INFORMATION

Example SKU: C-AR-A-SAL3-S22L-SCCT-UL-BZ

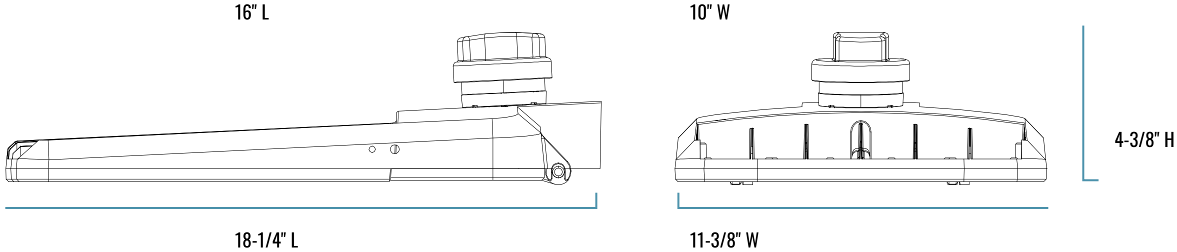
C-AR	A			SCCT	UL	BZ
PRODUCT	**SERIES**	**DISTRIBUTION PATTERN**	**LUMEN PACKAGE***	**FIELD SELECTABLE CCT**	**VOLTAGE**	**HOUSING COLOR**
C-AR	**A**	**SAL3** Type 3 distribution **SAL4** Type 4 distribution **SAL5** Type 5 distribution	**S22L** Up to 23,200 Lumens (Max. input 150W) **S30L** Up to 30,700 Lumens (Max. input 200W) **S45L** Up to 46,600 Lumens (Max. input 300W)	**SCCT** Warm White (3000K) Neutral White (4000K)* Cool White (5000K)	**UL** Universal 120V-277V	**BZ** Bronze

* Default settings at time of shipping are highest product wattage and 4000K.

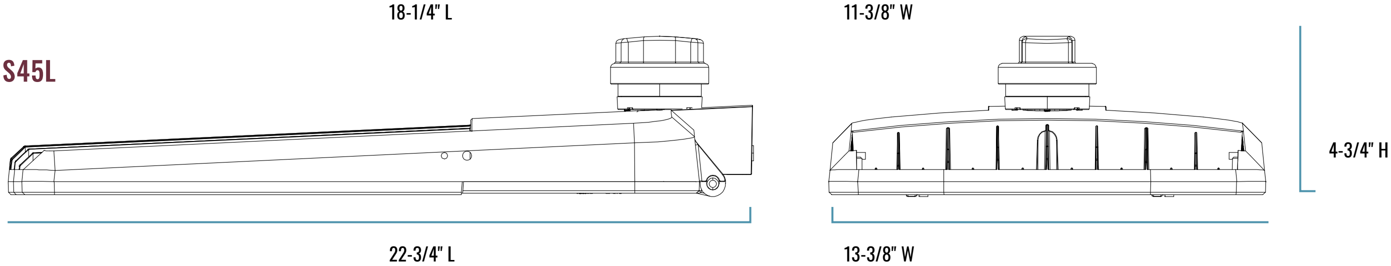
S22L



S30L



S45L



SERIES OVERVIEW

DIMENSIONS	PRODUCT WEIGHT	MOUNTING HEIGHT	SPACING
16" L x 10" W x 4-3/8" H **(S22L)**	7.5 lbs.	> 25 feet	4 to 5 times the mounting height
18-1/4" L x 11-3/8" W x 4-3/8" H **(S30L)**	8.7 lbs.		
22-3/4" L x 13-3/8" W x 4.75" H **(S45L)**	10.5 lbs.		

C-AR-A-SAL Series

FIXTURE SPECIFICATIONS

HOUSING	Bronze, durable aluminum extruded heat sink and die-cast housing. Comes standard with 3-foot cord and exposed leads.
LENS ASSEMBLY	Integrated UV stabilized polycarbonate diffuser lens with Type 3, 4 or 5 optical distribution.
MOUNTING	Mounting sold separately. 8-inch direct arm, 2-inch adjustable slip fitter or trunnion mount options.

LUMINAIRE AND ELECTRICAL PERFORMANCE

OPERATING TEMPERATURE RANGE	ESTIMATED L_{70} LIFETIME @ 25°C (77°F)	POWER FACTOR	TOTAL HARMONIC DISTORTION
-40°F to 104°F (-40°C to 40°C)	> 100,000 hours	≥0.9 at full load	< 20% at full load

LUMEN PACKAGE*	REPLACES	SYSTEM WATTS	CURRENT DRAW (AMPS)			
			120V	208V	240V	277V
S22L	400W PSMH	150	1.25	0.72	0.63	0.54
		107	0.89	0.51	0.45	0.39
		75	0.63	0.36	0.31	0.27
S30L		200	1.67	0.96	0.83	0.72
		143	1.19	0.69	0.60	0.52
		100	0.83	0.48	0.42	0.36
S45L	1000W PSMH	300	2.50	1.44	1.25	1.08
		214	1.78	1.03	0.89	0.77
		150	1.25	0.72	0.63	0.54

TYPE III DISTRIBUTION

LUMEN PACKAGE*	REPLACES	INITIAL DELIVERED LUMENS & BUG RATINGS PER TM-15-20					
		3000K	BUG RATINGS**	4000K	BUG RATINGS**	5000K	BUG RATINGS**
S22L	400W PSMH	20,600	B3-U0-G3	23,200	B3-U0-G3	22,000	B3-U0-G3
		16,000	B3-U0-G3	18,000	B3-U0-G3	17,100	B3-U0-G3
		11,800	B2-U0-G2	13,300	B3-U0-G2	12,600	B2-U0-G2
S30L		27,100	B3-U0-G3	30,400	B4-U0-G3	28,900	B3-U0-G3
		20,900	B3-U0-G3	23,500	B3-U0-G3	22,300	B3-U0-G3
		15,500	B3-U0-G3	17,400	B3-U0-G3	16,500	B3-U0-G3
S45L	1000W PSMH	40,300	B4-U0-G4	45,300	B4-U0-G4	43,000	B4-U0-G4
		31,200	B4-U0-G3	35,100	B4-U0-G4	33,300	B4-U0-G4
		23,100	B3-U0-G3	25,900	B3-U0-G3	24,600	B3-U0-G3

* Default settings at time of shipping are highest product wattage and 4000K.
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf. Valid with no tilt.

C-AR-A-SAL Series

TYPE IV DISTRIBUTION

LUMEN PACKAGE*	REPLACES	INITIAL DELIVERED LUMENS & BUG RATINGS PER TM-15-20					
		3000K	BUG RATINGS**	4000K	BUG RATINGS**	5000K	BUG RATINGS**
S22L	400W PSMH	20,000	B3-U0-G3	22,500	B3-U0-G3	21,400	B3-U0-G3
		15,500	B3-U0-G2	17,400	B3-U0-G2	16,500	B3-U0-G2
		11,500	B2-U0-G2	12,900	B3-U0-G2	12,300	B3-U0-G2
S30L		27,100	B3-U0-G3	30,400	B4-U0-G3	28,900	B3-U0-G3
		20,900	B3-U0-G3	23,500	B3-U0-G3	22,300	B3-U0-G3
		15,500	B3-U0-G2	17,400	B3-U0-G2	16,500	B3-U0-G2
S45L	1000W PSMH	41,500	B4-U0-G4	46,600	B4-U0-G4	44,300	B4-U0-G4
		32,100	B4-U0-G3	36,100	B4-U0-G4	34,300	B4-U0-G4
		23,700	B3-U0-G3	26,600	B3-U0-G3	25,300	B3-U0-G3

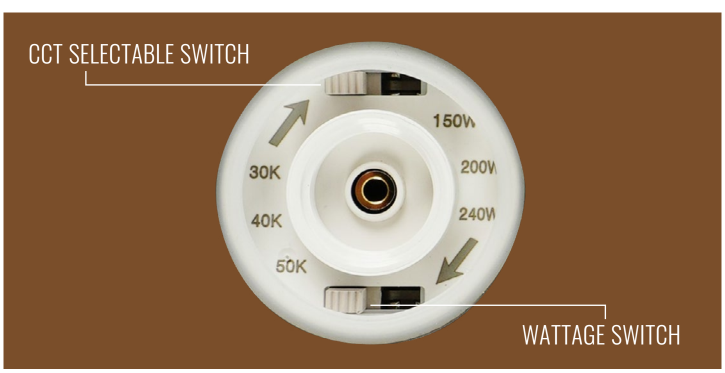
* Default settings at time of shipping are highest product wattage and 4000K.
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf. Valid with no tilt.

TYPE V DISTRIBUTION

LUMEN PACKAGE*	REPLACES	INITIAL DELIVERED LUMENS & BUG RATINGS PER TM-15-20					
		3000K	BUG RATINGS**	4000K	BUG RATINGS**	5000K	BUG RATINGS**
S22L	400W PSMH	19,800	B4-U0-G3	22,200	B4-U0-G3	21,100	B4-U0-G3
		15,300	B4-U0-G2	17,200	B4-U0-G2	16,300	B4-U0-G2
		11,300	B3-U0-G2	12,700	B3-U0-G2	12,100	B3-U0-G2
S30L		27,300	B4-U0-G3	30,700	B5-U0-G3	29,200	B5-U0-G3
		21,200	B4-U0-G3	23,800	B4-U0-G3	22,600	B4-U0-G3
		15,700	B4-U0-G2	17,600	B4-U0-G2	16,700	B4-U0-G2
S45L	1000W PSMH	40,700	B5-U0-G3	45,700	B5-U0-G4	43,400	B5-U0-G4
		31,500	B5-U0-G3	35,400	B5-U0-G3	33,600	B5-U0-G3
		23,200	B4-U0-G3	26,100	B4-U0-G3	24,800	B4-U0-G3

* Default settings at time of shipping are highest product wattage and 4000K.
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf. Valid with no tilt.

CCT & WATTAGE SELECTABLE SWITCH

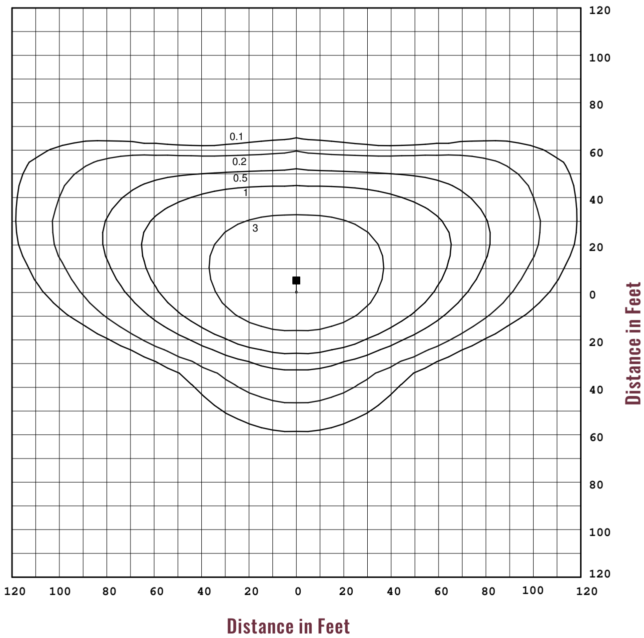


C-AR-A-SAL Series

ISO PLOT CHART

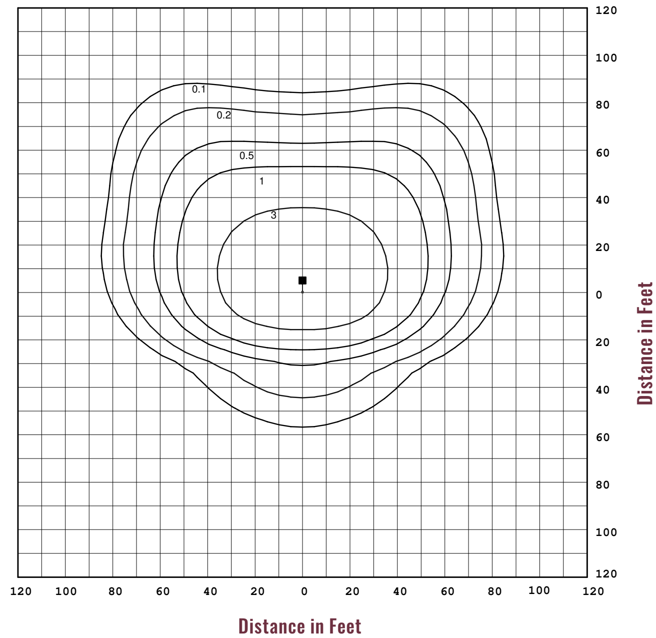
C-AR-A-SAL3_S30L-SCCT-UL-XX

Mounting Height: 25'



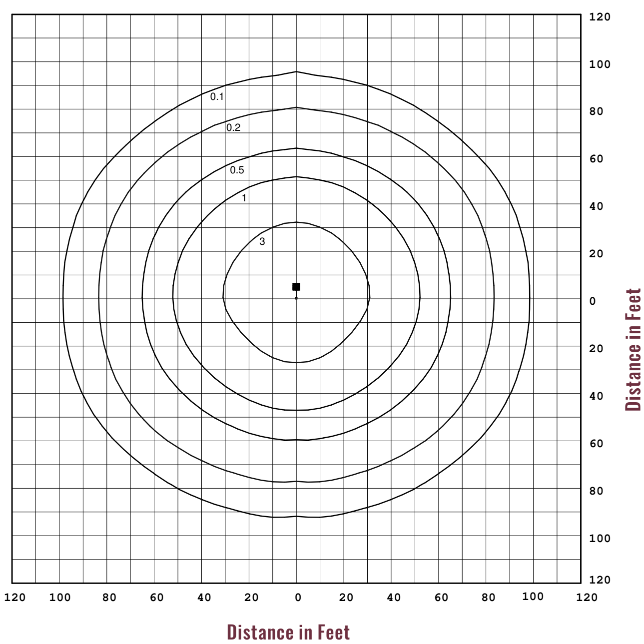
C-AR-A-SAL4-S30L-SCCT-UL-XX

Mounting Height: 25'



C-AR-A-SAL5-S30L-SCCT-UL-XX

Mounting Height: 25'



Note: All published photometric testing performed to IES LM-79 standards. Fixture photometry was completed on a single representative fixture. Foot candle levels are noted inside graph.

C-AR-A-SAL Series

ACCESSORIES

	**8-INCH DIRECT ARM MOUNT** **SKU:** C-AR-A-SAL-DM **USE:** 8-inch adjustable direct arm mount with a bronze finish. For use with C-AR-A-SAL Series only. Max tilt is 10 degrees
	**2-INCH ADJUSTABLE SLIP FITTER MOUNT** **SKU:** C-AR-A-SAL-SF **USE:** 2-inch adjustable slip fitter mount with a bronze finish. Works with 2-3/8" OD tenon or pipe. For use with C-AR-A-SAL Series only. Max tilt is 45 degrees
	**ADJUSTABLE TRUNNION MOUNT** **SKU:** C-AR-A-SAL-TR **USE:** Adjustable trunnion mount with a bronze finish. For use with C-AR-A-SAL Series only. Max tilt is 45 degrees
	**120-277V NEMA PHOTOCELL | 3-PIN** **SKU:** C-ACC-A-PCELL-NEMA3-LV **USE:** Gray, dusk to dawn operation that turns fixture on at dusk and off at dawn. Twist lock style semi-electronic. Field installed.

WARRANTY AND CERTIFICATIONS

WARRANTY	cULus LISTED	DLC
5-Year Limited*	Wet Locations	—

THE EDGE® Series

LED Area Luminaire – Round

Rev. Date: V11 12/20/2022

Product Description

THE EDGE® Series has a slim, low profile design. Its rugged cast aluminum housing minimizes wind load requirements and features an integral, weathertight LED driver compartment, spun vented cover, high performance aluminum heat sinks and leaf/debris guard.
Applications: Auto Dealerships, parking lots, campuses, facade lighting and general site lighting applications

Performance Summary

Patented NanoOptic® Product Technology

Assembled in the USA by Cree Lighting from US and imported parts

Initial Delivered Lumens: Up to 25,065

CRI: Minimum 70 CRI (4000K & 5700K); 80 CRI (3000K); 90 CRI (5000K)

CCT: Turtle Friendly Amber, 3000K (+/-300K), 4000K (+/-300K), 5000K (+/- 500K), 5700K (+/- 500K) standard

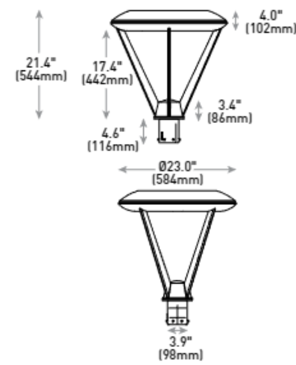
Limited Warranty†: 10 years on luminaire/10 years on Colorfast DeltaGuard® finish /1 year on accessories

† See http://creelighting.com/warranty for warranty terms

Accessories

Field-Installed	
Bird Spikes XA-BRDSPK **Synapse® SimplySnap 10V Interface** DIM10-220F - 120V-277V - Requires other Synapse components to complete system - Refer to DIM10-220F spec sheet for details	**Backlight Control Shields** XA-20BLS-4 - Four-pack - Unpainted stainless steel - For use with 5M and 5S optics - Consult factory for shielding for use with 2M, 3M, and 4M optics

R3 Mount



LED Count (x10)	Weight
04	33.8 lbs. (15.3kg)
06	35.2 lbs. (15.9kg)
08	37.0 lbs. (16.8kg)
10	40.7 lbs. (18.5kg)
12	42.4 lbs. (19.3kg)

R4/R5 Mount - see page 14 for weight & dimensions

Ordering Information

Example: ARE-EDR-2M-R3-12-E-UL-SV-350

ARE-EDR					E				
Product	**Optic**		**Mounting***	**LED Count (x10)**	**Series**	**Voltage**	**Color Options**	**Drive Current**	**Options**
ARE-EDR	**2M** Type II Medium **2MB** Type II Medium w/BLS **2MP** Type II Medium w/ Partial BLS **3M** Type III Medium **3MB** Type III Medium w/BLS	**3MP** Type III Medium w/Partial BLS **4M** Type IV Medium **4MB** Type IV Medium w/BLS **4MP** Type IV Medium w/Partial BLS **5M** Type V Medium **5S** Type V Short	**R3** Spider, Center Tenon, 2-3/8" to 3" OD **R4** Spider, Center Direct, 4" Square **R5** Spider, Center Direct, 5" Round	**04**** **06**** **08**** **10** **12**	**E**	**UL** Universal 120-277V **UH** Universal 347-480V	**BK** Black **BZ** Bronze **SV** Silver **WH** White	**350** 350mA **525** 525mA **700** 700mA - Available with 40-60 LEDs	**DIM 0-10V Dimming** - Control by others - Refer to Dimming spec sheet for details - Can't exceed specified drive current **F Fuse** - Compatible only with 120V, 277V or 347V (phase to neutral) - Consult factory if fusing is required for 208V, 240V or 480V (phase to phase) - When code dictates fusing, use time delay fuse **HL Hi/Low (Dual Circuit Input)** - Refer to HL spec sheet for details - Sensor not included **P Photocell** - Available with UL voltage only **30K 3000K Color Temperature** - Minimum 80 CRI - Color temperature per luminaire **40K 4000K Color Temperature** - Minimum 70 CRI - Color temperature per luminaire **50K 5000K Color Temperature** - Minimum 90 CRI - Color temperature per luminaire **TRL Amber Turtle Friendly LEDs** - Available only with 350mA - 600nm dominant wavelength - Additional shielding (by others) may be required for Florida Fish and Wildlife Conservation Commission compliance

* Reference EPA and pole configuration suitability data on page 14
** Consists of multiple 20 LED light bars. 40, 60, and 80 LED units use blanks as needed in place of populated light bars

Product Specifications

CONSTRUCTION & MATERIALS

- Slim, low profile, minimizing wind load requirements
- Luminaire sides are rugged die cast aluminum with integral, weathertight LED driver compartment, spun vented cover, and high performance aluminum heat sinks
- R3 spider mount hub slip-fits over a 2.375" (60mm) to 3" (76mm) O.D. minimum 4" (102mm) H steel or aluminum tenon or pole and secures with eight set screws
- R4 spider mount fits directly inside 4" (102mm) square pole and secures to pole with four set screws
- R5 spider mount fits directly inside of a 5" (127mm) round pole to provide a clean hardware-less outer appearance
- Includes leaf/debris guard
- Exclusive Colorfast DeltaGuard® finish features an E-Coat epoxy primer with an ultra-durable powder topcoat, providing excellent resistance to corrosion, ultraviolet degradation and abrasion. Black, bronze, silver, and white are available
- **Weight:** See Dimensions and Weight charts on pages 1 and 14

ELECTRICAL SYSTEM

- **Input Voltage:** 120-277V or 347-480V, 50/60Hz, Class 1 drivers
- **Power Factor:** > 0.9 at full load
- **Total Harmonic Distortion:** < 20% at full load
- **10V Source Current:** 40-80 LEDs: 0.15mA; 100-120 LEDs: 0.30mA
- Integral 10kV/5kA surge suppression protection standard
- When code dictates fusing, a slow blow fuse or type C/D breaker should be used to address inrush current

REGULATORY & VOLUNTARY QUALIFICATIONS

- cULus Listed
- Suitable for wet locations
- Meets FCC Part 15, Subpart B, Class A limits for conducted and radiated emissions
- Enclosure meets IP66 requirements per IEC 60529 when ordered without P option
- Certified to ANSI C136.31-2001, 1.5G normal vibration standards when ordered with R3, R4 and R5 mounts
- ANSI C136.2 10kV/5kA surge protection, tested in accordance with IEEE/ANSI C62.41.2
- Luminaire and finish endurance tested to withstand 5,000 hours of elevated ambient salt fog conditions as defined in ASTM Standard B 117
- RoHS compliant. Consult factory for additional details
- Assembled in the USA by Cree Lighting from US and imported parts
- Meets Buy American requirements within ARRA
- ⚠ **CA RESIDENTS WARNING:** Cancer and Reproductive Harm – www.p65warnings.ca.gov

Electrical Data*

LED Count (x10)	CCT	System Watts 120-480V	Total Current (A)					
			120V	208V	240V	277V	347V	480V
350mA								
04	30K, 40K, 50K, 57K	46	0.36	0.23	0.21	0.20	0.15	0.12
	TRL	35	0.29	0.17	0.15	0.13	0.10	0.07
06	30K, 40K, 50K, 57K	66	0.52	0.31	0.28	0.26	0.20	0.15
	TRL	50	0.41	0.24	0.21	0.18	0.14	0.10
08	30K, 40K, 50K, 57K	90	0.75	0.44	0.38	0.34	0.26	0.20
	TRL	68	0.57	0.33	0.28	0.25	0.20	0.14
10	30K, 40K, 50K, 57K	110	0.92	0.53	0.47	0.41	0.32	0.24
	TRL	83	0.69	0.40	0.35	0.30	0.24	0.17
12	30K, 40K, 50K, 57K	130	1.10	0.63	0.55	0.48	0.38	0.28
	TRL	99	0.82	0.48	0.41	0.36	0.28	0.21
525mA								
04	30K, 40K, 50K, 57K	70	0.58	0.34	0.31	0.28	0.21	0.16
06	30K, 40K, 50K, 57K	101	0.84	0.49	0.43	0.38	0.30	0.22
08	30K, 40K, 50K, 57K	133	1.13	0.66	0.58	0.51	0.39	0.28
10	30K, 40K, 50K, 57K	171	1.43	0.83	0.74	0.66	0.50	0.38
12	30K, 40K, 50K, 57K	202	1.69	0.98	0.86	0.77	0.59	0.44
700mA								
04	30K, 40K, 50K, 57K	93	0.78	0.46	0.40	0.36	0.27	0.20
06	30K, 40K, 50K, 57K	134	1.14	0.65	0.57	0.50	0.39	0.29

* Electrical data at 25°C (77°F). Actual wattage may differ by +/- 10% when operating between 120-277V or 347-480V +/- 10%

THE EDGE® Series Ambient Adjusted Lumen Maintenance[1]

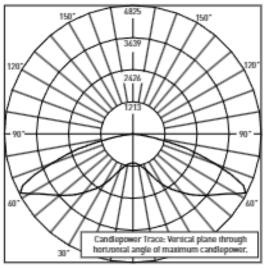
Ambient	CCT	Initial LMF	25K hr Reported[2] LMF	50K hr Reported[2] LMF	75K hr Reported[2]/ Estimated[3] LMF	100K hr Estimated[3] LMF
5°C (41°F)	30K/40K/50K/57K	1.04	1.03	1.03	1.03[2]	1.03
	TRL	1.06	1.06	1.06	1.06[3]	1.06
10°C (50°F)	30K/40K/50K/57K	1.03	1.02	1.02	1.02[2]	1.02
	TRL	1.04	1.04	1.04	1.04[3]	1.04
15°C (59°F)	30K/40K/50K/57K	1.02	1.01	1.01	1.01[2]	1.01
	TRL	1.03	1.03	1.03	1.03[3]	1.03
20°C (68°F)	30K/40K/50K/57K	1.01	0.99	0.99	0.99[2]	0.99
	TRL	1.01	1.01	1.01	1.01[3]	1.01
25°C (77°F)	30K/40K/50K/57K	1.00	0.98	0.98	0.98[2]	0.98
	TRL	1.00	1.00	1.00	1.00[3]	1.00

[1] Lumen maintenance values at 25°C (77°F) are calculated per IES TM-21 based on IES LM-80 report data for the LED package and in-situ luminaire testing. Luminaire ambient temperature factors (LATF) have been applied to all lumen maintenance factors. Please refer to the Temperature Zone Reference Document for outdoor average nighttime ambient conditions.
[2] In accordance with IES TM-21, Reported values represent interpolated values based on time durations that are up to 6x the tested duration in the IES LM-80 report for the LED.
[3] Estimated values are calculated and represent time durations that exceed the 6x test duration of the LED.

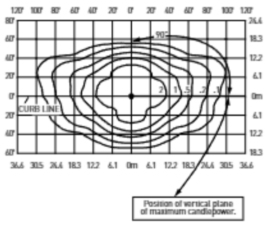
Photometry

All published luminaire photometric testing performed to IES LM-79 standards. To obtain an IES file specific to your project consult: https://www.creelighting.com/products/outdoor/area/the-edge-round-series/

2M



RESTL Test Report #: PL10270-004B
ARE-EDG-2M-**-06-E-UL-525-40K
Initial Delivered Lumens: 10,053



ARE-EDR-2M-**-10-E-UL-525-40K
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 17,504
Initial FC at grade

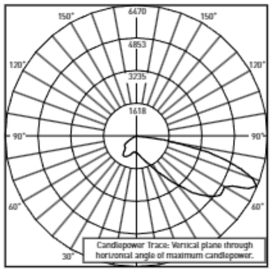
Type II Medium Distribution										
LED Count (x10)	3000K		4000K		5000K		5700K		TRL	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
350mA										
04	4,143	B2 U0 G1	5,003	B2 U0 G2	3,803	B1 U0 G1	5,102	B2 U0 G2	1,633	B1 U0 G1
06	6,144	B2 U0 G2	7,418	B2 U0 G2	5,640	B2 U0 G2	7,565	B2 U0 G2	2,421	B1 U0 G1
08	8,192	B2 U0 G2	9,891	B3 U0 G3	7,519	B2 U0 G2	10,087	B3 U0 G3	3,228	B1 U0 G1
10	10,215	B3 U0 G3	12,334	B3 U0 G3	9,377	B3 U0 G3	12,578	B3 U0 G3	4,025	B2 U0 G1
12	12,258	B3 U0 G3	14,801	B3 U0 G3	11,252	B3 U0 G3	15,094	B3 U0 G3	4,830	B2 U0 G2
525mA										
04	5,886	B2 U0 G2	7,099	B2 U0 G2	5,403	B2 U0 G2	7,248	B2 U0 G2	N/A	
06	8,729	B3 U0 G3	10,527	B3 U0 G3	8,012	B2 U0 G2	10,748	B3 U0 G3	N/A	
08	11,638	B3 U0 G3	14,037	B3 U0 G3	10,683	B3 U0 G3	14,331	B3 U0 G3	N/A	
10	14,513	B3 U0 G3	17,504	B3 U0 G3	13,322	B3 U0 G3	17,870	B3 U0 G3	N/A	
12	17,415	B3 U0 G3	21,004	B4 U0 G4	15,986	B3 U0 G3	21,444	B4 U0 G4	N/A	
700mA										
04	6,943	B2 U0 G2	8,379	B2 U0 G2	6,373	B2 U0 G2	8,549	B3 U0 G3	N/A	
06	10,296	B3 U0 G3	12,425	B3 U0 G3	9,451	B3 U0 G3	12,678	B3 U0 G3	N/A	

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf.

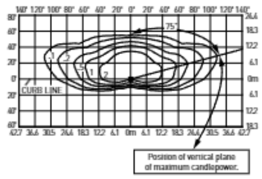
Photometry

All published luminaire photometric testing performed to IES LM-79 standards. To obtain an IES file specific to your project consult: https://www.creelighting.com/products/outdoor/area/the-edge-round-series/

2MB



RESTL Test Report #: PL10023-003B
ARE-EDG-2MB-**-06-E-UL-525-40K
Initial Delivered Lumens: 7,784



ARE-EDR-2MB-**-10-E-UL-525-40K
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 13,185
Initial FC at grade

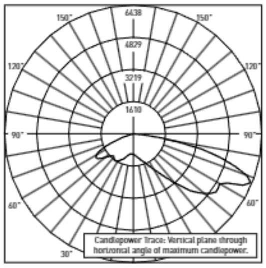
Type II Medium Distribution w/BLS										
LED Count (x10)	3000K		4000K		5000K		5700K		TRL	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
350mA										
04	3,121	B0 U0 G1	3,768	B1 U0 G1	2,865	B0 U0 G1	3,843	B1 U0 G1	1,230	B0 U0 G1
06	4,628	B1 U0 G1	5,588	B1 U0 G1	4,248	B1 U0 G1	5,698	B1 U0 G1	1,824	B0 U0 G1
08	6,170	B1 U0 G1	7,450	B1 U0 G2	5,664	B1 U0 G1	7,598	B1 U0 G2	2,431	B0 U0 G1
10	7,695	B1 U0 G2	9,291	B1 U0 G2	7,063	B1 U0 G2	9,475	B1 U0 G2	3,032	B0 U0 G1
12	9,233	B1 U0 G2	11,149	B1 U0 G2	8,476	B1 U0 G2	11,370	B1 U0 G2	3,638	B1 U0 G1
525mA										
04	4,434	B1 U0 G1	5,348	B1 U0 G1	4,070	B1 U0 G1	5,460	B1 U0 G1	N/A	
06	6,575	B1 U0 G2	7,930	B1 U0 G2	6,035	B1 U0 G1	8,096	B1 U0 G2	N/A	
08	8,766	B1 U0 G2	10,573	B1 U0 G2	8,047	B1 U0 G2	10,794	B1 U0 G2	N/A	
10	10,932	B1 U0 G2	13,185	B1 U0 G2	10,034	B1 U0 G2	13,461	B1 U0 G2	N/A	
12	13,118	B1 U0 G2	15,821	B2 U0 G3	12,041	B1 U0 G2	16,153	B2 U0 G3	N/A	
700mA										
04	5,230	B1 U0 G1	6,311	B1 U0 G2	4,801	B1 U0 G1	6,440	B1 U0 G2	N/A	
06	7,755	B1 U0 G2	9,359	B1 U0 G2	7,119	B1 U0 G2	9,549	B1 U0 G2	N/A	

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf.

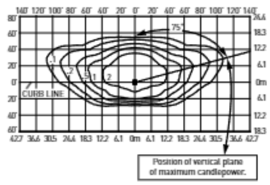
Photometry

All published luminaire photometric testing performed to IES LM-79 standards. To obtain an IES file specific to your project consult: https://www.creelighting.com/products/outdoor/area/the-edge-round-series/

2MP



RESTL Test Report #: PL10097-001B
ARE-EDG-2MP-**-06-E-UL-525-40K
Initial Delivered Lumens: 9,149



ARE-EDR-2MP-**-10-E-UL-525-40K
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 15,458
Initial FC at grade

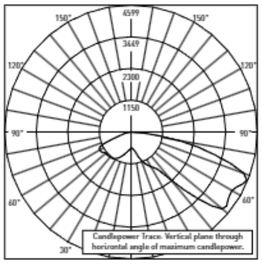
Type II Medium Distribution w/Partial BLS										
LED Count (x10)	3000K		4000K		5000K		5700K		TRL	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
350mA										
04	3,659	B1 U0 G1	4,418	B1 U0 G1	3,359	B1 U0 G1	4,505	B1 U0 G1	1,442	B0 U0 G1
06	5,426	B1 U0 G1	6,551	B1 U0 G1	4,980	B1 U0 G1	6,681	B1 U0 G1	2,138	B1 U0 G1
08	7,234	B2 U0 G1	8,735	B2 U0 G2	6,640	B1 U0 G1	8,908	B2 U0 G2	2,851	B1 U0 G1
10	9,021	B2 U0 G2	10,892	B2 U0 G2	8,281	B2 U0 G2	11,108	B2 U0 G2	3,555	B1 U0 G1
12	10,825	B2 U0 G2	13,071	B2 U0 G2	9,937	B2 U0 G2	13,330	B2 U0 G2	4,266	B1 U0 G1
525mA										
04	5,198	B1 U0 G1	6,270	B1 U0 G1	4,772	B1 U0 G1	6,401	B1 U0 G1	N/A	
06	7,708	B2 U0 G2	9,297	B2 U0 G2	7,076	B2 U0 G1	9,492	B2 U0 G2	N/A	
08	10,278	B2 U0 G2	12,396	B2 U0 G2	9,434	B2 U0 G2	12,656	B2 U0 G2	N/A	
10	12,817	B2 U0 G2	15,458	B2 U0 G2	11,764	B2 U0 G2	15,782	B2 U0 G2	N/A	
12	15,380	B2 U0 G2	18,549	B3 U0 G3	14,117	B2 U0 G2	18,938	B3 U0 G3	N/A	
700mA										
04	6,132	B1 U0 G1	7,400	B2 U0 G1	5,628	B1 U0 G1	7,550	B2 U0 G2	N/A	
06	9,092	B2 U0 G2	10,973	B2 U0 G2	8,346	B2 U0 G2	11,196	B2 U0 G2	N/A	

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf.

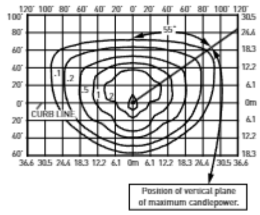
Photometry

All published luminaire photometric testing performed to IES LM-79 standards. To obtain an IES file specific to your project consult: https://www.creelighting.com/products/outdoor/area/the-edge-round-series/

3M



RESTL Test Report #: PL09405-001A
ARE-EDG-3M-**-06-E-UL-525-40K
Initial Delivered Lumens: 9,460



ARE-EDR-3M-**-10-E-UL-525-40K
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 16,594
Initial FC at grade

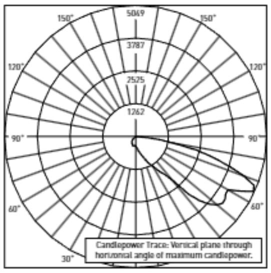
Type III Medium Distribution										
LED Count (x10)	3000K		4000K		5000K		5700K		TRL	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
350mA										
04	3,928	B1 U0 G1	4,743	B1 U0 G1	3,606	B1 U0 G1	4,837	B1 U0 G1	1,548	B1 U0 G1
06	5,825	B2 U0 G2	7,033	B2 U0 G2	5,347	B2 U0 G2	7,172	B2 U0 G2	2,295	B1 U0 G1
08	7,766	B2 U0 G2	9,377	B2 U0 G2	7,129	B2 U0 G2	9,563	B2 U0 G2	3,060	B1 U0 G1
10	9,685	B2 U0 G2	11,693	B3 U0 G3	8,890	B2 U0 G2	11,925	B3 U0 G3	3,816	B1 U0 G1
12	11,621	B3 U0 G3	14,032	B3 U0 G3	10,667	B3 U0 G3	14,310	B3 U0 G3	4,579	B1 U0 G1
525mA										
04	5,581	B2 U0 G2	6,731	B2 U0 G2	5,122	B2 U0 G2	6,872	B2 U0 G2	N/A	
06	8,275	B2 U0 G2	9,981	B3 U0 G3	7,596	B2 U0 G2	10,190	B3 U0 G3	N/A	
08	11,034	B3 U0 G3	13,307	B3 U0 G3	10,128	B3 U0 G3	13,586	B3 U0 G3	N/A	
10	13,759	B3 U0 G3	16,594	B3 U0 G3	12,630	B3 U0 G3	16,942	B3 U0 G3	N/A	
12	16,511	B3 U0 G3	19,913	B3 U0 G3	15,155	B3 U0 G3	20,330	B3 U0 G3	N/A	
700mA										
04	6,582	B2 U0 G2	7,944	B2 U0 G2	6,042	B2 U0 G2	8,105	B2 U0 G2	N/A	
06	9,761	B2 U0 G2	11,779	B3 U0 G3	8,960	B2 U0 G2	12,019	B3 U0 G3	N/A	

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf.

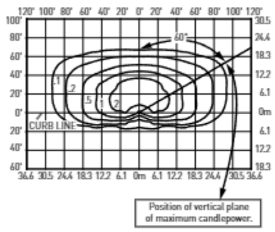
Photometry

All published luminaire photometric testing performed to IES LM-79 standards. To obtain an IES file specific to your project consult: https://www.creelighting.com/products/outdoor/area/the-edge-round-series/

3MB



RESTL Test Report #: PL10023-001B
ARE-EDG-3MB-**-06-E-UL-525-40K
Initial Delivered Lumens: 7,602



ARE-EDR-3MB-**-10-E-UL-525-40K
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 12,275
Initial FC at grade

Type III Medium Distribution w/BLS										
LED Count (x10)	3000K		4000K		5000K		5700K		TRL	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
350mA										
04	2,906	B0 U0 G1	3,508	B1 U0 G1	2,667	B0 U0 G1	3,578	B1 U0 G1	1,145	B0 U0 G1
06	4,309	B1 U0 G1	5,202	B1 U0 G1	3,955	B1 U0 G1	5,305	B1 U0 G1	1,698	B0 U0 G1
08	5,745	B1 U0 G2	6,936	B1 U0 G2	5,273	B1 U0 G1	7,074	B1 U0 G2	2,264	B0 U0 G1
10	7,164	B1 U0 G2	8,650	B1 U0 G2	6,576	B1 U0 G2	8,821	B1 U0 G2	2,823	B0 U0 G1
12	8,597	B1 U0 G2	10,380	B1 U0 G2	7,891	B1 U0 G2	10,585	B1 U0 G2	3,387	B1 U0 G1
525mA										
04	4,128	B1 U0 G1	4,979	B1 U0 G1	3,789	B1 U0 G1	5,083	B1 U0 G1	N/A	
06	6,121	B1 U0 G2	7,383	B1 U0 G2	5,619	B1 U0 G2	7,538	B1 U0 G2	N/A	
08	8,162	B1 U0 G2	9,844	B1 U0 G2	7,492	B1 U0 G2	10,050	B1 U0 G2	N/A	
10	10,178	B1 U0 G2	12,275	B1 U0 G2	9,342	B1 U0 G2	12,532	B1 U0 G2	N/A	
12	12,213	B1 U0 G2	14,730	B2 U0 G3	11,211	B1 U0 G2	15,039	B2 U0 G3	N/A	
700mA										
04	4,869	B1 U0 G1	5,876	B1 U0 G2	4,469	B1 U0 G1	5,996	B1 U0 G2	N/A	
06	7,220	B1 U0 G2	8,714	B1 U0 G2	6,628	B1 U0 G2	8,891	B1 U0 G2	N/A	

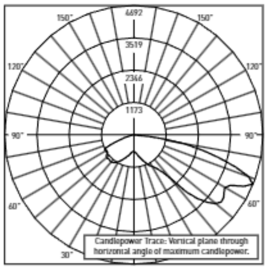
* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf.

CREE LIGHTING®

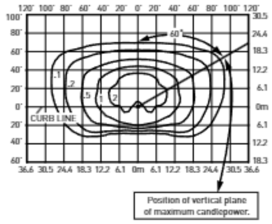
Photometry

All published luminaire photometric testing performed to IES LM-79 standards. To obtain an IES file specific to your project consult: https://www.creelighting.com/products/outdoor/area/the-edge-round-series/

3MP



RESTL Test Report #: PL10097-002B
ARE-EDG-3MP-**-06-E-UL-525-40K
Initial Delivered Lumens: 8,670



ARE-EDR-3MP-**-10-E-UL-525-40K
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 14,548
Initial FC at grade

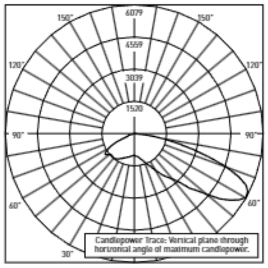
Type III Medium Distribution w/Partial BLS										
LED Count (x10)	3000K		4000K		5000K		5700K		TRL	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
350mA										
04	3,444	B1 U0 G1	4,158	B1 U0 G1	3,161	B1 U0 G1	4,240	B1 U0 G1	1,357	B0 U0 G1
06	5,107	B1 U0 G1	6,166	B1 U0 G2	4,687	B1 U0 G1	6,288	B1 U0 G2	2,012	B1 U0 G1
08	6,809	B1 U0 G2	8,221	B2 U0 G2	6,250	B1 U0 G2	8,384	B2 U0 G2	2,683	B1 U0 G1
10	8,491	B2 U0 G2	10,252	B2 U0 G2	7,794	B2 U0 G2	10,455	B2 U0 G2	3,346	B1 U0 G1
12	10,189	B2 U0 G2	12,302	B2 U0 G3	9,352	B2 U0 G2	12,546	B2 U0 G3	4,015	B1 U0 G1
525mA										
04	4,893	B1 U0 G1	5,901	B1 U0 G2	4,491	B1 U0 G1	6,024	B1 U0 G2	N/A	
06	7,255	B2 U0 G2	8,750	B2 U0 G2	6,659	B1 U0 G2	8,933	B2 U0 G2	N/A	
08	9,673	B2 U0 G2	11,667	B2 U0 G2	8,879	B2 U0 G2	11,911	B2 U0 G2	N/A	
10	12,063	B2 U0 G3	14,548	B3 U0 G3	11,072	B2 U0 G2	14,853	B3 U0 G3	N/A	
12	14,475	B3 U0 G3	17,458	B3 U0 G3	13,287	B2 U0 G3	17,824	B3 U0 G3	N/A	
700mA										
04	5,771	B1 U0 G2	6,964	B1 U0 G2	5,297	B1 U0 G1	7,106	B2 U0 G2	N/A	
06	8,557	B2 U0 G2	10,327	B2 U0 G2	7,855	B2 U0 G2	10,537	B2 U0 G2	N/A	

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf.

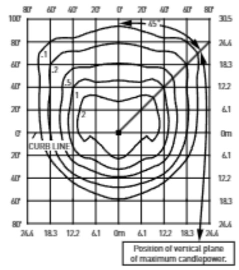
Photometry

All published luminaire photometric testing performed to IES LM-79 standards. To obtain an IES file specific to your project consult: https://www.creelighting.com/products/outdoor/area/the-edge-round-series/

4M



RESTL Test Report #: PL10270-001B
ARE-EDG-4M-**-06-E-UL-525-40K
Initial Delivered Lumens: 10,483



ARE-EDR-4M-**-10-E-UL-525-40K
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 17,504
Initial FC at grade

Type IV Medium Distribution

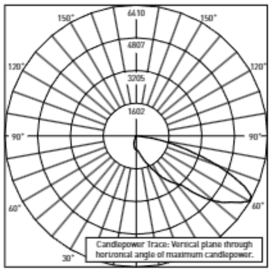
LED Count (x10)	3000K		4000K		5000K		5700K		TRL	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
350mA										
04	4,143	B1 U0 G1	5,003	B2 U0 G1	3,803	B1 U0 G1	5,102	B2 U0 G1	1,633	B1 U0 G1
06	6,144	B2 U0 G1	7,418	B2 U0 G2	5,640	B2 U0 G1	7,565	B2 U0 G2	2,421	B1 U0 G1
08	8,192	B2 U0 G2	9,891	B2 U0 G2	7,519	B2 U0 G2	10,087	B2 U0 G2	3,228	B1 U0 G1
10	10,215	B2 U0 G2	12,334	B3 U0 G2	9,377	B2 U0 G2	12,578	B3 U0 G2	4,025	B1 U0 G1
12	12,258	B2 U0 G2	14,801	B3 U0 G3	11,252	B2 U0 G2	15,094	B3 U0 G3	4,830	B1 U0 G1
525mA										
04	5,886	B2 U0 G1	7,099	B2 U0 G2	5,403	B2 U0 G1	7,248	B2 U0 G2	N/A	
06	8,729	B2 U0 G2	10,527	B2 U0 G2	8,012	B2 U0 G2	10,748	B2 U0 G2	N/A	
08	11,638	B2 U0 G2	14,037	B3 U0 G2	10,683	B2 U0 G2	14,331	B3 U0 G2	N/A	
10	14,513	B3 U0 G3	17,504	B3 U0 G3	13,322	B3 U0 G2	17,870	B3 U0 G3	N/A	
12	17,415	B3 U0 G3	21,004	B3 U0 G3	15,986	B3 U0 G3	21,444	B3 U0 G3	N/A	
700mA										
04	6,943	B2 U0 G1	8,379	B2 U0 G2	6,373	B2 U0 G1	8,549	B2 U0 G2	N/A	
06	10,296	B2 U0 G2	12,425	B3 U0 G2	9,451	B2 U0 G2	12,678	B3 U0 G2	N/A	

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf.

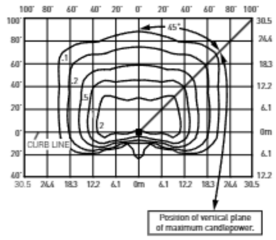
Photometry

All published luminaire photometric testing performed to IES LM-79 standards. To obtain an IES file specific to your project consult: https://www.creelighting.com/products/outdoor/area/the-edge-round-series/

4MB



RESTL Test Report #: PL10023-002B
ARE-EDG-4MB-**-06-E-UL-525-40K
Initial Delivered Lumens: 7,985



ARE-EDR-4MB-**-10-E-UL-525-40K
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 13,185
Initial FC at grade

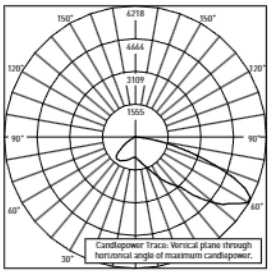
Type IV Medium Distribution w/BLS										
LED Count (x10)	3000K		4000K		5000K		5700K		TRL	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
350mA										
04	3,121	B1 U0 G1	3,768	B1 U0 G1	2,865	B0 U0 G1	3,843	B1 U0 G1	1,230	B0 U0 G1
06	4,628	B1 U0 G1	5,588	B1 U0 G1	4,248	B1 U0 G1	5,698	B1 U0 G2	1,824	B0 U0 G1
08	6,170	B1 U0 G2	7,450	B1 U0 G2	5,664	B1 U0 G2	7,598	B1 U0 G2	2,431	B0 U0 G1
10	7,695	B1 U0 G2	9,291	B1 U0 G2	7,063	B1 U0 G2	9,475	B1 U0 G2	3,032	B1 U0 G1
12	9,233	B1 U0 G2	11,149	B1 U0 G2	8,476	B1 U0 G2	11,370	B1 U0 G2	3,638	B1 U0 G1
525mA										
04	4,434	B1 U0 G1	5,348	B1 U0 G1	4,070	B1 U0 G1	5,460	B1 U0 G1	N/A	
06	6,575	B1 U0 G2	7,930	B1 U0 G2	6,035	B1 U0 G2	8,096	B1 U0 G2	N/A	
08	8,766	B1 U0 G2	10,573	B1 U0 G2	8,047	B1 U0 G2	10,794	B1 U0 G2	N/A	
10	10,932	B1 U0 G2	13,185	B1 U0 G2	10,034	B1 U0 G2	13,461	B2 U0 G2	N/A	
12	13,118	B1 U0 G2	15,821	B2 U0 G3	12,041	B1 U0 G2	16,153	B2 U0 G3	N/A	
700mA										
04	5,230	B1 U0 G1	6,311	B1 U0 G2	4,801	B1 U0 G1	6,440	B1 U0 G2	N/A	
06	7,755	B1 U0 G2	9,359	B1 U0 G2	7,119	B1 U0 G2	9,549	B1 U0 G2	N/A	

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf.

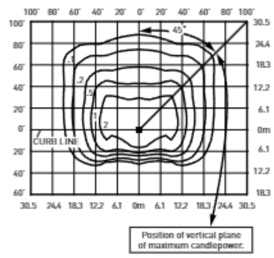
Photometry

All published luminaire photometric testing performed to IES LM-79 standards. To obtain an IES file specific to your project consult: https://www.creelighting.com/products/outdoor/area/the-edge-round-series/

4MP



RESTL Test Report #: PL10097-003B
ARE-EDG-4MP-**-06-E-UL-525-40K
Initial Delivered Lumens: 9,410



ARE-EDR-4MP-**-10-E-UL-525-40K
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 15,458
Initial FC at grade

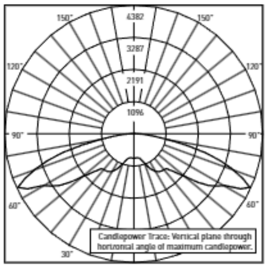
Type IV Medium Distribution w/Partial BLS										
LED Count (x10)	3000K		4000K		5000K		5700K		TRL	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
350mA										
04	3,659	B1 U0 G1	4,418	B1 U0 G1	3,359	B1 U0 G1	4,505	B1 U0 G1	1,442	B1 U0 G1
06	5,426	B1 U0 G1	6,551	B2 U0 G1	4,980	B1 U0 G1	6,681	B2 U0 G1	2,138	B1 U0 G1
08	7,234	B2 U0 G2	8,735	B2 U0 G2	6,640	B2 U0 G1	8,908	B2 U0 G2	2,851	B1 U0 G1
10	9,021	B2 U0 G2	10,892	B2 U0 G2	8,281	B2 U0 G2	11,108	B2 U0 G2	3,555	B1 U0 G1
12	10,825	B2 U0 G2	13,071	B2 U0 G2	9,937	B2 U0 G2	13,330	B2 U0 G2	4,266	B1 U0 G1
525mA										
04	5,198	B1 U0 G1	6,270	B2 U0 G1	4,772	B1 U0 G1	6,401	B2 U0 G1	N/A	
06	7,708	B2 U0 G2	9,297	B2 U0 G2	7,076	B2 U0 G2	9,492	B2 U0 G2	N/A	
08	10,278	B2 U0 G2	12,396	B2 U0 G2	9,434	B2 U0 G2	12,656	B2 U0 G2	N/A	
10	12,817	B2 U0 G2	15,458	B3 U0 G2	11,764	B2 U0 G2	15,782	B3 U0 G2	N/A	
12	15,380	B3 U0 G2	18,549	B3 U0 G2	14,117	B2 U0 G2	18,938	B3 U0 G3	N/A	
700mA										
04	6,132	B2 U0 G1	7,400	B2 U0 G2	5,628	B1 U0 G1	7,550	B2 U0 G2	N/A	
06	9,092	B2 U0 G2	10,973	B2 U0 G2	8,346	B2 U0 G2	11,196	B2 U0 G2	N/A	

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf.

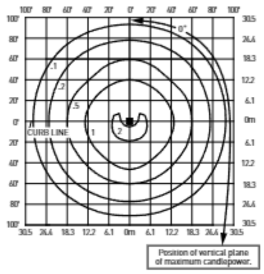
Photometry

All published luminaire photometric testing performed to IES LM-79 standards. To obtain an IES file specific to your project consult: https://www.creelighting.com/products/outdoor/area/the-edge-round-series/

5M



RESTL Test Report #: PL09285-001
ARE-EDG-5M-**-06-E-UL-700-40K
Initial Delivered Lumens: 13,136



ARE-EDR-5M-**-10-E-UL-525-40K
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 18,413
Initial FC at grade

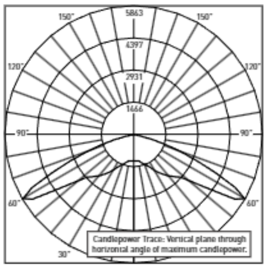
Type V Medium Distribution										
LED Count (x10)	3000K		4000K		5000K		5700K		TRL	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
350mA										
04	4,358	B3 U0 G1	5,262	B3 U0 G1	4,001	B2 U0 G1	5,367	B3 U0 G1	1,717	B1 U0 G1
06	6,463	B3 U0 G1	7,804	B3 U0 G2	5,932	B3 U0 G1	7,958	B3 U0 G2	2,547	B2 U0 G1
08	8,617	B3 U0 G2	10,405	B4 U0 G2	7,910	B3 U0 G2	10,611	B4 U0 G2	3,395	B2 U0 G1
10	10,746	B4 U0 G2	12,975	B4 U0 G2	9,864	B3 U0 G2	13,232	B4 U0 G2	4,234	B3 U0 G1
12	12,895	B4 U0 G2	15,570	B4 U0 G3	11,836	B4 U0 G2	15,878	B4 U0 G3	5,081	B3 U0 G1
525mA										
04	6,192	B3 U0 G1	7,468	B3 U0 G2	5,684	B3 U0 G1	7,625	B3 U0 G2	N/A	
06	9,182	B3 U0 G2	11,074	B4 U0 G2	8,428	B3 U0 G2	11,306	B4 U0 G2	N/A	
08	12,243	B4 U0 G2	14,766	B4 U0 G2	11,238	B4 U0 G2	15,075	B4 U0 G3	N/A	
10	15,267	B4 U0 G3	18,413	B4 U0 G3	14,014	B4 U0 G2	18,799	B4 U0 G3	N/A	
12	18,320	B4 U0 G3	22,096	B5 U0 G3	16,816	B4 U0 G3	22,558	B5 U0 G3	N/A	
700mA										
04	7,304	B3 U0 G2	8,814	B3 U0 G2	6,704	B3 U0 G2	8,993	B3 U0 G2	N/A	
06	10,831	B4 U0 G2	13,070	B4 U0 G2	9,941	B3 U0 G2	13,336	B4 U0 G2	N/A	

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf.

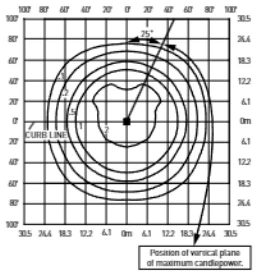
Photometry

All published luminaire photometric testing performed to IES LM-79 standards. To obtain an IES file specific to your project consult: https://www.creelighting.com/products/outdoor/area/the-edge-round-series/

5S



RESTL Test Report #: PL09286-001A
ARE-EDG-5S-**-06-E-UL-700-40K
Initial Delivered Lumens: 14,123



ARE-EDR-5S-**-10-E-UL-525-40K
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 20,459
Initial FC at grade

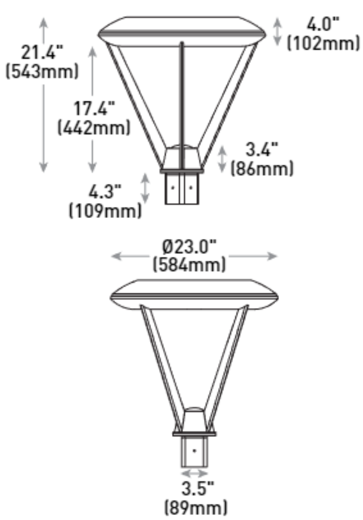
Type V Short Distribution										
LED Count (x10)	3000K		4000K		5000K		5700K		TRL	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
350mA										
04	4,843	B2 U0 G1	5,847	B3 U0 G1	4,445	B2 U0 G1	5,963	B3 U0 G1	1,908	B1 U0 G0
06	7,181	B3 U0 G1	8,671	B3 U0 G1	6,592	B3 U0 G1	8,842	B3 U0 G1	2,830	B2 U0 G0
08	9,575	B3 U0 G1	11,561	B3 U0 G2	8,789	B3 U0 G1	11,790	B3 U0 G2	3,773	B2 U0 G1
10	11,940	B3 U0 G2	14,416	B4 U0 G2	10,960	B3 U0 G2	14,702	B4 U0 G2	4,705	B2 U0 G1
12	14,328	B4 U0 G2	17,300	B4 U0 G2	13,152	B3 U0 G2	17,642	B4 U0 G2	5,646	B3 U0 G1
525mA										
04	6,880	B3 U0 G1	8,298	B3 U0 G1	6,315	B3 U0 G1	8,472	B3 U0 G1	N/A	
06	10,202	B3 U0 G2	12,305	B3 U0 G2	9,365	B3 U0 G1	12,563	B3 U0 G2	N/A	
08	13,603	B3 U0 G2	16,406	B4 U0 G2	12,486	B3 U0 G2	16,750	B4 U0 G2	N/A	
10	16,963	B4 U0 G2	20,459	B4 U0 G2	15,571	B4 U0 G2	20,887	B4 U0 G2	N/A	
12	20,356	B4 U0 G2	24,551	B4 U0 G2	18,685	B4 U0 G2	25,065	B4 U0 G2	N/A	
700mA										
04	8,115	B3 U0 G1	9,793	B3 U0 G1	7,449	B3 U0 G1	9,993	B3 U0 G2	N/A	
06	12,034	B3 U0 G2	14,523	B4 U0 G2	11,046	B3 U0 G2	14,818	B4 U0 G2	N/A	

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf.

Luminaire EPA

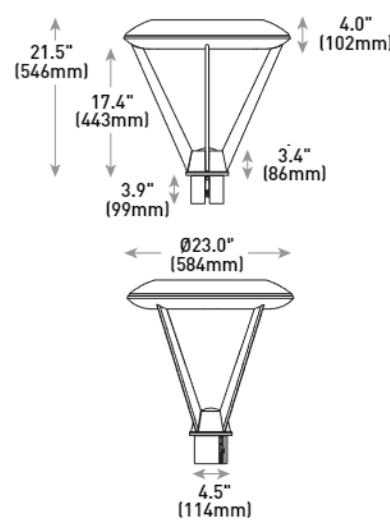
Post Top Mount – ARE-EDR-R3/R4/R5		
LED Count (x10)	Single R3	Single R4/R5
04	1.81	1.67
06	1.81	1.67
08	1.81	1.67
10	1.81	1.67
12	1.81	1.67

R4 Mount



LED Count (x10)	Weight
04	36.2 lbs. (16.4kg)
06	37.6 lbs. (17.0kg)
08	39.3 lbs. (17.8kg)
10	43.0 lbs. (19.5kg)
12	44.8 lbs. (20.3kg)

R5 Mount



LED Count (x10)	Weight
04	33.3 lbs. (15.1kg)
06	34.6 lbs. (15.7kg)
08	36.4 lbs. (16.5kg)
10	40.1 lbs. (18.2kg)
12	41.9 lbs. (19.0kg)

CREE LIGHTING
A COMPANY OF IDEAL INDUSTRIES, INC.

US: creelighting.com (800) 236-6800
Canada: creelighting-canada.com (800) 473-1234

XSP Series

XSPW™ LED Wall Mount Luminaire featuring Cree TrueWhite® Technology

Rev. Date: VersionB V6 08/03/2022

Product Description

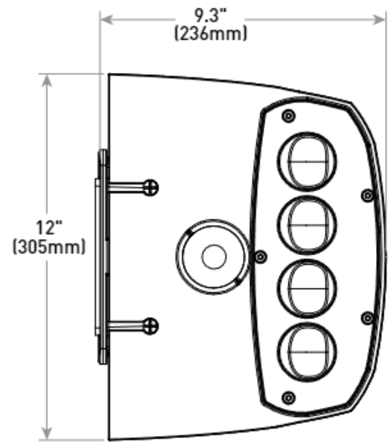
The XSPW™ LED wall mount luminaire has a slim, low profile design intended for outdoor wall mounted applications. The rugged lightweight aluminum housing and mounting box are designed for installation over standard single gang J-Boxes and mud ring single gang J-Boxes. The luminaire allows for through-wired or conduit entry from the top, bottom, sides and rear. The housing design is intended specifically for LED technology including a weathertight LED driver compartment and thermal management. Optic design features industry-leading NanoOptic® Precision Delivery Grid™ system in multiple distributions.

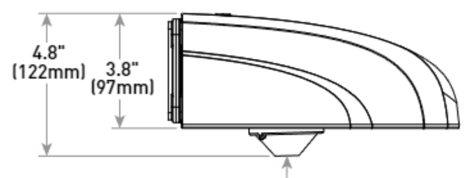
Applications: General area and security lighting

Performance Summary

NanoOptic® Precision Delivery Grid™ optic
Assembled in the USA by Cree Lighting from US and imported parts
Initial Delivered Lumens: Up to 8,475
CRI: Minimum 70 CRI (3000K, 4000K & 5700K); 90 CRI (5000K)
CCT: 3000K, 4000K, 5000K, 5700K
Limited Warranty†: 10 years on luminaire/10 years on Colorfast DeltaGuard® finish/up to 5 years for Synapse® accessories/1 year on accessories

† See http://creelighting.com/warranty for warranty terms





Multi-Level Sensor location (ordered as an option)

Lumen Package	Weight
2L, 4L, 6L	11.0 lbs. (5.0kg)
8L	11.8 lbs. (5.4kg)

Accessories

Field-Installed	
Beauty Plate WM-PLT12** - 12" (305mm) Square WM-PLT14** - 14" (356mm) Square - Covers holes left by incumbent wall packs **Synapse® SimplySnap 10V Interface** DIM10-220F - 120V-277V - Requires other Synapse components to complete system - Refer to DIM10-220F spec sheet for details	**Hand-Held Remote** XA-SENSREM - For successful implementation of the programmable multi-level option, a minimum of one hand-held remote is required

** Must specify color

Ordering Information

Example: XSPW-B-WM-2ME-2L-30K-UL-BK

XSPW	B	WM						
Product	**Version**	**Mounting**	**Optic**	**Lumen Package***	**CCT**	**Voltage**	**Color Options**	**Options**
XSPW	**B**	**WM** Wall	**2ME** Type II Medium **3ME** Type III Medium **4ME** Type IV Medium	**2L** 2,490 lumens **4L** 4,270 lumens **6L** 6,100 lumens **8L** 8,475 lumens	**30K** 3000K - 70 CRI **40K** 4000K - 70 CRI **50K** 5000K - 90 CRI **57K** 5700K - 70 CRI	**UL** Universal 120-277V **UH** Universal 347-480V **34** 347V - For use with P option only	**BK** Black **BZ** Bronze **SV** Silver **WH** White	**ML** **Multi-Level** - Refer to ML spec sheet for details - Available with UL voltage only **P** **Button Photocell** - Not available with ML or PML options - Available with UL and 34 voltages only **PML** **Programmable Multi-Level** - Refer to PML spec sheet for details - Available with UL voltage only

* Lumen Package selection codes identify approximate light output only. Actual lumen output levels may vary depending on CCT and optic selection. Refer to Initial Delivered Lumen tables for specific lumen values

Product Specifications

CREE TRUEWHITE® TECHNOLOGY

A revolutionary way to generate high-quality white light, Cree TrueWhite® Technology is a patented approach that delivers an exclusive combination of 90+ CRI, beautiful light characteristics and lifelong color consistency, all while maintaining high luminous efficacy – a true no compromise solution.

CONSTRUCTION & MATERIALS

- Slim, low profile design
- Luminaire housing specifically designed for LED applications with advanced LED thermal management and driver
- Luminaire mounting box designed for installation over standard single gang J-Boxes and mud ring single gang J-Boxes
- Luminaire can also be direct mounted to a wall and surface wired
- Secures to wall with four 3/16" (5mm) screws (by others)
- Conduit entry from top, bottom, sides, and rear
- Exclusive Colorfast DeltaGuard® finish features an E-coat epoxy primer with an ultra-durable powder topcoat, providing excellent resistance to corrosion, ultraviolet degradation and abrasion. Silver, black, white and bronze are available
- **Weight:** 2L, 4L, 6L - 11.0 lbs. (5.0kg); 8L - 11.8 lbs. (5.4kg)

ELECTRICAL SYSTEM

- **Input Voltage:** 120-277V or 347-480V, 50/60Hz
- **Power Factor:** > 0.9 at full load
- **Total Harmonic Distortion:** < 20% at full load
- Integral 10kV/5kA surge suppression protection standard
- When code dictates fusing, a slow blow fuse or type C/D breaker should be used to address inrush current
- Designed with 0-10V dimming capabilities. Controls by others
- **10V Source Current:** 0.15 mA
- Refer to Dimming spec sheet for details
- **Operating Temperature Range:** -40°C - +50°C (-40°F - +122°F)

REGULATORY & VOLUNTARY QUALIFICATIONS

- cULus Listed
- Suitable for wet locations
- Designed for downlight applications only
- Enclosure rated IP66 per IEC 60598
- ANSI C136.2 10kV/5kA surge protection, tested in accordance with IEEE/ANSI C62.41.2
- Meets FCC Part 15, Subpart B, Class A limits for conducted and radiated emissions
- Luminaire and finish endurance tested to withstand 5,000 hours of elevated ambient salt fog conditions as defined in ASTM Standard B 117
- Assembled in the USA by Cree Lighting from US and imported parts
- Meets Buy American requirements within ARRA
- RoHS compliant. Consult factory for additional details
- Dark Sky Friendly, IDA Approved when ordered with 30K CCT. Please refer to https://www.darksky.org/our-work/lighting/lighting-for-industry/fsa/fsa-products/ for most current information
- DLC and DLC Premium qualified versions available. Please refer to https://qpl.designlights.org/solid-state-lighting for most current information
- DLC Luna qualified when ordered with 4L-8L lumen packages and 30K CCT. Please refer to https://qpl.designlights.org/solid-state-lighting for most current information
- **CA RESIDENTS WARNING:** Cancer and Reproductive Harm – www.p65warnings.ca.gov

Electrical Data*

Lumen Package	CCT/CRI	System Watts	Efficacy	Total Current (A)					
		120-480V		120V	208V	240V	277V	347V	480V
2L	30K/70 CRI	20	125	0.17	0.10	0.08	0.07	0.06	0.05
	40K/70 CRI	19	131	0.16	0.09	0.08	0.07	0.06	0.04
	50K/90 CRI	24	104	0.20	0.11	0.10	0.08	0.07	0.05
	57K/70 CRI	19	131	0.16	0.09	0.08	0.07	0.06	0.04
4L	30K/70 CRI	33	129	0.28	0.16	0.14	0.13	0.10	0.07
	40K/70 CRI	31	138	0.27	0.15	0.13	0.12	0.09	0.07
	50K/90 CRI	40	107	0.34	0.20	0.17	0.16	0.12	0.09
	57K/70 CRI	31	138	0.26	0.15	0.13	0.12	0.09	0.07
6L	30K/70 CRI	51	120	0.43	0.25	0.22	0.19	0.14	0.11
	40K/70 CRI	47	130	0.40	0.23	0.20	0.18	0.14	0.10
	50K/90 CRI	60	102	0.51	0.29	0.25	0.23	0.17	0.13
	57K/70 CRI	47	130	0.40	0.23	0.20	0.17	0.14	0.10
8L	30K/70 CRI	77	110	0.65	0.38	0.32	0.28	0.22	0.16
	40K/70 CRI	72	118	0.61	0.35	0.31	0.27	0.21	0.15
	50K/90 CRI	78	89	0.66	0.37	0.33	0.29	0.22	0.16
	57K/70 CRI	71	119	0.60	0.35	0.30	0.26	0.20	0.15

* Electrical data at 25°C (77°F). Actual wattage may differ by +/- 10% when operating between 120-277V or 347- 480V +/- 10%

XSPW Series Ambient Adjusted Lumen Maintenance Factors[1]

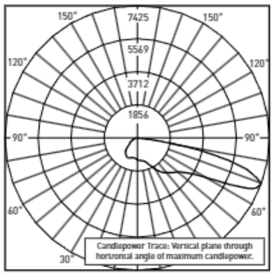
Ambient	Initial LMF	25K hr Reported[2] LMF	50K hr Reported[2] LMF	75K hr Estimated[3] LMF	100K hr Estimated[3] LMF
5°C (41°F)	1.03	0.98	0.96	0.94	0.92
10°C (50°F)	1.03	0.98	0.96	0.94	0.92
15°C (59°F)	1.02	0.97	0.95	0.93	0.92
20°C (68°F)	1.01	0.96	0.95	0.93	0.91
25°C (77°F)	1.00	0.96	0.94	0.92	0.90
30°C (86°F)	0.99	0.95	0.93	0.91	0.89
35°C (95°F)	0.98	0.94	0.92	0.90	0.88
40°C (104°F)	0.97	0.93	0.91	0.89	0.87

[1] Lumen maintenance values at 25°C (77°F) are calculated per IES TM-21 based on IES LM-80 report data for the LED package and in-situ luminaire testing. Luminaire ambient temperature factors (LATF) have been applied to all lumen maintenance factors. Please refer to the Temperature Zone Reference Document for outdoor average nighttime ambient conditions.
[2] In accordance with IES TM-21, Reported values represent interpolated values based on time durations that are up to 6x the tested duration in the IES LM-80 report for the LED.
[3] Estimated values are calculated and represent time durations that exceed the 6x test duration of the LED.

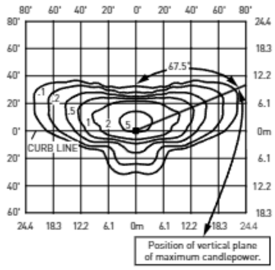
Photometry

All published luminaire photometric testing performed to IES LM-79 standards. To obtain an IES file specific to your project consult:
http://creelighting.com/products/outdoor/wall-mount/xsp-series-wall

2ME



CESTL Test Report #: PL12798-001A
XSPW-B-**-2ME-8L-40K-UL
Initial Delivered Lumens: 8,622

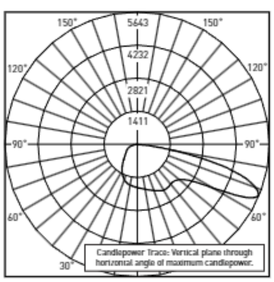


XSPW-B-**-2ME-8L-40K-UL
Mounting Height: 15' (4.6) A.F.G.
Initial Delivered Lumens: 8,475
Initial FC at grade

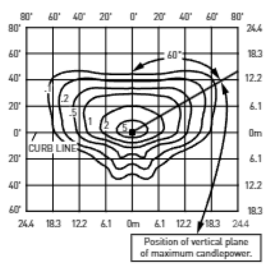
Type II Medium Distribution								
Lumen Package	3000K		4000K		5000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
2L	2,490	B1 U0 G1	2,490	B1 U0 G1	2,490	B1 U0 G1	2,490	B1 U0 G1
4L	4,270	B1 U0 G1	4,270	B1 U0 G1	4,270	B1 U0 G1	4,270	B1 U0 G1
6L	6,100	B1 U0 G2	6,100	B1 U0 G2	6,100	B1 U0 G2	6,100	B1 U0 G2
8L	8,475	B2 U0 G2	8,475	B2 U0 G2	6,925	B1 U0 G2	8,475	B2 U0 G2

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf

3ME



CESTL Test Report #: PL12366-007A
XSPW-B-**-3ME-8L-40K-UL
Initial Delivered Lumens: 8,543



XSPW-B-**-3ME-8L-40K-UL
Mounting Height: 15' (4.6m) A.F.G.
Initial Delivered Lumens: 8,475
Initial FC at grade

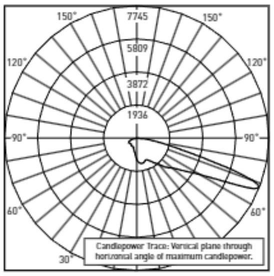
Type III Medium Distribution								
Lumen Package	3000K		4000K		5000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
2L	2,490	B1 U0 G1	2,490	B1 U0 G1	2,490	B1 U0 G1	2,490	B1 U0 G1
4L	4,270	B1 U0 G1	4,270	B1 U0 G1	4,270	B1 U0 G1	4,270	B1 U0 G1
6L	6,100	B1 U0 G2	6,100	B1 U0 G2	6,100	B1 U0 G2	6,100	B1 U0 G2
8L	8,475	B2 U0 G2	8,475	B2 U0 G2	6,925	B1 U0 G2	8,475	B2 U0 G2

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf

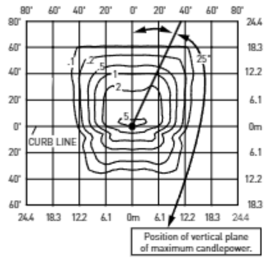
Photometry

All published luminaire photometric testing performed to IES LM-79 standards. To obtain an IES file specific to your project consult:
http://creelighting.com/products/outdoor/wall-mount/xsp-series-wall

4ME



RESTL Test Report #: PL14415-001A
XSPW-B-**-4ME-8L-40K-UL
Initial Delivered Lumens: 8,763



XSPW-B-**-4ME-8L-40K-UL
Mounting Height: 15' (4.6m) A.F.G.
Initial Delivered Lumens: 8,475
Initial FC at grade

Type IV Medium Distribution								
Lumen Package	3000K		4000K		5000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
2L	2,490	B1 U0 G1	2,490	B1 U0 G1	2,490	B1 U0 G1	2,490	B1 U0 G1
4L	4,270	B1 U0 G1	4,270	B1 U0 G1	4,270	B1 U0 G1	4,270	B1 U0 G1
6L	6,100	B1 U0 G2	6,100	B1 U0 G2	6,100	B1 U0 G2	6,100	B1 U0 G2
8L	8,475	B1 U0 G2	8,475	B1 U0 G2	6,925	B1 U0 G2	8,475	B1 U0 G2

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf

US: creelighting.com (800) 236-6800
Canada: creelighting-canada.com (800) 473-1234

A COMPANY OF *IDEAL INDUSTRIES, INC.*

EXHIBIT 20

NITROGEN CALCULATIONS AND PHOSPHORUS NARRATIVE

Phosphorus Narrative

Introduction

This document has been prepared to provide information regarding phosphorus in wastewater

Background

The Water Resources technical bulletin is required to be addressed by proposed Development of Regional Impact (DRI) proponents as a part of the Cape Cod Commission review process.

WR2 Methods

Under the WR2 method for addressing water resources the following requirement is found.

"Discharges of wastewater effluent over 2,000 gallons per day proposed anywhere in the watershed to a freshwater pond must evaluate the impact of phosphorus transported by groundwater on the pond."

This requirement applies to the proposed development because the applicant is planning for a discharge of greater than 2,000 gallons per day of wastewater from a septic system.

Phosphorus in Wastewater

Phosphorus in wastewater takes several forms (Lusk et. al. 2011) including:

1. Inorganic phosphorus from detergents and cleaners is minimal due to Massachusetts law limiting it to 0.5% max.
2. Organic phosphate from human excreta and food residues.

Phosphorus Removal – Septic Tank

Phosphorus removal in septic tank effluent explained.

- Phosphorus (P) accumulates in sludge, reducing P leaving the septic tank.
- Typical values of P include 19 milligrams per liter (mg/L) in raw wastewater, 10 mg/L in effluent leaving tank (Lowe et. al. 2007)

Continued on next page,

Phosphorus Narrative, Continued

Phosphorus Removal – Treatment System	Phosphorus removal in the proposed development treatment system (Klean-Tu NitROE system). • The manufacturers of the NitROE system, which includes secondary treatment, take no credit for P removal.
Phosphorus removal - SAS	Phosphorus removal in soil absorption system (SAS) explained. • Adsorption to mineral soil surfaces – stone in SAS. • Phosphorus is a negatively charged anion and will bind to positively charged sites on minerals, typically rich in iron, aluminium, and manganese. • Precipitation is also possible with sufficient soluble cations. Zanini et. al. (1998) found P enriched by a factor of 2 to 4 within 1 meter of an SAS pipe; Robertson and Harman (1999) observed removal rates of 23% to 99% near an SAS. • Biomats also play a role. Magdoff et. al. (1974) experiments found a 91% removal rate.
Phosphorus Removal - Soil	Phosphorus removal in soil media explained. • Low pH (acidic), non-calcareous soils were found to have enhanced P attenuation by Robertson et. al. (1998) • USDA-NRCS maps the project site as predominantly Hinckley soils, derived from granite and gneiss, which are extremely to moderately acid throughout. Granite and gneiss are rich in iron, aluminium, and manganese.

Continued on next page,

Phosphorus Narrative, Continued

Phosphorus Removal - Groundwater

Phosphorus removal in groundwater media explained.

- P can migrate in groundwater (saturated soils). Robertson et. al. (1998) noted strong attenuation in sandy soil with high gradients if soils are acidic, as is the case at the proposed development.
- Robertson (2008) found that adsorbed P could be remobilized in a calcareous sand and recommended a 300-meter setback to lakes in such cases. This proposed development and surrounding area are underlain by non-calcareous sand that limit remobilization. The SAS is also approximately 2,700 feet from the nearest pond. In addition, The State Environmental Code (Title 5) requires a 400-foot buffer from surface water supplies – reservoirs and impoundments.

Conclusion

The SAS is conservatively sited to have little to no impact on nearby surface waters, and the septic system provides multiple levels of P removal so that discharge to the groundwater is minimized.

Continued next page,

Phosphorus Narrative, Continued

References

- Crites, R., and G. Tchobanoglous. Small and Decentralized Wastewater Management Systems. San Francisco, CA: McGraw-Hill, 1998.
- Lowe, K.S., N.K. Rothe, J.M.B. Tomaras, K. DeJong, M.B. Tucholke, J.E. Drewes, J.E. McCray, and J. Munakata-Marr. “Influent Constituent Characteristics of the Modern Waste Stream from Single Sources: Literature Review.” Water Environment Research Foundation. Technical Report 04-DEC-1a, 2007.
- Lusk, M., Toor, Gurpal S., and Obreza, Tom. “Onsite Sewage Treatment and Disposal Systems: Phosphorus.” University of Florida IFAS Extension Document SL349 (2011): 1-8.
- Magdoff, F.R., J. Bouma, and D.R. Keeney. “Columns Representing Mound-type Disposal Systems for Septic Tank Effluent: II. Nutrient Transformations and Bacterial Populations.” Journal of Environmental Quality 3 (1974): 228-34.
- Robertson, W.D. “Irreversible Phosphorus Sorption in Septic System Plumes?” Ground Water 46 (2008): 51-60.
- Robertson, W.D., and J. Harman. “Phosphate Plume Persistence at Two Decommissioned Septic System Sites.” Ground Water 37 (1999): 228-36.
- Robertson, W.D., S.L. Schiff, and C.J. Ptacek. “Review of Phosphate Mobility and Persistence in 10 Septic System Plumes.” Ground Water 33 (1998): 1000–10.
- Zanini, L., W.D. Robertson, C.J. Ptacek, S.L. Schiff, and T. Mayer. “Phosphorus Characterization in Sediments Impacted by Septic Effluent at Four Sites in Central Canada.” Journal of Contaminant Hydrology 33 (1998): 405-29.

DRAFT

Water Resources Nitrogen Loading and Mitigation Worksheet

See Technical Bulletin 91-001 for further details: http://www.capecodcommission.org/regulatory/NitrogenLoadTechbulletin.pdf

Project Nitrogen Load — ***Wastewater*** — ***Proposed development***

1.

Project Title-5 wastewater flows:	7621.0	gpd		**(a)**
Actual wastewater flows:	7621.0 *			**(b)**
Average wastewater flows:	7621.0	gpd	**(a)+(b) ÷2=**	**(A)**

* Title-5 flows prescribed by TB91-001 for commercial uses

Place √ in applicable box:

Yes	**No**	
☐	x	Will the project be connected to sewer ?
☐	√	Is project Title-5 wastewater flow 10,000 gpd or greater ?

(If 'Yes', then the project must be reviewed for consistency with Additional Methods under Objective WR1)

Place √ in applicable box and multiply unsewered wastewater flow by applicable conversion factor:

☐	Standard Title-5 System (35-ppm-N)	x	0.048359
☐	DEP-approved I/A System (25-ppm-N)	x	0.034542
☐	DEP-approved I/A System (19-ppm-N)	x	0.026252
x	Groundwater Discharge (10-ppm-N)	x	0.013817

} Type of system: _ NiTROE

Wastewater nitrogen load **(Title-5 flows)** =	105.30	kg-N/yr	**(B)**
Wastewater nitrogen load **(Actual flows)** =	105.30	kg-N/yr	**(C)**

Stormwater Runoff

Town: ___ Falmouth

Recharge rate for town (inches; for natural areas from Technical Bulletin 91-001): : 21 **(RECH)**

Project site area:	7.818	acres	**(D)**
Project site wetland area:	0.000	acres	**(E)**
Project site upland area:	7.818	acres	**(F)**
Pervious unpaved upland:	3.838	acres	**(G)**
16 % using LID — Paved area:	128,560	s.f.	**(H)**
Factor may be adjusted for employment of LID → x	1.3592E-04		
=	17.4739575	kg-N/yr	**(I)**
Roof area:	44,789	s.f.	**(J)**
x	7.0792E-05		
=	3.1707	kg-N/yr	**(K)**

Fertilizer

Managed turf:	99,829	s.f.	
x	3.4019E-04		
=	33.961	kg-N/yr	**(L)**

Total Nitrogen Load

Total project nitrogen load **(Title-5 flows)**:	159.90	kg-N/yr	**(M)=**	**(B)+(I)+(K)+(L)**
Total project nitrogen load **(Actual flows)**:	159.90	kg-N/yr	**(N)=**	**(C)+(I)+(K)+(L)**
Nitrogen load per acre **(Average)**:	**20.45**	kg-N/yr/acre	**(O)=**	**(M)+(N) ÷2 ÷(F)**

Nitrogen Loading Concentration

Project nitrogen loading concentration (**Title-5 flows**):	**4.55**	ppm-N	**(P)=**	$\frac{\textbf{(M)}}{\textbf{(a)÷723.76 + (G)x(RECH)÷9.7286 + (H)÷10,594 + (K)÷0.75}}$
Project nitrogen loading concentration (**Actual flows**):	**4.55**	ppm-N	**(Q)=**	$\frac{\textbf{(N)}}{\textbf{(b)÷723.76 + (G)x(RECH)÷9.7286 + (H)÷10,594 + (K)÷0.75}}$
Project nitrogen loading concentration (**Average**):	**4.55**	ppm-N	**(R)=**	**(P)+(Q) ÷2**

next page -->

Existing (if redevelopment)

Calculate (A') through (P') as w/ (A) through (P):

Title-5 wastewater flows:		gpd	
Actual wastewater flows:	*		
Ave. wastewater flows:		gpd	**(A')**

Place √ in applicable box:

Yes	**No**	
☐	☐	Is existing development on sewer ? (If 'Yes', then go to line 2.)

☐	Standard Title-5 System
☐	DEP-approved I/A System (commercial)
☐	DEP-approved I/A System (residential)
☐	Wastewater Treatment Facility (GWDP)

		kg-N/yr	**(B')**
		kg-N/yr wastewater offsets	**(C')**
Project site area:	7.818	acres	**(D)**
Project site wetland area:	0.000	acres	**(E)**
Project site upland area:	7.818	acres	**(F)**
Pervious unpaved upland:	7.818	acres	**(G')**
Paved area:		s.f.	**(H')**
Paving runoff offset:		kg-N/yr	**(I')**
Roof area:		s.f.	**(J')**
Roof runoff offset:		kg-N/yr	**(K')**
Managed turf:		s.f.	
Fertilizer offset:		kg-N/yr	**(L')**
Existing nitrogen load (Title-5 flows):		kg-N/yr	**(M')**
Existing nitrogen load (Actual flows):		kg-N/yr	**(N')**
Nitrogen offset per acre:		kg-N/yr/acre	**(O')**

Existing nitrogen loading concentrations:

Title-5 flows		ppm-N	**(P')**
Actual flows		ppm-N	**(Q')**
Average		ppm-N	**(R')**

Resource/ Impact Based Criteria

Marine Water Recharge Areas

	Yes	No	
2.	☐	☒	Is the project in Marine Water Recharge Area (MWRA) with a nitrogen-loading limit OR in a MWRA that discharges to coastal waters with documented impaired water quality** ? *(If 'No', then go to line 3.)*

Name of Marine Water Recharge Area sub-embayment
(*from RPP Data Viewer*):

Nitrogen-loading limit** : **0.000** kg-N/year/acre **(S)**

☐ ☐ Does project's nitrogen load **(O)** exceed the existing load **(O')** <u>AND</u> the critical nitrogen load **(S)** ?
(If 'No', then go to line 3.)

Excess project nitrogen load to be mitigated: ____ kg-N/yr **(T)=** LESSER OF **(O)-(S) x(F)** <u>AND</u> **(O)-(O') x(F)**
x $8,290 /kg/yr
= $ ____ **(U)**

☐ Place √ in box if applicant intends to make this payment **(S)**
(If not checked, then the project must provide an alternative strategy for meeting its nitrogen load requirement pursuant to Objective WR3)

*** When a nitrogen-loading limit has been determined through either a Total Maximum Daily Load (TMDL), a Massachusetts Estuaries Project-accepted technical report, or specified by a Commission-approved comprehensive wastewater management plan pursuant to Objective WR3, or if impaired water quality has been documented for the receiving coastal waters, the nitrogen loading limit shall be 0 kg-N/yr per acre pursuant to Objective WR3.*

Groundwater Quality

	Yes	No	
3.	☐	☒	Does the project's nitrogen loading concentration in groundwater **(R)** exceed the greater of **5 ppm** *or* the existing concentration **(R')** ? ***(If 'Yes' and the project is not located in an Impaired Area, the project will need to provide an alternative strategy for meeting Objective WR1)***

Potential Public Water Supply Areas

	Yes	No	
4.	☐	☒	Is project in a Potential Public Water Supply Area (PPWSA) ? *(If 'No', then go to line 5.)*
	☐	☐	Does the project's nitrogen loading concentration **(R)** exceed **1 ppm** *or* the existing concentration **(R')** ? ***(If 'Yes', the project must provide an alternative strategy for meeting Objective WR1)***
	☐	☐	Does the project use, treat, generate, store or dispose of hazardous materials in excess of the greater of a) household quantities or b) existing quantities ? ***(If 'Yes', the project must provide an alternative strategy for meeting Objective WR1)***

Wellhead ProtectionAreas

	Yes	No	
5.	☐	☒	Is project in a Wellhead Protection Area (WHPA) ? *(If 'No', then go to line 6.)*
	☐	☐	Does the project's nitrogen loading concentration **(R)** exceed **5 ppm** *or* the existing concentration **(R')** ? ***(If 'Yes' and the project is not located in an Impaired Area, the project must provide an alternative strategy for meeting Objective WR1)***
	☐	☐	Does the project use, treat, generate, store or dispose of hazardous materials in excess of a) household quantities or b) existing quantities ? ***(If 'Yes', the project must provide an alternative strategy for meeting Objective WR1)***

Fresh Water Recharge Areas

	Yes	No	
6.	☐	☒	Is project wastewater disposed of within 300 feet of a stream or fresh surface water body? *(If 'No', then go to line 7.)*
	☐	☐	Is the project located in a freshwater recharge area (FWRA) hydraulically upgradient of a stream or fresh surface water body? ***(If 'Yes', the project must provide an alternative strategy for meeting Objective WR2)***

Other Potential Impacts

	Yes	No	
7.	☐	☒	Will the project withdraw more than 20,000 gallons of water per day ? ***(If 'Yes', then the project must provide documentation demonstrating that there will not be significant impacts to water levels, surface waters and wetlands)***

8. ***The project must demonstrate compliance with Objective WR4, including use of Low Impact Development to mitigate impacts of stormwater runoff and O & M plans for maintaining stormwater infrastructure and landscaping.***

EXHIBIT 21

WASTEWATER ENGINEERING SUMMARY

Wastewater Engineering Summary

Project Description

The Upper Cape YMCA development (the Facility) will be located at 487 Brick Kiln Road in Falmouth, Massachusetts. The property to be developed includes a vacant parcel of land created by a recent subdivision at 458 Brick Kiln Road that resulted in two separate parcels of land (Lot 2A and Lot 2B). The primary area proposed for development is Lot 2B, which is approximately 6.15 acres in size. Lot 2B is currently undeveloped woodland. The development will also develop (and re-develop) portions of Lot 2A consisting of an area of approximately 1.36 acres in size. The area of Lot 2A under consideration includes partially undeveloped woodland and a gravel parking area.

The proposed project will be serviced by a MassDEP Innovative Alternative wastewater treatment system (I/A system) under the Department's Piloting Use program. The I/A system will include a primary settling tank followed by aerobic digestion tanks and de-nitrification tanks, and is a proprietary system known as NitROE® manufactured by KleanTu, LLC of Bridgeville, Pennsylvania. Treated wastewater will be discharged via a pump chamber to a pressure dosed soil absorption system (SAS) consisting of GEOMATRIX GST-3724® trenches (approved by MassDEP under Transmittal No.: X280163).

Permits/Notices

With respect to wastewater, the relevant permits/notices include the following:

- Cape Cod Commission – Development of Regional Impact (DRI) review
- MassDEP – Piloting Use Certification
- Board of Health – I/A Septic System permit
- Health Department – Construction Works Disposal Permit
- Notice of Alternative Sewage Disposal System (Notice to be recorded and/or filed for registration in the chain of title of the Property)
- Special Permit to allow for greater than 7.5 gpd/1000 sf of lot area (pending Zoning Bylaw change)

Geographic Setting

A description of the geographic location and setting of the project including a Locus Map and Site Plans can be found in Exhibit 24 – Civil Engineering Plan (Sheet V-601).

Continued on next page

Wastewater Engineering Summary, Continued

Geology

As mapped by the NRCS Soil Survey, the site is underlain by Hinckley loamy sand (map unit 245B) associated with a kame terrace landform. A kame terrace is a stratified deposit from glacial meltwater streams flowing between glacial ice and an adjacent valley side.

Hydrology

The site is mostly a deep, well-drained, stratified sand with rapid infiltration. Deep test pit observations and percolation tests performed by Green Seal Environmental, LLC (GSE) (and witnessed by the Falmouth BOH in January 2023) indicate an infiltration rate of 4 minutes per inch.

The project site does NOT fall in the recently designated Nitrogen Sensitive areas as promulgated in the amendments to the Massachusetts State Environmental Code, Title 5, 310 CMR 15.000 and new Watershed Permit Regulations, 314 CMR 21.00.

Topography

Site topography is defined by mounds and depressions. As shown on the Civil Engineering Plans (Exhibit 24, sheet V-101), the site generally slopes from a high point of elevation 63 feet (North American Vertical Datum of 1988 [NAVD 88]) at the northerly property line to a low of 48 feet (NAVD 88) near the southern property line along Brick Kiln Road. Brick Kiln Road is raised approximately 2-feet higher than the surrounding topography.

Wastewater Design Flow

GSE utilized the Standard Requirements for the Siting, Construction, Inspection, Upgrade and Expansion of On-Site Sewage Treatment and Disposal Systems and for the Transport and Disposal of Septage - http://www.mass.gov/eea/docs/dep/service/regulations/310cmr15.pdf) within Title 5, to estimate wastewater design flows to be generated from the proposed facility.

Title 5, Section 15.203, System Sewage Flow Criteria, requires:

"each component of an on-site subsurface sewage disposal system shall be designed to treat sanitary sewage discharged from all buildings to be served by the system using the System Sewage Flow Design flows set forth at 310 CMR 15.203(2) through (5), except as provided in 310 CMR 15.203(6)."

Continued on next page

Wastewater Engineering Summary, Continued

Wastewater Design Flow, Continued

This section of Title 5 code includes an extensive list of common building uses/types. However, a YMCA facility with its various community services is an establishment type not listed.

Therefore, [per 310 CMR 15.203(6)], the facility may apply to MassDEP for a determination of design flow using actual water meter readings of established flows from existing or similar installations without the need for a variance. However, application has not yet been made to MassDEP at the time this document was prepared. In addition, YMCA is discussing pumping their sewage to the Falmouth wastewater treatment plant, which would make this section inapplicable to their application. As a worst-case scenario however, a discussion regarding the designed septic system follows.

Since the proposed YMCA facility use is not explicitly defined in Title 5, GSE obtained water use data from two (2) comparable facilities:

- Attleboro/Norton YMCA, Downtown Branch (63 N. Main Street, Attleboro)
- Attleboro Norton YMCA Pleasant Street (537 Pleasant Street, Attleboro).

Both these facilities have swimming pools and provide a member drop off babysitting service while they use the facility. The YMCA facility at 63 N. Main Street includes a 59,118 square foot (sf) building and the 537 Pleasant Street facility is 27,553 sf in size. Average water use records are summarized in the table below. Based on these projections, the proposed facility will generate approximately 7,612 gallons per day (gpd) of sanitary flow.

Comparable Facility	Average Water Use (per 1,000 sf gross building area)	Period of Record
63 N. Main St.	87.65 gpd	March 2016 to July 2021
537 Pleasant St.	88.71 gpd	January 2016 to July 2021
Average Use of Comparable Facilities:	**88.18 gpd**	

Continued on next page

Wastewater Engineering Summary, Continued

Local Water Supplies

Long Pond, a potable surface water supply for the Town of Falmouth, is located approximately 1,800 feet south- southwest of the proposed development at its closest point and is hydro-geologically downgradient.

MassGIS mapping indicates that the southern portion of the project site is in a Surface Water Protection (SWP) Zone B. A SWP Zone C covers a portion of the site's northwest corner. Zone B includes the land area within a ½ mile lateral distance from the upper boundary of the bank of a Class A surface water source or its tributary. Zone C includes the land area not designated as Zone A or B within the watershed of a Class A surface water source, as defined in 314 CMR 4.05(3)(a). Long Pond is a designated Class A surface water source. Strategically, GSE located the proposed SAS in the Zone C with only a portion in the Zone B.

Project Water Supply

Potable and fire protection service water will be provided by the Falmouth Water Department. Water will be delivered by a new 8-inch water main connected to a recently-installed water main servicing the "Villages at Brick Kiln" residential development abutting the site along its western boundary. GSE has estimated the daily demand to be 3,356 gallons per day.

Sewage Collection System

The Facility will be served by a gravity sewer discharging to a primary settling tank of the NitROE® treatment system. Backwash water from the facility's swimming pools will be discharged to a separate underground holding tank and not to the treatment system. Refer to **Exhibit 24** for site design plans.

Probable Collection System Future Expansion

This project will fully build out the capacity of the site and no foreseeable future expansions are contemplated. No connections to adjacent or nearby properties to share the wastewater collection and treatment infrastructure are contemplated.

Continued on next page

Wastewater Engineering Summary, Continued

Treatment Location Options

As noted earlier, the soil over the entire site is a deep, well drained, high permeability sand that is suitable for subsurface disposal of treated wastewater. The area chosen for the proposed Soil Absorption System (SAS) and required reserve area was chosen as the most reasonable location to allow development while respecting the SWP zones.

Proximity to Residences

As noted, the property to the west is currently being developed with medium-density residential housing. Land to the north and east is the location of the Falmouth High School, open space, Christ Lutheran Church of Falmouth, and a single-family residence.

Treatment & Disposal Alternatives

GSE evaluated the following treatment and disposal alternatives before selecting the NitROE® system:

- Aquapoint System consists of a primary anoxic settling system followed by a fixed film, 2 stage, aerobic moving bed bioreactor (MBBR). From there, the wastewater is treated using trickling filter then an anoxic moving bed bioreactor with nitrified trickling filter recycling. This system requires chemical addition to achieve nutrient reduction. A carbon source is dosed into the anoxic MBBR (typically in the form of glycol) to produce denitrification. Alkalinity adjustment is also typically required.

  Operation of the Aquapoint system is involved, requiring chemical pumps, dosing, and storage. Additionally, these systems are prone to fly infestation. Lastly, the cost of the Aquapoint system is double of the selected alternative.

- A membrane bioreactor/moving bed membrane bioreactor was also evaluated during the planning process.

  Membrane bioreactors (MBR) combine the activated sludge process with a membrane separation process to eliminate the need for clarifiers and effluent filters. A separate anoxic zone can be provided, or intermittent anoxic and aerobic phases can be used to allow biochemical oxygen demand (BOD)/nitrification and denitrification.

Continued on next page

Wastewater Engineering Summary, Continued

Treatment & Disposal Alternatives, Continued

The benefits include a relatively small footprint, very good BOD and suspended solids removal, and optimal nitrogen reduction with addition of alkalinity and an external carbon source. The drawbacks include biofouling of the membranes, the relatively high expenses to install and operate, and frequent membrane monitoring and maintenance are required.

Municipal Wastewater Management

The Town operates a wastewater treatment facility (WWTP) in North Falmouth on land off Route 151. The High School has a sewer lift station which discharges to the WWTP via force main. The YMCA is in negotiations with the Town and School Board relative to tie-in options.

The neighbouring properties are not connected to the High School lift station and no sewer collection systems are in the vicinity of the proposed project. The proposed I/A system for the YMCA facility is a planned private system and has not been sized to accept off-site sewage flows.

Local Wastewater Standards

The project site falls in Falmouth's Water Protection Overlay Zoning District (WPOD). As such, the amount of wastewater discharge is limited to 7.5 gpd/1000 sf. The applicant is currently pursuing a WPOD zoning change to clarify the bylaw's language and change the bylaw from only allowing a generic hydraulic loading rate to a comparative mass loading rate.

A summary of the anticipated I/A system discharge limits to be imposed by the Falmouth BOH are summarize int eh table below:

Analyte	Units
Total Nitrogen	12 – 14 mg/l
Total Suspended Solids (TSS)	30 mg/l
Turbidity	5 NTUs (Nephelometric Turbidity Units)
BOD_5 (5-day Biochemical Oxygen Demand)	30 mg/l

Continued on next page

Wastewater Engineering Summary, Continued

Local Wastewater Standards, Continued

The Cape Cod Commission has adopted a site wide mass balance loading rate with a maximum concentration goal of 5.0 mg/L for nitrate-nitrogen (NO3-N). The site-wide analysis accounts for all potential nitrogen sources including sanitary wastewater discharges (see **Exhibit 20**). To meet this standard, the wastewater effluent from the NiTROE system is assumed to be 10.0 mg/L total nitrogen.

Design Basis

Application/Description	Residential, Commercial & Institutional	
Collection System:	Gravity sewer	
Wastewater Flow:	Title V Design Flow	7,612 gpd
Typical Influent	(No kitchen flows, no garbage grinders)	
Parameter	Raw	Settled
pH	6 to 9	6 to 9
BOD_5 (mg/L)	275	250
TSS (mg/L)	250	250
TKN (mg/L - Total Kjeldahl Nitrogen)	70	70
Anticipated Effluent	**Parameter**	**Effluent Requirement**
	pH	6.5 to 8.5 units
	$CBOD_5$ (Carbonaceous BOD)	30 mg/L
	BOD_5	30 mg/L
	TSS	30 mg/L
	Total Nitrogen	<10mg/L
	Oil & Grease	15 mg/L

Wastewater Pumps

Alternating duplex submersible pumps will discharge final effluent to the SAS. Details on pump sizing and operating conditions will be provided with the wastewater equipment vendor's submittal package.

Continued on next page

Wastewater Engineering Summary, Continued

Wastewater Treatment Train	Wastewater treatment will include the following unit processes: • One 16,000-gallon enhanced settling tank compartment with two flow splitting outlet tees. • Two parallel sets of 5,000-gallon submerged aeration beds serviced by duplexed aeration blowers. • Two 7,000-gallon anaerobic denitrification beds with proprietary media including a wood chip carbon source and mollusc shell powder alkalinity adjustment. • One 8,000-gallon pump chamber with duplex pump/rail system. • 650 linear feet of GST-3724 pressure dosed leaching trenches. The I/A system will be provided with a stand-alone emergency electric generator with automatic transfer switch in compliance with Title 5 regulations.
Nitrogen Loading	Historically, NitROE® systems have produced a 90% reduction in total nitrogen achieving around 8.0 mg/l on average for the systems currently in the piloting program results (see Average Total Nitrogen Graph, below). Based on preliminary meetings with the Board of Health it is anticipated a maximum total nitrogen limit of 12 to 14 mg/l will be mandated. For the CCC sitewide nitrogen calculation we assumed 10 mg/l.
Layout & Flow Diagram	A schematic layout of the wastewater treatment systems is shown in **Exhibit 24** and on Sheet C-401 thru C-403 of the plan set.
Process Control	Process control will be fully automatic using control panels equipped with integrated Programmable Logic Controllers (PLCs) with a Human-Machine Interface (HMI), allowing plant operation from user-friendly, touch-pad computer screens. The control panels will be designed to data log performance history, record mechanical equipment run times, and log alarm conditions. Timer settings will be easily adjustable and test cycles can be run to efficiently test mechanical performance and ensure proper plant operation. Process controls will be in a weatherproof process building.

Continued on next page

Wastewater Engineering Summary, Continued

System Operation	The proposed system will be permitted through the BOH as well as MassDEP. Typically, the BOH requires NiTROE systems to have: • Licensed Operator • Periodic influent/effluent sampling • Monthly and/or annual reporting
Site Soil Explorations	The results of all site testing and evaluations including the location and log for all soil borings, deep observation holes, and percolation tests are included on the Plan set on Sheet V-601.
Chemical Usage	The NitROE® system utilizes mollusk shells in their proprietary media to provide alkalinity adjustment and no further chemical treatment is anticipated.
Ancillary Items	A description of other ancillary items, such as, but not limited to, HVAC, lighting, safety, Safety Data Sheets (SDS), fire suppression, and a compliance sampling plan will be provided with the BOH permit application.
Comparative Installations	The Town of Falmouth's Board of Health has permitted two similar installations: 1. College Light Opera Company - 6,000 gpd 2. "Villages at Brick Kiln" 40b residential development - 8,360 gpd Additionally, a 4,400 gpd system has been installed on Martha's Vineyard to service an affordable housing project.

Wastewater Engineering Summary, Continued

Nitrogen Loading

Historically, NitROE® systems have produced a 90% reduction in total nitrogen achieving around 8.0 mg/l on average for the systems currently in the piloting program results (see Average Total Nitrogen Graph, below). Based on preliminary meetings with the Board of Health it is anticipated a maximum total nitrogen limit of 12 to 14 mg/l will be mandated. For the CCC sitewide nitrogen calculation we assumed 10 mg/l.

Layout & Flow Diagram

A schematic layout of the wastewater treatment systems is shown in **Exhibit 24** and on Sheet C-401 thru C-403 of the plan set.

Process Control

Process control will be fully automatic using control panels equipped with integrated Programmable Logic Controllers (PLCs) with a Human-Machine Interface (HMI), allowing plant operation from user-friendly, touch-pad computer screens. The control panels will be designed to data log performance history, record mechanical equipment run times. and log alarm conditions. Timer settings will be easily adjustable and test cycles can be run to efficiently test mechanical performance and ensure proper plant operation. Process controls will be in a weatherproof process building.

Continued on next page,

Wastewater Engineering Summary, Continued

System Operation

The proposed system will be permitted through the BOH as well as MassDEP. Typically, the BOH requires NiTROE systems to have:

- Licensed Operator
- Periodic influent/effluent sampling
- Monthly and/or annual reporting

Site Soil Explorations

The results of all site testing and evaluations including the location and log for all soil borings, deep observation holes, and percolation tests are included on the Plan set on Sheet V-601.

Chemical Usage

The NitROE® system utilizes mollusc shells in their proprietary media to provide alkalinity adjustment and no further chemical treatment is anticipated.

Ancillary Items

A description of other ancillary items, such as, but not limited to; HVAC, lighting, safety, Safety Data Sheets (SDS), fire suppression, and a compliance sampling plan will be provided with the BOH permit application.

Comparative Installations

The Town of Falmouth's Board of Health has permitted two similar installations (see images below).

1. College Light Opera Company – 6,000 gpd
2. "Villages at Brick Kiln" 40b residential development -8,360 gpd

Additionally, a 4,400 gpd system has been installed on Martha' Vineyard to service an affordable housing project.

KleanTu® LLC
P.O. Box 206
Falmouth, MA 02541
(800) 303-4787

CONTRACT No. 80100-010-2301 for 487 Brick Kiln Road, Falmouth, MA

August 11, 2023

Terry Bauer
Green Seal Environmental, LLC
114 State Road
Sagamore Beach, MA 02562
t.bauer@gseenv.com

RE: NitROE® Wastewater Treatment System (WWTS) Sampling & Monitoring Plan
YMCA of Cape Cod, 487 Brick Kiln Road, Falmouth, MA 02540

Dear Mr. Bauer,

KleanTu® LLC is pleased to provide this proposed Sampling & Monitoring Plan for the YMCA of Cape Cod NitROE® WWTS at 487 Brick Kiln Road, Falmouth.

SAMPLING			
YEAR 1: Monthly Sampling			
YEAR 2 & Beyond: Quarterly Sampling			
For the following parameters:			
Parameter	**Influent**	**Effluent**	**Standard**
pH	X	X	6-9
BOD5	X	X	≤ 30 mg/L
TSS	X	X	≤ 30 mg/L
TKN	X		
TN*		X	≤ 11 mg/L
Alkalinity	X	X	
Field Testing**			
***The TN effluent limit of 11 mg/L or less shall be met.**			
****Field testing for pH, DO, turbidity, conductivity, color in accordance with Mass DEP Field Testing Protocol**			
INSPECTIONS			
YEAR 1: Monthly			
YEAR 2 & Beyond: Quarterly			
FLOW MEASUREMENT			
YEAR 1: Monthly			
YEAR 2 & Beyond: Quarterly			

Sincerely yours,

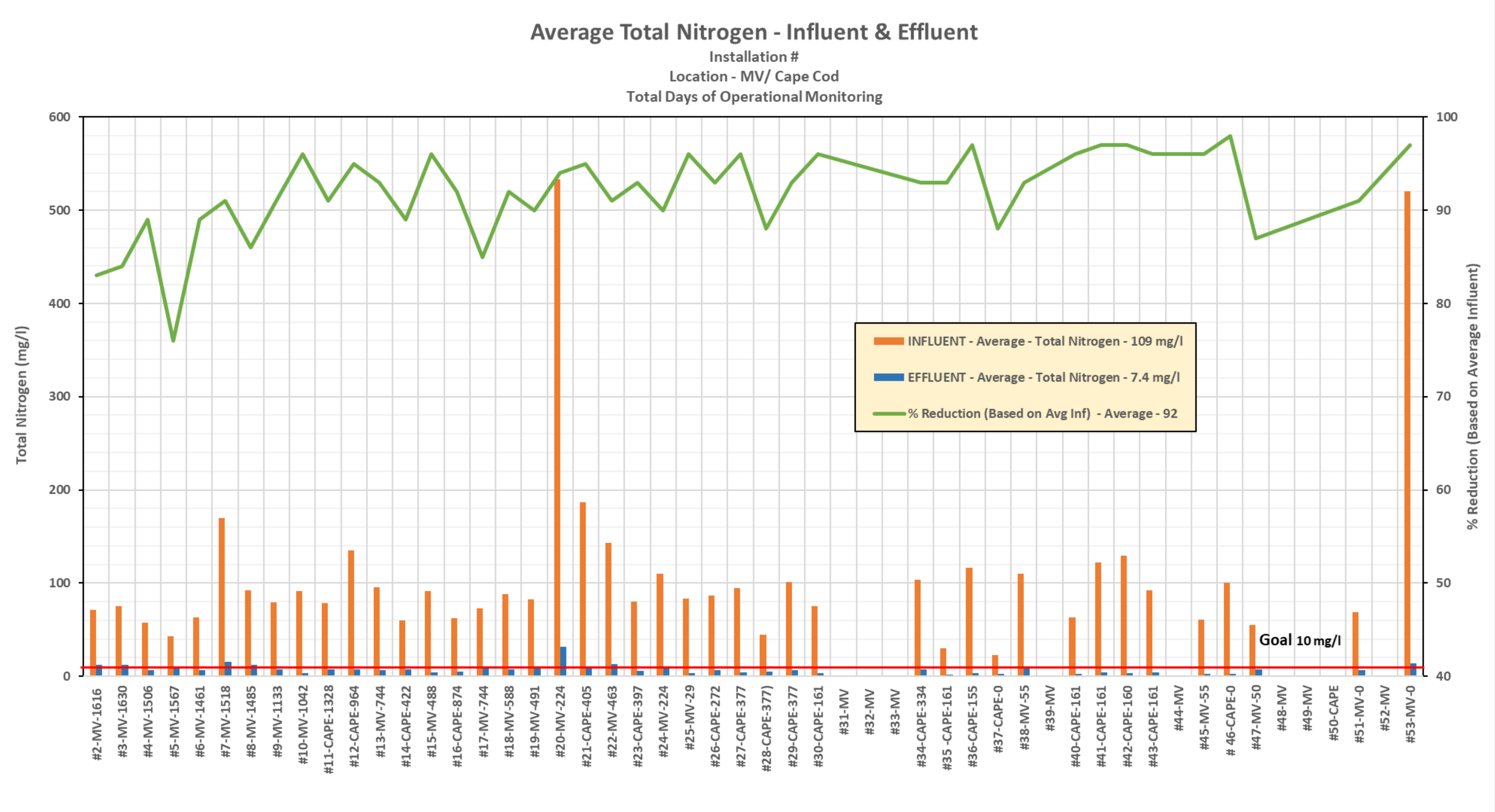
[s] Maureen A. Thomas

Maureen A. Thomas
Project Director
KleanTu® LLC
P.O. Box 206
Falmouth, MA 02540
(339) 832-2206
mthomas@kleantu.com

Cc: Stacie Peugh, President & CEO, YMCA of Cape Cod

Brick Kiln Road, Falmouth Cluster – 28 Units & 76 Bedrooms – 8,360 gpd


Brick Kiln Road, Falmouth



Average Total Nitrogen - Influent & Effluent
Installation #
Location - MV/ Cape Cod
Total Days of Operational Monitoring
Total Nitrogen (mg/l)
% Reduction (Based on Average Influent)
INFLUENT - Average - Total Nitrogen - 109 mg/l
EFFLUENT - Average - Total Nitrogen - 7.4 mg/l
% Reduction (Based on Avg Inf) - Average - 92
Goal 10 mg/l
#2-MV-1616
#3-MV-1630
#4-MV-1506
#5-MV-1567
#6-MV-1461
#7-MV-1518
#8-MV-1485
#9-MV-1133
#10-MV-1042
#11-CAPE-1328
#12-CAPE-964
#13-MV-744
#14-CAPE-422
#15-MV-488
#16-CAPE-874
#17-MV-744
#18-MV-588
#19-MV-491
#20-MV-224
#21-CAPE-405
#22-MV-463
#23-CAPE-397
#24-MV-224
#25-MV-29
#26-CAPE-272
#27-CAPE-377
#28-CAPE-377)
#29-CAPE-377
#30-CAPE-161
#31-MV
#32-MV
#33-MV
#34-CAPE-334
#35 -CAPE-161
#36-CAPE-155
#37-CAPE-0
#38-MV-55
#39-MV
#40-CAPE-161
#41-CAPE-161
#42-CAPE-160
#43-CAPE-161
#44-MV
#45-MV-55
46-CAPE-0
#47-MV-50
#48-MV
#49-MV
#50-CAPE
#51-MV-0
#52-MV
#53-MV-0

Commonwealth of Massachusetts
City/Town of Falmouth

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

Christ Lutheran Church of Falmouth; Prepared for YMCA Cape
Owner Name

#485 Brick Kiln Road
Street Address

26 01 019 002
Map/Lot #

Falmouth
City

MA
State

02536
Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade

2. Soil Survey
   Soil Web — Source
   245 B — Soil Map Unit
   Hinckley — Soil Series
   Pitted Plan — Landform
   Some limitations due to excessive permeability — Soil Limitations
   Outwash — Soil Parent material

3. Surficial Geological Report
   2009 - USGS — Year Published/Source
   Moraine/coarse deposits — Map Unit
   @ Boundary of Moraine deposits and Coarse deposits — Description of Geologic Map Unit:

4. Flood Rate Insurance Map — Within a regulatory floodway? ☐ Yes ☐ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☐ Yes ☐ No — If yes, MassGIS Wetland Data Layer: ______ Wetland Type

7. Current Water Resource Conditions (USGS): 1/13/2023 — Month/Day/ Year — Range: ☒ Above Normal ☐ Normal ☐ Below Normal

8. Other references reviewed: Town Assessors Map, Fema maps, Town Topography Maps, Cape Cod Groundwater Map
   (Zone II, IWPA, Zone A, EEA Data Portal, etc.)

Commonwealth of Massachusetts
City/Town of FALMOUTH

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: 500 (Hole #) 1/17/23 (Date) AM (Time) SUN 40°F (Weather) 41.58967 (Latitude) -70.61054 (Longitude)

1. Land Use WOODLAND (e.g., woodland, agricultural field, vacant lot, etc.) MIXED OVERSTORY (Vegetation) FEW STONES (Surface Stones (e.g., cobbles, stones, boulders, etc.)) 3-8 (Slope (%))

Description of Location: WOODLAND BEHIND CHURCH

2. Soil Parent Material: OUTWASH MORANE (Landform) SH (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body >100 feet Drainage Way >100 feet Wetlands >100 feet

Property Line >10 feet Drinking Water Well >100 feet Other ____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: ____ Depth to Weeping in Hole ____ Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0"-1"	Oi	FIBRIC	10YR 3/3		Cnc : Dpl:						
0"-6"	Ap	SANDY LOAM	7.5YR 4/4		Cnc : Dpl:				MASSIVE	FIRM	
6"-21"	Bw	SANDY LOAM	7.5YR 5/3		Cnc : Dpl:				MASSIVE	FIRM	
21"-88"	C1	SAND	2.5Y 5/4		Cnc : Dpl:		5		MASSIVE	FIRM	V. FINE
88"-144"	C2	SAND	2.5Y 7/4		Cnc : Dpl:		5		SINGLE GRAIN	LOOSE	COARSE
					Cnc : Dpl:						

Additional Notes:

Commonwealth of Massachusetts
City/Town of FALMOUTH

~~500~~ 501

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: ~~500~~ (Hole #) 1/17/23 (Date) AM (Time) SUN 40°F (Weather) 41.58967 (Latitude) -70.61054 (Longitude)

1. Land Use WOODLAND (e.g., woodland, agricultural field, vacant lot, etc.) MIXED OVERSTORY (Vegetation) FEW STONES (Surface Stones (e.g., cobbles, stones, boulders, etc.)) 3-8 (Slope (%))

Description of Location: WOODLAND BEHIND CHURCH

2. Soil Parent Material: OUTWASH MORANE (Landform) SH (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body >100 feet Drainage Way >100 feet Wetlands >100 feet

Property Line >10 feet Drinking Water Well >100 feet Other ____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: ____ Depth to Weeping in Hole ____ Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features Depth	Color	Percent	Coarse Fragments % by Volume Gravel	Cobbles & Stones	Soil Structure	Soil Consistence (Moist)	Other
0"-1"	Oi	FIBRIC	10YR 3/3		Cnc : Dpl:						
0"-6"	Ap	SANDY LOAM	7.5YR 4/4		Cnc : Dpl:				MASSIVE	FIRM	
6"-21"	Bw	SANDY LOAM	7.5YR 5/3		Cnc : Dpl:				MASSIVE	FIRM	
21"-88"	C1	SAND	2.5Y 5/4		Cnc : Dpl:		5		MASSIVE	FIRM	V. FINE
88"-141"	C2	SAND	2.5Y 7/4		Cnc : Dpl:		5		SINGLE GRAIN	LOOSE	COARSE
					Cnc : Dpl:						

Additional Notes:

4 OF 8

Commonwealth of Massachusetts
City/Town of FALMOUTH

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: 502 (Hole #) 1/17/23 (Date) AM (Time) SUN 40°F (Weather) 41.58967 (Latitude) -70.61054 (Longitude)

1. Land Use WOODLAND (e.g., woodland, agricultural field, vacant lot, etc.) MIXED OVERSTORY (Vegetation) FEW STONES (Surface Stones (e.g., cobbles, stones, boulders, etc.)) 3-8 (Slope (%))

Description of Location: WOODLAND BEHIND CHURCH

2. Soil Parent Material: OUTWASH MORANE (Landform) SH (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body >100 feet Drainage Way >100 feet Wetlands >100 feet

Property Line >10 feet Drinking Water Well >100 feet Other ____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: ____ Depth to Weeping in Hole ____ Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features Depth	Redoximorphic Features Color	Redoximorphic Features Percent	Coarse Fragments % by Volume Gravel	Coarse Fragments % by Volume Cobbles & Stones	Soil Structure	Soil Consistence (Moist)	Other
1"-0"	Oi	FIBRIC	2.5YR 3/3		Cnc : Dpl:						
0"-5"	Ap	SANDY LOAM	7.5 YR 4/4		Cnc : Dpl:				MASSIVE ~~[illegible]~~	FIRM	
5"-21"	Bw	SANDY LOAM	7.5YR 5/3		Cnc : Dpl:				MASSIVE	FIRM	
21"-55"	C1	LOAMY SAND	2.5 Y 7/3		Cnc : Dpl:				MASSIVE	FIRM	SILT LOAM LENSES VARIEGATION 10 YR 6/6
55"-96"	C2	GRAVELLY SAND	10 YR 6/6		Cnc : Dpl:		20	5	MASSIVE	FIRM*	VARIEGATION 2.5 YR 7/3
96"-135"	C3	COARSE SAND	2.5Y 7/3		Cnc : Dpl:		5		SINGLE GRAIN	LOOSE	

Additional Notes:
* DUE TO PACKING OF GRAVEL, COBBLES - OTHERWISE LOOSE

Commonwealth of Massachusetts
City/Town of FALMOUTH

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: 503 (Hole #) 1/17/23 (Date) AM (Time) SUN 40°F (Weather) 41.58967 (Latitude) -70.61054 (Longitude)

1. Land Use WOODLAND (e.g., woodland, agricultural field, vacant lot, etc.) MIXED OVERSTORY (Vegetation) FEW STONES (Surface Stones (e.g., cobbles, stones, boulders, etc.)) 3-8 (Slope (%))

Description of Location: WOODLAND BEHIND CHURCH

2. Soil Parent Material: OUTWASH MORAINE (Landform) SH (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body >100 feet Drainage Way >100 feet Wetlands >100 feet

Property Line >10 feet Drinking Water Well >100 feet Other ____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: ____ Depth to Weeping in Hole ____ Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features: Depth	Redoximorphic Features: Color	Redoximorphic Features: Percent	Coarse Fragments % by Volume: Gravel	Coarse Fragments % by Volume: Cobbles & Stones	Soil Structure	Soil Consistence (Moist)	Other
1"-0"	Oi	FIBRIC	2.5 YR 3/3		Cnc : Dpl:						
0"-7"	Ap	SANDY LOAM	7.5 YR 4/4		Cnc : Dpl:				MASSIVE	FIRM	
7"-20"	Bw	SANDY LOAM	7.5 YR 5/3		Cnc : Dpl:				MASSIVE	FIRM	
20"-58"	C1	SANDY LOAM	2.5 Y 7/3		Cnc : Dpl:				MASSIVE	FIRM	LOAMY SAND LENSES *
58"-97"	C2	GRAVELLY SAND	10 YR 6/6		Cnc : Dpl:		20	5	MASSIVE	FIRM**	VARIEGATION 2.5 YR 7/3 **
97"-125"	C3	SAND	2.5 Y 7/3		Cnc : Dpl:		5		SINGLE GRAIN	LOOSE	

Additional Notes: * REMOVE & REPLACE PER B.O.H. ** DUE TO PACKING OF GRAVEL

5 OF 8

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used (Choose one): Obs. Hole #_____ Obs. Hole #_____

- ☐ Depth to soil redoximorphic features _____ inches _____ inches
- ☐ Depth to observed standing water in observation hole _____ inches _____ inches
- ☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology) _____ inches _____ inches

_____ Index Well Number _____ Reading Date

$S_h = S_c - [S_r \times (OW_c - OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

OTHER METHOD: CAPE COD GROUNDWATER MAP, GW EL = 35.90
SURFACE ELEVATION = 60±
GROUNDWATER DEPTH = 24'±

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

   a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

   ☒ Yes ☐ No

   b. If yes, at what depth was it observed (exclude O, A, and E Horizons)? Upper boundary: 20± inches Lower boundary: ~~120+~~ 125+ inches

   c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

6 OF 8

Commonwealth of Massachusetts
City/Town of Falmouth

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

Jack O'Leary
Signature of Soil Evaluator

1/13/2023
Date

SE1785
Typed or Printed Name of Soil Evaluator / License #

6/30/2025
Expiration Date of License

BERNIE SULLIVAN
Name of Approving Authority Witness

FALMOUTH HEALTH DEPARTMENT
Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

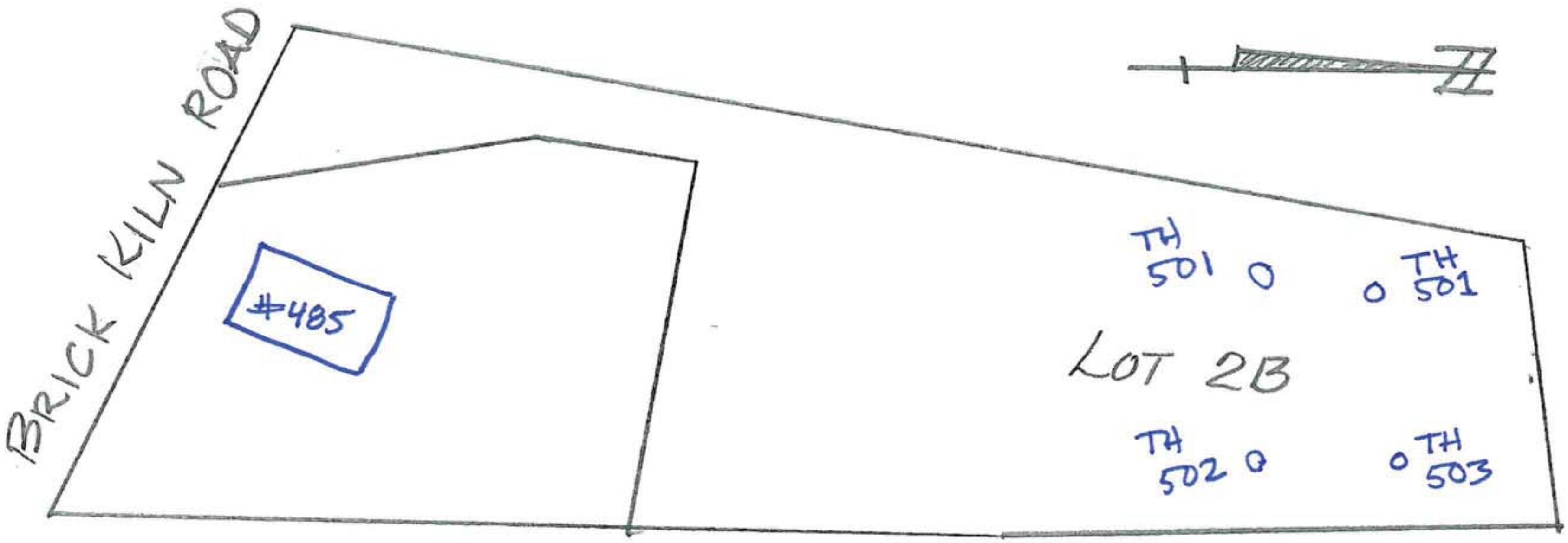
Field Diagrams: Use this area for field diagrams:

7 OF 8

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Field Diagrams

Use this sheet for field diagrams:



Commonwealth of Massachusetts City/ Town of Falmouth
Percolation Test
Form 12

Percolation test results must be submitted with the Soil Suitability Assessment for On-site Sewage Disposal. DEP has provided this form for use by local Boards of Health. Other forms may be used, but the information must be substantially the same as that provided here. Before using this form, check with the local Board of Health to determine the form they use.

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

tab

return

A. Site Information

Christ Lutheran Church of Falmouth, Prepared for YMCA Cape Cod - buyer (under purchase and sales agreement)
Owner Name

#485 Brick Kiln Road
Street Address or Lot #

Falmouth	MA	02536
City/Town	State	Zip Code

GREEN SEAL / ATTN. JACK O'LEARY — 508-888-6034
Contact Person (if different from Owner) — Telephone Number

B. Test Results

	1/17/23 (Date)	10 AM (Time)	1/17/23 (Date)	11 AM (Time)
Observation Hole #	TH 502		TH 501	
Depth of Perc	48"		46"	
Start Pre-Soak	10:20		11:06	
End Pre-Soak	C/N MAINTAIN		11:21	
Time at 12"			11:21	
Time at 9"			11:30	
Time at 6"			11:40	
Time (9"-6")			10	
Rate (Min./Inch)	< 2 minutes per inch		4 minutes per inch	
	Test Passed: ☒ Test Failed: ☐		Test Passed: ☒ Test Failed: ☐	

JACK O'LEARY
Test Performed By:

BERNIE SULLIVAN
Board of Health Witness

Comments:

Percolation rate of less than 2 mpi assigned to the coarse sand layer C encountered. Percolation test completed after 24 gallons of water poured in less than 15 minutes unable to maintain a depth of 9 inches during pre-soak stage (310 CMR 15.105(6)).

EXHIBIT 22

STORMWATER REPORT

Table of Contents

Stormwater Narrative

Introduction

Green Seal Environmental, LLC (GSE) has prepared this Stormwater Report as an exhibit to the Development of Regional Impact submittal for YMCA Cape Cod (hereinafter "Applicant"). Please note that GSE utilized HydroCAD® modelling software to analyze the proposed development's stormwater system.

The Applicant proposes a new YMCA development at 487 Brick Kiln Road in Falmouth, Massachusetts. This development will include construction of a regional YMCA recreational and healthcare facility to serve the Upper Cape area. The proposed development will consist of a principal structure hosting recreational and healthcare programming, a mechanical/storage outbuilding, and associated walks, activity areas and parking fields.

The Applicant has entered into a Purchase and Sale Agreement with Christ Lutheran Church of Falmouth (CLCF - owners of 485 Brick Kiln Road, please see DRI Exhibit 7 for a copy of the Agreement) to purchase a portion of their property by creating a separate parcel of land through the Approval Not Required (ANR) subdivision process allowed under the Massachusetts Subdivision Control Law (M.G.L. Chapter 41, subsection 81L). In addition to the ANR parcel, the parties have agreed to a lease for access and to redevelop a portion of the remaining CLCF property for shared parking.

The proposed development will alter approximately 6.21 acres of land and create approximately 2.92 acres of new impervious area that will consist of building structures, walkways, and parking/access pavement. The existing CLCF parking area (0.433 acres) will be redeveloped and upgraded for shared parking. Therefore, the total imperious area for the development is 3.35 acres. Stormwater from impervious areas will be collected, treated, and discharged on-site using Low Impact Development (LID) practices.

The development will be serviced by the Falmouth municipal water supply. Sanitary wastewater will be collected and treated on-site with a Title V approved Innovative/Alternative septic system, which will be permitted though the Falmouth Board of Health and MassDEP.

Continued next page

Stormwater Narrative, Continued

Existing Conditions

The proposed YMCA parcel (Lot 2B) is approximately 6.15 acres in size. The lot has a “pan handle” shape with the handle area connecting Brick Kiln Road along the CLCF property’s western side. Currently, Lot 2B is undeveloped and supports a typical Cape Cod woodland community consisting of pine and oak tree cover and some limited invasive plant species. Figure 1 presents an aerial photo of the development area.

The development site is abutted to the west by a residential development, approved under the Massachusetts Chapter 40B Regional Planning statute, which is currently under construction. Land owned by the Town of Falmouth, which includes both the High School and undeveloped land, abuts the north and east sides. A residential property (475 Brick Kiln Road) also abuts the proposed development in the east. Brick Kiln Road creates the southern boundary. Directly across Brick Kiln Road is land used as a protective buffer to the Long Pond surface water supply. Long Pond is located approximately 1,800 feet south, southwest of the proposed development at its closest point (west side development entrance driveway) and the main body of the proposed development is approximately 2,000 feet away (0.35 miles).

The subject parcel is in the Falmouth Agricultural AA Zone and is also within the Water Resources Protect Overlay District and Wildlife Corridor Migration Area 1. The property is transected by Massachusetts Surface Water Protection Zones B and C. Figure 2 presents the Falmouth Overlay Districts Map.

United States Department of Agriculture (USDA) mapping indicates the proposed development is underlain by Hinckley loamy sand (map unit 245B), which is typically associated with a kame terrace landform (a kame terrace is a stratified deposit from glacial meltwater streams flowing between glacial ice and an adjacent valley side). Figure 3 presents the USDA’s National Resource Conservation Service (NRCS) Soil Map for the development area obtained through MassMapper (a MassGIS internet site). These soils are defined as excessively well drained and are in Hydrological Group A (soils having high infiltration rates even when thoroughly wetted).

Continued next page

Stormwater Narrative, Continued

Existing Conditions, continued

GSE conducted excavations (test pits) on Lot 2A and Lot 2B on January 17, 2023, that confirmed the NRCS mapping. Please see DRI submittal Exhibit 24 (Civil Engineering Plans, Sheet V-601) for the soil logs generated during that event.

The parcel does not contain nor is it within 100-feet of a wetland resource area. National Heritage and Endangered Species Program (NHESP) mapping does not show Estimated or Priority Habitats of Rare Species, nor does it contain potential or certified vernal pools. Figure 4 presents a NHESP Map of the proposed development area.

The proposed development is located in FEMA Flood Zone X (Map 25001C0728J), which are areas outside the 0.2-percent-annual chance floodplain, areas within the 0.2-percent-annual-chance floodplain, and areas of 1 percent-annual-chance flooding where average depths are less than 1 foot. Figure 5 presents FEMA Flood Zone Maps for Falmouth, MA.

Existing topography creates four sub-watersheds that are denoted as "WSA" in the pre-development hydraulic model used. These watersheds drain to study points (denoted as "SP") where run-off exits the property. An Existing Conditions Watershed Map is presented in the HydroCAD model in Appendix A.

Proposed Conditions

The Applicant proposes to construct a 2-story YMCA facility near the center of the property. A second, smaller shed type building east of the YMCA building will be utilized for "back of the house" facilities including controls and blowers for a proposed wastewater treatment plant, controls for an emergency generator and pool backwash storage tank, and pool chemical storage. A pressure dosed wastewater treatment system leaching field will be located north of the YMCA building and will be covered by turf grass.

The Applicant also proposes outdoor age-delineated activity areas on the west side of the building. These areas will be covered with permeable pavers. The children's playground will be covered with a rubberized surface for safety. This rubber surface is considered impervious.

Continued next page

Stormwater Narrative, Continued

Proposed Conditions, continued

Shared parking area will be located on both Lot 2A and Lot 2B. Access for parking and maintenance on Lot 2A will be via an easement. The parking field will consist of bituminous pavement with 9-foot x 18-foot parking stalls and 24-ft wide drive aisles. The drive aisles are separated by 10-ft wide landscaped interior islands and rain gardens. A central walk will transect the parking field from the CLCF church building to the YMCA building.

Interior islands will provide greenspace and will be utilized for stormwater treatment using ACF Turret®, ACF Foxhole®, and Focal Point® bioretention technologies manufactured by Ferguson Waterworks. Informational product data including the Focal Point® rain gardens and infiltrator are identified in the HydroCAD model and in Exhibit 24 of the DRI submittal (Civil Engineering Plans, Sheet C-502).

Treated run-off from the rain gardens will be infiltrated in subsurface R-Tank® chambers as manufactured by Ferguson Waterworks.

In areas where the use of a rain garden is not practicable, the Applicant is proposing the use of hooded deep sump catch basins (denoted as CB) followed by oil/grit separators (denoted as OGS) prior to subsurface infiltration.

Surface runoff from the proposed development is divided into 19 individual sub-catchment areas, SCA-1 through SCA-19. Run-off from each sub-catchment area flows to a pretreatment device such as a catch basin, ACF Turret or ACF Foxhole. Sub-catchment areas UC-1 through UC-4 represent uncontrolled run-off.

Continued next page

Stormwater Narrative, Continued

Proposed Conditions, continued

The figure in the Post-Development HydroCAD® model (Appendix A) delineates sub-catchment areas. The proposed development will use the following stormwater Best Management Practices (BMPs):

- Non-Structural
    - Good housekeeping
    - Parking area sweeping
    - Periodic inspections and maintenance
- Pre-treatment Practices
    - ACF Environmental' s Turret and Foxhole devices
    - Hooded Deep sump catch basins.
- Treatment Practices
    - ACF Environmental' s Focal Point Rain Garden System
    - Subsurface infiltration

Stormwater Analysis Methodology

GSE completed pre-development and post-development stormwater analyses for the following storm events using the HydroCAD® stormwater modelling software, Version 10.00.

- 2-year,
- 10-year,
- 25-year,
- 100-year, and
- Type III, 24-hour event.

This stormwater modelling software was developed using Technical Release (TR) 55 and TR-20 modelling protocols, which are widely used and accepted in engineering design practice.

Continued next page

Stormwater Narrative, Continued

Stormwater Analysis Methodology, continued

The time of concentration for pre-development sub-watersheds was calculated assuming sheet flow followed by shallow concentrated flow. In all cases, the minimum time of concentration was set at a period of 6 minutes.

The Applicant proposes two rain garden sizes for the development: Type A (44.5 sq. ft.) and Type B (68.7 sq. ft.). A proprietary rain garden matrix will be contained by a 40 mil HDPE root barrier. Rain garden cross sections are shown on the Civil Engineering Plans in Exhibit 24 (Sheet C502) and include the following layers:

- 3" of shredded hardwood mulch
- 18" of proprietary Focal Point® Media
- 6" of pea stone
- R-tank Chamber

As noted earlier, the HydroCAD® reports for proposed/post-development conditions along with corresponding Watershed Maps are included in Appendix A.

Permeable paver curve number calculations follow.

Permeable Paver Curve Number (CN) Calculation:

SCS run-off equation: $Q = \frac{(P-0.2S)^2}{(P+0.2S)}$ Where $S = \frac{1000}{CN-10}$

or $CN = \frac{1000}{S+10}$

"S" is the available storage in the media under the pavers in inches. For this design there is 1" sand plus 4" pea stone over 12" crushed stone for a total of 17". Using a void space of 40% results in the following: S= 17" x 0.40% or 6.8".

When added into the equation above the resulting CN value is 59.5. Accordingly, the permeable pavers were modelled with a CN value of 60. Please note that this calculation is conservative and does not account for the native sand underlaying the paver base.

Continued next page

Stormwater Narrative, Continued

Results	Analysis of the stormwater management system's discharge points indicates that there will be no increase in stormwater discharge from the proposed development from pre-development to post-development conditions for the storm events analyzed.

Massachusetts Stormwater Management Standards

Stormwater Handbook

The Massachusetts Stormwater Handbook (Volumes 1, 2 and 3) provides guidance when designing stormwater collection and treatment systems. Volume 1 provides the legal and regulatory framework for the Stormwater Handbook. Volume 2 discusses the elements of stormwater management, particularly Best Management Practices (BMPs). Volume 3 describes how to prepare a Stormwater Report. Chapter 1 of Volume 1 contains Stormwater Standards.

Standards

The Massachusetts Stormwater Management Policy (the Policy) established ten stormwater management standards that need to be considered for new or redevelopment projects. The following sections present the Stormwater Standards, identify how each standard applies to the proposed development, and how the stormwater system design complies with each applicable standard.

Standard 1- No Untreated Discharges

No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in the wetlands or waters of the Commonwealth.

All stormwater from the altered development area will be directed through stormwater management systems which provide the required treatment prior to infiltration and groundwater discharge. Please note that no wetlands or Waters of the Commonwealth are located on or near the proposed development that could be affected by development runoff.

Continued next page

Massachusetts Stormwater Management Standards, Continued

Standard 2- Peak Rate

Stormwater management systems shall be designed so that the post-development peak discharge rates do not exceed the pre-development discharge rates.

The stormwater management system for the proposed development has been designed so that the peak stormwater runoff rate during proposed conditions (post-development) does not exceed the existing runoff rate (pre-development). The pre-development and post development peak stormwater flows leaving the development have been calculated for the 2-, 10-, 25-, 50- and 100-year (Type III, 24-hour) storm events.

Comparison of the off-site peak flow for the pre-development and post-development conditions are presented in the following table.

Peak Flow Rate Comparisons (cubic feet per second – cfs)

Study Point	2-Year		10-Year		25-year		50-Year		100-Year	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
# 1	0.00	0.00	0.00	0.00	0.01	0.01	0.03	0.02	0.14	0.07
# 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.15	0.02
# 3	0.00	0.00	0.01	0.00	0.04	0.01	0.14	0.03	0.59	0.13
# 4	0.13	0.00	1.45	0.02	2.97	0.30	4.34	1.12	6.70	6.61

<u>The Stormwater Management Policy requires peak runoff rates to be attenuated for the 2-year and 10-year storm events</u>. In addition to meeting those requirements, the peak rates are also attenuated for all storm events analyzed.

Continued next page

Massachusetts Stormwater Management Standards, Continued

Standard 3-Loss of Annual Recharge

Loss of annual recharge to groundwater shall be eliminated or minimized using environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. MassDEP only requires recharge to the maximum extent practicable where recharge volume may cause or contribute to groundwater contamination.

The proposed development is located within Falmouth's Water Protection Overlay District and is required to infiltrate run-off on-site.

Standard 4-Water Quality (TSS removal rates)

Stormwater Management Systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS).

The stormwater management system includes both non-structural and structural stormwater BMPs (including pre-treatment) that are designed to capture a water quality volume of 1 inch over the entire development's impervious surfaces excluding the impervious roof areas. The runoff water volume calculation and oil/grit separator design calculations are provided below.

The Water Quality Volume (WQV) calculation is as follows:

WQV = [D_{WQ}/(12") x *new impervious area]*
where D_{WQ} is the water quality depth (1") over the entire developed area (Local).

Accordingly:
WQV= 1"/ 12" * 83,983 sf= 6,999 cubic feet (cf).

However, the WQV must be calculated for each of the rain gardens to assure compliance as follows:

Type A Focal Point Rain Gardens
FP-1 > SCA-6 & SCA-8
WQV = 10,427 sf / 12"/ft = 869 cf (Storage Available =1,640 cf)
FP-2 > SCA-11
WQV = 5,857 sf / 12"/ft = 488 cf (Storage Available =1,220 cf)

Continued next page

Massachusetts Stormwater Management Standards, Continued

Standard 4, continued

FP-3 > SCA-6 & SCA-9
WQV = 7,864 sf x 12”/ft = 655 cf (Storage Available =1,510 cf)

Type B Focal Point Rain Gardens
FP-4 > SCA-12
WQV = 8,878 sf / 12”/ft = 734 cf (Storage Available =573 cf)
FP-5 > SCA-10
WQV = 7,484 sf /12”/ft = 654 cf (Storage Available =918 cf)
FP-6 > SCA-7
WQV =7,529 / 12”/ft = 627 cf (Storage Available =1,161 cf)

In compliance with design guidelines presented in the Stormwater Handbook (Volume 2), the oil/grit separators (OGS) are designed to provide 400 cf of storage in the first chamber per acre of impervious surfaces (excluding roof areas).

OGS-1
The amount of impervious pavement contributing runoff to area OGS-1 is 0.735 acres. Therefore, the first chamber size in OGS-1 = 0.735 impervious acres x 400 cf/ac = 294 cf or 2,200 gallons. GSE will use a 3,500-gallon OGS for this area.

OGS-2
The amount of impervious pavement contributing runoff to area OGS-2 is 0.154 acres. Therefore, the first chamber size in OGS-2 = 0.154 impervious acres x 400 cf/ac = 62 cf or 460 gallons. GSE will use a 3,500-gallon OGS for this area.

OGS-3
The amount of impervious pavement contributing runoff to OGS-3 is 0.735 acres. Therefore, the first chamber size in OGS-3 = 0.735 impervious acres x 400 cf/ac = 294 cf or 2,200 gallons. GSE will use a 3,500-gallon OGS for this area.

The stormwater management system is designed to remove 80% of the average annual post-construction load of TSS). The TSS removal calculations demonstrating greater than 80% TSS removal are included as Appendix B.

Continued next page

Massachusetts Stormwater Management Standards, Continued

Standard 4, continuedcontinued	A Long-term Operation and Maintenance Plan has been prepared outlining maintenance tasks and frequency required to promote reliable operation of the stormwater treatment system BMPs. The Long-Term Operations and Maintenance Plan is provided in Appendix C.
Standard 5- Land Use with Higher Potential Pollutant Loads	*For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable.* According to 310 CMR 22.00, The Massachusetts Drinking Water Regulations, the proposed development (Recreation and Health Care Facility) does not qualify as a Land Use with Higher Potential Pollutant Loads. Therefore, this Standard does not apply to the proposed development.
Standard 6- Critical Areas (Zone II discharges)	*Stormwater discharges within the Zone II or Interim Wellhead Protection Area (IWPA) of a public water supply and stormwater discharges near or to any other critical area require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook.* Although the proposed development is not located within a Zone II or IWPA it is located partially within a Zone B to a surface water supply (Long Pond) where treated stormwater will be infiltrated below the ground surface; therefore, this Standard applies. GSE has provided a design that meets all other applicable Stormwater Standards which includes 80% TSS removal, oil removal through OGS structures and subsurface infiltration on-site. Accordingly, the design meets this Standard for discharge in critical areas.

Continued next page

Massachusetts Stormwater Management Standards, Continued

Standard 7-Redevelopment

A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.

Although a portion of the development can be considered redevelopment (upgrade and expansion of shared parking), the overall development cannot. Therefore, this Standard does not apply.

Standard 8-Erosion and Sedimentation Control Plan

A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.

A Sediment and Erosion Control Plan is included in Exhibit 24 of the DRI submittal (Civil Engineering Drawings, Sheet C-109). Proposed erosion and sedimentation controls include perimeter erosion control barriers, stabilized construction entrance, stockpile management, and the stabilization of disturbed areas as well as good housekeeping measures. A written Construction Period Erosion & Sedimentation Pollution Prevention Plan is provided in Appendix D.

Continued next page

Massachusetts Stormwater Management Standards, Continued

Standard 9- O&M Plan

A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.

The Long-Term Operation and Maintenance Plan (O&M Plan) details the activities and good housekeeping practices required to maintain the effectiveness of the proposed stormwater system. The O&M Plan in Appendix C includes the following general practices as part of the long-term operations and maintenance of the stormwater system:

- Street Sweeping. Street Sweeping will take place to enhance TSS removal for all paved areas and will be conducted at designated periods, with the appropriate equipment, to increase TSS removal efficiencies.
- Good Housekeeping. In general, the development will be kept clean of litter, debris, and sediments with the establishment of regular inspections, litter clean-ups, and street sweeping. Landscaping at the development will be maintained with regular mowing, repair of erosion, removal of sedimentation, etc. Stormwater structures will be inspected and cleaned per the schedule outlined in the O&M Plan.
- Operational Controls. The development will operate in accordance with applicable permits, BMPs and the O&M Plan.

Standard 10- Illicit Discharges to the Stormwater Management System

All illicit discharges to the stormwater management system are prohibited.

The development will be constructed in accordance with the design plans and will not create illicit discharges (discharges that are not entirely comprised of stormwater) to the stormwater management system.

Continued next page

Massachusetts Stormwater Management Standards, Continued

Illicit Discharges to the Stormwater Management System, continued	Excluded from the definition of Illicit discharge under this Standard are the following discharges: • Firefighting, • Water line flushing, • Landscape irrigation, • Uncontaminated groundwater, • Potable water sources, • Foundation drains, • Air conditioning condensation, • Footing drains, • Individual resident car washing, • Flows from riparian habitats and wetlands, • Dechlorinated water from swimming pools, • Water used for street washing, and • Water used to clean residential buildings without detergents.

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

Checklist for Stormwater Report

A. Introduction

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

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

The Stormwater Report must include:

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

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

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

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

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

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

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

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

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

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

Registered Professional Engineer's Certification

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

Registered Professional Engineer Block and Signature

COMMONWEALTH OF MASSACHUSETTS
STUART D.
CLARK
CIVIL
No. 40697
REGISTERED
PROFESSIONAL ENGINEER

2-14-24

Signature and Date

Checklist

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

☒ New development

☐ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

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

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

Standard 1: No New Untreated Discharges

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

Checklist (continued)

Standard 2: Peak Rate Attenuation

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

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

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

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

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

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

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

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

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

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

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

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

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

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

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

Checklist (continued)

Standard 3: Recharge (continued)

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

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

Standard 4: Water Quality

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

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

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

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

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

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

Checklist (continued)

Standard 4: Water Quality (continued)

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

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

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

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

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

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

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

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

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

☐ All exposure has been eliminated.

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

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

Standard 6: Critical Areas

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

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

Checklist (continued)

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

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

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

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

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

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

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

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

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

Checklist (continued)

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

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

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

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

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

Standard 9: Operation and Maintenance Plan

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

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

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

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

Standard 10: Prohibition of Illicit Discharges

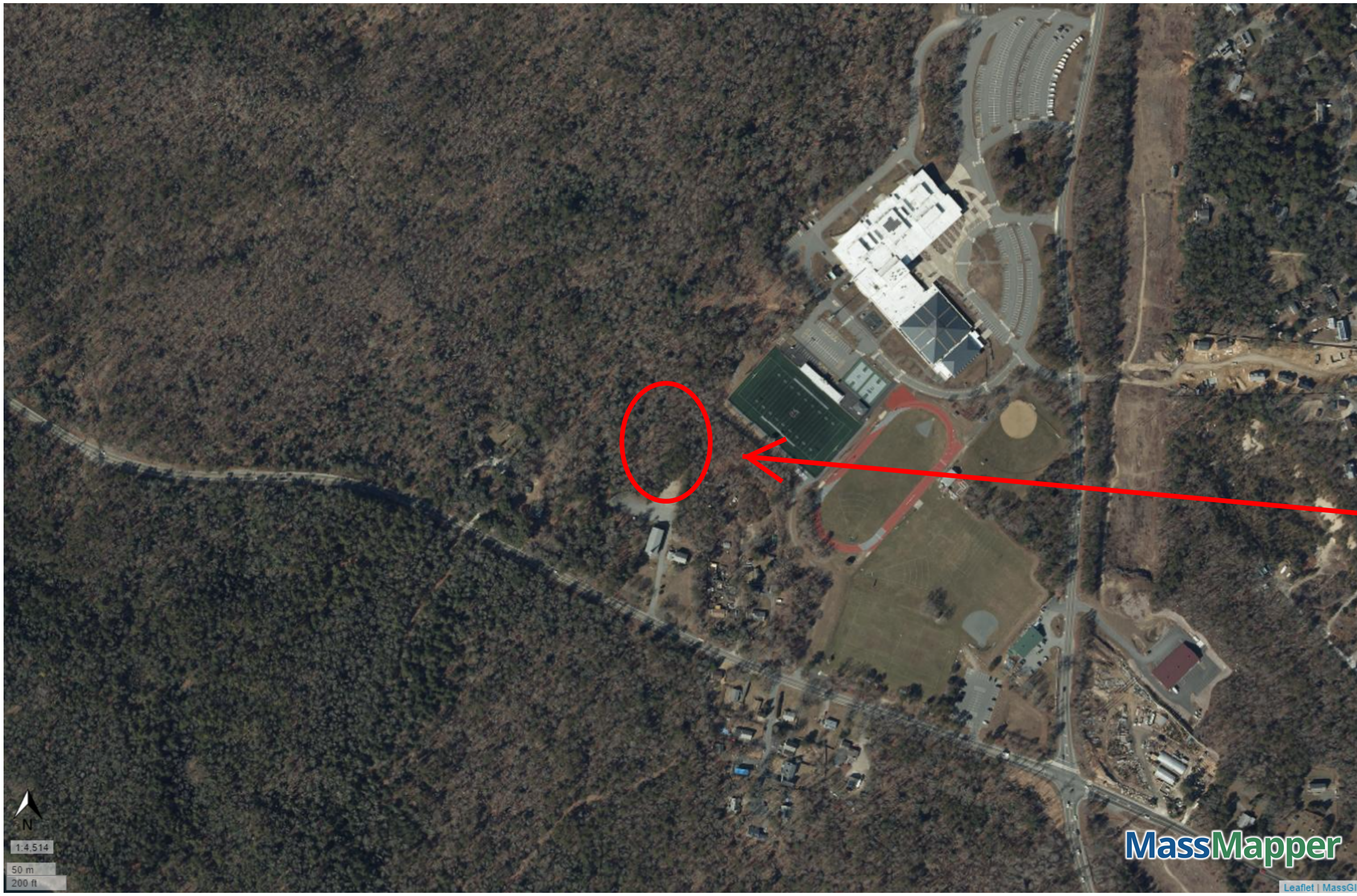
☐ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☒ An Illicit Discharge Compliance Statement is attached;

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

FIGURES

2021 Aerial Photo



2021 Aerial Imagery
Property Tax Parcels

Proposed
Development
Location

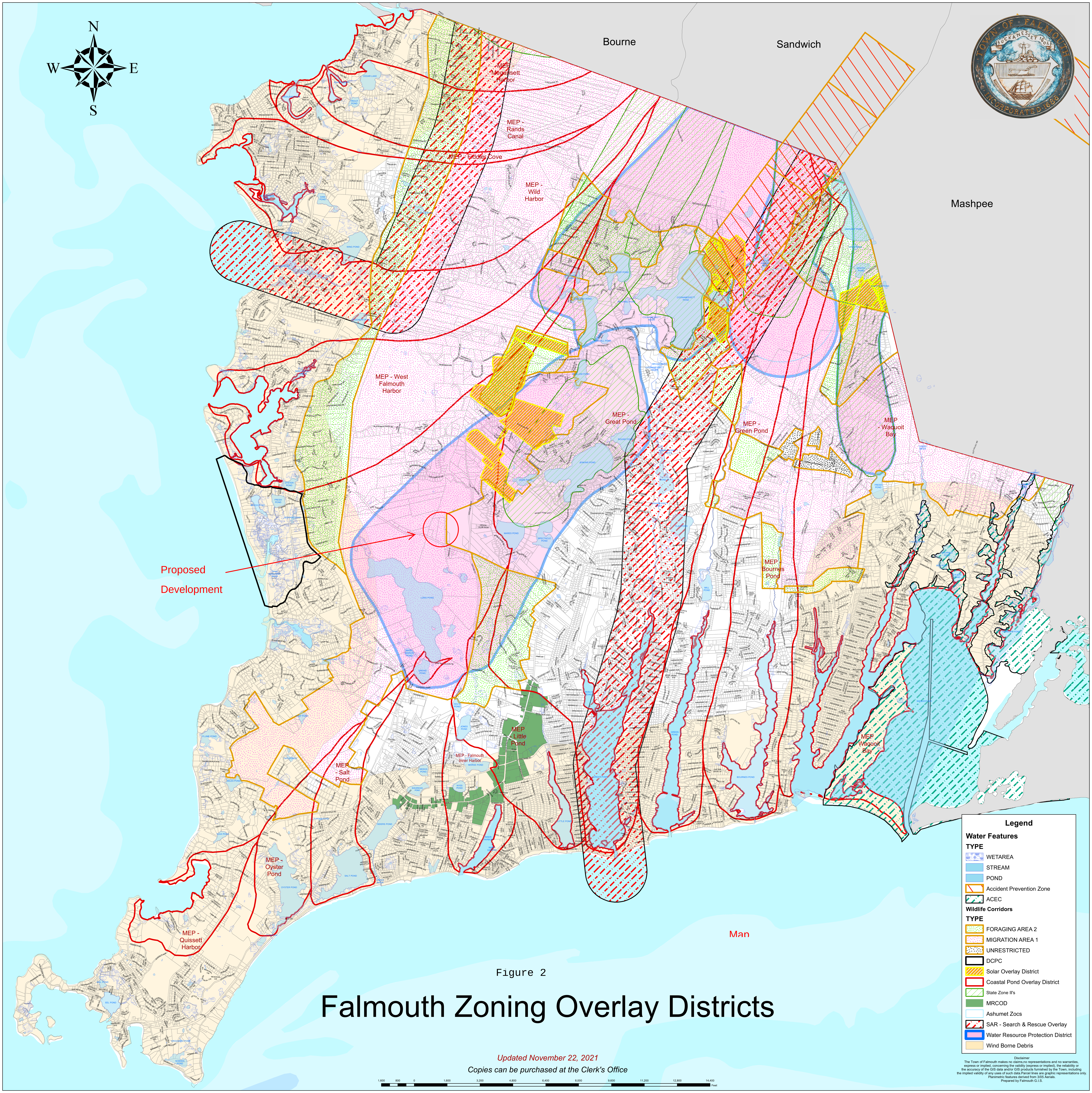


Figure 2

Falmouth Zoning Overlay Districts

Soils Map

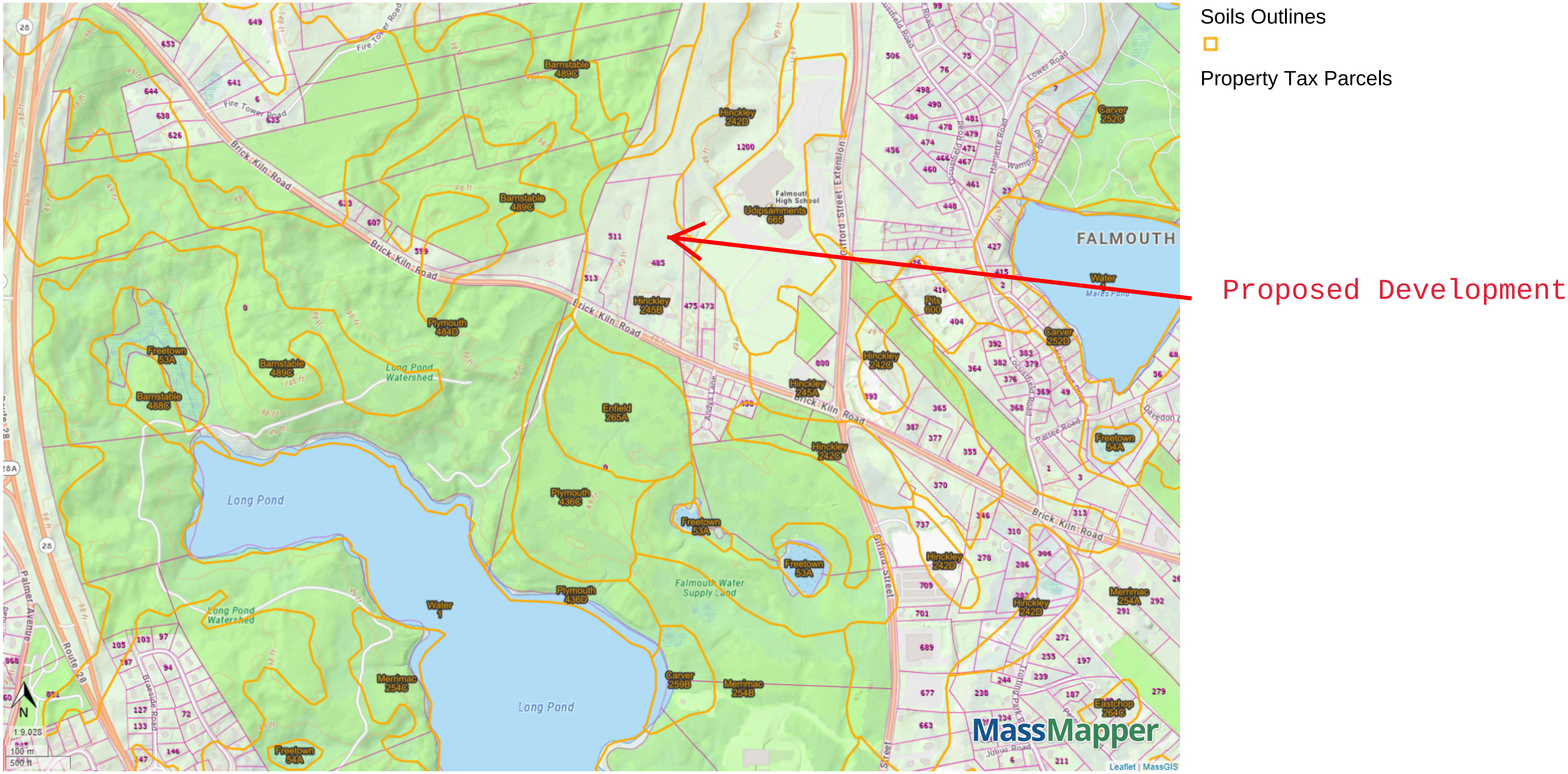
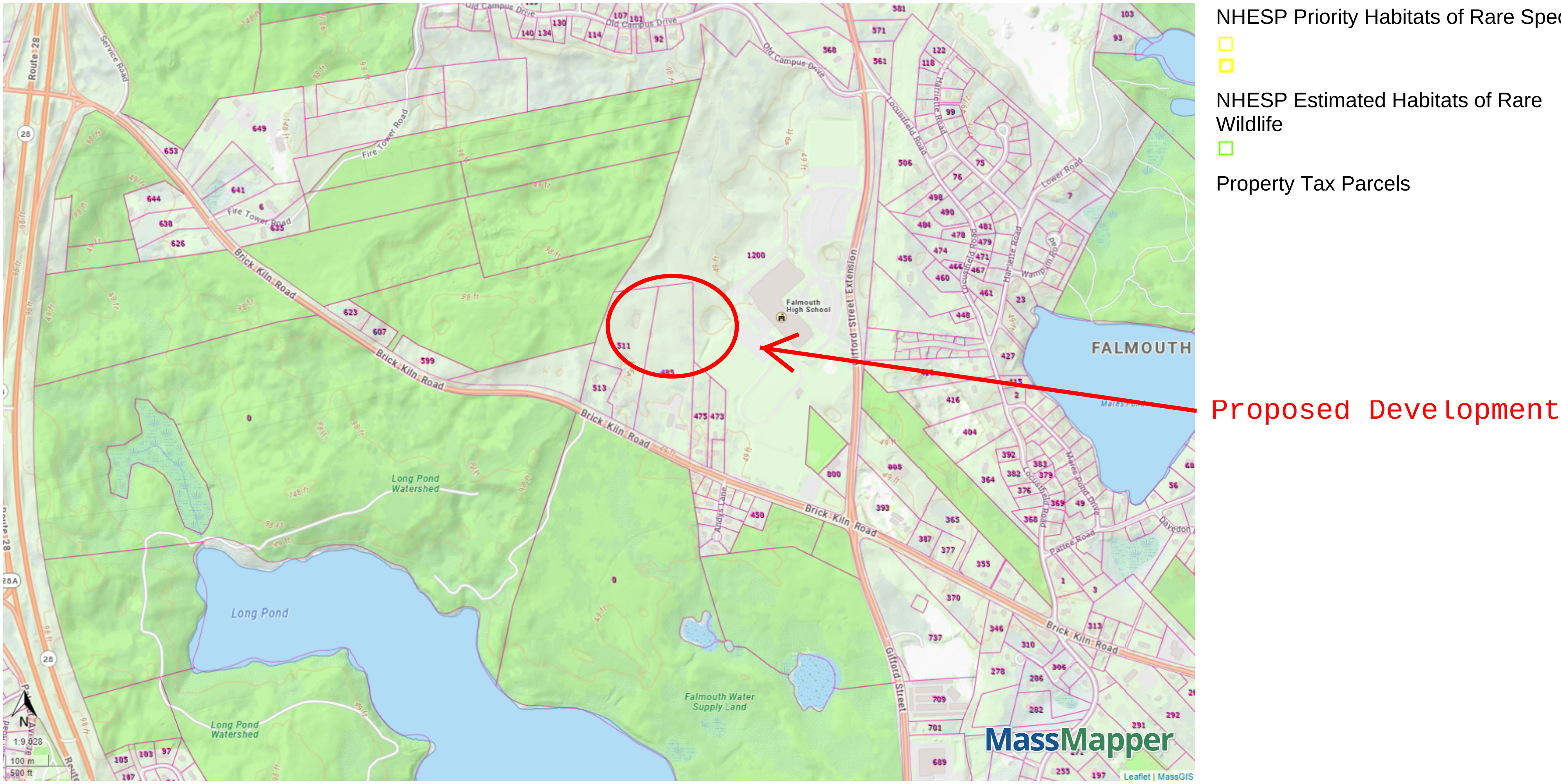


Figure 3

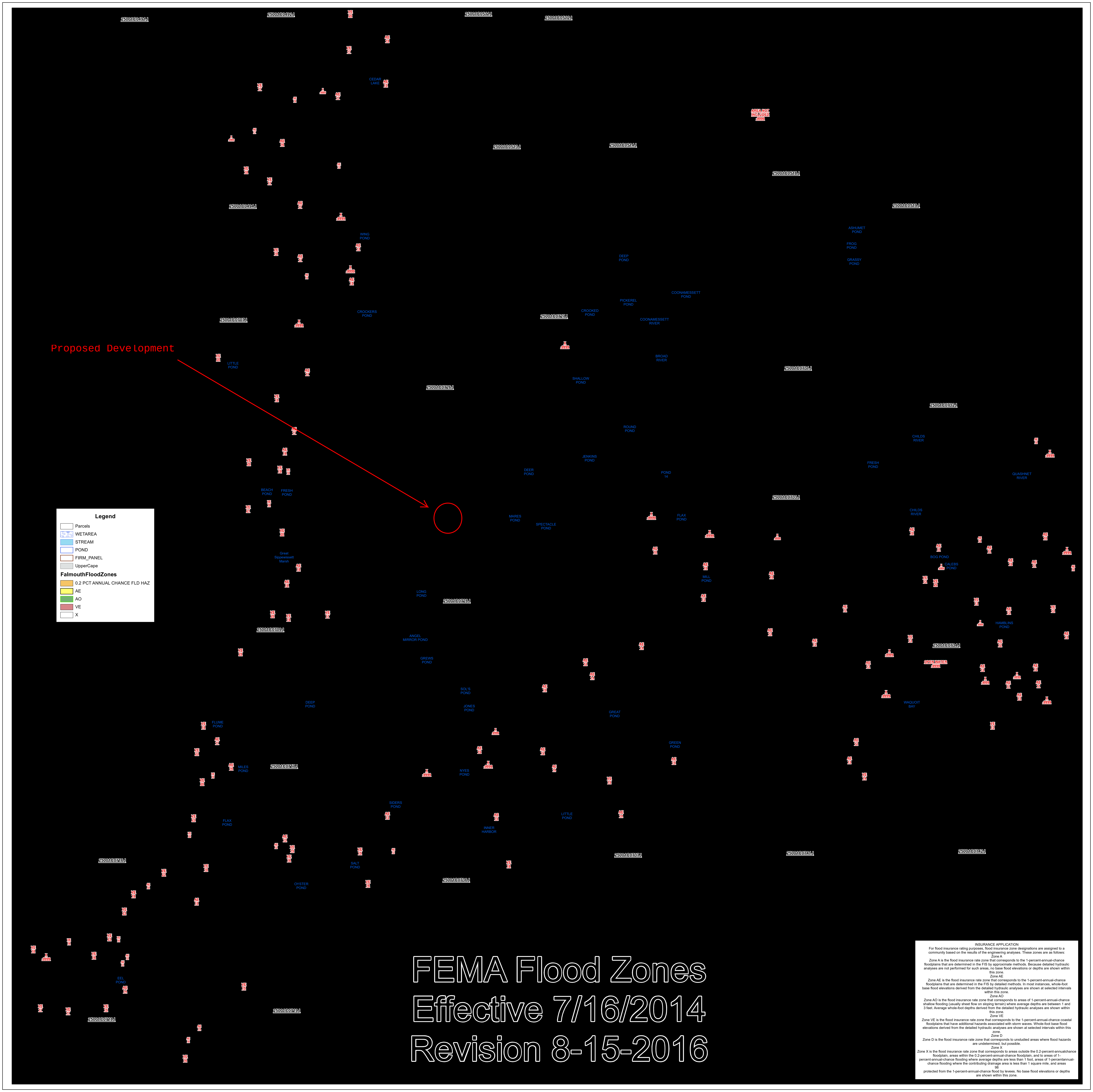
NHESP Map



NHESP Priority Habitats of Rare Species

NHESP Estimated Habitats of Rare Wildlife

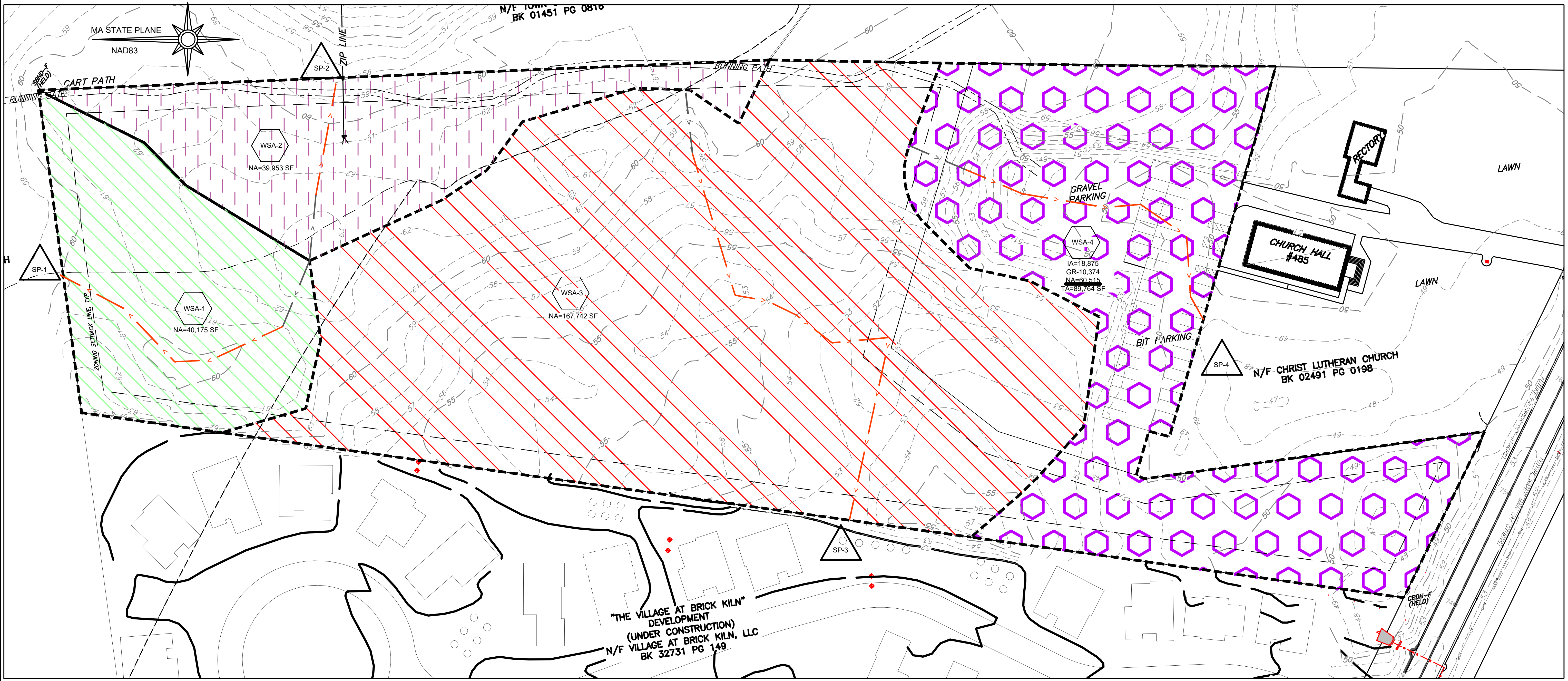
Property Tax Parcels



Proposed Development
Legend
Parcels
WETAREA
STREAM
POND
FIRM_PANEL
UpperCape
FalmouthFloodZones
0.2 PCT ANNUAL CHANCE FLD HAZ
AE
AO
VE
X
CEDAR LAKE
WING POND
CROCKERS POND
LITTLE POND
BEACH POND
FRESH POND
Great Sippewisset Marsh
DEEP POND
PICKEREL POND
COONAMESSETT POND
CROOKED POND
COONAMESSETT RIVER
BROAD RIVER
SHALLOW POND
ROUND POND
JENKINS POND
DEER POND
POND 14
MARES POND
SPECTACLE POND
FLAX POND
MILL POND
ASHUMET POND
FROG POND
GRASSY POND
CHILDS RIVER
FRESH POND
QUASHNET RIVER
BOG POND
CALEBS POND
HAMBLINS POND
WAQUOIT BAY
LONG POND
ANGEL MIRROR POND
GREWS POND
SOL'S POND
JONES POND
GREAT POND
GREEN POND
DEEP POND
PLUME POND
MILES POND
NYES POND
SIDERS POND
INNER HARBOR
LITTLE POND
FLAX POND
SALT POND
OYSTER POND
EEL POND
AREA NOT INCLUDED
FEMA Flood Zones
Effective 7/16/2014
Revision 8-15-2016
INSURANCE APPLICATION
For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:
Zone A
Zone A is the flood insurance rate zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.
Zone AE
Zone AE is the flood insurance rate zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.
Zone AO
Zone AO is the flood insurance rate zone that corresponds to areas of 1-percent-annual-chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the detailed hydraulic analyses are shown within this zone.
Zone VE
Zone VE is the flood insurance rate zone that corresponds to the 1-percent-annual-chance coastal floodplains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.
Zone D
Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.
Zone X
Zone X is the flood insurance rate zone that corresponds to areas outside the 0.2-percent-annualchance floodplain, areas within the 0.2-percent-annual-chance floodplain, and to areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percentannual-chance flooding where the contributing drainage area is less than 1 square mile, and areas
98
protected from the 1-percent-annual-chance flood by levees. No base flood elevations or depths are shown within this zone.

APPENDIX A

PRE- & POST-DEVELOPMENT HYDROCAD REPORTS



— > — > — SHEET FLOW

— > — > — SHALLOW CONCENTRATED FLOW

SP-1 STUDY POINT

WSA-5 WATERSHED AREA

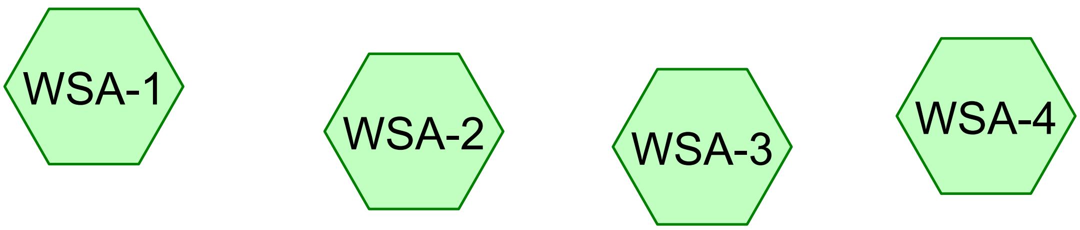
GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: (508) 888-6034
FAX: (508) 888-1506
WWW.GSEENV.COM

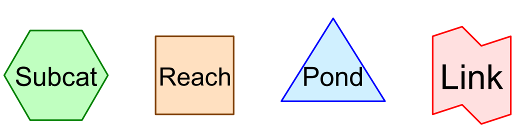
YMCA OF CAPE COD

PRE-EXISTING WATERSHED MAP

487 BRICK KILN ROAD
WEST FALMOUTH, MA

FIGURE 1.0





Routing Diagram for Pre 11.15.23
Prepared by Green Seal Environmental LLC, Printed 11/29/2023

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	NRCC 24-hr	C	Default	24.00	1	3.33	2
2	10-Year	NRCC 24-hr	C	Default	24.00	1	4.96	2
3	25-Year	NRCC 24-hr	C	Default	24.00	1	6.22	2
4	50-Year	NRCC 24-hr	C	Default	24.00	1	7.22	2
5	100-Year	NRCC 24-hr	C	Default	24.00	1	8.78	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
10,374	96	Gravel surface, HSG A (WSA-4)
18,875	98	Paved parking, HSG A (WSA-4)
310,231	30	Woods, Good, HSG A (WSA-1, WSA-2, WSA-3, WSA-4)
339,480	**36**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
339,480	HSG A	WSA-1, WSA-2, WSA-3, WSA-4
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
339,480		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Subcatchment Numbers
10,374	0	0	0	0	10,374	Gravel surface	WSA-4
18,875	0	0	0	0	18,875	Paved parking	WSA-4
310,231	0	0	0	0	310,231	Woods, Good	WSA-1, WSA-2, WSA-3, WSA-4
339,480	**0**	**0**	**0**	**0**	**339,480**	**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 Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment WSA-1: Runoff Area=40,175 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=280' Tc=19.4 min CN=30 Runoff=0.00 cfs 0 cf

Subcatchment WSA-2: Runoff Area=39,953 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=148' Slope=0.0200 '/' Tc=14.4 min CN=30 Runoff=0.00 cfs 0 cf

Subcatchment WSA-3: Runoff Area=169,588 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=441' Tc=22.1 min CN=30 Runoff=0.00 cfs 0 cf

Subcatchment WSA-4: Runoff Area=89,764 sf 21.03% Impervious Runoff Depth=0.21"
Flow Length=312' Tc=8.8 min CN=52 Runoff=0.10 cfs 1,537 cf

Total Runoff Area = 339,480 sf Runoff Volume = 1,537 cf Average Runoff Depth = 0.05"
94.44% Pervious = 320,605 sf 5.56% Impervious = 18,875 sf

Summary for Subcatchment WSA-1:

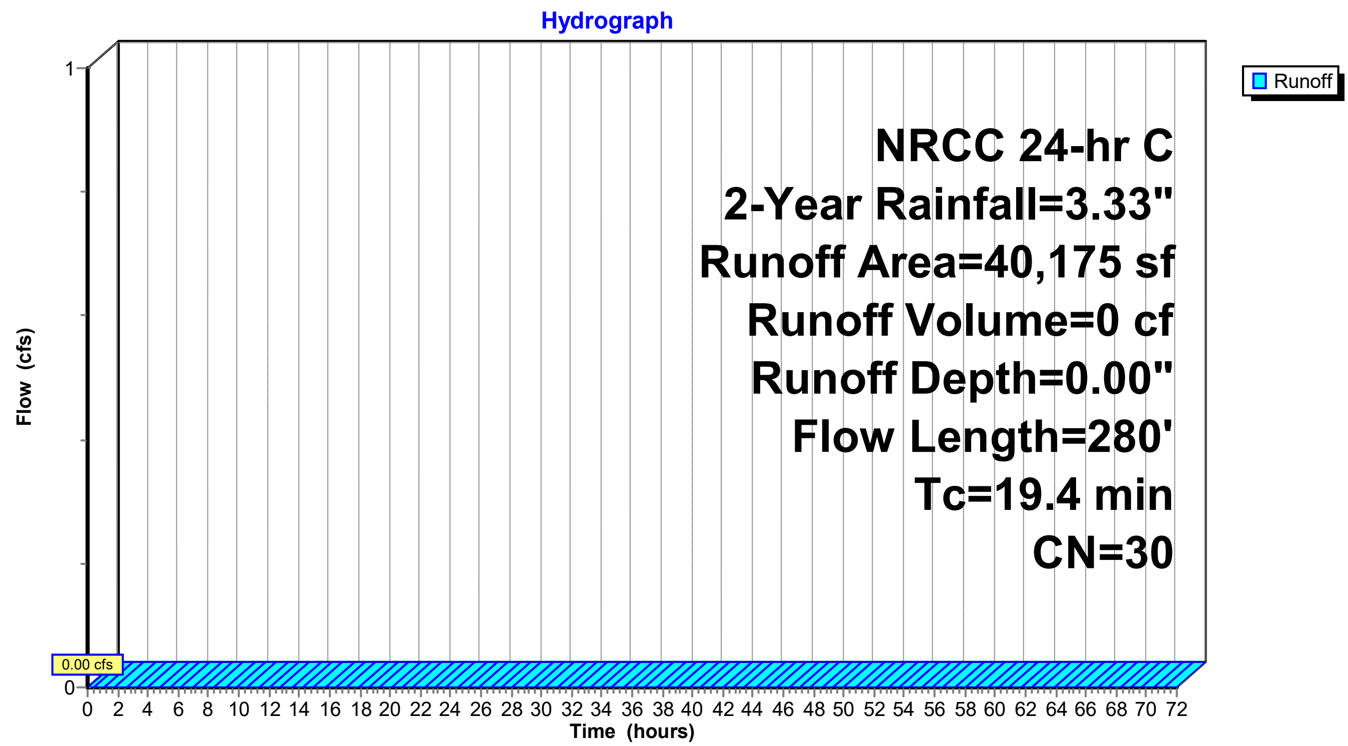
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
40,175	30	Woods, Good, HSG A
40,175		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	50	0.0300	0.08		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
9.2	230	0.0070	0.42		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
19.4	280	Total			

Subcatchment WSA-1:



Summary for Subcatchment WSA-2:

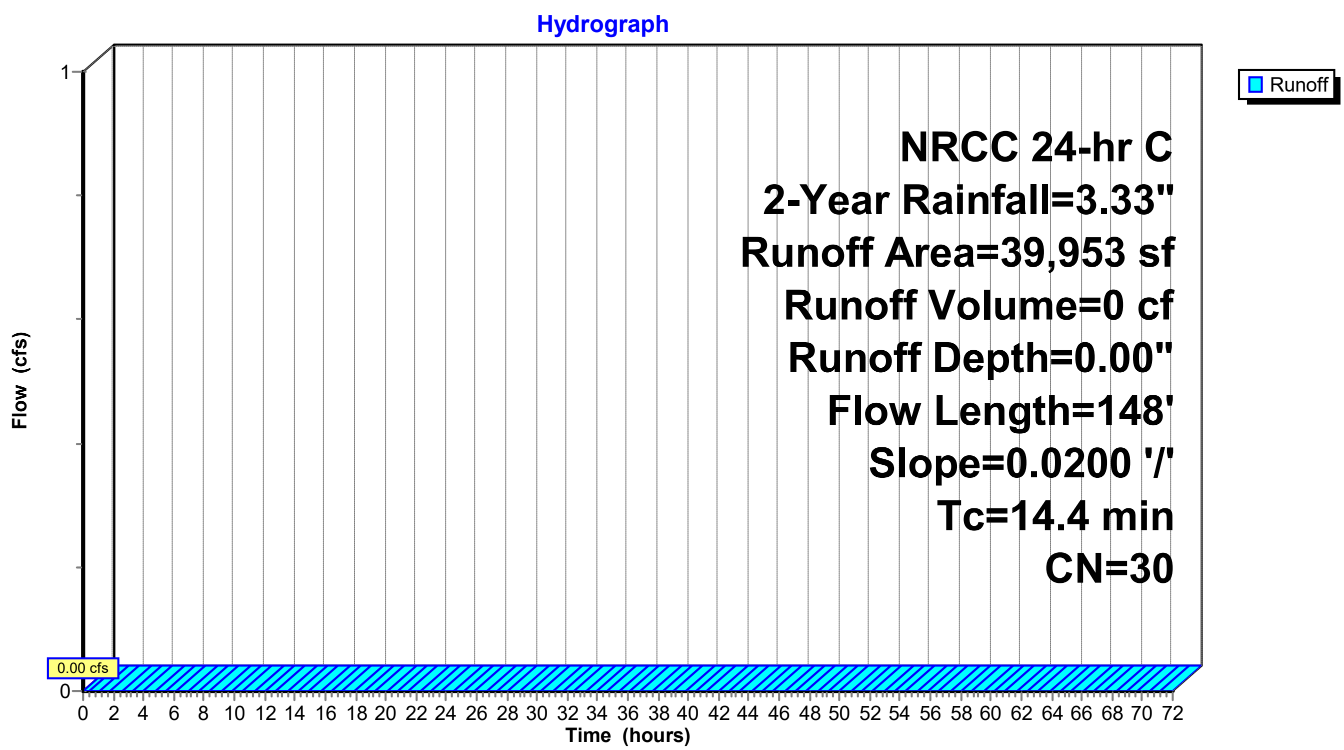
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to nonexistent node INF-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
39,953	30	Woods, Good, HSG A
39,953		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.1	50	0.0200	0.07		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
2.3	98	0.0200	0.71		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
14.4	148	Total			

Subcatchment WSA-2:



Summary for Subcatchment WSA-3:

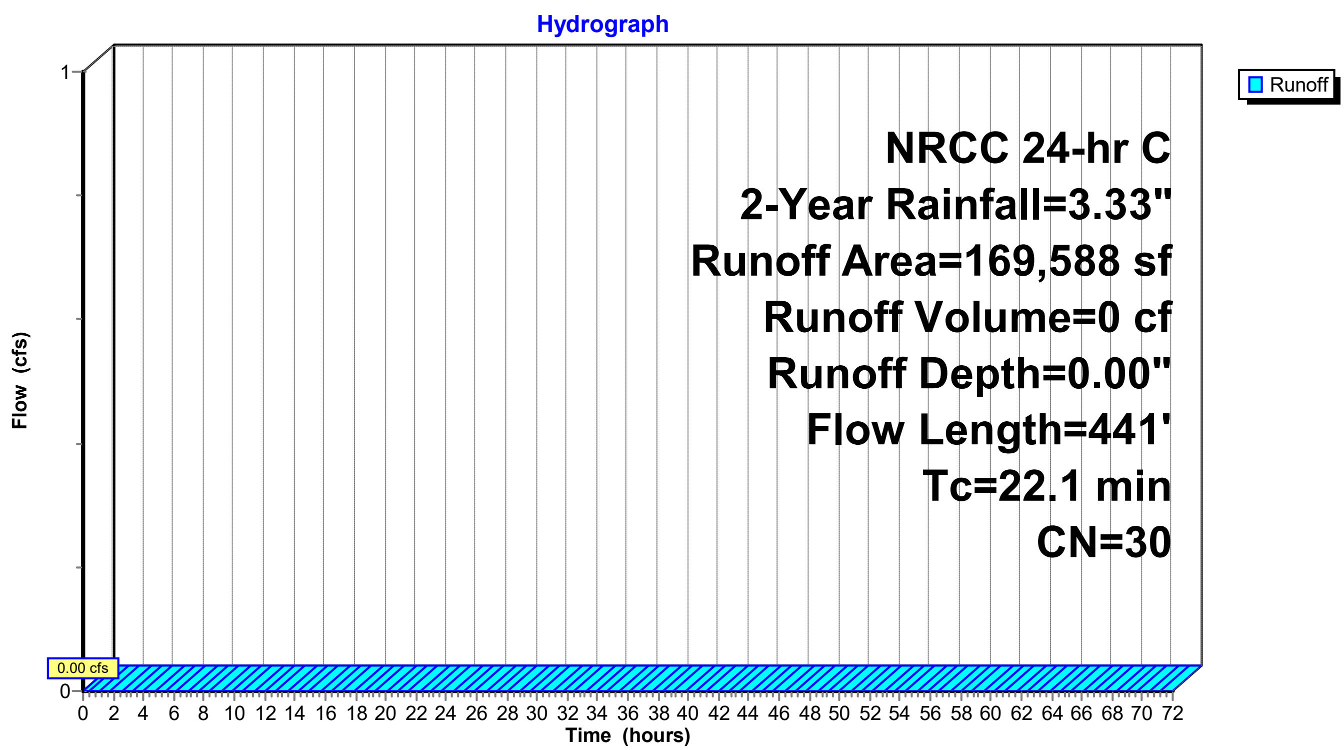
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to nonexistent node 1P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
169,588	30	Woods, Good, HSG A
169,588		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		**Sheet Flow, Natural Area (NA)**
					Woods: Light underbrush n= 0.400 P2= 3.35"
13.0	391	0.0100	0.50		**Shallow Concentrated Flow, Natural Area**
					Woodland Kv= 5.0 fps
22.1	441	Total			

Subcatchment WSA-3:



Summary for Subcatchment WSA-4:

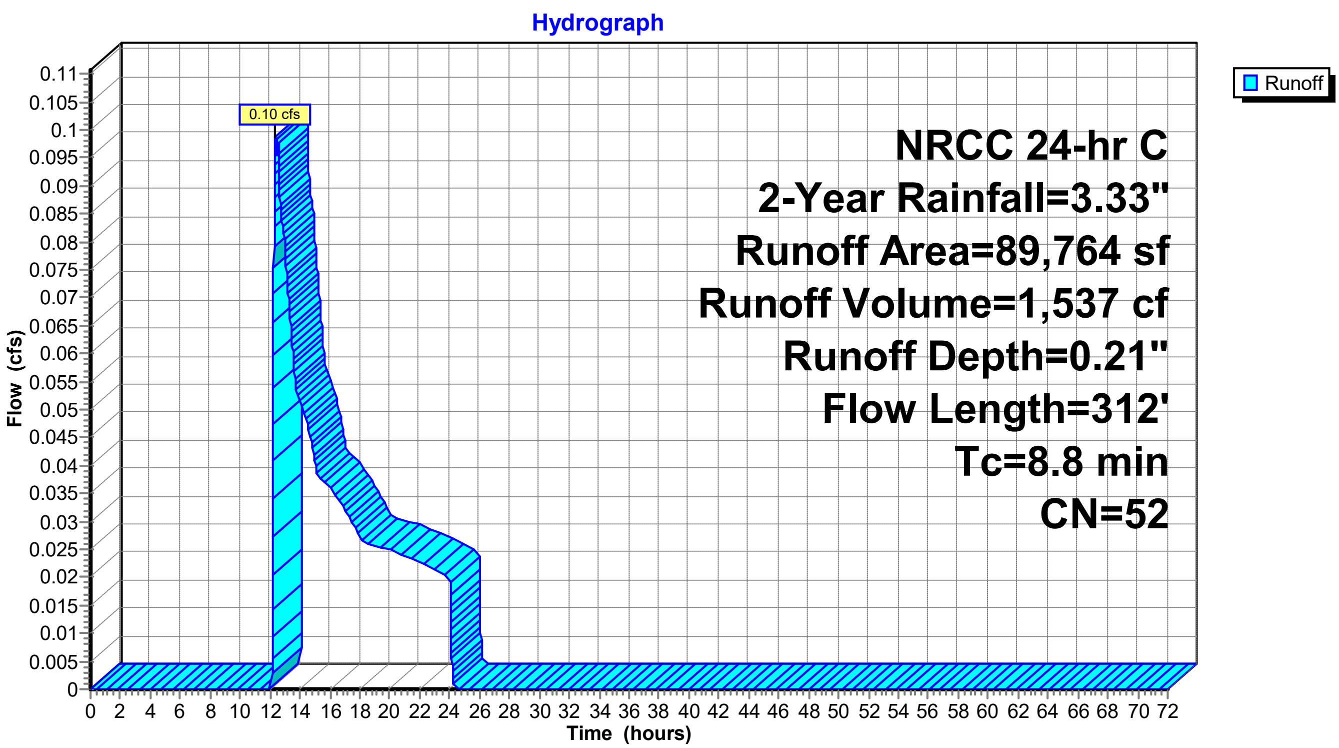
Runoff = 0.10 cfs @ 12.37 hrs, Volume= 1,537 cf, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
60,515	30	Woods, Good, HSG A
18,875	98	Paved parking, HSG A
10,374	96	Gravel surface, HSG A
89,764	52	Weighted Average
70,889		78.97% Pervious Area
18,875		21.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1000	0.13		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
0.5	50	0.1000	1.58		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
1.0	96	0.0100	1.61		**Shallow Concentrated Flow, Gravel Parkiing** Unpaved Kv= 16.1 fps
1.0	116	0.0100	2.03		**Shallow Concentrated Flow, Paved parking** Paved Kv= 20.3 fps
8.8	312	Total			

Subcatchment WSA-4:



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 Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment WSA-1: Runoff Area=40,175 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=280' Tc=19.4 min CN=30 Runoff=0.00 cfs 12 cf

Subcatchment WSA-2: Runoff Area=39,953 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=148' Slope=0.0200 '/' Tc=14.4 min CN=30 Runoff=0.00 cfs 12 cf

Subcatchment WSA-3: Runoff Area=169,588 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=441' Tc=22.1 min CN=30 Runoff=0.01 cfs 51 cf

Subcatchment WSA-4: Runoff Area=89,764 sf 21.03% Impervious Runoff Depth=0.79"
Flow Length=312' Tc=8.8 min CN=52 Runoff=1.37 cfs 5,875 cf

Total Runoff Area = 339,480 sf Runoff Volume = 5,951 cf Average Runoff Depth = 0.21"
94.44% Pervious = 320,605 sf 5.56% Impervious = 18,875 sf

Summary for Subcatchment WSA-1:

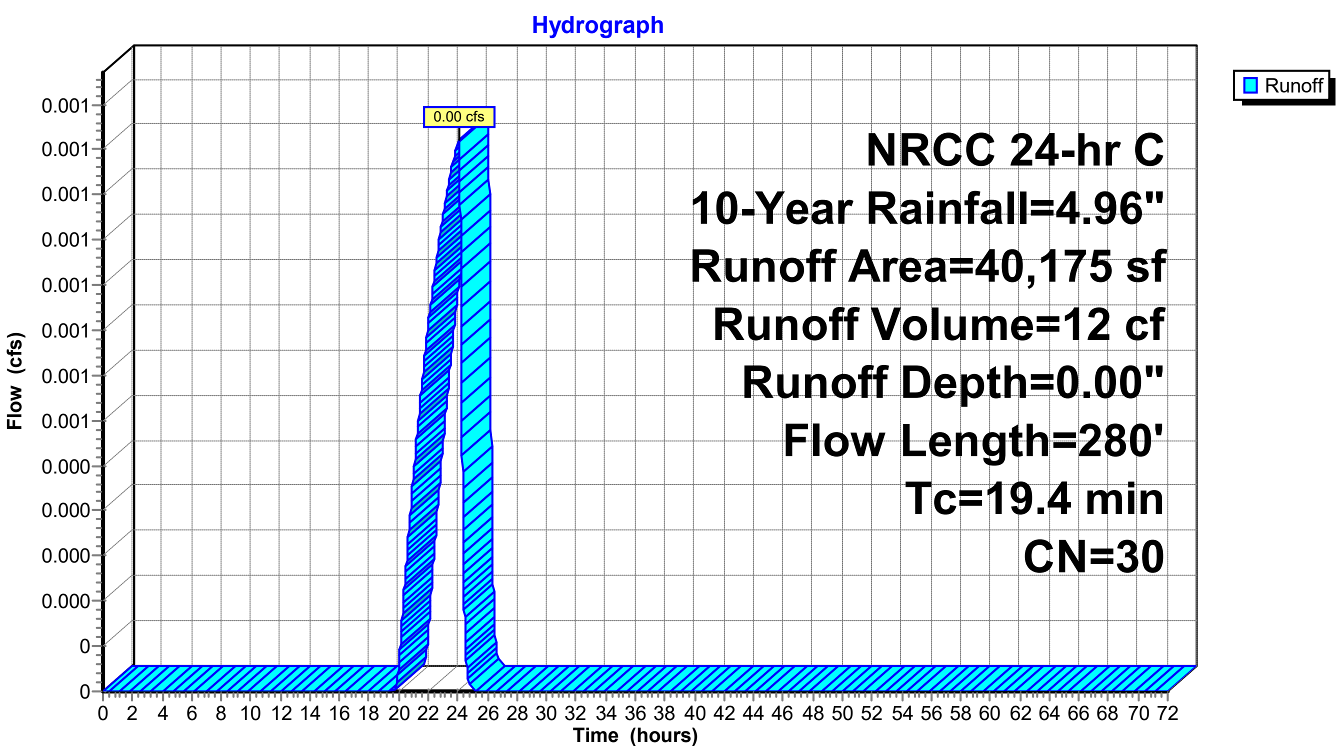
Runoff = 0.00 cfs @ 24.04 hrs, Volume= 12 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
40,175	30	Woods, Good, HSG A
40,175		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	50	0.0300	0.08		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
9.2	230	0.0070	0.42		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
19.4	280	Total			

Subcatchment WSA-1:



Summary for Subcatchment WSA-2:

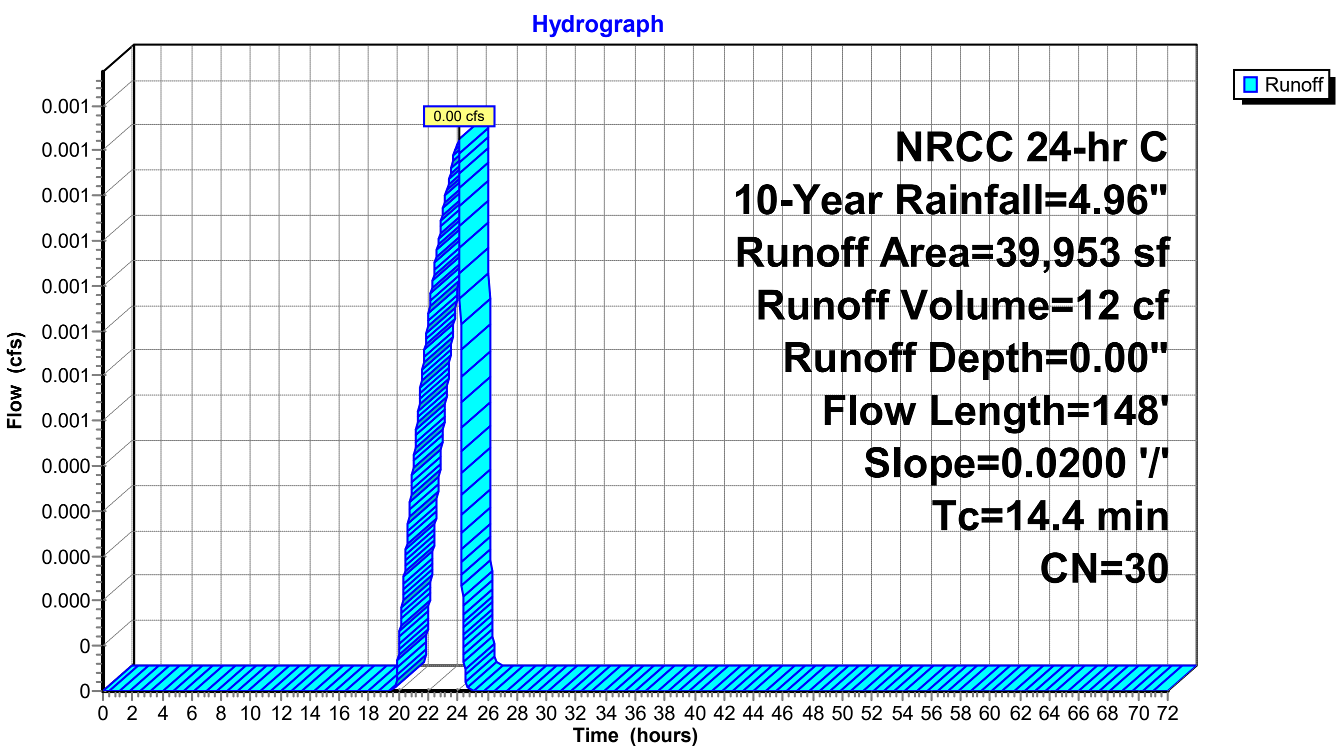
Runoff = 0.00 cfs @ 24.03 hrs, Volume= 12 cf, Depth= 0.00"
Routed to nonexistent node INF-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
39,953	30	Woods, Good, HSG A
39,953		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.1	50	0.0200	0.07		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
2.3	98	0.0200	0.71		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
14.4	148	Total			

Subcatchment WSA-2:



Summary for Subcatchment WSA-3:

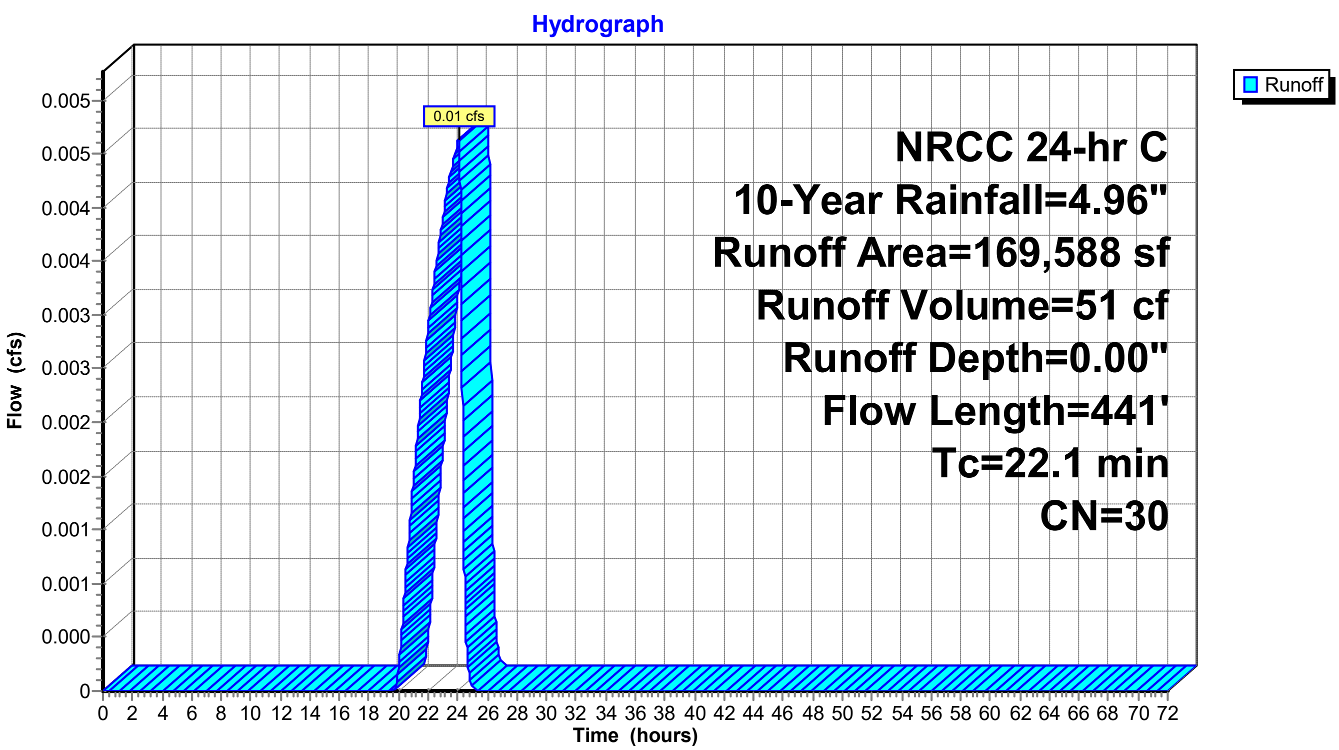
Runoff = 0.01 cfs @ 24.04 hrs, Volume= 51 cf, Depth= 0.00"
Routed to nonexistent node 1P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
169,588	30	Woods, Good, HSG A
169,588		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
13.0	391	0.0100	0.50		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
22.1	441	Total			

Subcatchment WSA-3:



Summary for Subcatchment WSA-4:

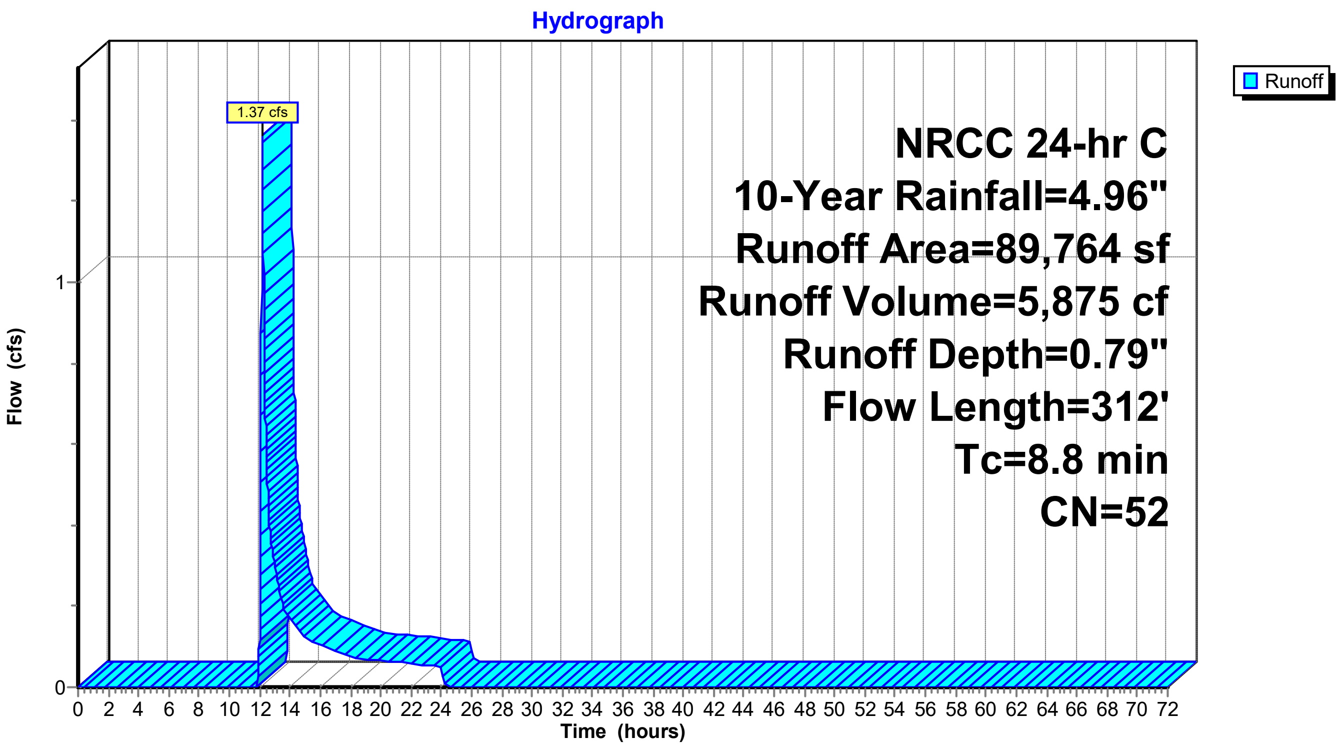
Runoff = 1.37 cfs @ 12.18 hrs, Volume= 5,875 cf, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
60,515	30	Woods, Good, HSG A
18,875	98	Paved parking, HSG A
10,374	96	Gravel surface, HSG A
89,764	52	Weighted Average
70,889		78.97% Pervious Area
18,875		21.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1000	0.13		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
0.5	50	0.1000	1.58		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
1.0	96	0.0100	1.61		**Shallow Concentrated Flow, Gravel Parkiing** Unpaved Kv= 16.1 fps
1.0	116	0.0100	2.03		**Shallow Concentrated Flow, Paved parking** Paved Kv= 20.3 fps
8.8	312	Total			

Subcatchment WSA-4:



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 Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment WSA-1: Runoff Area=40,175 sf 0.00% Impervious Runoff Depth=0.10"
Flow Length=280' Tc=19.4 min CN=30 Runoff=0.01 cfs 325 cf

Subcatchment WSA-2: Runoff Area=39,953 sf 0.00% Impervious Runoff Depth=0.10"
Flow Length=148' Slope=0.0200 '/' Tc=14.4 min CN=30 Runoff=0.01 cfs 323 cf

Subcatchment WSA-3: Runoff Area=169,588 sf 0.00% Impervious Runoff Depth=0.10"
Flow Length=441' Tc=22.1 min CN=30 Runoff=0.04 cfs 1,370 cf

Subcatchment WSA-4: Runoff Area=89,764 sf 21.03% Impervious Runoff Depth=1.41"
Flow Length=312' Tc=8.8 min CN=52 Runoff=2.91 cfs 10,519 cf

Total Runoff Area = 339,480 sf Runoff Volume = 12,536 cf Average Runoff Depth = 0.44"
94.44% Pervious = 320,605 sf 5.56% Impervious = 18,875 sf

Summary for Subcatchment WSA-1:

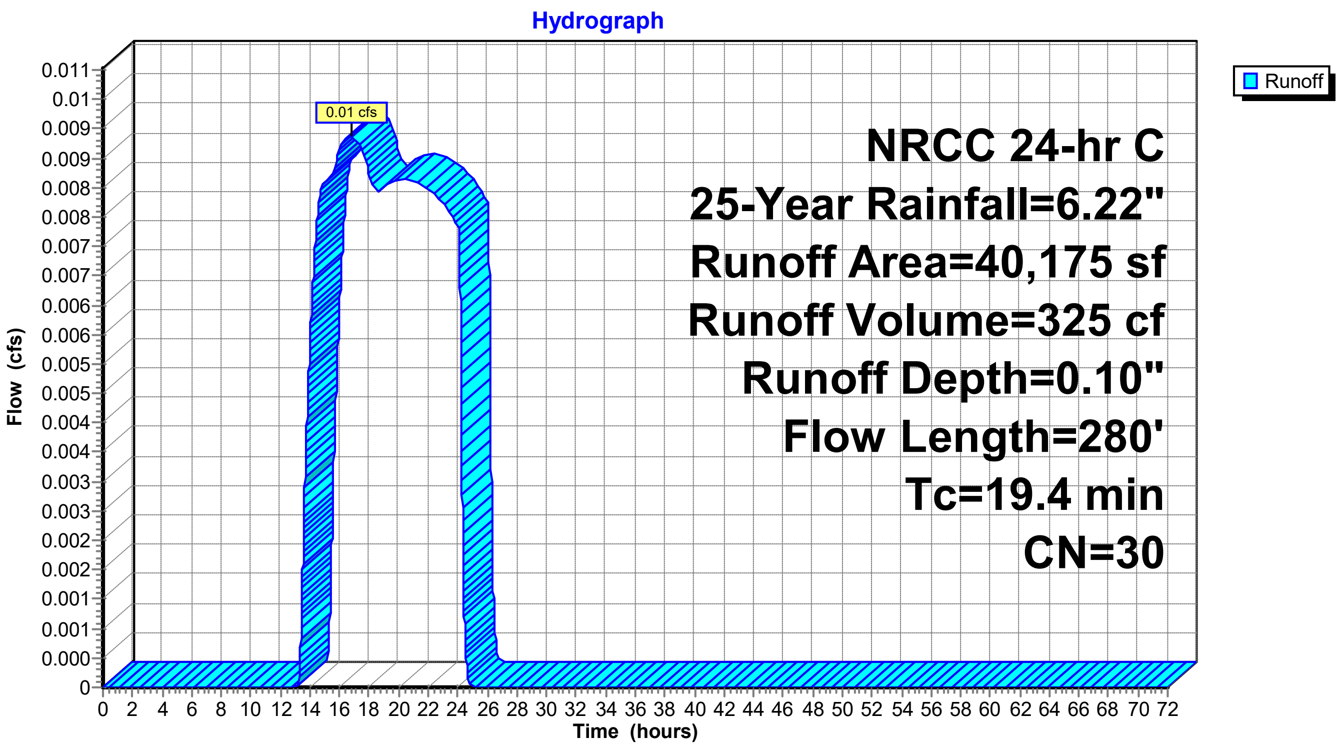
Runoff = 0.01 cfs @ 16.75 hrs, Volume= 325 cf, Depth= 0.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
40,175	30	Woods, Good, HSG A
40,175		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	50	0.0300	0.08		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
9.2	230	0.0070	0.42		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
19.4	280	Total			

Subcatchment WSA-1:



Summary for Subcatchment WSA-2:

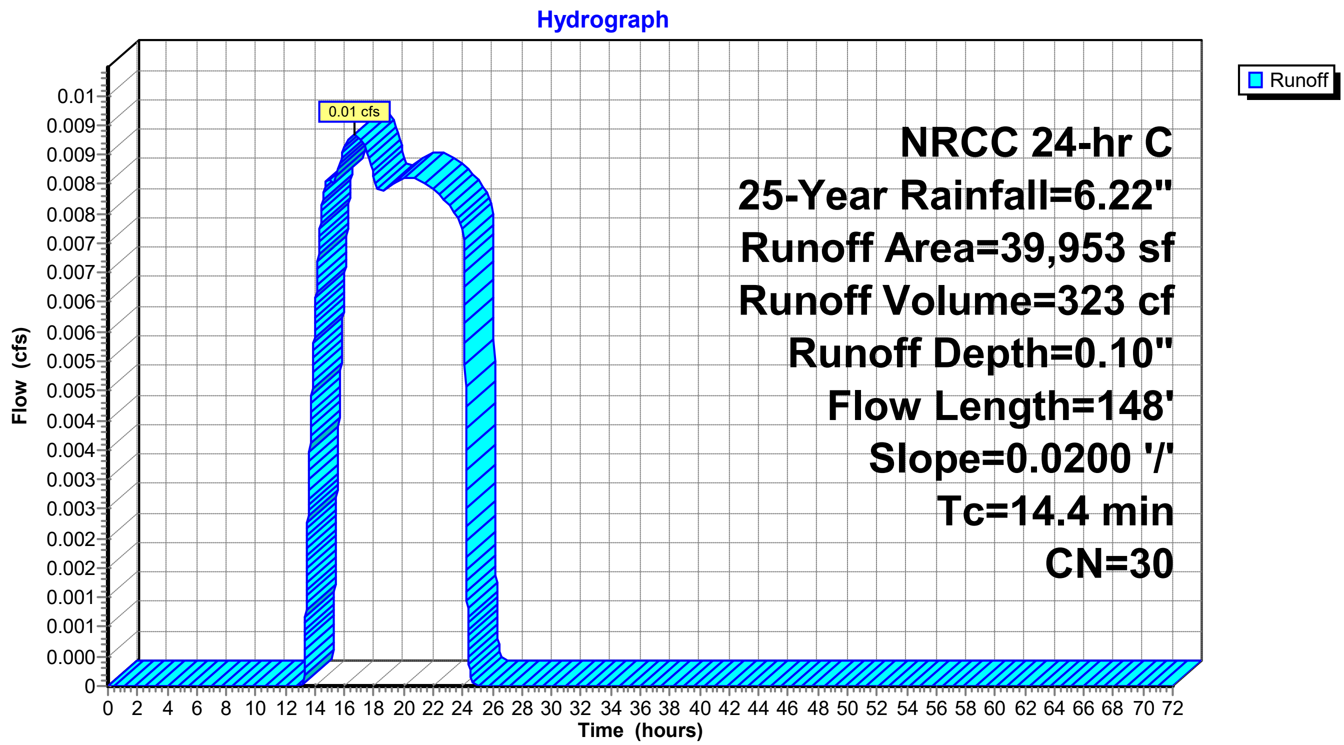
Runoff = 0.01 cfs @ 16.62 hrs, Volume= 323 cf, Depth= 0.10"
Routed to nonexistent node INF-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
39,953	30	Woods, Good, HSG A
39,953		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.1	50	0.0200	0.07		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
2.3	98	0.0200	0.71		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
14.4	148	Total			

Subcatchment WSA-2:



Summary for Subcatchment WSA-3:

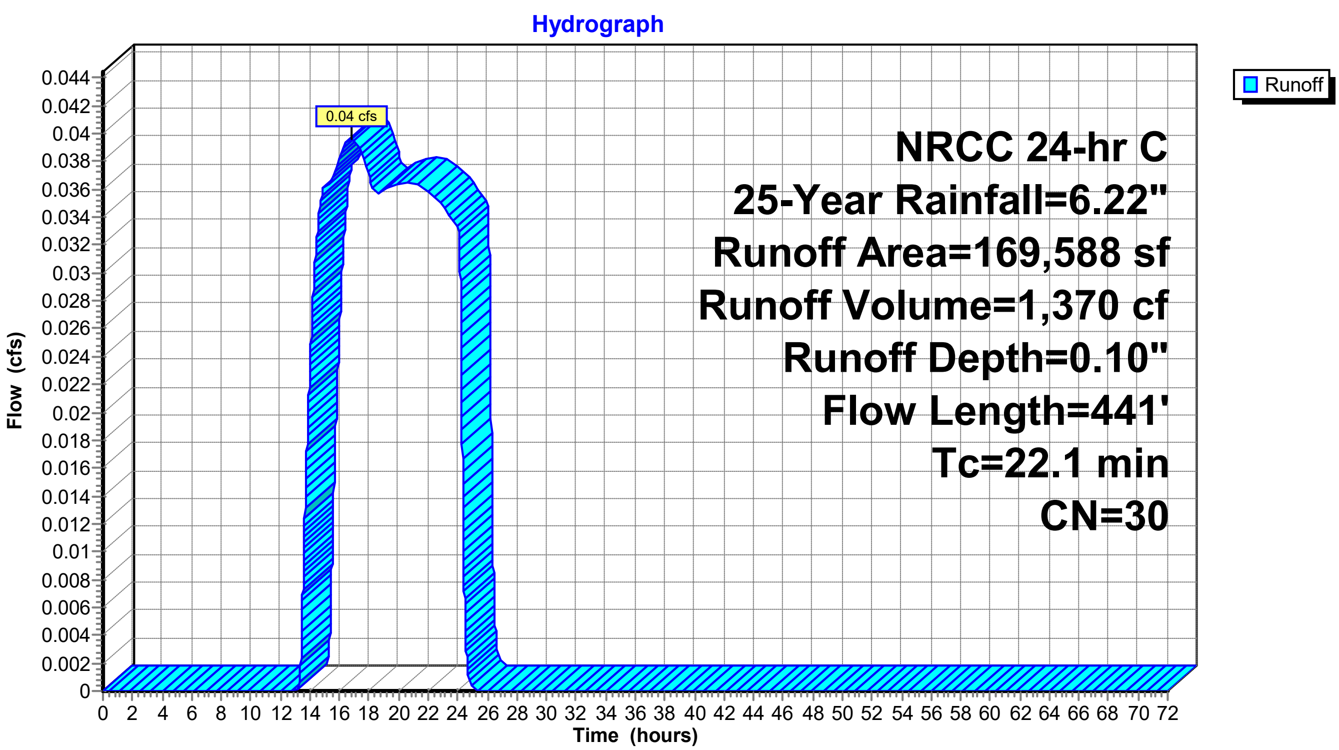
Runoff = 0.04 cfs @ 16.77 hrs, Volume= 1,370 cf, Depth= 0.10"
Routed to nonexistent node 1P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
169,588	30	Woods, Good, HSG A
169,588		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
13.0	391	0.0100	0.50		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
22.1	441	Total			

Subcatchment WSA-3:



Summary for Subcatchment WSA-4:

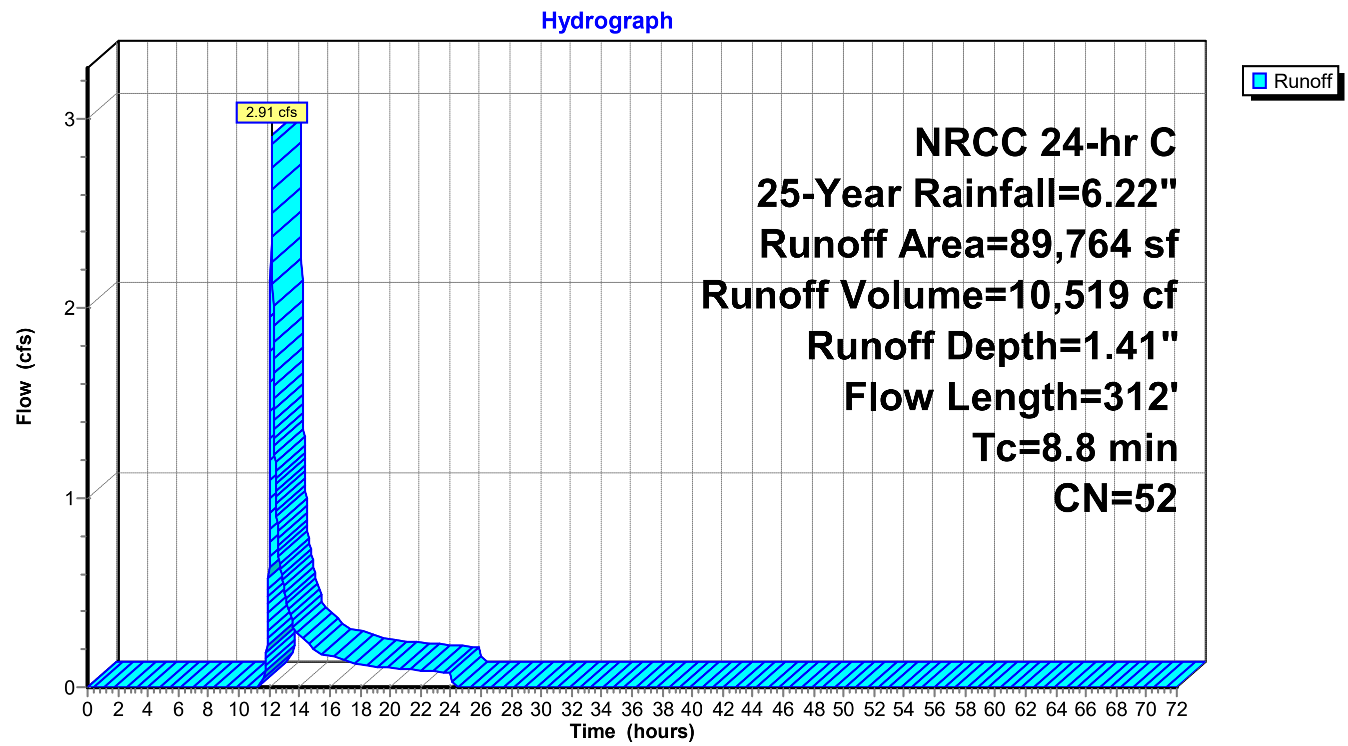
Runoff = 2.91 cfs @ 12.17 hrs, Volume= 10,519 cf, Depth= 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
60,515	30	Woods, Good, HSG A
18,875	98	Paved parking, HSG A
10,374	96	Gravel surface, HSG A
89,764	52	Weighted Average
70,889		78.97% Pervious Area
18,875		21.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1000	0.13		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
0.5	50	0.1000	1.58		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
1.0	96	0.0100	1.61		**Shallow Concentrated Flow, Gravel Parkiing** Unpaved Kv= 16.1 fps
1.0	116	0.0100	2.03		**Shallow Concentrated Flow, Paved parking** Paved Kv= 20.3 fps
8.8	312	Total			

Subcatchment WSA-4:



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 Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment WSA-1: Runoff Area=40,175 sf 0.00% Impervious Runoff Depth=0.25"
Flow Length=280' Tc=19.4 min CN=30 Runoff=0.03 cfs 843 cf

Subcatchment WSA-2: Runoff Area=39,953 sf 0.00% Impervious Runoff Depth=0.25"
Flow Length=148' Slope=0.0200 '/' Tc=14.4 min CN=30 Runoff=0.03 cfs 839 cf

Subcatchment WSA-3: Runoff Area=169,588 sf 0.00% Impervious Runoff Depth=0.25"
Flow Length=441' Tc=22.1 min CN=30 Runoff=0.14 cfs 3,559 cf

Subcatchment WSA-4: Runoff Area=89,764 sf 21.03% Impervious Runoff Depth=1.98"
Flow Length=312' Tc=8.8 min CN=52 Runoff=4.32 cfs 14,791 cf

Total Runoff Area = 339,480 sf Runoff Volume = 20,032 cf Average Runoff Depth = 0.71"
94.44% Pervious = 320,605 sf 5.56% Impervious = 18,875 sf

Summary for Subcatchment WSA-1:

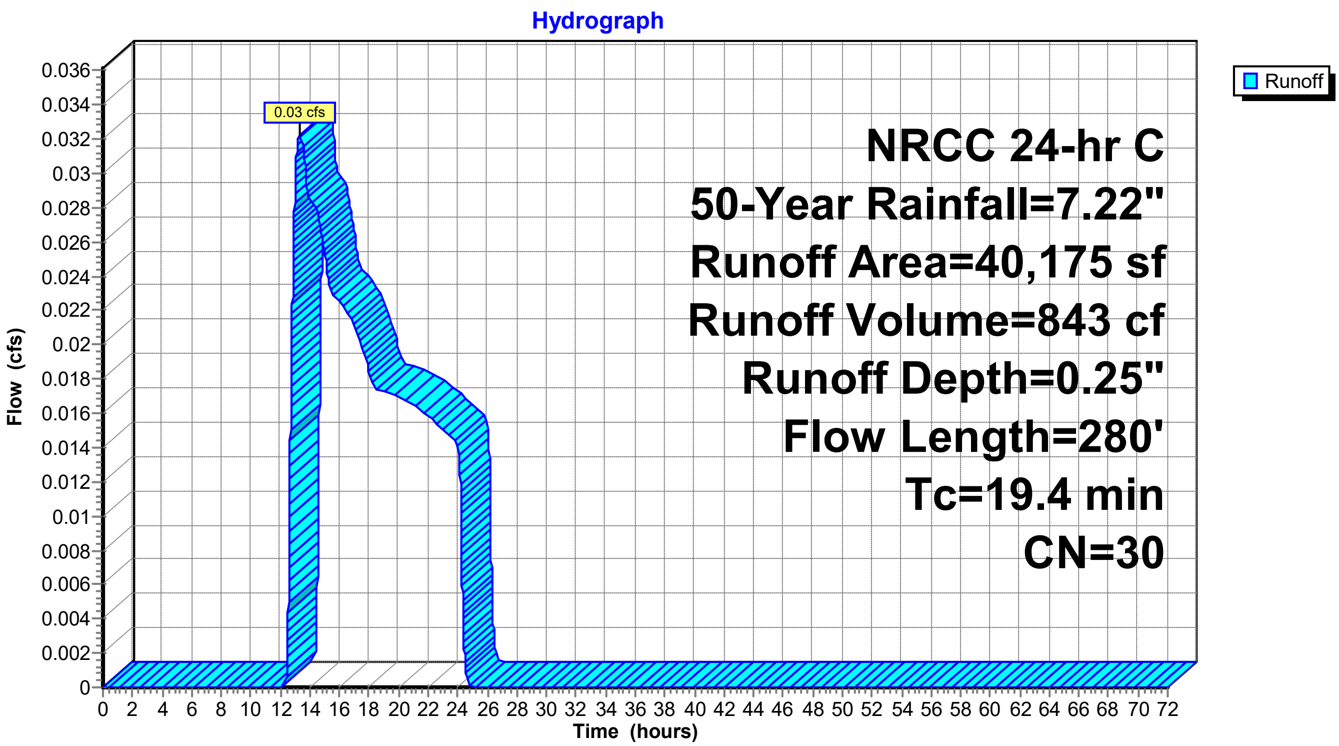
Runoff = 0.03 cfs @ 13.30 hrs, Volume= 843 cf, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
40,175	30	Woods, Good, HSG A
40,175		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	50	0.0300	0.08		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
9.2	230	0.0070	0.42		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
19.4	280	Total			

Subcatchment WSA-1:



Summary for Subcatchment WSA-2:

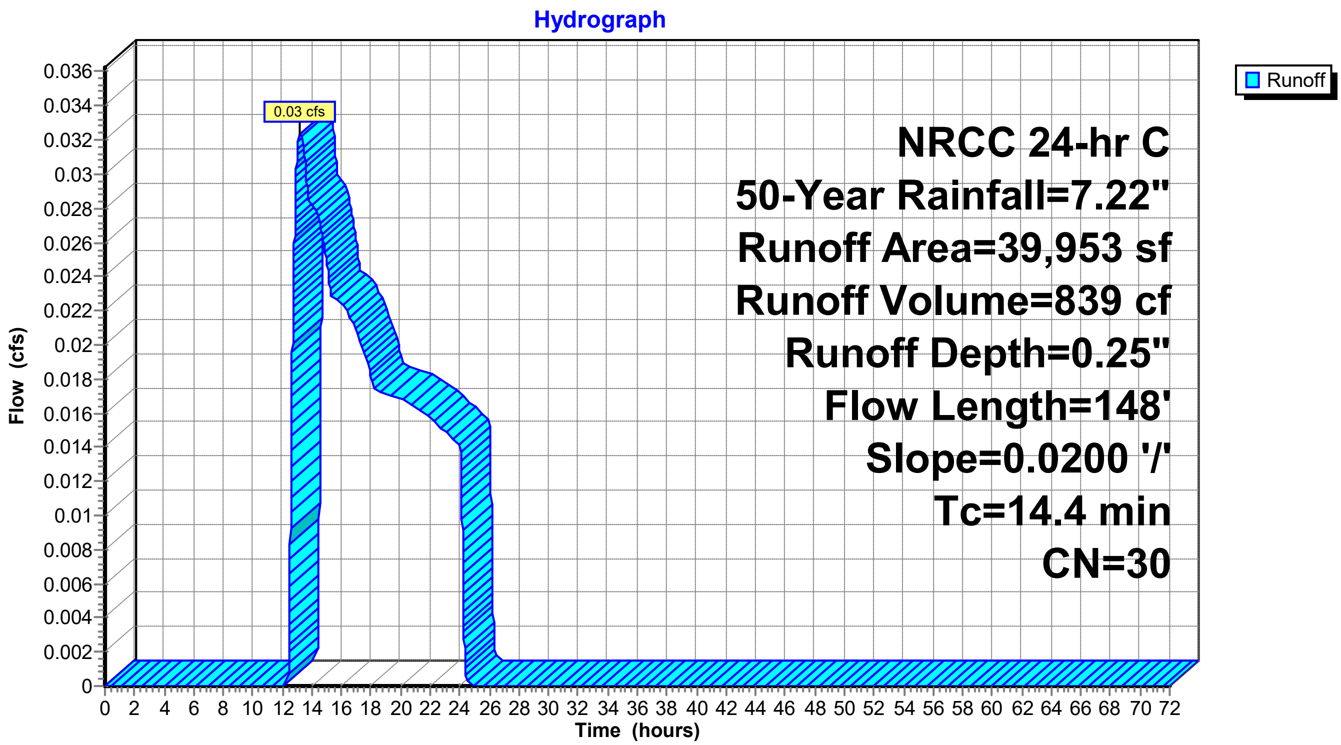
Runoff = 0.03 cfs @ 13.14 hrs, Volume= 839 cf, Depth= 0.25"
Routed to nonexistent node INF-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
39,953	30	Woods, Good, HSG A
39,953		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.1	50	0.0200	0.07		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
2.3	98	0.0200	0.71		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
14.4	148	Total			

Subcatchment WSA-2:



Summary for Subcatchment WSA-3:

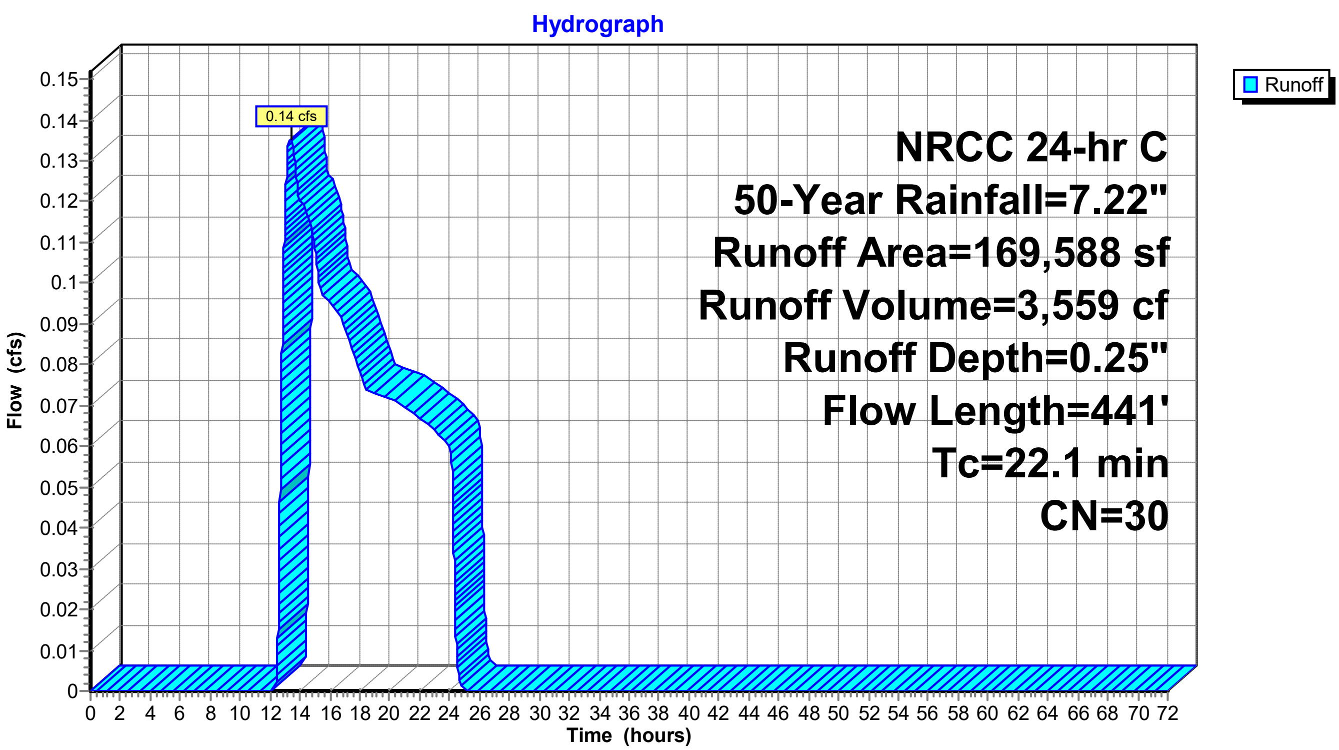
Runoff = 0.14 cfs @ 13.38 hrs, Volume= 3,559 cf, Depth= 0.25"
Routed to nonexistent node 1P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
169,588	30	Woods, Good, HSG A
169,588		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
13.0	391	0.0100	0.50		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
22.1	441	Total			

Subcatchment WSA-3:



Summary for Subcatchment WSA-4:

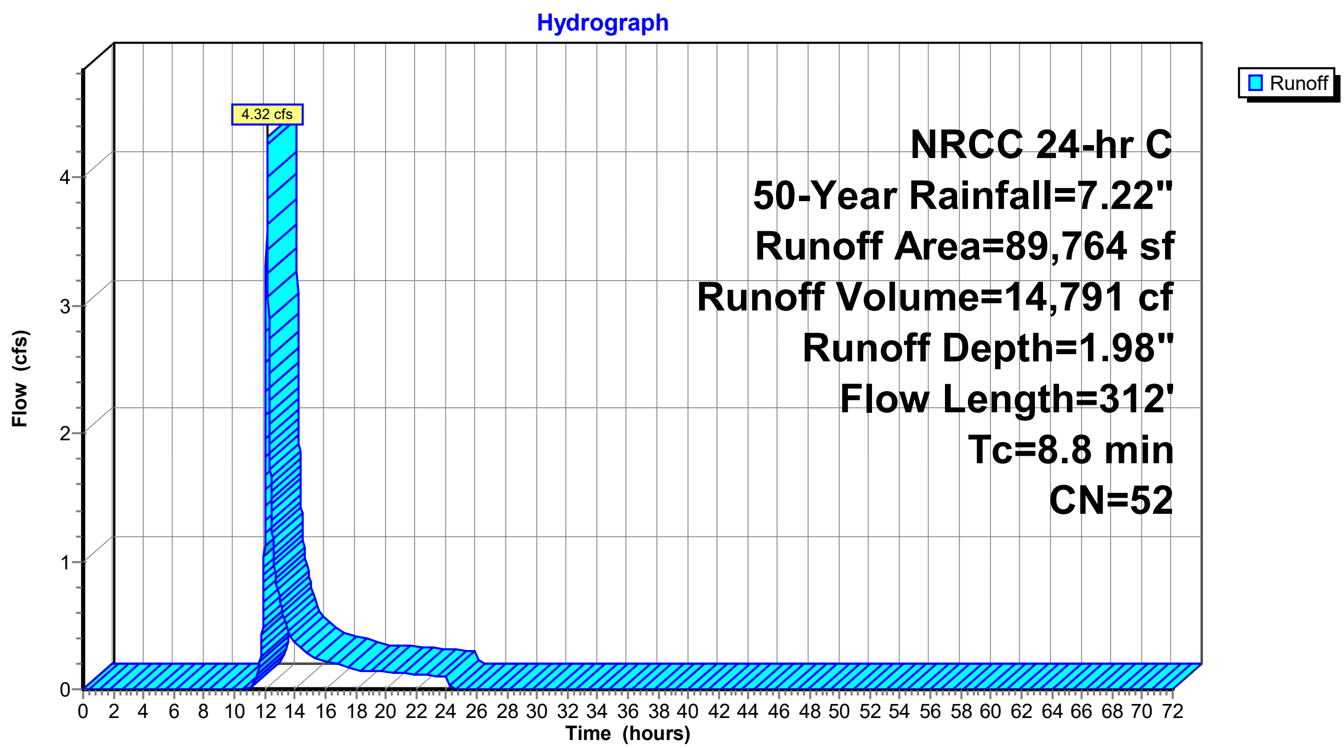
Runoff = 4.32 cfs @ 12.17 hrs, Volume= 14,791 cf, Depth= 1.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
60,515	30	Woods, Good, HSG A
18,875	98	Paved parking, HSG A
10,374	96	Gravel surface, HSG A
89,764	52	Weighted Average
70,889		78.97% Pervious Area
18,875		21.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1000	0.13		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
0.5	50	0.1000	1.58		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
1.0	96	0.0100	1.61		**Shallow Concentrated Flow, Gravel Parkiing** Unpaved Kv= 16.1 fps
1.0	116	0.0100	2.03		**Shallow Concentrated Flow, Paved parking** Paved Kv= 20.3 fps
8.8	312	Total			

Subcatchment WSA-4:



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 Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment WSA-1: Runoff Area=40,175 sf 0.00% Impervious Runoff Depth=0.62"
Flow Length=280' Tc=19.4 min CN=30 Runoff=0.14 cfs 2,064 cf

Subcatchment WSA-2: Runoff Area=39,953 sf 0.00% Impervious Runoff Depth=0.62"
Flow Length=148' Slope=0.0200 '/' Tc=14.4 min CN=30 Runoff=0.15 cfs 2,052 cf

Subcatchment WSA-3: Runoff Area=169,588 sf 0.00% Impervious Runoff Depth=0.62"
Flow Length=441' Tc=22.1 min CN=30 Runoff=0.58 cfs 8,712 cf

Subcatchment WSA-4: Runoff Area=89,764 sf 21.03% Impervious Runoff Depth=2.97"
Flow Length=312' Tc=8.8 min CN=52 Runoff=6.76 cfs 22,249 cf

Total Runoff Area = 339,480 sf Runoff Volume = 35,077 cf Average Runoff Depth = 1.24"
94.44% Pervious = 320,605 sf 5.56% Impervious = 18,875 sf

Summary for Subcatchment WSA-1:

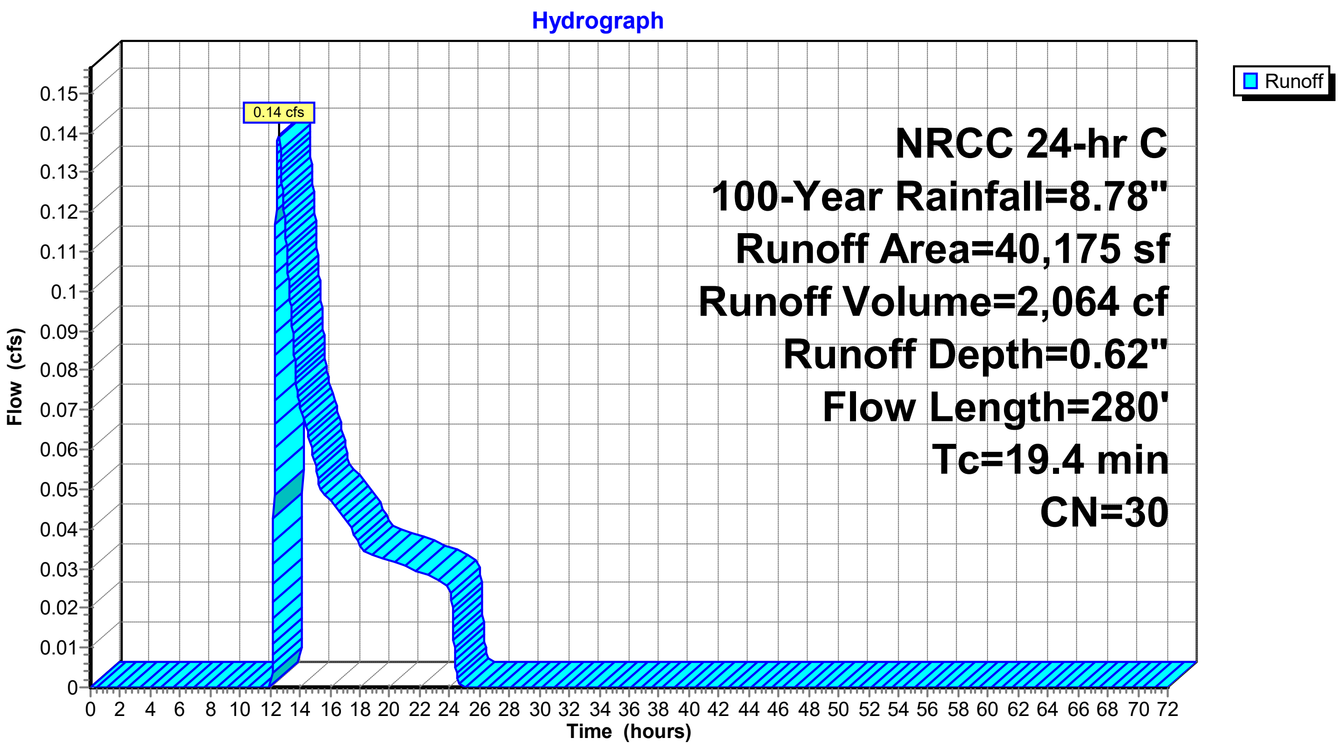
Runoff = 0.14 cfs @ 12.61 hrs, Volume= 2,064 cf, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
40,175	30	Woods, Good, HSG A
40,175		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	50	0.0300	0.08		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
9.2	230	0.0070	0.42		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
19.4	280	Total			

Subcatchment WSA-1:



Summary for Subcatchment WSA-2:

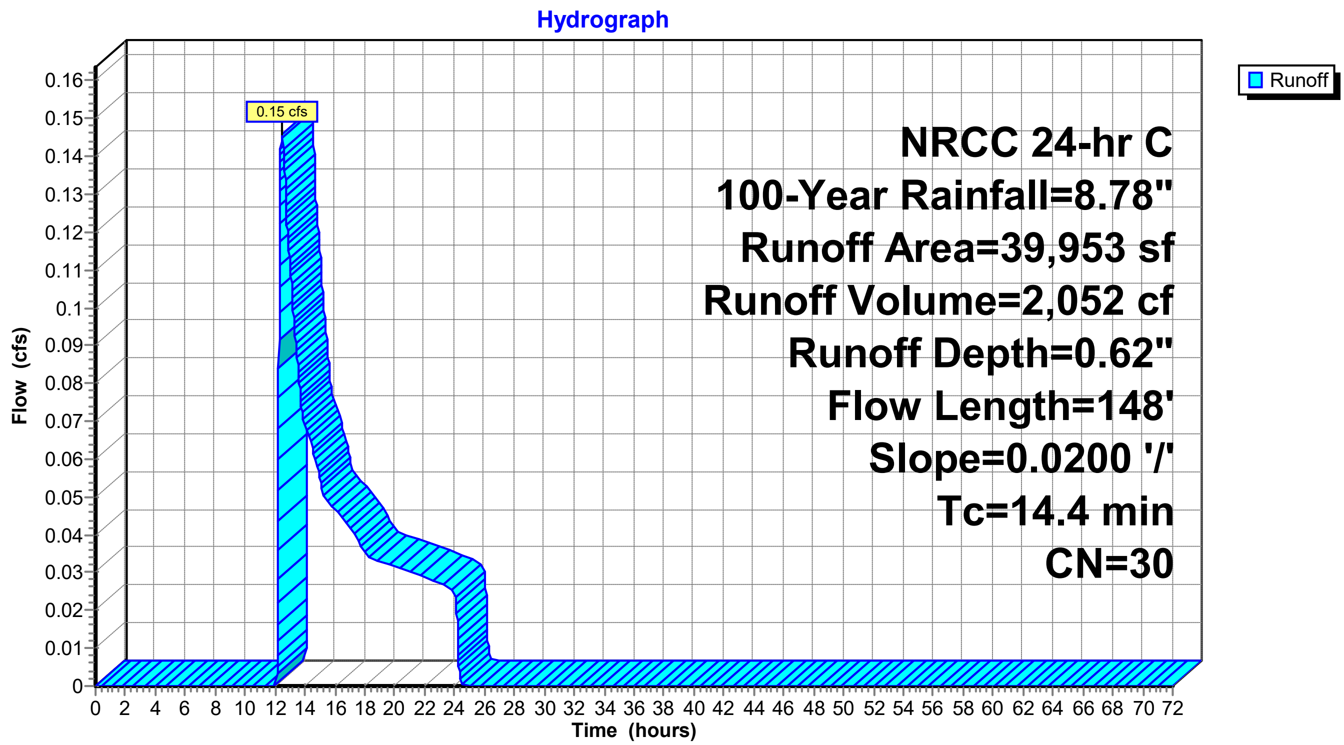
Runoff = 0.15 cfs @ 12.43 hrs, Volume= 2,052 cf, Depth= 0.62"
Routed to nonexistent node INF-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
39,953	30	Woods, Good, HSG A
39,953		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.1	50	0.0200	0.07		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
2.3	98	0.0200	0.71		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
14.4	148	Total			

Subcatchment WSA-2:



Summary for Subcatchment WSA-3:

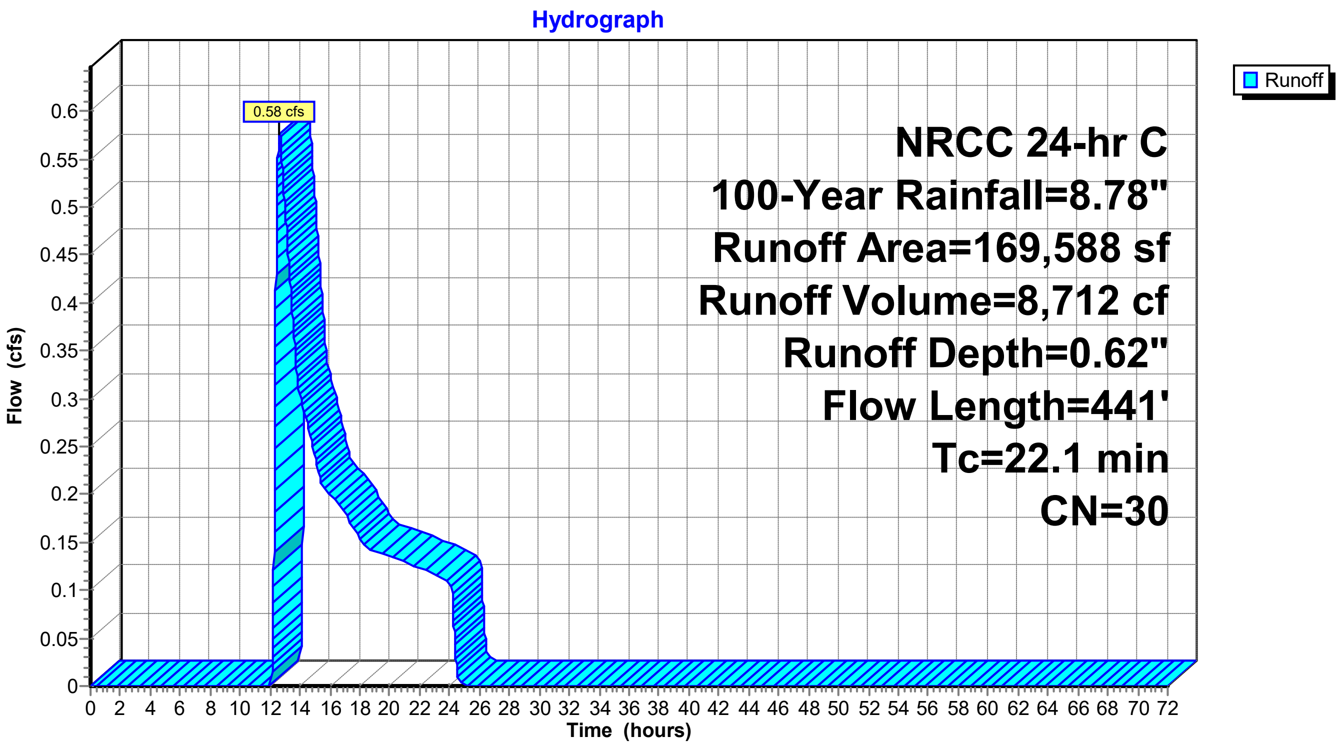
Runoff = 0.58 cfs @ 12.64 hrs, Volume= 8,712 cf, Depth= 0.62"
Routed to nonexistent node 1P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
169,588	30	Woods, Good, HSG A
169,588		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
13.0	391	0.0100	0.50		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
22.1	441	Total			

Subcatchment WSA-3:



Summary for Subcatchment WSA-4:

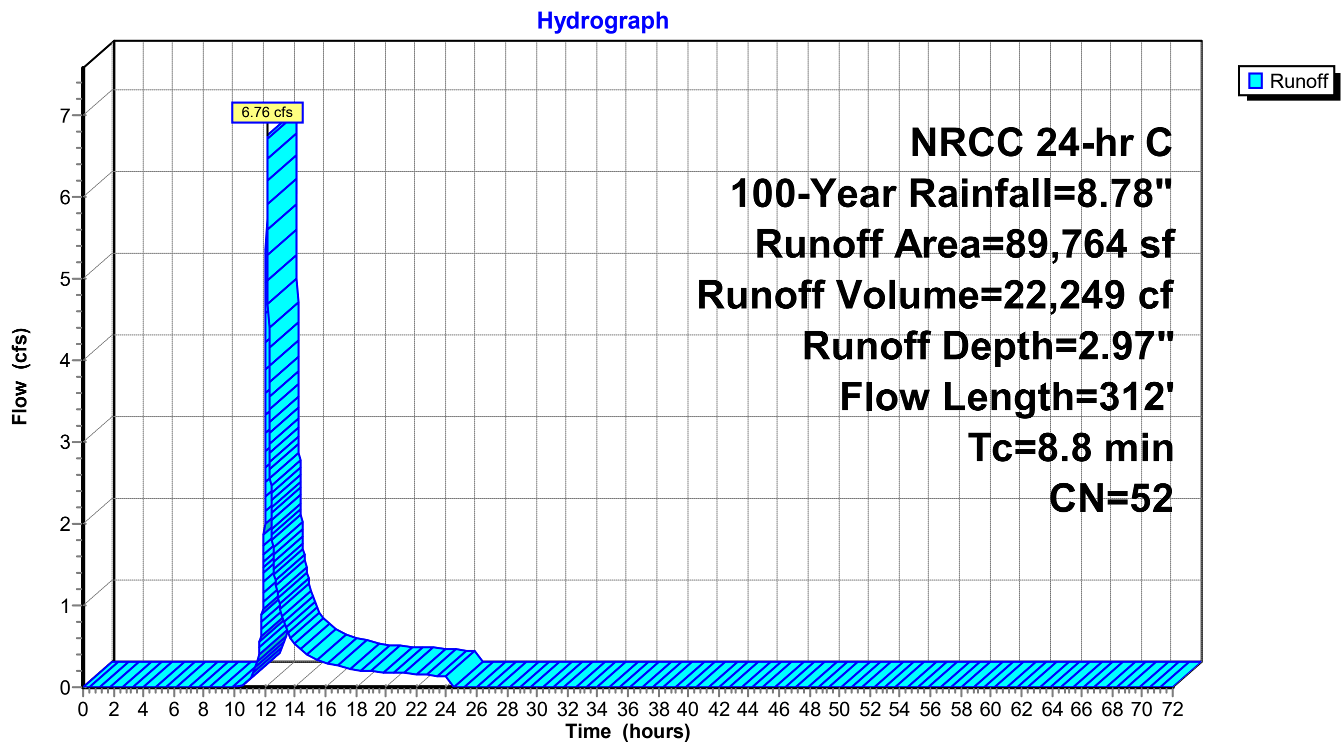
Runoff = 6.76 cfs @ 12.17 hrs, Volume= 22,249 cf, Depth= 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
60,515	30	Woods, Good, HSG A
18,875	98	Paved parking, HSG A
10,374	96	Gravel surface, HSG A
89,764	52	Weighted Average
70,889		78.97% Pervious Area
18,875		21.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1000	0.13		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
0.5	50	0.1000	1.58		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
1.0	96	0.0100	1.61		**Shallow Concentrated Flow, Gravel Parkiing** Unpaved Kv= 16.1 fps
1.0	116	0.0100	2.03		**Shallow Concentrated Flow, Paved parking** Paved Kv= 20.3 fps
8.8	312	Total			

Subcatchment WSA-4:



Events for Subcatchment WSA-1:

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-Year	3.33	0.00	0	0.00
10-Year	4.96	0.00	12	0.00
25-Year	6.22	0.01	325	0.10
50-Year	7.22	0.03	843	0.25
100-Year	**8.78**	**0.14**	**2,064**	**0.62**

Events for Subcatchment WSA-2:

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-Year	3.33	0.00	0	0.00
10-Year	4.96	0.00	12	0.00
25-Year	6.22	0.01	323	0.10
50-Year	7.22	0.03	839	0.25
100-Year	**8.78**	**0.15**	**2,052**	**0.62**

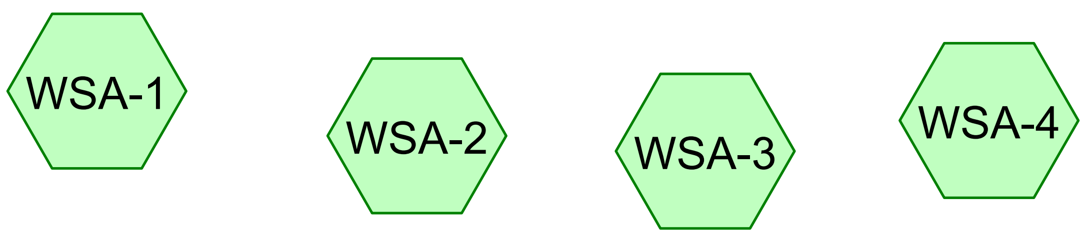
Events for Subcatchment WSA-3:

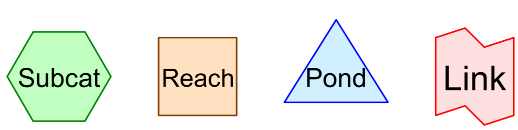
Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-Year	3.33	0.00	0	0.00
10-Year	4.96	0.01	51	0.00
25-Year	6.22	0.04	1,370	0.10
50-Year	7.22	0.14	3,559	0.25
100-Year	**8.78**	**0.58**	**8,712**	**0.62**

Events for Subcatchment WSA-4:

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-Year	3.33	0.10	1,537	0.21
10-Year	4.96	1.37	5,875	0.79
25-Year	6.22	2.91	10,519	1.41
50-Year	7.22	4.32	14,791	1.98
100-Year	**8.78**	**6.76**	**22,249**	**2.97**

TABLE OF CONTENTS





Routing Diagram for Pre 11.15.23
Prepared by Green Seal Environmental LLC, Printed 11/29/2023
HydroCAD® 10.20-3g s/n 07930 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	NRCC 24-hr	C	Default	24.00	1	3.33	2
2	10-Year	NRCC 24-hr	C	Default	24.00	1	4.96	2
3	25-Year	NRCC 24-hr	C	Default	24.00	1	6.22	2
4	50-Year	NRCC 24-hr	C	Default	24.00	1	7.22	2
5	100-Year	NRCC 24-hr	C	Default	24.00	1	8.78	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
10,374	96	Gravel surface, HSG A (WSA-4)
18,875	98	Paved parking, HSG A (WSA-4)
310,231	30	Woods, Good, HSG A (WSA-1, WSA-2, WSA-3, WSA-4)
339,480	**36**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
339,480	HSG A	WSA-1, WSA-2, WSA-3, WSA-4
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
339,480		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Subcatchment Numbers
10,374	0	0	0	0	10,374	Gravel surface	WSA-4
18,875	0	0	0	0	18,875	Paved parking	WSA-4
310,231	0	0	0	0	310,231	Woods, Good	WSA-1, WSA-2, WSA-3, WSA-4
339,480	**0**	**0**	**0**	**0**	**339,480**	**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 Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment WSA-1: Runoff Area=40,175 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=280' Tc=19.4 min CN=30 Runoff=0.00 cfs 0 cf

Subcatchment WSA-2: Runoff Area=39,953 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=148' Slope=0.0200 '/' Tc=14.4 min CN=30 Runoff=0.00 cfs 0 cf

Subcatchment WSA-3: Runoff Area=169,588 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=441' Tc=22.1 min CN=30 Runoff=0.00 cfs 0 cf

Subcatchment WSA-4: Runoff Area=89,764 sf 21.03% Impervious Runoff Depth=0.21"
Flow Length=312' Tc=8.8 min CN=52 Runoff=0.10 cfs 1,537 cf

Total Runoff Area = 339,480 sf Runoff Volume = 1,537 cf Average Runoff Depth = 0.05"
94.44% Pervious = 320,605 sf 5.56% Impervious = 18,875 sf

Summary for Subcatchment WSA-1:

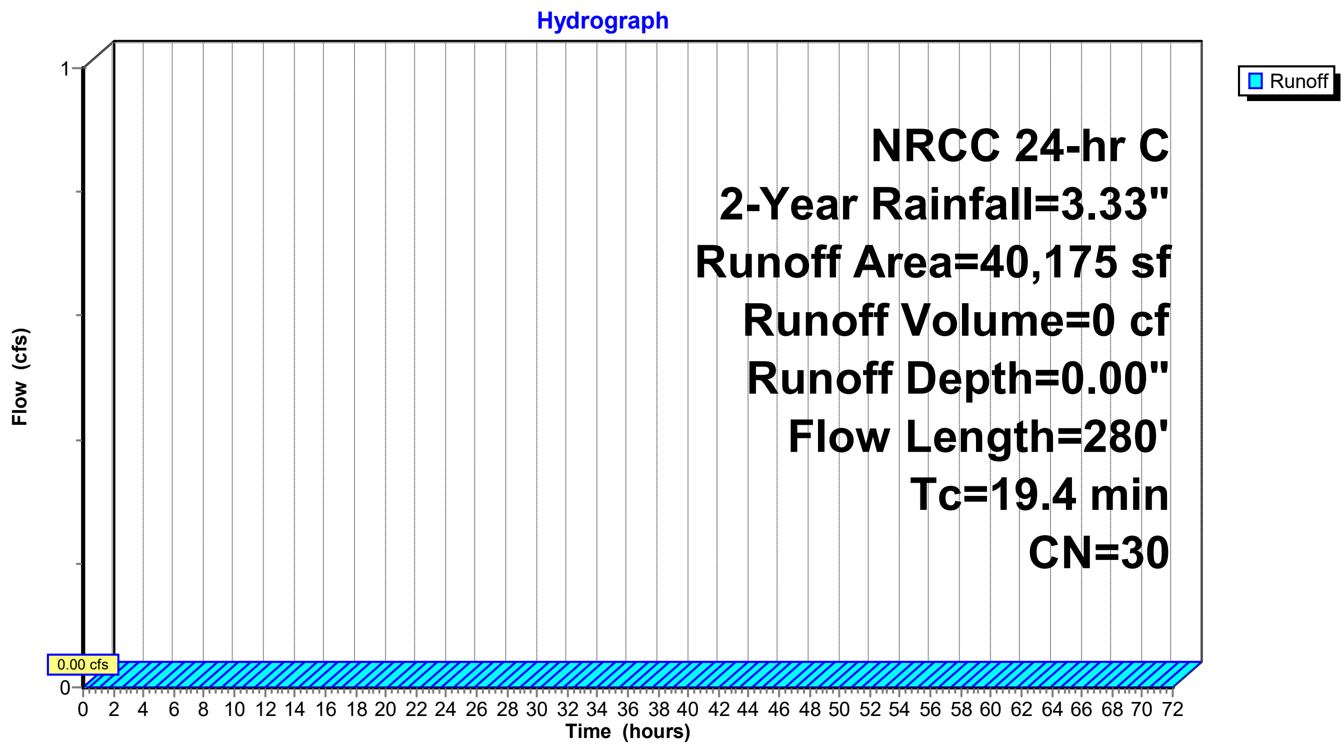
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
40,175	30	Woods, Good, HSG A
40,175		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	50	0.0300	0.08		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
9.2	230	0.0070	0.42		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
19.4	280	Total			

Subcatchment WSA-1:



Summary for Subcatchment WSA-2:

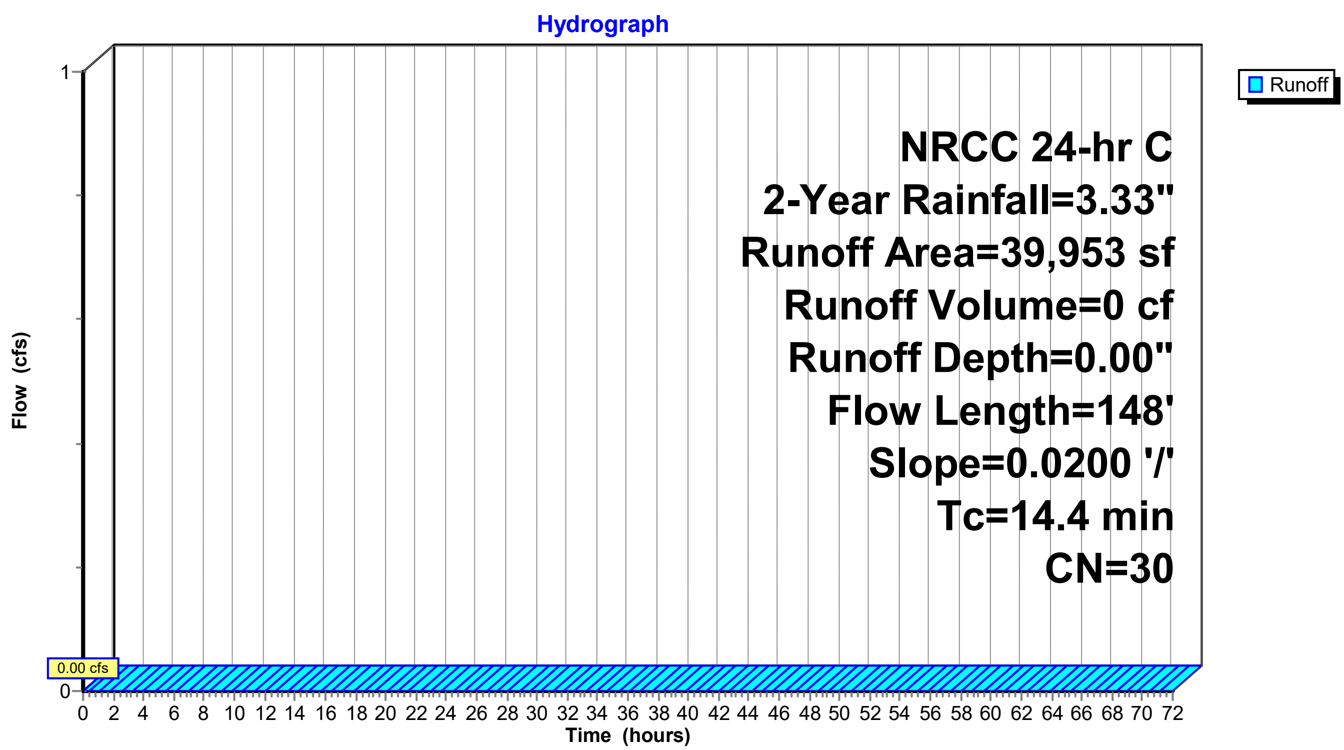
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to nonexistent node INF-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
39,953	30	Woods, Good, HSG A
39,953		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.1	50	0.0200	0.07		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
2.3	98	0.0200	0.71		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
14.4	148	Total			

Subcatchment WSA-2:



Summary for Subcatchment WSA-3:

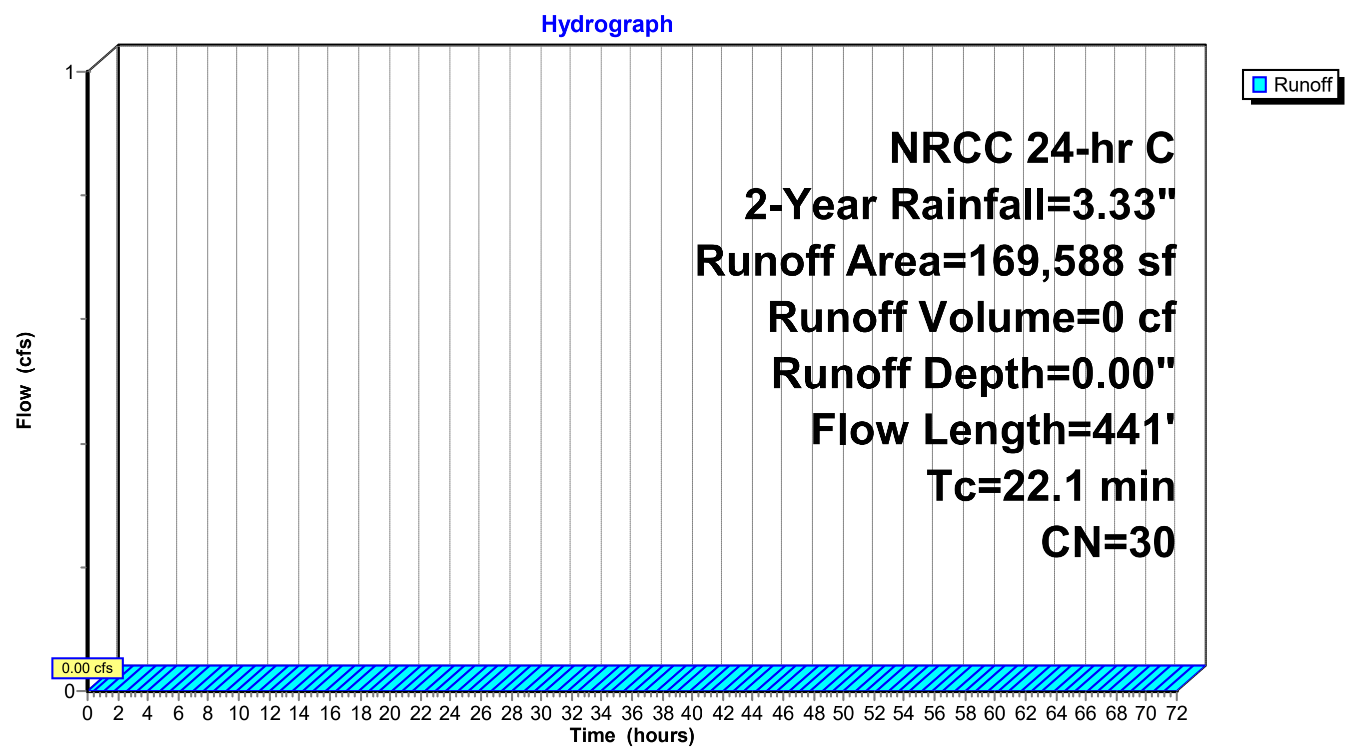
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to nonexistent node 1P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
169,588	30	Woods, Good, HSG A
169,588		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
13.0	391	0.0100	0.50		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
22.1	441	Total			

Subcatchment WSA-3:



Summary for Subcatchment WSA-4:

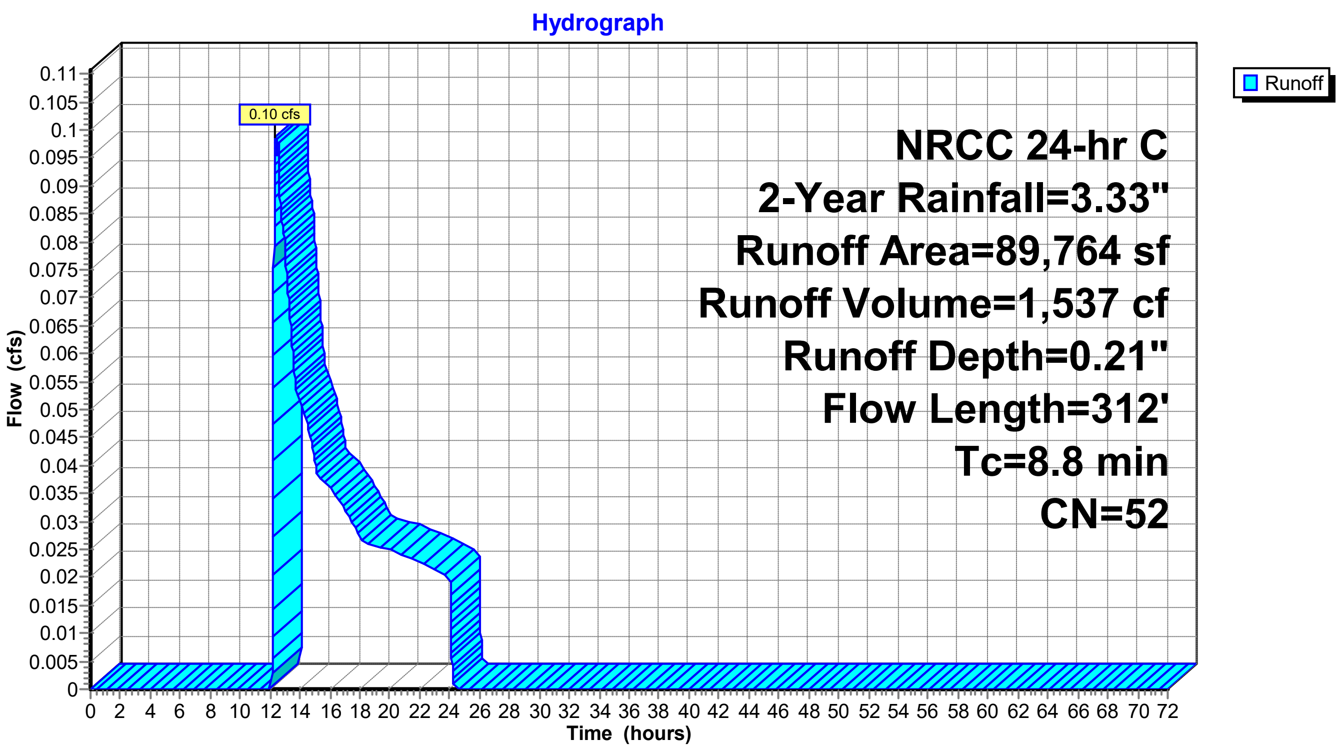
Runoff = 0.10 cfs @ 12.37 hrs, Volume= 1,537 cf, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
60,515	30	Woods, Good, HSG A
18,875	98	Paved parking, HSG A
10,374	96	Gravel surface, HSG A
89,764	52	Weighted Average
70,889		78.97% Pervious Area
18,875		21.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1000	0.13		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
0.5	50	0.1000	1.58		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
1.0	96	0.0100	1.61		**Shallow Concentrated Flow, Gravel Parkiing** Unpaved Kv= 16.1 fps
1.0	116	0.0100	2.03		**Shallow Concentrated Flow, Paved parking** Paved Kv= 20.3 fps
8.8	312	Total			

Subcatchment WSA-4:



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 Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment WSA-1: Runoff Area=40,175 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=280' Tc=19.4 min CN=30 Runoff=0.00 cfs 12 cf

Subcatchment WSA-2: Runoff Area=39,953 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=148' Slope=0.0200 '/' Tc=14.4 min CN=30 Runoff=0.00 cfs 12 cf

Subcatchment WSA-3: Runoff Area=169,588 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=441' Tc=22.1 min CN=30 Runoff=0.01 cfs 51 cf

Subcatchment WSA-4: Runoff Area=89,764 sf 21.03% Impervious Runoff Depth=0.79"
Flow Length=312' Tc=8.8 min CN=52 Runoff=1.37 cfs 5,875 cf

Total Runoff Area = 339,480 sf Runoff Volume = 5,951 cf Average Runoff Depth = 0.21"
94.44% Pervious = 320,605 sf 5.56% Impervious = 18,875 sf

Summary for Subcatchment WSA-1:

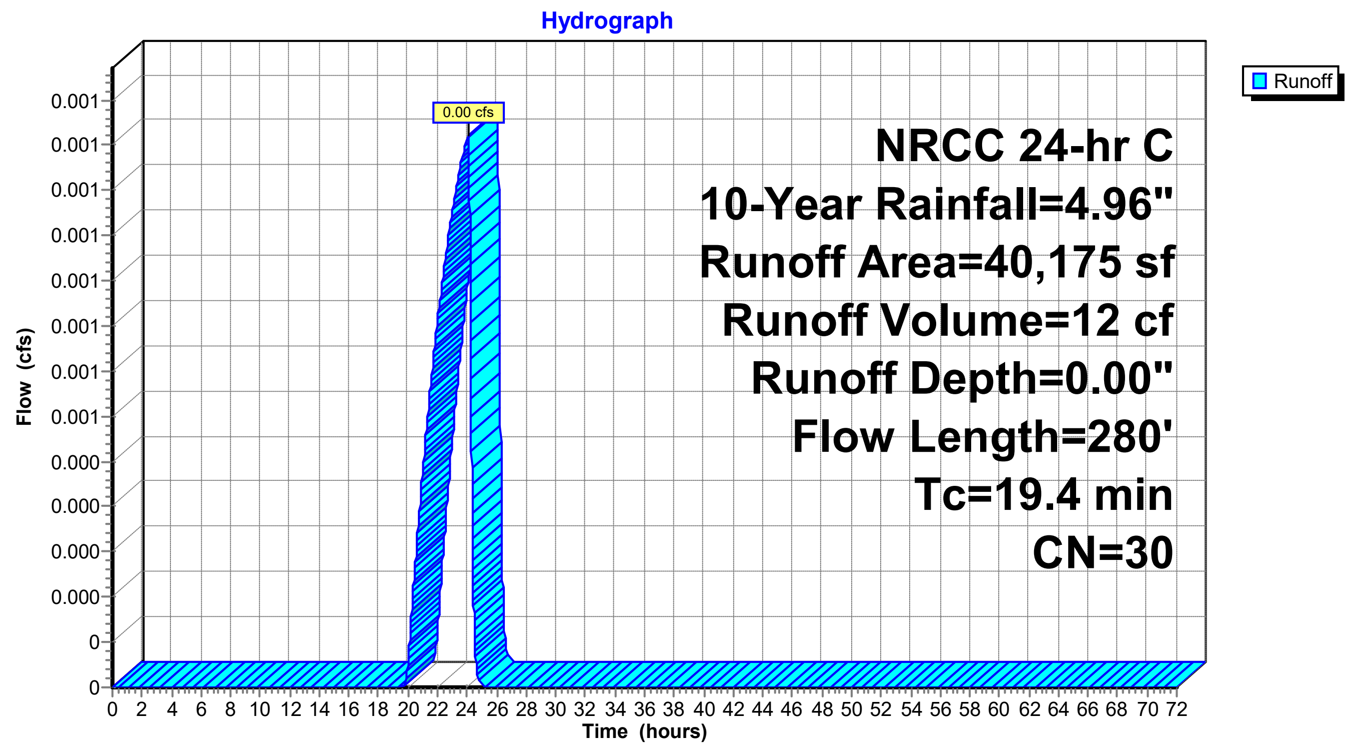
Runoff = 0.00 cfs @ 24.04 hrs, Volume= 12 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
40,175	30	Woods, Good, HSG A
40,175		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	50	0.0300	0.08		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
9.2	230	0.0070	0.42		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
19.4	280	Total			

Subcatchment WSA-1:



Summary for Subcatchment WSA-2:

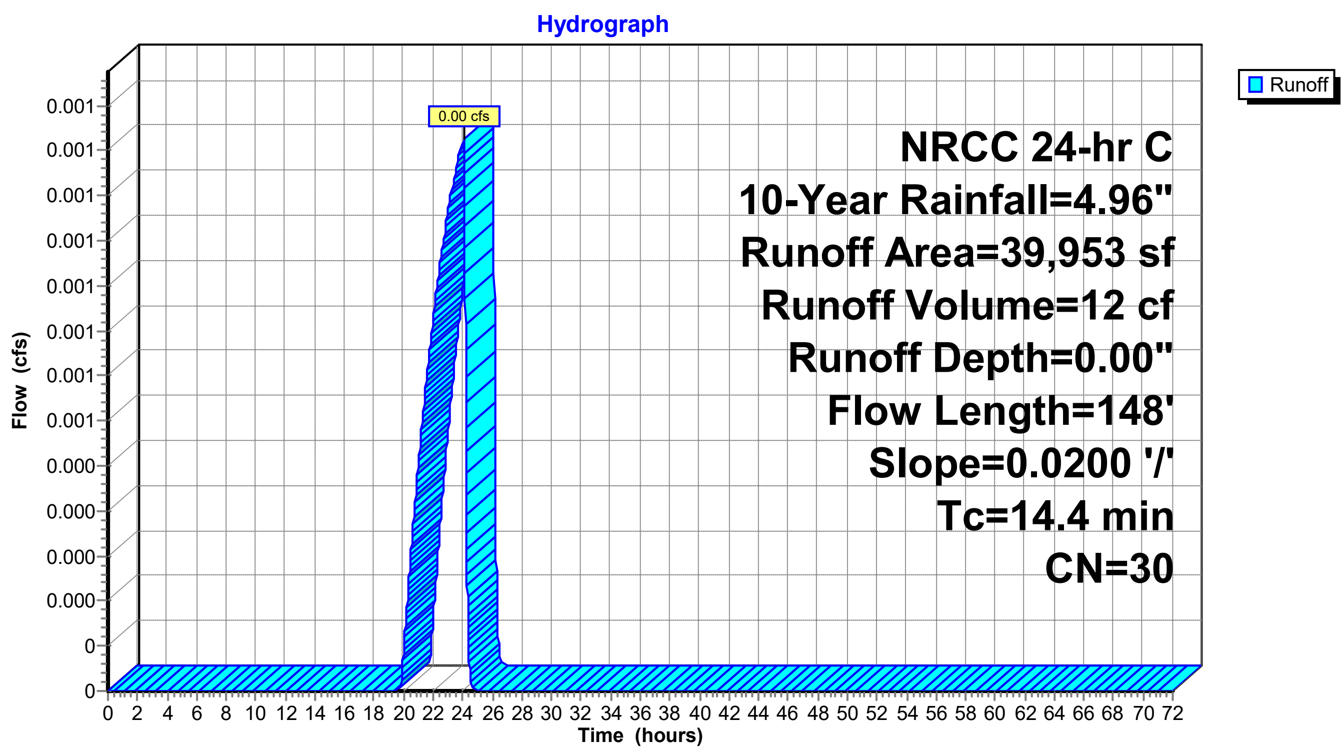
Runoff = 0.00 cfs @ 24.03 hrs, Volume= 12 cf, Depth= 0.00"
Routed to nonexistent node INF-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
39,953	30	Woods, Good, HSG A
39,953		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.1	50	0.0200	0.07		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
2.3	98	0.0200	0.71		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
14.4	148	Total			

Subcatchment WSA-2:



Summary for Subcatchment WSA-3:

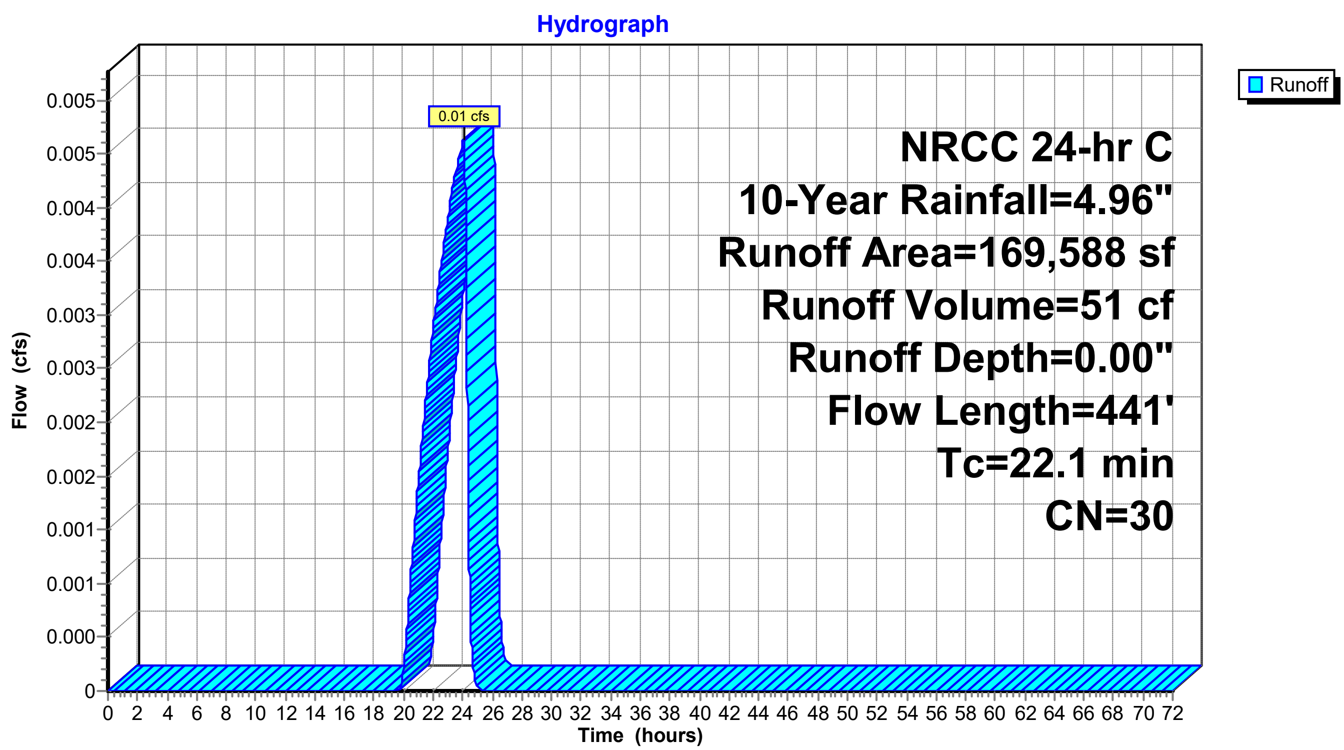
Runoff = 0.01 cfs @ 24.04 hrs, Volume= 51 cf, Depth= 0.00"
Routed to nonexistent node 1P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
169,588	30	Woods, Good, HSG A
169,588		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
13.0	391	0.0100	0.50		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
22.1	441	Total			

Subcatchment WSA-3:



Summary for Subcatchment WSA-4:

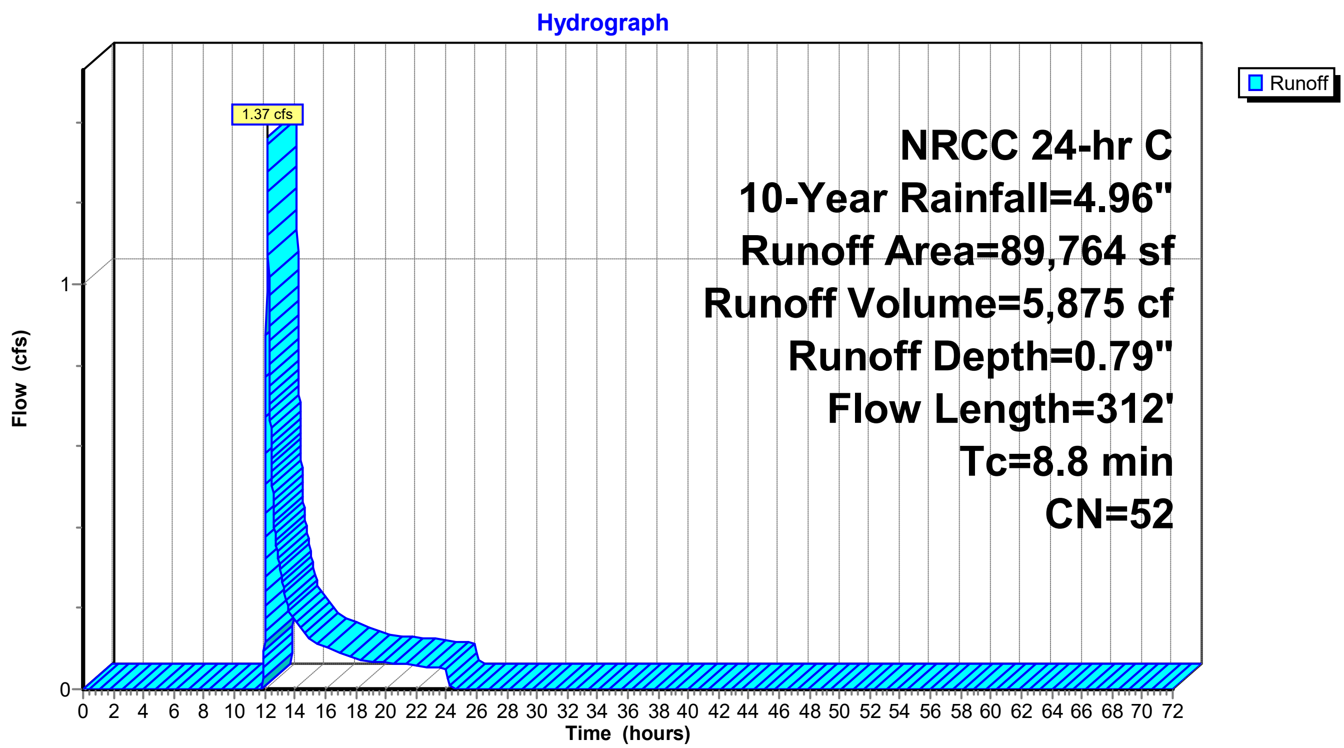
Runoff = 1.37 cfs @ 12.18 hrs, Volume= 5,875 cf, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
60,515	30	Woods, Good, HSG A
18,875	98	Paved parking, HSG A
10,374	96	Gravel surface, HSG A
89,764	52	Weighted Average
70,889		78.97% Pervious Area
18,875		21.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1000	0.13		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
0.5	50	0.1000	1.58		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
1.0	96	0.0100	1.61		**Shallow Concentrated Flow, Gravel Parkiing** Unpaved Kv= 16.1 fps
1.0	116	0.0100	2.03		**Shallow Concentrated Flow, Paved parking** Paved Kv= 20.3 fps
8.8	312	Total			

Subcatchment WSA-4:



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 Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment WSA-1: Runoff Area=40,175 sf 0.00% Impervious Runoff Depth=0.10"
Flow Length=280' Tc=19.4 min CN=30 Runoff=0.01 cfs 325 cf

Subcatchment WSA-2: Runoff Area=39,953 sf 0.00% Impervious Runoff Depth=0.10"
Flow Length=148' Slope=0.0200 '/' Tc=14.4 min CN=30 Runoff=0.01 cfs 323 cf

Subcatchment WSA-3: Runoff Area=169,588 sf 0.00% Impervious Runoff Depth=0.10"
Flow Length=441' Tc=22.1 min CN=30 Runoff=0.04 cfs 1,370 cf

Subcatchment WSA-4: Runoff Area=89,764 sf 21.03% Impervious Runoff Depth=1.41"
Flow Length=312' Tc=8.8 min CN=52 Runoff=2.91 cfs 10,519 cf

Total Runoff Area = 339,480 sf Runoff Volume = 12,536 cf Average Runoff Depth = 0.44"
94.44% Pervious = 320,605 sf 5.56% Impervious = 18,875 sf

Summary for Subcatchment WSA-1:

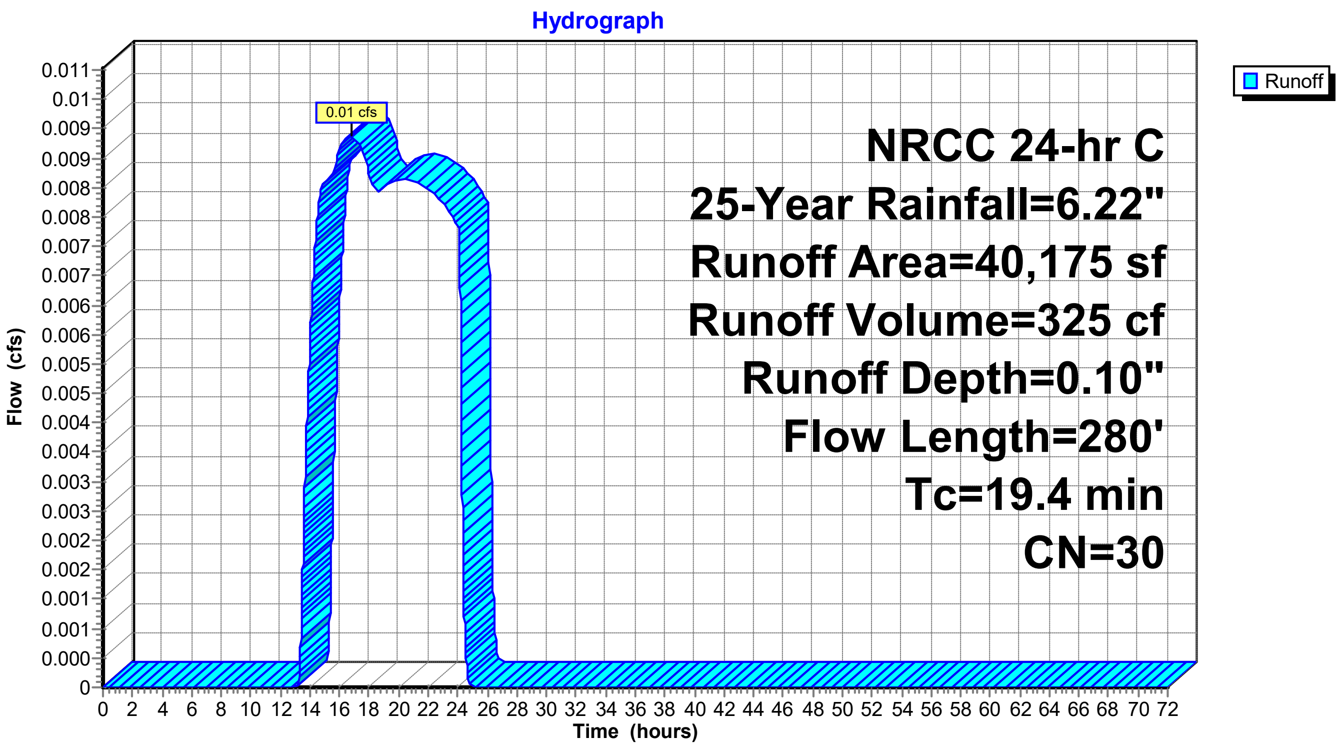
Runoff = 0.01 cfs @ 16.75 hrs, Volume= 325 cf, Depth= 0.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
40,175	30	Woods, Good, HSG A
40,175		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	50	0.0300	0.08		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
9.2	230	0.0070	0.42		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
19.4	280	Total			

Subcatchment WSA-1:



Summary for Subcatchment WSA-2:

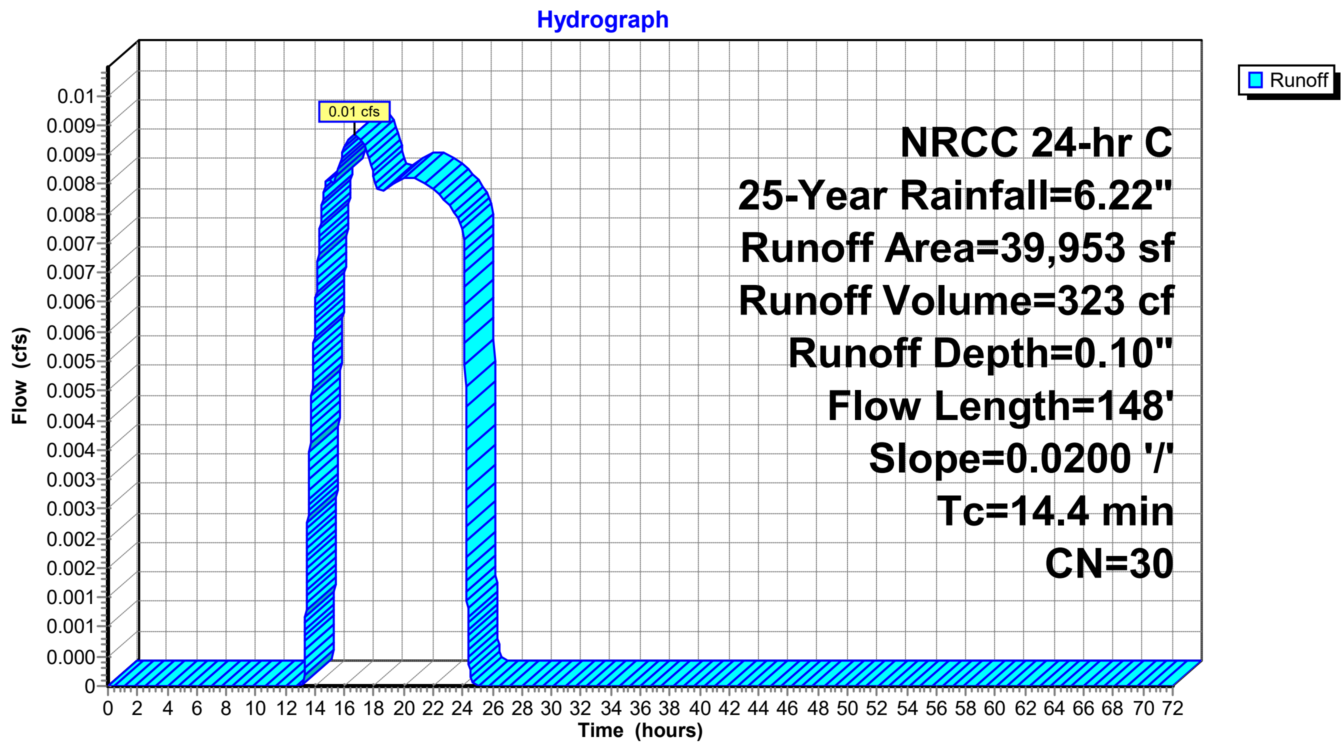
Runoff = 0.01 cfs @ 16.62 hrs, Volume= 323 cf, Depth= 0.10"
Routed to nonexistent node INF-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
39,953	30	Woods, Good, HSG A
39,953		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.1	50	0.0200	0.07		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
2.3	98	0.0200	0.71		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
14.4	148	Total			

Subcatchment WSA-2:



Summary for Subcatchment WSA-3:

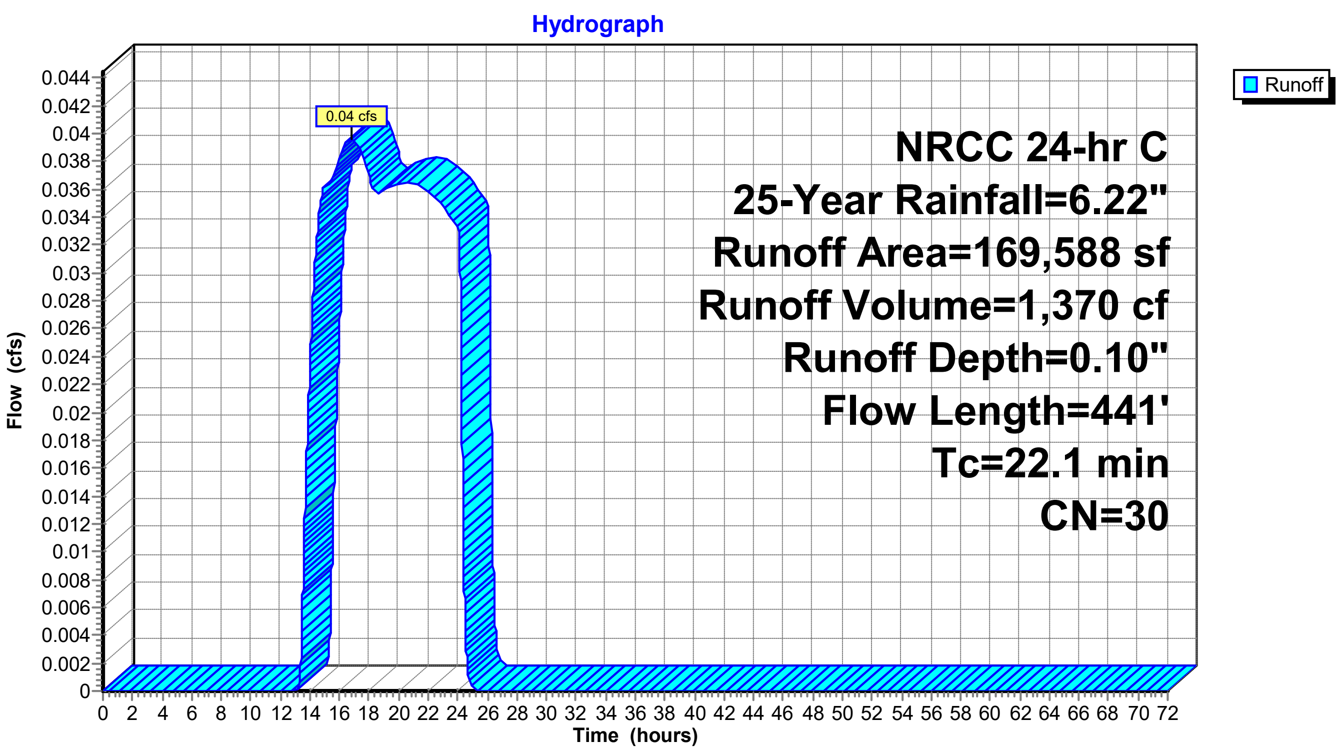
Runoff = 0.04 cfs @ 16.77 hrs, Volume= 1,370 cf, Depth= 0.10"
Routed to nonexistent node 1P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
169,588	30	Woods, Good, HSG A
169,588		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
13.0	391	0.0100	0.50		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
22.1	441	Total			

Subcatchment WSA-3:



Summary for Subcatchment WSA-4:

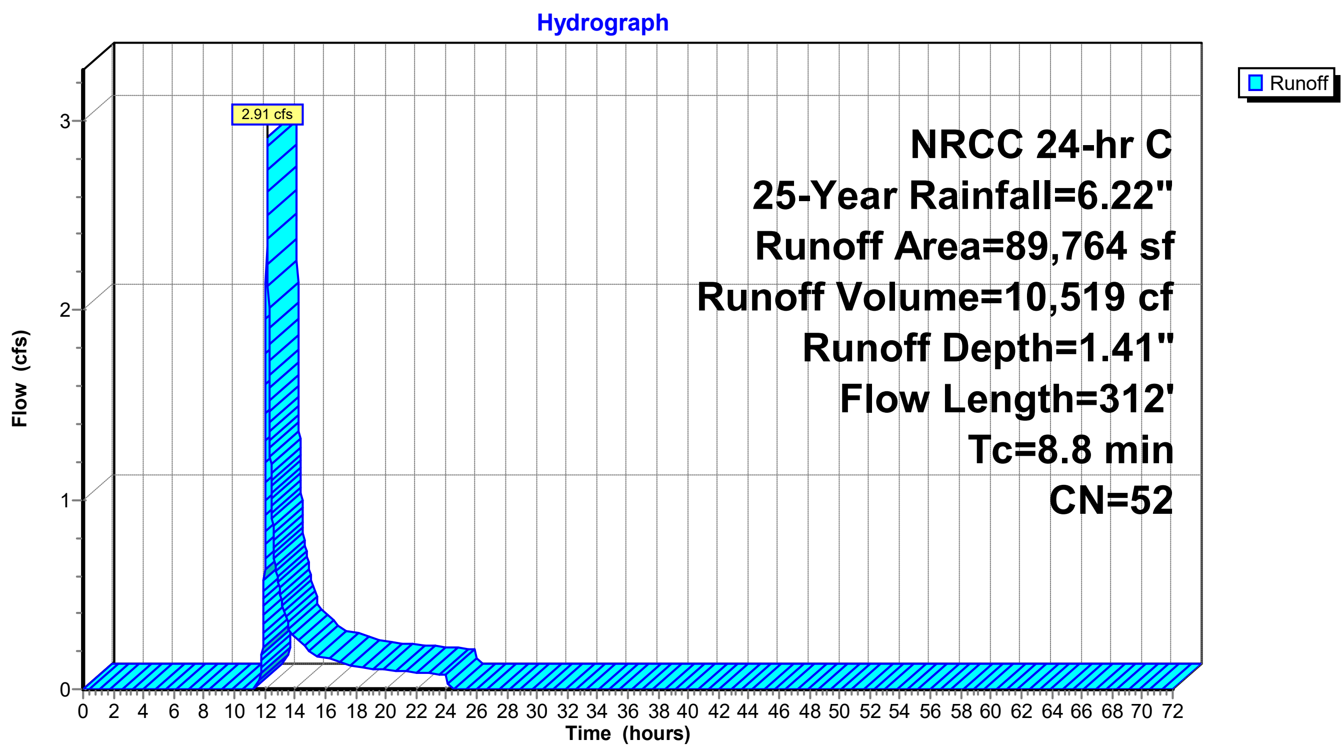
Runoff = 2.91 cfs @ 12.17 hrs, Volume= 10,519 cf, Depth= 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
60,515	30	Woods, Good, HSG A
18,875	98	Paved parking, HSG A
10,374	96	Gravel surface, HSG A
89,764	52	Weighted Average
70,889		78.97% Pervious Area
18,875		21.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1000	0.13		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
0.5	50	0.1000	1.58		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
1.0	96	0.0100	1.61		**Shallow Concentrated Flow, Gravel Parkiing** Unpaved Kv= 16.1 fps
1.0	116	0.0100	2.03		**Shallow Concentrated Flow, Paved parking** Paved Kv= 20.3 fps
8.8	312	Total			

Subcatchment WSA-4:



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 Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment WSA-1: Runoff Area=40,175 sf 0.00% Impervious Runoff Depth=0.25"
Flow Length=280' Tc=19.4 min CN=30 Runoff=0.03 cfs 843 cf

Subcatchment WSA-2: Runoff Area=39,953 sf 0.00% Impervious Runoff Depth=0.25"
Flow Length=148' Slope=0.0200 '/' Tc=14.4 min CN=30 Runoff=0.03 cfs 839 cf

Subcatchment WSA-3: Runoff Area=169,588 sf 0.00% Impervious Runoff Depth=0.25"
Flow Length=441' Tc=22.1 min CN=30 Runoff=0.14 cfs 3,559 cf

Subcatchment WSA-4: Runoff Area=89,764 sf 21.03% Impervious Runoff Depth=1.98"
Flow Length=312' Tc=8.8 min CN=52 Runoff=4.32 cfs 14,791 cf

Total Runoff Area = 339,480 sf Runoff Volume = 20,032 cf Average Runoff Depth = 0.71"
94.44% Pervious = 320,605 sf 5.56% Impervious = 18,875 sf

Summary for Subcatchment WSA-1:

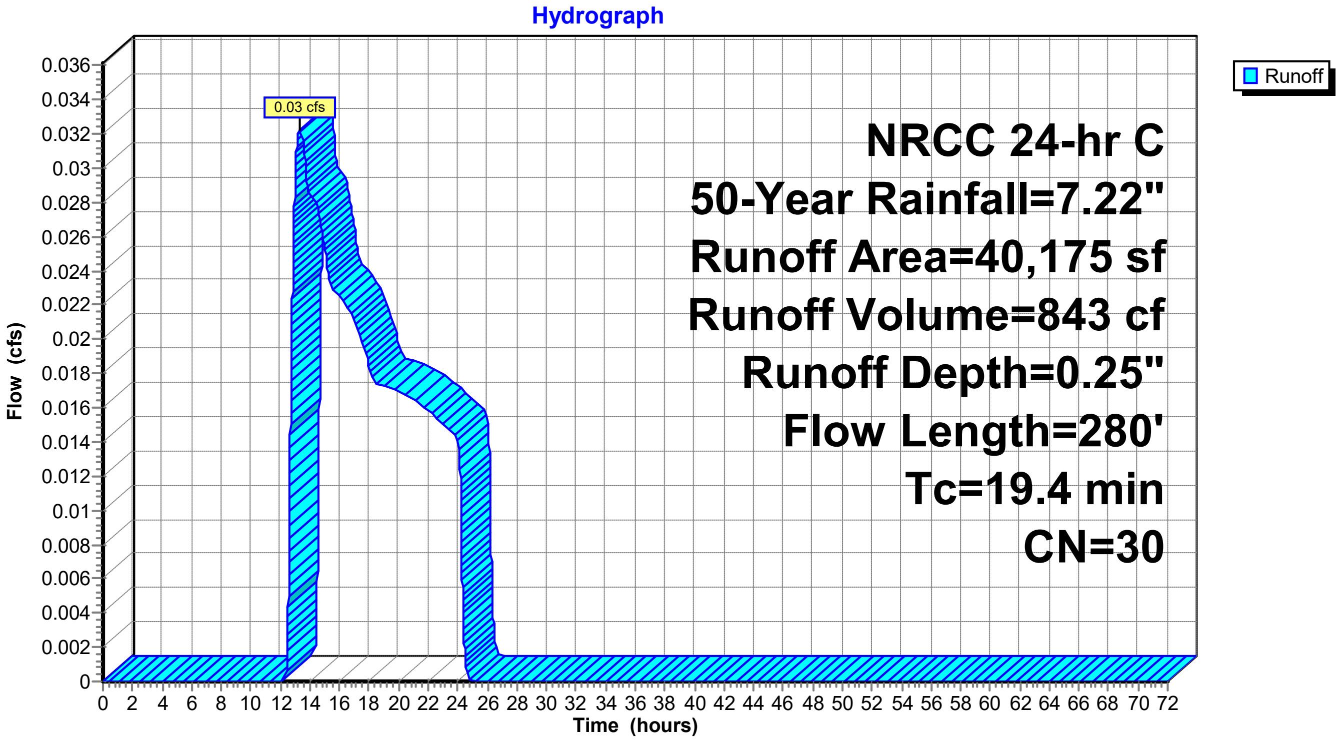
Runoff = 0.03 cfs @ 13.30 hrs, Volume= 843 cf, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
40,175	30	Woods, Good, HSG A
40,175		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	50	0.0300	0.08		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
9.2	230	0.0070	0.42		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
19.4	280	Total			

Subcatchment WSA-1:



Summary for Subcatchment WSA-2:

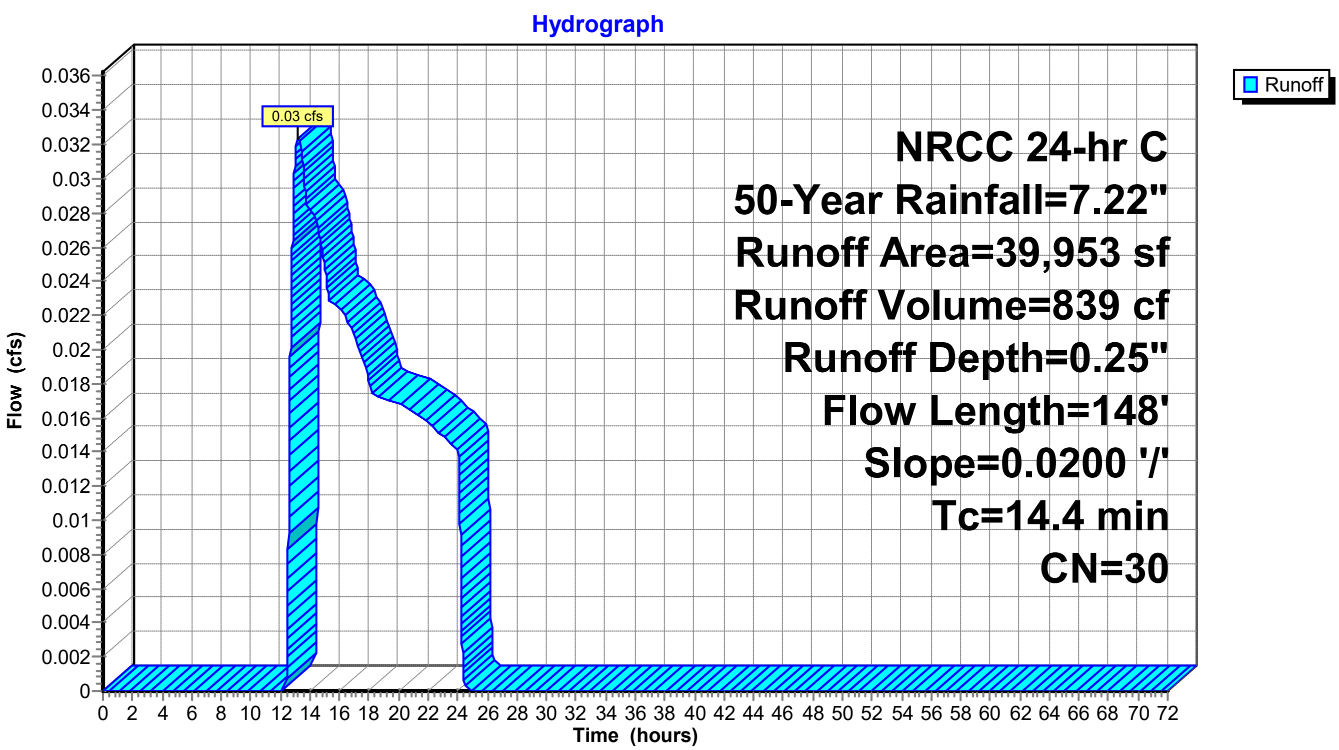
Runoff = 0.03 cfs @ 13.14 hrs, Volume= 839 cf, Depth= 0.25"
Routed to nonexistent node INF-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
39,953	30	Woods, Good, HSG A
39,953		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.1	50	0.0200	0.07		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
2.3	98	0.0200	0.71		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
14.4	148	Total			

Subcatchment WSA-2:



Summary for Subcatchment WSA-3:

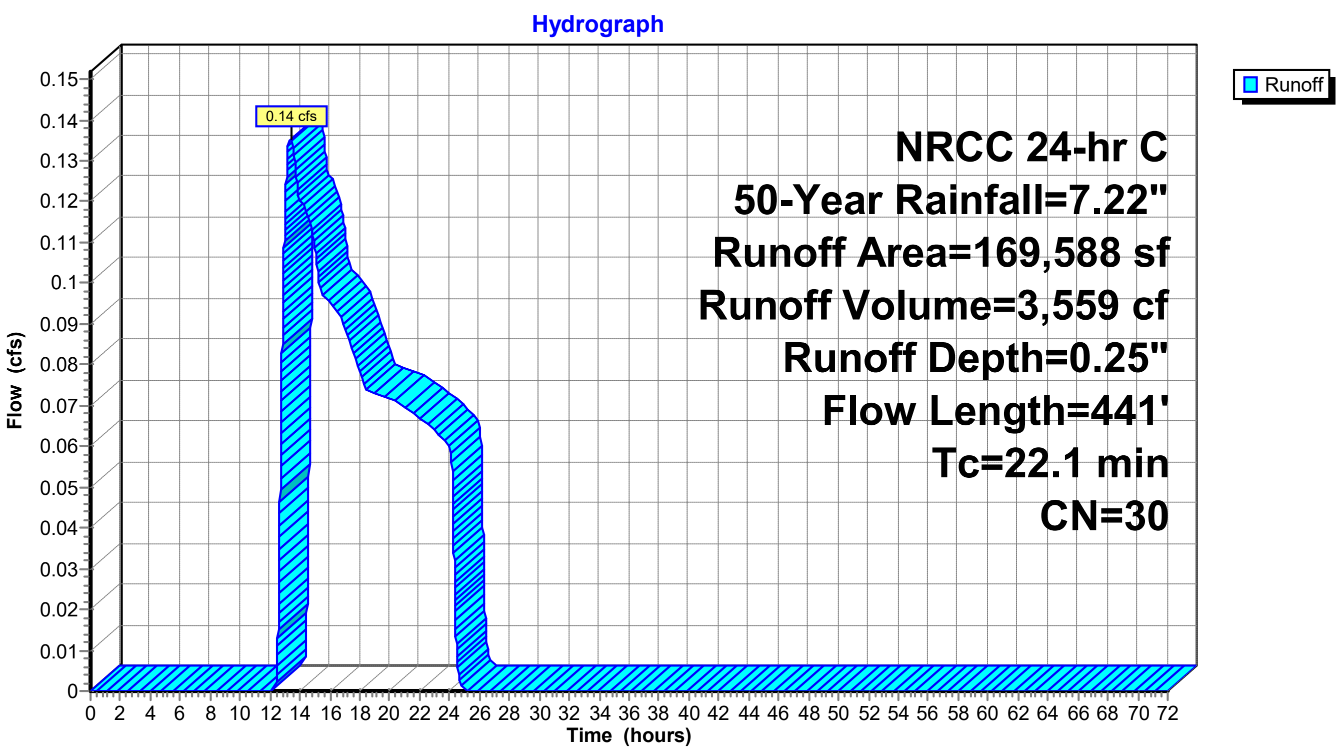
Runoff = 0.14 cfs @ 13.38 hrs, Volume= 3,559 cf, Depth= 0.25"
Routed to nonexistent node 1P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
169,588	30	Woods, Good, HSG A
169,588		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
13.0	391	0.0100	0.50		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
22.1	441	Total			

Subcatchment WSA-3:



Summary for Subcatchment WSA-4:

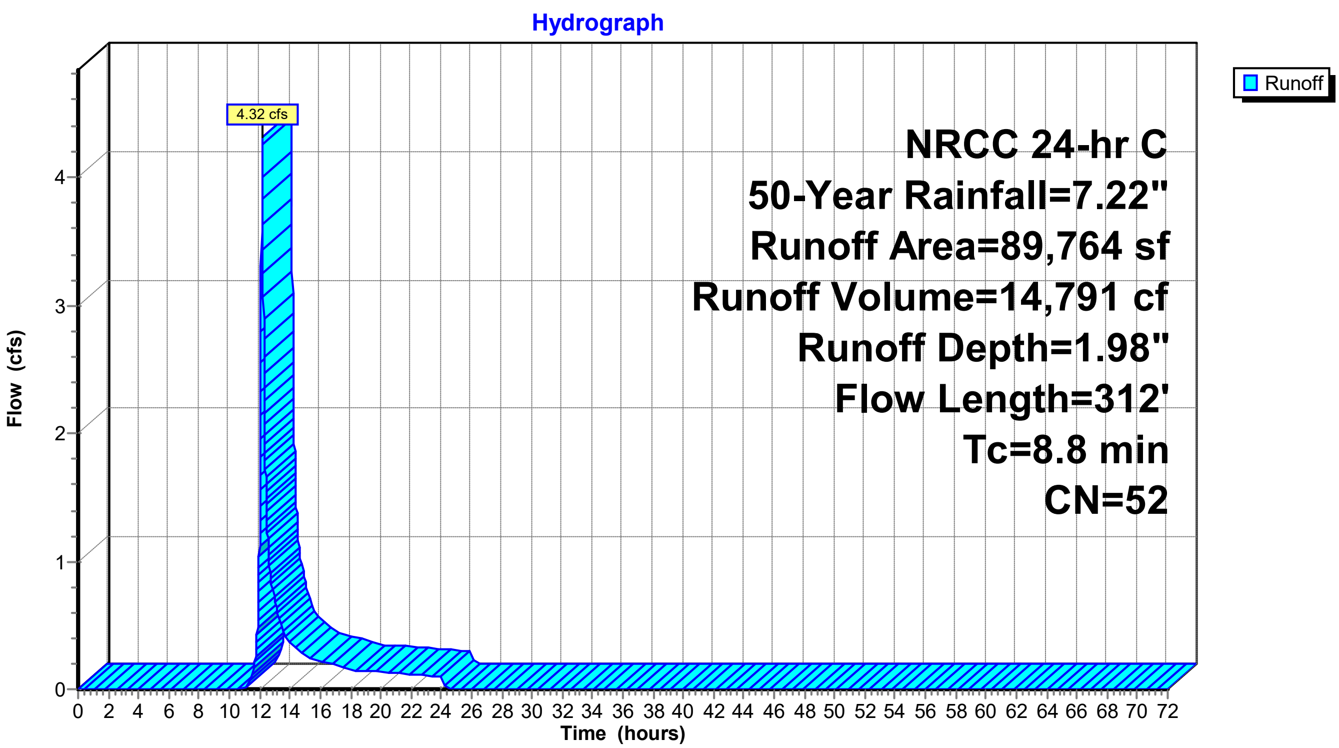
Runoff = 4.32 cfs @ 12.17 hrs, Volume= 14,791 cf, Depth= 1.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
60,515	30	Woods, Good, HSG A
18,875	98	Paved parking, HSG A
10,374	96	Gravel surface, HSG A
89,764	52	Weighted Average
70,889		78.97% Pervious Area
18,875		21.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1000	0.13		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
0.5	50	0.1000	1.58		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
1.0	96	0.0100	1.61		**Shallow Concentrated Flow, Gravel Parkiing** Unpaved Kv= 16.1 fps
1.0	116	0.0100	2.03		**Shallow Concentrated Flow, Paved parking** Paved Kv= 20.3 fps
8.8	312	Total			

Subcatchment WSA-4:



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 Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment WSA-1: Runoff Area=40,175 sf 0.00% Impervious Runoff Depth=0.62"
Flow Length=280' Tc=19.4 min CN=30 Runoff=0.14 cfs 2,064 cf

Subcatchment WSA-2: Runoff Area=39,953 sf 0.00% Impervious Runoff Depth=0.62"
Flow Length=148' Slope=0.0200 '/' Tc=14.4 min CN=30 Runoff=0.15 cfs 2,052 cf

Subcatchment WSA-3: Runoff Area=169,588 sf 0.00% Impervious Runoff Depth=0.62"
Flow Length=441' Tc=22.1 min CN=30 Runoff=0.58 cfs 8,712 cf

Subcatchment WSA-4: Runoff Area=89,764 sf 21.03% Impervious Runoff Depth=2.97"
Flow Length=312' Tc=8.8 min CN=52 Runoff=6.76 cfs 22,249 cf

Total Runoff Area = 339,480 sf Runoff Volume = 35,077 cf Average Runoff Depth = 1.24"
94.44% Pervious = 320,605 sf 5.56% Impervious = 18,875 sf

Summary for Subcatchment WSA-1:

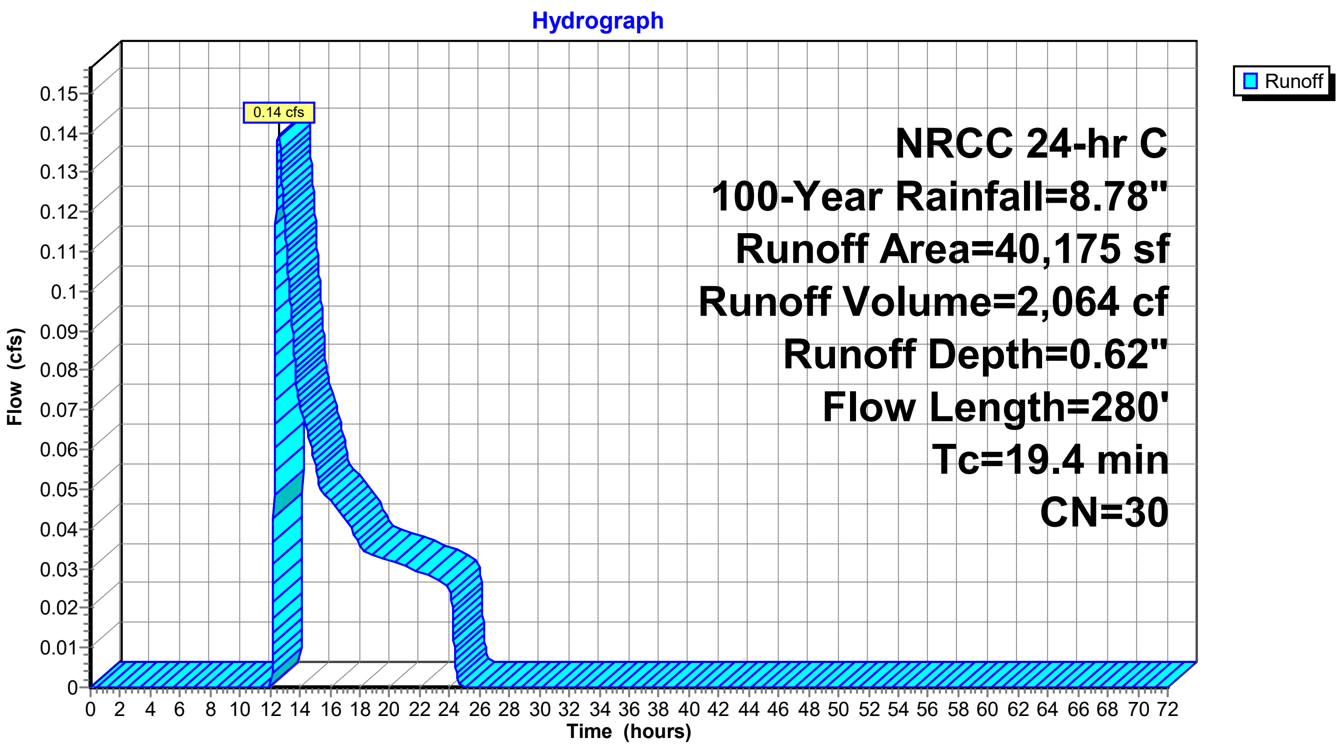
Runoff = 0.14 cfs @ 12.61 hrs, Volume= 2,064 cf, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
40,175	30	Woods, Good, HSG A
40,175		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	50	0.0300	0.08		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
9.2	230	0.0070	0.42		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
19.4	280	Total			

Subcatchment WSA-1:



Summary for Subcatchment WSA-2:

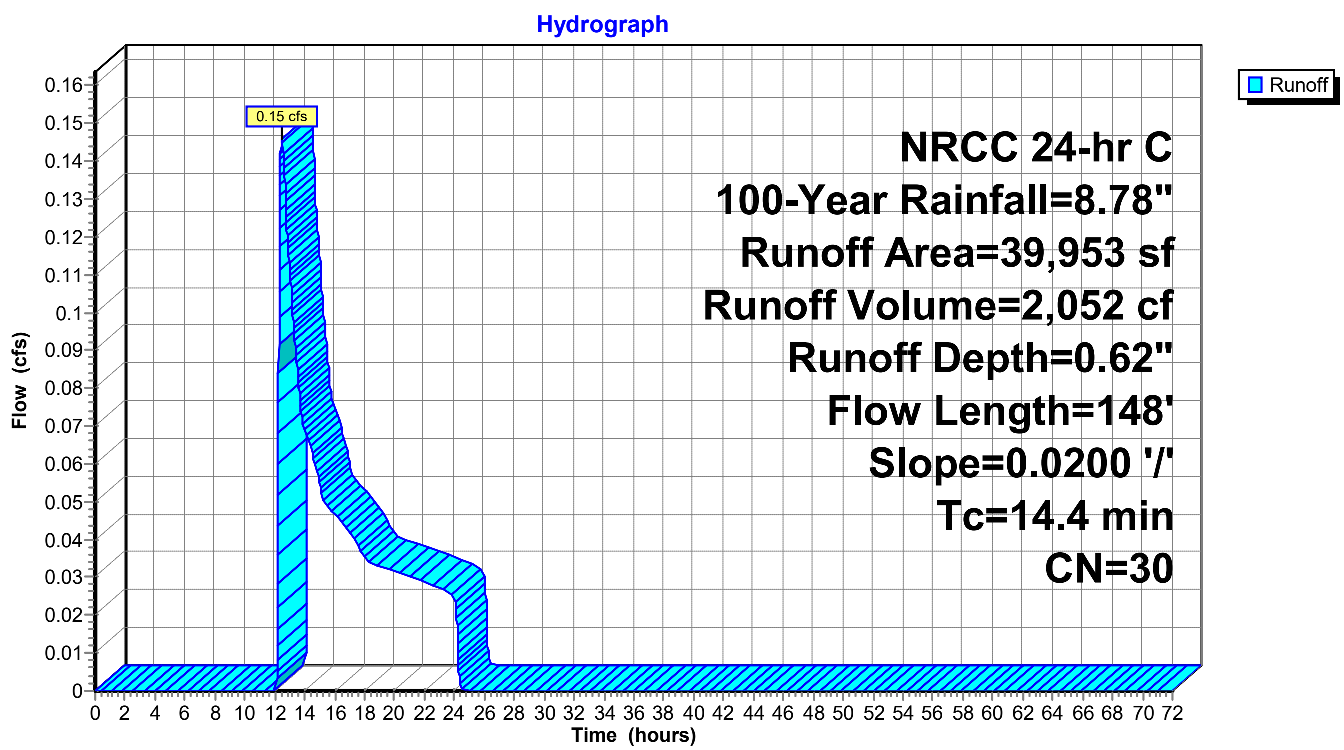
Runoff = 0.15 cfs @ 12.43 hrs, Volume= 2,052 cf, Depth= 0.62"
Routed to nonexistent node INF-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
39,953	30	Woods, Good, HSG A
39,953		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.1	50	0.0200	0.07		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
2.3	98	0.0200	0.71		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
14.4	148	Total			

Subcatchment WSA-2:



Summary for Subcatchment WSA-3:

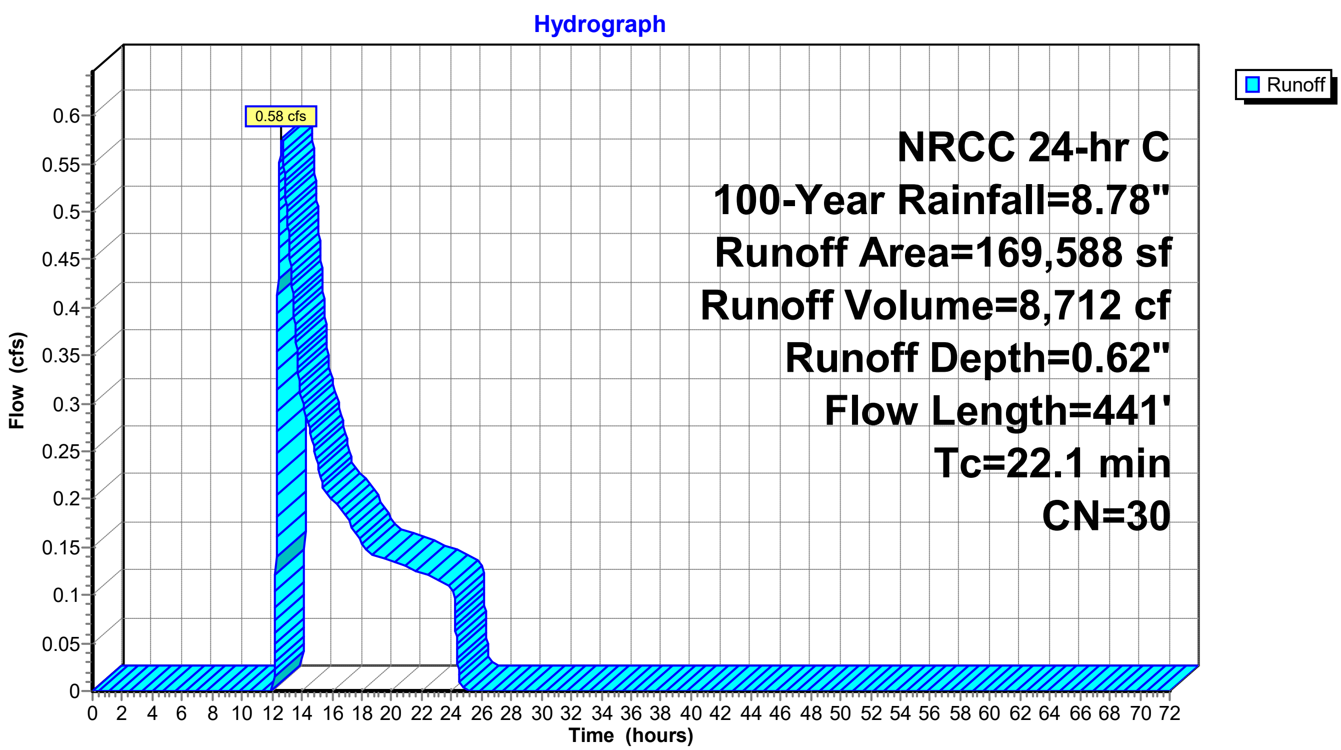
Runoff = 0.58 cfs @ 12.64 hrs, Volume= 8,712 cf, Depth= 0.62"
Routed to nonexistent node 1P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
169,588	30	Woods, Good, HSG A
169,588		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
13.0	391	0.0100	0.50		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
22.1	441	Total			

Subcatchment WSA-3:



Summary for Subcatchment WSA-4:

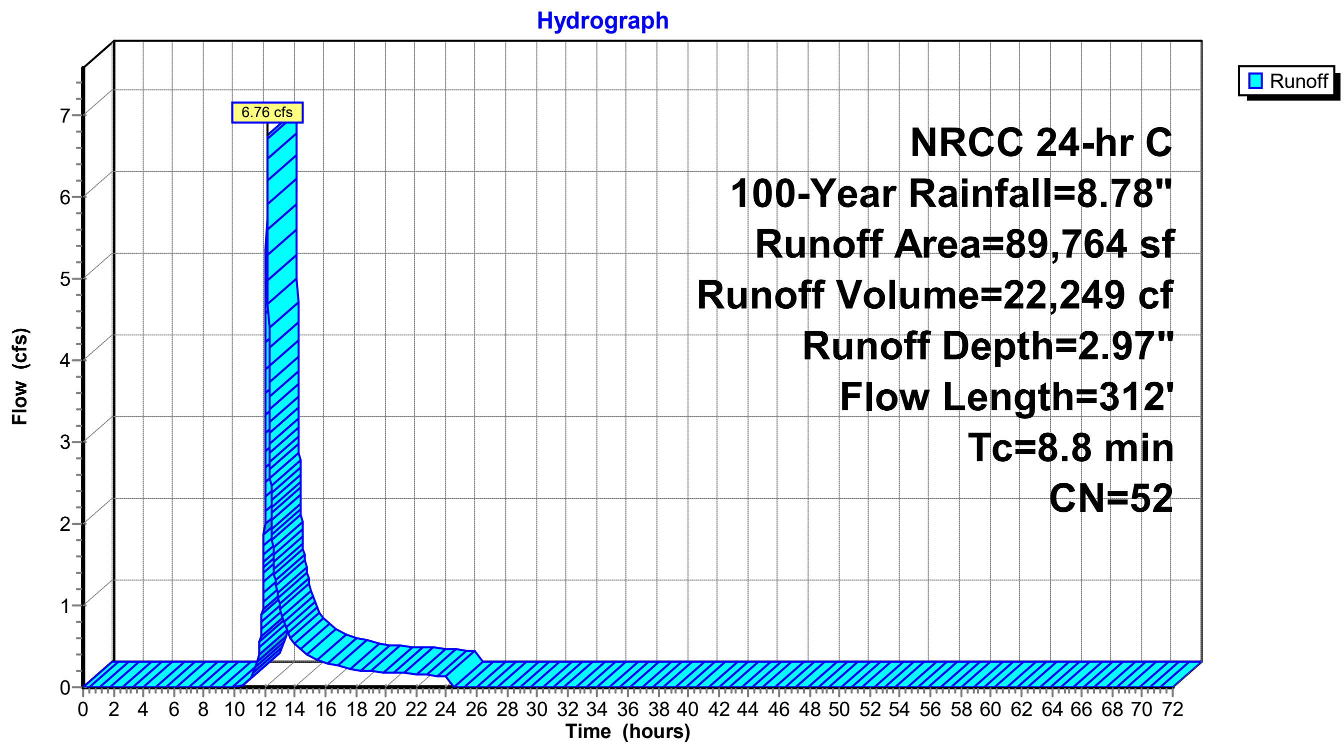
Runoff = 6.76 cfs @ 12.17 hrs, Volume= 22,249 cf, Depth= 2.97"

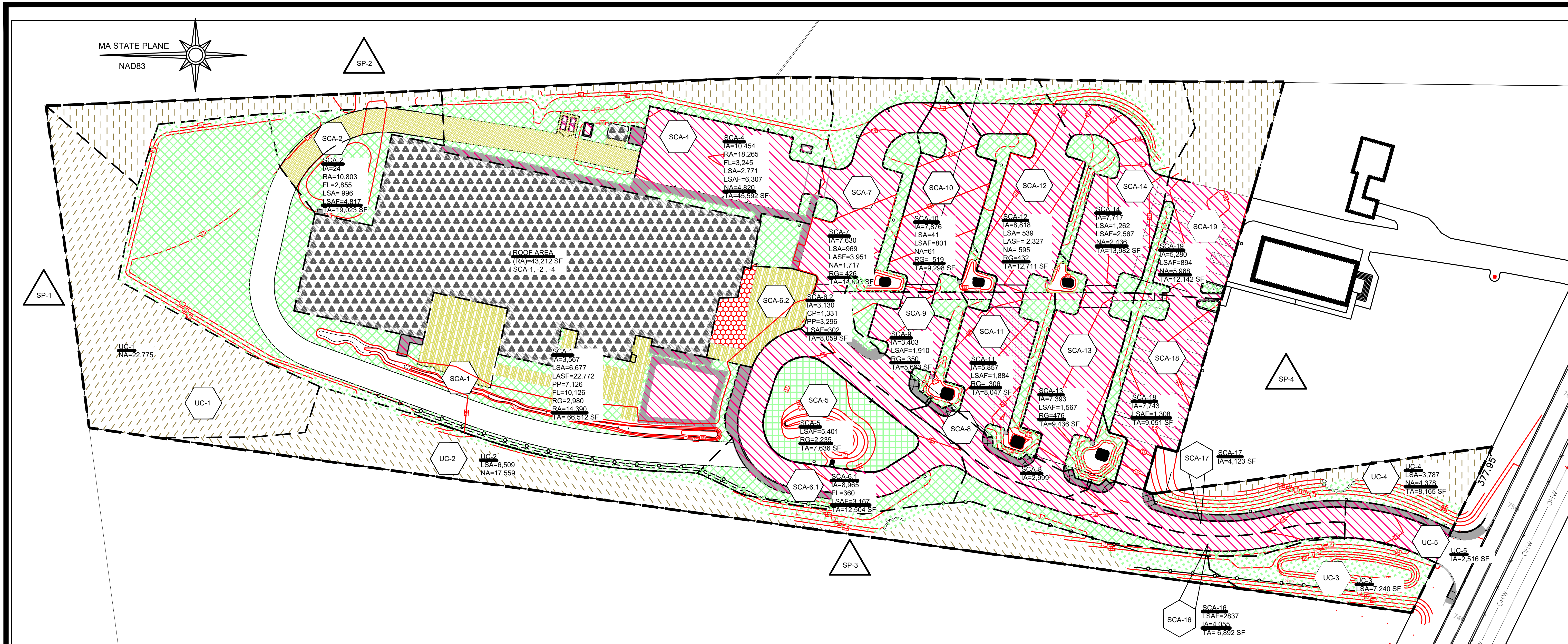
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
60,515	30	Woods, Good, HSG A
18,875	98	Paved parking, HSG A
10,374	96	Gravel surface, HSG A
89,764	52	Weighted Average
70,889		78.97% Pervious Area
18,875		21.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1000	0.13		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
0.5	50	0.1000	1.58		**Shallow Concentrated Flow, Natural Area** Woodland Kv= 5.0 fps
1.0	96	0.0100	1.61		**Shallow Concentrated Flow, Gravel Parkiing** Unpaved Kv= 16.1 fps
1.0	116	0.0100	2.03		**Shallow Concentrated Flow, Paved parking** Paved Kv= 20.3 fps
8.8	312	Total			

Subcatchment WSA-4:





STUDY POINT

SUBCACTCHMENT AREA

SHEET FLOW

SHALLOW CONCENTRATED FLOW

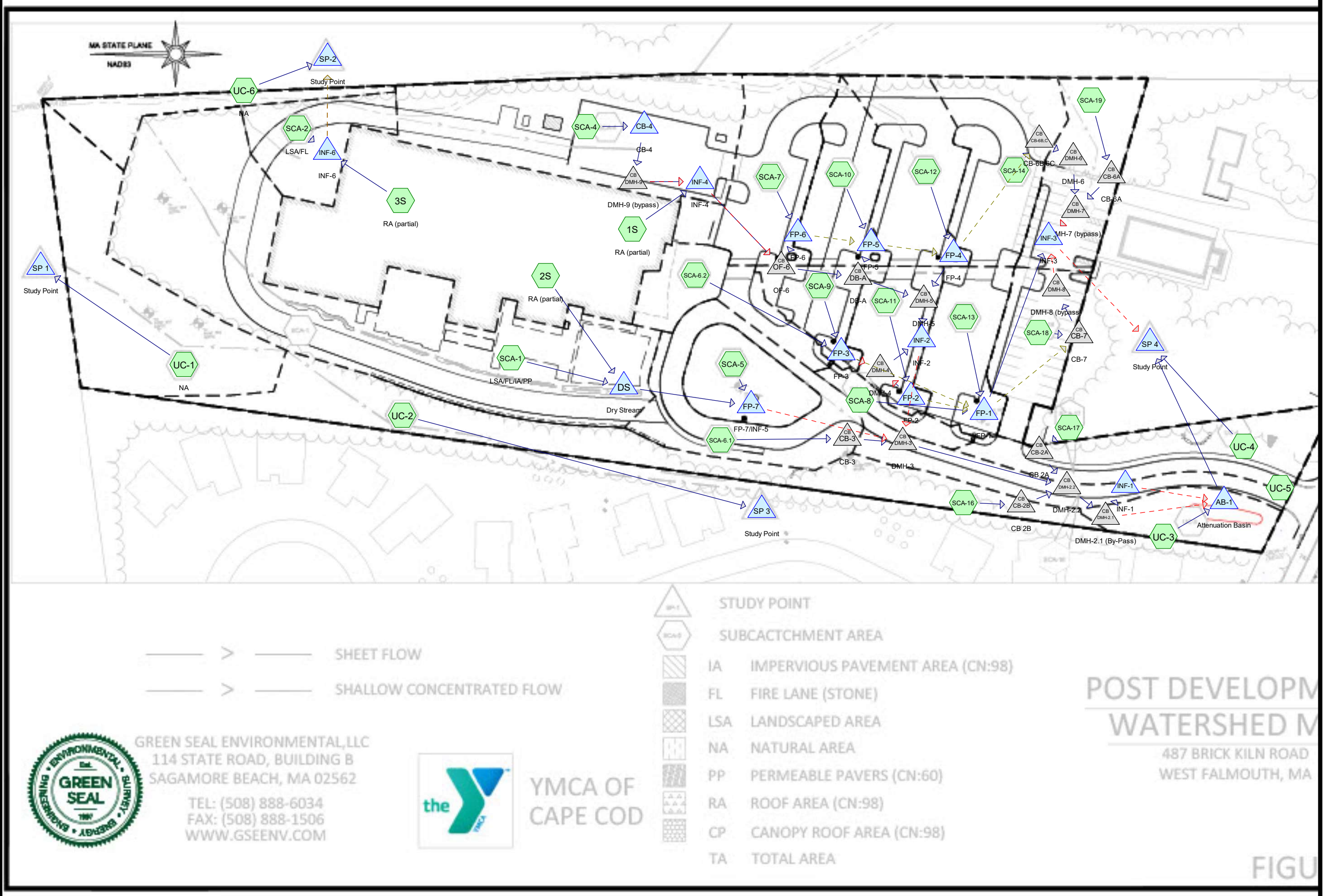
IA	IMPERVIOUS PAVEMENT AREA (CN:98)
FL	FIRE LANE (STONE)
LSA	UNFERTILIZED GRASS AREA
LSAF	FERTILIZED TURF/LANDSCAPING
NA	NATURAL AREA
PP	PERMEABLE PAVERS (CN:60)
RA	ROOF AREA (CN:98)
CP	CANOPY ROOF AREA (CN:98)
TA	TOTAL AREA

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: (508) 888-6034
FAX: (508) 888-1506
WWW.GSEENV.COM

YMCA OF CAPE COD

POST DEVELOPMENT WATERSHED MAP

487 BRICK KILN ROAD
WEST FALMOUTH, MA



Subcat Reach Pond Link

Routing Diagram for Post simplified
Prepared by Green Seal Environmental LLC, Printed 11/29/2023
HydroCAD® 10.20-3g s/n 07930 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-Year	NRCC 24-hr	C	Default	24.00	1	2.80	2
2	2-Year	NRCC 24-hr	C	Default	24.00	1	3.33	2
3	10-Year	NRCC 24-hr	C	Default	24.00	1	4.96	2
4	25-Year	NRCC 24-hr	C	Default	24.00	1	6.22	2
5	50-Year	NRCC 24-hr	C	Default	24.00	1	7.22	2
6	100-Year	NRCC 24-hr	C	Default	24.00	1	8.78	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
99,829	39	>75% Grass cover, Good, HSG A (SCA-1, SCA-10, SCA-11, SCA-12, SCA-13, SCA-14, SCA-16, SCA-18, SCA-19, SCA-2, SCA-4, SCA-5, SCA-6.1, SCA-6.2, SCA-7, SCA-9, UC-2, UC-3, UC-4)
1,331	98	Canopy (CP) (SCA-6.2)
20	98	Cocncrete step (SCA-2)
507	98	Concrete Walk (SCA-1)
360	60	Fire Lane (FL) (SCA-6.1)
94,837	98	Paved parking, HSG A (SCA-10, SCA-11, SCA-12, SCA-13, SCA-14, SCA-16, SCA-17, SCA-18, SCA-19, SCA-4, SCA-6.1, SCA-7, SCA-8, SCA-9, UC-5)
3,296	98	Paved roads w/curbs & sewers, HSG A (SCA-6.2)
7,138	60	Permeable Pavers (SCA-1)
3,130	60	Permeable Pavers (PP) (SCA-6.2)
43,212	98	Roofs, HSG A (1S, 2S, 3S)
3,036	98	Rubber Play Surface (SCA-1)
246	98	Shed Roof (SCA-4)
16,236	60	Stone Fire Lane (SCA-1, SCA-2, SCA-4)
58,617	30	Woods, Good, HSG A (SCA-10, SCA-12, SCA-14, SCA-4, UC-1, UC-2, UC-4, UC-6)
7,685	32	Woods/grass comb., Good, HSG A (SCA-19, SCA-7)
339,480	**64**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
307,476	HSG A	1S, 2S, 3S, SCA-1, SCA-10, SCA-11, SCA-12, SCA-13, SCA-14, SCA-16, SCA-17, SCA-18, SCA-19, SCA-2, SCA-4, SCA-5, SCA-6.1, SCA-6.2, SCA-7, SCA-8, SCA-9, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6
0	HSG B	
0	HSG C	
0	HSG D	
32,004	Other	SCA-1, SCA-2, SCA-4, SCA-6.1, SCA-6.2
339,480		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Subcatchment Numbers
99,829	0	0	0	0	99,829	>75% Grass cover, Good	SCA-1, SCA-10, SCA-11, SCA-12, SCA-13, SCA-14, SCA-16, SCA-18, SCA-19, SCA-2, SCA-4, SCA-5, SCA-6.1, SCA-6.2, SCA-7, SCA-9, UC-2, UC-3, UC-4
0	0	0	0	1,331	1,331	Canopy (CP)	SCA-6.2
0	0	0	0	20	20	Cocncrete step	SCA-2
0	0	0	0	507	507	Concrete Walk	SCA-1
0	0	0	0	360	360	Fire Lane (FL)	SCA-6.1
94,837	0	0	0	0	94,837	Paved parking	SCA-10, SCA-11, SCA-12, SCA-13, SCA-14, SCA-16, SCA-17, SCA-18, SCA-19, SCA-4, SCA-6.1, SCA-7, SCA-8, SCA-9, UC-5
3,296	0	0	0	0	3,296	Paved roads w/curbs & sewers	SCA-6.2
0	0	0	0	7,138	7,138	Permeable Pavers	SCA-1
0	0	0	0	3,130	3,130	Permeable Pavers (PP)	SCA-6.2
43,212	0	0	0	0	43,212	Roofs	1S, 2S, 3S
0	0	0	0	3,036	3,036	Rubber Play Surface	SCA-1
0	0	0	0	246	246	Shed Roof	SCA-4
0	0	0	0	16,236	16,236	Stone Fire Lane	SCA-1, SCA-2, SCA-4
58,617	0	0	0	0	58,617	Woods, Good	SCA-10, SCA-12, SCA-14, SCA-4, UC-1, UC-2, UC-4,

Ground Covers (all nodes) (continued)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Subcatchment Numbers
7,685	0	0	0	0	7,685	Woods/grass comb., Good	SCA-19, SCA-7
307,476	**0**	**0**	**0**	**32,004**	**339,480**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	AB-1	49.50	49.00	54.0	0.0093	0.013	0.0	18.0	0.0	Attenuation Basin
2	CB-2A	50.53	50.39	14.0	0.0100	0.013	0.0	12.0	0.0	CB 2A
3	CB-2B	50.53	50.39	4.0	0.0350	0.013	0.0	12.0	0.0	CB 2B
4	CB-3	51.55	51.45	7.0	0.0143	0.013	0.0	12.0	0.0	CB-3
5	CB-4	53.35	53.25	9.0	0.0111	0.013	0.0	12.0	0.0	CB-4
6	CB-6A	46.30	46.00	25.0	0.0120	0.013	0.0	12.0	0.0	CB-6A
7	CB-6B,C	47.50	46.45	19.0	0.0553	0.013	0.0	12.0	0.0	CB-6B,6C
8	CB-7	46.40	46.05	37.0	0.0095	0.013	0.0	12.0	0.0	CB-7
9	DB-A	50.55	49.00	46.0	0.0337	0.013	0.0	15.0	0.0	DB-A
10	DMH-2.1	49.60	49.55	2.3	0.0217	0.013	0.0	12.0	0.0	DMH-2.1 (By-Pass)
11	DMH-2.1	50.50	50.10	25.0	0.0160	0.013	0.0	15.0	0.0	DMH-2.1 (By-Pass)
12	DMH-2.2	49.80	49.60	36.0	0.0056	0.013	0.0	18.0	0.0	DMH-2.2
13	DMH-3	51.10	50.14	183.0	0.0052	0.013	0.0	18.0	0.0	DMH-3
14	DMH-4	49.15	48.95	20.0	0.0100	0.013	0.0	12.0	0.0	DMH-4
15	DMH-5	49.00	48.85	10.0	0.0150	0.013	0.0	18.0	0.0	DMH-5
16	DMH-6	46.35	46.00	17.0	0.0206	0.013	0.0	12.0	0.0	DMH-6
17	DMH-7	46.00	45.90	3.0	0.0333	0.013	0.0	12.0	0.0	DMH-7 (bypass)
18	DMH-7	46.60	45.58	11.0	0.0927	0.013	0.0	12.0	0.0	DMH-7 (bypass)
19	DMH-8	46.05	46.00	5.0	0.0100	0.013	0.0	12.0	0.0	DMH-8 (bypass)
20	DMH-8	46.55	45.58	13.5	0.0719	0.013	0.0	12.0	0.0	DMH-8 (bypass)
21	DMH-9	53.25	52.90	3.0	0.1167	0.013	0.0	12.0	0.0	DMH-9 (bypass)
22	DMH-9	53.75	52.90	3.0	0.2833	0.013	0.0	12.0	0.0	DMH-9 (bypass)
23	DS	54.15	53.75	48.0	0.0083	0.012	0.0	15.0	0.0	Dry Stream
24	FP-1	46.47	45.58	118.0	0.0075	0.013	0.0	12.0	0.0	FP-1
25	FP-2	49.40	49.15	10.0	0.0250	0.013	0.0	12.0	0.0	FP-2
26	FP-3	49.55	49.15	37.0	0.0108	0.013	0.0	12.0	0.0	FP-3
27	FP-4	49.42	49.15	26.0	0.0104	0.013	0.0	12.0	0.0	FP-4
28	FP-5	50.67	50.55	4.0	0.0300	0.010	0.0	12.0	0.0	FP-5
29	FP-6	51.59	51.50	6.0	0.0150	0.013	0.0	12.0	0.0	FP-6
30	INF-1	50.25	50.10	14.0	0.0107	0.012	0.0	12.0	0.0	INF-1
31	INF-2	51.35	51.10	24.0	0.0104	0.013	0.0	15.0	0.0	INF-2
32	INF-4	53.52	51.40	86.0	0.0247	0.012	0.0	12.0	0.0	INF-4
33	OF-6	51.40	50.55	72.0	0.0118	0.013	0.0	12.0	0.0	OF-6

Time span=0.00-24.00 hrs, dt=0.006 hrs, 4001 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: RA (partial) Runoff Area=18,019 sf 100.00% Impervious Runoff Depth>2.57"
Tc=6.0 min CN=98 Runoff=1.18 cfs 3,854 cf

Subcatchment 2S: RA (partial) Runoff Area=14,390 sf 100.00% Impervious Runoff Depth>2.57"
Tc=6.0 min CN=98 Runoff=0.94 cfs 3,077 cf

Subcatchment 3S: RA (partial) Runoff Area=10,803 sf 100.00% Impervious Runoff Depth>2.57"
Tc=6.0 min CN=98 Runoff=0.71 cfs 2,310 cf

Subcatchment SCA-1: LSA/FL/IA/PP Runoff Area=52,119 sf 6.80% Impervious Runoff Depth>0.26"
Flow Length=532' Slope=0.0100 '/' Tc=16.6 min CN=WQ Runoff=0.19 cfs 1,133 cf

Subcatchment SCA-10: Runoff Area=9,281 sf 84.56% Impervious Runoff Depth>2.17"
Tc=6.0 min CN=WQ Runoff=0.51 cfs 1,678 cf

Subcatchment SCA-11: Runoff Area=8,047 sf 72.78% Impervious Runoff Depth>1.87"
Tc=6.0 min CN=WQ Runoff=0.38 cfs 1,253 cf

Subcatchment SCA-12: Runoff Area=12,711 sf 69.37% Impervious Runoff Depth>1.78"
Tc=6.0 min CN=WQ Runoff=0.58 cfs 1,886 cf

Subcatchment SCA-13: Runoff Area=9,436 sf 78.35% Impervious Runoff Depth>2.01"
Tc=6.0 min CN=WQ Runoff=0.48 cfs 1,581 cf

Subcatchment SCA-14: Runoff Area=13,982 sf 55.19% Impervious Runoff Depth>1.42"
Tc=6.0 min CN=WQ Runoff=0.50 cfs 1,650 cf

Subcatchment SCA-16: Runoff Area=6,892 sf 58.84% Impervious Runoff Depth>1.51"
Tc=6.0 min CN=WQ Runoff=0.27 cfs 867 cf

Subcatchment SCA-17: Runoff Area=4,123 sf 100.00% Impervious Runoff Depth>2.57"
Tc=6.0 min CN=98 Runoff=0.27 cfs 882 cf

Subcatchment SCA-18: Runoff Area=9,051 sf 85.55% Impervious Runoff Depth>2.20"
Tc=6.0 min CN=WQ Runoff=0.51 cfs 1,656 cf

Subcatchment SCA-19: Runoff Area=12,142 sf 43.49% Impervious Runoff Depth>1.12"
Flow Length=145' Tc=9.6 min CN=WQ Runoff=0.30 cfs 1,128 cf

Subcatchment SCA-2: LSA/FL Runoff Area=8,220 sf 0.24% Impervious Runoff Depth>0.10"
Flow Length=75' Tc=6.1 min CN=WQ Runoff=0.01 cfs 67 cf

Subcatchment SCA-4: Runoff Area=27,573 sf 38.81% Impervious Runoff Depth>1.03"
Flow Length=254' Tc=6.8 min CN=WQ Runoff=0.69 cfs 2,359 cf

Subcatchment SCA-5: Runoff Area=7,636 sf 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0 cf

Subcatchment SCA-6.1: Runoff Area=12,884 sf 69.58% Impervious Runoff Depth>1.79"
Tc=6.0 min CN=WQ Runoff=0.59 cfs 1,925 cf

Subcatchment SCA-6.2: Runoff Area=8,059 sf 57.41% Impervious Runoff Depth>1.58"
Tc=6.0 min CN=WQ Runoff=0.31 cfs 1,058 cf

Subcatchment SCA-7: Runoff Area=14,693 sf 51.93% Impervious Runoff Depth>1.33"
Tc=6.0 min CN=WQ Runoff=0.50 cfs 1,632 cf

Subcatchment SCA-8: Runoff Area=3,035 sf 100.00% Impervious Runoff Depth>2.57"
Tc=6.0 min CN=98 Runoff=0.20 cfs 649 cf

Subcatchment SCA-9: Runoff Area=5,663 sf 60.09% Impervious Runoff Depth>1.54"
Tc=6.0 min CN=WQ Runoff=0.22 cfs 728 cf

Subcatchment UC-1: NA Runoff Area=22,775 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=434' Tc=34.9 min CN=30 Runoff=0.00 cfs 0 cf

Subcatchment UC-2: Runoff Area=24,068 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=450' Tc=16.6 min CN=WQ Runoff=0.00 cfs 0 cf

Subcatchment UC-3: Runoff Area=7,204 sf 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0 cf

Subcatchment UC-4: Runoff Area=8,165 sf 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=WQ Runoff=0.00 cfs 0 cf

Subcatchment UC-5: Runoff Area=2,516 sf 100.00% Impervious Runoff Depth>2.57"
Tc=6.0 min CN=98 Runoff=0.16 cfs 538 cf

Subcatchment UC-6: NA Runoff Area=5,993 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=45' Slope=0.0300 '/' Tc=9.4 min CN=30 Runoff=0.00 cfs 0 cf

Pond AB-1: Attenuation Basin Peak Elev=49.00' Storage=0 cf Inflow=0.00 cfs 0 cf
Discarded=0.00 cfs 0 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 0 cf

Pond CB-2A: CB 2A Peak Elev=50.81' Inflow=0.27 cfs 882 cf
12.0" Round Culvert n=0.013 L=14.0' S=0.0100 '/' Outflow=0.27 cfs 882 cf

Pond CB-2B: CB 2B Peak Elev=50.80' Inflow=0.27 cfs 867 cf
12.0" Round Culvert n=0.013 L=4.0' S=0.0350 '/' Outflow=0.27 cfs 867 cf

Pond CB-3: CB-3 Peak Elev=51.85' Inflow=0.59 cfs 1,925 cf
12.0" Round Culvert x 2.00 n=0.013 L=7.0' S=0.0143 '/' Outflow=0.59 cfs 1,925 cf

Pond CB-4: CB-4 Peak Elev=56.89' Storage=1 cf Inflow=0.69 cfs 2,359 cf
Outflow=0.69 cfs 2,359 cf

Pond CB-6A: CB-6A Peak Elev=46.66' Inflow=0.30 cfs 1,128 cf
12.0" Round Culvert n=0.013 L=25.0' S=0.0120 '/' Outflow=0.30 cfs 1,128 cf

Pond CB-6B,C: CB-6B,6C Peak Elev=47.76' Inflow=0.50 cfs 1,650 cf
12.0" Round Culvert x 2.00 n=0.013 L=19.0' S=0.0553 '/' Outflow=0.50 cfs 1,650 cf

Pond CB-7: CB-7 Peak Elev=46.81' Inflow=0.51 cfs 1,656 cf
12.0" Round Culvert n=0.013 L=37.0' S=0.0095 '/' Outflow=0.51 cfs 1,656 cf

Pond DB-A: DB-A Peak Elev=50.81' Inflow=0.28 cfs 345 cf
15.0" Round Culvert n=0.013 L=46.0' S=0.0337 '/' Outflow=0.28 cfs 345 cf

Pond DMH-2.1: DMH-2.1 (By-Pass) Peak Elev=50.27' Inflow=1.12 cfs 3,674 cf
Primary=1.12 cfs 3,674 cf Secondary=0.00 cfs 0 cf Outflow=1.12 cfs 3,674 cf

Pond DMH-2.2: DMH-2.2 Peak Elev=50.47' Inflow=1.12 cfs 3,674 cf
18.0" Round Culvert n=0.013 L=36.0' S=0.0056 '/' Outflow=1.12 cfs 3,674 cf

Pond DMH-3: DMH-3 Peak Elev=51.49' Inflow=0.59 cfs 1,925 cf
18.0" Round Culvert n=0.013 L=183.0' S=0.0052 '/' Outflow=0.59 cfs 1,925 cf

Pond DMH-4: DMH-4 Peak Elev=49.36' Inflow=0.16 cfs 35 cf
12.0" Round Culvert n=0.013 L=20.0' S=0.0100 '/' Outflow=0.16 cfs 35 cf

Pond DMH-5: DMH-5 Peak Elev=49.42' Inflow=0.73 cfs 815 cf
18.0" Round Culvert n=0.013 L=10.0' S=0.0150 '/' Outflow=0.73 cfs 815 cf

Pond DMH-6: DMH-6 Peak Elev=46.76' Inflow=0.50 cfs 1,650 cf
12.0" Round Culvert n=0.013 L=17.0' S=0.0206 '/' Outflow=0.50 cfs 1,650 cf

Pond DMH-7: DMH-7 (bypass) Peak Elev=46.51' Inflow=0.79 cfs 2,779 cf
Primary=0.79 cfs 2,779 cf Secondary=0.00 cfs 0 cf Outflow=0.79 cfs 2,779 cf

Pond DMH-8: DMH-8 (bypass) Peak Elev=46.48' Inflow=0.51 cfs 1,656 cf
Primary=0.51 cfs 1,656 cf Secondary=0.00 cfs 0 cf Outflow=0.51 cfs 1,656 cf

Pond DMH-9: DMH-9 (bypass) Peak Elev=53.70' Inflow=0.69 cfs 2,359 cf
Primary=0.69 cfs 2,359 cf Secondary=0.00 cfs 0 cf Outflow=0.69 cfs 2,359 cf

Pond DS: Dry Stream Peak Elev=54.65' Storage=149 cf Inflow=1.06 cfs 4,211 cf
Discarded=0.02 cfs 981 cf Primary=0.99 cfs 3,203 cf Outflow=1.02 cfs 4,183 cf

Pond FP-1: FP-1 Peak Elev=49.72' Storage=479 cf Inflow=0.68 cfs 2,230 cf
Discarded=0.15 cfs 2,013 cf Primary=0.42 cfs 217 cf Tertiary=0.00 cfs 0 cf Outflow=0.57 cfs 2,230 cf

Pond FP-2: FP-2 Peak Elev=49.07' Storage=335 cf Inflow=0.38 cfs 1,253 cf
Discarded=0.07 cfs 1,253 cf Primary=0.00 cfs 0 cf Tertiary=0.00 cfs 0 cf Outflow=0.07 cfs 1,253 cf

Pond FP-3: FP-3 Peak Elev=52.50' Storage=451 cf Inflow=0.53 cfs 1,786 cf
Discarded=0.12 cfs 1,751 cf Primary=0.16 cfs 35 cf Tertiary=0.00 cfs 0 cf Outflow=0.28 cfs 1,786 cf

Pond FP-4: FP-4 Peak Elev=53.34' Storage=354 cf Inflow=0.58 cfs 1,886 cf
Discarded=0.06 cfs 1,416 cf Primary=0.51 cfs 470 cf Tertiary=0.00 cfs 0 cf Outflow=0.57 cfs 1,886 cf

Pond FP-5: FP-5 Peak Elev=54.70' Storage=380 cf Inflow=0.51 cfs 1,678 cf
Discarded=0.15 cfs 1,506 cf Primary=0.11 cfs 172 cf Tertiary=0.00 cfs 0 cf Outflow=0.27 cfs 1,678 cf

Pond FP-6: FP-6 Peak Elev=55.42' Storage=370 cf Inflow=0.50 cfs 1,632 cf
Discarded=0.13 cfs 1,459 cf Primary=0.17 cfs 173 cf Tertiary=0.00 cfs 0 cf Outflow=0.29 cfs 1,632 cf

Pond FP-7: FP-7/INF-5 Peak Elev=48.43' Storage=1,038 cf Inflow=0.99 cfs 3,203 cf
Discarded=0.16 cfs 3,202 cf Secondary=0.00 cfs 0 cf Outflow=0.16 cfs 3,202 cf

Pond INF-1: INF-1 Peak Elev=48.04' Storage=933 cf Inflow=1.12 cfs 3,674 cf
Discarded=0.18 cfs 3,674 cf Secondary=0.00 cfs 0 cf Outflow=0.18 cfs 3,674 cf

Pond INF-2: INF-2 Peak Elev=47.94' Storage=221 cf Inflow=0.73 cfs 849 cf
Discarded=0.31 cfs 851 cf Secondary=0.00 cfs 0 cf Outflow=0.31 cfs 851 cf

Pond INF-3: INF-3 Peak Elev=43.82' Storage=617 cf Inflow=1.17 cfs 2,996 cf
Discarded=0.24 cfs 2,996 cf Secondary=0.00 cfs 0 cf Outflow=0.24 cfs 2,996 cf

Pond INF-4: INF-4 Peak Elev=51.58' Storage=1,361 cf Inflow=1.86 cfs 6,213 cf
Discarded=0.33 cfs 6,212 cf Secondary=0.00 cfs 0 cf Outflow=0.33 cfs 6,212 cf

Pond INF-6: INF-6 Peak Elev=52.98' Storage=640 cf Inflow=0.72 cfs 2,377 cf
Outflow=0.11 cfs 2,377 cf

Pond OF-6: OF-6 Peak Elev=51.61' Inflow=0.17 cfs 173 cf
12.0" Round Culvert n=0.013 L=72.0' S=0.0118 '/' Outflow=0.17 cfs 173 cf

Pond SP 1: Study Point Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Pond SP 3: Study Point Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Pond SP 4: Study Point Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Pond SP-2: Study Point Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Total Runoff Area = 339,480 sf Runoff Volume = 31,913 cf Average Runoff Depth = 1.13"
56.85% Pervious = 192,995 sf 43.15% Impervious = 146,485 sf

Summary for Subcatchment 1S: RA (partial)

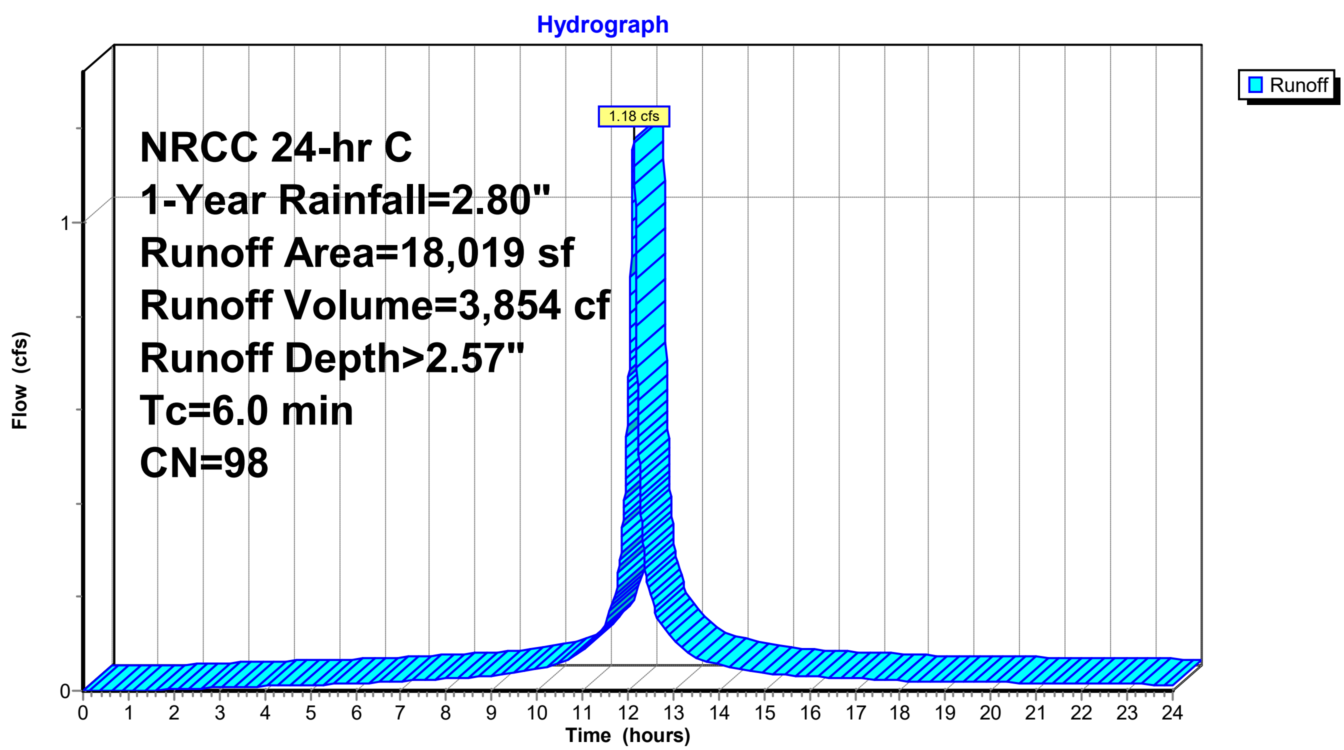
Runoff = 1.18 cfs @ 12.13 hrs, Volume= 3,854 cf, Depth> 2.57"
Routed to Pond INF-4 : INF-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

Area (sf)	CN	Description
18,019	98	Roofs, HSG A
18,019	98	100.00% Impervious Area

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

Subcatchment 1S: RA (partial)



Summary for Subcatchment 2S: RA (partial)

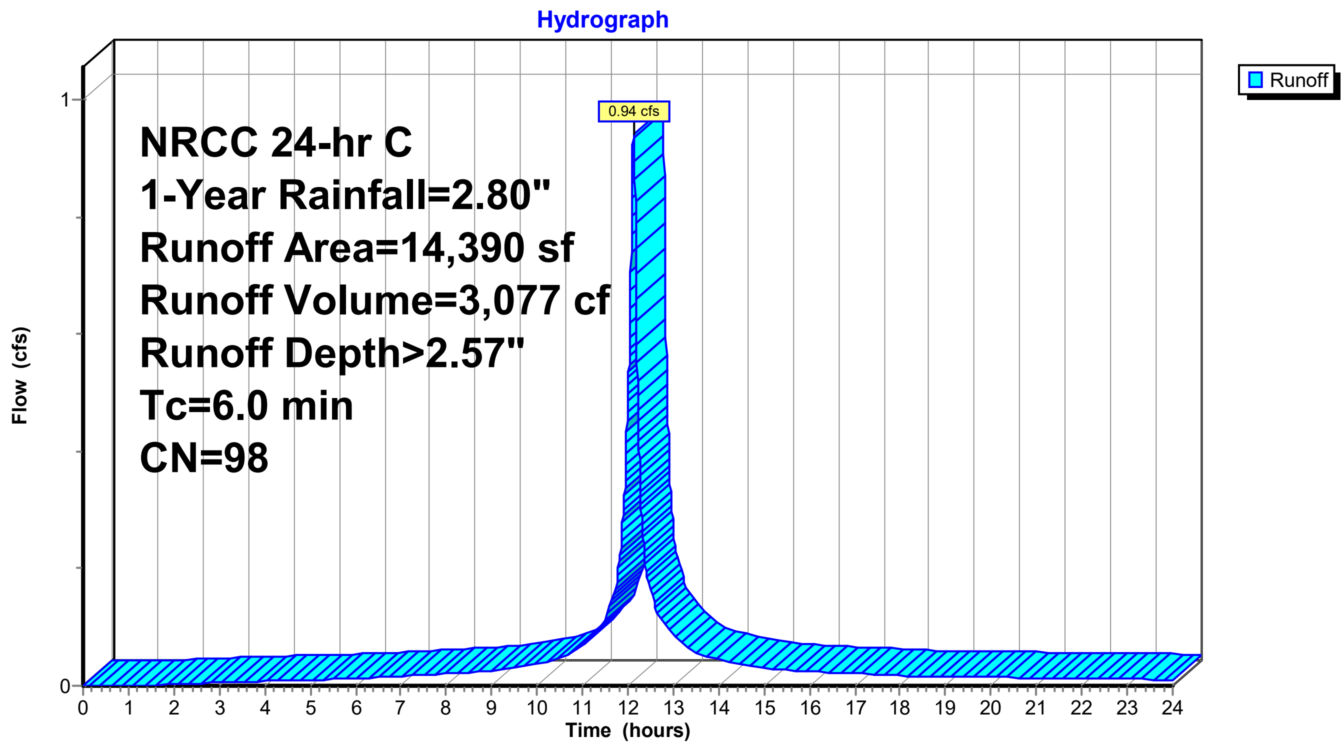
Runoff = 0.94 cfs @ 12.13 hrs, Volume= 3,077 cf, Depth> 2.57"
Routed to Pond DS : Dry Stream

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

Area (sf)	CN	Description
14,390	98	Roofs, HSG A
14,390	98	100.00% Impervious Area

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

Subcatchment 2S: RA (partial)



Summary for Subcatchment 3S: RA (partial)

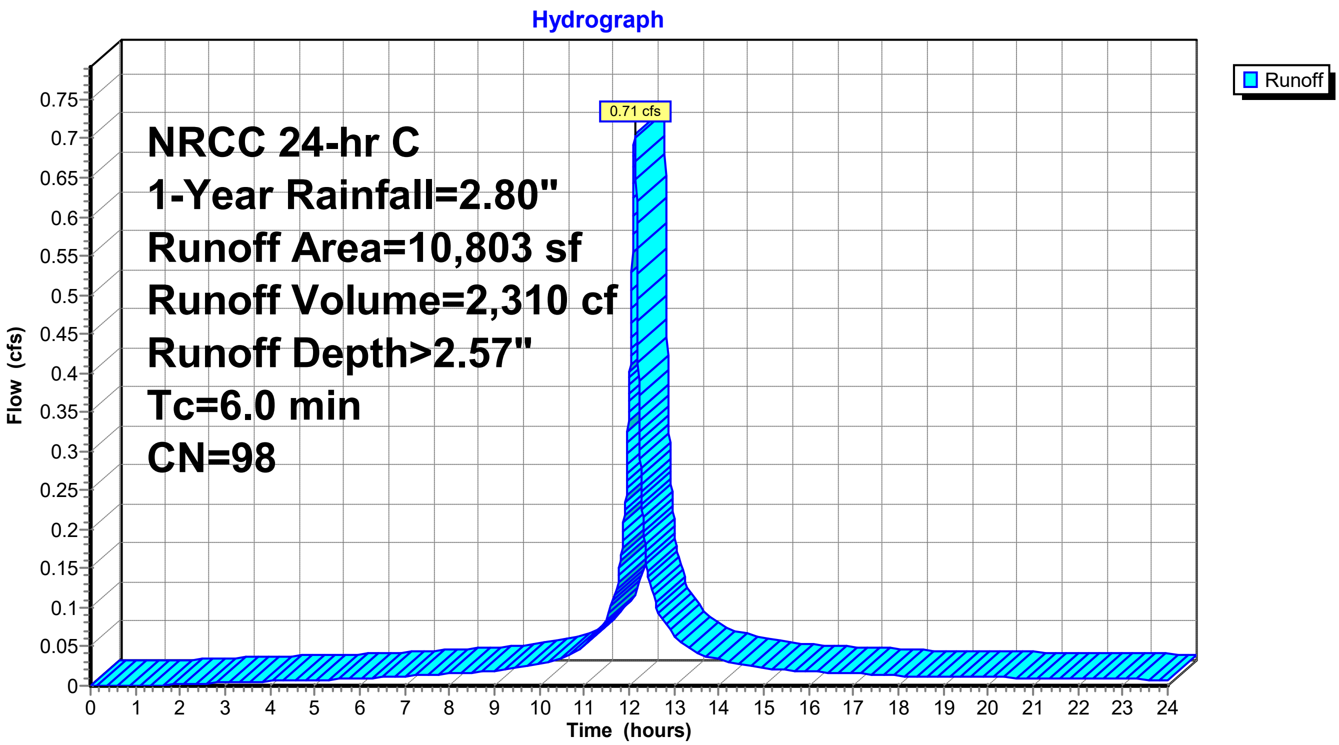
Runoff = 0.71 cfs @ 12.13 hrs, Volume= 2,310 cf, Depth> 2.57"
Routed to Pond INF-6 : INF-6

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

Area (sf)	CN	Description
10,803	98	Roofs, HSG A
10,803	98	100.00% Impervious Area

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

Subcatchment 3S: RA (partial)



Summary for Subcatchment SCA-1: LSA/FL/IA/PP

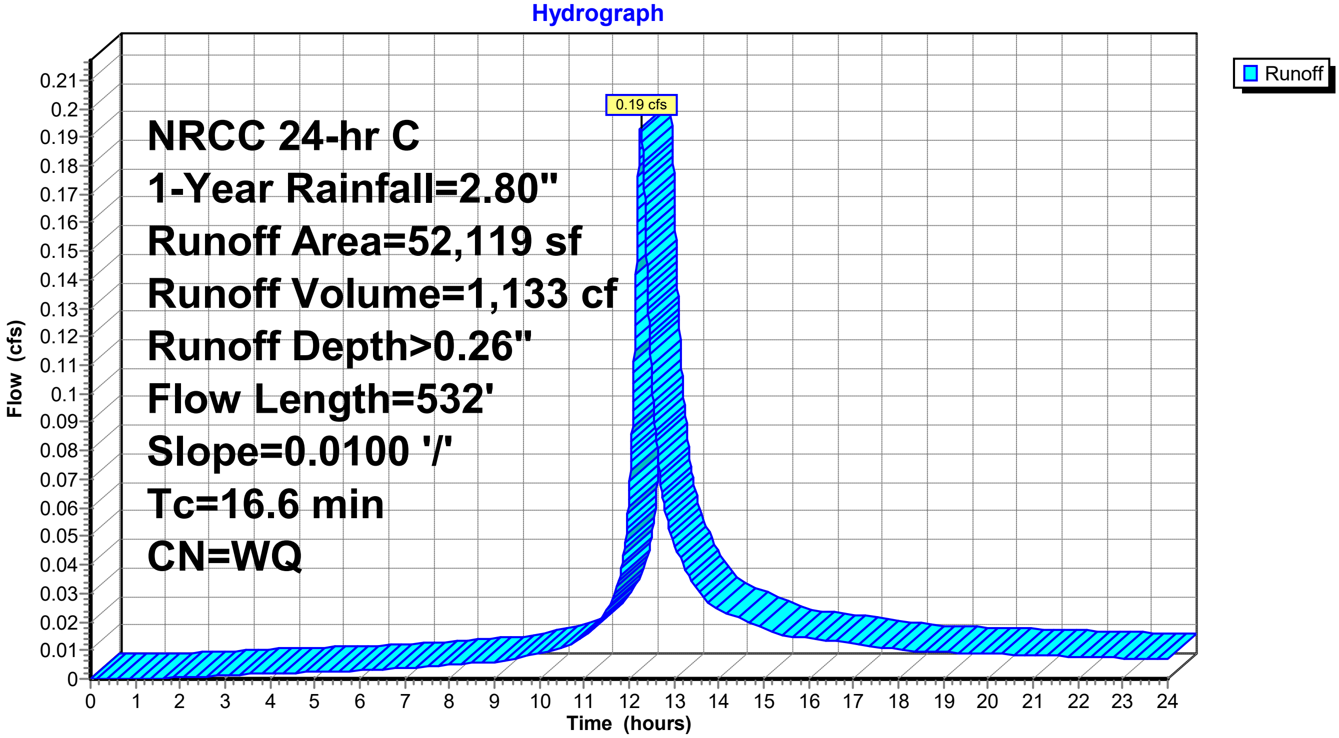
Runoff = 0.19 cfs @ 12.26 hrs, Volume= 1,133 cf, Depth> 0.26"
Routed to Pond DS : Dry Stream

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

	Area (sf)	CN	Description
	31,302	39	>75% Grass cover, Good, HSG A
*	10,136	60	Stone Fire Lane
*	3,036	98	Rubber Play Surface
*	507	98	Concrete Walk
*	7,138	60	Permeable Pavers
	52,119		Weighted Average
	48,576	46	93.20% Pervious Area
	3,543	98	6.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.6	100	0.0100	0.13		**Sheet Flow, Grass**
					Grass: Short n= 0.150 P2= 3.35"
1.0	42	0.0100	0.70		**Shallow Concentrated Flow, Grass**
					Short Grass Pasture Kv= 7.0 fps
0.2	22	0.0100	1.61		**Shallow Concentrated Flow, Stone Fire Lane**
					Unpaved Kv= 16.1 fps
0.7	28	0.0100	0.70		**Shallow Concentrated Flow, Grass**
					Short Grass Pasture Kv= 7.0 fps
2.1	340	0.0100	2.64	7.93	**Channel Flow, Dry Stream Bed**
					Area= 3.0 sf Perim= 5.0' r= 0.60'
					n= 0.040 Earth, cobble bottom, clean sides
16.6	532	Total			

Subcatchment SCA-1: LSA/FL/IA/PP



Summary for Subcatchment SCA-10:

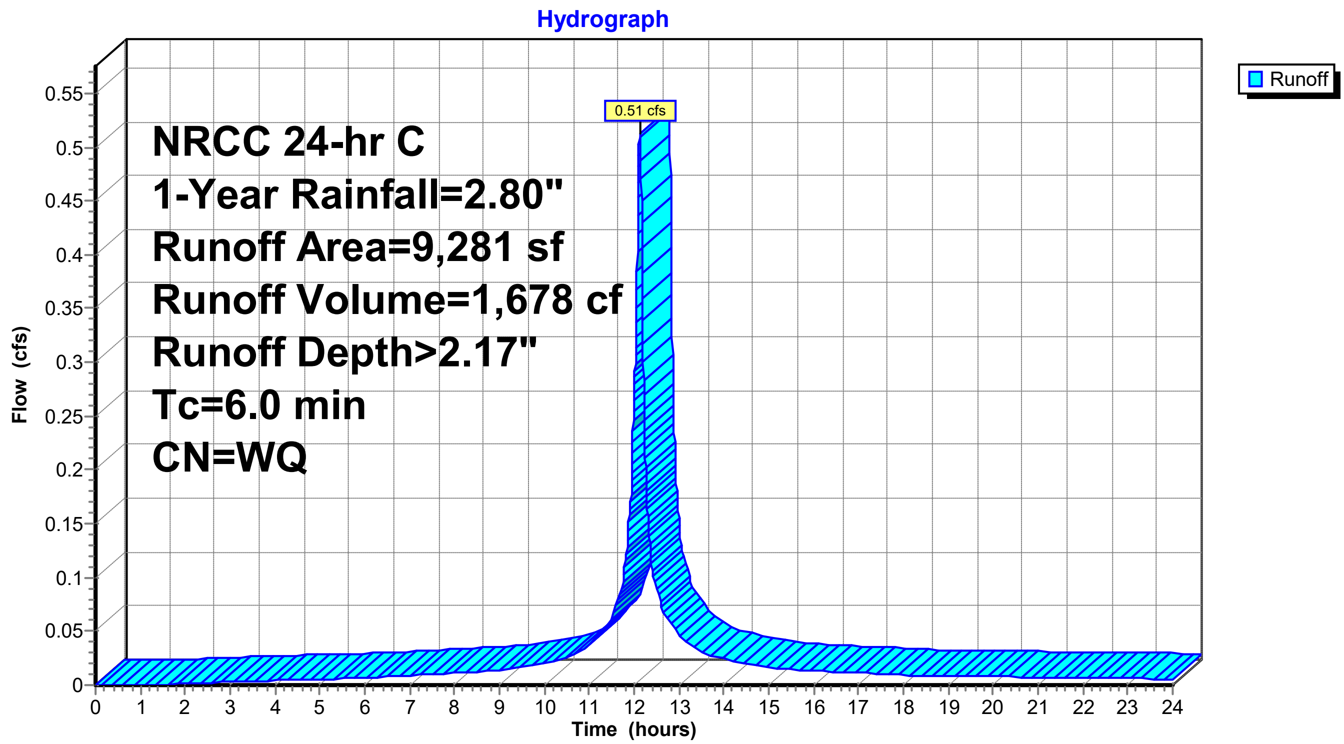
Runoff = 0.51 cfs @ 12.13 hrs, Volume= 1,678 cf, Depth> 2.17"
Routed to Pond FP-5 : FP-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

Area (sf)	CN	Description
7,848	98	Paved parking, HSG A
1,372	39	>75% Grass cover, Good, HSG A
61	30	Woods, Good, HSG A
9,281		Weighted Average
1,433	39	15.44% Pervious Area
7,848	98	84.56% Impervious Area

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

Subcatchment SCA-10:



Summary for Subcatchment SCA-11:

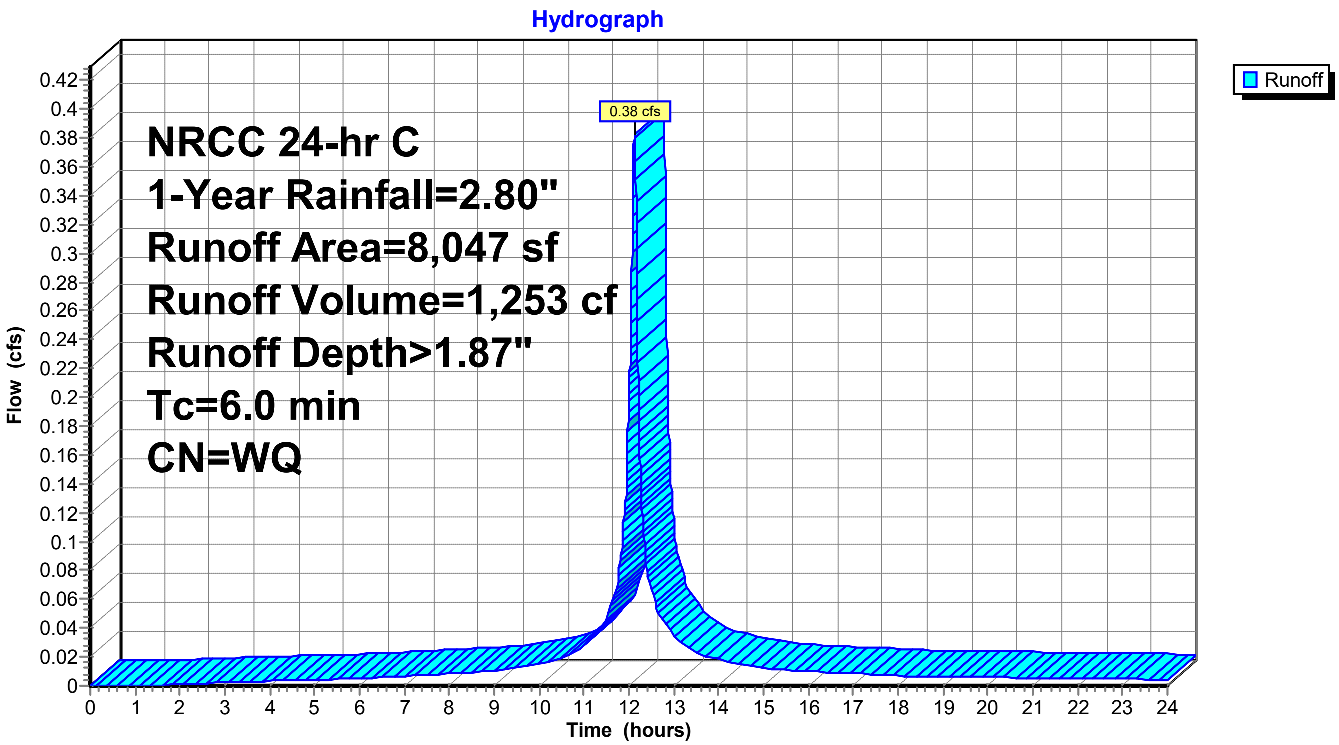
Runoff = 0.38 cfs @ 12.13 hrs, Volume= 1,253 cf, Depth> 1.87"
Routed to Pond FP-2 : FP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

Area (sf)	CN	Description
5,857	98	Paved parking, HSG A
2,190	39	>75% Grass cover, Good, HSG A
8,047		Weighted Average
2,190	39	27.22% Pervious Area
5,857	98	72.78% Impervious Area

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

Subcatchment SCA-11:



Summary for Subcatchment SCA-12:

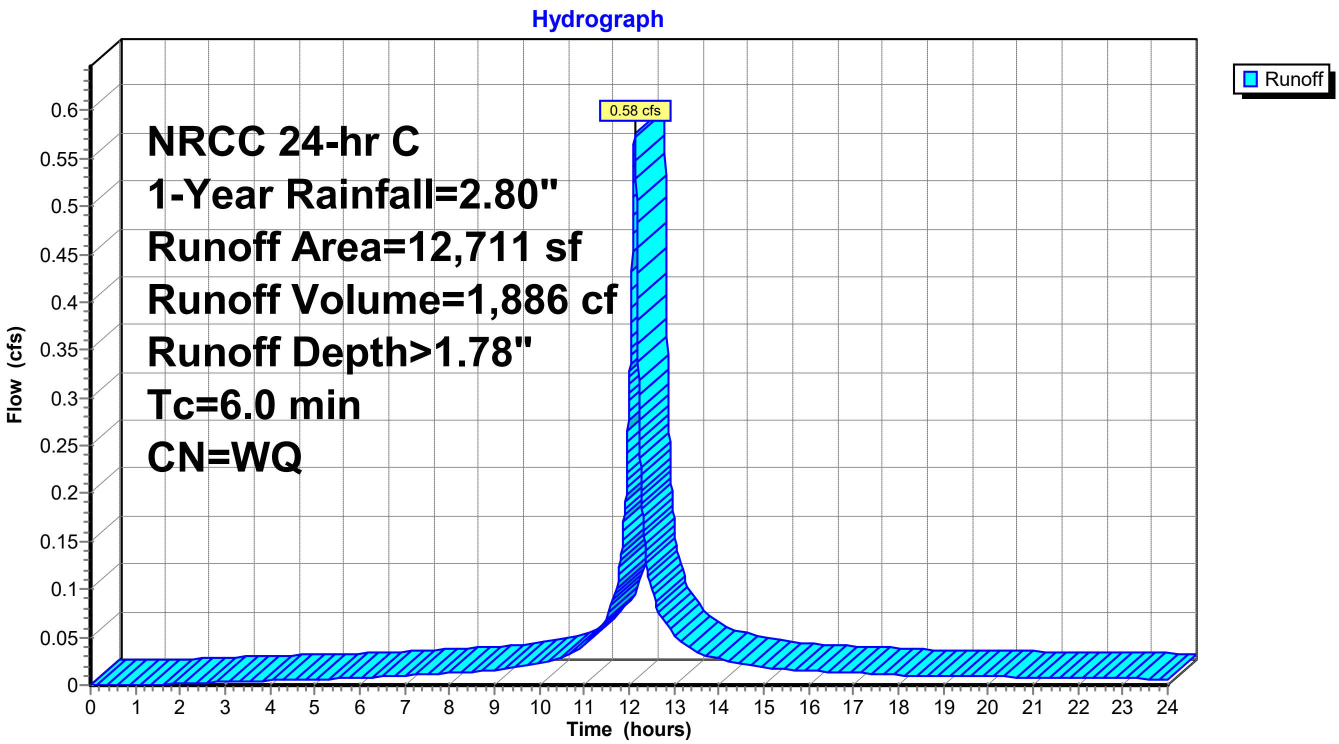
Runoff = 0.58 cfs @ 12.13 hrs, Volume= 1,886 cf, Depth> 1.78"
Routed to Pond FP-4 : FP-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

Area (sf)	CN	Description
8,818	98	Paved parking, HSG A
3,298	39	>75% Grass cover, Good, HSG A
595	30	Woods, Good, HSG A
12,711		Weighted Average
3,893	38	30.63% Pervious Area
8,818	98	69.37% Impervious Area

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

Subcatchment SCA-12:



Summary for Subcatchment SCA-13:

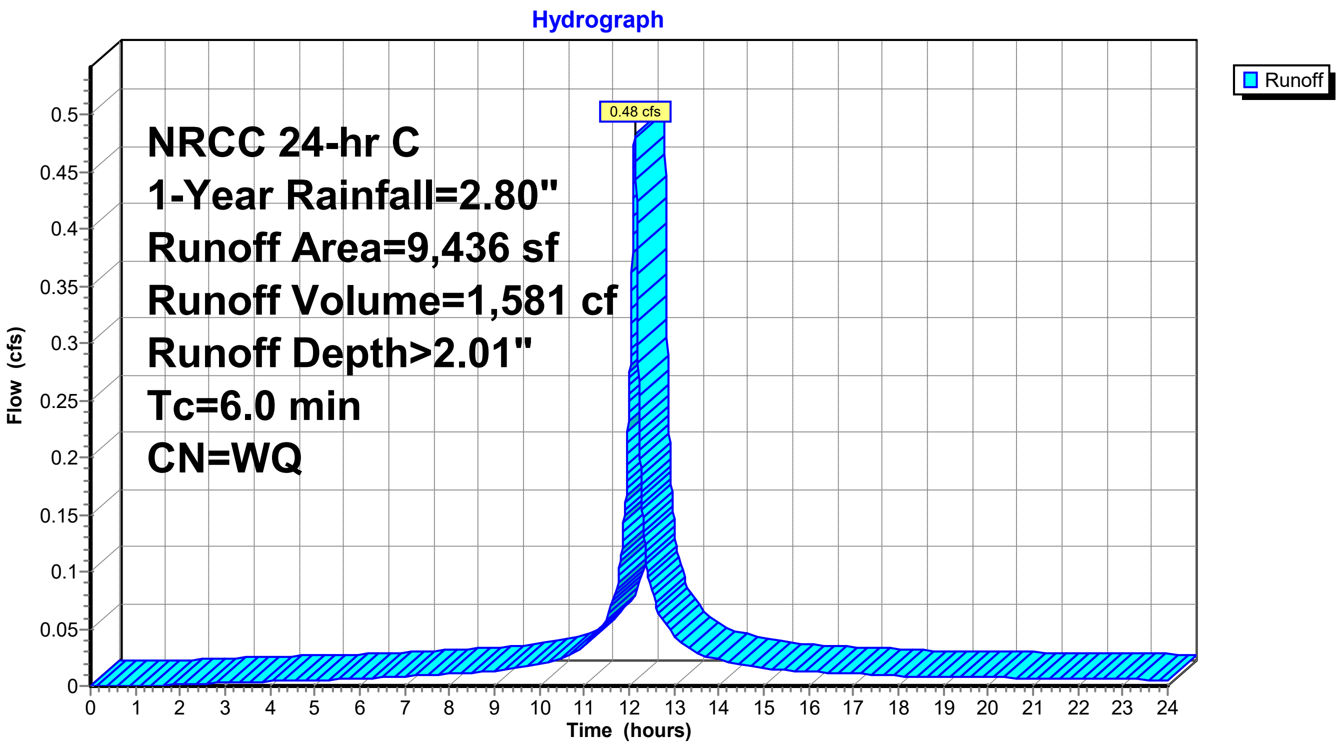
Runoff = 0.48 cfs @ 12.13 hrs, Volume= 1,581 cf, Depth> 2.01"
Routed to Pond FP-1 : FP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

Area (sf)	CN	Description
7,393	98	Paved parking, HSG A
2,043	39	>75% Grass cover, Good, HSG A
9,436		Weighted Average
2,043	39	21.65% Pervious Area
7,393	98	78.35% Impervious Area

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

Subcatchment SCA-13:



Summary for Subcatchment SCA-14:

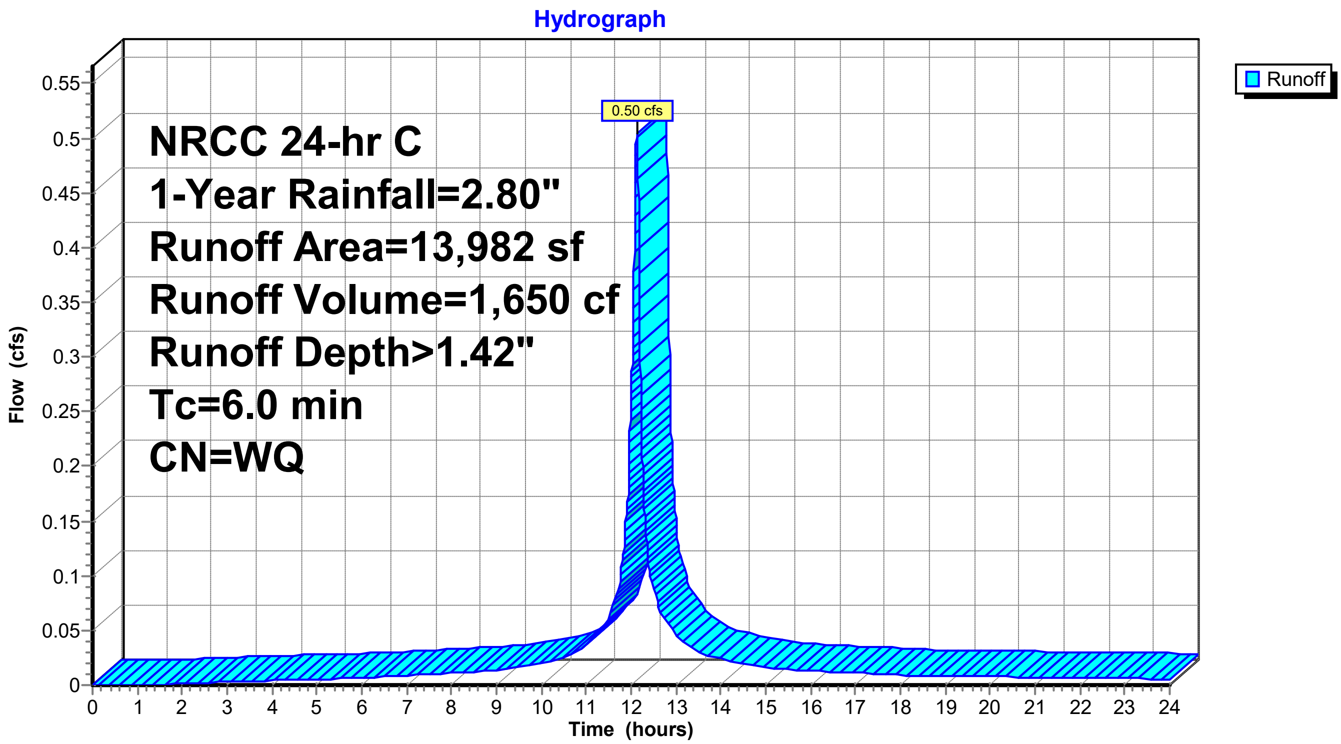
Runoff = 0.50 cfs @ 12.13 hrs, Volume= 1,650 cf, Depth> 1.42"
Routed to Pond CB-6B,C : CB-6B,6C

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

Area (sf)	CN	Description
7,717	98	Paved parking, HSG A
3,829	39	>75% Grass cover, Good, HSG A
2,436	30	Woods, Good, HSG A
13,982		Weighted Average
6,265	36	44.81% Pervious Area
7,717	98	55.19% Impervious Area

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

Subcatchment SCA-14:



Summary for Subcatchment SCA-16:

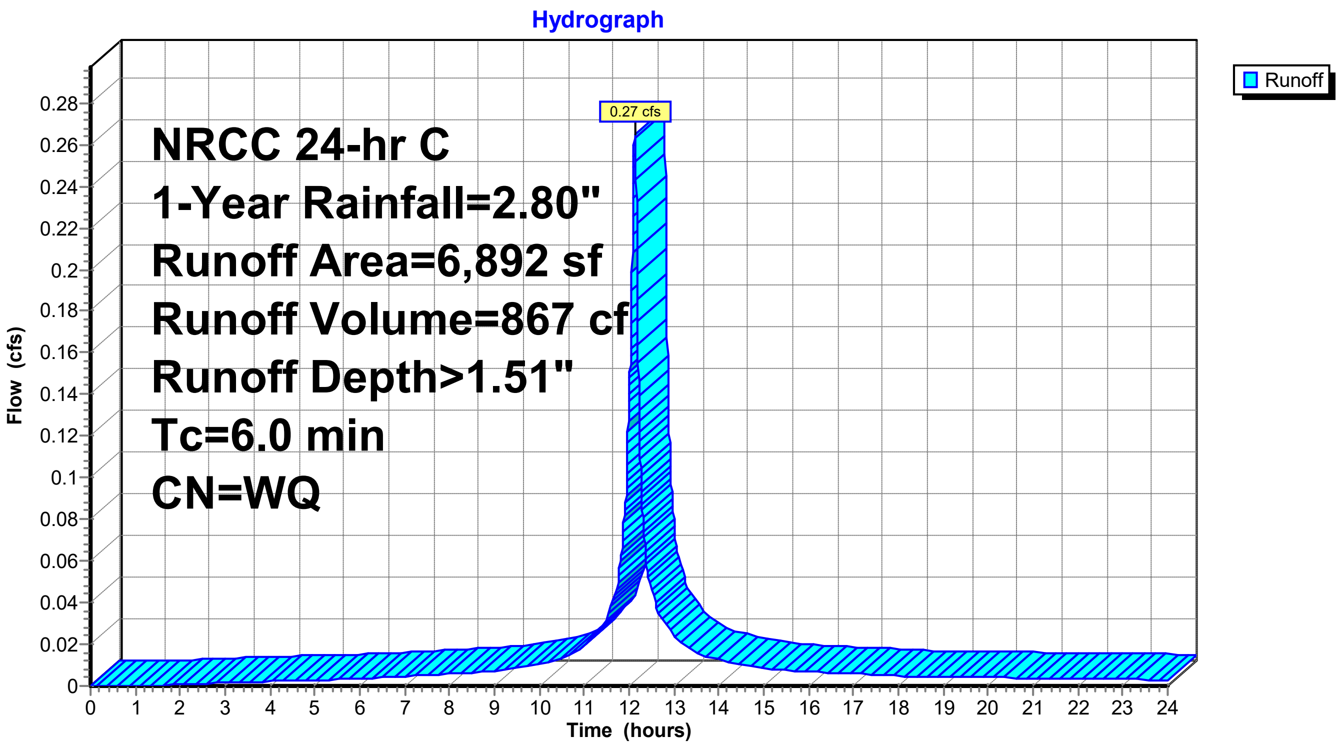
Runoff = 0.27 cfs @ 12.13 hrs, Volume= 867 cf, Depth> 1.51"
Routed to Pond CB-2B : CB 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

Area (sf)	CN	Description
4,055	98	Paved parking, HSG A
2,837	39	>75% Grass cover, Good, HSG A
6,892		Weighted Average
2,837	39	41.16% Pervious Area
4,055	98	58.84% Impervious Area

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

Subcatchment SCA-16:



Summary for Subcatchment SCA-17:

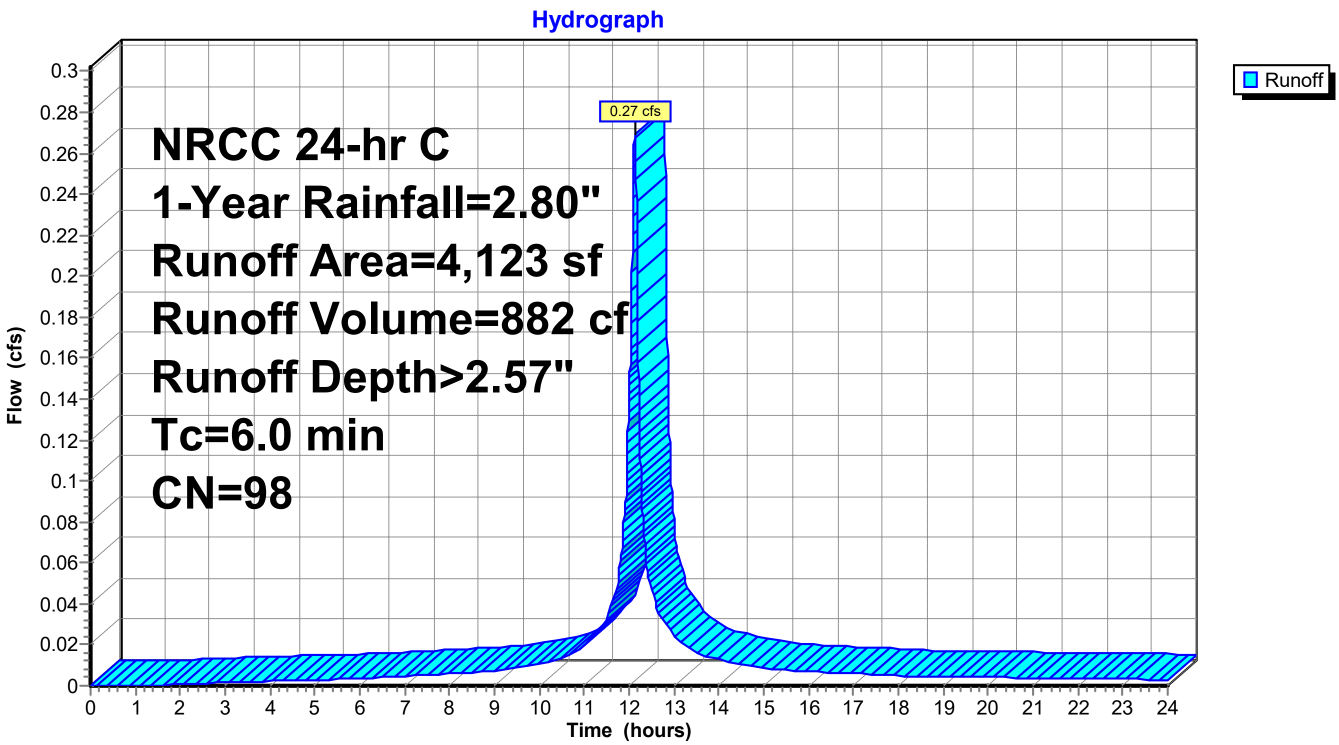
Runoff = 0.27 cfs @ 12.13 hrs, Volume= 882 cf, Depth> 2.57"
Routed to Pond CB-2A : CB 2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

Area (sf)	CN	Description
4,123	98	Paved parking, HSG A
4,123	98	100.00% Impervious Area

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

Subcatchment SCA-17:



Summary for Subcatchment SCA-18:

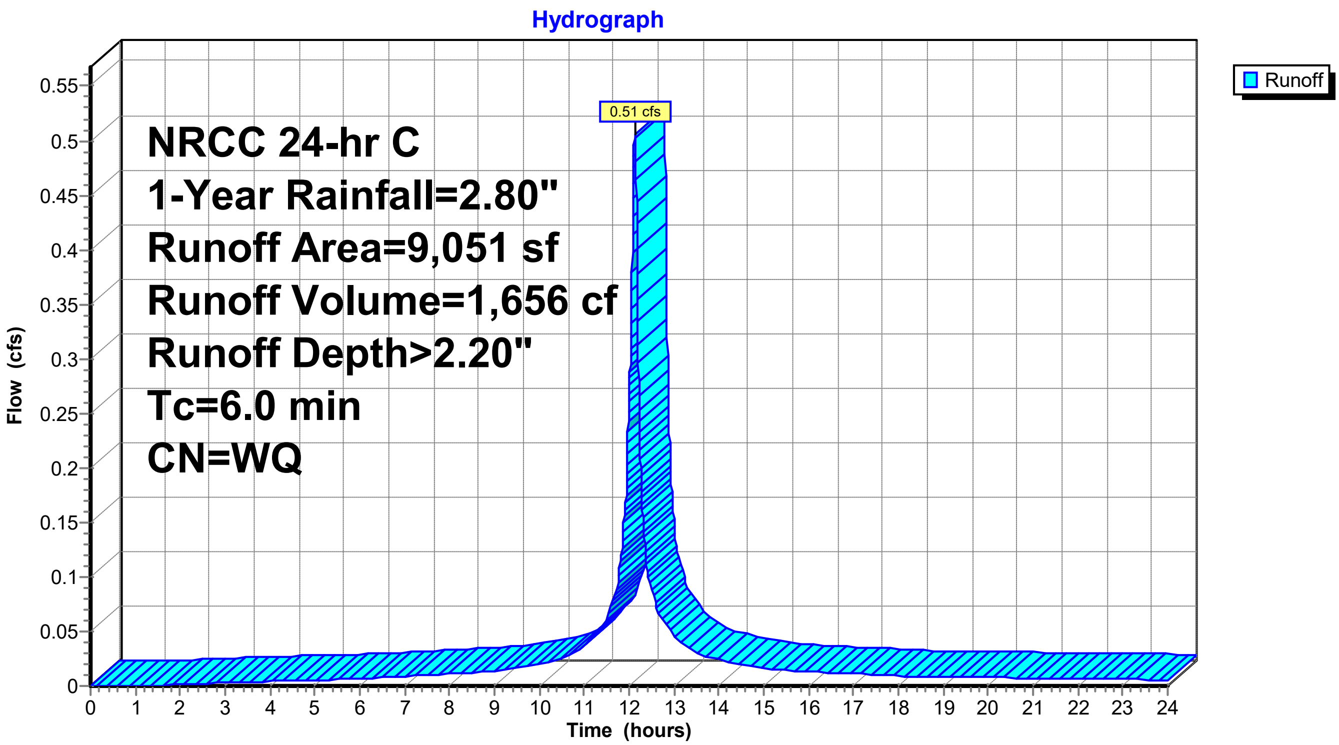
Runoff = 0.51 cfs @ 12.13 hrs, Volume= 1,656 cf, Depth> 2.20"
Routed to Pond CB-7 : CB-7

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

Area (sf)	CN	Description
7,743	98	Paved parking, HSG A
1,308	39	>75% Grass cover, Good, HSG A
9,051		Weighted Average
1,308	39	14.45% Pervious Area
7,743	98	85.55% Impervious Area

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

Subcatchment SCA-18:



Summary for Subcatchment SCA-19:

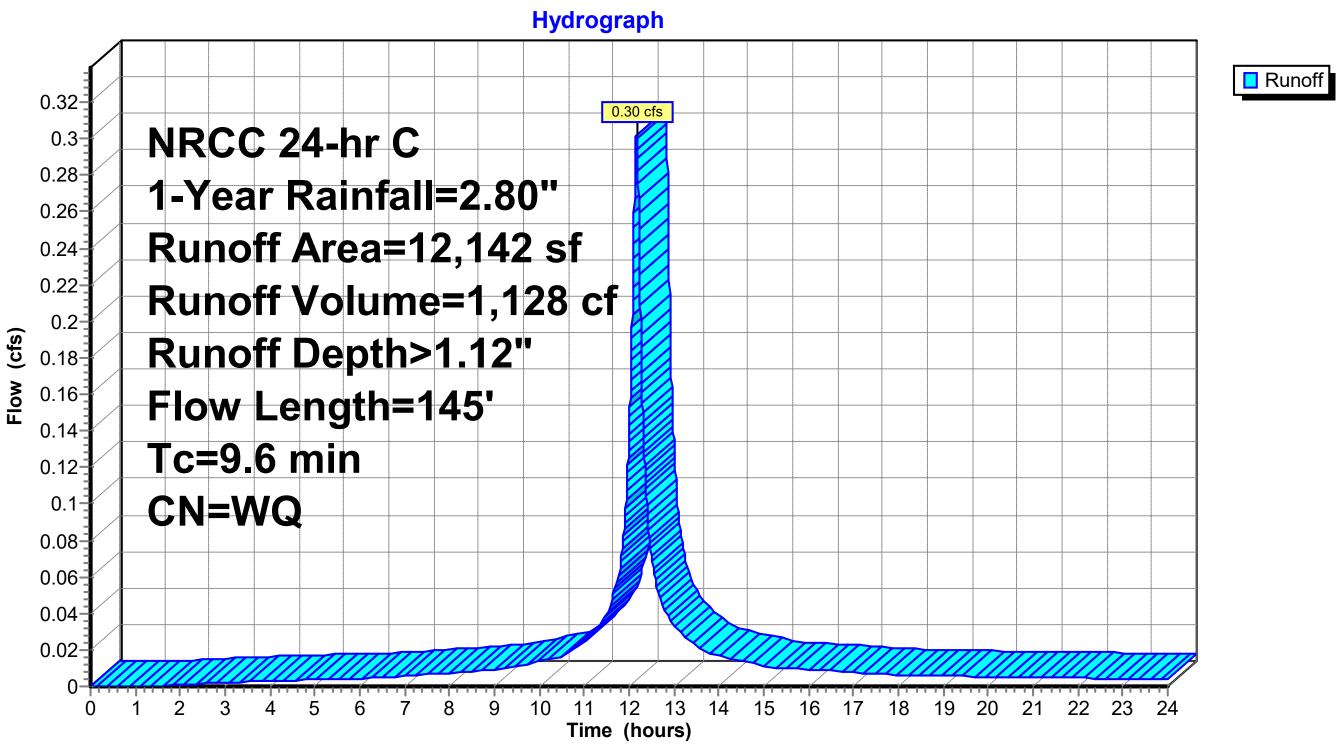
Runoff = 0.30 cfs @ 12.17 hrs, Volume= 1,128 cf, Depth> 1.12"
Routed to Pond CB-6A : CB-6A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

Area (sf)	CN	Description
5,280	98	Paved parking, HSG A
5,968	32	Woods/grass comb., Good, HSG A
894	39	>75% Grass cover, Good, HSG A
12,142		Weighted Average
6,862	33	56.51% Pervious Area
5,280	98	43.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	50	0.0500	0.10		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.35"
1.0	70	0.0600	1.22		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.2	25	0.0100	2.03		**Shallow Concentrated Flow, Parking** Paved Kv= 20.3 fps
9.6	145	Total			

Subcatchment SCA-19:



Summary for Subcatchment SCA-2: LSA/FL

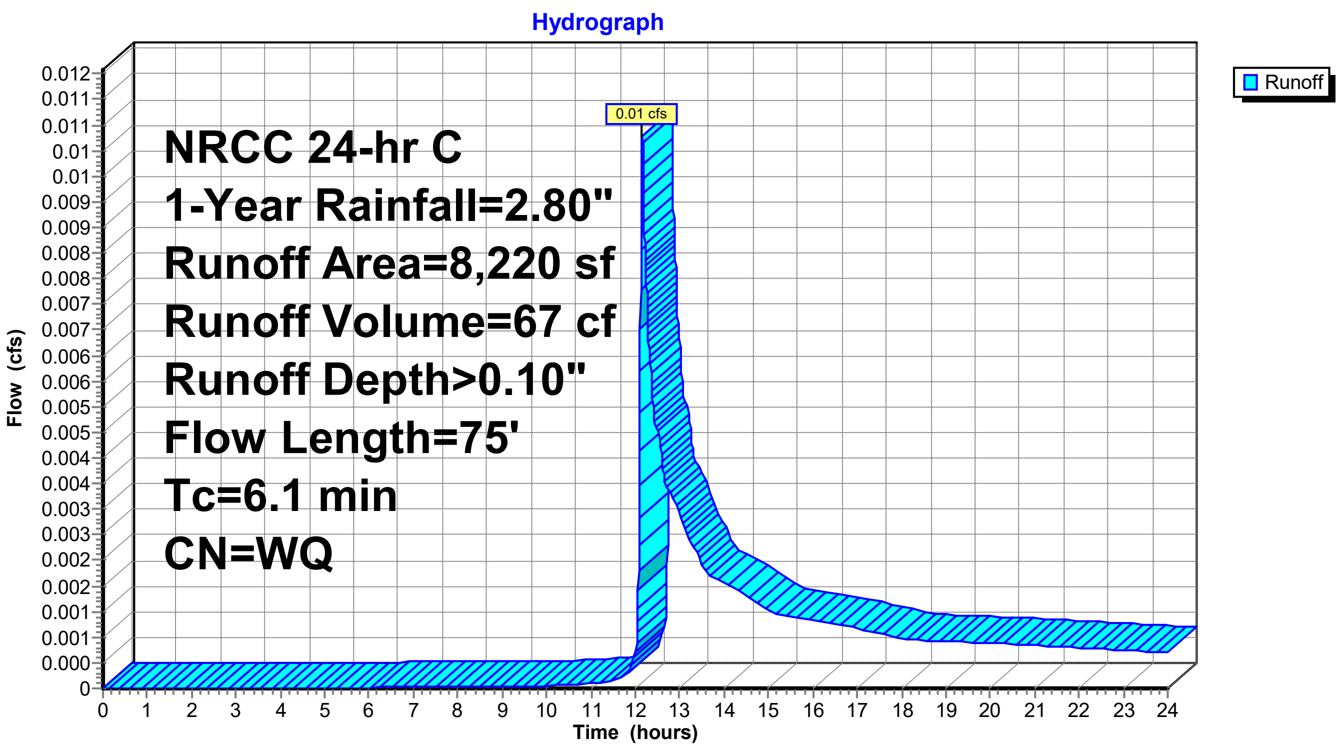
Runoff = 0.01 cfs @ 12.16 hrs, Volume= 67 cf, Depth> 0.10"
Routed to Pond INF-6 : INF-6

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

	Area (sf)	CN	Description
*	20	98	Cocncrete step
	5,345	39	>75% Grass cover, Good, HSG A
*	2,855	60	Stone Fire Lane
	8,220		Weighted Average
	8,200	46	99.76% Pervious Area
	20	98	0.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	35	0.0150	0.13		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.35"
1.4	20	0.0100	0.23		**Sheet Flow, Stone Fire Lane** Fallow n= 0.050 P2= 3.35"
0.1	20	0.1500	2.71		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
6.1	75	Total			

Subcatchment SCA-2: LSA/FL



Summary for Subcatchment SCA-4:

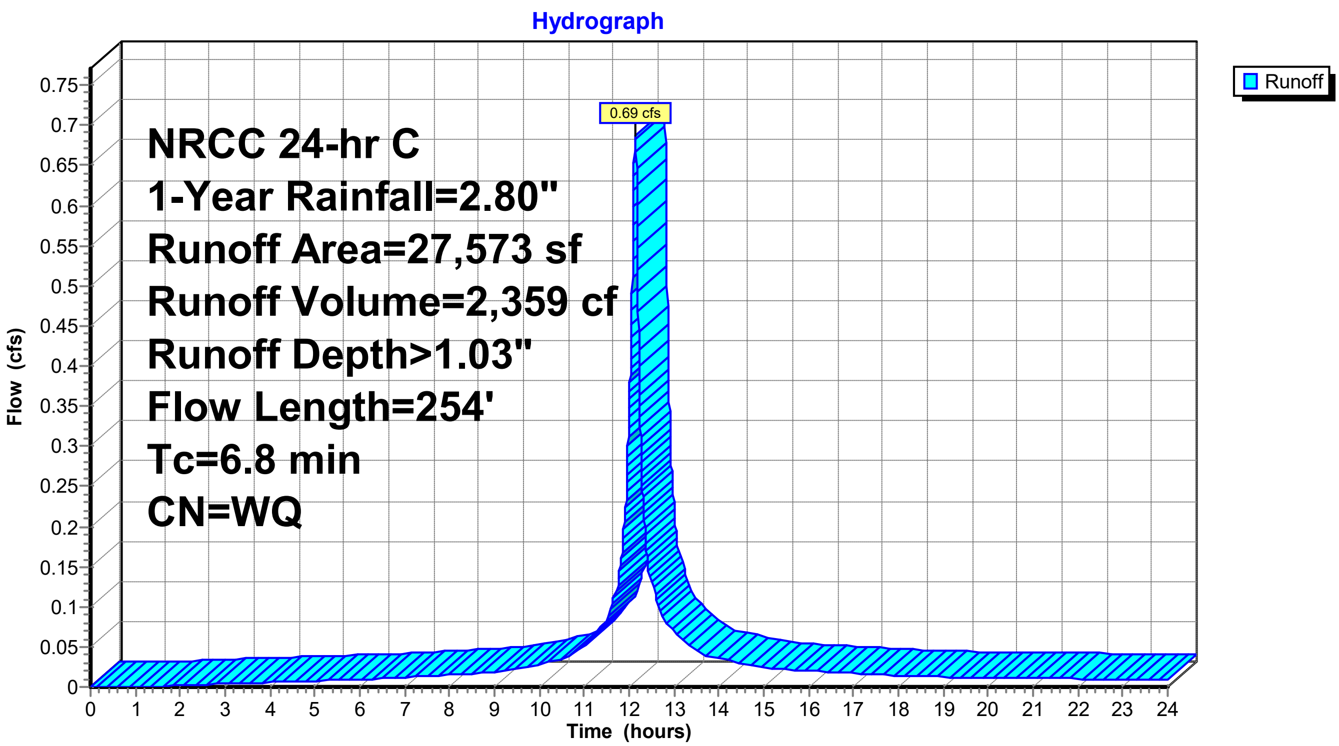
Runoff = 0.69 cfs @ 12.14 hrs, Volume= 2,359 cf, Depth> 1.03"
Routed to Pond CB-4 : CB-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

	Area (sf)	CN	Description
	10,454	98	Paved parking, HSG A
	8,808	39	>75% Grass cover, Good, HSG A
	4,820	30	Woods, Good, HSG A
*	3,245	60	Stone Fire Lane
*	246	98	Shed Roof
	27,573		Weighted Average
	16,873	40	61.19% Pervious Area
	10,700	98	38.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	23	0.0100	0.10		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.35"
2.3	158	0.0050	1.14		**Shallow Concentrated Flow, Stone Fire Lane** Unpaved Kv= 16.1 fps
0.6	73	0.0100	2.03		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
6.8	254	Total			

Subcatchment SCA-4:



Summary for Subcatchment SCA-5:

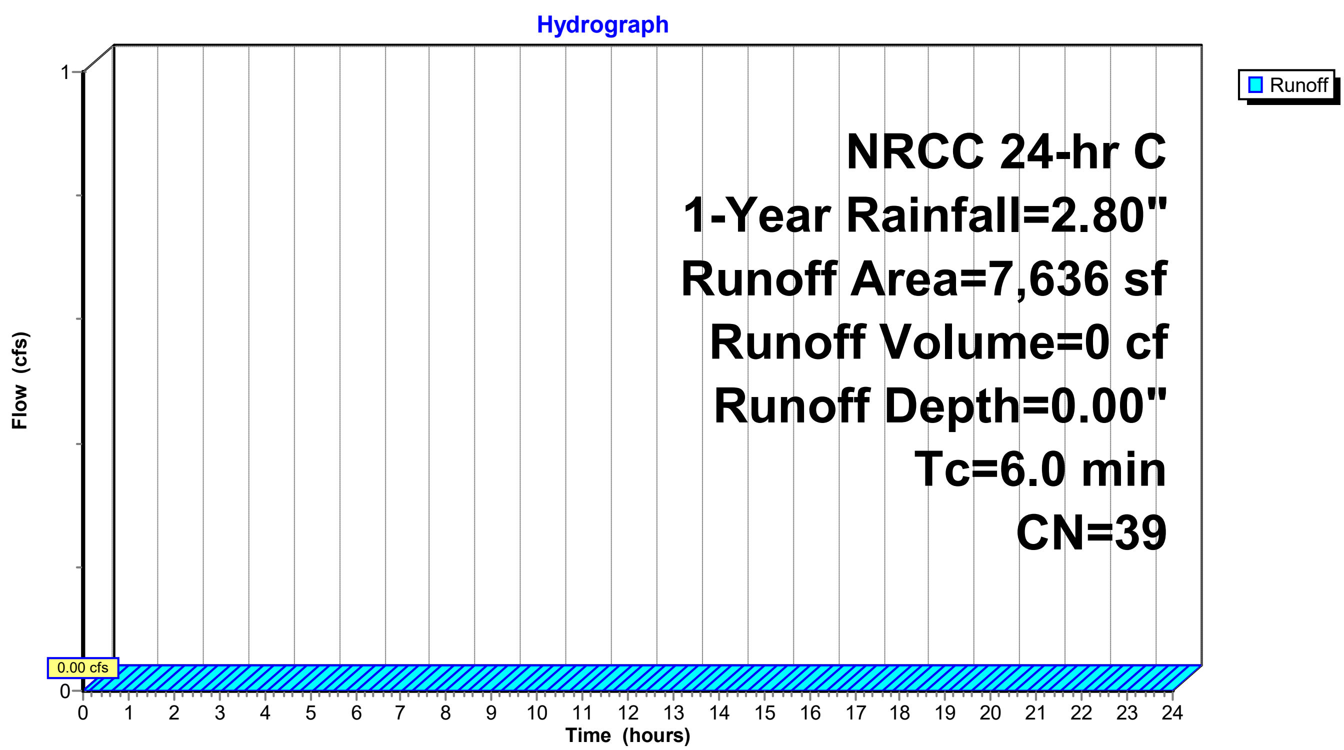
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Pond FP-7 : FP-7/INF-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

Area (sf)	CN	Description
7,636	39	>75% Grass cover, Good, HSG A
7,636	39	100.00% Pervious Area

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

Subcatchment SCA-5:



Summary for Subcatchment SCA-6.1:

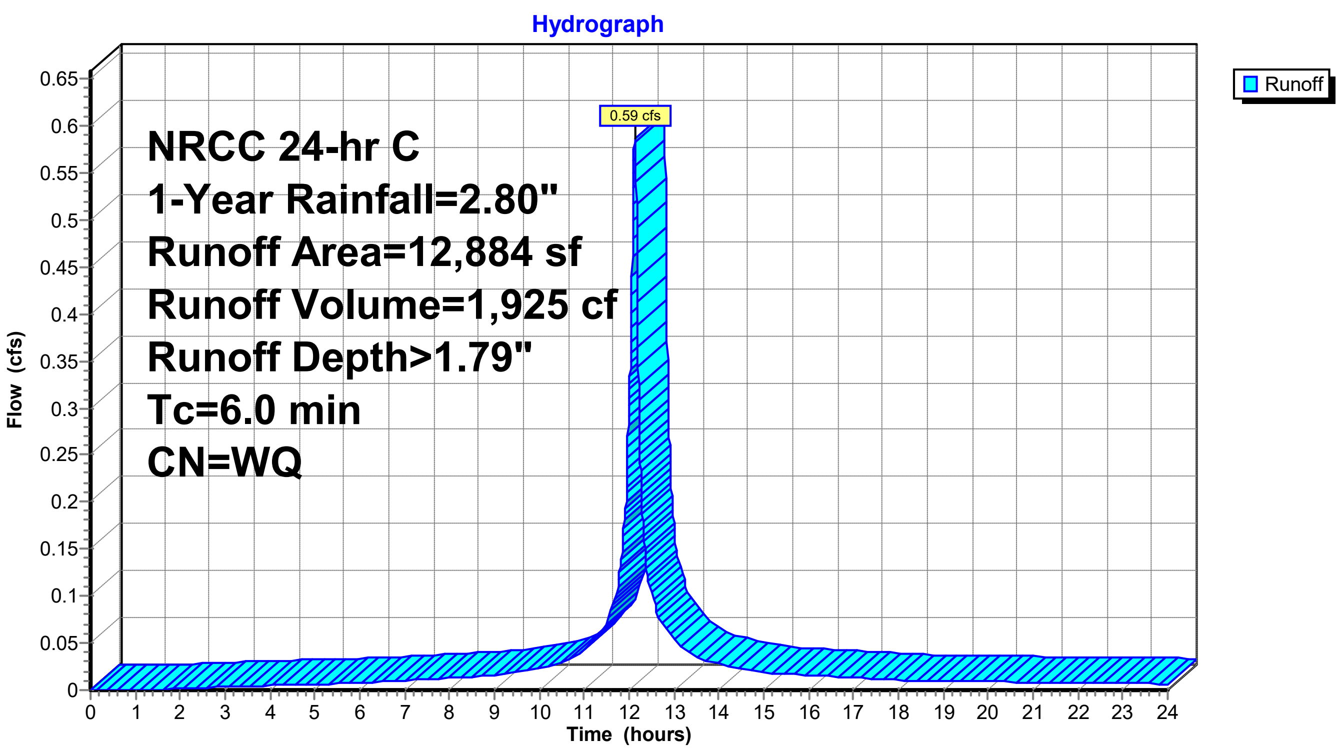
Runoff = 0.59 cfs @ 12.13 hrs, Volume= 1,925 cf, Depth> 1.79"
Routed to Pond CB-3 : CB-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

	Area (sf)	CN	Description
	8,965	98	Paved parking, HSG A
	3,559	39	>75% Grass cover, Good, HSG A
*	360	60	Fire Lane (FL)
	12,884		Weighted Average
	3,919	41	30.42% Pervious Area
	8,965	98	69.58% Impervious Area

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

Subcatchment SCA-6.1:



Summary for Subcatchment SCA-6.2:

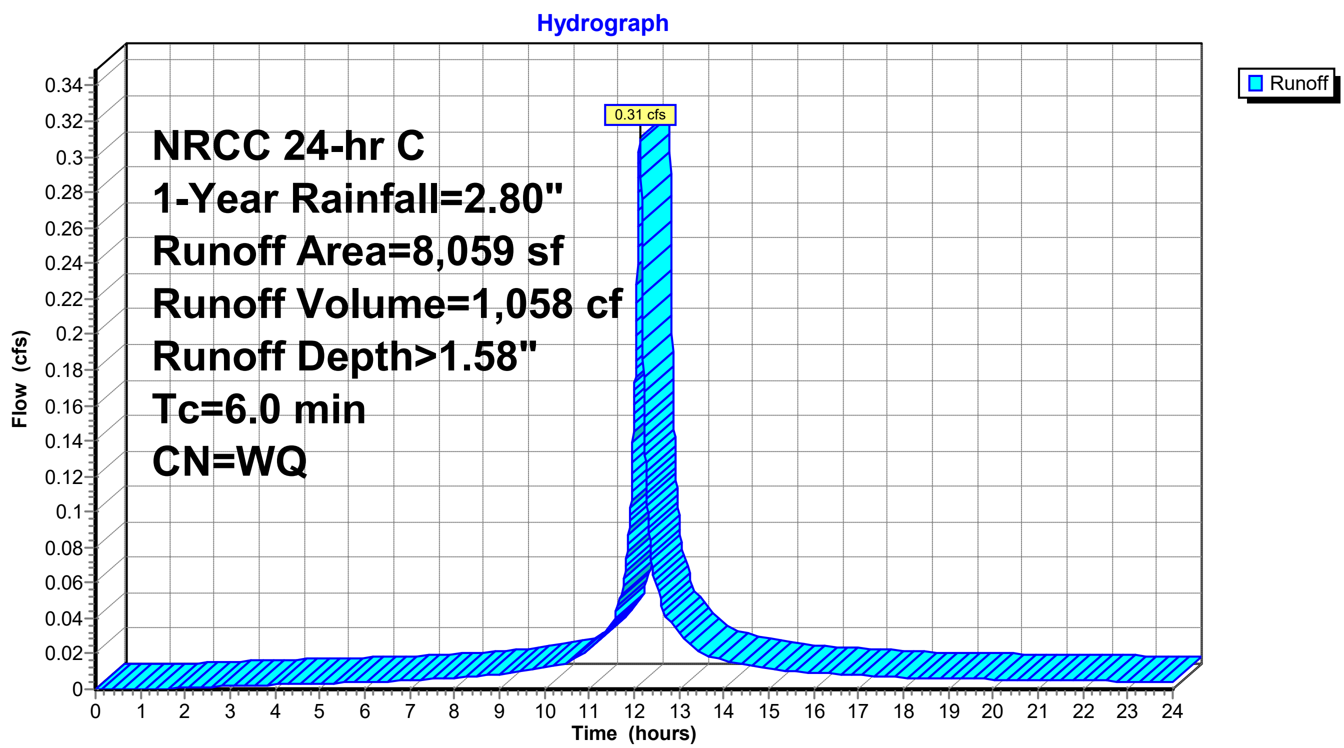
Runoff = 0.31 cfs @ 12.13 hrs, Volume= 1,058 cf, Depth> 1.58"
Routed to Pond FP-3 : FP-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

	Area (sf)	CN	Description
*	3,130	60	Permeable Pavers (PP)
	3,296	98	Paved roads w/curbs & sewers, HSG A
*	1,331	98	Canopy (CP)
	302	39	>75% Grass cover, Good, HSG A
	8,059		Weighted Average
	3,432	58	42.59% Pervious Area
	4,627	98	57.41% Impervious Area

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

Subcatchment SCA-6.2:



Summary for Subcatchment SCA-7:

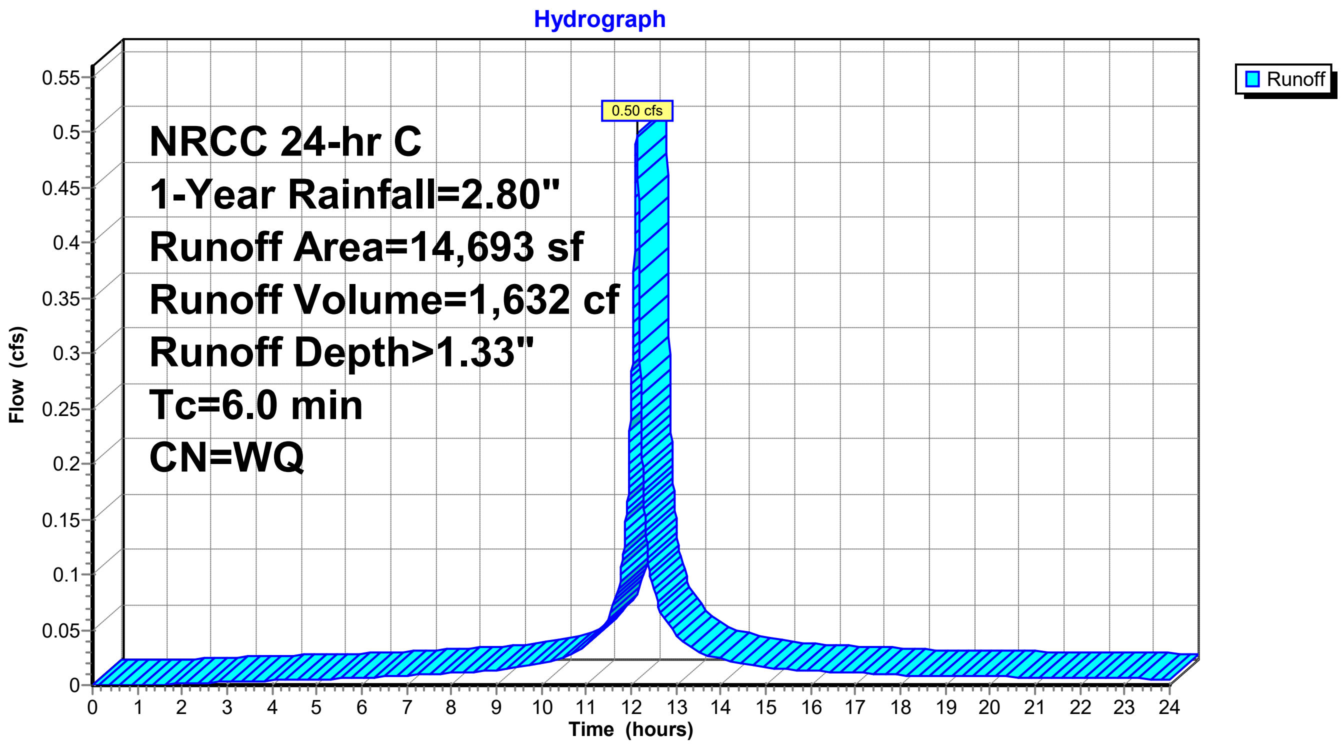
Runoff = 0.50 cfs @ 12.13 hrs, Volume= 1,632 cf, Depth> 1.33"
Routed to Pond FP-6 : FP-6

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

Area (sf)	CN	Description
7,630	98	Paved parking, HSG A
5,346	39	>75% Grass cover, Good, HSG A
1,717	32	Woods/grass comb., Good, HSG A
14,693		Weighted Average
7,063	37	48.07% Pervious Area
7,630	98	51.93% Impervious Area

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

Subcatchment SCA-7:



Summary for Subcatchment SCA-8:

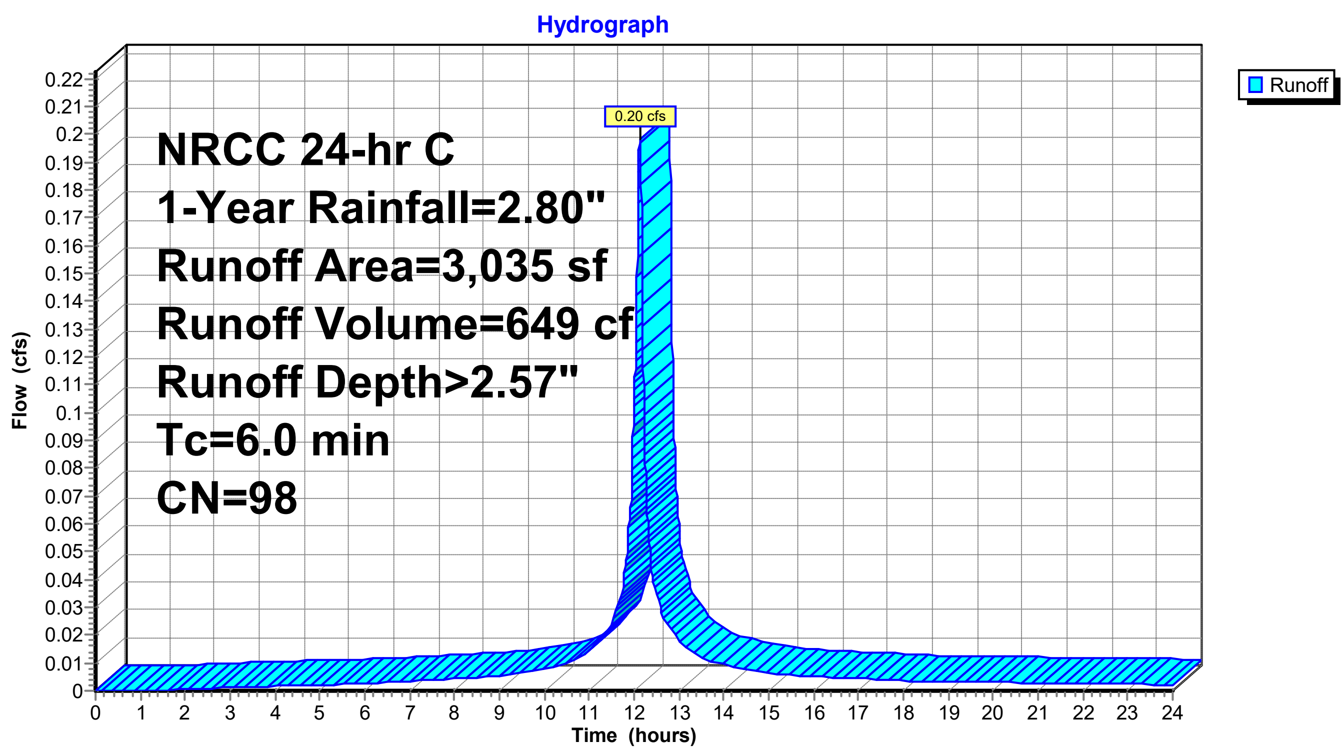
Runoff = 0.20 cfs @ 12.13 hrs, Volume= 649 cf, Depth> 2.57"
Routed to Pond FP-1 : FP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

Area (sf)	CN	Description
3,035	98	Paved parking, HSG A
3,035	98	100.00% Impervious Area

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

Subcatchment SCA-8:



Summary for Subcatchment SCA-9:

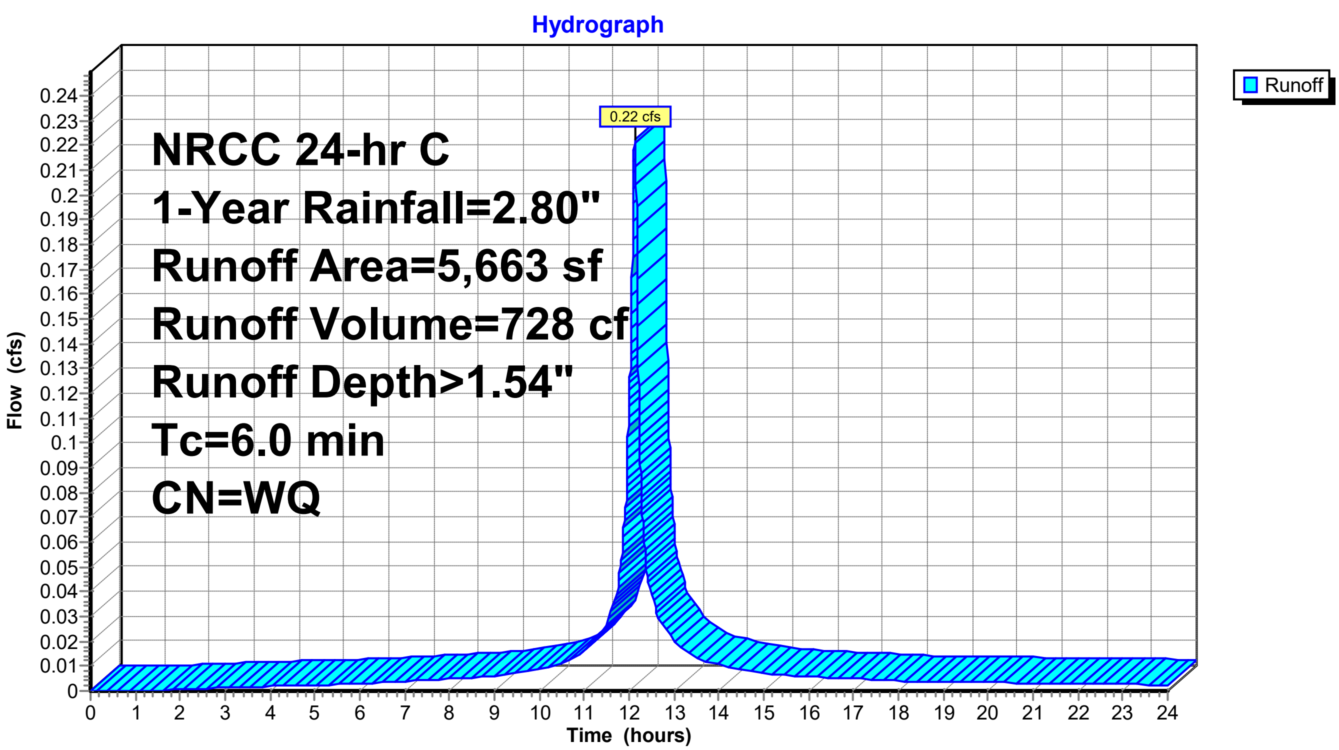
Runoff = 0.22 cfs @ 12.13 hrs, Volume= 728 cf, Depth> 1.54"
Routed to Pond FP-3 : FP-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

Area (sf)	CN	Description
3,403	98	Paved parking, HSG A
2,260	39	>75% Grass cover, Good, HSG A
5,663		Weighted Average
2,260	39	39.91% Pervious Area
3,403	98	60.09% Impervious Area

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

Subcatchment SCA-9:



Summary for Subcatchment UC-1: NA

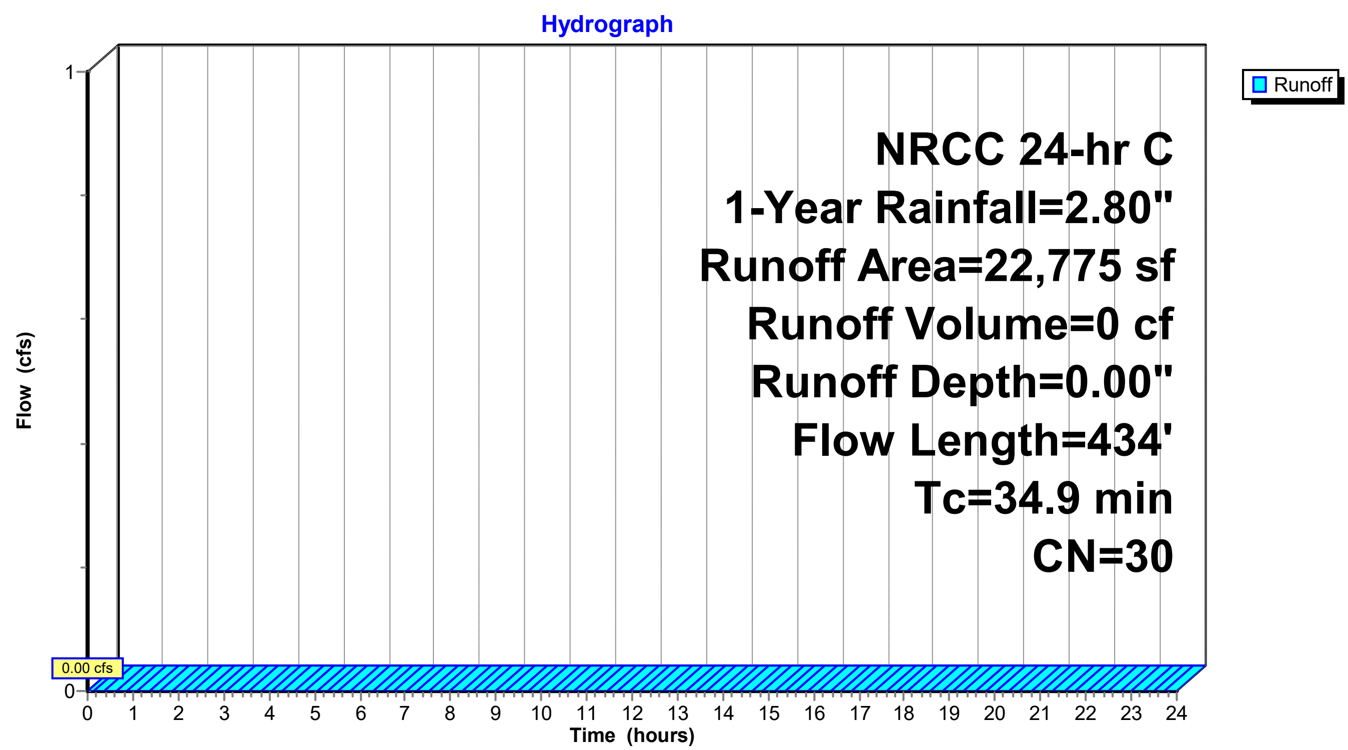
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Pond SP 1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

Area (sf)	CN	Description
22,775	30	Woods, Good, HSG A
22,775	30	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.2	100	0.0250	0.09		**Sheet Flow, Natural Area (NA)**
					Woods: Light underbrush n= 0.400 P2= 3.35"
15.7	334	0.0050	0.35		**Shallow Concentrated Flow, Woods**
					Woodland Kv= 5.0 fps
34.9	434	Total			

Subcatchment UC-1: NA



Summary for Subcatchment UC-2:

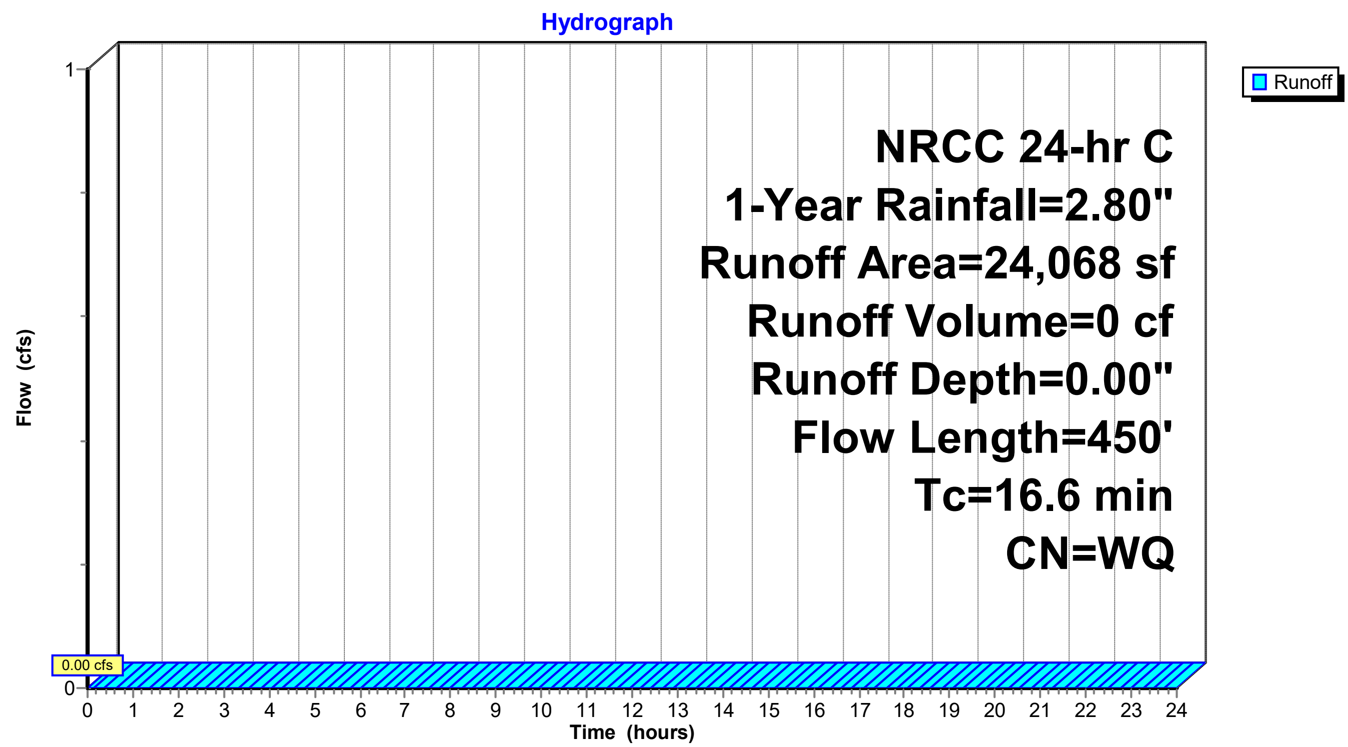
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Pond SP 3 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

Area (sf)	CN	Description
17,559	30	Woods, Good, HSG A
6,509	39	>75% Grass cover, Good, HSG A
24,068		Weighted Average
24,068	32	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	50	0.0590	0.11		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
6.6	199	0.0100	0.50		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
2.2	201	0.0100	1.50		**Shallow Concentrated Flow, SWALE** Grassed Waterway Kv= 15.0 fps
16.6	450	Total			

Subcatchment UC-2:



Summary for Subcatchment UC-3:

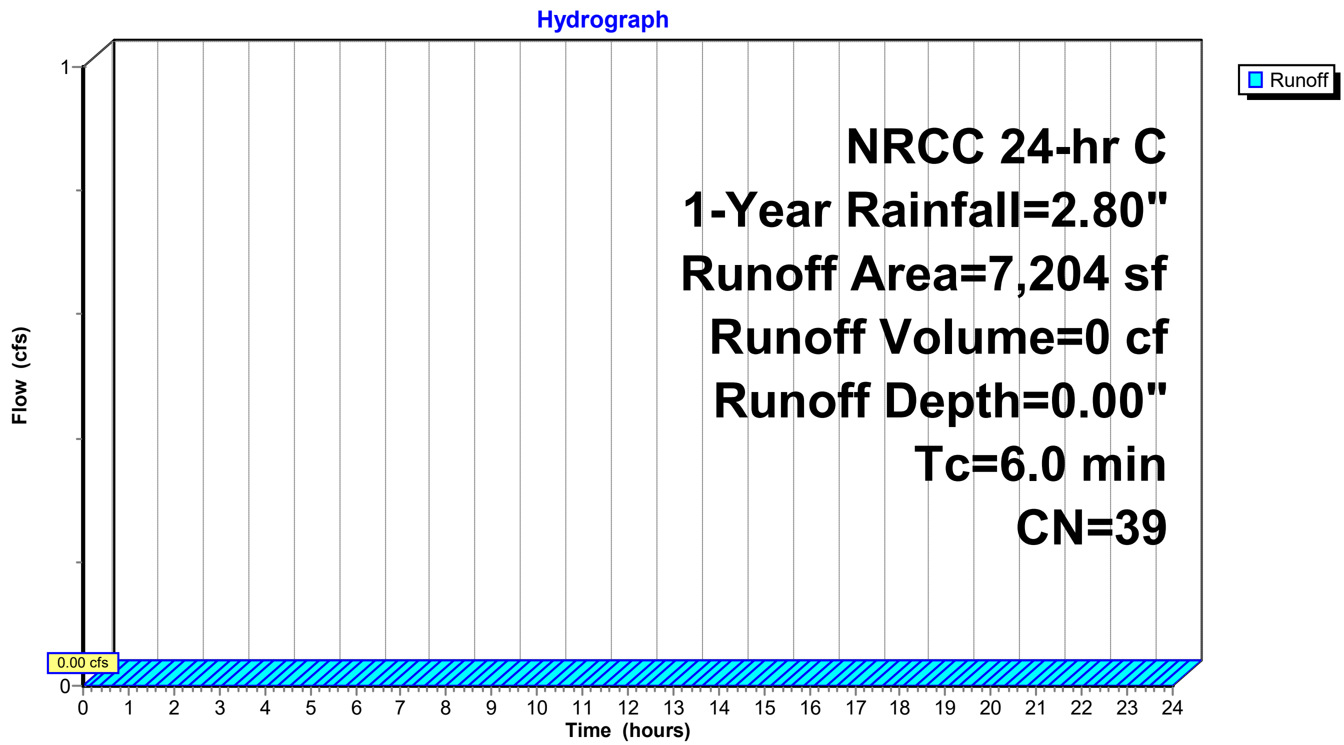
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Pond AB-1 : Attenuation Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

Area (sf)	CN	Description
7,204	39	>75% Grass cover, Good, HSG A
7,204	39	100.00% Pervious Area

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

Subcatchment UC-3:



Summary for Subcatchment UC-4:

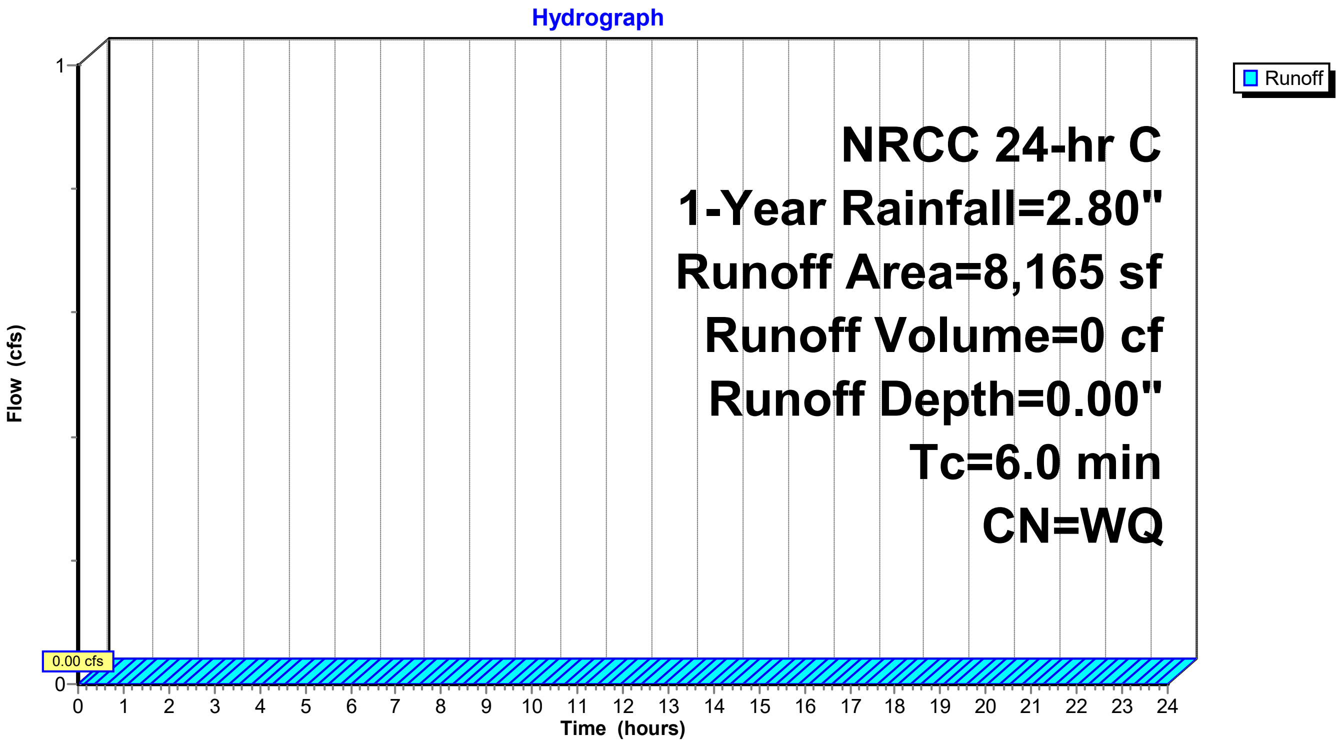
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Pond SP 4 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

Area (sf)	CN	Description
3,787	39	>75% Grass cover, Good, HSG A
4,378	30	Woods, Good, HSG A
8,165		Weighted Average
8,165	34	100.00% Pervious Area

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

Subcatchment UC-4:



Summary for Subcatchment UC-5:

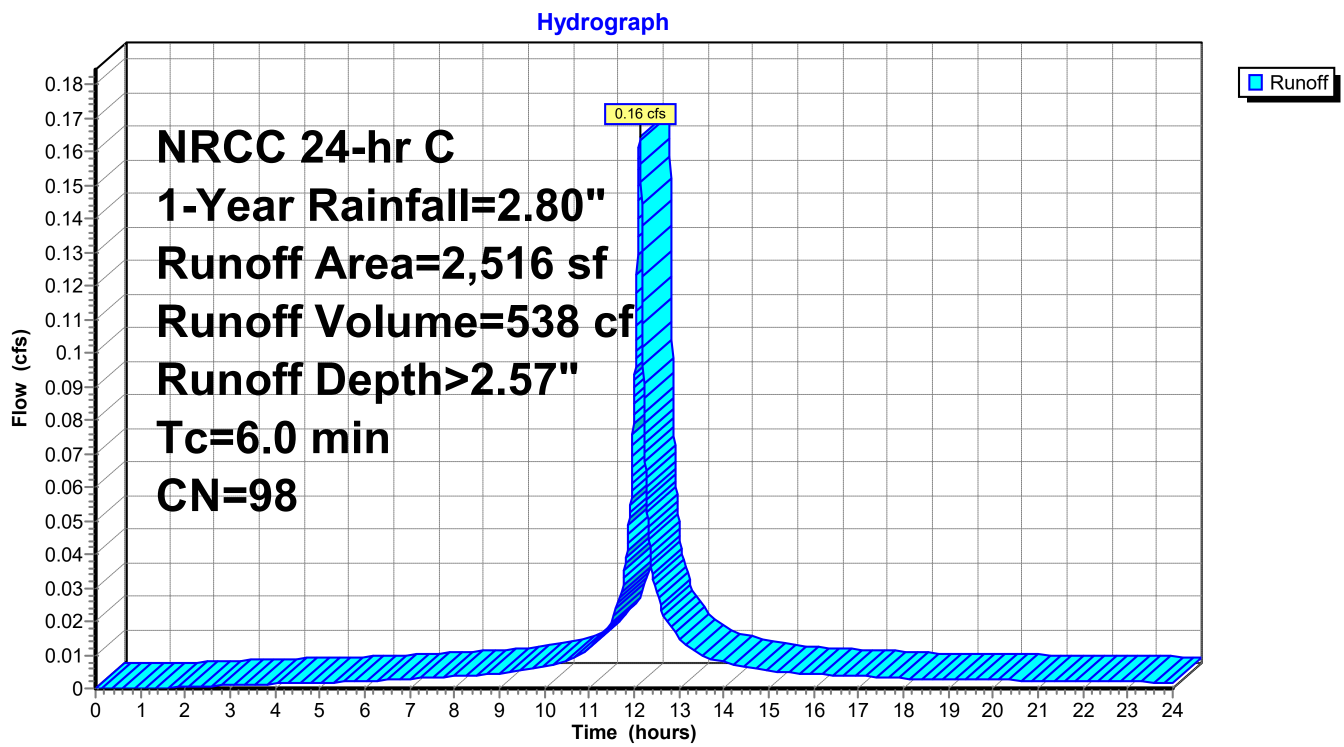
Runoff = 0.16 cfs @ 12.13 hrs, Volume= 538 cf, Depth> 2.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

Area (sf)	CN	Description
2,516	98	Paved parking, HSG A
2,516	98	100.00% Impervious Area

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

Subcatchment UC-5:



Summary for Subcatchment UC-6: NA

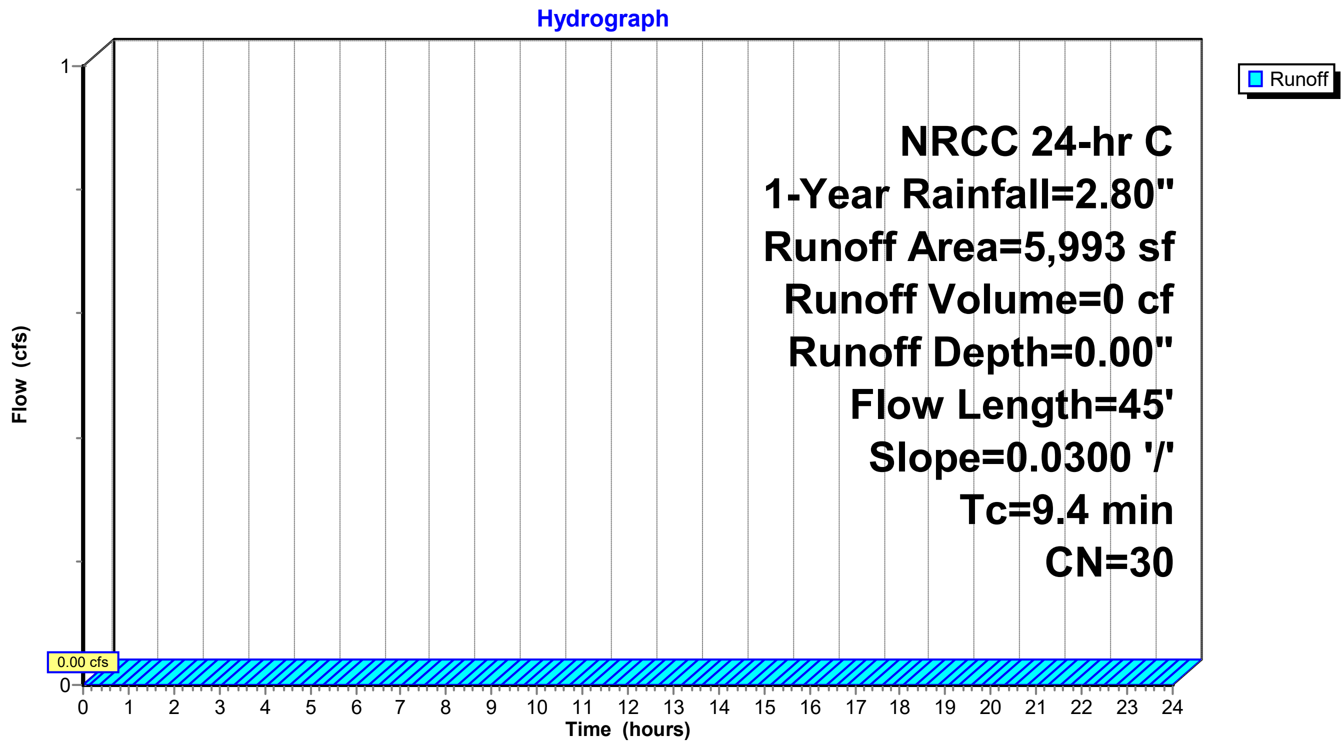
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Pond SP-2 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 1-Year Rainfall=2.80"

Area (sf)	CN	Description
5,993	30	Woods, Good, HSG A
5,993	30	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	45	0.0300	0.08		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"

Subcatchment UC-6: NA



Summary for Pond AB-1: Attenuation Basin

Inflow Area = 7,204 sf, 0.00% Impervious, Inflow Depth = 0.00" for 1-Year 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
Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond SP 4 : Study Point

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 49.00' @ 0.00 hrs Surf.Area= 766 sf Storage= 0 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	49.00'	4,514 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

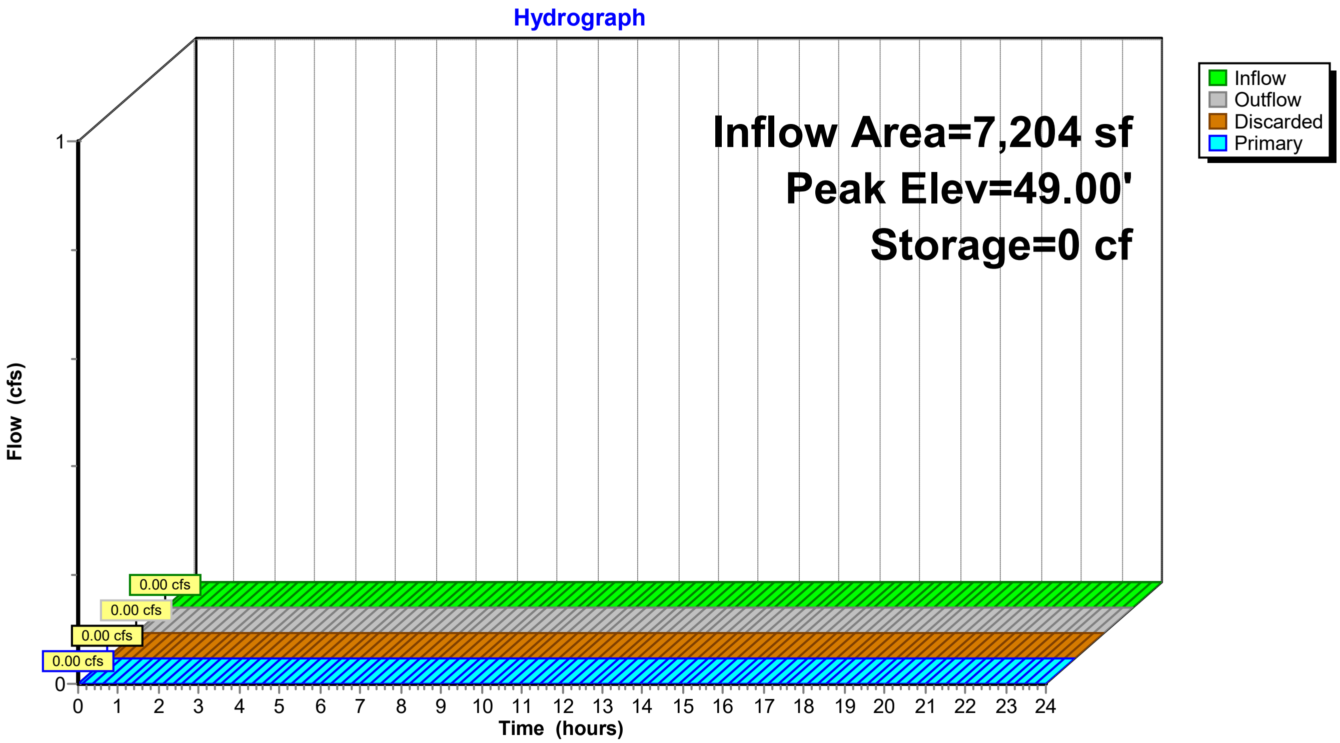
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
49.00	766	147.0	0	0	766
50.00	1,048	206.0	903	903	2,433
51.00	1,801	246.0	1,408	2,311	3,889
52.00	2,632	275.0	2,203	4,514	5,119

Device	Routing	Invert	Outlet Devices
#1	Primary	49.50'	**18.0" Round Culvert** L= 54.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 49.50' / 49.00' S= 0.0093 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	49.50'	**20.0 deg x 2.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.69 (C= 3.36)
#3	Device 1	51.75'	**28.0" x 28.0" Horiz. Bar Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	49.00'	**3.000 in/hr Exfiltration over Surface area from 49.00' - 50.00'** Excluded Surface area = 766 sf Phase-In= 0.01'

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.00' (Free Discharge)
└─**4=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.00' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  ├─**2=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)
  └─**3=Bar Grate** (Controls 0.00 cfs)

Pond AB-1: Attenuation Basin



Summary for Pond CB-2A: CB 2A

Inflow Area =	4,123 sf,100.00% Impervious,	Inflow Depth > 2.57"	for 1-Year event	
Inflow =	0.27 cfs @	12.13 hrs, Volume=	882 cf	
Outflow =	0.27 cfs @	12.13 hrs, Volume=	882 cf, Atten= 0%, Lag= 0.0 min	
Primary =	0.27 cfs @	12.13 hrs, Volume=	882 cf	

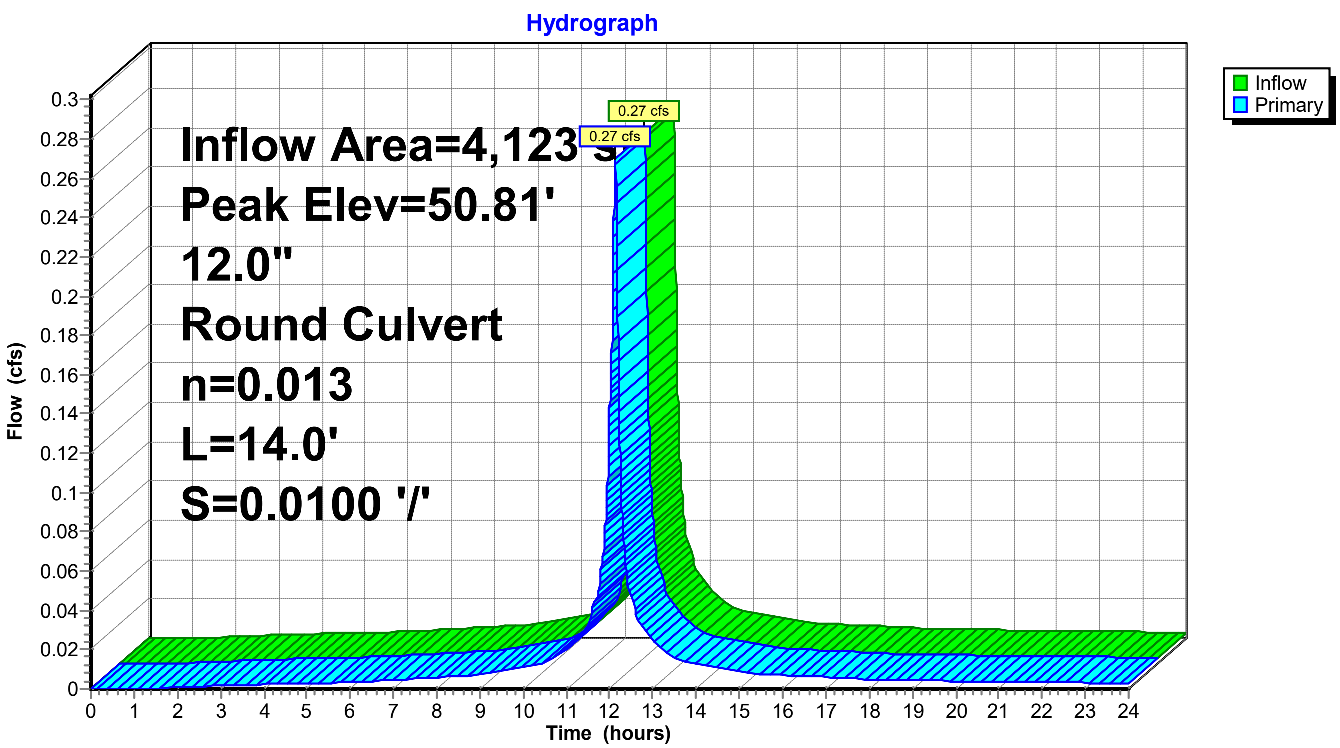
Routed to Pond DMH-2.2 : DMH-2.2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 50.81' @ 12.13 hrs
Flood Elev= 53.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	50.53'	**12.0" Round Culvert** L= 14.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.53' / 50.39' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.27 cfs @ 12.13 hrs HW=50.81' TW=50.47' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.27 cfs @ 2.21 fps)

Pond CB-2A: CB 2A



Summary for Pond CB-2B: CB 2B

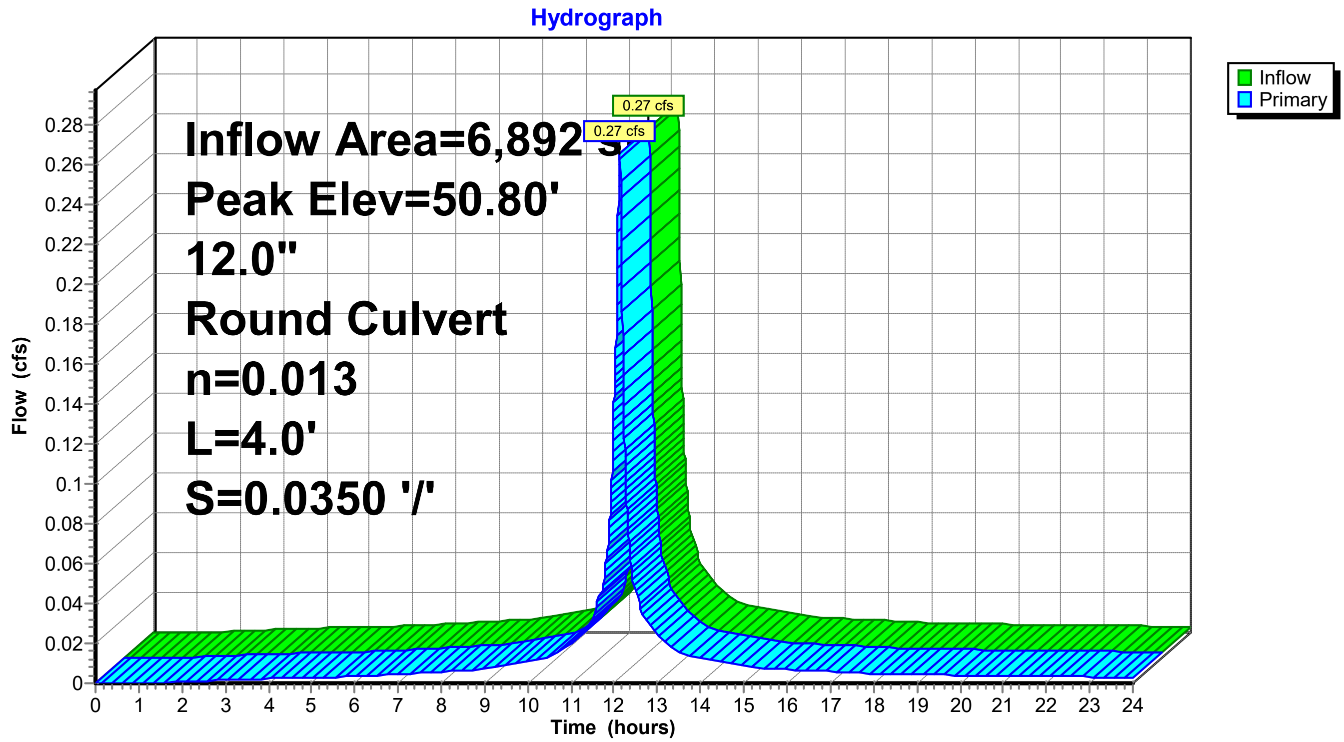
Inflow Area = 6,892 sf, 58.84% Impervious, Inflow Depth > 1.51" for 1-Year event
Inflow = 0.27 cfs @ 12.13 hrs, Volume= 867 cf
Outflow = 0.27 cfs @ 12.13 hrs, Volume= 867 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.27 cfs @ 12.13 hrs, Volume= 867 cf
Routed to Pond DMH-2.2 : DMH-2.2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 50.80' @ 12.13 hrs
Flood Elev= 53.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	50.53'	**12.0" Round Culvert** L= 4.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.53' / 50.39' S= 0.0350 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.27 cfs @ 12.13 hrs HW=50.80' TW=50.47' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.27 cfs @ 1.56 fps)

Pond CB-2B: CB 2B



Summary for Pond CB-3: CB-3

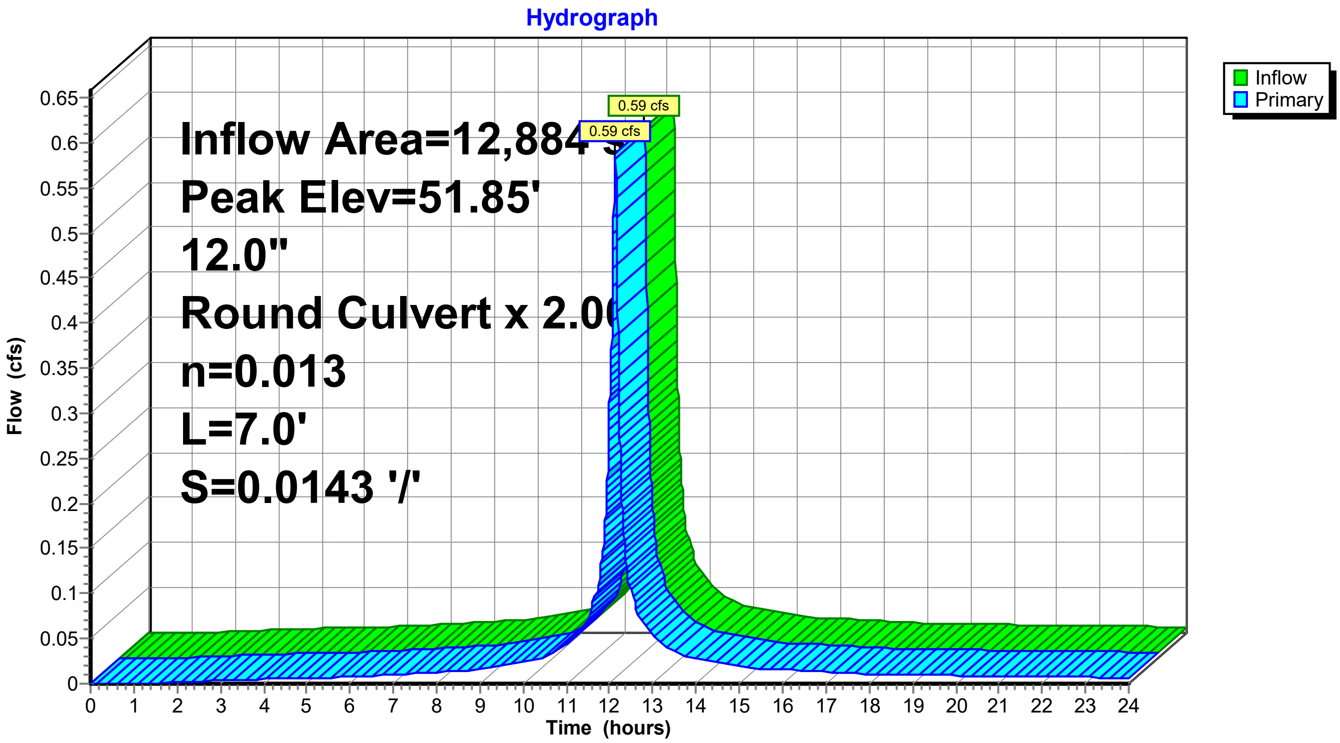
Inflow Area = 12,884 sf, 69.58% Impervious, Inflow Depth > 1.79" for 1-Year event
Inflow = 0.59 cfs @ 12.13 hrs, Volume= 1,925 cf
Outflow = 0.59 cfs @ 12.13 hrs, Volume= 1,925 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.59 cfs @ 12.13 hrs, Volume= 1,925 cf
Routed to Pond DMH-3 : DMH-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.85' @ 12.13 hrs
Flood Elev= 53.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.55'	**12.0" Round Culvert X 2.00** L= 7.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 51.55' / 51.45' S= 0.0143 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.59 cfs @ 12.13 hrs HW=51.85' TW=51.49' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.59 cfs @ 2.25 fps)

Pond CB-3: CB-3



Summary for Pond CB-4: CB-4

Inflow Area = 27,573 sf, 38.81% Impervious, Inflow Depth > 1.03" for 1-Year event
Inflow = 0.69 cfs @ 12.14 hrs, Volume= 2,359 cf
Outflow = 0.69 cfs @ 12.14 hrs, Volume= 2,359 cf, Atten= 0%, Lag= 0.1 min
Primary = 0.69 cfs @ 12.14 hrs, Volume= 2,359 cf
Routed to Pond DMH-9 : DMH-9 (bypass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 56.89' @ 12.14 hrs Surf.Area= 61 sf Storage= 1 cf
Flood Elev= 56.85' Surf.Area= 4 sf Storage= 0 cf

Plug-Flow detention time= 0.0 min calculated for 2,359 cf (100% of inflow)
Center-of-Mass det. time= 0.0 min (767.5 - 767.5)

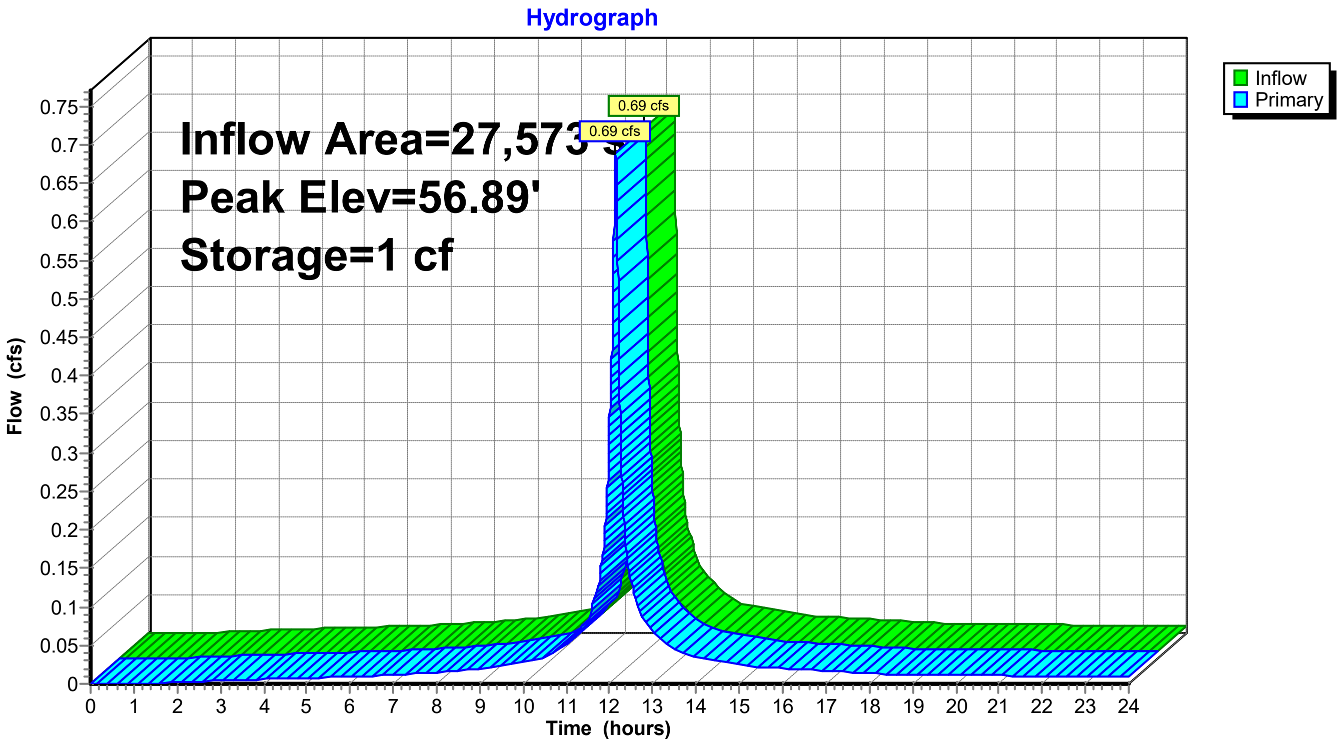
Volume	Invert	Avail.Storage	Storage Description
#1	56.85'	4,465 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
56.85	4	8.0	0	0	4
57.00	589	96.0	32	32	732
58.00	10,253	534.0	4,433	4,465	22,693

Device	Routing	Invert	Outlet Devices
#1	Primary	53.35'	**12.0" Round Culvert** L= 9.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 53.35' / 53.25' S= 0.0111 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	56.85'	**1.2" x 1.2" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 Limited to weir flow at low heads
#3	Device 1	56.85'	**1.2" x 1.2" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.69 cfs @ 12.14 hrs HW=56.89' TW=53.70' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.69 cfs of 5.82 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.34 cfs @ 0.95 fps)
  └─**3=Orifice/Grate** (Orifice Controls 0.34 cfs @ 0.95 fps)

Pond CB-4: CB-4


Hydrograph
Inflow
Primary
0.69 cfs
0.69 cfs
Inflow Area=27,573 sf
Peak Elev=56.89'
Storage=1 cf
Flow (cfs)
0.75
0.7
0.65
0.6
0.55
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Time (hours)

Summary for Pond CB-6A: CB-6A

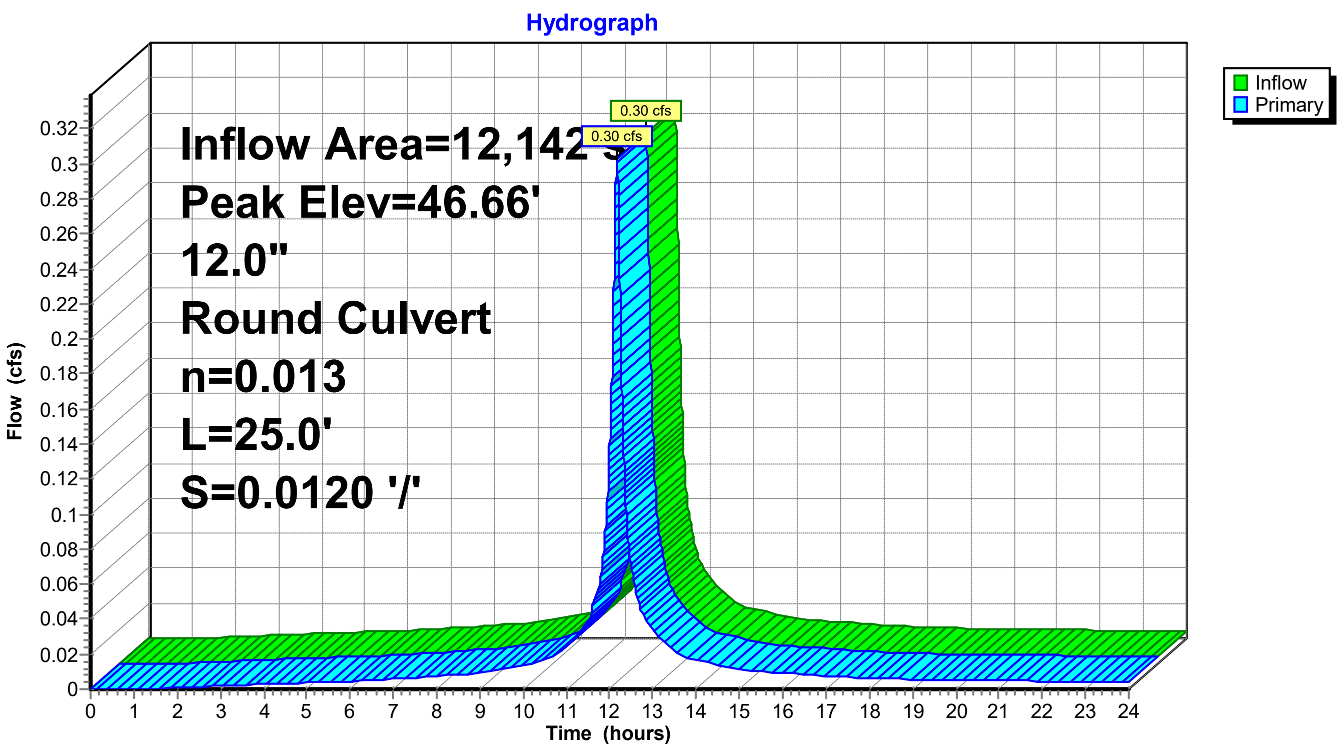
Inflow Area = 12,142 sf, 43.49% Impervious, Inflow Depth > 1.12" for 1-Year event
Inflow = 0.30 cfs @ 12.17 hrs, Volume= 1,128 cf
Outflow = 0.30 cfs @ 12.17 hrs, Volume= 1,128 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.30 cfs @ 12.17 hrs, Volume= 1,128 cf
Routed to Pond DMH-7 : DMH-7 (bypass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 46.66' @ 12.15 hrs
Flood Elev= 49.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.30'	**12.0" Round Culvert** L= 25.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.30' / 46.00' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.30 cfs @ 12.17 hrs HW=46.65' TW=46.49' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.30 cfs @ 1.82 fps)

Pond CB-6A: CB-6A



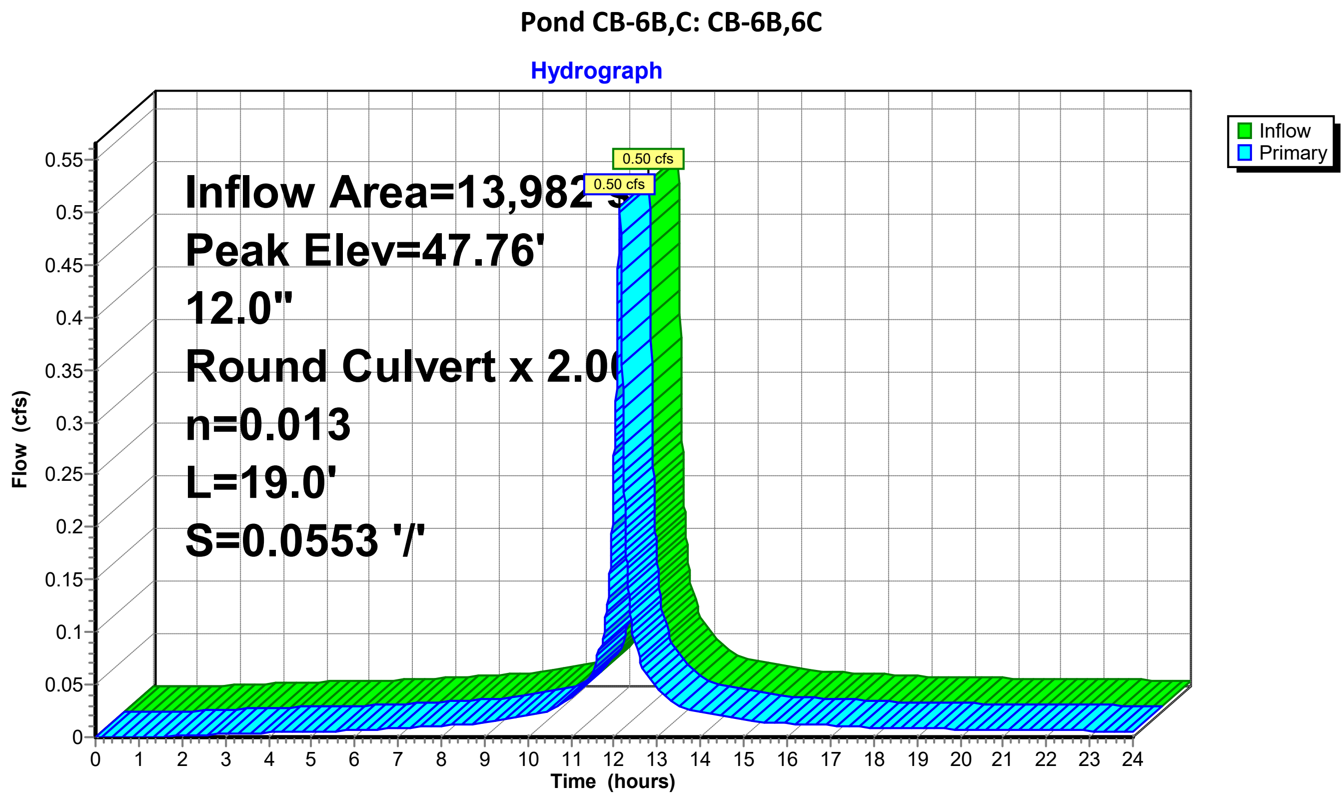
Summary for Pond CB-6B,C: CB-6B,6C

Inflow Area = 13,982 sf, 55.19% Impervious, Inflow Depth > 1.42" for 1-Year event
Inflow = 0.50 cfs @ 12.13 hrs, Volume= 1,650 cf
Outflow = 0.50 cfs @ 12.13 hrs, Volume= 1,650 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.50 cfs @ 12.13 hrs, Volume= 1,650 cf
Routed to Pond DMH-6 : DMH-6

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 47.76' @ 12.13 hrs
Flood Elev= 50.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	47.50'	**12.0" Round Culvert X 2.00** L= 19.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 47.50' / 46.45' S= 0.0553 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.50 cfs @ 12.13 hrs HW=47.76' TW=46.76' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.50 cfs @ 1.54 fps)



Summary for Pond CB-7: CB-7

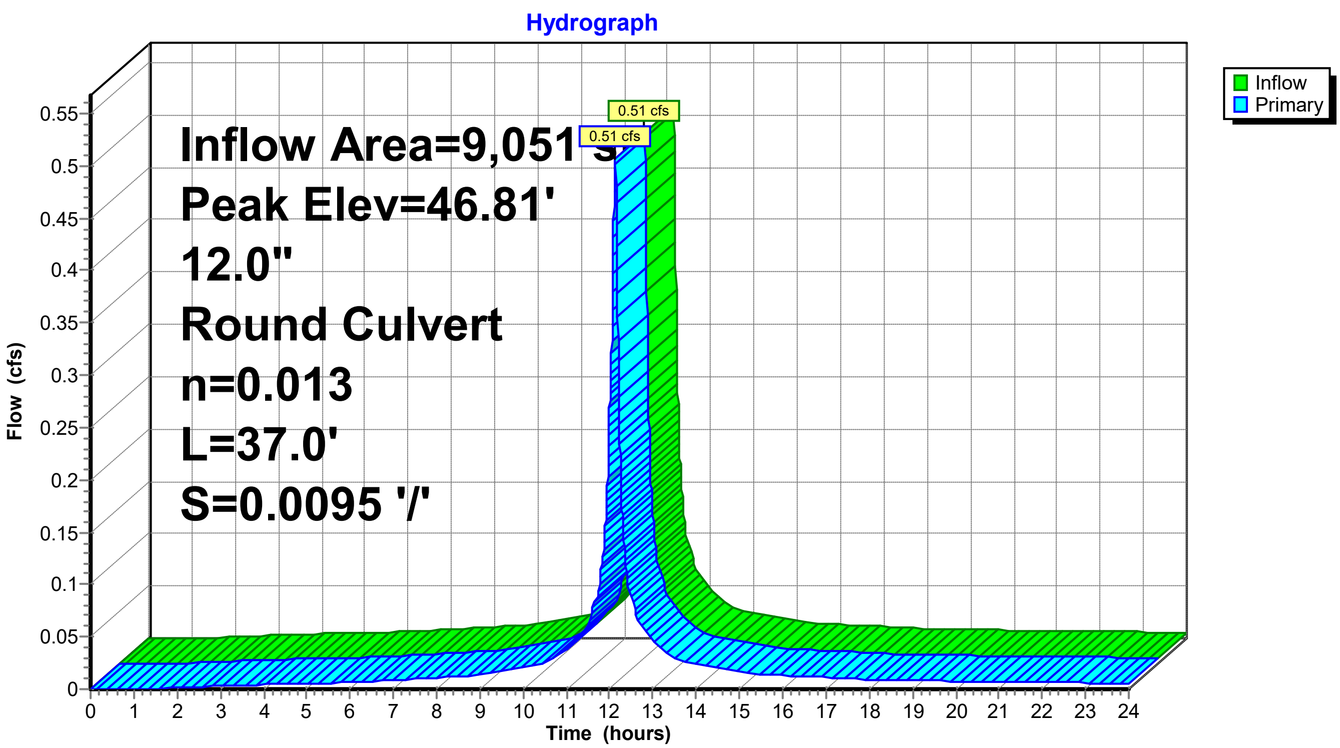
Inflow Area = 9,051 sf, 85.55% Impervious, Inflow Depth > 2.20" for 1-Year event
Inflow = 0.51 cfs @ 12.13 hrs, Volume= 1,656 cf
Outflow = 0.51 cfs @ 12.13 hrs, Volume= 1,656 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.51 cfs @ 12.13 hrs, Volume= 1,656 cf
Routed to Pond DMH-8 : DMH-8 (bypass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 46.81' @ 12.13 hrs
Flood Elev= 49.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.40'	**12.0" Round Culvert** L= 37.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.40' / 46.05' S= 0.0095 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.51 cfs @ 12.13 hrs HW=46.81' TW=46.48' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.51 cfs @ 2.44 fps)

Pond CB-7: CB-7



Summary for Pond DB-A: DB-A

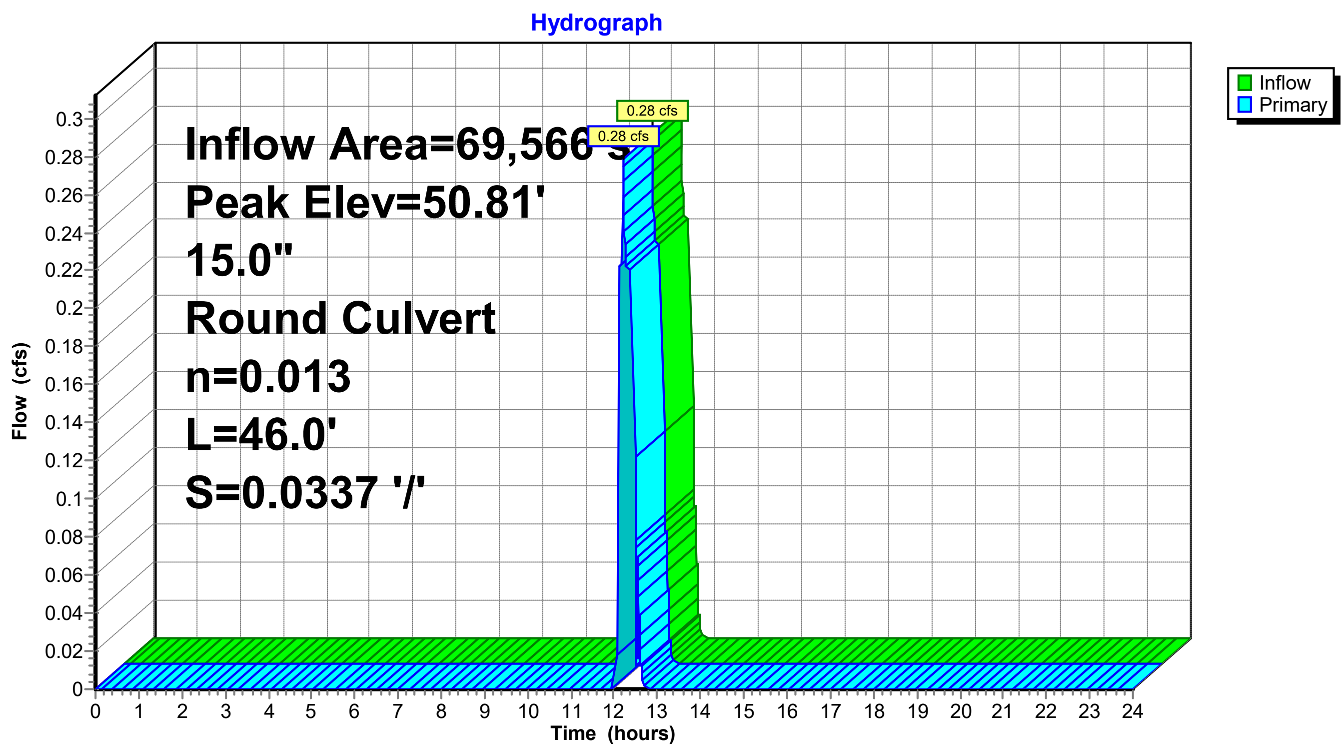
Inflow Area = 69,566 sf, 63.53% Impervious, Inflow Depth = 0.06" for 1-Year event
Inflow = 0.28 cfs @ 12.20 hrs, Volume= 345 cf
Outflow = 0.28 cfs @ 12.20 hrs, Volume= 345 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.28 cfs @ 12.20 hrs, Volume= 345 cf
Routed to Pond DMH-5 : DMH-5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 50.81' @ 12.20 hrs
Flood Elev= 54.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	50.55'	**15.0" Round Culvert** L= 46.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.55' / 49.00' S= 0.0337 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.28 cfs @ 12.20 hrs HW=50.81' TW=49.37' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.28 cfs @ 1.53 fps)

Pond DB-A: DB-A



Summary for Pond DMH-2.1: DMH-2.1 (By-Pass)

Inflow Area = 23,899 sf, 71.73% Impervious, Inflow Depth > 1.84" for 1-Year event
Inflow = 1.12 cfs @ 12.13 hrs, Volume= 3,674 cf
Outflow = 1.12 cfs @ 12.13 hrs, Volume= 3,674 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.12 cfs @ 12.13 hrs, Volume= 3,674 cf
Routed to Pond INF-1 : INF-1
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond AB-1 : Attenuation Basin

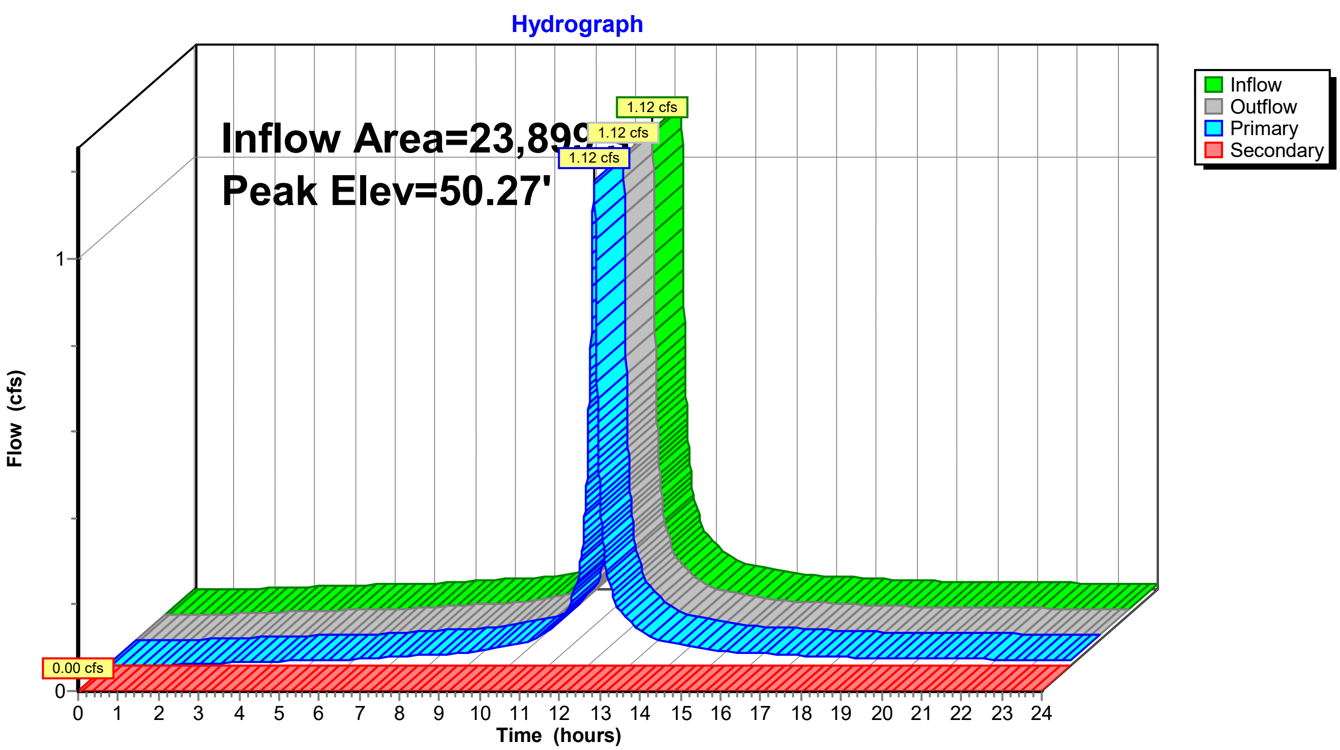
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 50.27' @ 12.13 hrs
Flood Elev= 52.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.60'	**12.0" Round OSG-1** L= 2.3' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.60' / 49.55' S= 0.0217 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	50.50'	**15.0" Round FES** L= 25.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 50.50' / 50.10' S= 0.0160 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.12 cfs @ 12.13 hrs HW=50.27' TW=47.28' (Dynamic Tailwater)
└**1=OSG-1** (Barrel Controls 1.12 cfs @ 2.82 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.60' TW=49.00' (Dynamic Tailwater)
└**2=FES** (Controls 0.00 cfs)

Pond DMH-2.1: DMH-2.1 (By-Pass)



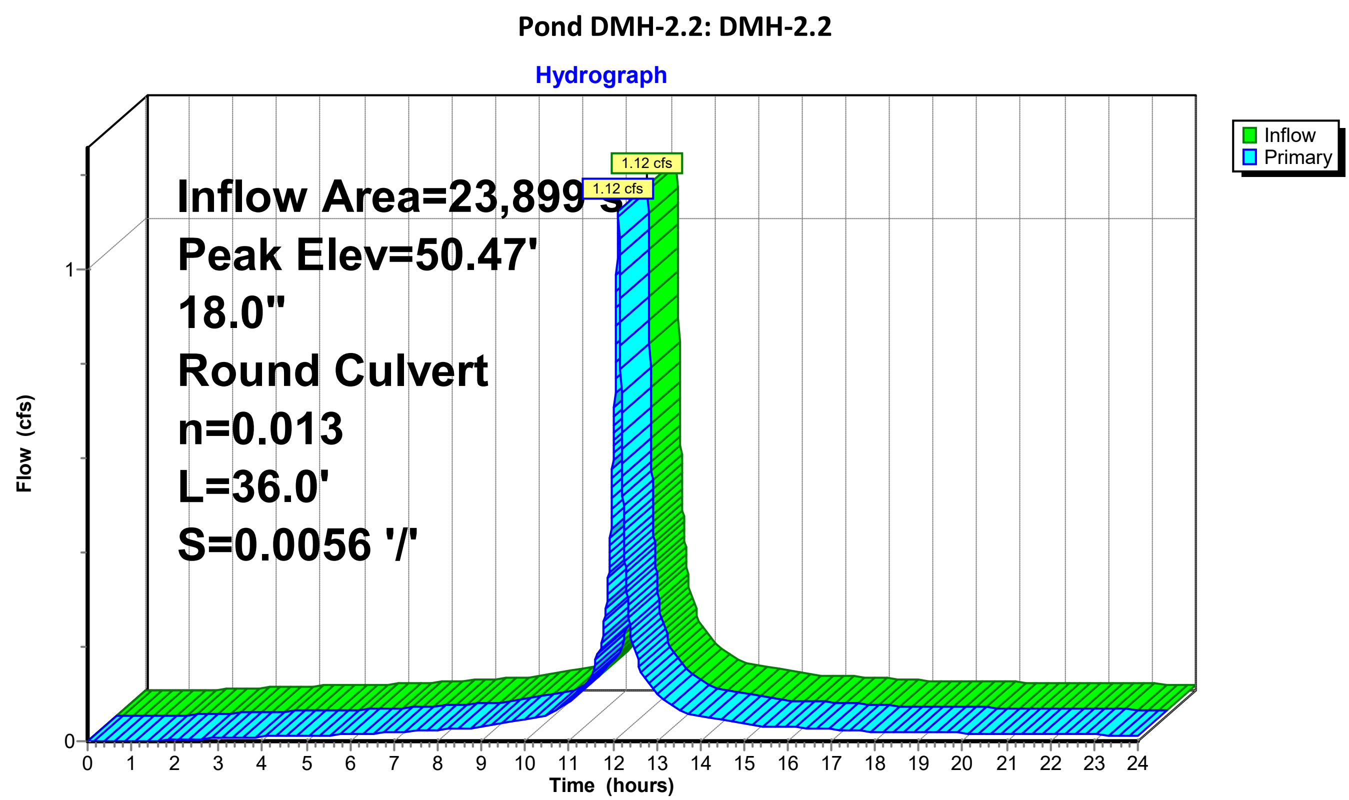
Summary for Pond DMH-2.2: DMH-2.2

Inflow Area = 23,899 sf, 71.73% Impervious, Inflow Depth > 1.84" for 1-Year event
Inflow = 1.12 cfs @ 12.13 hrs, Volume= 3,674 cf
Outflow = 1.12 cfs @ 12.13 hrs, Volume= 3,674 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.12 cfs @ 12.13 hrs, Volume= 3,674 cf
Routed to Pond DMH-2.1 : DMH-2.1 (By-Pass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 50.47' @ 12.13 hrs
Flood Elev= 53.63'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.80'	**18.0" Round DMH 2.1** L= 36.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.80' / 49.60' S= 0.0056 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.12 cfs @ 12.13 hrs HW=50.47' TW=50.27' (Dynamic Tailwater)
└─**1=DMH 2.1** (Outlet Controls 1.12 cfs @ 2.17 fps)



Summary for Pond DMH-3: DMH-3

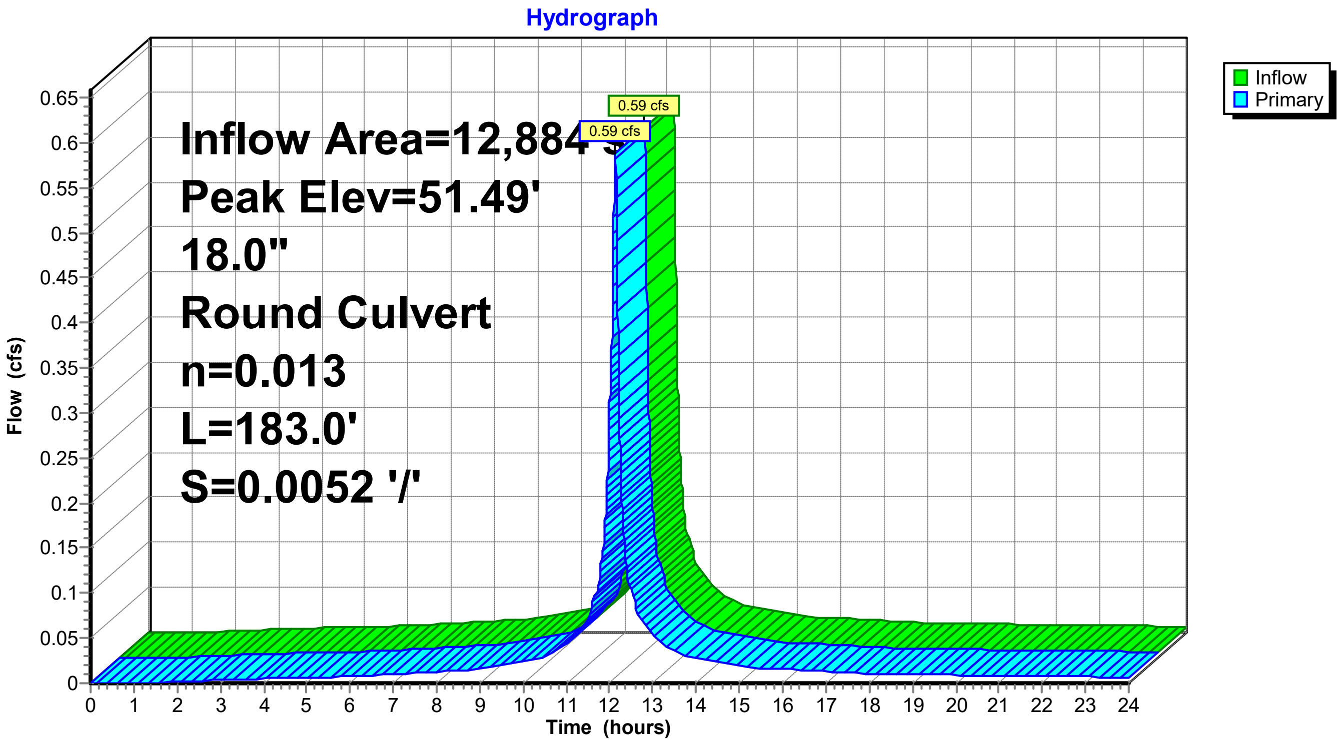
Inflow Area = 12,884 sf, 69.58% Impervious, Inflow Depth > 1.79" for 1-Year event
Inflow = 0.59 cfs @ 12.13 hrs, Volume= 1,925 cf
Outflow = 0.59 cfs @ 12.13 hrs, Volume= 1,925 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.59 cfs @ 12.13 hrs, Volume= 1,925 cf
Routed to Pond DMH-2.2 : DMH-2.2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.49' @ 12.13 hrs
Flood Elev= 54.22'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.10'	**18.0" Round Culvert** L= 183.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 51.10' / 50.14' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.59 cfs @ 12.13 hrs HW=51.49' TW=50.47' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.59 cfs @ 2.45 fps)

Pond DMH-3: DMH-3



Summary for Pond DMH-4: DMH-4

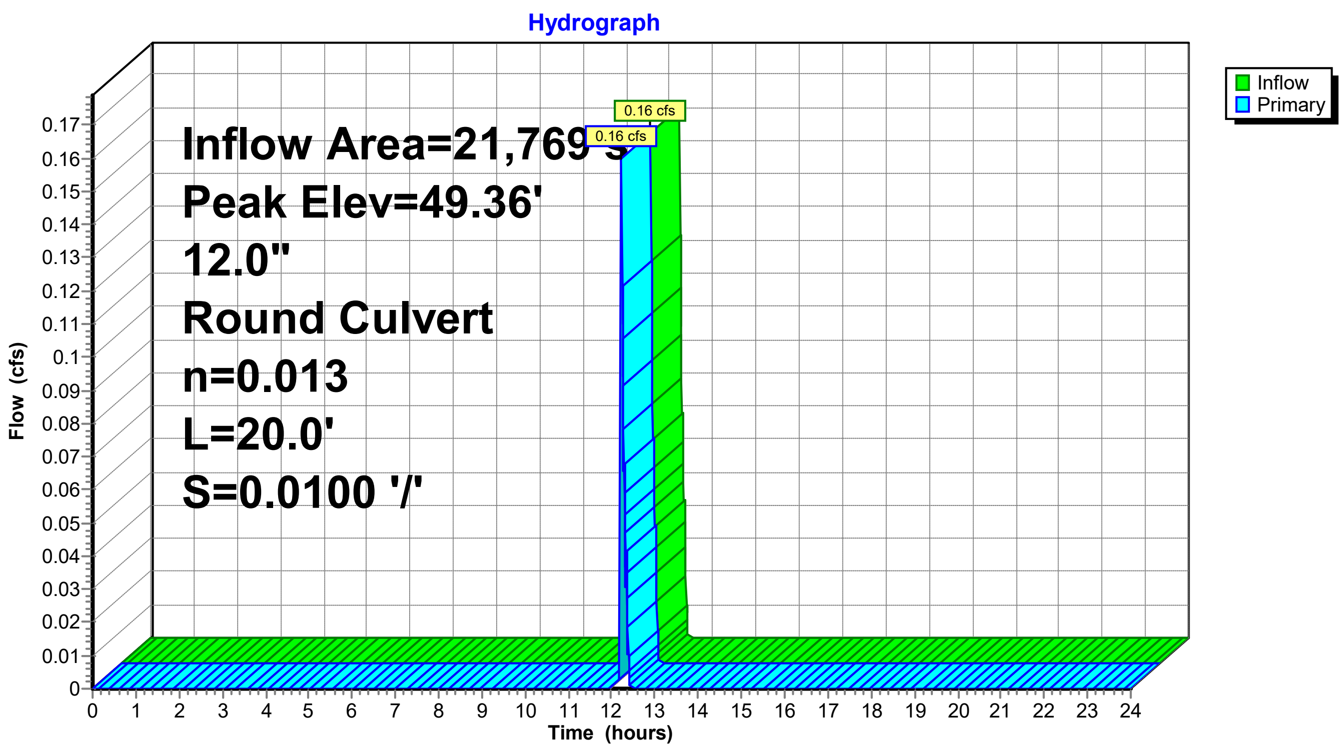
Inflow Area = 21,769 sf, 63.79% Impervious, Inflow Depth = 0.02" for 1-Year event
Inflow = 0.16 cfs @ 12.23 hrs, Volume= 35 cf
Outflow = 0.16 cfs @ 12.23 hrs, Volume= 35 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.16 cfs @ 12.23 hrs, Volume= 35 cf
Routed to Pond INF-2 : INF-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 49.36' @ 12.23 hrs
Flood Elev= 53.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.15'	**12.0" Round Culvert** L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.15' / 48.95' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.15 cfs @ 12.23 hrs HW=49.35' TW=47.89' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.15 cfs @ 2.01 fps)

Pond DMH-4: DMH-4



Summary for Pond DMH-5: DMH-5

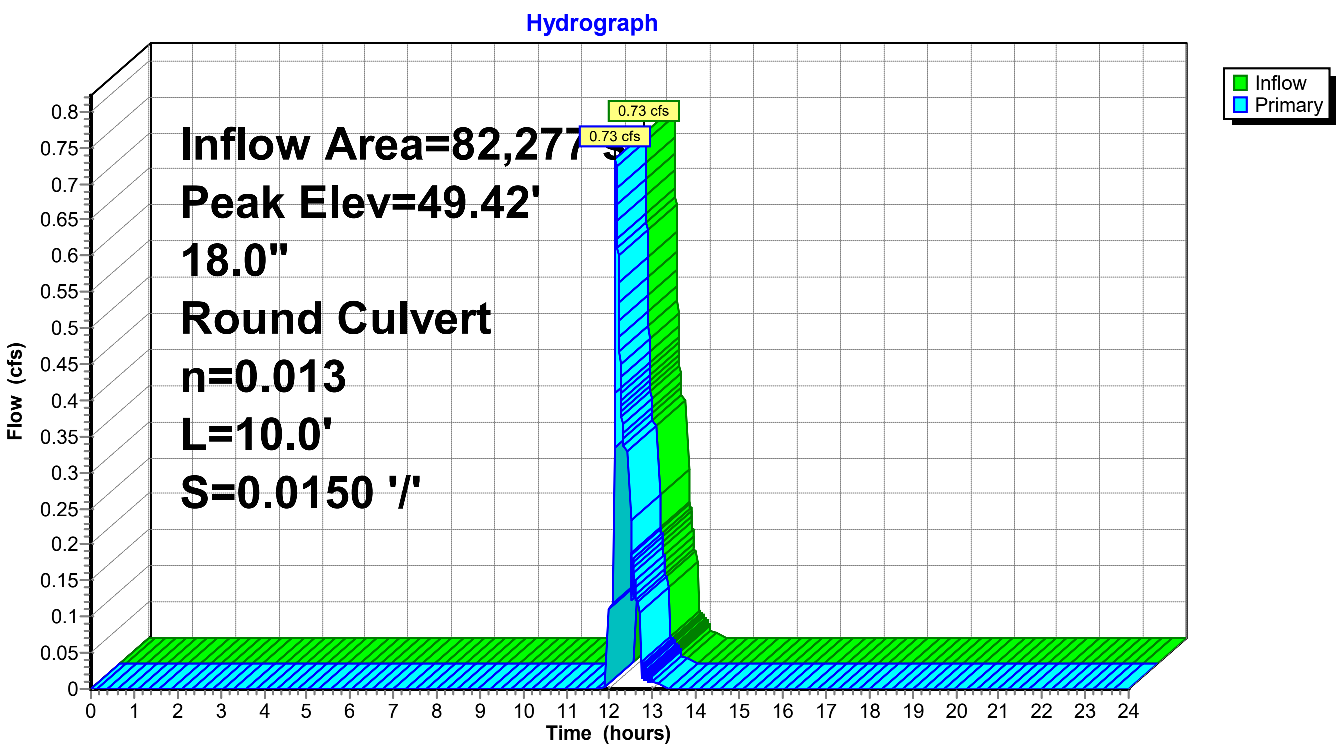
Inflow Area = 82,277 sf, 64.43% Impervious, Inflow Depth = 0.12" for 1-Year event
Inflow = 0.73 cfs @ 12.14 hrs, Volume= 815 cf
Outflow = 0.73 cfs @ 12.14 hrs, Volume= 815 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.73 cfs @ 12.14 hrs, Volume= 815 cf
Routed to Pond INF-2 : INF-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 49.42' @ 12.14 hrs
Flood Elev= 54.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**18.0" Round Culvert** L= 10.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.00' / 48.85' S= 0.0150 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.73 cfs @ 12.14 hrs HW=49.42' TW=47.71' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.73 cfs @ 2.75 fps)

Pond DMH-5: DMH-5



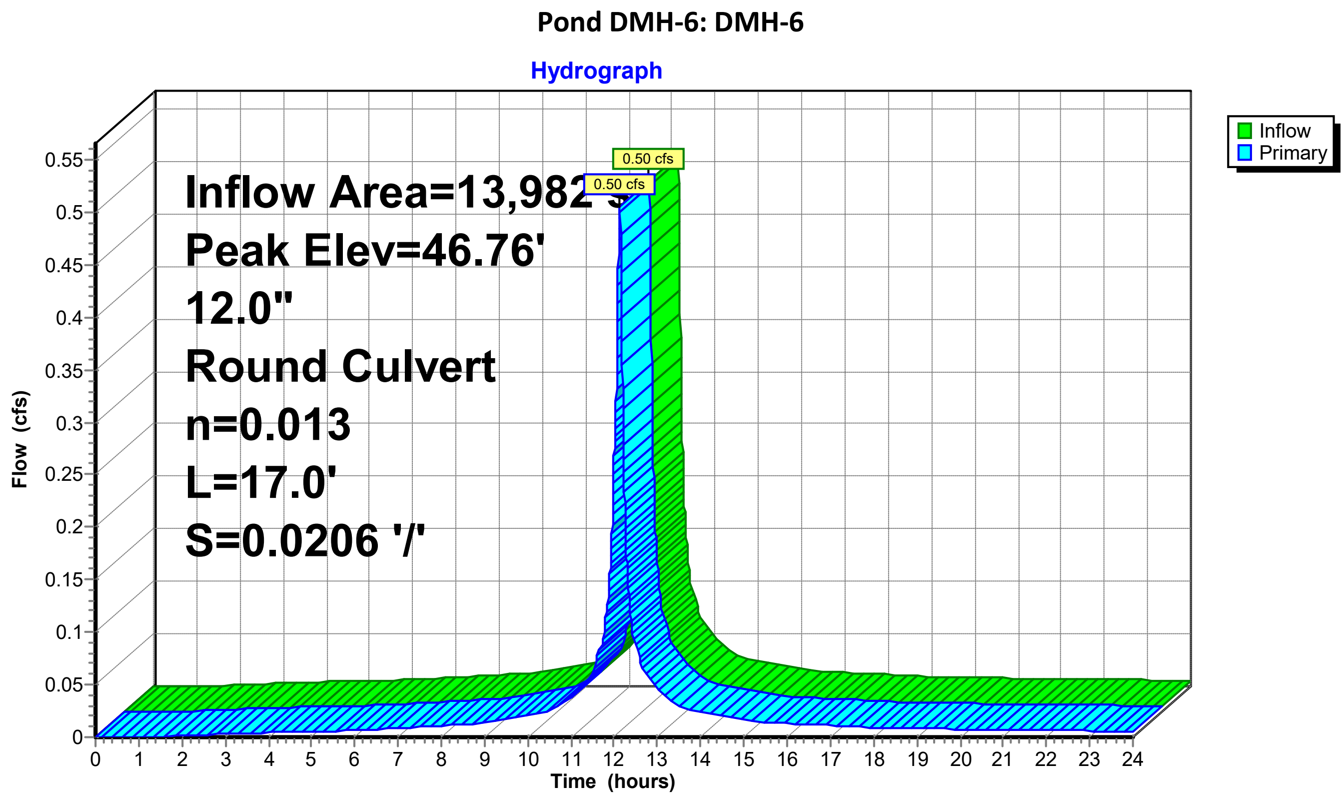
Summary for Pond DMH-6: DMH-6

Inflow Area = 13,982 sf, 55.19% Impervious, Inflow Depth > 1.42" for 1-Year event
Inflow = 0.50 cfs @ 12.13 hrs, Volume= 1,650 cf
Outflow = 0.50 cfs @ 12.13 hrs, Volume= 1,650 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.50 cfs @ 12.13 hrs, Volume= 1,650 cf
Routed to Pond DMH-7 : DMH-7 (bypass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 46.76' @ 12.13 hrs
Flood Elev= 50.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.35'	**12.0" Round Culvert** L= 17.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.35' / 46.00' S= 0.0206 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.50 cfs @ 12.13 hrs HW=46.76' TW=46.51' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.50 cfs @ 2.49 fps)



Summary for Pond DMH-7: DMH-7 (bypass)

Inflow Area = 26,124 sf, 49.75% Impervious, Inflow Depth > 1.28" for 1-Year event
Inflow = 0.79 cfs @ 12.14 hrs, Volume= 2,779 cf
Outflow = 0.79 cfs @ 12.14 hrs, Volume= 2,779 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.79 cfs @ 12.14 hrs, Volume= 2,779 cf
Routed to Pond INF-3 : INF-3
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond INF-3 : INF-3

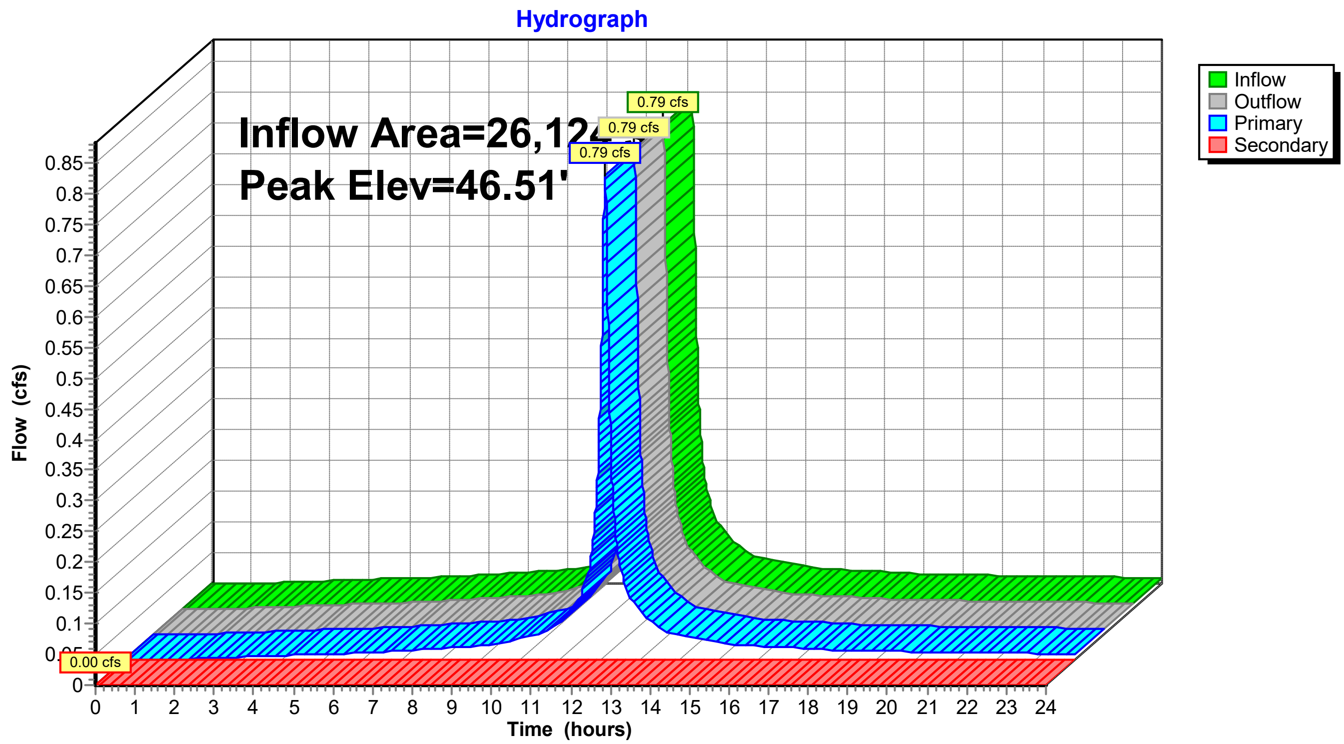
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 46.51' @ 12.14 hrs
Flood Elev= 50.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.00'	**12.0" Round OGS-2** L= 3.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.00' / 45.90' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	46.60'	**12.0" Round By-Pass** L= 11.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.60' / 45.58' S= 0.0927 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.79 cfs @ 12.14 hrs HW=46.51' TW=43.40' (Dynamic Tailwater)
└─**1=OGS-2** (Barrel Controls 0.79 cfs @ 2.84 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.00' TW=43.00' (Dynamic Tailwater)
└─**2=By-Pass** (Controls 0.00 cfs)

Pond DMH-7: DMH-7 (bypass)



Summary for Pond DMH-8: DMH-8 (bypass)

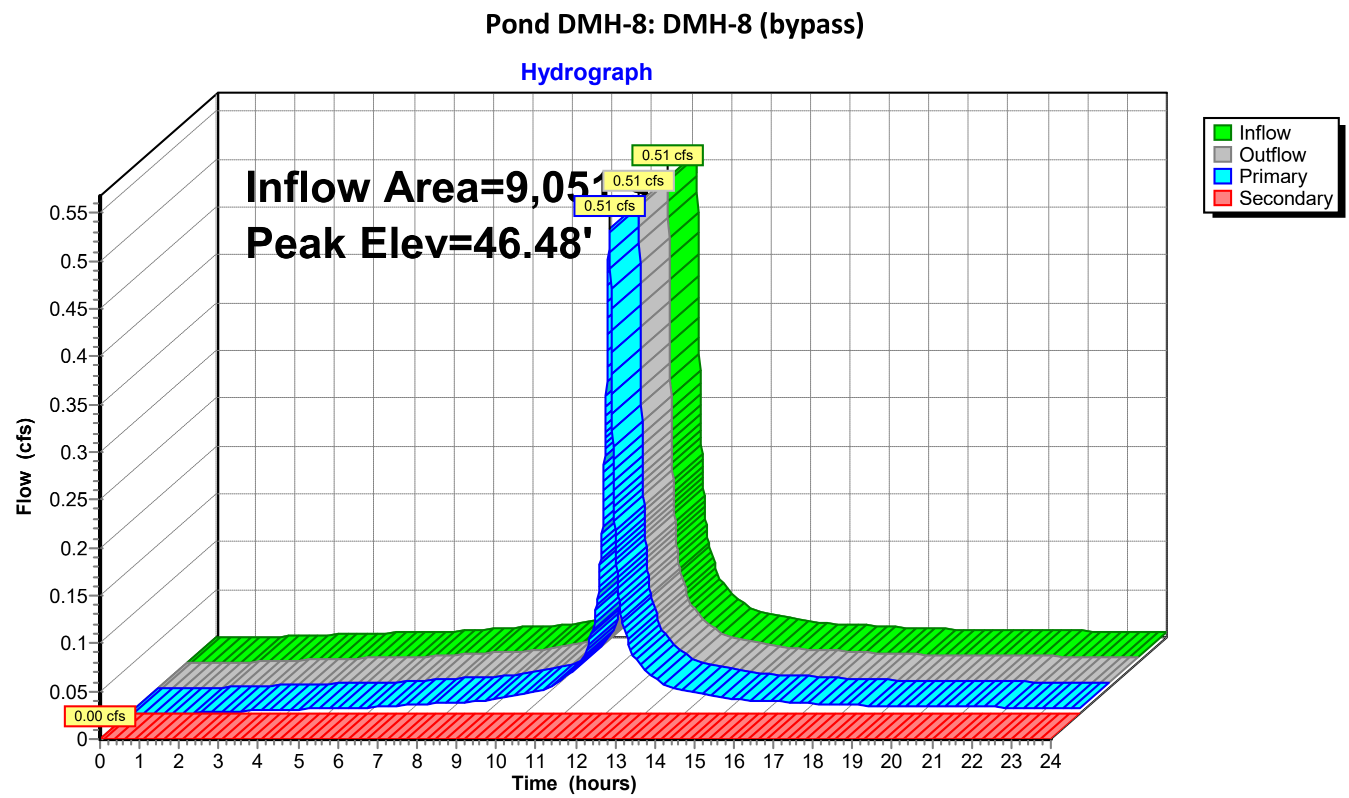
Inflow Area = 9,051 sf, 85.55% Impervious, Inflow Depth > 2.20" for 1-Year event
Inflow = 0.51 cfs @ 12.13 hrs, Volume= 1,656 cf
Outflow = 0.51 cfs @ 12.13 hrs, Volume= 1,656 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.51 cfs @ 12.13 hrs, Volume= 1,656 cf
Routed to nonexistent node 5P
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond INF-3 : INF-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 46.48' @ 12.13 hrs
Flood Elev= 50.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.05'	**12.0" Round OSG** L= 5.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.05' / 46.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	46.55'	**12.0" Round By-Pass** L= 13.5' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.55' / 45.58' S= 0.0719 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.51 cfs @ 12.13 hrs HW=46.48' (Free Discharge)
└**1=OSG** (Barrel Controls 0.51 cfs @ 2.29 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.05' TW=43.00' (Dynamic Tailwater)
└**2=By-Pass** (Controls 0.00 cfs)



Summary for Pond DMH-9: DMH-9 (bypass)

Inflow Area = 27,573 sf, 38.81% Impervious, Inflow Depth > 1.03" for 1-Year event
Inflow = 0.69 cfs @ 12.14 hrs, Volume= 2,359 cf
Outflow = 0.69 cfs @ 12.14 hrs, Volume= 2,359 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.69 cfs @ 12.14 hrs, Volume= 2,359 cf
Routed to Pond INF-4 : INF-4
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond INF-4 : INF-4

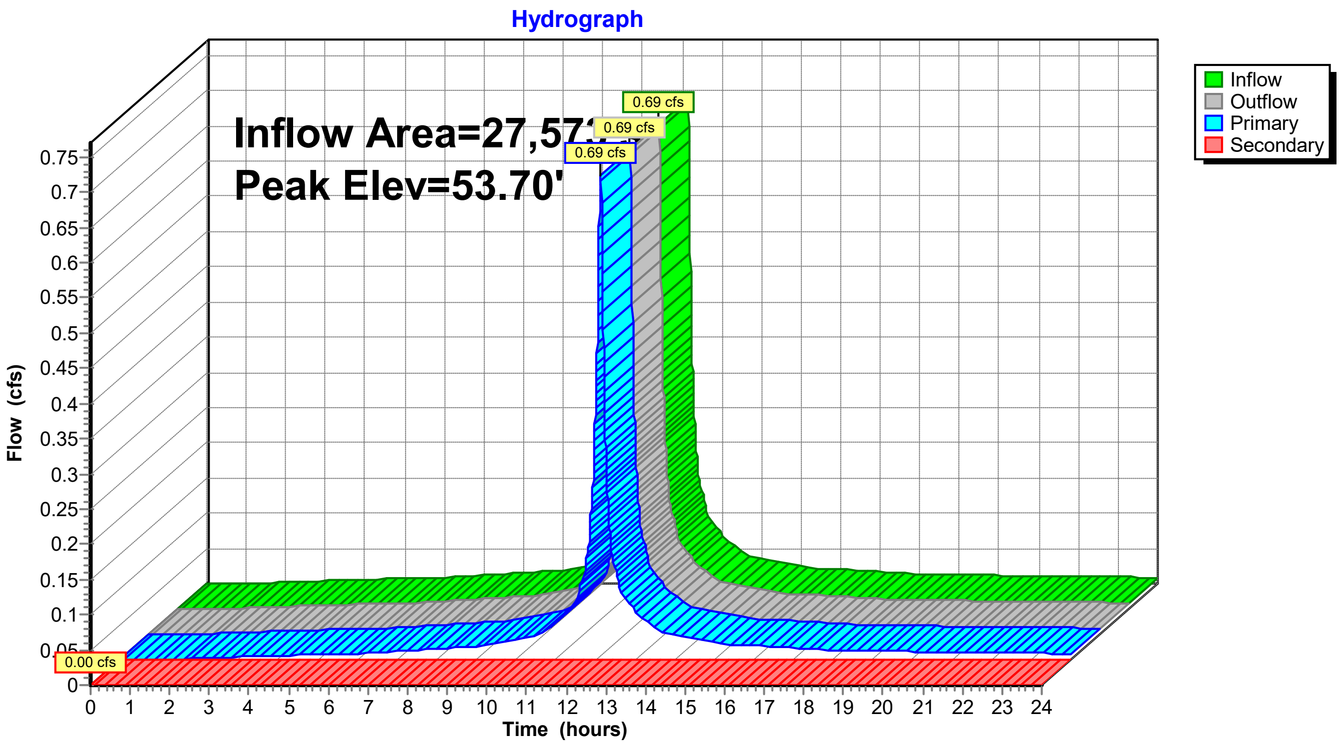
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 53.70' @ 12.14 hrs
Flood Elev= 57.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	53.25'	**12.0" Round OGS-4** L= 3.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 53.25' / 52.90' S= 0.1167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	53.75'	**12.0" Round By-Pass** L= 3.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 53.75' / 52.90' S= 0.2833 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.69 cfs @ 12.14 hrs HW=53.70' TW=51.14' (Dynamic Tailwater)
└─**1=OGS-4** (Inlet Controls 0.69 cfs @ 2.01 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.25' TW=50.32' (Dynamic Tailwater)
└─**2=By-Pass** (Controls 0.00 cfs)

Pond DMH-9: DMH-9 (bypass)



Summary for Pond DS: Dry Stream

Inflow Area = 66,509 sf, 26.96% Impervious, Inflow Depth > 0.76" for 1-Year event
Inflow = 1.06 cfs @ 12.13 hrs, Volume= 4,211 cf
Outflow = 1.02 cfs @ 12.15 hrs, Volume= 4,183 cf, Atten= 5%, Lag= 1.3 min
Discarded = 0.02 cfs @ 12.15 hrs, Volume= 981 cf
Primary = 0.99 cfs @ 12.15 hrs, Volume= 3,203 cf
Routed to Pond FP-7 : FP-7/INF-5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 54.65' @ 12.15 hrs Surf.Area= 354 sf Storage= 149 cf

Plug-Flow detention time= 10.2 min calculated for 4,183 cf (99% of inflow)
Center-of-Mass det. time= 6.0 min (786.7 - 780.8)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	2,359 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

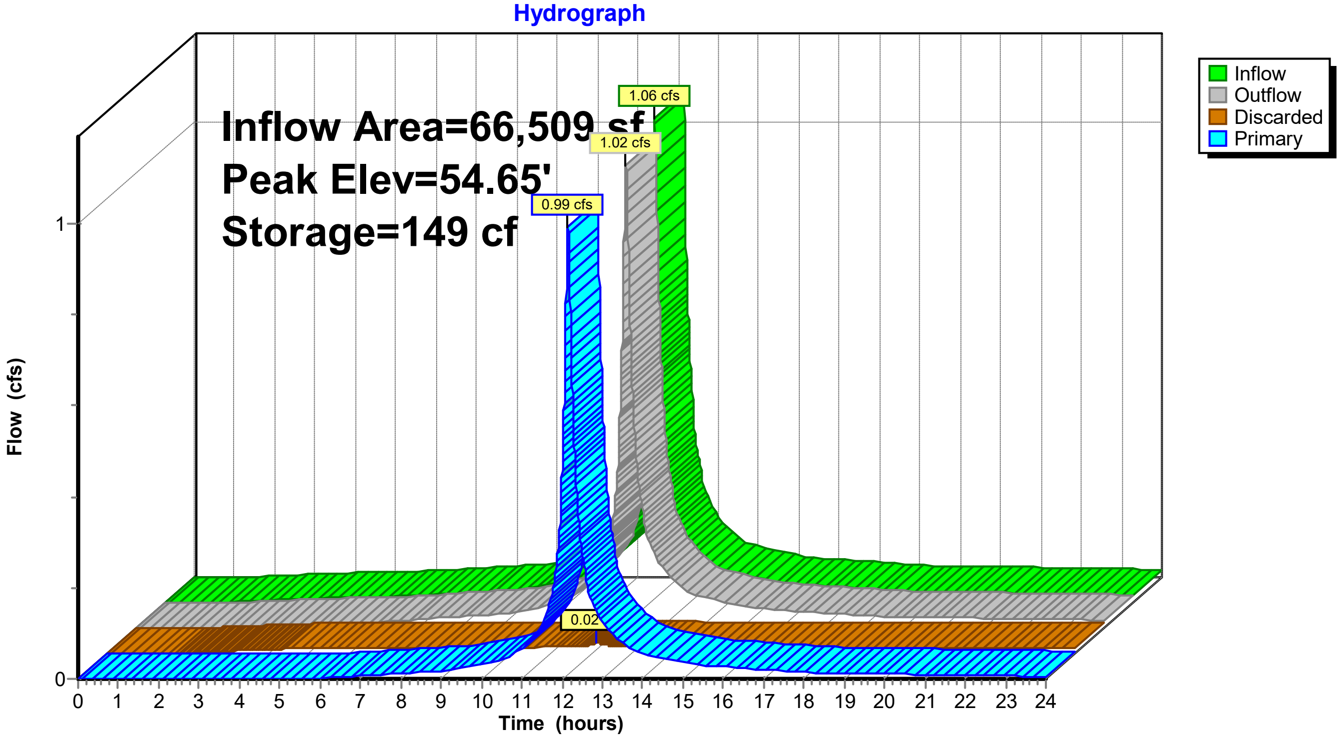
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
54.00	121	64.0	0	0	121
55.00	526	236.0	300	300	4,230
56.00	1,068	524.0	781	1,081	21,652
57.00	1,500	613.0	1,278	2,359	29,725

Device	Routing	Invert	Outlet Devices
#1	Discarded	54.00'	**3.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.10'
#2	Primary	54.15'	**15.0" Round Overflow** L= 48.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 54.15' / 53.75' S= 0.0083 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=0.02 cfs @ 12.15 hrs HW=54.65' (Free Discharge)
└─**1=Exfiltration** (Controls 0.02 cfs)

Primary OutFlow Max=0.99 cfs @ 12.15 hrs HW=54.65' TW=47.20' (Dynamic Tailwater)
└─**2=Overflow** (Inlet Controls 0.99 cfs @ 2.13 fps)

Pond DS: Dry Stream



Summary for Pond FP-1: FP-1

Inflow Area = 12,471 sf, 83.62% Impervious, Inflow Depth > 2.15" for 1-Year event
Inflow = 0.68 cfs @ 12.13 hrs, Volume= 2,230 cf
Outflow = 0.57 cfs @ 12.17 hrs, Volume= 2,230 cf, Atten= 16%, Lag= 2.4 min
Discarded = 0.15 cfs @ 12.17 hrs, Volume= 2,013 cf
Primary = 0.42 cfs @ 12.17 hrs, Volume= 217 cf
Routed to Pond INF-3 : INF-3
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond CB-7 : CB-7

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 49.72' @ 12.17 hrs Surf.Area= 412 sf Storage= 479 cf

Plug-Flow detention time= 36.3 min calculated for 2,230 cf (100% of inflow)
Center-of-Mass det. time= 36.2 min (797.1 - 760.8)

Volume	Invert	Avail.Storage	Storage Description
#1	47.22'	32 cf	**8.00'W x 9.00'L x 2.25'H FP (mulch/media/stone)**
			162 cf Overall x 20.0% Voids
#2	49.47'	1,648 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#3A	43.43'	168 cf	**11.87'W x 13.38'L x 4.29'H Field A**
			682 cf Overall - 262 cf Embedded = 420 cf x 40.0% Voids
#4A	43.68'	249 cf	**Ferguson R-Tank HD 2.5** x 24 Inside #3
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			24 Chambers in 6 Rows
		2,098 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
49.47	68	30.0	0	0	68
50.00	375	76.0	106	106	457
51.00	539	88.0	455	561	634
52.25	1,250	260.0	1,087	1,648	5,402

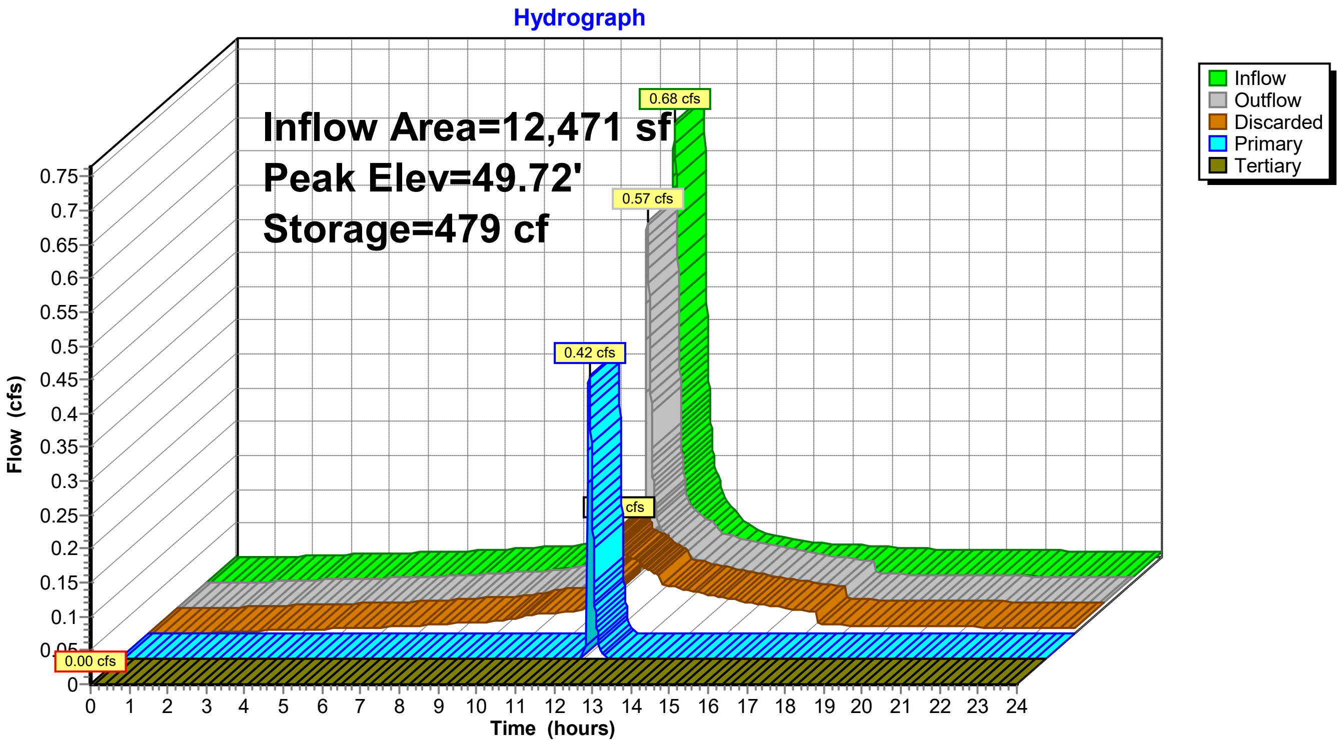
Device	Routing	Invert	Outlet Devices
#1	Primary	46.47'	**12.0" Round Culvert** L= 118.0' CPP, mitered to conform to fill, Ke= 0.700
			Inlet / Outlet Invert= 46.47' / 45.58' S= 0.0075 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	51.50'	**18.0" Horiz. Dome Grate(OF-1)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	47.22'	**100.000 in/hr Focal Point Media over Surface area from 47.22' - 49.80'**
			Excluded Surface area = 231 sf Phase-In= 0.01'
#4	Discarded	49.80'	**2.810 in/hr Bowl Exfiltration over Surface area above 49.80'**
			Excluded Surface area = 461 sf Phase-In= 0.01'
#5	Discarded	43.43'	**8.270 in/hr R Tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#6	Tertiary	52.20'	**3.5' long x 2.0' breadth BSpillway**
			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=0.15 cfs @ 12.17 hrs HW=49.72' (Free Discharge)
├─**4=Bowl Exfiltration** (Controls 0.00 cfs)
└─**5=R Tank Exfiltration** (Controls 0.15 cfs)

Primary OutFlow Max=0.42 cfs @ 12.17 hrs HW=49.72' TW=43.52' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.42 cfs of 4.80 cfs potential flow)
  ├─**2=Dome Grate(OF-1)** (Controls 0.00 cfs)
  └─**3=Focal Point Media** (Exfiltration Controls 0.42 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=43.43' TW=46.40' (Dynamic Tailwater)
└─**6=BSpillway** (Controls 0.00 cfs)

Pond FP-1: FP-1



Summary for Pond FP-2: FP-2

Inflow Area = 8,047 sf, 72.78% Impervious, Inflow Depth > 1.87" for 1-Year event
Inflow = 0.38 cfs @ 12.13 hrs, Volume= 1,253 cf
Outflow = 0.07 cfs @ 12.52 hrs, Volume= 1,253 cf, Atten= 83%, Lag= 23.3 min
Discarded = 0.07 cfs @ 12.52 hrs, Volume= 1,253 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond DMH-4 : DMH-4
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond FP-1 : FP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 49.07' @ 12.52 hrs Surf.Area= 159 sf Storage= 335 cf
Flood Elev= 53.75' Surf.Area= 945 sf Storage= 1,046 cf

Plug-Flow detention time= 34.9 min calculated for 1,253 cf (100% of inflow)
Center-of-Mass det. time= 34.9 min (795.7 - 760.8)

Volume	Invert	Avail.Storage	Storage Description
#1	50.05'	25 cf	**8.00'W x 9.00'L x 1.75'H FP (mulch/media)**
			126 cf Overall x 20.0% Voids
#2	51.80'	760 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#3A	45.76'	168 cf	**11.87'W x 13.38'L x 4.29'H Field A**
			682 cf Overall - 262 cf Embedded = 420 cf x 40.0% Voids
#4A	46.01'	249 cf	**Ferguson R-Tank HD 2.5** x 24 Inside #3
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			24 Chambers in 6 Rows
		1,202 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
51.80	69	30.6	0	0	69
52.00	112	38.0	18	18	110
53.00	321	60.0	208	225	288
53.95	845	157.0	534	760	1,967

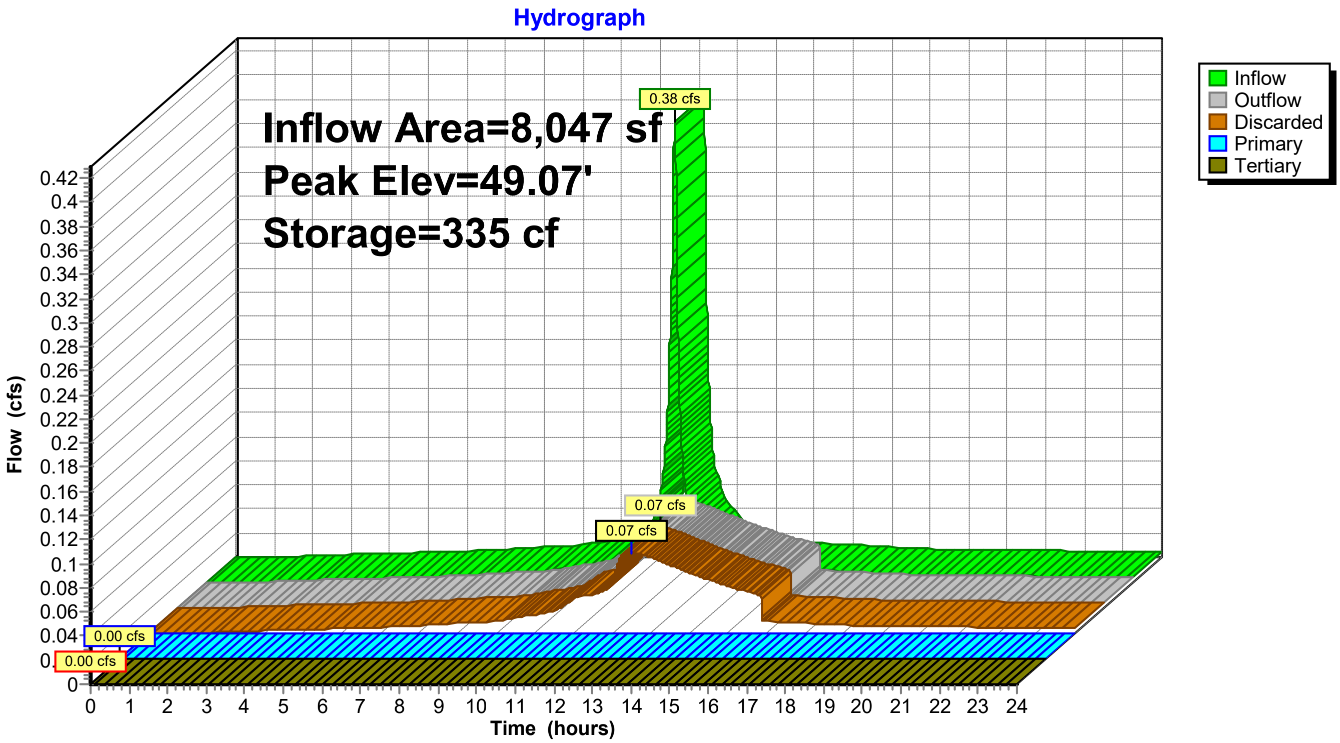
Device	Routing	Invert	Outlet Devices
#1	Primary	49.40'	**12.0" Round Overflow** L= 10.0' CPP, mitered to conform to fill, Ke= 0.700
			Inlet / Outlet Invert= 49.40' / 49.15' S= 0.0250 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	52.85'	**18.0" Horiz. Dome Grate (OF-2)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	49.55'	**100.000 in/hr Focal Point Media over Surface area from 49.55' - 51.80'**
			Excluded Surface area = 159 sf Phase-In= 0.01'
#4	Discarded	45.76'	**8.270 in/hr R Tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#5	Discarded	51.80'	**3.000 in/hr Bowl Exfiltration over Surface area above 51.80'**
			Excluded Surface area = 300 sf Phase-In= 0.01'
#6	Tertiary	53.90'	**3.5' long x 2.0' breadth Spillway**
			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 @ 12.52 hrs HW=49.07' (Free Discharge)
├─**4=R Tank Exfiltration** (Controls 0.07 cfs)
└─**5=Bowl Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=45.76' TW=49.15' (Dynamic Tailwater)
└─**1=Overflow** (Controls 0.00 cfs)
  ├─**2=Dome Grate (OF-2)** (Controls 0.00 cfs)
  └─**3=Focal Point Media** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=45.76' TW=43.43' (Dynamic Tailwater)
└─**6=Spillway** (Controls 0.00 cfs)

Pond FP-2: FP-2



Summary for Pond FP-3: FP-3

Inflow Area = 13,722 sf, 58.52% Impervious, Inflow Depth > 1.56" for 1-Year event
Inflow = 0.53 cfs @ 12.13 hrs, Volume= 1,786 cf
Outflow = 0.28 cfs @ 12.23 hrs, Volume= 1,786 cf, Atten= 47%, Lag= 6.3 min
Discarded = 0.12 cfs @ 12.23 hrs, Volume= 1,751 cf
Primary = 0.16 cfs @ 12.23 hrs, Volume= 35 cf
Routed to Pond DMH-4 : DMH-4
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond FP-1 : FP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 52.50' @ 12.23 hrs Surf.Area= 300 sf Storage= 451 cf
Flood Elev= 54.96' Surf.Area= 1,220 sf Storage= 1,539 cf

Plug-Flow detention time= 39.3 min calculated for 1,785 cf (100% of inflow)
Center-of-Mass det. time= 39.2 min (807.7 - 768.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	46.38'	168 cf	**11.87'W x 13.38'L x 4.29'H Field A**
			682 cf Overall - 262 cf Embedded = 420 cf x 40.0% Voids
#2A	46.63'	249 cf	**Ferguson R-Tank HD 2.5** x 24 Inside #1
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			24 Chambers in 6 Rows
#3	50.17'	34 cf	**8.00'W x 9.00'L x 2.33'H FP (mulch/media/stone)**
			168 cf Overall x 20.0% Voids
#4	52.50'	1,129 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
		1,579 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
52.50	68	30.6	0	0	68
53.00	210	58.0	66	66	262
54.00	476	104.0	334	400	861
55.00	1,015	183.0	729	1,129	2,671

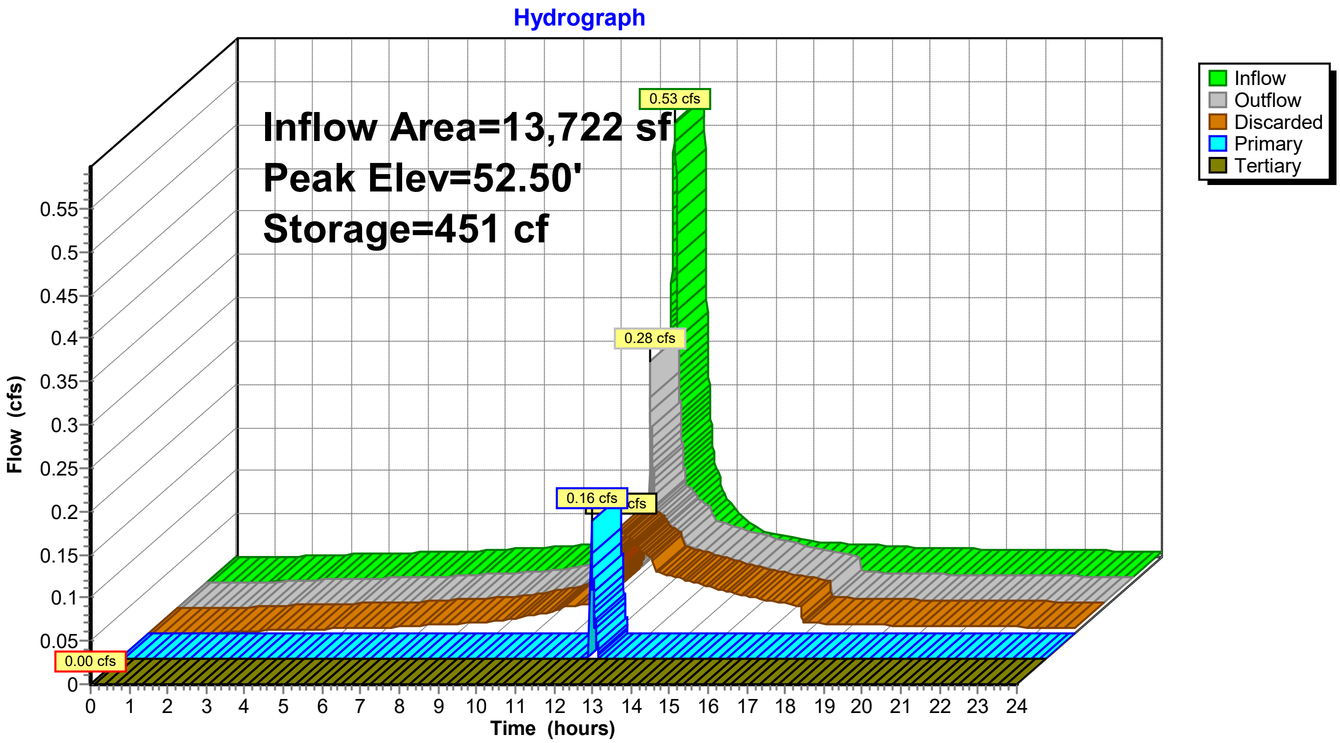
Device	Routing	Invert	Outlet Devices
#1	Primary	49.55'	**12.0" Round Culvert** L= 37.0' CPP, mitered to conform to fill, Ke= 0.700
			Inlet / Outlet Invert= 49.55' / 49.15' S= 0.0108 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	53.75'	**18.0" Horiz. Dome Grate (OF-3)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	50.22'	**100.000 in/hr Focal Point Media over Surface area from 50.22' - 52.55'**
			Excluded Surface area = 231 sf Phase-In= 0.01'
#4	Discarded	46.38'	**8.270 in/hr R tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#5	Discarded	52.80'	**3.000 in/hr Bowl Exfiltration over Wetted area above 52.80'**
			Excluded Wetted area = 697 sf Phase-In= 0.01'
#6	Tertiary	54.90'	**3.0' 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=0.12 cfs @ 12.23 hrs HW=52.50' (Free Discharge)
└**4=R tank Exfiltration** (Controls 0.12 cfs)
└**5=Bowl Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.16 cfs @ 12.23 hrs HW=52.50' TW=49.35' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.16 cfs of 5.23 cfs potential flow)
  └**2=Dome Grate (OF-3)** (Controls 0.00 cfs)
  └**3=Focal Point Media** (Exfiltration Controls 0.16 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.38' TW=43.43' (Dynamic Tailwater)
└**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond FP-3: FP-3



Summary for Pond FP-4: FP-4

Inflow Area = 12,711 sf, 69.37% Impervious, Inflow Depth > 1.78" for 1-Year event
Inflow = 0.58 cfs @ 12.13 hrs, Volume= 1,886 cf
Outflow = 0.57 cfs @ 12.14 hrs, Volume= 1,886 cf, Atten= 1%, Lag= 0.6 min
Discarded = 0.06 cfs @ 12.14 hrs, Volume= 1,416 cf
Primary = 0.51 cfs @ 12.14 hrs, Volume= 470 cf
Routed to Pond DMH-5 : DMH-5
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond CB-6B,C : CB-6B,6C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 53.34' @ 12.14 hrs Surf.Area= 313 sf Storage= 354 cf
Flood Elev= 54.25' Surf.Area= 543 sf Storage= 574 cf

Plug-Flow detention time= 33.8 min calculated for 1,885 cf (100% of inflow)
Center-of-Mass det. time= 33.7 min (794.6 - 760.8)

Volume	Invert	Avail.Storage	Storage Description
#1	52.50'	303 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#2	50.75'	17 cf	**6.00'W x 8.00'L x 1.75'H FP (mulch/media)** 84 cf Overall x 20.0% Voids
#3A	46.88'	155 cf	**Ferguson R-Tank HD 2.5** x 15 Inside #4 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 15 Chambers in 5 Rows
#4A	46.63'	98 cf	**10.56'W x 9.04'L x 4.29'H Field A** 410 cf Overall - 164 cf Embedded = 246 cf x 40.0% Voids
		574 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
52.50	45	24.5	0	0	45
53.00	106	37.0	37	37	108
54.00	338	76.0	211	248	463
54.15	400	80.0	55	303	514

Device	Routing	Invert	Outlet Devices
#1	Primary	49.42'	**12.0" Round Culvert** L= 26.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.42' / 49.15' S= 0.0104 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	53.25'	**18.0" Horiz. Dome Grate (OF-4)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	47.74'	**100.000 in/hr Focal Point Media over Surface area from 47.74' - 51.50'** Excluded Surface area = 95 sf Phase-In= 0.01'
#4	Discarded	46.63'	**8.700 in/hr R Tank Exfiltration over Wetted area from 45.13' - 48.92'** Conductivity to Groundwater Elevation = 10.00' Excluded Wetted area = 0 sf Phase-In= 0.01'
#5	Discarded	51.50'	**3.000 in/hr Bowl Exfiltration over Wetted area above 51.50'** Conductivity to Groundwater Elevation = 10.00' Excluded Wetted area = 333 sf Phase-In= 0.01'
#6	Tertiary	54.10'	**3.5' long x 2.5' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00

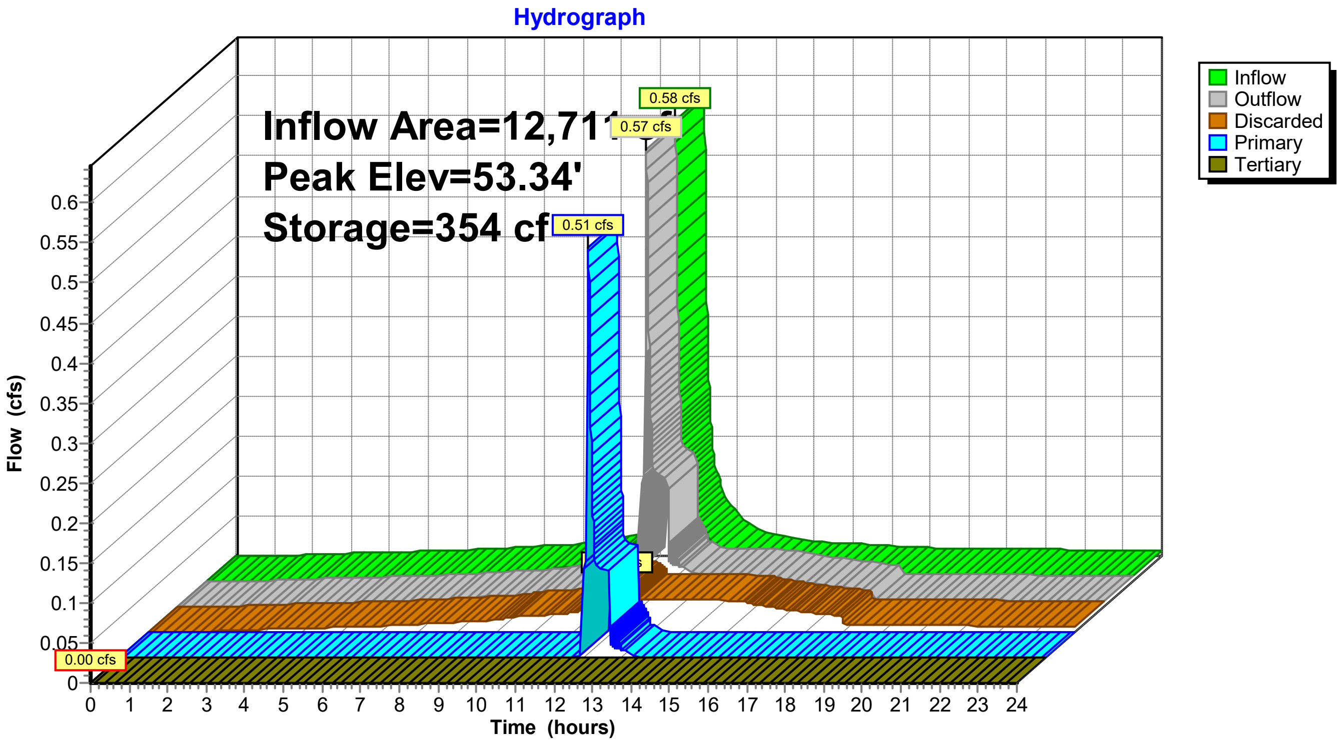
Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74 2.76 2.89 3.05 3.19 3.32

Discarded OutFlow Max=0.06 cfs @ 12.14 hrs HW=53.34' (Free Discharge)
4=R Tank Exfiltration (Controls 0.04 cfs)
5=Bowl Exfiltration (Controls 0.02 cfs)

Primary OutFlow Max=0.51 cfs @ 12.14 hrs HW=53.34' TW=49.42' (Dynamic Tailwater)
1=Culvert (Passes 0.51 cfs of 6.17 cfs potential flow)
2=Dome Grate (OF-4) (Weir Controls 0.40 cfs @ 0.97 fps)
3=Focal Point Media (Exfiltration Controls 0.11 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.63' TW=47.50' (Dynamic Tailwater)
6=Spillway (Controls 0.00 cfs)

Pond FP-4: FP-4



Summary for Pond FP-5: FP-5

Inflow Area = 9,281 sf, 84.56% Impervious, Inflow Depth > 2.17" for 1-Year event
Inflow = 0.51 cfs @ 12.13 hrs, Volume= 1,678 cf
Outflow = 0.27 cfs @ 12.22 hrs, Volume= 1,678 cf, Atten= 48%, Lag= 5.4 min
Discarded = 0.15 cfs @ 12.22 hrs, Volume= 1,506 cf
Primary = 0.11 cfs @ 12.09 hrs, Volume= 172 cf
Routed to Pond DB-A : DB-A
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond FP-4 : FP-4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 54.70' @ 12.22 hrs Surf.Area= 344 sf Storage= 380 cf
Flood Elev= 57.00' Surf.Area= 606 sf Storage= 921 cf

Plug-Flow detention time= 32.1 min calculated for 1,678 cf (100% of inflow)
Center-of-Mass det. time= 32.1 min (792.9 - 760.8)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	614 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#2	52.25'	17 cf	**6.00'W x 8.00'L x 1.75'H FP (mulch/media)** 84 cf Overall x 20.0% Voids
#3A	47.96'	135 cf	**10.56'W x 11.04'L x 4.29'H Field A** 500 cf Overall - 164 cf Embedded = 337 cf x 40.0% Voids
#4A	48.21'	155 cf	**Ferguson R-Tank HD 2.5** x 15 Inside #3 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 15 Chambers in 5 Rows
		921 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
54.00	45	24.5	0	0	45
55.00	267	76.7	141	141	468
56.35	441	85.7	473	614	628

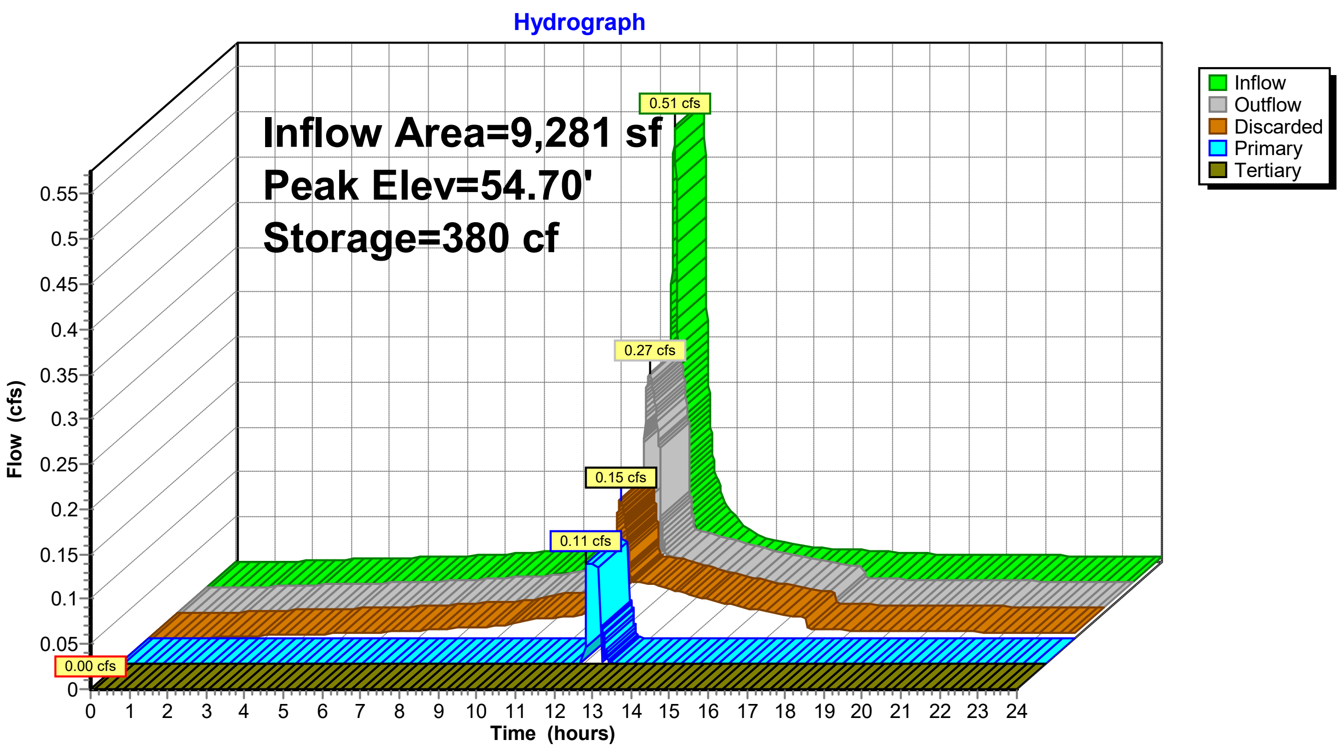
Device	Routing	Invert	Outlet Devices
#1	Primary	50.67'	**12.0" Round Culvert** L= 4.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.67' / 50.55' S= 0.0300 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	55.20'	**18.0" Horiz. Dome Grate (OF-5)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	50.55'	**100.000 in/hr Focal Point Media over Surface area from 50.55' - 52.55'** Excluded Surface area = 117 sf Phase-In= 0.01'
#4	Discarded	47.96'	**8.270 in/hr R-Tank Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#5	Discarded	52.80'	**3.000 in/hr Bowl Exfiltration over Surface area above 52.80'** Excluded Surface area = 165 sf Phase-In= 0.01'
#6	Tertiary	56.33'	**3.5' long x 2.5' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74 2.76 2.89 3.05 3.19 3.32

Discarded OutFlow Max=0.15 cfs @ 12.22 hrs HW=54.70' (Free Discharge)
├─**4=R-Tank Exfiltration** (Controls 0.14 cfs)
└─**5=Bowl Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.11 cfs @ 12.09 hrs HW=52.53' TW=50.71' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.11 cfs of 3.89 cfs potential flow)
  ├─**2=Dome Grate (OF-5)** (Controls 0.00 cfs)
  └─**3=Focal Point Media** (Exfiltration Controls 0.11 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=47.96' TW=46.63' (Dynamic Tailwater)
└─**6=Spillway** (Controls 0.00 cfs)

Pond FP-5: FP-5



Summary for Pond FP-6: FP-6

Inflow Area = 14,693 sf, 51.93% Impervious, Inflow Depth > 1.33" for 1-Year event
Inflow = 0.50 cfs @ 12.13 hrs, Volume= 1,632 cf
Outflow = 0.29 cfs @ 12.20 hrs, Volume= 1,632 cf, Atten= 41%, Lag= 4.5 min
Discarded = 0.13 cfs @ 12.20 hrs, Volume= 1,459 cf
Primary = 0.17 cfs @ 12.20 hrs, Volume= 173 cf
Routed to Pond OF-6 : OF-6
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond FP-5 : FP-5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 55.42' @ 12.20 hrs Surf.Area= 334 sf Storage= 370 cf

Plug-Flow detention time= 32.3 min calculated for 1,632 cf (100% of inflow)
Center-of-Mass det. time= 32.2 min (793.1 - 760.8)

Volume	Invert	Avail.Storage	Storage Description
#1	54.92'	857 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#2	53.17'	17 cf	**6.00'W x 8.00'L x 1.75'H FP (mulch/media)**
			84 cf Overall x 20.0% Voids
#3A	48.88'	135 cf	**10.56'W x 11.04'L x 4.29'H Field A**
			500 cf Overall - 164 cf Embedded = 337 cf x 40.0% Voids
#4A	49.13'	155 cf	**Ferguson R-Tank HD 2.5** x 15 Inside #3
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			15 Chambers in 5 Rows
		1,164 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
54.92	86	36.0	0	0	86
56.00	300	65.0	197	197	325
57.00	511	79.0	401	598	501
57.50	525	82.0	259	857	557

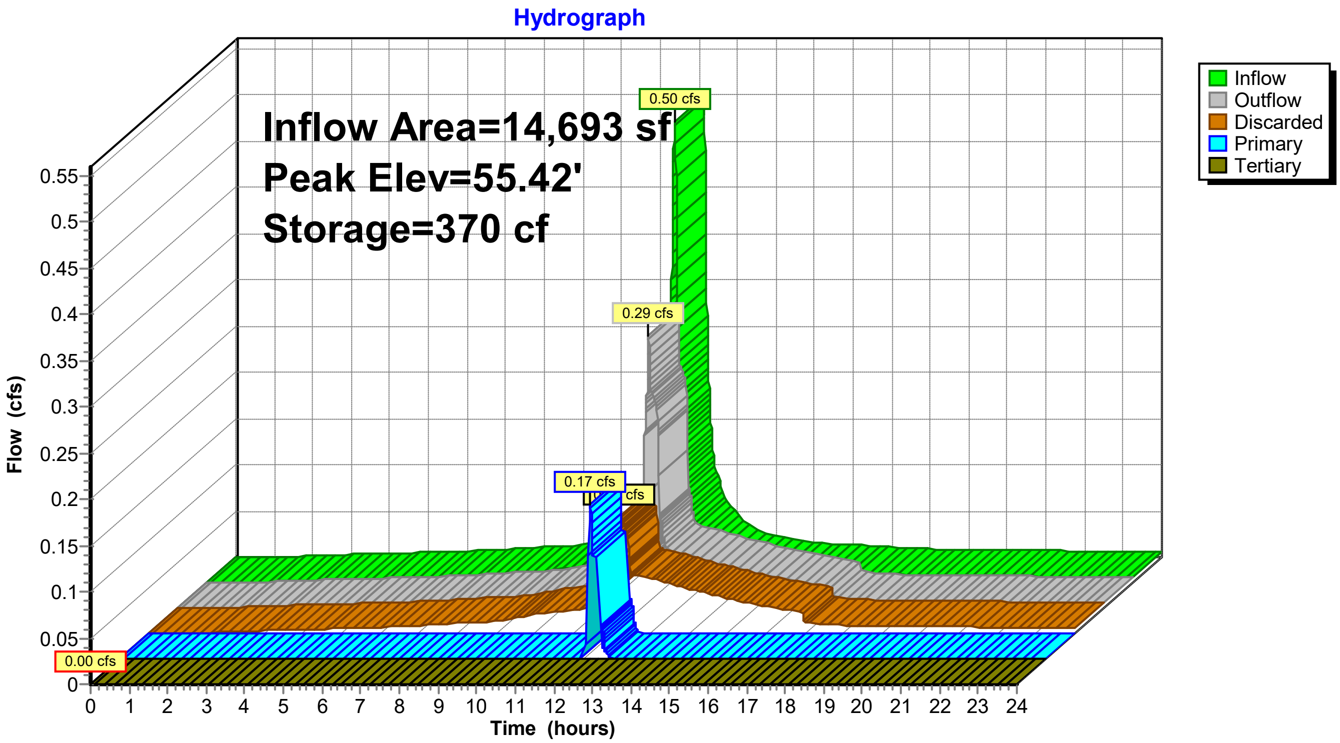
Device	Routing	Invert	Outlet Devices
#1	Primary	51.59'	**12.0" Round Culvert** L= 6.0' CPP, mitered to conform to fill, Ke= 0.700
			Inlet / Outlet Invert= 51.59' / 51.50' S= 0.0150 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	55.40'	**18.0" Horiz. Dome Grate (OF-6)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	52.67'	**100.000 in/hr Focal Point Media over Surface area from 52.67' - 54.67'**
			Excluded Surface area = 117 sf Phase-In= 0.01'
#4	Discarded	48.88'	**8.270 in/hr R-Tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#5	Discarded	54.92'	**3.000 in/hr Bowl Exfiltration over Wetted area above 54.92'**
			Excluded Wetted area = 485 sf Phase-In= 0.01'
#6	Tertiary	57.38'	**3.5' long x 2.0' breadth Spillway**
			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=0.13 cfs @ 12.20 hrs HW=55.42' (Free Discharge)
├─**4=R-Tank Exfiltration** (Controls 0.12 cfs)
└─**5=Bowl Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.17 cfs @ 12.20 hrs HW=55.42' TW=51.61' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.17 cfs of 6.09 cfs potential flow)
  ├─**2=Dome Grate (OF-6)** (Weir Controls 0.06 cfs @ 0.50 fps)
  └─**3=Focal Point Media** (Exfiltration Controls 0.11 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=48.88' TW=47.96' (Dynamic Tailwater)
└─**6=Spillway** (Controls 0.00 cfs)

Pond FP-6: FP-6



Summary for Pond FP-7: FP-7/INF-5

Inflow Area = 74,145 sf, 24.19% Impervious, Inflow Depth > 0.52" for 1-Year event
Inflow = 0.99 cfs @ 12.15 hrs, Volume= 3,203 cf
Outflow = 0.16 cfs @ 12.77 hrs, Volume= 3,202 cf, Atten= 84%, Lag= 36.9 min
Discarded = 0.16 cfs @ 12.77 hrs, Volume= 3,202 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond DMH-3 : DMH-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 48.43' @ 12.77 hrs Surf.Area= 551 sf Storage= 1,038 cf
Flood Elev= 57.18' Surf.Area= 2,830 sf Storage= 16,463 cf

Plug-Flow detention time= 49.5 min calculated for 3,202 cf (100% of inflow)
Center-of-Mass det. time= 49.5 min (827.0 - 777.5)

Volume	Invert	Avail.Storage	Storage Description
#1	51.90'	14,781 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#2	50.15'	17 cf	**8.00'W x 6.00'L x 1.75'H Media/Mulch**
			84 cf Overall x 20.0% Voids
#3A	45.86'	422 cf	**17.12'W x 32.15'L x 4.29'H Field A**
			2,364 cf Overall - 1,309 cf Embedded = 1,055 cf x 40.0% Voids
#4A	46.11'	1,244 cf	**Ferguson R-Tank HD 2.5** x 120 Inside #3
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			120 Chambers in 10 Rows
		16,463 cf	Total Available Storage

Storage Group A created with Chamber Wizard

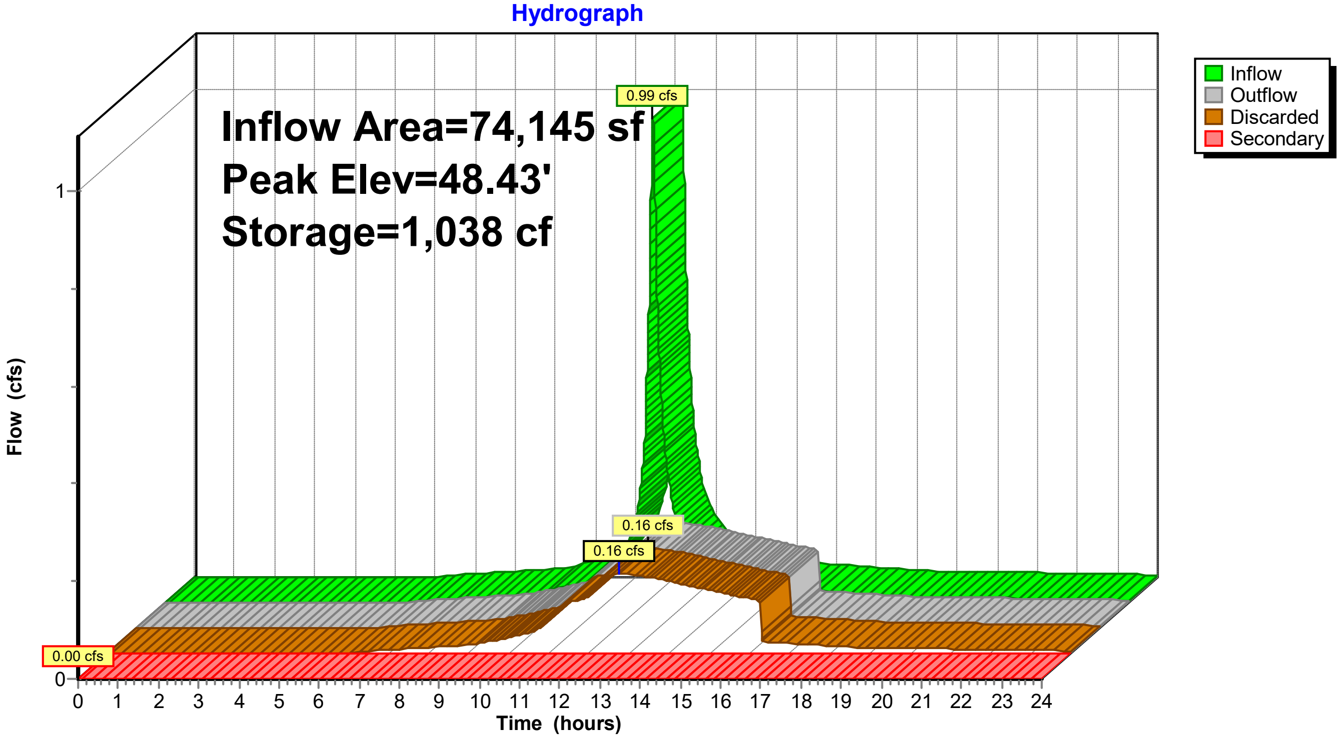
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
51.90	33	22.0	0	0	33
52.00	211	64.0	11	11	320
53.00	549	145.0	367	378	1,672
54.00	874	156.0	705	1,083	1,975
55.00	14,388	179.0	6,269	7,352	2,611
56.00	2,231	200.0	7,428	14,781	3,272

Device	Routing	Invert	Outlet Devices
#1	Discarded	52.00'	**3.000 in/hr RG Exfiltration over Surface area from 52.00' - 54.50'**
			Conductivity to Groundwater Elevation = 10.00'
			Excluded Surface area = 810 sf Phase-In= 0.01'
#2	Discarded	45.86'	**8.270 in/hr R-tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#3	Secondary	55.70'	**32.0" W x 9.0" H Vert. TR-7 (backflow)** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.16 cfs @ 12.77 hrs HW=48.43' (Free Discharge)
1=RG Exfiltration (Controls 0.00 cfs)
2=R-tank Exfiltration (Controls 0.16 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=45.86' TW=51.10' (Dynamic Tailwater)
3=TR-7 (backflow) (Controls 0.00 cfs)

Pond FP-7: FP-7/INF-5



Summary for Pond INF-1: INF-1

Inflow Area = 23,899 sf, 71.73% Impervious, Inflow Depth > 1.84" for 1-Year event
Inflow = 1.12 cfs @ 12.13 hrs, Volume= 3,674 cf
Outflow = 0.18 cfs @ 12.57 hrs, Volume= 3,674 cf, Atten= 84%, Lag= 26.6 min
Discarded = 0.18 cfs @ 12.57 hrs, Volume= 3,674 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond AB-1 : Attenuation Basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 48.04' @ 12.57 hrs Surf.Area= 636 sf Storage= 933 cf

Plug-Flow detention time= 32.2 min calculated for 3,674 cf (100% of inflow)
Center-of-Mass det. time= 32.1 min (793.4 - 761.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	46.00'	626 cf	**14.50'W x 43.88'L x 4.79'H Field A**
			3,049 cf Overall - 1,483 cf Embedded = 1,566 cf x 40.0% Voids
#2A	46.25'	1,409 cf	**Ferguson R-Tank HD 2.5** x 136 Inside #1
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			136 Chambers in 8 Rows
		2,036 cf	Total Available Storage

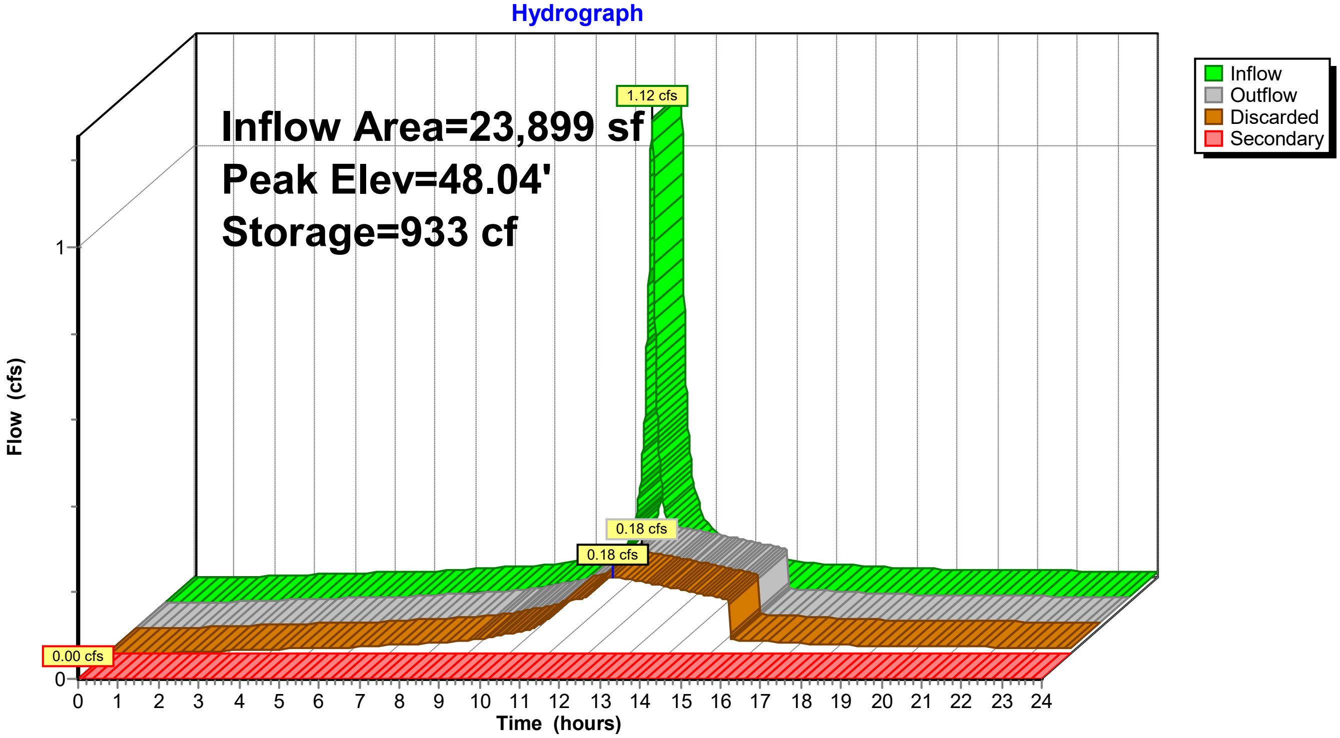
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	46.00'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00'
			Phase-In= 0.01'
#2	Secondary	50.25'	**12.0" Round Overflow** L= 14.0' CPP, mitered to conform to fill, Ke= 0.700
			Inlet / Outlet Invert= 50.25' / 50.10' S= 0.0107 '/' Cc= 0.900
			n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.18 cfs @ 12.57 hrs HW=48.04' (Free Discharge)
↑**1=Exfiltration** (Controls 0.18 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.00' TW=49.00' (Dynamic Tailwater)
↑**2=Overflow** (Controls 0.00 cfs)

Pond INF-1: INF-1



Summary for Pond INF-2: INF-2

Inflow Area = 104,046 sf, 64.30% Impervious, Inflow Depth = 0.10" for 1-Year event
Inflow = 0.73 cfs @ 12.14 hrs, Volume= 849 cf
Outflow = 0.31 cfs @ 12.48 hrs, Volume= 851 cf, Atten= 57%, Lag= 20.5 min
Discarded = 0.31 cfs @ 12.48 hrs, Volume= 851 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond DMH-3 : DMH-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 47.94' @ 12.48 hrs Surf.Area= 1,566 sf Storage= 221 cf
Flood Elev= 54.00' Surf.Area= 1,566 sf Storage= 6,187 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 7.2 min (746.3 - 739.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	47.64'	1,398 cf	**21.06'W x 74.37'L x 5.45'H Field A**
			8,536 cf Overall - 5,042 cf Embedded = 3,494 cf x 40.0% Voids
#2A	47.89'	4,790 cf	**Ferguson R-Tank HD 3** x 390 Inside #1
			Inside= 15.7"W x 50.4"H => 5.24 sf x 2.35'L = 12.3 cf
			Outside= 15.7"W x 50.4"H => 5.51 sf x 2.35'L = 12.9 cf
			390 Chambers in 13 Rows
		6,187 cf	Total Available Storage

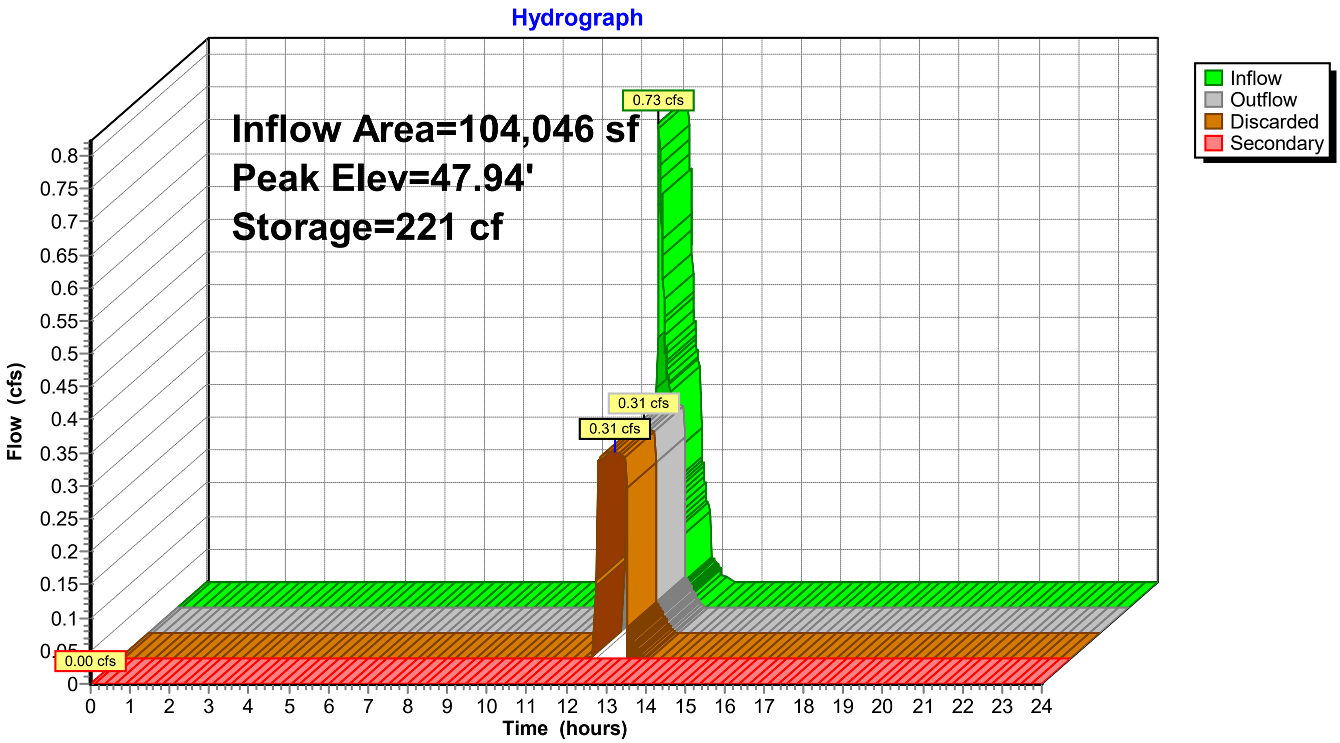
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	47.64'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00'
#2	Secondary	51.35'	**15.0" Round Culvert** L= 24.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 51.35' / 51.10' S= 0.0104 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=0.31 cfs @ 12.48 hrs HW=47.94' (Free Discharge)
1=Exfiltration (Controls 0.31 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=47.64' TW=51.10' (Dynamic Tailwater)
2=Culvert (Controls 0.00 cfs)

Pond INF-2: INF-2



Summary for Pond INF-3: INF-3

Inflow Area = 38,595 sf, 60.69% Impervious, Inflow Depth > 0.93" for 1-Year event
Inflow = 1.17 cfs @ 12.15 hrs, Volume= 2,996 cf
Outflow = 0.24 cfs @ 12.39 hrs, Volume= 2,996 cf, Atten= 79%, Lag= 14.3 min
Discarded = 0.24 cfs @ 12.39 hrs, Volume= 2,996 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond SP 4 : Study Point

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 43.82' @ 12.39 hrs Surf.Area= 1,112 sf Storage= 617 cf

Plug-Flow detention time= 11.8 min calculated for 2,996 cf (100% of inflow)
Center-of-Mass det. time= 11.7 min (771.6 - 759.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	43.00'	1,058 cf	**18.44'W x 60.30'L x 5.45'H Field A** 6,058 cf Overall - 3,413 cf Embedded = 2,645 cf x 40.0% Voids
#2A	43.25'	3,242 cf	**Ferguson R-Tank HD 3** x 264 Inside #1 Inside= 15.7"W x 50.4"H => 5.24 sf x 2.35'L = 12.3 cf Outside= 15.7"W x 50.4"H => 5.51 sf x 2.35'L = 12.9 cf 264 Chambers in 11 Rows
		4,300 cf	Total Available Storage

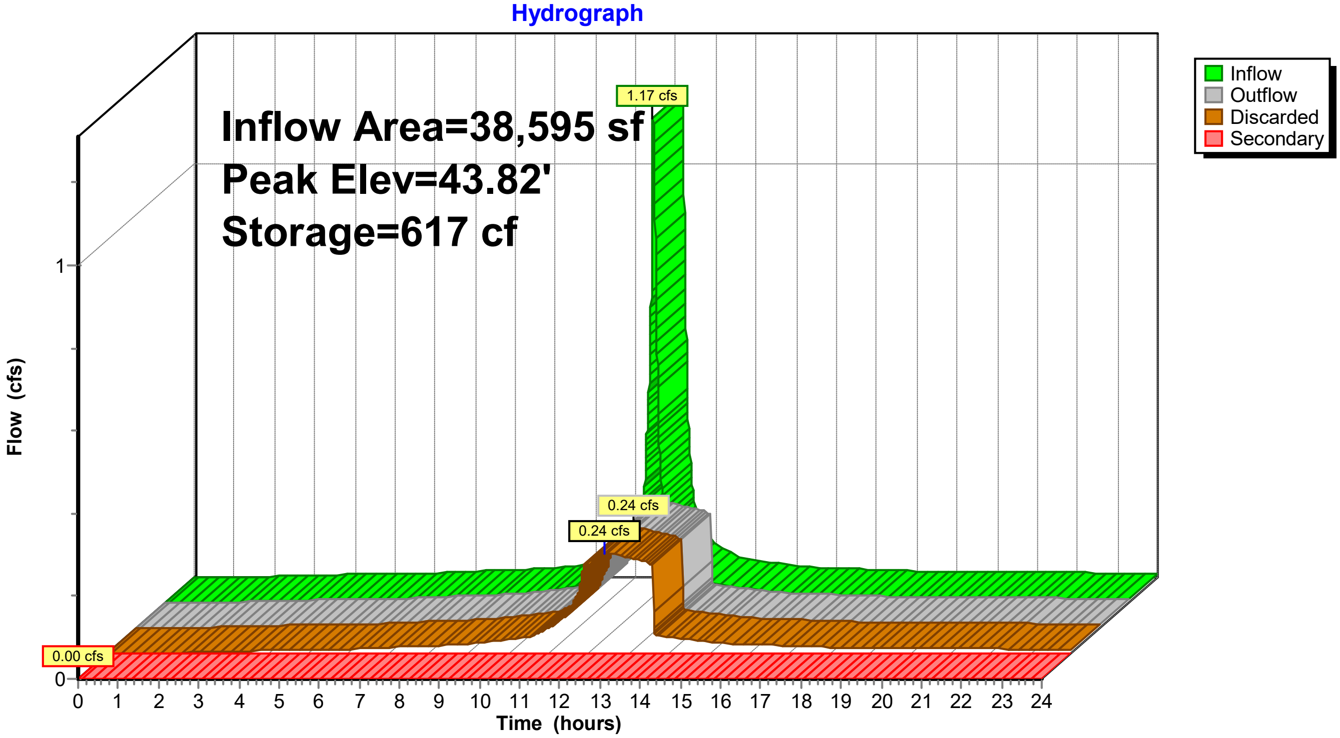
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	43.00'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#2	Secondary	49.80'	**24.0" x 24.0" Horiz. CB-6A** C= 0.600 Limited to weir flow at low heads
#3	Secondary	49.80'	**24.0" x 24.0" Horiz. CB-7** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.24 cfs @ 12.39 hrs HW=43.82' (Free Discharge)
└**1=Exfiltration** (Controls 0.24 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=43.00' TW=0.00' (Dynamic Tailwater)
├**2=CB-6A** (Controls 0.00 cfs)
└**3=CB-7** (Controls 0.00 cfs)

Pond INF-3: INF-3



Summary for Pond INF-4: INF-4

Inflow Area = 45,592 sf, 62.99% Impervious, Inflow Depth > 1.64" for 1-Year event
Inflow = 1.86 cfs @ 12.13 hrs, Volume= 6,213 cf
Outflow = 0.33 cfs @ 12.52 hrs, Volume= 6,212 cf, Atten= 82%, Lag= 23.0 min
Discarded = 0.33 cfs @ 12.52 hrs, Volume= 6,212 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond OF-6 : OF-6

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.58' @ 12.52 hrs Surf.Area= 1,468 sf Storage= 1,361 cf
Flood Elev= 57.18' Surf.Area= 1,468 sf Storage= 5,494 cf

Plug-Flow detention time= 21.6 min calculated for 6,212 cf (100% of inflow)
Center-of-Mass det. time= 21.5 min (784.9 - 763.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	50.32'	1,023 cf	**21.06'W x 69.68'L x 4.95'H Field A** 7,264 cf Overall - 4,706 cf Embedded = 2,558 cf x 40.0% Voids
#2A	50.57'	4,471 cf	**Ferguson R-Tank HD 3** x 364 Inside #1 Inside= 15.7"W x 50.4"H => 5.24 sf x 2.35'L = 12.3 cf Outside= 15.7"W x 50.4"H => 5.51 sf x 2.35'L = 12.9 cf 364 Chambers in 13 Rows
		5,494 cf	Total Available Storage

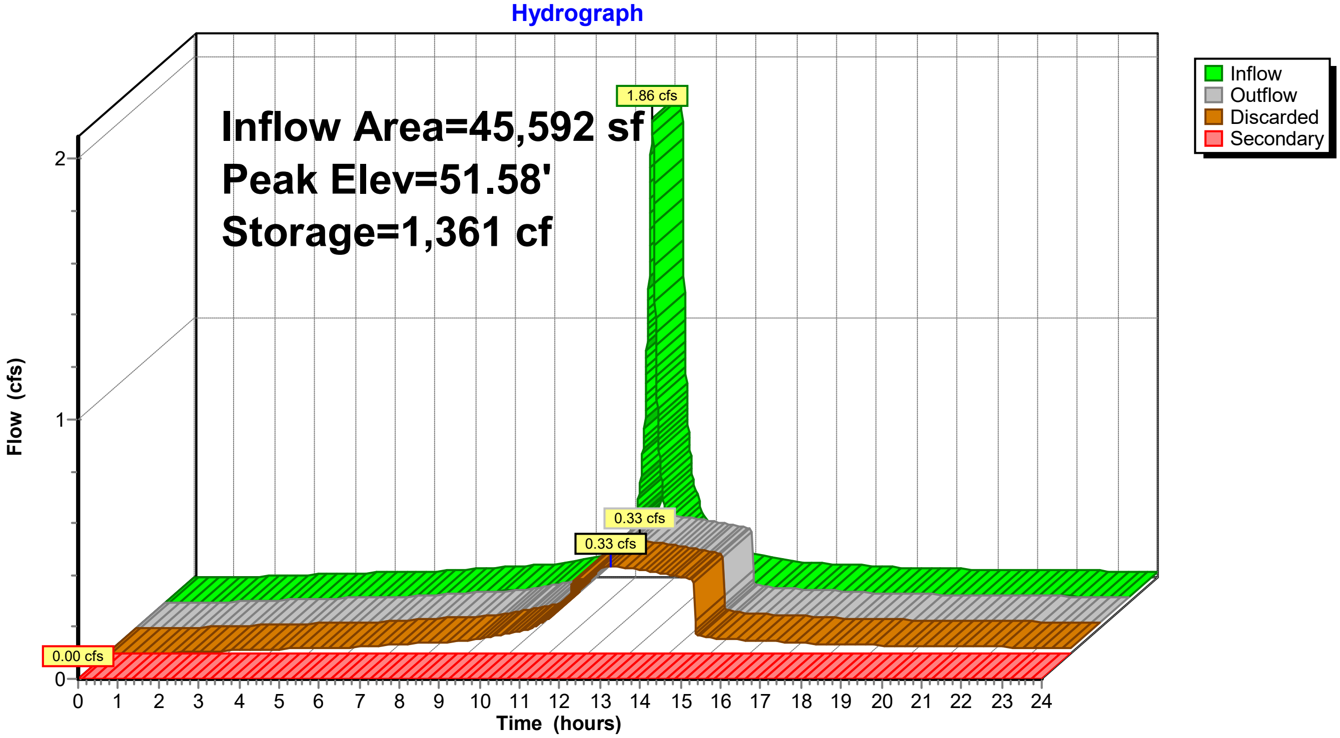
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	50.32'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#2	Secondary	53.52'	**12.0" Round Overflow** L= 86.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 53.52' / 51.40' S= 0.0247 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.33 cfs @ 12.52 hrs HW=51.58' (Free Discharge)
└─**1=Exfiltration** (Controls 0.33 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=50.32' TW=51.40' (Dynamic Tailwater)
└─**2=Overflow** (Controls 0.00 cfs)

Pond INF-4: INF-4



Summary for Pond INF-6: INF-6

Inflow Area = 19,023 sf, 56.89% Impervious, Inflow Depth > 1.50" for 1-Year event
Inflow = 0.72 cfs @ 12.13 hrs, Volume= 2,377 cf
Outflow = 0.11 cfs @ 12.59 hrs, Volume= 2,377 cf, Atten= 85%, Lag= 27.7 min
Discarded = 0.11 cfs @ 12.59 hrs, Volume= 2,377 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 52.98' @ 12.59 hrs Surf.Area= 330 sf Storage= 640 cf

Plug-Flow detention time= 39.3 min calculated for 2,377 cf (100% of inflow)
Center-of-Mass det. time= 39.2 min (805.3 - 766.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	50.46'	663 cf	**Ferguson R-Tank HD 2.5** x 64 Inside #2
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			64 Chambers in 8 Rows
#2A	50.21'	288 cf	**14.50'W x 22.77'L x 4.29'H Field A**
			1,417 cf Overall - 698 cf Embedded = 719 cf x 40.0% Voids
#3	56.00'	4,508 cf	**Depression (Irregular)** Listed below (Recalc)
		5,459 cf	Total Available Storage

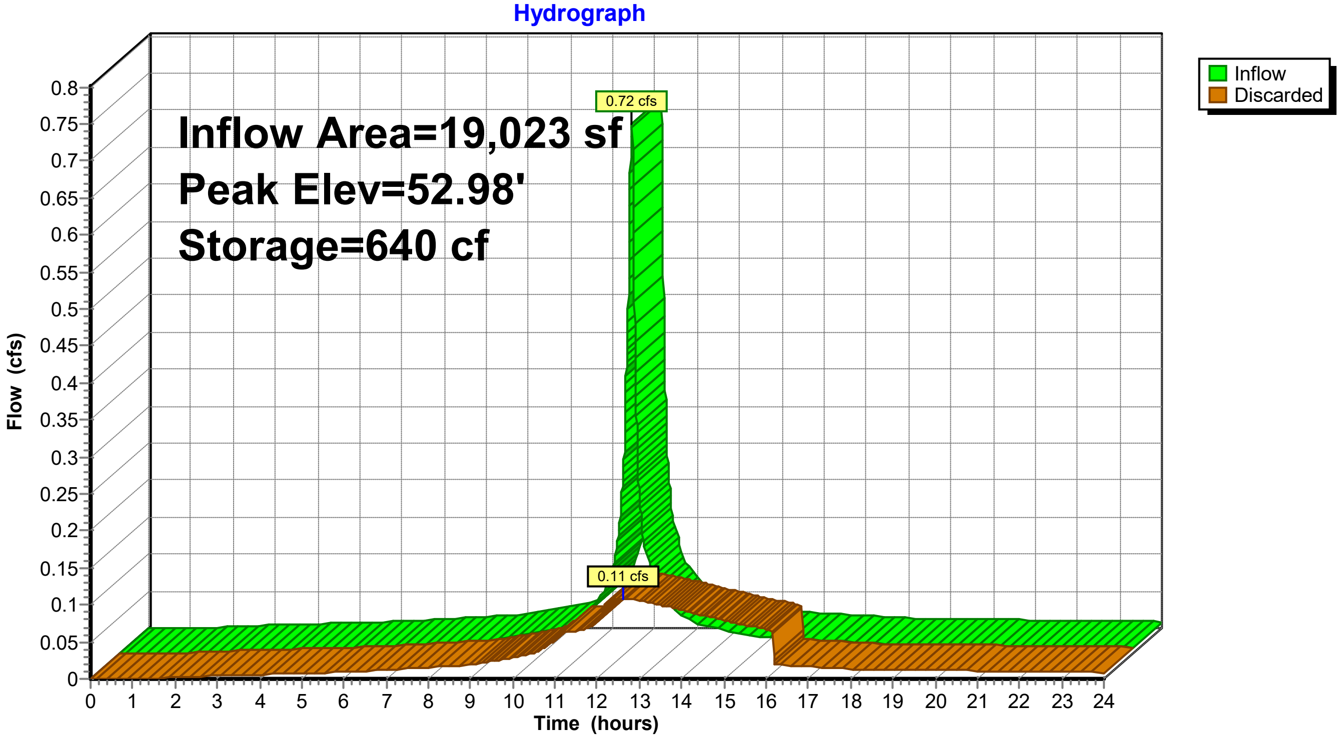
Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
56.00	361	76.0	0	0	361
57.00	1,869	162.0	1,017	1,017	1,994
58.00	3,616	269.0	2,695	3,712	5,670
58.20	4,360	285.0	796	4,508	6,378

Device	Routing	Invert	Outlet Devices
#1	Discarded	50.21'	**8.270 in/hr R Tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'

Discarded OutFlow Max=0.11 cfs @ 12.59 hrs HW=52.98' (Free Discharge)
└**1=R Tank Exfiltration** (Controls 0.11 cfs)

Pond INF-6: INF-6



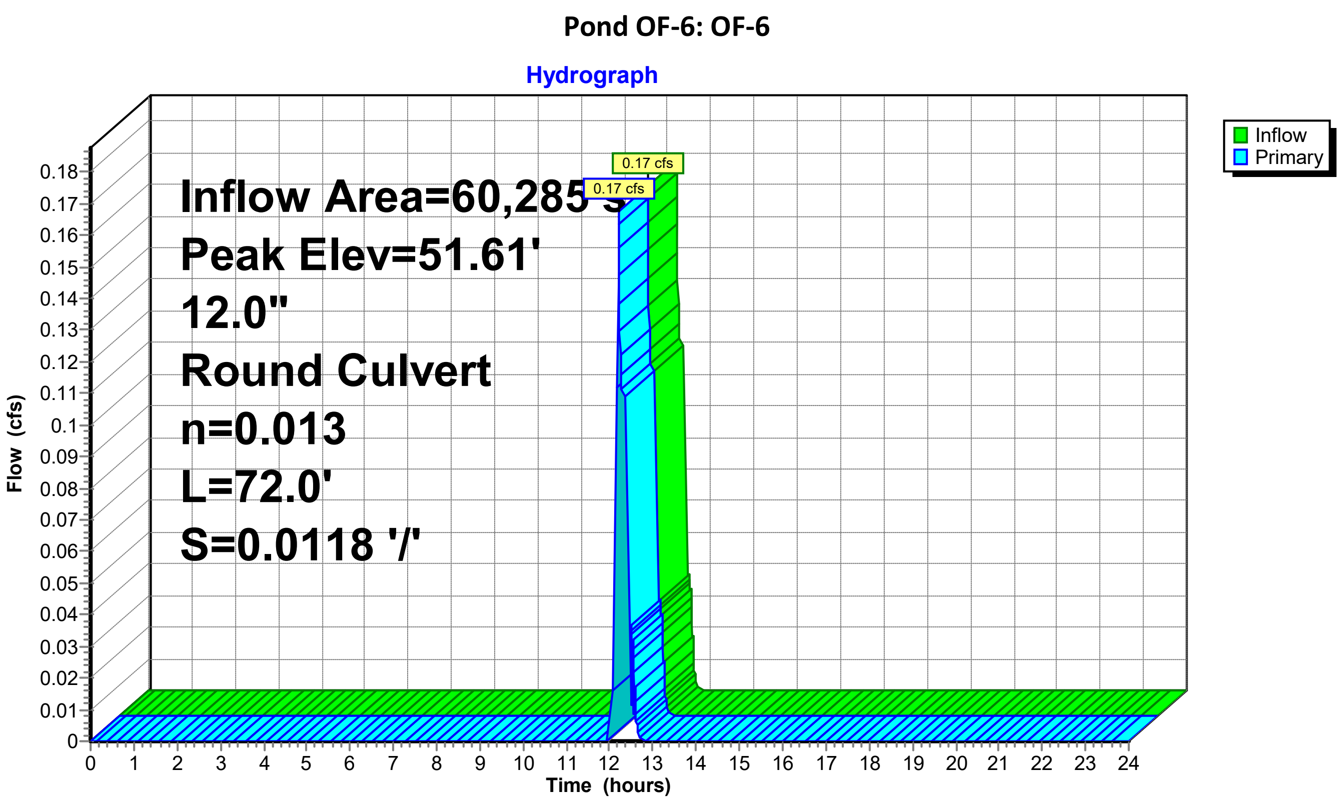
Summary for Pond OF-6: OF-6

Inflow Area = 60,285 sf, 60.30% Impervious, Inflow Depth = 0.03" for 1-Year event
Inflow = 0.17 cfs @ 12.20 hrs, Volume= 173 cf
Outflow = 0.17 cfs @ 12.20 hrs, Volume= 173 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.17 cfs @ 12.20 hrs, Volume= 173 cf
Routed to Pond DB-A : DB-A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.61' @ 12.20 hrs
Flood Elev= 54.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.40'	**12.0" Round Culvert** L= 72.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 51.40' / 50.55' S= 0.0118 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.17 cfs @ 12.20 hrs HW=51.61' TW=50.81' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.17 cfs @ 1.38 fps)

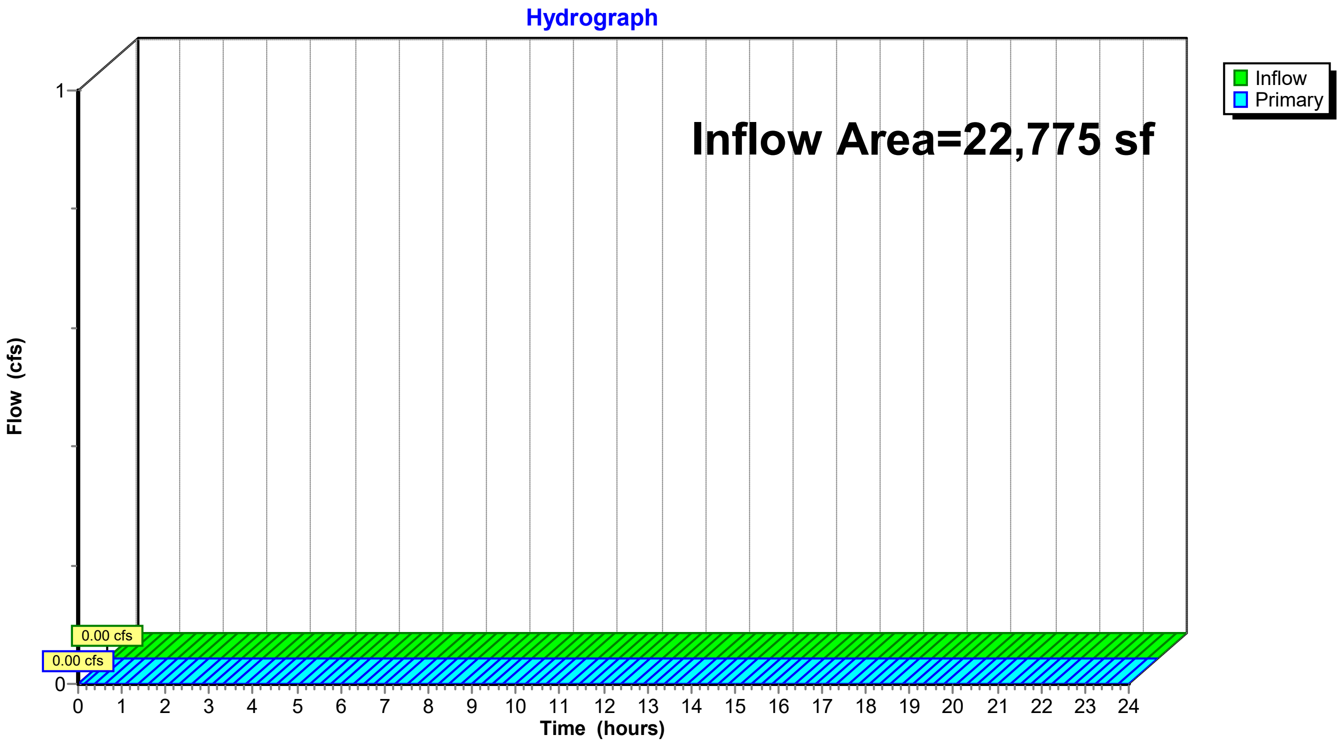


Summary for Pond SP 1: Study Point

Inflow Area = 22,775 sf, 0.00% Impervious, Inflow Depth = 0.00" for 1-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3

Pond SP 1: Study Point

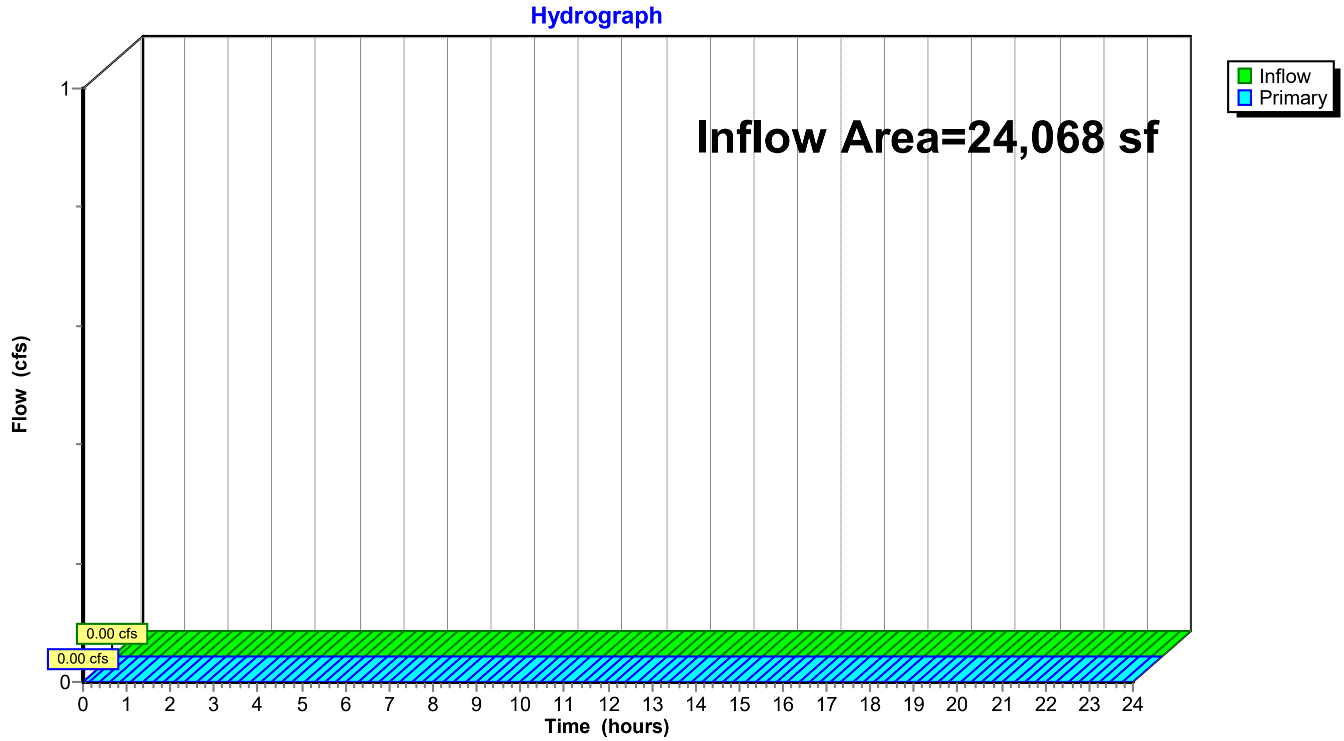


Summary for Pond SP 3: Study Point

Inflow Area = 24,068 sf, 0.00% Impervious, Inflow Depth = 0.00" for 1-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3

Pond SP 3: Study Point

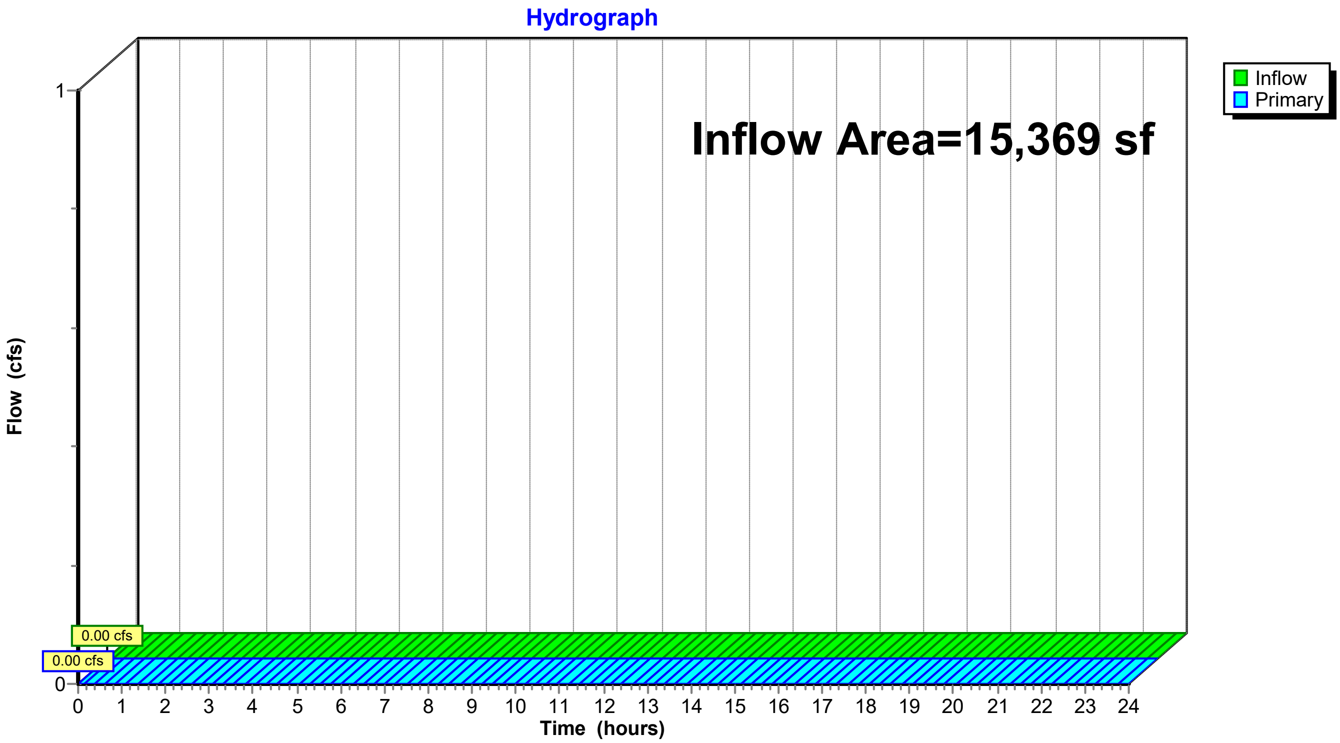


Summary for Pond SP 4: Study Point

Inflow Area = 15,369 sf, 0.00% Impervious, Inflow Depth = 0.00" for 1-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3

Pond SP 4: Study Point

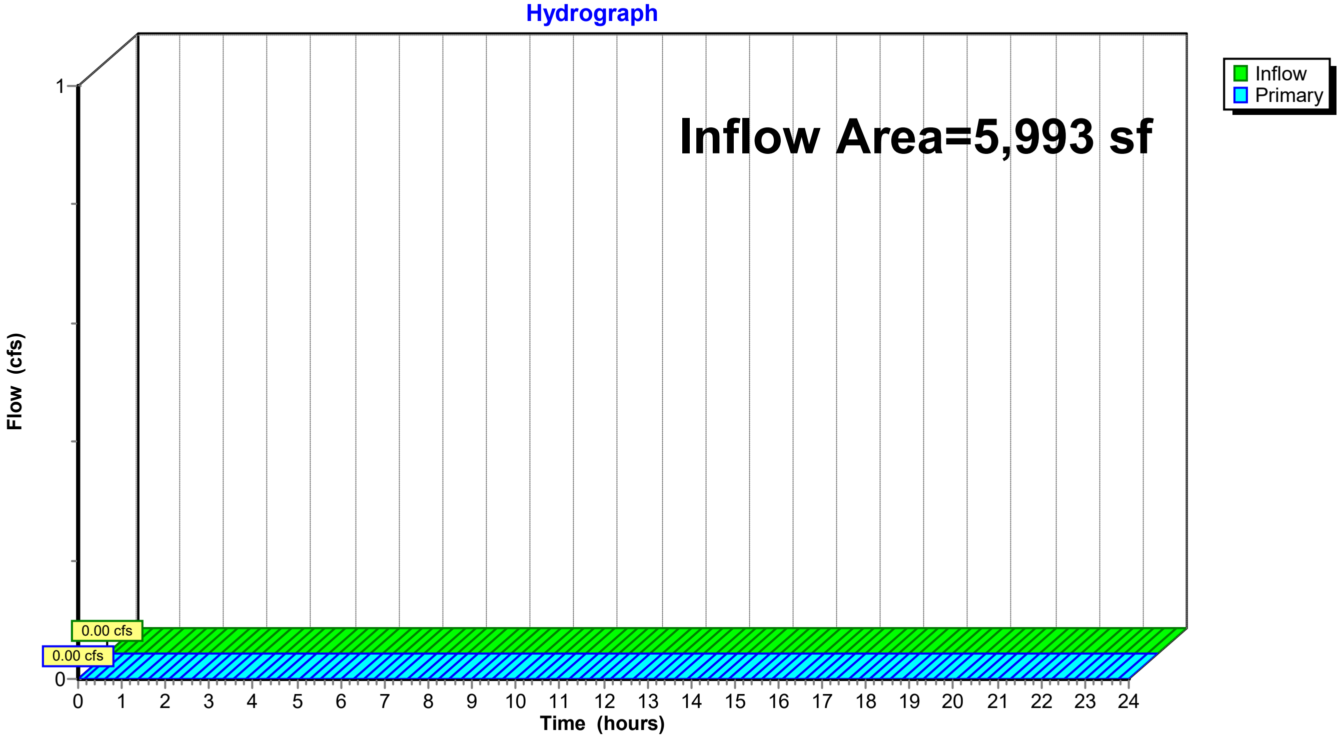


Summary for Pond SP-2: Study Point

Inflow Area =	5,993 sf,	0.00% Impervious,	Inflow Depth = 0.00"	for 1-Year event
Inflow =	0.00 cfs @	0.00 hrs, Volume=	0 cf	
Primary =	0.00 cfs @	0.00 hrs, Volume=	0 cf, Atten= 0%, Lag= 0.0 min	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3

Pond SP-2: Study Point



Time span=0.00-24.00 hrs, dt=0.006 hrs, 4001 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: RA (partial) Runoff Area=18,019 sf 100.00% Impervious Runoff Depth>3.09"
Tc=6.0 min CN=98 Runoff=1.41 cfs 4,645 cf

Subcatchment 2S: RA (partial) Runoff Area=14,390 sf 100.00% Impervious Runoff Depth>3.09"
Tc=6.0 min CN=98 Runoff=1.12 cfs 3,710 cf

Subcatchment 3S: RA (partial) Runoff Area=10,803 sf 100.00% Impervious Runoff Depth>3.09"
Tc=6.0 min CN=98 Runoff=0.84 cfs 2,785 cf

Subcatchment SCA-1: LSA/FL/IA/PP Runoff Area=52,119 sf 6.80% Impervious Runoff Depth>0.36"
Flow Length=532' Slope=0.0100 '/' Tc=16.6 min CN=WQ Runoff=0.29 cfs 1,575 cf

Subcatchment SCA-10: Runoff Area=9,281 sf 84.56% Impervious Runoff Depth>2.62"
Tc=6.0 min CN=WQ Runoff=0.61 cfs 2,024 cf

Subcatchment SCA-11: Runoff Area=8,047 sf 72.78% Impervious Runoff Depth>2.25"
Tc=6.0 min CN=WQ Runoff=0.46 cfs 1,510 cf

Subcatchment SCA-12: Runoff Area=12,711 sf 69.37% Impervious Runoff Depth>2.15"
Tc=6.0 min CN=WQ Runoff=0.69 cfs 2,274 cf

Subcatchment SCA-13: Runoff Area=9,436 sf 78.35% Impervious Runoff Depth>2.42"
Tc=6.0 min CN=WQ Runoff=0.58 cfs 1,906 cf

Subcatchment SCA-14: Runoff Area=13,982 sf 55.19% Impervious Runoff Depth>1.71"
Tc=6.0 min CN=WQ Runoff=0.60 cfs 1,990 cf

Subcatchment SCA-16: Runoff Area=6,892 sf 58.84% Impervious Runoff Depth>1.82"
Tc=6.0 min CN=WQ Runoff=0.32 cfs 1,046 cf

Subcatchment SCA-17: Runoff Area=4,123 sf 100.00% Impervious Runoff Depth>3.09"
Tc=6.0 min CN=98 Runoff=0.32 cfs 1,063 cf

Subcatchment SCA-18: Runoff Area=9,051 sf 85.55% Impervious Runoff Depth>2.65"
Tc=6.0 min CN=WQ Runoff=0.61 cfs 1,996 cf

Subcatchment SCA-19: Runoff Area=12,142 sf 43.49% Impervious Runoff Depth>1.34"
Flow Length=145' Tc=9.6 min CN=WQ Runoff=0.36 cfs 1,360 cf

Subcatchment SCA-2: LSA/FL Runoff Area=8,220 sf 0.24% Impervious Runoff Depth>0.17"
Flow Length=75' Tc=6.1 min CN=WQ Runoff=0.03 cfs 115 cf

Subcatchment SCA-4: Runoff Area=27,573 sf 38.81% Impervious Runoff Depth>1.26"
Flow Length=254' Tc=6.8 min CN=WQ Runoff=0.84 cfs 2,884 cf

Subcatchment SCA-5: Runoff Area=7,636 sf 0.00% Impervious Runoff Depth>0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 2 cf

Subcatchment SCA-6.1: Runoff Area=12,884 sf 69.58% Impervious Runoff Depth>2.17"
Tc=6.0 min CN=WQ Runoff=0.70 cfs 2,326 cf

Subcatchment SCA-6.2: Runoff Area=8,059 sf 57.41% Impervious Runoff Depth>1.95"
Tc=6.0 min CN=WQ Runoff=0.39 cfs 1,313 cf

Subcatchment SCA-7: Runoff Area=14,693 sf 51.93% Impervious Runoff Depth>1.61"
Tc=6.0 min CN=WQ Runoff=0.60 cfs 1,968 cf

Subcatchment SCA-8: Runoff Area=3,035 sf 100.00% Impervious Runoff Depth>3.09"
Tc=6.0 min CN=98 Runoff=0.24 cfs 782 cf

Subcatchment SCA-9: Runoff Area=5,663 sf 60.09% Impervious Runoff Depth>1.86"
Tc=6.0 min CN=WQ Runoff=0.27 cfs 878 cf

Subcatchment UC-1: NA Runoff Area=22,775 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=434' Tc=34.9 min CN=30 Runoff=0.00 cfs 0 cf

Subcatchment UC-2: Runoff Area=24,068 sf 0.00% Impervious Runoff Depth>0.00"
Flow Length=450' Tc=16.6 min CN=WQ Runoff=0.00 cfs 1 cf

Subcatchment UC-3: Runoff Area=7,204 sf 0.00% Impervious Runoff Depth>0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 1 cf

Subcatchment UC-4: Runoff Area=8,165 sf 0.00% Impervious Runoff Depth>0.00"
Tc=6.0 min CN=WQ Runoff=0.00 cfs 1 cf

Subcatchment UC-5: Runoff Area=2,516 sf 100.00% Impervious Runoff Depth>3.09"
Tc=6.0 min CN=98 Runoff=0.20 cfs 649 cf

Subcatchment UC-6: NA Runoff Area=5,993 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=45' Slope=0.0300 '/' Tc=9.4 min CN=30 Runoff=0.00 cfs 0 cf

Pond AB-1: Attenuation Basin Peak Elev=49.00' Storage=1 cf Inflow=0.00 cfs 1 cf
Discarded=0.00 cfs 0 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 0 cf

Pond CB-2A: CB 2A Peak Elev=50.84' Inflow=0.32 cfs 1,063 cf
12.0" Round Culvert n=0.013 L=14.0' S=0.0100 '/' Outflow=0.32 cfs 1,063 cf

Pond CB-2B: CB 2B Peak Elev=50.83' Inflow=0.32 cfs 1,046 cf
12.0" Round Culvert n=0.013 L=4.0' S=0.0350 '/' Outflow=0.32 cfs 1,046 cf

Pond CB-3: CB-3 Peak Elev=51.88' Inflow=0.70 cfs 2,326 cf
12.0" Round Culvert x 2.00 n=0.013 L=7.0' S=0.0143 '/' Outflow=0.70 cfs 2,326 cf

Pond CB-4: CB-4 Peak Elev=56.91' Storage=3 cf Inflow=0.84 cfs 2,884 cf
Outflow=0.84 cfs 2,884 cf

Pond CB-6A: CB-6A Peak Elev=46.71' Inflow=0.36 cfs 1,360 cf
12.0" Round Culvert n=0.013 L=25.0' S=0.0120 '/' Outflow=0.36 cfs 1,360 cf

Pond CB-6B,C: CB-6B,6C Peak Elev=47.79' Inflow=0.60 cfs 1,990 cf
12.0" Round Culvert x 2.00 n=0.013 L=19.0' S=0.0553 '/' Outflow=0.60 cfs 1,990 cf

Pond CB-7: CB-7 Peak Elev=46.86' Inflow=0.61 cfs 1,996 cf
12.0" Round Culvert n=0.013 L=37.0' S=0.0095 '/' Outflow=0.61 cfs 1,996 cf

Pond DB-A: DB-A Peak Elev=50.92' Inflow=0.56 cfs 552 cf
15.0" Round Culvert n=0.013 L=46.0' S=0.0337 '/' Outflow=0.56 cfs 552 cf

Pond DMH-2.1: DMH-2.1 (By-Pass) Peak Elev=50.35' Inflow=1.34 cfs 4,435 cf
Primary=1.34 cfs 4,435 cf Secondary=0.00 cfs 0 cf Outflow=1.34 cfs 4,435 cf

Pond DMH-2.2: DMH-2.2 Peak Elev=50.55' Inflow=1.34 cfs 4,435 cf
18.0" Round Culvert n=0.013 L=36.0' S=0.0056 '/' Outflow=1.34 cfs 4,435 cf

Pond DMH-3: DMH-3 Peak Elev=51.53' Inflow=0.70 cfs 2,326 cf
18.0" Round Culvert n=0.013 L=183.0' S=0.0052 '/' Outflow=0.70 cfs 2,326 cf

Pond DMH-4: DMH-4 Peak Elev=49.38' Inflow=0.19 cfs 167 cf
12.0" Round Culvert n=0.013 L=20.0' S=0.0100 '/' Outflow=0.19 cfs 167 cf

Pond DMH-5: DMH-5 Peak Elev=49.55' Inflow=1.18 cfs 1,229 cf
18.0" Round Culvert n=0.013 L=10.0' S=0.0150 '/' Outflow=1.18 cfs 1,229 cf

Pond DMH-6: DMH-6 Peak Elev=46.81' Inflow=0.60 cfs 1,990 cf
12.0" Round Culvert n=0.013 L=17.0' S=0.0206 '/' Outflow=0.60 cfs 1,990 cf

Pond DMH-7: DMH-7 (bypass) Peak Elev=46.57' Inflow=0.94 cfs 3,351 cf
Primary=0.94 cfs 3,351 cf Secondary=0.00 cfs 0 cf Outflow=0.94 cfs 3,351 cf

Pond DMH-8: DMH-8 (bypass) Peak Elev=46.53' Inflow=0.61 cfs 1,996 cf
Primary=0.61 cfs 1,996 cf Secondary=0.00 cfs 0 cf Outflow=0.61 cfs 1,996 cf

Pond DMH-9: DMH-9 (bypass) Peak Elev=53.75' Inflow=0.84 cfs 2,884 cf
Primary=0.84 cfs 2,884 cf Secondary=0.00 cfs 0 cf Outflow=0.84 cfs 2,884 cf

Pond DS: Dry Stream Peak Elev=54.71' Storage=171 cf Inflow=1.30 cfs 5,284 cf
Discarded=0.03 cfs 1,031 cf Primary=1.21 cfs 4,223 cf Outflow=1.24 cfs 5,255 cf

Pond FP-1: FP-1 Peak Elev=49.84' Storage=505 cf Inflow=0.82 cfs 2,689 cf
Discarded=0.17 cfs 2,292 cf Primary=0.53 cfs 397 cf Tertiary=0.00 cfs 0 cf Outflow=0.71 cfs 2,689 cf

Pond FP-2: FP-2 Peak Elev=50.05' Storage=417 cf Inflow=0.46 cfs 1,510 cf
Discarded=0.08 cfs 1,504 cf Primary=0.04 cfs 7 cf Tertiary=0.00 cfs 0 cf Outflow=0.12 cfs 1,510 cf

Pond FP-3: FP-3 Peak Elev=52.92' Storage=501 cf Inflow=0.66 cfs 2,190 cf
Discarded=0.16 cfs 2,030 cf Primary=0.18 cfs 161 cf Tertiary=0.00 cfs 0 cf Outflow=0.34 cfs 2,190 cf

Pond FP-4: FP-4 Peak Elev=53.35' Storage=356 cf Inflow=0.69 cfs 2,274 cf
Discarded=0.06 cfs 1,597 cf Primary=0.63 cfs 677 cf Tertiary=0.00 cfs 0 cf Outflow=0.69 cfs 2,274 cf

Pond FP-5: FP-5 Peak Elev=55.00' Storage=449 cf Inflow=0.61 cfs 2,024 cf
Discarded=0.20 cfs 1,778 cf Primary=0.11 cfs 245 cf Tertiary=0.00 cfs 0 cf Outflow=0.31 cfs 2,023 cf

Pond FP-6: FP-6 Peak Elev=55.48' Storage=380 cf Inflow=0.60 cfs 1,968 cf
Discarded=0.13 cfs 1,662 cf Primary=0.45 cfs 306 cf Tertiary=0.00 cfs 0 cf Outflow=0.58 cfs 1,968 cf

Pond FP-7: FP-7/INF-5 Peak Elev=49.37' Storage=1,434 cf Inflow=1.21 cfs 4,225 cf
Discarded=0.18 cfs 4,225 cf Secondary=0.00 cfs 0 cf Outflow=0.18 cfs 4,225 cf

Pond INF-1: INF-1 Peak Elev=48.63' Storage=1,216 cf Inflow=1.34 cfs 4,435 cf
Discarded=0.19 cfs 4,434 cf Secondary=0.00 cfs 0 cf Outflow=0.19 cfs 4,434 cf

Pond INF-2: INF-2 Peak Elev=48.20' Storage=557 cf Inflow=1.36 cfs 1,396 cf
Discarded=0.32 cfs 1,396 cf Secondary=0.00 cfs 0 cf Outflow=0.32 cfs 1,396 cf

Pond INF-3: INF-3 Peak Elev=44.18' Storage=939 cf Inflow=1.47 cfs 3,748 cf
Discarded=0.26 cfs 3,747 cf Secondary=0.00 cfs 0 cf Outflow=0.26 cfs 3,747 cf

Pond INF-4: INF-4 Peak Elev=51.96' Storage=1,825 cf Inflow=2.24 cfs 7,529 cf
Discarded=0.35 cfs 7,529 cf Secondary=0.00 cfs 0 cf Outflow=0.35 cfs 7,529 cf

Pond INF-6: INF-6 Peak Elev=53.79' Storage=834 cf Inflow=0.87 cfs 2,901 cf
Outflow=0.12 cfs 2,900 cf

Pond OF-6: OF-6 Peak Elev=51.75' Inflow=0.45 cfs 306 cf
12.0" Round Culvert n=0.013 L=72.0' S=0.0118 '/' Outflow=0.45 cfs 306 cf

Pond SP 1: Study Point Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Pond SP 3: Study Point Inflow=0.00 cfs 1 cf
Primary=0.00 cfs 1 cf

Pond SP 4: Study Point Inflow=0.00 cfs 1 cf
Primary=0.00 cfs 1 cf

Pond SP-2: Study Point Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Total Runoff Area = 339,480 sf Runoff Volume = 38,805 cf Average Runoff Depth = 1.37"
56.85% Pervious = 192,995 sf 43.15% Impervious = 146,485 sf

Summary for Subcatchment 1S: RA (partial)

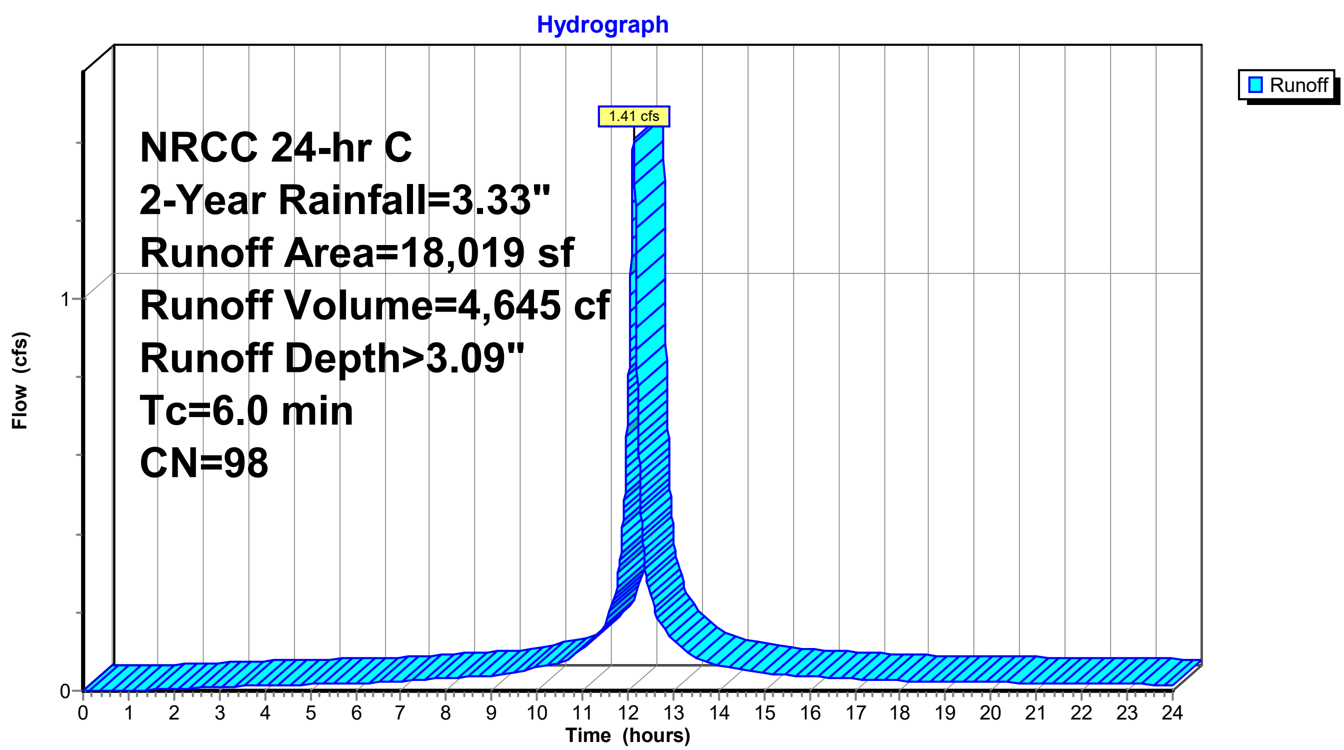
Runoff = 1.41 cfs @ 12.13 hrs, Volume= 4,645 cf, Depth> 3.09"
Routed to Pond INF-4 : INF-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
18,019	98	Roofs, HSG A
18,019	98	100.00% Impervious Area

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

Subcatchment 1S: RA (partial)



Summary for Subcatchment 2S: RA (partial)

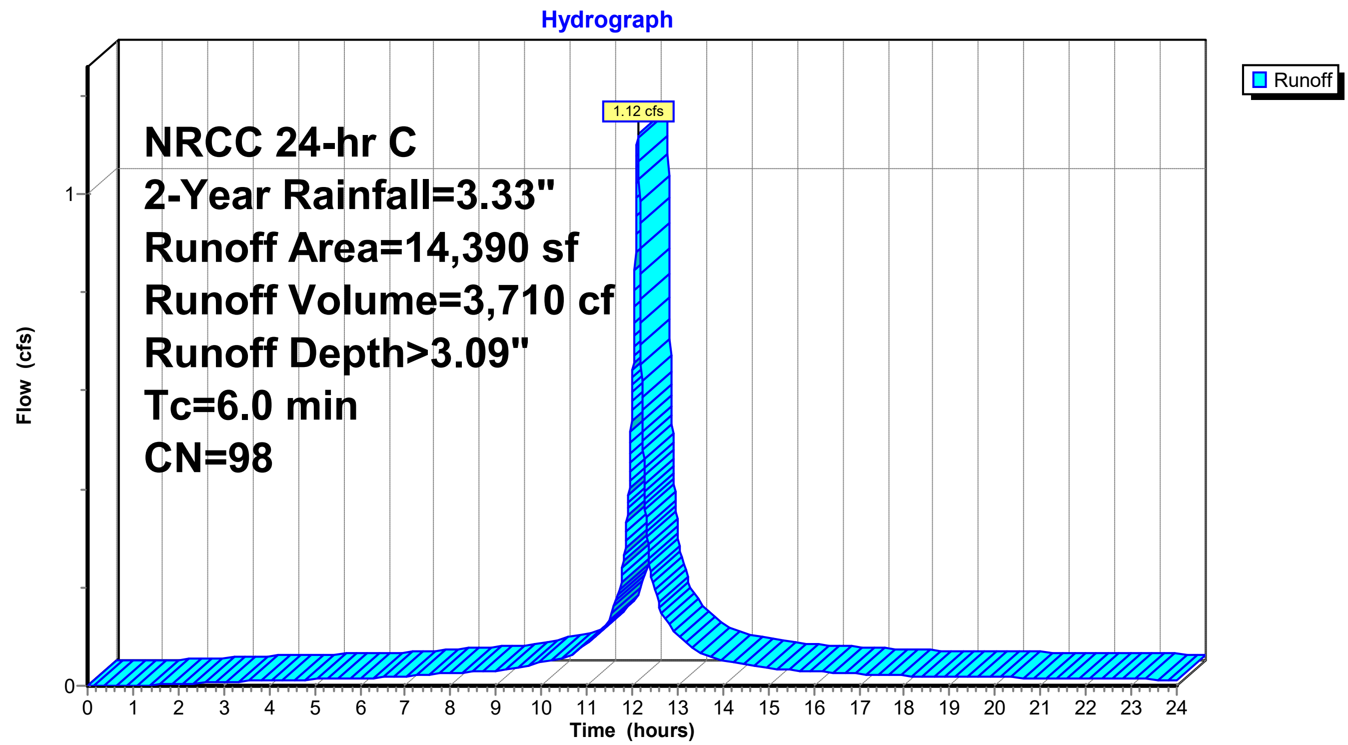
Runoff = 1.12 cfs @ 12.13 hrs, Volume= 3,710 cf, Depth> 3.09"
Routed to Pond DS : Dry Stream

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
14,390	98	Roofs, HSG A
14,390	98	100.00% Impervious Area

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

Subcatchment 2S: RA (partial)



Summary for Subcatchment 3S: RA (partial)

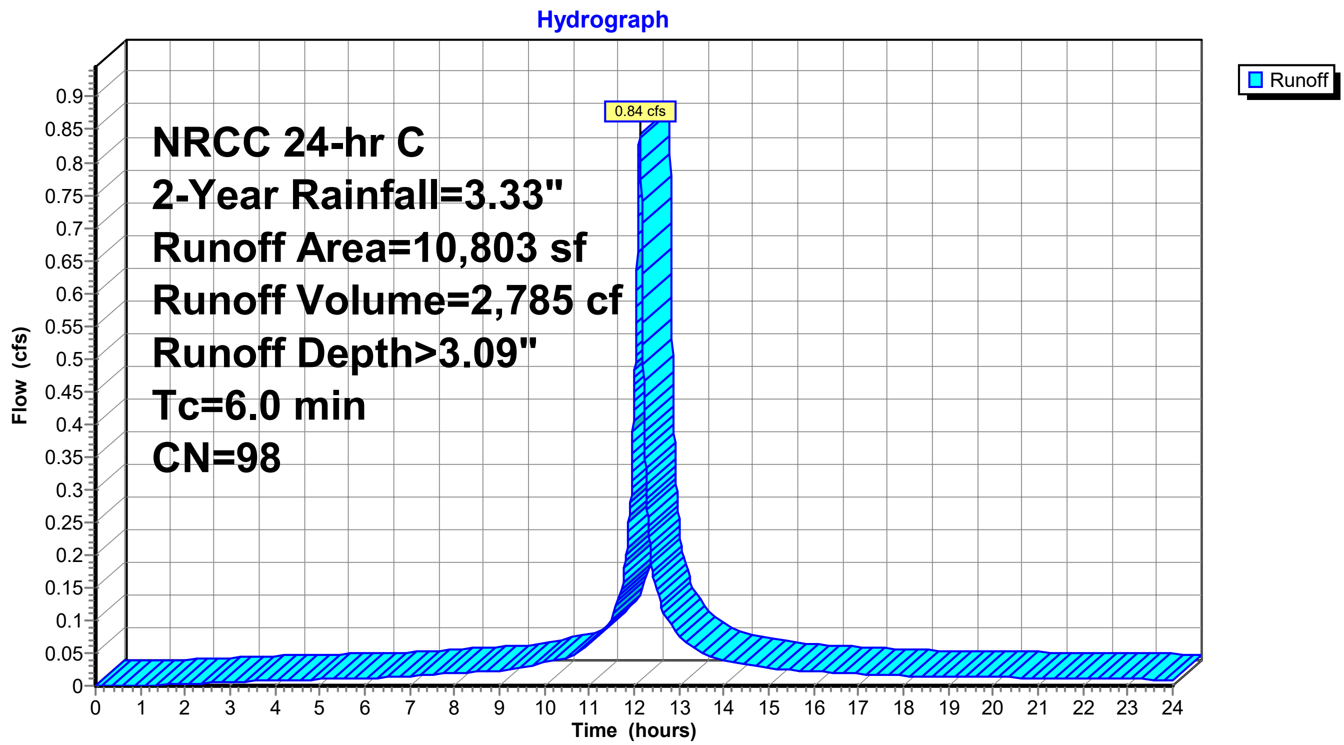
Runoff = 0.84 cfs @ 12.13 hrs, Volume= 2,785 cf, Depth> 3.09"
Routed to Pond INF-6 : INF-6

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
10,803	98	Roofs, HSG A
10,803	98	100.00% Impervious Area

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

Subcatchment 3S: RA (partial)



Summary for Subcatchment SCA-1: LSA/FL/IA/PP

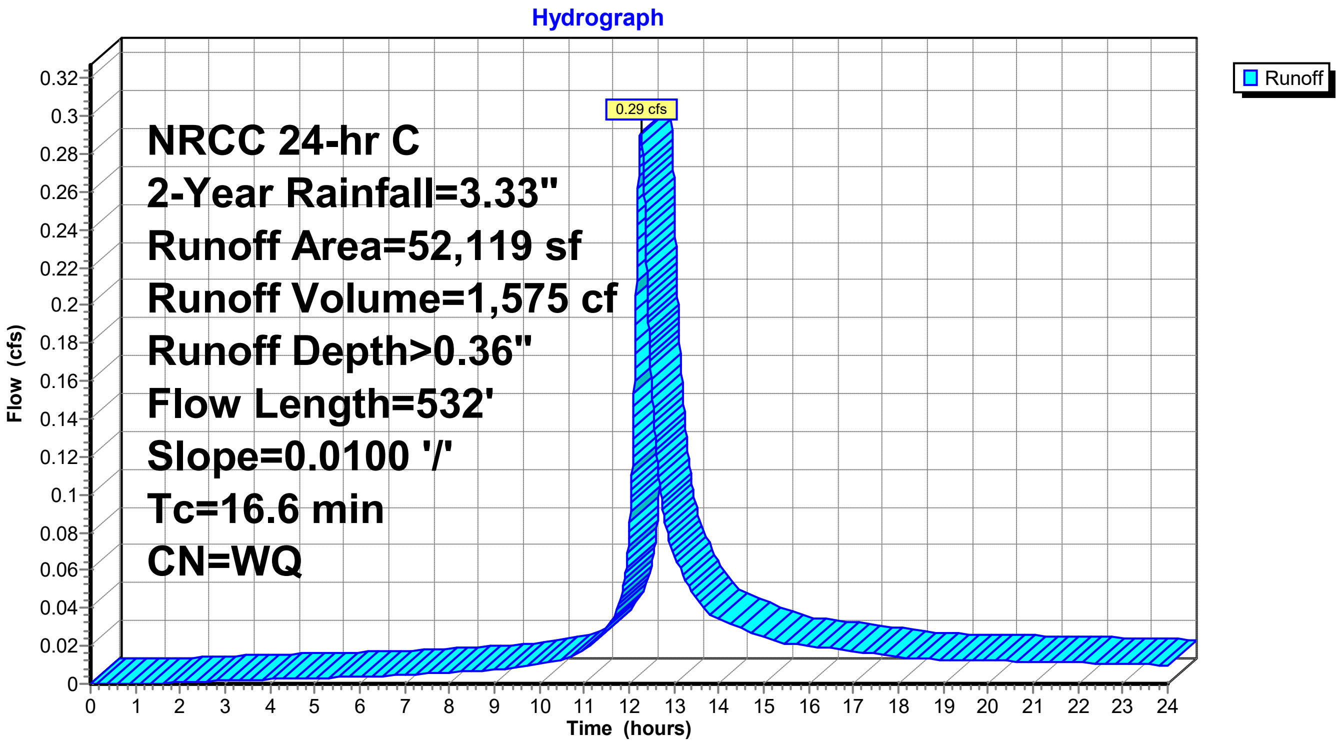
Runoff = 0.29 cfs @ 12.26 hrs, Volume= 1,575 cf, Depth> 0.36"
Routed to Pond DS : Dry Stream

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

	Area (sf)	CN	Description
	31,302	39	>75% Grass cover, Good, HSG A
*	10,136	60	Stone Fire Lane
*	3,036	98	Rubber Play Surface
*	507	98	Concrete Walk
*	7,138	60	Permeable Pavers
	52,119		Weighted Average
	48,576	46	93.20% Pervious Area
	3,543	98	6.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.6	100	0.0100	0.13		**Sheet Flow, Grass**
					Grass: Short n= 0.150 P2= 3.35"
1.0	42	0.0100	0.70		**Shallow Concentrated Flow, Grass**
					Short Grass Pasture Kv= 7.0 fps
0.2	22	0.0100	1.61		**Shallow Concentrated Flow, Stone Fire Lane**
					Unpaved Kv= 16.1 fps
0.7	28	0.0100	0.70		**Shallow Concentrated Flow, Grass**
					Short Grass Pasture Kv= 7.0 fps
2.1	340	0.0100	2.64	7.93	**Channel Flow, Dry Stream Bed**
					Area= 3.0 sf Perim= 5.0' r= 0.60'
					n= 0.040 Earth, cobble bottom, clean sides
16.6	532	Total			

Subcatchment SCA-1: LSA/FL/IA/PP



Summary for Subcatchment SCA-10:

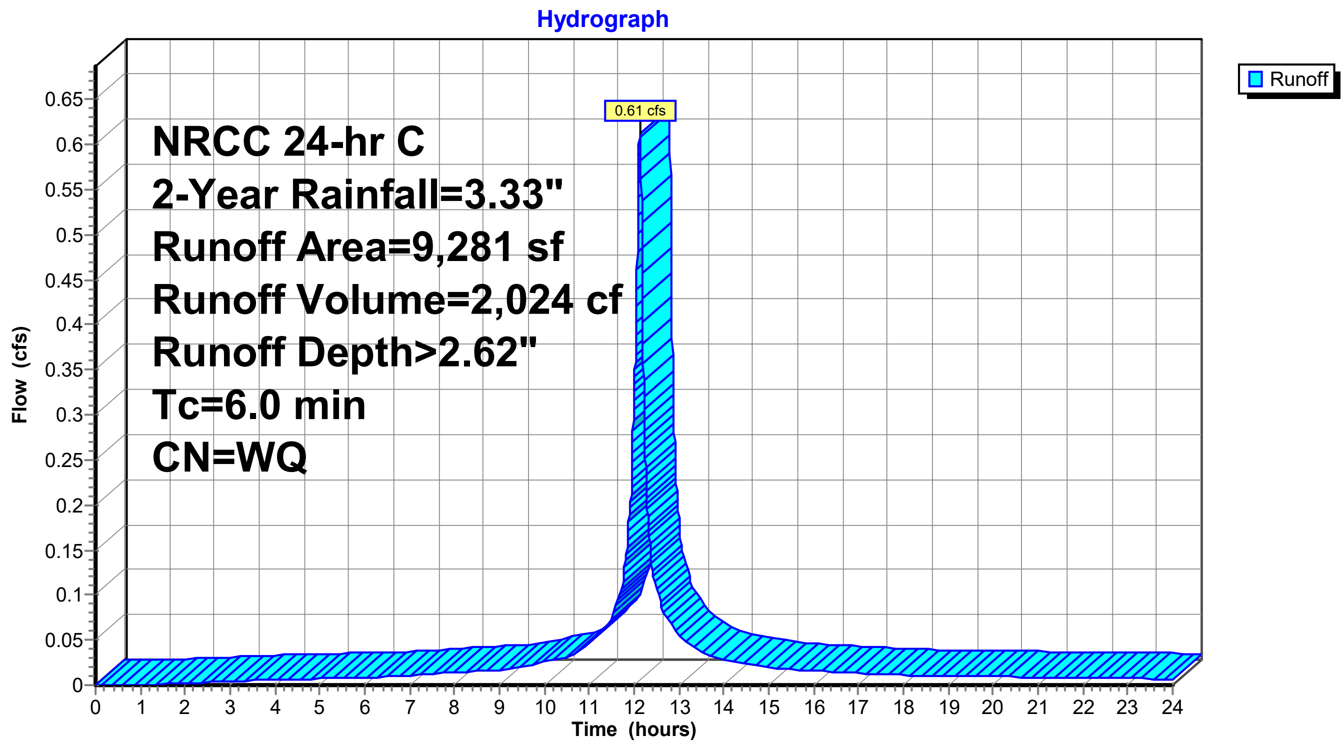
Runoff = 0.61 cfs @ 12.13 hrs, Volume= 2,024 cf, Depth> 2.62"
Routed to Pond FP-5 : FP-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
7,848	98	Paved parking, HSG A
1,372	39	>75% Grass cover, Good, HSG A
61	30	Woods, Good, HSG A
9,281		Weighted Average
1,433	39	15.44% Pervious Area
7,848	98	84.56% Impervious Area

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

Subcatchment SCA-10:



Summary for Subcatchment SCA-11:

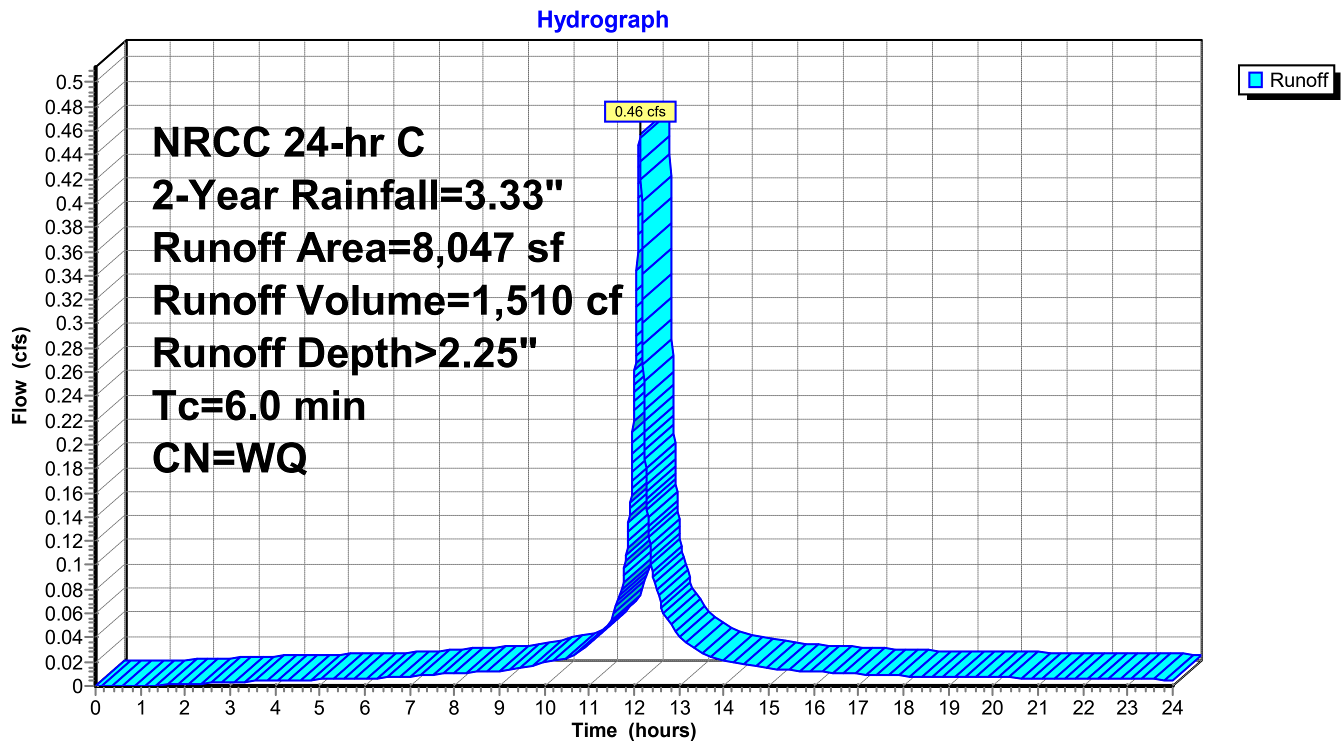
Runoff = 0.46 cfs @ 12.13 hrs, Volume= 1,510 cf, Depth> 2.25"
Routed to Pond FP-2 : FP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
5,857	98	Paved parking, HSG A
2,190	39	>75% Grass cover, Good, HSG A
8,047		Weighted Average
2,190	39	27.22% Pervious Area
5,857	98	72.78% Impervious Area

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

Subcatchment SCA-11:



Summary for Subcatchment SCA-12:

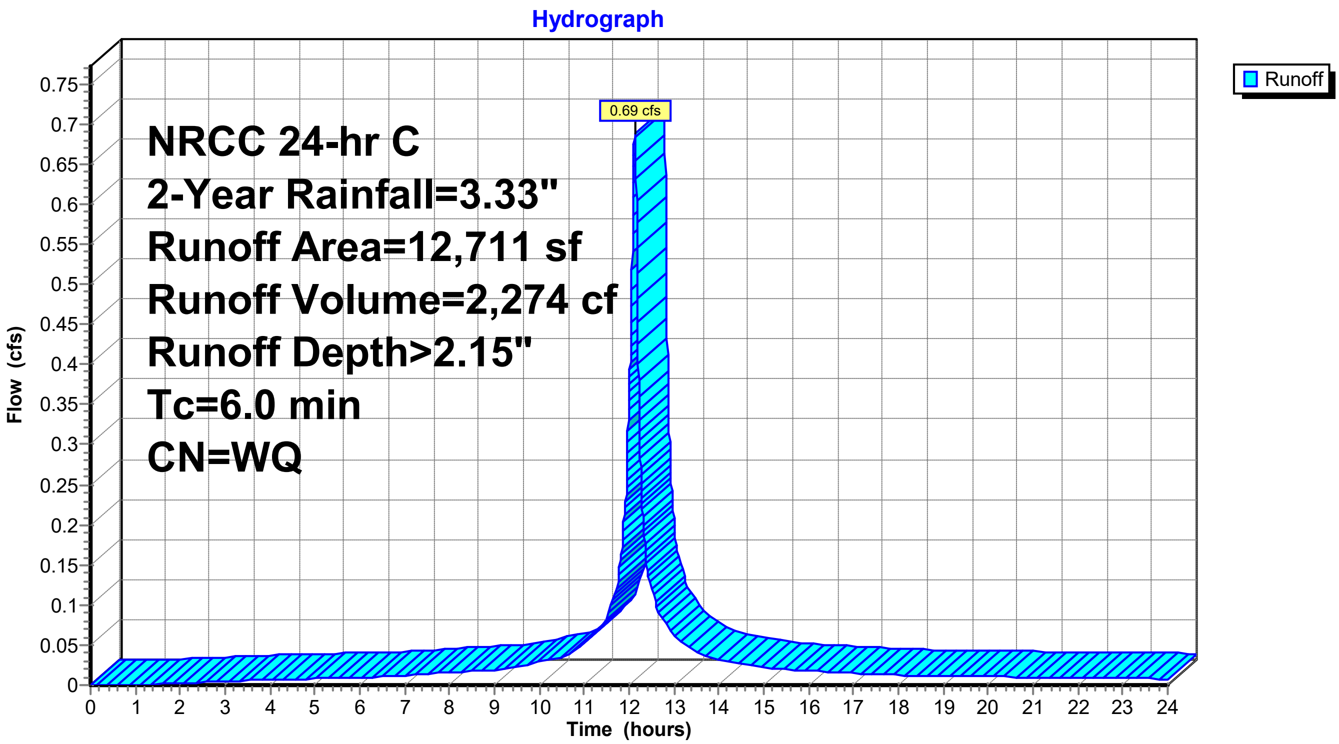
Runoff = 0.69 cfs @ 12.13 hrs, Volume= 2,274 cf, Depth> 2.15"
Routed to Pond FP-4 : FP-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
8,818	98	Paved parking, HSG A
3,298	39	>75% Grass cover, Good, HSG A
595	30	Woods, Good, HSG A
12,711		Weighted Average
3,893	38	30.63% Pervious Area
8,818	98	69.37% Impervious Area

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

Subcatchment SCA-12:



Summary for Subcatchment SCA-13:

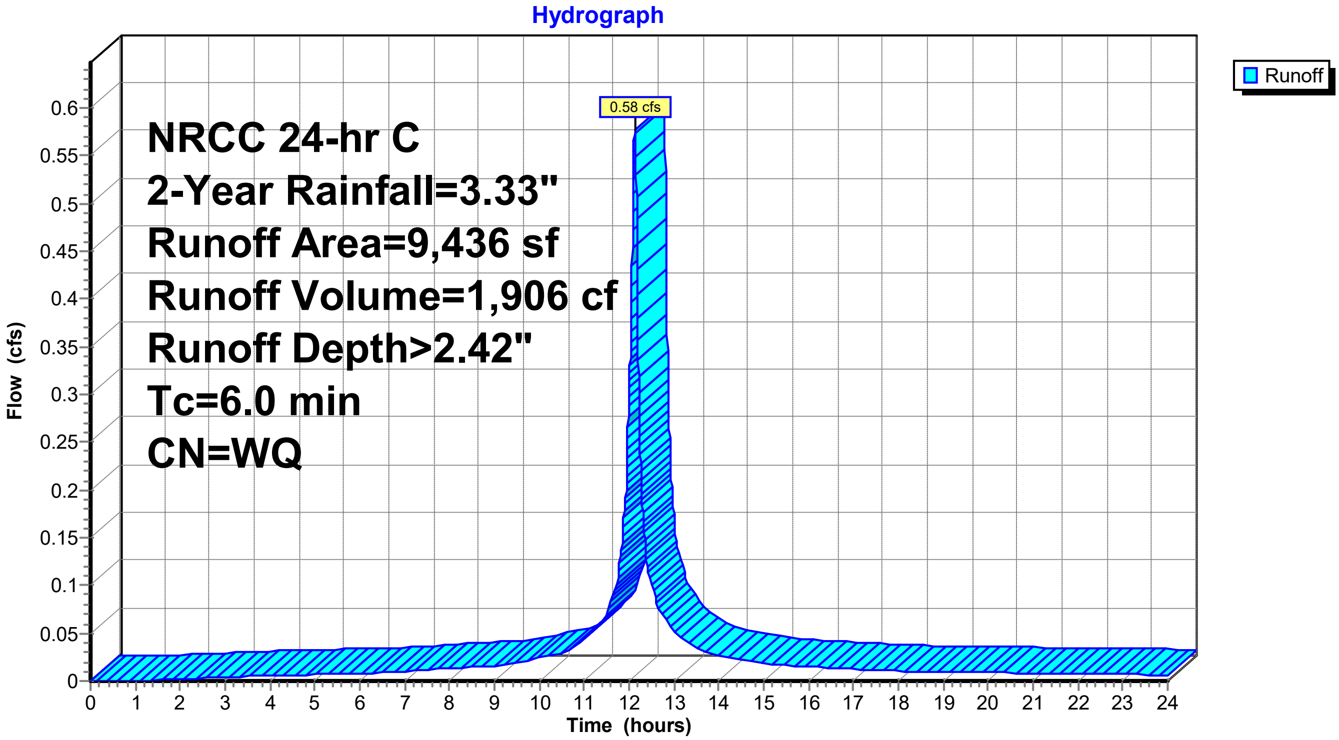
Runoff = 0.58 cfs @ 12.13 hrs, Volume= 1,906 cf, Depth> 2.42"
Routed to Pond FP-1 : FP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
7,393	98	Paved parking, HSG A
2,043	39	>75% Grass cover, Good, HSG A
9,436		Weighted Average
2,043	39	21.65% Pervious Area
7,393	98	78.35% Impervious Area

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

Subcatchment SCA-13:



Summary for Subcatchment SCA-14:

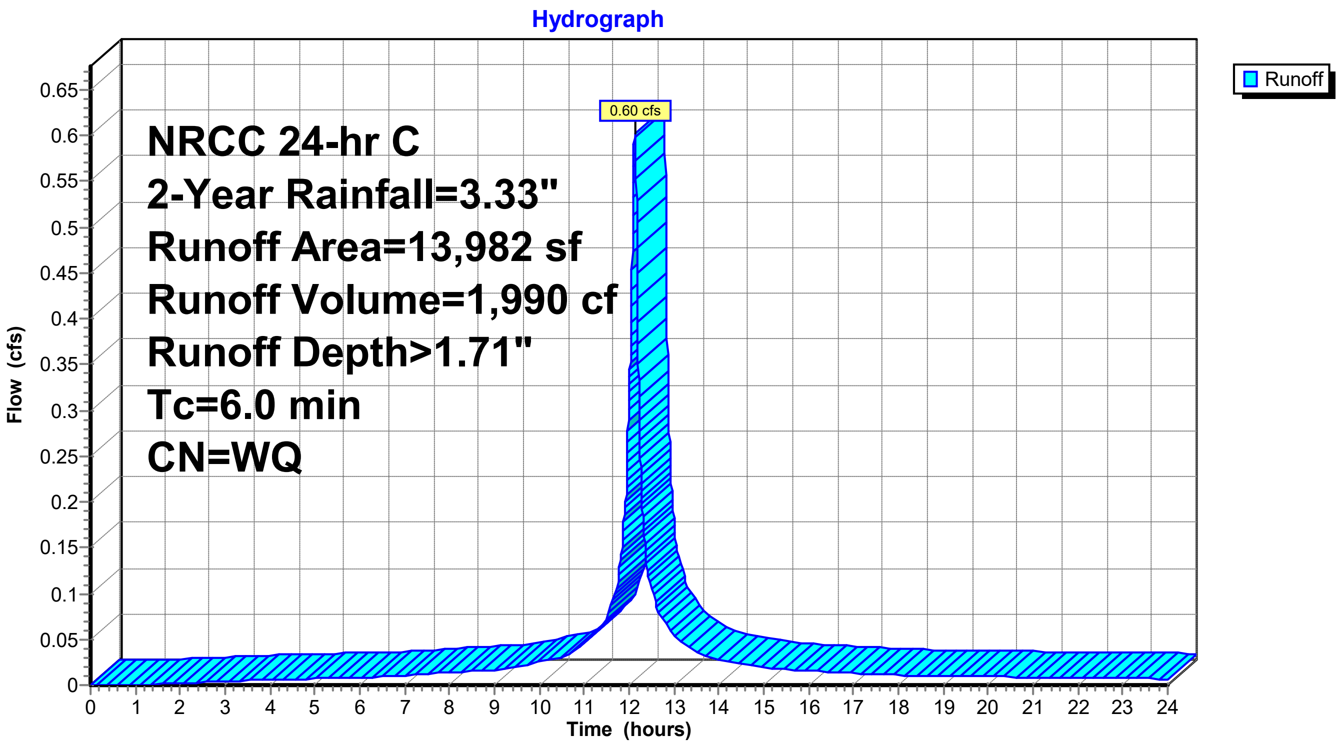
Runoff = 0.60 cfs @ 12.13 hrs, Volume= 1,990 cf, Depth> 1.71"
Routed to Pond CB-6B,C : CB-6B,6C

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
7,717	98	Paved parking, HSG A
3,829	39	>75% Grass cover, Good, HSG A
2,436	30	Woods, Good, HSG A
13,982		Weighted Average
6,265	36	44.81% Pervious Area
7,717	98	55.19% Impervious Area

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

Subcatchment SCA-14:



Summary for Subcatchment SCA-16:

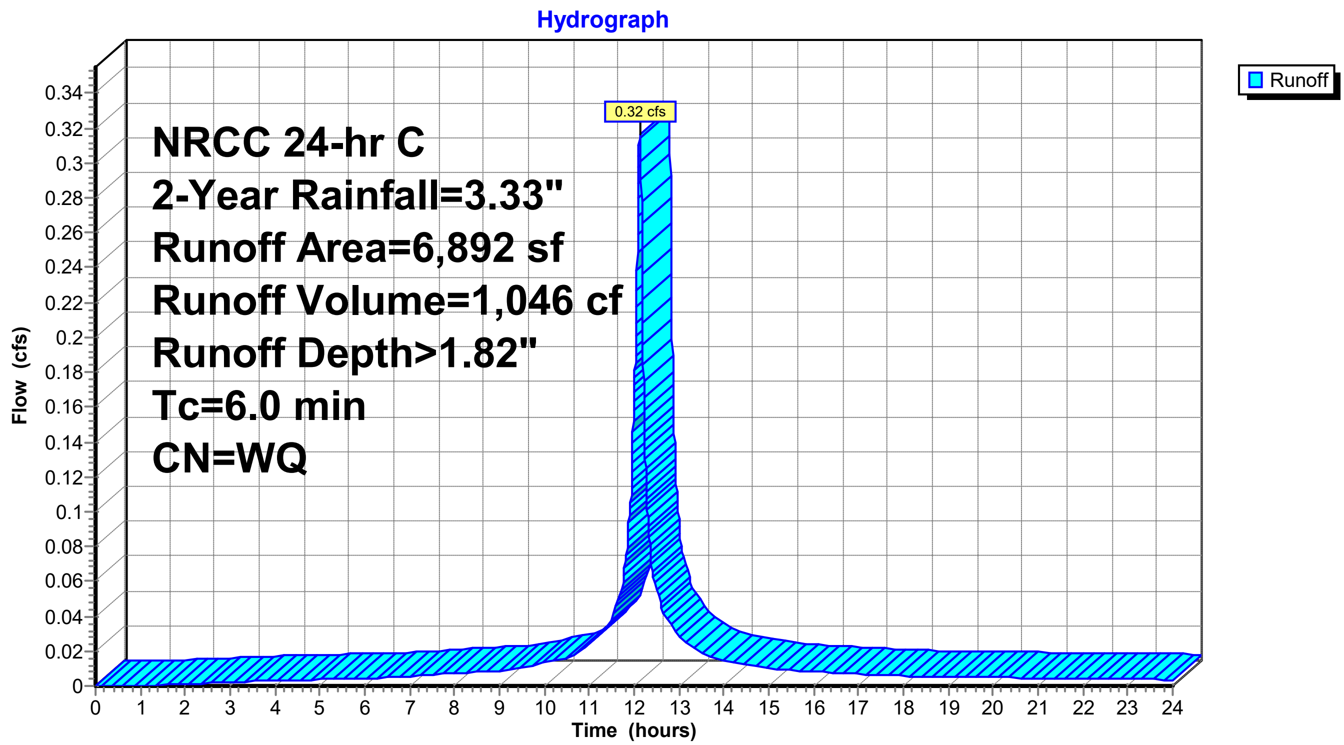
Runoff = 0.32 cfs @ 12.13 hrs, Volume= 1,046 cf, Depth> 1.82"
Routed to Pond CB-2B : CB 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
4,055	98	Paved parking, HSG A
2,837	39	>75% Grass cover, Good, HSG A
6,892		Weighted Average
2,837	39	41.16% Pervious Area
4,055	98	58.84% Impervious Area

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

Subcatchment SCA-16:



Summary for Subcatchment SCA-17:

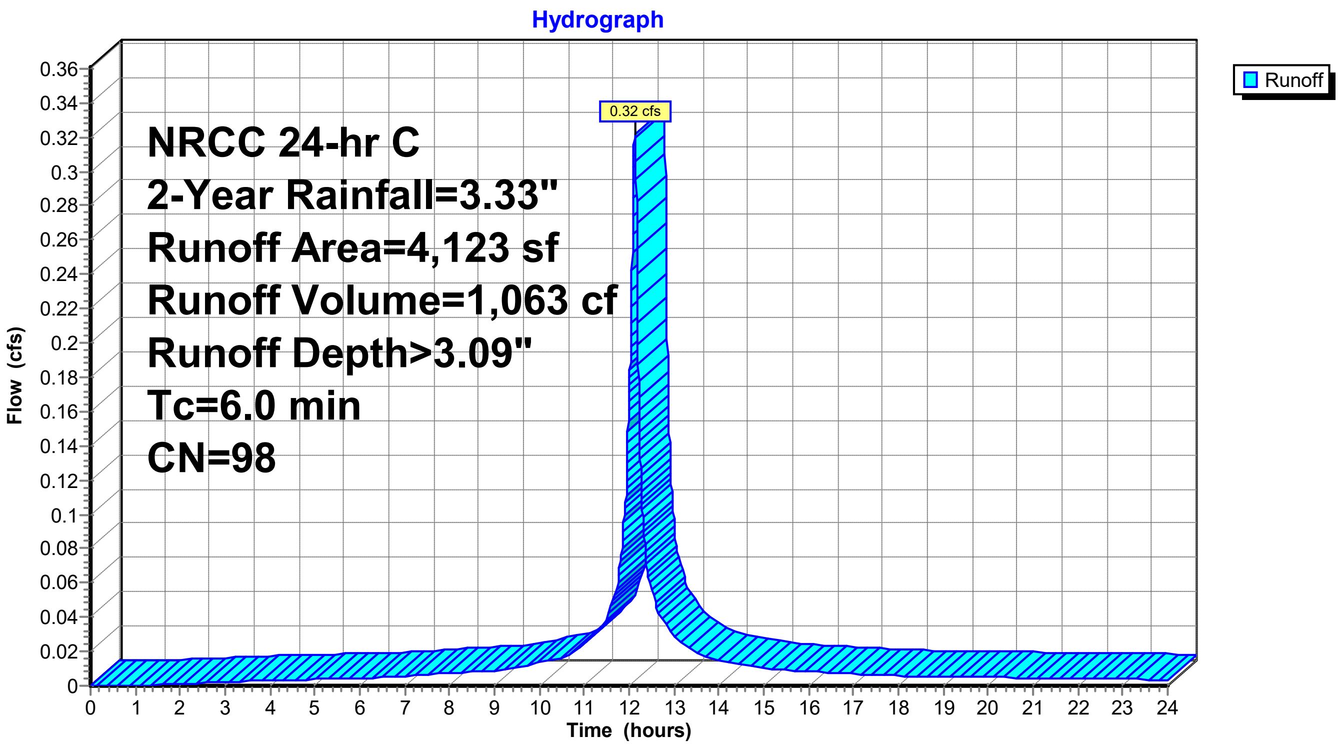
Runoff = 0.32 cfs @ 12.13 hrs, Volume= 1,063 cf, Depth> 3.09"
Routed to Pond CB-2A : CB 2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
4,123	98	Paved parking, HSG A
4,123	98	100.00% Impervious Area

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

Subcatchment SCA-17:



Summary for Subcatchment SCA-18:

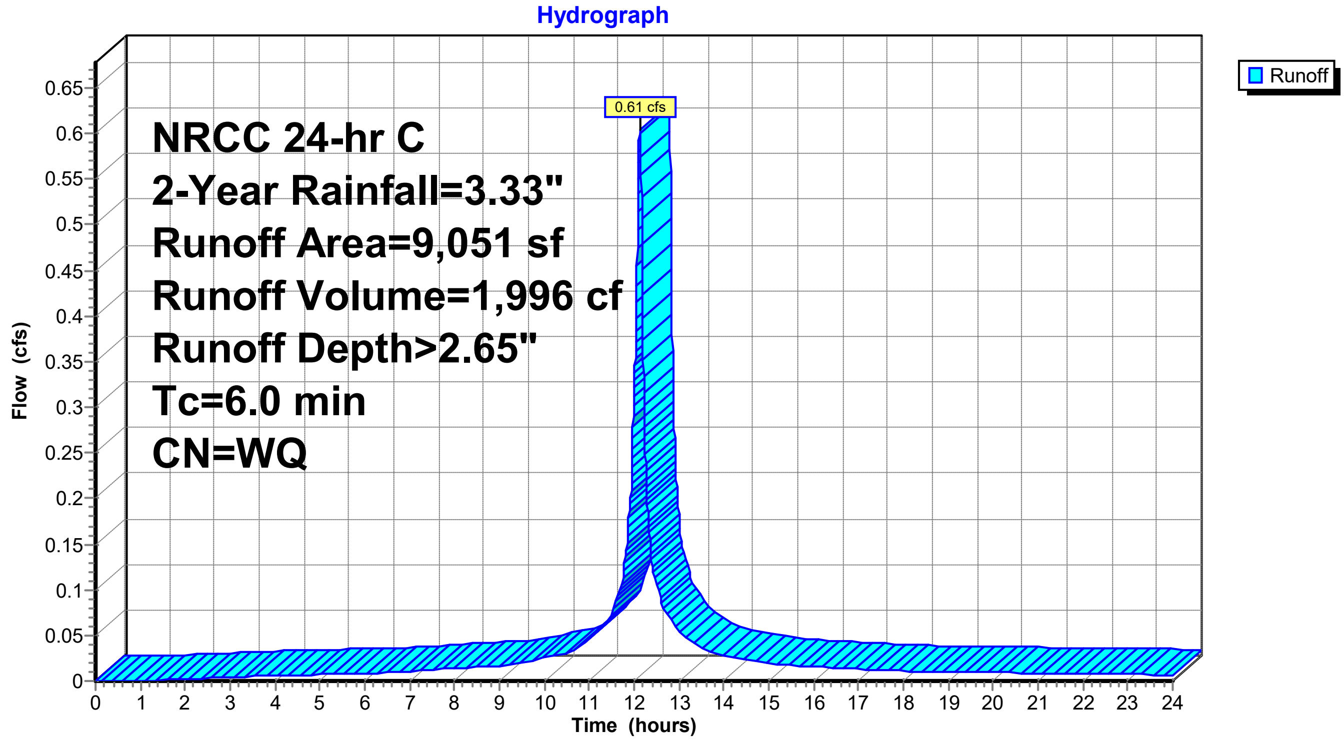
Runoff = 0.61 cfs @ 12.13 hrs, Volume= 1,996 cf, Depth> 2.65"
Routed to Pond CB-7 : CB-7

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
7,743	98	Paved parking, HSG A
1,308	39	>75% Grass cover, Good, HSG A
9,051		Weighted Average
1,308	39	14.45% Pervious Area
7,743	98	85.55% Impervious Area

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

Subcatchment SCA-18:



Summary for Subcatchment SCA-19:

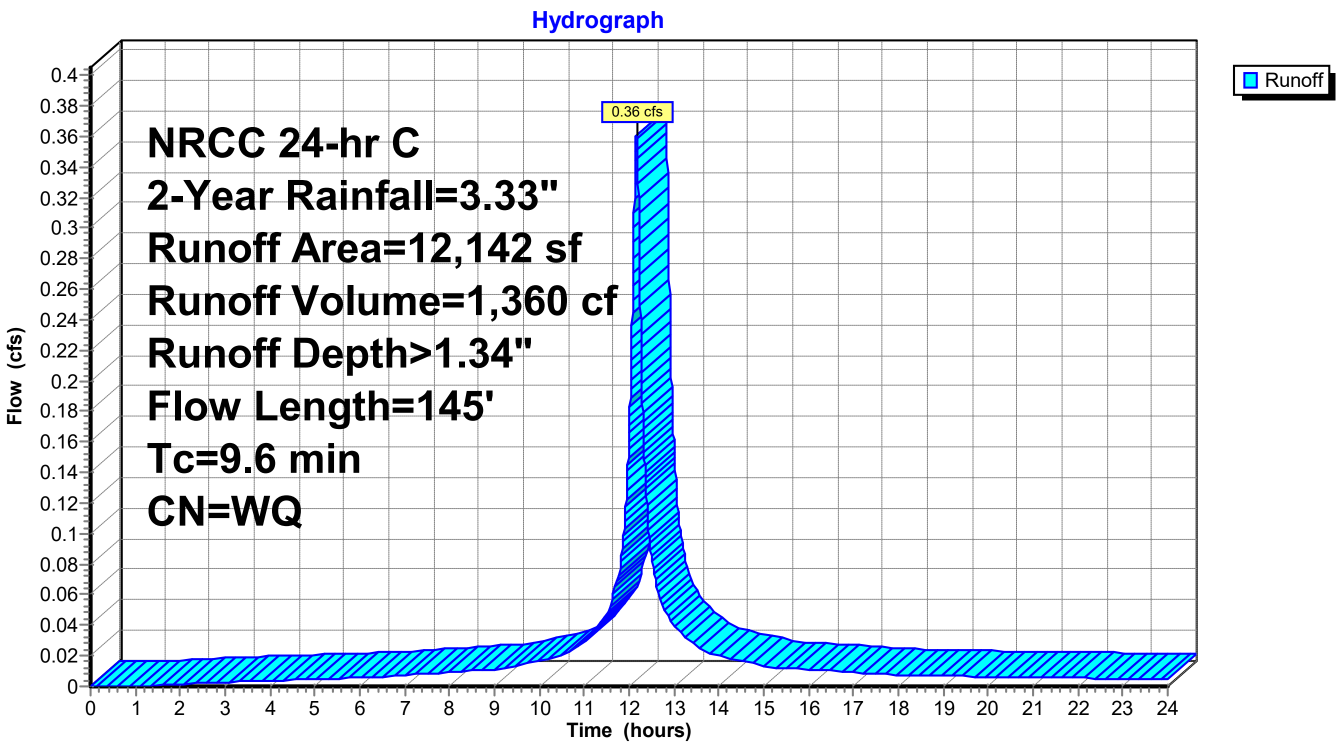
Runoff = 0.36 cfs @ 12.17 hrs, Volume= 1,360 cf, Depth> 1.34"
Routed to Pond CB-6A : CB-6A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
5,280	98	Paved parking, HSG A
5,968	32	Woods/grass comb., Good, HSG A
894	39	>75% Grass cover, Good, HSG A
12,142		Weighted Average
6,862	33	56.51% Pervious Area
5,280	98	43.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	50	0.0500	0.10		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.35"
1.0	70	0.0600	1.22		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.2	25	0.0100	2.03		**Shallow Concentrated Flow, Parking** Paved Kv= 20.3 fps
9.6	145	Total			

Subcatchment SCA-19:



Summary for Subcatchment SCA-2: LSA/FL

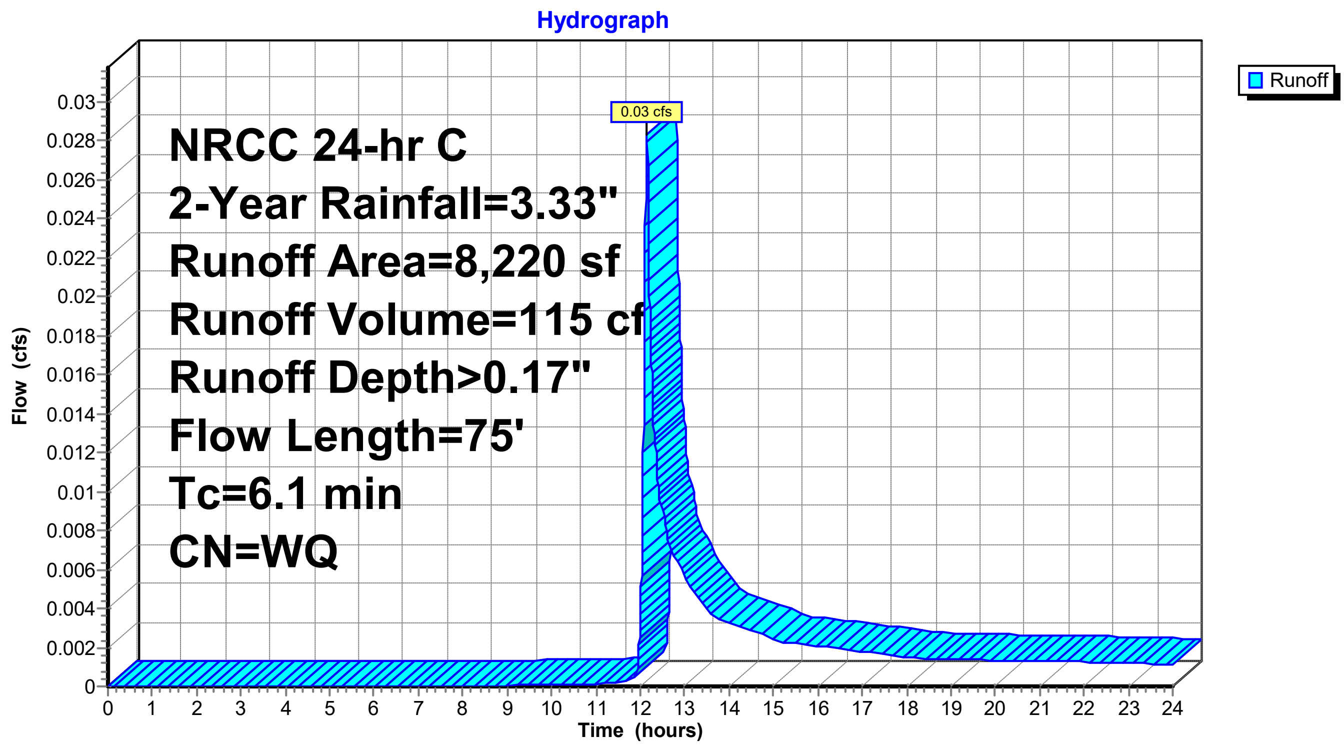
Runoff = 0.03 cfs @ 12.15 hrs, Volume= 115 cf, Depth> 0.17"
Routed to Pond INF-6 : INF-6

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

	Area (sf)	CN	Description
*	20	98	Cocncrete step
	5,345	39	>75% Grass cover, Good, HSG A
*	2,855	60	Stone Fire Lane
	8,220		Weighted Average
	8,200	46	99.76% Pervious Area
	20	98	0.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	35	0.0150	0.13		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.35"
1.4	20	0.0100	0.23		**Sheet Flow, Stone Fire Lane** Fallow n= 0.050 P2= 3.35"
0.1	20	0.1500	2.71		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
6.1	75	Total			

Subcatchment SCA-2: LSA/FL



Summary for Subcatchment SCA-4:

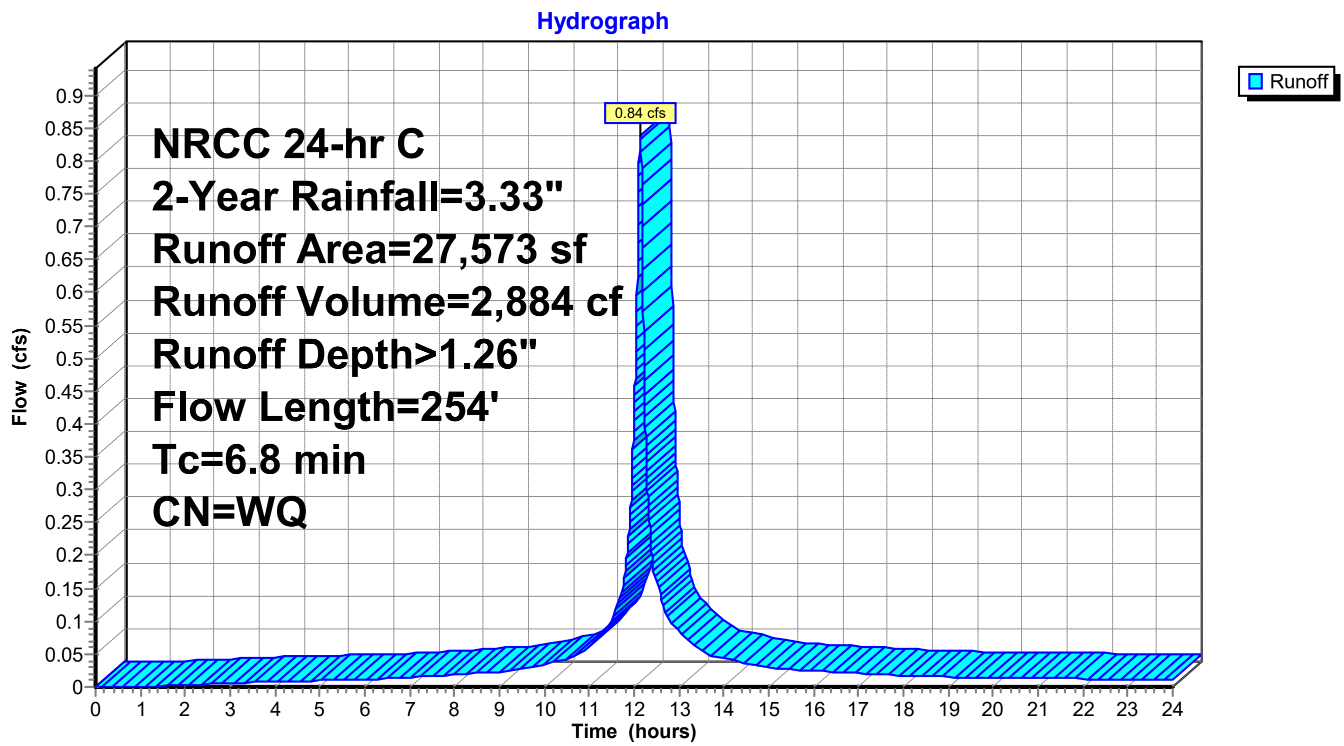
Runoff = 0.84 cfs @ 12.14 hrs, Volume= 2,884 cf, Depth> 1.26"
Routed to Pond CB-4 : CB-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

	Area (sf)	CN	Description
	10,454	98	Paved parking, HSG A
	8,808	39	>75% Grass cover, Good, HSG A
	4,820	30	Woods, Good, HSG A
*	3,245	60	Stone Fire Lane
*	246	98	Shed Roof
	27,573		Weighted Average
	16,873	40	61.19% Pervious Area
	10,700	98	38.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	23	0.0100	0.10		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.35"
2.3	158	0.0050	1.14		**Shallow Concentrated Flow, Stone Fire Lane** Unpaved Kv= 16.1 fps
0.6	73	0.0100	2.03		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
6.8	254	Total			

Subcatchment SCA-4:



Summary for Subcatchment SCA-5:

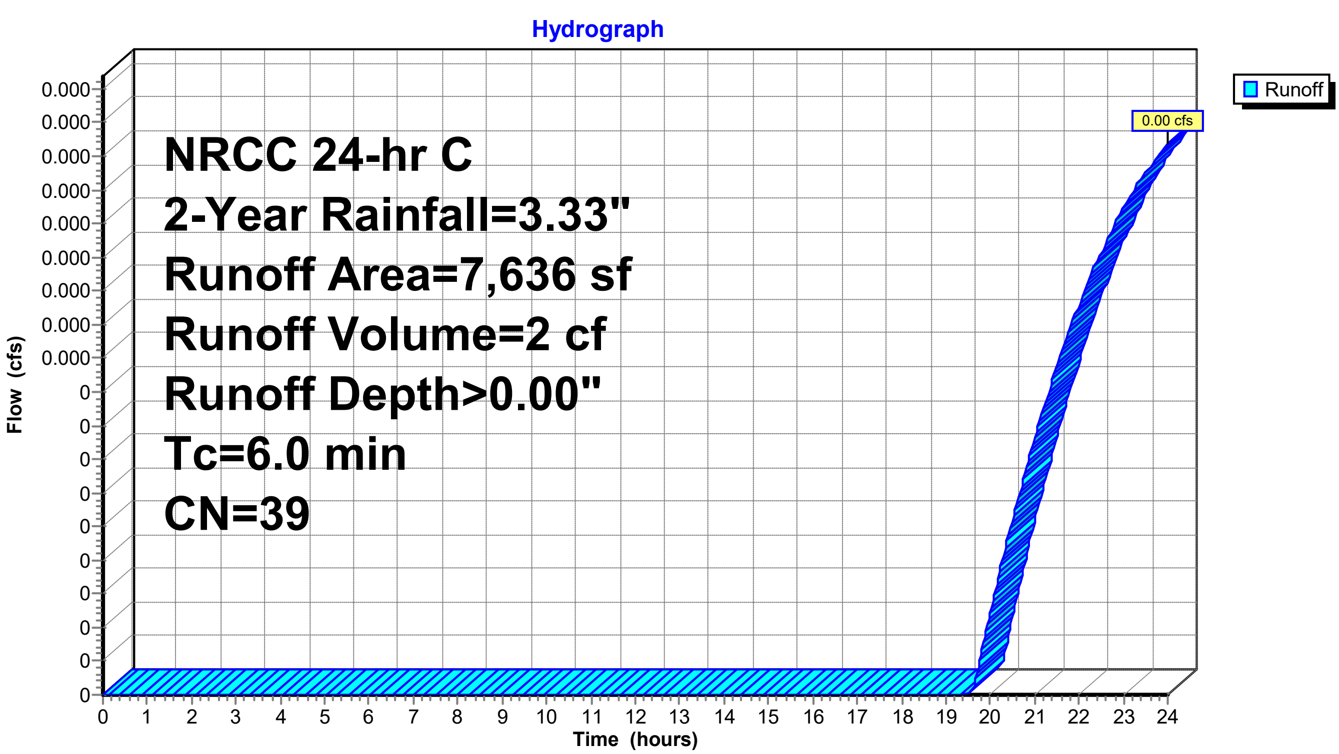
Runoff = 0.00 cfs @ 24.00 hrs, Volume= 2 cf, Depth> 0.00"
Routed to Pond FP-7 : FP-7/INF-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
7,636	39	>75% Grass cover, Good, HSG A
7,636	39	100.00% Pervious Area

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

Subcatchment SCA-5:



Summary for Subcatchment SCA-6.1:

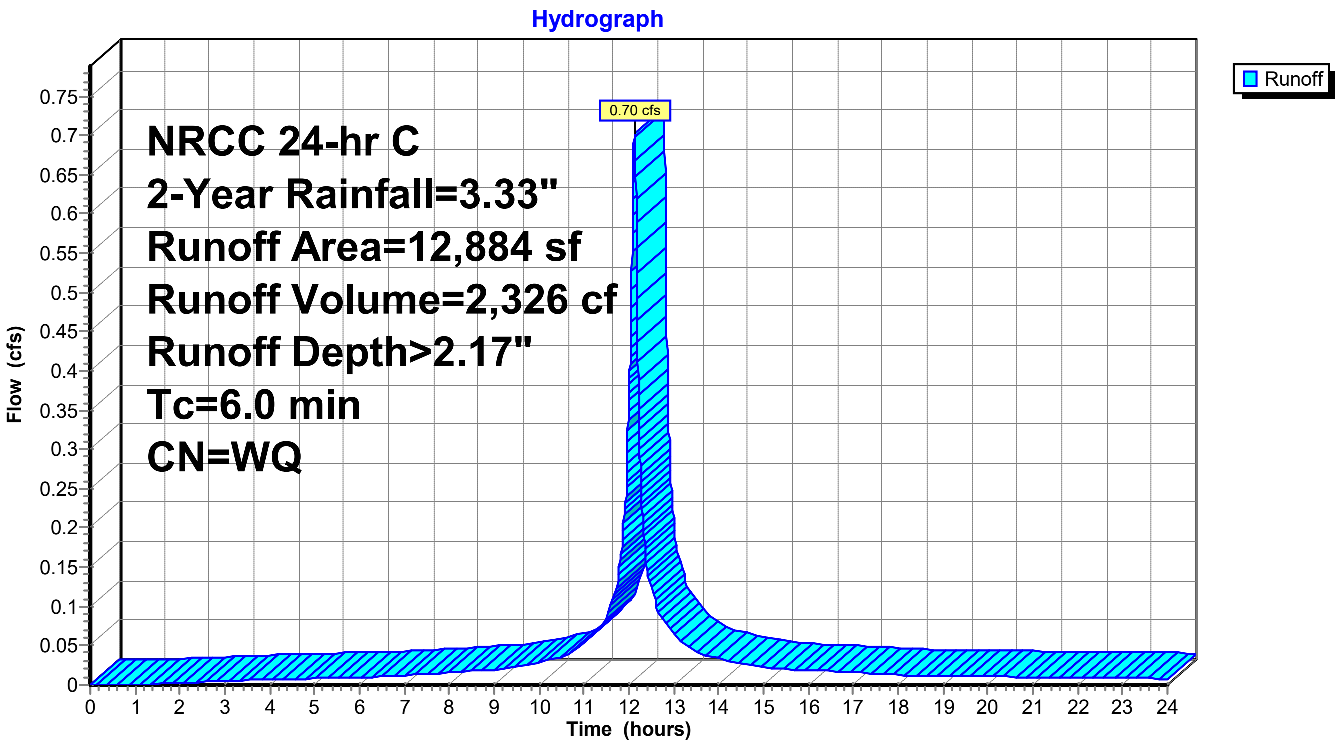
Runoff = 0.70 cfs @ 12.13 hrs, Volume= 2,326 cf, Depth> 2.17"
Routed to Pond CB-3 : CB-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

	Area (sf)	CN	Description
	8,965	98	Paved parking, HSG A
	3,559	39	>75% Grass cover, Good, HSG A
*	360	60	Fire Lane (FL)
	12,884		Weighted Average
	3,919	41	30.42% Pervious Area
	8,965	98	69.58% Impervious Area

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

Subcatchment SCA-6.1:



Summary for Subcatchment SCA-6.2:

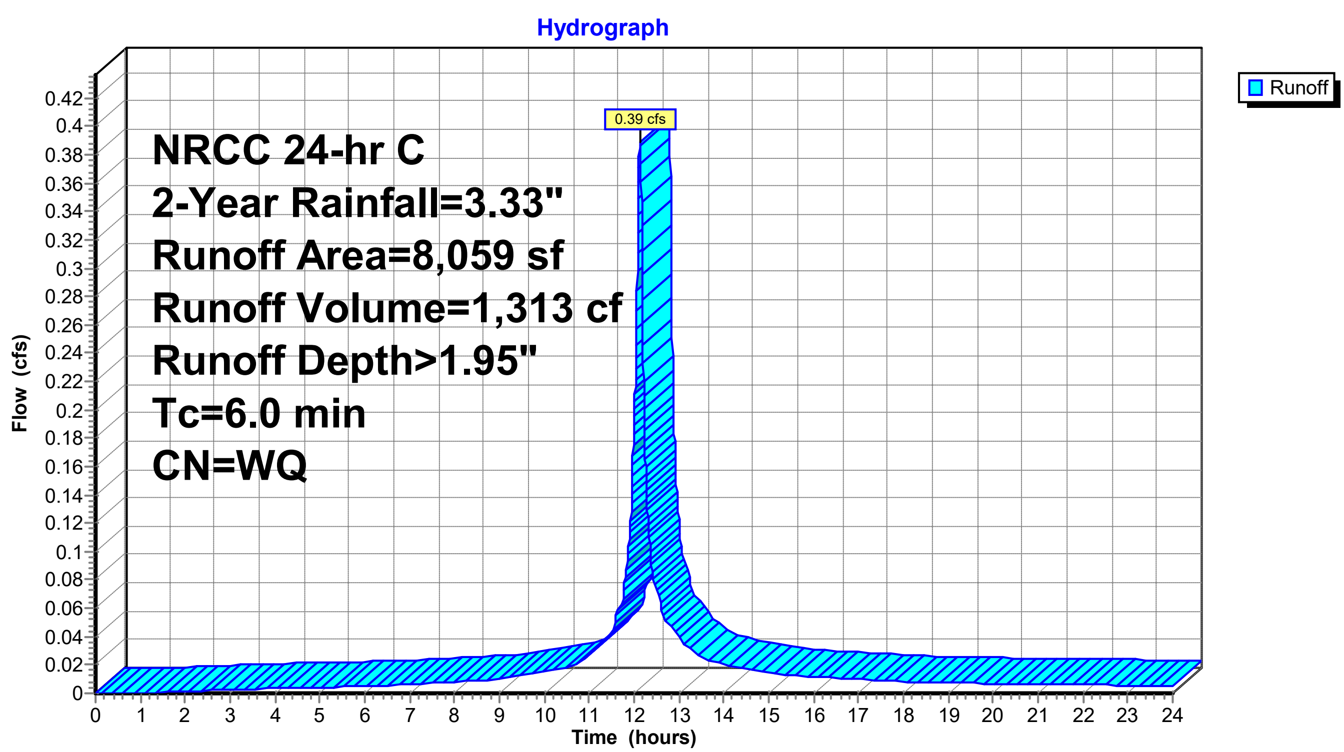
Runoff = 0.39 cfs @ 12.13 hrs, Volume= 1,313 cf, Depth> 1.95"
Routed to Pond FP-3 : FP-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

	Area (sf)	CN	Description
*	3,130	60	Permeable Pavers (PP)
	3,296	98	Paved roads w/curbs & sewers, HSG A
*	1,331	98	Canopy (CP)
	302	39	>75% Grass cover, Good, HSG A
	8,059		Weighted Average
	3,432	58	42.59% Pervious Area
	4,627	98	57.41% Impervious Area

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

Subcatchment SCA-6.2:



Summary for Subcatchment SCA-7:

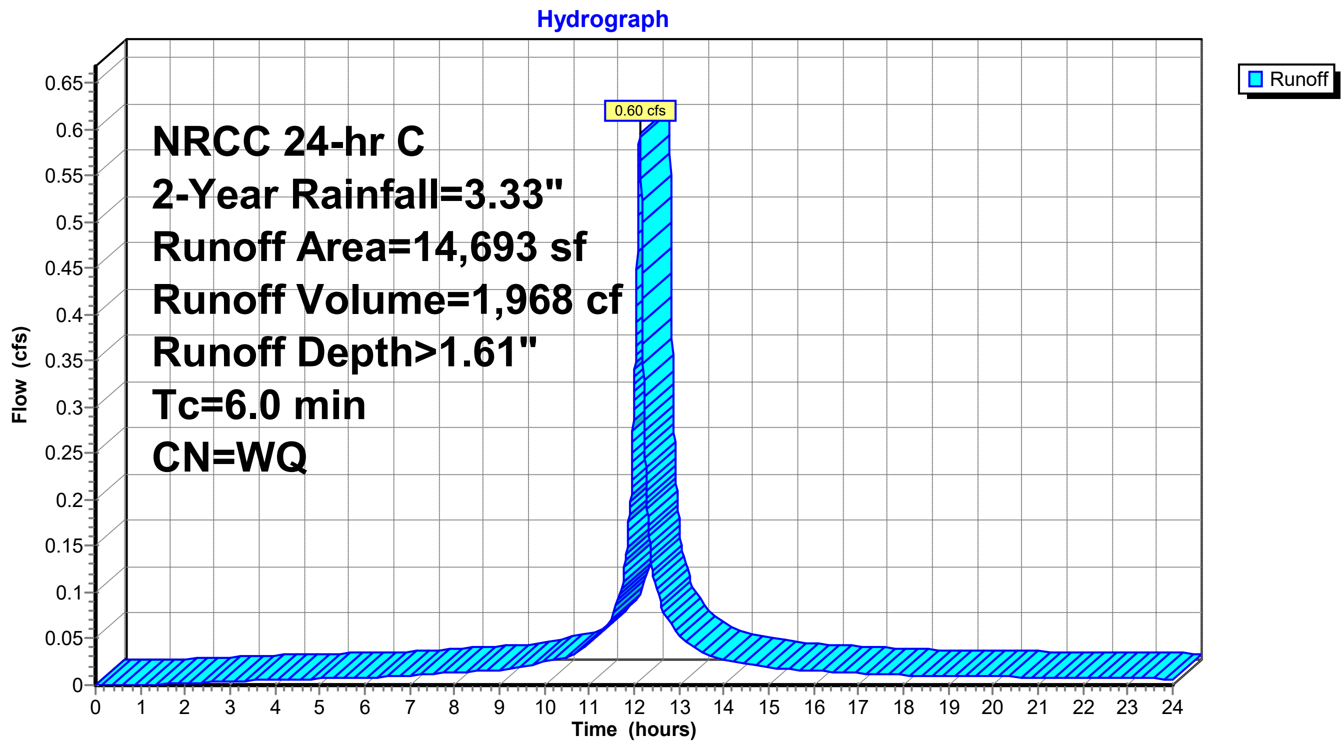
Runoff = 0.60 cfs @ 12.13 hrs, Volume= 1,968 cf, Depth> 1.61"
Routed to Pond FP-6 : FP-6

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
7,630	98	Paved parking, HSG A
5,346	39	>75% Grass cover, Good, HSG A
1,717	32	Woods/grass comb., Good, HSG A
14,693		Weighted Average
7,063	37	48.07% Pervious Area
7,630	98	51.93% Impervious Area

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

Subcatchment SCA-7:



Summary for Subcatchment SCA-8:

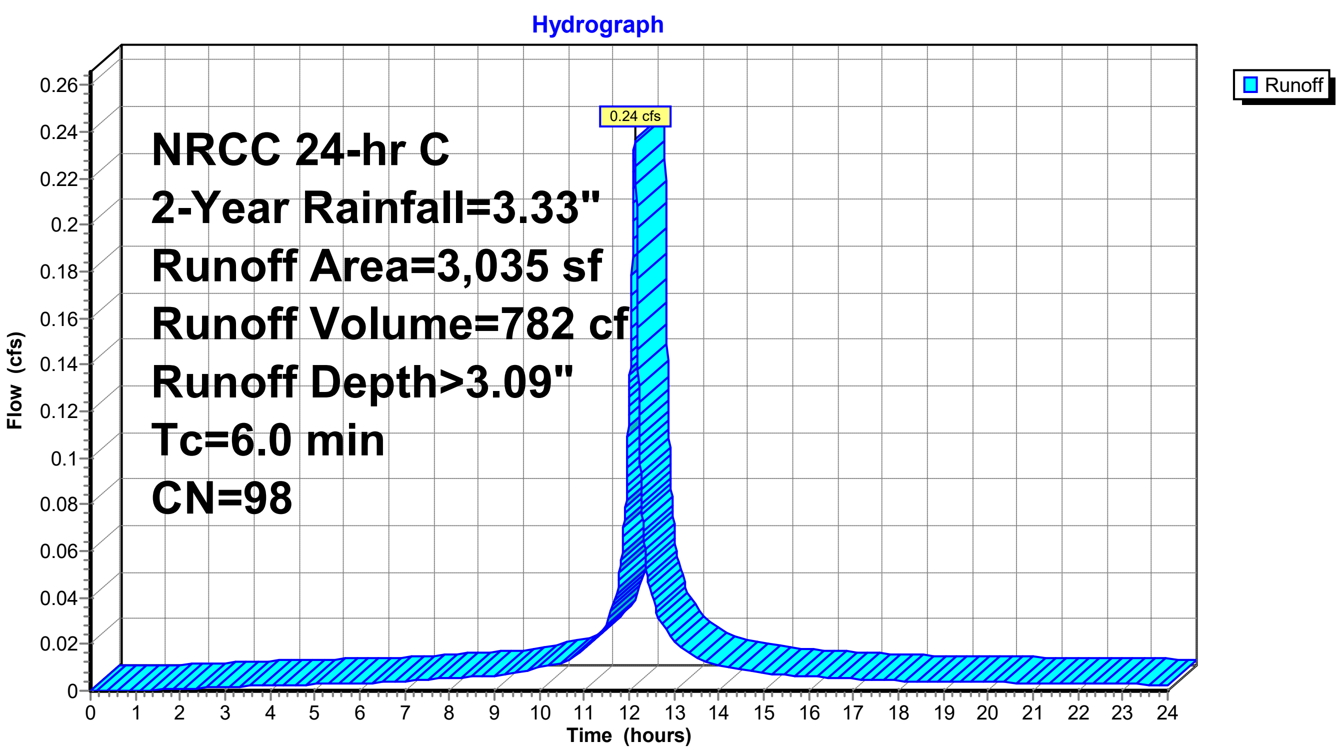
Runoff = 0.24 cfs @ 12.13 hrs, Volume= 782 cf, Depth> 3.09"
Routed to Pond FP-1 : FP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
3,035	98	Paved parking, HSG A
3,035	98	100.00% Impervious Area

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

Subcatchment SCA-8:



Summary for Subcatchment SCA-9:

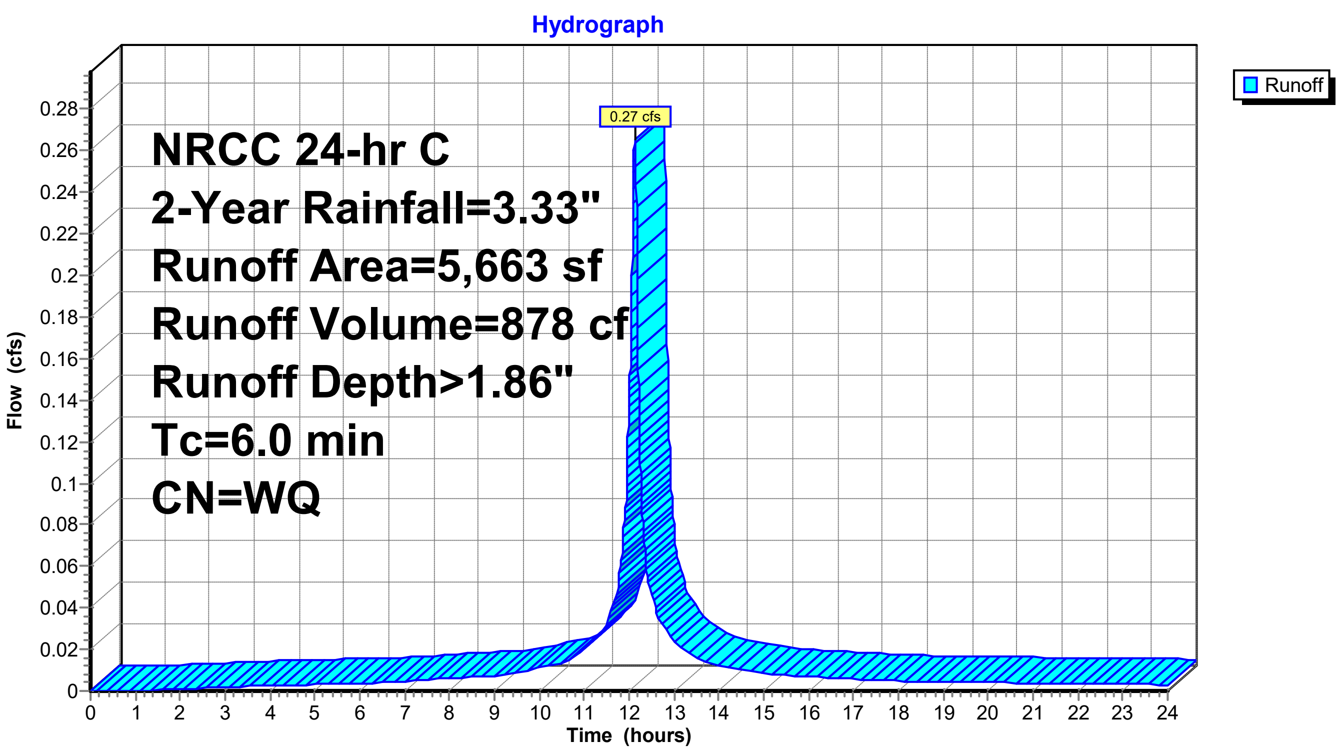
Runoff = 0.27 cfs @ 12.13 hrs, Volume= 878 cf, Depth> 1.86"
Routed to Pond FP-3 : FP-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
3,403	98	Paved parking, HSG A
2,260	39	>75% Grass cover, Good, HSG A
5,663		Weighted Average
2,260	39	39.91% Pervious Area
3,403	98	60.09% Impervious Area

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

Subcatchment SCA-9:



Summary for Subcatchment UC-1: NA

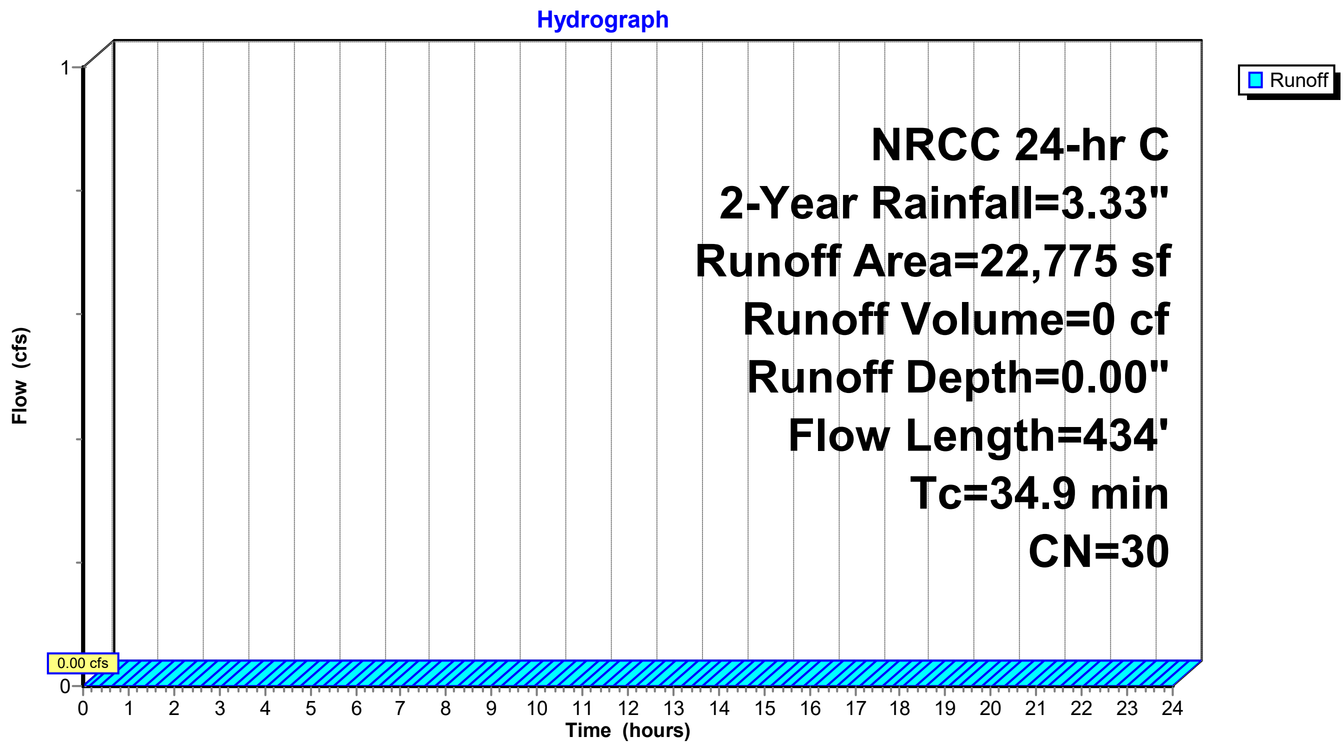
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Pond SP 1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
22,775	30	Woods, Good, HSG A
22,775	30	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.2	100	0.0250	0.09		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
15.7	334	0.0050	0.35		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
34.9	434	Total			

Subcatchment UC-1: NA



Summary for Subcatchment UC-2:

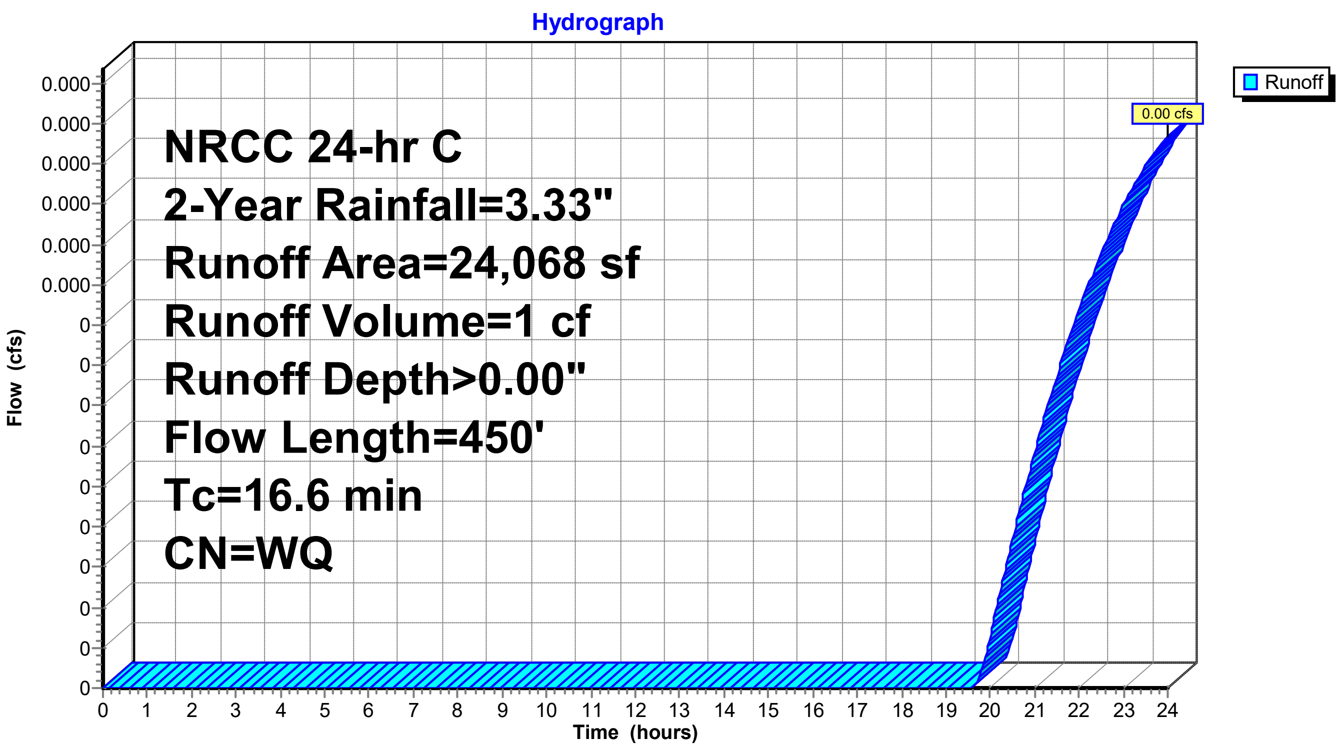
Runoff = 0.00 cfs @ 24.00 hrs, Volume= 1 cf, Depth> 0.00"
Routed to Pond SP 3 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
17,559	30	Woods, Good, HSG A
6,509	39	>75% Grass cover, Good, HSG A
24,068		Weighted Average
24,068	32	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	50	0.0590	0.11		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
6.6	199	0.0100	0.50		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
2.2	201	0.0100	1.50		**Shallow Concentrated Flow, SWALE** Grassed Waterway Kv= 15.0 fps
16.6	450	Total			

Subcatchment UC-2:



Summary for Subcatchment UC-3:

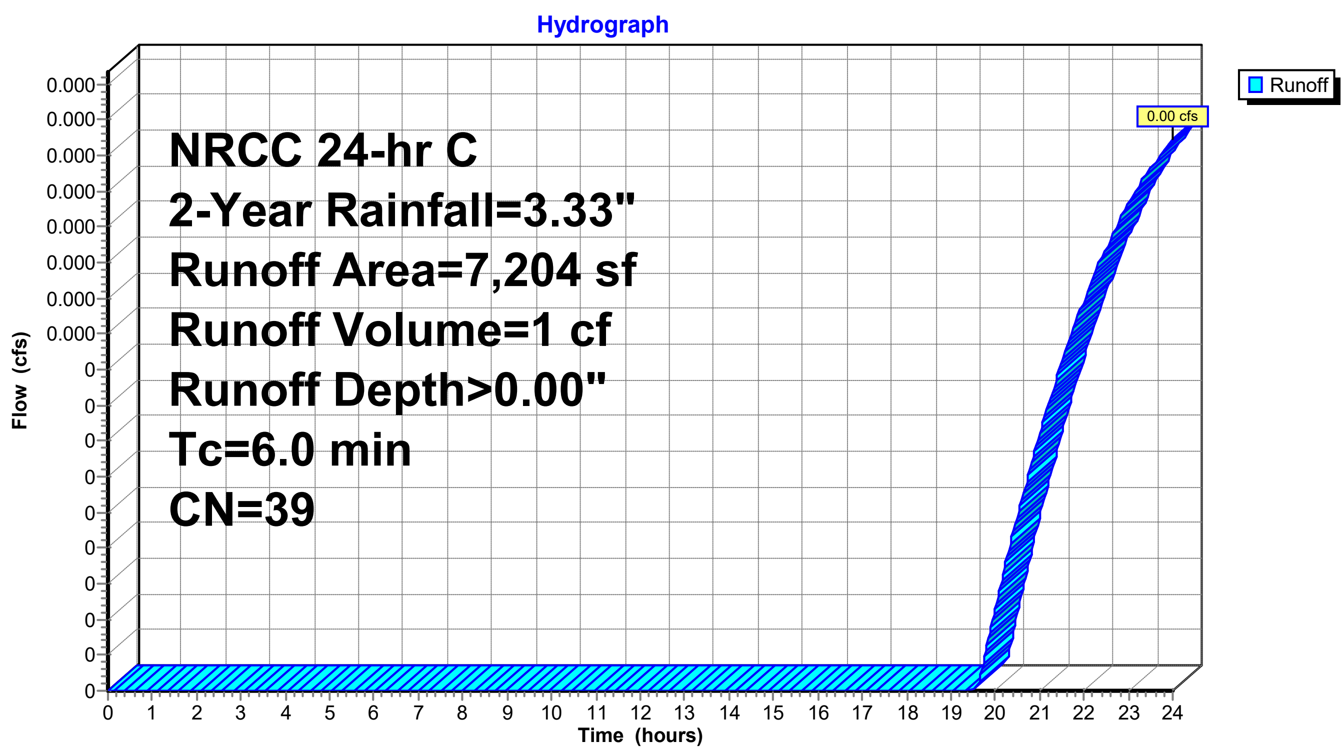
Runoff = 0.00 cfs @ 24.00 hrs, Volume= 1 cf, Depth> 0.00"
Routed to Pond AB-1 : Attenuation Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
7,204	39	>75% Grass cover, Good, HSG A
7,204	39	100.00% Pervious Area

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

Subcatchment UC-3:



Summary for Subcatchment UC-4:

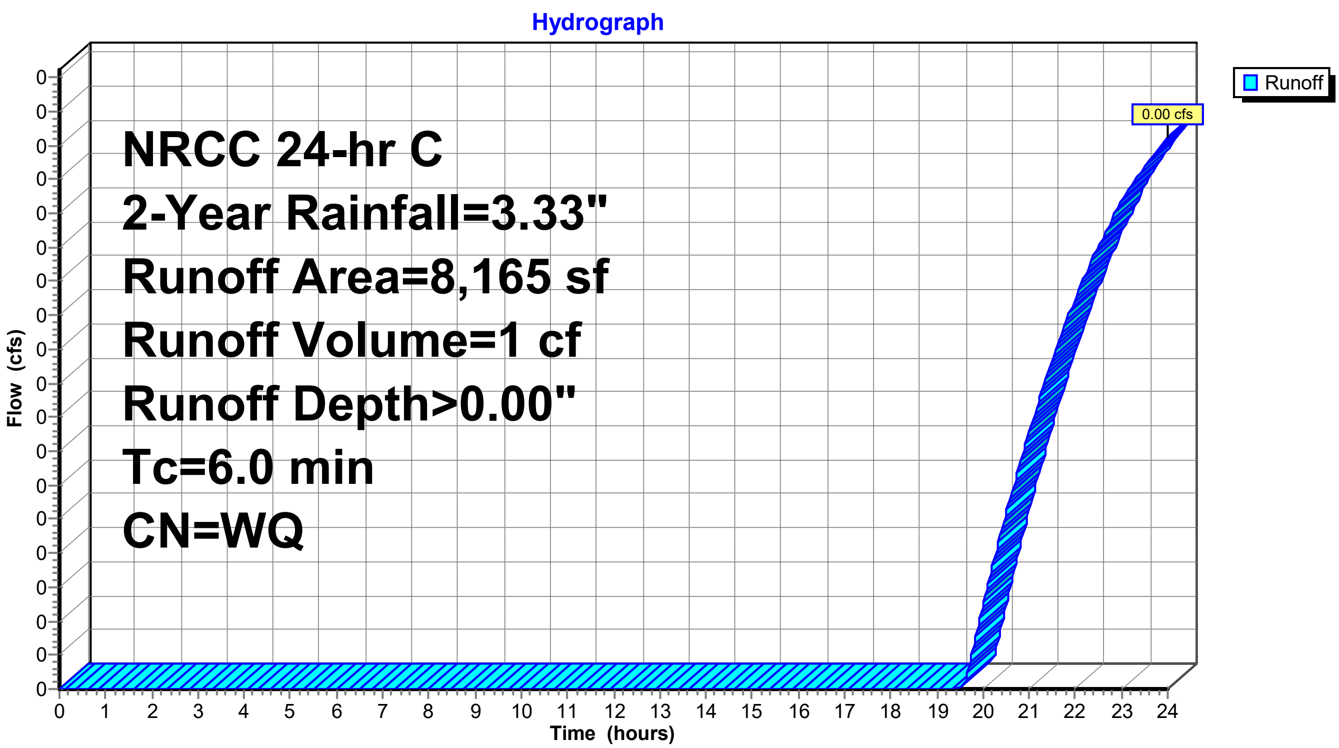
Runoff = 0.00 cfs @ 24.00 hrs, Volume= 1 cf, Depth> 0.00"
Routed to Pond SP 4 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
3,787	39	>75% Grass cover, Good, HSG A
4,378	30	Woods, Good, HSG A
8,165		Weighted Average
8,165	34	100.00% Pervious Area

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

Subcatchment UC-4:



Summary for Subcatchment UC-5:

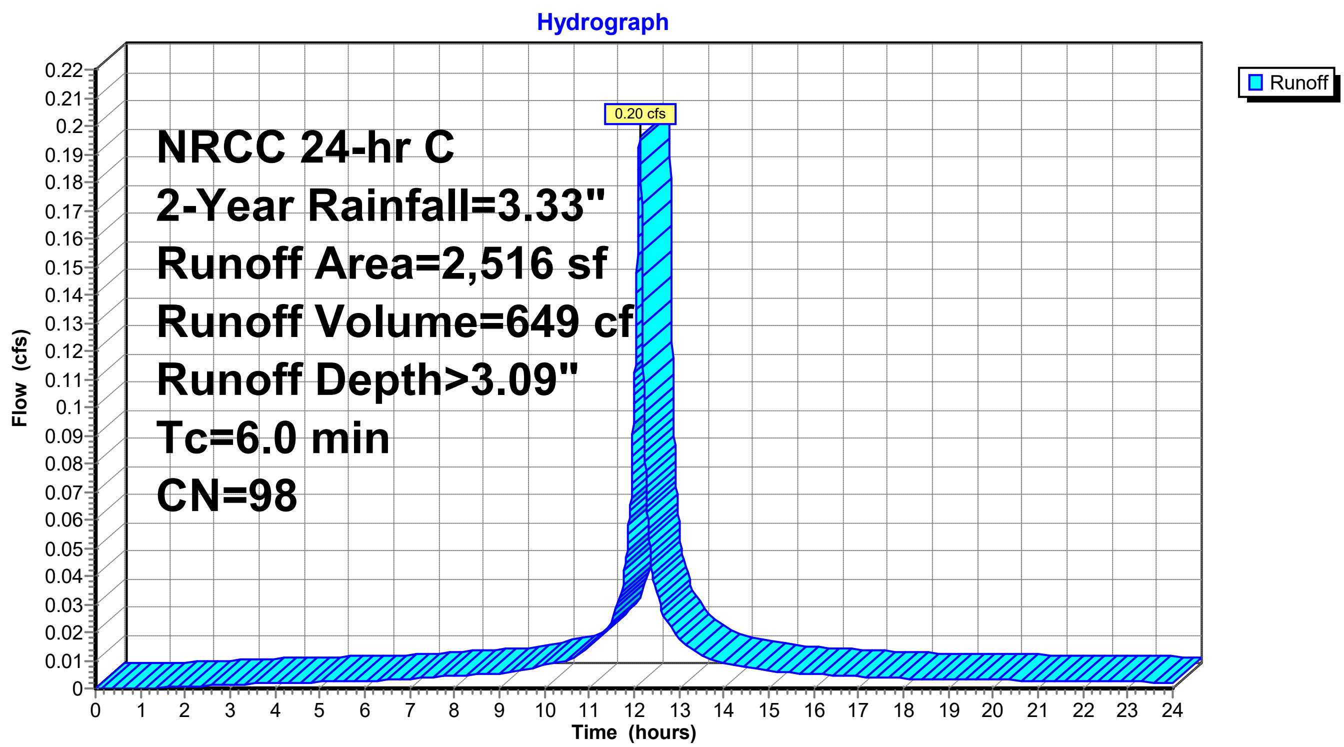
Runoff = 0.20 cfs @ 12.13 hrs, Volume= 649 cf, Depth> 3.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
2,516	98	Paved parking, HSG A
2,516	98	100.00% Impervious Area

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

Subcatchment UC-5:



Summary for Subcatchment UC-6: NA

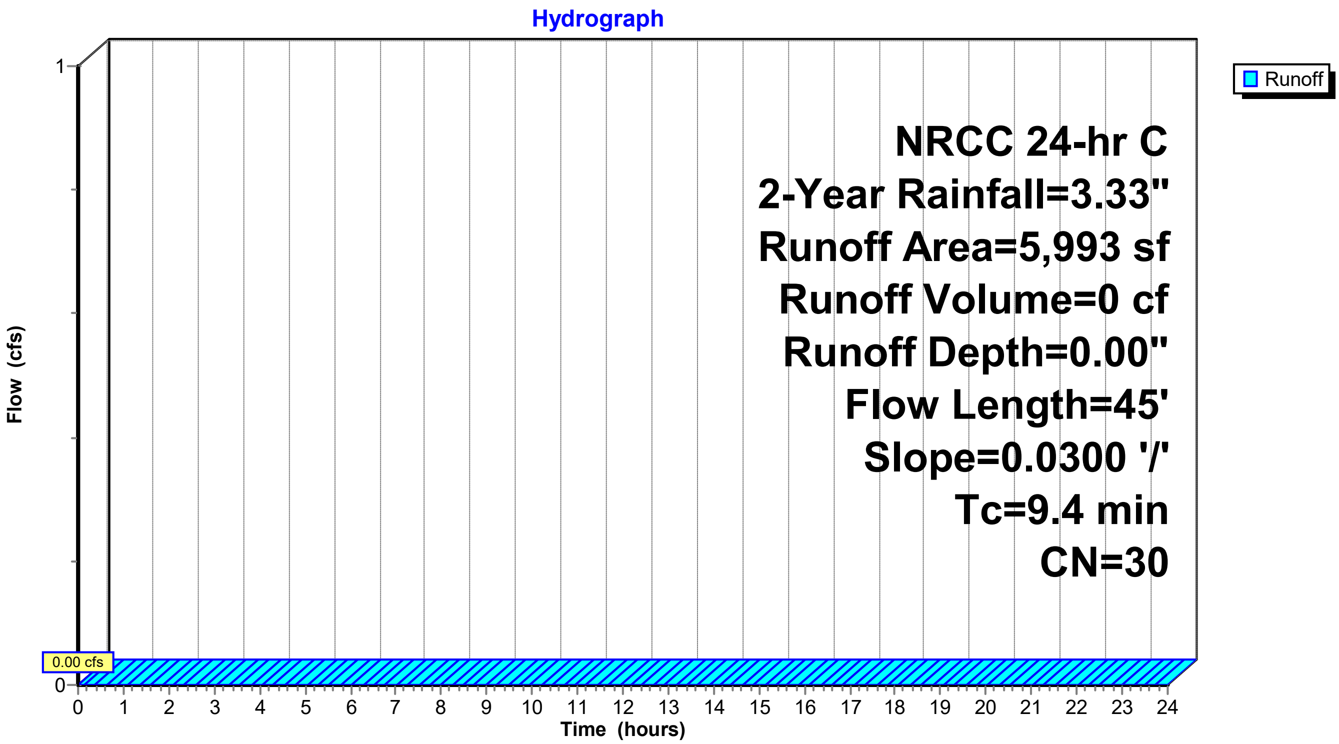
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Pond SP-2 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 2-Year Rainfall=3.33"

Area (sf)	CN	Description
5,993	30	Woods, Good, HSG A
5,993	30	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	45	0.0300	0.08		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"

Subcatchment UC-6: NA



Summary for Pond AB-1: Attenuation Basin

Inflow Area = 7,204 sf, 0.00% Impervious, Inflow Depth > 0.00" for 2-Year event
Inflow = 0.00 cfs @ 24.00 hrs, Volume= 1 cf
Outflow = 0.00 cfs @ 24.00 hrs, Volume= 0 cf, Atten= 96%, Lag= 0.0 min
Discarded = 0.00 cfs @ 24.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond SP 4 : Study Point

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 49.00' @ 24.00 hrs Surf.Area= 766 sf Storage= 1 cf

Plug-Flow detention time= 197.1 min calculated for 0 cf (2% of inflow)
Center-of-Mass det. time= 48.2 min (1,391.9 - 1,343.7)

Volume	Invert	Avail.Storage	Storage Description
#1	49.00'	4,514 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

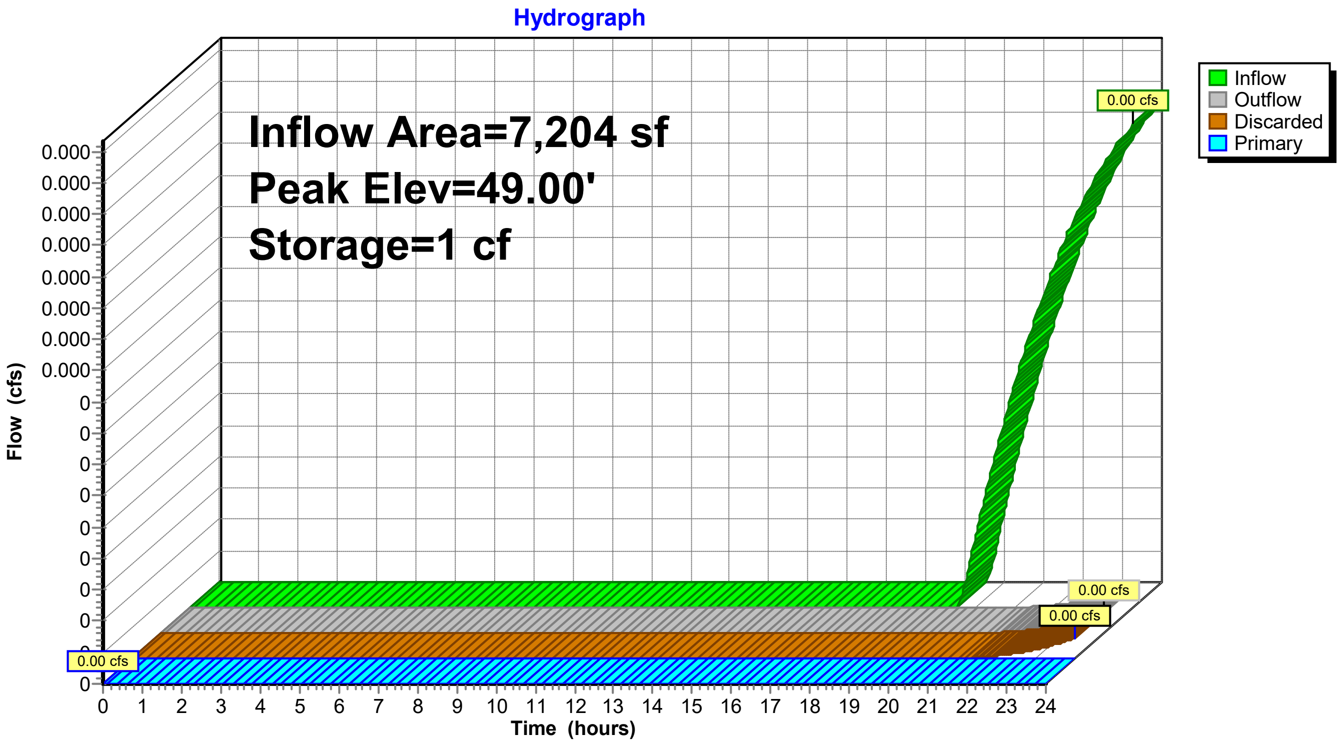
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
49.00	766	147.0	0	0	766
50.00	1,048	206.0	903	903	2,433
51.00	1,801	246.0	1,408	2,311	3,889
52.00	2,632	275.0	2,203	4,514	5,119

Device	Routing	Invert	Outlet Devices
#1	Primary	49.50'	**18.0" Round Culvert** L= 54.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 49.50' / 49.00' S= 0.0093 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	49.50'	**20.0 deg x 2.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.69 (C= 3.36)
#3	Device 1	51.75'	**28.0" x 28.0" Horiz. Bar Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	49.00'	**3.000 in/hr Exfiltration over Surface area from 49.00' - 50.00'** Excluded Surface area = 766 sf Phase-In= 0.01'

Discarded OutFlow Max=0.00 cfs @ 24.00 hrs HW=49.00' (Free Discharge)
└─**4=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.00' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  ├─**2=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)
  └─**3=Bar Grate** (Controls 0.00 cfs)

Pond AB-1: Attenuation Basin



Summary for Pond CB-2A: CB 2A

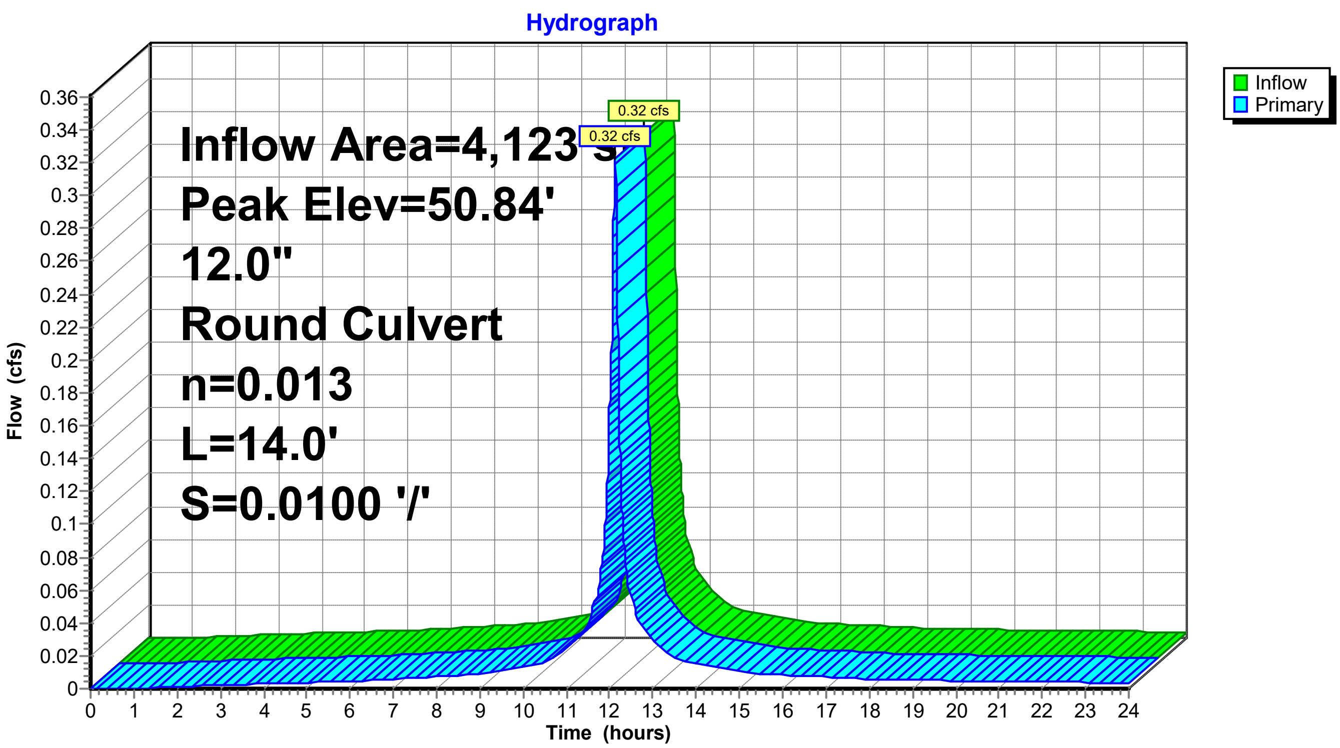
Inflow Area = 4,123 sf,100.00% Impervious, Inflow Depth > 3.09" for 2-Year event
Inflow = 0.32 cfs @ 12.13 hrs, Volume= 1,063 cf
Outflow = 0.32 cfs @ 12.13 hrs, Volume= 1,063 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.32 cfs @ 12.13 hrs, Volume= 1,063 cf
Routed to Pond DMH-2.2 : DMH-2.2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 50.84' @ 12.13 hrs
Flood Elev= 53.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	50.53'	**12.0" Round Culvert** L= 14.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.53' / 50.39' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.32 cfs @ 12.13 hrs HW=50.84' TW=50.55' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.32 cfs @ 2.30 fps)

Pond CB-2A: CB 2A



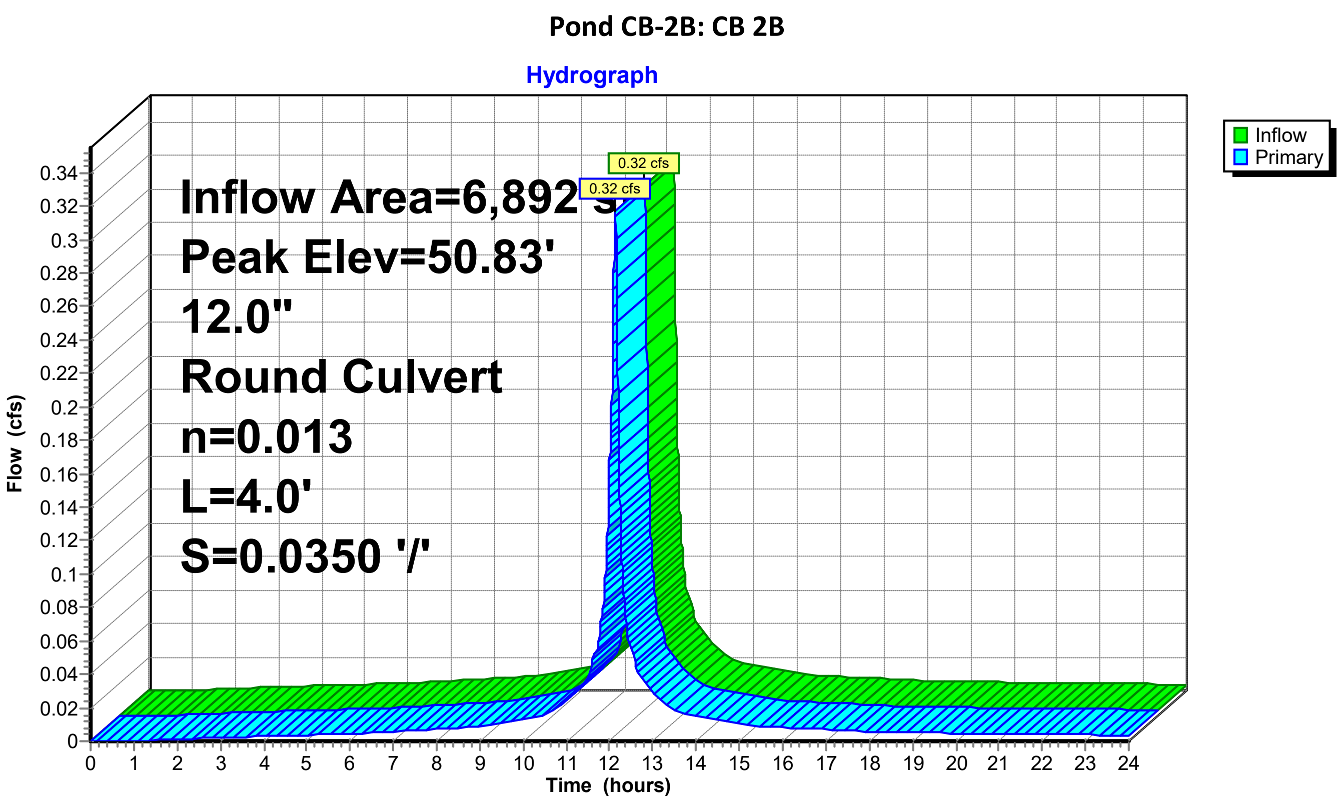
Summary for Pond CB-2B: CB 2B

Inflow Area = 6,892 sf, 58.84% Impervious, Inflow Depth > 1.82" for 2-Year event
Inflow = 0.32 cfs @ 12.13 hrs, Volume= 1,046 cf
Outflow = 0.32 cfs @ 12.13 hrs, Volume= 1,046 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.32 cfs @ 12.13 hrs, Volume= 1,046 cf
Routed to Pond DMH-2.2 : DMH-2.2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 50.83' @ 12.13 hrs
Flood Elev= 53.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	50.53'	**12.0" Round Culvert** L= 4.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.53' / 50.39' S= 0.0350 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.32 cfs @ 12.13 hrs HW=50.83' TW=50.55' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.32 cfs @ 1.63 fps)



Summary for Pond CB-3: CB-3

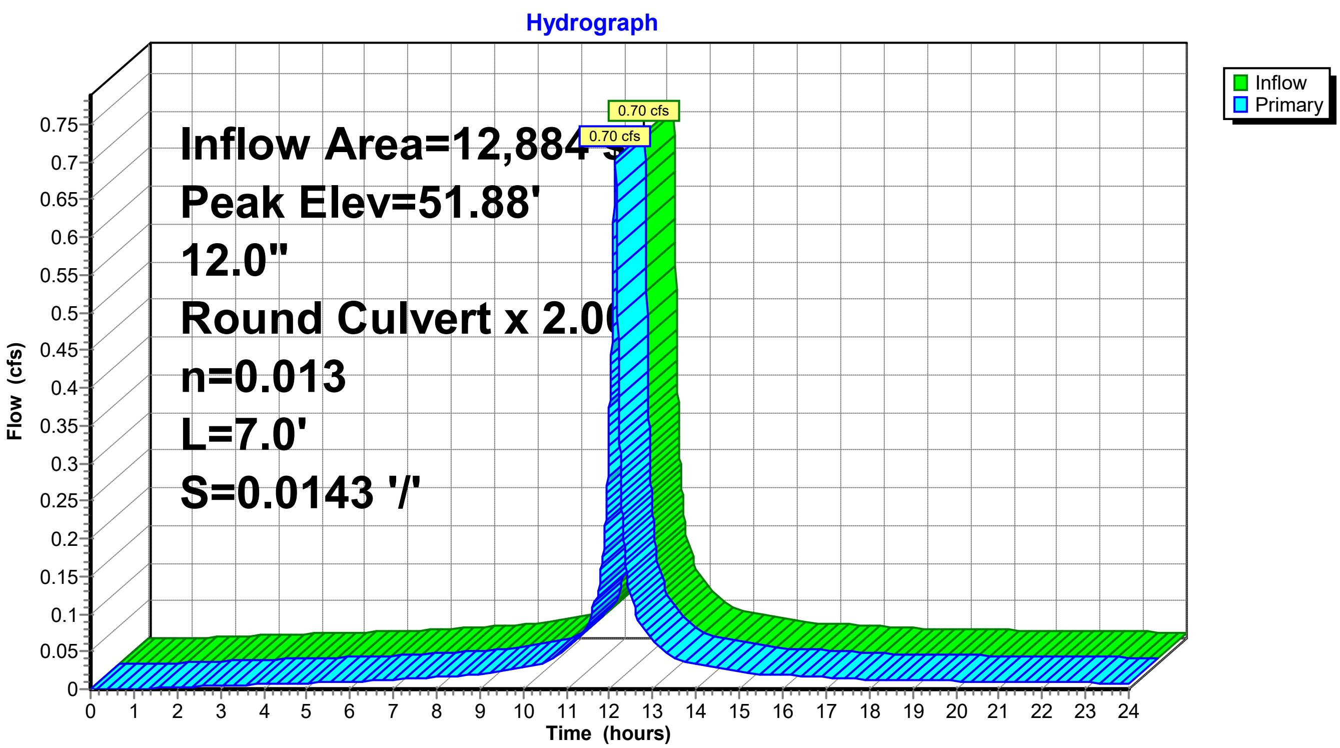
Inflow Area = 12,884 sf, 69.58% Impervious, Inflow Depth > 2.17" for 2-Year event
Inflow = 0.70 cfs @ 12.13 hrs, Volume= 2,326 cf
Outflow = 0.70 cfs @ 12.13 hrs, Volume= 2,326 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.70 cfs @ 12.13 hrs, Volume= 2,326 cf
Routed to Pond DMH-3 : DMH-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.88' @ 12.13 hrs
Flood Elev= 53.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.55'	**12.0" Round Culvert X 2.00** L= 7.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 51.55' / 51.45' S= 0.0143 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.70 cfs @ 12.13 hrs HW=51.88' TW=51.53' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.70 cfs @ 2.33 fps)

Pond CB-3: CB-3



Summary for Pond CB-4: CB-4

Inflow Area = 27,573 sf, 38.81% Impervious, Inflow Depth > 1.26" for 2-Year event
Inflow = 0.84 cfs @ 12.14 hrs, Volume= 2,884 cf
Outflow = 0.84 cfs @ 12.14 hrs, Volume= 2,884 cf, Atten= 0%, Lag= 0.2 min
Primary = 0.84 cfs @ 12.14 hrs, Volume= 2,884 cf
Routed to Pond DMH-9 : DMH-9 (bypass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 56.91' @ 12.14 hrs Surf.Area= 114 sf Storage= 3 cf
Flood Elev= 56.85' Surf.Area= 4 sf Storage= 0 cf

Plug-Flow detention time= 0.0 min calculated for 2,884 cf (100% of inflow)
Center-of-Mass det. time= 0.0 min (765.3 - 765.3)

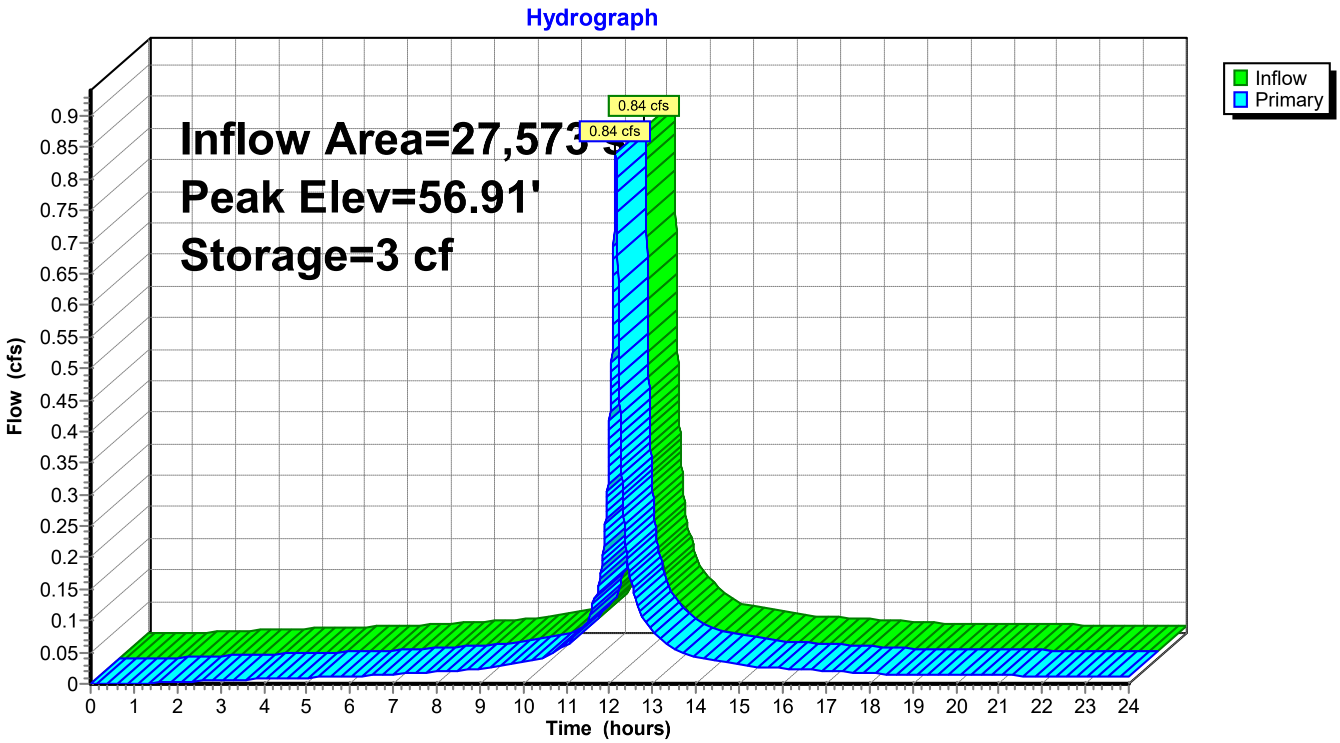
Volume	Invert	Avail.Storage	Storage Description
#1	56.85'	4,465 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
56.85	4	8.0	0	0	4
57.00	589	96.0	32	32	732
58.00	10,253	534.0	4,433	4,465	22,693

Device	Routing	Invert	Outlet Devices
#1	Primary	53.35'	**12.0" Round Culvert** L= 9.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 53.35' / 53.25' S= 0.0111 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	56.85'	**1.2" x 1.2" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 Limited to weir flow at low heads
#3	Device 1	56.85'	**1.2" x 1.2" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.84 cfs @ 12.14 hrs HW=56.91' TW=53.75' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.84 cfs of 5.84 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.42 cfs @ 1.16 fps)
  └─**3=Orifice/Grate** (Orifice Controls 0.42 cfs @ 1.16 fps)

Pond CB-4: CB-4


Hydrograph
Inflow Area=27,573 sf
Peak Elev=56.91'
Storage=3 cf
0.84 cfs
0.84 cfs
Inflow
Primary
Flow (cfs)
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
0.55
0.6
0.65
0.7
0.75
0.8
0.85
0.9
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Time (hours)

Summary for Pond CB-6A: CB-6A

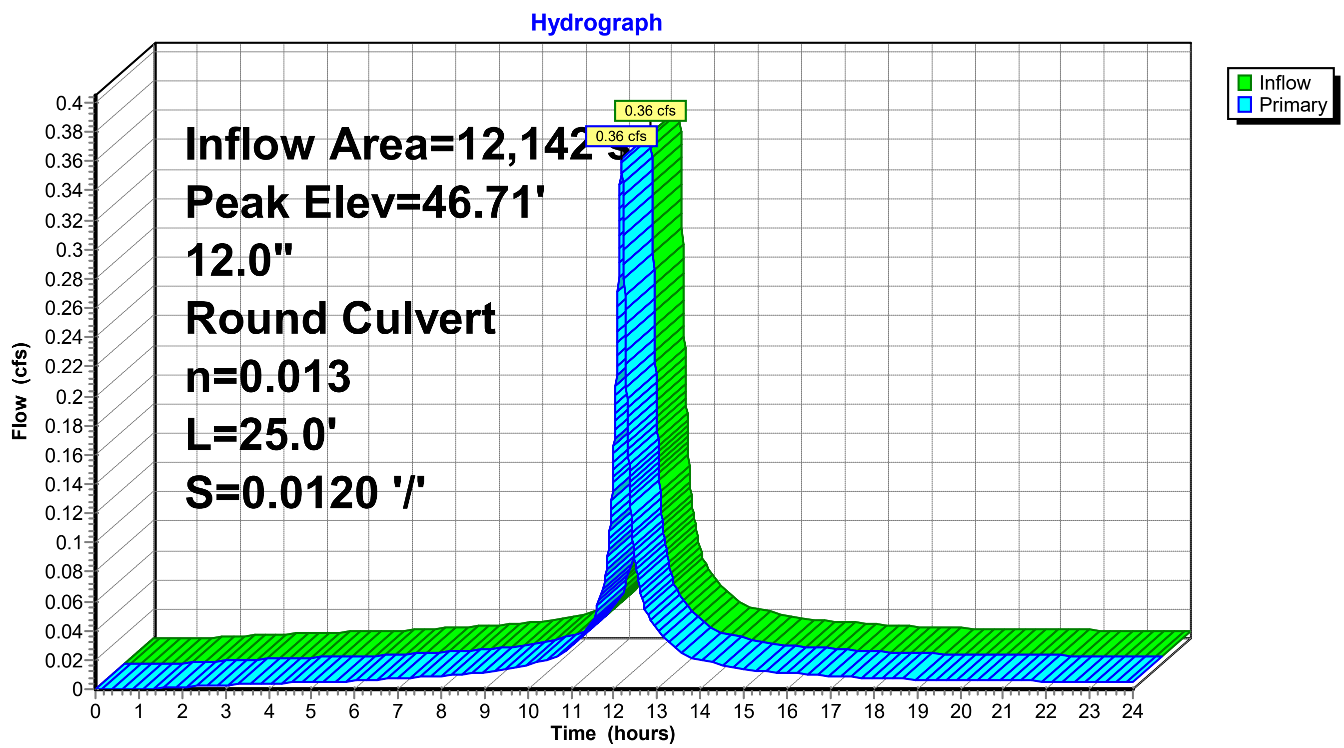
Inflow Area = 12,142 sf, 43.49% Impervious, Inflow Depth > 1.34" for 2-Year event
Inflow = 0.36 cfs @ 12.17 hrs, Volume= 1,360 cf
Outflow = 0.36 cfs @ 12.17 hrs, Volume= 1,360 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.36 cfs @ 12.17 hrs, Volume= 1,360 cf
Routed to Pond DMH-7 : DMH-7 (bypass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 46.71' @ 12.15 hrs
Flood Elev= 49.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.30'	**12.0" Round Culvert** L= 25.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.30' / 46.00' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.36 cfs @ 12.17 hrs HW=46.70' TW=46.54' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.36 cfs @ 1.83 fps)

Pond CB-6A: CB-6A



Summary for Pond CB-6B,C: CB-6B,6C

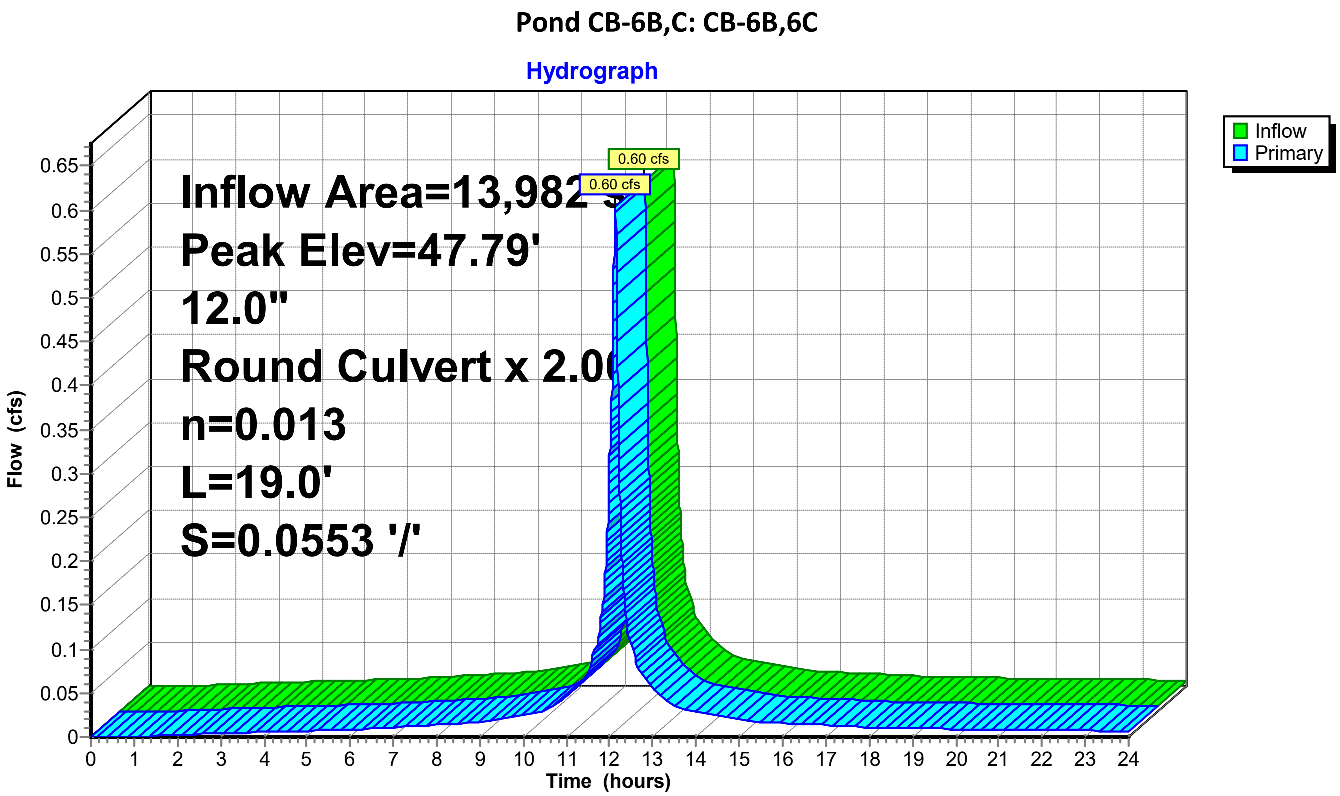
Inflow Area =	13,982 sf,	55.19% Impervious,	Inflow Depth > 1.71"	for 2-Year event
Inflow =	0.60 cfs @	12.13 hrs, Volume=	1,990 cf	
Outflow =	0.60 cfs @	12.13 hrs, Volume=	1,990 cf, Atten= 0%, Lag= 0.0 min	
Primary =	0.60 cfs @	12.13 hrs, Volume=	1,990 cf	

Routed to Pond DMH-6 : DMH-6

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 47.79' @ 12.13 hrs
Flood Elev= 50.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	47.50'	**12.0" Round Culvert X 2.00** L= 19.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 47.50' / 46.45' S= 0.0553 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.60 cfs @ 12.13 hrs HW=47.79' TW=46.81' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.60 cfs @ 1.61 fps)



Summary for Pond CB-7: CB-7

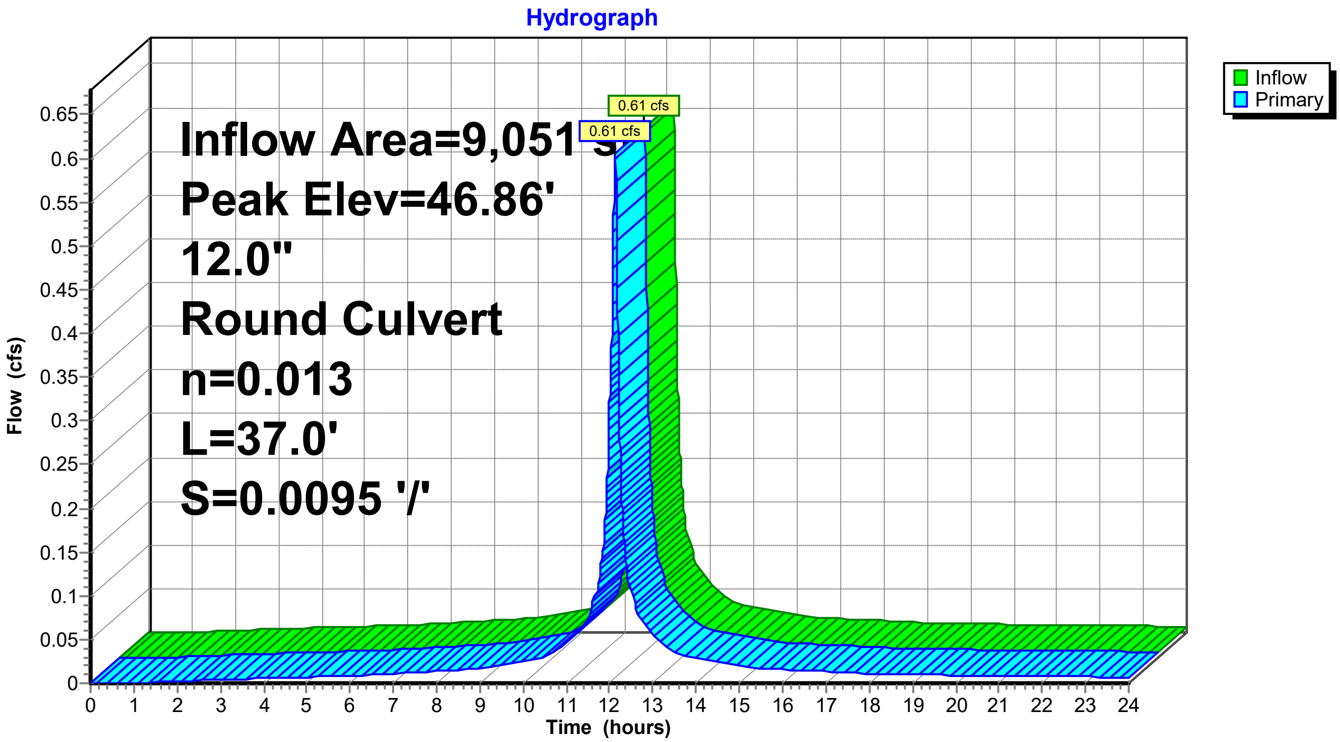
Inflow Area = 9,051 sf, 85.55% Impervious, Inflow Depth > 2.65" for 2-Year event
Inflow = 0.61 cfs @ 12.13 hrs, Volume= 1,996 cf
Outflow = 0.61 cfs @ 12.13 hrs, Volume= 1,996 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.61 cfs @ 12.13 hrs, Volume= 1,996 cf
Routed to Pond DMH-8 : DMH-8 (bypass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 46.86' @ 12.13 hrs
Flood Elev= 49.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.40'	**12.0" Round Culvert** L= 37.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.40' / 46.05' S= 0.0095 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.60 cfs @ 12.13 hrs HW=46.86' TW=46.53' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.60 cfs @ 2.52 fps)

Pond CB-7: CB-7



Summary for Pond DB-A: DB-A

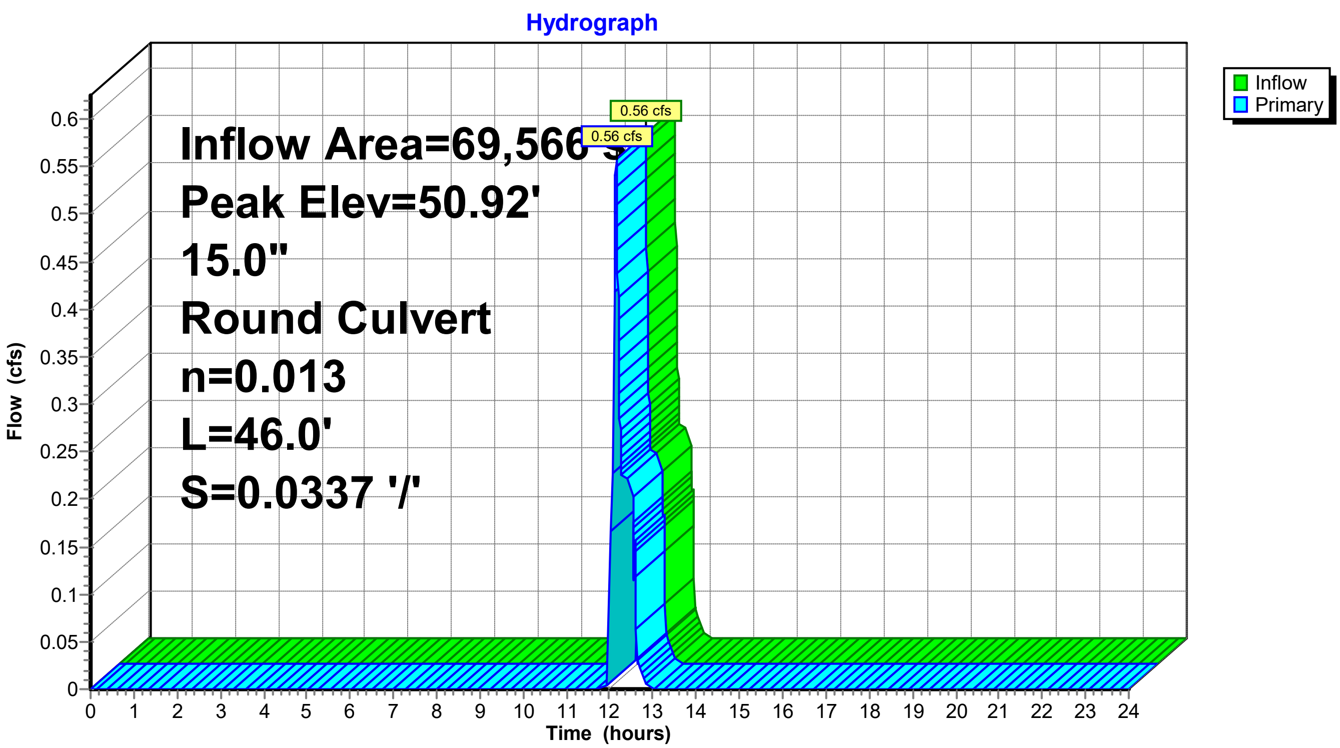
Inflow Area = 69,566 sf, 63.53% Impervious, Inflow Depth = 0.10" for 2-Year event
Inflow = 0.56 cfs @ 12.15 hrs, Volume= 552 cf
Outflow = 0.56 cfs @ 12.15 hrs, Volume= 552 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.56 cfs @ 12.15 hrs, Volume= 552 cf
Routed to Pond DMH-5 : DMH-5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 50.92' @ 12.15 hrs
Flood Elev= 54.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	50.55'	**15.0" Round Culvert** L= 46.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.55' / 49.00' S= 0.0337 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.56 cfs @ 12.15 hrs HW=50.92' TW=49.54' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.56 cfs @ 1.83 fps)

Pond DB-A: DB-A



Summary for Pond DMH-2.1: DMH-2.1 (By-Pass)

Inflow Area = 23,899 sf, 71.73% Impervious, Inflow Depth > 2.23" for 2-Year event
Inflow = 1.34 cfs @ 12.13 hrs, Volume= 4,435 cf
Outflow = 1.34 cfs @ 12.13 hrs, Volume= 4,435 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.34 cfs @ 12.13 hrs, Volume= 4,435 cf
Routed to Pond INF-1 : INF-1
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond AB-1 : Attenuation Basin

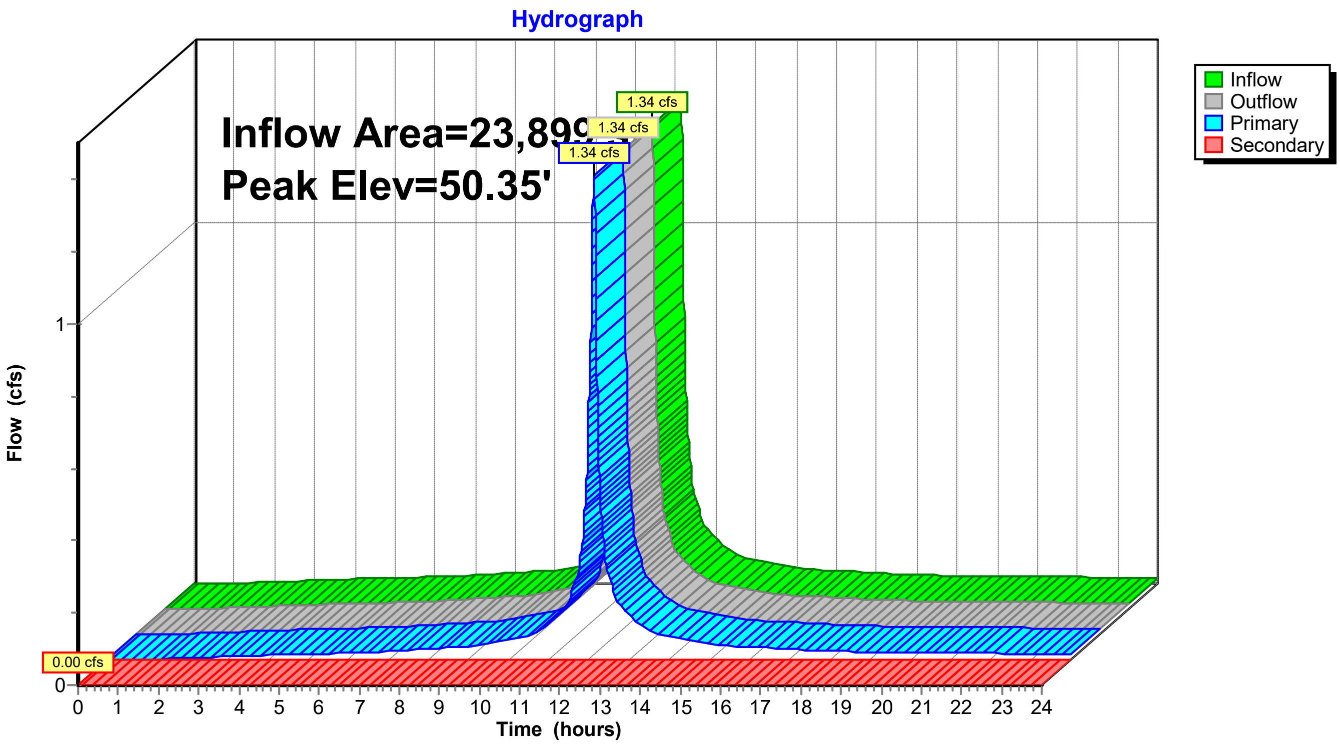
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 50.35' @ 12.13 hrs
Flood Elev= 52.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.60'	**12.0" Round OSG-1** L= 2.3' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.60' / 49.55' S= 0.0217 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	50.50'	**15.0" Round FES** L= 25.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 50.50' / 50.10' S= 0.0160 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.34 cfs @ 12.13 hrs HW=50.35' TW=47.64' (Dynamic Tailwater)
└**1=OSG-1** (Barrel Controls 1.34 cfs @ 2.94 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.60' TW=49.00' (Dynamic Tailwater)
└**2=FES** (Controls 0.00 cfs)

Pond DMH-2.1: DMH-2.1 (By-Pass)



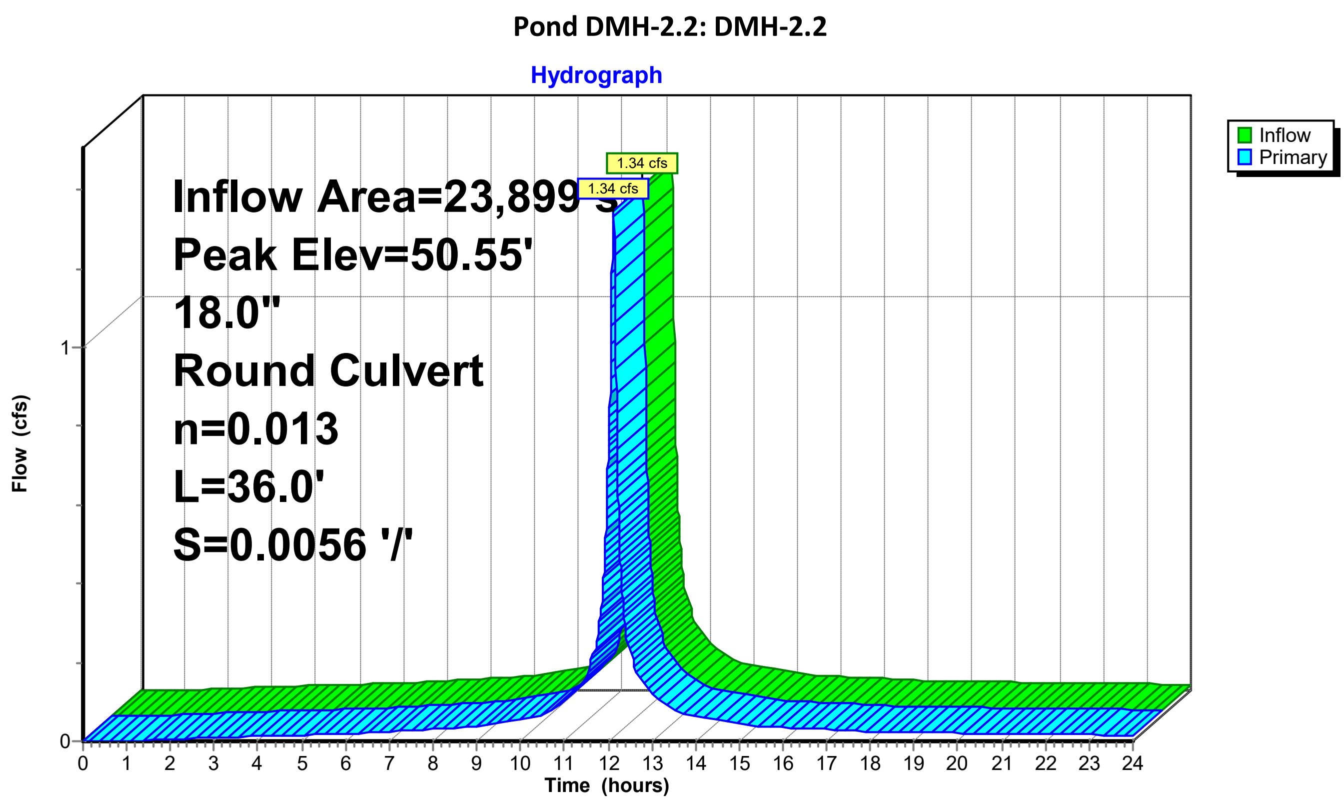
Summary for Pond DMH-2.2: DMH-2.2

Inflow Area = 23,899 sf, 71.73% Impervious, Inflow Depth > 2.23" for 2-Year event
Inflow = 1.34 cfs @ 12.13 hrs, Volume= 4,435 cf
Outflow = 1.34 cfs @ 12.13 hrs, Volume= 4,435 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.34 cfs @ 12.13 hrs, Volume= 4,435 cf
Routed to Pond DMH-2.1 : DMH-2.1 (By-Pass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 50.55' @ 12.13 hrs
Flood Elev= 53.63'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.80'	**18.0" Round DMH 2.1** L= 36.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.80' / 49.60' S= 0.0056 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.34 cfs @ 12.13 hrs HW=50.55' TW=50.35' (Dynamic Tailwater)
↑**1=DMH 2.1** (Outlet Controls 1.34 cfs @ 2.22 fps)



Summary for Pond DMH-3: DMH-3

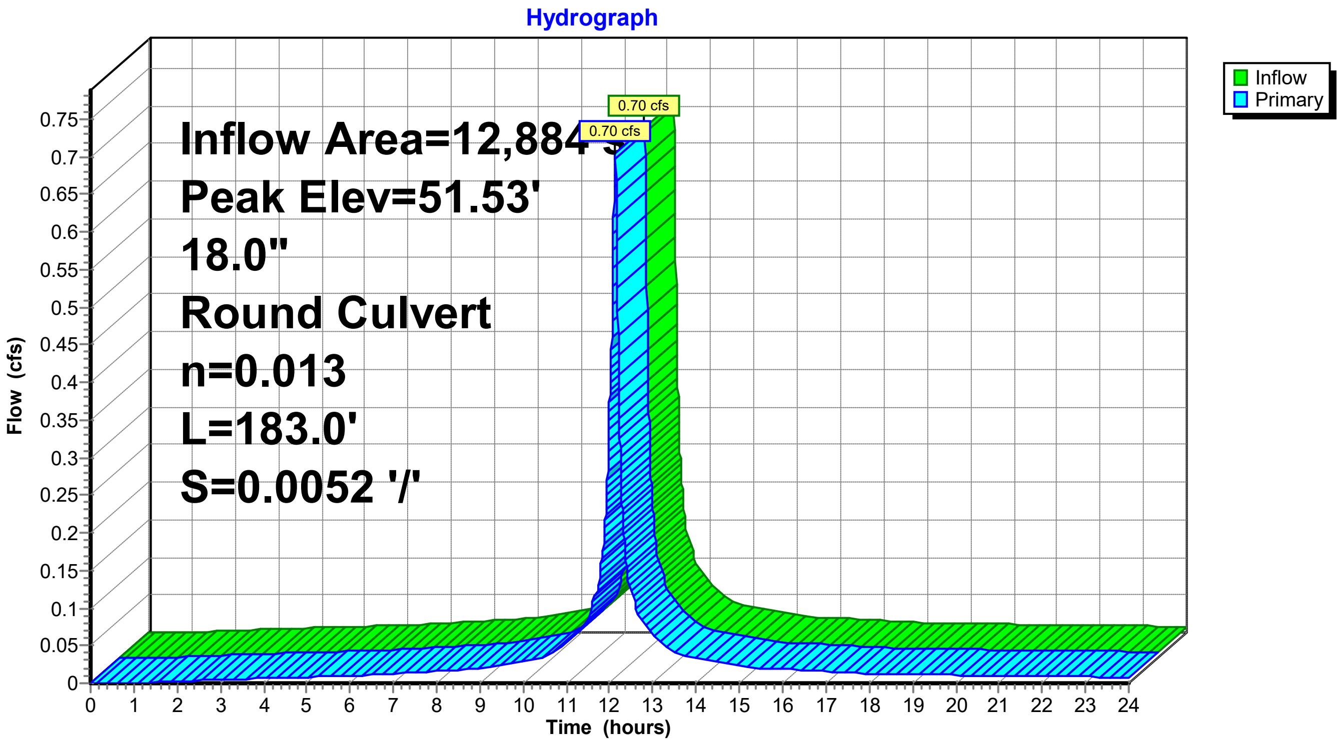
Inflow Area = 12,884 sf, 69.58% Impervious, Inflow Depth > 2.17" for 2-Year event
Inflow = 0.70 cfs @ 12.13 hrs, Volume= 2,326 cf
Outflow = 0.70 cfs @ 12.13 hrs, Volume= 2,326 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.70 cfs @ 12.13 hrs, Volume= 2,326 cf
Routed to Pond DMH-2.2 : DMH-2.2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.53' @ 12.13 hrs
Flood Elev= 54.22'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.10'	**18.0" Round Culvert** L= 183.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 51.10' / 50.14' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.70 cfs @ 12.13 hrs HW=51.53' TW=50.55' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.70 cfs @ 2.53 fps)

Pond DMH-3: DMH-3



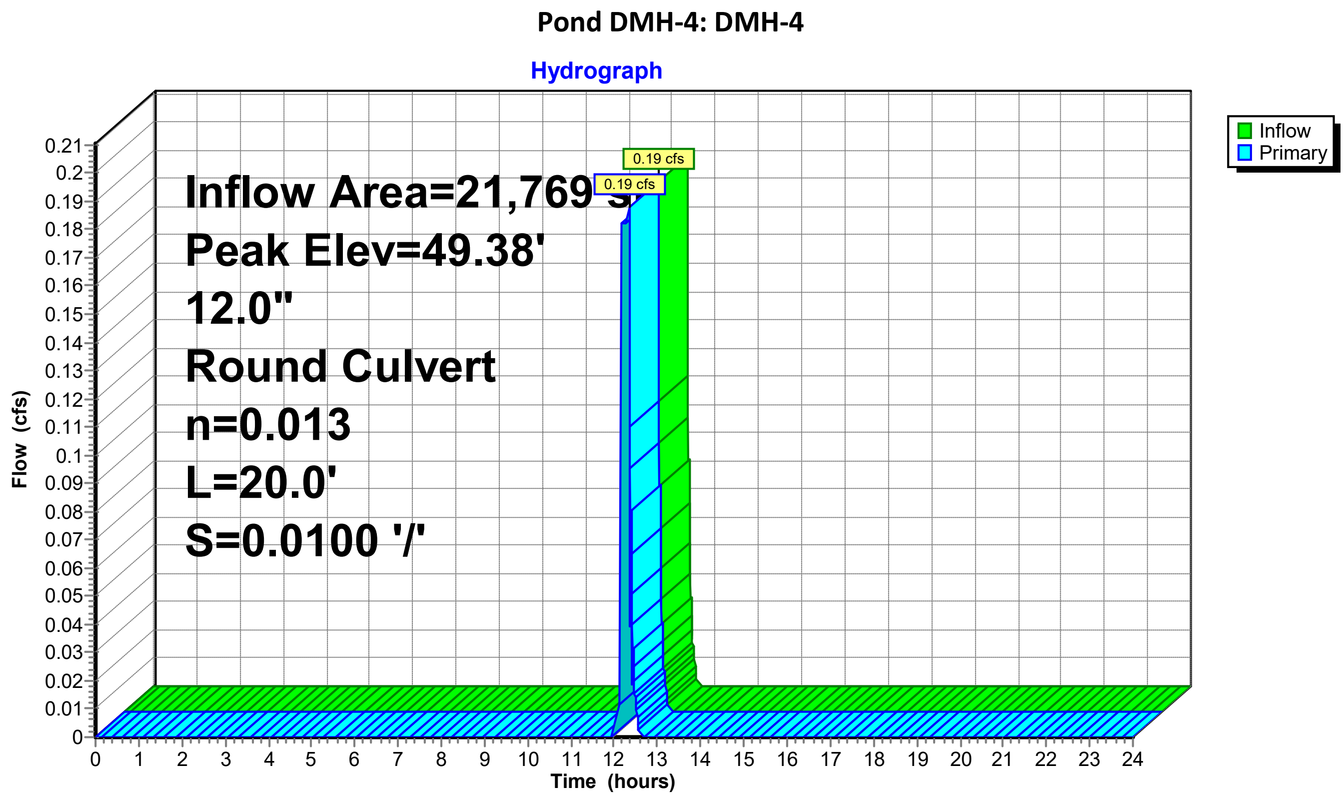
Summary for Pond DMH-4: DMH-4

Inflow Area = 21,769 sf, 63.79% Impervious, Inflow Depth = 0.09" for 2-Year event
Inflow = 0.19 cfs @ 12.36 hrs, Volume= 167 cf
Outflow = 0.19 cfs @ 12.36 hrs, Volume= 167 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.19 cfs @ 12.36 hrs, Volume= 167 cf
Routed to Pond INF-2 : INF-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 49.38' @ 12.36 hrs
Flood Elev= 53.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.15'	**12.0" Round Culvert** L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.15' / 48.95' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.19 cfs @ 12.36 hrs HW=49.38' TW=48.18' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.19 cfs @ 2.11 fps)



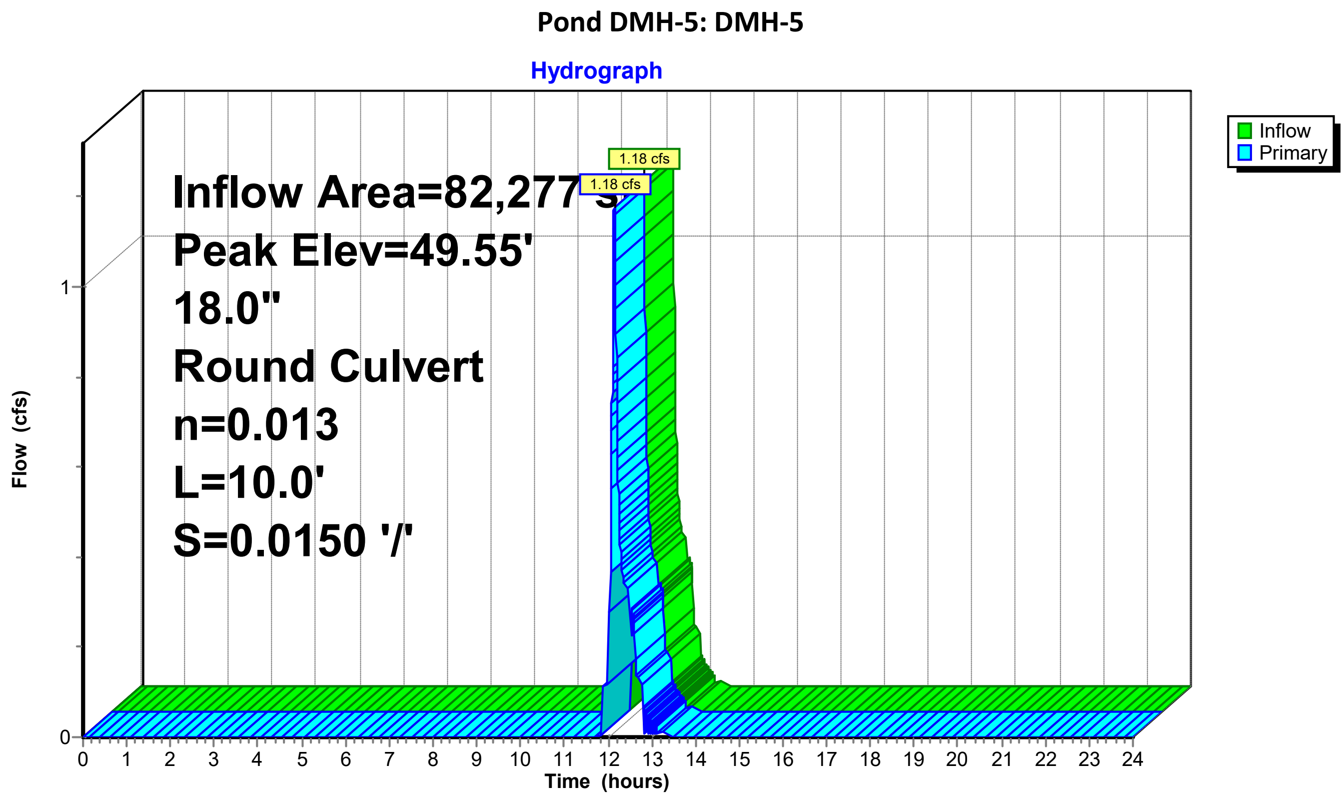
Summary for Pond DMH-5: DMH-5

Inflow Area = 82,277 sf, 64.43% Impervious, Inflow Depth = 0.18" for 2-Year event
Inflow = 1.18 cfs @ 12.14 hrs, Volume= 1,229 cf
Outflow = 1.18 cfs @ 12.14 hrs, Volume= 1,229 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.18 cfs @ 12.14 hrs, Volume= 1,229 cf
Routed to Pond INF-2 : INF-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 49.55' @ 12.14 hrs
Flood Elev= 54.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**18.0" Round Culvert** L= 10.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.00' / 48.85' S= 0.0150 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.18 cfs @ 12.14 hrs HW=49.55' TW=47.90' (Dynamic Tailwater)
1=Culvert (Barrel Controls 1.18 cfs @ 3.01 fps)



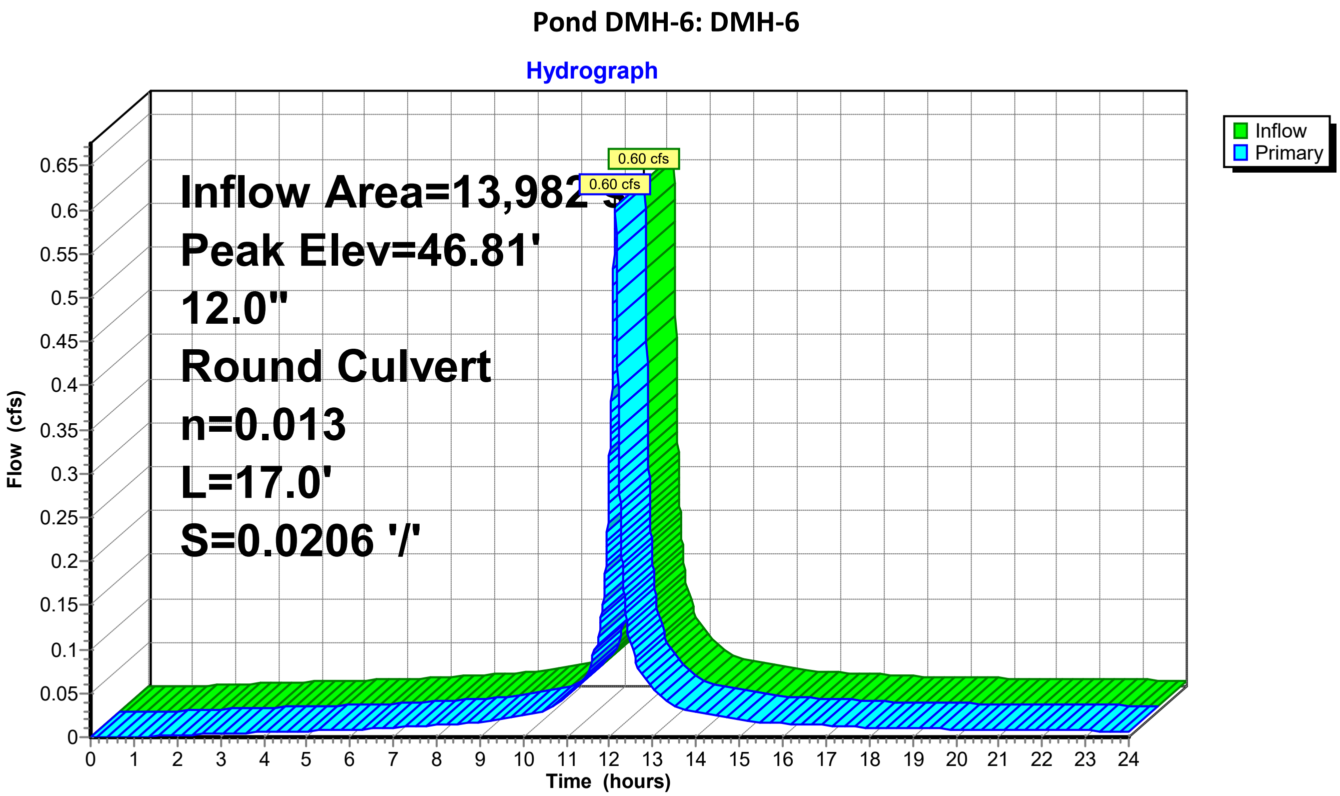
Summary for Pond DMH-6: DMH-6

Inflow Area = 13,982 sf, 55.19% Impervious, Inflow Depth > 1.71" for 2-Year event
Inflow = 0.60 cfs @ 12.13 hrs, Volume= 1,990 cf
Outflow = 0.60 cfs @ 12.13 hrs, Volume= 1,990 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.60 cfs @ 12.13 hrs, Volume= 1,990 cf
Routed to Pond DMH-7 : DMH-7 (bypass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 46.81' @ 12.13 hrs
Flood Elev= 50.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.35'	**12.0" Round Culvert** L= 17.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.35' / 46.00' S= 0.0206 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.60 cfs @ 12.13 hrs HW=46.81' TW=46.57' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.60 cfs @ 2.51 fps)



Summary for Pond DMH-7: DMH-7 (bypass)

Inflow Area = 26,124 sf, 49.75% Impervious, Inflow Depth > 1.54" for 2-Year event
Inflow = 0.94 cfs @ 12.14 hrs, Volume= 3,351 cf
Outflow = 0.94 cfs @ 12.14 hrs, Volume= 3,351 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.94 cfs @ 12.14 hrs, Volume= 3,351 cf
Routed to Pond INF-3 : INF-3
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond INF-3 : INF-3

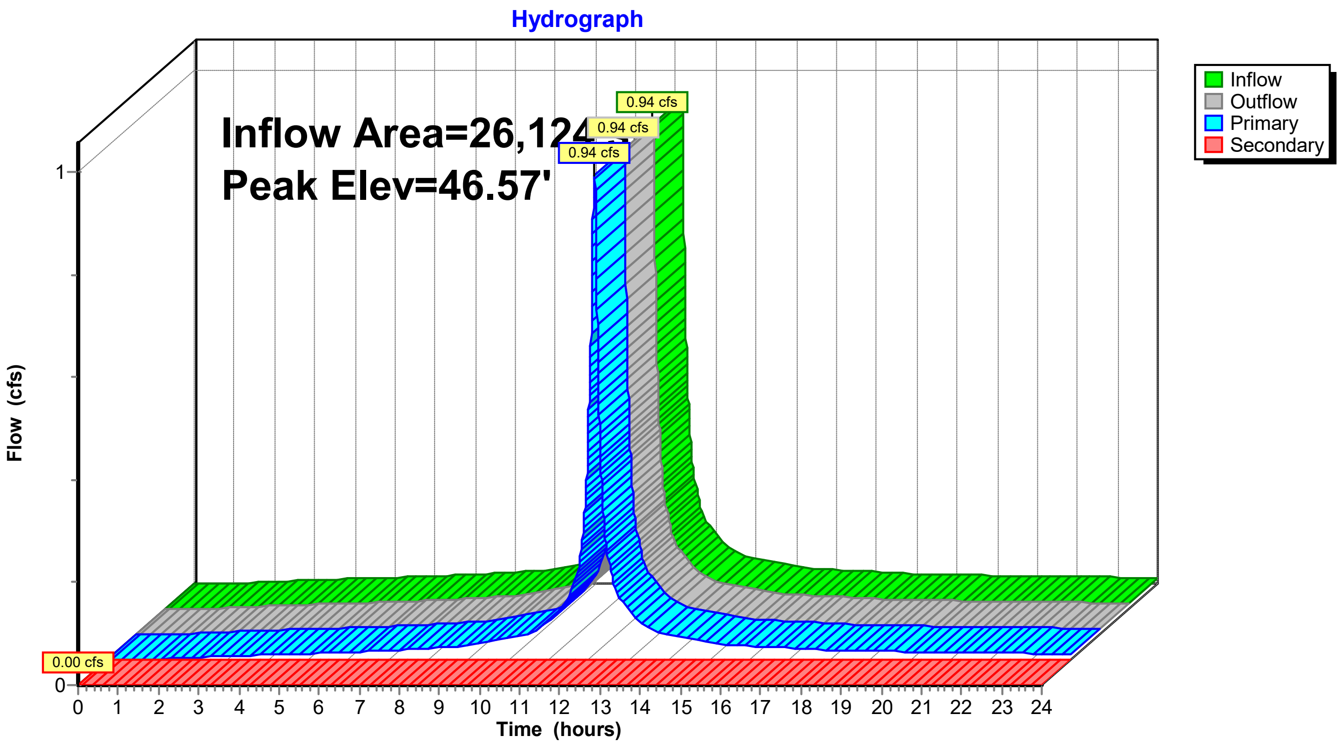
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 46.57' @ 12.14 hrs
Flood Elev= 50.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.00'	**12.0" Round OGS-2** L= 3.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.00' / 45.90' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	46.60'	**12.0" Round By-Pass** L= 11.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.60' / 45.58' S= 0.0927 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.94 cfs @ 12.14 hrs HW=46.57' TW=43.60' (Dynamic Tailwater)
└**1=OGS-2** (Barrel Controls 0.94 cfs @ 2.94 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.00' TW=43.00' (Dynamic Tailwater)
└**2=By-Pass** (Controls 0.00 cfs)

Pond DMH-7: DMH-7 (bypass)



Summary for Pond DMH-8: DMH-8 (bypass)

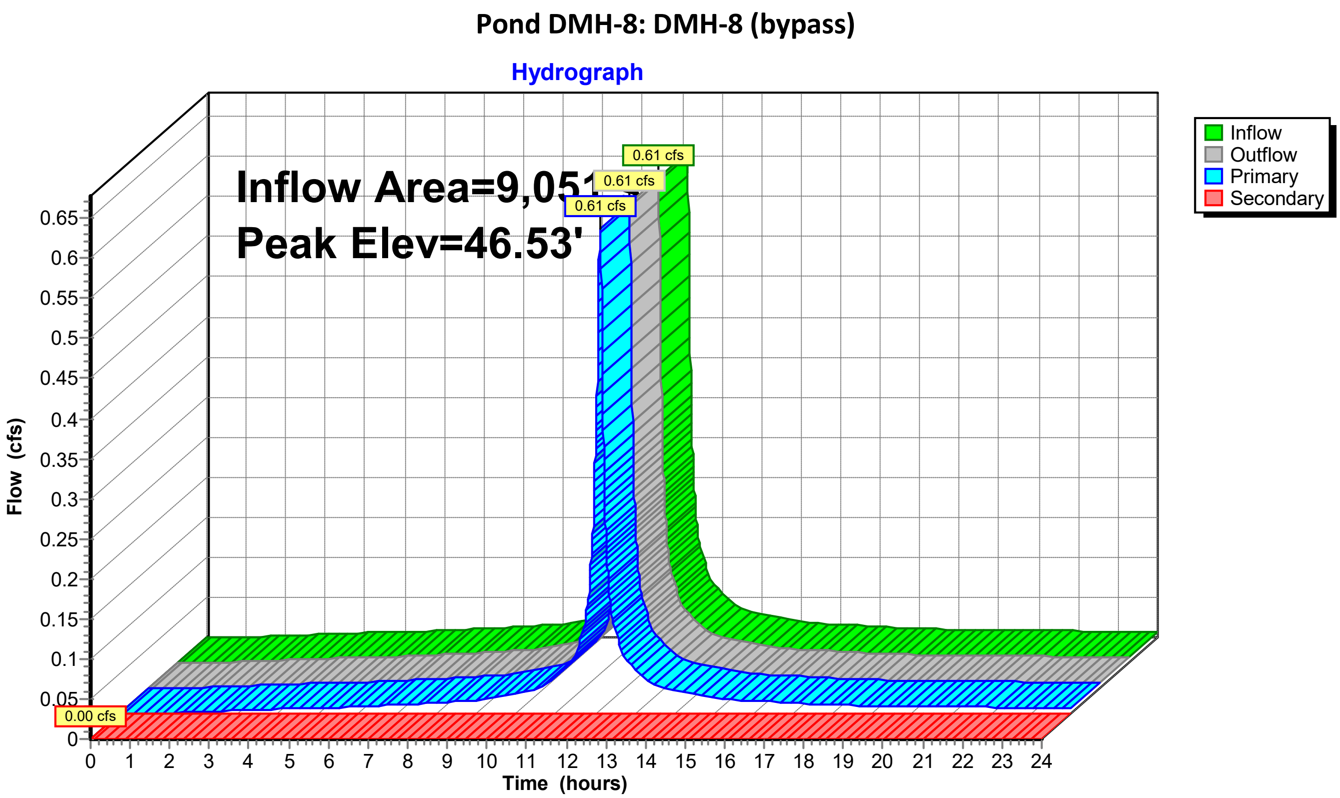
Inflow Area = 9,051 sf, 85.55% Impervious, Inflow Depth > 2.65" for 2-Year event
Inflow = 0.61 cfs @ 12.13 hrs, Volume= 1,996 cf
Outflow = 0.61 cfs @ 12.13 hrs, Volume= 1,996 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.61 cfs @ 12.13 hrs, Volume= 1,996 cf
Routed to nonexistent node 5P
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond INF-3 : INF-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 46.53' @ 12.13 hrs
Flood Elev= 50.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.05'	**12.0" Round OSG** L= 5.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.05' / 46.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	46.55'	**12.0" Round By-Pass** L= 13.5' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.55' / 45.58' S= 0.0719 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.60 cfs @ 12.13 hrs HW=46.53' (Free Discharge)
↑**1=OSG** (Barrel Controls 0.60 cfs @ 2.39 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.05' TW=43.00' (Dynamic Tailwater)
↑**2=By-Pass** (Controls 0.00 cfs)



Summary for Pond DMH-9: DMH-9 (bypass)

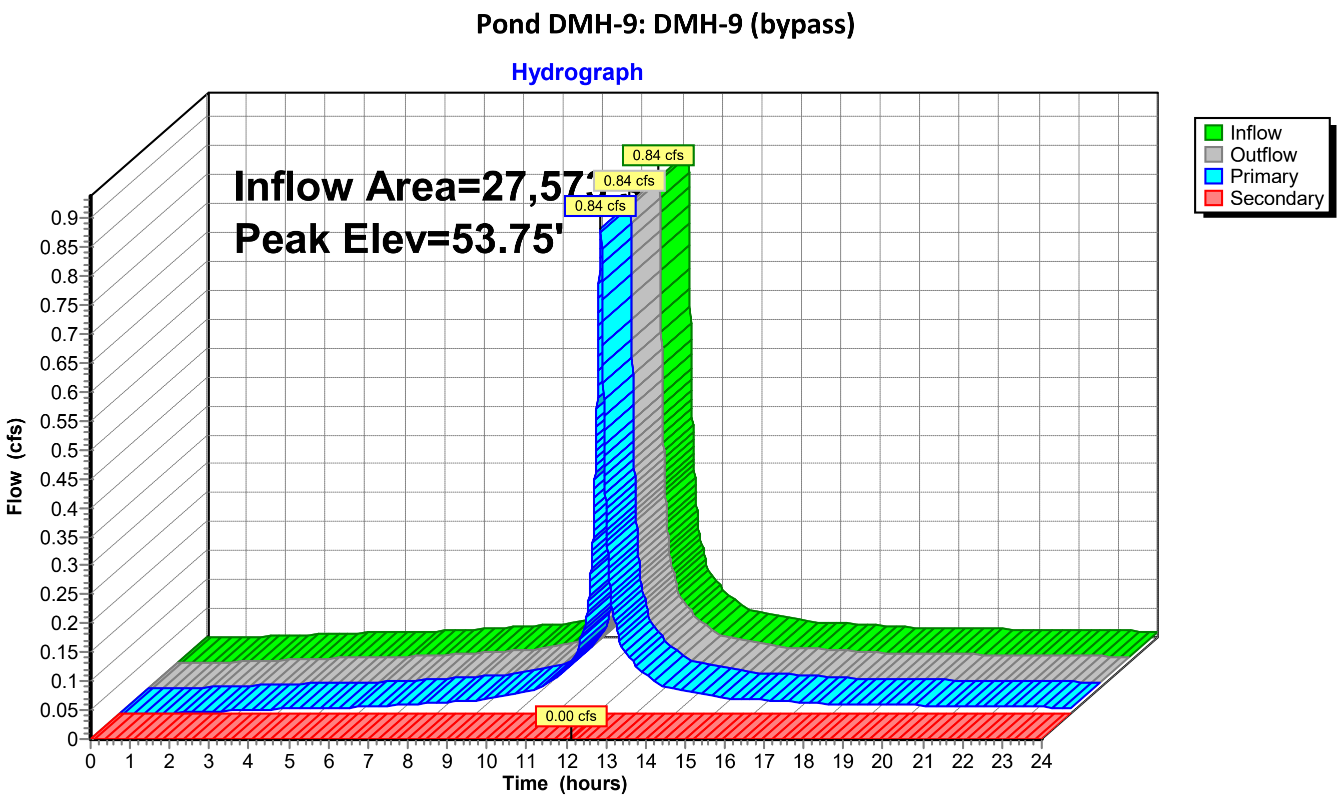
Inflow Area = 27,573 sf, 38.81% Impervious, Inflow Depth > 1.26" for 2-Year event
Inflow = 0.84 cfs @ 12.14 hrs, Volume= 2,884 cf
Outflow = 0.84 cfs @ 12.14 hrs, Volume= 2,884 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.84 cfs @ 12.14 hrs, Volume= 2,884 cf
Routed to Pond INF-4 : INF-4
Secondary = 0.00 cfs @ 12.14 hrs, Volume= 0 cf
Routed to Pond INF-4 : INF-4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 53.75' @ 12.14 hrs
Flood Elev= 57.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	53.25'	**12.0" Round OGS-4** L= 3.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 53.25' / 52.90' S= 0.1167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	53.75'	**12.0" Round By-Pass** L= 3.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 53.75' / 52.90' S= 0.2833 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.84 cfs @ 12.14 hrs HW=53.75' TW=51.38' (Dynamic Tailwater)
└**1=OGS-4** (Inlet Controls 0.84 cfs @ 2.13 fps)

Secondary OutFlow Max=0.00 cfs @ 12.14 hrs HW=53.75' TW=51.39' (Dynamic Tailwater)
└**2=By-Pass** (Inlet Controls 0.00 cfs @ 0.10 fps)



Summary for Pond DS: Dry Stream

Inflow Area = 66,509 sf, 26.96% Impervious, Inflow Depth > 0.95" for 2-Year event
Inflow = 1.30 cfs @ 12.13 hrs, Volume= 5,284 cf
Outflow = 1.24 cfs @ 12.16 hrs, Volume= 5,255 cf, Atten= 5%, Lag= 1.3 min
Discarded = 0.03 cfs @ 12.16 hrs, Volume= 1,031 cf
Primary = 1.21 cfs @ 12.16 hrs, Volume= 4,223 cf
Routed to Pond FP-7 : FP-7/INF-5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 54.71' @ 12.16 hrs Surf.Area= 381 sf Storage= 171 cf

Plug-Flow detention time= 9.0 min calculated for 5,255 cf (99% of inflow)
Center-of-Mass det. time= 5.4 min (786.8 - 781.5)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	2,359 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

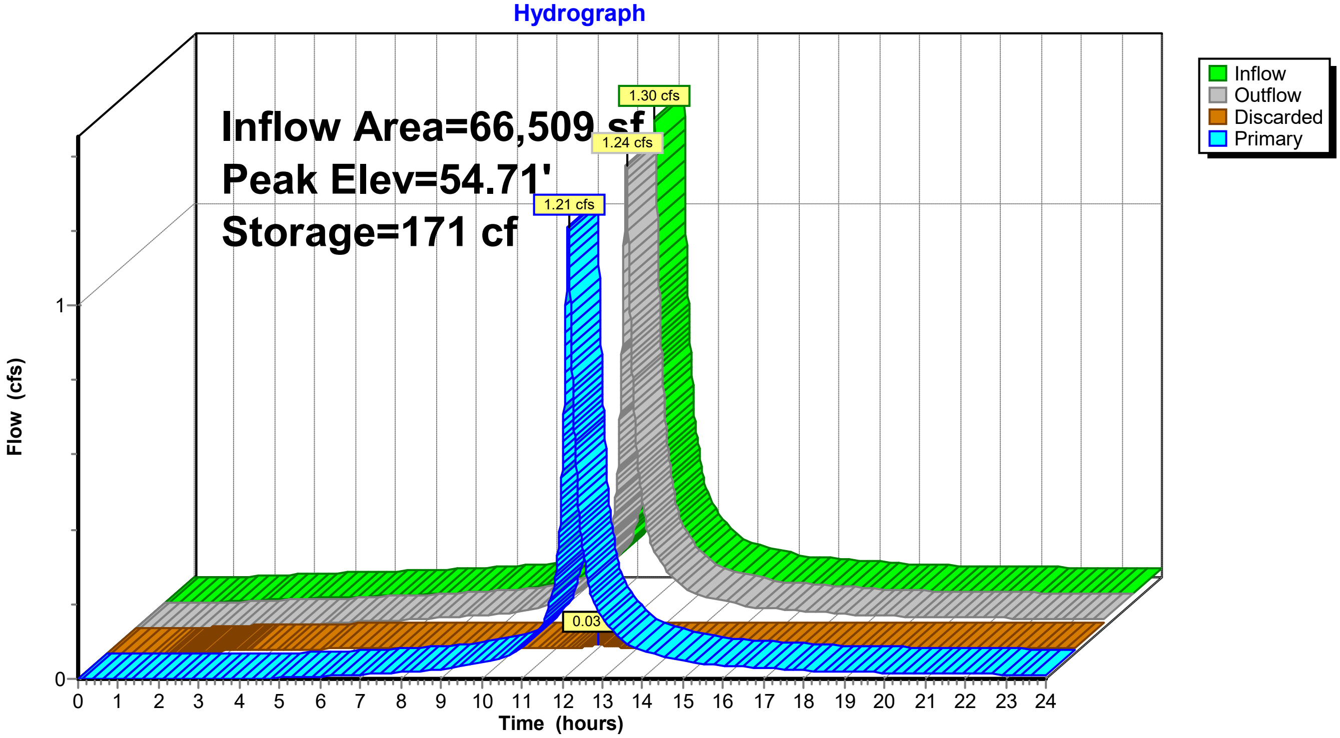
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
54.00	121	64.0	0	0	121
55.00	526	236.0	300	300	4,230
56.00	1,068	524.0	781	1,081	21,652
57.00	1,500	613.0	1,278	2,359	29,725

Device	Routing	Invert	Outlet Devices
#1	Discarded	54.00'	**3.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.10'
#2	Primary	54.15'	**15.0" Round Overflow** L= 48.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 54.15' / 53.75' S= 0.0083 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=0.03 cfs @ 12.16 hrs HW=54.71' (Free Discharge)
└─**1=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=1.21 cfs @ 12.16 hrs HW=54.71' TW=47.63' (Dynamic Tailwater)
└─**2=Overflow** (Inlet Controls 1.21 cfs @ 2.26 fps)

Pond DS: Dry Stream



Summary for Pond FP-1: FP-1

Inflow Area = 12,471 sf, 83.62% Impervious, Inflow Depth > 2.59" for 2-Year event
Inflow = 0.82 cfs @ 12.13 hrs, Volume= 2,689 cf
Outflow = 0.71 cfs @ 12.16 hrs, Volume= 2,689 cf, Atten= 13%, Lag= 2.1 min
Discarded = 0.17 cfs @ 12.16 hrs, Volume= 2,292 cf
Primary = 0.53 cfs @ 12.13 hrs, Volume= 397 cf
Routed to Pond INF-3 : INF-3
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond CB-7 : CB-7

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 49.84' @ 12.16 hrs Surf.Area= 486 sf Storage= 505 cf

Plug-Flow detention time= 34.7 min calculated for 2,689 cf (100% of inflow)
Center-of-Mass det. time= 34.7 min (791.5 - 756.9)

Volume	Invert	Avail.Storage	Storage Description
#1	47.22'	32 cf	**8.00'W x 9.00'L x 2.25'H FP (mulch/media/stone)**
			162 cf Overall x 20.0% Voids
#2	49.47'	1,648 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#3A	43.43'	168 cf	**11.87'W x 13.38'L x 4.29'H Field A**
			682 cf Overall - 262 cf Embedded = 420 cf x 40.0% Voids
#4A	43.68'	249 cf	**Ferguson R-Tank HD 2.5** x 24 Inside #3
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			24 Chambers in 6 Rows
		2,098 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
49.47	68	30.0	0	0	68
50.00	375	76.0	106	106	457
51.00	539	88.0	455	561	634
52.25	1,250	260.0	1,087	1,648	5,402

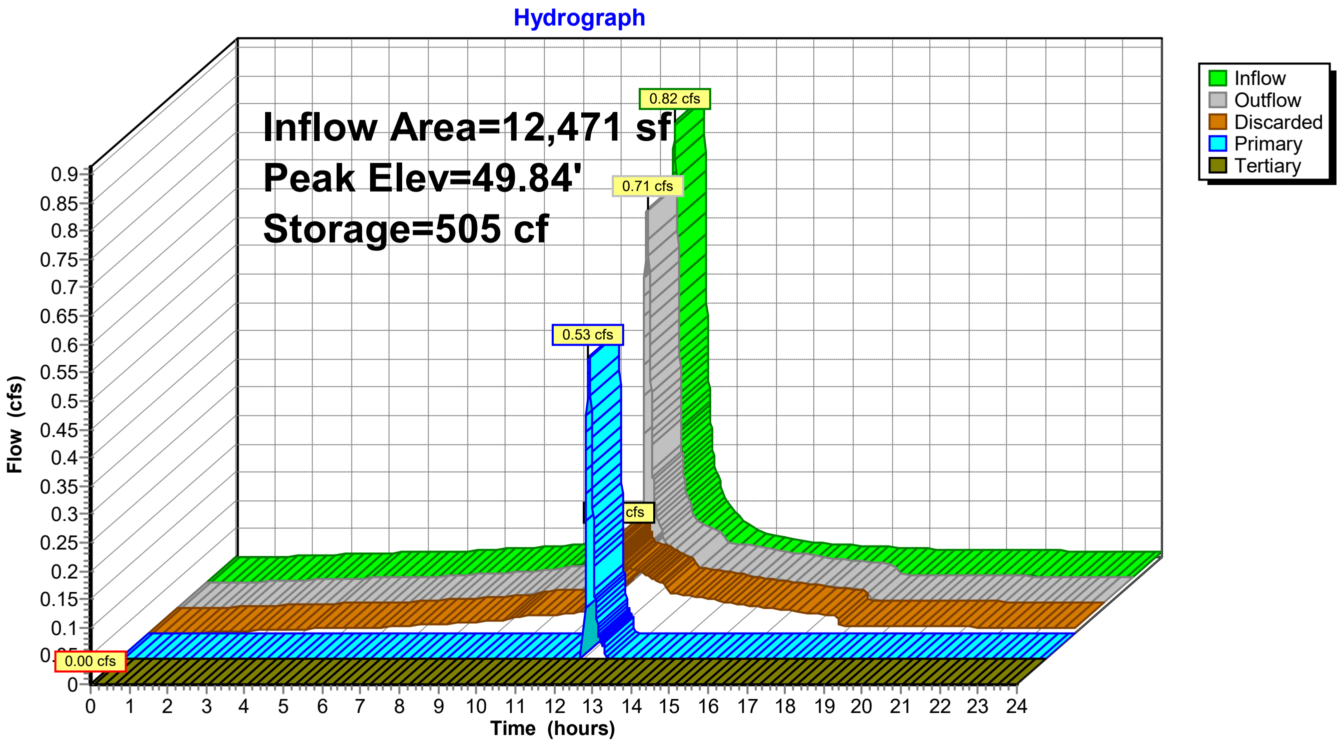
Device	Routing	Invert	Outlet Devices
#1	Primary	46.47'	**12.0" Round Culvert** L= 118.0' CPP, mitered to conform to fill, Ke= 0.700
			Inlet / Outlet Invert= 46.47' / 45.58' S= 0.0075 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	51.50'	**18.0" Horiz. Dome Grate(OF-1)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	47.22'	**100.000 in/hr Focal Point Media over Surface area from 47.22' - 49.80'**
			Excluded Surface area = 231 sf Phase-In= 0.01'
#4	Discarded	49.80'	**2.810 in/hr Bowl Exfiltration over Surface area above 49.80'**
			Excluded Surface area = 461 sf Phase-In= 0.01'
#5	Discarded	43.43'	**8.270 in/hr R Tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#6	Tertiary	52.20'	**3.5' long x 2.0' breadth BSpillway**
			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=0.17 cfs @ 12.16 hrs HW=49.84' (Free Discharge)
├─**4=Bowl Exfiltration** (Exfiltration Controls 0.00 cfs)
└─**5=R Tank Exfiltration** (Controls 0.17 cfs)

Primary OutFlow Max=0.53 cfs @ 12.13 hrs HW=49.80' TW=43.57' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.53 cfs of 4.87 cfs potential flow)
  ├─**2=Dome Grate(OF-1)** (Controls 0.00 cfs)
  └─**3=Focal Point Media** (Exfiltration Controls 0.53 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=43.43' TW=46.40' (Dynamic Tailwater)
└─**6=BSpillway** (Controls 0.00 cfs)

Pond FP-1: FP-1



Summary for Pond FP-2: FP-2

Inflow Area = 8,047 sf, 72.78% Impervious, Inflow Depth > 2.25" for 2-Year event
Inflow = 0.46 cfs @ 12.13 hrs, Volume= 1,510 cf
Outflow = 0.12 cfs @ 12.37 hrs, Volume= 1,510 cf, Atten= 73%, Lag= 14.2 min
Discarded = 0.08 cfs @ 12.37 hrs, Volume= 1,504 cf
Primary = 0.04 cfs @ 12.37 hrs, Volume= 7 cf
Routed to Pond DMH-4 : DMH-4
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond FP-1 : FP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 50.05' @ 12.37 hrs Surf.Area= 159 sf Storage= 417 cf
Flood Elev= 53.75' Surf.Area= 945 sf Storage= 1,046 cf

Plug-Flow detention time= 40.3 min calculated for 1,510 cf (100% of inflow)
Center-of-Mass det. time= 40.2 min (797.2 - 757.0)

Volume	Invert	Avail.Storage	Storage Description
#1	50.05'	25 cf	**8.00'W x 9.00'L x 1.75'H FP (mulch/media)**
			126 cf Overall x 20.0% Voids
#2	51.80'	760 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#3A	45.76'	168 cf	**11.87'W x 13.38'L x 4.29'H Field A**
			682 cf Overall - 262 cf Embedded = 420 cf x 40.0% Voids
#4A	46.01'	249 cf	**Ferguson R-Tank HD 2.5** x 24 Inside #3
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			24 Chambers in 6 Rows
		1,202 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
51.80	69	30.6	0	0	69
52.00	112	38.0	18	18	110
53.00	321	60.0	208	225	288
53.95	845	157.0	534	760	1,967

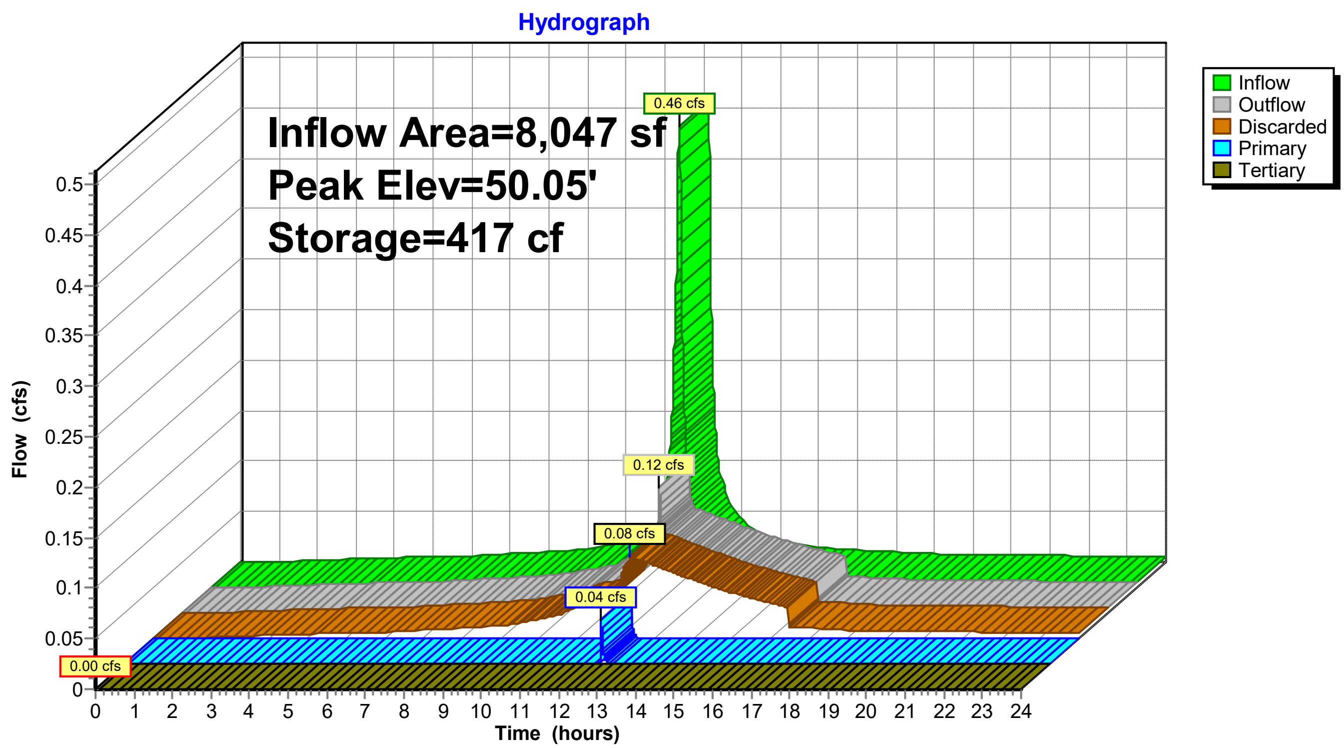
Device	Routing	Invert	Outlet Devices
#1	Primary	49.40'	**12.0" Round Overflow** L= 10.0' CPP, mitered to conform to fill, Ke= 0.700
			Inlet / Outlet Invert= 49.40' / 49.15' S= 0.0250 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	52.85'	**18.0" Horiz. Dome Grate (OF-2)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	49.55'	**100.000 in/hr Focal Point Media over Surface area from 49.55' - 51.80'**
			Excluded Surface area = 159 sf Phase-In= 0.01'
#4	Discarded	45.76'	**8.270 in/hr R Tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#5	Discarded	51.80'	**3.000 in/hr Bowl Exfiltration over Surface area above 51.80'**
			Excluded Surface area = 300 sf Phase-In= 0.01'
#6	Tertiary	53.90'	**3.5' long x 2.0' breadth Spillway**
			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 @ 12.37 hrs HW=50.05' (Free Discharge)
4=R Tank Exfiltration (Controls 0.08 cfs)
5=Bowl Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 12.37 hrs HW=50.05' TW=49.32' (Dynamic Tailwater)
1=Overflow (Passes 0.00 cfs of 1.31 cfs potential flow)
2=Dome Grate (OF-2) (Controls 0.00 cfs)
3=Focal Point Media (Exfiltration Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=45.76' TW=43.43' (Dynamic Tailwater)
6=Spillway (Controls 0.00 cfs)

Pond FP-2: FP-2



Summary for Pond FP-3: FP-3

Inflow Area = 13,722 sf, 58.52% Impervious, Inflow Depth > 1.92" for 2-Year event
Inflow = 0.66 cfs @ 12.13 hrs, Volume= 2,190 cf
Outflow = 0.34 cfs @ 12.22 hrs, Volume= 2,190 cf, Atten= 48%, Lag= 5.4 min
Discarded = 0.16 cfs @ 12.22 hrs, Volume= 2,030 cf
Primary = 0.18 cfs @ 12.14 hrs, Volume= 161 cf
Routed to Pond DMH-4 : DMH-4
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond FP-1 : FP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 52.92' @ 12.22 hrs Surf.Area= 412 sf Storage= 501 cf
Flood Elev= 54.96' Surf.Area= 1,220 sf Storage= 1,539 cf

Plug-Flow detention time= 37.2 min calculated for 2,190 cf (100% of inflow)
Center-of-Mass det. time= 37.2 min (803.6 - 766.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	46.38'	168 cf	**11.87'W x 13.38'L x 4.29'H Field A** 682 cf Overall - 262 cf Embedded = 420 cf x 40.0% Voids
#2A	46.63'	249 cf	**Ferguson R-Tank HD 2.5** x 24 Inside #1 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 24 Chambers in 6 Rows
#3	50.17'	34 cf	**8.00'W x 9.00'L x 2.33'H FP (mulch/media/stone)** 168 cf Overall x 20.0% Voids
#4	52.50'	1,129 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
		1,579 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
52.50	68	30.6	0	0	68
53.00	210	58.0	66	66	262
54.00	476	104.0	334	400	861
55.00	1,015	183.0	729	1,129	2,671

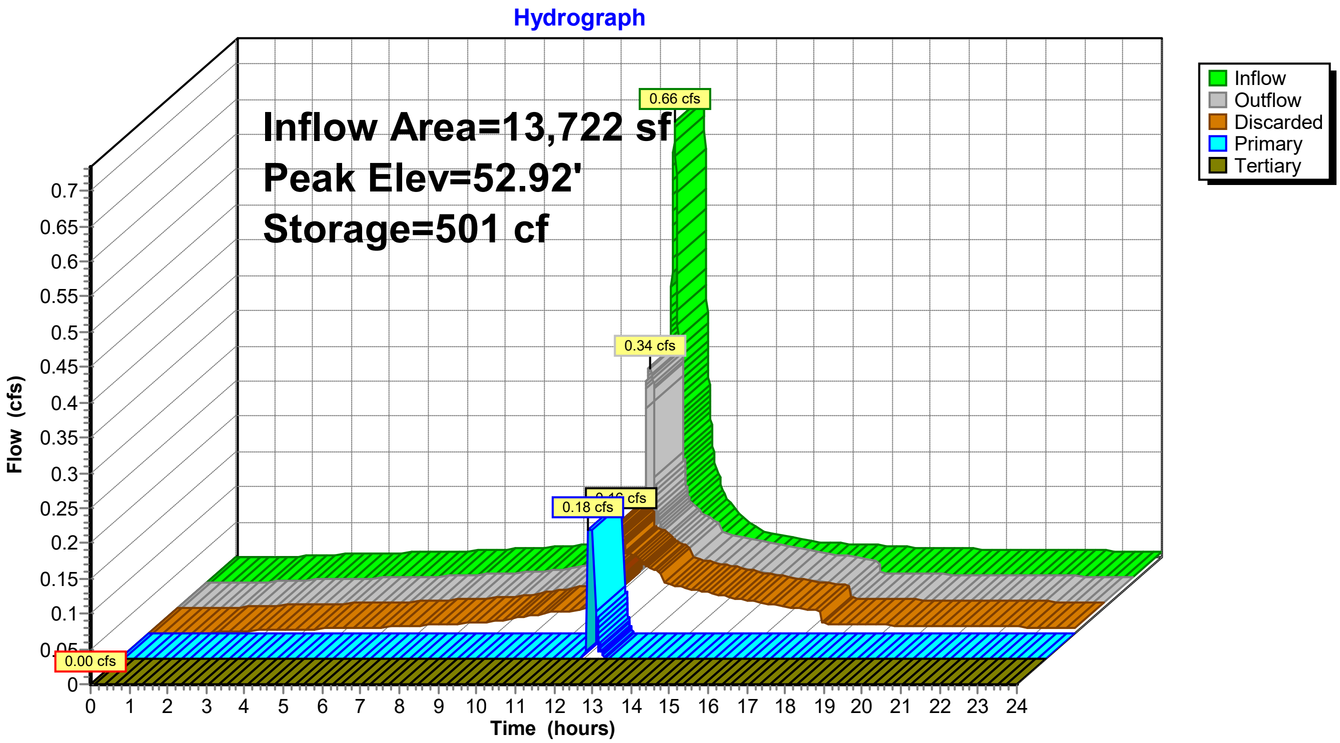
Device	Routing	Invert	Outlet Devices
#1	Primary	49.55'	**12.0" Round Culvert** L= 37.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.55' / 49.15' S= 0.0108 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	53.75'	**18.0" Horiz. Dome Grate (OF-3)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	50.22'	**100.000 in/hr Focal Point Media over Surface area from 50.22' - 52.55'** Excluded Surface area = 231 sf Phase-In= 0.01'
#4	Discarded	46.38'	**8.270 in/hr R tank Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#5	Discarded	52.80'	**3.000 in/hr Bowl Exfiltration over Wetted area above 52.80'** Excluded Wetted area = 697 sf Phase-In= 0.01'
#6	Tertiary	54.90'	**3.0' 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=0.16 cfs @ 12.22 hrs HW=52.92' (Free Discharge)
├─**4=R tank Exfiltration** (Controls 0.16 cfs)
└─**5=Bowl Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.18 cfs @ 12.14 hrs HW=52.60' TW=49.37' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.18 cfs of 5.33 cfs potential flow)
  ├─**2=Dome Grate (OF-3)** (Controls 0.00 cfs)
  └─**3=Focal Point Media** (Exfiltration Controls 0.18 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.38' TW=43.43' (Dynamic Tailwater)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond FP-3: FP-3



Summary for Pond FP-4: FP-4

Inflow Area = 12,711 sf, 69.37% Impervious, Inflow Depth > 2.15" for 2-Year event
Inflow = 0.69 cfs @ 12.13 hrs, Volume= 2,274 cf
Outflow = 0.69 cfs @ 12.14 hrs, Volume= 2,274 cf, Atten= 0%, Lag= 0.4 min
Discarded = 0.06 cfs @ 12.14 hrs, Volume= 1,597 cf
Primary = 0.63 cfs @ 12.14 hrs, Volume= 677 cf
Routed to Pond DMH-5 : DMH-5
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond CB-6B,C : CB-6B,6C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 53.35' @ 12.14 hrs Surf.Area= 317 sf Storage= 356 cf
Flood Elev= 54.25' Surf.Area= 543 sf Storage= 574 cf

Plug-Flow detention time= 32.8 min calculated for 2,274 cf (100% of inflow)
Center-of-Mass det. time= 32.8 min (789.7 - 757.0)

Volume	Invert	Avail.Storage	Storage Description
#1	52.50'	303 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#2	50.75'	17 cf	**6.00'W x 8.00'L x 1.75'H FP (mulch/media)** 84 cf Overall x 20.0% Voids
#3A	46.88'	155 cf	**Ferguson R-Tank HD 2.5** x 15 Inside #4 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 15 Chambers in 5 Rows
#4A	46.63'	98 cf	**10.56'W x 9.04'L x 4.29'H Field A** 410 cf Overall - 164 cf Embedded = 246 cf x 40.0% Voids
		574 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
52.50	45	24.5	0	0	45
53.00	106	37.0	37	37	108
54.00	338	76.0	211	248	463
54.15	400	80.0	55	303	514

Device	Routing	Invert	Outlet Devices
#1	Primary	49.42'	**12.0" Round Culvert** L= 26.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.42' / 49.15' S= 0.0104 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	53.25'	**18.0" Horiz. Dome Grate (OF-4)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	47.74'	**100.000 in/hr Focal Point Media over Surface area from 47.74' - 51.50'** Excluded Surface area = 95 sf Phase-In= 0.01'
#4	Discarded	46.63'	**8.700 in/hr R Tank Exfiltration over Wetted area from 45.13' - 48.92'** Conductivity to Groundwater Elevation = 10.00' Excluded Wetted area = 0 sf Phase-In= 0.01'
#5	Discarded	51.50'	**3.000 in/hr Bowl Exfiltration over Wetted area above 51.50'** Conductivity to Groundwater Elevation = 10.00' Excluded Wetted area = 333 sf Phase-In= 0.01'
#6	Tertiary	54.10'	**3.5' long x 2.5' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00

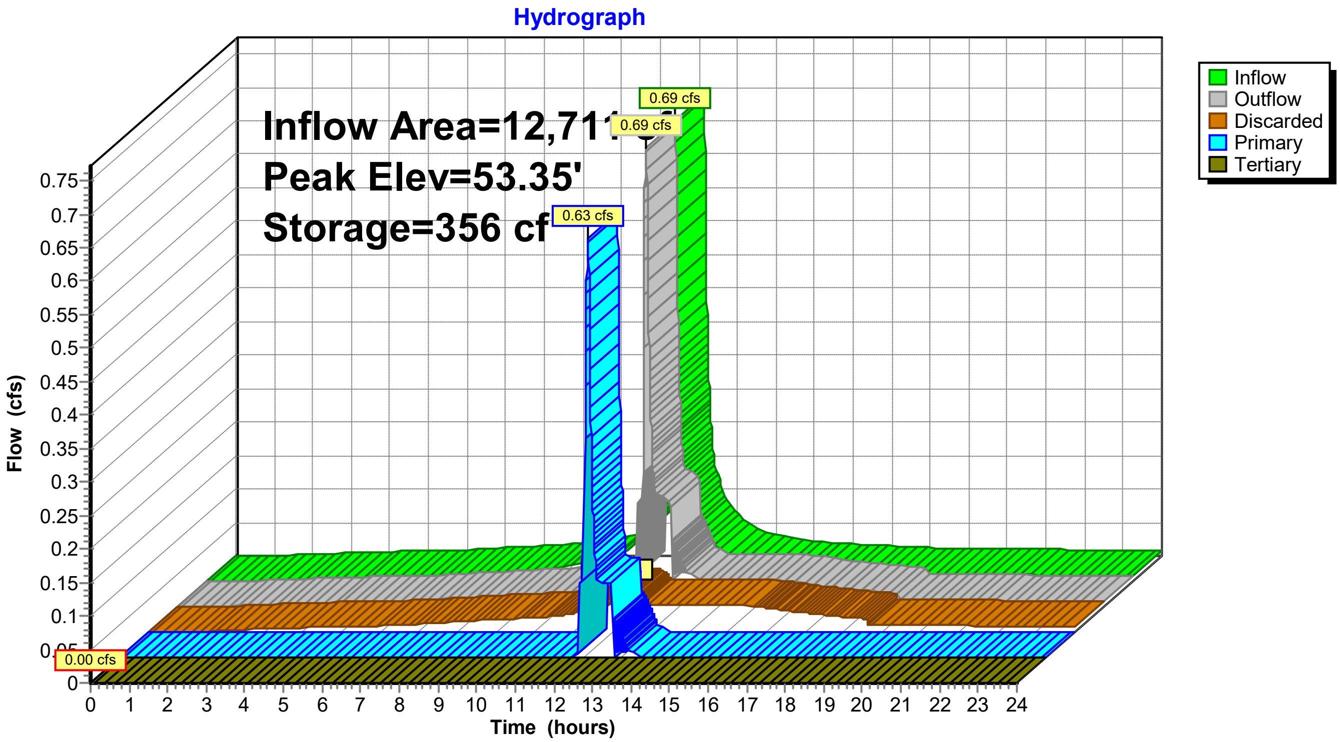
Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74 2.76 2.89 3.05 3.19 3.32

Discarded OutFlow Max=0.06 cfs @ 12.14 hrs HW=53.35' (Free Discharge)
4=R Tank Exfiltration (Controls 0.04 cfs)
5=Bowl Exfiltration (Controls 0.02 cfs)

Primary OutFlow Max=0.63 cfs @ 12.14 hrs HW=53.35' TW=49.54' (Dynamic Tailwater)
1=Culvert (Passes 0.63 cfs of 6.18 cfs potential flow)
2=Dome Grate (OF-4) (Weir Controls 0.51 cfs @ 1.05 fps)
3=Focal Point Media (Exfiltration Controls 0.11 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.63' TW=47.50' (Dynamic Tailwater)
6=Spillway (Controls 0.00 cfs)

Pond FP-4: FP-4



Summary for Pond FP-5: FP-5

Inflow Area = 9,281 sf, 84.56% Impervious, Inflow Depth > 2.62" for 2-Year event
Inflow = 0.61 cfs @ 12.13 hrs, Volume= 2,024 cf
Outflow = 0.31 cfs @ 12.22 hrs, Volume= 2,023 cf, Atten= 50%, Lag= 5.6 min
Discarded = 0.20 cfs @ 12.22 hrs, Volume= 1,778 cf
Primary = 0.11 cfs @ 12.03 hrs, Volume= 245 cf
Routed to Pond DB-A : DB-A
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond FP-4 : FP-4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 55.00' @ 12.22 hrs Surf.Area= 432 sf Storage= 449 cf
Flood Elev= 57.00' Surf.Area= 606 sf Storage= 921 cf

Plug-Flow detention time= 31.6 min calculated for 2,023 cf (100% of inflow)
Center-of-Mass det. time= 31.5 min (788.4 - 756.9)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	614 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#2	52.25'	17 cf	**6.00'W x 8.00'L x 1.75'H FP (mulch/media)** 84 cf Overall x 20.0% Voids
#3A	47.96'	135 cf	**10.56'W x 11.04'L x 4.29'H Field A** 500 cf Overall - 164 cf Embedded = 337 cf x 40.0% Voids
#4A	48.21'	155 cf	**Ferguson R-Tank HD 2.5** x 15 Inside #3 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 15 Chambers in 5 Rows
		921 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
54.00	45	24.5	0	0	45
55.00	267	76.7	141	141	468
56.35	441	85.7	473	614	628

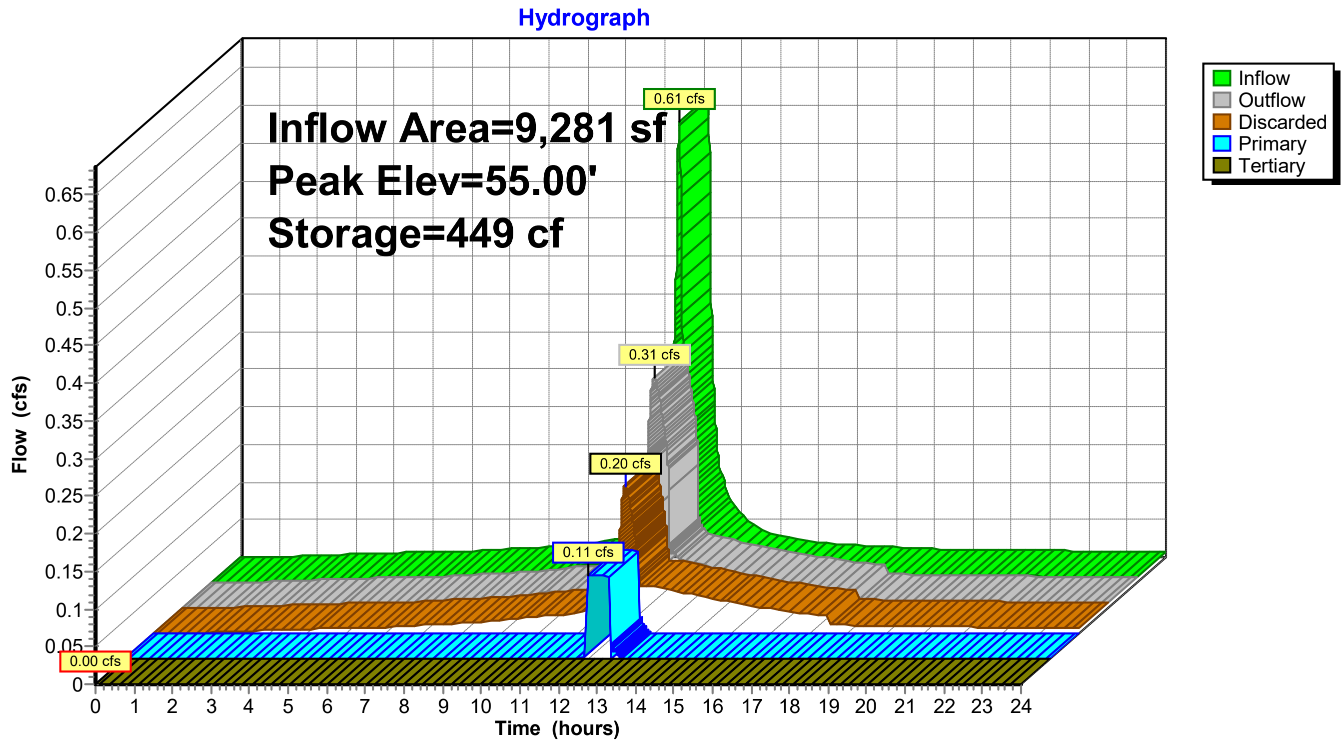
Device	Routing	Invert	Outlet Devices
#1	Primary	50.67'	**12.0" Round Culvert** L= 4.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.67' / 50.55' S= 0.0300 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	55.20'	**18.0" Horiz. Dome Grate (OF-5)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	50.55'	**100.000 in/hr Focal Point Media over Surface area from 50.55' - 52.55'** Excluded Surface area = 117 sf Phase-In= 0.01'
#4	Discarded	47.96'	**8.270 in/hr R-Tank Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#5	Discarded	52.80'	**3.000 in/hr Bowl Exfiltration over Surface area above 52.80'** Excluded Surface area = 165 sf Phase-In= 0.01'
#6	Tertiary	56.33'	**3.5' long x 2.5' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74 2.76 2.89 3.05 3.19 3.32

Discarded OutFlow Max=0.20 cfs @ 12.22 hrs HW=55.00' (Free Discharge)
├**4=R-Tank Exfiltration** (Controls 0.18 cfs)
└**5=Bowl Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.11 cfs @ 12.03 hrs HW=52.43' TW=50.71' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.11 cfs of 3.75 cfs potential flow)
  ├**2=Dome Grate (OF-5)** (Controls 0.00 cfs)
  └**3=Focal Point Media** (Exfiltration Controls 0.11 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=47.96' TW=46.63' (Dynamic Tailwater)
└**6=Spillway** (Controls 0.00 cfs)

Pond FP-5: FP-5



Summary for Pond FP-6: FP-6

Inflow Area = 14,693 sf, 51.93% Impervious, Inflow Depth > 1.61" for 2-Year event
Inflow = 0.60 cfs @ 12.13 hrs, Volume= 1,968 cf
Outflow = 0.58 cfs @ 12.15 hrs, Volume= 1,968 cf, Atten= 3%, Lag= 1.1 min
Discarded = 0.13 cfs @ 12.15 hrs, Volume= 1,662 cf
Primary = 0.45 cfs @ 12.15 hrs, Volume= 306 cf
Routed to Pond OF-6 : OF-6
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond FP-5 : FP-5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 55.48' @ 12.15 hrs Surf.Area= 345 sf Storage= 380 cf

Plug-Flow detention time= 31.0 min calculated for 1,968 cf (100% of inflow)
Center-of-Mass det. time= 31.0 min (788.1 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1	54.92'	857 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#2	53.17'	17 cf	**6.00'W x 8.00'L x 1.75'H FP (mulch/media)** 84 cf Overall x 20.0% Voids
#3A	48.88'	135 cf	**10.56'W x 11.04'L x 4.29'H Field A** 500 cf Overall - 164 cf Embedded = 337 cf x 40.0% Voids
#4A	49.13'	155 cf	**Ferguson R-Tank HD 2.5** x 15 Inside #3 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 15 Chambers in 5 Rows
		1,164 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
54.92	86	36.0	0	0	86
56.00	300	65.0	197	197	325
57.00	511	79.0	401	598	501
57.50	525	82.0	259	857	557

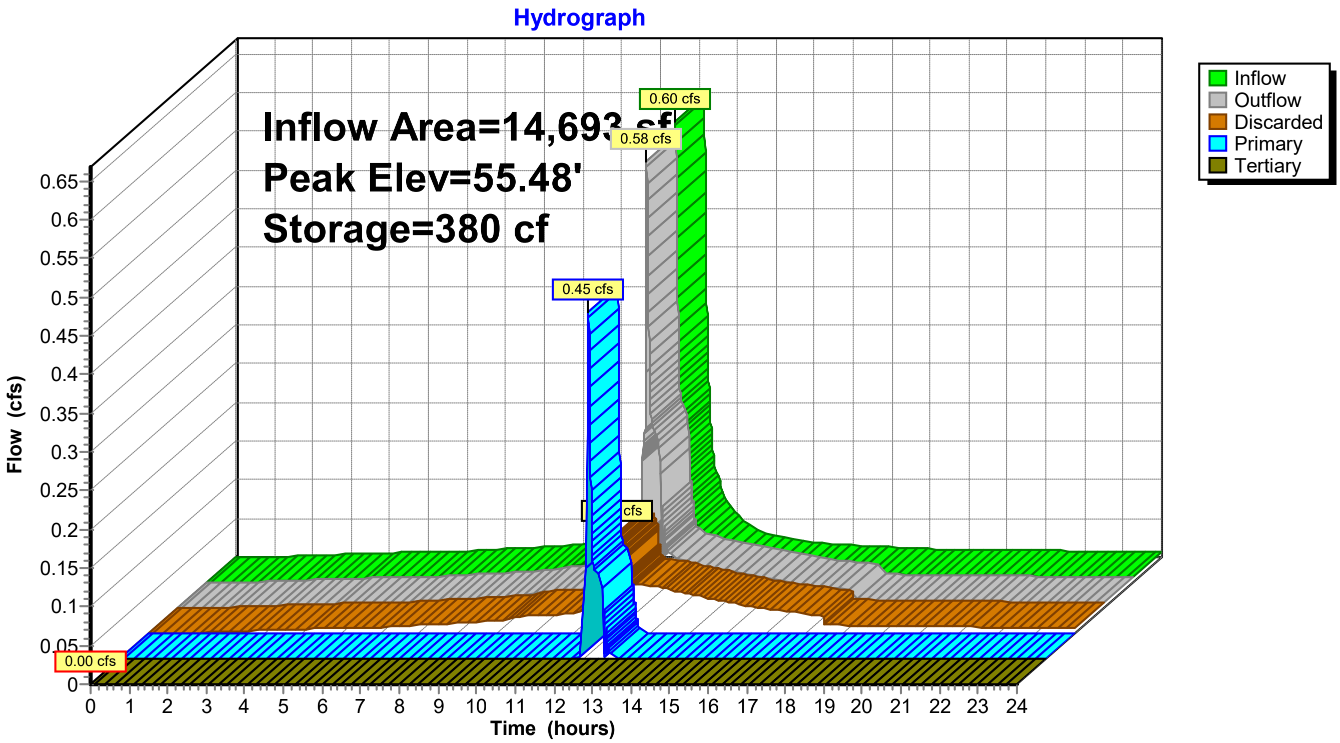
Device	Routing	Invert	Outlet Devices
#1	Primary	51.59'	**12.0" Round Culvert** L= 6.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 51.59' / 51.50' S= 0.0150 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	55.40'	**18.0" Horiz. Dome Grate (OF-6)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	52.67'	**100.000 in/hr Focal Point Media over Surface area from 52.67' - 54.67'** Excluded Surface area = 117 sf Phase-In= 0.01'
#4	Discarded	48.88'	**8.270 in/hr R-Tank Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#5	Discarded	54.92'	**3.000 in/hr Bowl Exfiltration over Wetted area above 54.92'** Excluded Wetted area = 485 sf Phase-In= 0.01'
#6	Tertiary	57.38'	**3.5' long x 2.0' breadth Spillway** 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=0.13 cfs @ 12.15 hrs HW=55.48' (Free Discharge)
├**4=R-Tank Exfiltration** (Controls 0.12 cfs)
└**5=Bowl Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.45 cfs @ 12.15 hrs HW=55.48' TW=51.75' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.45 cfs of 6.14 cfs potential flow)
  ├**2=Dome Grate (OF-6)** (Weir Controls 0.33 cfs @ 0.91 fps)
  └**3=Focal Point Media** (Exfiltration Controls 0.11 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=48.88' TW=47.96' (Dynamic Tailwater)
└**6=Spillway** (Controls 0.00 cfs)

Pond FP-6: FP-6



Summary for Pond FP-7: FP-7/INF-5

Inflow Area = 74,145 sf, 24.19% Impervious, Inflow Depth > 0.68" for 2-Year event
Inflow = 1.21 cfs @ 12.16 hrs, Volume= 4,225 cf
Outflow = 0.18 cfs @ 12.89 hrs, Volume= 4,225 cf, Atten= 85%, Lag= 44.0 min
Discarded = 0.18 cfs @ 12.89 hrs, Volume= 4,225 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond DMH-3 : DMH-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 49.37' @ 12.89 hrs Surf.Area= 551 sf Storage= 1,434 cf
Flood Elev= 57.18' Surf.Area= 2,830 sf Storage= 16,463 cf

Plug-Flow detention time= 63.7 min calculated for 4,224 cf (100% of inflow)
Center-of-Mass det. time= 63.7 min (847.1 - 783.4)

Volume	Invert	Avail.Storage	Storage Description
#1	51.90'	14,781 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#2	50.15'	17 cf	**8.00'W x 6.00'L x 1.75'H Media/Mulch**
			84 cf Overall x 20.0% Voids
#3A	45.86'	422 cf	**17.12'W x 32.15'L x 4.29'H Field A**
			2,364 cf Overall - 1,309 cf Embedded = 1,055 cf x 40.0% Voids
#4A	46.11'	1,244 cf	**Ferguson R-Tank HD 2.5** x 120 Inside #3
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			120 Chambers in 10 Rows
		16,463 cf	Total Available Storage

Storage Group A created with Chamber Wizard

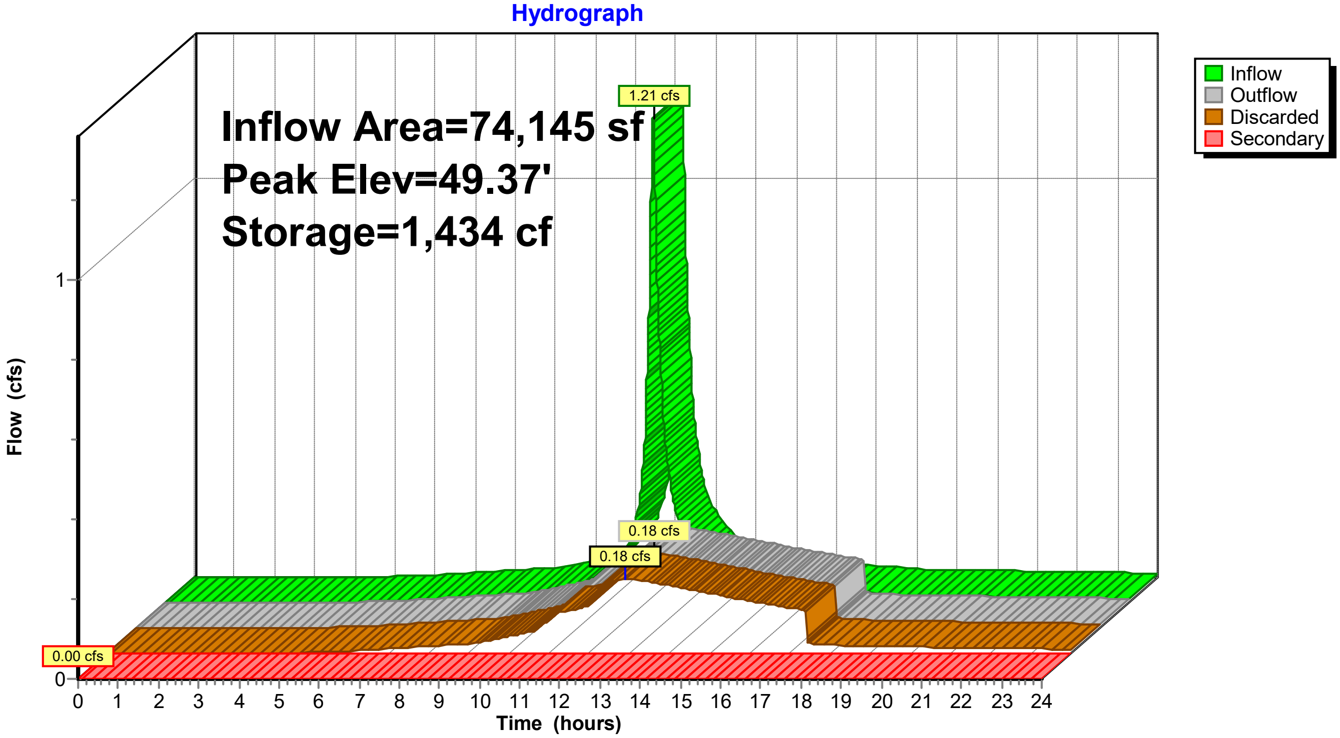
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
51.90	33	22.0	0	0	33
52.00	211	64.0	11	11	320
53.00	549	145.0	367	378	1,672
54.00	874	156.0	705	1,083	1,975
55.00	14,388	179.0	6,269	7,352	2,611
56.00	2,231	200.0	7,428	14,781	3,272

Device	Routing	Invert	Outlet Devices
#1	Discarded	52.00'	**3.000 in/hr RG Exfiltration over Surface area from 52.00' - 54.50'**
			Conductivity to Groundwater Elevation = 10.00'
			Excluded Surface area = 810 sf Phase-In= 0.01'
#2	Discarded	45.86'	**8.270 in/hr R-tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#3	Secondary	55.70'	**32.0" W x 9.0" H Vert. TR-7 (backflow)** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.18 cfs @ 12.89 hrs HW=49.37' (Free Discharge)
1=RG Exfiltration (Controls 0.00 cfs)
2=R-tank Exfiltration (Controls 0.18 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=45.86' TW=51.10' (Dynamic Tailwater)
3=TR-7 (backflow) (Controls 0.00 cfs)

Pond FP-7: FP-7/INF-5



Summary for Pond INF-1: INF-1

Inflow Area = 23,899 sf, 71.73% Impervious, Inflow Depth > 2.23" for 2-Year event
Inflow = 1.34 cfs @ 12.13 hrs, Volume= 4,435 cf
Outflow = 0.19 cfs @ 12.60 hrs, Volume= 4,434 cf, Atten= 86%, Lag= 28.4 min
Discarded = 0.19 cfs @ 12.60 hrs, Volume= 4,434 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond AB-1 : Attenuation Basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 48.63' @ 12.60 hrs Surf.Area= 636 sf Storage= 1,216 cf

Plug-Flow detention time= 41.2 min calculated for 4,433 cf (100% of inflow)
Center-of-Mass det. time= 41.2 min (798.7 - 757.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	46.00'	626 cf	**14.50'W x 43.88'L x 4.79'H Field A**
			3,049 cf Overall - 1,483 cf Embedded = 1,566 cf x 40.0% Voids
#2A	46.25'	1,409 cf	**Ferguson R-Tank HD 2.5** x 136 Inside #1
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			136 Chambers in 8 Rows
		2,036 cf	Total Available Storage

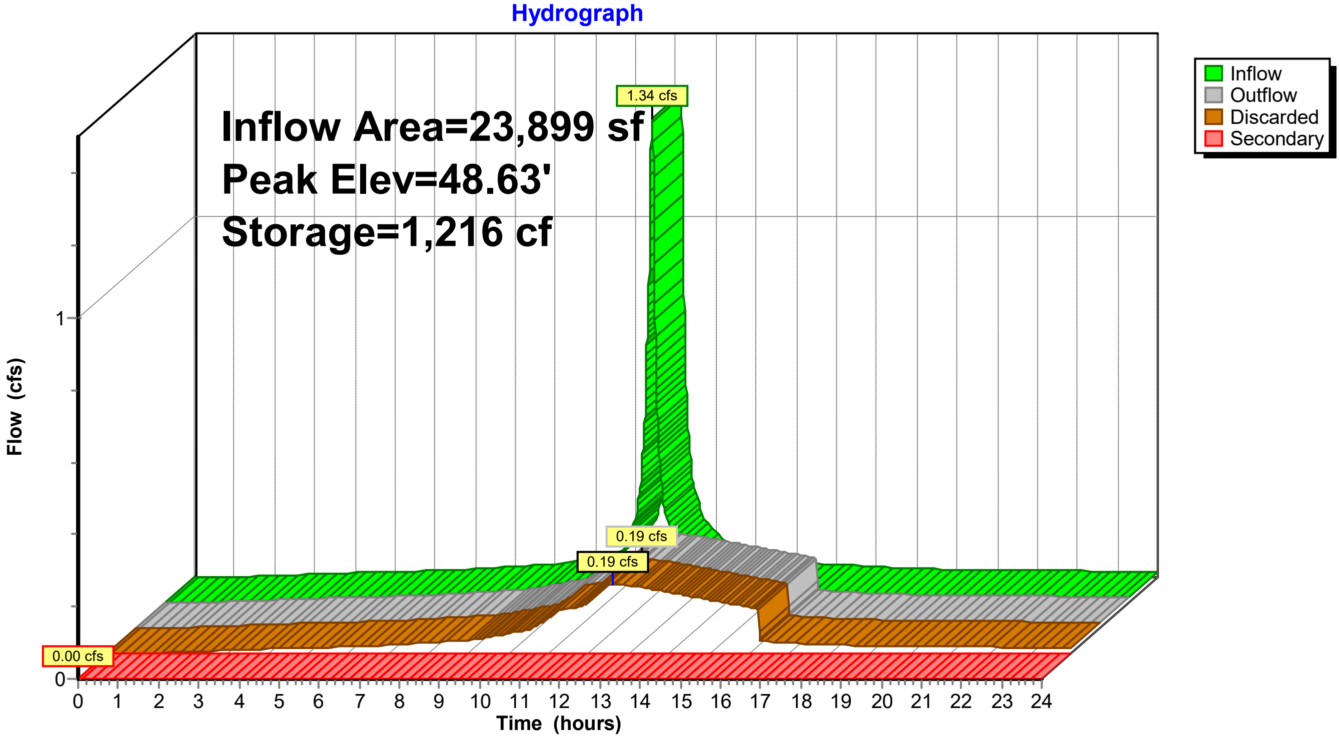
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	46.00'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#2	Secondary	50.25'	**12.0" Round Overflow** L= 14.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.25' / 50.10' S= 0.0107 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.19 cfs @ 12.60 hrs HW=48.63' (Free Discharge)
↑**1=Exfiltration** (Controls 0.19 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.00' TW=49.00' (Dynamic Tailwater)
↑**2=Overflow** (Controls 0.00 cfs)

Pond INF-1: INF-1



Summary for Pond INF-2: INF-2

Inflow Area = 104,046 sf, 64.30% Impervious, Inflow Depth = 0.16" for 2-Year event
Inflow = 1.36 cfs @ 12.15 hrs, Volume= 1,396 cf
Outflow = 0.32 cfs @ 12.53 hrs, Volume= 1,396 cf, Atten= 76%, Lag= 23.1 min
Discarded = 0.32 cfs @ 12.53 hrs, Volume= 1,396 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond DMH-3 : DMH-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 48.20' @ 12.53 hrs Surf.Area= 1,566 sf Storage= 557 cf
Flood Elev= 54.00' Surf.Area= 1,566 sf Storage= 6,187 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 17.4 min (755.7 - 738.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	47.64'	1,398 cf	**21.06'W x 74.37'L x 5.45'H Field A**
			8,536 cf Overall - 5,042 cf Embedded = 3,494 cf x 40.0% Voids
#2A	47.89'	4,790 cf	**Ferguson R-Tank HD 3** x 390 Inside #1
			Inside= 15.7"W x 50.4"H => 5.24 sf x 2.35'L = 12.3 cf
			Outside= 15.7"W x 50.4"H => 5.51 sf x 2.35'L = 12.9 cf
			390 Chambers in 13 Rows
		6,187 cf	Total Available Storage

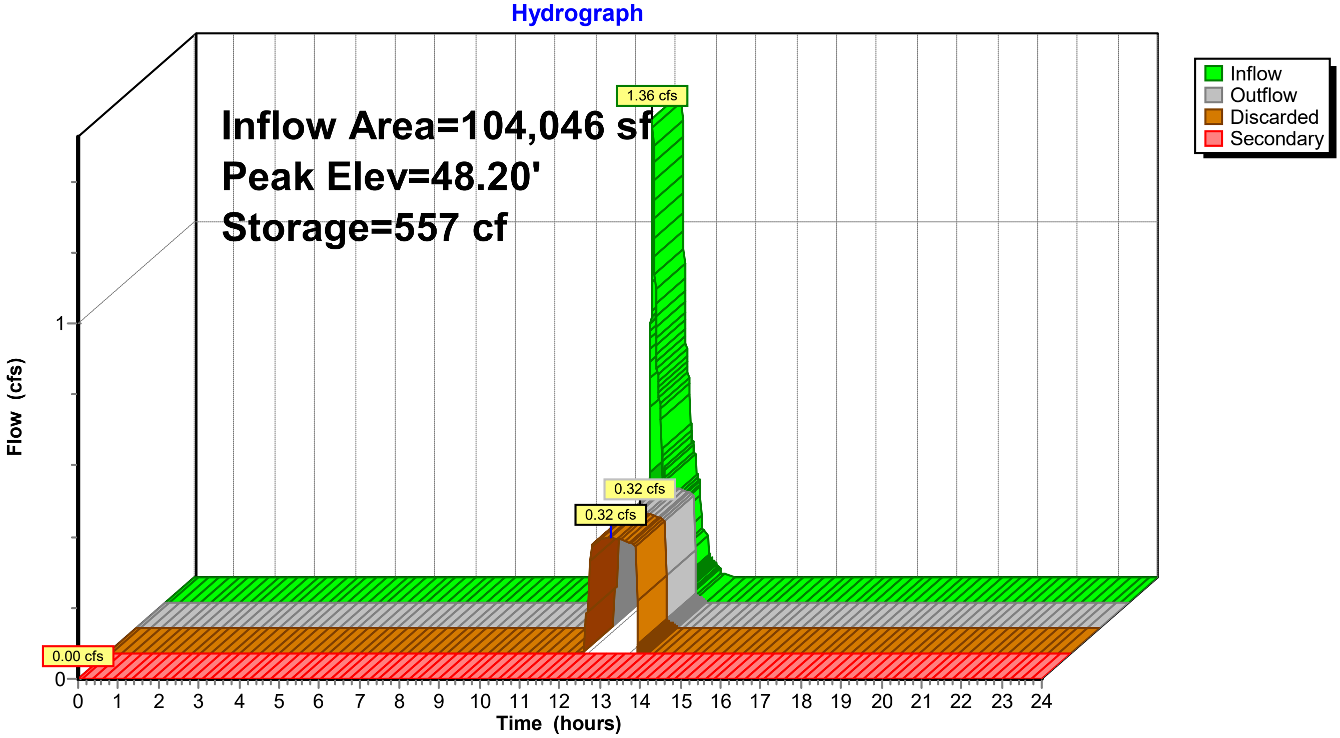
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	47.64'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00'
#2	Secondary	51.35'	**15.0" Round Culvert** L= 24.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 51.35' / 51.10' S= 0.0104 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=0.32 cfs @ 12.53 hrs HW=48.20' (Free Discharge)
└─**1=Exfiltration** (Controls 0.32 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=47.64' TW=51.10' (Dynamic Tailwater)
└─**2=Culvert** (Controls 0.00 cfs)

Pond INF-2: INF-2



Summary for Pond INF-3: INF-3

Inflow Area = 38,595 sf, 60.69% Impervious, Inflow Depth > 1.17" for 2-Year event
Inflow = 1.47 cfs @ 12.14 hrs, Volume= 3,748 cf
Outflow = 0.26 cfs @ 12.43 hrs, Volume= 3,747 cf, Atten= 83%, Lag= 17.8 min
Discarded = 0.26 cfs @ 12.43 hrs, Volume= 3,747 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond SP 4 : Study Point

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 44.18' @ 12.43 hrs Surf.Area= 1,112 sf Storage= 939 cf

Plug-Flow detention time= 19.1 min calculated for 3,747 cf (100% of inflow)
Center-of-Mass det. time= 19.1 min (774.5 - 755.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	43.00'	1,058 cf	**18.44'W x 60.30'L x 5.45'H Field A**
			6,058 cf Overall - 3,413 cf Embedded = 2,645 cf x 40.0% Voids
#2A	43.25'	3,242 cf	**Ferguson R-Tank HD 3** x 264 Inside #1
			Inside= 15.7"W x 50.4"H => 5.24 sf x 2.35'L = 12.3 cf
			Outside= 15.7"W x 50.4"H => 5.51 sf x 2.35'L = 12.9 cf
			264 Chambers in 11 Rows
		4,300 cf	Total Available Storage

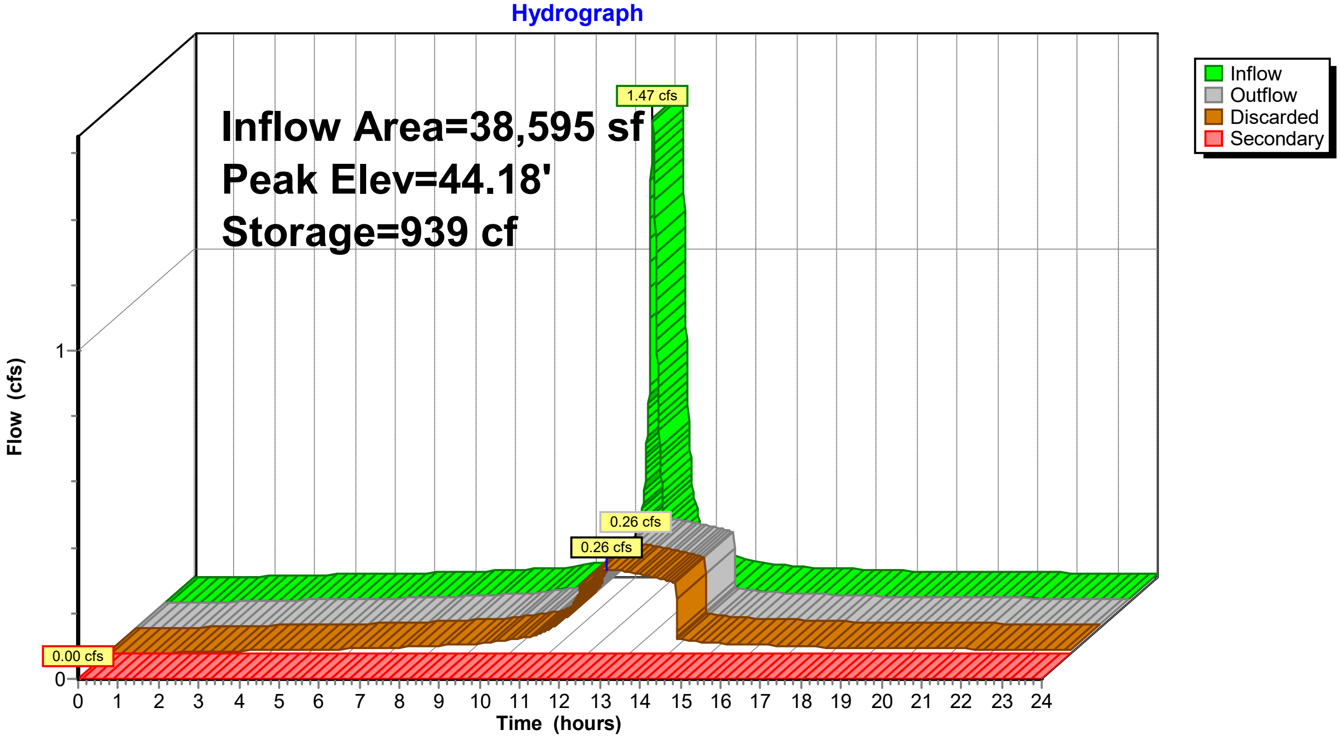
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	43.00'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#2	Secondary	49.80'	**24.0" x 24.0" Horiz. CB-6A** C= 0.600 Limited to weir flow at low heads
#3	Secondary	49.80'	**24.0" x 24.0" Horiz. CB-7** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.26 cfs @ 12.43 hrs HW=44.18' (Free Discharge)
└─**1=Exfiltration** (Controls 0.26 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=43.00' TW=0.00' (Dynamic Tailwater)
├─**2=CB-6A** (Controls 0.00 cfs)
└─**3=CB-7** (Controls 0.00 cfs)

Pond INF-3: INF-3



Summary for Pond INF-4: INF-4

Inflow Area = 45,592 sf, 62.99% Impervious, Inflow Depth > 1.98" for 2-Year event
Inflow = 2.24 cfs @ 12.13 hrs, Volume= 7,529 cf
Outflow = 0.35 cfs @ 12.58 hrs, Volume= 7,529 cf, Atten= 84%, Lag= 27.0 min
Discarded = 0.35 cfs @ 12.58 hrs, Volume= 7,529 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond OF-6 : OF-6

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.96' @ 12.58 hrs Surf.Area= 1,468 sf Storage= 1,825 cf
Flood Elev= 57.18' Surf.Area= 1,468 sf Storage= 5,494 cf

Plug-Flow detention time= 29.6 min calculated for 7,527 cf (100% of inflow)
Center-of-Mass det. time= 29.6 min (789.6 - 760.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	50.32'	1,023 cf	**21.06'W x 69.68'L x 4.95'H Field A** 7,264 cf Overall - 4,706 cf Embedded = 2,558 cf x 40.0% Voids
#2A	50.57'	4,471 cf	**Ferguson R-Tank HD 3** x 364 Inside #1 Inside= 15.7"W x 50.4"H => 5.24 sf x 2.35'L = 12.3 cf Outside= 15.7"W x 50.4"H => 5.51 sf x 2.35'L = 12.9 cf 364 Chambers in 13 Rows
		5,494 cf	Total Available Storage

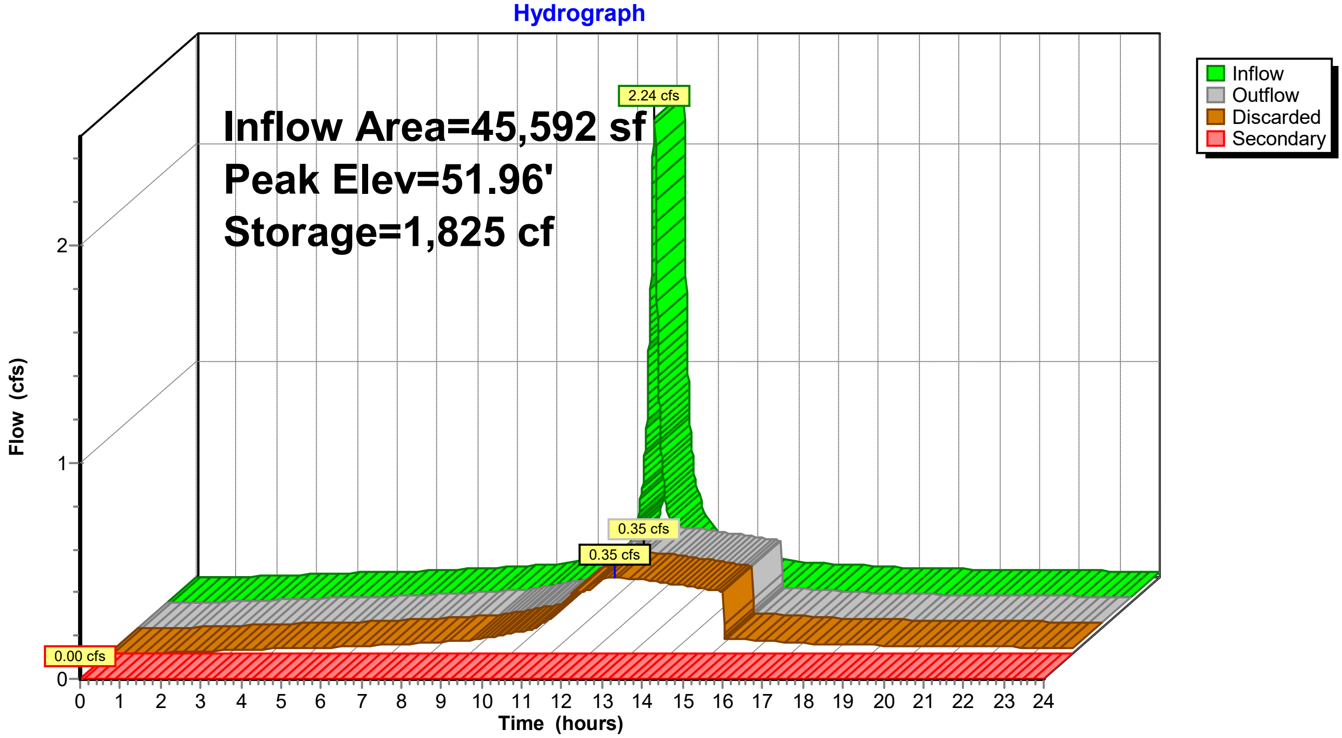
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	50.32'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#2	Secondary	53.52'	**12.0" Round Overflow** L= 86.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 53.52' / 51.40' S= 0.0247 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.35 cfs @ 12.58 hrs HW=51.96' (Free Discharge)
└─**1=Exfiltration** (Controls 0.35 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=50.32' TW=51.40' (Dynamic Tailwater)
└─**2=Overflow** (Controls 0.00 cfs)

Pond INF-4: INF-4



Summary for Pond INF-6: INF-6

Inflow Area = 19,023 sf, 56.89% Impervious, Inflow Depth > 1.83" for 2-Year event
Inflow = 0.87 cfs @ 12.13 hrs, Volume= 2,901 cf
Outflow = 0.12 cfs @ 12.62 hrs, Volume= 2,900 cf, Atten= 86%, Lag= 29.6 min
Discarded = 0.12 cfs @ 12.62 hrs, Volume= 2,900 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 53.79' @ 12.62 hrs Surf.Area= 330 sf Storage= 834 cf

Plug-Flow detention time= 49.0 min calculated for 2,900 cf (100% of inflow)
Center-of-Mass det. time= 48.9 min (812.5 - 763.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	50.46'	663 cf	**Ferguson R-Tank HD 2.5** x 64 Inside #2 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 64 Chambers in 8 Rows
#2A	50.21'	288 cf	**14.50'W x 22.77'L x 4.29'H Field A** 1,417 cf Overall - 698 cf Embedded = 719 cf x 40.0% Voids
#3	56.00'	4,508 cf	**Depression (Irregular)** Listed below (Recalc)
		5,459 cf	Total Available Storage

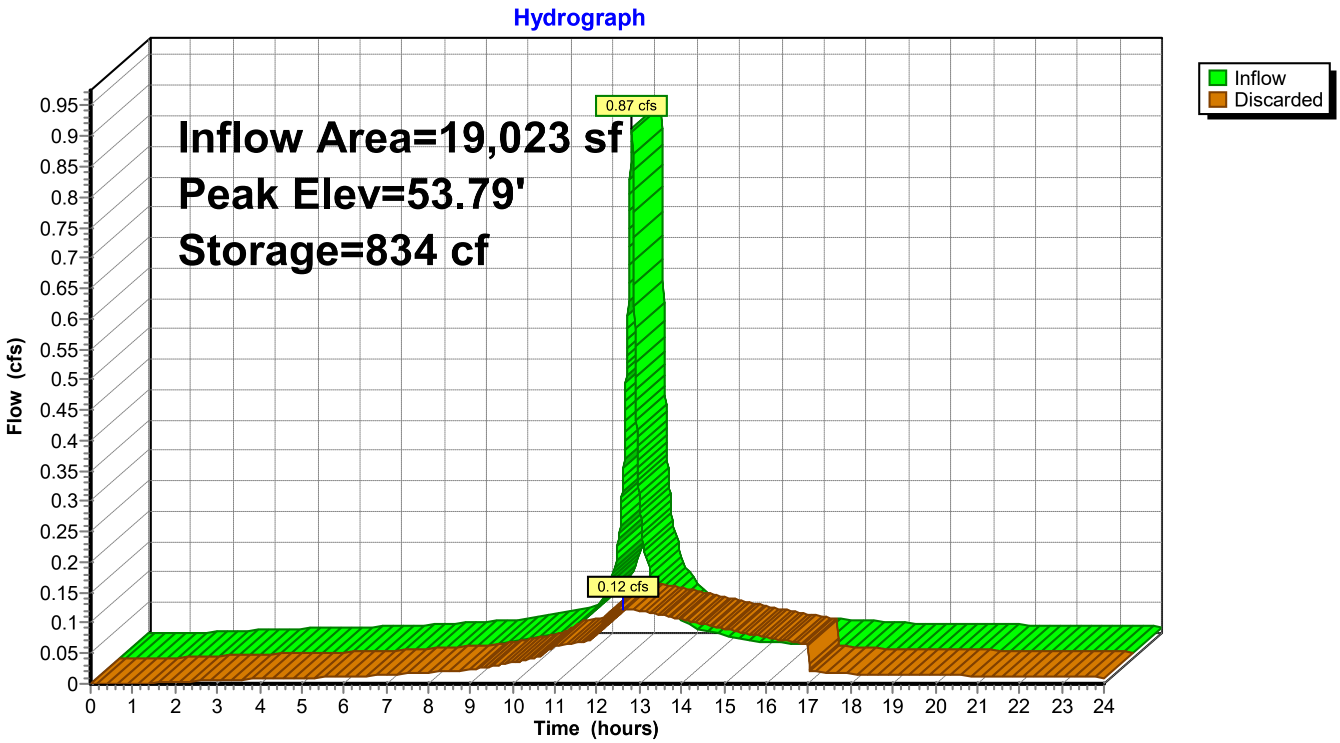
Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
56.00	361	76.0	0	0	361
57.00	1,869	162.0	1,017	1,017	1,994
58.00	3,616	269.0	2,695	3,712	5,670
58.20	4,360	285.0	796	4,508	6,378

Device	Routing	Invert	Outlet Devices
#1	Discarded	50.21'	**8.270 in/hr R Tank Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'

Discarded OutFlow Max=0.12 cfs @ 12.62 hrs HW=53.79' (Free Discharge)
1=R Tank Exfiltration (Controls 0.12 cfs)

Pond INF-6: INF-6



Summary for Pond OF-6: OF-6

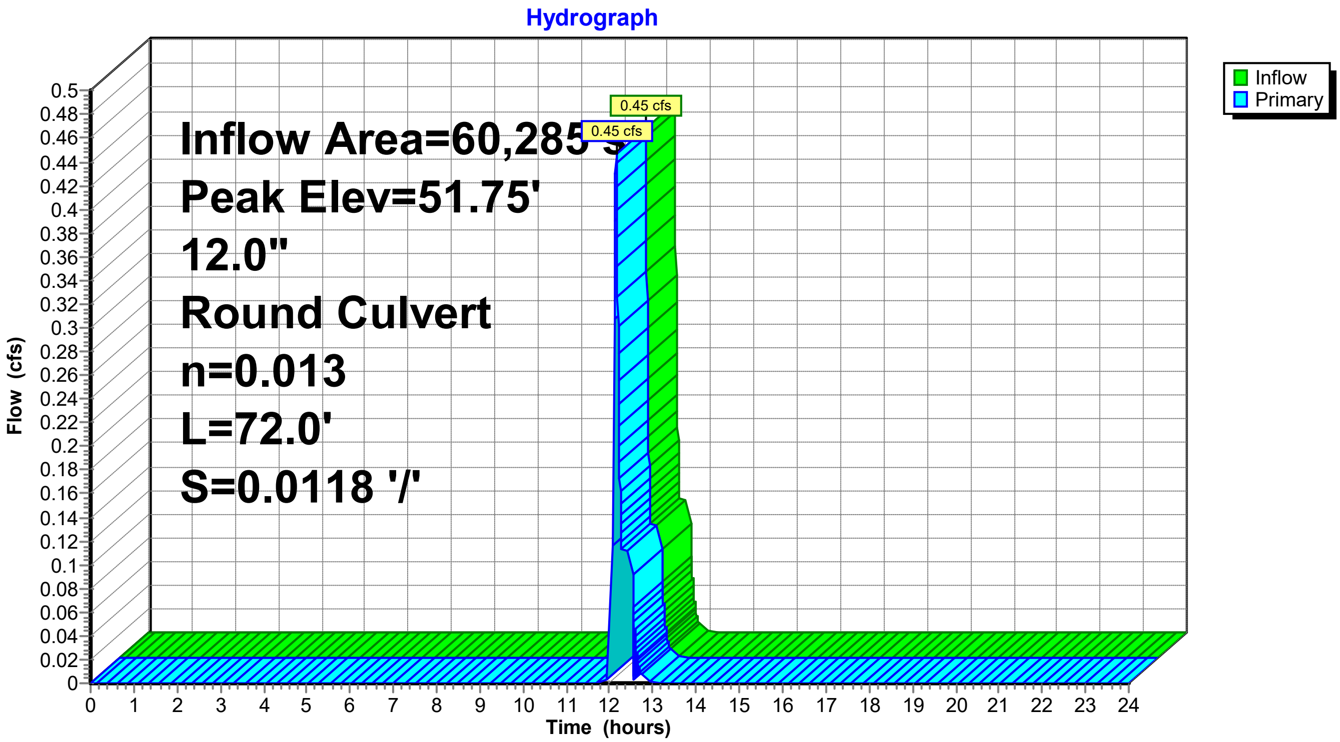
Inflow Area = 60,285 sf, 60.30% Impervious, Inflow Depth = 0.06" for 2-Year event
Inflow = 0.45 cfs @ 12.15 hrs, Volume= 306 cf
Outflow = 0.45 cfs @ 12.15 hrs, Volume= 306 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.45 cfs @ 12.15 hrs, Volume= 306 cf
Routed to Pond DB-A : DB-A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.75' @ 12.15 hrs
Flood Elev= 54.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.40'	**12.0" Round Culvert** L= 72.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 51.40' / 50.55' S= 0.0118 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.45 cfs @ 12.15 hrs HW=51.75' TW=50.92' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.45 cfs @ 1.79 fps)

Pond OF-6: OF-6

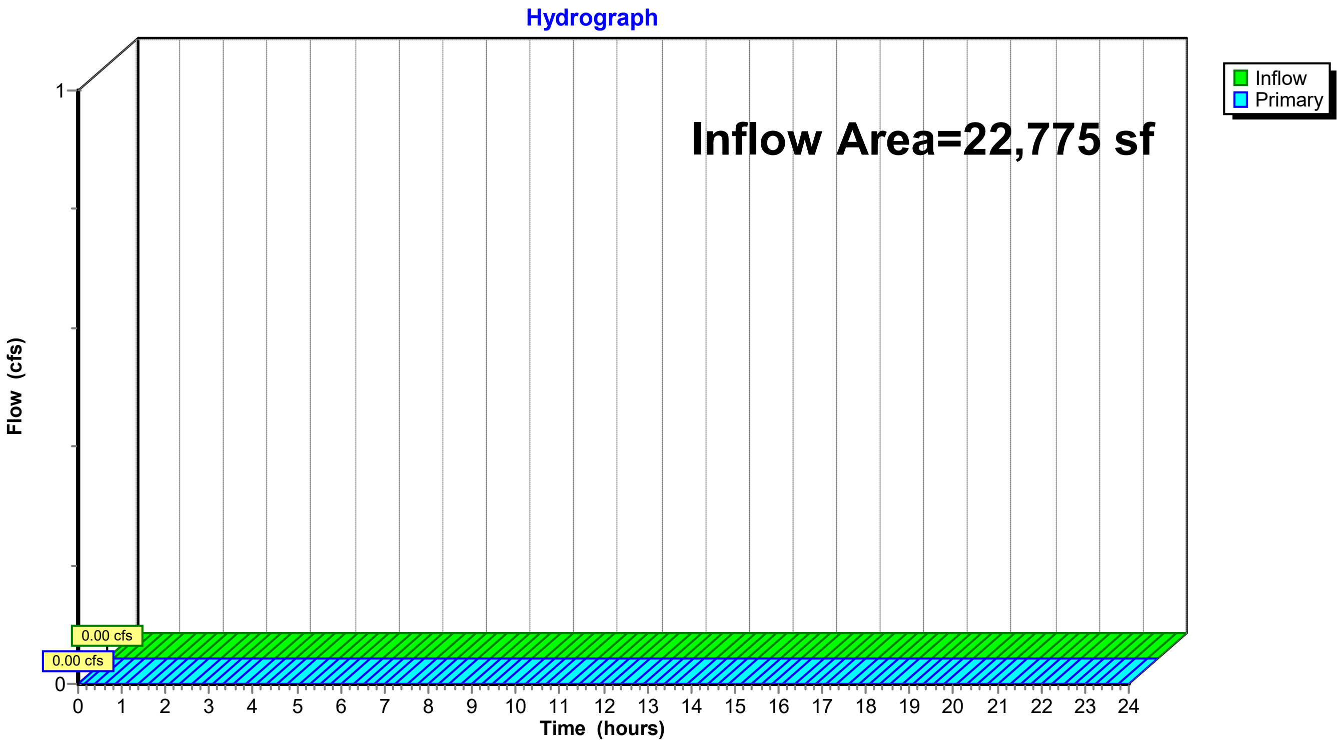


Summary for Pond SP 1: Study Point

Inflow Area =	22,775 sf,	0.00% Impervious, Inflow Depth = 0.00"	for 2-Year event
Inflow =	0.00 cfs @	0.00 hrs, Volume=	0 cf
Primary =	0.00 cfs @	0.00 hrs, Volume=	0 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3

Pond SP 1: Study Point

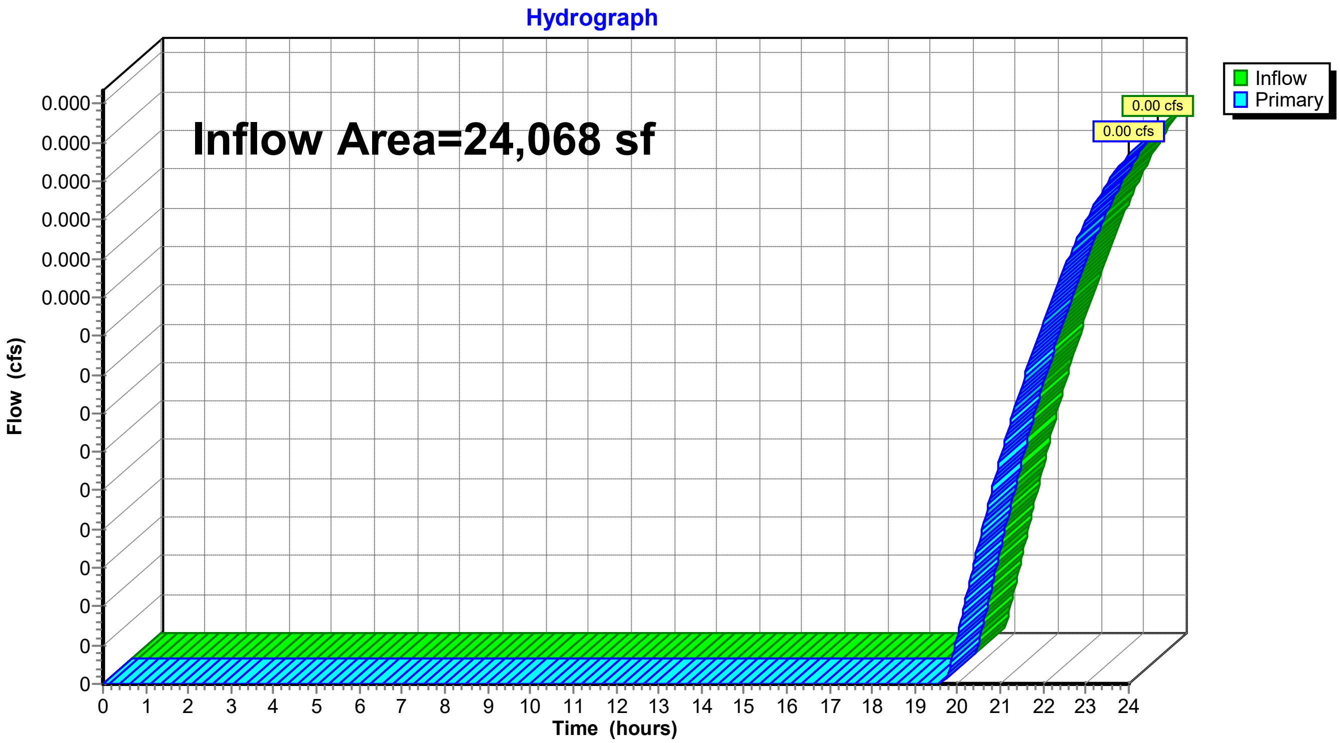


Summary for Pond SP 3: Study Point

Inflow Area = 24,068 sf, 0.00% Impervious, Inflow Depth > 0.00" for 2-Year event
Inflow = 0.00 cfs @ 24.00 hrs, Volume= 1 cf
Primary = 0.00 cfs @ 24.00 hrs, Volume= 1 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3

Pond SP 3: Study Point

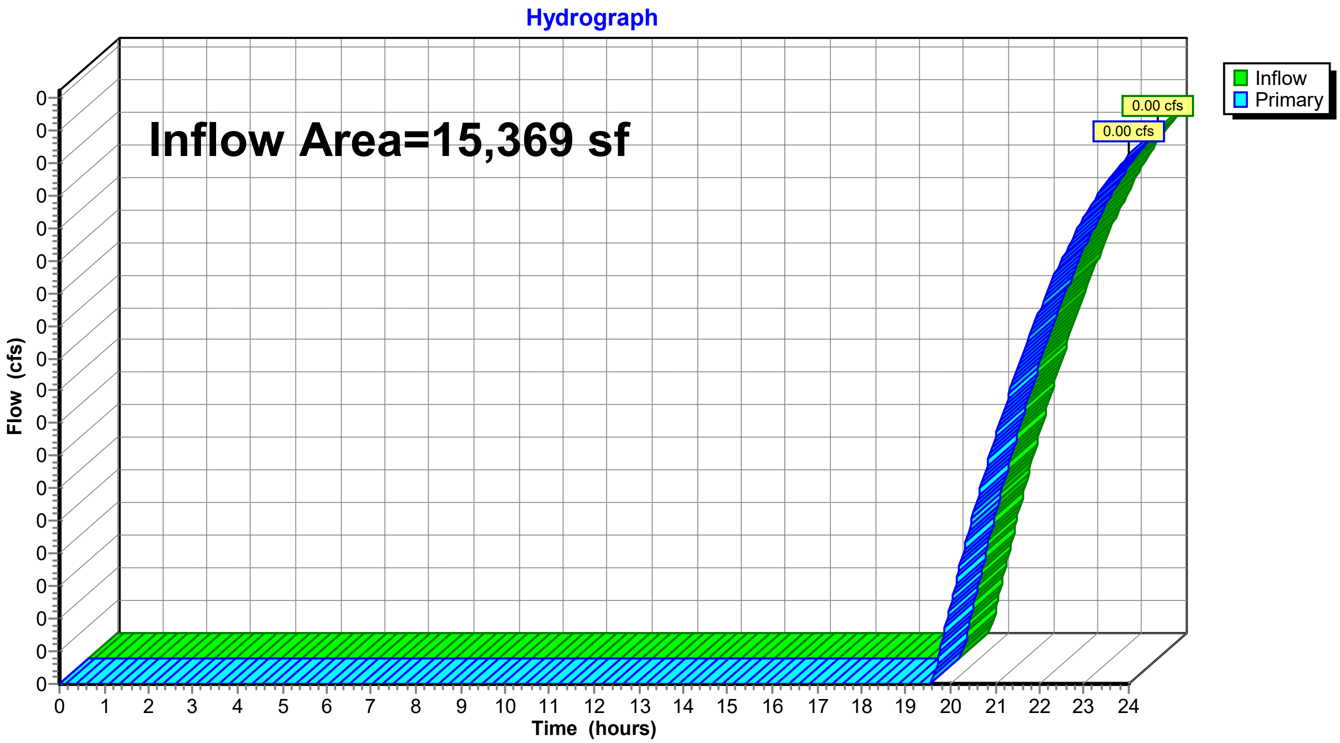


Summary for Pond SP 4: Study Point

Inflow Area = 15,369 sf, 0.00% Impervious, Inflow Depth > 0.00" for 2-Year event
Inflow = 0.00 cfs @ 24.00 hrs, Volume= 1 cf
Primary = 0.00 cfs @ 24.00 hrs, Volume= 1 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3

Pond SP 4: Study Point

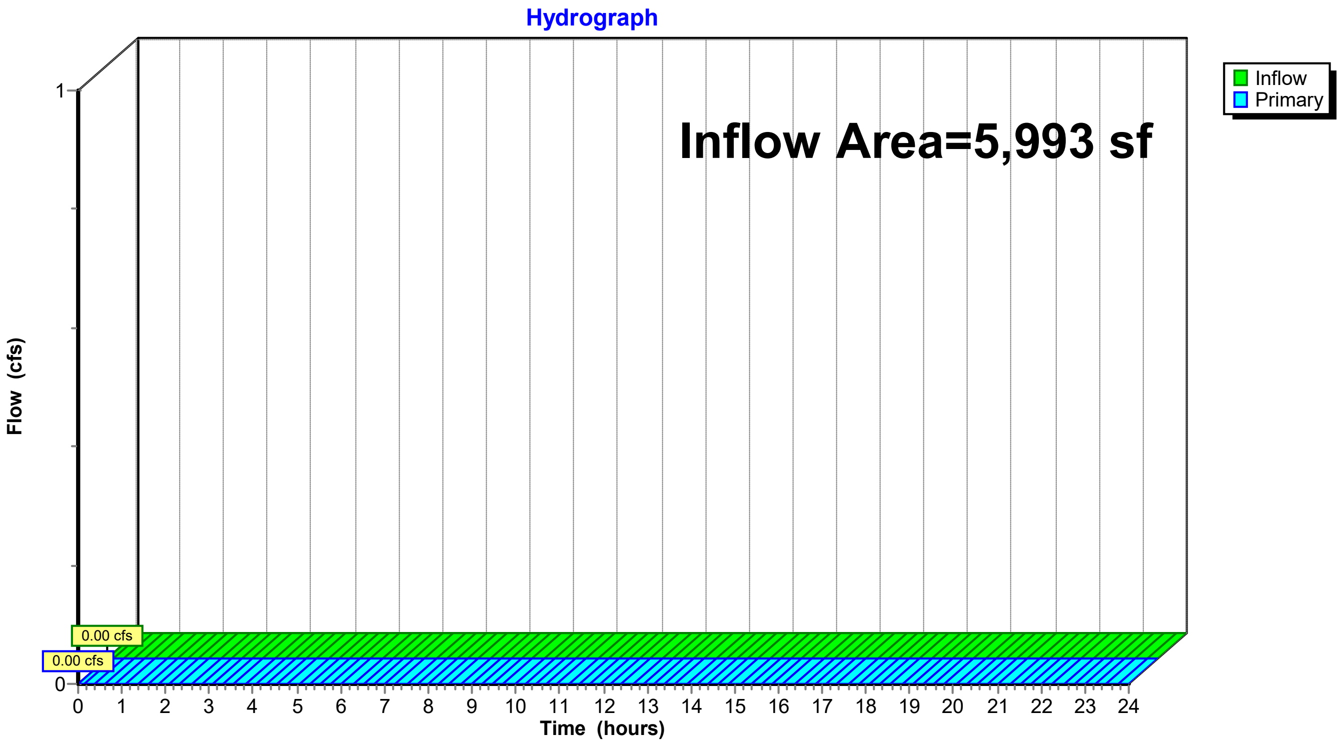


Summary for Pond SP-2: Study Point

Inflow Area = 5,993 sf, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3

Pond SP-2: Study Point



Time span=0.00-24.00 hrs, dt=0.006 hrs, 4001 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: RA (partial) Runoff Area=18,019 sf 100.00% Impervious Runoff Depth>4.72"
Tc=6.0 min CN=98 Runoff=2.11 cfs 7,085 cf

Subcatchment 2S: RA (partial) Runoff Area=14,390 sf 100.00% Impervious Runoff Depth>4.72"
Tc=6.0 min CN=98 Runoff=1.69 cfs 5,658 cf

Subcatchment 3S: RA (partial) Runoff Area=10,803 sf 100.00% Impervious Runoff Depth>4.72"
Tc=6.0 min CN=98 Runoff=1.27 cfs 4,248 cf

Subcatchment SCA-1: LSA/FL/IA/PP Runoff Area=52,119 sf 6.80% Impervious Runoff Depth>0.85"
Flow Length=532' Slope=0.0100 '/' Tc=16.6 min CN=WQ Runoff=0.69 cfs 3,712 cf

Subcatchment SCA-10: Runoff Area=9,281 sf 84.56% Impervious Runoff Depth>4.02"
Tc=6.0 min CN=WQ Runoff=0.92 cfs 3,108 cf

Subcatchment SCA-11: Runoff Area=8,047 sf 72.78% Impervious Runoff Depth>3.49"
Tc=6.0 min CN=WQ Runoff=0.69 cfs 2,338 cf

Subcatchment SCA-12: Runoff Area=12,711 sf 69.37% Impervious Runoff Depth>3.32"
Tc=6.0 min CN=WQ Runoff=1.03 cfs 3,520 cf

Subcatchment SCA-13: Runoff Area=9,436 sf 78.35% Impervious Runoff Depth>3.74"
Tc=6.0 min CN=WQ Runoff=0.87 cfs 2,939 cf

Subcatchment SCA-14: Runoff Area=13,982 sf 55.19% Impervious Runoff Depth>2.66"
Tc=6.0 min CN=WQ Runoff=0.90 cfs 3,096 cf

Subcatchment SCA-16: Runoff Area=6,892 sf 58.84% Impervious Runoff Depth>2.85"
Tc=6.0 min CN=WQ Runoff=0.47 cfs 1,640 cf

Subcatchment SCA-17: Runoff Area=4,123 sf 100.00% Impervious Runoff Depth>4.72"
Tc=6.0 min CN=98 Runoff=0.48 cfs 1,621 cf

Subcatchment SCA-18: Runoff Area=9,051 sf 85.55% Impervious Runoff Depth>4.06"
Tc=6.0 min CN=WQ Runoff=0.91 cfs 3,065 cf

Subcatchment SCA-19: Runoff Area=12,142 sf 43.49% Impervious Runoff Depth>2.08"
Flow Length=145' Tc=9.6 min CN=WQ Runoff=0.54 cfs 2,100 cf

Subcatchment SCA-2: LSA/FL Runoff Area=8,220 sf 0.24% Impervious Runoff Depth>0.58"
Flow Length=75' Tc=6.1 min CN=WQ Runoff=0.10 cfs 396 cf

Subcatchment SCA-4: Runoff Area=27,573 sf 38.81% Impervious Runoff Depth>2.04"
Flow Length=254' Tc=6.8 min CN=WQ Runoff=1.32 cfs 4,693 cf

Subcatchment SCA-5: Runoff Area=7,636 sf 0.00% Impervious Runoff Depth>0.19"
Tc=6.0 min CN=39 Runoff=0.01 cfs 122 cf

Subcatchment SCA-6.1: Runoff Area=12,884 sf 69.58% Impervious Runoff Depth>3.37"
Tc=6.0 min CN=WQ Runoff=1.06 cfs 3,620 cf

Subcatchment SCA-6.2: Runoff Area=8,059 sf 57.41% Impervious Runoff Depth>3.21"
Tc=6.0 min CN=WQ Runoff=0.65 cfs 2,157 cf

Subcatchment SCA-7: Runoff Area=14,693 sf 51.93% Impervious Runoff Depth>2.52"
Tc=6.0 min CN=WQ Runoff=0.89 cfs 3,088 cf

Subcatchment SCA-8: Runoff Area=3,035 sf 100.00% Impervious Runoff Depth>4.72"
Tc=6.0 min CN=98 Runoff=0.36 cfs 1,193 cf

Subcatchment SCA-9: Runoff Area=5,663 sf 60.09% Impervious Runoff Depth>2.91"
Tc=6.0 min CN=WQ Runoff=0.40 cfs 1,374 cf

Subcatchment UC-1: NA Runoff Area=22,775 sf 0.00% Impervious Runoff Depth>0.00"
Flow Length=434' Tc=34.9 min CN=30 Runoff=0.00 cfs 6 cf

Subcatchment UC-2: Runoff Area=24,068 sf 0.00% Impervious Runoff Depth>0.05"
Flow Length=450' Tc=16.6 min CN=WQ Runoff=0.00 cfs 107 cf

Subcatchment UC-3: Runoff Area=7,204 sf 0.00% Impervious Runoff Depth>0.19"
Tc=6.0 min CN=39 Runoff=0.00 cfs 115 cf

Subcatchment UC-4: Runoff Area=8,165 sf 0.00% Impervious Runoff Depth>0.09"
Tc=6.0 min CN=WQ Runoff=0.00 cfs 62 cf

Subcatchment UC-5: Runoff Area=2,516 sf 100.00% Impervious Runoff Depth>4.72"
Tc=6.0 min CN=98 Runoff=0.29 cfs 989 cf

Subcatchment UC-6: NA Runoff Area=5,993 sf 0.00% Impervious Runoff Depth>0.00"
Flow Length=45' Slope=0.0300 '/' Tc=9.4 min CN=30 Runoff=0.00 cfs 2 cf

Pond AB-1: Attenuation Basin Peak Elev=49.29' Storage=235 cf Inflow=0.26 cfs 350 cf
Discarded=0.01 cfs 192 cf Primary=0.00 cfs 0 cf Outflow=0.01 cfs 192 cf

Pond CB-2A: CB 2A Peak Elev=50.96' Inflow=0.48 cfs 1,621 cf
12.0" Round Culvert n=0.013 L=14.0' S=0.0100 '/' Outflow=0.48 cfs 1,621 cf

Pond CB-2B: CB 2B Peak Elev=50.94' Inflow=0.47 cfs 1,640 cf
12.0" Round Culvert n=0.013 L=4.0' S=0.0350 '/' Outflow=0.47 cfs 1,640 cf

Pond CB-3: CB-3 Peak Elev=51.97' Inflow=1.06 cfs 3,620 cf
12.0" Round Culvert x 2.00 n=0.013 L=7.0' S=0.0143 '/' Outflow=1.06 cfs 3,620 cf

Pond CB-4: CB-4 Peak Elev=56.99' Storage=25 cf Inflow=1.32 cfs 4,693 cf
Outflow=1.28 cfs 4,693 cf

Pond CB-6A: CB-6A Peak Elev=46.84' Inflow=0.54 cfs 2,100 cf
12.0" Round Culvert n=0.013 L=25.0' S=0.0120 '/' Outflow=0.54 cfs 2,100 cf

Pond CB-6B,C: CB-6B,6C Peak Elev=47.86' Inflow=0.90 cfs 3,096 cf
12.0" Round Culvert x 2.00 n=0.013 L=19.0' S=0.0553 '/' Outflow=0.90 cfs 3,096 cf

Pond CB-7: CB-7 Peak Elev=46.99' Inflow=0.91 cfs 3,065 cf
12.0" Round Culvert n=0.013 L=37.0' S=0.0095 '/' Outflow=0.91 cfs 3,065 cf

Pond DB-A: DB-A Peak Elev=51.17' Inflow=1.42 cfs 1,413 cf
15.0" Round Culvert n=0.013 L=46.0' S=0.0337 '/' Outflow=1.42 cfs 1,413 cf

Pond DMH-2.1: DMH-2.1 (By-Pass) Peak Elev=50.57' Inflow=2.02 cfs 6,880 cf
Primary=2.00 cfs 6,876 cf Secondary=0.02 cfs 5 cf Outflow=2.02 cfs 6,880 cf

Pond DMH-2.2: DMH-2.2 Peak Elev=50.77' Inflow=2.02 cfs 6,880 cf
18.0" Round Culvert n=0.013 L=36.0' S=0.0056 '/' Outflow=2.02 cfs 6,880 cf

Pond DMH-3: DMH-3 Peak Elev=51.65' Inflow=1.06 cfs 3,620 cf
18.0" Round Culvert n=0.013 L=183.0' S=0.0052 '/' Outflow=1.06 cfs 3,620 cf

Pond DMH-4: DMH-4 Peak Elev=49.60' Inflow=0.64 cfs 805 cf
12.0" Round Culvert n=0.013 L=20.0' S=0.0100 '/' Outflow=0.64 cfs 805 cf

Pond DMH-5: DMH-5 Peak Elev=49.82' Inflow=2.38 cfs 2,809 cf
18.0" Round Culvert n=0.013 L=10.0' S=0.0150 '/' Outflow=2.38 cfs 2,809 cf

Pond DMH-6: DMH-6 Peak Elev=46.95' Inflow=0.90 cfs 3,096 cf
12.0" Round Culvert n=0.013 L=17.0' S=0.0206 '/' Outflow=0.90 cfs 3,096 cf

Pond DMH-7: DMH-7 (bypass) Peak Elev=46.72' Inflow=1.41 cfs 5,196 cf
Primary=1.36 cfs 5,183 cf Secondary=0.05 cfs 13 cf Outflow=1.41 cfs 5,196 cf

Pond DMH-8: DMH-8 (bypass) Peak Elev=46.64' Inflow=0.91 cfs 3,065 cf
Primary=0.87 cfs 3,058 cf Secondary=0.03 cfs 7 cf Outflow=0.91 cfs 3,065 cf

Pond DMH-9: DMH-9 (bypass) Peak Elev=53.87' Inflow=1.28 cfs 4,693 cf
Primary=1.22 cfs 4,674 cf Secondary=0.06 cfs 18 cf Outflow=1.28 cfs 4,693 cf

Pond DS: Dry Stream Peak Elev=54.90' Storage=250 cf Inflow=2.13 cfs 9,370 cf
Discarded=0.03 cfs 1,151 cf Primary=1.99 cfs 8,182 cf Outflow=2.02 cfs 9,333 cf

Pond FP-1: FP-1 Peak Elev=50.26' Storage=660 cf Inflow=1.22 cfs 4,133 cf
Discarded=0.22 cfs 3,160 cf Primary=0.53 cfs 973 cf Tertiary=0.00 cfs 0 cf Outflow=0.76 cfs 4,132 cf

Pond FP-2: FP-2 Peak Elev=52.20' Storage=486 cf Inflow=0.69 cfs 2,338 cf
Discarded=0.14 cfs 2,036 cf Primary=0.33 cfs 302 cf Tertiary=0.00 cfs 0 cf Outflow=0.47 cfs 2,338 cf

Pond FP-3: FP-3 Peak Elev=53.79' Storage=758 cf Inflow=1.05 cfs 3,531 cf
Discarded=0.29 cfs 3,027 cf Primary=0.31 cfs 503 cf Tertiary=0.00 cfs 0 cf Outflow=0.60 cfs 3,530 cf

Pond FP-4: FP-4 Peak Elev=53.40' Storage=364 cf Inflow=1.03 cfs 3,520 cf
Discarded=0.06 cfs 2,123 cf Primary=0.97 cfs 1,396 cf Tertiary=0.00 cfs 0 cf Outflow=1.03 cfs 3,520 cf

Pond FP-5: FP-5 Peak Elev=55.31' Storage=536 cf Inflow=0.92 cfs 3,108 cf
Discarded=0.21 cfs 2,474 cf Primary=0.67 cfs 633 cf Tertiary=0.00 cfs 0 cf Outflow=0.88 cfs 3,107 cf

Pond FP-6: FP-6 Peak Elev=55.52' Storage=388 cf Inflow=0.89 cfs 3,088 cf
Discarded=0.13 cfs 2,309 cf Primary=0.76 cfs 779 cf Tertiary=0.00 cfs 0 cf Outflow=0.89 cfs 3,088 cf

Pond FP-7: FP-7/INF-5 Peak Elev=53.38' Storage=2,289 cf Inflow=1.99 cfs 8,303 cf
Discarded=0.62 cfs 8,303 cf Secondary=0.00 cfs 0 cf Outflow=0.62 cfs 8,303 cf

Pond INF-1: INF-1 Peak Elev=50.52' Storage=1,965 cf Inflow=2.00 cfs 6,876 cf
Discarded=0.24 cfs 6,644 cf Secondary=0.25 cfs 231 cf Outflow=0.50 cfs 6,875 cf

Pond INF-2: INF-2 Peak Elev=49.31' Storage=1,981 cf Inflow=2.88 cfs 3,614 cf
Discarded=0.38 cfs 3,616 cf Secondary=0.00 cfs 0 cf Outflow=0.38 cfs 3,616 cf

Pond INF-3: INF-3 Peak Elev=45.38' Storage=2,012 cf Inflow=1.98 cfs 6,176 cf
Discarded=0.30 cfs 6,175 cf Secondary=0.00 cfs 0 cf Outflow=0.30 cfs 6,175 cf

Pond INF-4: INF-4 Peak Elev=53.31' Storage=3,440 cf Inflow=3.35 cfs 11,778 cf
Discarded=0.41 cfs 11,777 cf Secondary=0.00 cfs 0 cf Outflow=0.41 cfs 11,777 cf

Pond INF-6: INF-6 Peak Elev=56.51' Storage=1,277 cf Inflow=1.37 cfs 4,644 cf
Outflow=0.34 cfs 4,644 cf

Pond OF-6: OF-6 Peak Elev=51.87' Inflow=0.76 cfs 779 cf
12.0" Round Culvert n=0.013 L=72.0' S=0.0118 '/' Outflow=0.76 cfs 779 cf

Pond SP 1: Study Point Inflow=0.00 cfs 6 cf
Primary=0.00 cfs 6 cf

Pond SP 3: Study Point Inflow=0.00 cfs 107 cf
Primary=0.00 cfs 107 cf

Pond SP 4: Study Point Inflow=0.00 cfs 62 cf
Primary=0.00 cfs 62 cf

Pond SP-2: Study Point Inflow=0.00 cfs 2 cf
Primary=0.00 cfs 2 cf

Total Runoff Area = 339,480 sf Runoff Volume = 62,051 cf Average Runoff Depth = 2.19"
56.85% Pervious = 192,995 sf 43.15% Impervious = 146,485 sf

Summary for Subcatchment 1S: RA (partial)

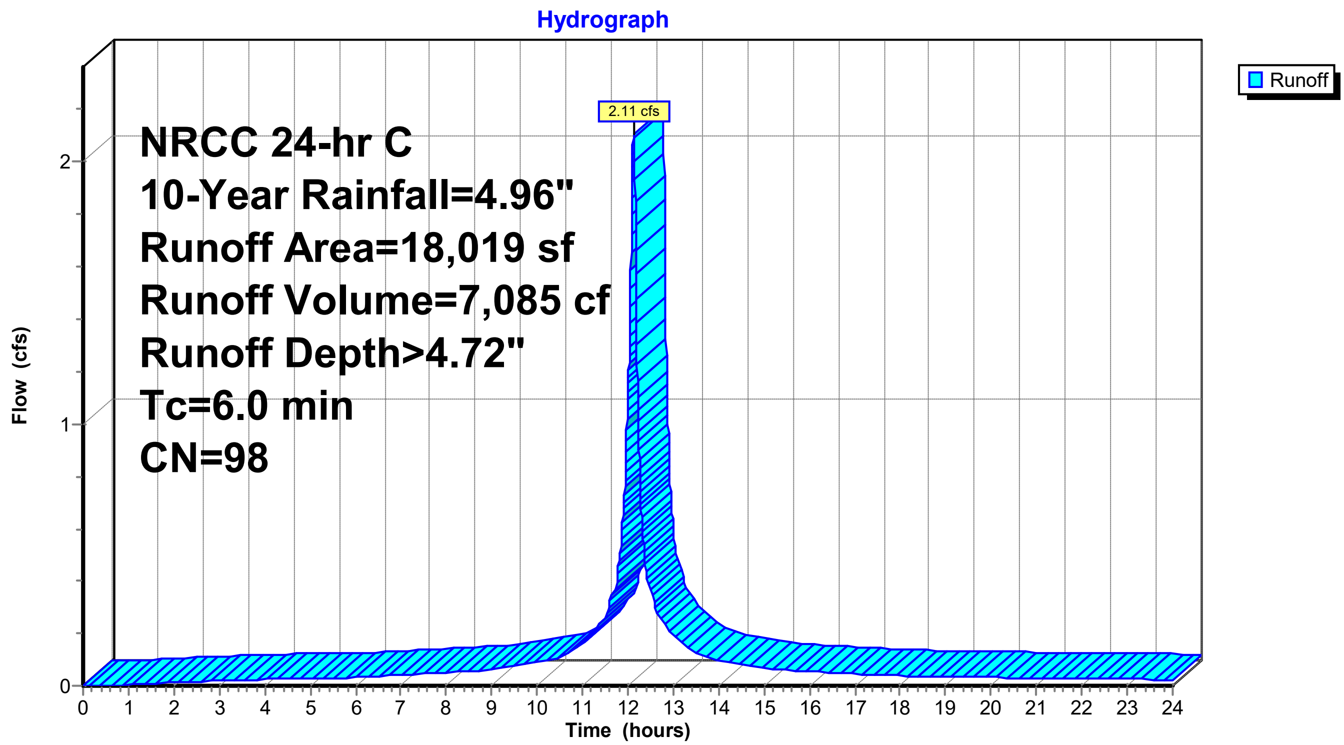
Runoff = 2.11 cfs @ 12.13 hrs, Volume= 7,085 cf, Depth> 4.72"
Routed to Pond INF-4 : INF-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
18,019	98	Roofs, HSG A
18,019	98	100.00% Impervious Area

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

Subcatchment 1S: RA (partial)



Summary for Subcatchment 2S: RA (partial)

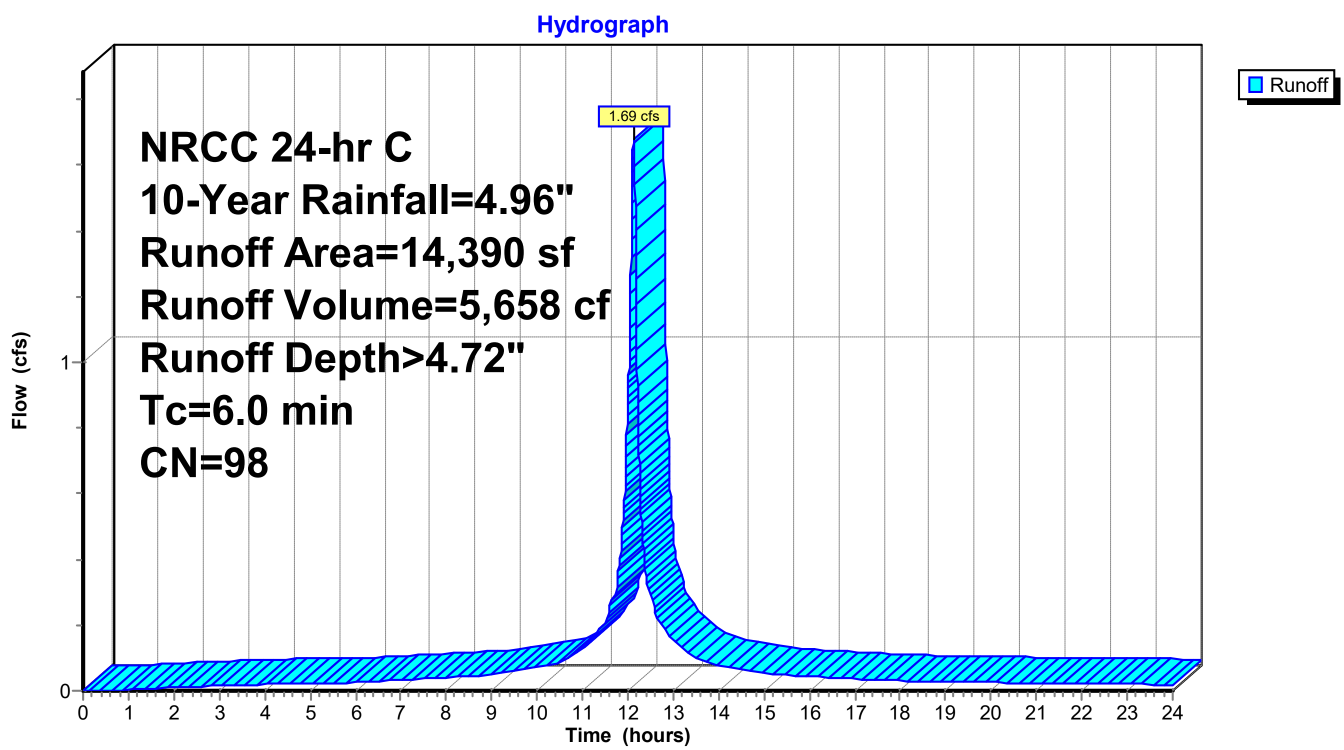
Runoff = 1.69 cfs @ 12.13 hrs, Volume= 5,658 cf, Depth> 4.72"
Routed to Pond DS : Dry Stream

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
14,390	98	Roofs, HSG A
14,390	98	100.00% Impervious Area

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

Subcatchment 2S: RA (partial)



Summary for Subcatchment 3S: RA (partial)

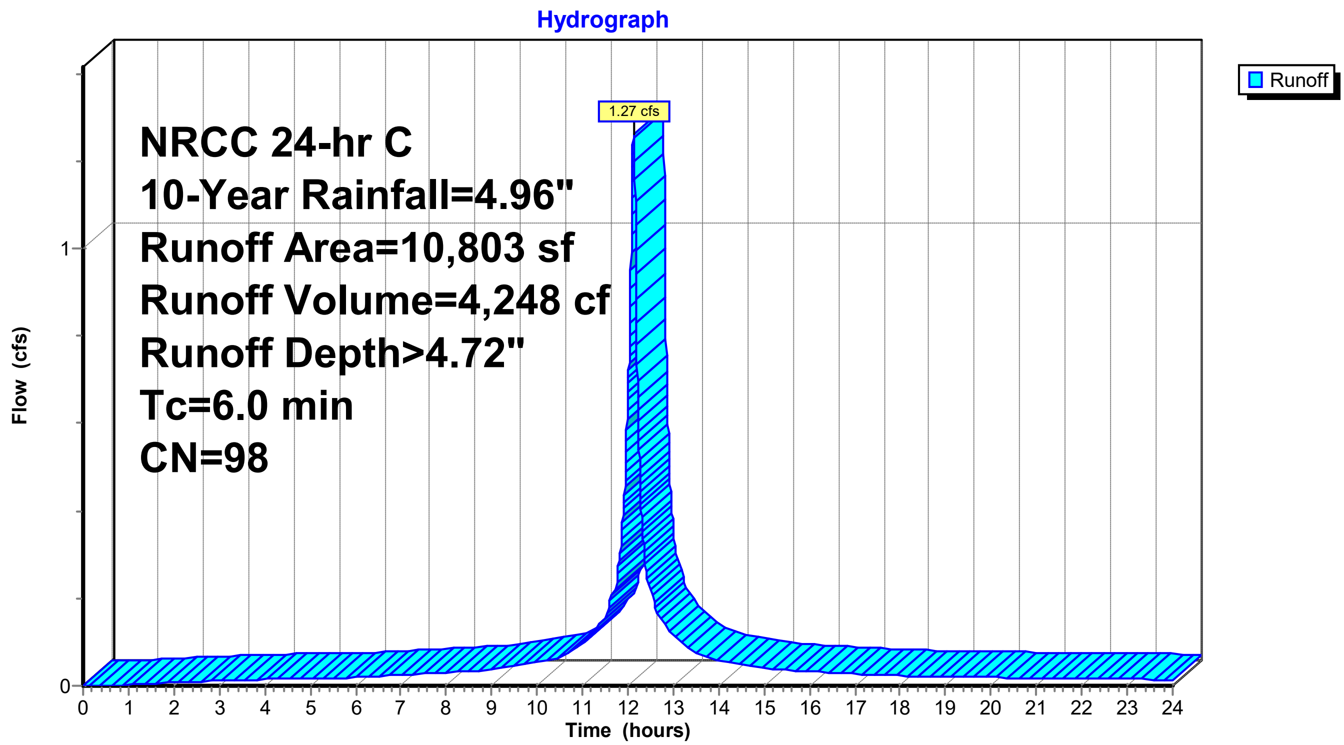
Runoff = 1.27 cfs @ 12.13 hrs, Volume= 4,248 cf, Depth> 4.72"
Routed to Pond INF-6 : INF-6

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
10,803	98	Roofs, HSG A
10,803	98	100.00% Impervious Area

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

Subcatchment 3S: RA (partial)



Summary for Subcatchment SCA-1: LSA/FL/IA/PP

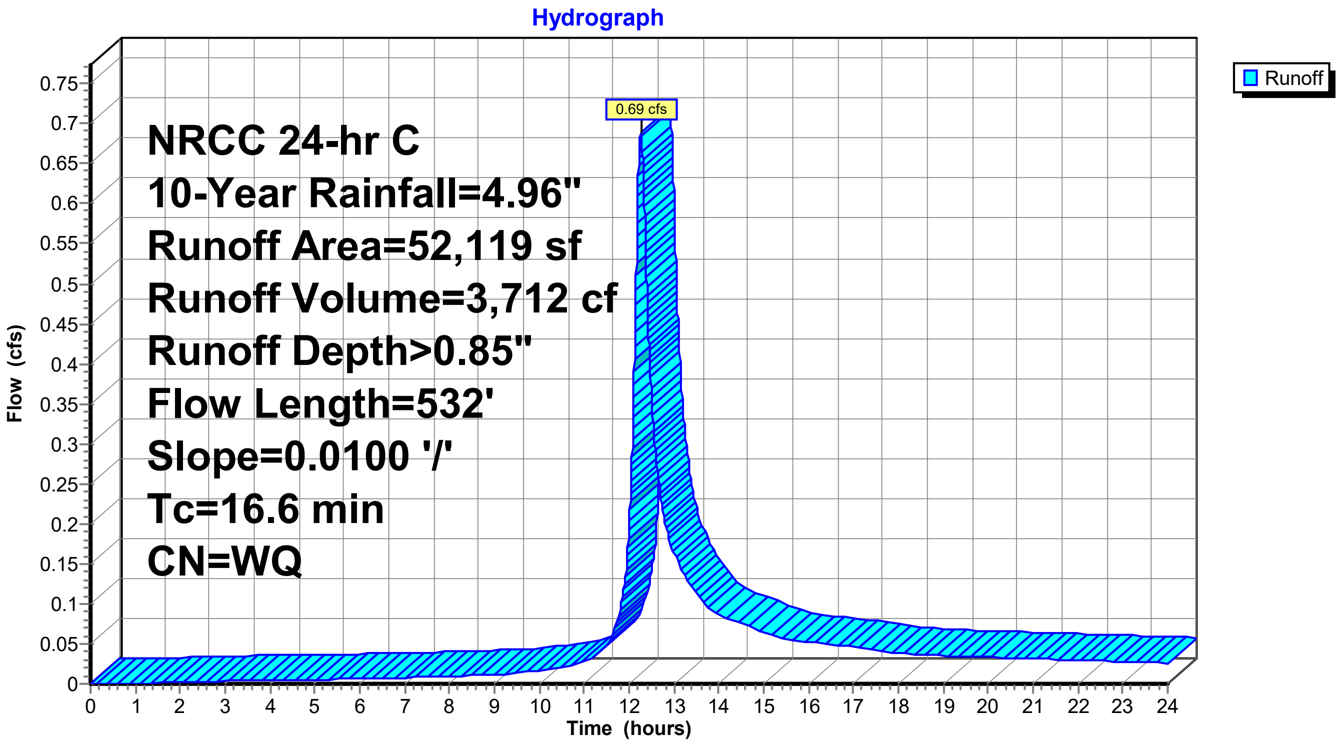
Runoff = 0.69 cfs @ 12.26 hrs, Volume= 3,712 cf, Depth> 0.85"
Routed to Pond DS : Dry Stream

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

	Area (sf)	CN	Description
	31,302	39	>75% Grass cover, Good, HSG A
*	10,136	60	Stone Fire Lane
*	3,036	98	Rubber Play Surface
*	507	98	Concrete Walk
*	7,138	60	Permeable Pavers
	52,119		Weighted Average
	48,576	46	93.20% Pervious Area
	3,543	98	6.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.6	100	0.0100	0.13		**Sheet Flow, Grass**
					Grass: Short n= 0.150 P2= 3.35"
1.0	42	0.0100	0.70		**Shallow Concentrated Flow, Grass**
					Short Grass Pasture Kv= 7.0 fps
0.2	22	0.0100	1.61		**Shallow Concentrated Flow, Stone Fire Lane**
					Unpaved Kv= 16.1 fps
0.7	28	0.0100	0.70		**Shallow Concentrated Flow, Grass**
					Short Grass Pasture Kv= 7.0 fps
2.1	340	0.0100	2.64	7.93	**Channel Flow, Dry Stream Bed**
					Area= 3.0 sf Perim= 5.0' r= 0.60'
					n= 0.040 Earth, cobble bottom, clean sides
16.6	532	Total			

Subcatchment SCA-1: LSA/FL/IA/PP



Summary for Subcatchment SCA-10:

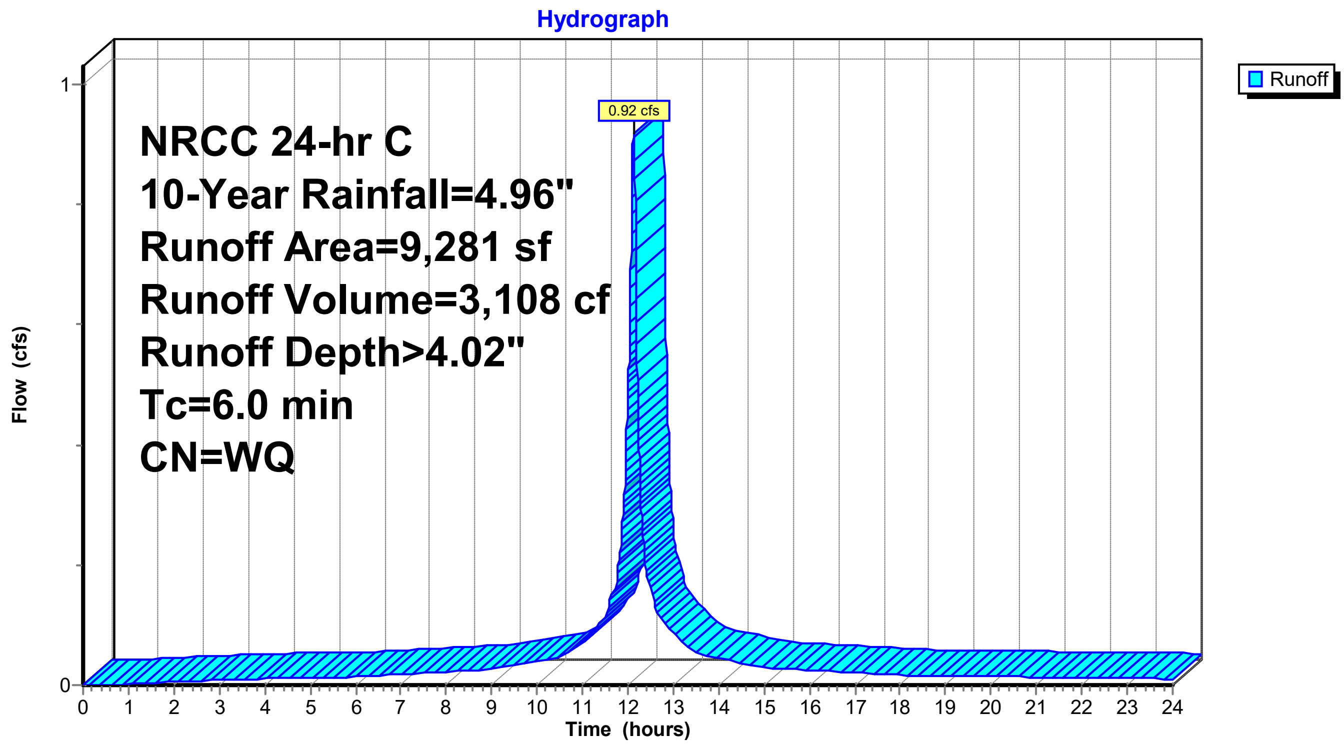
Runoff = 0.92 cfs @ 12.13 hrs, Volume= 3,108 cf, Depth> 4.02"
Routed to Pond FP-5 : FP-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
7,848	98	Paved parking, HSG A
1,372	39	>75% Grass cover, Good, HSG A
61	30	Woods, Good, HSG A
9,281		Weighted Average
1,433	39	15.44% Pervious Area
7,848	98	84.56% Impervious Area

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

Subcatchment SCA-10:



Summary for Subcatchment SCA-11:

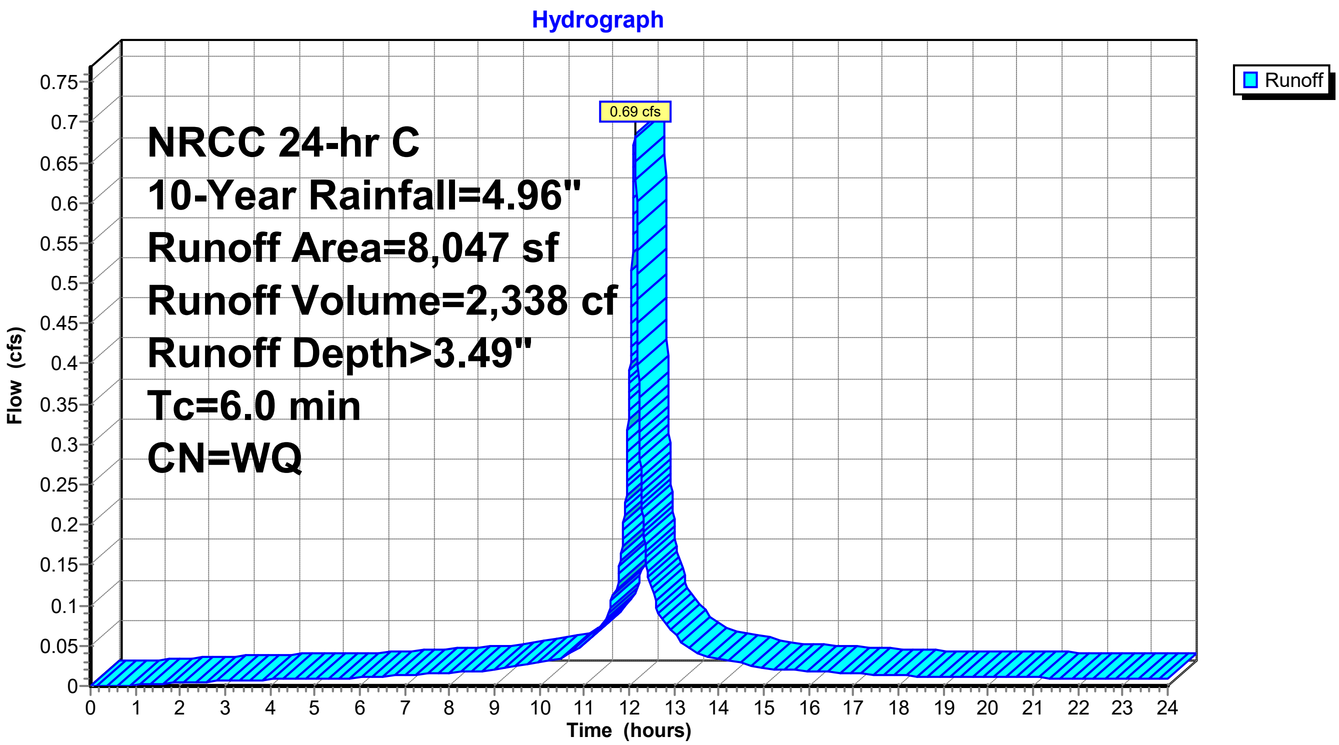
Runoff = 0.69 cfs @ 12.13 hrs, Volume= 2,338 cf, Depth> 3.49"
Routed to Pond FP-2 : FP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
5,857	98	Paved parking, HSG A
2,190	39	>75% Grass cover, Good, HSG A
8,047		Weighted Average
2,190	39	27.22% Pervious Area
5,857	98	72.78% Impervious Area

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

Subcatchment SCA-11:



Summary for Subcatchment SCA-12:

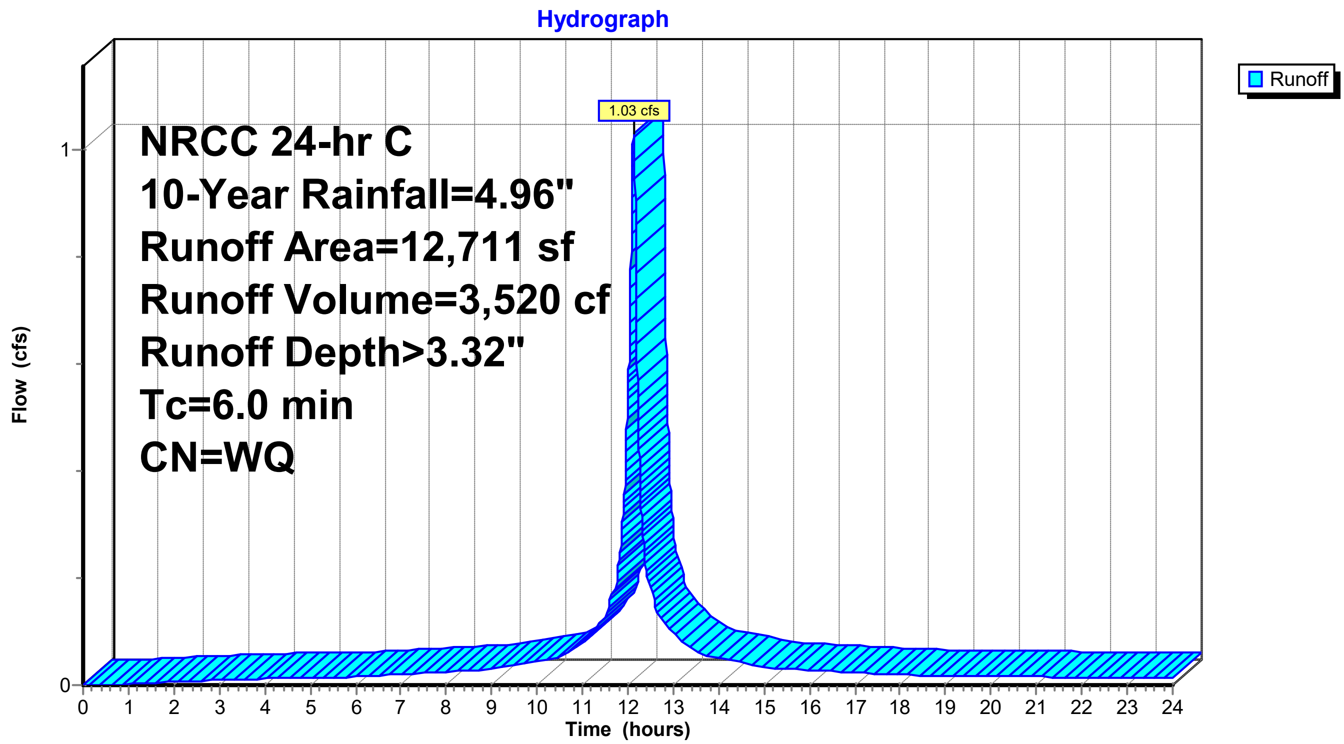
Runoff = 1.03 cfs @ 12.13 hrs, Volume= 3,520 cf, Depth> 3.32"
Routed to Pond FP-4 : FP-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
8,818	98	Paved parking, HSG A
3,298	39	>75% Grass cover, Good, HSG A
595	30	Woods, Good, HSG A
12,711		Weighted Average
3,893	38	30.63% Pervious Area
8,818	98	69.37% Impervious Area

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

Subcatchment SCA-12:



Summary for Subcatchment SCA-13:

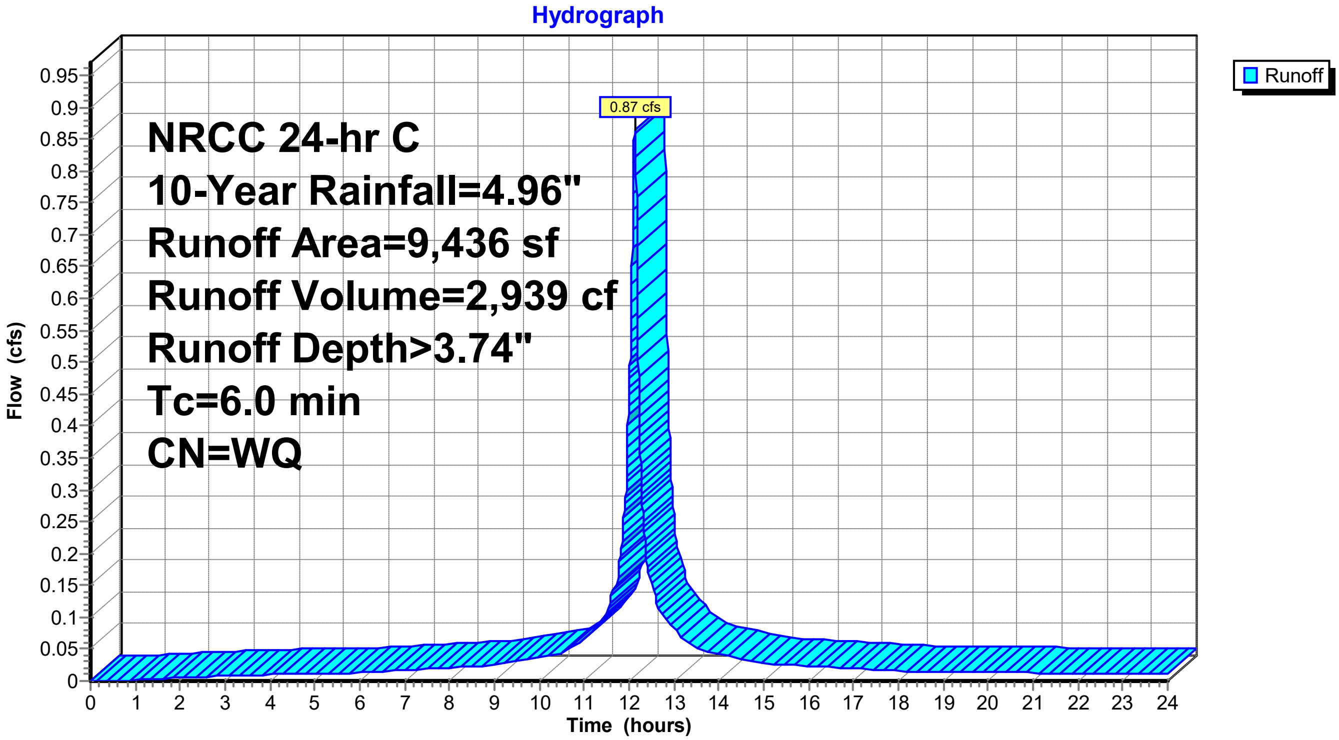
Runoff = 0.87 cfs @ 12.13 hrs, Volume= 2,939 cf, Depth> 3.74"
Routed to Pond FP-1 : FP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
7,393	98	Paved parking, HSG A
2,043	39	>75% Grass cover, Good, HSG A
9,436		Weighted Average
2,043	39	21.65% Pervious Area
7,393	98	78.35% Impervious Area

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

Subcatchment SCA-13:



Summary for Subcatchment SCA-14:

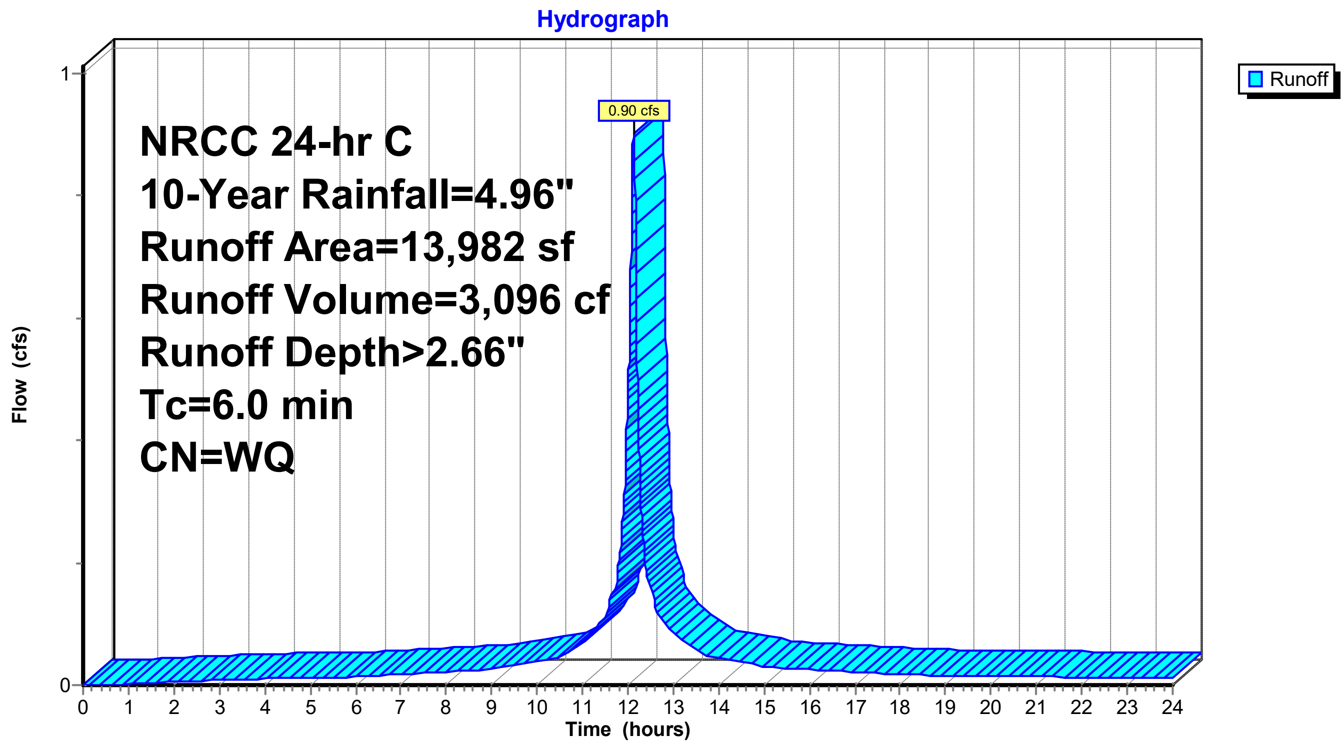
Runoff = 0.90 cfs @ 12.13 hrs, Volume= 3,096 cf, Depth> 2.66"
Routed to Pond CB-6B,C : CB-6B,6C

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
7,717	98	Paved parking, HSG A
3,829	39	>75% Grass cover, Good, HSG A
2,436	30	Woods, Good, HSG A
13,982		Weighted Average
6,265	36	44.81% Pervious Area
7,717	98	55.19% Impervious Area

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

Subcatchment SCA-14:



Summary for Subcatchment SCA-16:

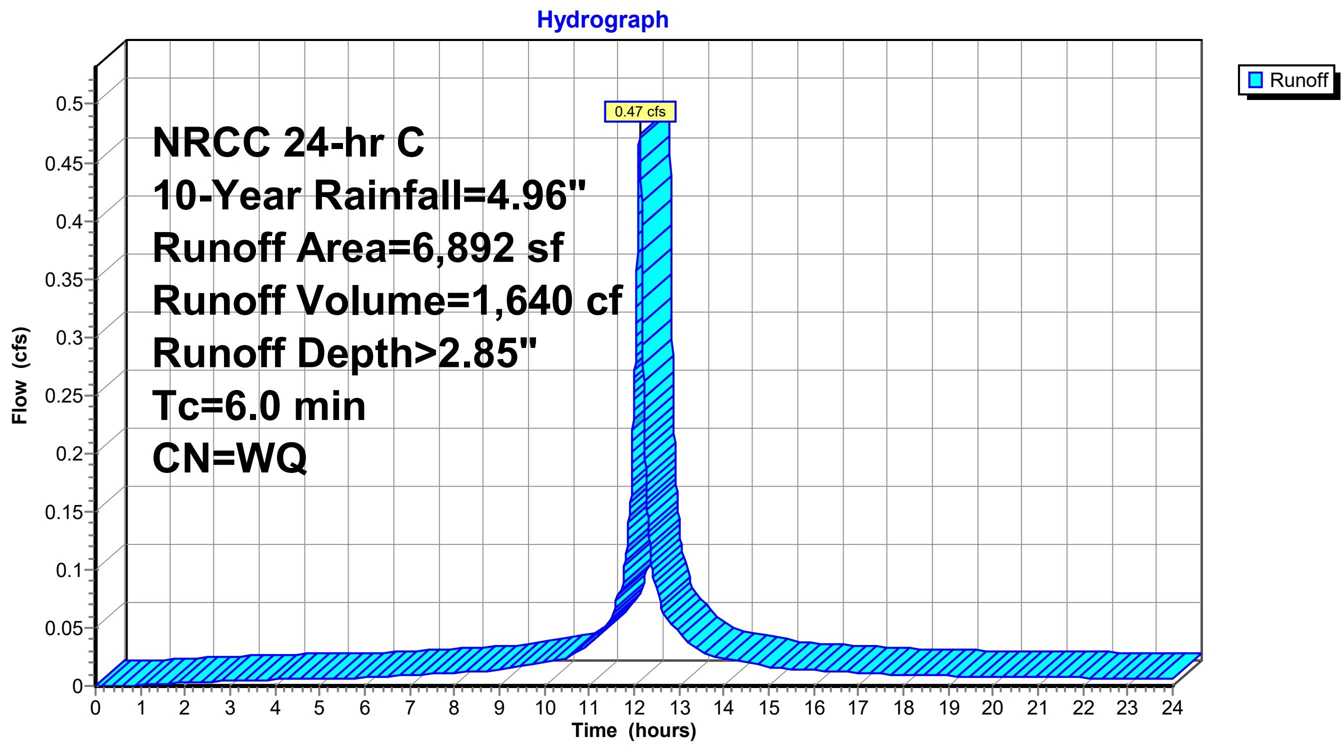
Runoff = 0.47 cfs @ 12.13 hrs, Volume= 1,640 cf, Depth> 2.85"
Routed to Pond CB-2B : CB 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
4,055	98	Paved parking, HSG A
2,837	39	>75% Grass cover, Good, HSG A
6,892		Weighted Average
2,837	39	41.16% Pervious Area
4,055	98	58.84% Impervious Area

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

Subcatchment SCA-16:



Summary for Subcatchment SCA-17:

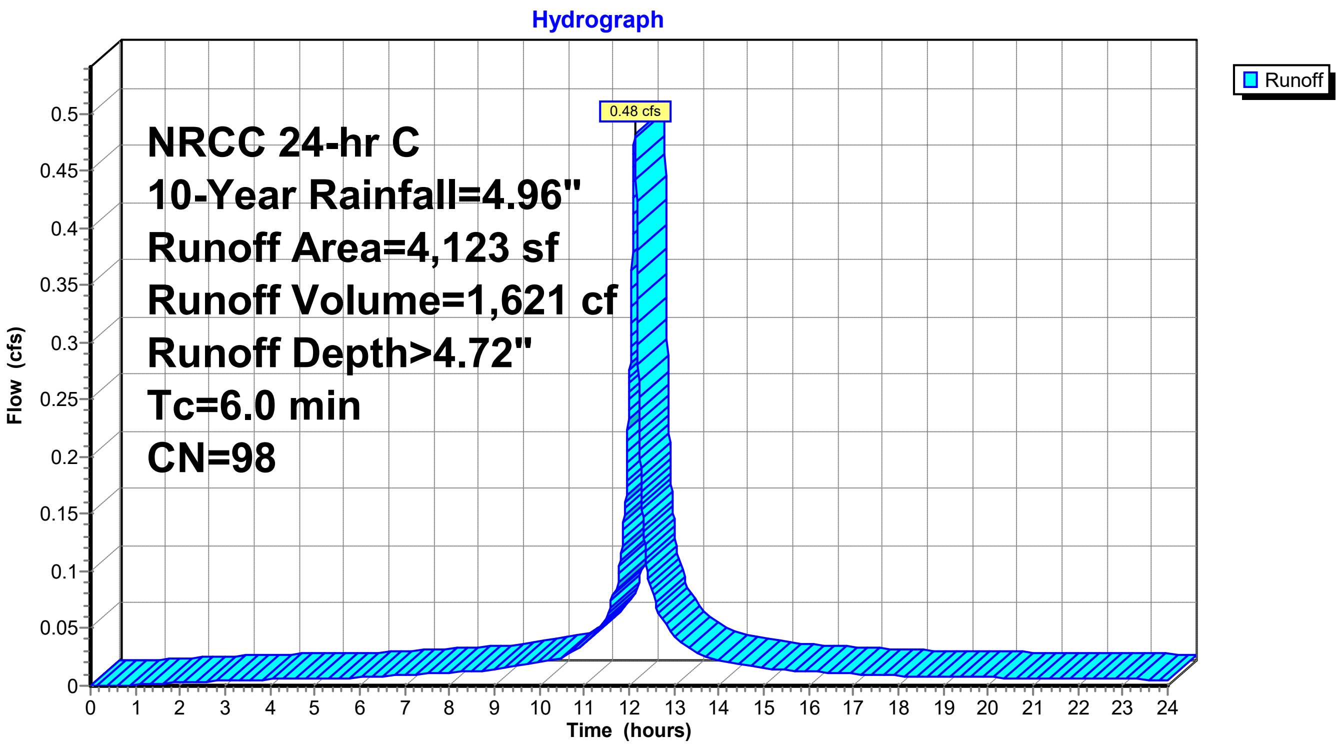
Runoff = 0.48 cfs @ 12.13 hrs, Volume= 1,621 cf, Depth> 4.72"
Routed to Pond CB-2A : CB 2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
4,123	98	Paved parking, HSG A
4,123	98	100.00% Impervious Area

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

Subcatchment SCA-17:



Summary for Subcatchment SCA-18:

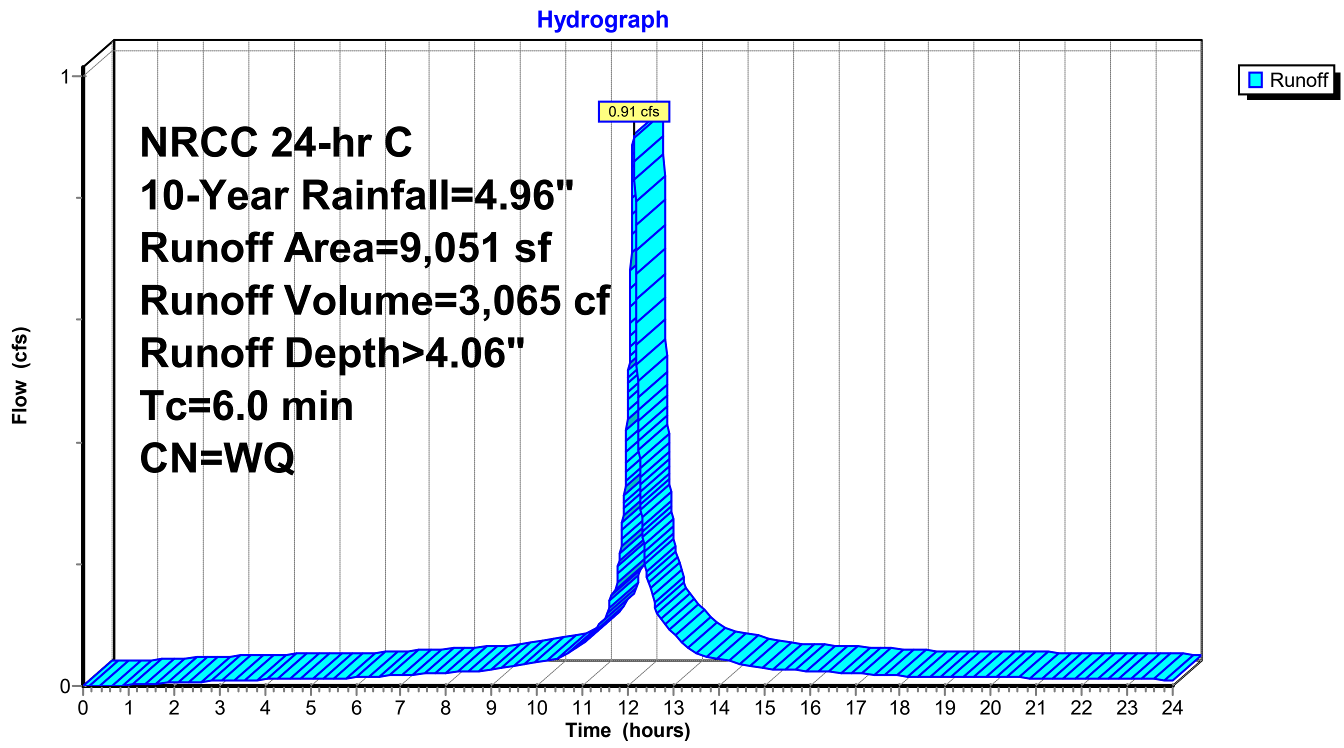
Runoff = 0.91 cfs @ 12.13 hrs, Volume= 3,065 cf, Depth> 4.06"
Routed to Pond CB-7 : CB-7

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
7,743	98	Paved parking, HSG A
1,308	39	>75% Grass cover, Good, HSG A
9,051		Weighted Average
1,308	39	14.45% Pervious Area
7,743	98	85.55% Impervious Area

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

Subcatchment SCA-18:



Summary for Subcatchment SCA-19:

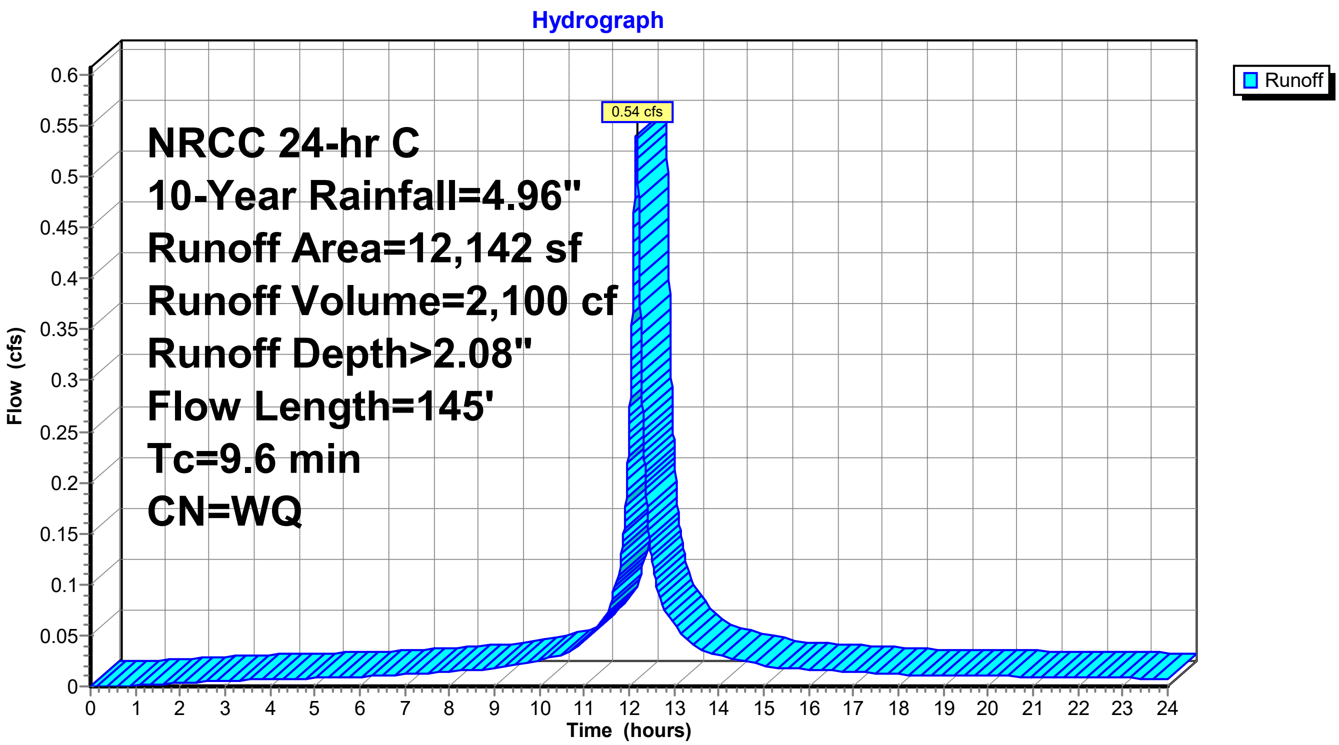
Runoff = 0.54 cfs @ 12.17 hrs, Volume= 2,100 cf, Depth> 2.08"
Routed to Pond CB-6A : CB-6A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
5,280	98	Paved parking, HSG A
5,968	32	Woods/grass comb., Good, HSG A
894	39	>75% Grass cover, Good, HSG A
12,142		Weighted Average
6,862	33	56.51% Pervious Area
5,280	98	43.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	50	0.0500	0.10		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.35"
1.0	70	0.0600	1.22		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.2	25	0.0100	2.03		**Shallow Concentrated Flow, Parking** Paved Kv= 20.3 fps
9.6	145	Total			

Subcatchment SCA-19:



Summary for Subcatchment SCA-2: LSA/FL

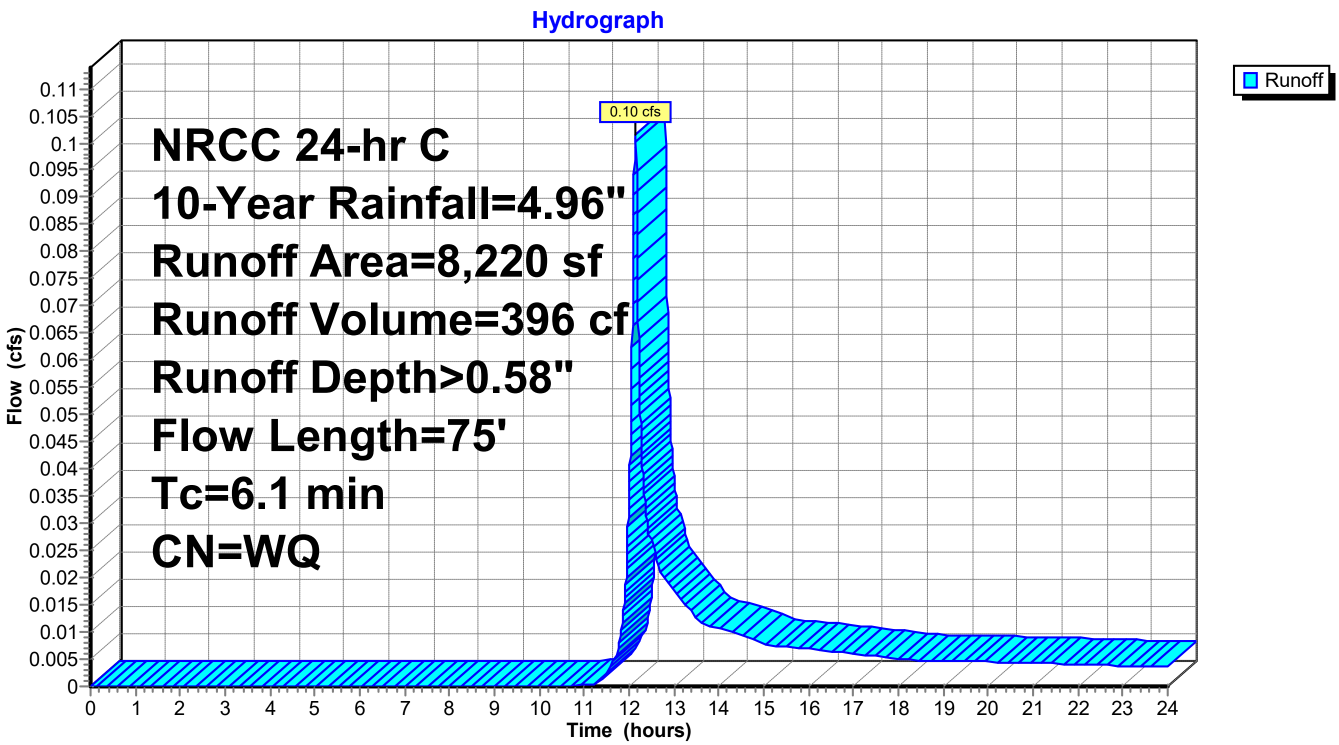
Runoff = 0.10 cfs @ 12.14 hrs, Volume= 396 cf, Depth> 0.58"
Routed to Pond INF-6 : INF-6

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

	Area (sf)	CN	Description
*	20	98	Cocncrete step
	5,345	39	>75% Grass cover, Good, HSG A
*	2,855	60	Stone Fire Lane
	8,220		Weighted Average
	8,200	46	99.76% Pervious Area
	20	98	0.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	35	0.0150	0.13		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.35"
1.4	20	0.0100	0.23		**Sheet Flow, Stone Fire Lane** Fallow n= 0.050 P2= 3.35"
0.1	20	0.1500	2.71		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
6.1	75	Total			

Subcatchment SCA-2: LSA/FL



Summary for Subcatchment SCA-4:

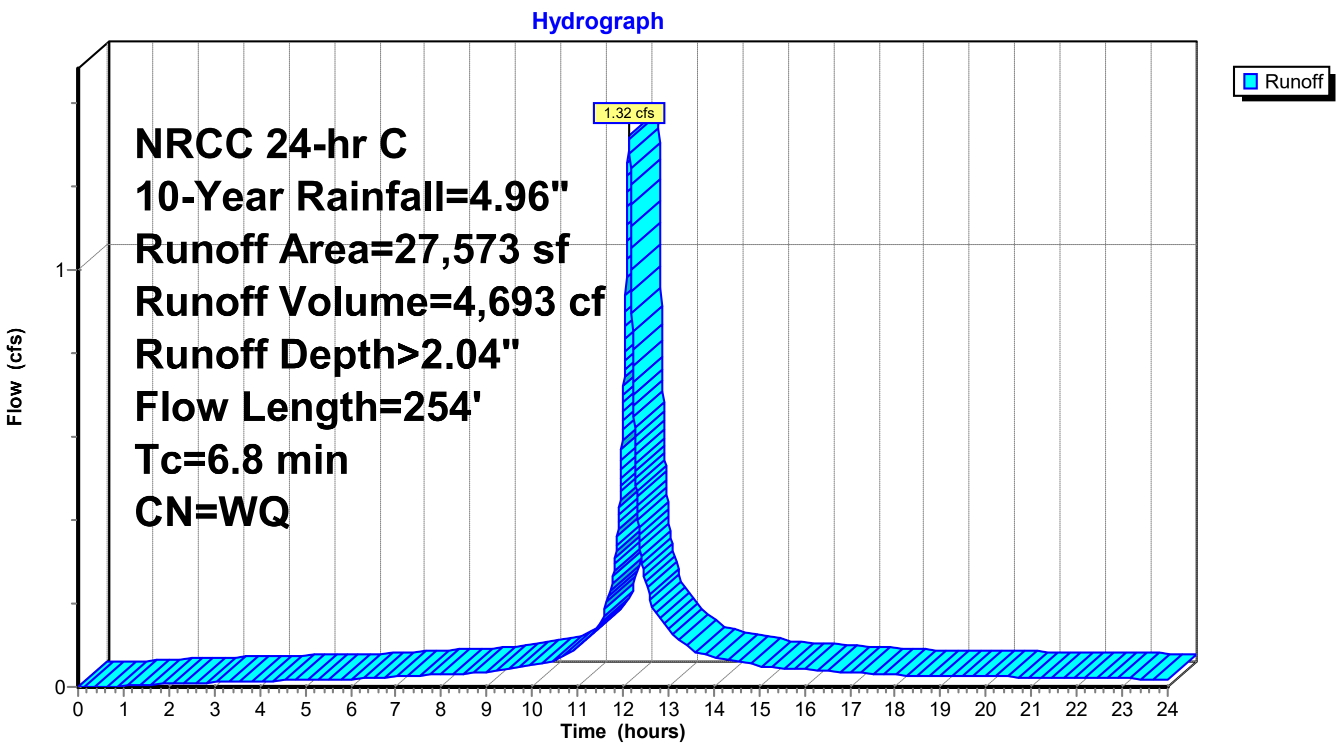
Runoff = 1.32 cfs @ 12.14 hrs, Volume= 4,693 cf, Depth> 2.04"
Routed to Pond CB-4 : CB-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

	Area (sf)	CN	Description
	10,454	98	Paved parking, HSG A
	8,808	39	>75% Grass cover, Good, HSG A
	4,820	30	Woods, Good, HSG A
*	3,245	60	Stone Fire Lane
*	246	98	Shed Roof
	27,573		Weighted Average
	16,873	40	61.19% Pervious Area
	10,700	98	38.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	23	0.0100	0.10		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.35"
2.3	158	0.0050	1.14		**Shallow Concentrated Flow, Stone Fire Lane** Unpaved Kv= 16.1 fps
0.6	73	0.0100	2.03		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
6.8	254	Total			

Subcatchment SCA-4:



Summary for Subcatchment SCA-5:

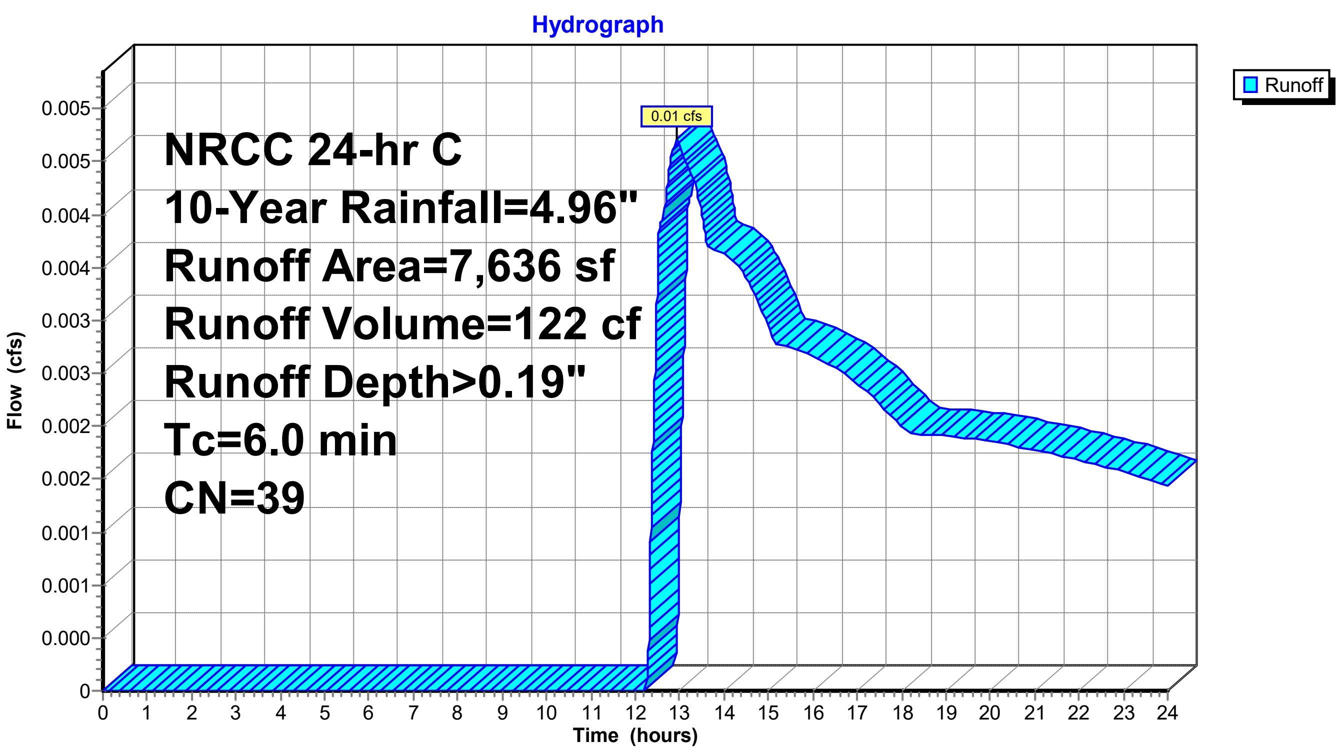
Runoff = 0.01 cfs @ 12.94 hrs, Volume= 122 cf, Depth> 0.19"
Routed to Pond FP-7 : FP-7/INF-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
7,636	39	>75% Grass cover, Good, HSG A
7,636	39	100.00% Pervious Area

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

Subcatchment SCA-5:



Summary for Subcatchment SCA-6.1:

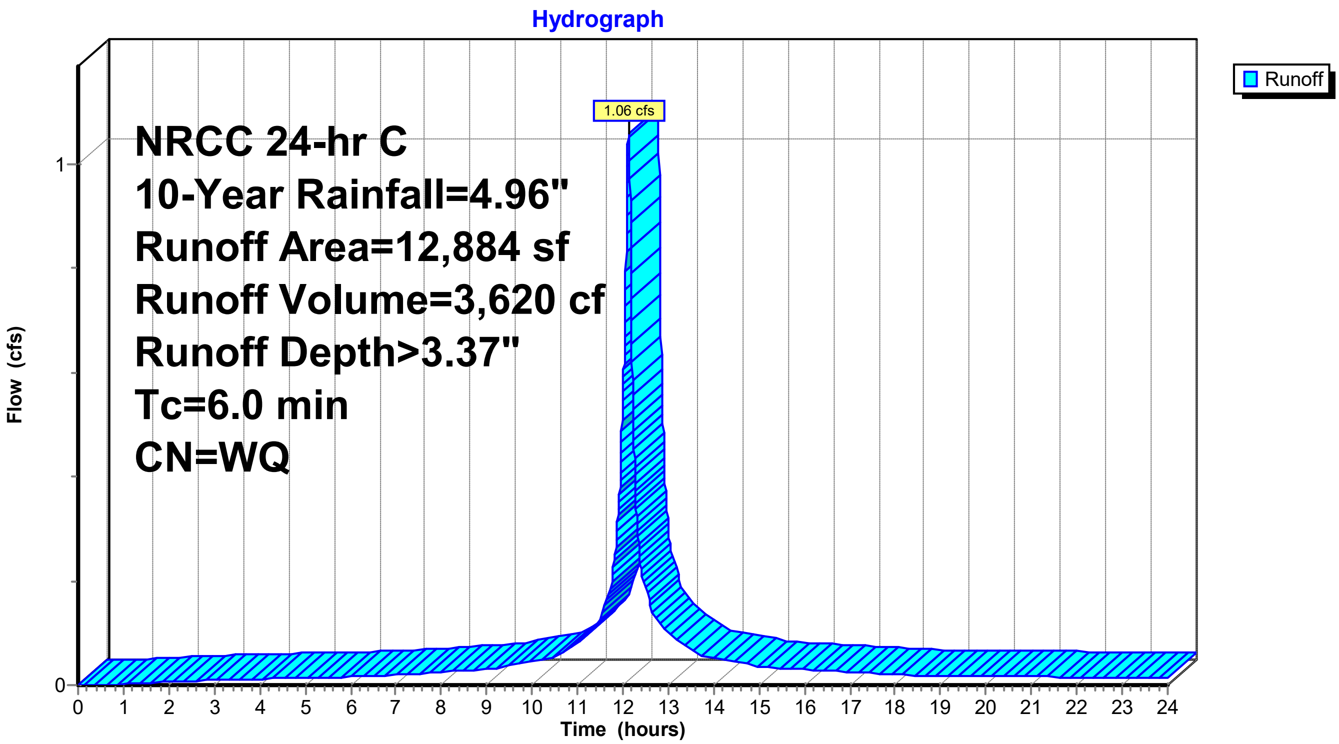
Runoff = 1.06 cfs @ 12.13 hrs, Volume= 3,620 cf, Depth> 3.37"
Routed to Pond CB-3 : CB-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

	Area (sf)	CN	Description
	8,965	98	Paved parking, HSG A
	3,559	39	>75% Grass cover, Good, HSG A
*	360	60	Fire Lane (FL)
	12,884		Weighted Average
	3,919	41	30.42% Pervious Area
	8,965	98	69.58% Impervious Area

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

Subcatchment SCA-6.1:



Summary for Subcatchment SCA-6.2:

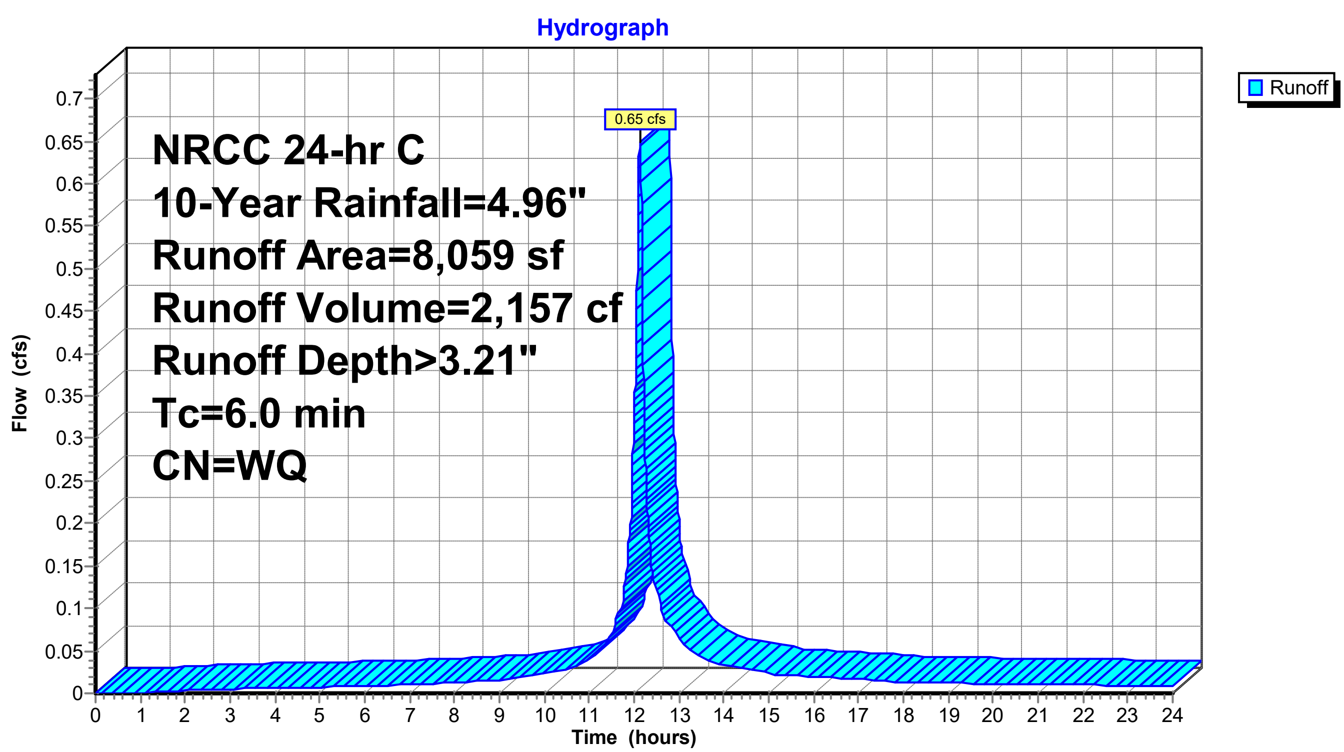
Runoff = 0.65 cfs @ 12.13 hrs, Volume= 2,157 cf, Depth> 3.21"
Routed to Pond FP-3 : FP-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

	Area (sf)	CN	Description
*	3,130	60	Permeable Pavers (PP)
	3,296	98	Paved roads w/curbs & sewers, HSG A
*	1,331	98	Canopy (CP)
	302	39	>75% Grass cover, Good, HSG A
	8,059		Weighted Average
	3,432	58	42.59% Pervious Area
	4,627	98	57.41% Impervious Area

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

Subcatchment SCA-6.2:



Summary for Subcatchment SCA-7:

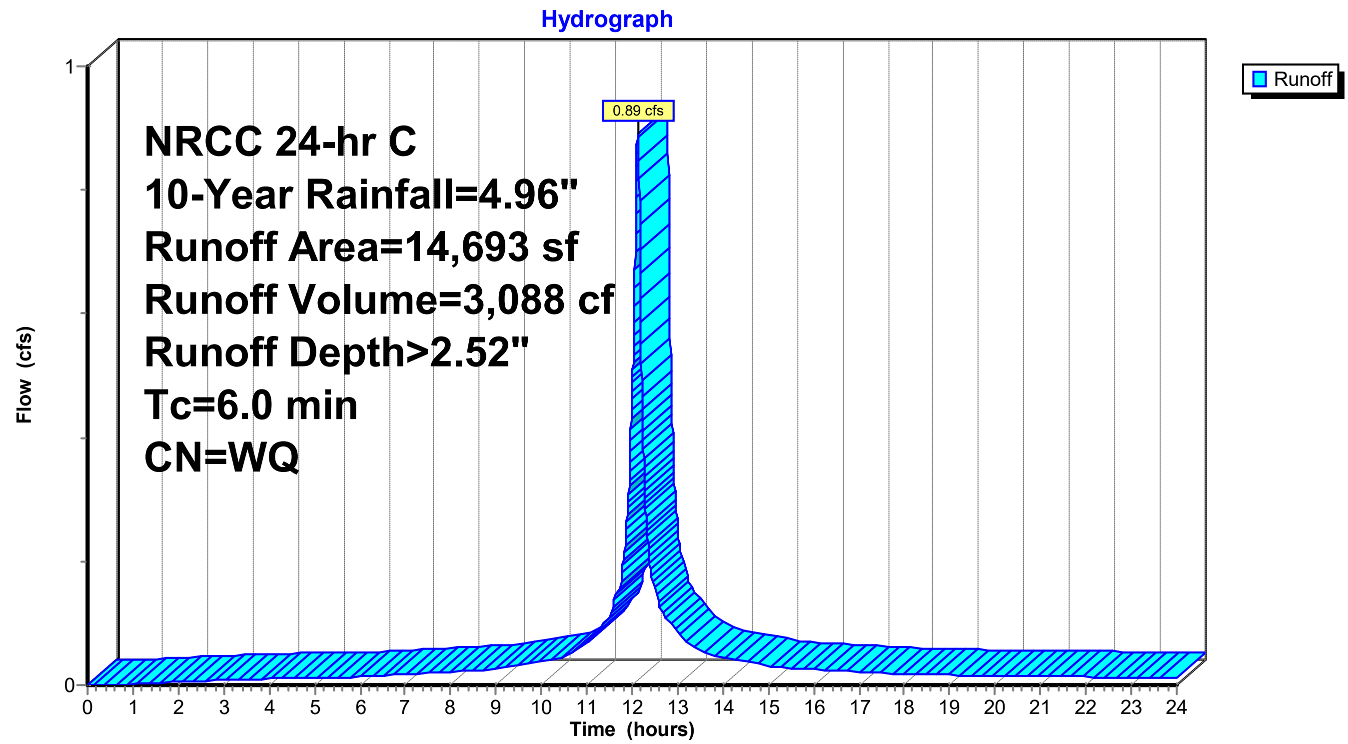
Runoff = 0.89 cfs @ 12.13 hrs, Volume= 3,088 cf, Depth> 2.52"
Routed to Pond FP-6 : FP-6

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
7,630	98	Paved parking, HSG A
5,346	39	>75% Grass cover, Good, HSG A
1,717	32	Woods/grass comb., Good, HSG A
14,693		Weighted Average
7,063	37	48.07% Pervious Area
7,630	98	51.93% Impervious Area

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

Subcatchment SCA-7:



Summary for Subcatchment SCA-8:

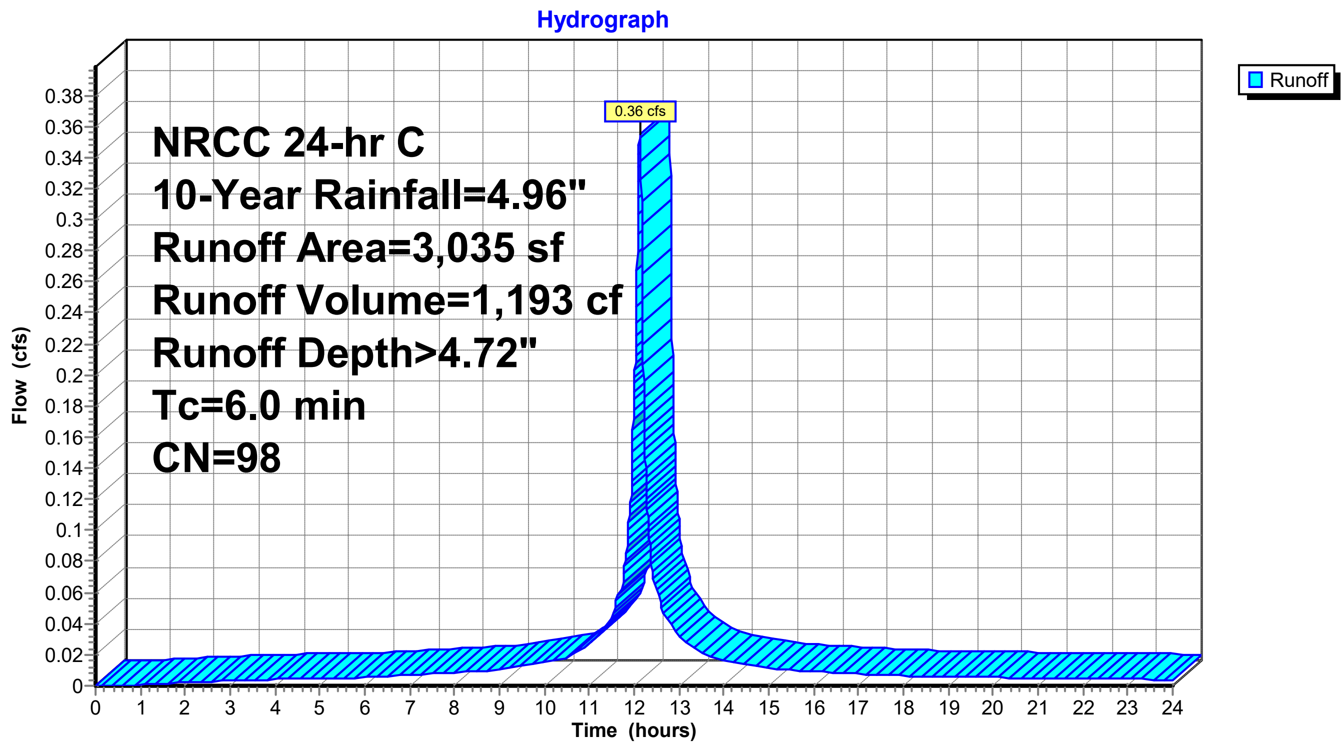
Runoff = 0.36 cfs @ 12.13 hrs, Volume= 1,193 cf, Depth> 4.72"
Routed to Pond FP-1 : FP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
3,035	98	Paved parking, HSG A
3,035	98	100.00% Impervious Area

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

Subcatchment SCA-8:



Summary for Subcatchment SCA-9:

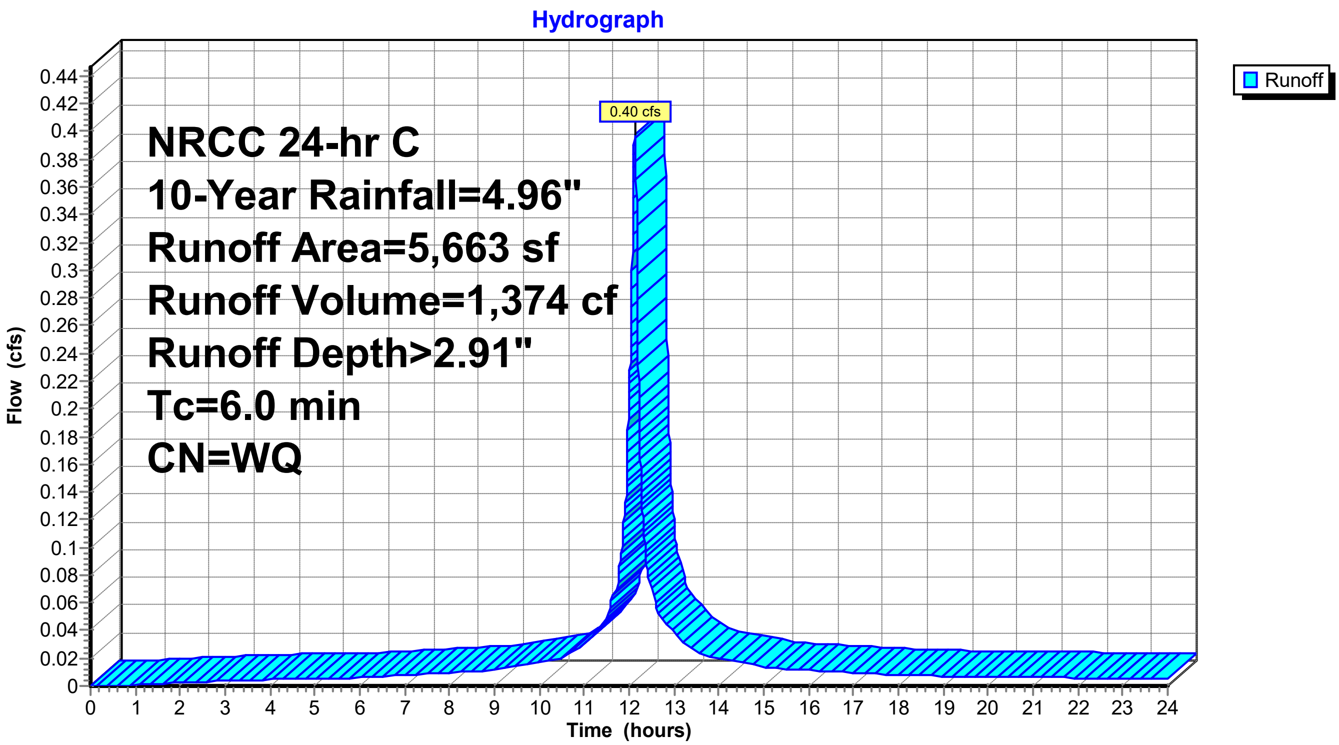
Runoff = 0.40 cfs @ 12.13 hrs, Volume= 1,374 cf, Depth> 2.91"
Routed to Pond FP-3 : FP-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
3,403	98	Paved parking, HSG A
2,260	39	>75% Grass cover, Good, HSG A
5,663		Weighted Average
2,260	39	39.91% Pervious Area
3,403	98	60.09% Impervious Area

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

Subcatchment SCA-9:



Summary for Subcatchment UC-1: NA

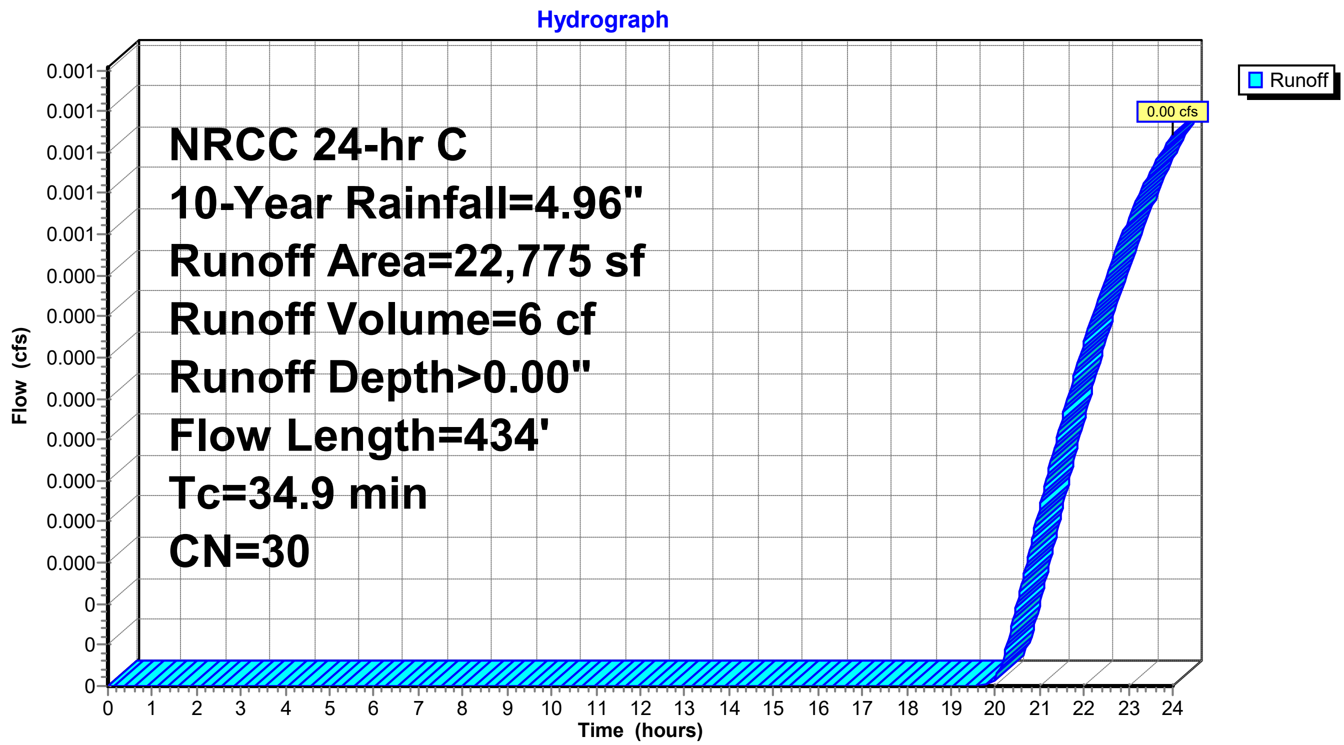
Runoff = 0.00 cfs @ 24.00 hrs, Volume= 6 cf, Depth> 0.00"
Routed to Pond SP 1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
22,775	30	Woods, Good, HSG A
22,775	30	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.2	100	0.0250	0.09		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
15.7	334	0.0050	0.35		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
34.9	434	Total			

Subcatchment UC-1: NA



Summary for Subcatchment UC-2:

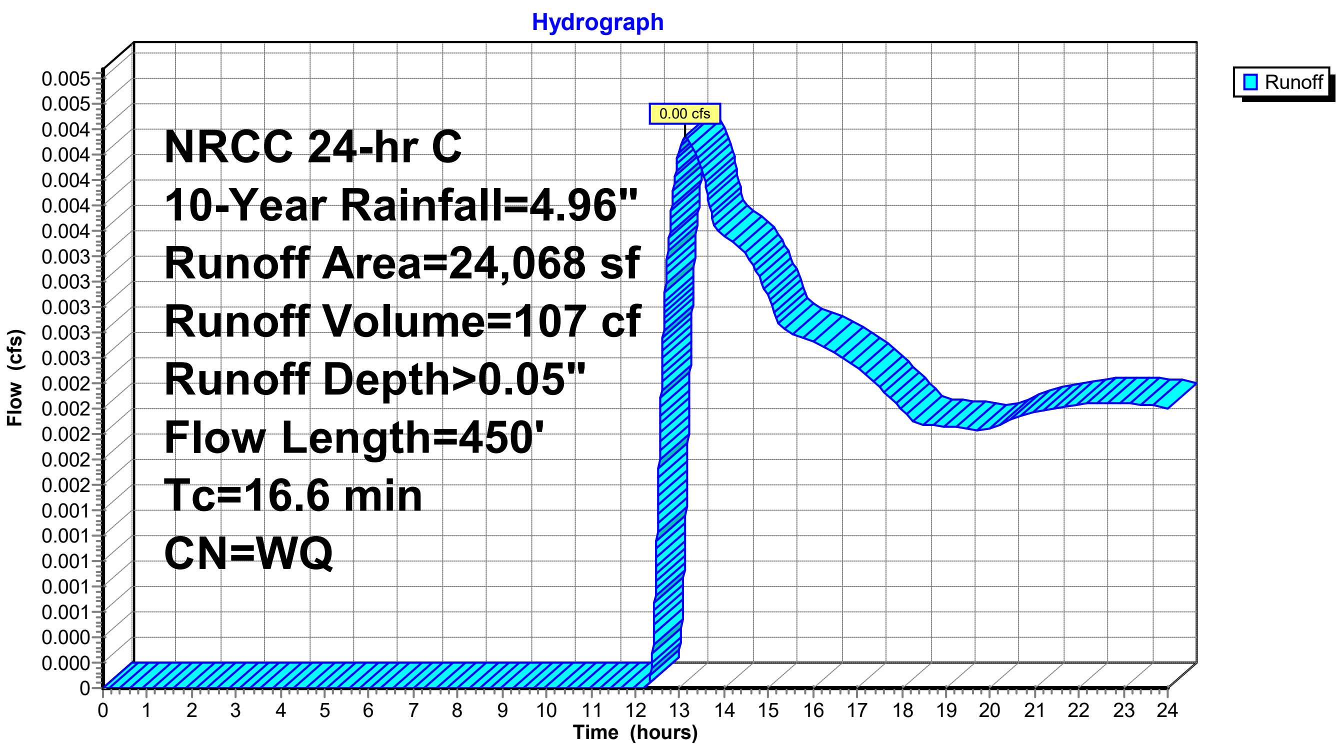
Runoff = 0.00 cfs @ 13.12 hrs, Volume= 107 cf, Depth> 0.05"
Routed to Pond SP 3 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
17,559	30	Woods, Good, HSG A
6,509	39	>75% Grass cover, Good, HSG A
24,068		Weighted Average
24,068	32	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	50	0.0590	0.11		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
6.6	199	0.0100	0.50		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
2.2	201	0.0100	1.50		**Shallow Concentrated Flow, SWALE** Grassed Waterway Kv= 15.0 fps
16.6	450	Total			

Subcatchment UC-2:



Summary for Subcatchment UC-3:

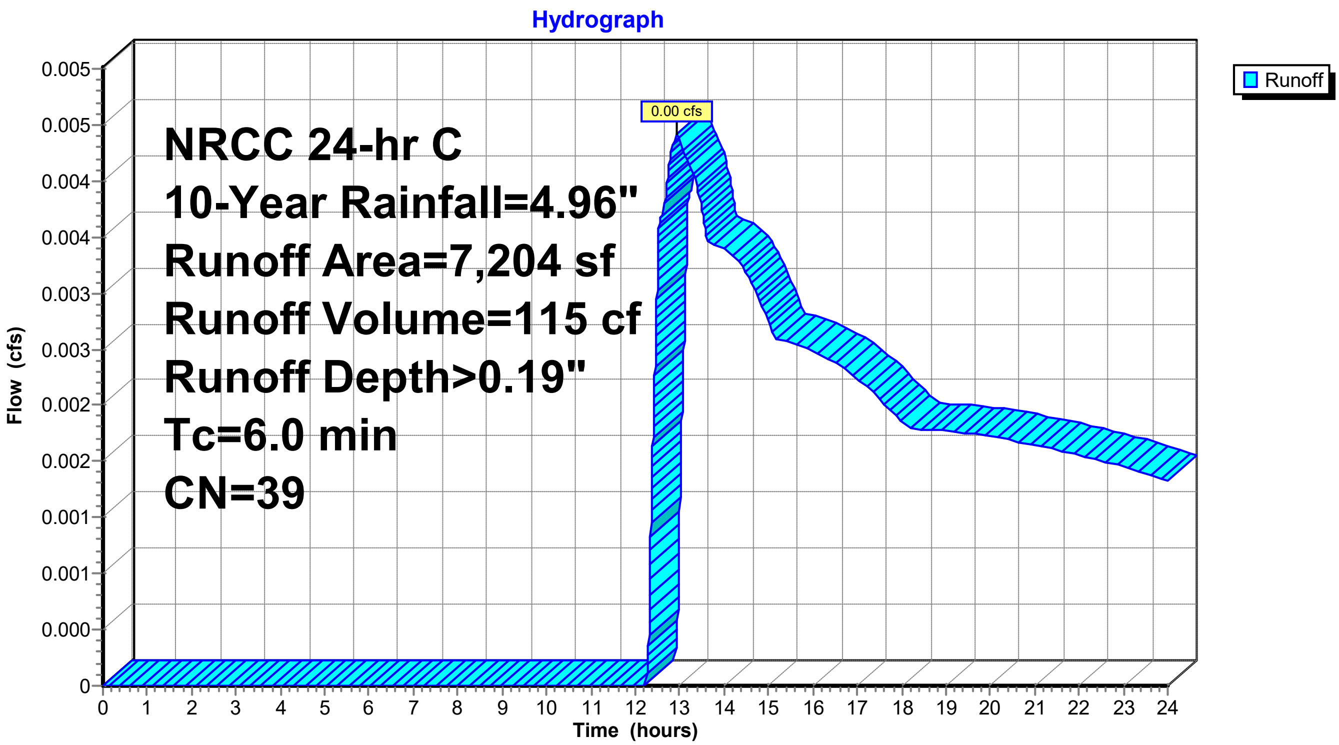
Runoff = 0.00 cfs @ 12.94 hrs, Volume= 115 cf, Depth> 0.19"
Routed to Pond AB-1 : Attenuation Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
7,204	39	>75% Grass cover, Good, HSG A
7,204	39	100.00% Pervious Area

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

Subcatchment UC-3:



Summary for Subcatchment UC-4:

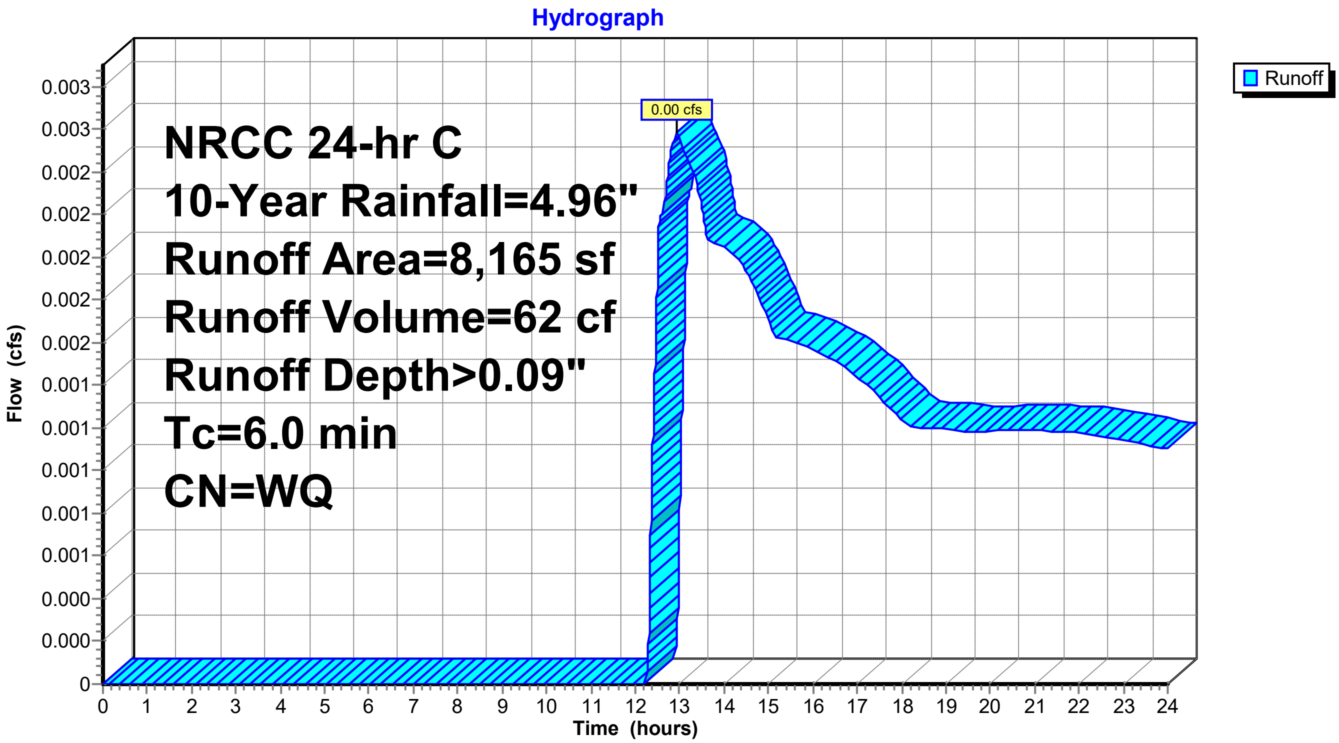
Runoff = 0.00 cfs @ 12.94 hrs, Volume= 62 cf, Depth> 0.09"
Routed to Pond SP 4 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
3,787	39	>75% Grass cover, Good, HSG A
4,378	30	Woods, Good, HSG A
8,165		Weighted Average
8,165	34	100.00% Pervious Area

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

Subcatchment UC-4:



Summary for Subcatchment UC-5:

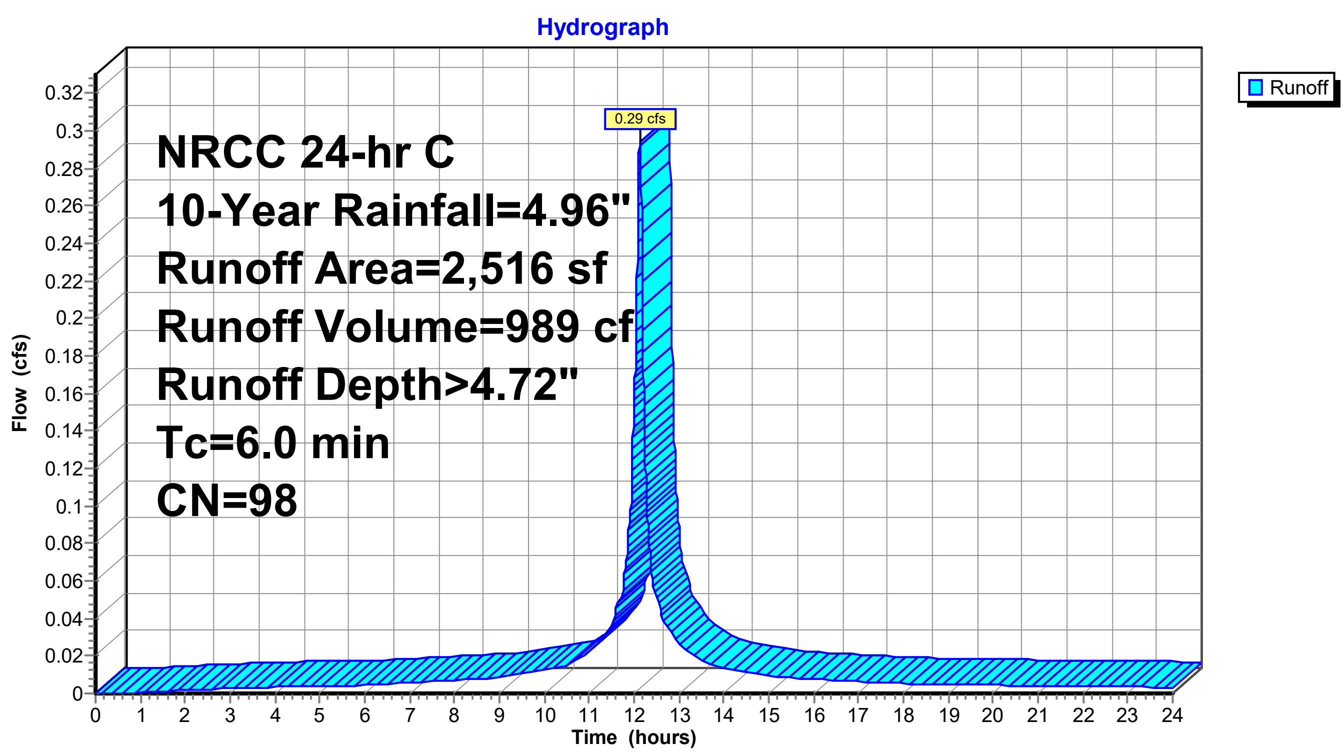
Runoff = 0.29 cfs @ 12.13 hrs, Volume= 989 cf, Depth> 4.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
2,516	98	Paved parking, HSG A
2,516	98	100.00% Impervious Area

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

Subcatchment UC-5:



Summary for Subcatchment UC-6: NA

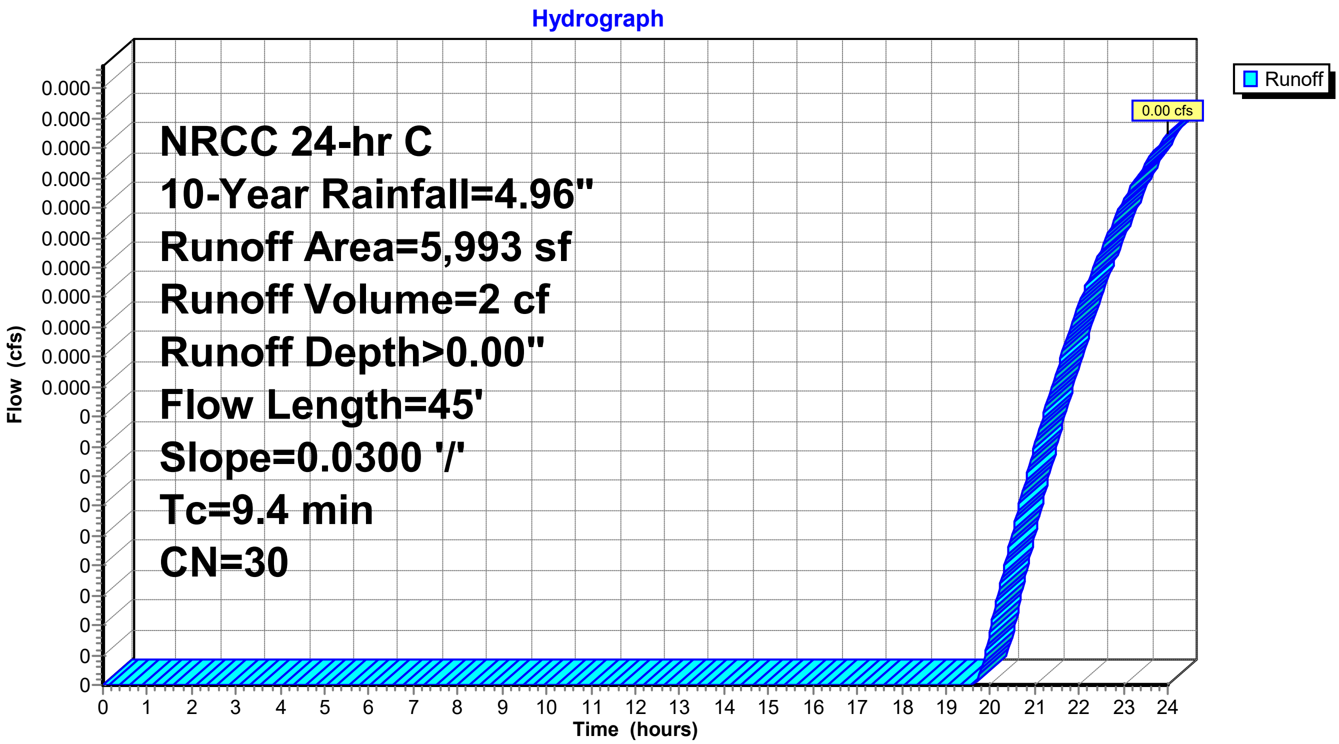
Runoff = 0.00 cfs @ 24.00 hrs, Volume= 2 cf, Depth> 0.00"
Routed to Pond SP-2 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 10-Year Rainfall=4.96"

Area (sf)	CN	Description
5,993	30	Woods, Good, HSG A
5,993	30	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	45	0.0300	0.08		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"

Subcatchment UC-6: NA



Summary for Pond AB-1: Attenuation Basin

Inflow Area = 7,204 sf, 0.00% Impervious, Inflow Depth > 0.58" for 10-Year event
Inflow = 0.26 cfs @ 12.36 hrs, Volume= 350 cf
Outflow = 0.01 cfs @ 12.94 hrs, Volume= 192 cf, Atten= 98%, Lag= 35.1 min
Discarded = 0.01 cfs @ 12.94 hrs, Volume= 192 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond SP 4 : Study Point

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 49.29' @ 12.94 hrs Surf.Area= 844 sf Storage= 235 cf

Plug-Flow detention time= 325.5 min calculated for 192 cf (55% of inflow)
Center-of-Mass det. time= 228.0 min (1,070.3 - 842.3)

Volume	Invert	Avail.Storage	Storage Description
#1	49.00'	4,514 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

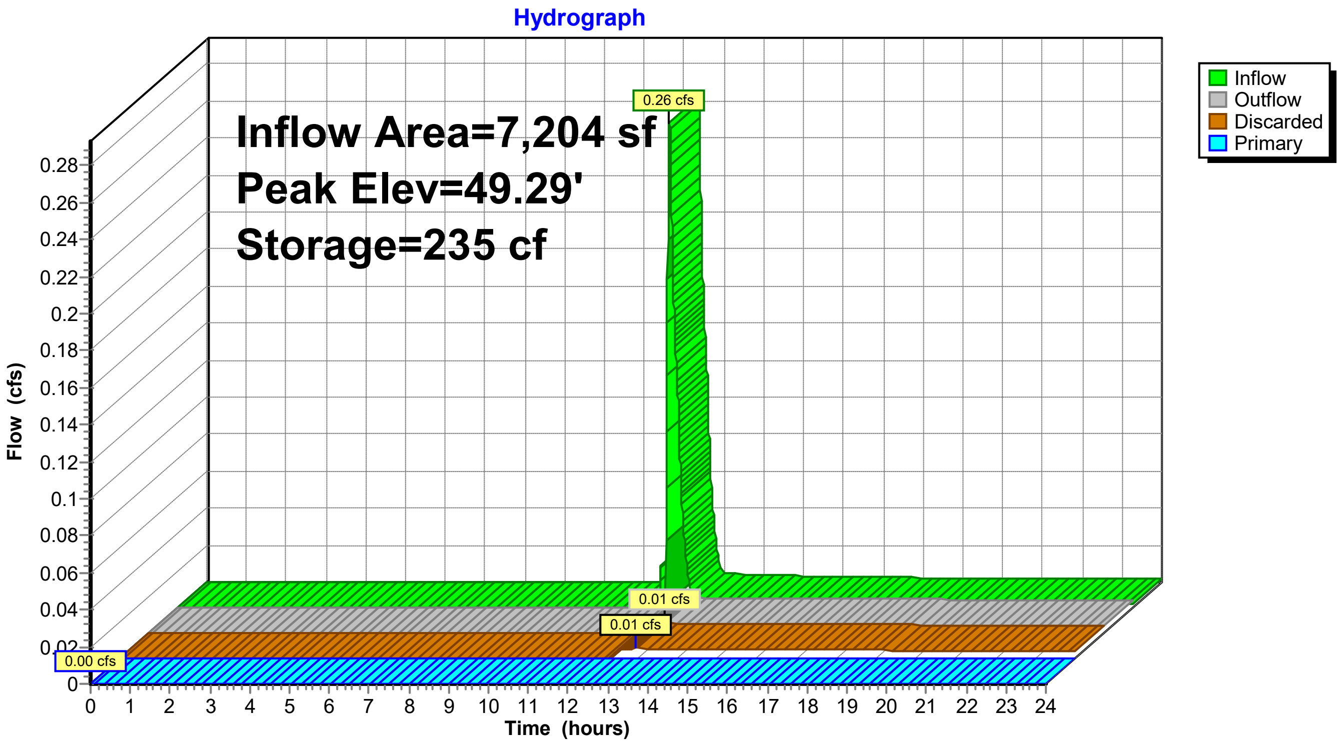
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
49.00	766	147.0	0	0	766
50.00	1,048	206.0	903	903	2,433
51.00	1,801	246.0	1,408	2,311	3,889
52.00	2,632	275.0	2,203	4,514	5,119

Device	Routing	Invert	Outlet Devices
#1	Primary	49.50'	**18.0" Round Culvert** L= 54.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 49.50' / 49.00' S= 0.0093 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	49.50'	**20.0 deg x 2.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.69 (C= 3.36)
#3	Device 1	51.75'	**28.0" x 28.0" Horiz. Bar Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	49.00'	**3.000 in/hr Exfiltration over Surface area from 49.00' - 50.00'** Excluded Surface area = 766 sf Phase-In= 0.01'

Discarded OutFlow Max=0.01 cfs @ 12.94 hrs HW=49.29' (Free Discharge)
4=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.00' TW=0.00' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)
2=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)
3=Bar Grate (Controls 0.00 cfs)

Pond AB-1: Attenuation Basin



Summary for Pond CB-2A: CB 2A

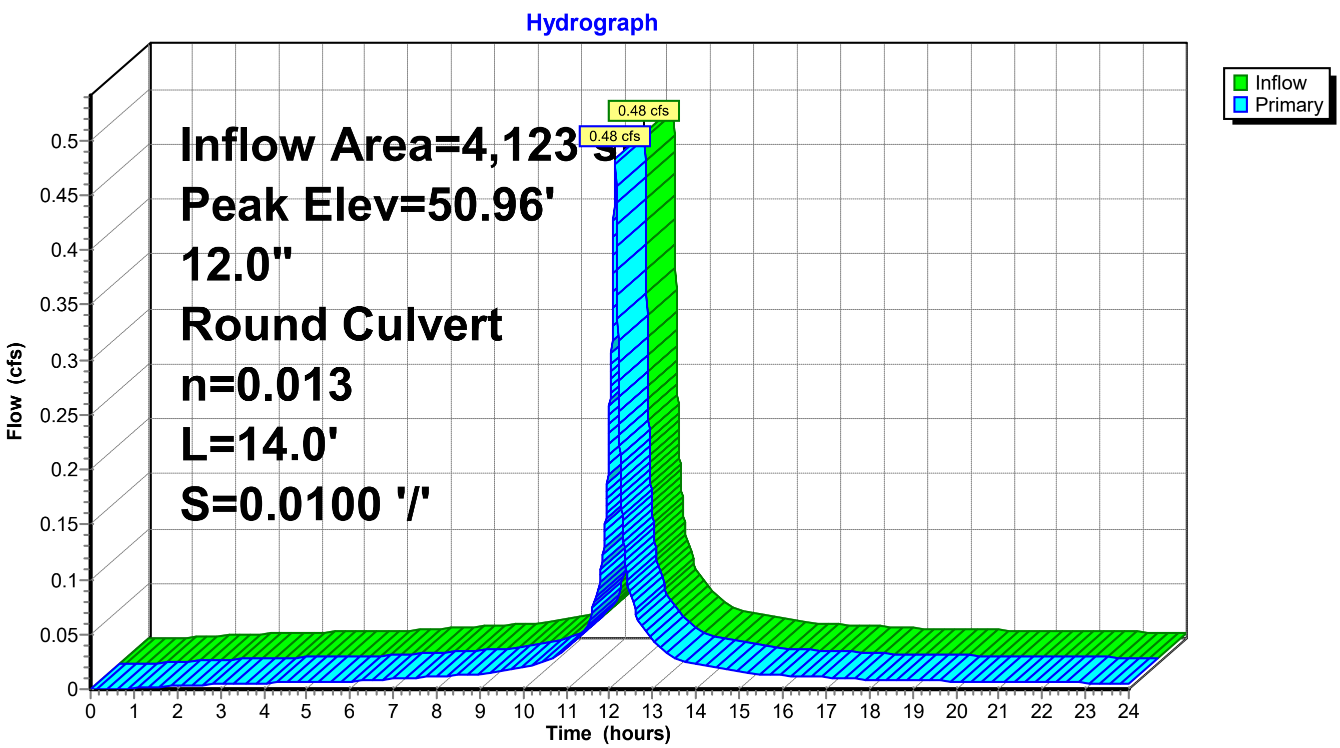
Inflow Area = 4,123 sf,100.00% Impervious, Inflow Depth > 4.72" for 10-Year event
Inflow = 0.48 cfs @ 12.13 hrs, Volume= 1,621 cf
Outflow = 0.48 cfs @ 12.13 hrs, Volume= 1,621 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.48 cfs @ 12.13 hrs, Volume= 1,621 cf
Routed to Pond DMH-2.2 : DMH-2.2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 50.96' @ 12.13 hrs
Flood Elev= 53.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	50.53'	**12.0" Round Culvert** L= 14.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.53' / 50.39' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.48 cfs @ 12.13 hrs HW=50.96' TW=50.77' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.48 cfs @ 2.23 fps)

Pond CB-2A: CB 2A



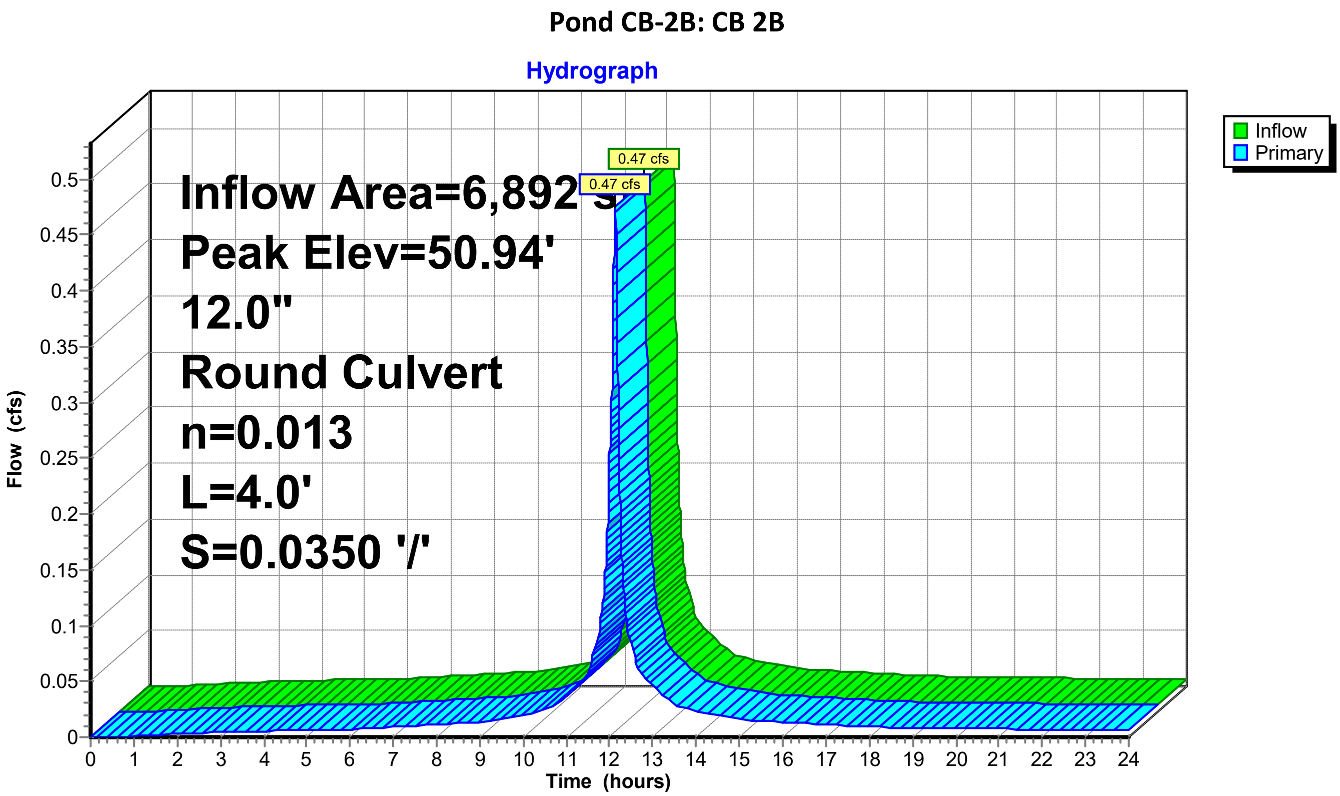
Summary for Pond CB-2B: CB 2B

Inflow Area = 6,892 sf, 58.84% Impervious, Inflow Depth > 2.85" for 10-Year event
Inflow = 0.47 cfs @ 12.13 hrs, Volume= 1,640 cf
Outflow = 0.47 cfs @ 12.13 hrs, Volume= 1,640 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.47 cfs @ 12.13 hrs, Volume= 1,640 cf
Routed to Pond DMH-2.2 : DMH-2.2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 50.94' @ 12.13 hrs
Flood Elev= 53.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	50.53'	**12.0" Round Culvert** L= 4.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.53' / 50.39' S= 0.0350 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.47 cfs @ 12.13 hrs HW=50.94' TW=50.77' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.47 cfs @ 2.35 fps)



Summary for Pond CB-3: CB-3

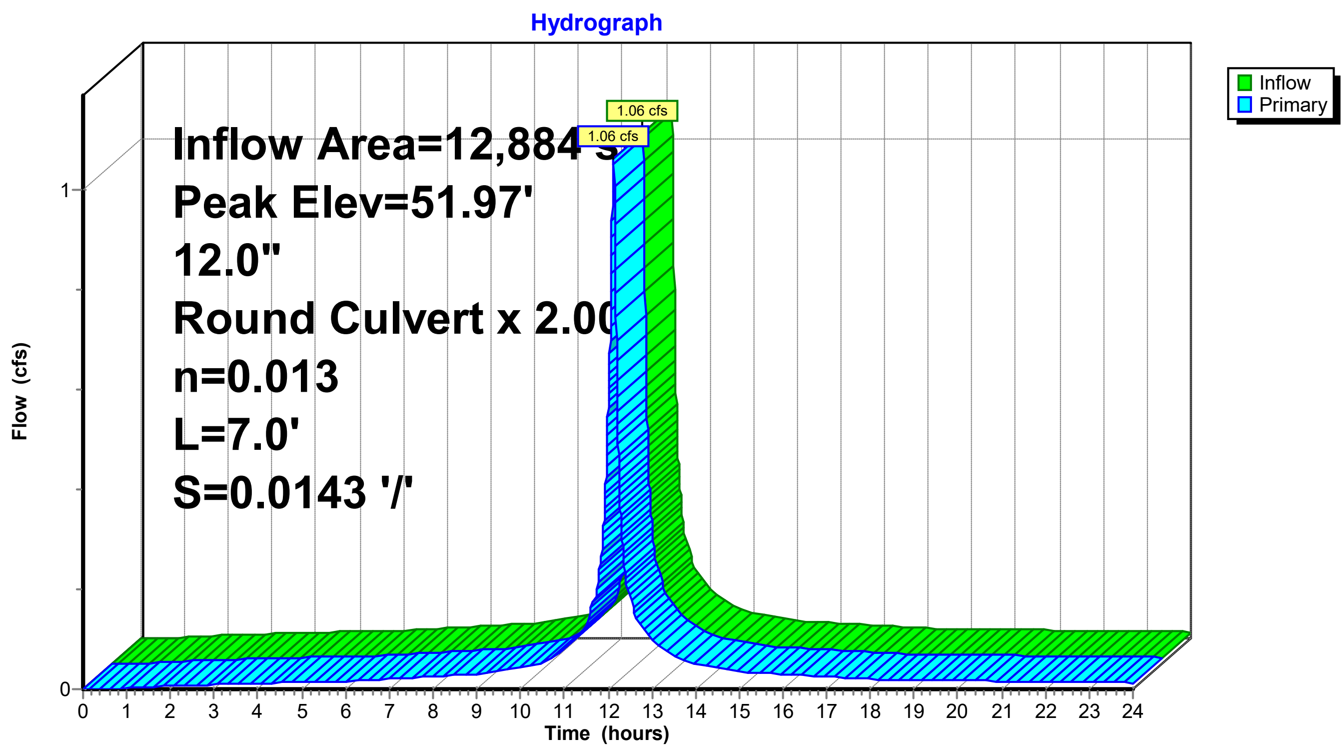
Inflow Area = 12,884 sf, 69.58% Impervious, Inflow Depth > 3.37" for 10-Year event
Inflow = 1.06 cfs @ 12.13 hrs, Volume= 3,620 cf
Outflow = 1.06 cfs @ 12.13 hrs, Volume= 3,620 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.06 cfs @ 12.13 hrs, Volume= 3,620 cf
Routed to Pond DMH-3 : DMH-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.97' @ 12.13 hrs
Flood Elev= 53.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.55'	**12.0" Round Culvert X 2.00** L= 7.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 51.55' / 51.45' S= 0.0143 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.06 cfs @ 12.13 hrs HW=51.97' TW=51.65' (Dynamic Tailwater)
1=Culvert (Barrel Controls 1.06 cfs @ 2.53 fps)

Pond CB-3: CB-3



Summary for Pond CB-4: CB-4

Inflow Area = 27,573 sf, 38.81% Impervious, Inflow Depth > 2.04" for 10-Year event
Inflow = 1.32 cfs @ 12.14 hrs, Volume= 4,693 cf
Outflow = 1.28 cfs @ 12.16 hrs, Volume= 4,693 cf, Atten= 3%, Lag= 1.1 min
Primary = 1.28 cfs @ 12.16 hrs, Volume= 4,693 cf
Routed to Pond DMH-9 : DMH-9 (bypass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 56.99' @ 12.16 hrs Surf.Area= 496 sf Storage= 25 cf
Flood Elev= 56.85' Surf.Area= 4 sf Storage= 0 cf

Plug-Flow detention time= 0.0 min calculated for 4,693 cf (100% of inflow)
Center-of-Mass det. time= 0.0 min (768.5 - 768.5)

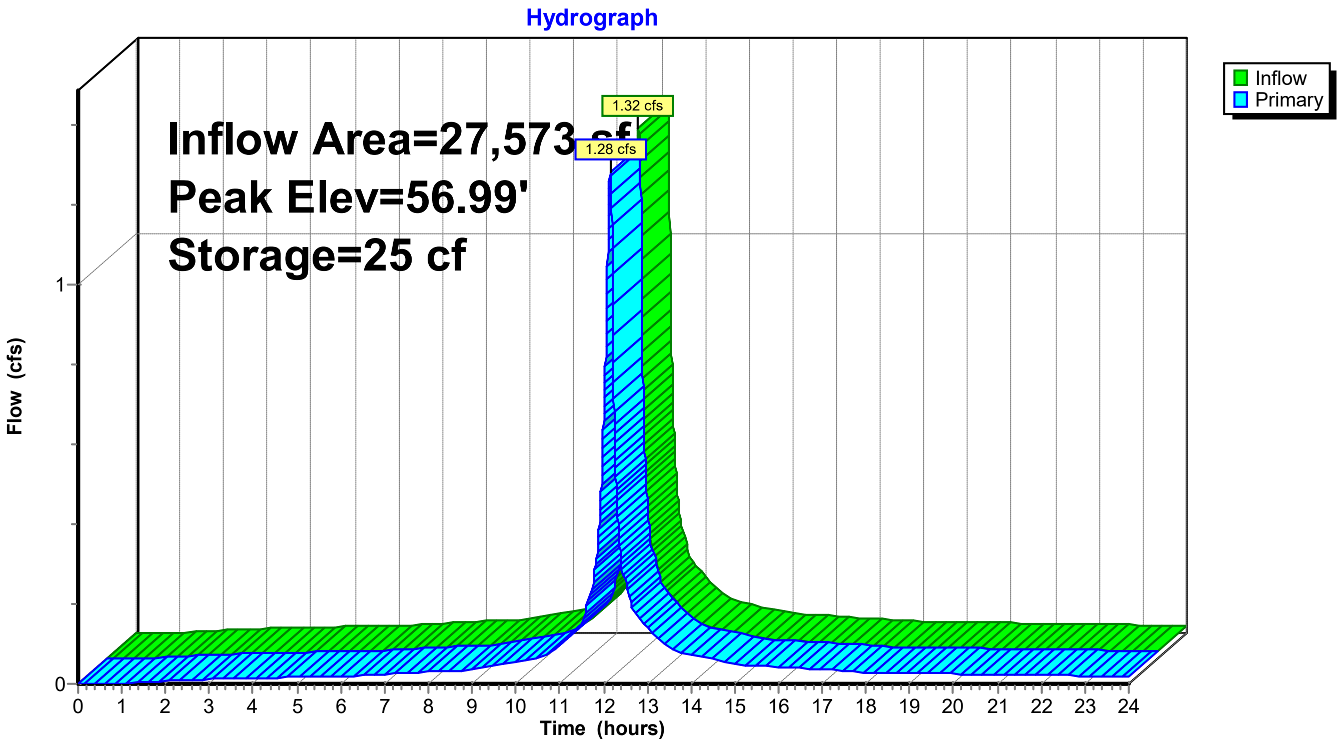
Volume	Invert	Avail.Storage	Storage Description
#1	56.85'	4,465 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
56.85	4	8.0	0	0	4
57.00	589	96.0	32	32	732
58.00	10,253	534.0	4,433	4,465	22,693

Device	Routing	Invert	Outlet Devices
#1	Primary	53.35'	**12.0" Round Culvert** L= 9.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 53.35' / 53.25' S= 0.0111 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	56.85'	**1.2" x 1.2" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 Limited to weir flow at low heads
#3	Device 1	56.85'	**1.2" x 1.2" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.28 cfs @ 12.16 hrs HW=56.99' TW=53.87' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.28 cfs of 5.89 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.64 cfs @ 1.78 fps)
  └─**3=Orifice/Grate** (Orifice Controls 0.64 cfs @ 1.78 fps)

Pond CB-4: CB-4


Hydrograph
Inflow Area=27,573 sf
Peak Elev=56.99'
Storage=25 cf
1.32 cfs
1.28 cfs
Inflow
Primary
Flow (cfs)
0
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Time (hours)

Summary for Pond CB-6A: CB-6A

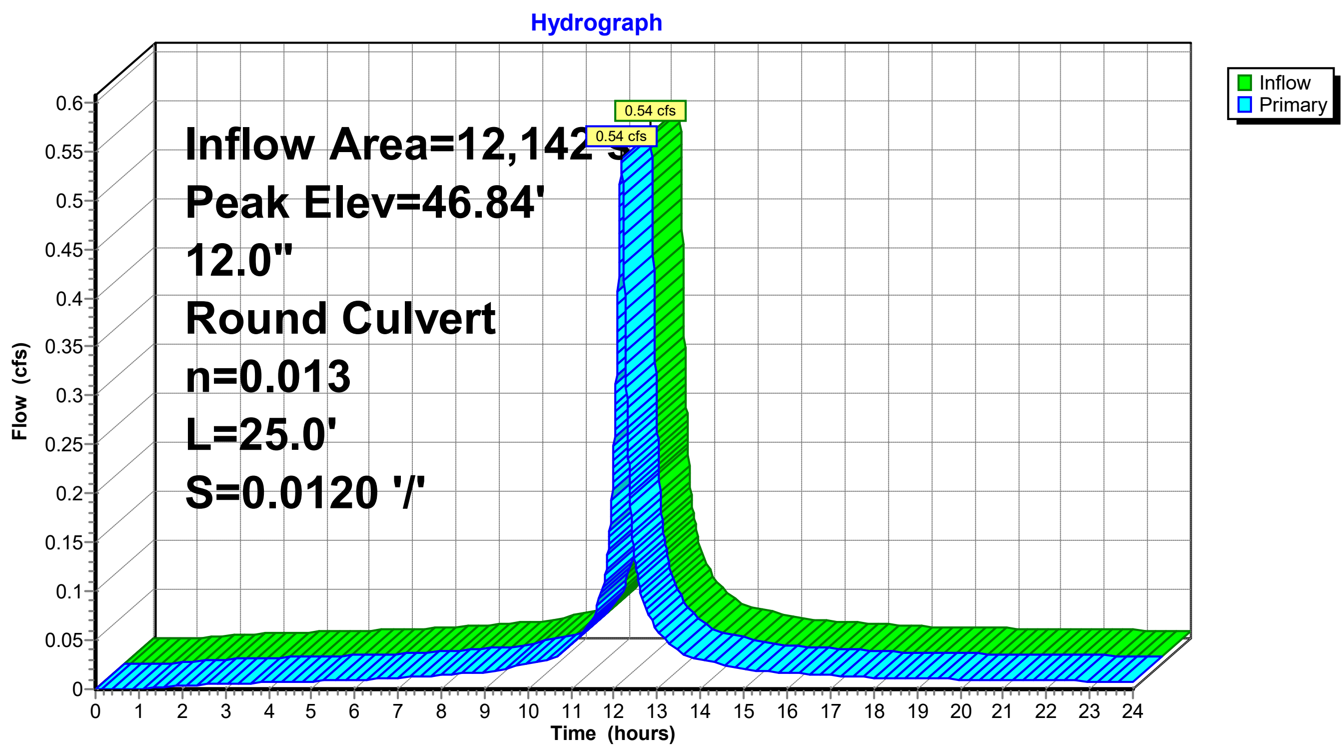
Inflow Area = 12,142 sf, 43.49% Impervious, Inflow Depth > 2.08" for 10-Year event
Inflow = 0.54 cfs @ 12.17 hrs, Volume= 2,100 cf
Outflow = 0.54 cfs @ 12.17 hrs, Volume= 2,100 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.54 cfs @ 12.17 hrs, Volume= 2,100 cf
Routed to Pond DMH-7 : DMH-7 (bypass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 46.84' @ 12.15 hrs
Flood Elev= 49.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.30'	**12.0" Round Culvert** L= 25.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.30' / 46.00' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.54 cfs @ 12.17 hrs HW=46.83' TW=46.69' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.54 cfs @ 1.86 fps)

Pond CB-6A: CB-6A



Summary for Pond CB-6B,C: CB-6B,6C

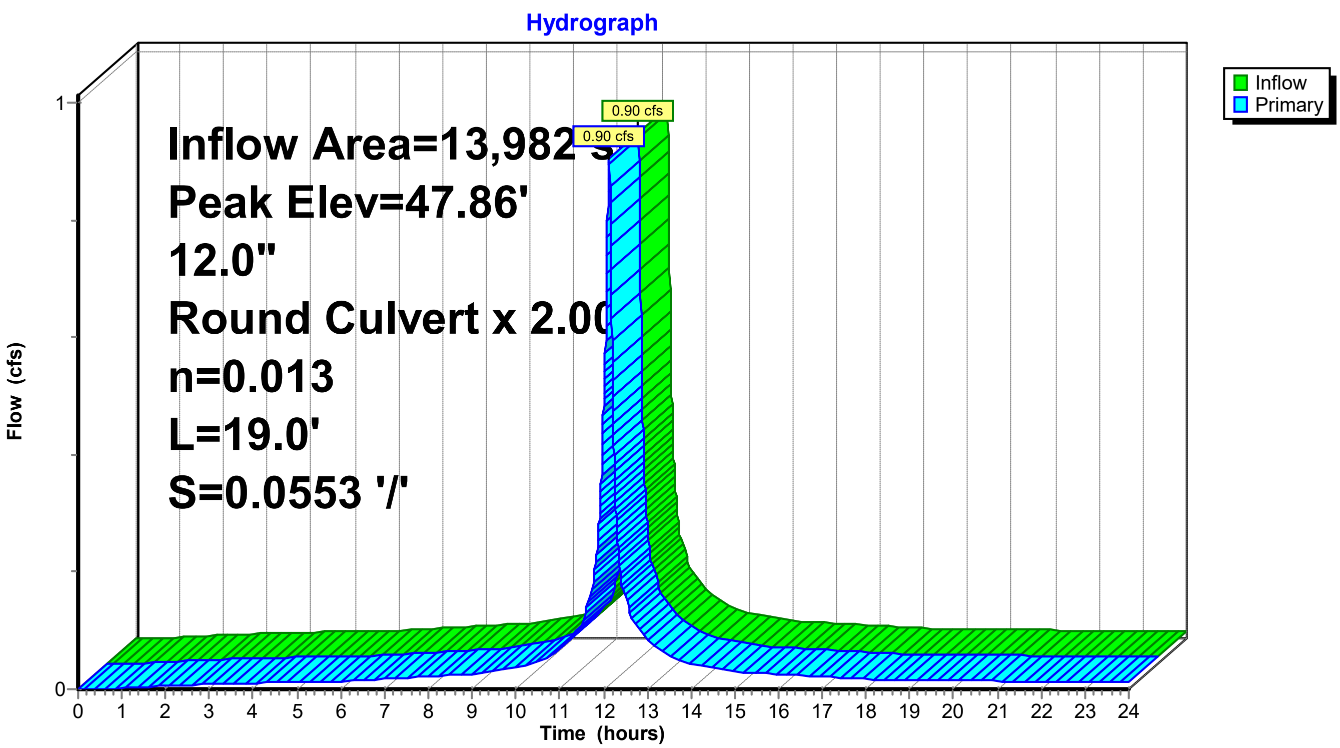
Inflow Area = 13,982 sf, 55.19% Impervious, Inflow Depth > 2.66" for 10-Year event
Inflow = 0.90 cfs @ 12.13 hrs, Volume= 3,096 cf
Outflow = 0.90 cfs @ 12.13 hrs, Volume= 3,096 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.90 cfs @ 12.13 hrs, Volume= 3,096 cf
Routed to Pond DMH-6 : DMH-6

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 47.86' @ 12.13 hrs
Flood Elev= 50.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	47.50'	**12.0" Round Culvert X 2.00** L= 19.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 47.50' / 46.45' S= 0.0553 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.90 cfs @ 12.13 hrs HW=47.86' TW=46.95' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.90 cfs @ 1.79 fps)

Pond CB-6B,C: CB-6B,6C



Summary for Pond CB-7: CB-7

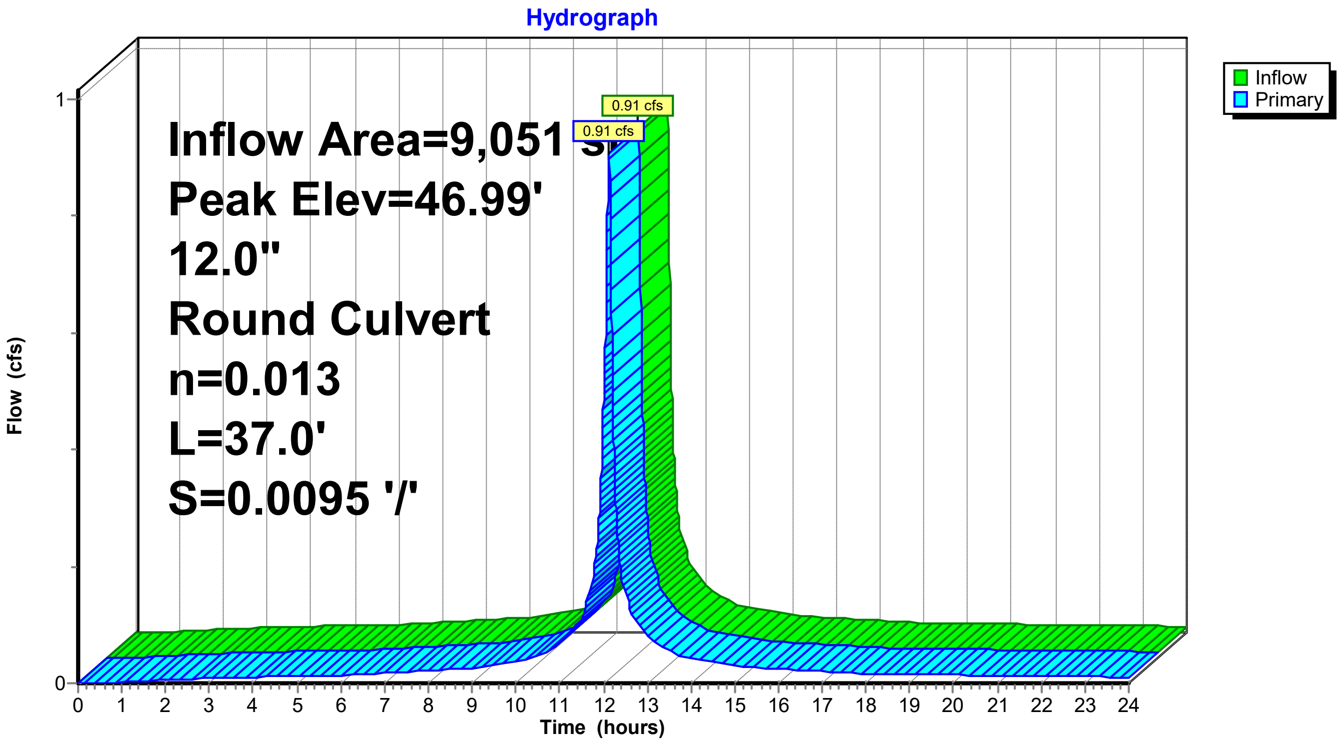
Inflow Area = 9,051 sf, 85.55% Impervious, Inflow Depth > 4.06" for 10-Year event
Inflow = 0.91 cfs @ 12.13 hrs, Volume= 3,065 cf
Outflow = 0.91 cfs @ 12.13 hrs, Volume= 3,065 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.91 cfs @ 12.13 hrs, Volume= 3,065 cf
Routed to Pond DMH-8 : DMH-8 (bypass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 46.99' @ 12.13 hrs
Flood Elev= 49.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.40'	**12.0" Round Culvert** L= 37.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.40' / 46.05' S= 0.0095 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.91 cfs @ 12.13 hrs HW=46.99' TW=46.64' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.91 cfs @ 2.72 fps)

Pond CB-7: CB-7



Summary for Pond DB-A: DB-A

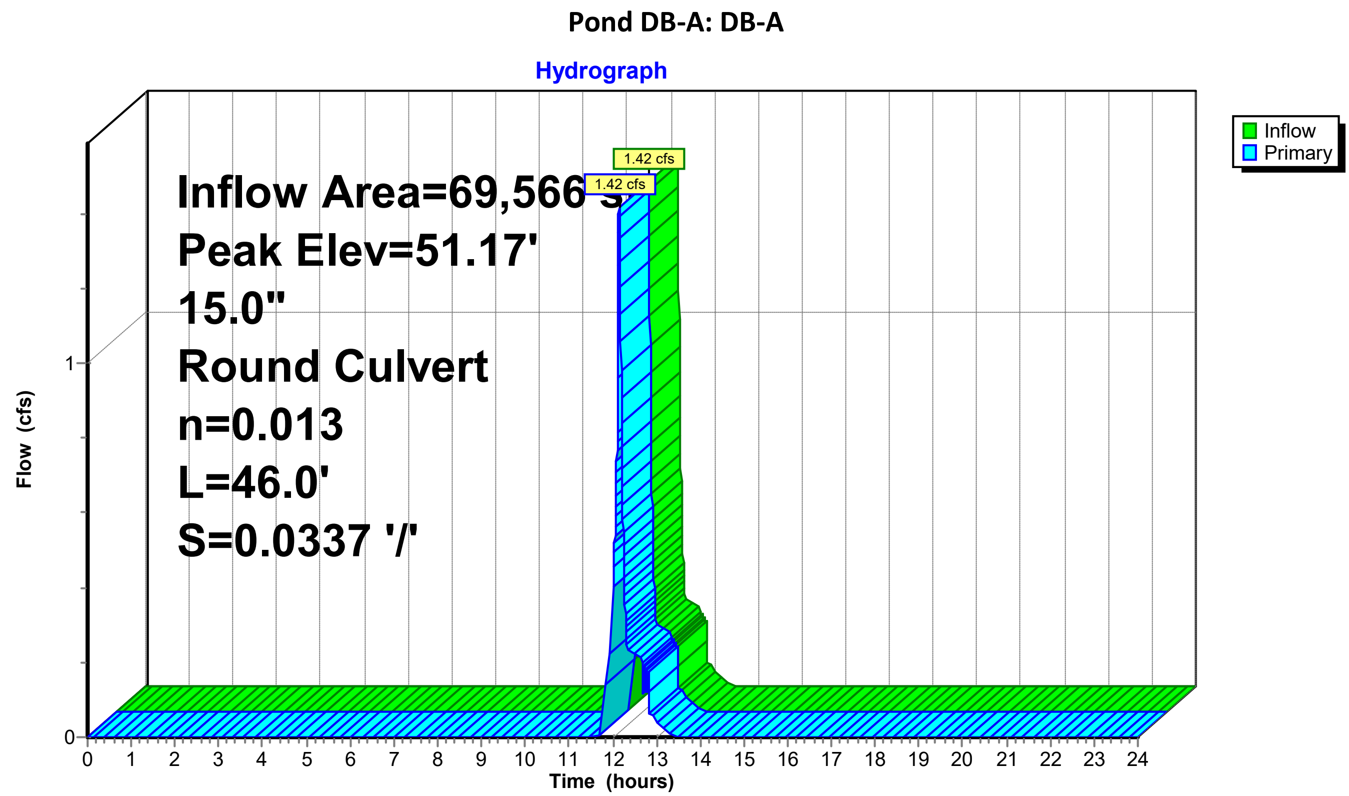
Inflow Area =	69,566 sf,	63.53% Impervious,	Inflow Depth = 0.24"	for 10-Year event
Inflow =	1.42 cfs @	12.15 hrs, Volume=	1,413 cf	
Outflow =	1.42 cfs @	12.15 hrs, Volume=	1,413 cf, Atten= 0%, Lag= 0.0 min	
Primary =	1.42 cfs @	12.15 hrs, Volume=	1,413 cf	

Routed to Pond DMH-5 : DMH-5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.17' @ 12.15 hrs
Flood Elev= 54.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	50.55'	**15.0" Round Culvert** L= 46.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.55' / 49.00' S= 0.0337 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.41 cfs @ 12.15 hrs HW=51.16' TW=49.82' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.41 cfs @ 2.36 fps)



Summary for Pond DMH-2.1: DMH-2.1 (By-Pass)

Inflow Area = 23,899 sf, 71.73% Impervious, Inflow Depth > 3.45" for 10-Year event
Inflow = 2.02 cfs @ 12.13 hrs, Volume= 6,880 cf
Outflow = 2.02 cfs @ 12.13 hrs, Volume= 6,880 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.00 cfs @ 12.13 hrs, Volume= 6,876 cf
Routed to Pond INF-1 : INF-1
Secondary = 0.02 cfs @ 12.13 hrs, Volume= 5 cf
Routed to Pond AB-1 : Attenuation Basin

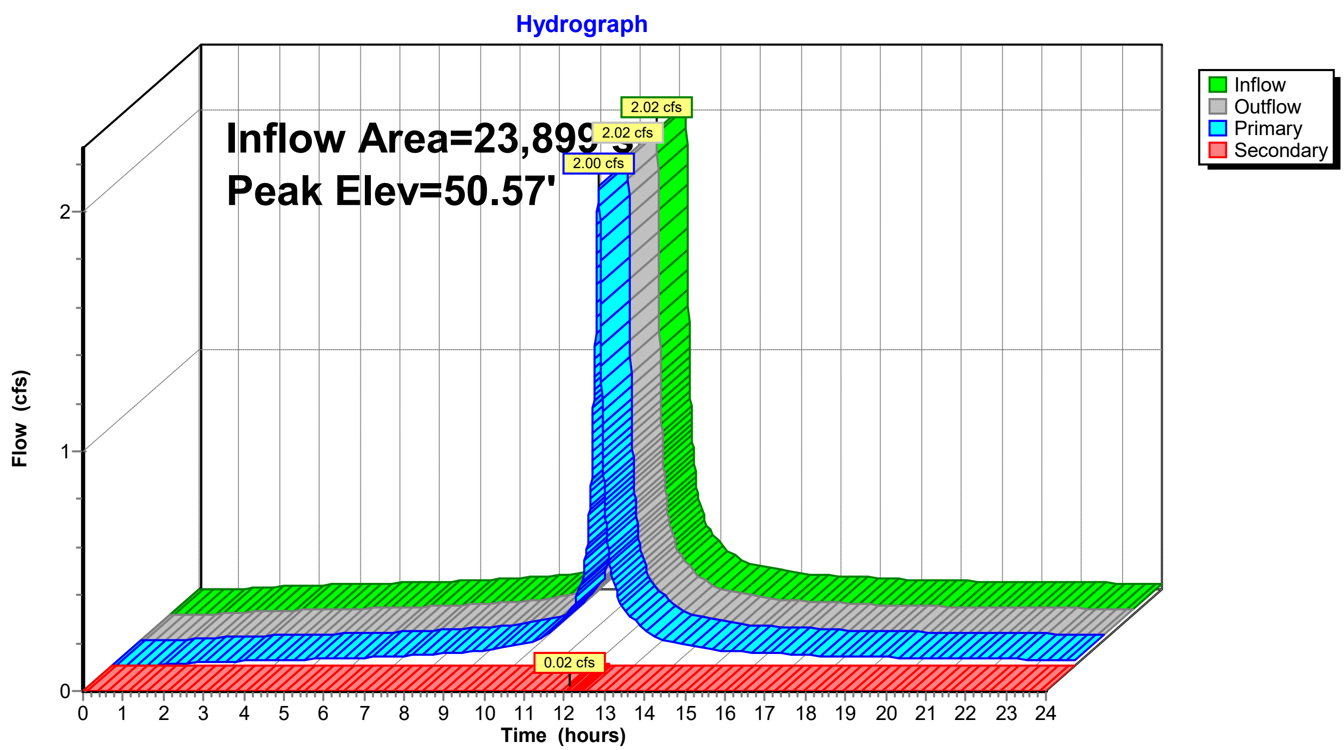
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 50.57' @ 12.13 hrs
Flood Elev= 52.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.60'	**12.0" Round OSG-1** L= 2.3' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.60' / 49.55' S= 0.0217 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	50.50'	**15.0" Round FES** L= 25.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 50.50' / 50.10' S= 0.0160 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.00 cfs @ 12.13 hrs HW=50.57' TW=48.88' (Dynamic Tailwater)
└**1=OSG-1** (Barrel Controls 2.00 cfs @ 3.27 fps)

Secondary OutFlow Max=0.02 cfs @ 12.13 hrs HW=50.57' TW=49.00' (Dynamic Tailwater)
└**2=FES** (Inlet Controls 0.02 cfs @ 0.88 fps)

Pond DMH-2.1: DMH-2.1 (By-Pass)



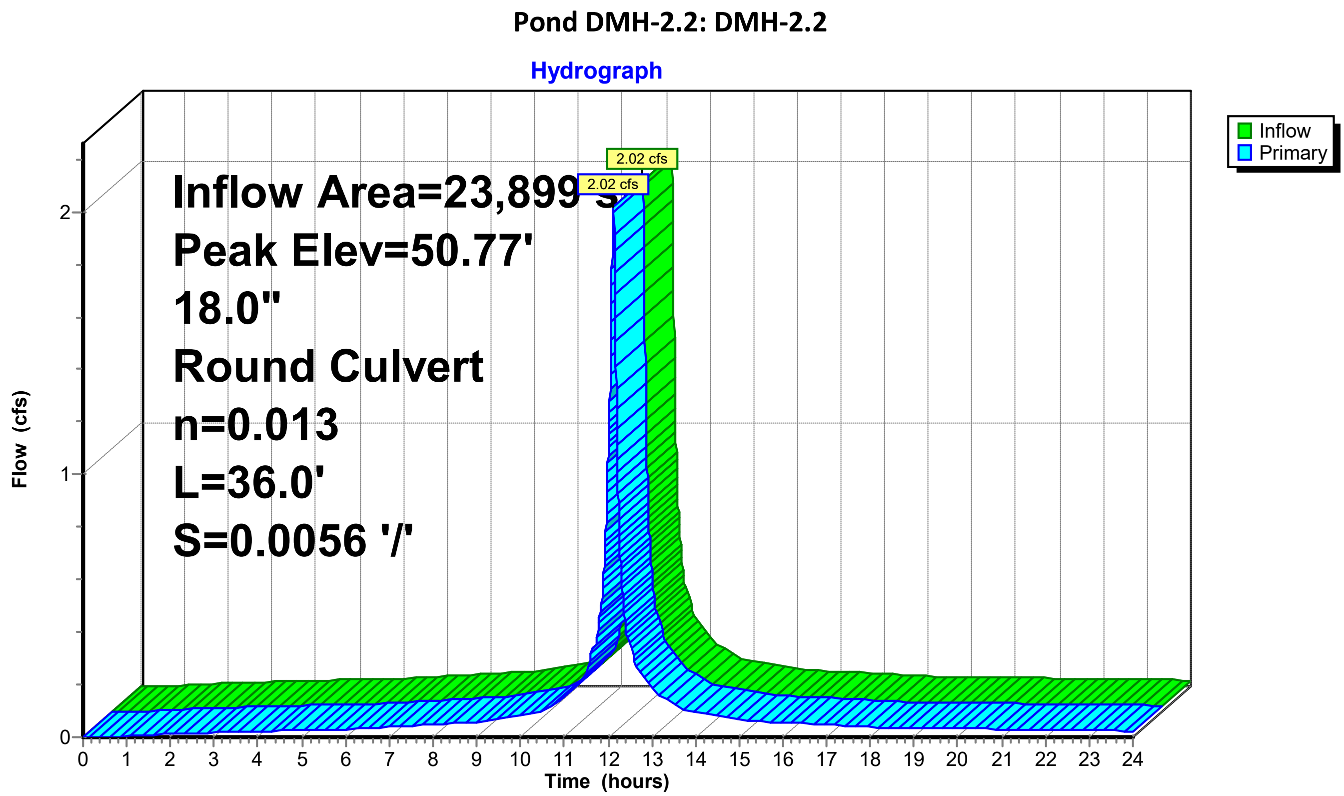
Summary for Pond DMH-2.2: DMH-2.2

Inflow Area = 23,899 sf, 71.73% Impervious, Inflow Depth > 3.45" for 10-Year event
Inflow = 2.02 cfs @ 12.13 hrs, Volume= 6,880 cf
Outflow = 2.02 cfs @ 12.13 hrs, Volume= 6,880 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.02 cfs @ 12.13 hrs, Volume= 6,880 cf
Routed to Pond DMH-2.1 : DMH-2.1 (By-Pass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 50.77' @ 12.13 hrs
Flood Elev= 53.63'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.80'	**18.0" Round DMH 2.1** L= 36.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.80' / 49.60' S= 0.0056 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=2.02 cfs @ 12.13 hrs HW=50.77' TW=50.57' (Dynamic Tailwater)
└─**1=DMH 2.1** (Outlet Controls 2.02 cfs @ 2.36 fps)



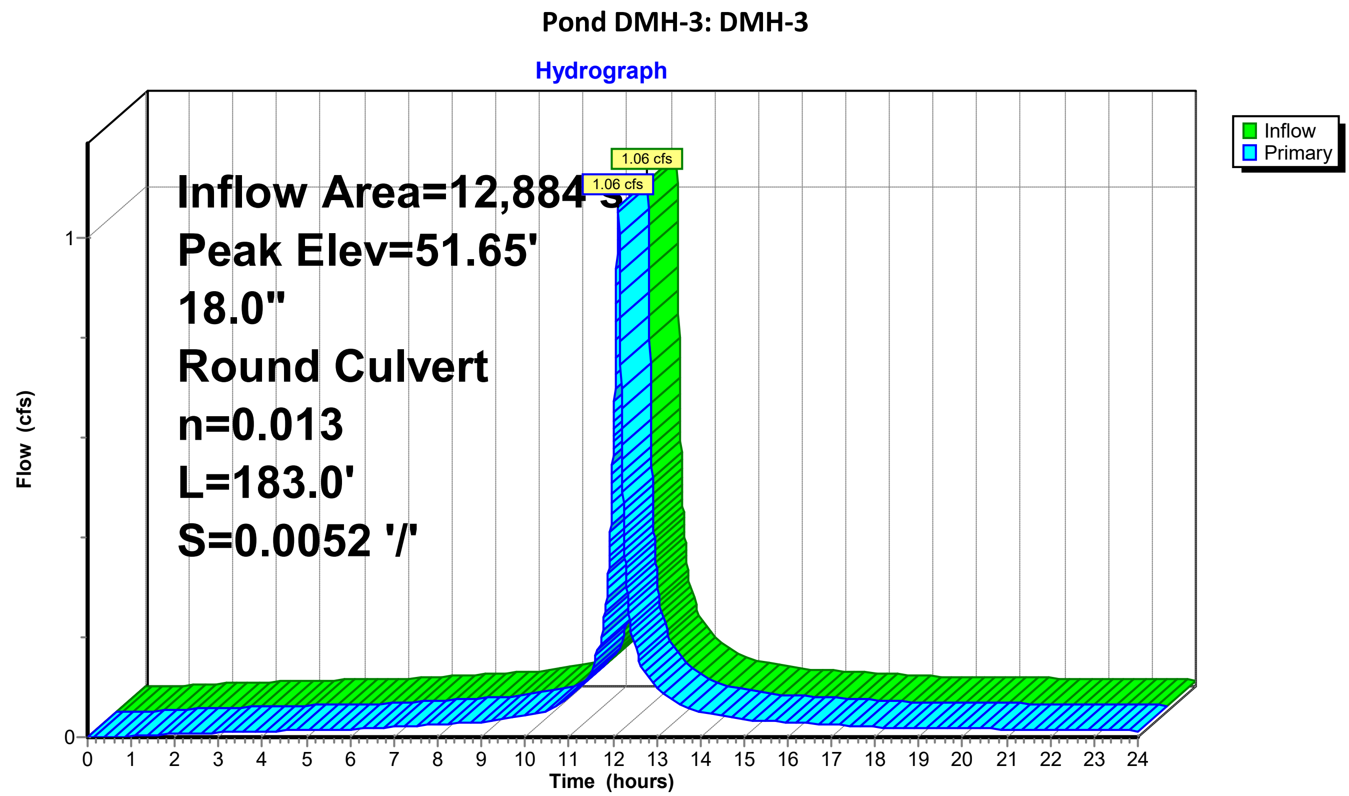
Summary for Pond DMH-3: DMH-3

Inflow Area = 12,884 sf, 69.58% Impervious, Inflow Depth > 3.37" for 10-Year event
Inflow = 1.06 cfs @ 12.13 hrs, Volume= 3,620 cf
Outflow = 1.06 cfs @ 12.13 hrs, Volume= 3,620 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.06 cfs @ 12.13 hrs, Volume= 3,620 cf
Routed to Pond DMH-2.2 : DMH-2.2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.65' @ 12.13 hrs
Flood Elev= 54.22'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.10'	**18.0" Round Culvert** L= 183.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 51.10' / 50.14' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.06 cfs @ 12.13 hrs HW=51.65' TW=50.77' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.06 cfs @ 2.69 fps)



Summary for Pond DMH-4: DMH-4

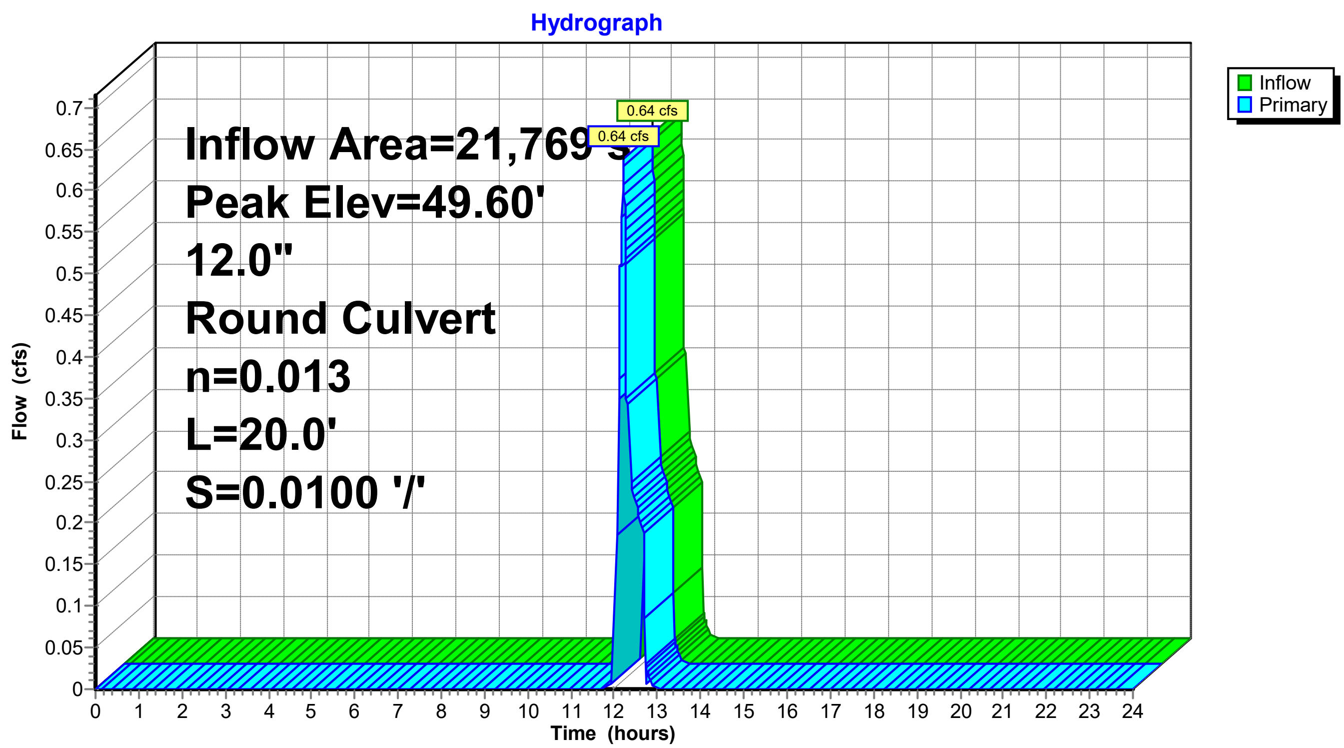
Inflow Area = 21,769 sf, 63.79% Impervious, Inflow Depth = 0.44" for 10-Year event
Inflow = 0.64 cfs @ 12.21 hrs, Volume= 805 cf
Outflow = 0.64 cfs @ 12.21 hrs, Volume= 805 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.64 cfs @ 12.21 hrs, Volume= 805 cf
Routed to Pond INF-2 : INF-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 49.60' @ 12.21 hrs
Flood Elev= 53.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.15'	**12.0" Round Culvert** L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.15' / 48.95' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.64 cfs @ 12.21 hrs HW=49.60' TW=48.76' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.64 cfs @ 2.76 fps)

Pond DMH-4: DMH-4



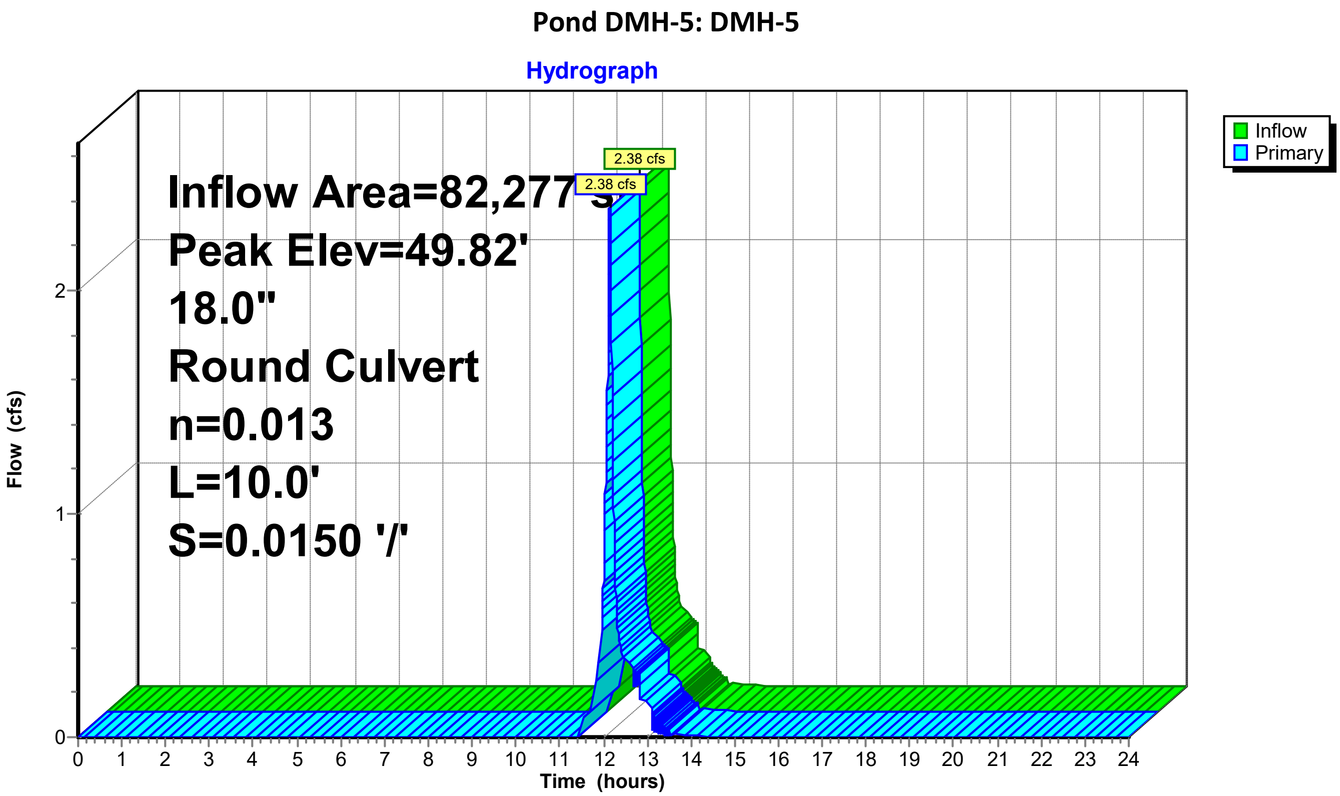
Summary for Pond DMH-5: DMH-5

Inflow Area = 82,277 sf, 64.43% Impervious, Inflow Depth = 0.41" for 10-Year event
Inflow = 2.38 cfs @ 12.14 hrs, Volume= 2,809 cf
Outflow = 2.38 cfs @ 12.14 hrs, Volume= 2,809 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.38 cfs @ 12.14 hrs, Volume= 2,809 cf
Routed to Pond INF-2 : INF-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 49.82' @ 12.14 hrs
Flood Elev= 54.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**18.0" Round Culvert** L= 10.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.00' / 48.85' S= 0.0150 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=2.37 cfs @ 12.14 hrs HW=49.82' TW=48.37' (Dynamic Tailwater)
1=Culvert (Barrel Controls 2.37 cfs @ 3.46 fps)



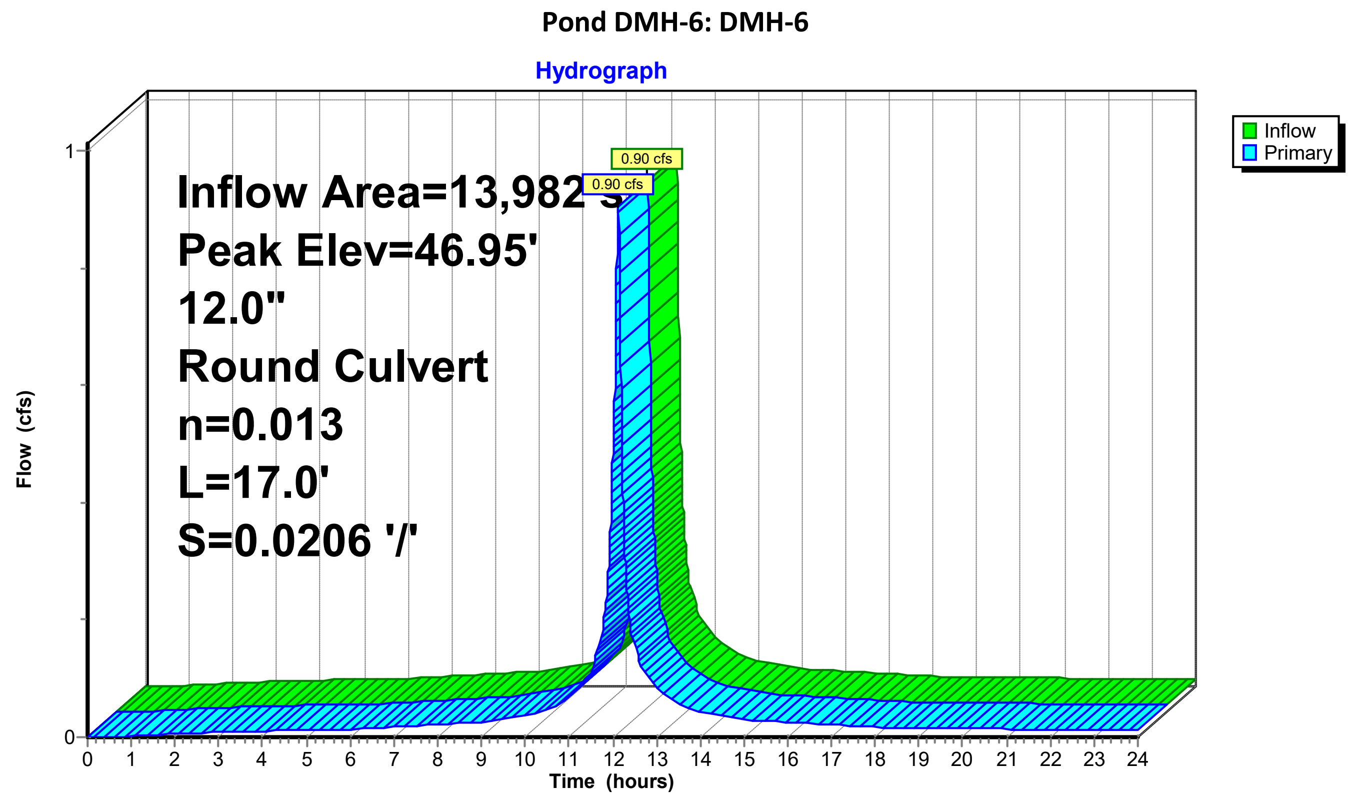
Summary for Pond DMH-6: DMH-6

Inflow Area = 13,982 sf, 55.19% Impervious, Inflow Depth > 2.66" for 10-Year event
Inflow = 0.90 cfs @ 12.13 hrs, Volume= 3,096 cf
Outflow = 0.90 cfs @ 12.13 hrs, Volume= 3,096 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.90 cfs @ 12.13 hrs, Volume= 3,096 cf
Routed to Pond DMH-7 : DMH-7 (bypass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 46.95' @ 12.13 hrs
Flood Elev= 50.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.35'	**12.0" Round Culvert** L= 17.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.35' / 46.00' S= 0.0206 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.90 cfs @ 12.13 hrs HW=46.95' TW=46.71' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.90 cfs @ 2.61 fps)



Summary for Pond DMH-7: DMH-7 (bypass)

Inflow Area = 26,124 sf, 49.75% Impervious, Inflow Depth > 2.39" for 10-Year event
Inflow = 1.41 cfs @ 12.14 hrs, Volume= 5,196 cf
Outflow = 1.41 cfs @ 12.14 hrs, Volume= 5,196 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.36 cfs @ 12.14 hrs, Volume= 5,183 cf
Routed to Pond INF-3 : INF-3
Secondary = 0.05 cfs @ 12.14 hrs, Volume= 13 cf
Routed to Pond INF-3 : INF-3

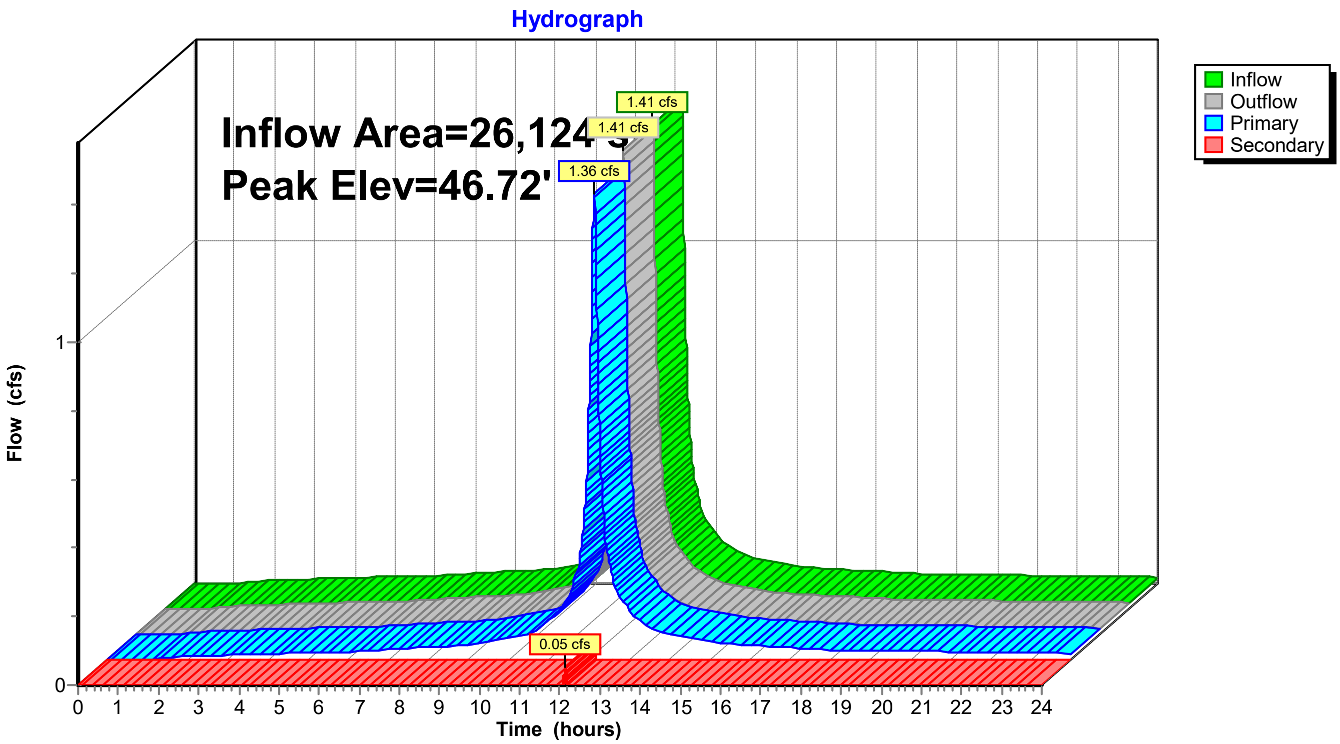
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 46.72' @ 12.14 hrs
Flood Elev= 50.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.00'	**12.0" Round OGS-2** L= 3.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.00' / 45.90' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	46.60'	**12.0" Round By-Pass** L= 11.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.60' / 45.58' S= 0.0927 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.36 cfs @ 12.14 hrs HW=46.72' TW=44.25' (Dynamic Tailwater)
└**1=OGS-2** (Barrel Controls 1.36 cfs @ 3.17 fps)

Secondary OutFlow Max=0.05 cfs @ 12.14 hrs HW=46.72' TW=44.25' (Dynamic Tailwater)
└**2=By-Pass** (Inlet Controls 0.05 cfs @ 1.02 fps)

Pond DMH-7: DMH-7 (bypass)



Summary for Pond DMH-8: DMH-8 (bypass)

Inflow Area = 9,051 sf, 85.55% Impervious, Inflow Depth > 4.06" for 10-Year event
Inflow = 0.91 cfs @ 12.13 hrs, Volume= 3,065 cf
Outflow = 0.91 cfs @ 12.13 hrs, Volume= 3,065 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.87 cfs @ 12.13 hrs, Volume= 3,058 cf
Routed to nonexistent node 5P
Secondary = 0.03 cfs @ 12.13 hrs, Volume= 7 cf
Routed to Pond INF-3 : INF-3

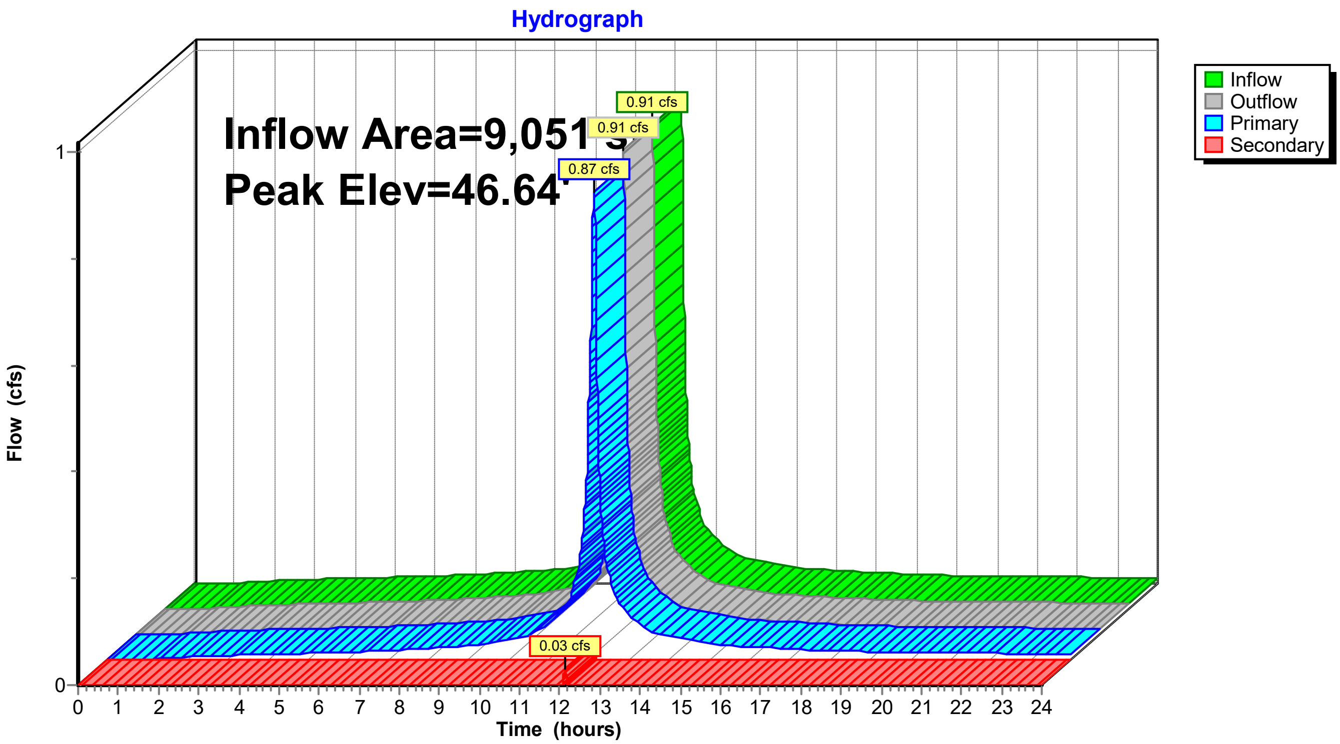
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 46.64' @ 12.13 hrs
Flood Elev= 50.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.05'	**12.0" Round OSG** L= 5.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.05' / 46.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	46.55'	**12.0" Round By-Pass** L= 13.5' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.55' / 45.58' S= 0.0719 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.87 cfs @ 12.13 hrs HW=46.64' (Free Discharge)
└**1=OSG** (Barrel Controls 0.87 cfs @ 2.61 fps)

Secondary OutFlow Max=0.03 cfs @ 12.13 hrs HW=46.64' TW=44.19' (Dynamic Tailwater)
└**2=By-Pass** (Inlet Controls 0.03 cfs @ 0.90 fps)

Pond DMH-8: DMH-8 (bypass)



Summary for Pond DMH-9: DMH-9 (bypass)

Inflow Area = 27,573 sf, 38.81% Impervious, Inflow Depth > 2.04" for 10-Year event
Inflow = 1.28 cfs @ 12.16 hrs, Volume= 4,693 cf
Outflow = 1.28 cfs @ 12.16 hrs, Volume= 4,693 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.22 cfs @ 12.16 hrs, Volume= 4,674 cf
Routed to Pond INF-4 : INF-4
Secondary = 0.06 cfs @ 12.16 hrs, Volume= 18 cf
Routed to Pond INF-4 : INF-4

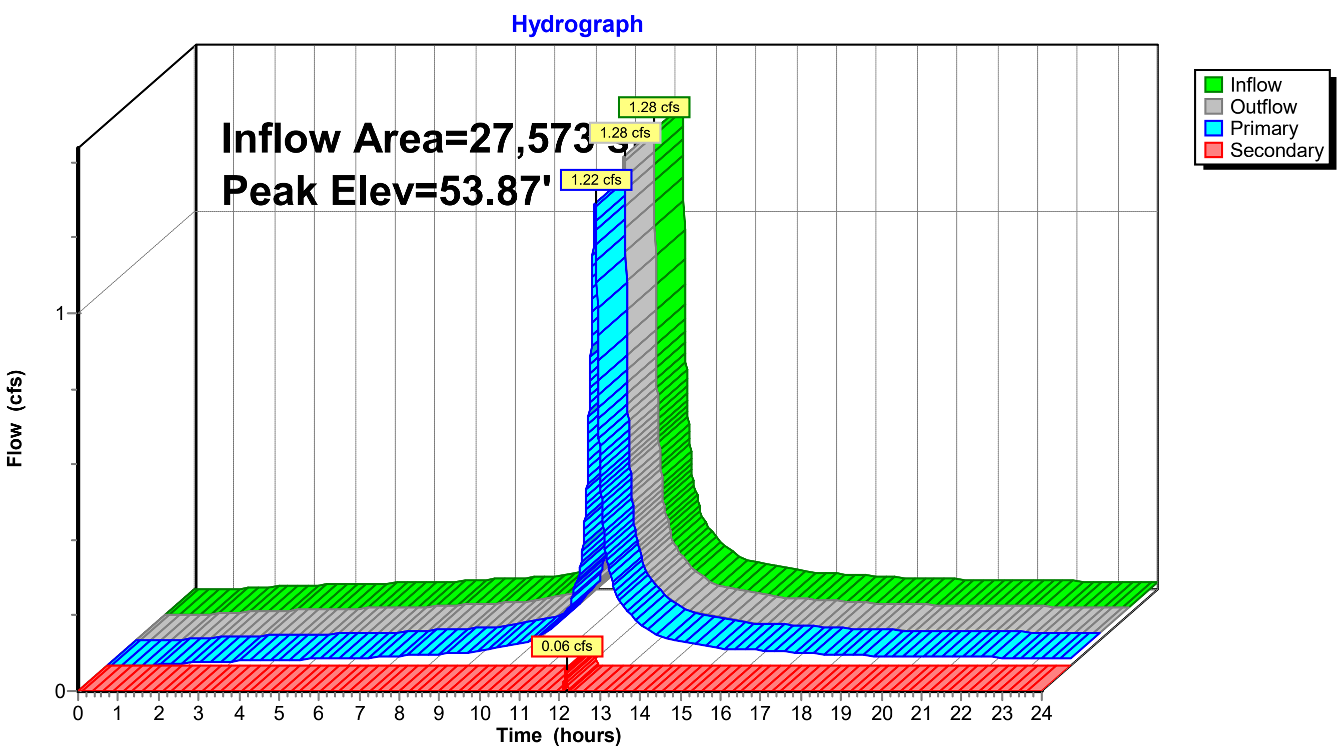
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 53.87' @ 12.16 hrs
Flood Elev= 57.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	53.25'	**12.0" Round OGS-4** L= 3.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 53.25' / 52.90' S= 0.1167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	53.75'	**12.0" Round By-Pass** L= 3.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 53.75' / 52.90' S= 0.2833 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.22 cfs @ 12.16 hrs HW=53.87' TW=52.31' (Dynamic Tailwater)
└**1=OGS-4** (Inlet Controls 1.22 cfs @ 2.37 fps)

Secondary OutFlow Max=0.06 cfs @ 12.16 hrs HW=53.87' TW=52.31' (Dynamic Tailwater)
└**2=By-Pass** (Inlet Controls 0.06 cfs @ 1.06 fps)

Pond DMH-9: DMH-9 (bypass)



Summary for Pond DS: Dry Stream

Inflow Area = 66,509 sf, 26.96% Impervious, Inflow Depth > 1.69" for 10-Year event
Inflow = 2.13 cfs @ 12.14 hrs, Volume= 9,370 cf
Outflow = 2.02 cfs @ 12.16 hrs, Volume= 9,333 cf, Atten= 5%, Lag= 1.4 min
Discarded = 0.03 cfs @ 12.16 hrs, Volume= 1,151 cf
Primary = 1.99 cfs @ 12.16 hrs, Volume= 8,182 cf
Routed to Pond FP-7 : FP-7/INF-5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 54.90' @ 12.16 hrs Surf.Area= 473 sf Storage= 250 cf

Plug-Flow detention time= 6.5 min calculated for 9,331 cf (100% of inflow)
Center-of-Mass det. time= 4.0 min (798.4 - 794.3)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	2,359 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

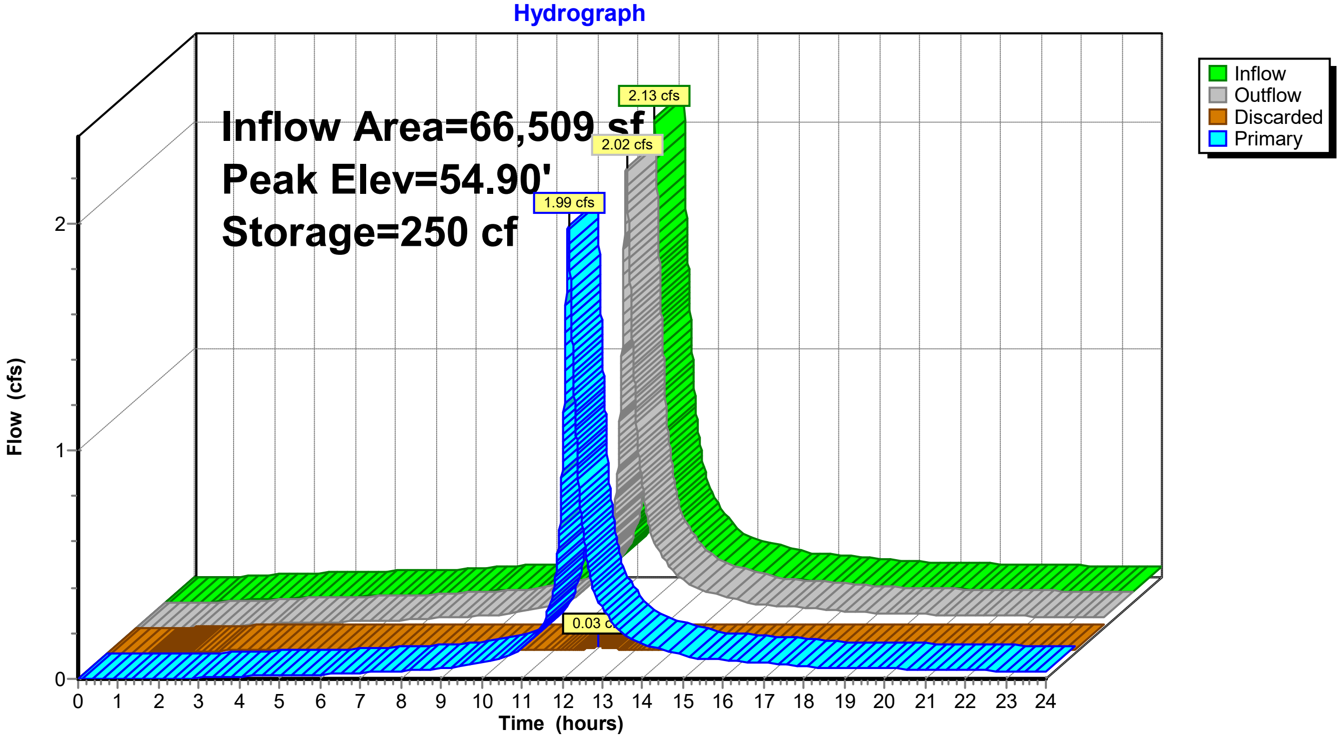
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
54.00	121	64.0	0	0	121
55.00	526	236.0	300	300	4,230
56.00	1,068	524.0	781	1,081	21,652
57.00	1,500	613.0	1,278	2,359	29,725

Device	Routing	Invert	Outlet Devices
#1	Discarded	54.00'	**3.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.10'
#2	Primary	54.15'	**15.0" Round Overflow** L= 48.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 54.15' / 53.75' S= 0.0083 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=0.03 cfs @ 12.16 hrs HW=54.90' (Free Discharge)
└─**1=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=1.99 cfs @ 12.16 hrs HW=54.90' TW=49.32' (Dynamic Tailwater)
└─**2=Overflow** (Barrel Controls 1.99 cfs @ 3.71 fps)

Pond DS: Dry Stream



Summary for Pond FP-1: FP-1

Inflow Area = 12,471 sf, 83.62% Impervious, Inflow Depth > 3.98" for 10-Year event
Inflow = 1.22 cfs @ 12.13 hrs, Volume= 4,133 cf
Outflow = 0.76 cfs @ 12.20 hrs, Volume= 4,132 cf, Atten= 38%, Lag= 4.2 min
Discarded = 0.22 cfs @ 12.20 hrs, Volume= 3,160 cf
Primary = 0.53 cfs @ 12.05 hrs, Volume= 973 cf
Routed to Pond INF-3 : INF-3
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond CB-7 : CB-7

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 50.26' @ 12.20 hrs Surf.Area= 646 sf Storage= 660 cf

Plug-Flow detention time= 33.2 min calculated for 4,131 cf (100% of inflow)
Center-of-Mass det. time= 33.2 min (784.2 - 751.0)

Volume	Invert	Avail.Storage	Storage Description
#1	47.22'	32 cf	**8.00'W x 9.00'L x 2.25'H FP (mulch/media/stone)**
			162 cf Overall x 20.0% Voids
#2	49.47'	1,648 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#3A	43.43'	168 cf	**11.87'W x 13.38'L x 4.29'H Field A**
			682 cf Overall - 262 cf Embedded = 420 cf x 40.0% Voids
#4A	43.68'	249 cf	**Ferguson R-Tank HD 2.5** x 24 Inside #3
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			24 Chambers in 6 Rows
		2,098 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
49.47	68	30.0	0	0	68
50.00	375	76.0	106	106	457
51.00	539	88.0	455	561	634
52.25	1,250	260.0	1,087	1,648	5,402

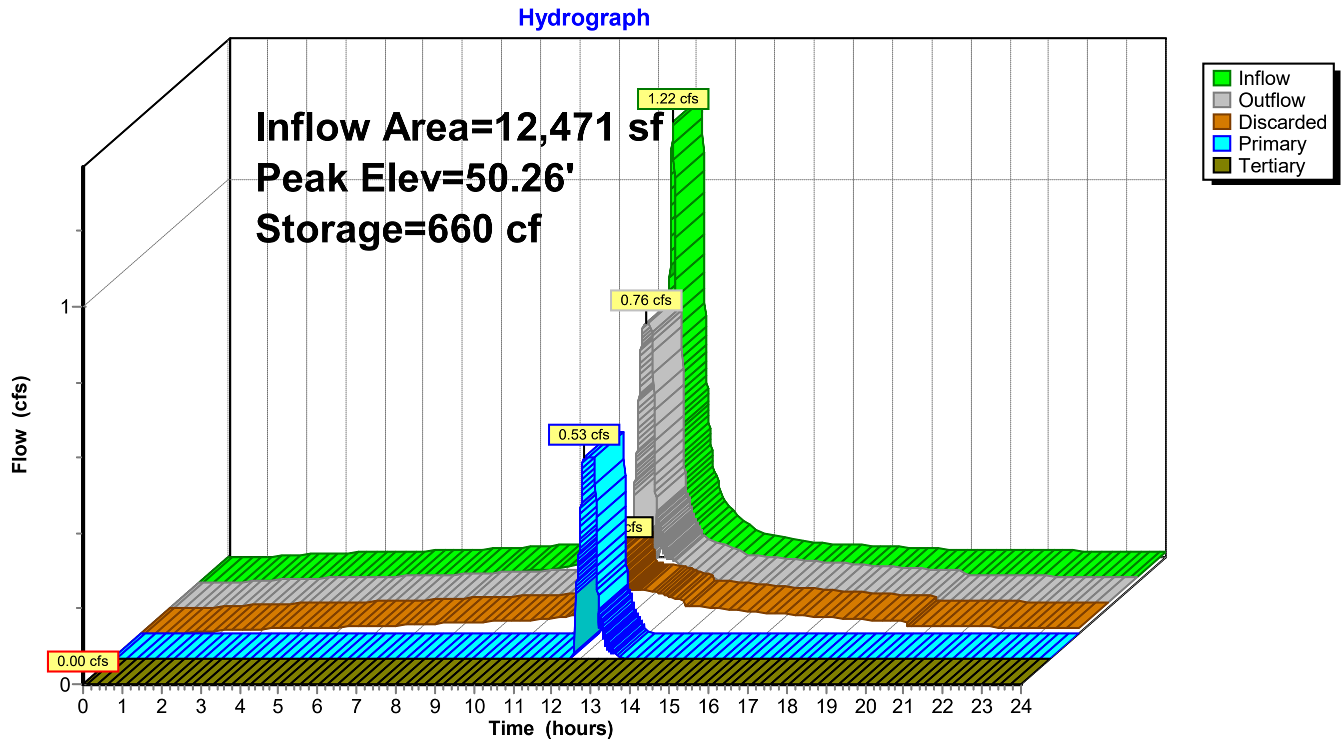
Device	Routing	Invert	Outlet Devices
#1	Primary	46.47'	**12.0" Round Culvert** L= 118.0' CPP, mitered to conform to fill, Ke= 0.700
			Inlet / Outlet Invert= 46.47' / 45.58' S= 0.0075 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	51.50'	**18.0" Horiz. Dome Grate(OF-1)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	47.22'	**100.000 in/hr Focal Point Media over Surface area from 47.22' - 49.80'**
			Excluded Surface area = 231 sf Phase-In= 0.01'
#4	Discarded	49.80'	**2.810 in/hr Bowl Exfiltration over Surface area above 49.80'**
			Excluded Surface area = 461 sf Phase-In= 0.01'
#5	Discarded	43.43'	**8.270 in/hr R Tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#6	Tertiary	52.20'	**3.5' long x 2.0' breadth BSpillway**
			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=0.22 cfs @ 12.20 hrs HW=50.26' (Free Discharge)
4=Bowl Exfiltration (Exfiltration Controls 0.01 cfs)
5=R Tank Exfiltration (Controls 0.21 cfs)

Primary OutFlow Max=0.53 cfs @ 12.05 hrs HW=49.80' TW=43.74' (Dynamic Tailwater)
1=Culvert (Passes 0.53 cfs of 4.87 cfs potential flow)
2=Dome Grate(OF-1) (Controls 0.00 cfs)
3=Focal Point Media (Exfiltration Controls 0.53 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=43.43' TW=46.40' (Dynamic Tailwater)
6=BSpillway (Controls 0.00 cfs)

Pond FP-1: FP-1



Summary for Pond FP-2: FP-2

Inflow Area = 8,047 sf, 72.78% Impervious, Inflow Depth > 3.49" for 10-Year event
Inflow = 0.69 cfs @ 12.13 hrs, Volume= 2,338 cf
Outflow = 0.47 cfs @ 12.19 hrs, Volume= 2,338 cf, Atten= 32%, Lag= 3.6 min
Discarded = 0.14 cfs @ 12.19 hrs, Volume= 2,036 cf
Primary = 0.33 cfs @ 12.12 hrs, Volume= 302 cf
Routed to Pond DMH-4 : DMH-4
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond FP-1 : FP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 52.20' @ 12.19 hrs Surf.Area= 376 sf Storage= 486 cf
Flood Elev= 53.75' Surf.Area= 945 sf Storage= 1,046 cf

Plug-Flow detention time= 35.7 min calculated for 2,338 cf (100% of inflow)
Center-of-Mass det. time= 35.7 min (788.8 - 753.0)

Volume	Invert	Avail.Storage	Storage Description
#1	50.05'	25 cf	**8.00'W x 9.00'L x 1.75'H FP (mulch/media)**
			126 cf Overall x 20.0% Voids
#2	51.80'	760 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#3A	45.76'	168 cf	**11.87'W x 13.38'L x 4.29'H Field A**
			682 cf Overall - 262 cf Embedded = 420 cf x 40.0% Voids
#4A	46.01'	249 cf	**Ferguson R-Tank HD 2.5** x 24 Inside #3
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			24 Chambers in 6 Rows
		1,202 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
51.80	69	30.6	0	0	69
52.00	112	38.0	18	18	110
53.00	321	60.0	208	225	288
53.95	845	157.0	534	760	1,967

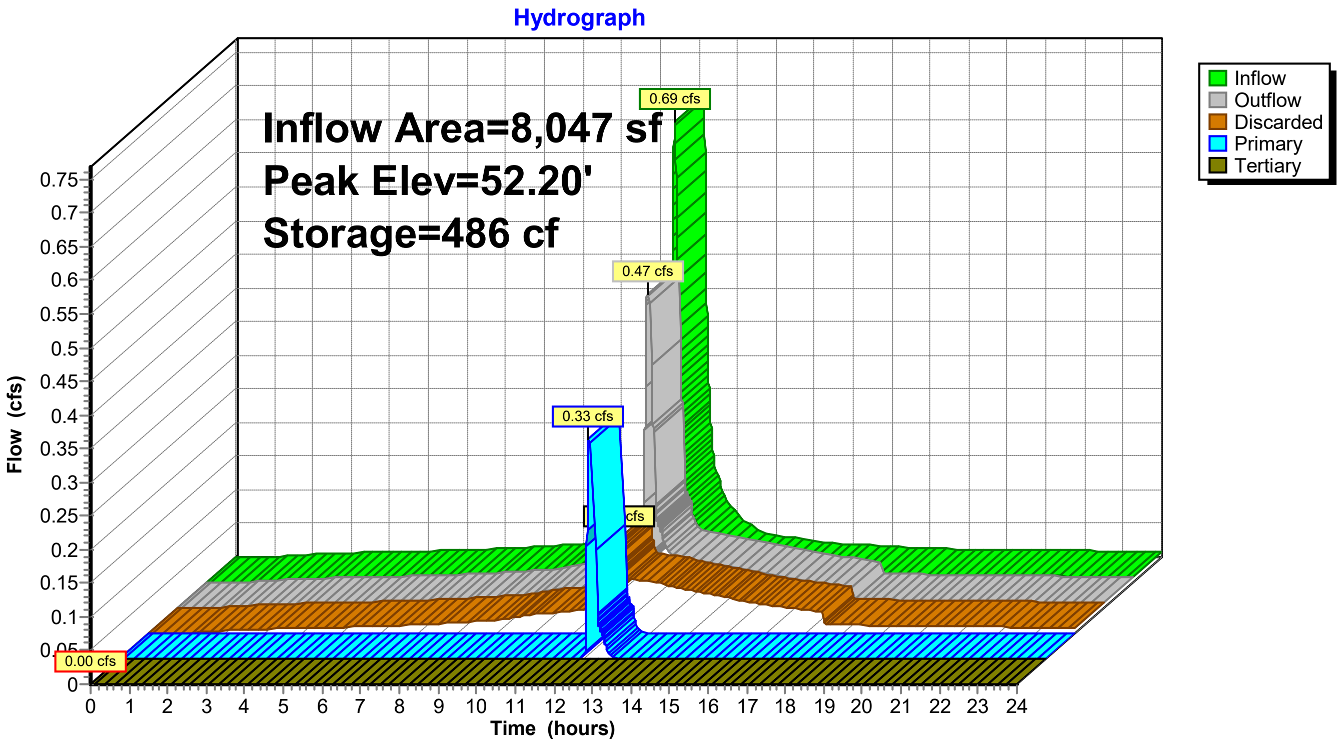
Device	Routing	Invert	Outlet Devices
#1	Primary	49.40'	**12.0" Round Overflow** L= 10.0' CPP, mitered to conform to fill, Ke= 0.700
			Inlet / Outlet Invert= 49.40' / 49.15' S= 0.0250 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	52.85'	**18.0" Horiz. Dome Grate (OF-2)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	49.55'	**100.000 in/hr Focal Point Media over Surface area from 49.55' - 51.80'**
			Excluded Surface area = 159 sf Phase-In= 0.01'
#4	Discarded	45.76'	**8.270 in/hr R Tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#5	Discarded	51.80'	**3.000 in/hr Bowl Exfiltration over Surface area above 51.80'**
			Excluded Surface area = 300 sf Phase-In= 0.01'
#6	Tertiary	53.90'	**3.5' long x 2.0' breadth Spillway**
			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=0.14 cfs @ 12.19 hrs HW=52.20' (Free Discharge)
↑**4=R Tank Exfiltration** (Controls 0.14 cfs)
└**5=Bowl Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.33 cfs @ 12.12 hrs HW=51.88' TW=49.54' (Dynamic Tailwater)
↑**1=Overflow** (Passes 0.33 cfs of 4.70 cfs potential flow)
↑**2=Dome Grate (OF-2)** (Controls 0.00 cfs)
└**3=Focal Point Media** (Exfiltration Controls 0.33 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=45.76' TW=43.43' (Dynamic Tailwater)
↑**6=Spillway** (Controls 0.00 cfs)

Pond FP-2: FP-2



Summary for Pond FP-3: FP-3

Inflow Area = 13,722 sf, 58.52% Impervious, Inflow Depth > 3.09" for 10-Year event
Inflow = 1.05 cfs @ 12.13 hrs, Volume= 3,531 cf
Outflow = 0.60 cfs @ 12.21 hrs, Volume= 3,530 cf, Atten= 43%, Lag= 4.7 min
Discarded = 0.29 cfs @ 12.21 hrs, Volume= 3,027 cf
Primary = 0.31 cfs @ 12.21 hrs, Volume= 503 cf
Routed to Pond DMH-4 : DMH-4
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond FP-1 : FP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 53.79' @ 12.21 hrs Surf.Area= 643 sf Storage= 758 cf
Flood Elev= 54.96' Surf.Area= 1,220 sf Storage= 1,539 cf

Plug-Flow detention time= 36.0 min calculated for 3,530 cf (100% of inflow)
Center-of-Mass det. time= 35.9 min (801.2 - 765.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	46.38'	168 cf	**11.87'W x 13.38'L x 4.29'H Field A**
			682 cf Overall - 262 cf Embedded = 420 cf x 40.0% Voids
#2A	46.63'	249 cf	**Ferguson R-Tank HD 2.5** x 24 Inside #1
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			24 Chambers in 6 Rows
#3	50.17'	34 cf	**8.00'W x 9.00'L x 2.33'H FP (mulch/media/stone)**
			168 cf Overall x 20.0% Voids
#4	52.50'	1,129 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
		1,579 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
52.50	68	30.6	0	0	68
53.00	210	58.0	66	66	262
54.00	476	104.0	334	400	861
55.00	1,015	183.0	729	1,129	2,671

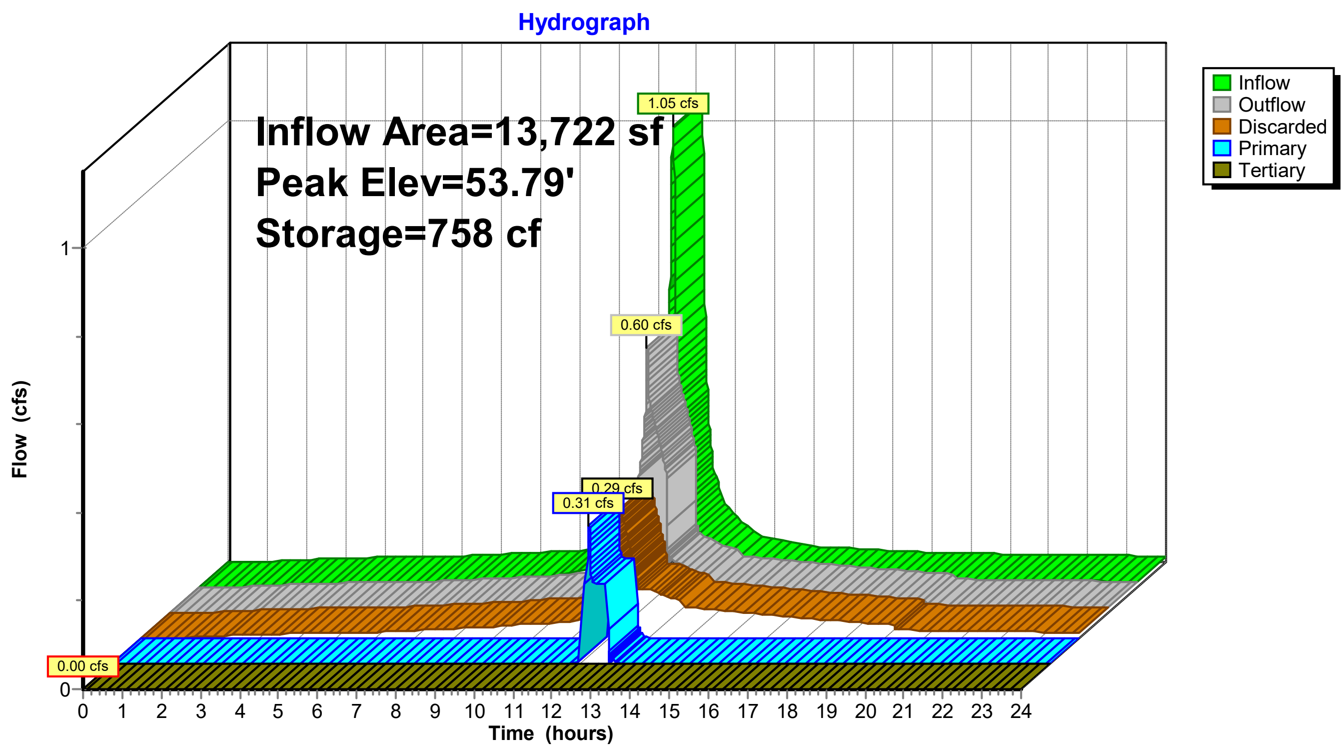
Device	Routing	Invert	Outlet Devices
#1	Primary	49.55'	**12.0" Round Culvert** L= 37.0' CPP, mitered to conform to fill, Ke= 0.700
			Inlet / Outlet Invert= 49.55' / 49.15' S= 0.0108 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	53.75'	**18.0" Horiz. Dome Grate (OF-3)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	50.22'	**100.000 in/hr Focal Point Media over Surface area from 50.22' - 52.55'**
			Excluded Surface area = 231 sf Phase-In= 0.01'
#4	Discarded	46.38'	**8.270 in/hr R tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#5	Discarded	52.80'	**3.000 in/hr Bowl Exfiltration over Wetted area above 52.80'**
			Excluded Wetted area = 697 sf Phase-In= 0.01'
#6	Tertiary	54.90'	**3.0' 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=0.29 cfs @ 12.21 hrs HW=53.79' (Free Discharge)
├─**4=R tank Exfiltration** (Controls 0.25 cfs)
└─**5=Bowl Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.31 cfs @ 12.21 hrs HW=53.79' TW=49.60' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.31 cfs of 6.45 cfs potential flow)
  ├─**2=Dome Grate (OF-3)** (Weir Controls 0.13 cfs @ 0.66 fps)
  └─**3=Focal Point Media** (Exfiltration Controls 0.18 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.38' TW=43.43' (Dynamic Tailwater)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond FP-3: FP-3



Summary for Pond FP-4: FP-4

Inflow Area = 12,711 sf, 69.37% Impervious, Inflow Depth > 3.32" for 10-Year event
Inflow = 1.03 cfs @ 12.13 hrs, Volume= 3,520 cf
Outflow = 1.03 cfs @ 12.13 hrs, Volume= 3,520 cf, Atten= 0%, Lag= 0.4 min
Discarded = 0.06 cfs @ 12.13 hrs, Volume= 2,123 cf
Primary = 0.97 cfs @ 12.13 hrs, Volume= 1,396 cf
Routed to Pond DMH-5 : DMH-5
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond CB-6B,C : CB-6B,6C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 53.40' @ 12.13 hrs Surf.Area= 326 sf Storage= 364 cf
Flood Elev= 54.25' Surf.Area= 543 sf Storage= 574 cf

Plug-Flow detention time= 32.5 min calculated for 3,519 cf (100% of inflow)
Center-of-Mass det. time= 32.5 min (785.6 - 753.1)

Volume	Invert	Avail.Storage	Storage Description
#1	52.50'	303 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#2	50.75'	17 cf	**6.00'W x 8.00'L x 1.75'H FP (mulch/media)** 84 cf Overall x 20.0% Voids
#3A	46.88'	155 cf	**Ferguson R-Tank HD 2.5** x 15 Inside #4 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 15 Chambers in 5 Rows
#4A	46.63'	98 cf	**10.56'W x 9.04'L x 4.29'H Field A** 410 cf Overall - 164 cf Embedded = 246 cf x 40.0% Voids
		574 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
52.50	45	24.5	0	0	45
53.00	106	37.0	37	37	108
54.00	338	76.0	211	248	463
54.15	400	80.0	55	303	514

Device	Routing	Invert	Outlet Devices
#1	Primary	49.42'	**12.0" Round Culvert** L= 26.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.42' / 49.15' S= 0.0104 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	53.25'	**18.0" Horiz. Dome Grate (OF-4)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	47.74'	**100.000 in/hr Focal Point Media over Surface area from 47.74' - 51.50'** Excluded Surface area = 95 sf Phase-In= 0.01'
#4	Discarded	46.63'	**8.700 in/hr R Tank Exfiltration over Wetted area from 45.13' - 48.92'** Conductivity to Groundwater Elevation = 10.00' Excluded Wetted area = 0 sf Phase-In= 0.01'
#5	Discarded	51.50'	**3.000 in/hr Bowl Exfiltration over Wetted area above 51.50'** Conductivity to Groundwater Elevation = 10.00' Excluded Wetted area = 333 sf Phase-In= 0.01'
#6	Tertiary	54.10'	**3.5' long x 2.5' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00

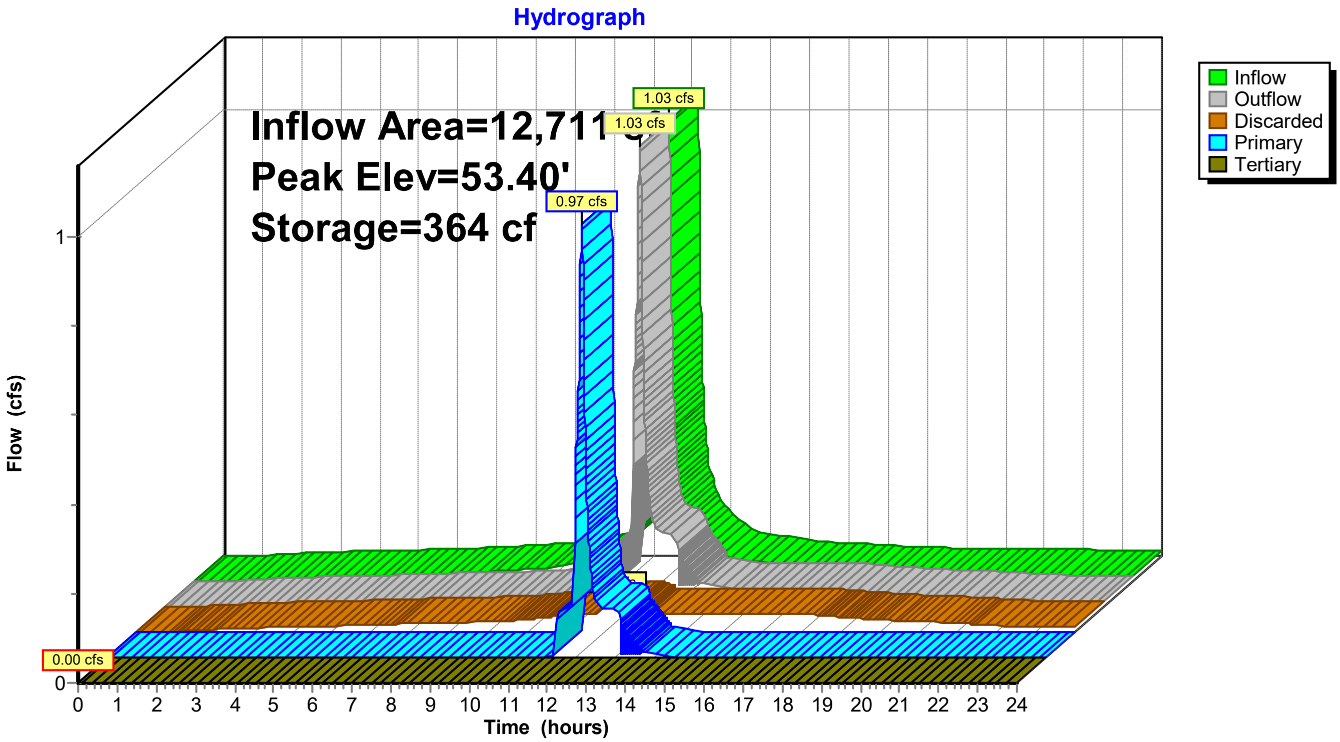
Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74 2.76 2.89 3.05 3.19 3.32

Discarded OutFlow Max=0.06 cfs @ 12.13 hrs HW=53.40' (Free Discharge)
4=R Tank Exfiltration (Controls 0.04 cfs)
5=Bowl Exfiltration (Controls 0.02 cfs)

Primary OutFlow Max=0.97 cfs @ 12.13 hrs HW=53.40' TW=49.82' (Dynamic Tailwater)
1=Culvert (Passes 0.97 cfs of 6.22 cfs potential flow)
2=Dome Grate (OF-4) (Weir Controls 0.86 cfs @ 1.25 fps)
3=Focal Point Media (Exfiltration Controls 0.11 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.63' TW=47.50' (Dynamic Tailwater)
6=Spillway (Controls 0.00 cfs)

Pond FP-4: FP-4



Summary for Pond FP-5: FP-5

Inflow Area = 9,281 sf, 84.56% Impervious, Inflow Depth > 4.02" for 10-Year event
Inflow = 0.92 cfs @ 12.13 hrs, Volume= 3,108 cf
Outflow = 0.88 cfs @ 12.15 hrs, Volume= 3,107 cf, Atten= 5%, Lag= 1.3 min
Discarded = 0.21 cfs @ 12.15 hrs, Volume= 2,474 cf
Primary = 0.67 cfs @ 12.15 hrs, Volume= 633 cf
Routed to Pond DB-A : DB-A
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond FP-4 : FP-4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 55.31' @ 12.15 hrs Surf.Area= 468 sf Storage= 536 cf
Flood Elev= 57.00' Surf.Area= 606 sf Storage= 921 cf

Plug-Flow detention time= 30.8 min calculated for 3,107 cf (100% of inflow)
Center-of-Mass det. time= 30.7 min (781.5 - 750.8)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	614 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#2	52.25'	17 cf	**6.00'W x 8.00'L x 1.75'H FP (mulch/media)** 84 cf Overall x 20.0% Voids
#3A	47.96'	135 cf	**10.56'W x 11.04'L x 4.29'H Field A** 500 cf Overall - 164 cf Embedded = 337 cf x 40.0% Voids
#4A	48.21'	155 cf	**Ferguson R-Tank HD 2.5** x 15 Inside #3 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 15 Chambers in 5 Rows
		921 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
54.00	45	24.5	0	0	45
55.00	267	76.7	141	141	468
56.35	441	85.7	473	614	628

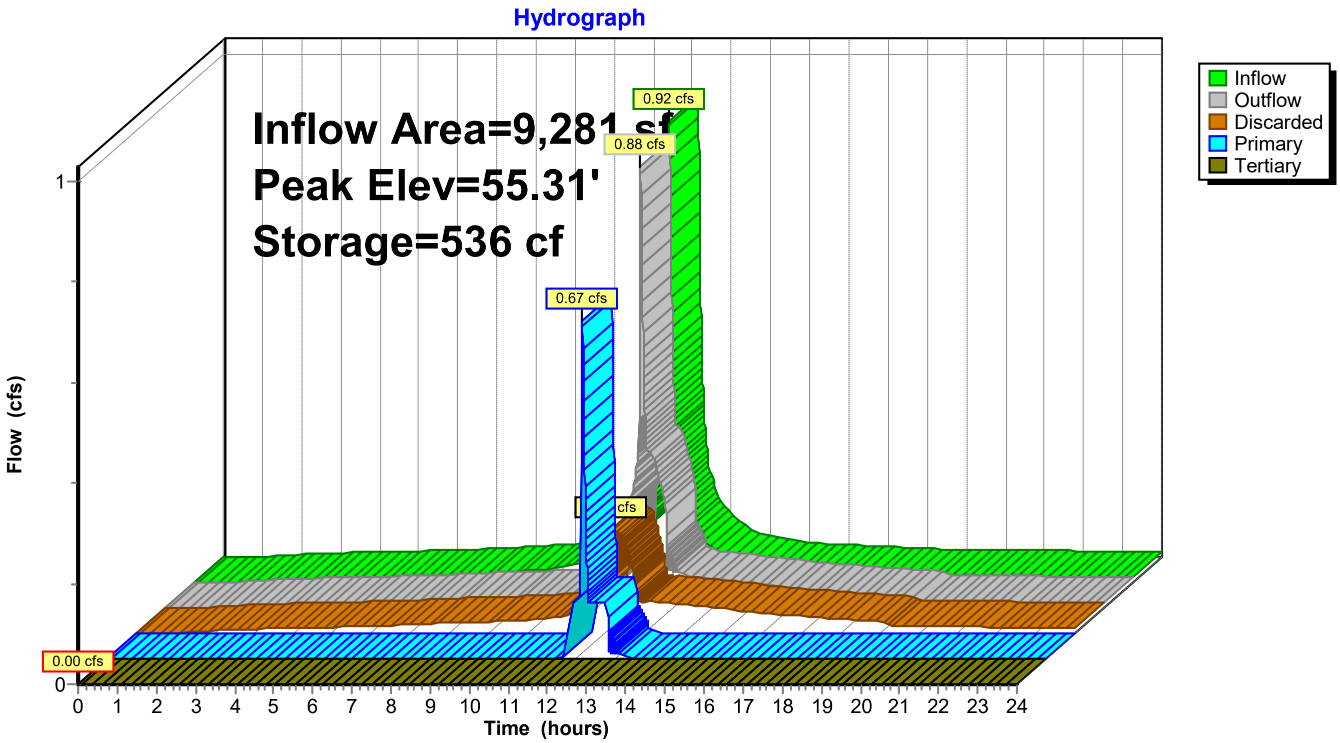
Device	Routing	Invert	Outlet Devices
#1	Primary	50.67'	**12.0" Round Culvert** L= 4.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.67' / 50.55' S= 0.0300 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	55.20'	**18.0" Horiz. Dome Grate (OF-5)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	50.55'	**100.000 in/hr Focal Point Media over Surface area from 50.55' - 52.55'** Excluded Surface area = 117 sf Phase-In= 0.01'
#4	Discarded	47.96'	**8.270 in/hr R-Tank Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#5	Discarded	52.80'	**3.000 in/hr Bowl Exfiltration over Surface area above 52.80'** Excluded Surface area = 165 sf Phase-In= 0.01'
#6	Tertiary	56.33'	**3.5' long x 2.5' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74 2.76 2.89 3.05 3.19 3.32

Discarded OutFlow Max=0.21 cfs @ 12.15 hrs HW=55.31' (Free Discharge)
├─**4=R-Tank Exfiltration** (Controls 0.18 cfs)
└─**5=Bowl Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.67 cfs @ 12.15 hrs HW=55.31' TW=51.16' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.67 cfs of 6.79 cfs potential flow)
  ├─**2=Dome Grate (OF-5)** (Weir Controls 0.56 cfs @ 1.08 fps)
  └─**3=Focal Point Media** (Exfiltration Controls 0.11 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=47.96' TW=46.63' (Dynamic Tailwater)
└─**6=Spillway** (Controls 0.00 cfs)

Pond FP-5: FP-5



Summary for Pond FP-6: FP-6

Inflow Area = 14,693 sf, 51.93% Impervious, Inflow Depth > 2.52" for 10-Year event
Inflow = 0.89 cfs @ 12.13 hrs, Volume= 3,088 cf
Outflow = 0.89 cfs @ 12.14 hrs, Volume= 3,088 cf, Atten= 0%, Lag= 0.4 min
Discarded = 0.13 cfs @ 12.14 hrs, Volume= 2,309 cf
Primary = 0.76 cfs @ 12.14 hrs, Volume= 779 cf
Routed to Pond OF-6 : OF-6
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond FP-5 : FP-5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 55.52' @ 12.14 hrs Surf.Area= 354 sf Storage= 388 cf

Plug-Flow detention time= 29.9 min calculated for 3,088 cf (100% of inflow)
Center-of-Mass det. time= 29.8 min (787.0 - 757.2)

Volume	Invert	Avail.Storage	Storage Description
#1	54.92'	857 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#2	53.17'	17 cf	**6.00'W x 8.00'L x 1.75'H FP (mulch/media)**
			84 cf Overall x 20.0% Voids
#3A	48.88'	135 cf	**10.56'W x 11.04'L x 4.29'H Field A**
			500 cf Overall - 164 cf Embedded = 337 cf x 40.0% Voids
#4A	49.13'	155 cf	**Ferguson R-Tank HD 2.5** x 15 Inside #3
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			15 Chambers in 5 Rows
		1,164 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
54.92	86	36.0	0	0	86
56.00	300	65.0	197	197	325
57.00	511	79.0	401	598	501
57.50	525	82.0	259	857	557

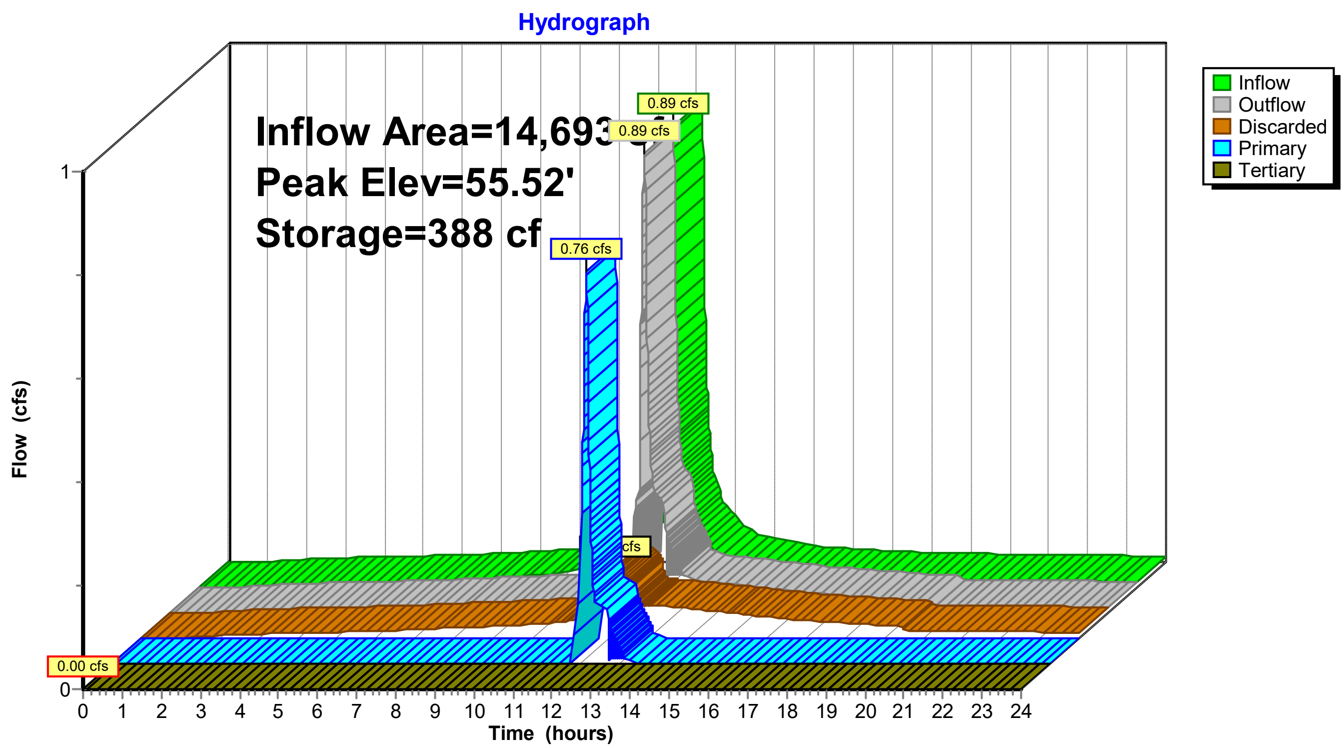
Device	Routing	Invert	Outlet Devices
#1	Primary	51.59'	**12.0" Round Culvert** L= 6.0' CPP, mitered to conform to fill, Ke= 0.700
			Inlet / Outlet Invert= 51.59' / 51.50' S= 0.0150 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	55.40'	**18.0" Horiz. Dome Grate (OF-6)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	52.67'	**100.000 in/hr Focal Point Media over Surface area from 52.67' - 54.67'**
			Excluded Surface area = 117 sf Phase-In= 0.01'
#4	Discarded	48.88'	**8.270 in/hr R-Tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#5	Discarded	54.92'	**3.000 in/hr Bowl Exfiltration over Wetted area above 54.92'**
			Excluded Wetted area = 485 sf Phase-In= 0.01'
#6	Tertiary	57.38'	**3.5' long x 2.0' breadth Spillway**
			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=0.13 cfs @ 12.14 hrs HW=55.52' (Free Discharge)
4=R-Tank Exfiltration (Controls 0.12 cfs)
5=Bowl Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.76 cfs @ 12.14 hrs HW=55.52' TW=51.87' (Dynamic Tailwater)
1=Culvert (Passes 0.76 cfs of 6.18 cfs potential flow)
2=Dome Grate (OF-6) (Weir Controls 0.65 cfs @ 1.14 fps)
3=Focal Point Media (Exfiltration Controls 0.11 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=48.88' TW=47.96' (Dynamic Tailwater)
6=Spillway (Controls 0.00 cfs)

Pond FP-6: FP-6



Summary for Pond FP-7: FP-7/INF-5

Inflow Area = 74,145 sf, 24.19% Impervious, Inflow Depth > 1.34" for 10-Year event
Inflow = 1.99 cfs @ 12.16 hrs, Volume= 8,303 cf
Outflow = 0.62 cfs @ 12.54 hrs, Volume= 8,303 cf, Atten= 69%, Lag= 23.1 min
Discarded = 0.62 cfs @ 12.54 hrs, Volume= 8,303 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond DMH-3 : DMH-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 53.38' @ 12.54 hrs Surf.Area= 1,262 sf Storage= 2,289 cf
Flood Elev= 57.18' Surf.Area= 2,830 sf Storage= 16,463 cf

Plug-Flow detention time= 64.5 min calculated for 8,301 cf (100% of inflow)
Center-of-Mass det. time= 64.5 min (868.8 - 804.3)

Volume	Invert	Avail.Storage	Storage Description
#1	51.90'	14,781 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#2	50.15'	17 cf	**8.00'W x 6.00'L x 1.75'H Media/Mulch** 84 cf Overall x 20.0% Voids
#3A	45.86'	422 cf	**17.12'W x 32.15'L x 4.29'H Field A** 2,364 cf Overall - 1,309 cf Embedded = 1,055 cf x 40.0% Voids
#4A	46.11'	1,244 cf	**Ferguson R-Tank HD 2.5** x 120 Inside #3 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 120 Chambers in 10 Rows
		16,463 cf	Total Available Storage

Storage Group A created with Chamber Wizard

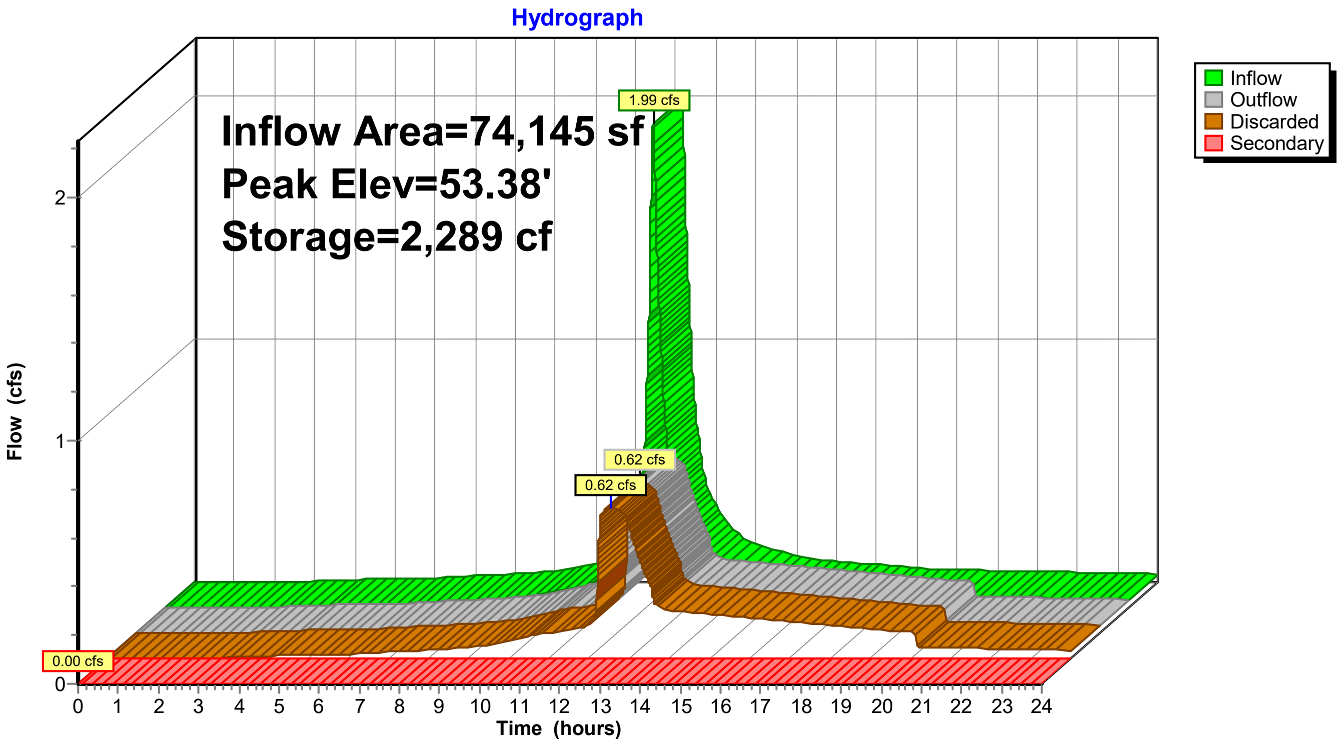
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
51.90	33	22.0	0	0	33
52.00	211	64.0	11	11	320
53.00	549	145.0	367	378	1,672
54.00	874	156.0	705	1,083	1,975
55.00	14,388	179.0	6,269	7,352	2,611
56.00	2,231	200.0	7,428	14,781	3,272

Device	Routing	Invert	Outlet Devices
#1	Discarded	52.00'	**3.000 in/hr RG Exfiltration over Surface area from 52.00' - 54.50'** Conductivity to Groundwater Elevation = 10.00' Excluded Surface area = 810 sf Phase-In= 0.01'
#2	Discarded	45.86'	**8.270 in/hr R-tank Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#3	Secondary	55.70'	**32.0" W x 9.0" H Vert. TR-7 (backflow)** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.62 cfs @ 12.54 hrs HW=53.38' (Free Discharge)
1=RG Exfiltration (Controls 0.03 cfs)
2=R-tank Exfiltration (Controls 0.59 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=45.86' TW=51.10' (Dynamic Tailwater)
3=TR-7 (backflow) (Controls 0.00 cfs)

Pond FP-7: FP-7/INF-5



Summary for Pond INF-1: INF-1

Inflow Area = 23,899 sf, 71.73% Impervious, Inflow Depth > 3.45" for 10-Year event
Inflow = 2.00 cfs @ 12.13 hrs, Volume= 6,876 cf
Outflow = 0.50 cfs @ 12.36 hrs, Volume= 6,875 cf, Atten= 75%, Lag= 13.8 min
Discarded = 0.24 cfs @ 12.36 hrs, Volume= 6,644 cf
Secondary = 0.25 cfs @ 12.36 hrs, Volume= 231 cf
Routed to Pond AB-1 : Attenuation Basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 50.52' @ 12.36 hrs Surf.Area= 636 sf Storage= 1,965 cf

Plug-Flow detention time= 59.0 min calculated for 6,874 cf (100% of inflow)
Center-of-Mass det. time= 59.0 min (812.8 - 753.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	46.00'	626 cf	**14.50'W x 43.88'L x 4.79'H Field A**
			3,049 cf Overall - 1,483 cf Embedded = 1,566 cf x 40.0% Voids
#2A	46.25'	1,409 cf	**Ferguson R-Tank HD 2.5** x 136 Inside #1
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			136 Chambers in 8 Rows
		2,036 cf	Total Available Storage

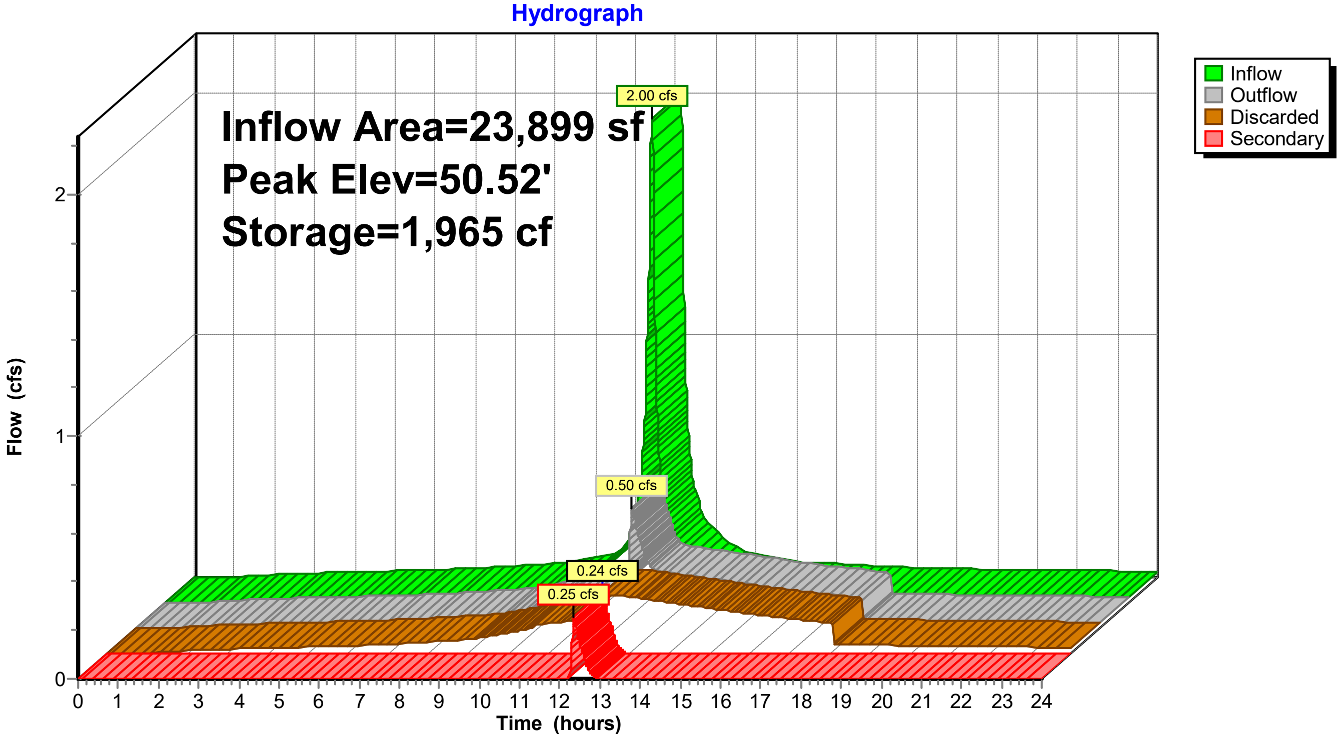
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	46.00'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#2	Secondary	50.25'	**12.0" Round Overflow** L= 14.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.25' / 50.10' S= 0.0107 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.24 cfs @ 12.36 hrs HW=50.52' (Free Discharge)
└─**1=Exfiltration** (Controls 0.24 cfs)

Secondary OutFlow Max=0.25 cfs @ 12.36 hrs HW=50.52' TW=49.07' (Dynamic Tailwater)
└─**2=Overflow** (Barrel Controls 0.25 cfs @ 2.27 fps)

Pond INF-1: INF-1



Summary for Pond INF-2: INF-2

Inflow Area = 104,046 sf, 64.30% Impervious, Inflow Depth = 0.42" for 10-Year event
Inflow = 2.88 cfs @ 12.14 hrs, Volume= 3,614 cf
Outflow = 0.38 cfs @ 12.71 hrs, Volume= 3,616 cf, Atten= 87%, Lag= 34.2 min
Discarded = 0.38 cfs @ 12.71 hrs, Volume= 3,616 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond DMH-3 : DMH-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 49.31' @ 12.71 hrs Surf.Area= 1,566 sf Storage= 1,981 cf
Flood Elev= 54.00' Surf.Area= 1,566 sf Storage= 6,187 cf

Plug-Flow detention time= 51.0 min calculated for 3,614 cf (100% of inflow)
Center-of-Mass det. time= 51.1 min (788.7 - 737.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	47.64'	1,398 cf	**21.06'W x 74.37'L x 5.45'H Field A** 8,536 cf Overall - 5,042 cf Embedded = 3,494 cf x 40.0% Voids
#2A	47.89'	4,790 cf	**Ferguson R-Tank HD 3** x 390 Inside #1 Inside= 15.7"W x 50.4"H => 5.24 sf x 2.35'L = 12.3 cf Outside= 15.7"W x 50.4"H => 5.51 sf x 2.35'L = 12.9 cf 390 Chambers in 13 Rows
		6,187 cf	Total Available Storage

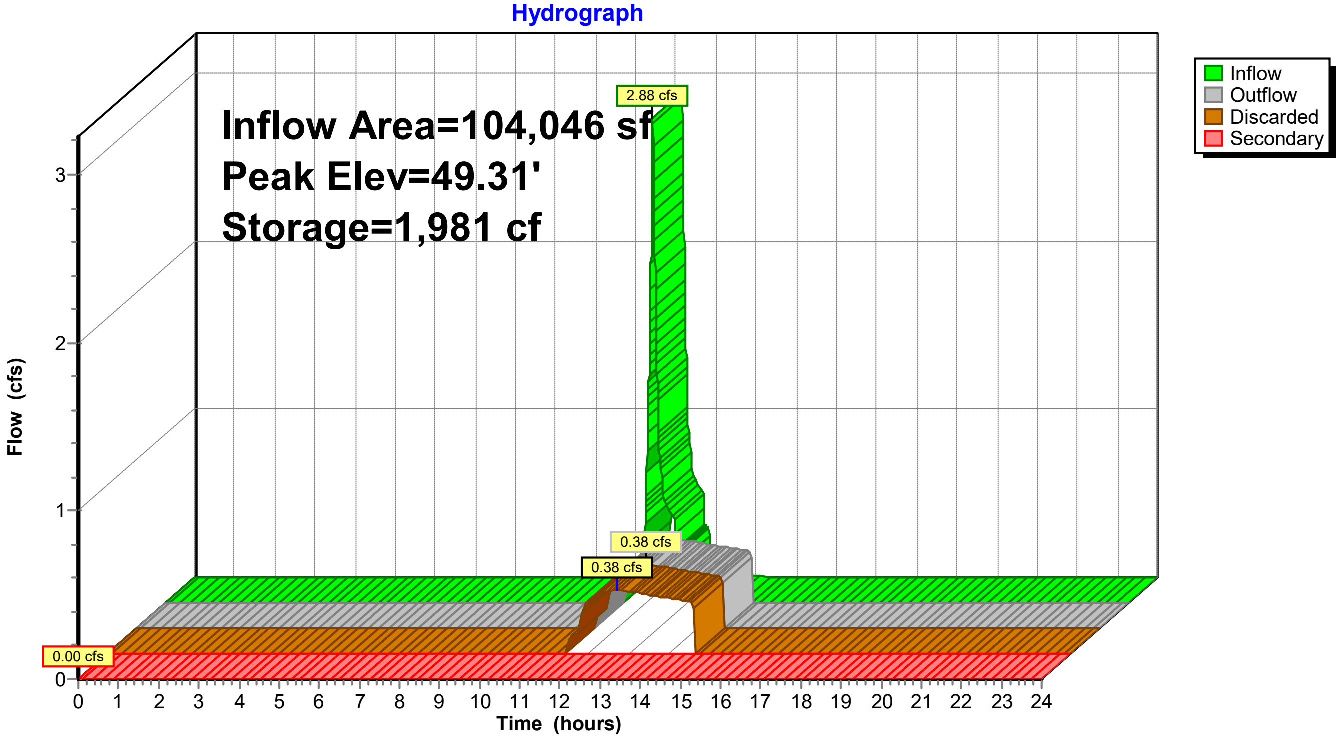
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	47.64'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00'
#2	Secondary	51.35'	**15.0" Round Culvert** L= 24.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 51.35' / 51.10' S= 0.0104 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=0.38 cfs @ 12.71 hrs HW=49.31' (Free Discharge)
↑**1=Exfiltration** (Controls 0.38 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=47.64' TW=51.10' (Dynamic Tailwater)
↑**2=Culvert** (Controls 0.00 cfs)

Pond INF-2: INF-2



Summary for Pond INF-3: INF-3

Inflow Area = 38,595 sf, 60.69% Impervious, Inflow Depth > 1.92" for 10-Year event
Inflow = 1.98 cfs @ 12.14 hrs, Volume= 6,176 cf
Outflow = 0.30 cfs @ 12.59 hrs, Volume= 6,175 cf, Atten= 85%, Lag= 27.2 min
Discarded = 0.30 cfs @ 12.59 hrs, Volume= 6,175 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond SP 4 : Study Point

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 45.38' @ 12.59 hrs Surf.Area= 1,112 sf Storage= 2,012 cf

Plug-Flow detention time= 42.6 min calculated for 6,175 cf (100% of inflow)
Center-of-Mass det. time= 42.5 min (794.1 - 751.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	43.00'	1,058 cf	**18.44'W x 60.30'L x 5.45'H Field A** 6,058 cf Overall - 3,413 cf Embedded = 2,645 cf x 40.0% Voids
#2A	43.25'	3,242 cf	**Ferguson R-Tank HD 3** x 264 Inside #1 Inside= 15.7"W x 50.4"H => 5.24 sf x 2.35'L = 12.3 cf Outside= 15.7"W x 50.4"H => 5.51 sf x 2.35'L = 12.9 cf 264 Chambers in 11 Rows
		4,300 cf	Total Available Storage

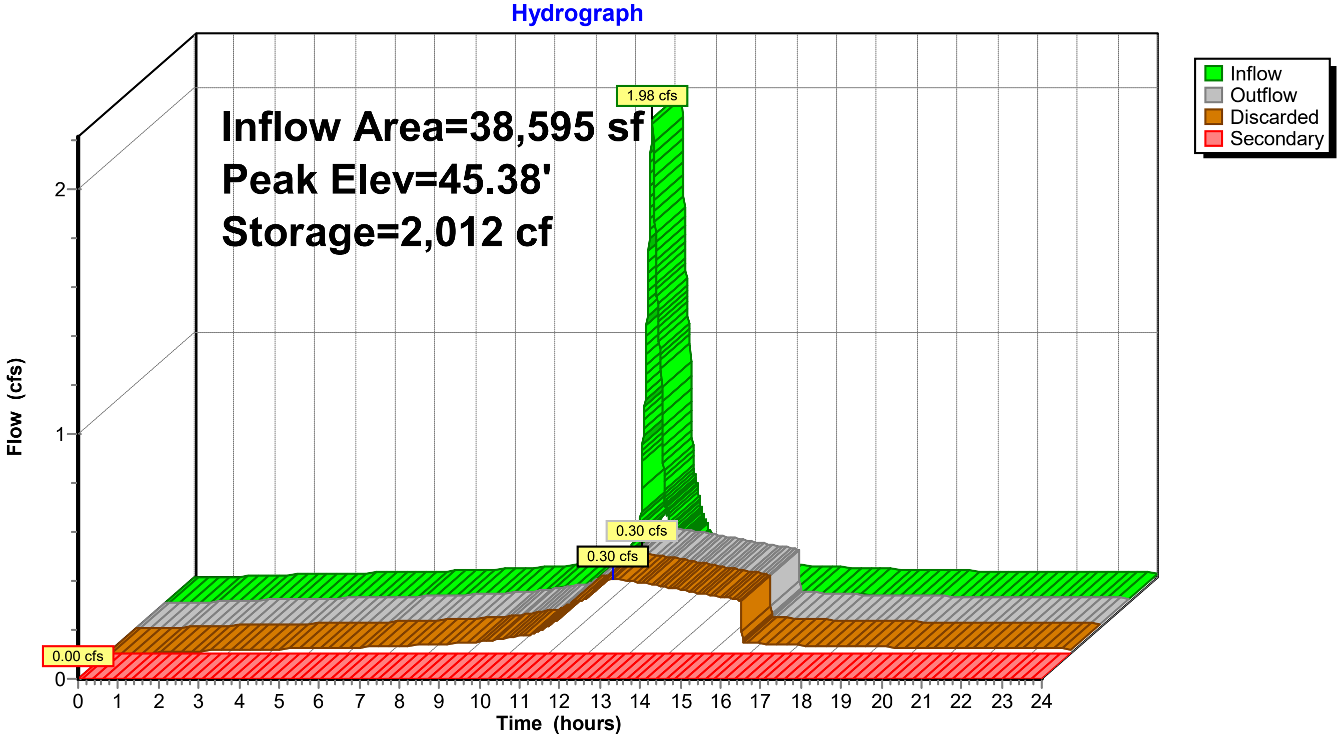
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	43.00'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#2	Secondary	49.80'	**24.0" x 24.0" Horiz. CB-6A** C= 0.600 Limited to weir flow at low heads
#3	Secondary	49.80'	**24.0" x 24.0" Horiz. CB-7** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.30 cfs @ 12.59 hrs HW=45.38' (Free Discharge)
└**1=Exfiltration** (Controls 0.30 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=43.00' TW=0.00' (Dynamic Tailwater)
├**2=CB-6A** (Controls 0.00 cfs)
└**3=CB-7** (Controls 0.00 cfs)

Pond INF-3: INF-3



Summary for Pond INF-4: INF-4

Inflow Area = 45,592 sf, 62.99% Impervious, Inflow Depth > 3.10" for 10-Year event
Inflow = 3.35 cfs @ 12.14 hrs, Volume= 11,778 cf
Outflow = 0.41 cfs @ 12.78 hrs, Volume= 11,777 cf, Atten= 88%, Lag= 38.7 min
Discarded = 0.41 cfs @ 12.78 hrs, Volume= 11,777 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond OF-6 : OF-6

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 53.31' @ 12.78 hrs Surf.Area= 1,468 sf Storage= 3,440 cf
Flood Elev= 57.18' Surf.Area= 1,468 sf Storage= 5,494 cf

Plug-Flow detention time= 56.7 min calculated for 11,777 cf (100% of inflow)
Center-of-Mass det. time= 56.6 min (813.3 - 756.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	50.32'	1,023 cf	**21.06'W x 69.68'L x 4.95'H Field A**
			7,264 cf Overall - 4,706 cf Embedded = 2,558 cf x 40.0% Voids
#2A	50.57'	4,471 cf	**Ferguson R-Tank HD 3** x 364 Inside #1
			Inside= 15.7"W x 50.4"H => 5.24 sf x 2.35'L = 12.3 cf
			Outside= 15.7"W x 50.4"H => 5.51 sf x 2.35'L = 12.9 cf
			364 Chambers in 13 Rows
		5,494 cf	Total Available Storage

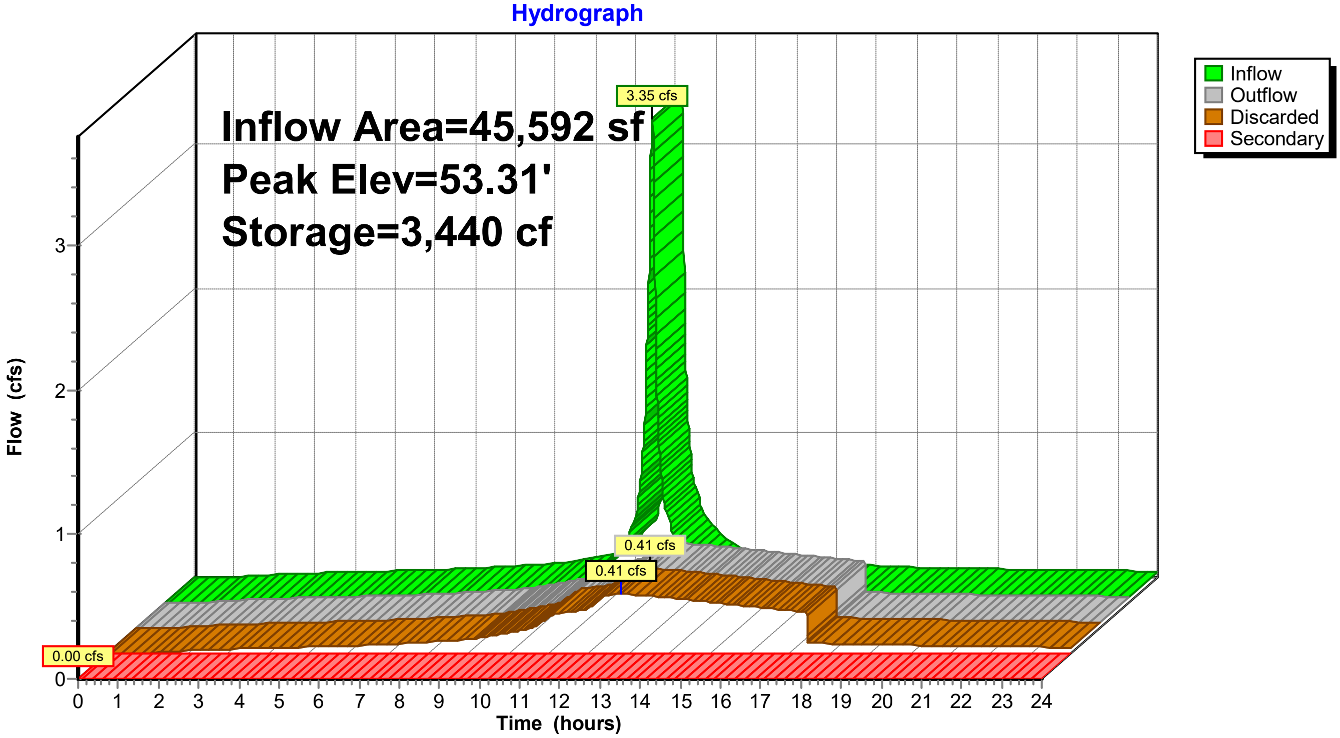
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	50.32'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#2	Secondary	53.52'	**12.0" Round Overflow** L= 86.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 53.52' / 51.40' S= 0.0247 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.41 cfs @ 12.78 hrs HW=53.31' (Free Discharge)
└**1=Exfiltration** (Controls 0.41 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=50.32' TW=51.40' (Dynamic Tailwater)
└**2=Overflow** (Controls 0.00 cfs)

Pond INF-4: INF-4



Summary for Pond INF-6: INF-6

Inflow Area = 19,023 sf, 56.89% Impervious, Inflow Depth > 2.93" for 10-Year event
Inflow = 1.37 cfs @ 12.13 hrs, Volume= 4,644 cf
Outflow = 0.34 cfs @ 12.36 hrs, Volume= 4,644 cf, Atten= 75%, Lag= 14.1 min
Discarded = 0.34 cfs @ 12.36 hrs, Volume= 4,644 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 56.51' @ 12.36 hrs Surf.Area= 1,307 sf Storage= 1,277 cf

Plug-Flow detention time= 51.5 min calculated for 4,644 cf (100% of inflow)
Center-of-Mass det. time= 51.4 min (814.6 - 763.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	50.46'	663 cf	**Ferguson R-Tank HD 2.5** x 64 Inside #2 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 64 Chambers in 8 Rows
#2A	50.21'	288 cf	**14.50'W x 22.77'L x 4.29'H Field A** 1,417 cf Overall - 698 cf Embedded = 719 cf x 40.0% Voids
#3	56.00'	4,508 cf	**Depression (Irregular)** Listed below (Recalc)
		5,459 cf	Total Available Storage

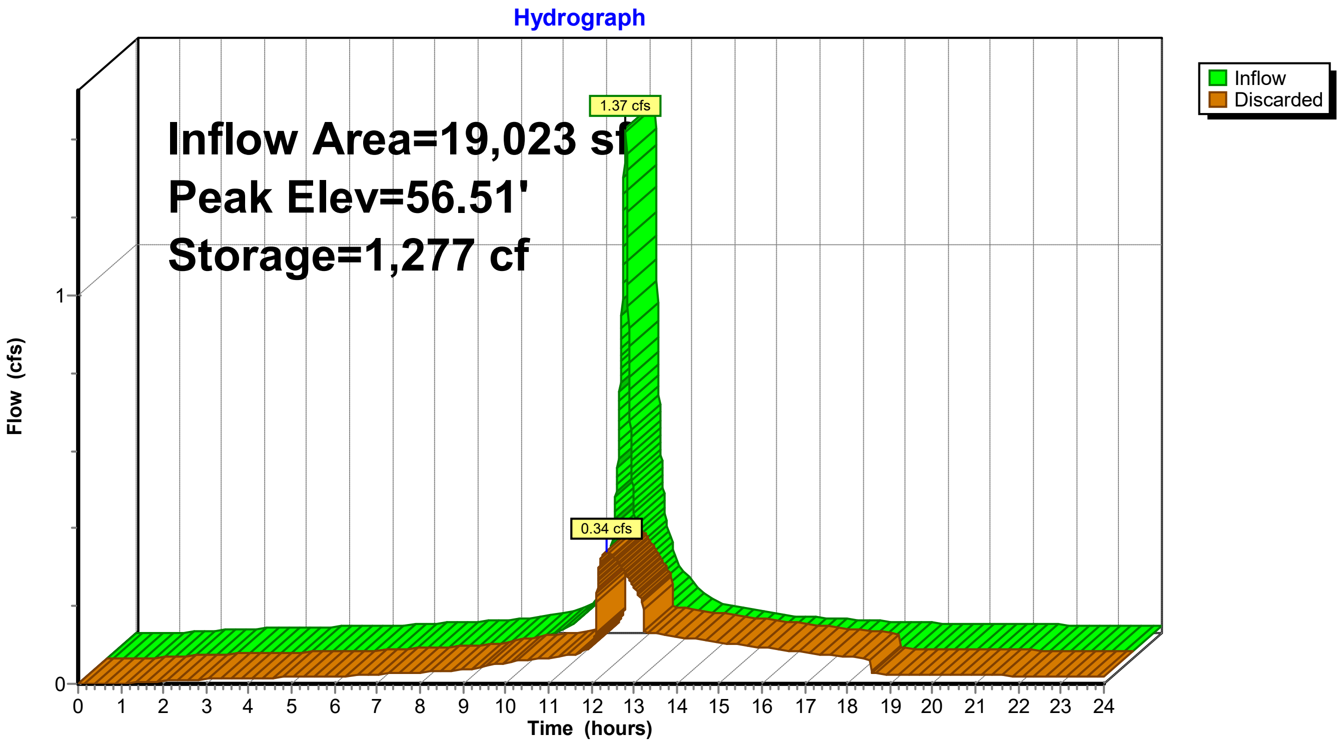
Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
56.00	361	76.0	0	0	361
57.00	1,869	162.0	1,017	1,017	1,994
58.00	3,616	269.0	2,695	3,712	5,670
58.20	4,360	285.0	796	4,508	6,378

Device	Routing	Invert	Outlet Devices
#1	Discarded	50.21'	**8.270 in/hr R Tank Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'

Discarded OutFlow Max=0.34 cfs @ 12.36 hrs HW=56.51' (Free Discharge)
↑**1=R Tank Exfiltration** (Controls 0.34 cfs)

Pond INF-6: INF-6



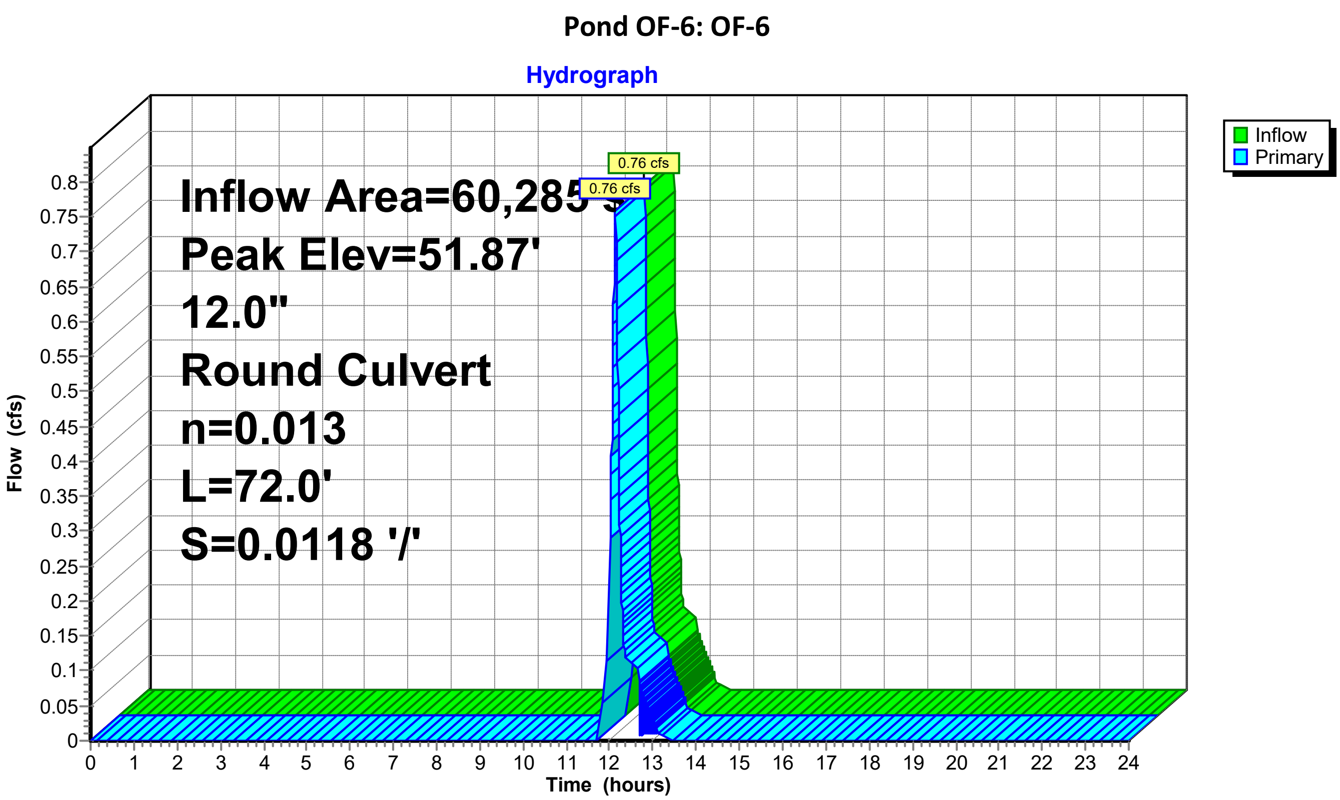
Summary for Pond OF-6: OF-6

Inflow Area = 60,285 sf, 60.30% Impervious, Inflow Depth = 0.16" for 10-Year event
Inflow = 0.76 cfs @ 12.14 hrs, Volume= 779 cf
Outflow = 0.76 cfs @ 12.14 hrs, Volume= 779 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.76 cfs @ 12.14 hrs, Volume= 779 cf
Routed to Pond DB-A : DB-A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.87' @ 12.14 hrs
Flood Elev= 54.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.40'	**12.0" Round Culvert** L= 72.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 51.40' / 50.55' S= 0.0118 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.76 cfs @ 12.14 hrs HW=51.87' TW=51.15' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.76 cfs @ 2.07 fps)

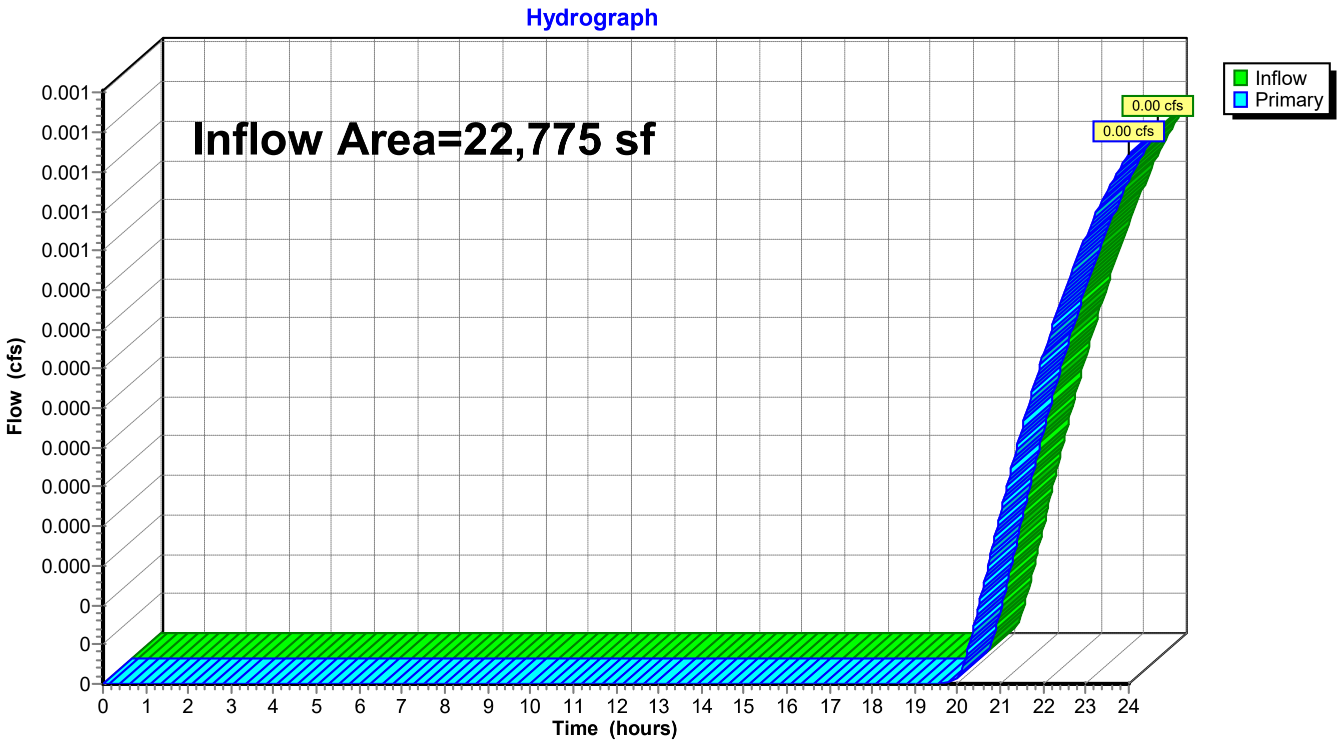


Summary for Pond SP 1: Study Point

Inflow Area =	22,775 sf, 0.00% Impervious, Inflow Depth > 0.00" for 10-Year event	
Inflow =	0.00 cfs @ 24.00 hrs, Volume=	6 cf
Primary =	0.00 cfs @ 24.00 hrs, Volume=	6 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3

Pond SP 1: Study Point

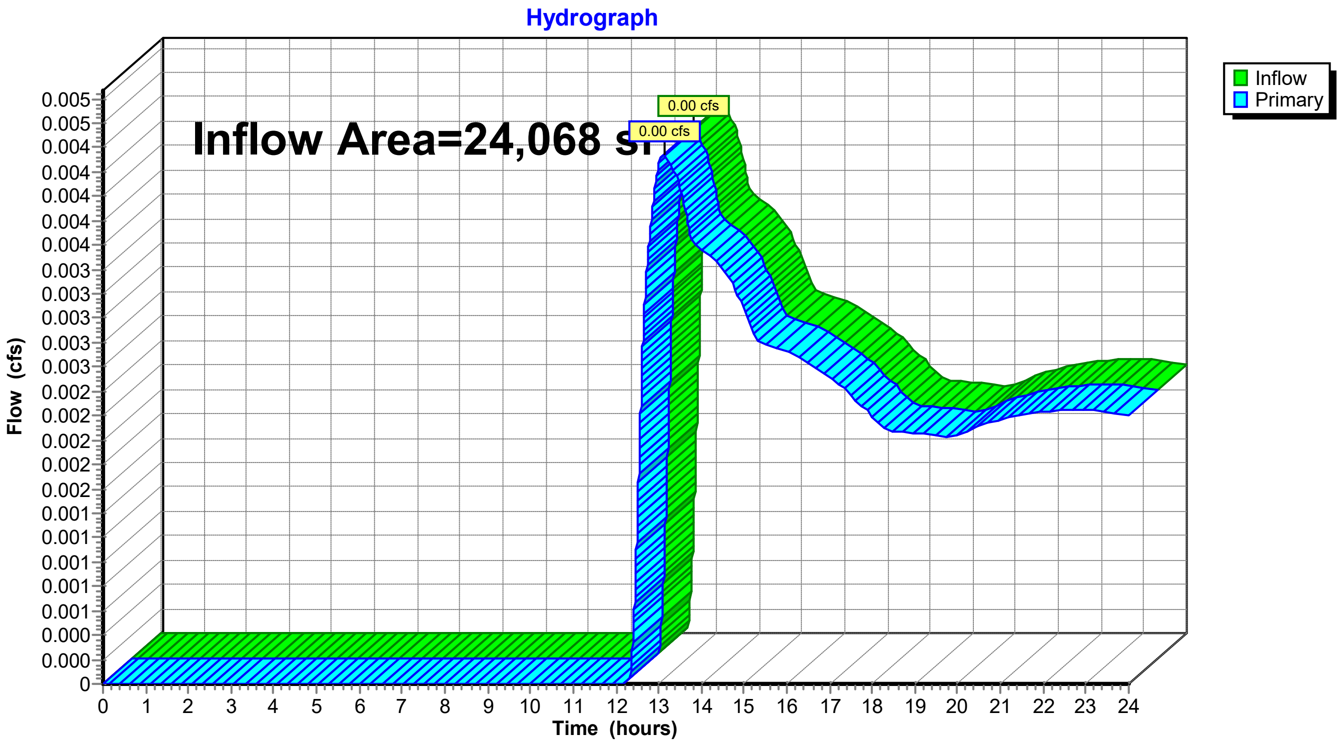


Summary for Pond SP 3: Study Point

Inflow Area =	24,068 sf, 0.00% Impervious, Inflow Depth > 0.05"	for 10-Year event
Inflow =	0.00 cfs @ 13.12 hrs, Volume=	107 cf
Primary =	0.00 cfs @ 13.12 hrs, Volume=	107 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3

Pond SP 3: Study Point

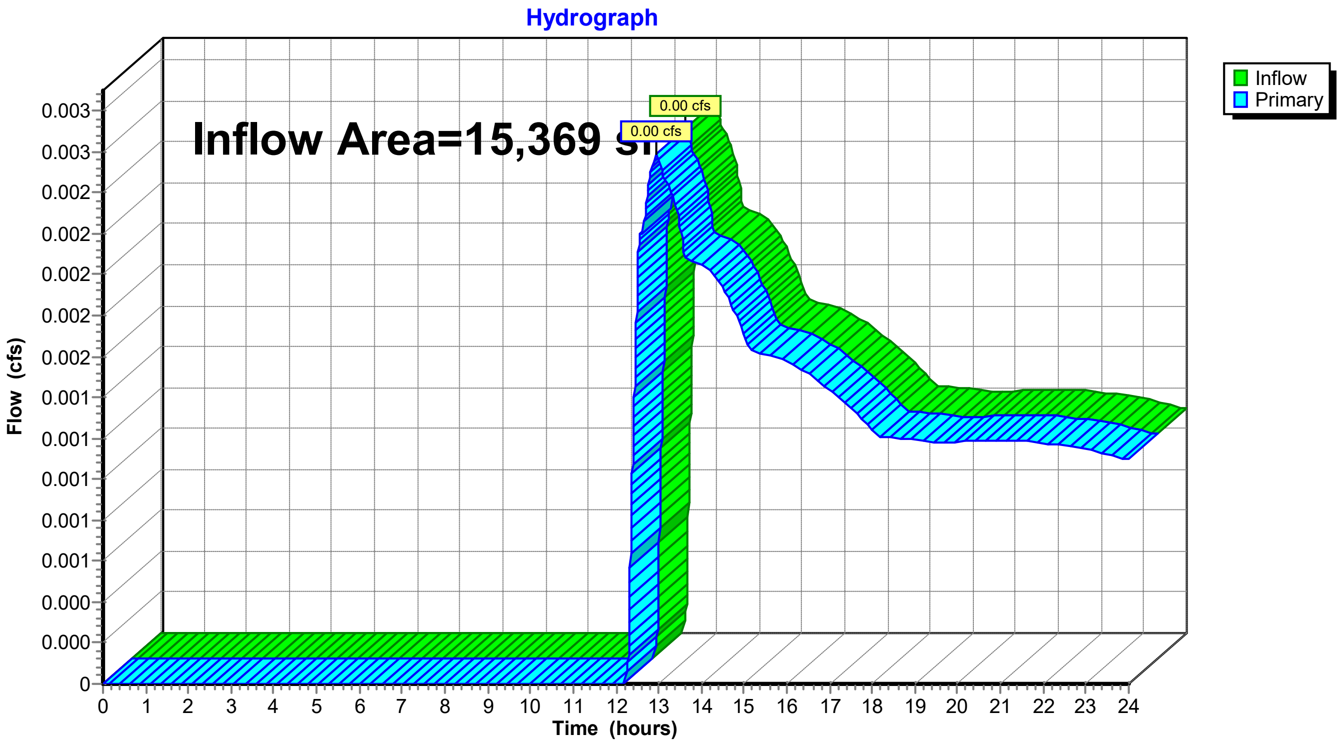


Summary for Pond SP 4: Study Point

Inflow Area =	15,369 sf,	0.00% Impervious, Inflow Depth > 0.05"	for 10-Year event
Inflow =	0.00 cfs @ 12.94 hrs, Volume=	62 cf	
Primary =	0.00 cfs @ 12.94 hrs, Volume=	62 cf, Atten= 0%, Lag= 0.0 min	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3

Pond SP 4: Study Point

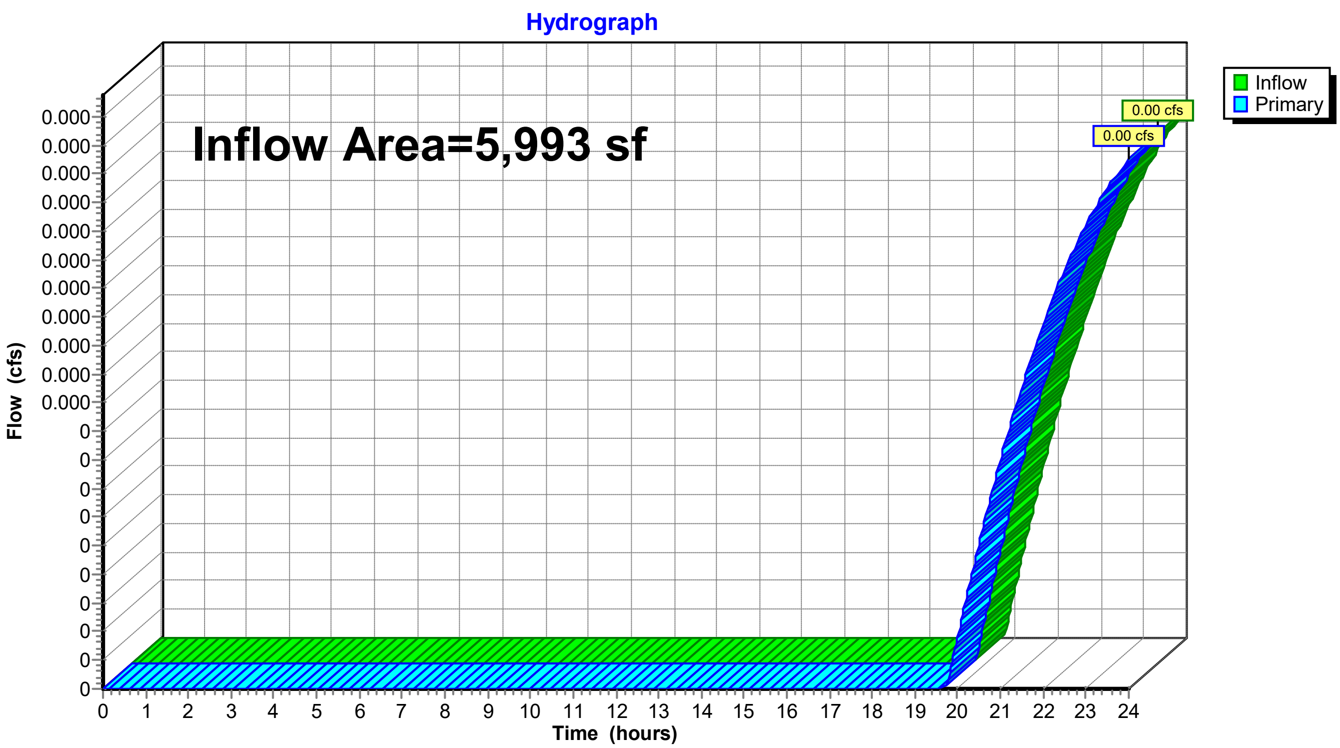


Summary for Pond SP-2: Study Point

Inflow Area =	5,993 sf,	0.00% Impervious, Inflow Depth > 0.00"	for 10-Year event
Inflow =	0.00 cfs @ 24.00 hrs,	Volume=	2 cf
Primary =	0.00 cfs @ 24.00 hrs,	Volume=	2 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3

Pond SP-2: Study Point



Time span=0.00-24.00 hrs, dt=0.006 hrs, 4001 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: RA (partial)
Runoff Area=18,019 sf 100.00% Impervious Runoff Depth>5.98"
Tc=6.0 min CN=98 Runoff=2.65 cfs 8,973 cf

Subcatchment 2S: RA (partial)
Runoff Area=14,390 sf 100.00% Impervious Runoff Depth>5.98"
Tc=6.0 min CN=98 Runoff=2.12 cfs 7,165 cf

Subcatchment 3S: RA (partial)
Runoff Area=10,803 sf 100.00% Impervious Runoff Depth>5.98"
Tc=6.0 min CN=98 Runoff=1.59 cfs 5,379 cf

Subcatchment SCA-1: LSA/FL/IA/PP
Runoff Area=52,119 sf 6.80% Impervious Runoff Depth>1.39"
Flow Length=532' Slope=0.0100 '/' Tc=16.6 min CN=WQ Runoff=1.13 cfs 6,036 cf

Subcatchment SCA-10:
Runoff Area=9,281 sf 84.56% Impervious Runoff Depth>5.13"
Tc=6.0 min CN=WQ Runoff=1.16 cfs 3,967 cf

Subcatchment SCA-11:
Runoff Area=8,047 sf 72.78% Impervious Runoff Depth>4.49"
Tc=6.0 min CN=WQ Runoff=0.87 cfs 3,009 cf

Subcatchment SCA-12:
Runoff Area=12,711 sf 69.37% Impervious Runoff Depth>4.28"
Tc=6.0 min CN=WQ Runoff=1.31 cfs 4,535 cf

Subcatchment SCA-13:
Runoff Area=9,436 sf 78.35% Impervious Runoff Depth>4.79"
Tc=6.0 min CN=WQ Runoff=1.09 cfs 3,768 cf

Subcatchment SCA-14:
Runoff Area=13,982 sf 55.19% Impervious Runoff Depth>3.45"
Tc=6.0 min CN=WQ Runoff=1.15 cfs 4,024 cf

Subcatchment SCA-16:
Runoff Area=6,892 sf 58.84% Impervious Runoff Depth>3.72"
Tc=6.0 min CN=WQ Runoff=0.61 cfs 2,139 cf

Subcatchment SCA-17:
Runoff Area=4,123 sf 100.00% Impervious Runoff Depth>5.98"
Tc=6.0 min CN=98 Runoff=0.61 cfs 2,053 cf

Subcatchment SCA-18:
Runoff Area=9,051 sf 85.55% Impervious Runoff Depth>5.19"
Tc=6.0 min CN=WQ Runoff=1.14 cfs 3,911 cf

Subcatchment SCA-19:
Runoff Area=12,142 sf 43.49% Impervious Runoff Depth>2.72"
Flow Length=145' Tc=9.6 min CN=WQ Runoff=0.68 cfs 2,748 cf

Subcatchment SCA-2: LSA/FL
Runoff Area=8,220 sf 0.24% Impervious Runoff Depth>1.06"
Flow Length=75' Tc=6.1 min CN=WQ Runoff=0.19 cfs 727 cf

Subcatchment SCA-4:
Runoff Area=27,573 sf 38.81% Impervious Runoff Depth>2.74"
Flow Length=254' Tc=6.8 min CN=WQ Runoff=1.74 cfs 6,296 cf

Subcatchment SCA-5:
Runoff Area=7,636 sf 0.00% Impervious Runoff Depth>0.51"
Tc=6.0 min CN=39 Runoff=0.04 cfs 324 cf

Subcatchment SCA-6.1:
Runoff Area=12,884 sf 69.58% Impervious Runoff Depth>4.36"
Tc=6.0 min CN=WQ Runoff=1.35 cfs 4,677 cf

Subcatchment SCA-6.2: Runoff Area=8,059 sf 57.41% Impervious Runoff Depth>4.25"
Tc=6.0 min CN=WQ Runoff=0.87 cfs 2,855 cf

Subcatchment SCA-7: Runoff Area=14,693 sf 51.93% Impervious Runoff Depth>3.31"
Tc=6.0 min CN=WQ Runoff=1.14 cfs 4,050 cf

Subcatchment SCA-8: Runoff Area=3,035 sf 100.00% Impervious Runoff Depth>5.98"
Tc=6.0 min CN=98 Runoff=0.45 cfs 1,511 cf

Subcatchment SCA-9: Runoff Area=5,663 sf 60.09% Impervious Runoff Depth>3.79"
Tc=6.0 min CN=WQ Runoff=0.51 cfs 1,790 cf

Subcatchment UC-1: NA Runoff Area=22,775 sf 0.00% Impervious Runoff Depth>0.09"
Flow Length=434' Tc=34.9 min CN=30 Runoff=0.01 cfs 175 cf

Subcatchment UC-2: Runoff Area=24,068 sf 0.00% Impervious Runoff Depth>0.21"
Flow Length=450' Tc=16.6 min CN=WQ Runoff=0.02 cfs 413 cf

Subcatchment UC-3: Runoff Area=7,204 sf 0.00% Impervious Runoff Depth>0.51"
Tc=6.0 min CN=39 Runoff=0.04 cfs 305 cf

Subcatchment UC-4: Runoff Area=8,165 sf 0.00% Impervious Runoff Depth>0.29"
Tc=6.0 min CN=WQ Runoff=0.02 cfs 196 cf

Subcatchment UC-5: Runoff Area=2,516 sf 100.00% Impervious Runoff Depth>5.98"
Tc=6.0 min CN=98 Runoff=0.37 cfs 1,253 cf

Subcatchment UC-6: NA Runoff Area=5,993 sf 0.00% Impervious Runoff Depth>0.10"
Flow Length=45' Slope=0.0300 '/' Tc=9.4 min CN=30 Runoff=0.00 cfs 48 cf

Pond AB-1: Attenuation Basin Peak Elev=50.06' Storage=969 cf Inflow=1.63 cfs 1,454 cf
Discarded=0.02 cfs 520 cf Primary=0.11 cfs 554 cf Outflow=0.13 cfs 1,074 cf

Pond CB-2A: CB 2A Peak Elev=51.11' Inflow=0.61 cfs 2,053 cf
12.0" Round Culvert n=0.013 L=14.0' S=0.0100 '/' Outflow=0.61 cfs 2,053 cf

Pond CB-2B: CB 2B Peak Elev=51.10' Inflow=0.61 cfs 2,139 cf
12.0" Round Culvert n=0.013 L=4.0' S=0.0350 '/' Outflow=0.61 cfs 2,139 cf

Pond CB-3: CB-3 Peak Elev=52.03' Inflow=1.35 cfs 4,677 cf
12.0" Round Culvert x 2.00 n=0.013 L=7.0' S=0.0143 '/' Outflow=1.35 cfs 4,677 cf

Pond CB-4: CB-4 Peak Elev=57.06' Storage=75 cf Inflow=1.74 cfs 6,296 cf
Outflow=1.59 cfs 6,296 cf

Pond CB-6A: CB-6A Peak Elev=46.93' Inflow=0.68 cfs 2,748 cf
12.0" Round Culvert n=0.013 L=25.0' S=0.0120 '/' Outflow=0.68 cfs 2,748 cf

Pond CB-6B,C: CB-6B,6C Peak Elev=47.91' Inflow=1.15 cfs 4,024 cf
12.0" Round Culvert x 2.00 n=0.013 L=19.0' S=0.0553 '/' Outflow=1.15 cfs 4,024 cf

Pond CB-7: CB-7 Peak Elev=47.07' Inflow=1.14 cfs 3,911 cf
12.0" Round Culvert n=0.013 L=37.0' S=0.0095 '/' Outflow=1.14 cfs 3,911 cf

Pond DB-A: DB-A Peak Elev=51.29' Inflow=1.94 cfs 3,385 cf
15.0" Round Culvert n=0.013 L=46.0' S=0.0337 '/' Outflow=1.94 cfs 3,385 cf

Pond DMH-2.1: DMH-2.1 (By-Pass) Peak Elev=50.91' Inflow=2.56 cfs 8,869 cf
Primary=2.38 cfs 8,543 cf Secondary=0.78 cfs 326 cf Outflow=2.56 cfs 8,869 cf

Pond DMH-2.2: DMH-2.2 Peak Elev=51.04' Inflow=2.56 cfs 8,869 cf
18.0" Round Culvert n=0.013 L=36.0' S=0.0056 '/' Outflow=2.56 cfs 8,869 cf

Pond DMH-3: DMH-3 Peak Elev=51.74' Inflow=1.35 cfs 4,677 cf
18.0" Round Culvert n=0.013 L=183.0' S=0.0052 '/' Outflow=1.35 cfs 4,677 cf

Pond DMH-4: DMH-4 Peak Elev=51.10' Inflow=1.31 cfs 1,476 cf
12.0" Round Culvert n=0.013 L=20.0' S=0.0100 '/' Outflow=1.31 cfs 1,476 cf

Pond DMH-5: DMH-5 Peak Elev=51.10' Inflow=3.19 cfs 5,436 cf
18.0" Round Culvert n=0.013 L=10.0' S=0.0150 '/' Outflow=3.19 cfs 5,436 cf

Pond DMH-6: DMH-6 Peak Elev=47.06' Inflow=1.15 cfs 4,024 cf
12.0" Round Culvert n=0.013 L=17.0' S=0.0206 '/' Outflow=1.15 cfs 4,024 cf

Pond DMH-7: DMH-7 (bypass) Peak Elev=46.80' Inflow=1.79 cfs 6,772 cf
Primary=1.63 cfs 6,719 cf Secondary=0.16 cfs 53 cf Outflow=1.79 cfs 6,772 cf

Pond DMH-8: DMH-8 (bypass) Peak Elev=46.71' Inflow=1.14 cfs 3,911 cf
Primary=1.05 cfs 3,883 cf Secondary=0.09 cfs 28 cf Outflow=1.14 cfs 3,911 cf

Pond DMH-9: DMH-9 (bypass) Peak Elev=53.98' Inflow=1.59 cfs 6,296 cf
Primary=1.45 cfs 6,137 cf Secondary=0.14 cfs 160 cf Outflow=1.59 cfs 6,296 cf

Pond DS: Dry Stream Peak Elev=55.04' Storage=324 cf Inflow=2.82 cfs 13,202 cf
Discarded=0.04 cfs 1,229 cf Primary=2.64 cfs 11,932 cf Outflow=2.67 cfs 13,161 cf

Pond FP-1: FP-1 Peak Elev=50.66' Storage=837 cf Inflow=1.54 cfs 5,279 cf
Discarded=0.24 cfs 3,812 cf Primary=0.53 cfs 1,467 cf Tertiary=0.00 cfs 0 cf Outflow=0.78 cfs 5,279 cf

Pond FP-2: FP-2 Peak Elev=52.72' Storage=588 cf Inflow=0.87 cfs 3,009 cf
Discarded=0.17 cfs 2,496 cf Primary=0.33 cfs 520 cf Tertiary=0.00 cfs 0 cf Outflow=0.49 cfs 3,009 cf

Pond FP-3: FP-3 Peak Elev=53.89' Storage=800 cf Inflow=1.37 cfs 4,645 cf
Discarded=0.31 cfs 3,690 cf Primary=0.98 cfs 955 cf Tertiary=0.00 cfs 0 cf Outflow=1.29 cfs 4,645 cf

Pond FP-4: FP-4 Peak Elev=53.43' Storage=369 cf Inflow=1.31 cfs 4,535 cf
Discarded=0.06 cfs 2,484 cf Primary=1.24 cfs 2,051 cf Tertiary=0.00 cfs 0 cf Outflow=1.30 cfs 4,535 cf

Pond FP-5: FP-5 Peak Elev=55.34' Storage=546 cf Inflow=1.16 cfs 3,967 cf
Discarded=0.21 cfs 2,942 cf Primary=0.94 cfs 1,025 cf Tertiary=0.00 cfs 0 cf Outflow=1.15 cfs 3,966 cf

Pond FP-6: FP-6 Peak Elev=55.55' Storage=393 cf Inflow=1.14 cfs 4,050 cf
Discarded=0.13 cfs 2,812 cf Primary=1.00 cfs 1,237 cf Tertiary=0.00 cfs 0 cf Outflow=1.14 cfs 4,049 cf

Pond FP-7: FP-7/INF-5 Peak Elev=54.30' Storage=3,335 cf Inflow=2.67 cfs 12,256 cf
Discarded=0.88 cfs 12,255 cf Secondary=0.00 cfs 0 cf Outflow=0.88 cfs 12,255 cf

Pond INF-1: INF-1 Peak Elev=50.78' Storage=2,033 cf Inflow=2.38 cfs 8,543 cf
Discarded=0.25 cfs 7,720 cf Secondary=0.85 cfs 823 cf Outflow=1.11 cfs 8,543 cf

Pond INF-2: INF-2 Peak Elev=51.10' Storage=4,282 cf Inflow=4.44 cfs 6,911 cf
Discarded=0.46 cfs 6,914 cf Secondary=0.00 cfs 0 cf Outflow=0.46 cfs 6,914 cf

Pond INF-3: INF-3 Peak Elev=46.43' Storage=2,949 cf Inflow=2.41 cfs 8,267 cf
Discarded=0.34 cfs 8,267 cf Secondary=0.00 cfs 0 cf Outflow=0.34 cfs 8,267 cf

Pond INF-4: INF-4 Peak Elev=53.96' Storage=4,224 cf Inflow=4.16 cfs 15,269 cf
Discarded=0.44 cfs 14,145 cf Secondary=0.66 cfs 1,123 cf Outflow=1.10 cfs 15,268 cf

Pond INF-6: INF-6 Peak Elev=56.85' Storage=1,703 cf Inflow=1.78 cfs 6,106 cf
Outflow=0.46 cfs 6,106 cf

Pond OF-6: OF-6 Peak Elev=51.96' Inflow=1.00 cfs 2,360 cf
12.0" Round Culvert n=0.013 L=72.0' S=0.0118 '/' Outflow=1.00 cfs 2,360 cf

Pond SP 1: Study Point Inflow=0.01 cfs 175 cf
Primary=0.01 cfs 175 cf

Pond SP 3: Study Point Inflow=0.02 cfs 413 cf
Primary=0.02 cfs 413 cf

Pond SP 4: Study Point Inflow=0.12 cfs 749 cf
Primary=0.12 cfs 749 cf

Pond SP-2: Study Point Inflow=0.00 cfs 48 cf
Primary=0.00 cfs 48 cf

Total Runoff Area = 339,480 sf Runoff Volume = 82,327 cf Average Runoff Depth = 2.91"
56.85% Pervious = 192,995 sf 43.15% Impervious = 146,485 sf

Summary for Subcatchment 1S: RA (partial)

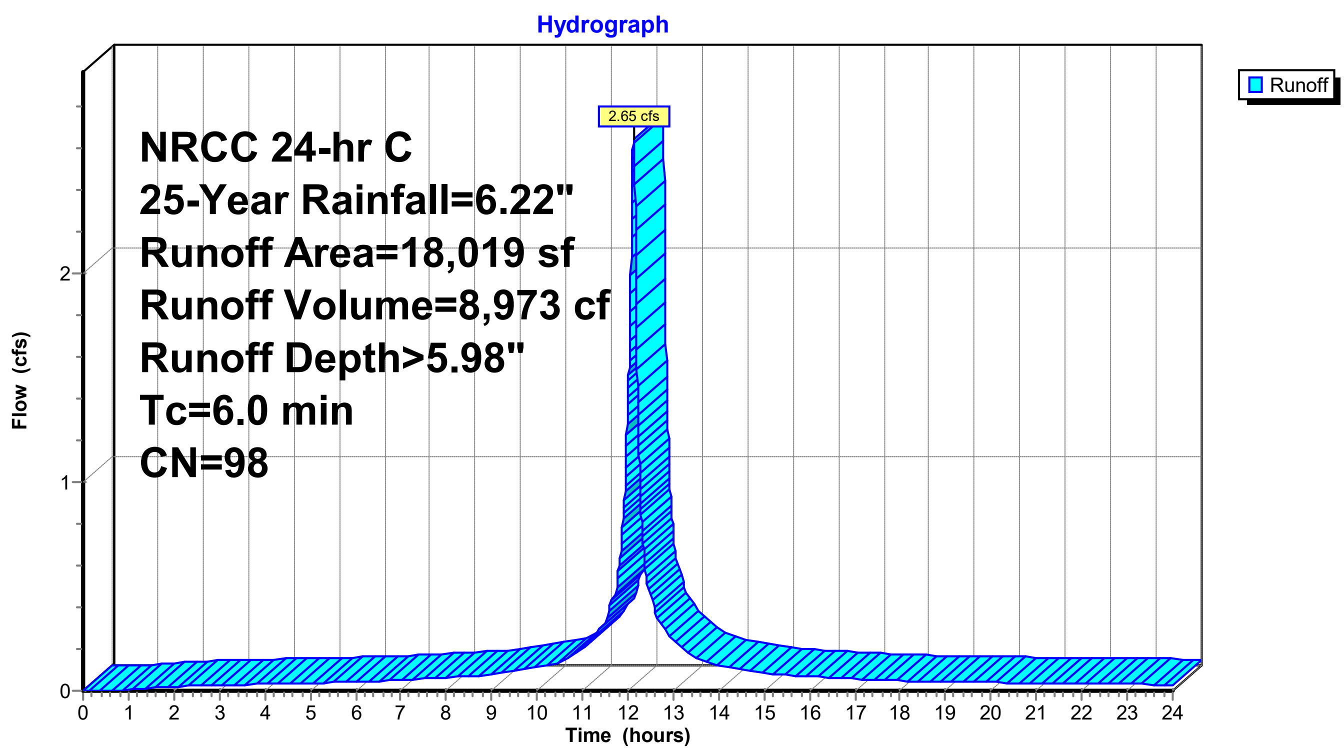
Runoff = 2.65 cfs @ 12.13 hrs, Volume= 8,973 cf, Depth> 5.98"
Routed to Pond INF-4 : INF-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
18,019	98	Roofs, HSG A
18,019	98	100.00% Impervious Area

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

Subcatchment 1S: RA (partial)



Summary for Subcatchment 2S: RA (partial)

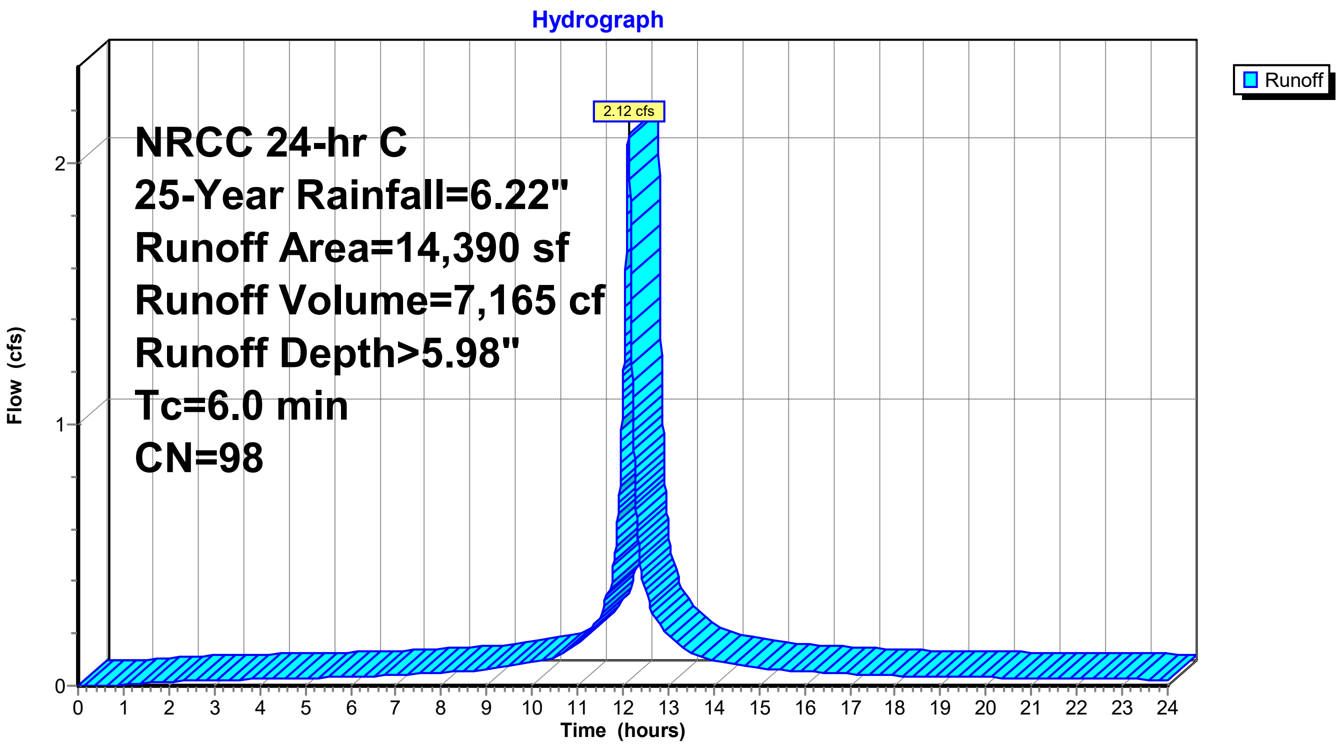
Runoff = 2.12 cfs @ 12.13 hrs, Volume= 7,165 cf, Depth> 5.98"
Routed to Pond DS : Dry Stream

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
14,390	98	Roofs, HSG A
14,390	98	100.00% Impervious Area

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

Subcatchment 2S: RA (partial)



Summary for Subcatchment 3S: RA (partial)

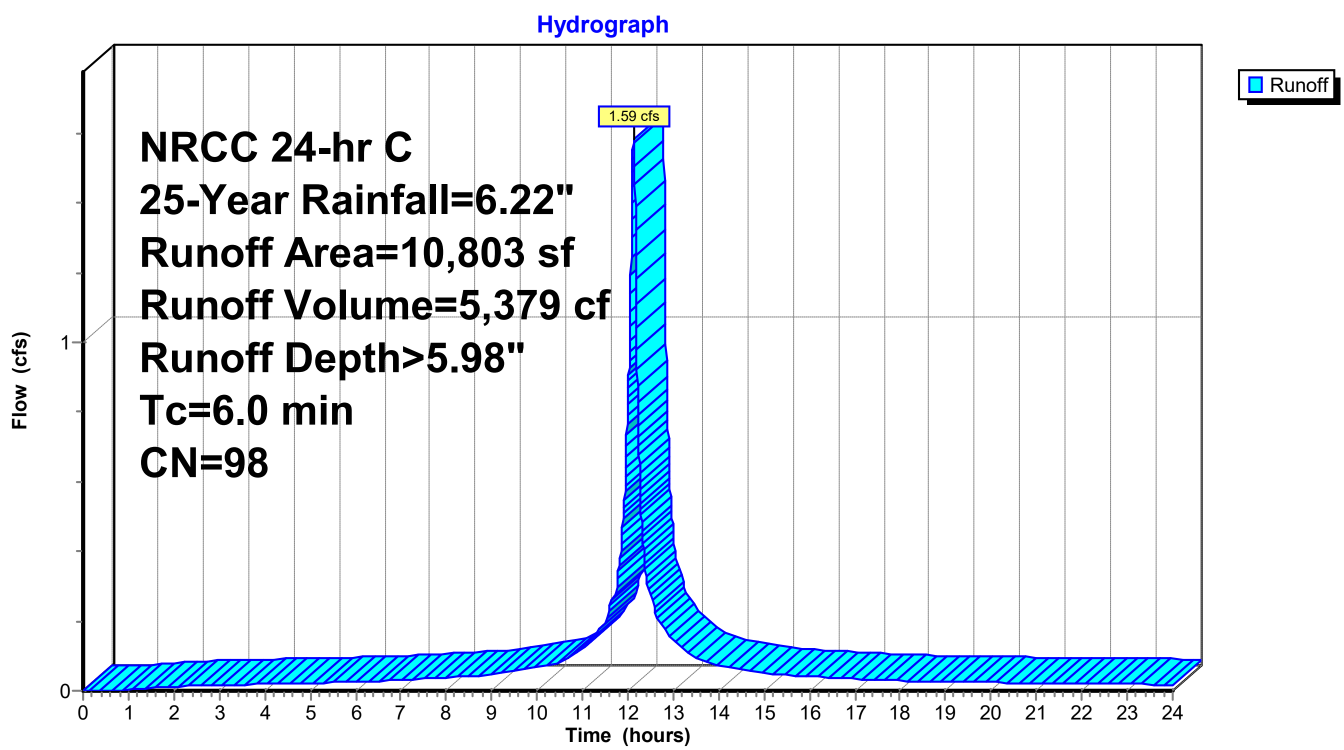
Runoff = 1.59 cfs @ 12.13 hrs, Volume= 5,379 cf, Depth> 5.98"
Routed to Pond INF-6 : INF-6

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
10,803	98	Roofs, HSG A
10,803	98	100.00% Impervious Area

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

Subcatchment 3S: RA (partial)



Summary for Subcatchment SCA-1: LSA/FL/IA/PP

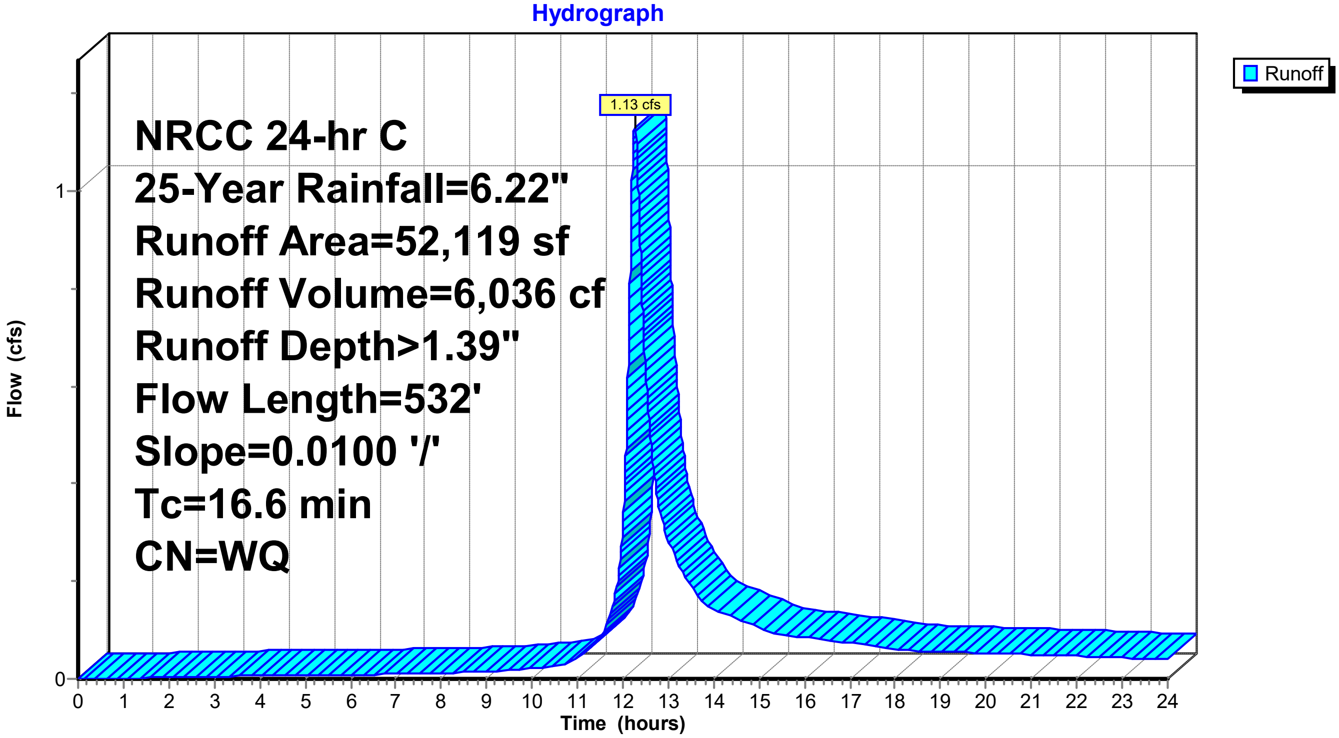
Runoff = 1.13 cfs @ 12.26 hrs, Volume= 6,036 cf, Depth> 1.39"
Routed to Pond DS : Dry Stream

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

	Area (sf)	CN	Description
	31,302	39	>75% Grass cover, Good, HSG A
*	10,136	60	Stone Fire Lane
*	3,036	98	Rubber Play Surface
*	507	98	Concrete Walk
*	7,138	60	Permeable Pavers
	52,119		Weighted Average
	48,576	46	93.20% Pervious Area
	3,543	98	6.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.6	100	0.0100	0.13		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.35"
1.0	42	0.0100	0.70		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.2	22	0.0100	1.61		**Shallow Concentrated Flow, Stone Fire Lane** Unpaved Kv= 16.1 fps
0.7	28	0.0100	0.70		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
2.1	340	0.0100	2.64	7.93	**Channel Flow, Dry Stream Bed** Area= 3.0 sf Perim= 5.0' r= 0.60' n= 0.040 Earth, cobble bottom, clean sides
16.6	532	Total			

Subcatchment SCA-1: LSA/FL/IA/PP



Summary for Subcatchment SCA-10:

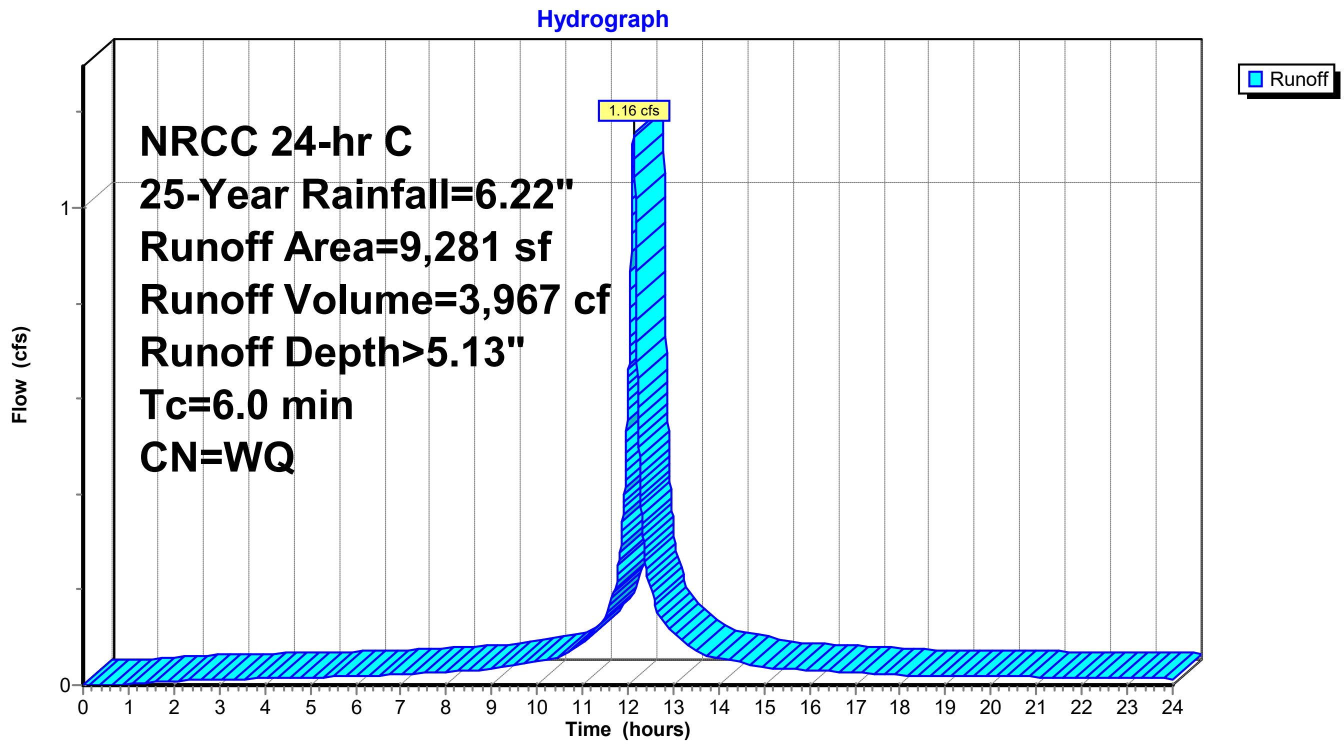
Runoff = 1.16 cfs @ 12.13 hrs, Volume= 3,967 cf, Depth> 5.13"
Routed to Pond FP-5 : FP-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
7,848	98	Paved parking, HSG A
1,372	39	>75% Grass cover, Good, HSG A
61	30	Woods, Good, HSG A
9,281		Weighted Average
1,433	39	15.44% Pervious Area
7,848	98	84.56% Impervious Area

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

Subcatchment SCA-10:



Summary for Subcatchment SCA-11:

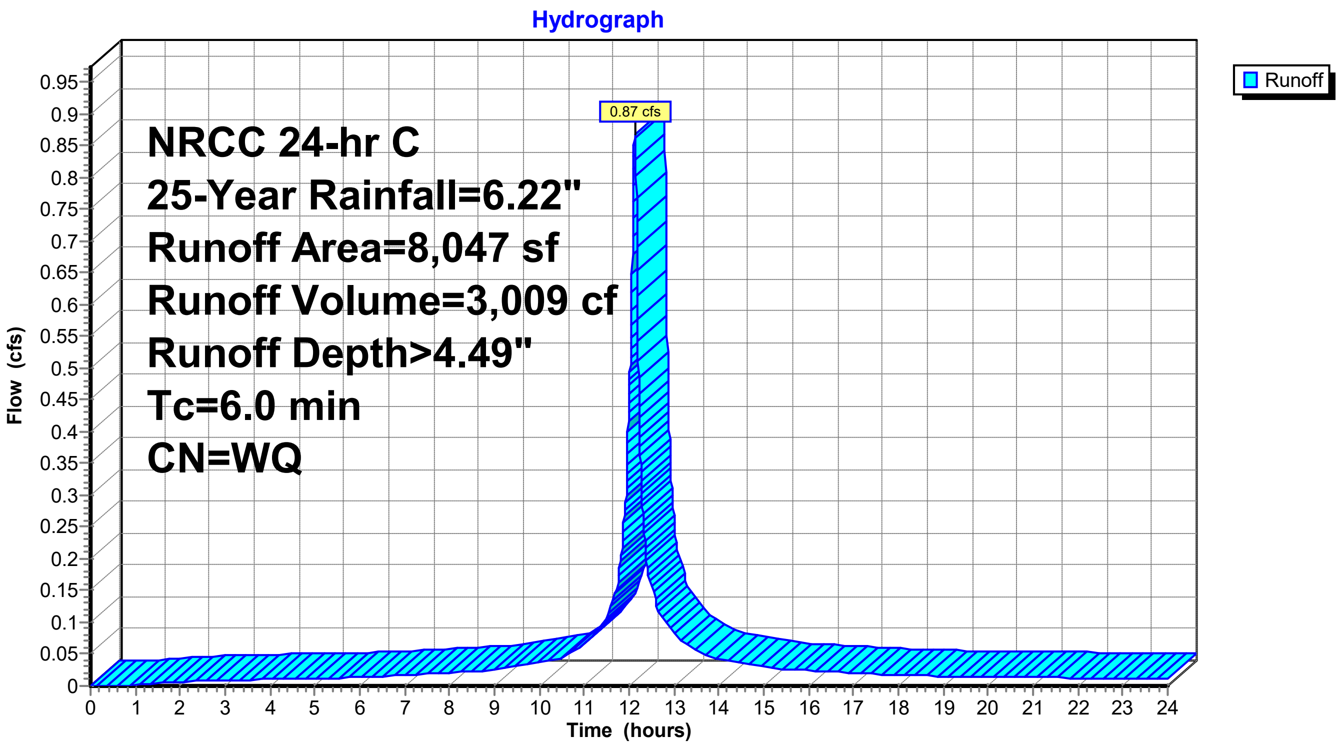
Runoff = 0.87 cfs @ 12.13 hrs, Volume= 3,009 cf, Depth> 4.49"
Routed to Pond FP-2 : FP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
5,857	98	Paved parking, HSG A
2,190	39	>75% Grass cover, Good, HSG A
8,047		Weighted Average
2,190	39	27.22% Pervious Area
5,857	98	72.78% Impervious Area

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

Subcatchment SCA-11:



Summary for Subcatchment SCA-12:

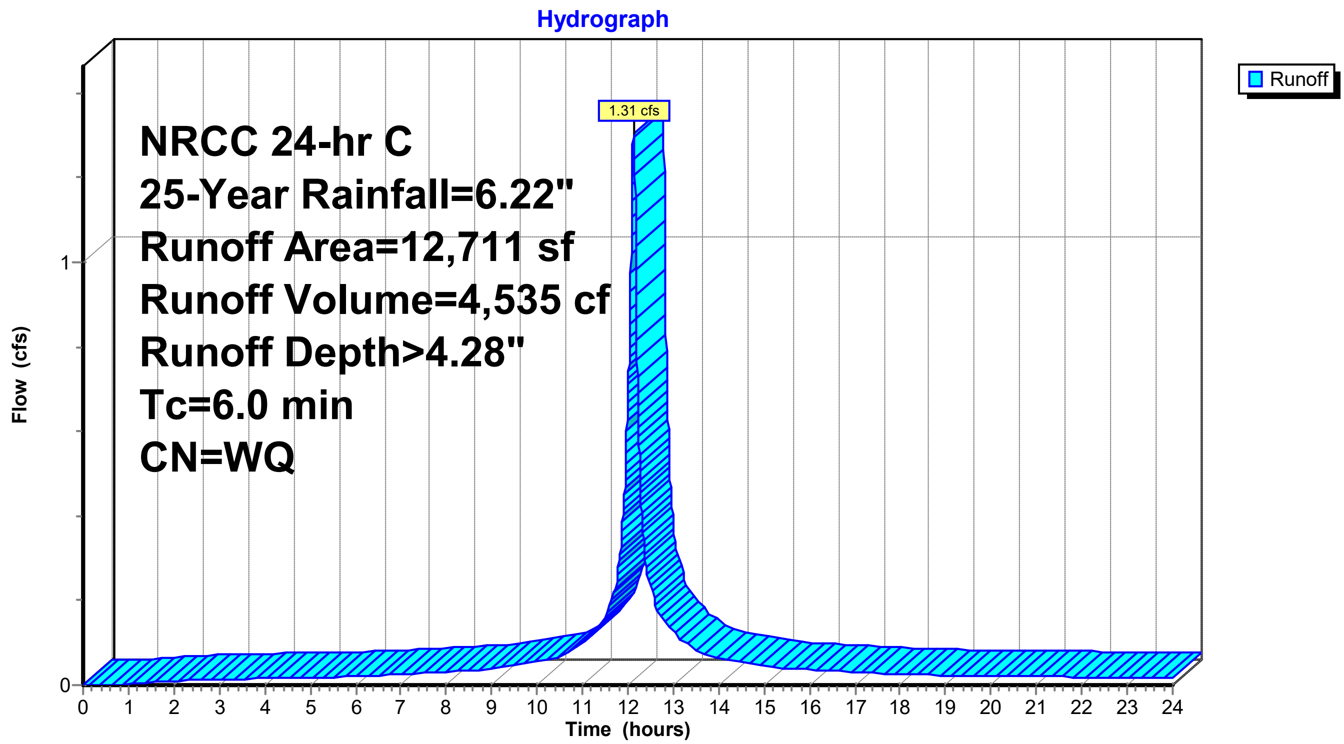
Runoff = 1.31 cfs @ 12.13 hrs, Volume= 4,535 cf, Depth> 4.28"
Routed to Pond FP-4 : FP-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
8,818	98	Paved parking, HSG A
3,298	39	>75% Grass cover, Good, HSG A
595	30	Woods, Good, HSG A
12,711		Weighted Average
3,893	38	30.63% Pervious Area
8,818	98	69.37% Impervious Area

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

Subcatchment SCA-12:



Summary for Subcatchment SCA-13:

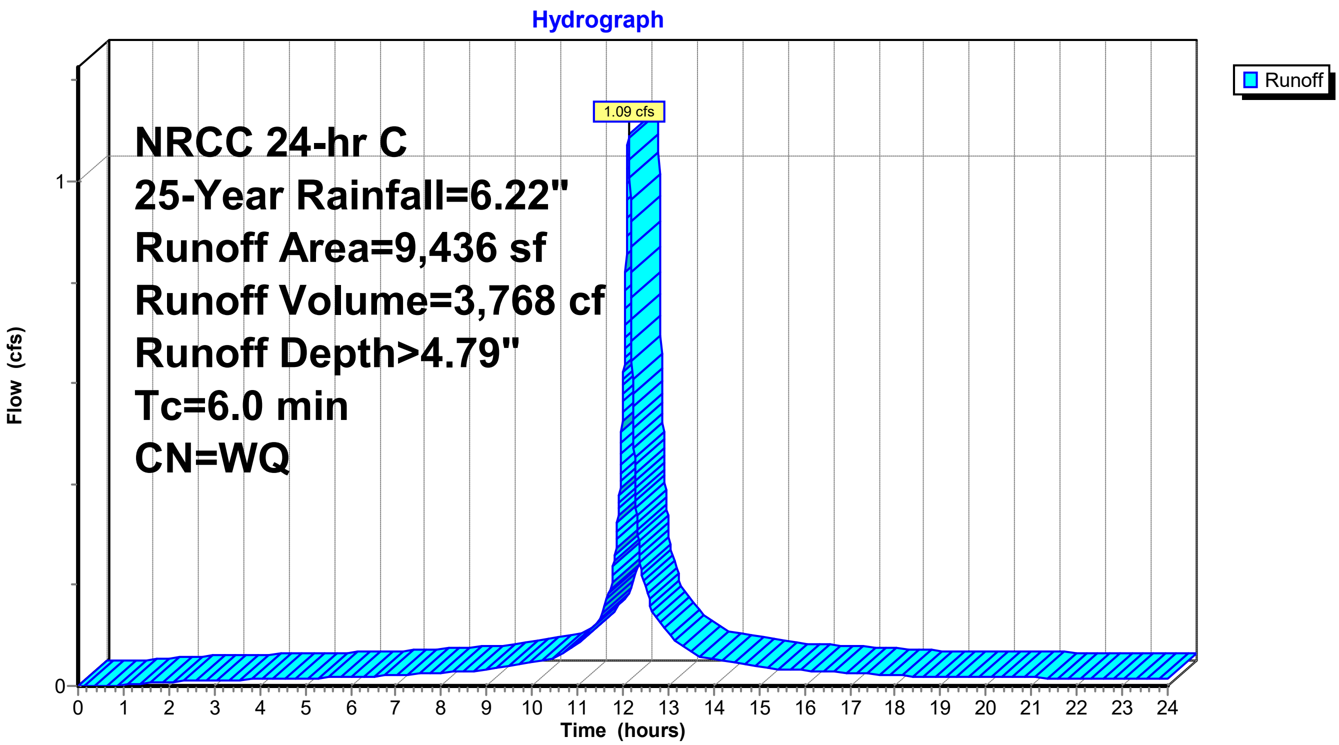
Runoff = 1.09 cfs @ 12.13 hrs, Volume= 3,768 cf, Depth> 4.79"
Routed to Pond FP-1 : FP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
7,393	98	Paved parking, HSG A
2,043	39	>75% Grass cover, Good, HSG A
9,436		Weighted Average
2,043	39	21.65% Pervious Area
7,393	98	78.35% Impervious Area

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

Subcatchment SCA-13:



Summary for Subcatchment SCA-14:

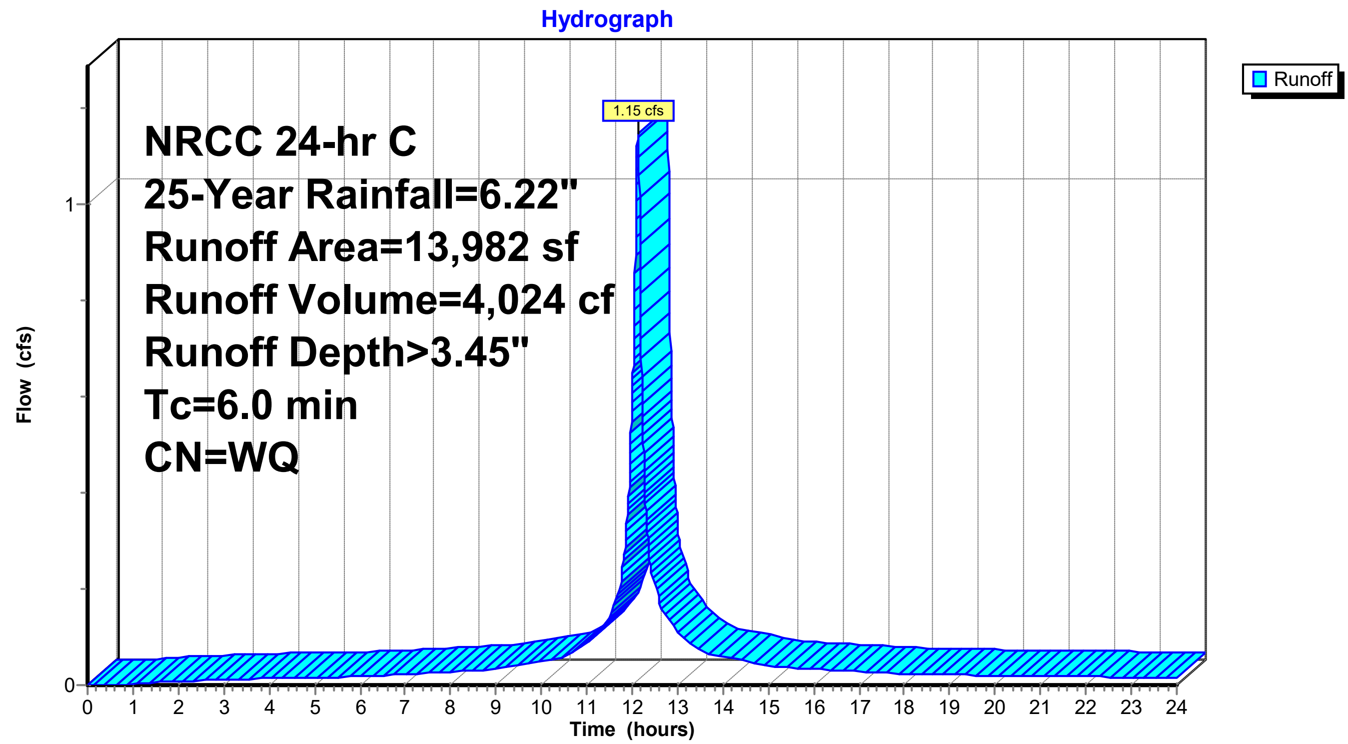
Runoff = 1.15 cfs @ 12.13 hrs, Volume= 4,024 cf, Depth> 3.45"
Routed to Pond CB-6B,C : CB-6B,6C

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
7,717	98	Paved parking, HSG A
3,829	39	>75% Grass cover, Good, HSG A
2,436	30	Woods, Good, HSG A
13,982		Weighted Average
6,265	36	44.81% Pervious Area
7,717	98	55.19% Impervious Area

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

Subcatchment SCA-14:



Summary for Subcatchment SCA-16:

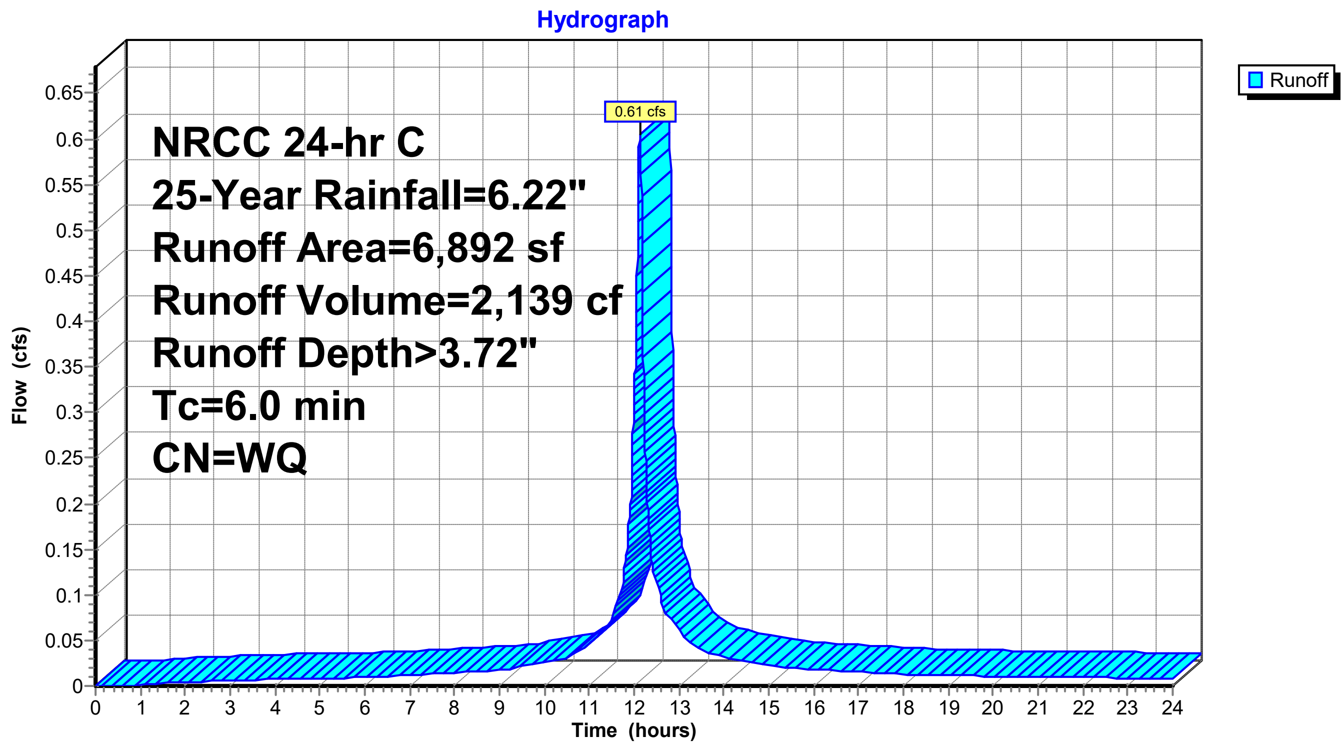
Runoff = 0.61 cfs @ 12.13 hrs, Volume= 2,139 cf, Depth> 3.72"
Routed to Pond CB-2B : CB 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
4,055	98	Paved parking, HSG A
2,837	39	>75% Grass cover, Good, HSG A
6,892		Weighted Average
2,837	39	41.16% Pervious Area
4,055	98	58.84% Impervious Area

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

Subcatchment SCA-16:



Summary for Subcatchment SCA-17:

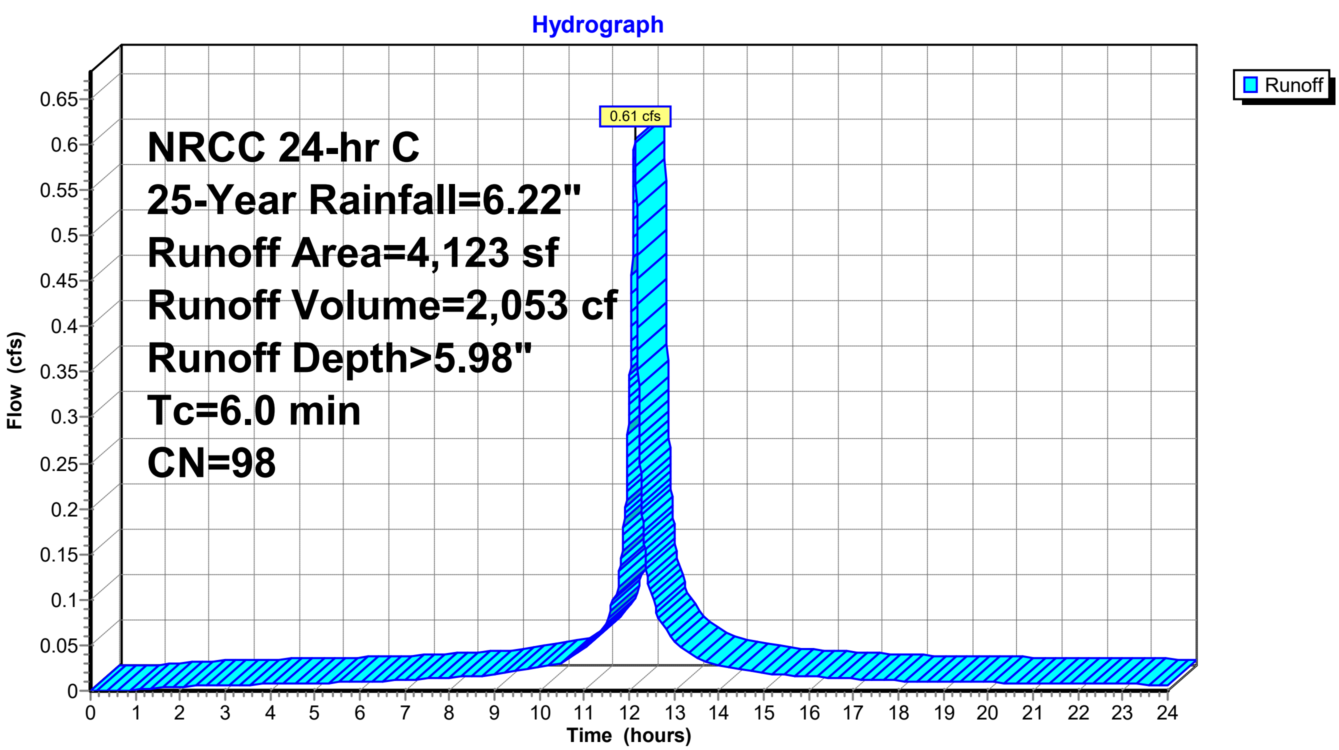
Runoff = 0.61 cfs @ 12.13 hrs, Volume= 2,053 cf, Depth> 5.98"
Routed to Pond CB-2A : CB 2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
4,123	98	Paved parking, HSG A
4,123	98	100.00% Impervious Area

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

Subcatchment SCA-17:



Summary for Subcatchment SCA-18:

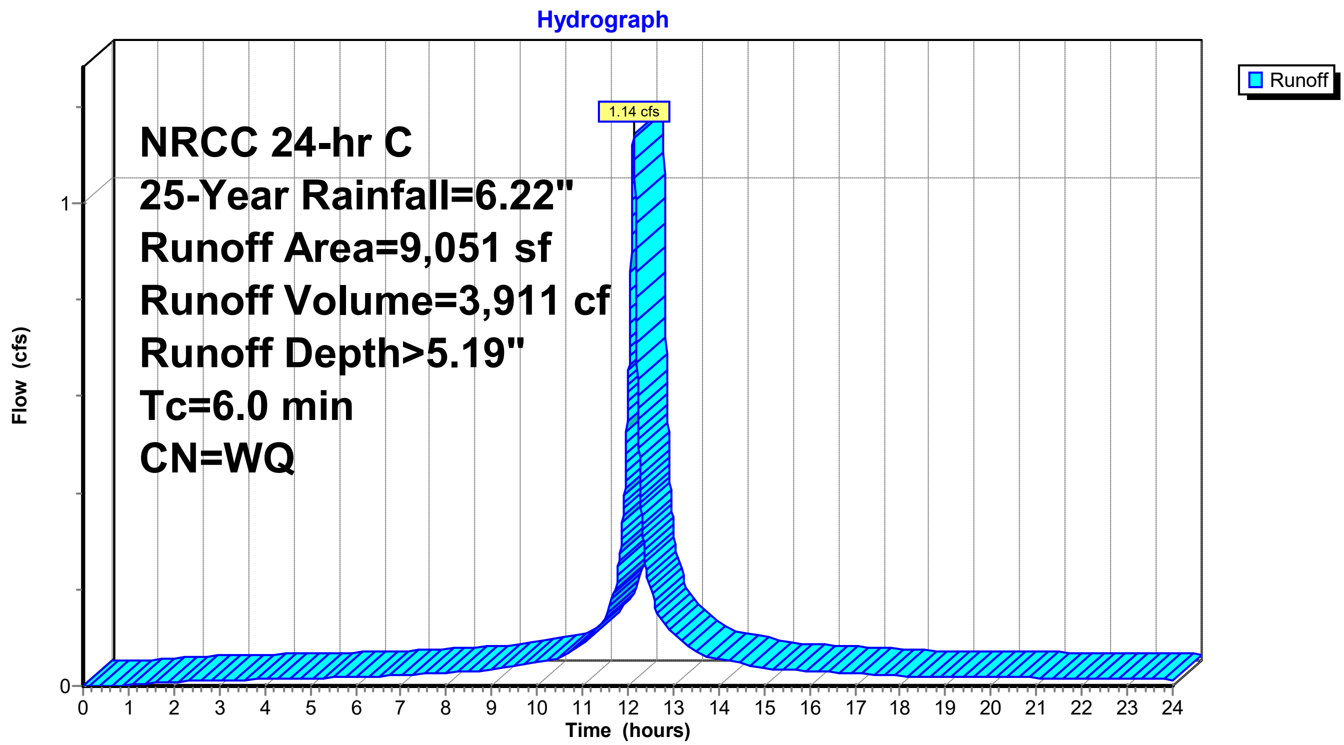
Runoff = 1.14 cfs @ 12.13 hrs, Volume= 3,911 cf, Depth> 5.19"
Routed to Pond CB-7 : CB-7

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
7,743	98	Paved parking, HSG A
1,308	39	>75% Grass cover, Good, HSG A
9,051		Weighted Average
1,308	39	14.45% Pervious Area
7,743	98	85.55% Impervious Area

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

Subcatchment SCA-18:



Summary for Subcatchment SCA-19:

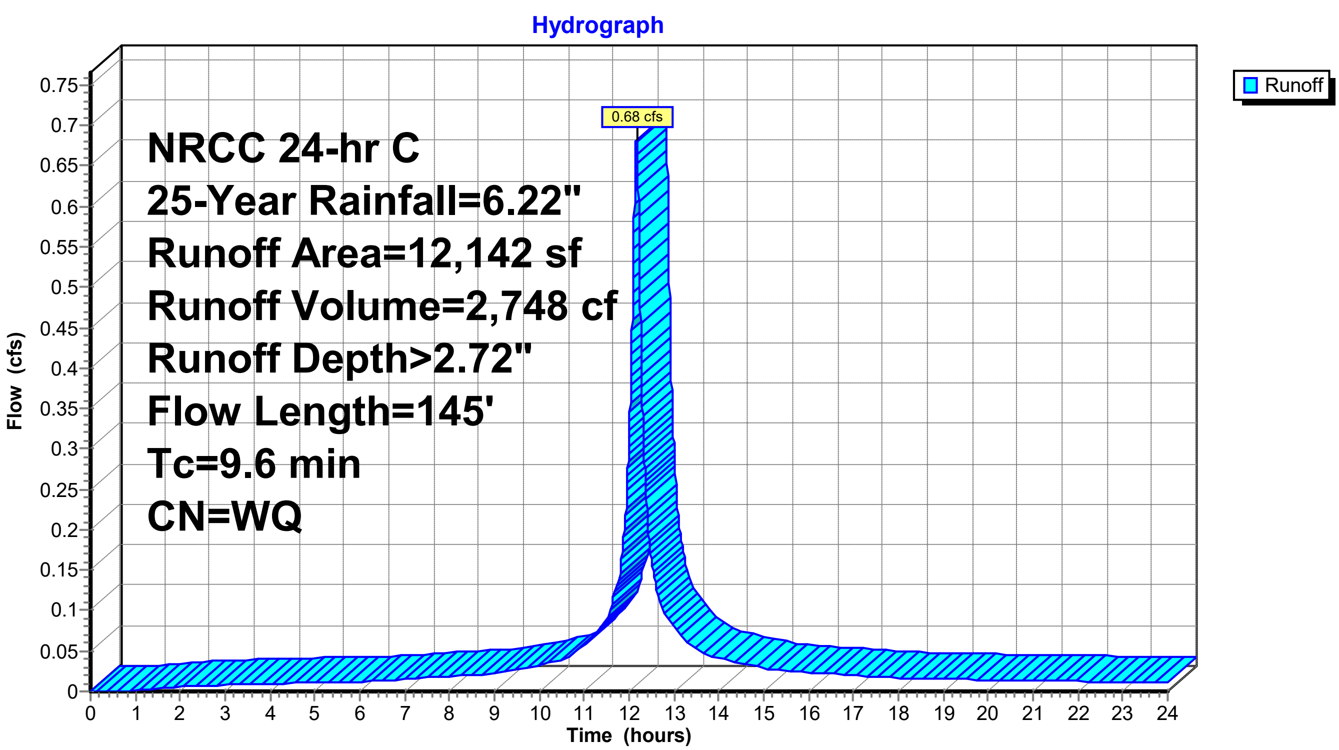
Runoff = 0.68 cfs @ 12.17 hrs, Volume= 2,748 cf, Depth> 2.72"
Routed to Pond CB-6A : CB-6A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
5,280	98	Paved parking, HSG A
5,968	32	Woods/grass comb., Good, HSG A
894	39	>75% Grass cover, Good, HSG A
12,142		Weighted Average
6,862	33	56.51% Pervious Area
5,280	98	43.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	50	0.0500	0.10		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.35"
1.0	70	0.0600	1.22		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.2	25	0.0100	2.03		**Shallow Concentrated Flow, Parking** Paved Kv= 20.3 fps
9.6	145	Total			

Subcatchment SCA-19:



Summary for Subcatchment SCA-2: LSA/FL

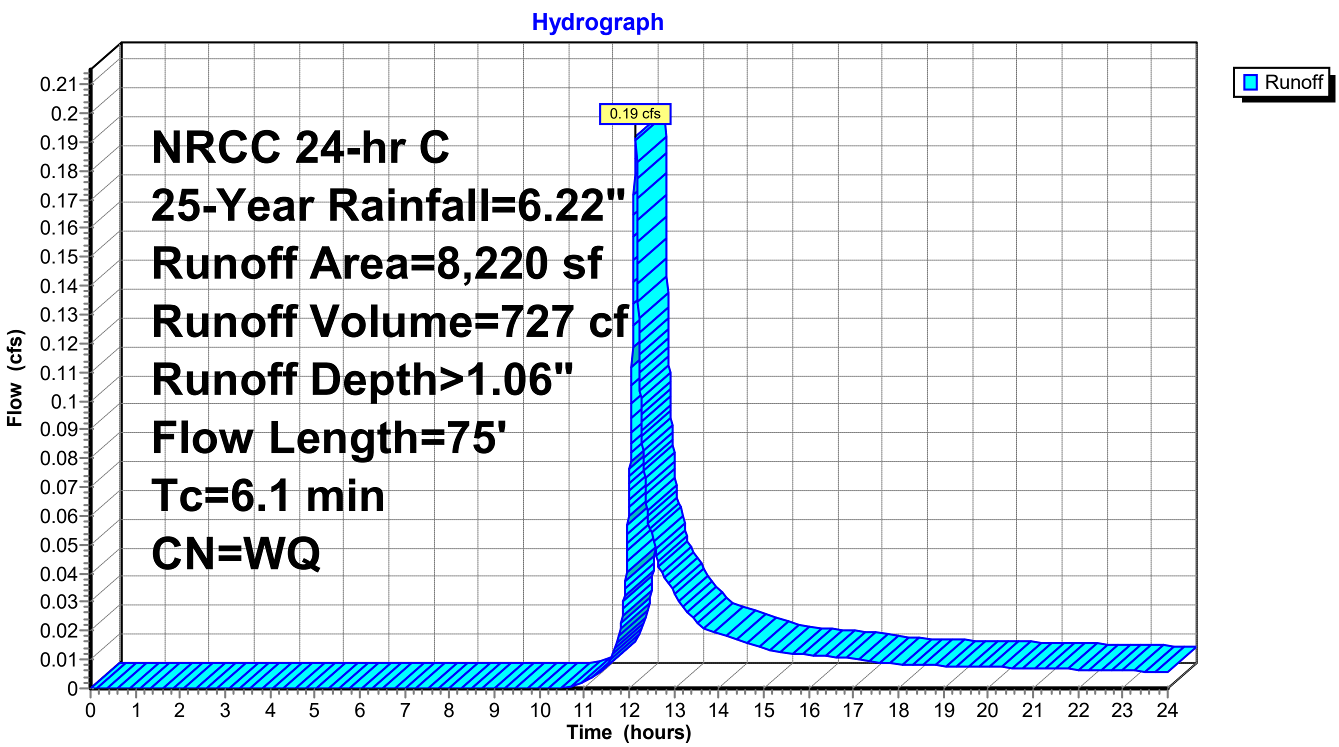
Runoff = 0.19 cfs @ 12.14 hrs, Volume= 727 cf, Depth> 1.06"
Routed to Pond INF-6 : INF-6

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

	Area (sf)	CN	Description
*	20	98	Cocncrete step
	5,345	39	>75% Grass cover, Good, HSG A
*	2,855	60	Stone Fire Lane
	8,220		Weighted Average
	8,200	46	99.76% Pervious Area
	20	98	0.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	35	0.0150	0.13		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.35"
1.4	20	0.0100	0.23		**Sheet Flow, Stone Fire Lane** Fallow n= 0.050 P2= 3.35"
0.1	20	0.1500	2.71		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
6.1	75	Total			

Subcatchment SCA-2: LSA/FL



Summary for Subcatchment SCA-4:

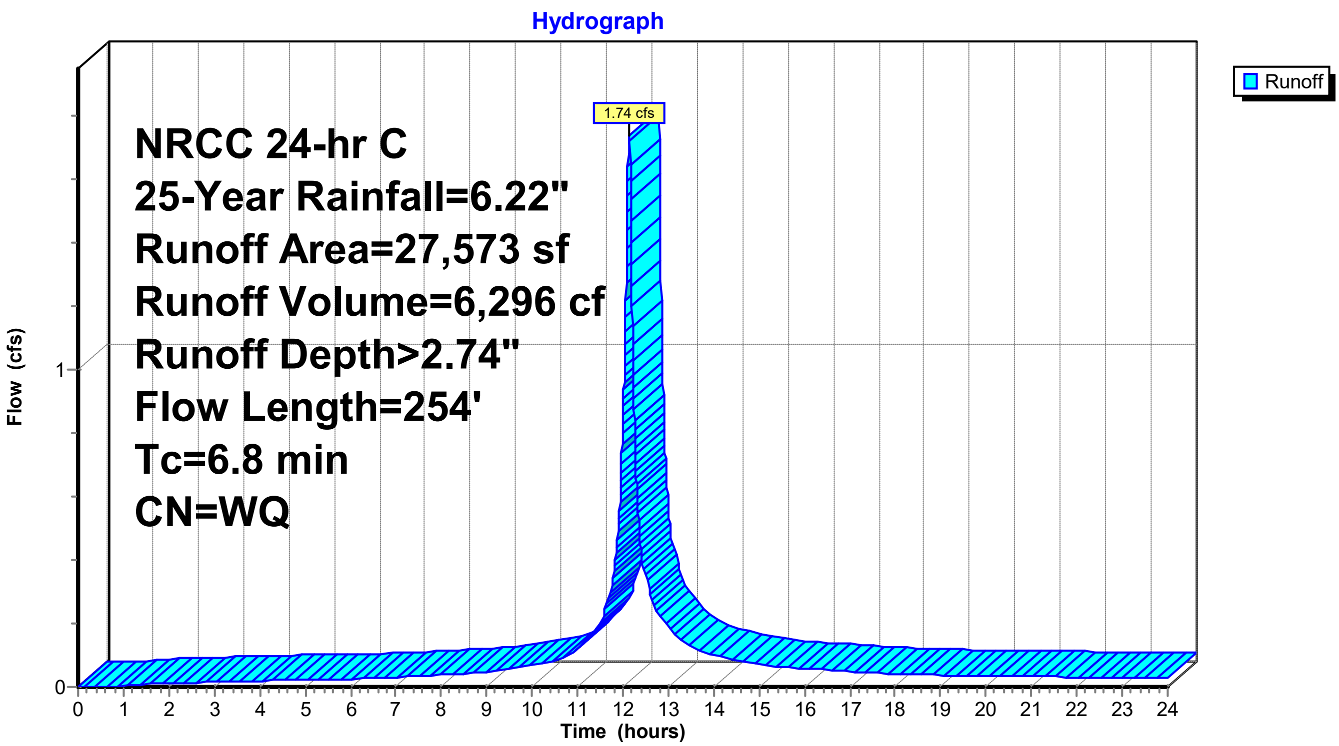
Runoff = 1.74 cfs @ 12.14 hrs, Volume= 6,296 cf, Depth> 2.74"
Routed to Pond CB-4 : CB-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

	Area (sf)	CN	Description
	10,454	98	Paved parking, HSG A
	8,808	39	>75% Grass cover, Good, HSG A
	4,820	30	Woods, Good, HSG A
*	3,245	60	Stone Fire Lane
*	246	98	Shed Roof
	27,573		Weighted Average
	16,873	40	61.19% Pervious Area
	10,700	98	38.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	23	0.0100	0.10		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.35"
2.3	158	0.0050	1.14		**Shallow Concentrated Flow, Stone Fire Lane** Unpaved Kv= 16.1 fps
0.6	73	0.0100	2.03		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
6.8	254	Total			

Subcatchment SCA-4:



Summary for Subcatchment SCA-5:

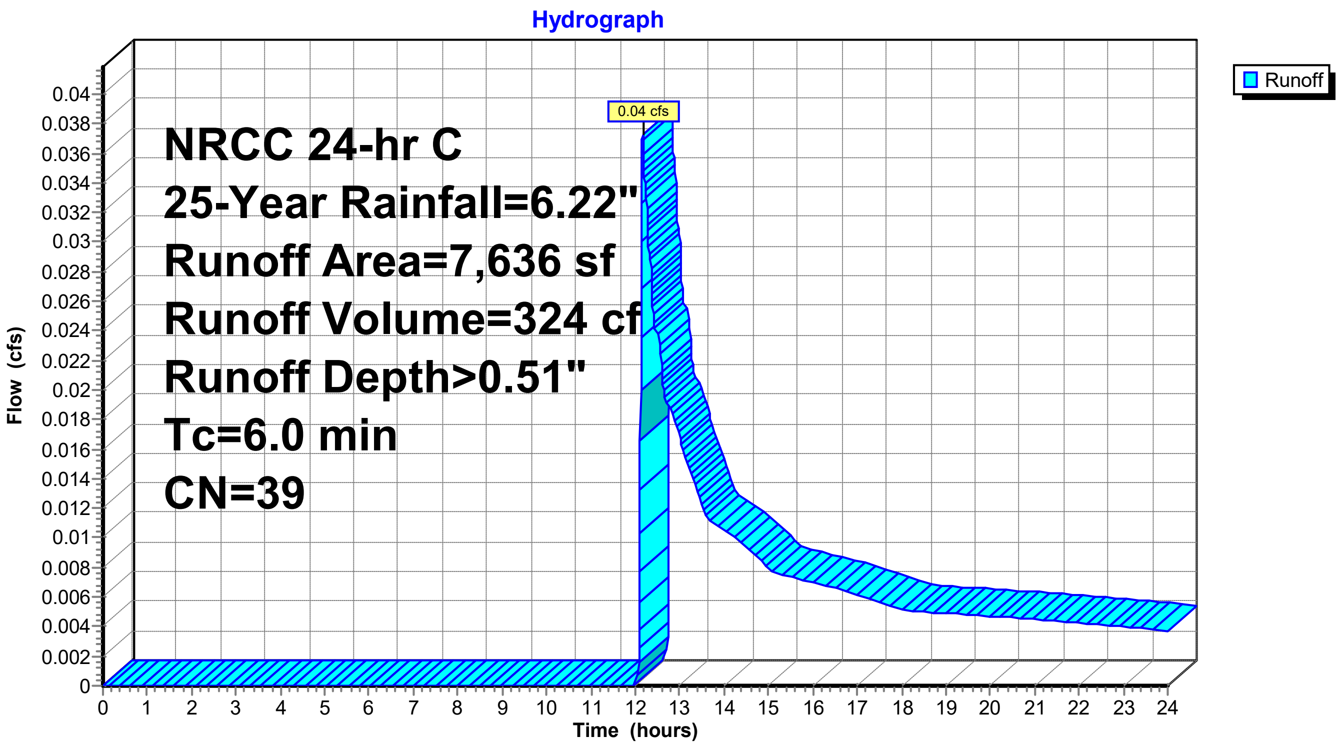
Runoff = 0.04 cfs @ 12.17 hrs, Volume= 324 cf, Depth> 0.51"
Routed to Pond FP-7 : FP-7/INF-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
7,636	39	>75% Grass cover, Good, HSG A
7,636	39	100.00% Pervious Area

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

Subcatchment SCA-5:



Summary for Subcatchment SCA-6.1:

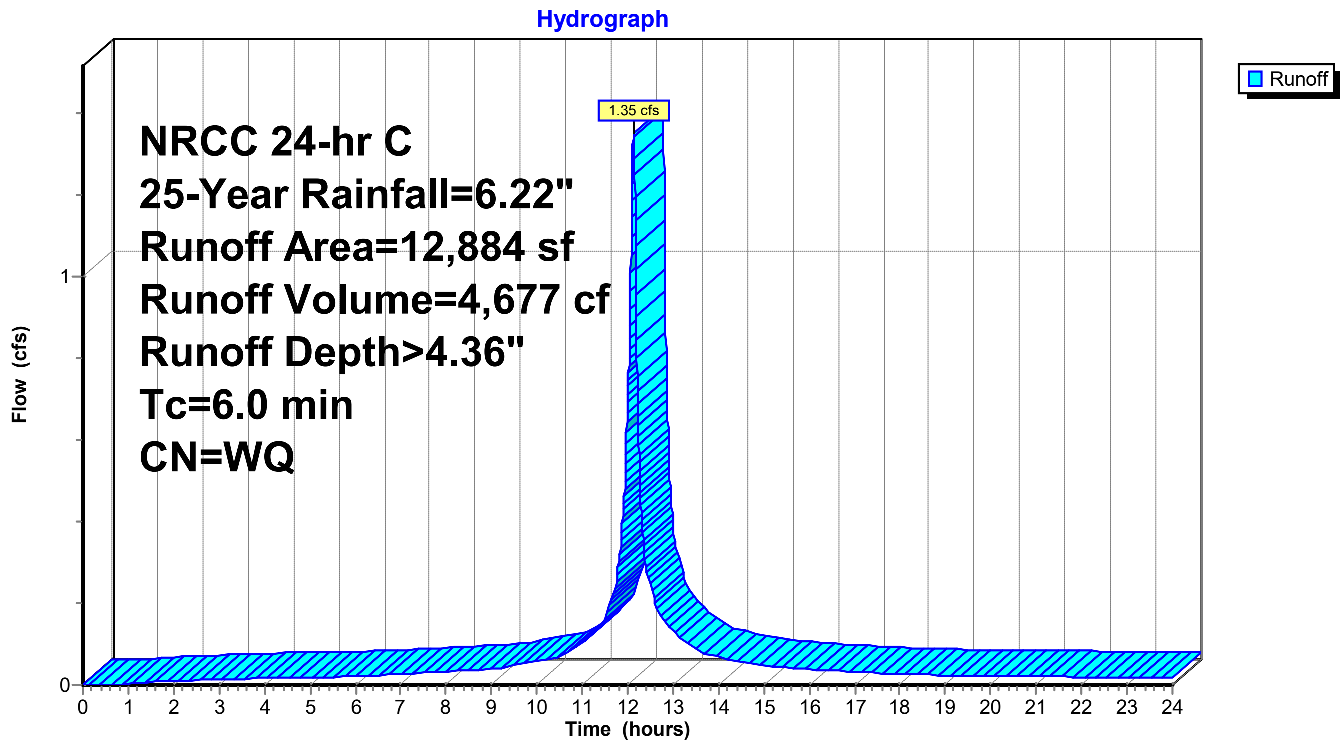
Runoff = 1.35 cfs @ 12.13 hrs, Volume= 4,677 cf, Depth> 4.36"
Routed to Pond CB-3 : CB-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

	Area (sf)	CN	Description
	8,965	98	Paved parking, HSG A
	3,559	39	>75% Grass cover, Good, HSG A
*	360	60	Fire Lane (FL)
	12,884		Weighted Average
	3,919	41	30.42% Pervious Area
	8,965	98	69.58% Impervious Area

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

Subcatchment SCA-6.1:



Summary for Subcatchment SCA-6.2:

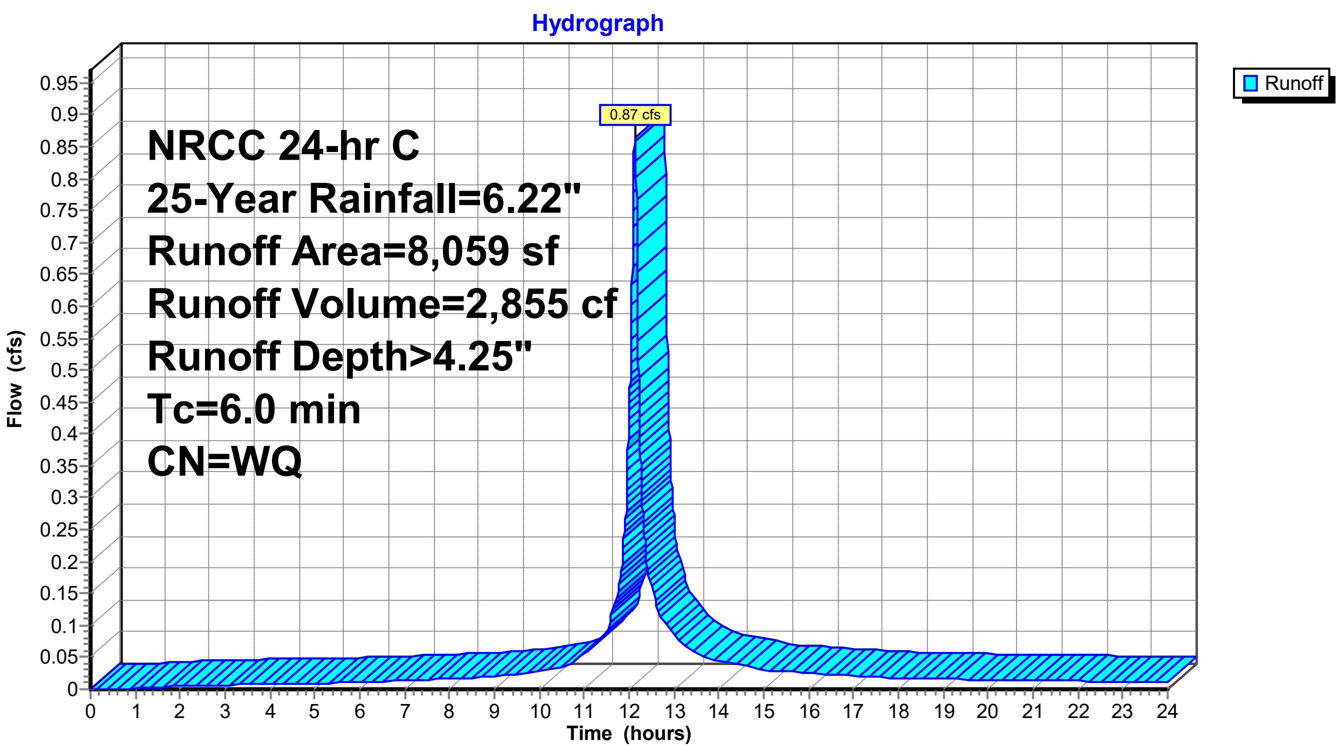
Runoff = 0.87 cfs @ 12.13 hrs, Volume= 2,855 cf, Depth> 4.25"
Routed to Pond FP-3 : FP-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

	Area (sf)	CN	Description
*	3,130	60	Permeable Pavers (PP)
	3,296	98	Paved roads w/curbs & sewers, HSG A
*	1,331	98	Canopy (CP)
	302	39	>75% Grass cover, Good, HSG A
	8,059		Weighted Average
	3,432	58	42.59% Pervious Area
	4,627	98	57.41% Impervious Area

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

Subcatchment SCA-6.2:



Summary for Subcatchment SCA-7:

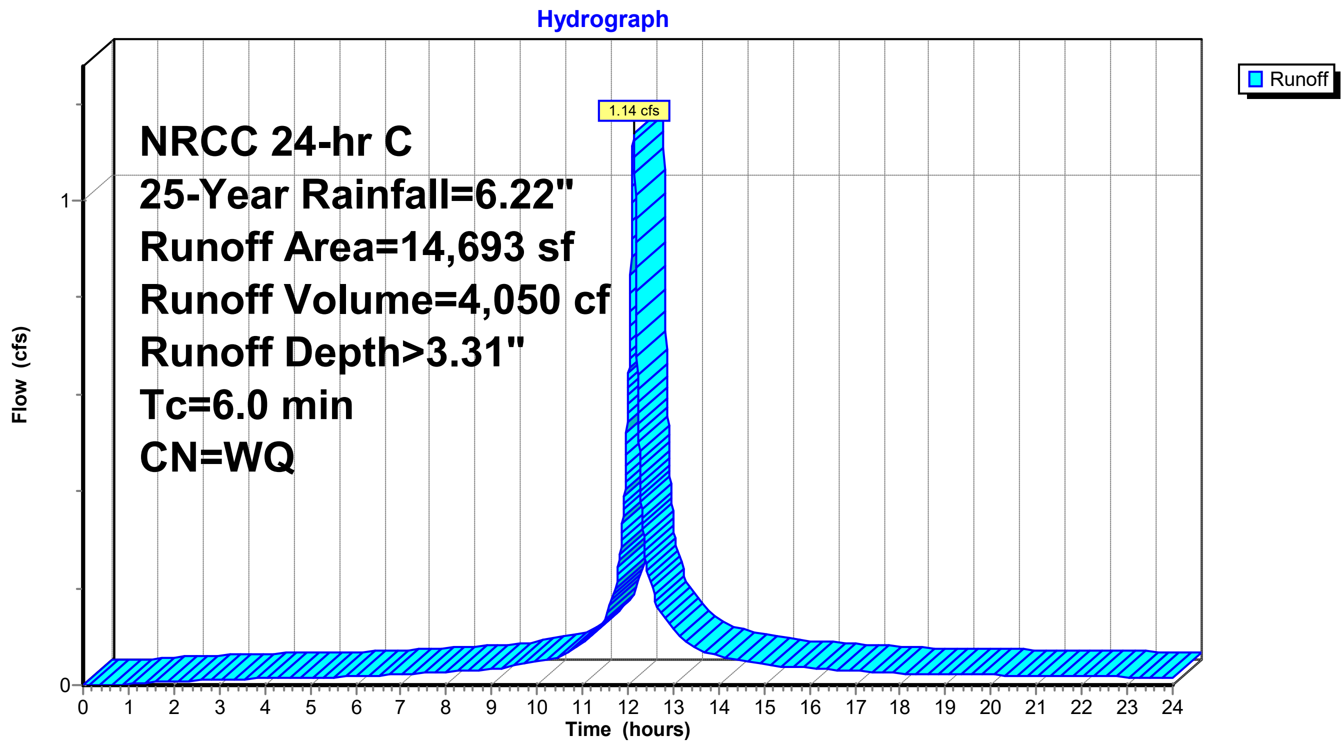
Runoff = 1.14 cfs @ 12.13 hrs, Volume= 4,050 cf, Depth> 3.31"
Routed to Pond FP-6 : FP-6

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
7,630	98	Paved parking, HSG A
5,346	39	>75% Grass cover, Good, HSG A
1,717	32	Woods/grass comb., Good, HSG A
14,693		Weighted Average
7,063	37	48.07% Pervious Area
7,630	98	51.93% Impervious Area

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

Subcatchment SCA-7:



Summary for Subcatchment SCA-8:

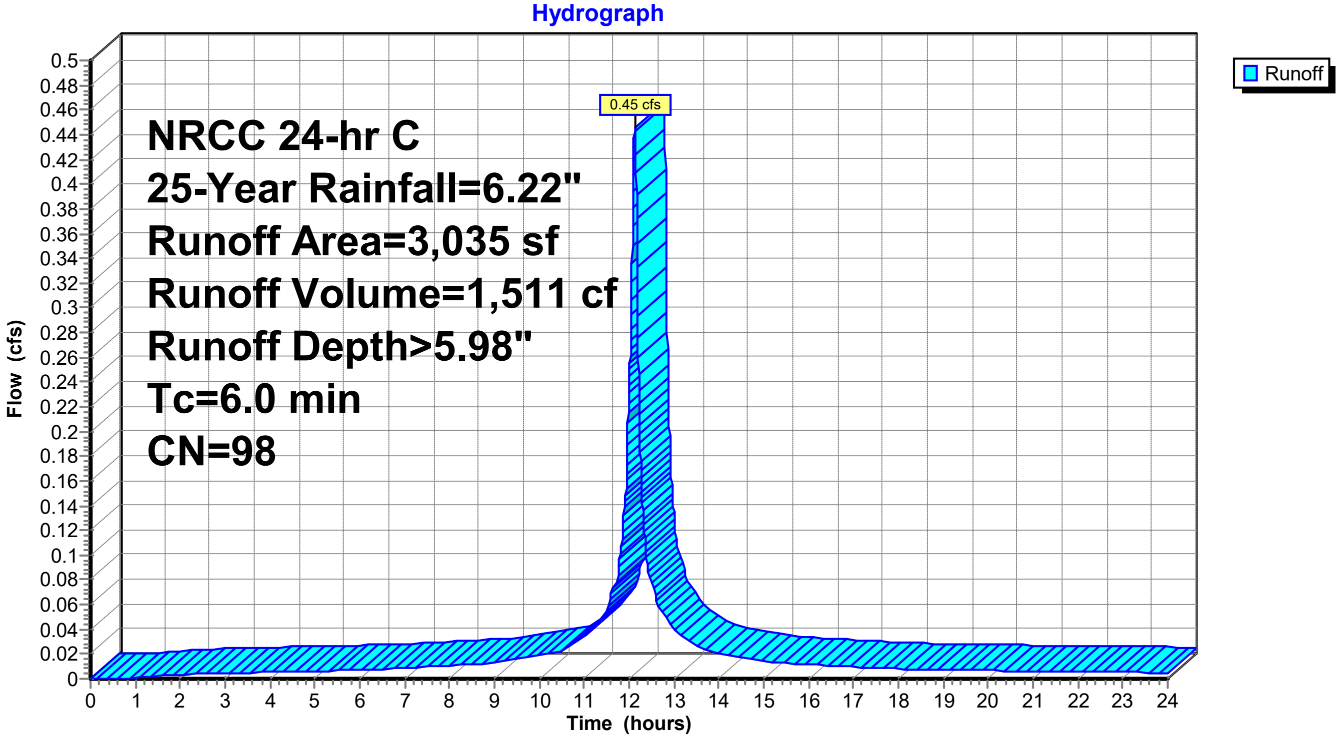
Runoff = 0.45 cfs @ 12.13 hrs, Volume= 1,511 cf, Depth> 5.98"
Routed to Pond FP-1 : FP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
3,035	98	Paved parking, HSG A
3,035	98	100.00% Impervious Area

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

Subcatchment SCA-8:



Summary for Subcatchment SCA-9:

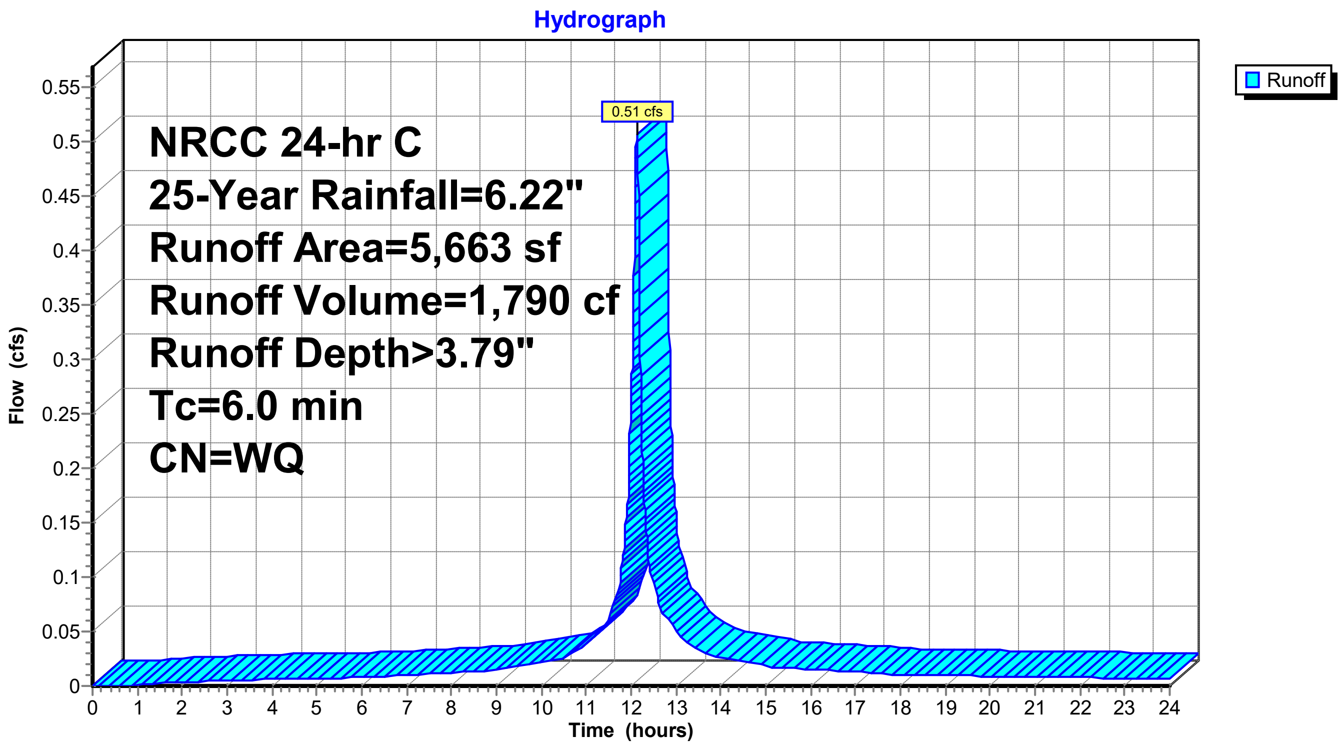
Runoff = 0.51 cfs @ 12.13 hrs, Volume= 1,790 cf, Depth> 3.79"
Routed to Pond FP-3 : FP-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
3,403	98	Paved parking, HSG A
2,260	39	>75% Grass cover, Good, HSG A
5,663		Weighted Average
2,260	39	39.91% Pervious Area
3,403	98	60.09% Impervious Area

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

Subcatchment SCA-9:



Summary for Subcatchment UC-1: NA

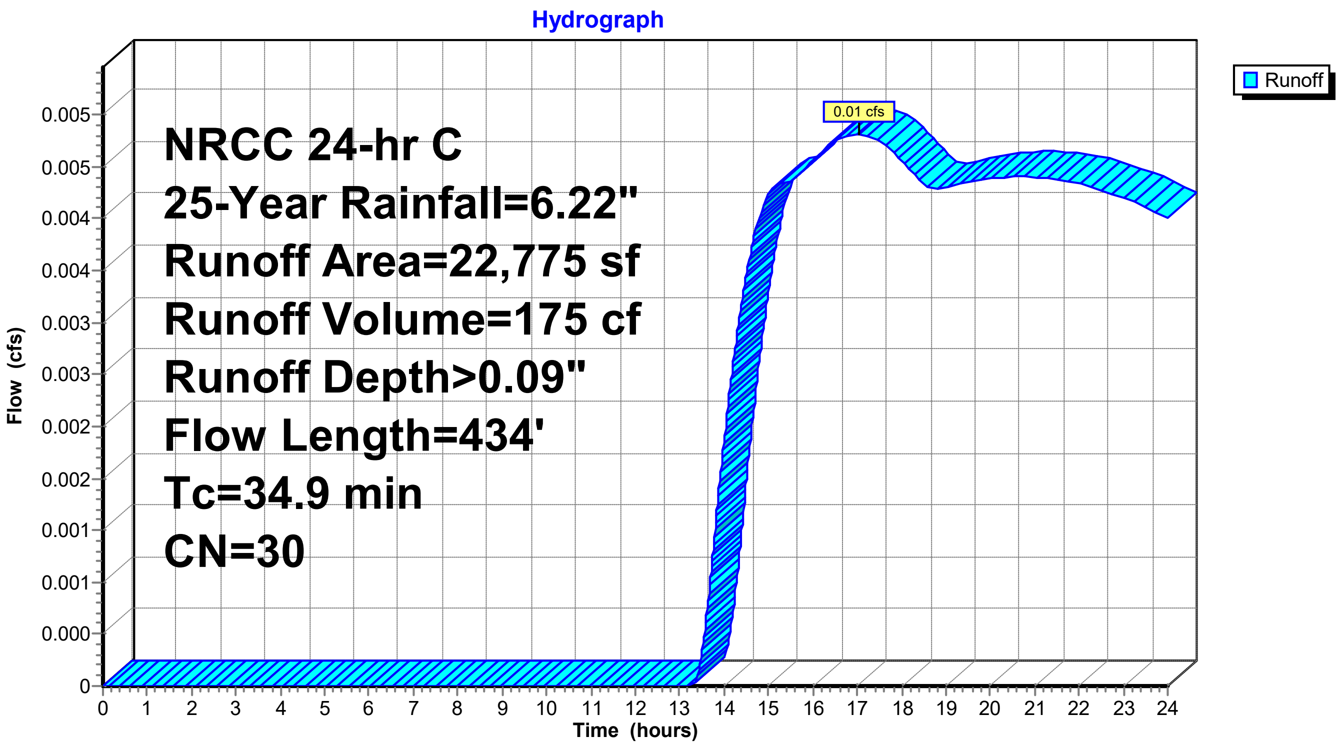
Runoff = 0.01 cfs @ 17.02 hrs, Volume= 175 cf, Depth> 0.09"
Routed to Pond SP 1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
22,775	30	Woods, Good, HSG A
22,775	30	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.2	100	0.0250	0.09		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
15.7	334	0.0050	0.35		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
34.9	434	Total			

Subcatchment UC-1: NA



Summary for Subcatchment UC-2:

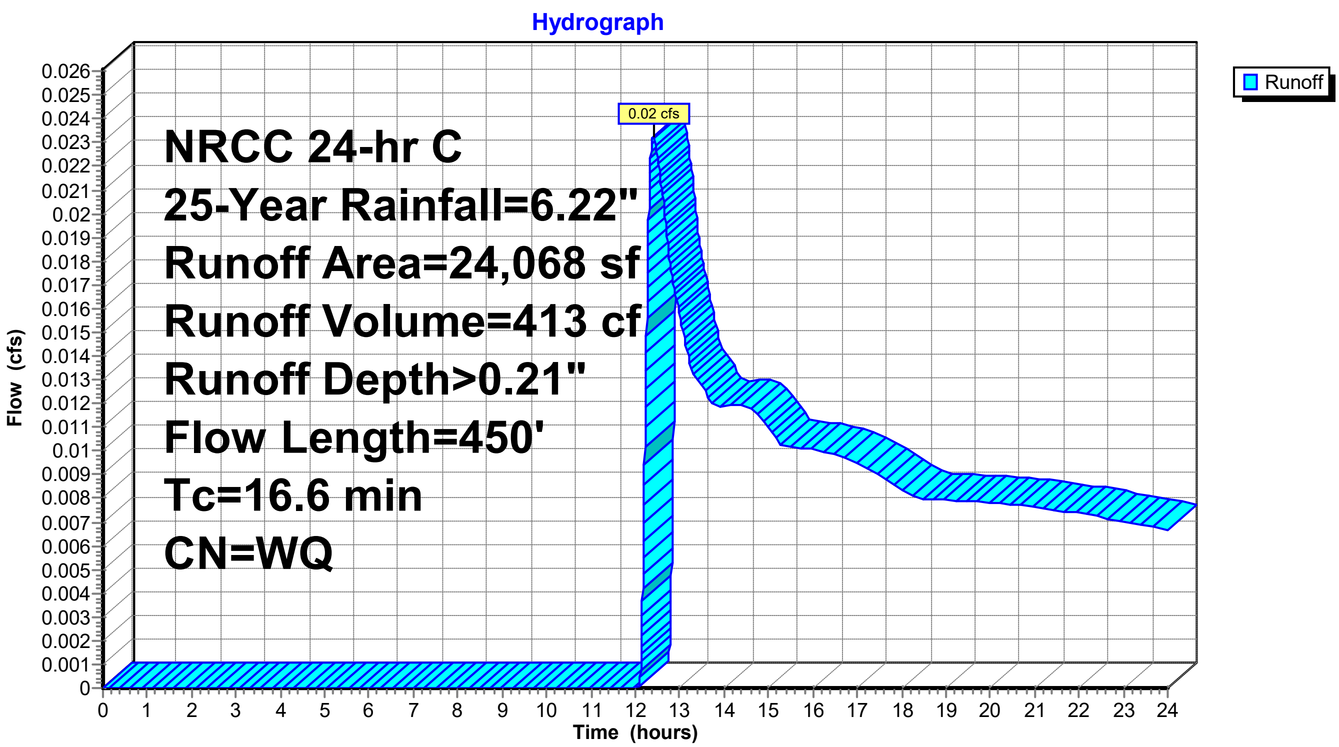
Runoff = 0.02 cfs @ 12.41 hrs, Volume= 413 cf, Depth> 0.21"
Routed to Pond SP 3 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
17,559	30	Woods, Good, HSG A
6,509	39	>75% Grass cover, Good, HSG A
24,068		Weighted Average
24,068	32	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	50	0.0590	0.11		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
6.6	199	0.0100	0.50		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
2.2	201	0.0100	1.50		**Shallow Concentrated Flow, SWALE** Grassed Waterway Kv= 15.0 fps
16.6	450	Total			

Subcatchment UC-2:



Summary for Subcatchment UC-3:

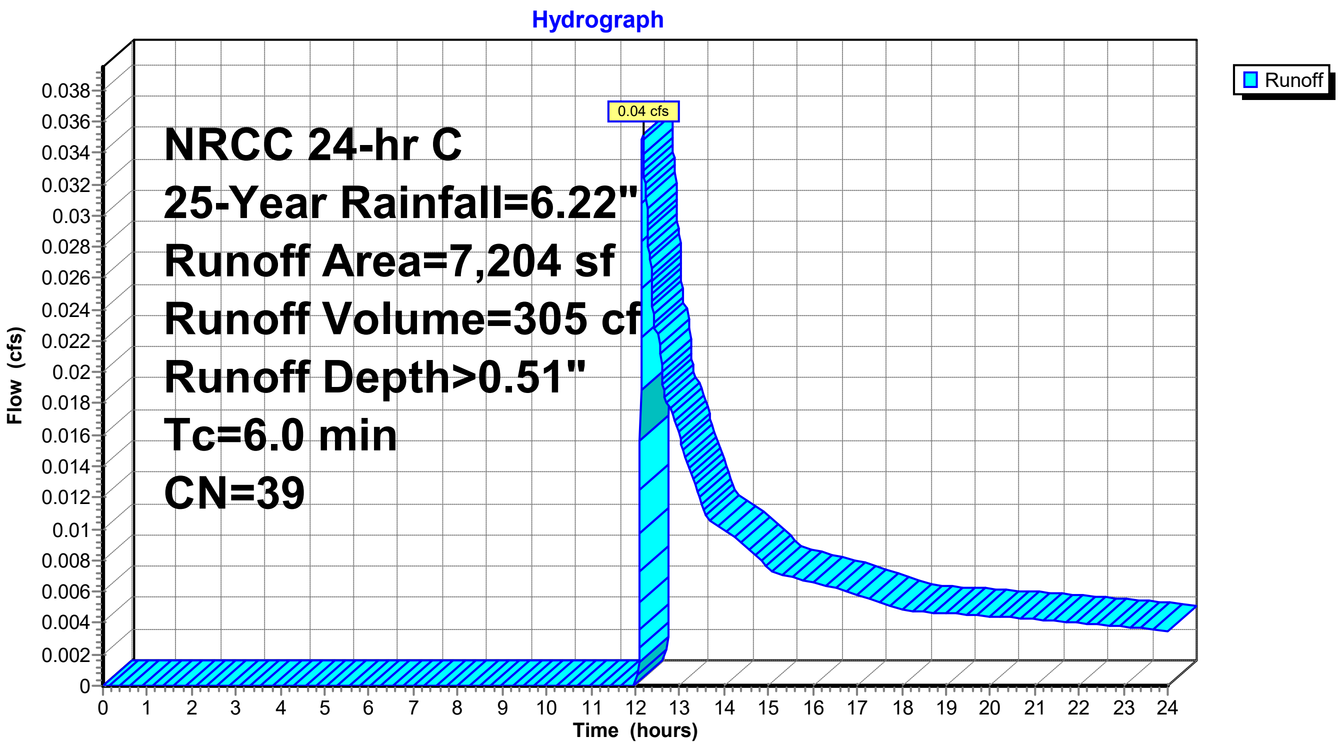
Runoff = 0.04 cfs @ 12.17 hrs, Volume= 305 cf, Depth> 0.51"
Routed to Pond AB-1 : Attenuation Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
7,204	39	>75% Grass cover, Good, HSG A
7,204	39	100.00% Pervious Area

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

Subcatchment UC-3:



Summary for Subcatchment UC-4:

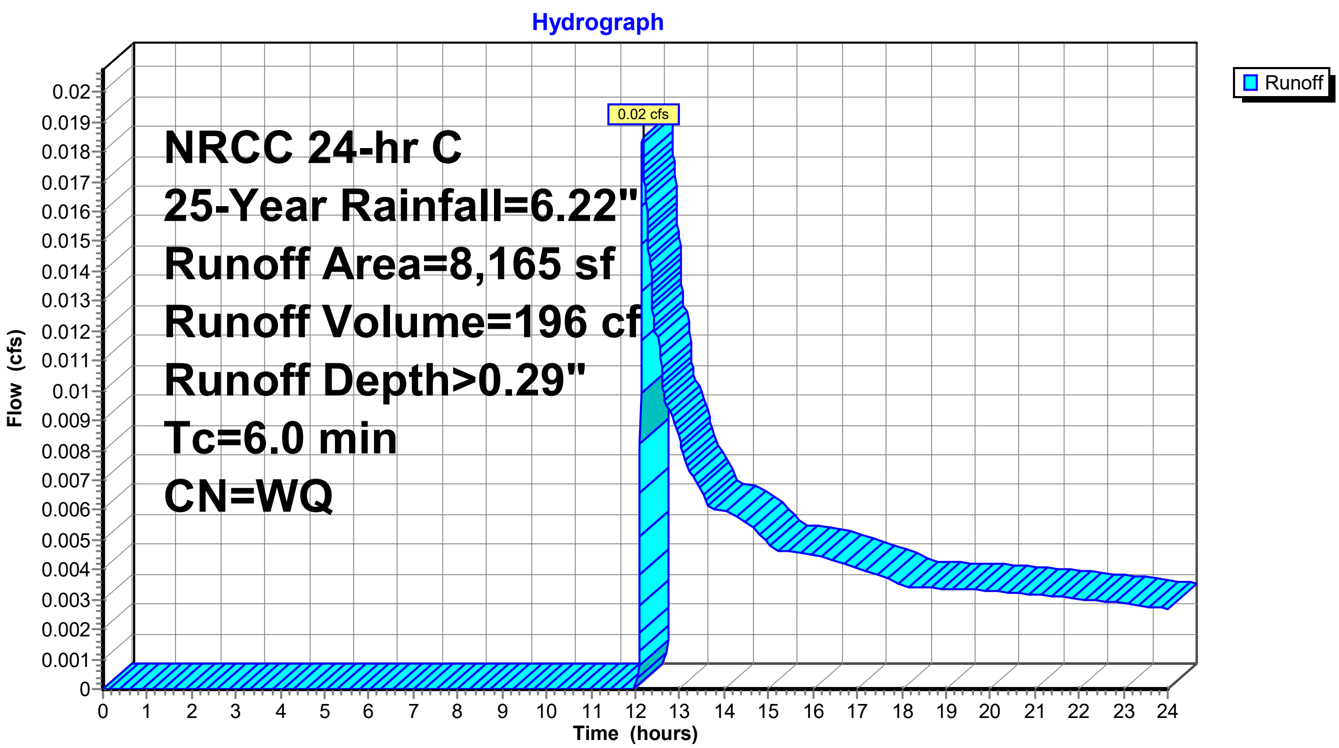
Runoff = 0.02 cfs @ 12.17 hrs, Volume= 196 cf, Depth> 0.29"
Routed to Pond SP 4 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
3,787	39	>75% Grass cover, Good, HSG A
4,378	30	Woods, Good, HSG A
8,165		Weighted Average
8,165	34	100.00% Pervious Area

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

Subcatchment UC-4:



Summary for Subcatchment UC-5:

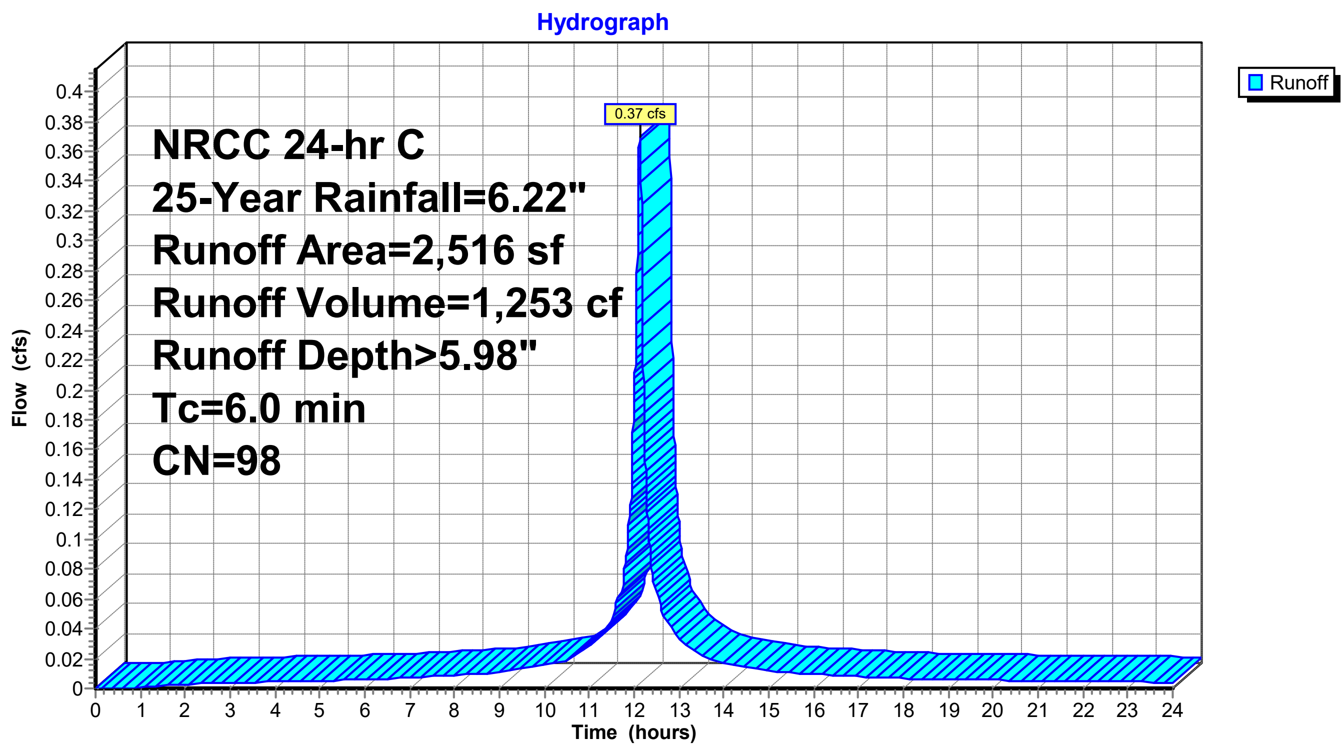
Runoff = 0.37 cfs @ 12.13 hrs, Volume= 1,253 cf, Depth> 5.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
2,516	98	Paved parking, HSG A
2,516	98	100.00% Impervious Area

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

Subcatchment UC-5:



Summary for Subcatchment UC-6: NA

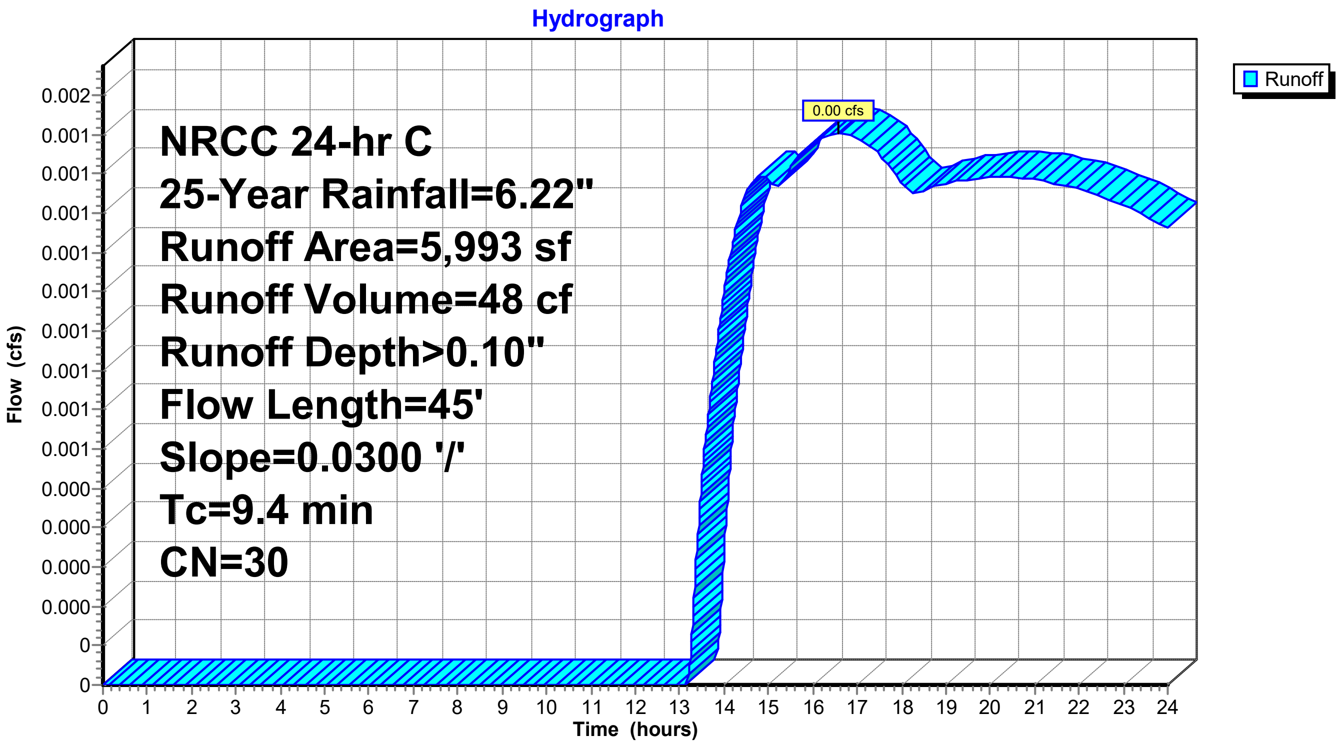
Runoff = 0.00 cfs @ 16.55 hrs, Volume= 48 cf, Depth> 0.10"
Routed to Pond SP-2 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 25-Year Rainfall=6.22"

Area (sf)	CN	Description
5,993	30	Woods, Good, HSG A
5,993	30	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	45	0.0300	0.08		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"

Subcatchment UC-6: NA



Summary for Pond AB-1: Attenuation Basin

Inflow Area = 7,204 sf, 0.00% Impervious, Inflow Depth > 2.42" for 25-Year event
Inflow = 1.63 cfs @ 12.18 hrs, Volume= 1,454 cf
Outflow = 0.13 cfs @ 12.70 hrs, Volume= 1,074 cf, Atten= 92%, Lag= 31.1 min
Discarded = 0.02 cfs @ 12.49 hrs, Volume= 520 cf
Primary = 0.11 cfs @ 12.70 hrs, Volume= 554 cf
Routed to Pond SP 4 : Study Point

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 50.06' @ 12.70 hrs Surf.Area= 1,088 sf Storage= 969 cf

Plug-Flow detention time= 185.1 min calculated for 1,074 cf (74% of inflow)
Center-of-Mass det. time= 133.6 min (922.4 - 788.8)

Volume	Invert	Avail.Storage	Storage Description
#1	49.00'	4,514 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

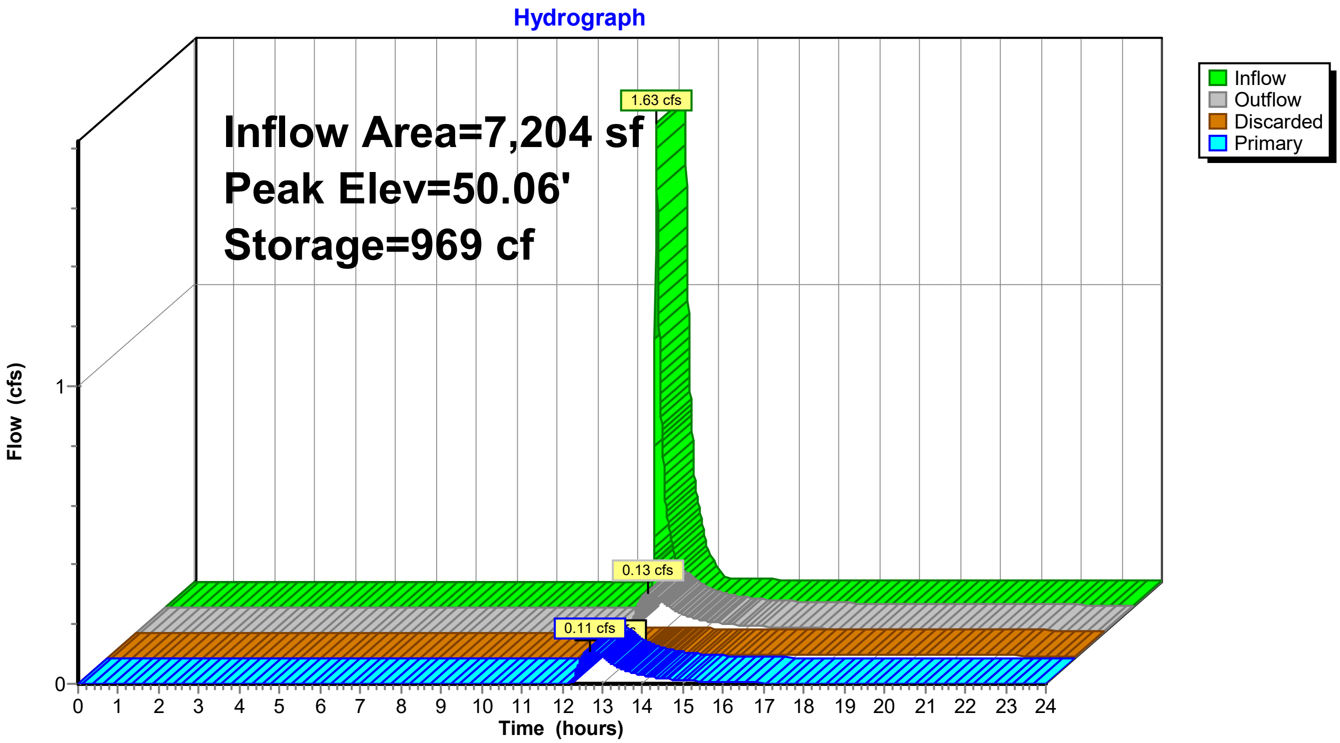
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
49.00	766	147.0	0	0	766
50.00	1,048	206.0	903	903	2,433
51.00	1,801	246.0	1,408	2,311	3,889
52.00	2,632	275.0	2,203	4,514	5,119

Device	Routing	Invert	Outlet Devices
#1	Primary	49.50'	**18.0" Round Culvert** L= 54.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 49.50' / 49.00' S= 0.0093 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	49.50'	**20.0 deg x 2.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.69 (C= 3.36)
#3	Device 1	51.75'	**28.0" x 28.0" Horiz. Bar Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	49.00'	**3.000 in/hr Exfiltration over Surface area from 49.00' - 50.00'** Excluded Surface area = 766 sf Phase-In= 0.01'

Discarded OutFlow Max=0.02 cfs @ 12.49 hrs HW=50.00' (Free Discharge)
└─**4=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.11 cfs @ 12.70 hrs HW=50.06' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.11 cfs of 1.44 cfs potential flow)
  ├─**2=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.11 cfs @ 2.02 fps)
  └─**3=Bar Grate** (Controls 0.00 cfs)

Pond AB-1: Attenuation Basin



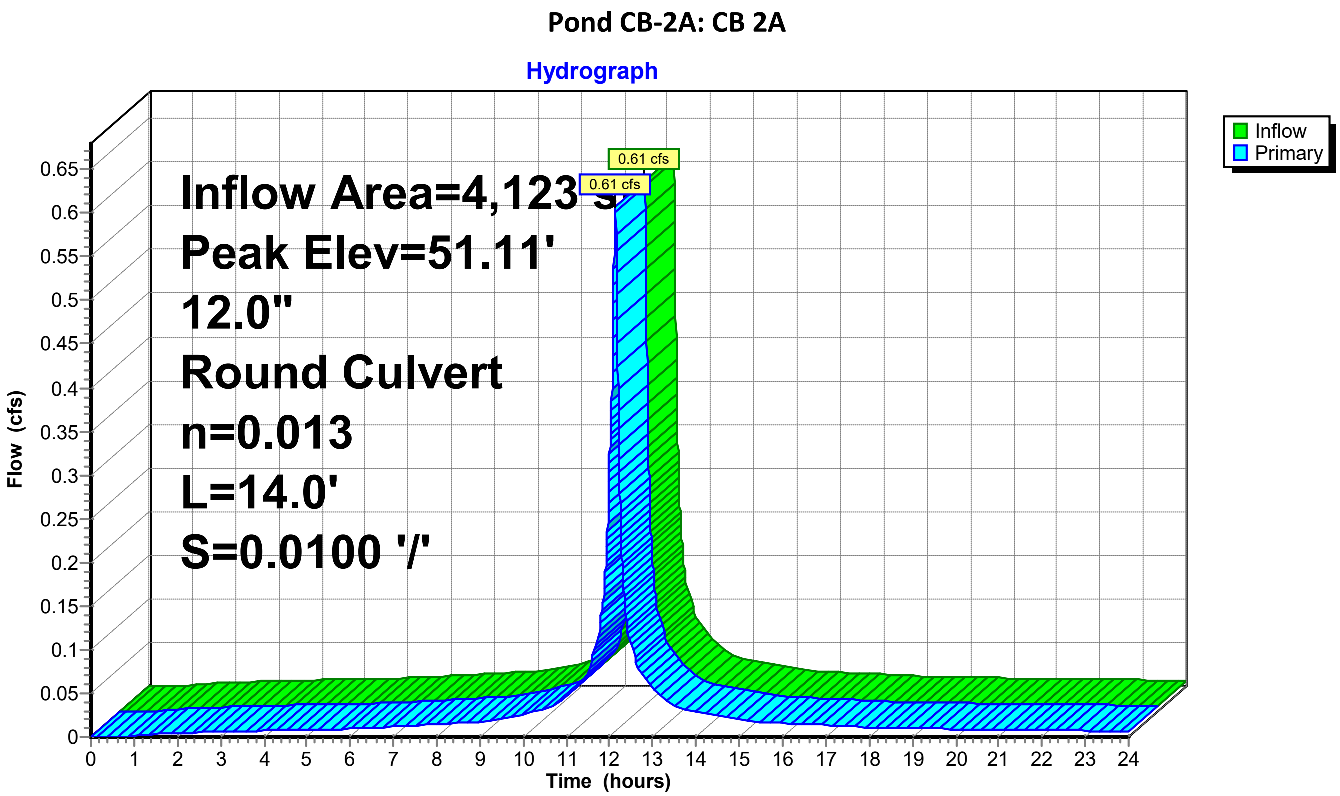
Summary for Pond CB-2A: CB 2A

Inflow Area = 4,123 sf,100.00% Impervious, Inflow Depth > 5.98" for 25-Year event
Inflow = 0.61 cfs @ 12.13 hrs, Volume= 2,053 cf
Outflow = 0.61 cfs @ 12.13 hrs, Volume= 2,053 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.61 cfs @ 12.13 hrs, Volume= 2,053 cf
Routed to Pond DMH-2.2 : DMH-2.2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.11' @ 12.16 hrs
Flood Elev= 53.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	50.53'	**12.0" Round Culvert** L= 14.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.53' / 50.39' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.61 cfs @ 12.13 hrs HW=51.07' TW=50.92' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.61 cfs @ 2.05 fps)



Summary for Pond CB-2B: CB 2B

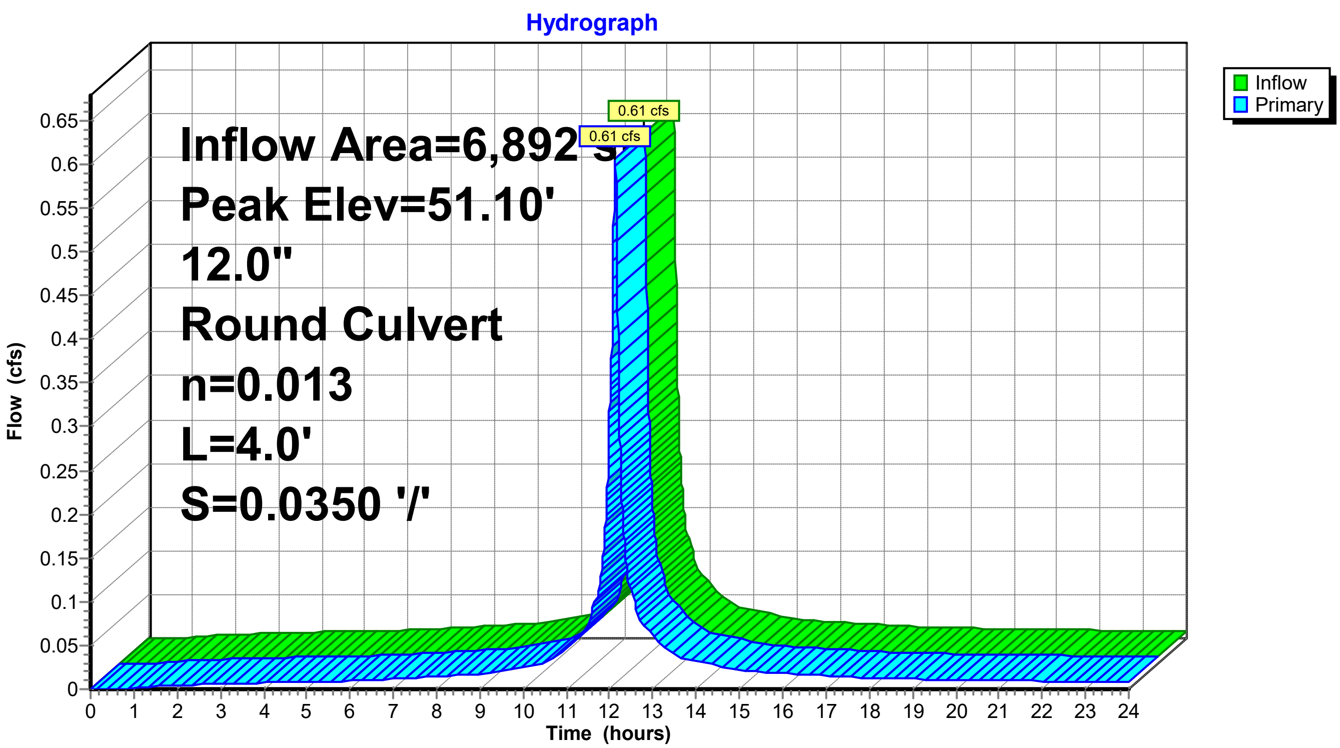
Inflow Area = 6,892 sf, 58.84% Impervious, Inflow Depth > 3.72" for 25-Year event
Inflow = 0.61 cfs @ 12.13 hrs, Volume= 2,139 cf
Outflow = 0.61 cfs @ 12.13 hrs, Volume= 2,139 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.61 cfs @ 12.13 hrs, Volume= 2,139 cf
Routed to Pond DMH-2.2 : DMH-2.2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.10' @ 12.16 hrs
Flood Elev= 53.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	50.53'	**12.0" Round Culvert** L= 4.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.53' / 50.39' S= 0.0350 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.61 cfs @ 12.13 hrs HW=51.05' TW=50.92' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.61 cfs @ 2.13 fps)

Pond CB-2B: CB 2B



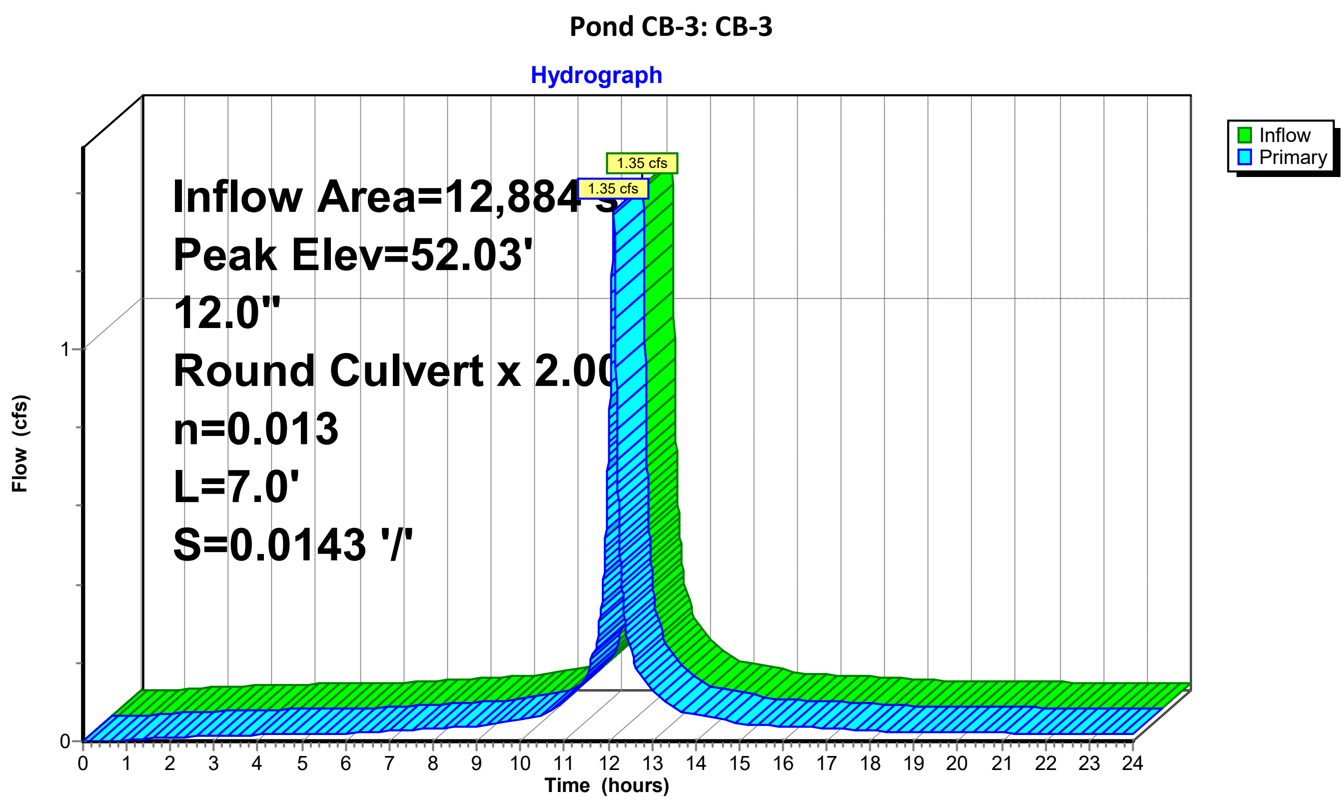
Summary for Pond CB-3: CB-3

Inflow Area = 12,884 sf, 69.58% Impervious, Inflow Depth > 4.36" for 25-Year event
Inflow = 1.35 cfs @ 12.13 hrs, Volume= 4,677 cf
Outflow = 1.35 cfs @ 12.13 hrs, Volume= 4,677 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.35 cfs @ 12.13 hrs, Volume= 4,677 cf
Routed to Pond DMH-3 : DMH-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 52.03' @ 12.13 hrs
Flood Elev= 53.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.55'	**12.0" Round Culvert X 2.00** L= 7.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 51.55' / 51.45' S= 0.0143 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.35 cfs @ 12.13 hrs HW=52.03' TW=51.74' (Dynamic Tailwater)
1=Culvert (Barrel Controls 1.35 cfs @ 2.66 fps)



Summary for Pond CB-4: CB-4

Inflow Area = 27,573 sf, 38.81% Impervious, Inflow Depth > 2.74" for 25-Year event
Inflow = 1.74 cfs @ 12.14 hrs, Volume= 6,296 cf
Outflow = 1.59 cfs @ 12.17 hrs, Volume= 6,296 cf, Atten= 9%, Lag= 1.7 min
Primary = 1.59 cfs @ 12.17 hrs, Volume= 6,296 cf
Routed to Pond DMH-9 : DMH-9 (bypass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 57.06' @ 12.17 hrs Surf.Area= 838 sf Storage= 75 cf
Flood Elev= 56.85' Surf.Area= 4 sf Storage= 0 cf

Plug-Flow detention time= 0.1 min calculated for 6,295 cf (100% of inflow)
Center-of-Mass det. time= 0.1 min (772.7 - 772.6)

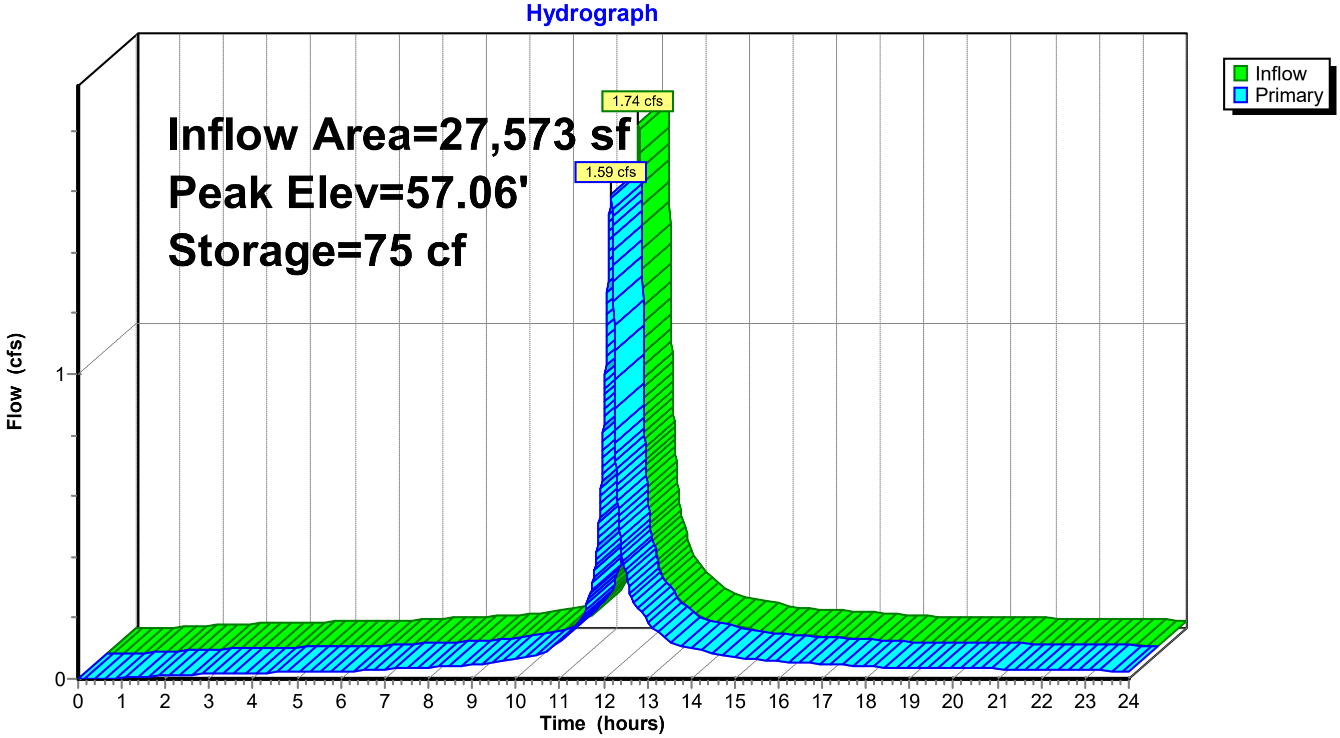
Volume	Invert	Avail.Storage	Storage Description
#1	56.85'	4,465 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
56.85	4	8.0	0	0	4
57.00	589	96.0	32	32	732
58.00	10,253	534.0	4,433	4,465	22,693

Device	Routing	Invert	Outlet Devices
#1	Primary	53.35'	**12.0" Round Culvert** L= 9.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 53.35' / 53.25' S= 0.0111 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	56.85'	**1.2" x 1.2" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 Limited to weir flow at low heads
#3	Device 1	56.85'	**1.2" x 1.2" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.59 cfs @ 12.17 hrs HW=57.06' TW=53.94' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.59 cfs of 5.89 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.80 cfs @ 2.21 fps)
  └─**3=Orifice/Grate** (Orifice Controls 0.80 cfs @ 2.21 fps)

Pond CB-4: CB-4


Hydrograph
Inflow
Primary
1.74 cfs
1.59 cfs
Inflow Area=27,573 sf
Peak Elev=57.06'
Storage=75 cf
Flow (cfs)
0
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Time (hours)

Summary for Pond CB-6A: CB-6A

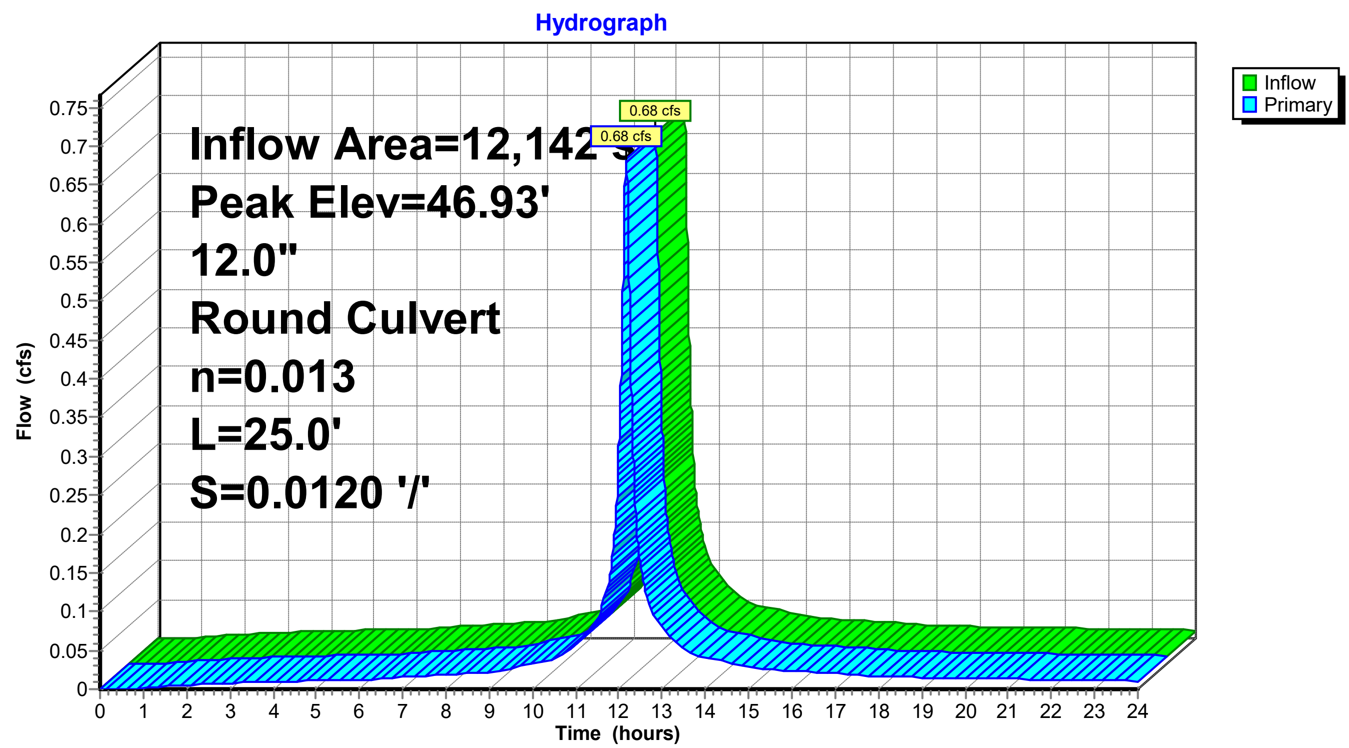
Inflow Area = 12,142 sf, 43.49% Impervious, Inflow Depth > 2.72" for 25-Year event
Inflow = 0.68 cfs @ 12.17 hrs, Volume= 2,748 cf
Outflow = 0.68 cfs @ 12.17 hrs, Volume= 2,748 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.68 cfs @ 12.17 hrs, Volume= 2,748 cf
Routed to Pond DMH-7 : DMH-7 (bypass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 46.93' @ 12.15 hrs
Flood Elev= 49.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.30'	**12.0" Round Culvert** L= 25.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.30' / 46.00' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.68 cfs @ 12.17 hrs HW=46.92' TW=46.78' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.68 cfs @ 1.91 fps)

Pond CB-6A: CB-6A



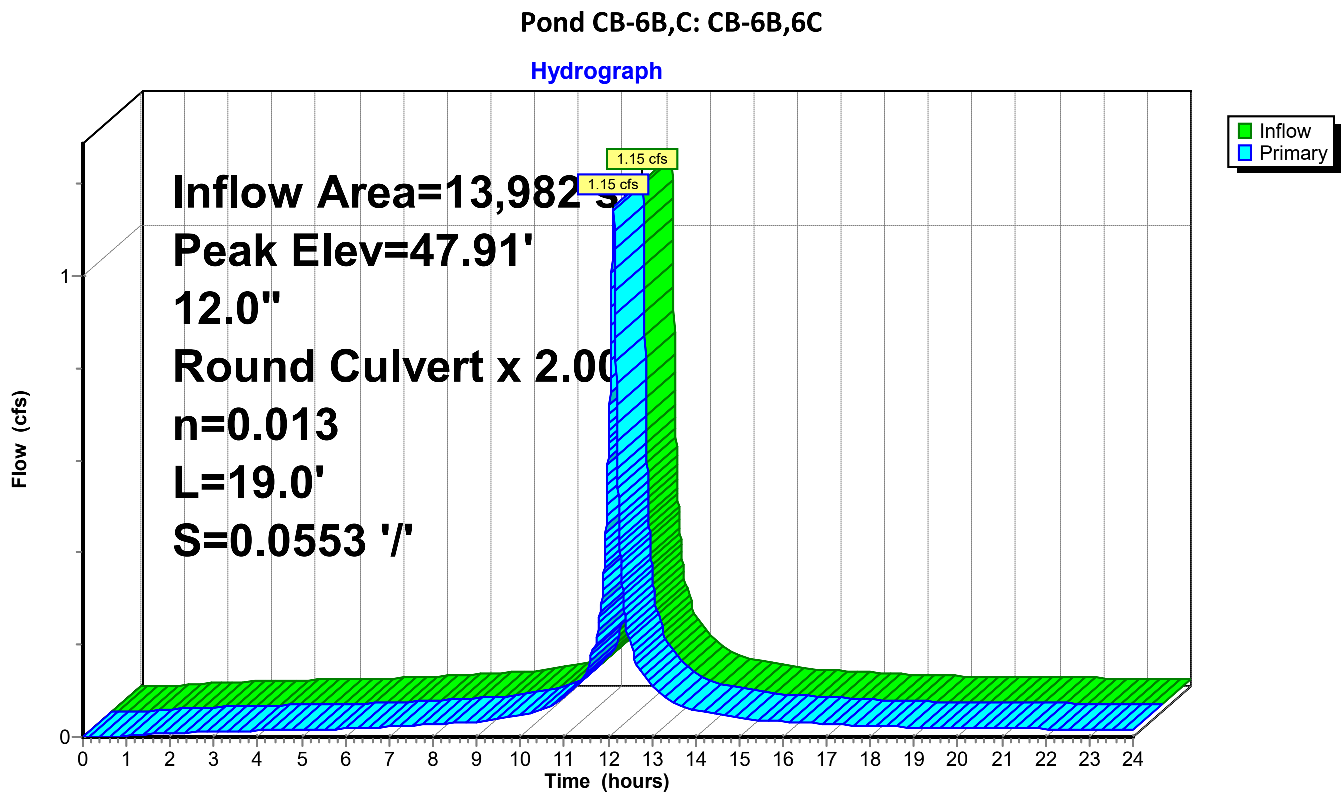
Summary for Pond CB-6B,C: CB-6B,6C

Inflow Area = 13,982 sf, 55.19% Impervious, Inflow Depth > 3.45" for 25-Year event
Inflow = 1.15 cfs @ 12.13 hrs, Volume= 4,024 cf
Outflow = 1.15 cfs @ 12.13 hrs, Volume= 4,024 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.15 cfs @ 12.13 hrs, Volume= 4,024 cf
Routed to Pond DMH-6 : DMH-6

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 47.91' @ 12.13 hrs
Flood Elev= 50.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	47.50'	**12.0" Round Culvert X 2.00** L= 19.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 47.50' / 46.45' S= 0.0553 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.15 cfs @ 12.13 hrs HW=47.91' TW=47.06' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.15 cfs @ 1.91 fps)



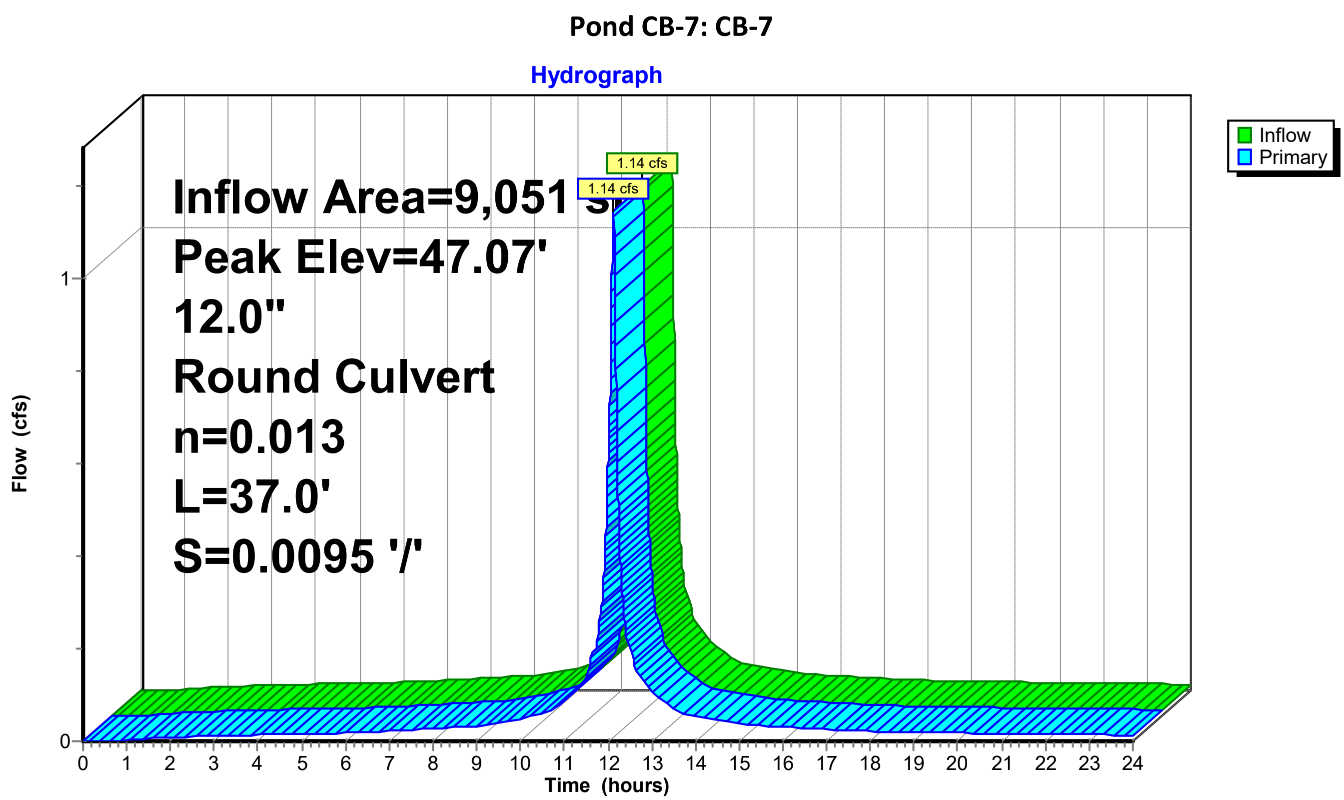
Summary for Pond CB-7: CB-7

Inflow Area = 9,051 sf, 85.55% Impervious, Inflow Depth > 5.19" for 25-Year event
Inflow = 1.14 cfs @ 12.13 hrs, Volume= 3,911 cf
Outflow = 1.14 cfs @ 12.13 hrs, Volume= 3,911 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.14 cfs @ 12.13 hrs, Volume= 3,911 cf
Routed to Pond DMH-8 : DMH-8 (bypass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 47.07' @ 12.13 hrs
Flood Elev= 49.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.40'	**12.0" Round Culvert** L= 37.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.40' / 46.05' S= 0.0095 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.14 cfs @ 12.13 hrs HW=47.07' TW=46.71' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 1.14 cfs @ 2.88 fps)



Summary for Pond DB-A: DB-A

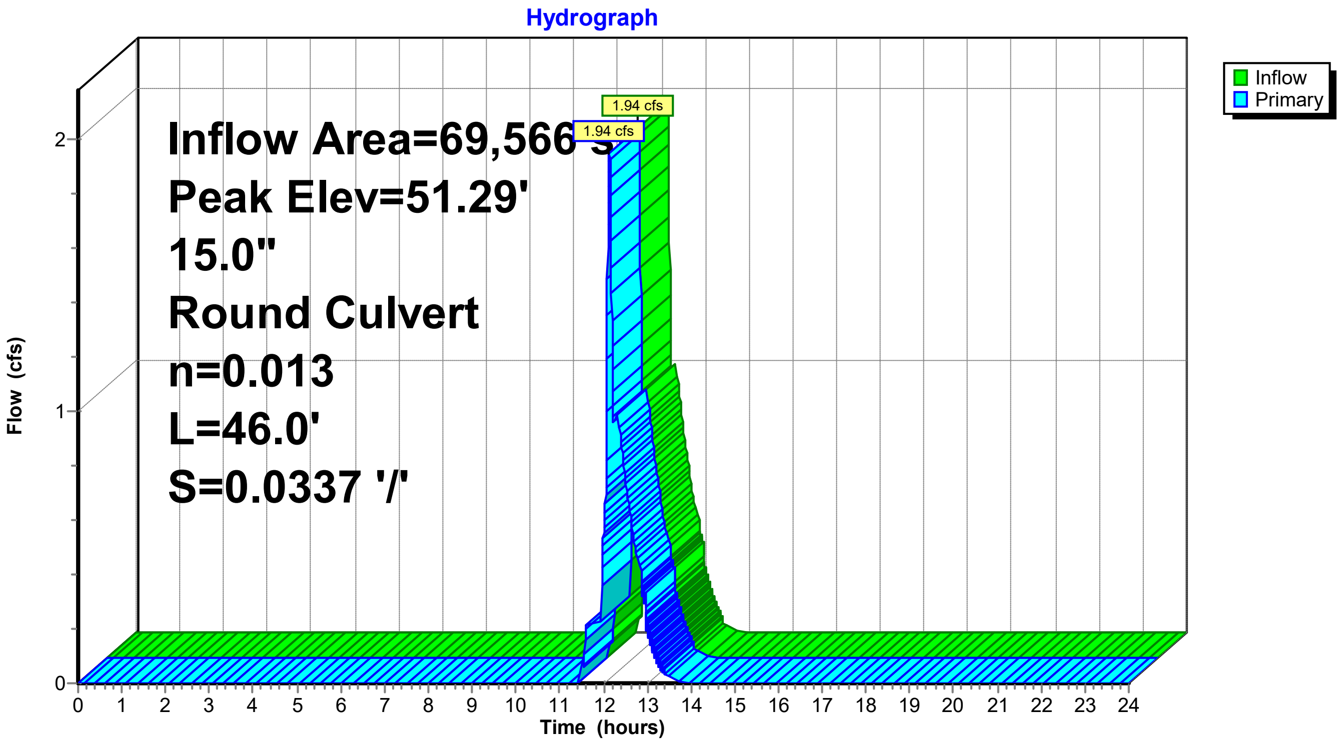
Inflow Area = 69,566 sf, 63.53% Impervious, Inflow Depth = 0.58" for 25-Year event
Inflow = 1.94 cfs @ 12.14 hrs, Volume= 3,385 cf
Outflow = 1.94 cfs @ 12.14 hrs, Volume= 3,385 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.94 cfs @ 12.14 hrs, Volume= 3,385 cf
Routed to Pond DMH-5 : DMH-5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.29' @ 12.14 hrs
Flood Elev= 54.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	50.55'	**15.0" Round Culvert** L= 46.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.55' / 49.00' S= 0.0337 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.94 cfs @ 12.14 hrs HW=51.29' TW=49.98' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.94 cfs @ 2.58 fps)

Pond DB-A: DB-A



Summary for Pond DMH-2.1: DMH-2.1 (By-Pass)

Inflow Area = 23,899 sf, 71.73% Impervious, Inflow Depth > 4.45" for 25-Year event
Inflow = 2.56 cfs @ 12.13 hrs, Volume= 8,869 cf
Outflow = 2.56 cfs @ 12.13 hrs, Volume= 8,869 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.38 cfs @ 12.13 hrs, Volume= 8,543 cf
Routed to Pond INF-1 : INF-1
Secondary = 0.78 cfs @ 12.17 hrs, Volume= 326 cf
Routed to Pond AB-1 : Attenuation Basin

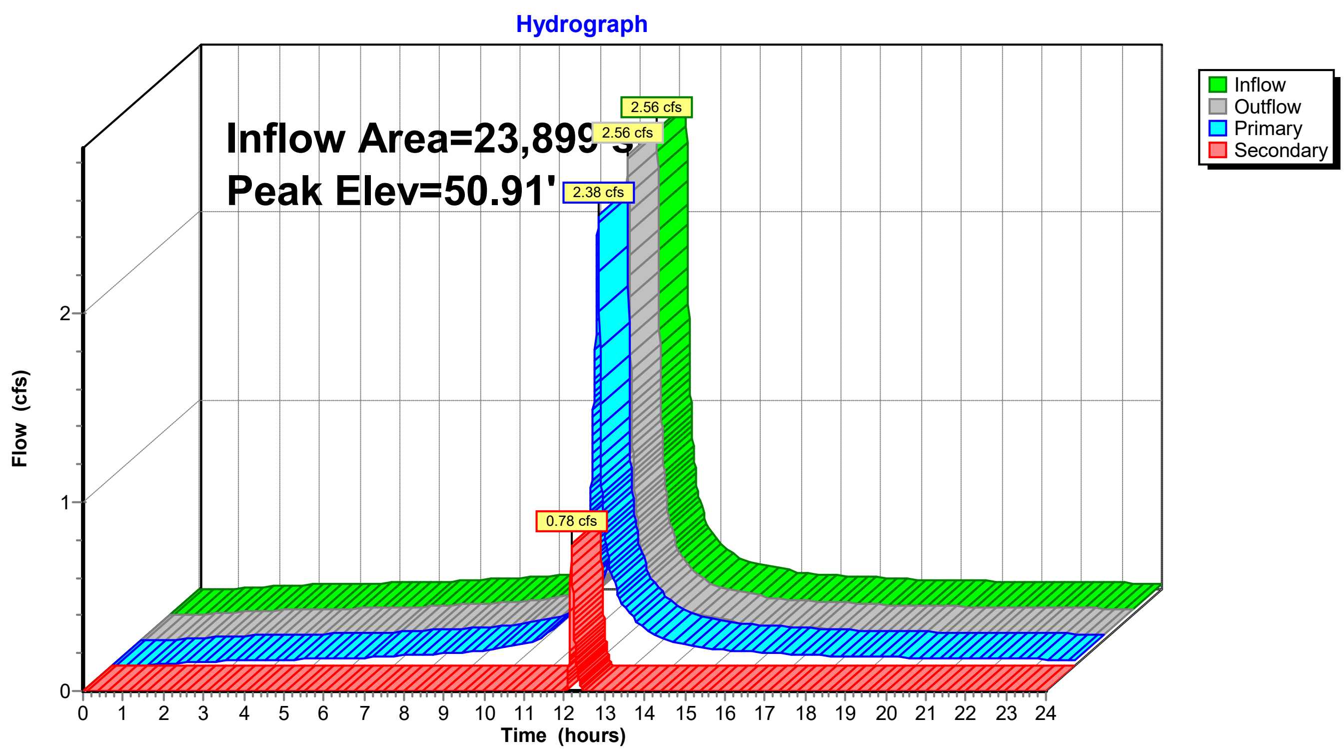
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 50.91' @ 12.17 hrs
Flood Elev= 52.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.60'	**12.0" Round OSG-1** L= 2.3' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.60' / 49.55' S= 0.0217 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	50.50'	**15.0" Round FES** L= 25.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 50.50' / 50.10' S= 0.0160 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.38 cfs @ 12.13 hrs HW=50.70' TW=50.07' (Dynamic Tailwater)
└**1=OSG-1** (Barrel Controls 2.38 cfs @ 3.45 fps)

Secondary OutFlow Max=0.78 cfs @ 12.17 hrs HW=50.91' TW=49.19' (Dynamic Tailwater)
└**2=FES** (Inlet Controls 0.78 cfs @ 2.19 fps)

Pond DMH-2.1: DMH-2.1 (By-Pass)



Summary for Pond DMH-2.2: DMH-2.2

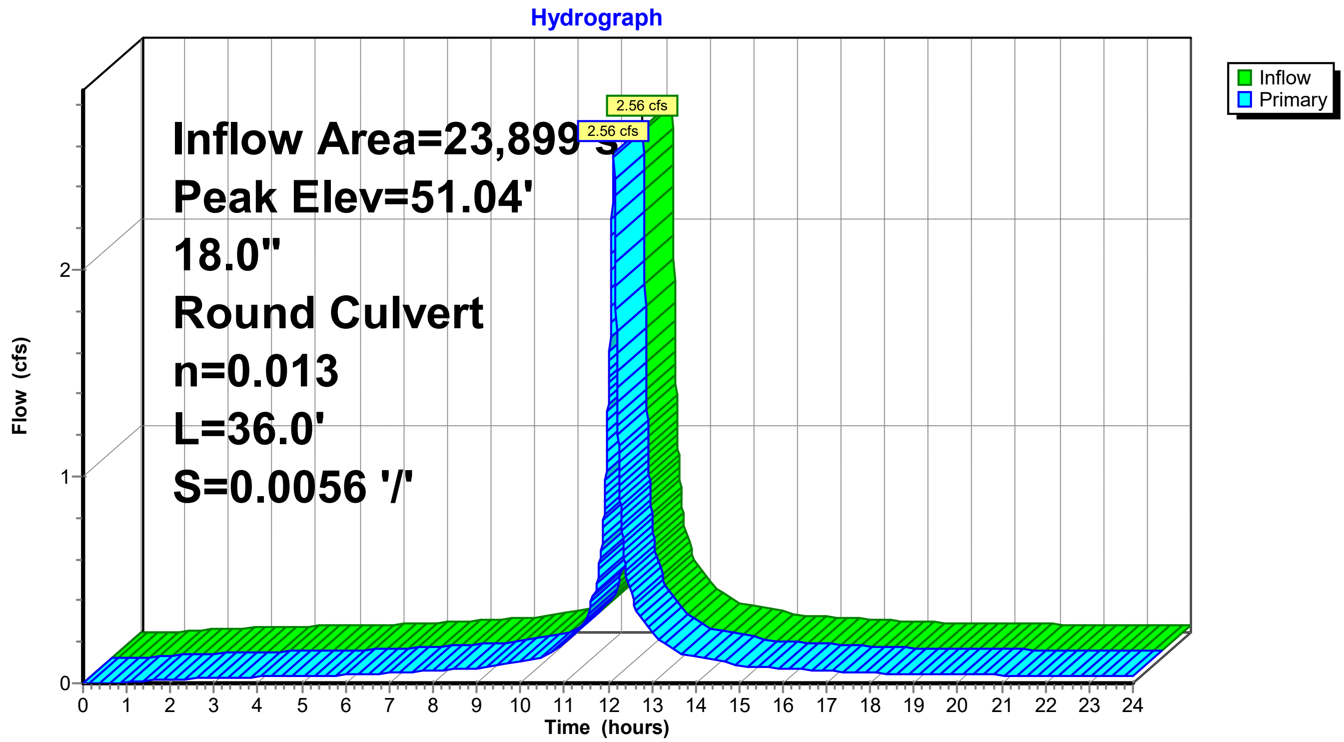
Inflow Area = 23,899 sf, 71.73% Impervious, Inflow Depth > 4.45" for 25-Year event
Inflow = 2.56 cfs @ 12.13 hrs, Volume= 8,869 cf
Outflow = 2.56 cfs @ 12.13 hrs, Volume= 8,869 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.56 cfs @ 12.13 hrs, Volume= 8,869 cf
Routed to Pond DMH-2.1 : DMH-2.1 (By-Pass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.04' @ 12.16 hrs
Flood Elev= 53.63'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.80'	**18.0" Round DMH 2.1** L= 36.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.80' / 49.60' S= 0.0056 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=2.56 cfs @ 12.13 hrs HW=50.92' TW=50.69' (Dynamic Tailwater)
1=DMH 2.1 (Outlet Controls 2.56 cfs @ 2.51 fps)

Pond DMH-2.2: DMH-2.2



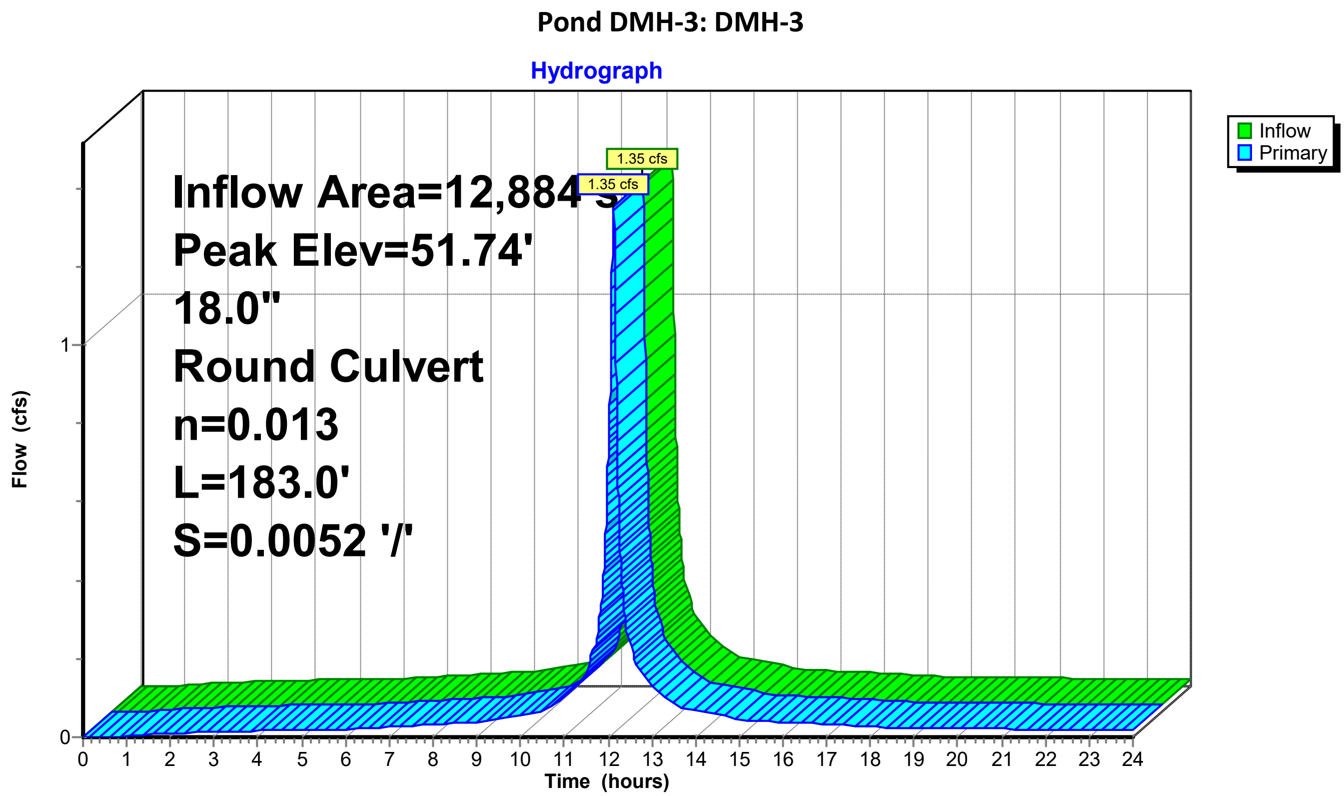
Summary for Pond DMH-3: DMH-3

Inflow Area = 12,884 sf, 69.58% Impervious, Inflow Depth > 4.36" for 25-Year event
Inflow = 1.35 cfs @ 12.13 hrs, Volume= 4,677 cf
Outflow = 1.35 cfs @ 12.13 hrs, Volume= 4,677 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.35 cfs @ 12.13 hrs, Volume= 4,677 cf
Routed to Pond DMH-2.2 : DMH-2.2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.74' @ 12.13 hrs
Flood Elev= 54.22'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.10'	**18.0" Round Culvert** L= 183.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 51.10' / 50.14' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.35 cfs @ 12.13 hrs HW=51.74' TW=50.92' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 1.35 cfs @ 2.77 fps)



Summary for Pond DMH-4: DMH-4

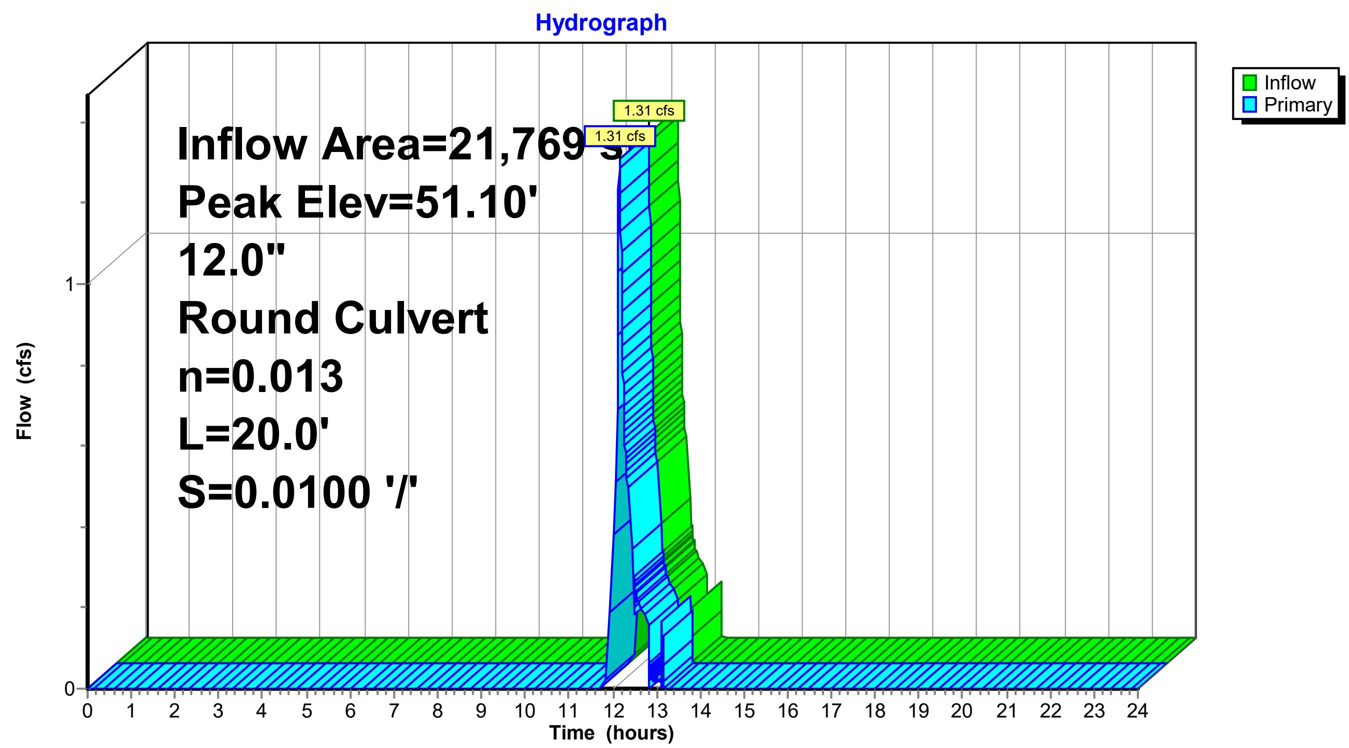
Inflow Area = 21,769 sf, 63.79% Impervious, Inflow Depth = 0.81" for 25-Year event
Inflow = 1.31 cfs @ 12.15 hrs, Volume= 1,476 cf
Outflow = 1.31 cfs @ 12.15 hrs, Volume= 1,476 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.31 cfs @ 12.15 hrs, Volume= 1,476 cf
Routed to Pond INF-2 : INF-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.10' @ 12.94 hrs
Flood Elev= 53.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.15'	**12.0" Round Culvert** L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.15' / 48.95' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.31 cfs @ 12.15 hrs HW=49.83' TW=49.06' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 1.31 cfs @ 3.21 fps)

Pond DMH-4: DMH-4



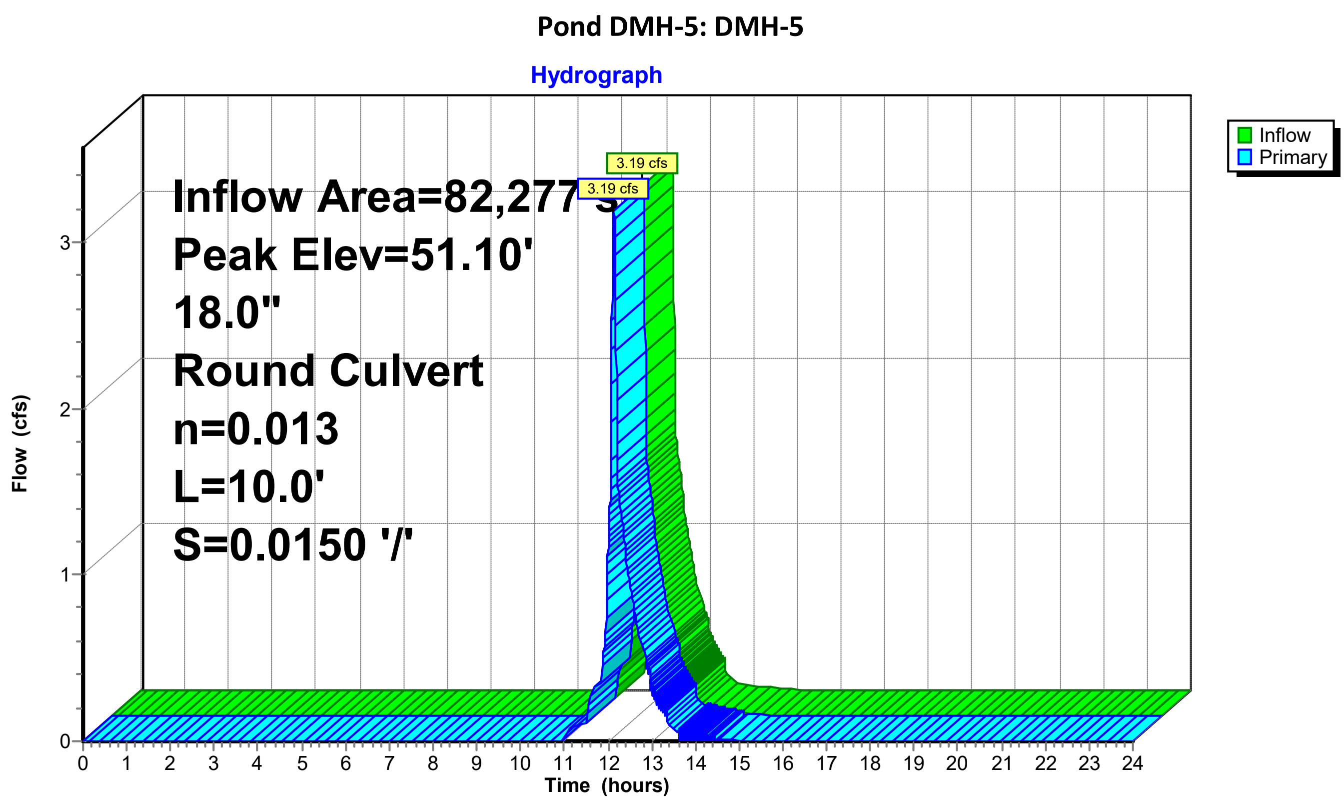
Summary for Pond DMH-5: DMH-5

Inflow Area = 82,277 sf, 64.43% Impervious, Inflow Depth = 0.79" for 25-Year event
Inflow = 3.19 cfs @ 12.14 hrs, Volume= 5,436 cf
Outflow = 3.19 cfs @ 12.14 hrs, Volume= 5,436 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.19 cfs @ 12.14 hrs, Volume= 5,436 cf
Routed to Pond INF-2 : INF-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.10' @ 12.93 hrs
Flood Elev= 54.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**18.0" Round Culvert** L= 10.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.00' / 48.85' S= 0.0150 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.18 cfs @ 12.14 hrs HW=49.98' TW=48.86' (Dynamic Tailwater)
1=Culvert (Barrel Controls 3.18 cfs @ 3.68 fps)



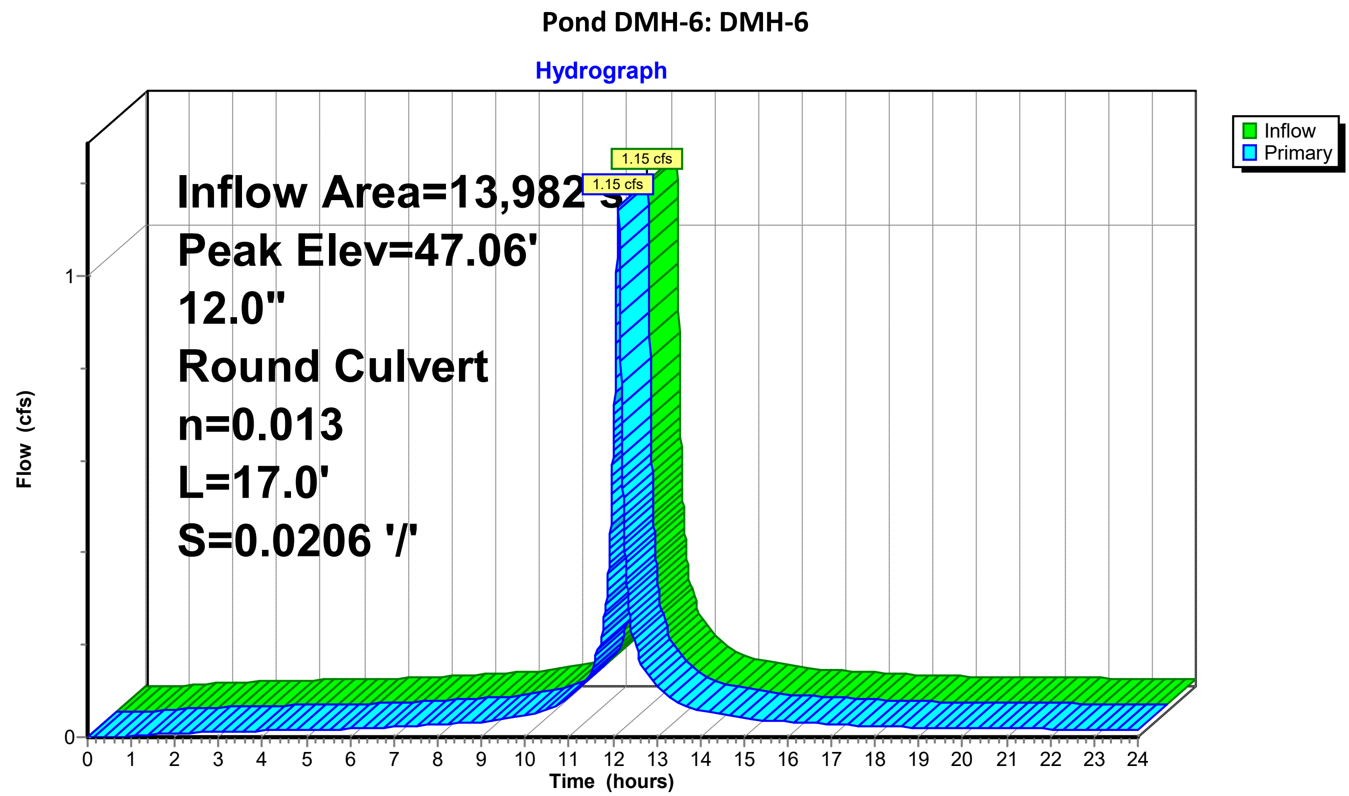
Summary for Pond DMH-6: DMH-6

Inflow Area = 13,982 sf, 55.19% Impervious, Inflow Depth > 3.45" for 25-Year event
Inflow = 1.15 cfs @ 12.13 hrs, Volume= 4,024 cf
Outflow = 1.15 cfs @ 12.13 hrs, Volume= 4,024 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.15 cfs @ 12.13 hrs, Volume= 4,024 cf
Routed to Pond DMH-7 : DMH-7 (bypass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 47.06' @ 12.13 hrs
Flood Elev= 50.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.35'	**12.0" Round Culvert** L= 17.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.35' / 46.00' S= 0.0206 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.15 cfs @ 12.13 hrs HW=47.06' TW=46.80' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 1.15 cfs @ 2.72 fps)



Summary for Pond DMH-7: DMH-7 (bypass)

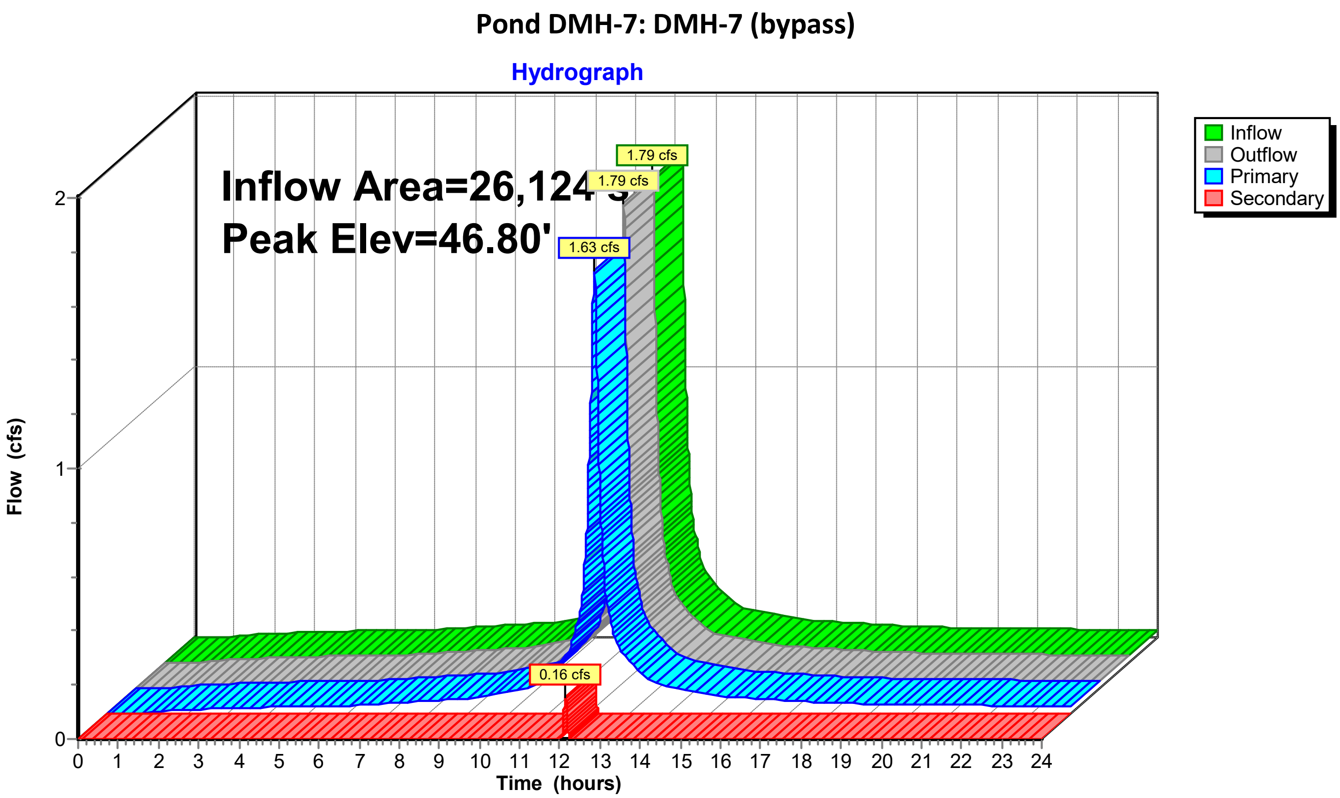
Inflow Area = 26,124 sf, 49.75% Impervious, Inflow Depth > 3.11" for 25-Year event
Inflow = 1.79 cfs @ 12.14 hrs, Volume= 6,772 cf
Outflow = 1.79 cfs @ 12.14 hrs, Volume= 6,772 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.63 cfs @ 12.14 hrs, Volume= 6,719 cf
Routed to Pond INF-3 : INF-3
Secondary = 0.16 cfs @ 12.14 hrs, Volume= 53 cf
Routed to Pond INF-3 : INF-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 46.80' @ 12.14 hrs
Flood Elev= 50.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.00'	**12.0" Round OGS-2** L= 3.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.00' / 45.90' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	46.60'	**12.0" Round By-Pass** L= 11.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.60' / 45.58' S= 0.0927 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.63 cfs @ 12.14 hrs HW=46.80' TW=44.79' (Dynamic Tailwater)
└─**1=OGS-2** (Barrel Controls 1.63 cfs @ 3.30 fps)

Secondary OutFlow Max=0.16 cfs @ 12.14 hrs HW=46.80' TW=44.79' (Dynamic Tailwater)
└─**2=By-Pass** (Inlet Controls 0.16 cfs @ 1.36 fps)



Summary for Pond DMH-8: DMH-8 (bypass)

Inflow Area = 9,051 sf, 85.55% Impervious, Inflow Depth > 5.19" for 25-Year event
Inflow = 1.14 cfs @ 12.13 hrs, Volume= 3,911 cf
Outflow = 1.14 cfs @ 12.13 hrs, Volume= 3,911 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.05 cfs @ 12.13 hrs, Volume= 3,883 cf
Routed to nonexistent node 5P
Secondary = 0.09 cfs @ 12.13 hrs, Volume= 28 cf
Routed to Pond INF-3 : INF-3

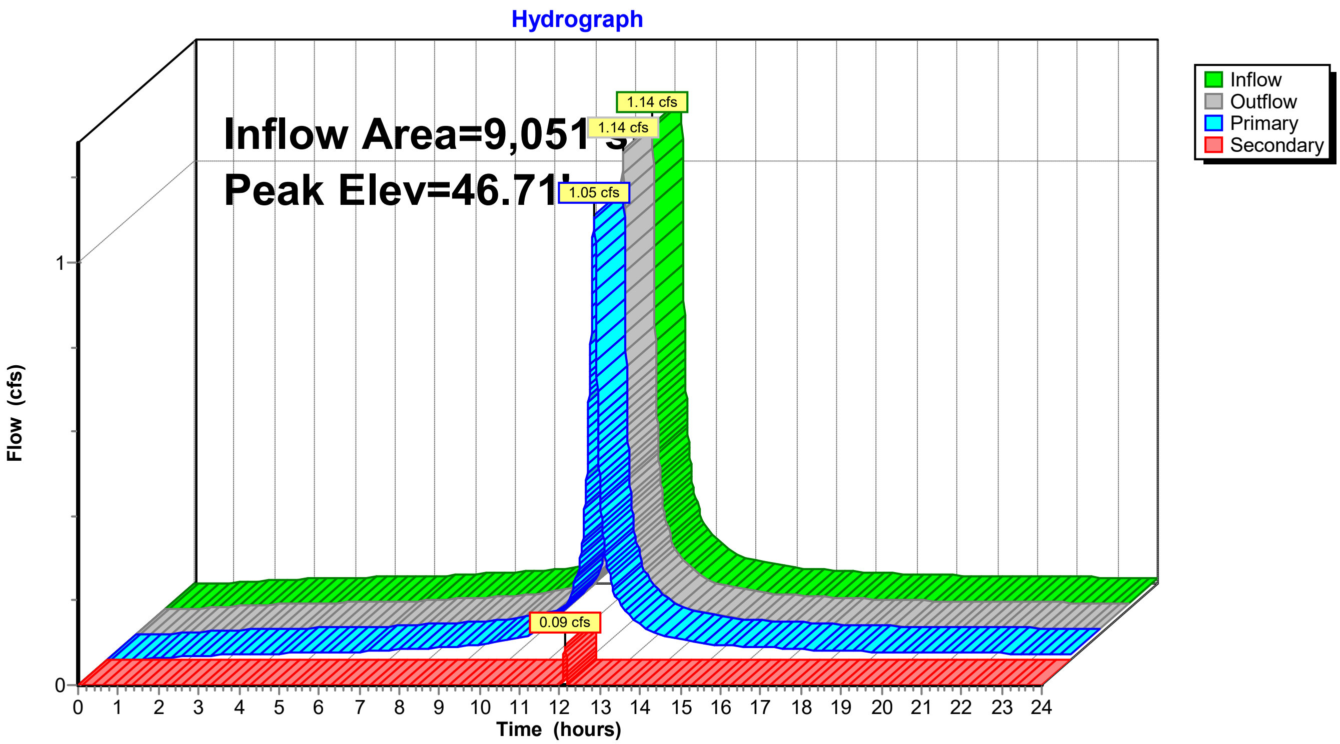
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 46.71' @ 12.13 hrs
Flood Elev= 50.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.05'	**12.0" Round OSG** L= 5.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.05' / 46.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	46.55'	**12.0" Round By-Pass** L= 13.5' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.55' / 45.58' S= 0.0719 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.05 cfs @ 12.13 hrs HW=46.71' (Free Discharge)
└**1=OSG** (Barrel Controls 1.05 cfs @ 2.72 fps)

Secondary OutFlow Max=0.09 cfs @ 12.13 hrs HW=46.71' TW=44.71' (Dynamic Tailwater)
└**2=By-Pass** (Inlet Controls 0.09 cfs @ 1.19 fps)

Pond DMH-8: DMH-8 (bypass)



Summary for Pond DMH-9: DMH-9 (bypass)

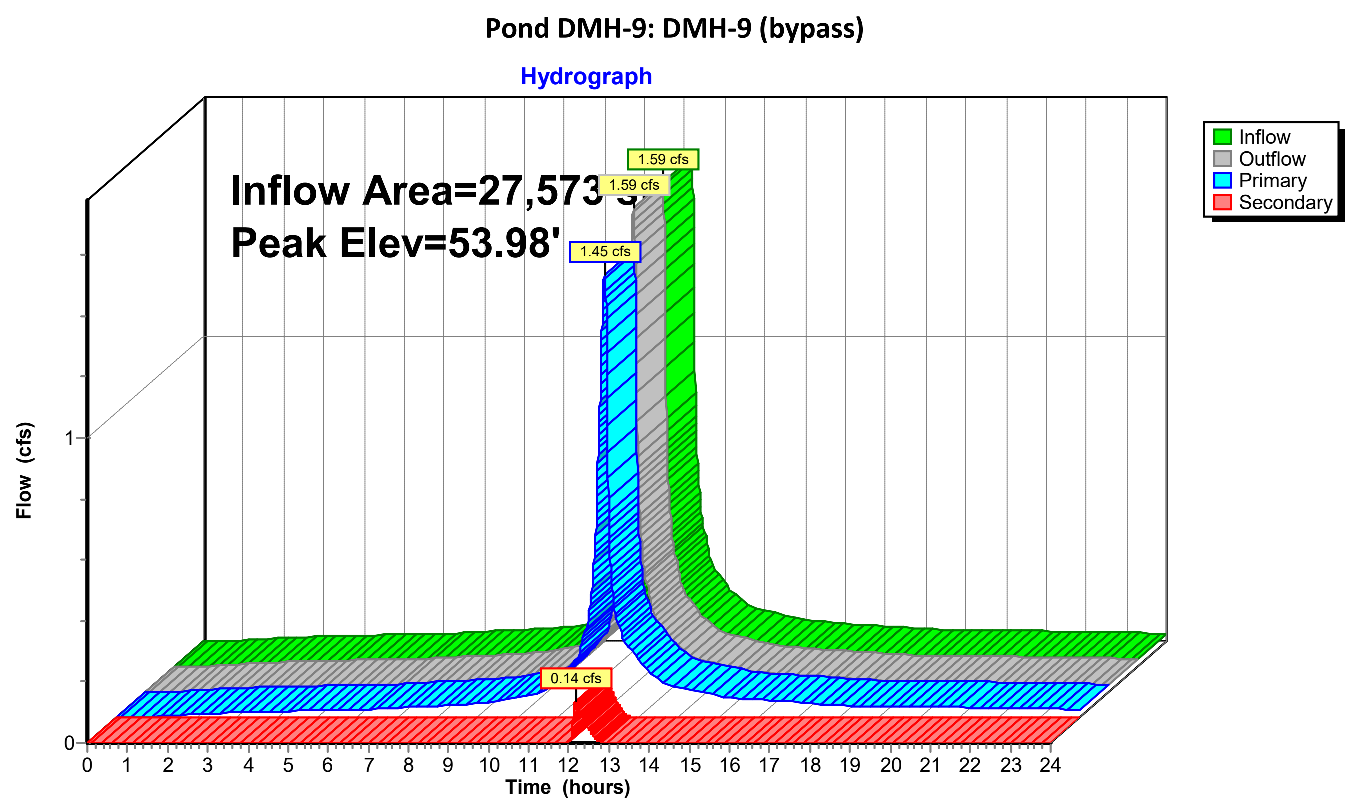
Inflow Area = 27,573 sf, 38.81% Impervious, Inflow Depth > 2.74" for 25-Year event
Inflow = 1.59 cfs @ 12.17 hrs, Volume= 6,296 cf
Outflow = 1.59 cfs @ 12.17 hrs, Volume= 6,296 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.45 cfs @ 12.17 hrs, Volume= 6,137 cf
Routed to Pond INF-4 : INF-4
Secondary = 0.14 cfs @ 12.17 hrs, Volume= 160 cf
Routed to Pond INF-4 : INF-4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 53.98' @ 12.36 hrs
Flood Elev= 57.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	53.25'	**12.0" Round OGS-4** L= 3.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 53.25' / 52.90' S= 0.1167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	53.75'	**12.0" Round By-Pass** L= 3.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 53.75' / 52.90' S= 0.2833 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.45 cfs @ 12.17 hrs HW=53.94' TW=53.17' (Dynamic Tailwater)
└**1=OGS-4** (Inlet Controls 1.45 cfs @ 2.50 fps)

Secondary OutFlow Max=0.14 cfs @ 12.17 hrs HW=53.94' TW=53.17' (Dynamic Tailwater)
└**2=By-Pass** (Inlet Controls 0.14 cfs @ 1.32 fps)



Summary for Pond DS: Dry Stream

Inflow Area = 66,509 sf, 26.96% Impervious, Inflow Depth > 2.38" for 25-Year event
Inflow = 2.82 cfs @ 12.14 hrs, Volume= 13,202 cf
Outflow = 2.67 cfs @ 12.16 hrs, Volume= 13,161 cf, Atten= 5%, Lag= 1.5 min
Discarded = 0.04 cfs @ 12.16 hrs, Volume= 1,229 cf
Primary = 2.64 cfs @ 12.16 hrs, Volume= 11,932 cf
Routed to Pond FP-7 : FP-7/INF-5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 55.04' @ 12.16 hrs Surf.Area= 546 sf Storage= 324 cf

Plug-Flow detention time= 5.4 min calculated for 13,158 cf (100% of inflow)
Center-of-Mass det. time= 3.5 min (803.0 - 799.5)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	2,359 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

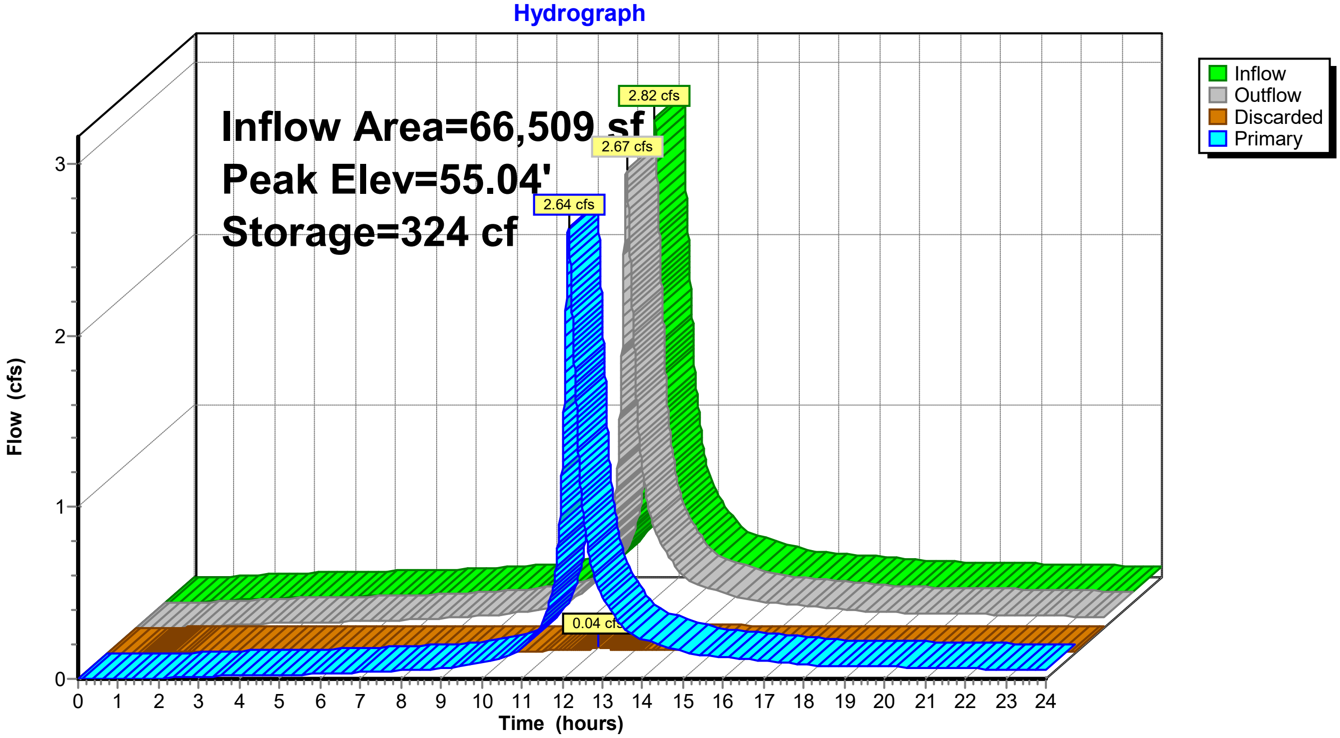
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
54.00	121	64.0	0	0	121
55.00	526	236.0	300	300	4,230
56.00	1,068	524.0	781	1,081	21,652
57.00	1,500	613.0	1,278	2,359	29,725

Device	Routing	Invert	Outlet Devices
#1	Discarded	54.00'	**3.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.10'
#2	Primary	54.15'	**15.0" Round Overflow** L= 48.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 54.15' / 53.75' S= 0.0083 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=0.04 cfs @ 12.16 hrs HW=55.04' (Free Discharge)
1=Exfiltration (Controls 0.04 cfs)

Primary OutFlow Max=2.63 cfs @ 12.16 hrs HW=55.04' TW=53.03' (Dynamic Tailwater)
2=Overflow (Barrel Controls 2.63 cfs @ 3.93 fps)

Pond DS: Dry Stream



Summary for Pond FP-1: FP-1

Inflow Area = 12,471 sf, 83.62% Impervious, Inflow Depth > 5.08" for 25-Year event
Inflow = 1.54 cfs @ 12.13 hrs, Volume= 5,279 cf
Outflow = 0.78 cfs @ 12.22 hrs, Volume= 5,279 cf, Atten= 50%, Lag= 5.6 min
Discarded = 0.24 cfs @ 12.22 hrs, Volume= 3,812 cf
Primary = 0.53 cfs @ 12.01 hrs, Volume= 1,467 cf
Routed to Pond INF-3 : INF-3
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond CB-7 : CB-7

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 50.66' @ 12.22 hrs Surf.Area= 711 sf Storage= 837 cf

Plug-Flow detention time= 33.8 min calculated for 5,278 cf (100% of inflow)
Center-of-Mass det. time= 33.7 min (782.4 - 748.7)

Volume	Invert	Avail.Storage	Storage Description
#1	47.22'	32 cf	**8.00'W x 9.00'L x 2.25'H FP (mulch/media/stone)**
			162 cf Overall x 20.0% Voids
#2	49.47'	1,648 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#3A	43.43'	168 cf	**11.87'W x 13.38'L x 4.29'H Field A**
			682 cf Overall - 262 cf Embedded = 420 cf x 40.0% Voids
#4A	43.68'	249 cf	**Ferguson R-Tank HD 2.5** x 24 Inside #3
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			24 Chambers in 6 Rows
		2,098 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
49.47	68	30.0	0	0	68
50.00	375	76.0	106	106	457
51.00	539	88.0	455	561	634
52.25	1,250	260.0	1,087	1,648	5,402

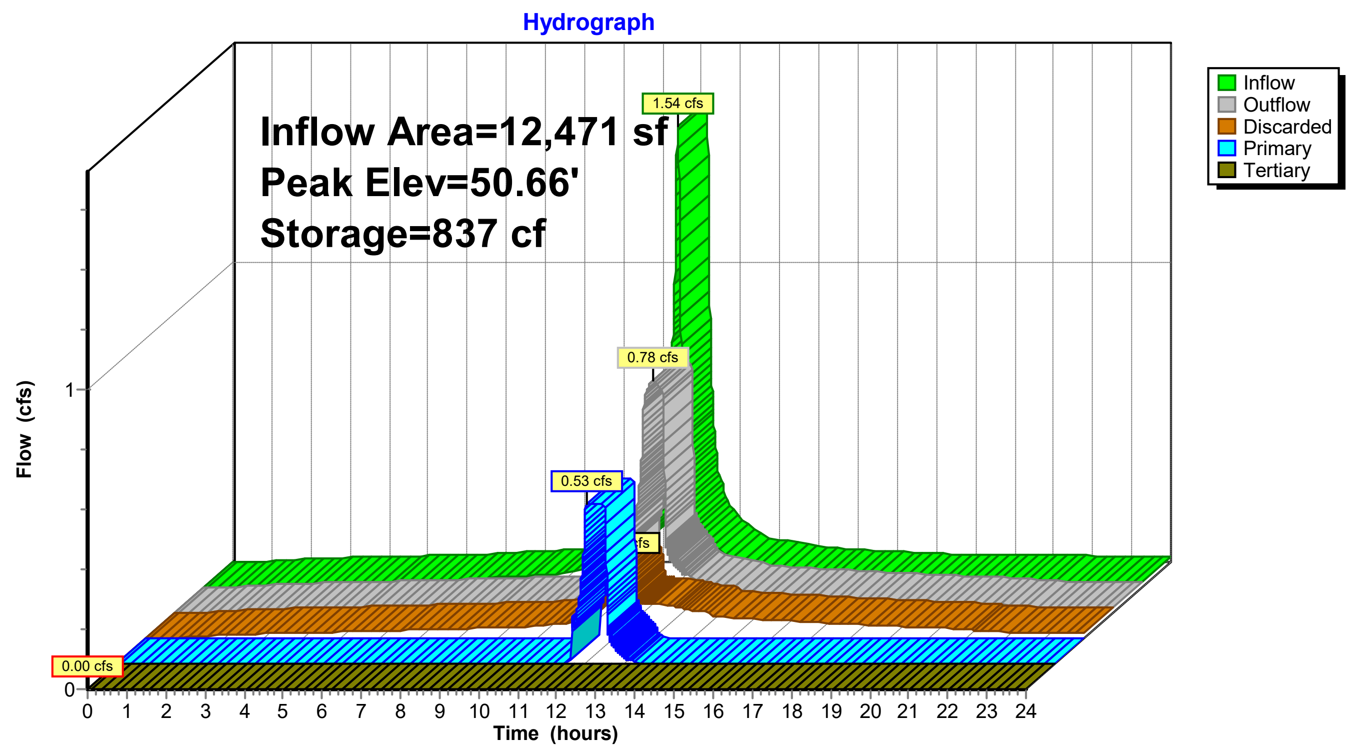
Device	Routing	Invert	Outlet Devices
#1	Primary	46.47'	**12.0" Round Culvert** L= 118.0' CPP, mitered to conform to fill, Ke= 0.700
			Inlet / Outlet Invert= 46.47' / 45.58' S= 0.0075 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	51.50'	**18.0" Horiz. Dome Grate(OF-1)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	47.22'	**100.000 in/hr Focal Point Media over Surface area from 47.22' - 49.80'**
			Excluded Surface area = 231 sf Phase-In= 0.01'
#4	Discarded	49.80'	**2.810 in/hr Bowl Exfiltration over Surface area above 49.80'**
			Excluded Surface area = 461 sf Phase-In= 0.01'
#5	Discarded	43.43'	**8.270 in/hr R Tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#6	Tertiary	52.20'	**3.5' long x 2.0' breadth BSpillway**
			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=0.24 cfs @ 12.22 hrs HW=50.66' (Free Discharge)
├─**4=Bowl Exfiltration** (Exfiltration Controls 0.02 cfs)
└─**5=R Tank Exfiltration** (Controls 0.23 cfs)

Primary OutFlow Max=0.53 cfs @ 12.01 hrs HW=49.80' TW=43.90' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.53 cfs of 4.87 cfs potential flow)
  ├─**2=Dome Grate(OF-1)** (Controls 0.00 cfs)
  └─**3=Focal Point Media** (Exfiltration Controls 0.53 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=43.43' TW=46.40' (Dynamic Tailwater)
└─**6=BSpillway** (Controls 0.00 cfs)

Pond FP-1: FP-1



Summary for Pond FP-2: FP-2

Inflow Area = 8,047 sf, 72.78% Impervious, Inflow Depth > 4.49" for 25-Year event
Inflow = 0.87 cfs @ 12.13 hrs, Volume= 3,009 cf
Outflow = 0.49 cfs @ 12.21 hrs, Volume= 3,009 cf, Atten= 43%, Lag= 4.7 min
Discarded = 0.17 cfs @ 12.21 hrs, Volume= 2,496 cf
Primary = 0.33 cfs @ 12.05 hrs, Volume= 520 cf
Routed to Pond DMH-4 : DMH-4
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond FP-1 : FP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 52.72' @ 12.21 hrs Surf.Area= 483 sf Storage= 588 cf
Flood Elev= 53.75' Surf.Area= 945 sf Storage= 1,046 cf

Plug-Flow detention time= 34.9 min calculated for 3,009 cf (100% of inflow)
Center-of-Mass det. time= 34.8 min (786.7 - 751.9)

Volume	Invert	Avail.Storage	Storage Description
#1	50.05'	25 cf	**8.00'W x 9.00'L x 1.75'H FP (mulch/media)**
			126 cf Overall x 20.0% Voids
#2	51.80'	760 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#3A	45.76'	168 cf	**11.87'W x 13.38'L x 4.29'H Field A**
			682 cf Overall - 262 cf Embedded = 420 cf x 40.0% Voids
#4A	46.01'	249 cf	**Ferguson R-Tank HD 2.5** x 24 Inside #3
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			24 Chambers in 6 Rows
		1,202 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
51.80	69	30.6	0	0	69
52.00	112	38.0	18	18	110
53.00	321	60.0	208	225	288
53.95	845	157.0	534	760	1,967

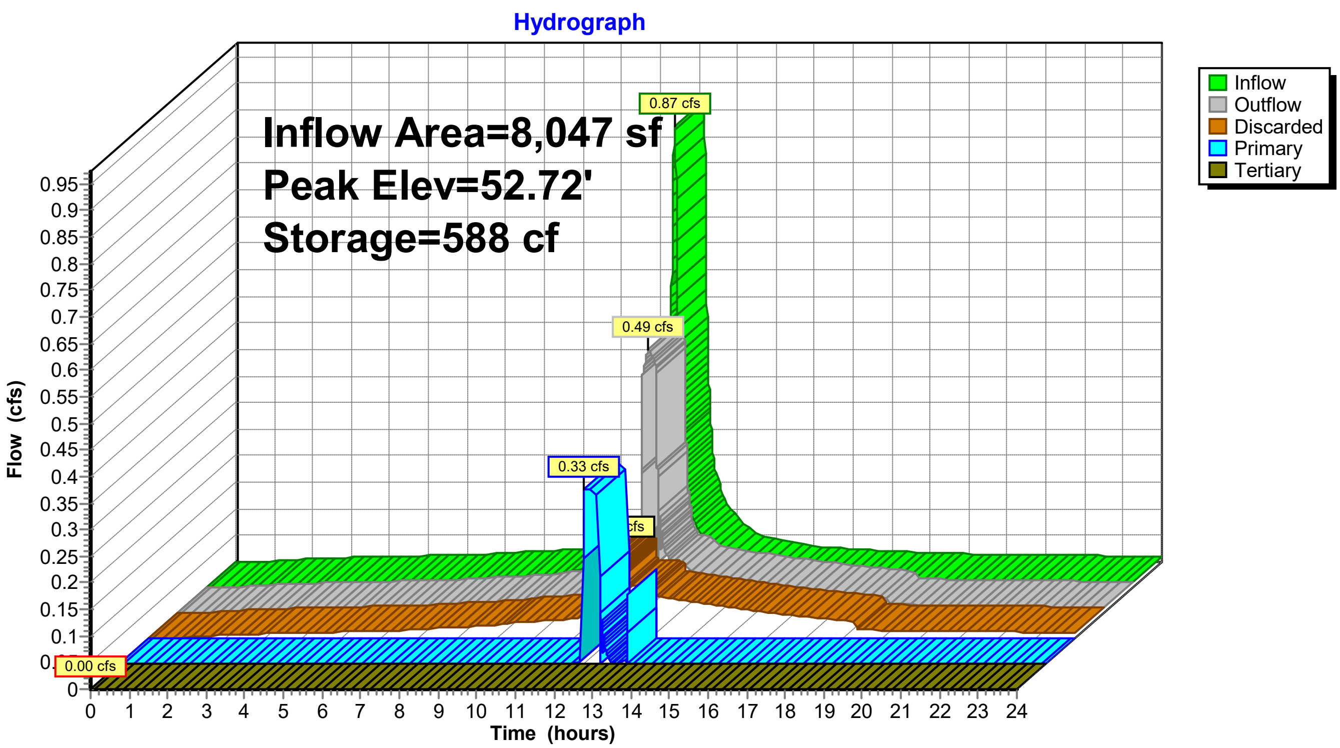
Device	Routing	Invert	Outlet Devices
#1	Primary	49.40'	**12.0" Round Overflow** L= 10.0' CPP, mitered to conform to fill, Ke= 0.700
			Inlet / Outlet Invert= 49.40' / 49.15' S= 0.0250 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	52.85'	**18.0" Horiz. Dome Grate (OF-2)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	49.55'	**100.000 in/hr Focal Point Media over Surface area from 49.55' - 51.80'**
			Excluded Surface area = 159 sf Phase-In= 0.01'
#4	Discarded	45.76'	**8.270 in/hr R Tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#5	Discarded	51.80'	**3.000 in/hr Bowl Exfiltration over Surface area above 51.80'**
			Excluded Surface area = 300 sf Phase-In= 0.01'
#6	Tertiary	53.90'	**3.5' long x 2.0' breadth Spillway**
			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=0.17 cfs @ 12.21 hrs HW=52.72' (Free Discharge)
└**4=R Tank Exfiltration** (Controls 0.15 cfs)
└**5=Bowl Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.33 cfs @ 12.05 hrs HW=51.81' TW=49.54' (Dynamic Tailwater)
└**1=Overflow** (Passes 0.33 cfs of 4.61 cfs potential flow)
  └**2=Dome Grate (OF-2)** (Controls 0.00 cfs)
  └**3=Focal Point Media** (Exfiltration Controls 0.33 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=45.76' TW=43.43' (Dynamic Tailwater)
└**6=Spillway** (Controls 0.00 cfs)

Pond FP-2: FP-2



Summary for Pond FP-3: FP-3

Inflow Area = 13,722 sf, 58.52% Impervious, Inflow Depth > 4.06" for 25-Year event
Inflow = 1.37 cfs @ 12.13 hrs, Volume= 4,645 cf
Outflow = 1.29 cfs @ 12.15 hrs, Volume= 4,645 cf, Atten= 6%, Lag= 1.4 min
Discarded = 0.31 cfs @ 12.15 hrs, Volume= 3,690 cf
Primary = 0.98 cfs @ 12.15 hrs, Volume= 955 cf
Routed to Pond DMH-4 : DMH-4
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond FP-1 : FP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 53.89' @ 12.15 hrs Surf.Area= 672 sf Storage= 800 cf
Flood Elev= 54.96' Surf.Area= 1,220 sf Storage= 1,539 cf

Plug-Flow detention time= 35.4 min calculated for 4,644 cf (100% of inflow)
Center-of-Mass det. time= 35.3 min (800.3 - 765.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	46.38'	168 cf	**11.87'W x 13.38'L x 4.29'H Field A**
			682 cf Overall - 262 cf Embedded = 420 cf x 40.0% Voids
#2A	46.63'	249 cf	**Ferguson R-Tank HD 2.5** x 24 Inside #1
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			24 Chambers in 6 Rows
#3	50.17'	34 cf	**8.00'W x 9.00'L x 2.33'H FP (mulch/media/stone)**
			168 cf Overall x 20.0% Voids
#4	52.50'	1,129 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
		1,579 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
52.50	68	30.6	0	0	68
53.00	210	58.0	66	66	262
54.00	476	104.0	334	400	861
55.00	1,015	183.0	729	1,129	2,671

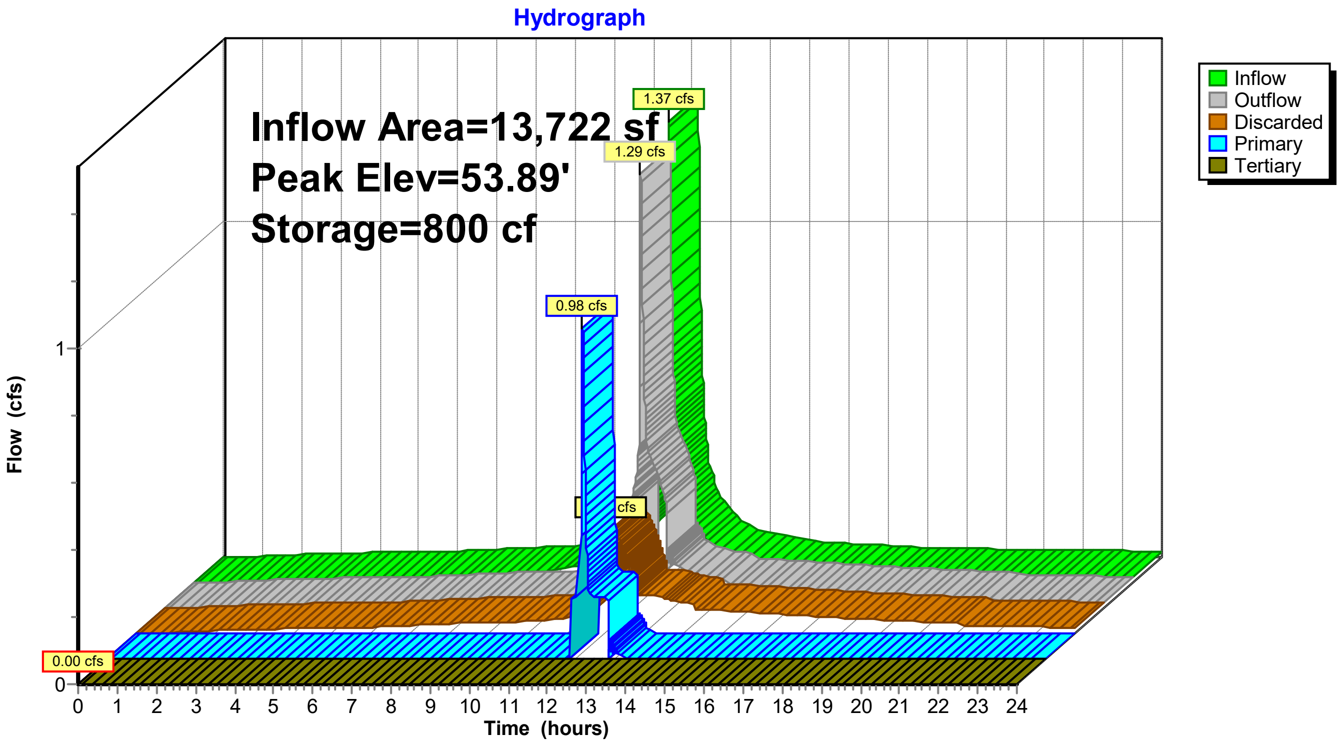
Device	Routing	Invert	Outlet Devices
#1	Primary	49.55'	**12.0" Round Culvert** L= 37.0' CPP, mitered to conform to fill, Ke= 0.700
			Inlet / Outlet Invert= 49.55' / 49.15' S= 0.0108 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	53.75'	**18.0" Horiz. Dome Grate (OF-3)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	50.22'	**100.000 in/hr Focal Point Media over Surface area from 50.22' - 52.55'**
			Excluded Surface area = 231 sf Phase-In= 0.01'
#4	Discarded	46.38'	**8.270 in/hr R tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#5	Discarded	52.80'	**3.000 in/hr Bowl Exfiltration over Wetted area above 52.80'**
			Excluded Wetted area = 697 sf Phase-In= 0.01'
#6	Tertiary	54.90'	**3.0' 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=0.31 cfs @ 12.15 hrs HW=53.89' (Free Discharge)
└**4=R tank Exfiltration** (Controls 0.27 cfs)
└**5=Bowl Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.98 cfs @ 12.15 hrs HW=53.89' TW=49.83' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.98 cfs of 6.54 cfs potential flow)
  └**2=Dome Grate (OF-3)** (Weir Controls 0.80 cfs @ 1.22 fps)
  └**3=Focal Point Media** (Exfiltration Controls 0.18 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.38' TW=43.43' (Dynamic Tailwater)
└**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond FP-3: FP-3



Summary for Pond FP-4: FP-4

Inflow Area = 12,711 sf, 69.37% Impervious, Inflow Depth > 4.28" for 25-Year event
Inflow = 1.31 cfs @ 12.13 hrs, Volume= 4,535 cf
Outflow = 1.30 cfs @ 12.13 hrs, Volume= 4,535 cf, Atten= 0%, Lag= 0.3 min
Discarded = 0.06 cfs @ 12.13 hrs, Volume= 2,484 cf
Primary = 1.24 cfs @ 12.13 hrs, Volume= 2,051 cf
Routed to Pond DMH-5 : DMH-5
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond CB-6B,C : CB-6B,6C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 53.43' @ 12.13 hrs Surf.Area= 332 sf Storage= 369 cf
Flood Elev= 54.25' Surf.Area= 543 sf Storage= 574 cf

Plug-Flow detention time= 33.3 min calculated for 4,534 cf (100% of inflow)
Center-of-Mass det. time= 33.3 min (785.6 - 752.3)

Volume	Invert	Avail.Storage	Storage Description
#1	52.50'	303 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#2	50.75'	17 cf	**6.00'W x 8.00'L x 1.75'H FP (mulch/media)** 84 cf Overall x 20.0% Voids
#3A	46.88'	155 cf	**Ferguson R-Tank HD 2.5** x 15 Inside #4 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 15 Chambers in 5 Rows
#4A	46.63'	98 cf	**10.56'W x 9.04'L x 4.29'H Field A** 410 cf Overall - 164 cf Embedded = 246 cf x 40.0% Voids
		574 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
52.50	45	24.5	0	0	45
53.00	106	37.0	37	37	108
54.00	338	76.0	211	248	463
54.15	400	80.0	55	303	514

Device	Routing	Invert	Outlet Devices
#1	Primary	49.42'	**12.0" Round Culvert** L= 26.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.42' / 49.15' S= 0.0104 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	53.25'	**18.0" Horiz. Dome Grate (OF-4)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	47.74'	**100.000 in/hr Focal Point Media over Surface area from 47.74' - 51.50'** Excluded Surface area = 95 sf Phase-In= 0.01'
#4	Discarded	46.63'	**8.700 in/hr R Tank Exfiltration over Wetted area from 45.13' - 48.92'** Conductivity to Groundwater Elevation = 10.00' Excluded Wetted area = 0 sf Phase-In= 0.01'
#5	Discarded	51.50'	**3.000 in/hr Bowl Exfiltration over Wetted area above 51.50'** Conductivity to Groundwater Elevation = 10.00' Excluded Wetted area = 333 sf Phase-In= 0.01'
#6	Tertiary	54.10'	**3.5' long x 2.5' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00

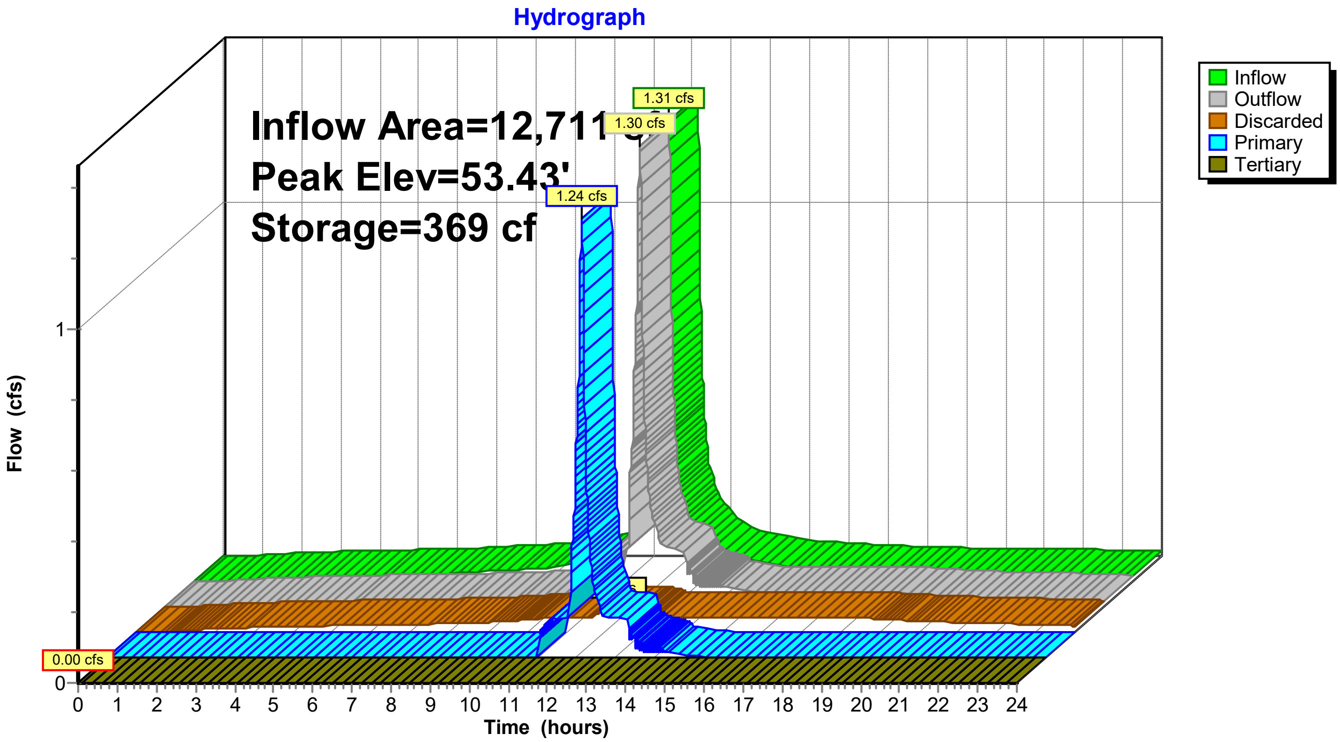
Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74 2.76 2.89 3.05 3.19 3.32

Discarded OutFlow Max=0.06 cfs @ 12.13 hrs HW=53.43' (Free Discharge)
4=R Tank Exfiltration (Controls 0.04 cfs)
5=Bowl Exfiltration (Controls 0.02 cfs)

Primary OutFlow Max=1.24 cfs @ 12.13 hrs HW=53.43' TW=49.98' (Dynamic Tailwater)
1=Culvert (Passes 1.24 cfs of 6.19 cfs potential flow)
2=Dome Grate (OF-4) (Weir Controls 1.13 cfs @ 1.37 fps)
3=Focal Point Media (Exfiltration Controls 0.11 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.63' TW=47.50' (Dynamic Tailwater)
6=Spillway (Controls 0.00 cfs)

Pond FP-4: FP-4



Summary for Pond FP-5: FP-5

Inflow Area = 9,281 sf, 84.56% Impervious, Inflow Depth > 5.13" for 25-Year event
Inflow = 1.16 cfs @ 12.13 hrs, Volume= 3,967 cf
Outflow = 1.15 cfs @ 12.14 hrs, Volume= 3,966 cf, Atten= 1%, Lag= 0.6 min
Discarded = 0.21 cfs @ 12.14 hrs, Volume= 2,942 cf
Primary = 0.94 cfs @ 12.14 hrs, Volume= 1,025 cf
Routed to Pond DB-A : DB-A
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond FP-4 : FP-4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 55.34' @ 12.14 hrs Surf.Area= 472 sf Storage= 546 cf
Flood Elev= 57.00' Surf.Area= 606 sf Storage= 921 cf

Plug-Flow detention time= 30.9 min calculated for 3,966 cf (100% of inflow)
Center-of-Mass det. time= 30.8 min (779.1 - 748.3)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	614 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#2	52.25'	17 cf	**6.00'W x 8.00'L x 1.75'H FP (mulch/media)**
			84 cf Overall x 20.0% Voids
#3A	47.96'	135 cf	**10.56'W x 11.04'L x 4.29'H Field A**
			500 cf Overall - 164 cf Embedded = 337 cf x 40.0% Voids
#4A	48.21'	155 cf	**Ferguson R-Tank HD 2.5** x 15 Inside #3
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			15 Chambers in 5 Rows
		921 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
54.00	45	24.5	0	0	45
55.00	267	76.7	141	141	468
56.35	441	85.7	473	614	628

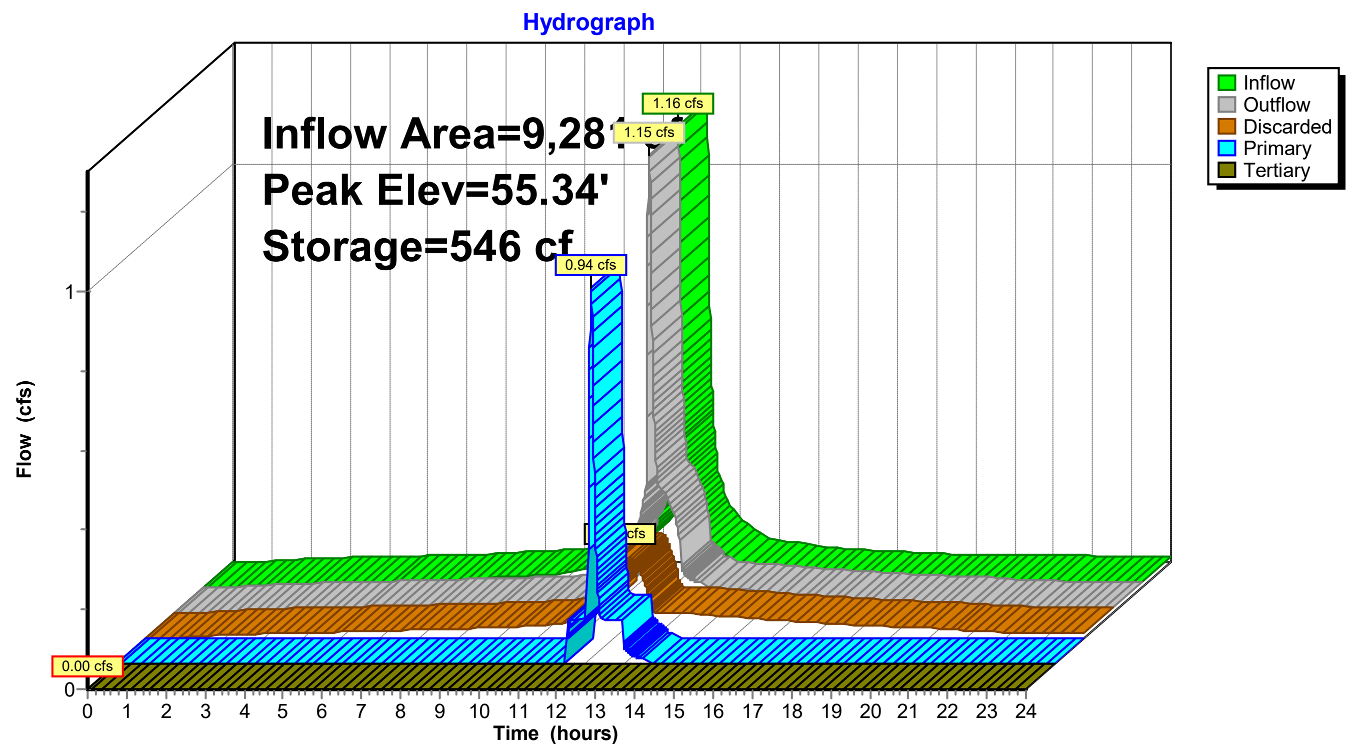
Device	Routing	Invert	Outlet Devices
#1	Primary	50.67'	**12.0" Round Culvert** L= 4.0' CPP, mitered to conform to fill, Ke= 0.700
			Inlet / Outlet Invert= 50.67' / 50.55' S= 0.0300 '/' Cc= 0.900
			n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	55.20'	**18.0" Horiz. Dome Grate (OF-5)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	50.55'	**100.000 in/hr Focal Point Media over Surface area from 50.55' - 52.55'**
			Excluded Surface area = 117 sf Phase-In= 0.01'
#4	Discarded	47.96'	**8.270 in/hr R-Tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#5	Discarded	52.80'	**3.000 in/hr Bowl Exfiltration over Surface area above 52.80'**
			Excluded Surface area = 165 sf Phase-In= 0.01'
#6	Tertiary	56.33'	**3.5' long x 2.5' breadth Spillway**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00
			Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74 2.76 2.89 3.05 3.19 3.32

Discarded OutFlow Max=0.21 cfs @ 12.14 hrs HW=55.34' (Free Discharge)
└**4=R-Tank Exfiltration** (Controls 0.19 cfs)
└**5=Bowl Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.94 cfs @ 12.14 hrs HW=55.34' TW=51.29' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.94 cfs of 6.72 cfs potential flow)
  └**2=Dome Grate (OF-5)** (Weir Controls 0.83 cfs @ 1.24 fps)
  └**3=Focal Point Media** (Exfiltration Controls 0.11 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=47.96' TW=46.63' (Dynamic Tailwater)
└**6=Spillway** (Controls 0.00 cfs)

Pond FP-5: FP-5



Summary for Pond FP-6: FP-6

Inflow Area = 14,693 sf, 51.93% Impervious, Inflow Depth > 3.31" for 25-Year event
Inflow = 1.14 cfs @ 12.13 hrs, Volume= 4,050 cf
Outflow = 1.14 cfs @ 12.14 hrs, Volume= 4,049 cf, Atten= 0%, Lag= 0.4 min
Discarded = 0.13 cfs @ 12.14 hrs, Volume= 2,812 cf
Primary = 1.00 cfs @ 12.14 hrs, Volume= 1,237 cf
Routed to Pond OF-6 : OF-6
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond FP-5 : FP-5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 55.55' @ 12.14 hrs Surf.Area= 360 sf Storage= 393 cf

Plug-Flow detention time= 30.6 min calculated for 4,049 cf (100% of inflow)
Center-of-Mass det. time= 30.6 min (790.1 - 759.5)

Volume	Invert	Avail.Storage	Storage Description
#1	54.92'	857 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#2	53.17'	17 cf	**6.00'W x 8.00'L x 1.75'H FP (mulch/media)** 84 cf Overall x 20.0% Voids
#3A	48.88'	135 cf	**10.56'W x 11.04'L x 4.29'H Field A** 500 cf Overall - 164 cf Embedded = 337 cf x 40.0% Voids
#4A	49.13'	155 cf	**Ferguson R-Tank HD 2.5** x 15 Inside #3 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 15 Chambers in 5 Rows
		1,164 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
54.92	86	36.0	0	0	86
56.00	300	65.0	197	197	325
57.00	511	79.0	401	598	501
57.50	525	82.0	259	857	557

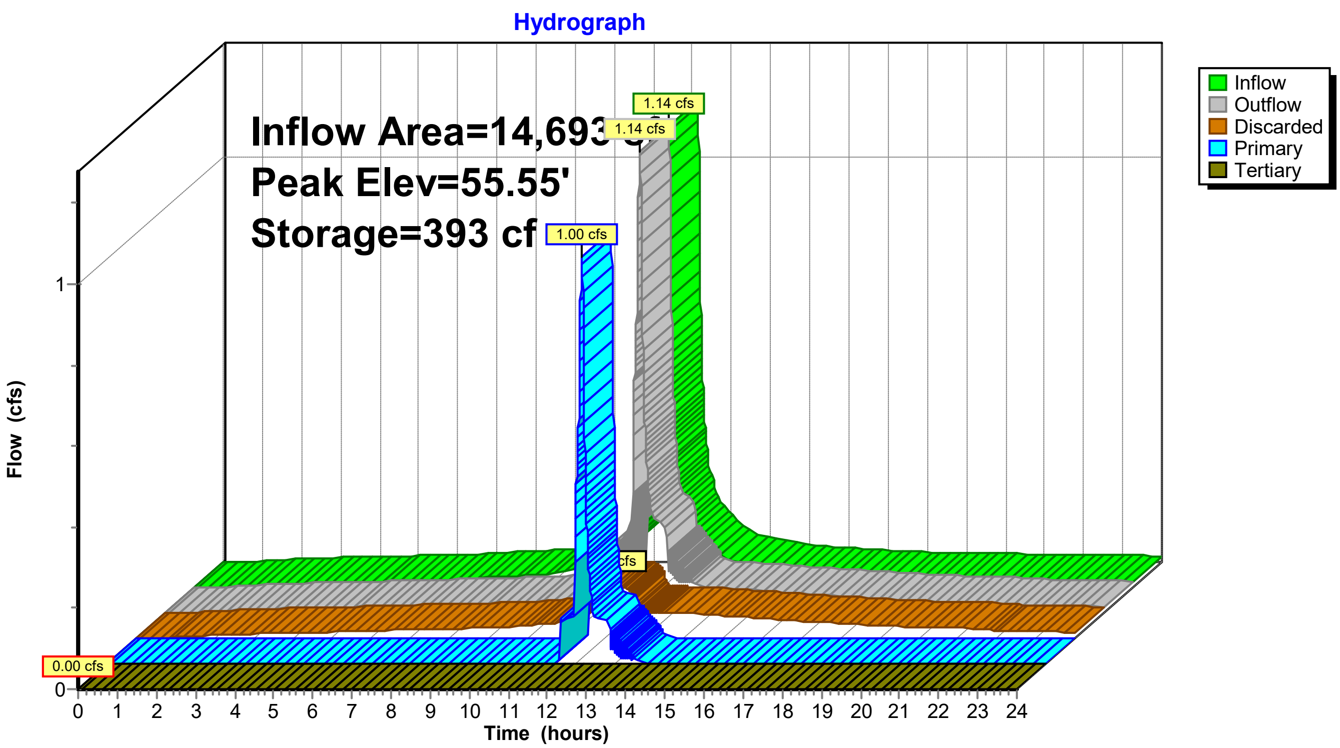
Device	Routing	Invert	Outlet Devices
#1	Primary	51.59'	**12.0" Round Culvert** L= 6.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 51.59' / 51.50' S= 0.0150 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	55.40'	**18.0" Horiz. Dome Grate (OF-6)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	52.67'	**100.000 in/hr Focal Point Media over Surface area from 52.67' - 54.67'** Excluded Surface area = 117 sf Phase-In= 0.01'
#4	Discarded	48.88'	**8.270 in/hr R-Tank Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#5	Discarded	54.92'	**3.000 in/hr Bowl Exfiltration over Wetted area above 54.92'** Excluded Wetted area = 485 sf Phase-In= 0.01'
#6	Tertiary	57.38'	**3.5' long x 2.0' breadth Spillway** 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=0.13 cfs @ 12.14 hrs HW=55.55' (Free Discharge)
└**4=R-Tank Exfiltration** (Controls 0.13 cfs)
└**5=Bowl Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=1.00 cfs @ 12.14 hrs HW=55.55' TW=51.96' (Dynamic Tailwater)
└**1=Culvert** (Passes 1.00 cfs of 6.21 cfs potential flow)
  └**2=Dome Grate (OF-6)** (Weir Controls 0.89 cfs @ 1.26 fps)
  └**3=Focal Point Media** (Exfiltration Controls 0.11 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=48.88' TW=47.96' (Dynamic Tailwater)
└**6=Spillway** (Controls 0.00 cfs)

Pond FP-6: FP-6



Summary for Pond FP-7: FP-7/INF-5

Inflow Area = 74,145 sf, 24.19% Impervious, Inflow Depth > 1.98" for 25-Year event
Inflow = 2.67 cfs @ 12.16 hrs, Volume= 12,256 cf
Outflow = 0.88 cfs @ 12.58 hrs, Volume= 12,255 cf, Atten= 67%, Lag= 25.2 min
Discarded = 0.88 cfs @ 12.58 hrs, Volume= 12,255 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond DMH-3 : DMH-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 54.30' @ 12.58 hrs Surf.Area= 3,791 sf Storage= 3,335 cf
Flood Elev= 57.18' Surf.Area= 2,830 sf Storage= 16,463 cf

Plug-Flow detention time= 67.2 min calculated for 12,251 cf (100% of inflow)
Center-of-Mass det. time= 67.1 min (877.4 - 810.3)

Volume	Invert	Avail.Storage	Storage Description
#1	51.90'	14,781 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#2	50.15'	17 cf	**8.00'W x 6.00'L x 1.75'H Media/Mulch**
			84 cf Overall x 20.0% Voids
#3A	45.86'	422 cf	**17.12'W x 32.15'L x 4.29'H Field A**
			2,364 cf Overall - 1,309 cf Embedded = 1,055 cf x 40.0% Voids
#4A	46.11'	1,244 cf	**Ferguson R-Tank HD 2.5** x 120 Inside #3
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			120 Chambers in 10 Rows
		16,463 cf	Total Available Storage

Storage Group A created with Chamber Wizard

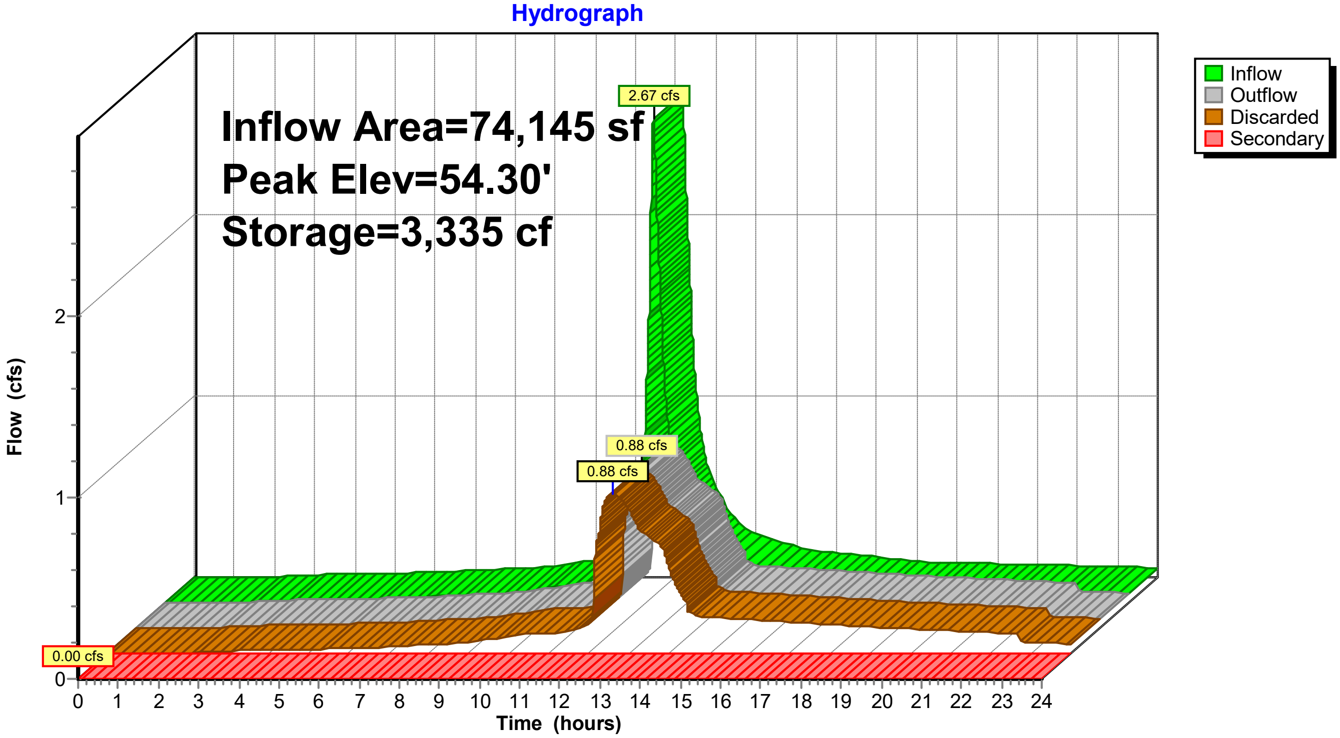
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
51.90	33	22.0	0	0	33
52.00	211	64.0	11	11	320
53.00	549	145.0	367	378	1,672
54.00	874	156.0	705	1,083	1,975
55.00	14,388	179.0	6,269	7,352	2,611
56.00	2,231	200.0	7,428	14,781	3,272

Device	Routing	Invert	Outlet Devices
#1	Discarded	52.00'	**3.000 in/hr RG Exfiltration over Surface area from 52.00' - 54.50'**
			Conductivity to Groundwater Elevation = 10.00'
			Excluded Surface area = 810 sf Phase-In= 0.01'
#2	Discarded	45.86'	**8.270 in/hr R-tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#3	Secondary	55.70'	**32.0" W x 9.0" H Vert. TR-7 (backflow)** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.88 cfs @ 12.58 hrs HW=54.30' (Free Discharge)
1=RG Exfiltration (Controls 0.21 cfs)
2=R-tank Exfiltration (Controls 0.67 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=45.86' TW=51.10' (Dynamic Tailwater)
3=TR-7 (backflow) (Controls 0.00 cfs)

Pond FP-7: FP-7/INF-5



Summary for Pond INF-1: INF-1

Inflow Area = 23,899 sf, 71.73% Impervious, Inflow Depth > 4.29" for 25-Year event
Inflow = 2.38 cfs @ 12.13 hrs, Volume= 8,543 cf
Outflow = 1.11 cfs @ 12.19 hrs, Volume= 8,543 cf, Atten= 53%, Lag= 3.3 min
Discarded = 0.25 cfs @ 12.19 hrs, Volume= 7,720 cf
Secondary = 0.85 cfs @ 12.19 hrs, Volume= 823 cf
Routed to Pond AB-1 : Attenuation Basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 50.78' @ 12.19 hrs Surf.Area= 636 sf Storage= 2,033 cf

Plug-Flow detention time= 56.6 min calculated for 8,540 cf (100% of inflow)
Center-of-Mass det. time= 56.5 min (810.1 - 753.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	46.00'	626 cf	**14.50'W x 43.88'L x 4.79'H Field A** 3,049 cf Overall - 1,483 cf Embedded = 1,566 cf x 40.0% Voids
#2A	46.25'	1,409 cf	**Ferguson R-Tank HD 2.5** x 136 Inside #1 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 136 Chambers in 8 Rows
		2,036 cf	Total Available Storage

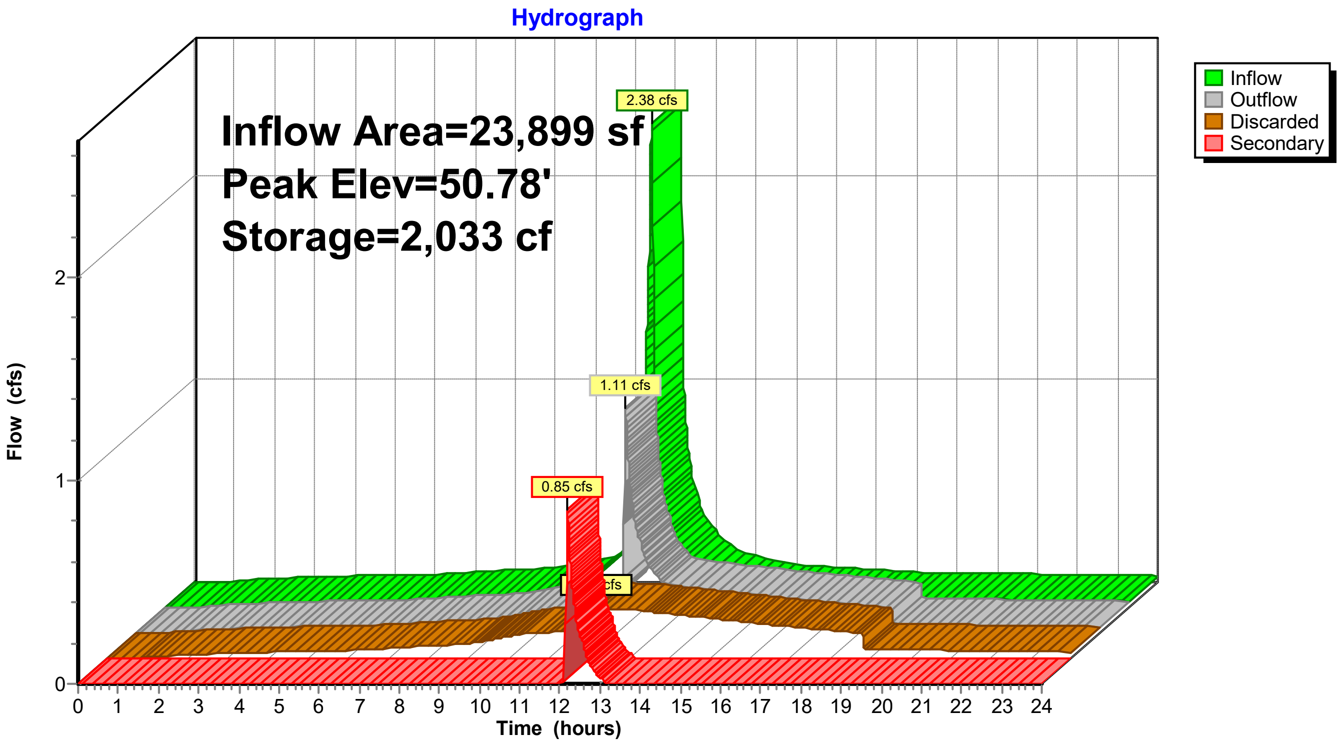
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	46.00'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#2	Secondary	50.25'	**12.0" Round Overflow** L= 14.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.25' / 50.10' S= 0.0107 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.25 cfs @ 12.19 hrs HW=50.78' (Free Discharge)
1=Exfiltration (Controls 0.25 cfs)

Secondary OutFlow Max=0.85 cfs @ 12.19 hrs HW=50.78' TW=49.31' (Dynamic Tailwater)
2=Overflow (Barrel Controls 0.85 cfs @ 2.91 fps)

Pond INF-1: INF-1



Summary for Pond INF-2: INF-2

Inflow Area = 104,046 sf, 64.30% Impervious, Inflow Depth = 0.80" for 25-Year event
Inflow = 4.44 cfs @ 12.14 hrs, Volume= 6,911 cf
Outflow = 0.46 cfs @ 12.94 hrs, Volume= 6,914 cf, Atten= 90%, Lag= 47.8 min
Discarded = 0.46 cfs @ 12.94 hrs, Volume= 6,914 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond DMH-3 : DMH-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.10' @ 12.94 hrs Surf.Area= 1,566 sf Storage= 4,282 cf
Flood Elev= 54.00' Surf.Area= 1,566 sf Storage= 6,187 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 92.7 min (832.7 - 740.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	47.64'	1,398 cf	**21.06'W x 74.37'L x 5.45'H Field A** 8,536 cf Overall - 5,042 cf Embedded = 3,494 cf x 40.0% Voids
#2A	47.89'	4,790 cf	**Ferguson R-Tank HD 3** x 390 Inside #1 Inside= 15.7"W x 50.4"H => 5.24 sf x 2.35'L = 12.3 cf Outside= 15.7"W x 50.4"H => 5.51 sf x 2.35'L = 12.9 cf 390 Chambers in 13 Rows
		6,187 cf	Total Available Storage

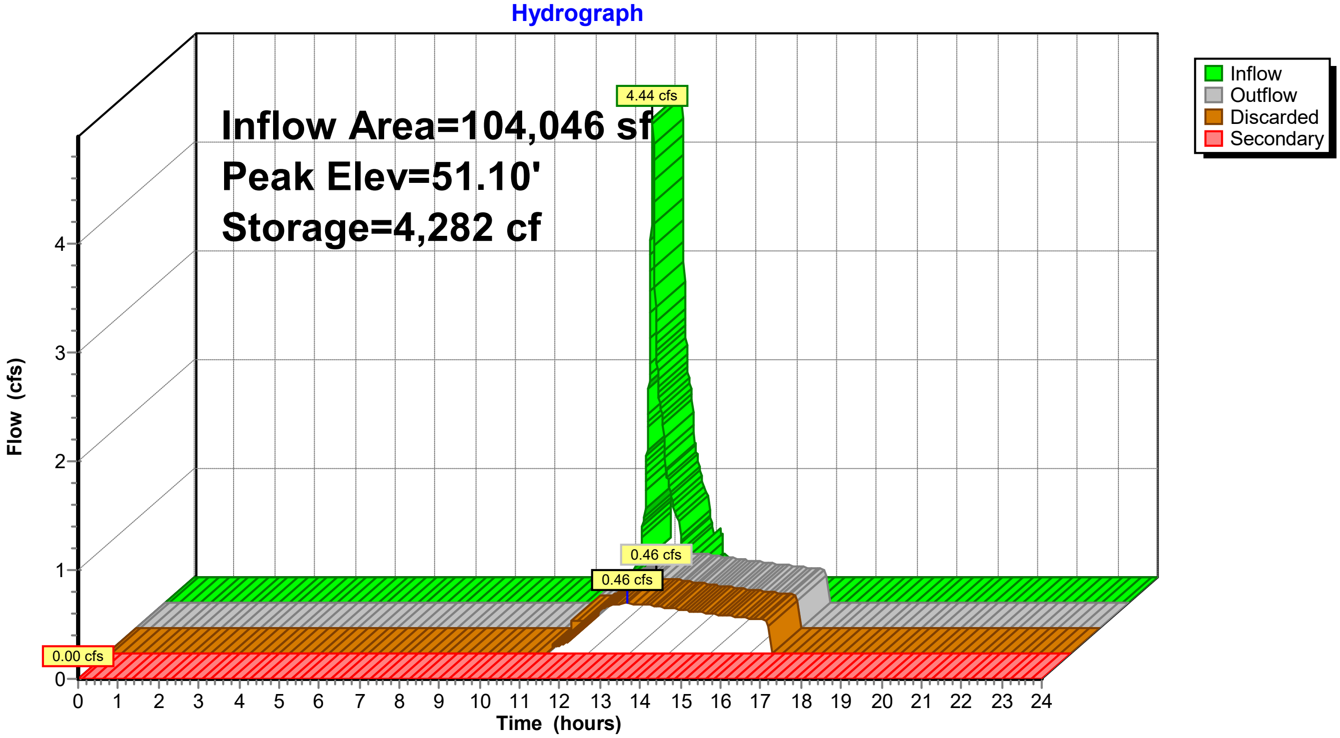
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	47.64'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00'
#2	Secondary	51.35'	**15.0" Round Culvert** L= 24.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 51.35' / 51.10' S= 0.0104 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=0.46 cfs @ 12.94 hrs HW=51.10' (Free Discharge)
└─**1=Exfiltration** (Controls 0.46 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=47.64' TW=51.10' (Dynamic Tailwater)
└─**2=Culvert** (Controls 0.00 cfs)

Pond INF-2: INF-2



Summary for Pond INF-3: INF-3

Inflow Area = 38,595 sf, 60.69% Impervious, Inflow Depth > 2.57" for 25-Year event
Inflow = 2.41 cfs @ 12.14 hrs, Volume= 8,267 cf
Outflow = 0.34 cfs @ 12.67 hrs, Volume= 8,267 cf, Atten= 86%, Lag= 32.2 min
Discarded = 0.34 cfs @ 12.67 hrs, Volume= 8,267 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond SP 4 : Study Point

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 46.43' @ 12.67 hrs Surf.Area= 1,112 sf Storage= 2,949 cf

Plug-Flow detention time= 61.1 min calculated for 8,267 cf (100% of inflow)
Center-of-Mass det. time= 61.1 min (814.5 - 753.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	43.00'	1,058 cf	**18.44'W x 60.30'L x 5.45'H Field A**
			6,058 cf Overall - 3,413 cf Embedded = 2,645 cf x 40.0% Voids
#2A	43.25'	3,242 cf	**Ferguson R-Tank HD 3** x 264 Inside #1
			Inside= 15.7"W x 50.4"H => 5.24 sf x 2.35'L = 12.3 cf
			Outside= 15.7"W x 50.4"H => 5.51 sf x 2.35'L = 12.9 cf
			264 Chambers in 11 Rows
		4,300 cf	Total Available Storage

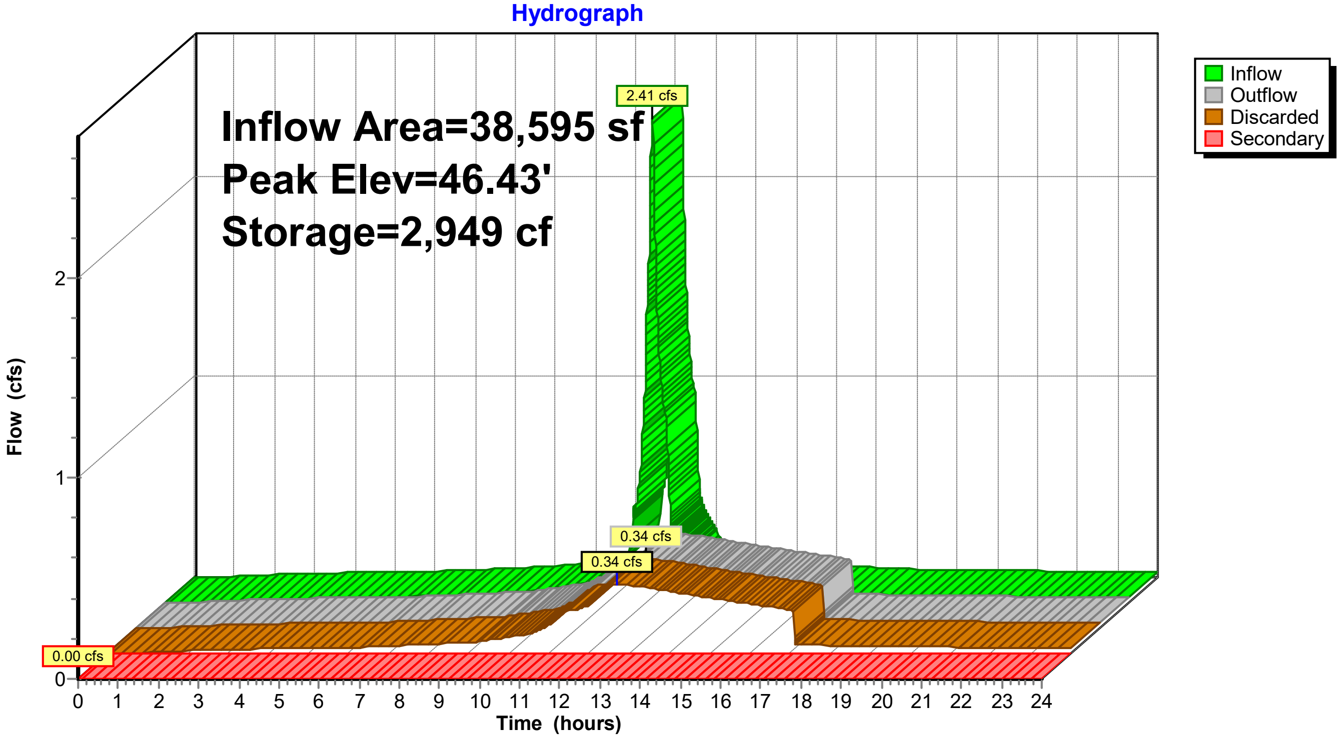
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	43.00'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#2	Secondary	49.80'	**24.0" x 24.0" Horiz. CB-6A** C= 0.600 Limited to weir flow at low heads
#3	Secondary	49.80'	**24.0" x 24.0" Horiz. CB-7** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.34 cfs @ 12.67 hrs HW=46.43' (Free Discharge)
└**1=Exfiltration** (Controls 0.34 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=43.00' TW=0.00' (Dynamic Tailwater)
├**2=CB-6A** (Controls 0.00 cfs)
└**3=CB-7** (Controls 0.00 cfs)

Pond INF-3: INF-3



Summary for Pond INF-4: INF-4

Inflow Area = 45,592 sf, 62.99% Impervious, Inflow Depth > 4.02" for 25-Year event
Inflow = 4.16 cfs @ 12.14 hrs, Volume= 15,269 cf
Outflow = 1.10 cfs @ 12.37 hrs, Volume= 15,268 cf, Atten= 74%, Lag= 14.2 min
Discarded = 0.44 cfs @ 12.37 hrs, Volume= 14,145 cf
Secondary = 0.66 cfs @ 12.37 hrs, Volume= 1,123 cf
Routed to Pond OF-6 : OF-6

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 53.96' @ 12.37 hrs Surf.Area= 1,468 sf Storage= 4,224 cf
Flood Elev= 57.18' Surf.Area= 1,468 sf Storage= 5,494 cf

Plug-Flow detention time= 60.2 min calculated for 15,264 cf (100% of inflow)
Center-of-Mass det. time= 60.2 min (816.5 - 756.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	50.32'	1,023 cf	**21.06'W x 69.68'L x 4.95'H Field A** 7,264 cf Overall - 4,706 cf Embedded = 2,558 cf x 40.0% Voids
#2A	50.57'	4,471 cf	**Ferguson R-Tank HD 3** x 364 Inside #1 Inside= 15.7"W x 50.4"H => 5.24 sf x 2.35'L = 12.3 cf Outside= 15.7"W x 50.4"H => 5.51 sf x 2.35'L = 12.9 cf 364 Chambers in 13 Rows
		5,494 cf	Total Available Storage

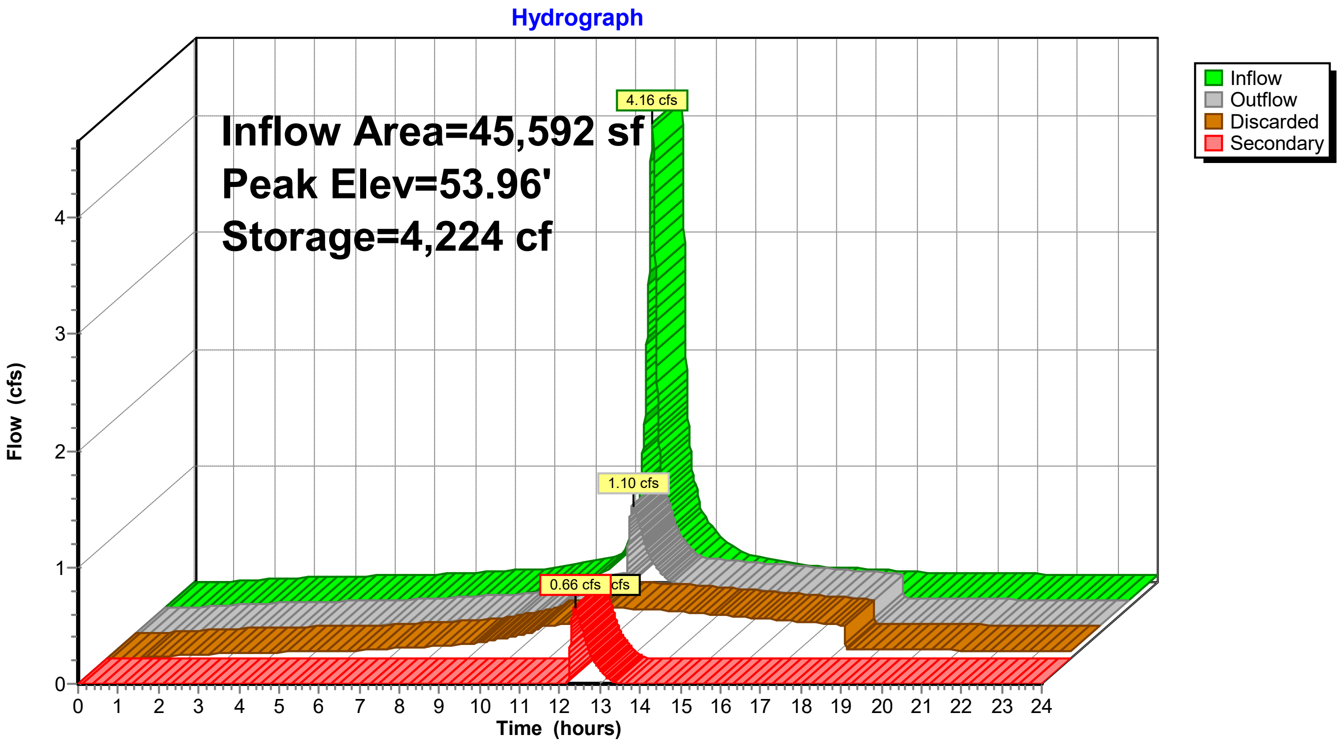
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	50.32'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#2	Secondary	53.52'	**12.0" Round Overflow** L= 86.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 53.52' / 51.40' S= 0.0247 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.44 cfs @ 12.37 hrs HW=53.96' (Free Discharge)
1=Exfiltration (Controls 0.44 cfs)

Secondary OutFlow Max=0.66 cfs @ 12.37 hrs HW=53.96' TW=51.90' (Dynamic Tailwater)
2=Overflow (Inlet Controls 0.66 cfs @ 1.99 fps)

Pond INF-4: INF-4



Summary for Pond INF-6: INF-6

Inflow Area = 19,023 sf, 56.89% Impervious, Inflow Depth > 3.85" for 25-Year event
Inflow = 1.78 cfs @ 12.13 hrs, Volume= 6,106 cf
Outflow = 0.46 cfs @ 12.36 hrs, Volume= 6,106 cf, Atten= 74%, Lag= 13.8 min
Discarded = 0.46 cfs @ 12.36 hrs, Volume= 6,106 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 56.85' @ 12.36 hrs Surf.Area= 1,889 sf Storage= 1,703 cf

Plug-Flow detention time= 52.9 min calculated for 6,106 cf (100% of inflow)
Center-of-Mass det. time= 52.8 min (816.4 - 763.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	50.46'	663 cf	**Ferguson R-Tank HD 2.5** x 64 Inside #2 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 64 Chambers in 8 Rows
#2A	50.21'	288 cf	**14.50'W x 22.77'L x 4.29'H Field A** 1,417 cf Overall - 698 cf Embedded = 719 cf x 40.0% Voids
#3	56.00'	4,508 cf	**Depression (Irregular)** Listed below (Recalc)
		5,459 cf	Total Available Storage

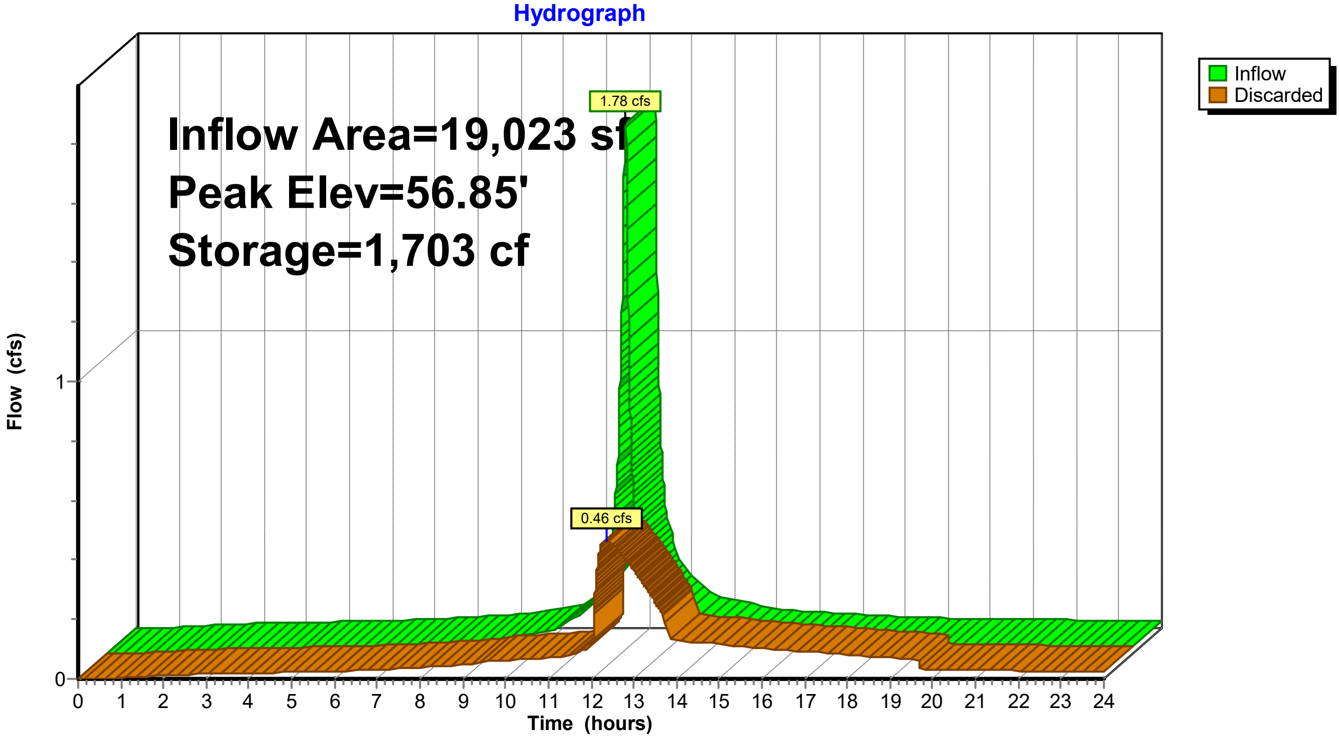
Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
56.00	361	76.0	0	0	361
57.00	1,869	162.0	1,017	1,017	1,994
58.00	3,616	269.0	2,695	3,712	5,670
58.20	4,360	285.0	796	4,508	6,378

Device	Routing	Invert	Outlet Devices
#1	Discarded	50.21'	**8.270 in/hr R Tank Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'

Discarded OutFlow Max=0.46 cfs @ 12.36 hrs HW=56.85' (Free Discharge)
1=R Tank Exfiltration (Controls 0.46 cfs)

Pond INF-6: INF-6



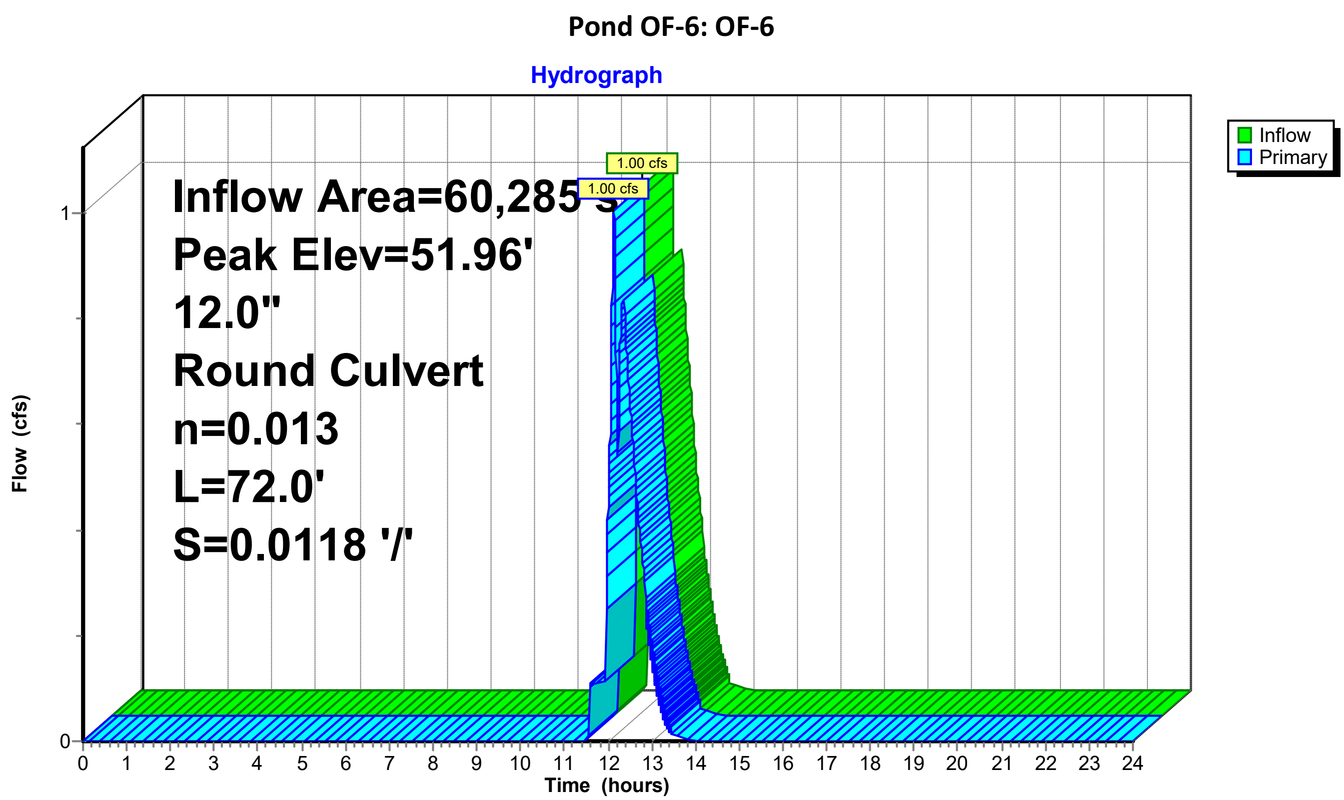
Summary for Pond OF-6: OF-6

Inflow Area = 60,285 sf, 60.30% Impervious, Inflow Depth = 0.47" for 25-Year event
Inflow = 1.00 cfs @ 12.14 hrs, Volume= 2,360 cf
Outflow = 1.00 cfs @ 12.14 hrs, Volume= 2,360 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.00 cfs @ 12.14 hrs, Volume= 2,360 cf
Routed to Pond DB-A : DB-A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.96' @ 12.14 hrs
Flood Elev= 54.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.40'	**12.0" Round Culvert** L= 72.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 51.40' / 50.55' S= 0.0118 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.00 cfs @ 12.14 hrs HW=51.96' TW=51.29' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.00 cfs @ 3.17 fps)

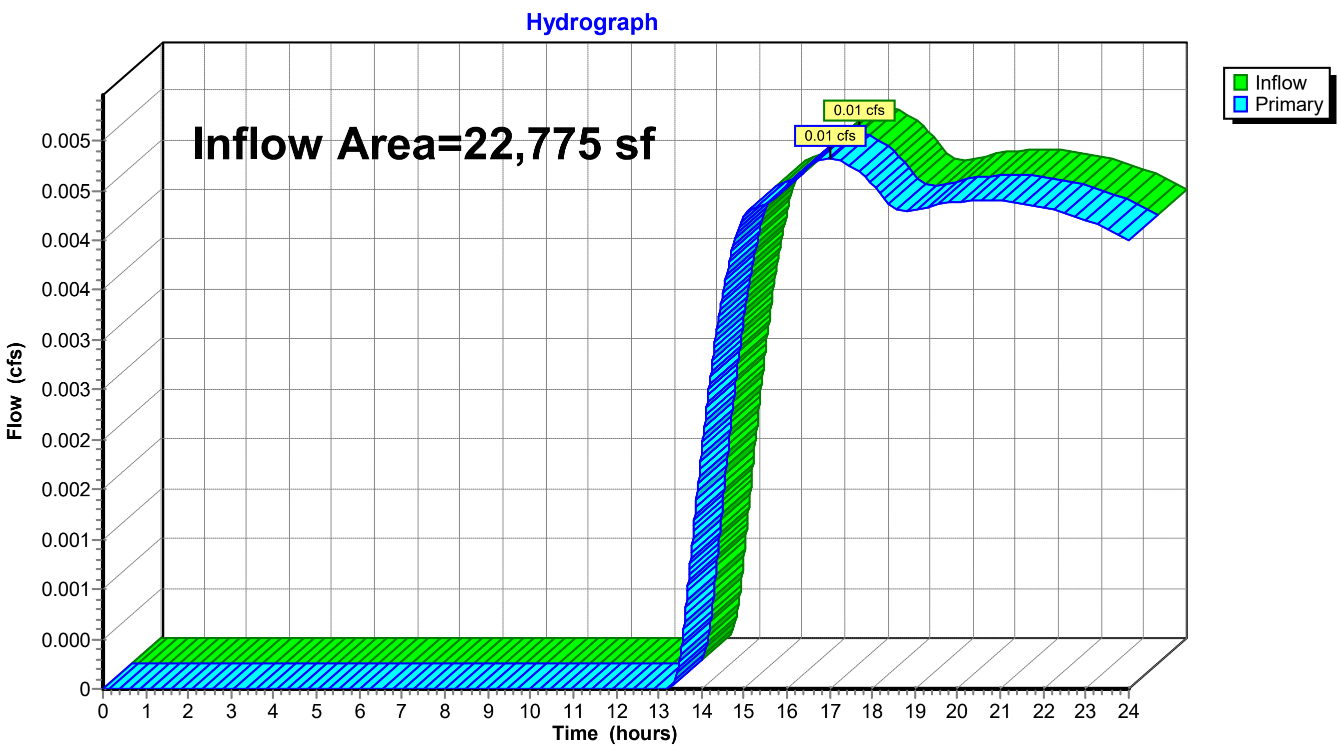


Summary for Pond SP 1: Study Point

Inflow Area = 22,775 sf, 0.00% Impervious, Inflow Depth > 0.09" for 25-Year event
Inflow = 0.01 cfs @ 17.02 hrs, Volume= 175 cf
Primary = 0.01 cfs @ 17.02 hrs, Volume= 175 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3

Pond SP 1: Study Point

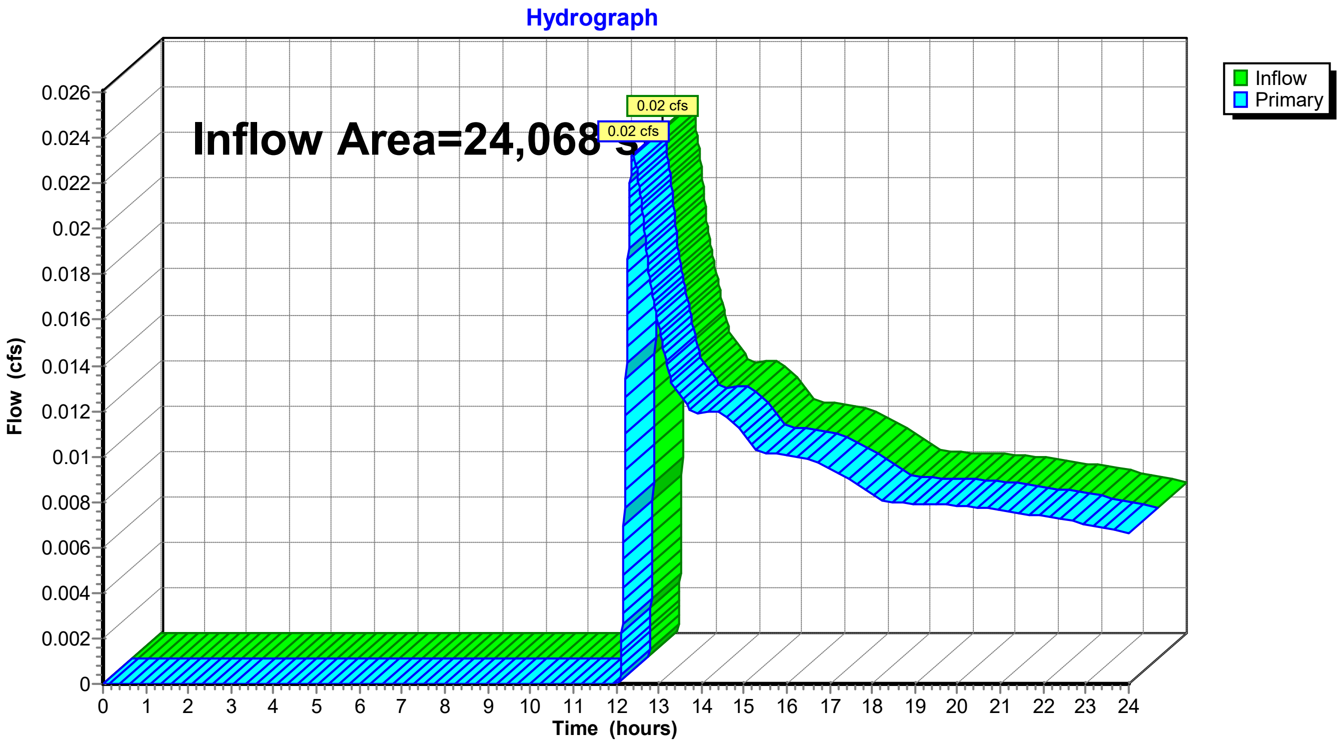


Summary for Pond SP 3: Study Point

Inflow Area = 24,068 sf, 0.00% Impervious, Inflow Depth > 0.21" for 25-Year event
Inflow = 0.02 cfs @ 12.41 hrs, Volume= 413 cf
Primary = 0.02 cfs @ 12.41 hrs, Volume= 413 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3

Pond SP 3: Study Point

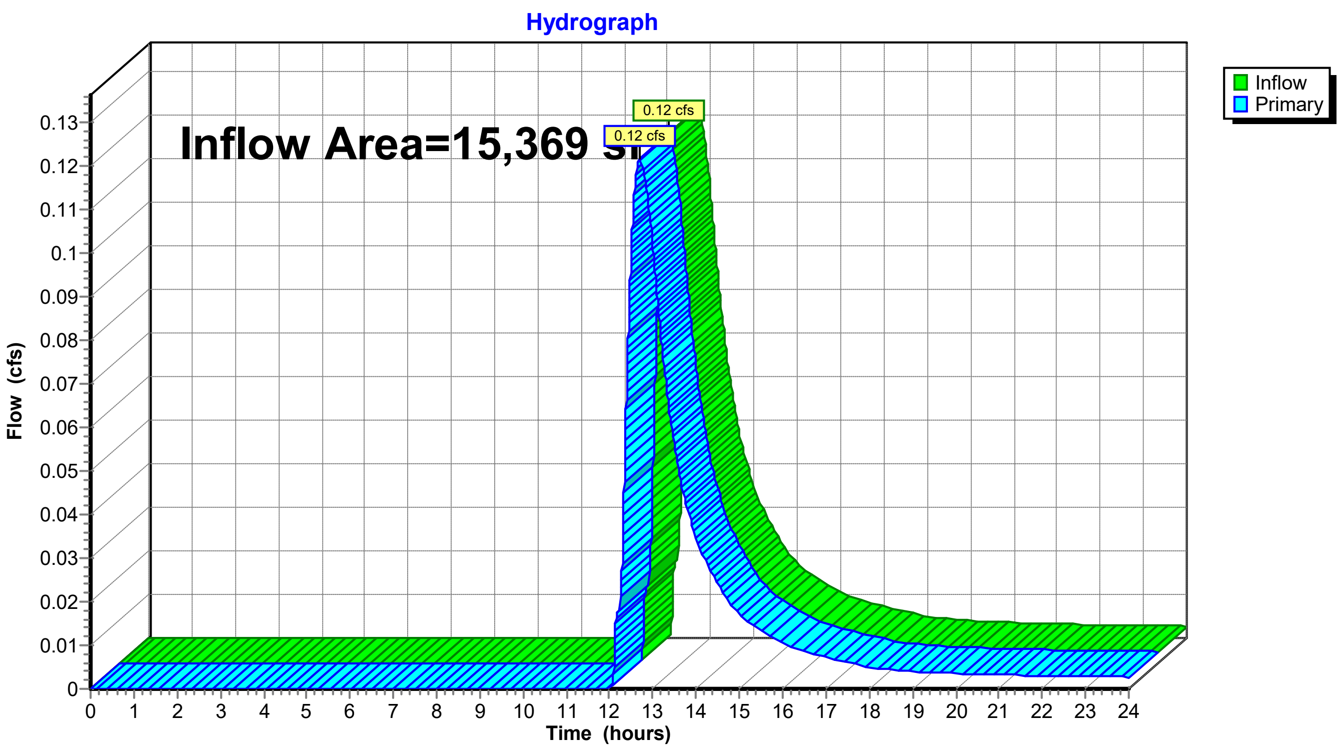


Summary for Pond SP 4: Study Point

Inflow Area = 15,369 sf, 0.00% Impervious, Inflow Depth > 0.58" for 25-Year event
Inflow = 0.12 cfs @ 12.69 hrs, Volume= 749 cf
Primary = 0.12 cfs @ 12.69 hrs, Volume= 749 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3

Pond SP 4: Study Point

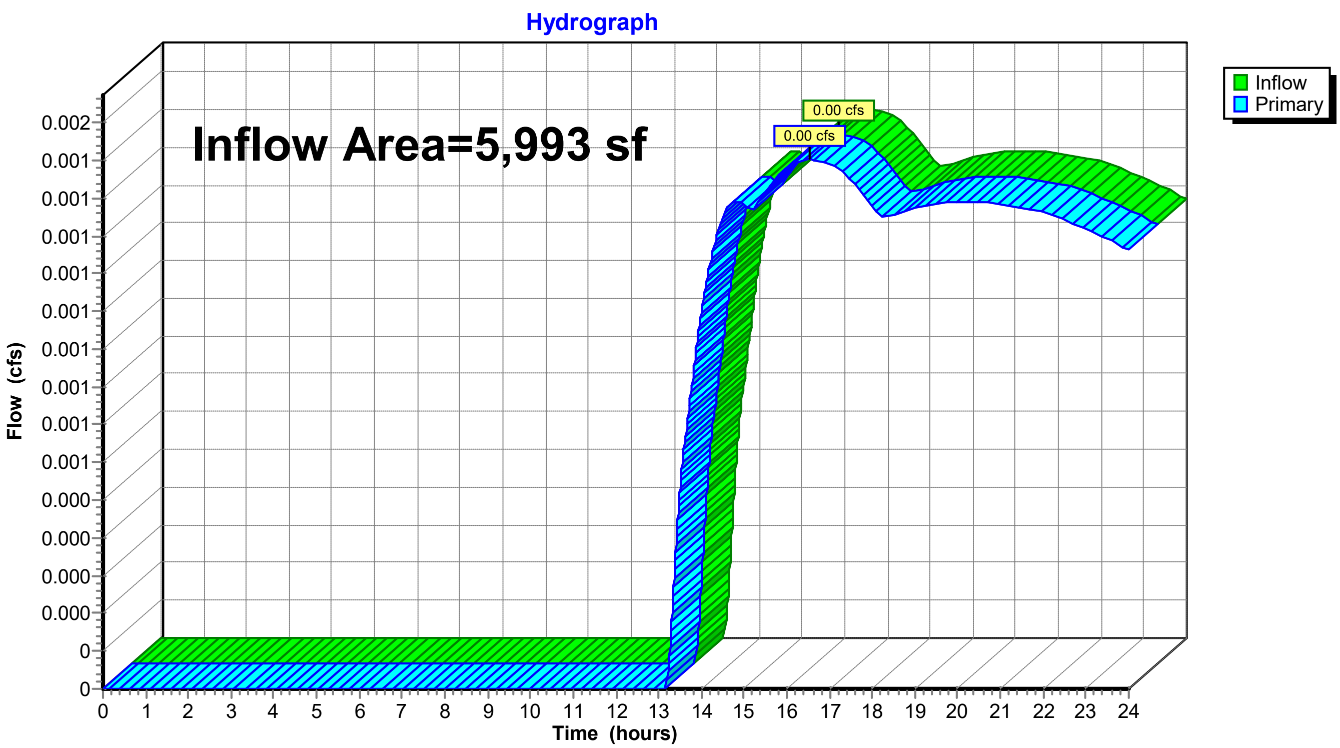


Summary for Pond SP-2: Study Point

Inflow Area = 5,993 sf, 0.00% Impervious, Inflow Depth > 0.10" for 25-Year event
Inflow = 0.00 cfs @ 16.55 hrs, Volume= 48 cf
Primary = 0.00 cfs @ 16.55 hrs, Volume= 48 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3

Pond SP-2: Study Point



Time span=0.00-24.00 hrs, dt=0.006 hrs, 4001 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: RA (partial) Runoff Area=18,019 sf 100.00% Impervious Runoff Depth>6.97"
Tc=6.0 min CN=98 Runoff=3.08 cfs 10,471 cf

Subcatchment 2S: RA (partial) Runoff Area=14,390 sf 100.00% Impervious Runoff Depth>6.97"
Tc=6.0 min CN=98 Runoff=2.46 cfs 8,362 cf

Subcatchment 3S: RA (partial) Runoff Area=10,803 sf 100.00% Impervious Runoff Depth>6.97"
Tc=6.0 min CN=98 Runoff=1.85 cfs 6,278 cf

Subcatchment SCA-1: LSA/FL/IA/PP Runoff Area=52,119 sf 6.80% Impervious Runoff Depth>1.89"
Flow Length=532' Slope=0.0100 '/' Tc=16.6 min CN=WQ Runoff=1.63 cfs 8,201 cf

Subcatchment SCA-10: Runoff Area=9,281 sf 84.56% Impervious Runoff Depth>6.02"
Tc=6.0 min CN=WQ Runoff=1.36 cfs 4,659 cf

Subcatchment SCA-11: Runoff Area=8,047 sf 72.78% Impervious Runoff Depth>5.31"
Tc=6.0 min CN=WQ Runoff=1.03 cfs 3,558 cf

Subcatchment SCA-12: Runoff Area=12,711 sf 69.37% Impervious Runoff Depth>5.07"
Tc=6.0 min CN=WQ Runoff=1.55 cfs 5,369 cf

Subcatchment SCA-13: Runoff Area=9,436 sf 78.35% Impervious Runoff Depth>5.65"
Tc=6.0 min CN=WQ Runoff=1.29 cfs 4,440 cf

Subcatchment SCA-14: Runoff Area=13,982 sf 55.19% Impervious Runoff Depth>4.12"
Tc=6.0 min CN=WQ Runoff=1.37 cfs 4,805 cf

Subcatchment SCA-16: Runoff Area=6,892 sf 58.84% Impervious Runoff Depth>4.45"
Tc=6.0 min CN=WQ Runoff=0.73 cfs 2,556 cf

Subcatchment SCA-17: Runoff Area=4,123 sf 100.00% Impervious Runoff Depth>6.97"
Tc=6.0 min CN=98 Runoff=0.70 cfs 2,396 cf

Subcatchment SCA-18: Runoff Area=9,051 sf 85.55% Impervious Runoff Depth>6.09"
Tc=6.0 min CN=WQ Runoff=1.34 cfs 4,592 cf

Subcatchment SCA-19: Runoff Area=12,142 sf 43.49% Impervious Runoff Depth>3.27"
Flow Length=145' Tc=9.6 min CN=WQ Runoff=0.80 cfs 3,309 cf

Subcatchment SCA-2: LSA/FL Runoff Area=8,220 sf 0.24% Impervious Runoff Depth>1.52"
Flow Length=75' Tc=6.1 min CN=WQ Runoff=0.31 cfs 1,044 cf

Subcatchment SCA-4: Runoff Area=27,573 sf 38.81% Impervious Runoff Depth>3.34"
Flow Length=254' Tc=6.8 min CN=WQ Runoff=2.14 cfs 7,683 cf

Subcatchment SCA-5: Runoff Area=7,636 sf 0.00% Impervious Runoff Depth>0.85"
Tc=6.0 min CN=39 Runoff=0.11 cfs 538 cf

Subcatchment SCA-6.1: Runoff Area=12,884 sf 69.58% Impervious Runoff Depth>5.16"
Tc=6.0 min CN=WQ Runoff=1.61 cfs 5,543 cf

Subcatchment SCA-6.2: Runoff Area=8,059 sf 57.41% Impervious Runoff Depth>5.11"
Tc=6.0 min CN=WQ Runoff=1.04 cfs 3,429 cf

Subcatchment SCA-7: Runoff Area=14,693 sf 51.93% Impervious Runoff Depth>3.97"
Tc=6.0 min CN=WQ Runoff=1.38 cfs 4,863 cf

Subcatchment SCA-8: Runoff Area=3,035 sf 100.00% Impervious Runoff Depth>6.97"
Tc=6.0 min CN=98 Runoff=0.52 cfs 1,764 cf

Subcatchment SCA-9: Runoff Area=5,663 sf 60.09% Impervious Runoff Depth>4.53"
Tc=6.0 min CN=WQ Runoff=0.61 cfs 2,137 cf

Subcatchment UC-1: NA Runoff Area=22,775 sf 0.00% Impervious Runoff Depth>0.24"
Flow Length=434' Tc=34.9 min CN=30 Runoff=0.02 cfs 462 cf

Subcatchment UC-2: Runoff Area=24,068 sf 0.00% Impervious Runoff Depth>0.41"
Flow Length=450' Tc=16.6 min CN=WQ Runoff=0.06 cfs 819 cf

Subcatchment UC-3: Runoff Area=7,204 sf 0.00% Impervious Runoff Depth>0.85"
Tc=6.0 min CN=39 Runoff=0.11 cfs 508 cf

Subcatchment UC-4: Runoff Area=8,165 sf 0.00% Impervious Runoff Depth>0.53"
Tc=6.0 min CN=WQ Runoff=0.06 cfs 358 cf

Subcatchment UC-5: Runoff Area=2,516 sf 100.00% Impervious Runoff Depth>6.97"
Tc=6.0 min CN=98 Runoff=0.43 cfs 1,462 cf

Subcatchment UC-6: NA Runoff Area=5,993 sf 0.00% Impervious Runoff Depth>0.25"
Flow Length=45' Slope=0.0300 '/' Tc=9.4 min CN=30 Runoff=0.00 cfs 125 cf

Pond AB-1: Attenuation Basin Peak Elev=50.81' Storage=1,984 cf Inflow=3.27 cfs 4,408 cf
Discarded=0.02 cfs 578 cf Primary=0.93 cfs 3,403 cf Outflow=0.95 cfs 3,981 cf

Pond CB-2A: CB 2A Peak Elev=51.39' Inflow=0.70 cfs 2,396 cf
12.0" Round Culvert n=0.013 L=14.0' S=0.0100 '/' Outflow=0.70 cfs 2,396 cf

Pond CB-2B: CB 2B Peak Elev=51.39' Inflow=0.73 cfs 2,556 cf
12.0" Round Culvert n=0.013 L=4.0' S=0.0350 '/' Outflow=0.73 cfs 2,556 cf

Pond CB-3: CB-3 Peak Elev=52.09' Inflow=1.61 cfs 5,543 cf
12.0" Round Culvert x 2.00 n=0.013 L=7.0' S=0.0143 '/' Outflow=1.61 cfs 5,543 cf

Pond CB-4: CB-4 Peak Elev=57.13' Storage=147 cf Inflow=2.14 cfs 7,683 cf
Outflow=1.84 cfs 7,683 cf

Pond CB-6A: CB-6A Peak Elev=47.36' Inflow=0.80 cfs 3,309 cf
12.0" Round Culvert n=0.013 L=25.0' S=0.0120 '/' Outflow=0.80 cfs 3,309 cf

Pond CB-6B,C: CB-6B,6C Peak Elev=47.95' Inflow=1.37 cfs 4,805 cf
12.0" Round Culvert x 2.00 n=0.013 L=19.0' S=0.0553 '/' Outflow=1.37 cfs 4,805 cf

Pond CB-7: CB-7 Peak Elev=47.14' Inflow=1.34 cfs 4,592 cf
12.0" Round Culvert n=0.013 L=37.0' S=0.0095 '/' Outflow=1.34 cfs 4,592 cf

Pond DB-A: DB-A Peak Elev=52.08' Inflow=2.59 cfs 5,562 cf
15.0" Round Culvert n=0.013 L=46.0' S=0.0337 '/' Outflow=2.59 cfs 5,562 cf

Pond DMH-2.1: DMH-2.1 (By-Pass) Peak Elev=51.11' Inflow=3.05 cfs 12,473 cf
Primary=2.38 cfs 10,821 cf Secondary=1.59 cfs 1,653 cf Outflow=3.05 cfs 12,473 cf

Pond DMH-2.2: DMH-2.2 Peak Elev=51.36' Inflow=3.05 cfs 12,473 cf
18.0" Round Culvert n=0.013 L=36.0' S=0.0056 '/' Outflow=3.05 cfs 12,473 cf

Pond DMH-3: DMH-3 Peak Elev=51.89' Inflow=1.61 cfs 7,521 cf
18.0" Round Culvert n=0.013 L=183.0' S=0.0052 '/' Outflow=1.61 cfs 7,521 cf

Pond DMH-4: DMH-4 Peak Elev=52.01' Inflow=1.81 cfs 2,070 cf
12.0" Round Culvert n=0.013 L=20.0' S=0.0100 '/' Outflow=1.81 cfs 2,070 cf

Pond DMH-5: DMH-5 Peak Elev=52.03' Inflow=3.86 cfs 8,197 cf
18.0" Round Culvert n=0.013 L=10.0' S=0.0150 '/' Outflow=3.86 cfs 8,197 cf

Pond DMH-6: DMH-6 Peak Elev=47.37' Inflow=1.37 cfs 4,805 cf
12.0" Round Culvert n=0.013 L=17.0' S=0.0206 '/' Outflow=1.37 cfs 4,805 cf

Pond DMH-7: DMH-7 (bypass) Peak Elev=47.36' Inflow=2.12 cfs 8,114 cf
Primary=1.85 cfs 7,596 cf Secondary=0.27 cfs 518 cf Outflow=2.12 cfs 8,114 cf

Pond DMH-8: DMH-8 (bypass) Peak Elev=46.76' Inflow=1.34 cfs 4,592 cf
Primary=1.18 cfs 4,537 cf Secondary=0.16 cfs 55 cf Outflow=1.34 cfs 4,592 cf

Pond DMH-9: DMH-9 (bypass) Peak Elev=54.37' Inflow=1.84 cfs 7,683 cf
Primary=1.59 cfs 7,201 cf Secondary=0.61 cfs 482 cf Outflow=1.84 cfs 7,683 cf

Pond DS: Dry Stream Peak Elev=55.17' Storage=395 cf Inflow=3.45 cfs 16,563 cf
Discarded=0.04 cfs 1,294 cf Primary=3.21 cfs 15,225 cf Outflow=3.26 cfs 16,519 cf

Pond FP-1: FP-1 Peak Elev=51.00' Storage=1,008 cf Inflow=1.81 cfs 6,204 cf
Discarded=0.26 cfs 4,325 cf Primary=0.53 cfs 1,879 cf Tertiary=0.00 cfs 0 cf Outflow=0.79 cfs 6,204 cf

Pond FP-2: FP-2 Peak Elev=52.92' Storage=644 cf Inflow=1.03 cfs 3,558 cf
Discarded=0.18 cfs 2,861 cf Primary=0.63 cfs 697 cf Tertiary=0.00 cfs 0 cf Outflow=0.81 cfs 3,558 cf

Pond FP-3: FP-3 Peak Elev=53.92' Storage=816 cf Inflow=1.66 cfs 5,566 cf
Discarded=0.32 cfs 4,192 cf Primary=1.31 cfs 1,374 cf Tertiary=0.00 cfs 0 cf Outflow=1.62 cfs 5,565 cf

Pond FP-4: FP-4 Peak Elev=53.45' Storage=374 cf Inflow=1.55 cfs 5,369 cf
Discarded=0.06 cfs 2,707 cf Primary=1.49 cfs 2,635 cf Tertiary=0.00 cfs 0 cf Outflow=1.55 cfs 5,342 cf

Pond FP-5: FP-5 Peak Elev=55.36' Storage=553 cf Inflow=1.36 cfs 4,659 cf
Discarded=0.21 cfs 3,296 cf Primary=1.14 cfs 1,363 cf Tertiary=0.00 cfs 0 cf Outflow=1.35 cfs 4,658 cf

Pond FP-6: FP-6 Peak Elev=55.57' Storage=398 cf Inflow=1.38 cfs 4,863 cf
Discarded=0.14 cfs 3,190 cf Primary=1.24 cfs 1,671 cf Tertiary=0.00 cfs 0 cf Outflow=1.37 cfs 4,862 cf

Pond FP-7: FP-7/INF-5 Peak Elev=54.52' Storage=4,348 cf Inflow=3.32 cfs 15,763 cf
Discarded=1.08 cfs 15,603 cf Secondary=0.00 cfs 0 cf Outflow=1.08 cfs 15,603 cf

Pond INF-1: INF-1 Peak Elev=51.05' Storage=2,036 cf Inflow=2.38 cfs 10,821 cf
Discarded=0.25 cfs 8,572 cf Secondary=1.64 cfs 2,248 cf Outflow=1.89 cfs 10,820 cf

Pond INF-2: INF-2 Peak Elev=52.00' Storage=5,441 cf Inflow=5.51 cfs 10,268 cf
Discarded=0.50 cfs 8,290 cf Secondary=1.13 cfs 1,978 cf Outflow=1.63 cfs 10,268 cf

Pond INF-3: INF-3 Peak Elev=47.36' Storage=3,776 cf Inflow=2.81 cfs 10,048 cf
Discarded=0.38 cfs 10,048 cf Secondary=0.00 cfs 0 cf Outflow=0.38 cfs 10,048 cf

Pond INF-4: INF-4 Peak Elev=54.31' Storage=4,647 cf Inflow=4.80 cfs 18,154 cf
Discarded=0.45 cfs 15,625 cf Secondary=1.78 cfs 2,528 cf Outflow=2.23 cfs 18,153 cf

Pond INF-6: INF-6 Peak Elev=57.06' Storage=2,076 cf Inflow=2.15 cfs 7,322 cf
Outflow=0.56 cfs 7,321 cf

Pond OF-6: OF-6 Peak Elev=52.34' Inflow=2.19 cfs 4,200 cf
12.0" Round Culvert n=0.013 L=72.0' S=0.0118 '/' Outflow=2.19 cfs 4,200 cf

Pond SP 1: Study Point Inflow=0.02 cfs 462 cf
Primary=0.02 cfs 462 cf

Pond SP 3: Study Point Inflow=0.06 cfs 819 cf
Primary=0.06 cfs 819 cf

Pond SP 4: Study Point Inflow=0.95 cfs 3,761 cf
Primary=0.95 cfs 3,761 cf

Pond SP-2: Study Point Inflow=0.00 cfs 125 cf
Primary=0.00 cfs 125 cf

Total Runoff Area = 339,480 sf Runoff Volume = 99,731 cf Average Runoff Depth = 3.53"
56.85% Pervious = 192,995 sf 43.15% Impervious = 146,485 sf

Summary for Subcatchment 1S: RA (partial)

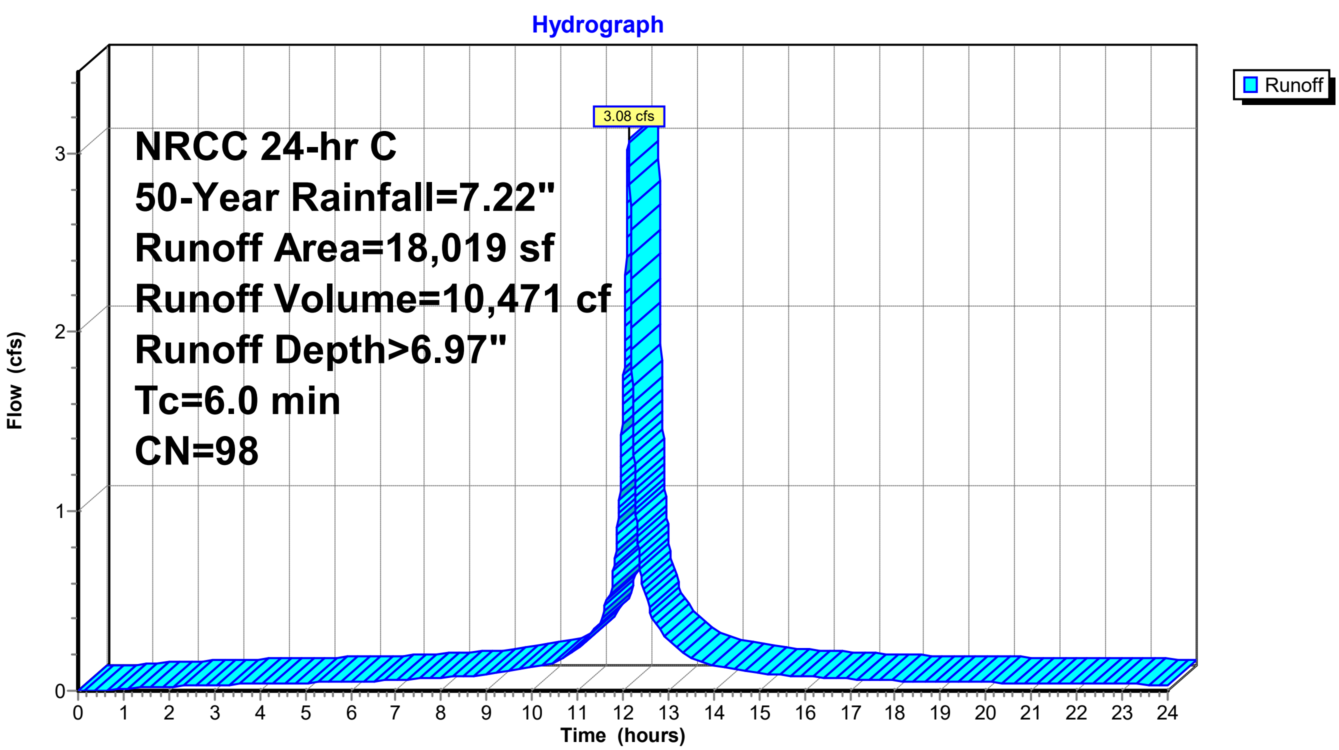
Runoff = 3.08 cfs @ 12.13 hrs, Volume= 10,471 cf, Depth> 6.97"
Routed to Pond INF-4 : INF-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
18,019	98	Roofs, HSG A
18,019	98	100.00% Impervious Area

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

Subcatchment 1S: RA (partial)



Summary for Subcatchment 2S: RA (partial)

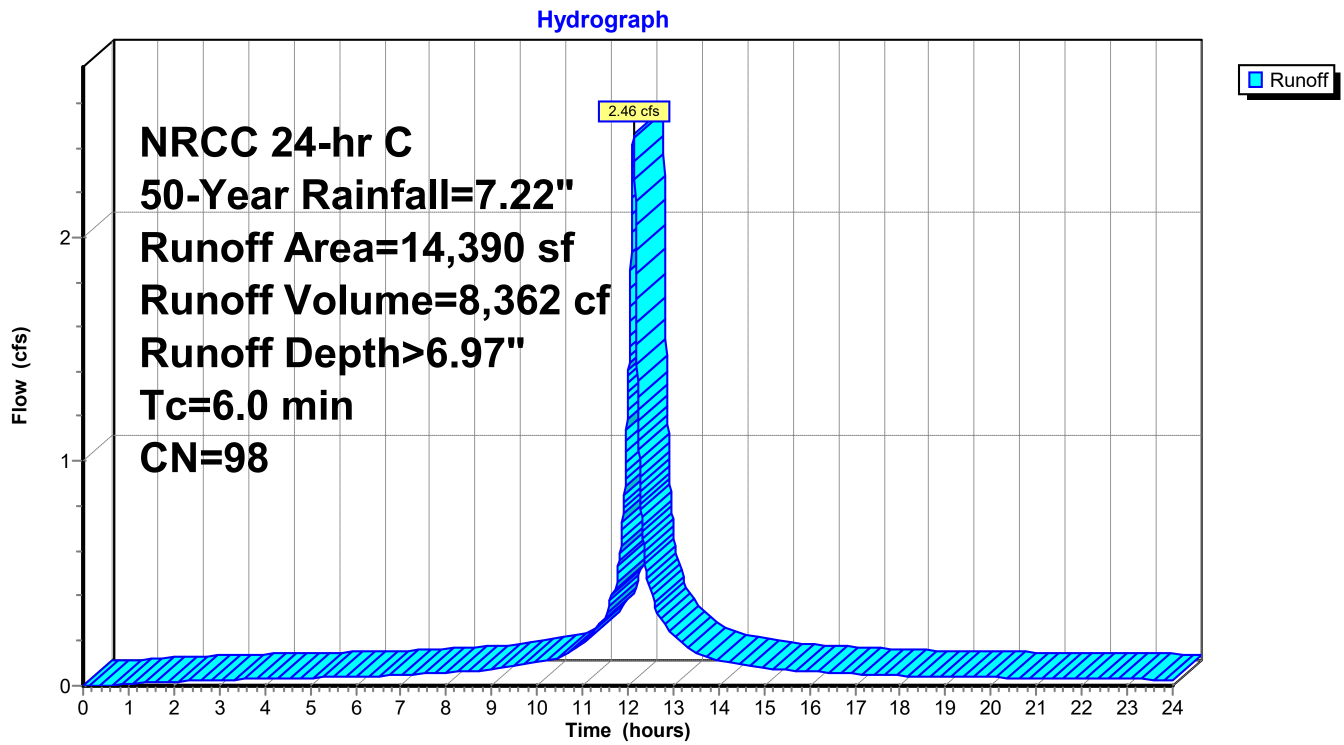
Runoff = 2.46 cfs @ 12.13 hrs, Volume= 8,362 cf, Depth> 6.97"
Routed to Pond DS : Dry Stream

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
14,390	98	Roofs, HSG A
14,390	98	100.00% Impervious Area

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

Subcatchment 2S: RA (partial)



Summary for Subcatchment 3S: RA (partial)

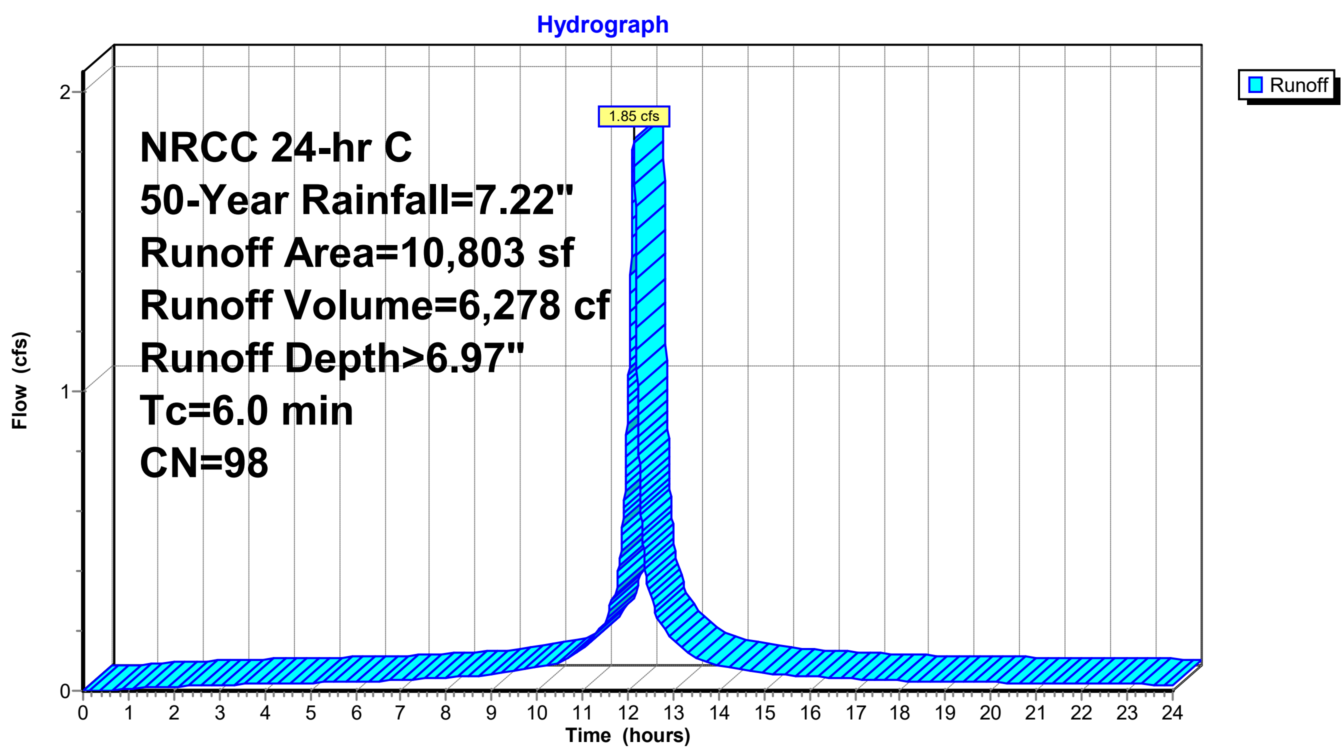
Runoff = 1.85 cfs @ 12.13 hrs, Volume= 6,278 cf, Depth> 6.97"
Routed to Pond INF-6 : INF-6

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
10,803	98	Roofs, HSG A
10,803	98	100.00% Impervious Area

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

Subcatchment 3S: RA (partial)



Summary for Subcatchment SCA-1: LSA/FL/IA/PP

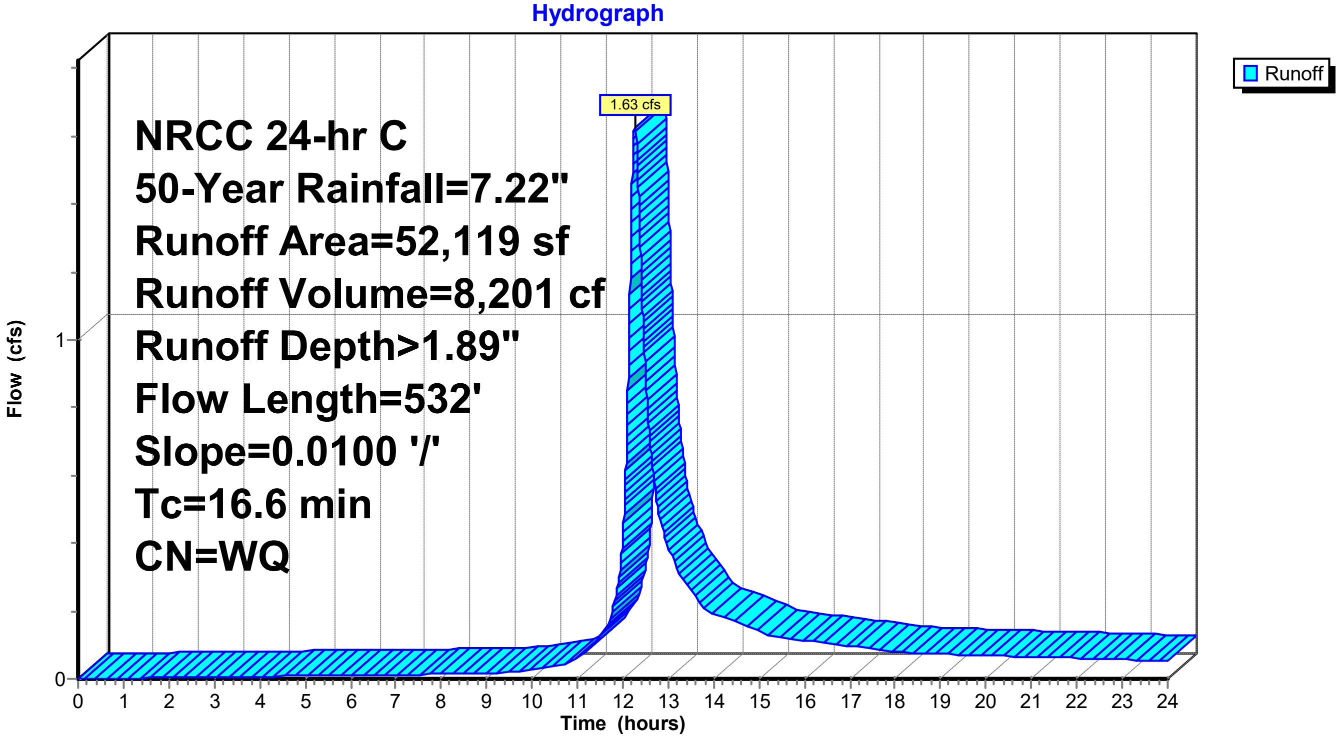
Runoff = 1.63 cfs @ 12.26 hrs, Volume= 8,201 cf, Depth> 1.89"
Routed to Pond DS : Dry Stream

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

	Area (sf)	CN	Description
	31,302	39	>75% Grass cover, Good, HSG A
*	10,136	60	Stone Fire Lane
*	3,036	98	Rubber Play Surface
*	507	98	Concrete Walk
*	7,138	60	Permeable Pavers
	52,119		Weighted Average
	48,576	46	93.20% Pervious Area
	3,543	98	6.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.6	100	0.0100	0.13		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.35"
1.0	42	0.0100	0.70		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.2	22	0.0100	1.61		**Shallow Concentrated Flow, Stone Fire Lane** Unpaved Kv= 16.1 fps
0.7	28	0.0100	0.70		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
2.1	340	0.0100	2.64	7.93	**Channel Flow, Dry Stream Bed** Area= 3.0 sf Perim= 5.0' r= 0.60' n= 0.040 Earth, cobble bottom, clean sides
16.6	532	Total			

Subcatchment SCA-1: LSA/FL/IA/PP



Summary for Subcatchment SCA-10:

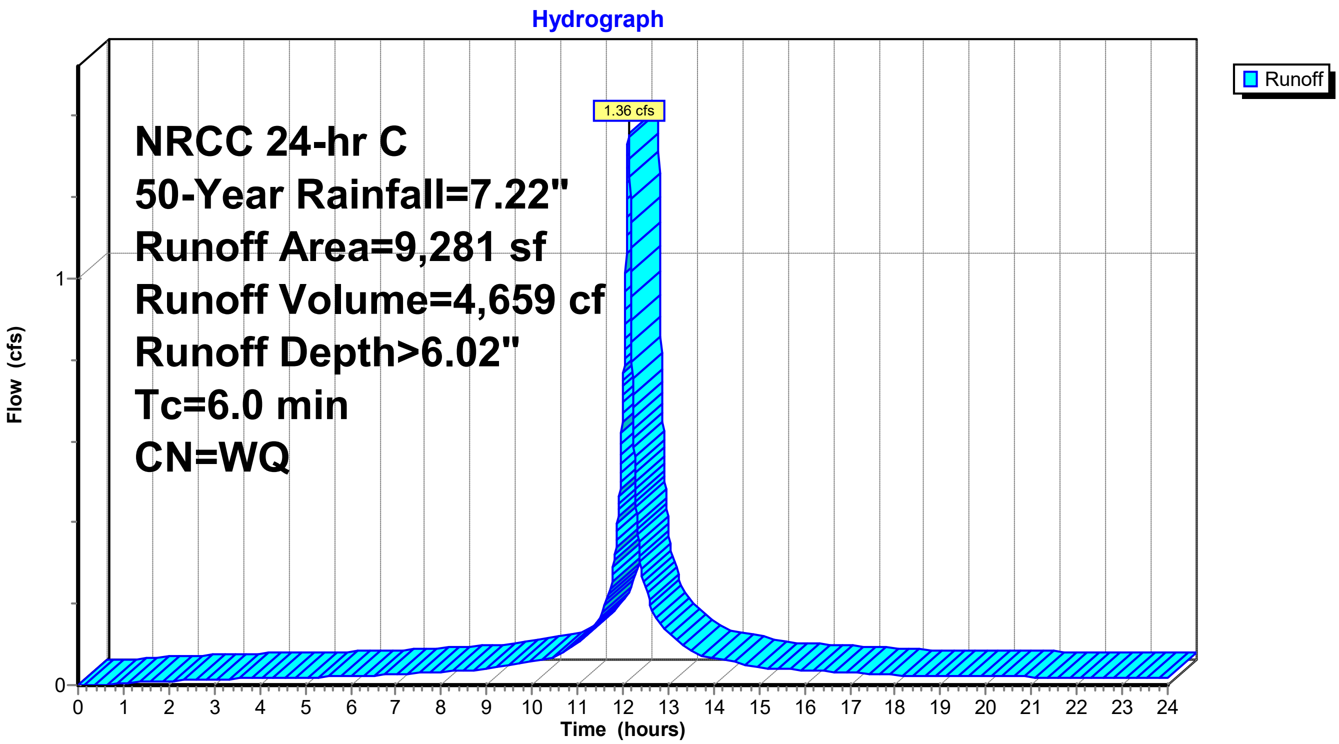
Runoff = 1.36 cfs @ 12.13 hrs, Volume= 4,659 cf, Depth> 6.02"
Routed to Pond FP-5 : FP-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
7,848	98	Paved parking, HSG A
1,372	39	>75% Grass cover, Good, HSG A
61	30	Woods, Good, HSG A
9,281		Weighted Average
1,433	39	15.44% Pervious Area
7,848	98	84.56% Impervious Area

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

Subcatchment SCA-10:



Summary for Subcatchment SCA-11:

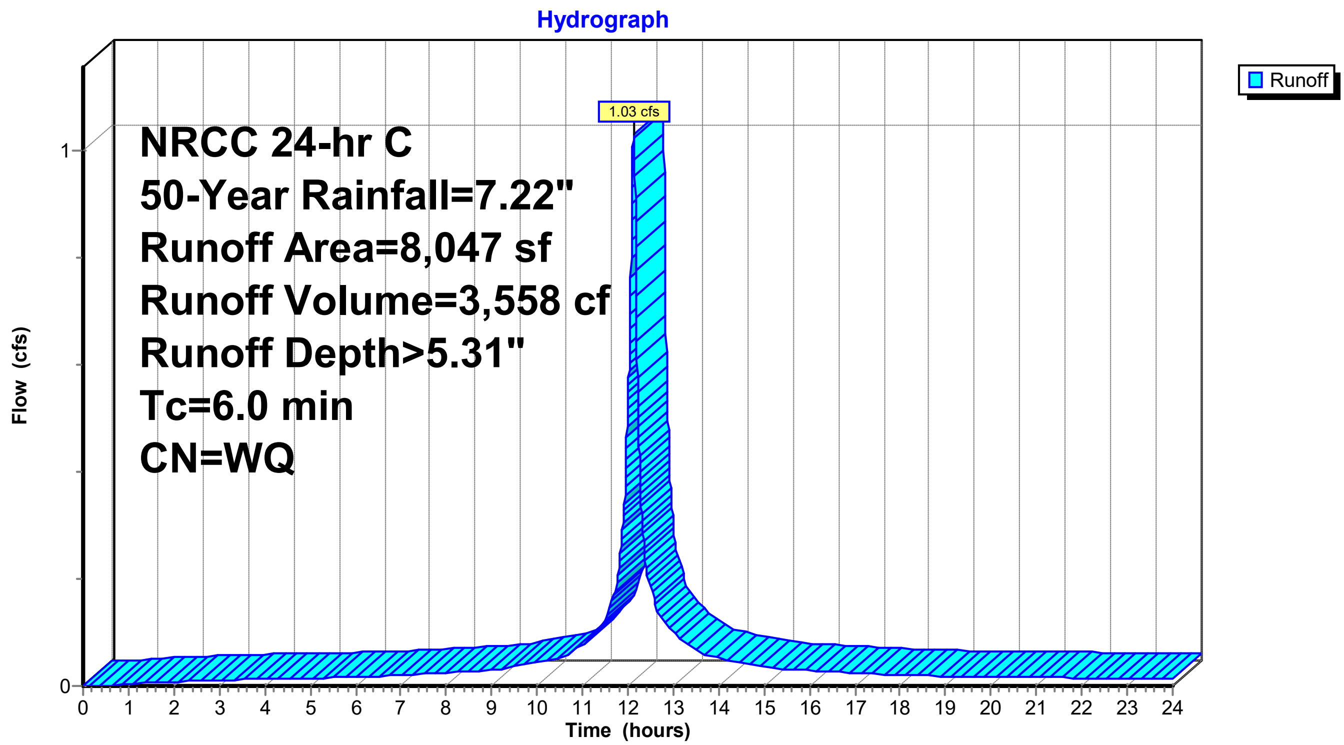
Runoff = 1.03 cfs @ 12.13 hrs, Volume= 3,558 cf, Depth> 5.31"
Routed to Pond FP-2 : FP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
5,857	98	Paved parking, HSG A
2,190	39	>75% Grass cover, Good, HSG A
8,047		Weighted Average
2,190	39	27.22% Pervious Area
5,857	98	72.78% Impervious Area

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

Subcatchment SCA-11:



Summary for Subcatchment SCA-12:

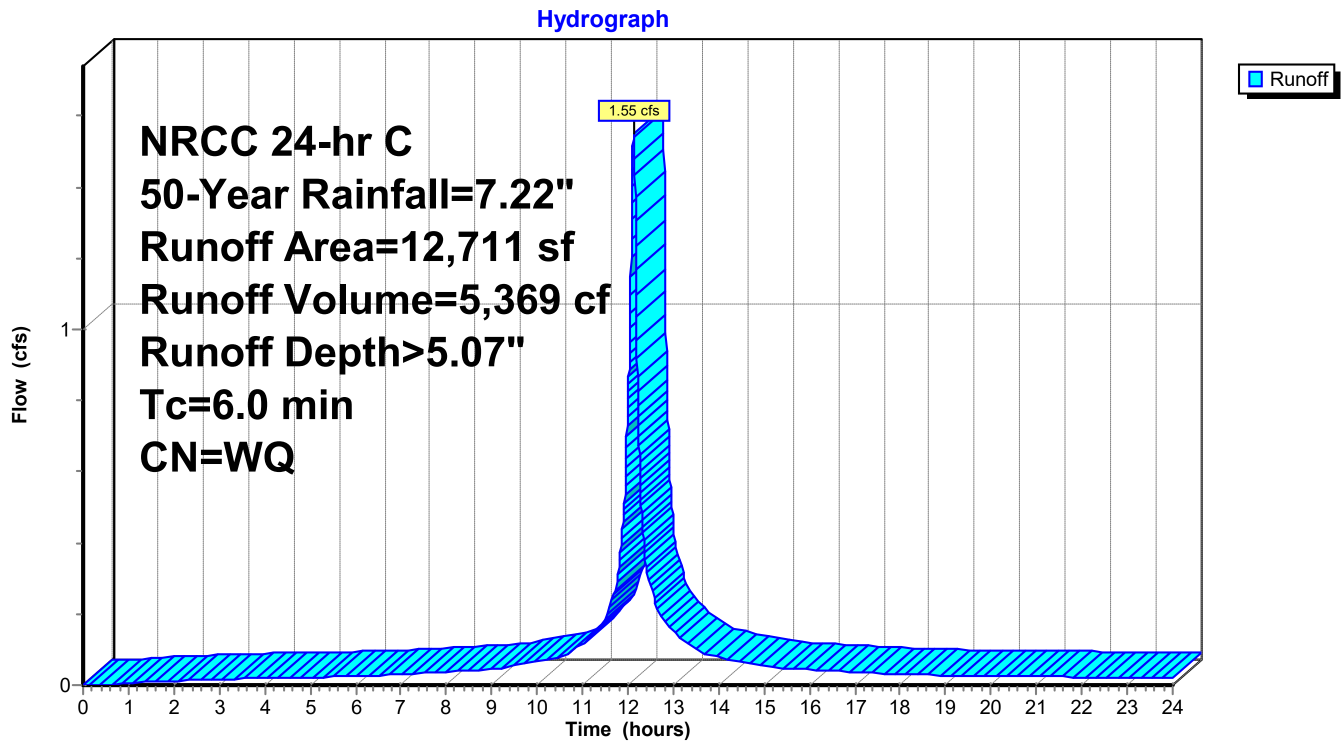
Runoff = 1.55 cfs @ 12.13 hrs, Volume= 5,369 cf, Depth> 5.07"
Routed to Pond FP-4 : FP-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
8,818	98	Paved parking, HSG A
3,298	39	>75% Grass cover, Good, HSG A
595	30	Woods, Good, HSG A
12,711		Weighted Average
3,893	38	30.63% Pervious Area
8,818	98	69.37% Impervious Area

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

Subcatchment SCA-12:



Summary for Subcatchment SCA-13:

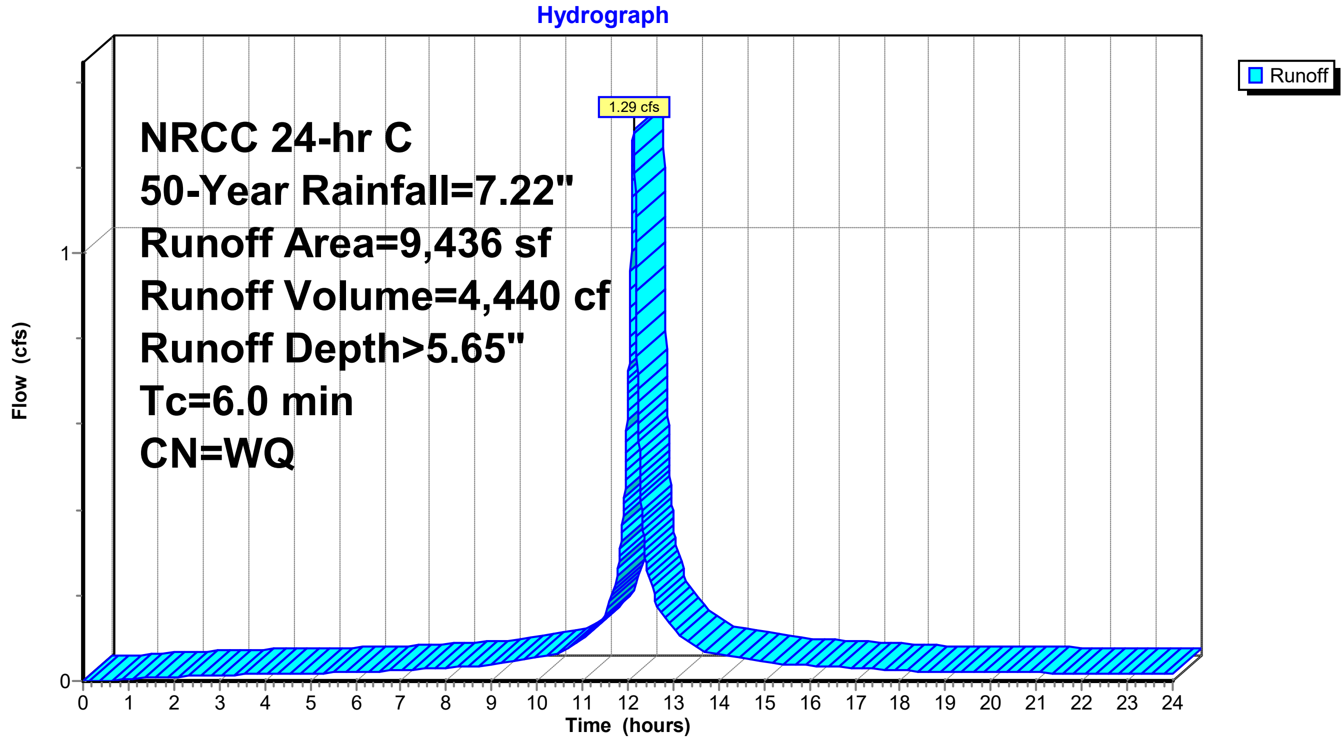
Runoff = 1.29 cfs @ 12.13 hrs, Volume= 4,440 cf, Depth> 5.65"
Routed to Pond FP-1 : FP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
7,393	98	Paved parking, HSG A
2,043	39	>75% Grass cover, Good, HSG A
9,436		Weighted Average
2,043	39	21.65% Pervious Area
7,393	98	78.35% Impervious Area

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

Subcatchment SCA-13:



Summary for Subcatchment SCA-14:

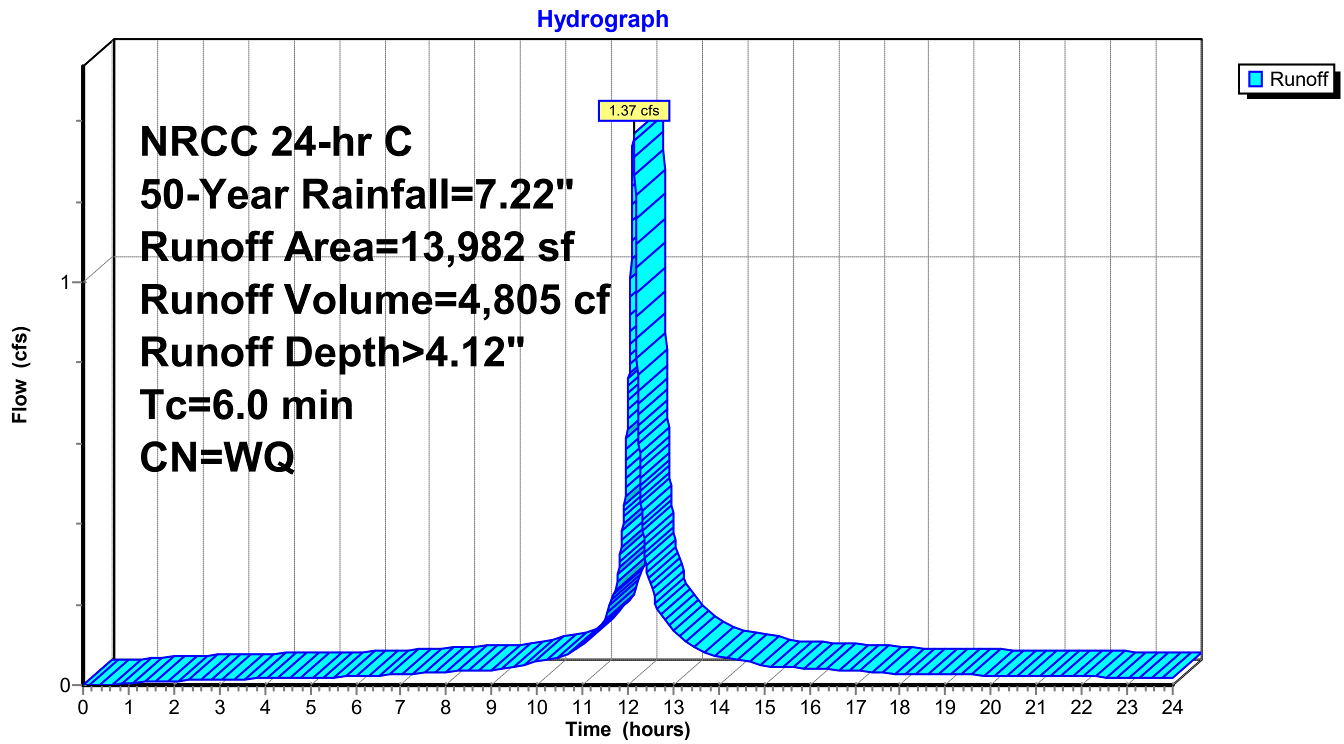
Runoff = 1.37 cfs @ 12.13 hrs, Volume= 4,805 cf, Depth> 4.12"
Routed to Pond CB-6B,C : CB-6B,6C

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
7,717	98	Paved parking, HSG A
3,829	39	>75% Grass cover, Good, HSG A
2,436	30	Woods, Good, HSG A
13,982		Weighted Average
6,265	36	44.81% Pervious Area
7,717	98	55.19% Impervious Area

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

Subcatchment SCA-14:



Summary for Subcatchment SCA-16:

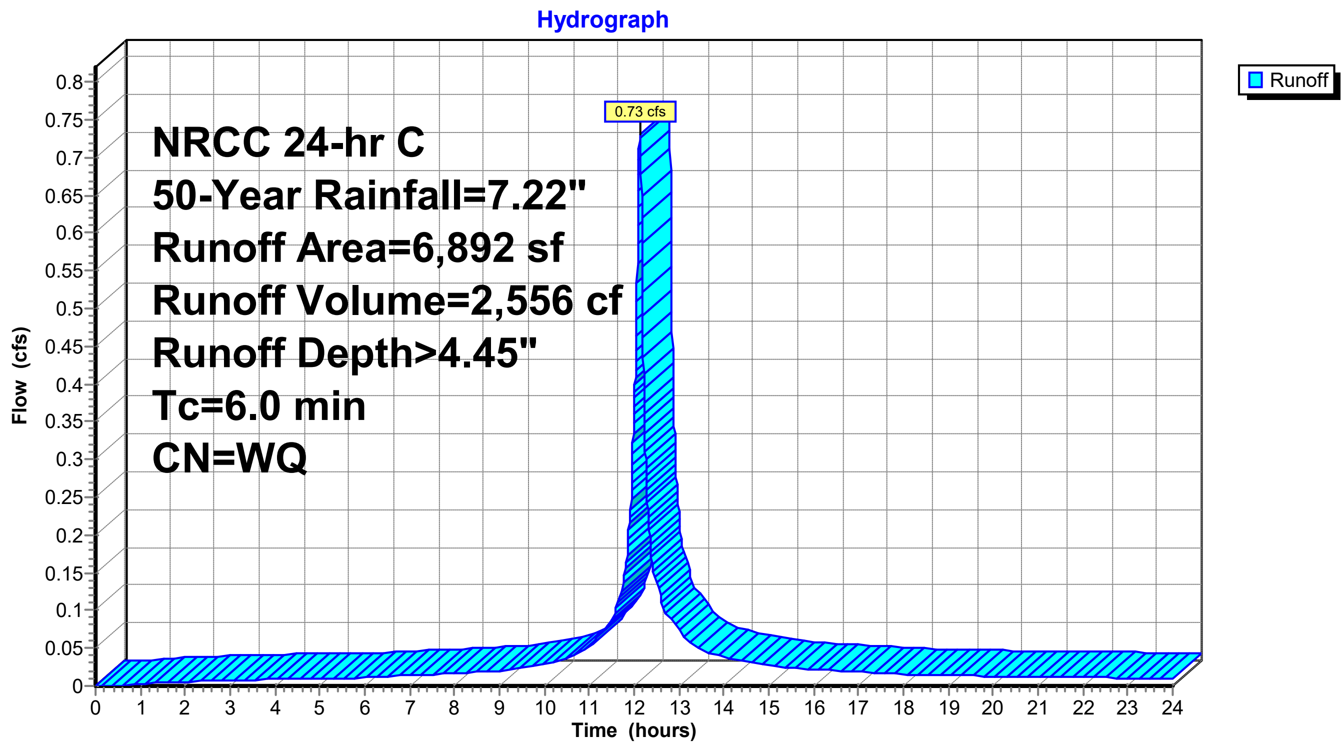
Runoff = 0.73 cfs @ 12.13 hrs, Volume= 2,556 cf, Depth> 4.45"
Routed to Pond CB-2B : CB 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
4,055	98	Paved parking, HSG A
2,837	39	>75% Grass cover, Good, HSG A
6,892		Weighted Average
2,837	39	41.16% Pervious Area
4,055	98	58.84% Impervious Area

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

Subcatchment SCA-16:



Summary for Subcatchment SCA-17:

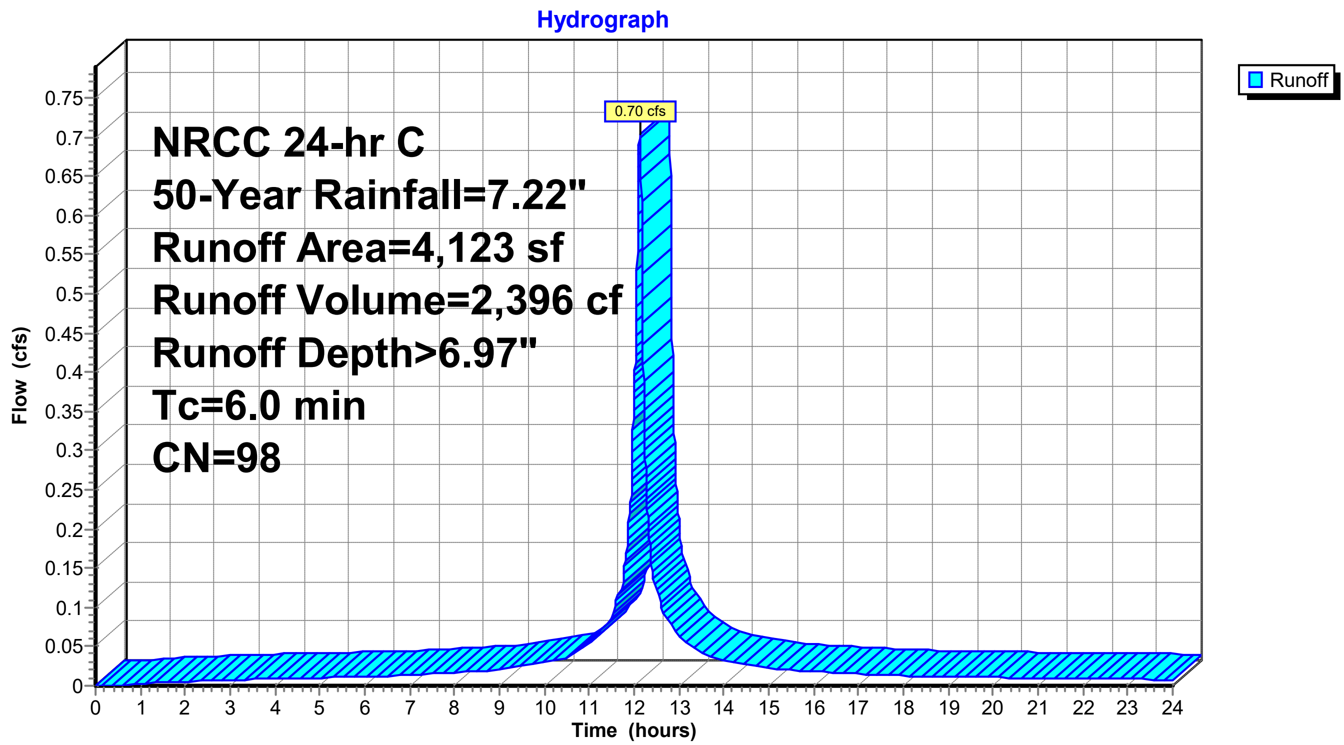
Runoff = 0.70 cfs @ 12.13 hrs, Volume= 2,396 cf, Depth> 6.97"
Routed to Pond CB-2A : CB 2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
4,123	98	Paved parking, HSG A
4,123	98	100.00% Impervious Area

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

Subcatchment SCA-17:



Summary for Subcatchment SCA-18:

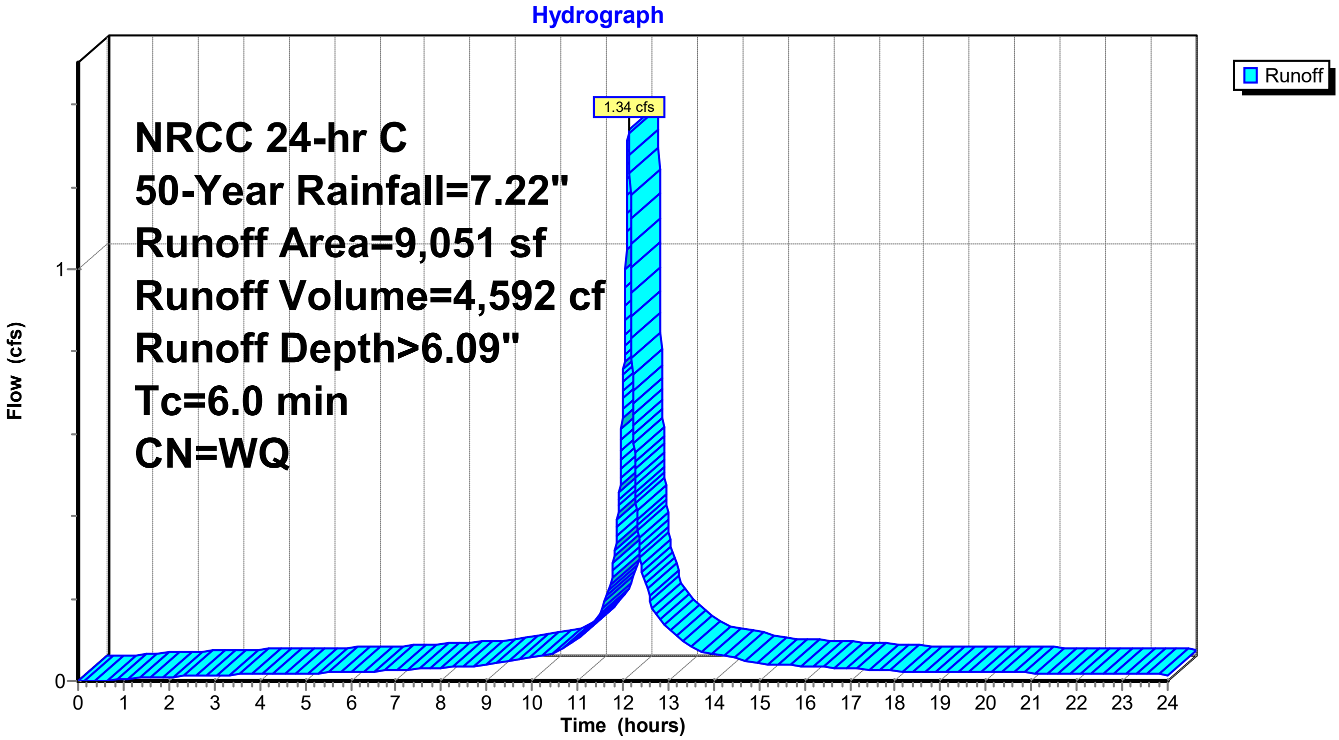
Runoff = 1.34 cfs @ 12.13 hrs, Volume= 4,592 cf, Depth> 6.09"
Routed to Pond CB-7 : CB-7

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
7,743	98	Paved parking, HSG A
1,308	39	>75% Grass cover, Good, HSG A
9,051		Weighted Average
1,308	39	14.45% Pervious Area
7,743	98	85.55% Impervious Area

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

Subcatchment SCA-18:



Summary for Subcatchment SCA-19:

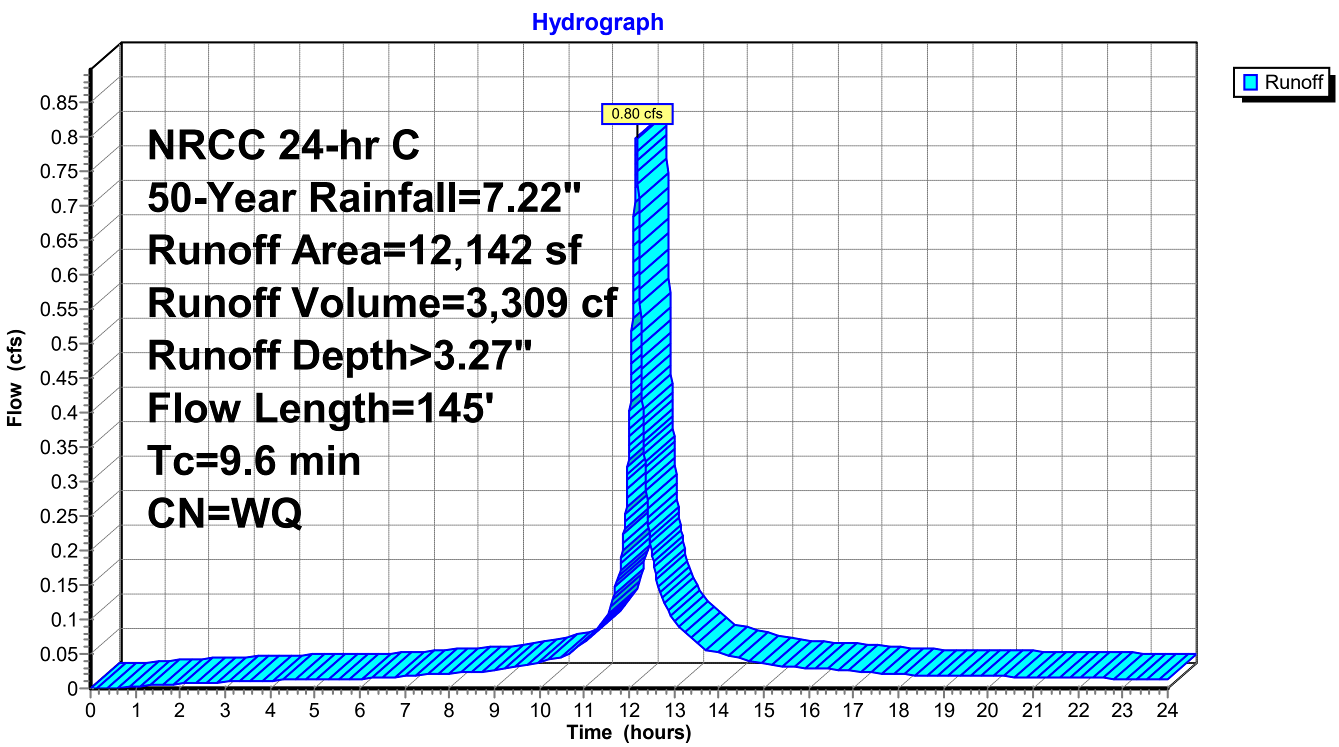
Runoff = 0.80 cfs @ 12.17 hrs, Volume= 3,309 cf, Depth> 3.27"
Routed to Pond CB-6A : CB-6A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
5,280	98	Paved parking, HSG A
5,968	32	Woods/grass comb., Good, HSG A
894	39	>75% Grass cover, Good, HSG A
12,142		Weighted Average
6,862	33	56.51% Pervious Area
5,280	98	43.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	50	0.0500	0.10		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.35"
1.0	70	0.0600	1.22		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.2	25	0.0100	2.03		**Shallow Concentrated Flow, Parking** Paved Kv= 20.3 fps
9.6	145	Total			

Subcatchment SCA-19:



Summary for Subcatchment SCA-2: LSA/FL

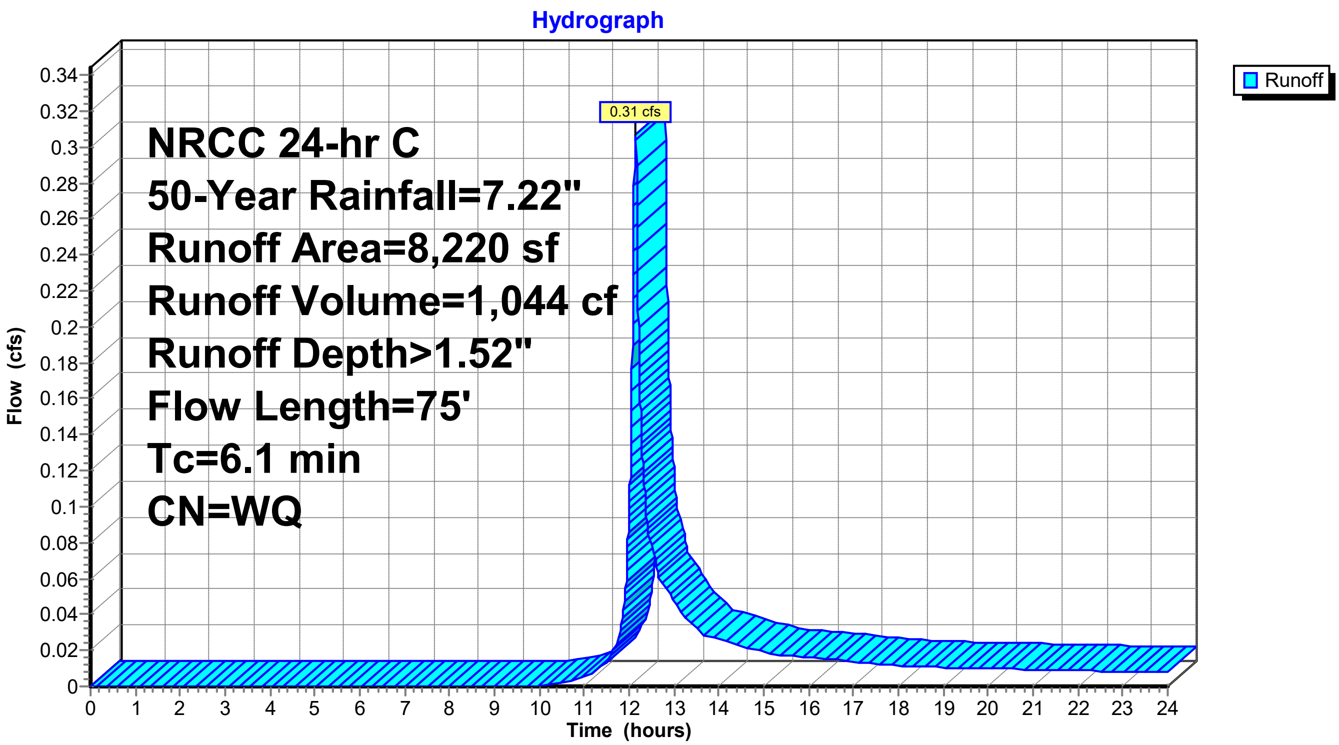
Runoff = 0.31 cfs @ 12.14 hrs, Volume= 1,044 cf, Depth> 1.52"
Routed to Pond INF-6 : INF-6

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

	Area (sf)	CN	Description
*	20	98	Cocncrete step
	5,345	39	>75% Grass cover, Good, HSG A
*	2,855	60	Stone Fire Lane
	8,220		Weighted Average
	8,200	46	99.76% Pervious Area
	20	98	0.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	35	0.0150	0.13		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.35"
1.4	20	0.0100	0.23		**Sheet Flow, Stone Fire Lane** Fallow n= 0.050 P2= 3.35"
0.1	20	0.1500	2.71		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
6.1	75	Total			

Subcatchment SCA-2: LSA/FL



Summary for Subcatchment SCA-4:

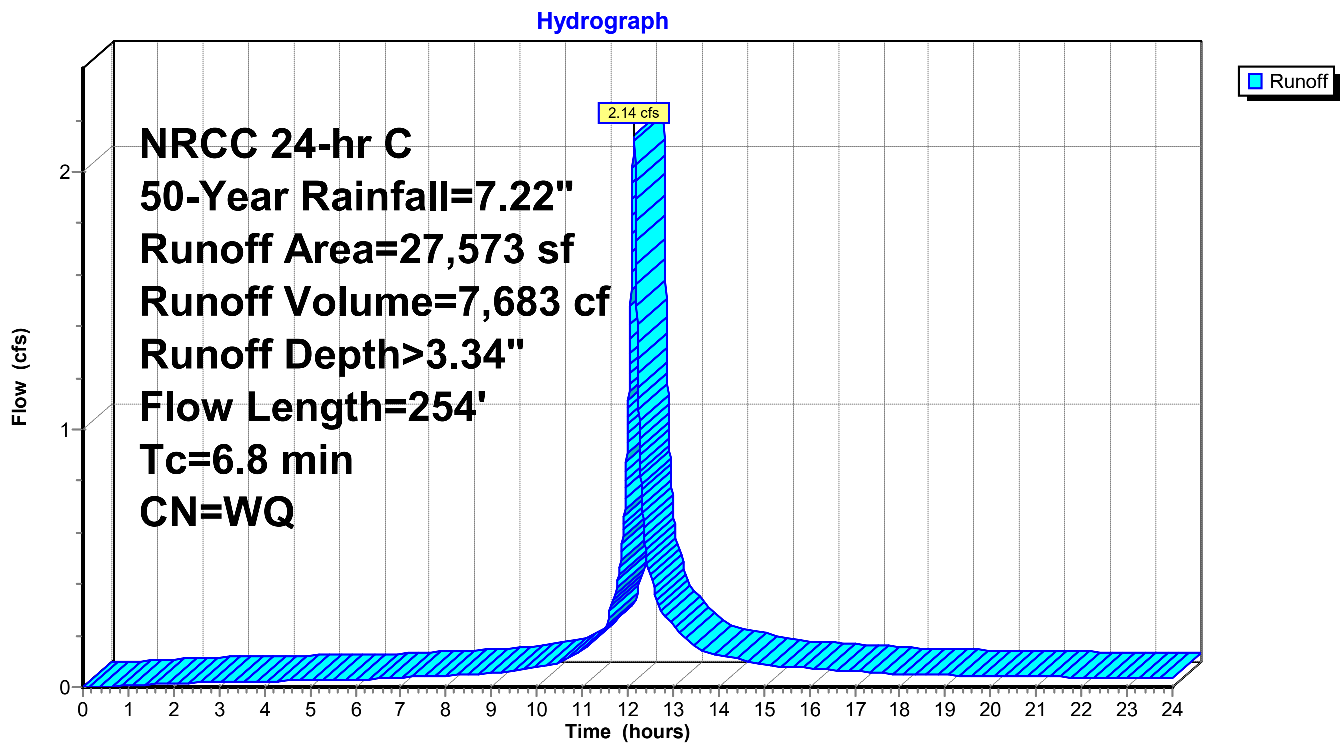
Runoff = 2.14 cfs @ 12.14 hrs, Volume= 7,683 cf, Depth> 3.34"
Routed to Pond CB-4 : CB-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

	Area (sf)	CN	Description
	10,454	98	Paved parking, HSG A
	8,808	39	>75% Grass cover, Good, HSG A
	4,820	30	Woods, Good, HSG A
*	3,245	60	Stone Fire Lane
*	246	98	Shed Roof
	27,573		Weighted Average
	16,873	40	61.19% Pervious Area
	10,700	98	38.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	23	0.0100	0.10		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.35"
2.3	158	0.0050	1.14		**Shallow Concentrated Flow, Stone Fire Lane** Unpaved Kv= 16.1 fps
0.6	73	0.0100	2.03		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
6.8	254	Total			

Subcatchment SCA-4:



Summary for Subcatchment SCA-5:

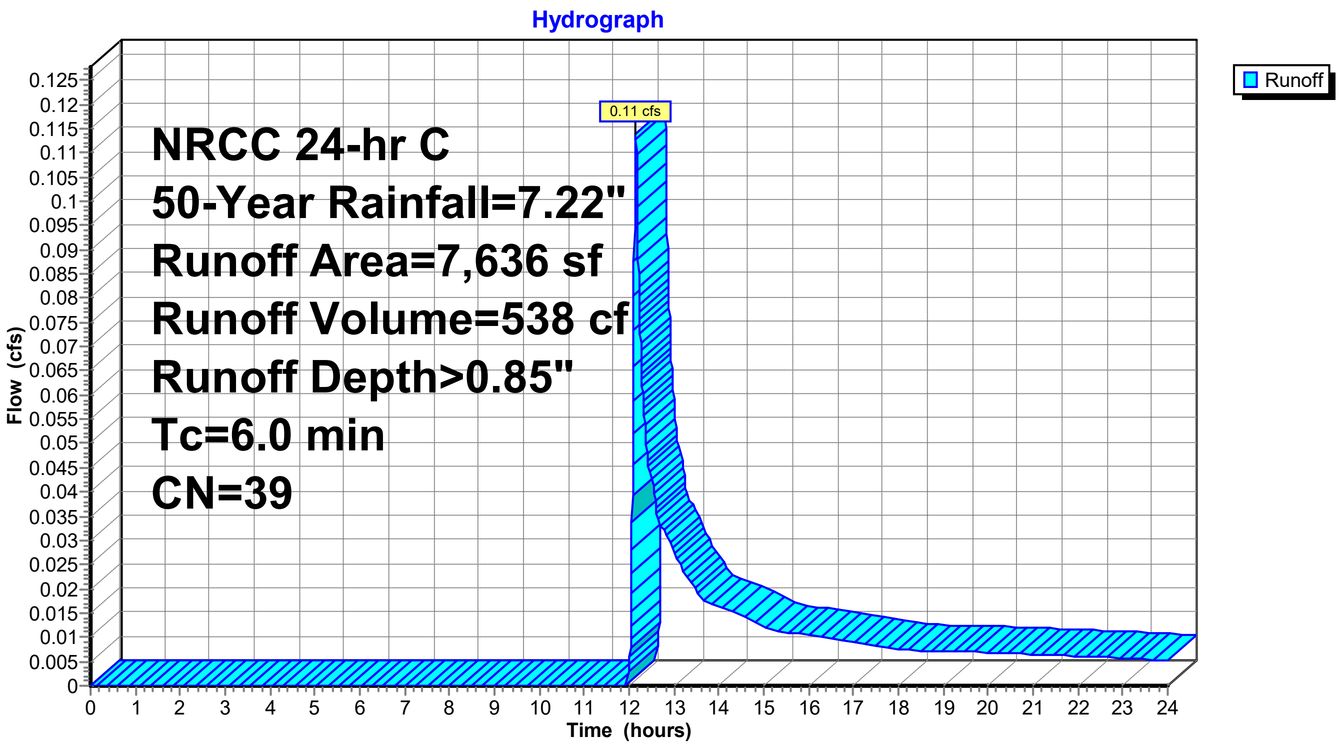
Runoff = 0.11 cfs @ 12.15 hrs, Volume= 538 cf, Depth> 0.85"
Routed to Pond FP-7 : FP-7/INF-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
7,636	39	>75% Grass cover, Good, HSG A
7,636	39	100.00% Pervious Area

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

Subcatchment SCA-5:



Summary for Subcatchment SCA-6.1:

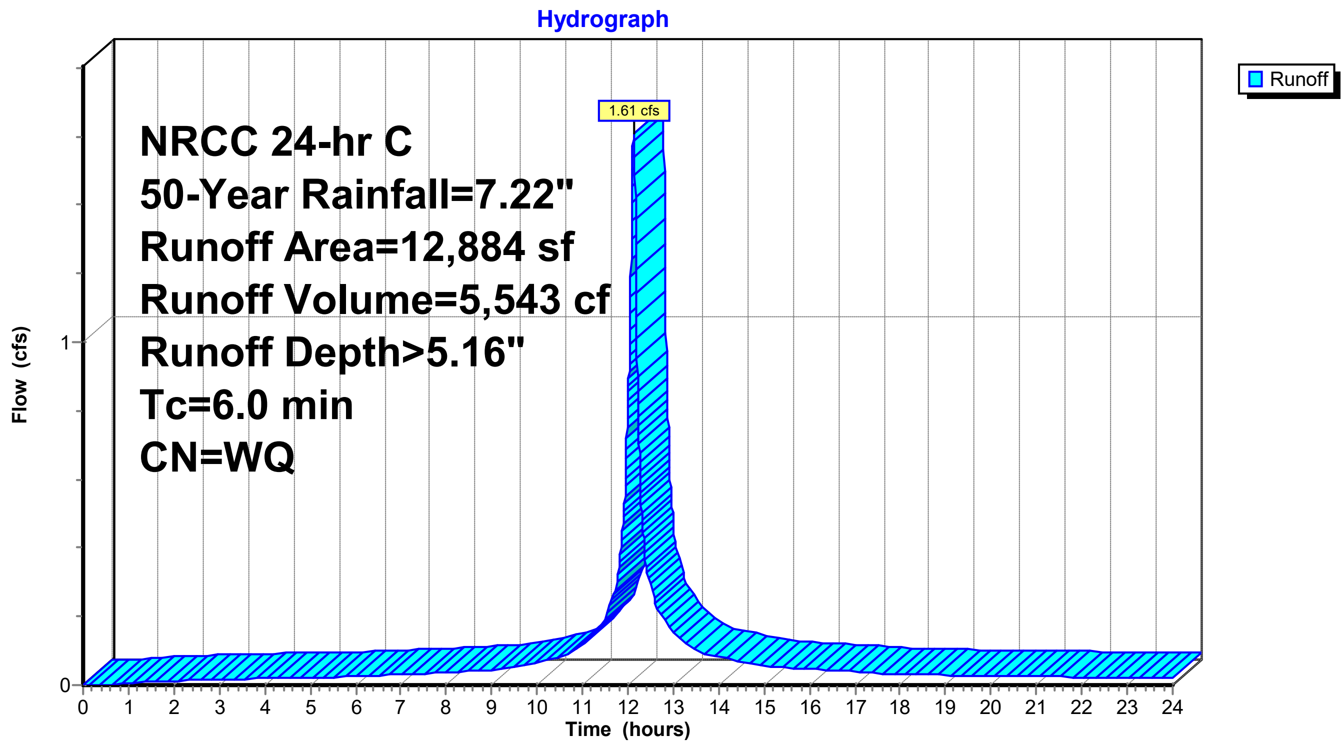
Runoff = 1.61 cfs @ 12.13 hrs, Volume= 5,543 cf, Depth> 5.16"
Routed to Pond CB-3 : CB-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

	Area (sf)	CN	Description
	8,965	98	Paved parking, HSG A
	3,559	39	>75% Grass cover, Good, HSG A
*	360	60	Fire Lane (FL)
	12,884		Weighted Average
	3,919	41	30.42% Pervious Area
	8,965	98	69.58% Impervious Area

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

Subcatchment SCA-6.1:



Summary for Subcatchment SCA-6.2:

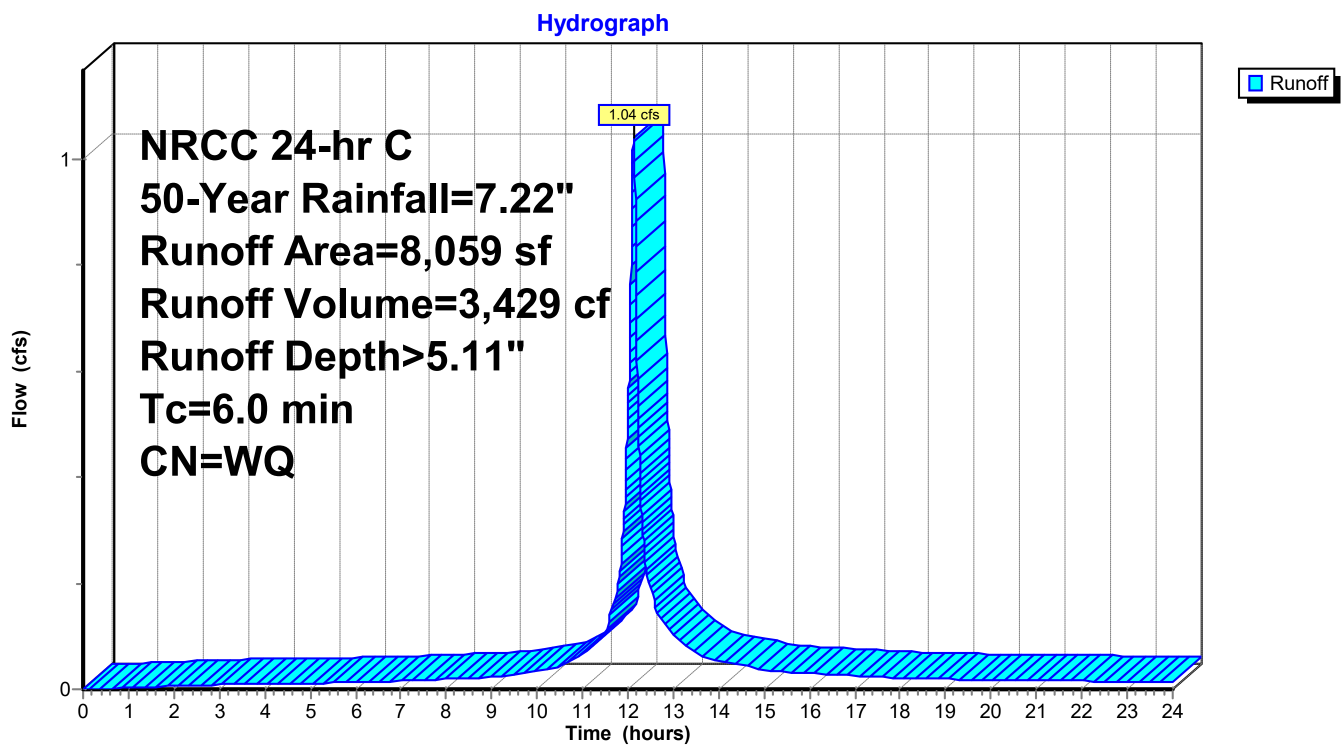
Runoff = 1.04 cfs @ 12.13 hrs, Volume= 3,429 cf, Depth> 5.11"
Routed to Pond FP-3 : FP-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

	Area (sf)	CN	Description
*	3,130	60	Permeable Pavers (PP)
	3,296	98	Paved roads w/curbs & sewers, HSG A
*	1,331	98	Canopy (CP)
	302	39	>75% Grass cover, Good, HSG A
	8,059		Weighted Average
	3,432	58	42.59% Pervious Area
	4,627	98	57.41% Impervious Area

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

Subcatchment SCA-6.2:



Summary for Subcatchment SCA-7:

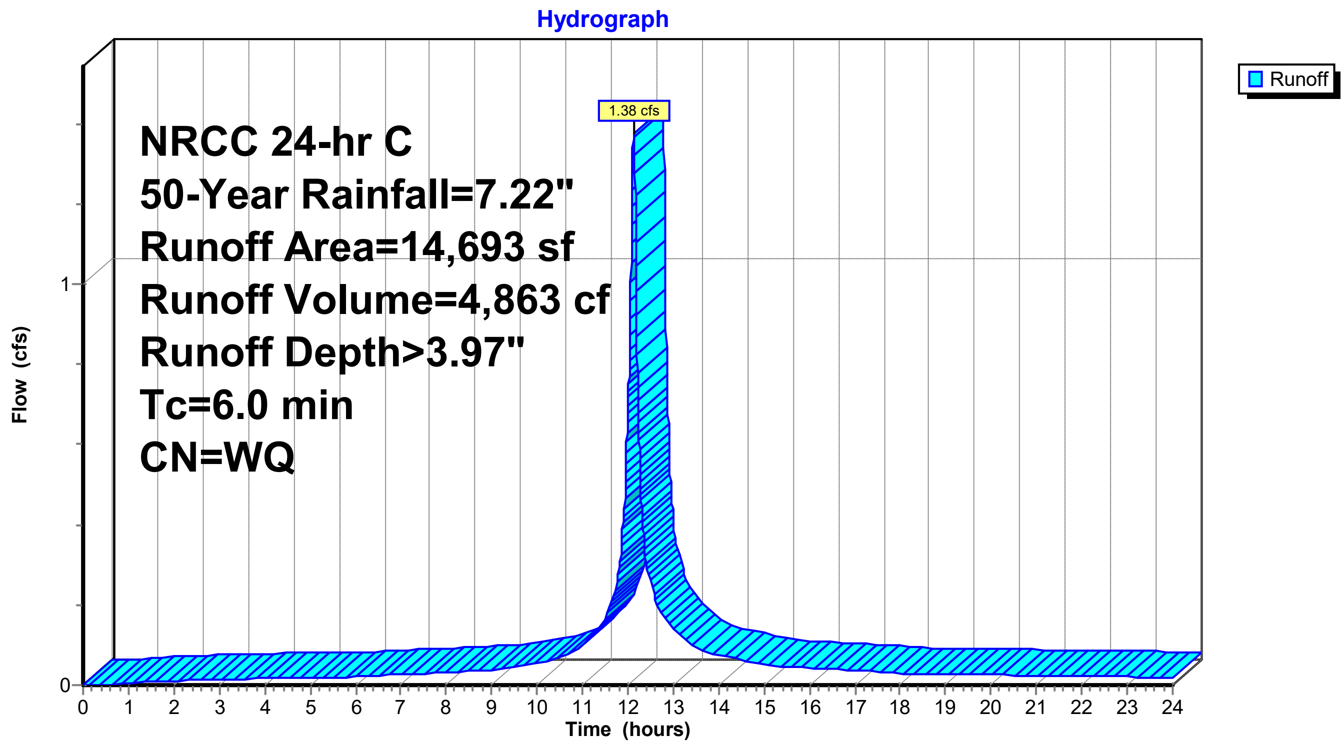
Runoff = 1.38 cfs @ 12.13 hrs, Volume= 4,863 cf, Depth> 3.97"
Routed to Pond FP-6 : FP-6

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
7,630	98	Paved parking, HSG A
5,346	39	>75% Grass cover, Good, HSG A
1,717	32	Woods/grass comb., Good, HSG A
14,693		Weighted Average
7,063	37	48.07% Pervious Area
7,630	98	51.93% Impervious Area

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

Subcatchment SCA-7:



Summary for Subcatchment SCA-8:

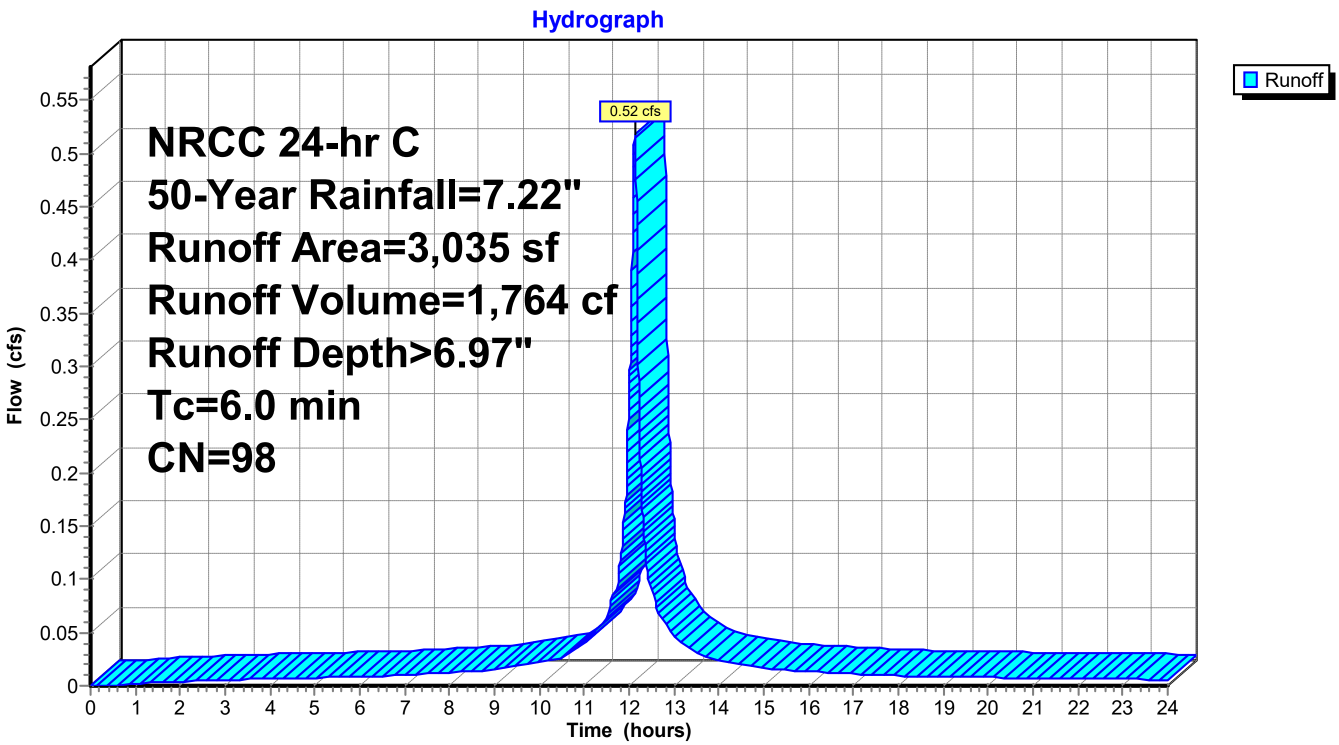
Runoff = 0.52 cfs @ 12.13 hrs, Volume= 1,764 cf, Depth> 6.97"
Routed to Pond FP-1 : FP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
3,035	98	Paved parking, HSG A
3,035	98	100.00% Impervious Area

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

Subcatchment SCA-8:



Summary for Subcatchment SCA-9:

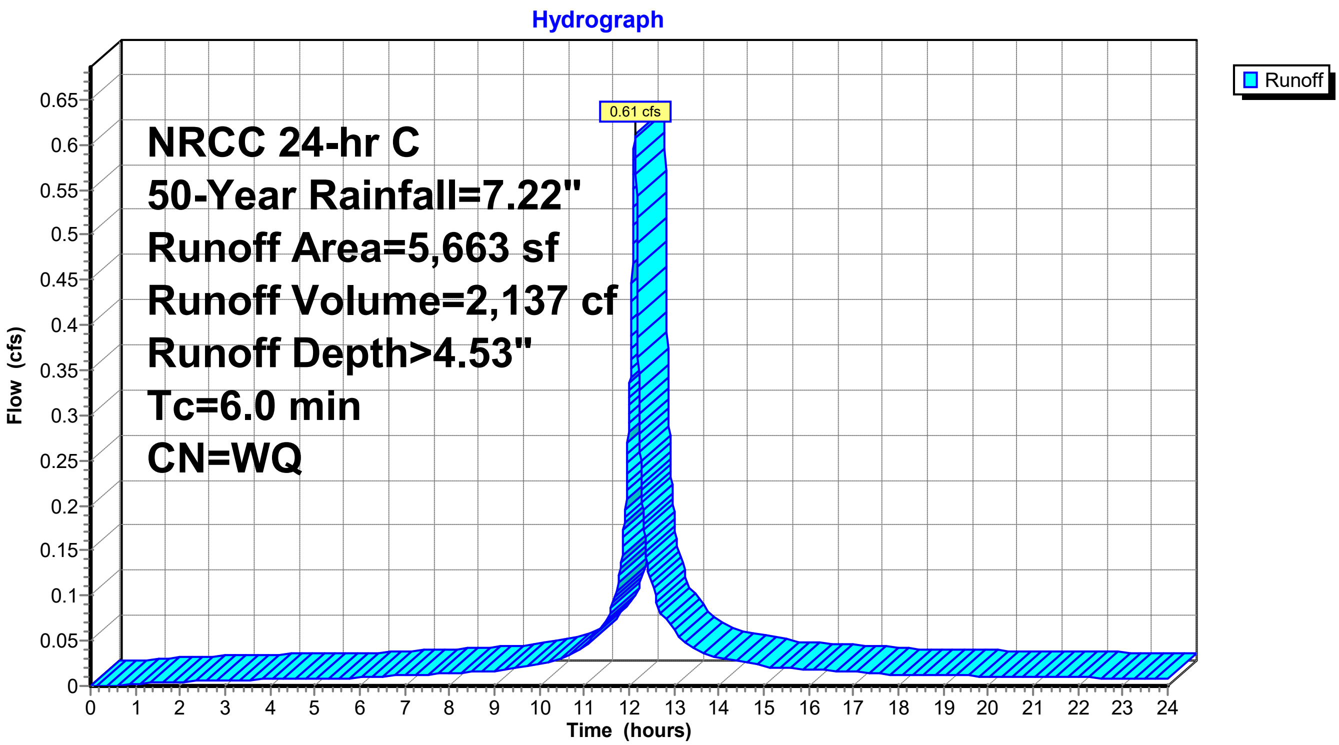
Runoff = 0.61 cfs @ 12.13 hrs, Volume= 2,137 cf, Depth> 4.53"
Routed to Pond FP-3 : FP-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
3,403	98	Paved parking, HSG A
2,260	39	>75% Grass cover, Good, HSG A
5,663		Weighted Average
2,260	39	39.91% Pervious Area
3,403	98	60.09% Impervious Area

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

Subcatchment SCA-9:



Summary for Subcatchment UC-1: NA

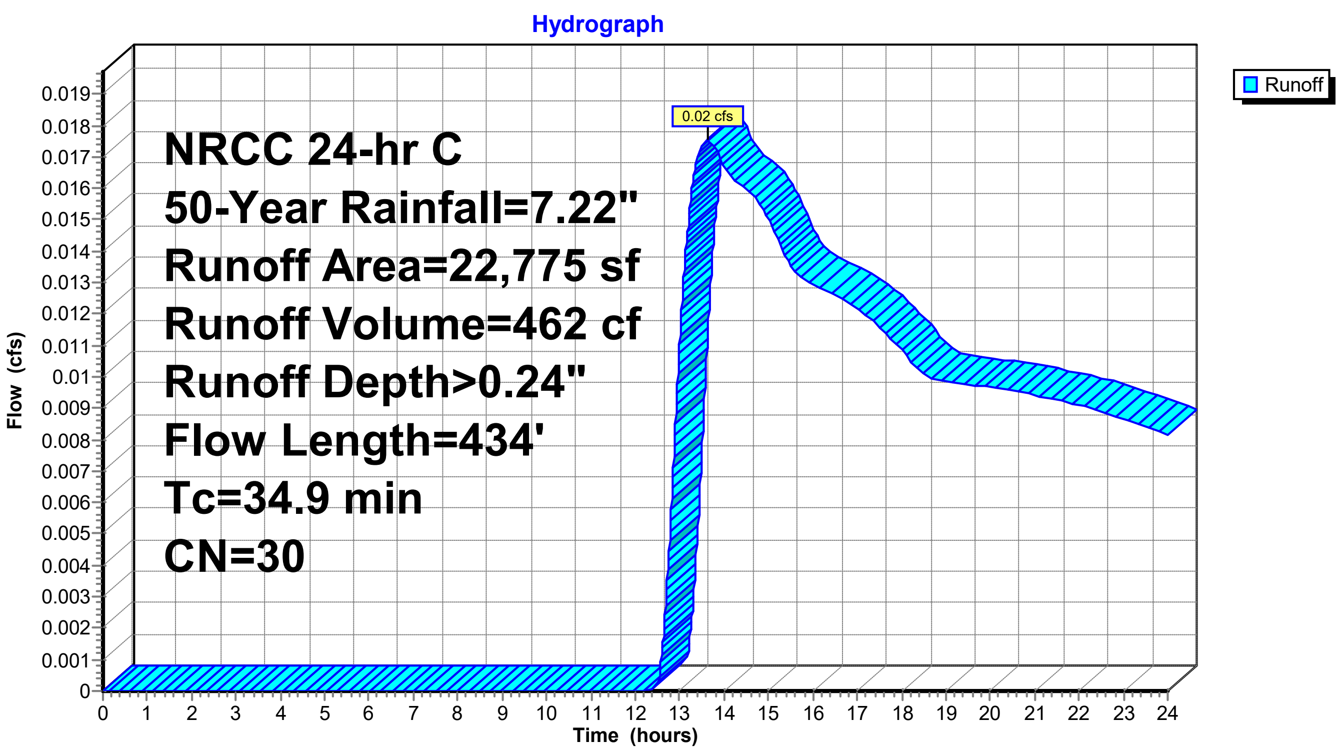
Runoff = 0.02 cfs @ 13.61 hrs, Volume= 462 cf, Depth> 0.24"
Routed to Pond SP 1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
22,775	30	Woods, Good, HSG A
22,775	30	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.2	100	0.0250	0.09		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
15.7	334	0.0050	0.35		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
34.9	434	Total			

Subcatchment UC-1: NA



Summary for Subcatchment UC-2:

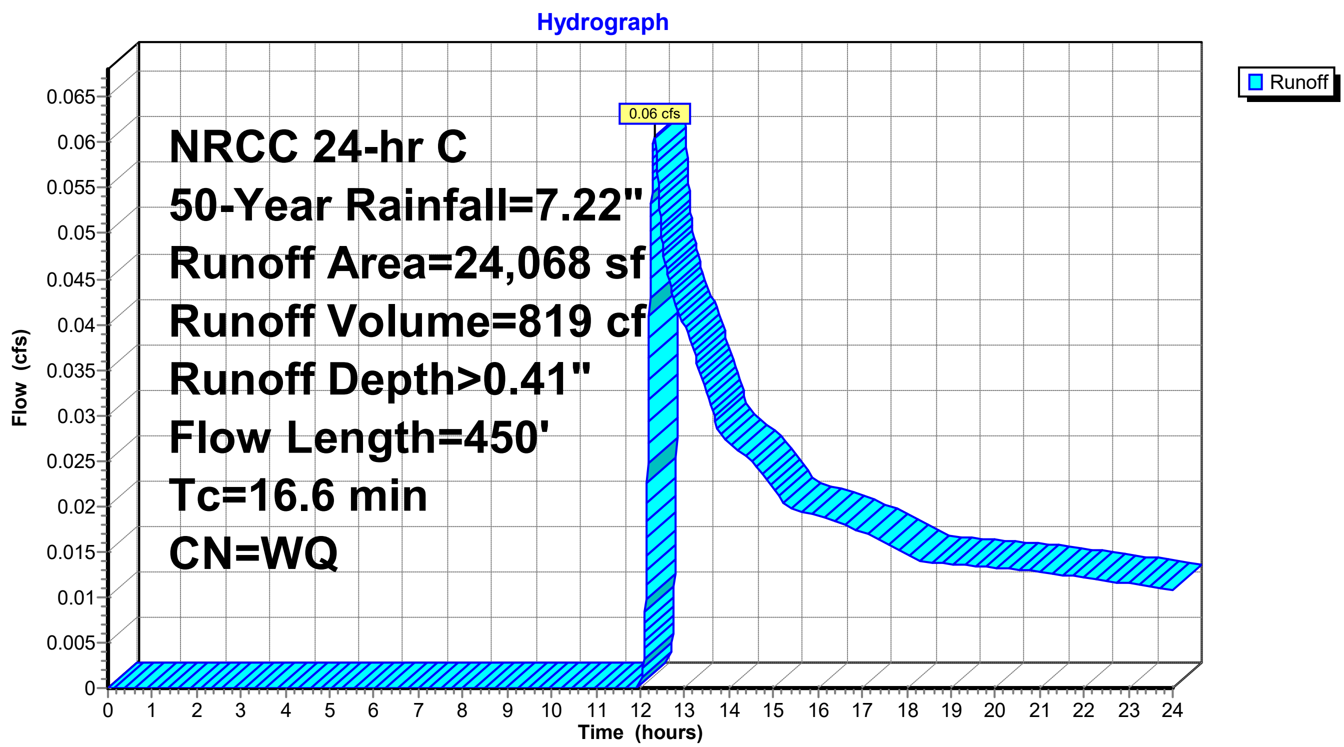
Runoff = 0.06 cfs @ 12.32 hrs, Volume= 819 cf, Depth> 0.41"
Routed to Pond SP 3 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
17,559	30	Woods, Good, HSG A
6,509	39	>75% Grass cover, Good, HSG A
24,068		Weighted Average
24,068	32	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	50	0.0590	0.11		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
6.6	199	0.0100	0.50		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
2.2	201	0.0100	1.50		**Shallow Concentrated Flow, SWALE** Grassed Waterway Kv= 15.0 fps
16.6	450	Total			

Subcatchment UC-2:



Summary for Subcatchment UC-3:

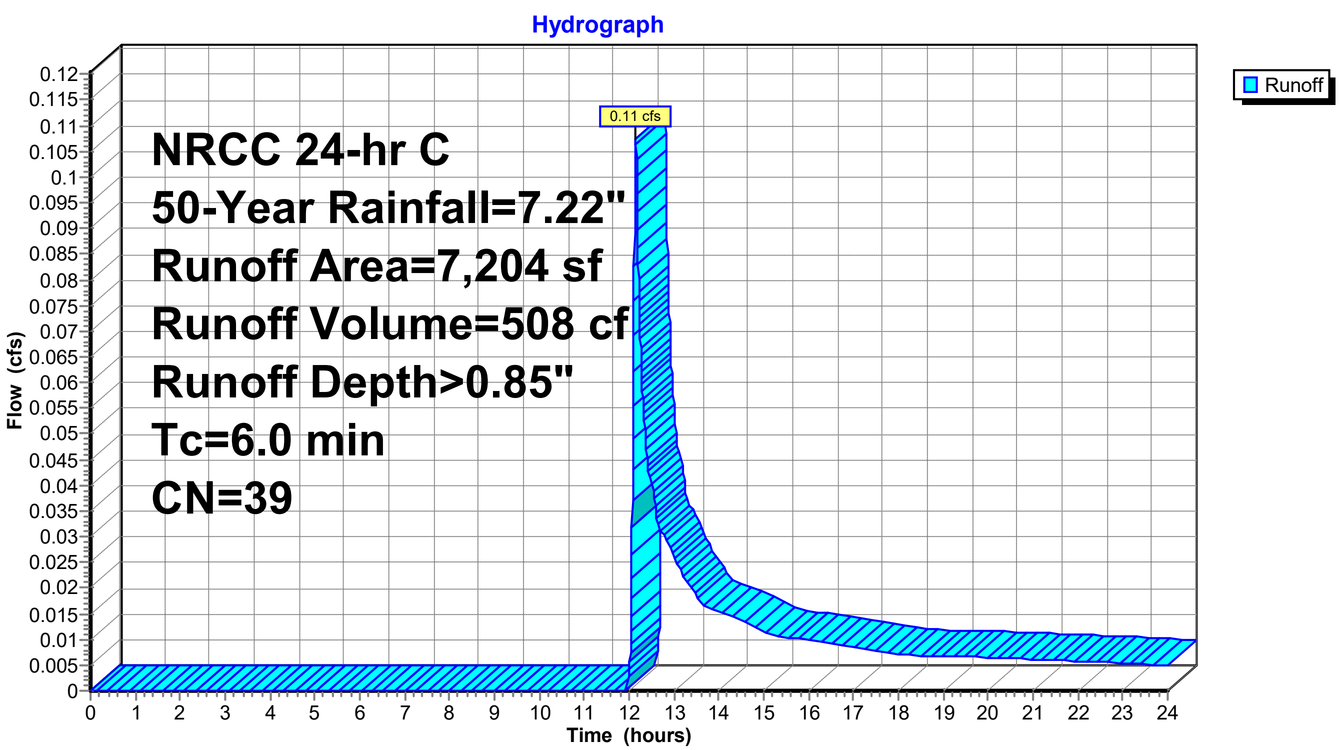
Runoff = 0.11 cfs @ 12.15 hrs, Volume= 508 cf, Depth> 0.85"
Routed to Pond AB-1 : Attenuation Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
7,204	39	>75% Grass cover, Good, HSG A
7,204	39	100.00% Pervious Area

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

Subcatchment UC-3:



Summary for Subcatchment UC-4:

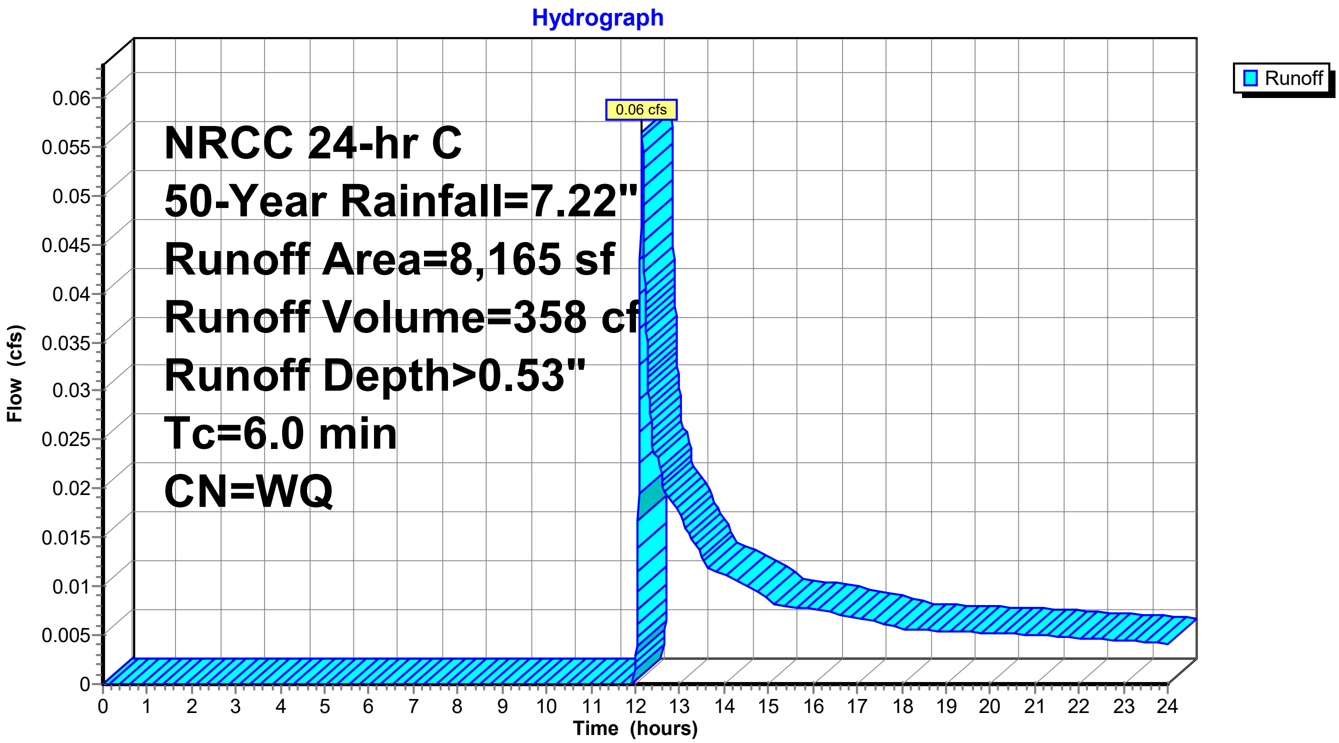
Runoff = 0.06 cfs @ 12.15 hrs, Volume= 358 cf, Depth> 0.53"
Routed to Pond SP 4 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
3,787	39	>75% Grass cover, Good, HSG A
4,378	30	Woods, Good, HSG A
8,165		Weighted Average
8,165	34	100.00% Pervious Area

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

Subcatchment UC-4:



Summary for Subcatchment UC-5:

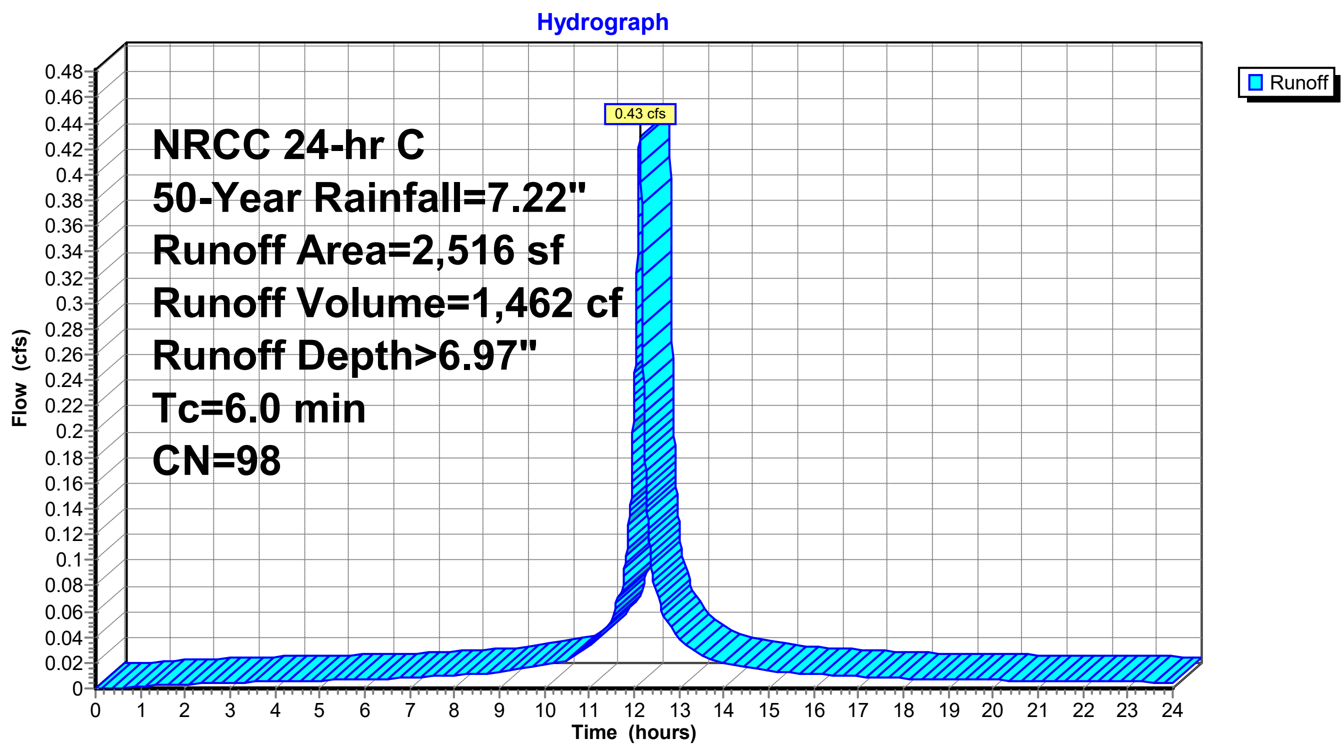
Runoff = 0.43 cfs @ 12.13 hrs, Volume= 1,462 cf, Depth> 6.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
2,516	98	Paved parking, HSG A
2,516	98	100.00% Impervious Area

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

Subcatchment UC-5:



Summary for Subcatchment UC-6: NA

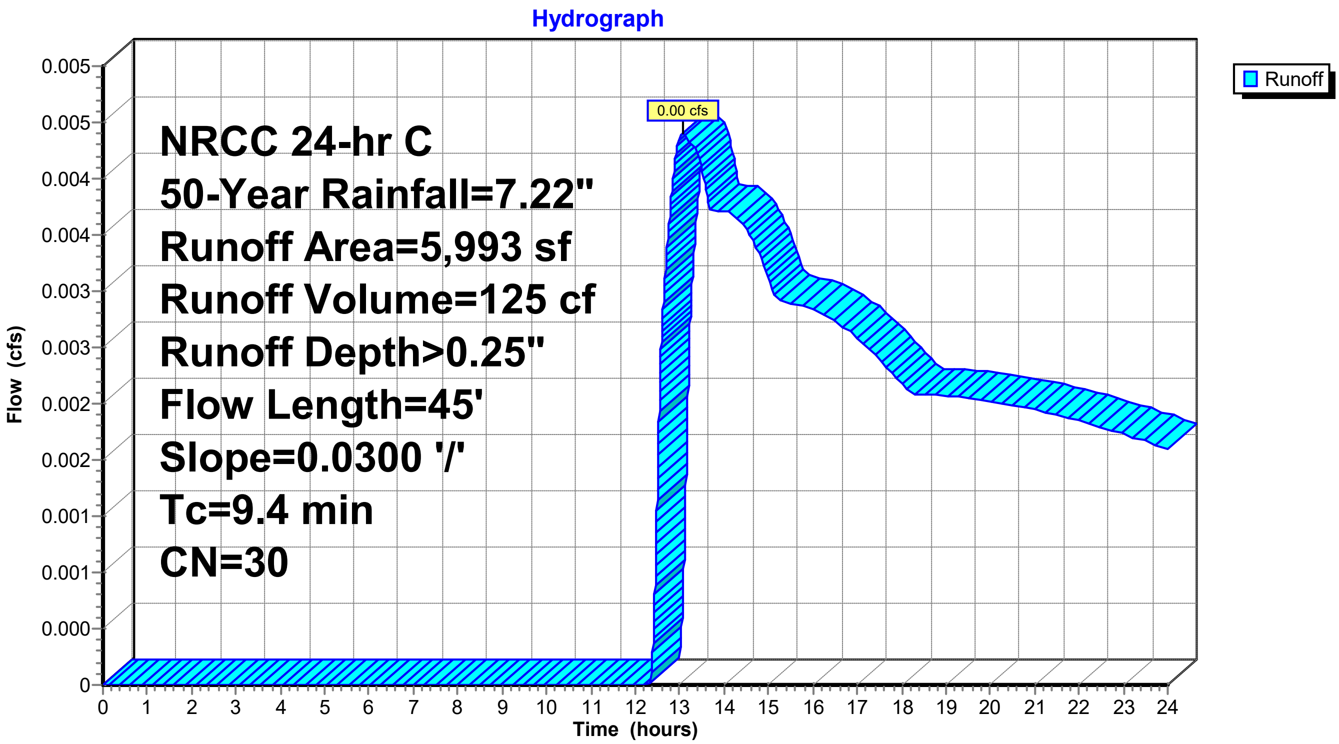
Runoff = 0.00 cfs @ 13.07 hrs, Volume= 125 cf, Depth> 0.25"
Routed to Pond SP-2 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 50-Year Rainfall=7.22"

Area (sf)	CN	Description
5,993	30	Woods, Good, HSG A
5,993	30	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	45	0.0300	0.08		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"

Subcatchment UC-6: NA



Summary for Pond AB-1: Attenuation Basin

Inflow Area = 7,204 sf, 0.00% Impervious, Inflow Depth > 7.34" for 50-Year event
Inflow = 3.27 cfs @ 12.13 hrs, Volume= 4,408 cf
Outflow = 0.95 cfs @ 12.70 hrs, Volume= 3,981 cf, Atten= 71%, Lag= 34.6 min
Discarded = 0.02 cfs @ 12.20 hrs, Volume= 578 cf
Primary = 0.93 cfs @ 12.70 hrs, Volume= 3,403 cf
Routed to Pond SP 4 : Study Point

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 50.81' @ 12.70 hrs Surf.Area= 1,643 sf Storage= 1,984 cf

Plug-Flow detention time= 76.0 min calculated for 3,980 cf (90% of inflow)
Center-of-Mass det. time= 52.9 min (825.6 - 772.7)

Volume	Invert	Avail.Storage	Storage Description
#1	49.00'	4,514 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

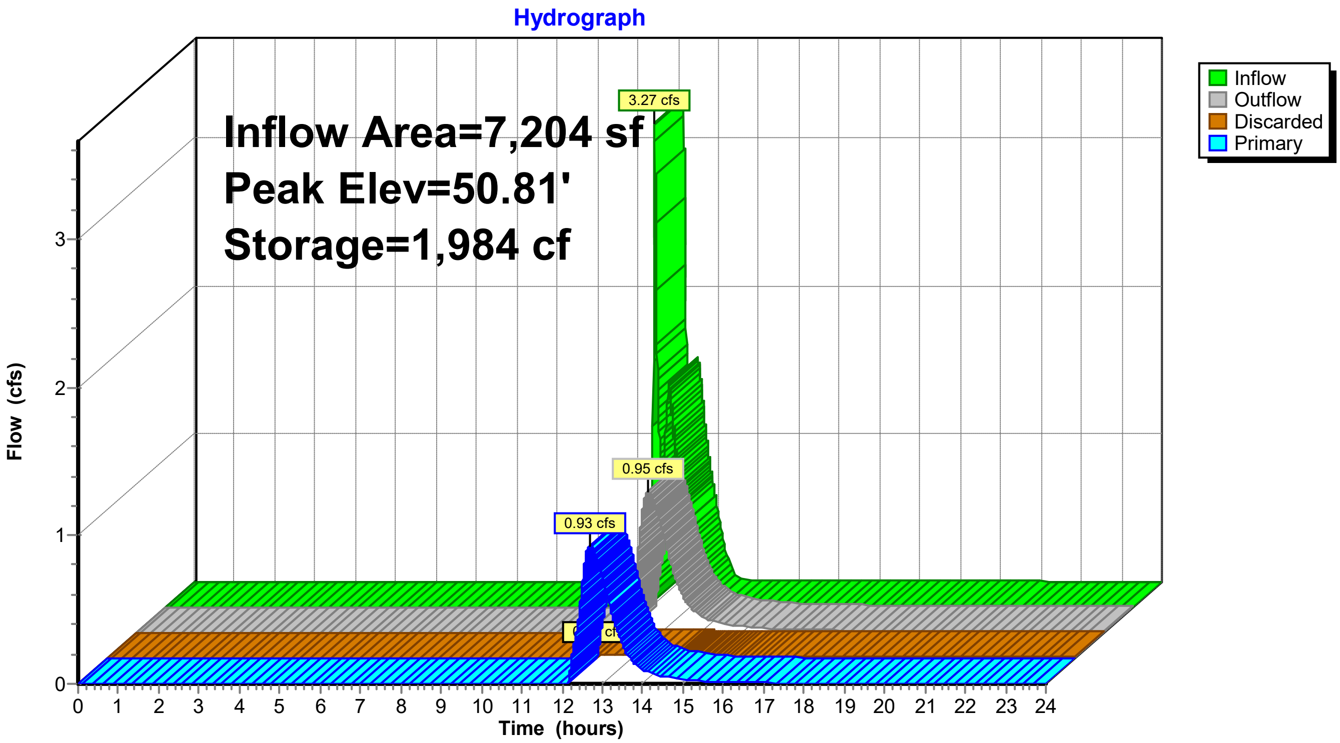
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
49.00	766	147.0	0	0	766
50.00	1,048	206.0	903	903	2,433
51.00	1,801	246.0	1,408	2,311	3,889
52.00	2,632	275.0	2,203	4,514	5,119

Device	Routing	Invert	Outlet Devices
#1	Primary	49.50'	**18.0" Round Culvert** L= 54.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 49.50' / 49.00' S= 0.0093 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	49.50'	**20.0 deg x 2.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.69 (C= 3.36)
#3	Device 1	51.75'	**28.0" x 28.0" Horiz. Bar Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	49.00'	**3.000 in/hr Exfiltration over Surface area from 49.00' - 50.00'** Excluded Surface area = 766 sf Phase-In= 0.01'

Discarded OutFlow Max=0.02 cfs @ 12.20 hrs HW=50.00' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.93 cfs @ 12.70 hrs HW=50.81' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.93 cfs of 5.89 cfs potential flow)
  ├**2=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.93 cfs @ 3.08 fps)
  └**3=Bar Grate** (Controls 0.00 cfs)

Pond AB-1: Attenuation Basin



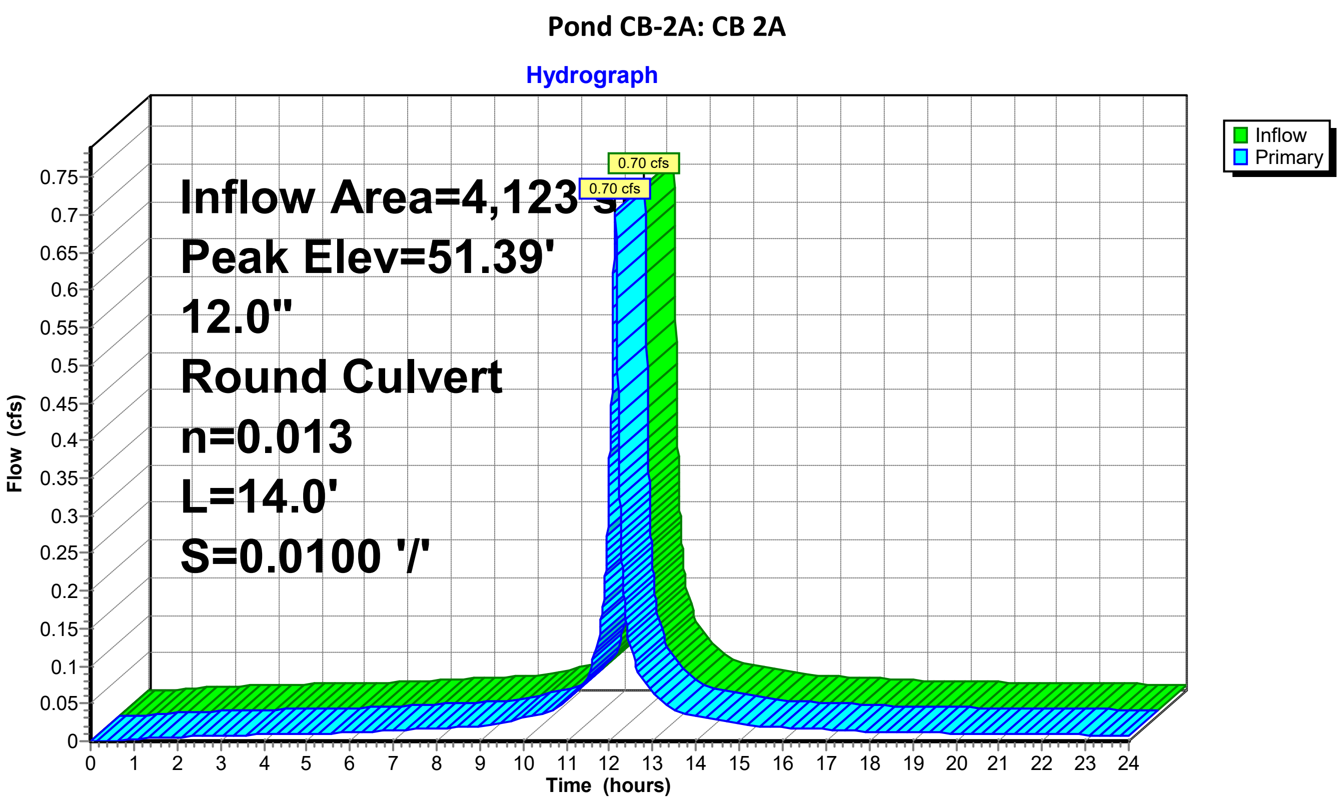
Summary for Pond CB-2A: CB 2A

Inflow Area = 4,123 sf,100.00% Impervious, Inflow Depth > 6.97" for 50-Year event
Inflow = 0.70 cfs @ 12.13 hrs, Volume= 2,396 cf
Outflow = 0.70 cfs @ 12.13 hrs, Volume= 2,396 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.70 cfs @ 12.13 hrs, Volume= 2,396 cf
Routed to Pond DMH-2.2 : DMH-2.2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.39' @ 12.13 hrs
Flood Elev= 53.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	50.53'	**12.0" Round Culvert** L= 14.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.53' / 50.39' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.59 cfs @ 12.13 hrs HW=51.35' TW=51.30' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.59 cfs @ 1.18 fps)



Summary for Pond CB-2B: CB 2B

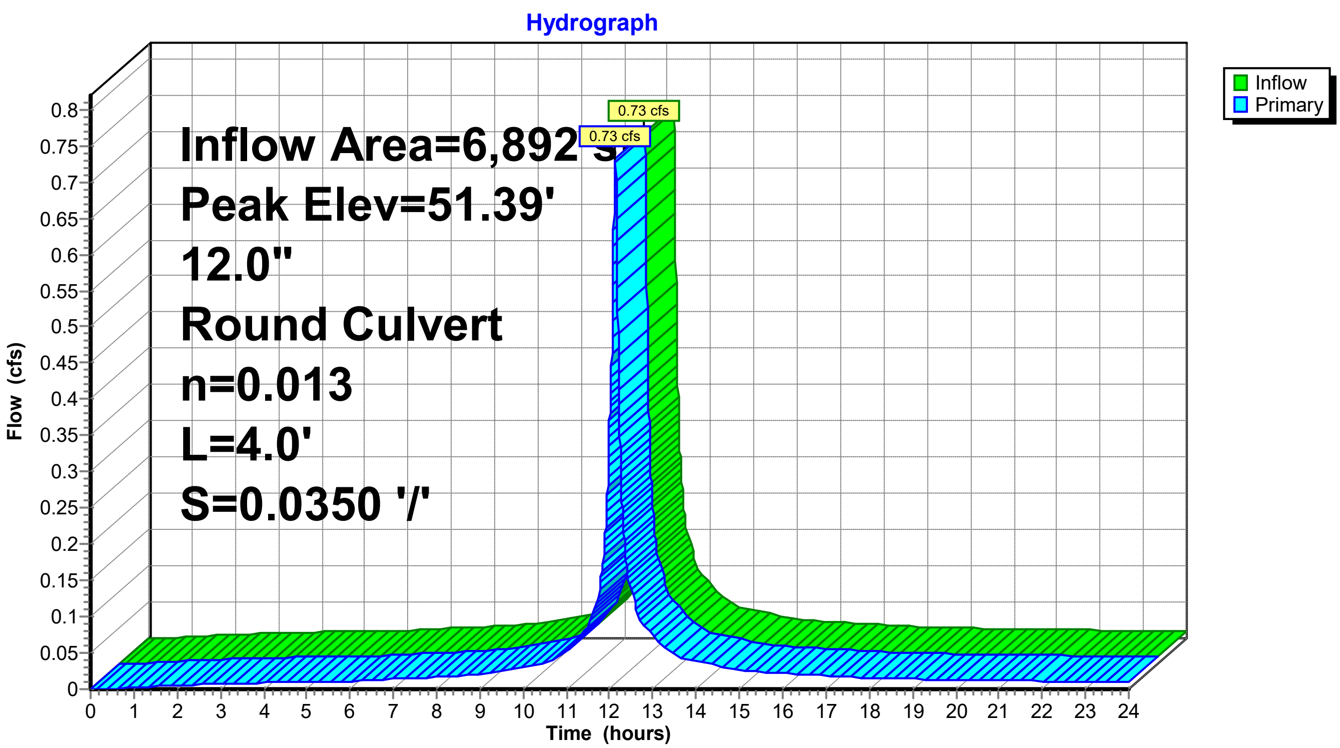
Inflow Area = 6,892 sf, 58.84% Impervious, Inflow Depth > 4.45" for 50-Year event
Inflow = 0.73 cfs @ 12.13 hrs, Volume= 2,556 cf
Outflow = 0.73 cfs @ 12.13 hrs, Volume= 2,556 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.73 cfs @ 12.13 hrs, Volume= 2,556 cf
Routed to Pond DMH-2.2 : DMH-2.2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.39' @ 12.13 hrs
Flood Elev= 53.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	50.53'	**12.0" Round Culvert** L= 4.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.53' / 50.39' S= 0.0350 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.02 cfs @ 12.13 hrs HW=51.37' TW=51.25' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.02 cfs @ 1.45 fps)

Pond CB-2B: CB 2B



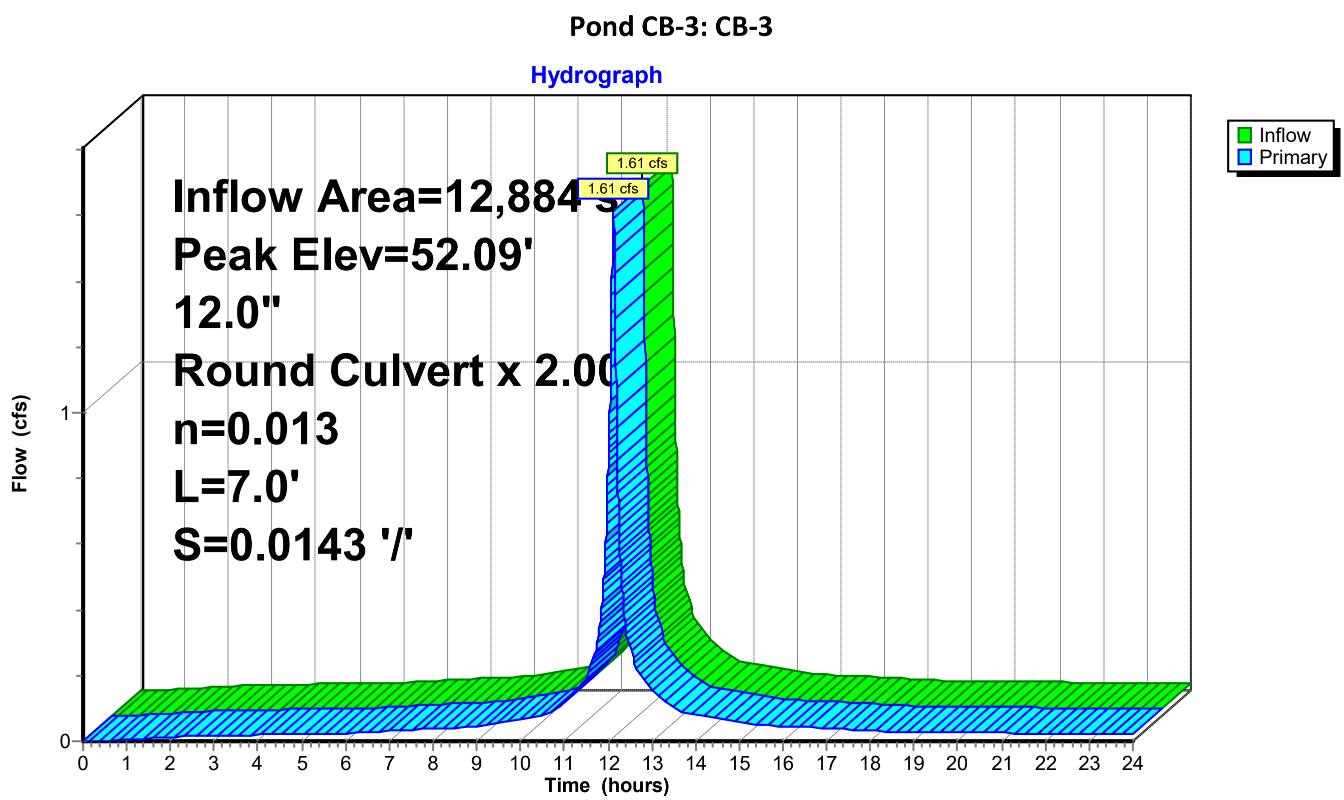
Summary for Pond CB-3: CB-3

Inflow Area = 12,884 sf, 69.58% Impervious, Inflow Depth > 5.16" for 50-Year event
Inflow = 1.61 cfs @ 12.13 hrs, Volume= 5,543 cf
Outflow = 1.61 cfs @ 12.13 hrs, Volume= 5,543 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.61 cfs @ 12.13 hrs, Volume= 5,543 cf
Routed to Pond DMH-3 : DMH-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 52.09' @ 12.13 hrs
Flood Elev= 53.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.55'	**12.0" Round Culvert X 2.00** L= 7.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 51.55' / 51.45' S= 0.0143 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.56 cfs @ 12.13 hrs HW=52.09' TW=51.88' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.56 cfs @ 2.62 fps)



Summary for Pond CB-4: CB-4

Inflow Area = 27,573 sf, 38.81% Impervious, Inflow Depth > 3.34" for 50-Year event
Inflow = 2.14 cfs @ 12.14 hrs, Volume= 7,683 cf
Outflow = 1.84 cfs @ 12.18 hrs, Volume= 7,683 cf, Atten= 14%, Lag= 2.2 min
Primary = 1.84 cfs @ 12.18 hrs, Volume= 7,683 cf
Routed to Pond DMH-9 : DMH-9 (bypass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 57.13' @ 12.18 hrs Surf.Area= 1,188 sf Storage= 147 cf
Flood Elev= 56.85' Surf.Area= 4 sf Storage= 0 cf

Plug-Flow detention time= 0.2 min calculated for 7,683 cf (100% of inflow)
Center-of-Mass det. time= 0.2 min (775.3 - 775.1)

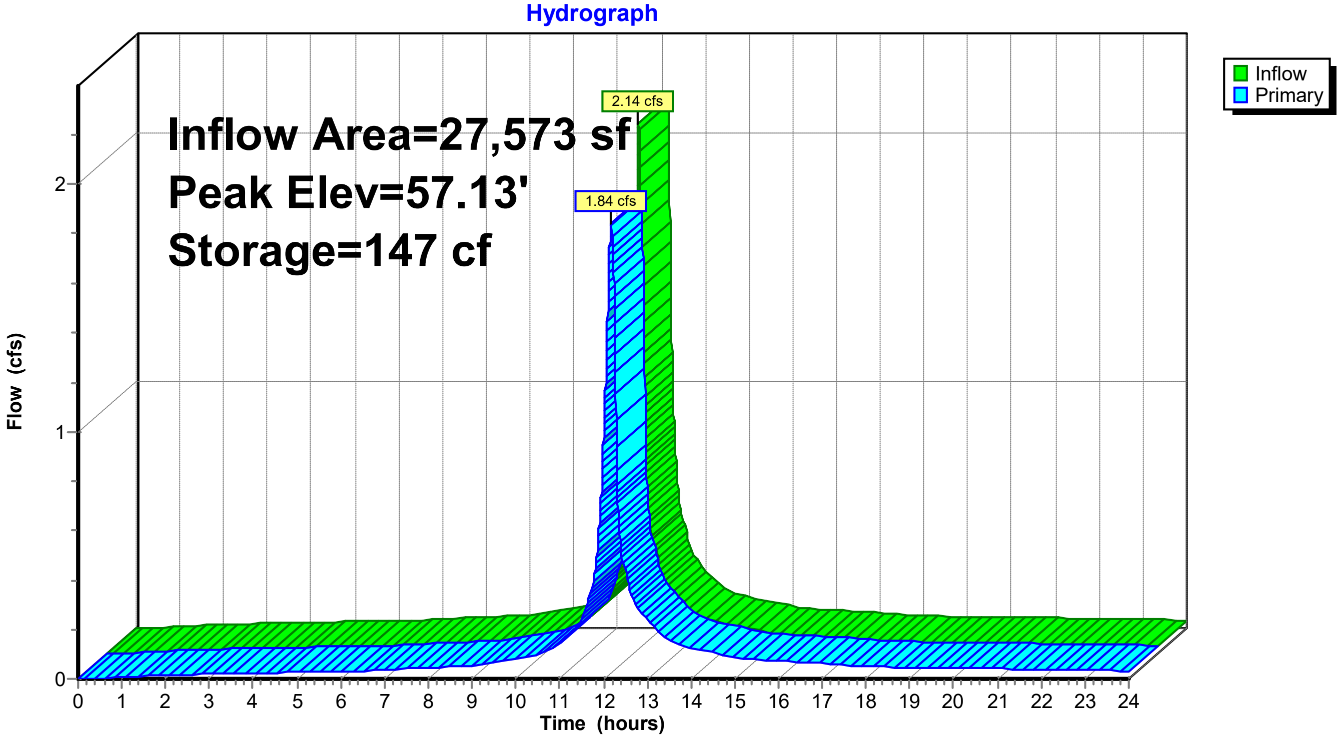
Volume	Invert	Avail.Storage	Storage Description
#1	56.85'	4,465 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
56.85	4	8.0	0	0	4
57.00	589	96.0	32	32	732
58.00	10,253	534.0	4,433	4,465	22,693

Device	Routing	Invert	Outlet Devices
#1	Primary	53.35'	**12.0" Round Culvert** L= 9.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 53.35' / 53.25' S= 0.0111 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	56.85'	**1.2" x 1.2" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 Limited to weir flow at low heads
#3	Device 1	56.85'	**1.2" x 1.2" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.84 cfs @ 12.18 hrs HW=57.13' TW=54.11' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.84 cfs of 5.81 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.92 cfs @ 2.56 fps)
  └─**3=Orifice/Grate** (Orifice Controls 0.92 cfs @ 2.56 fps)

Pond CB-4: CB-4


Hydrograph
Inflow
Primary
2.14 cfs
1.84 cfs
Inflow Area=27,573 sf
Peak Elev=57.13'
Storage=147 cf
Flow (cfs)
0
1
2
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Time (hours)

Summary for Pond CB-6A: CB-6A

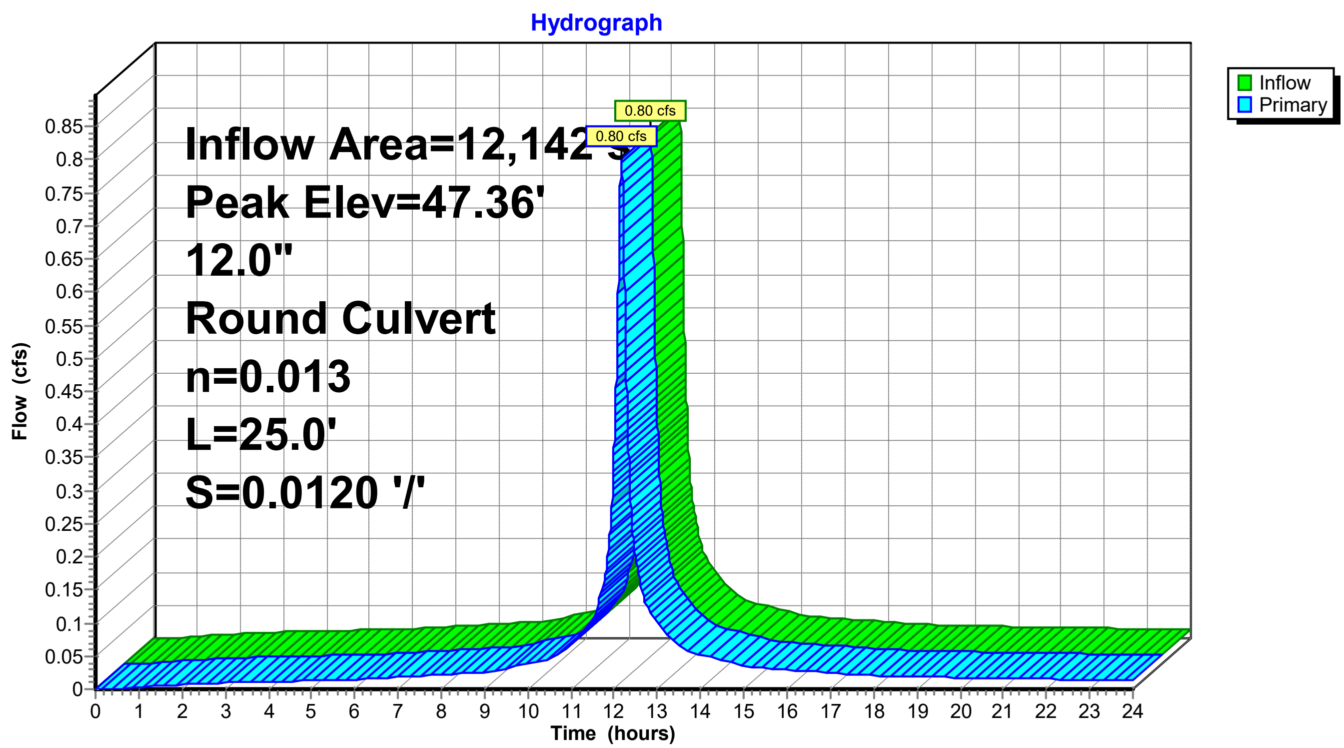
Inflow Area = 12,142 sf, 43.49% Impervious, Inflow Depth > 3.27" for 50-Year event
Inflow = 0.80 cfs @ 12.17 hrs, Volume= 3,309 cf
Outflow = 0.80 cfs @ 12.17 hrs, Volume= 3,309 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.80 cfs @ 12.17 hrs, Volume= 3,309 cf
Routed to Pond DMH-7 : DMH-7 (bypass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 47.36' @ 12.78 hrs
Flood Elev= 49.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.30'	**12.0" Round Culvert** L= 25.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.30' / 46.00' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.80 cfs @ 12.17 hrs HW=46.99' TW=46.84' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.80 cfs @ 1.96 fps)

Pond CB-6A: CB-6A



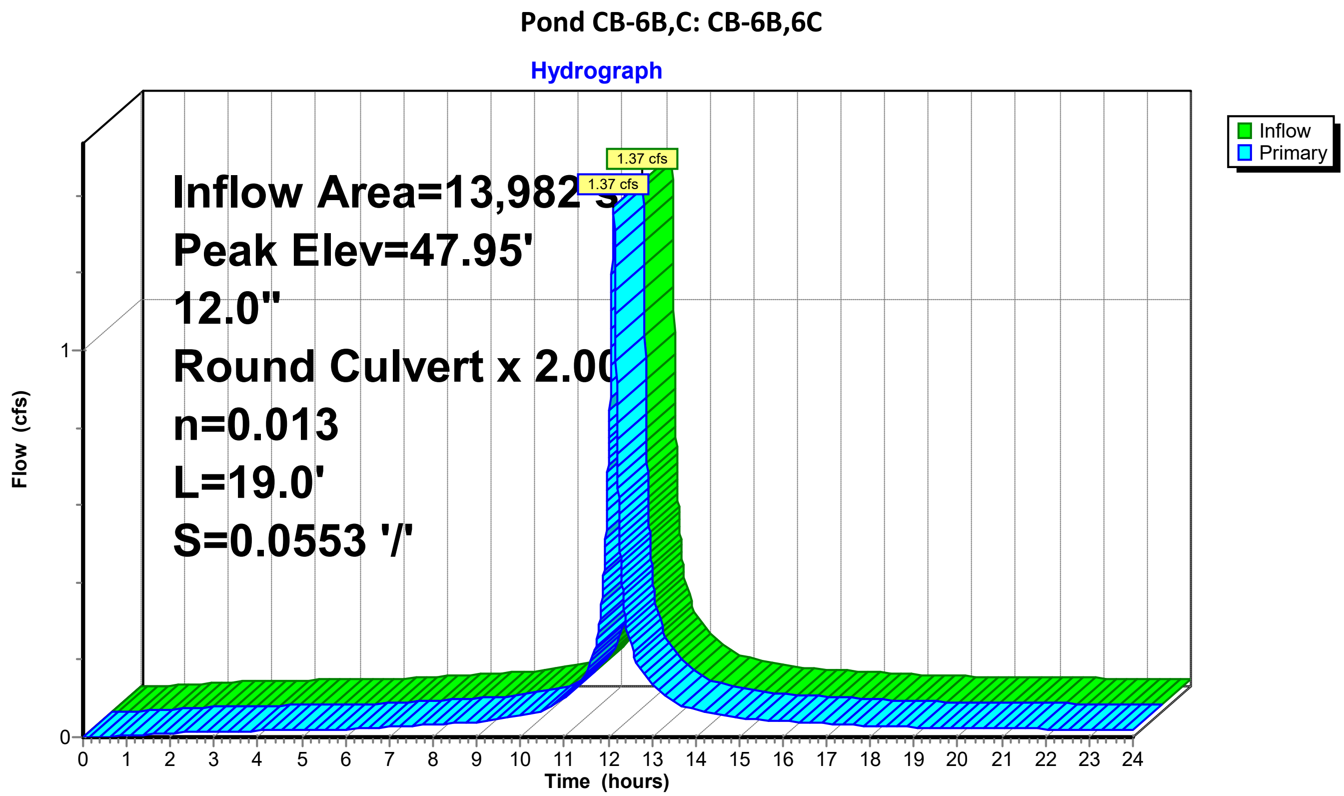
Summary for Pond CB-6B,C: CB-6B,6C

Inflow Area = 13,982 sf, 55.19% Impervious, Inflow Depth > 4.12" for 50-Year event
Inflow = 1.37 cfs @ 12.13 hrs, Volume= 4,805 cf
Outflow = 1.37 cfs @ 12.13 hrs, Volume= 4,805 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.37 cfs @ 12.13 hrs, Volume= 4,805 cf
Routed to Pond DMH-6 : DMH-6

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 47.95' @ 12.13 hrs
Flood Elev= 50.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	47.50'	**12.0" Round Culvert X 2.00** L= 19.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 47.50' / 46.45' S= 0.0553 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.37 cfs @ 12.13 hrs HW=47.95' TW=47.14' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.37 cfs @ 2.01 fps)



Summary for Pond CB-7: CB-7

Inflow Area =	9,051 sf, 85.55% Impervious,	Inflow Depth > 6.09"	for 50-Year event
Inflow =	1.34 cfs @ 12.13 hrs, Volume=	4,592 cf	
Outflow =	1.34 cfs @ 12.13 hrs, Volume=	4,592 cf, Atten= 0%, Lag= 0.0 min	
Primary =	1.34 cfs @ 12.13 hrs, Volume=	4,592 cf	

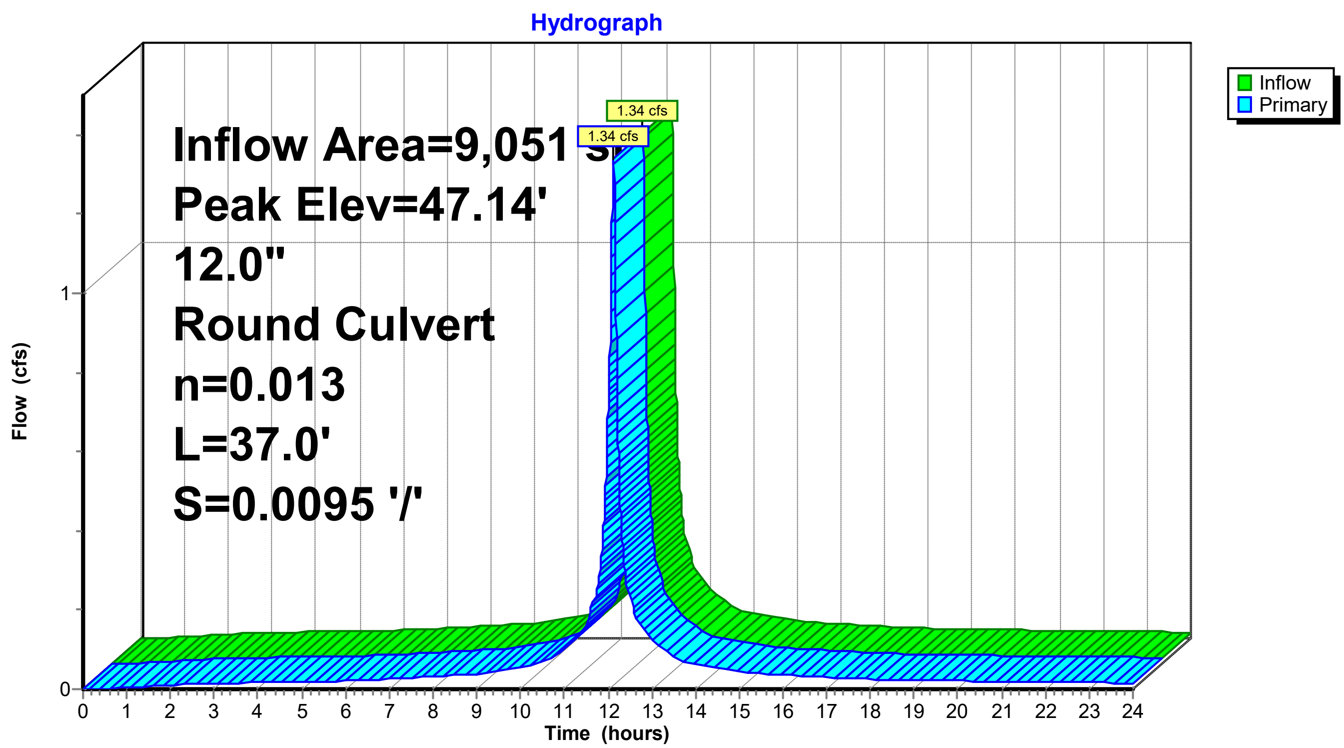
Routed to Pond DMH-8 : DMH-8 (bypass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 47.14' @ 12.13 hrs
Flood Elev= 49.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.40'	**12.0" Round Culvert** L= 37.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.40' / 46.05' S= 0.0095 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.34 cfs @ 12.13 hrs HW=47.14' TW=46.75' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 1.34 cfs @ 2.99 fps)

Pond CB-7: CB-7



Summary for Pond DB-A: DB-A

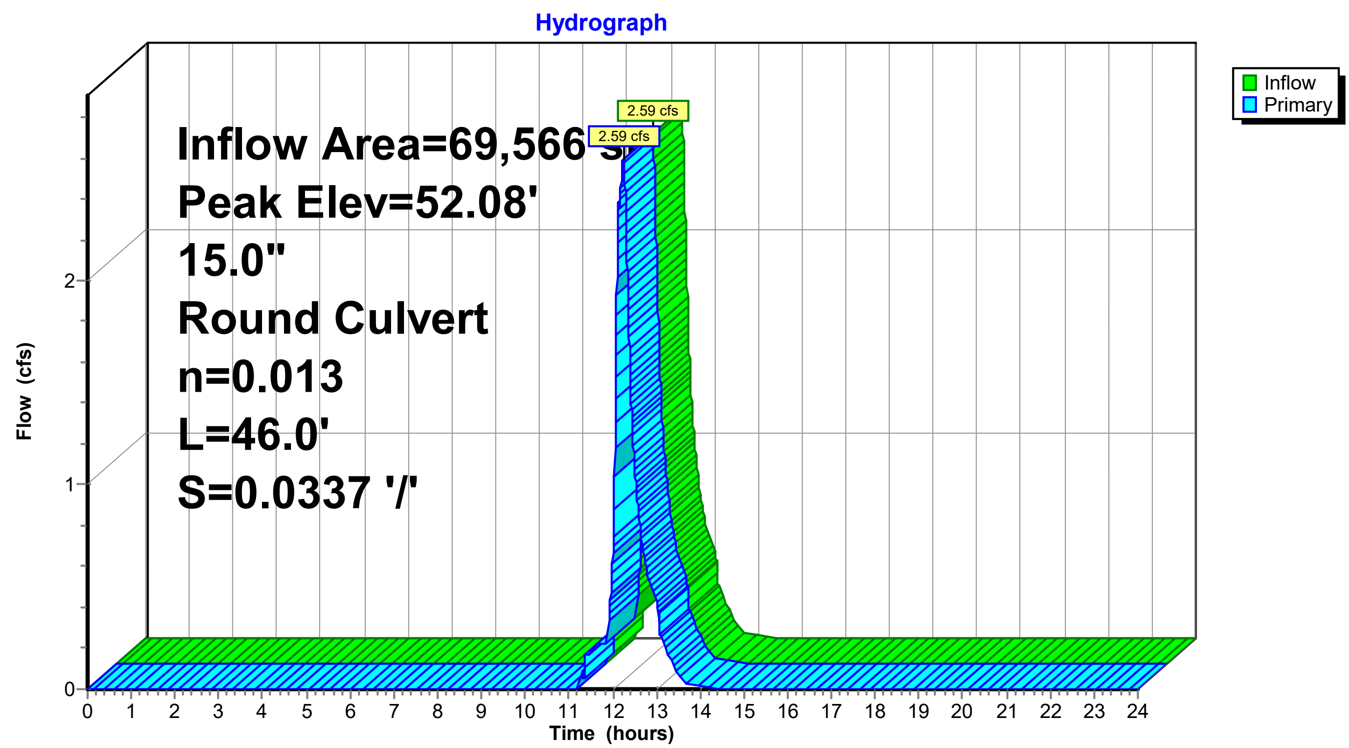
Inflow Area = 69,566 sf, 63.53% Impervious, Inflow Depth = 0.96" for 50-Year event
Inflow = 2.59 cfs @ 12.24 hrs, Volume= 5,562 cf
Outflow = 2.59 cfs @ 12.24 hrs, Volume= 5,562 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.59 cfs @ 12.24 hrs, Volume= 5,562 cf
Routed to Pond DMH-5 : DMH-5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 52.08' @ 12.47 hrs
Flood Elev= 54.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	50.55'	**15.0" Round Culvert** L= 46.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.55' / 49.00' S= 0.0337 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.59 cfs @ 12.24 hrs HW=51.49' TW=50.95' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 2.59 cfs @ 3.61 fps)

Pond DB-A: DB-A



Summary for Pond DMH-2.1: DMH-2.1 (By-Pass)

Inflow Area = 23,899 sf, 71.73% Impervious, Inflow Depth > 6.26" for 50-Year event
Inflow = 3.05 cfs @ 12.13 hrs, Volume= 12,473 cf
Outflow = 3.05 cfs @ 12.13 hrs, Volume= 12,473 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.38 cfs @ 12.09 hrs, Volume= 10,821 cf
Routed to Pond INF-1 : INF-1
Secondary = 1.59 cfs @ 12.13 hrs, Volume= 1,653 cf
Routed to Pond AB-1 : Attenuation Basin

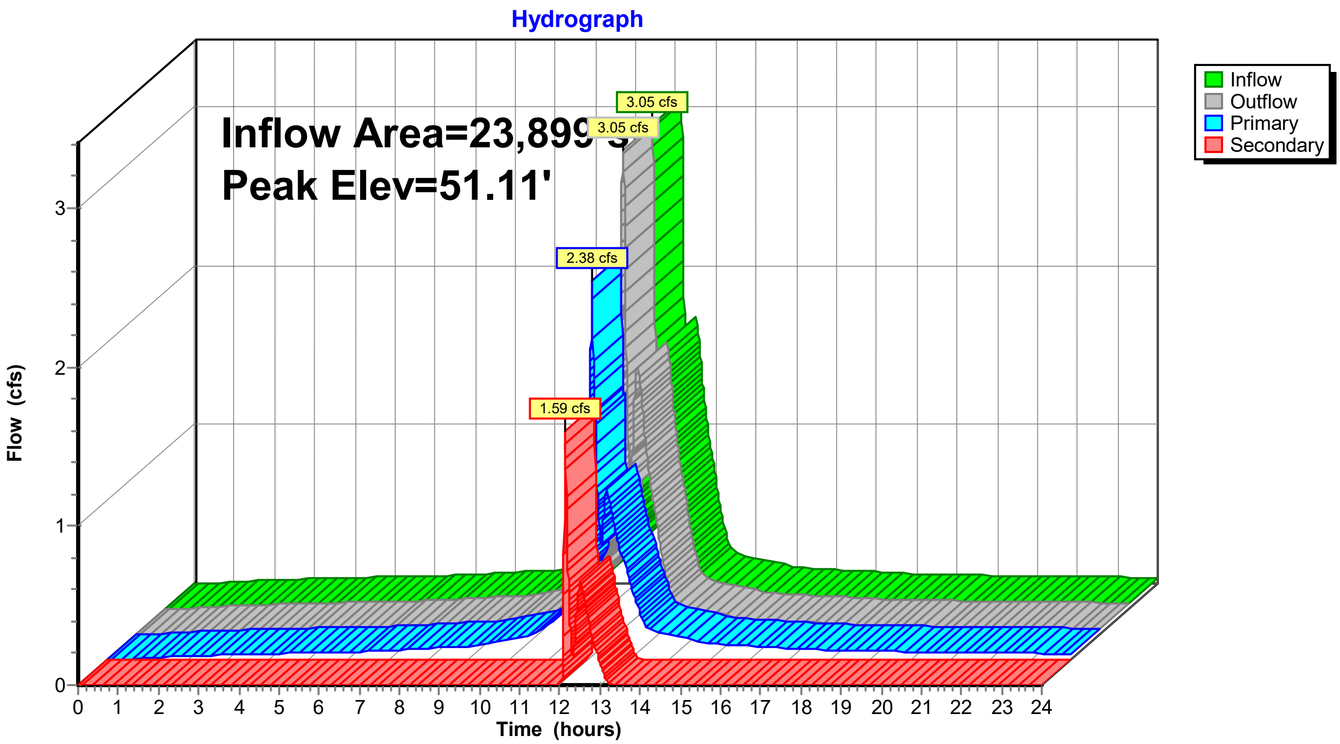
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.11' @ 12.13 hrs
Flood Elev= 52.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.60'	**12.0" Round OSG-1** L= 2.3' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.60' / 49.55' S= 0.0217 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	50.50'	**15.0" Round FES** L= 25.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 50.50' / 50.10' S= 0.0160 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.42 cfs @ 12.09 hrs HW=50.71' TW=50.12' (Dynamic Tailwater)
└**1=OSG-1** (Barrel Controls 2.42 cfs @ 3.47 fps)

Secondary OutFlow Max=1.56 cfs @ 12.13 hrs HW=51.11' TW=49.31' (Dynamic Tailwater)
└**2=FES** (Inlet Controls 1.56 cfs @ 2.65 fps)

Pond DMH-2.1: DMH-2.1 (By-Pass)



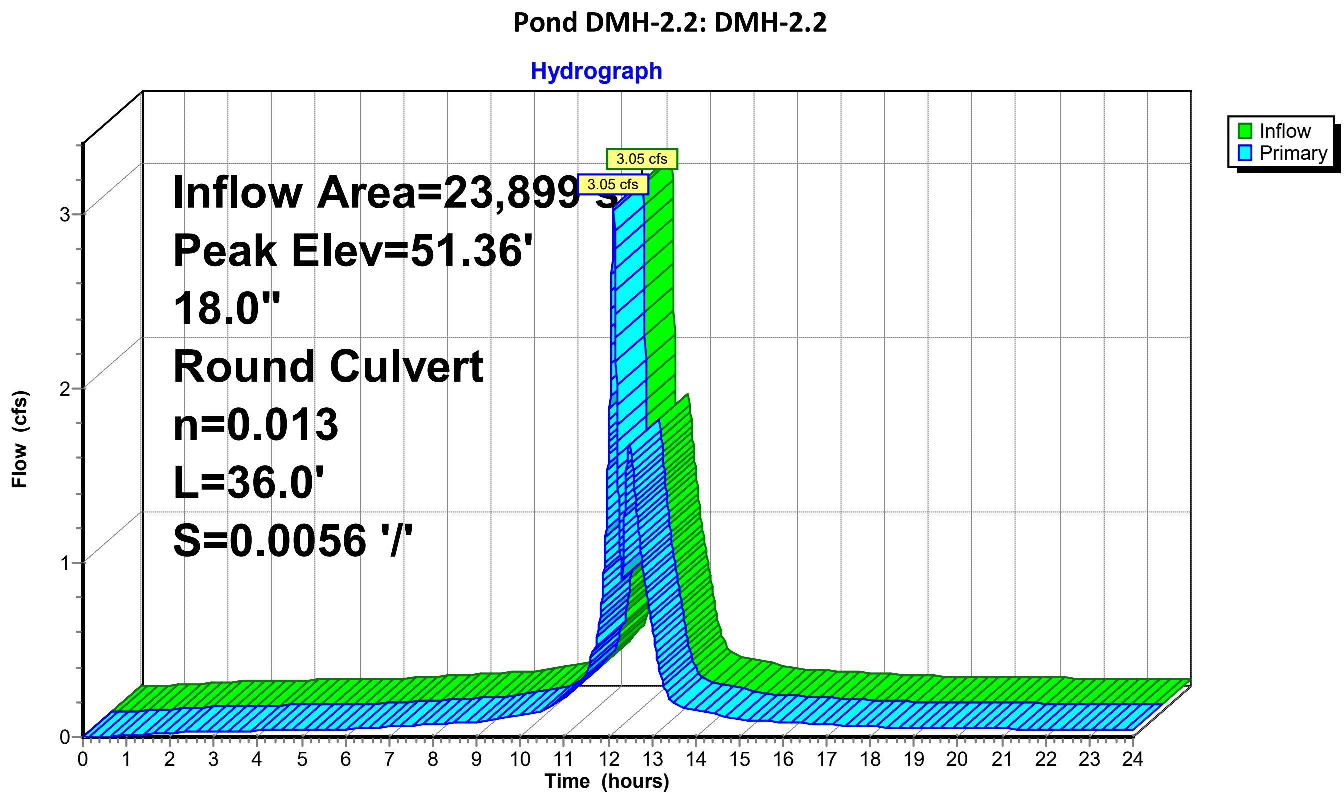
Summary for Pond DMH-2.2: DMH-2.2

Inflow Area = 23,899 sf, 71.73% Impervious, Inflow Depth > 6.26" for 50-Year event
Inflow = 3.05 cfs @ 12.13 hrs, Volume= 12,473 cf
Outflow = 3.05 cfs @ 12.13 hrs, Volume= 12,473 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.05 cfs @ 12.13 hrs, Volume= 12,473 cf
Routed to Pond DMH-2.1 : DMH-2.1 (By-Pass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.36' @ 12.14 hrs
Flood Elev= 53.63'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.80'	**18.0" Round DMH 2.1** L= 36.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.80' / 49.60' S= 0.0056 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.16 cfs @ 12.13 hrs HW=51.28' TW=51.10' (Dynamic Tailwater)
↑**1=DMH 2.1** (Inlet Controls 3.16 cfs @ 1.80 fps)



Summary for Pond DMH-3: DMH-3

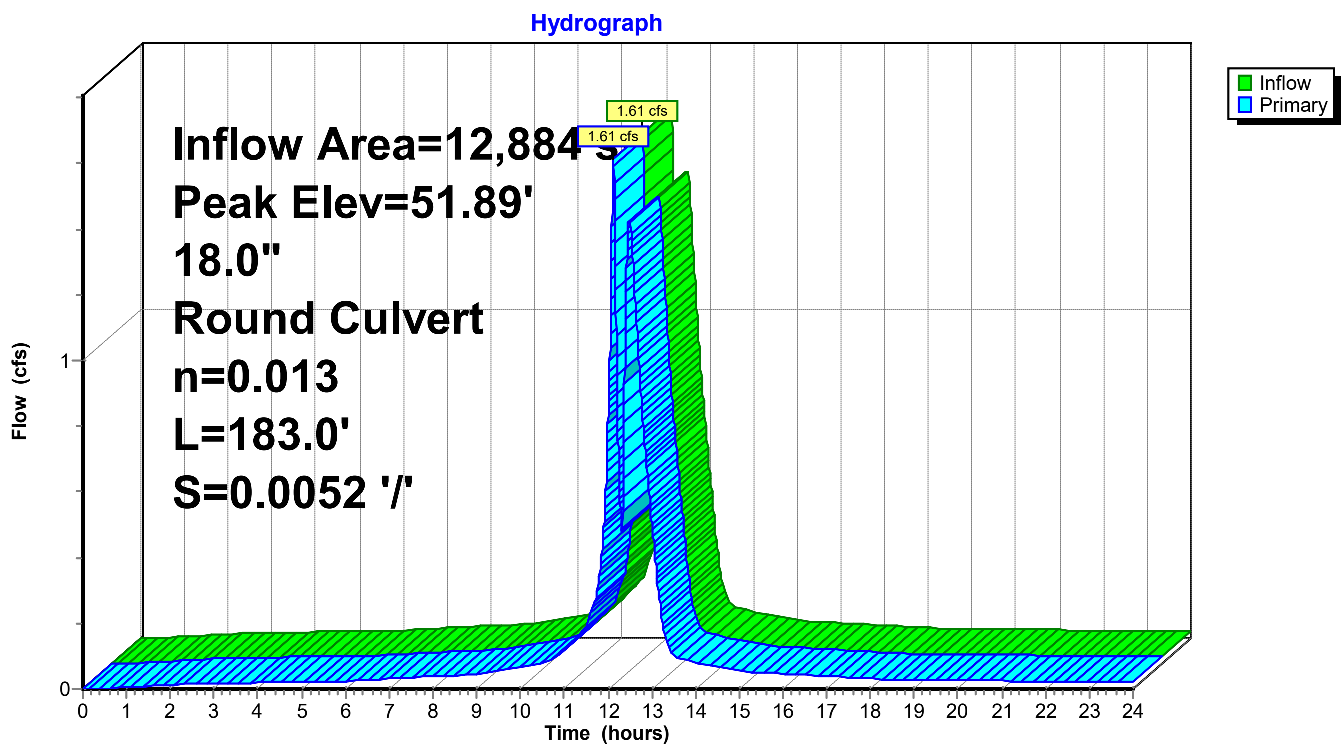
Inflow Area = 12,884 sf, 69.58% Impervious, Inflow Depth > 7.00" for 50-Year event
Inflow = 1.61 cfs @ 12.13 hrs, Volume= 7,521 cf
Outflow = 1.61 cfs @ 12.13 hrs, Volume= 7,521 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.61 cfs @ 12.13 hrs, Volume= 7,521 cf
Routed to Pond DMH-2.2 : DMH-2.2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.89' @ 12.13 hrs
Flood Elev= 54.22'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.10'	**18.0" Round Culvert** L= 183.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 51.10' / 50.14' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.65 cfs @ 12.13 hrs HW=51.88' TW=51.27' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.65 cfs @ 2.57 fps)

Pond DMH-3: DMH-3



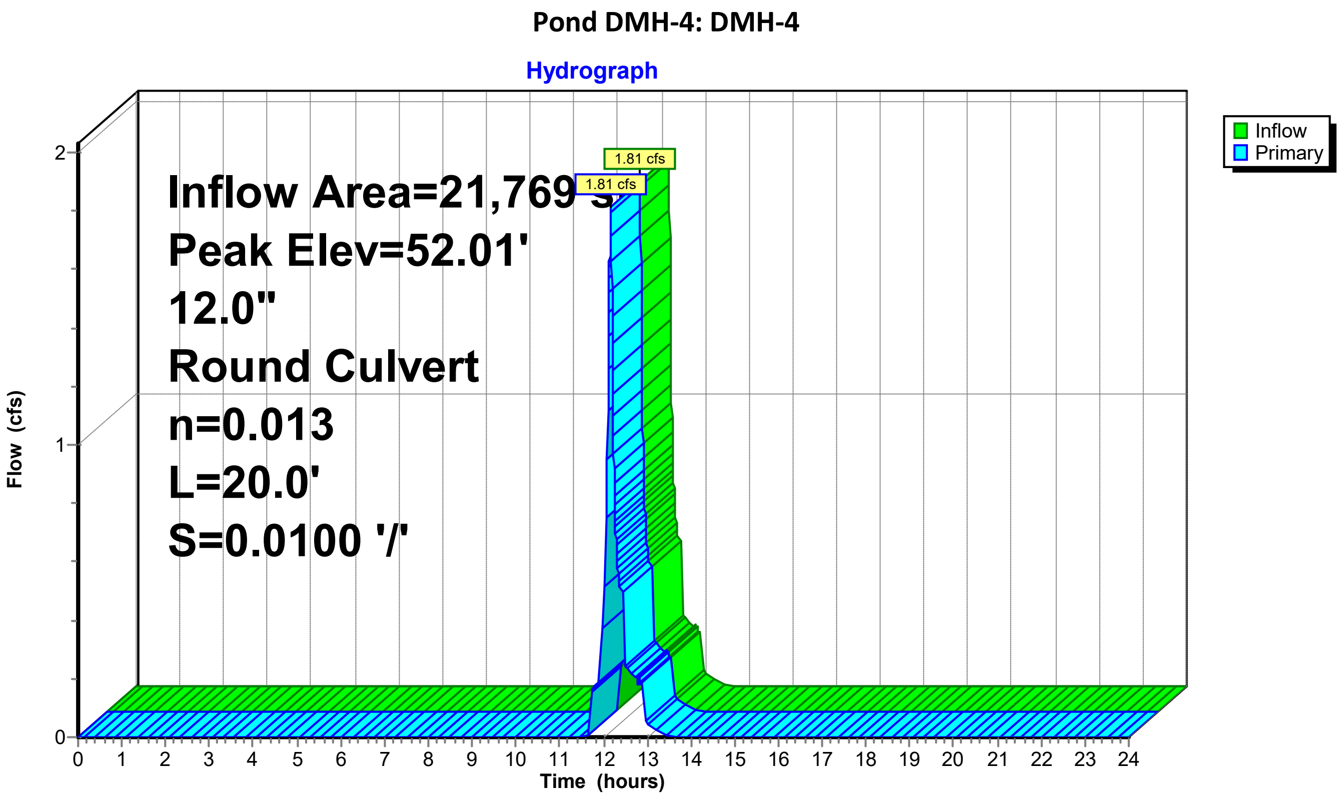
Summary for Pond DMH-4: DMH-4

Inflow Area = 21,769 sf, 63.79% Impervious, Inflow Depth = 1.14" for 50-Year event
Inflow = 1.81 cfs @ 12.17 hrs, Volume= 2,070 cf
Outflow = 1.81 cfs @ 12.17 hrs, Volume= 2,070 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.81 cfs @ 12.17 hrs, Volume= 2,070 cf
Routed to Pond INF-2 : INF-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 52.01' @ 12.46 hrs
Flood Elev= 53.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.15'	**12.0" Round Culvert** L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.15' / 48.95' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.83 cfs @ 12.17 hrs HW=50.12' TW=49.82' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.83 cfs @ 2.34 fps)



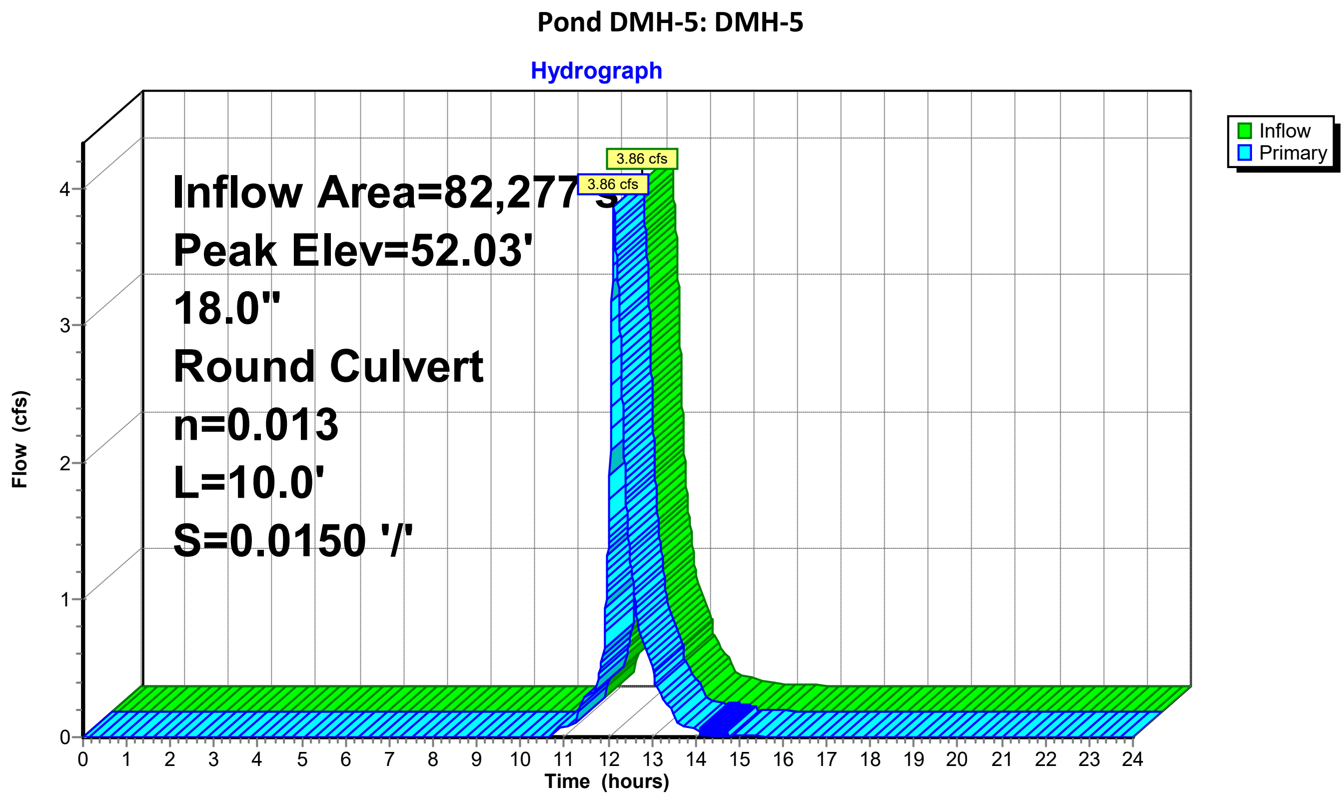
Summary for Pond DMH-5: DMH-5

Inflow Area = 82,277 sf, 64.43% Impervious, Inflow Depth = 1.20" for 50-Year event
Inflow = 3.86 cfs @ 12.14 hrs, Volume= 8,197 cf
Outflow = 3.86 cfs @ 12.14 hrs, Volume= 8,197 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.86 cfs @ 12.14 hrs, Volume= 8,197 cf
Routed to Pond INF-2 : INF-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 52.03' @ 12.47 hrs
Flood Elev= 54.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**18.0" Round Culvert** L= 10.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.00' / 48.85' S= 0.0150 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.86 cfs @ 12.14 hrs HW=50.11' TW=49.39' (Dynamic Tailwater)
1=Culvert (Barrel Controls 3.86 cfs @ 3.84 fps)



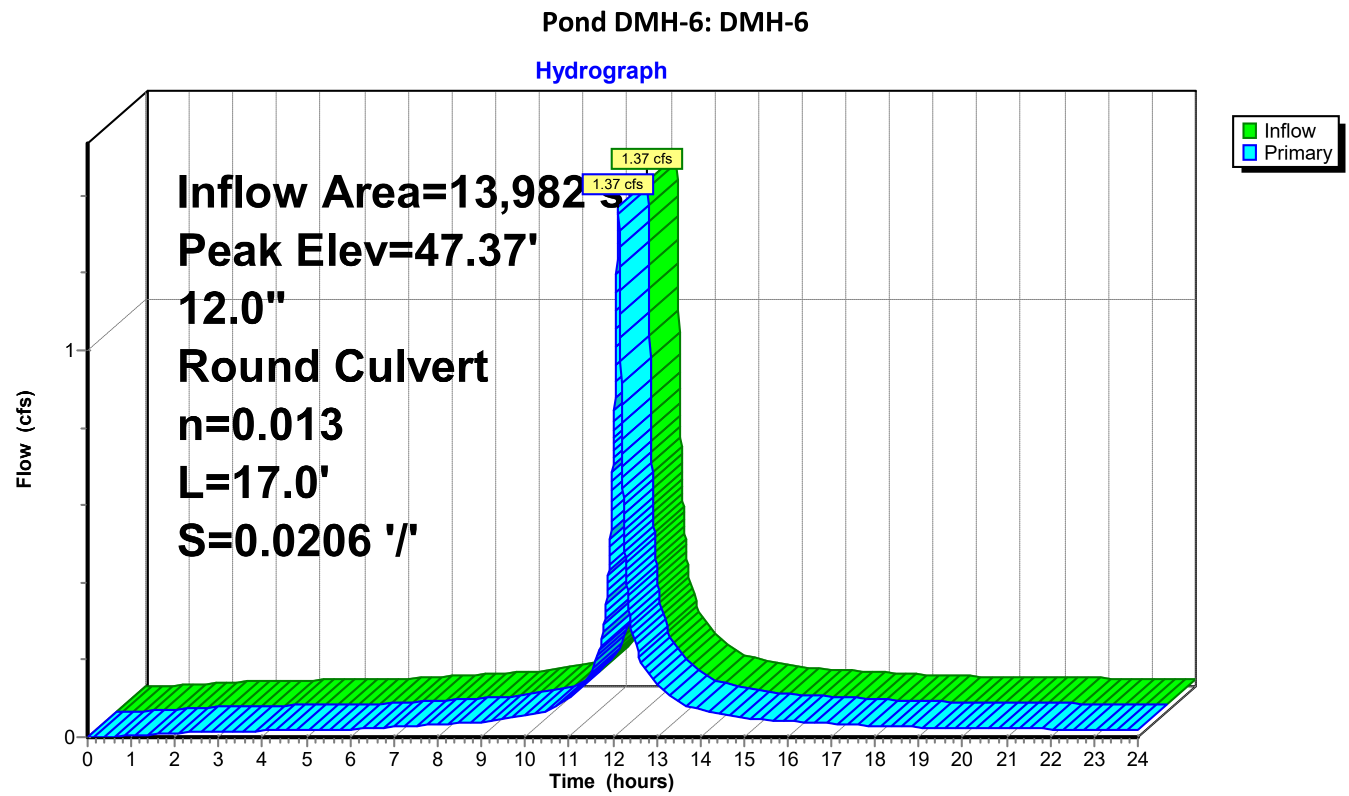
Summary for Pond DMH-6: DMH-6

Inflow Area = 13,982 sf, 55.19% Impervious, Inflow Depth > 4.12" for 50-Year event
Inflow = 1.37 cfs @ 12.13 hrs, Volume= 4,805 cf
Outflow = 1.37 cfs @ 12.13 hrs, Volume= 4,805 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.37 cfs @ 12.13 hrs, Volume= 4,805 cf
Routed to Pond DMH-7 : DMH-7 (bypass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 47.37' @ 12.78 hrs
Flood Elev= 50.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.35'	**12.0" Round Culvert** L= 17.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.35' / 46.00' S= 0.0206 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.37 cfs @ 12.13 hrs HW=47.14' TW=46.87' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.37 cfs @ 2.83 fps)



Summary for Pond DMH-7: DMH-7 (bypass)

Inflow Area = 26,124 sf, 49.75% Impervious, Inflow Depth > 3.73" for 50-Year event
Inflow = 2.12 cfs @ 12.14 hrs, Volume= 8,114 cf
Outflow = 2.12 cfs @ 12.14 hrs, Volume= 8,114 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.85 cfs @ 12.14 hrs, Volume= 7,596 cf
Routed to Pond INF-3 : INF-3
Secondary = 0.27 cfs @ 12.14 hrs, Volume= 518 cf
Routed to Pond INF-3 : INF-3

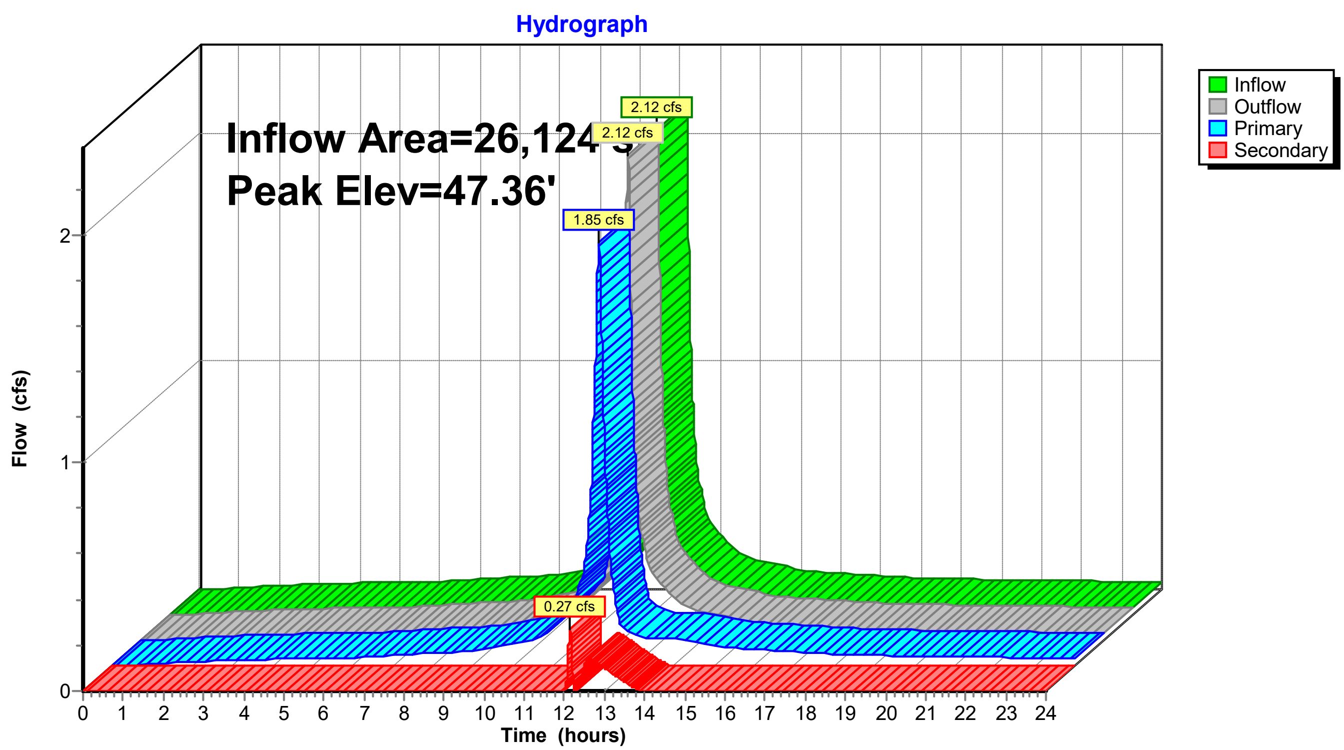
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 47.36' @ 12.78 hrs
Flood Elev= 50.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.00'	**12.0" Round OGS-2** L= 3.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.00' / 45.90' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	46.60'	**12.0" Round By-Pass** L= 11.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.60' / 45.58' S= 0.0927 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.85 cfs @ 12.14 hrs HW=46.87' TW=45.25' (Dynamic Tailwater)
↑**1=OGS-2** (Barrel Controls 1.85 cfs @ 3.40 fps)

Secondary OutFlow Max=0.27 cfs @ 12.14 hrs HW=46.87' TW=45.25' (Dynamic Tailwater)
↑**2=By-Pass** (Inlet Controls 0.27 cfs @ 1.57 fps)

Pond DMH-7: DMH-7 (bypass)



Summary for Pond DMH-8: DMH-8 (bypass)

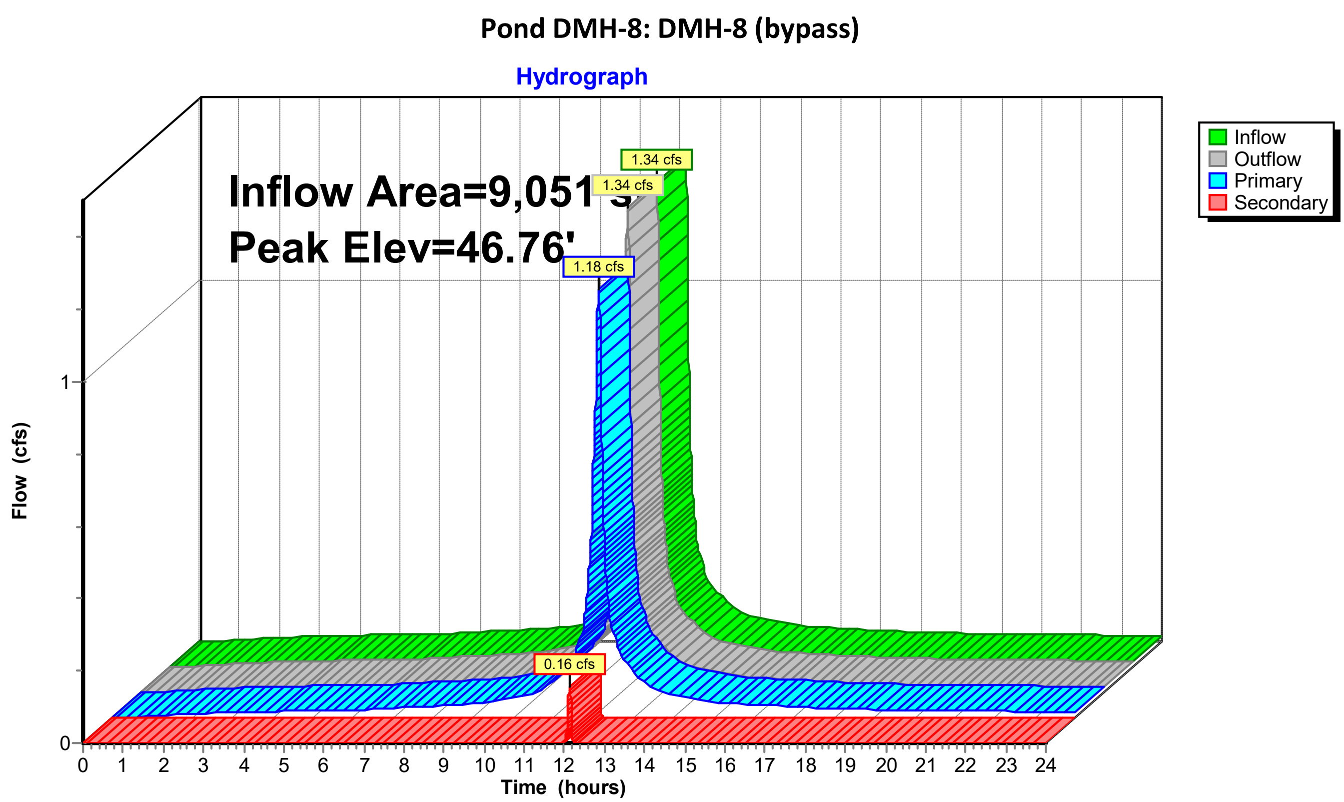
Inflow Area = 9,051 sf, 85.55% Impervious, Inflow Depth > 6.09" for 50-Year event
Inflow = 1.34 cfs @ 12.13 hrs, Volume= 4,592 cf
Outflow = 1.34 cfs @ 12.13 hrs, Volume= 4,592 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.18 cfs @ 12.13 hrs, Volume= 4,537 cf
Routed to nonexistent node 5P
Secondary = 0.16 cfs @ 12.13 hrs, Volume= 55 cf
Routed to Pond INF-3 : INF-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 46.76' @ 12.13 hrs
Flood Elev= 50.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.05'	**12.0" Round OSG** L= 5.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.05' / 46.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	46.55'	**12.0" Round By-Pass** L= 13.5' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.55' / 45.58' S= 0.0719 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.18 cfs @ 12.13 hrs HW=46.75' (Free Discharge)
└**1=OSG** (Barrel Controls 1.18 cfs @ 2.81 fps)

Secondary OutFlow Max=0.16 cfs @ 12.13 hrs HW=46.75' TW=45.16' (Dynamic Tailwater)
└**2=By-Pass** (Inlet Controls 0.16 cfs @ 1.36 fps)



Summary for Pond DMH-9: DMH-9 (bypass)

Inflow Area = 27,573 sf, 38.81% Impervious, Inflow Depth > 3.34" for 50-Year event
Inflow = 1.84 cfs @ 12.18 hrs, Volume= 7,683 cf
Outflow = 1.84 cfs @ 12.18 hrs, Volume= 7,683 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.59 cfs @ 12.15 hrs, Volume= 7,201 cf
Routed to Pond INF-4 : INF-4
Secondary = 0.61 cfs @ 12.23 hrs, Volume= 482 cf
Routed to Pond INF-4 : INF-4

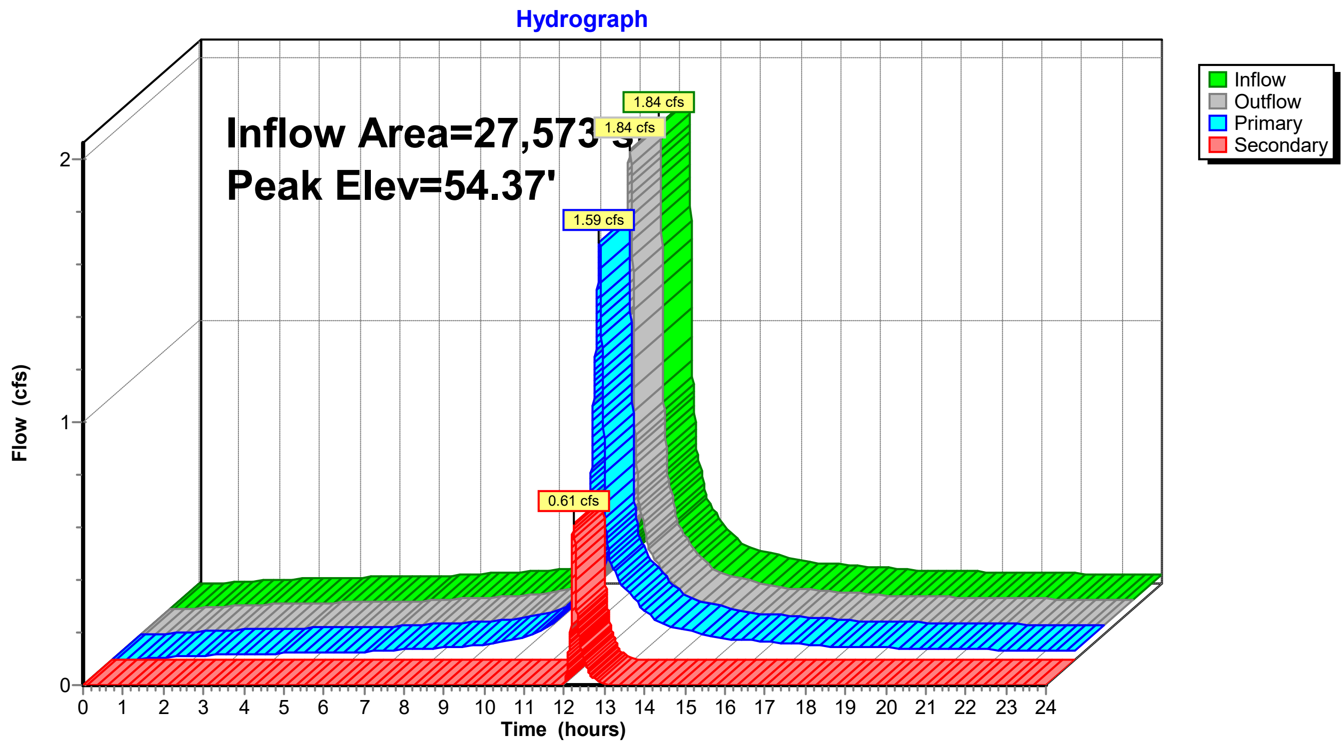
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 54.37' @ 12.26 hrs
Flood Elev= 57.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	53.25'	**12.0" Round OGS-4** L= 3.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 53.25' / 52.90' S= 0.1167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	53.75'	**12.0" Round By-Pass** L= 3.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 53.75' / 52.90' S= 0.2833 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.60 cfs @ 12.15 hrs HW=53.99' TW=53.59' (Dynamic Tailwater)
└**1=OGS-4** (Inlet Controls 1.60 cfs @ 2.58 fps)

Secondary OutFlow Max=0.61 cfs @ 12.23 hrs HW=54.32' TW=54.22' (Dynamic Tailwater)
└**2=By-Pass** (Outlet Controls 0.61 cfs @ 1.91 fps)

Pond DMH-9: DMH-9 (bypass)



Summary for Pond DS: Dry Stream

Inflow Area = 66,509 sf, 26.96% Impervious, Inflow Depth > 2.99" for 50-Year event
Inflow = 3.45 cfs @ 12.14 hrs, Volume= 16,563 cf
Outflow = 3.26 cfs @ 12.17 hrs, Volume= 16,519 cf, Atten= 6%, Lag= 1.7 min
Discarded = 0.04 cfs @ 12.17 hrs, Volume= 1,294 cf
Primary = 3.21 cfs @ 12.17 hrs, Volume= 15,225 cf
Routed to Pond FP-7 : FP-7/INF-5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 55.17' @ 12.17 hrs Surf.Area= 604 sf Storage= 395 cf

Plug-Flow detention time= 4.9 min calculated for 16,515 cf (100% of inflow)
Center-of-Mass det. time= 3.2 min (805.0 - 801.7)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	2,359 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

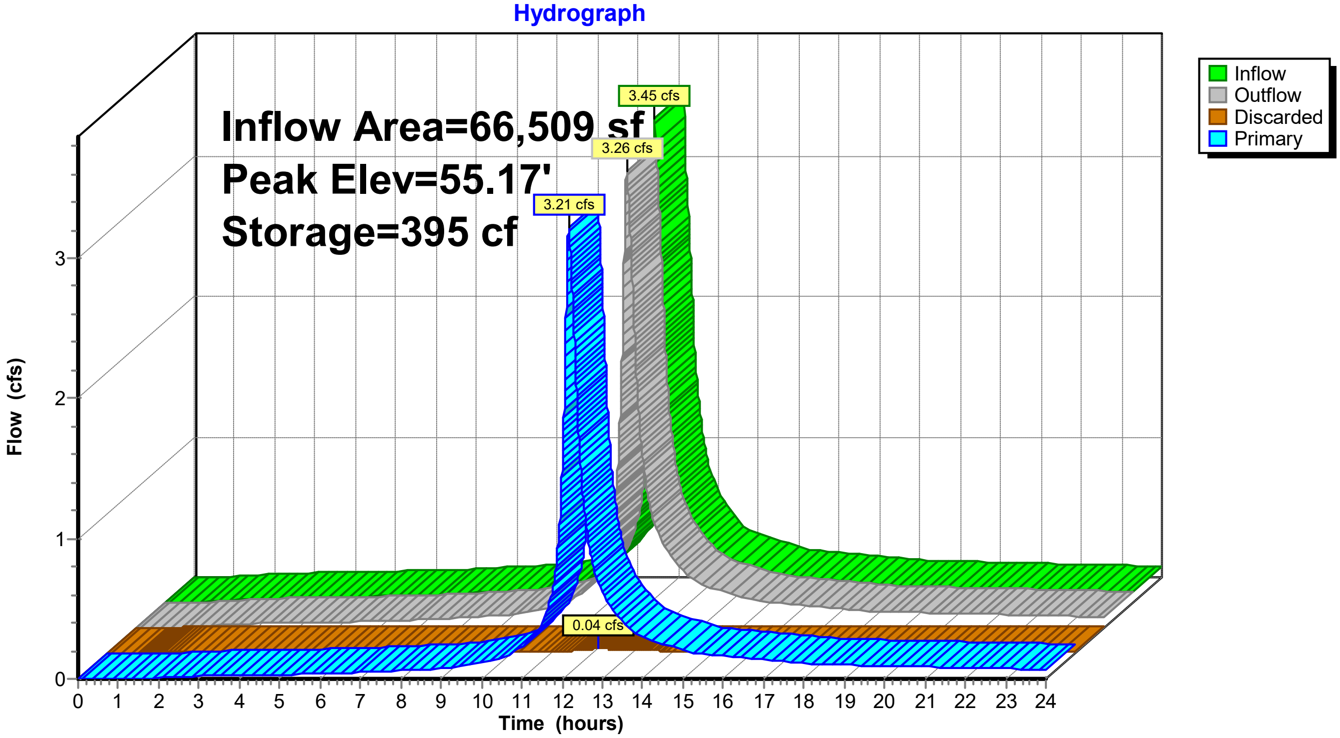
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
54.00	121	64.0	0	0	121
55.00	526	236.0	300	300	4,230
56.00	1,068	524.0	781	1,081	21,652
57.00	1,500	613.0	1,278	2,359	29,725

Device	Routing	Invert	Outlet Devices
#1	Discarded	54.00'	**3.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.10'
#2	Primary	54.15'	**15.0" Round Overflow** L= 48.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 54.15' / 53.75' S= 0.0083 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=0.04 cfs @ 12.17 hrs HW=55.17' (Free Discharge)
1=Exfiltration (Controls 0.04 cfs)

Primary OutFlow Max=3.21 cfs @ 12.17 hrs HW=55.17' TW=53.89' (Dynamic Tailwater)
2=Overflow (Barrel Controls 3.21 cfs @ 4.09 fps)

Pond DS: Dry Stream



Summary for Pond FP-1: FP-1

Inflow Area = 12,471 sf, 83.62% Impervious, Inflow Depth > 5.97" for 50-Year event
Inflow = 1.81 cfs @ 12.13 hrs, Volume= 6,204 cf
Outflow = 0.79 cfs @ 12.24 hrs, Volume= 6,204 cf, Atten= 56%, Lag= 6.9 min
Discarded = 0.26 cfs @ 12.24 hrs, Volume= 4,325 cf
Primary = 0.53 cfs @ 11.98 hrs, Volume= 1,879 cf
Routed to Pond INF-3 : INF-3
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond CB-7 : CB-7

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.00' @ 12.24 hrs Surf.Area= 769 sf Storage= 1,008 cf

Plug-Flow detention time= 34.8 min calculated for 6,204 cf (100% of inflow)
Center-of-Mass det. time= 34.7 min (782.1 - 747.4)

Volume	Invert	Avail.Storage	Storage Description
#1	47.22'	32 cf	**8.00'W x 9.00'L x 2.25'H FP (mulch/media/stone)**
			162 cf Overall x 20.0% Voids
#2	49.47'	1,648 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#3A	43.43'	168 cf	**11.87'W x 13.38'L x 4.29'H Field A**
			682 cf Overall - 262 cf Embedded = 420 cf x 40.0% Voids
#4A	43.68'	249 cf	**Ferguson R-Tank HD 2.5** x 24 Inside #3
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			24 Chambers in 6 Rows
		2,098 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
49.47	68	30.0	0	0	68
50.00	375	76.0	106	106	457
51.00	539	88.0	455	561	634
52.25	1,250	260.0	1,087	1,648	5,402

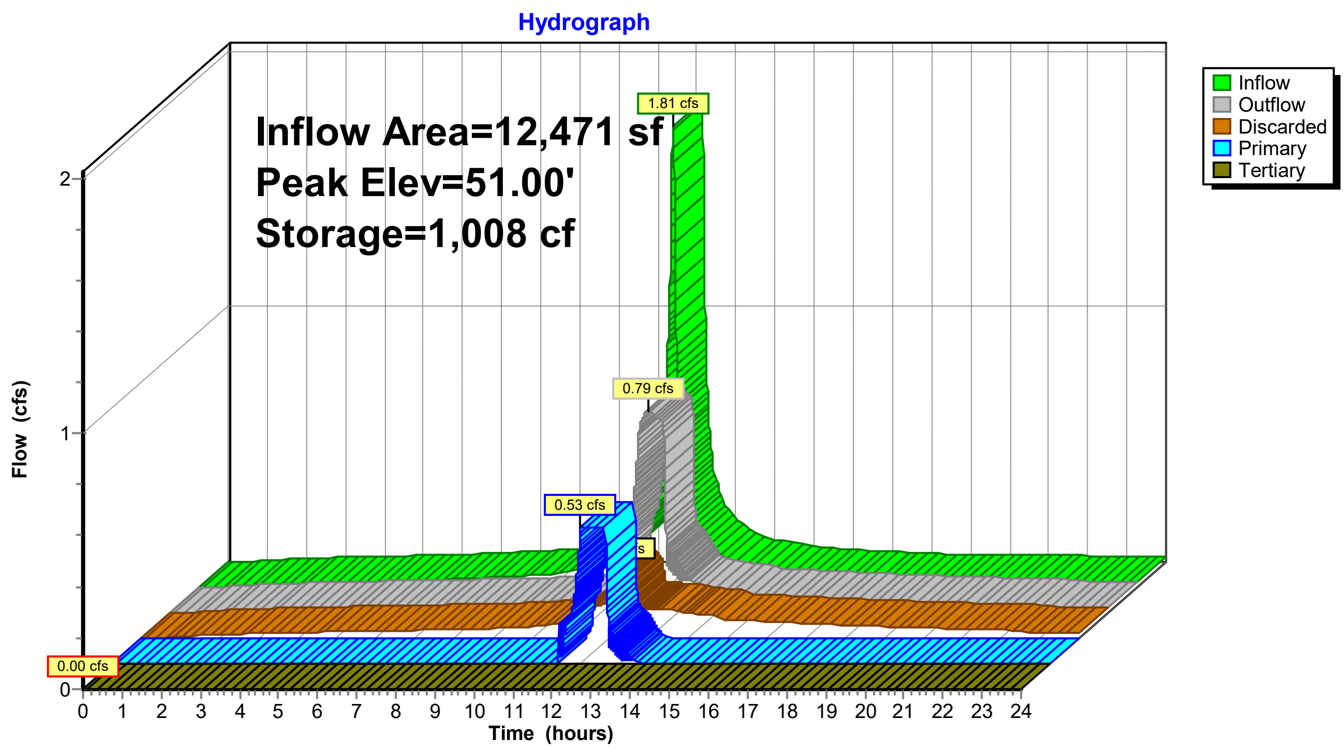
Device	Routing	Invert	Outlet Devices
#1	Primary	46.47'	**12.0" Round Culvert** L= 118.0' CPP, mitered to conform to fill, Ke= 0.700
			Inlet / Outlet Invert= 46.47' / 45.58' S= 0.0075 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	51.50'	**18.0" Horiz. Dome Grate(OF-1)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	47.22'	**100.000 in/hr Focal Point Media over Surface area from 47.22' - 49.80'**
			Excluded Surface area = 231 sf Phase-In= 0.01'
#4	Discarded	49.80'	**2.810 in/hr Bowl Exfiltration over Surface area above 49.80'**
			Excluded Surface area = 461 sf Phase-In= 0.01'
#5	Discarded	43.43'	**8.270 in/hr R Tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#6	Tertiary	52.20'	**3.5' long x 2.0' breadth BSpillway**
			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=0.26 cfs @ 12.24 hrs HW=51.00' (Free Discharge)
├─**4=Bowl Exfiltration** (Exfiltration Controls 0.02 cfs)
└─**5=R Tank Exfiltration** (Controls 0.24 cfs)

Primary OutFlow Max=0.53 cfs @ 11.98 hrs HW=49.80' TW=44.09' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.53 cfs of 4.87 cfs potential flow)
  ├─**2=Dome Grate(OF-1)** (Controls 0.00 cfs)
  └─**3=Focal Point Media** (Exfiltration Controls 0.53 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=43.43' TW=46.40' (Dynamic Tailwater)
└─**6=BSpillway** (Controls 0.00 cfs)

Pond FP-1: FP-1



Summary for Pond FP-2: FP-2

Inflow Area = 8,047 sf, 72.78% Impervious, Inflow Depth > 5.31" for 50-Year event
Inflow = 1.03 cfs @ 12.13 hrs, Volume= 3,558 cf
Outflow = 0.81 cfs @ 12.18 hrs, Volume= 3,558 cf, Atten= 21%, Lag= 2.8 min
Discarded = 0.18 cfs @ 12.18 hrs, Volume= 2,861 cf
Primary = 0.63 cfs @ 12.18 hrs, Volume= 697 cf
Routed to Pond DMH-4 : DMH-4
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond FP-1 : FP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 52.92' @ 12.18 hrs Surf.Area= 532 sf Storage= 644 cf
Flood Elev= 53.75' Surf.Area= 945 sf Storage= 1,046 cf

Plug-Flow detention time= 34.6 min calculated for 3,557 cf (100% of inflow)
Center-of-Mass det. time= 34.6 min (786.0 - 751.4)

Volume	Invert	Avail.Storage	Storage Description
#1	50.05'	25 cf	**8.00'W x 9.00'L x 1.75'H FP (mulch/media)** 126 cf Overall x 20.0% Voids
#2	51.80'	760 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#3A	45.76'	168 cf	**11.87'W x 13.38'L x 4.29'H Field A** 682 cf Overall - 262 cf Embedded = 420 cf x 40.0% Voids
#4A	46.01'	249 cf	**Ferguson R-Tank HD 2.5** x 24 Inside #3 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 24 Chambers in 6 Rows
		1,202 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
51.80	69	30.6	0	0	69
52.00	112	38.0	18	18	110
53.00	321	60.0	208	225	288
53.95	845	157.0	534	760	1,967

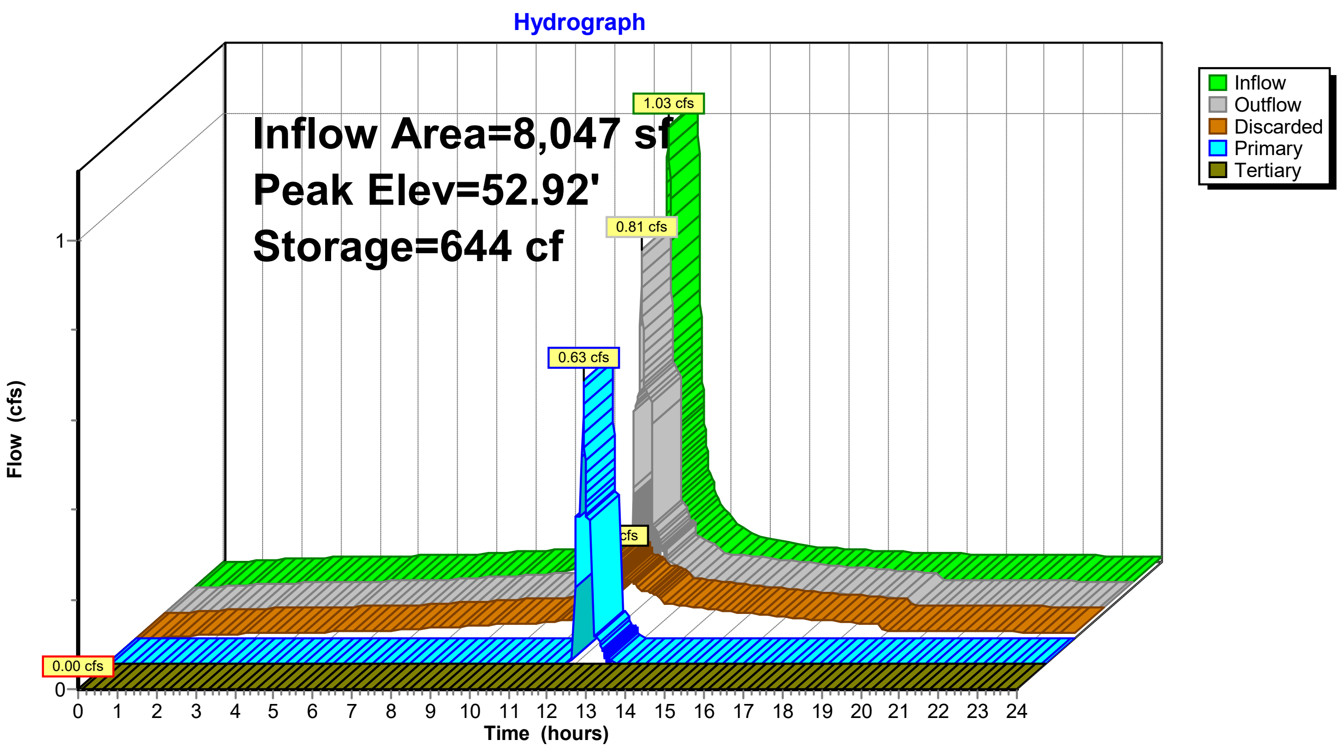
Device	Routing	Invert	Outlet Devices
#1	Primary	49.40'	**12.0" Round Overflow** L= 10.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.40' / 49.15' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	52.85'	**18.0" Horiz. Dome Grate (OF-2)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	49.55'	**100.000 in/hr Focal Point Media over Surface area from 49.55' - 51.80'** Excluded Surface area = 159 sf Phase-In= 0.01'
#4	Discarded	45.76'	**8.270 in/hr R Tank Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#5	Discarded	51.80'	**3.000 in/hr Bowl Exfiltration over Surface area above 51.80'** Excluded Surface area = 300 sf Phase-In= 0.01'
#6	Tertiary	53.90'	**3.5' long x 2.0' breadth Spillway** 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=0.18 cfs @ 12.18 hrs HW=52.92' (Free Discharge)
├─**4=R Tank Exfiltration** (Controls 0.16 cfs)
└─**5=Bowl Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.63 cfs @ 12.18 hrs HW=52.92' TW=50.23' (Dynamic Tailwater)
└─**1=Overflow** (Passes 0.63 cfs of 5.47 cfs potential flow)
  ├─**2=Dome Grate (OF-2)** (Weir Controls 0.30 cfs @ 0.88 fps)
  └─**3=Focal Point Media** (Exfiltration Controls 0.33 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=45.76' TW=43.43' (Dynamic Tailwater)
└─**6=Spillway** (Controls 0.00 cfs)

Pond FP-2: FP-2



Summary for Pond FP-3: FP-3

Inflow Area = 13,722 sf, 58.52% Impervious, Inflow Depth > 4.87" for 50-Year event
Inflow = 1.66 cfs @ 12.13 hrs, Volume= 5,566 cf
Outflow = 1.62 cfs @ 12.14 hrs, Volume= 5,565 cf, Atten= 2%, Lag= 0.8 min
Discarded = 0.32 cfs @ 12.14 hrs, Volume= 4,192 cf
Primary = 1.31 cfs @ 12.14 hrs, Volume= 1,374 cf
Routed to Pond DMH-4 : DMH-4
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond FP-1 : FP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 53.92' @ 12.14 hrs Surf.Area= 683 sf Storage= 816 cf
Flood Elev= 54.96' Surf.Area= 1,220 sf Storage= 1,539 cf

Plug-Flow detention time= 35.4 min calculated for 5,565 cf (100% of inflow)
Center-of-Mass det. time= 35.3 min (800.1 - 764.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	46.38'	168 cf	**11.87'W x 13.38'L x 4.29'H Field A** 682 cf Overall - 262 cf Embedded = 420 cf x 40.0% Voids
#2A	46.63'	249 cf	**Ferguson R-Tank HD 2.5** x 24 Inside #1 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 24 Chambers in 6 Rows
#3	50.17'	34 cf	**8.00'W x 9.00'L x 2.33'H FP (mulch/media/stone)** 168 cf Overall x 20.0% Voids
#4	52.50'	1,129 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
		1,579 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
52.50	68	30.6	0	0	68
53.00	210	58.0	66	66	262
54.00	476	104.0	334	400	861
55.00	1,015	183.0	729	1,129	2,671

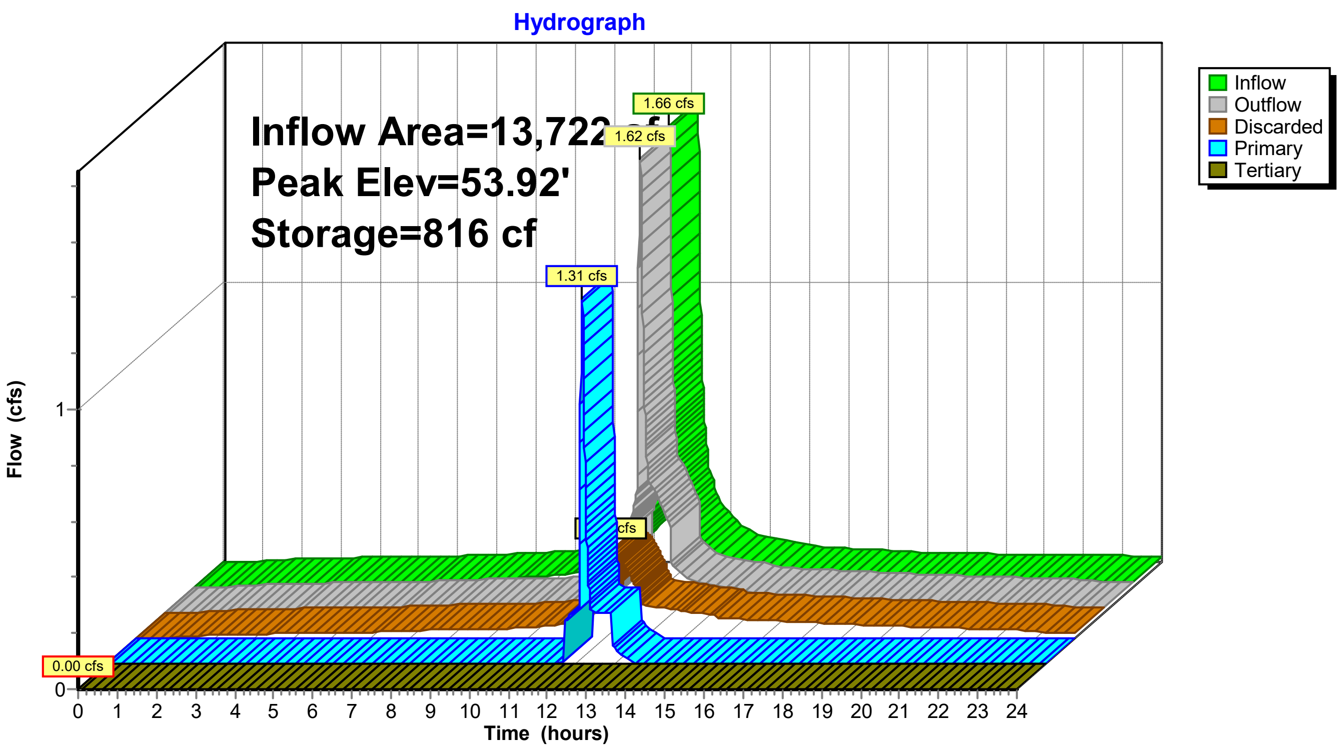
Device	Routing	Invert	Outlet Devices
#1	Primary	49.55'	**12.0" Round Culvert** L= 37.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.55' / 49.15' S= 0.0108 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	53.75'	**18.0" Horiz. Dome Grate (OF-3)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	50.22'	**100.000 in/hr Focal Point Media over Surface area from 50.22' - 52.55'** Excluded Surface area = 231 sf Phase-In= 0.01'
#4	Discarded	46.38'	**8.270 in/hr R tank Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#5	Discarded	52.80'	**3.000 in/hr Bowl Exfiltration over Wetted area above 52.80'** Excluded Wetted area = 697 sf Phase-In= 0.01'
#6	Tertiary	54.90'	**3.0' 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=0.32 cfs @ 12.14 hrs HW=53.92' (Free Discharge)
├─**4=R tank Exfiltration** (Controls 0.27 cfs)
└─**5=Bowl Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=1.31 cfs @ 12.14 hrs HW=53.92' TW=49.94' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.31 cfs of 6.57 cfs potential flow)
  ├─**2=Dome Grate (OF-3)** (Weir Controls 1.13 cfs @ 1.37 fps)
  └─**3=Focal Point Media** (Exfiltration Controls 0.18 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.38' TW=43.43' (Dynamic Tailwater)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond FP-3: FP-3



Summary for Pond FP-4: FP-4

Inflow Area = 12,711 sf, 69.37% Impervious, Inflow Depth > 5.07" for 50-Year event
Inflow = 1.55 cfs @ 12.13 hrs, Volume= 5,369 cf
Outflow = 1.55 cfs @ 12.13 hrs, Volume= 5,342 cf, Atten= 0%, Lag= 0.3 min
Discarded = 0.06 cfs @ 12.13 hrs, Volume= 2,707 cf
Primary = 1.49 cfs @ 12.13 hrs, Volume= 2,635 cf
Routed to Pond DMH-5 : DMH-5
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond CB-6B,C : CB-6B,6C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 53.45' @ 12.13 hrs Surf.Area= 338 sf Storage= 374 cf
Flood Elev= 54.25' Surf.Area= 543 sf Storage= 574 cf

Plug-Flow detention time= 33.8 min calculated for 5,340 cf (99% of inflow)
Center-of-Mass det. time= 30.3 min (782.4 - 752.1)

Volume	Invert	Avail.Storage	Storage Description
#1	52.50'	303 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#2	50.75'	17 cf	**6.00'W x 8.00'L x 1.75'H FP (mulch/media)** 84 cf Overall x 20.0% Voids
#3A	46.88'	155 cf	**Ferguson R-Tank HD 2.5** x 15 Inside #4 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 15 Chambers in 5 Rows
#4A	46.63'	98 cf	**10.56'W x 9.04'L x 4.29'H Field A** 410 cf Overall - 164 cf Embedded = 246 cf x 40.0% Voids
		574 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
52.50	45	24.5	0	0	45
53.00	106	37.0	37	37	108
54.00	338	76.0	211	248	463
54.15	400	80.0	55	303	514

Device	Routing	Invert	Outlet Devices
#1	Primary	49.42'	**12.0" Round Culvert** L= 26.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.42' / 49.15' S= 0.0104 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	53.25'	**18.0" Horiz. Dome Grate (OF-4)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	47.74'	**100.000 in/hr Focal Point Media over Surface area from 47.74' - 51.50'** Excluded Surface area = 95 sf Phase-In= 0.01'
#4	Discarded	46.63'	**8.700 in/hr R Tank Exfiltration over Wetted area from 45.13' - 48.92'** Conductivity to Groundwater Elevation = 10.00' Excluded Wetted area = 0 sf Phase-In= 0.01'
#5	Discarded	51.50'	**3.000 in/hr Bowl Exfiltration over Wetted area above 51.50'** Conductivity to Groundwater Elevation = 10.00' Excluded Wetted area = 333 sf Phase-In= 0.01'
#6	Tertiary	54.10'	**3.5' long x 2.5' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00

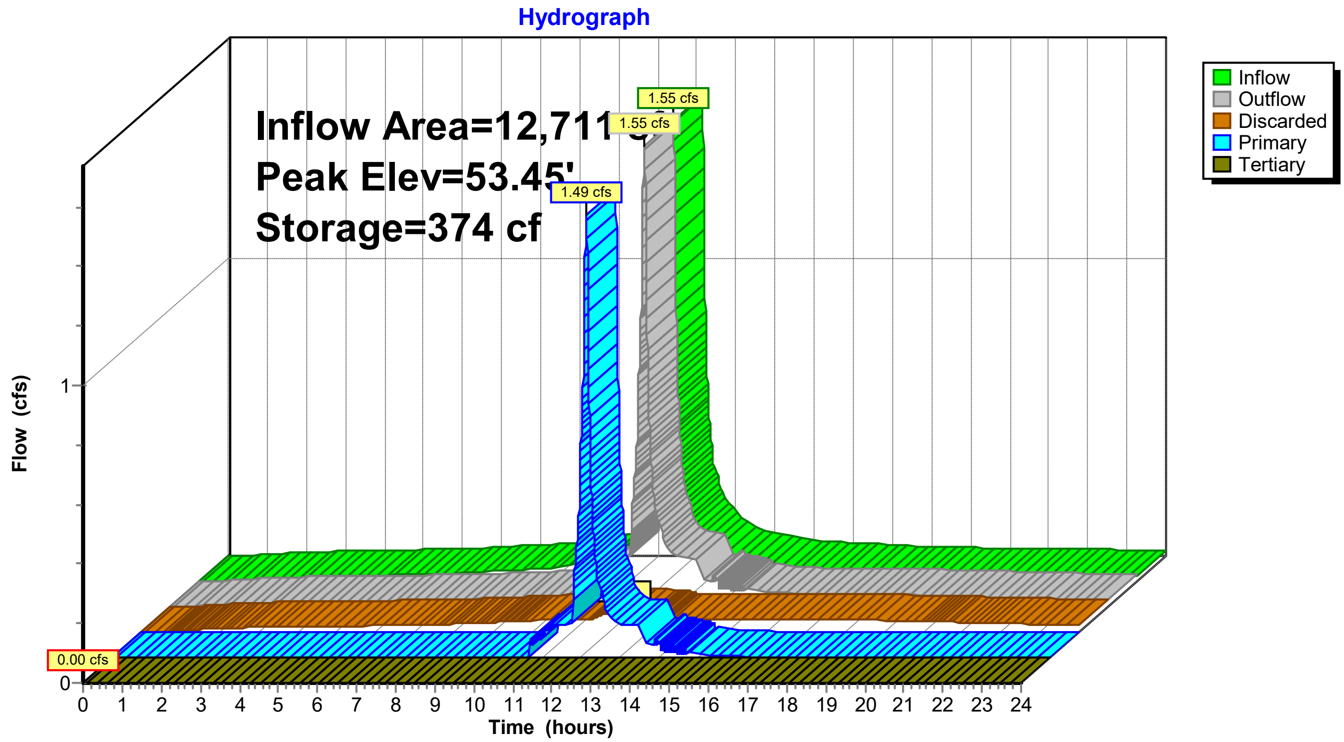
Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74 2.76 2.89 3.05 3.19 3.32

Discarded OutFlow Max=0.06 cfs @ 12.13 hrs HW=53.45' (Free Discharge)
4=R Tank Exfiltration (Controls 0.04 cfs)
5=Bowl Exfiltration (Controls 0.02 cfs)

Primary OutFlow Max=1.48 cfs @ 12.13 hrs HW=53.45' TW=50.11' (Dynamic Tailwater)
1=Culvert (Passes 1.48 cfs of 6.10 cfs potential flow)
2=Dome Grate (OF-4) (Weir Controls 1.37 cfs @ 1.46 fps)
3=Focal Point Media (Exfiltration Controls 0.11 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.63' TW=47.50' (Dynamic Tailwater)
6=Spillway (Controls 0.00 cfs)

Pond FP-4: FP-4



Summary for Pond FP-5: FP-5

Inflow Area = 9,281 sf, 84.56% Impervious, Inflow Depth > 6.02" for 50-Year event
Inflow = 1.36 cfs @ 12.13 hrs, Volume= 4,659 cf
Outflow = 1.35 cfs @ 12.14 hrs, Volume= 4,658 cf, Atten= 1%, Lag= 0.5 min
Discarded = 0.21 cfs @ 12.14 hrs, Volume= 3,296 cf
Primary = 1.14 cfs @ 12.14 hrs, Volume= 1,363 cf
Routed to Pond DB-A : DB-A
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond FP-4 : FP-4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 55.36' @ 12.14 hrs Surf.Area= 474 sf Storage= 553 cf
Flood Elev= 57.00' Surf.Area= 606 sf Storage= 921 cf

Plug-Flow detention time= 31.1 min calculated for 4,658 cf (100% of inflow)
Center-of-Mass det. time= 31.1 min (778.0 - 747.0)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	614 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#2	52.25'	17 cf	**6.00'W x 8.00'L x 1.75'H FP (mulch/media)** 84 cf Overall x 20.0% Voids
#3A	47.96'	135 cf	**10.56'W x 11.04'L x 4.29'H Field A** 500 cf Overall - 164 cf Embedded = 337 cf x 40.0% Voids
#4A	48.21'	155 cf	**Ferguson R-Tank HD 2.5** x 15 Inside #3 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 15 Chambers in 5 Rows
		921 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
54.00	45	24.5	0	0	45
55.00	267	76.7	141	141	468
56.35	441	85.7	473	614	628

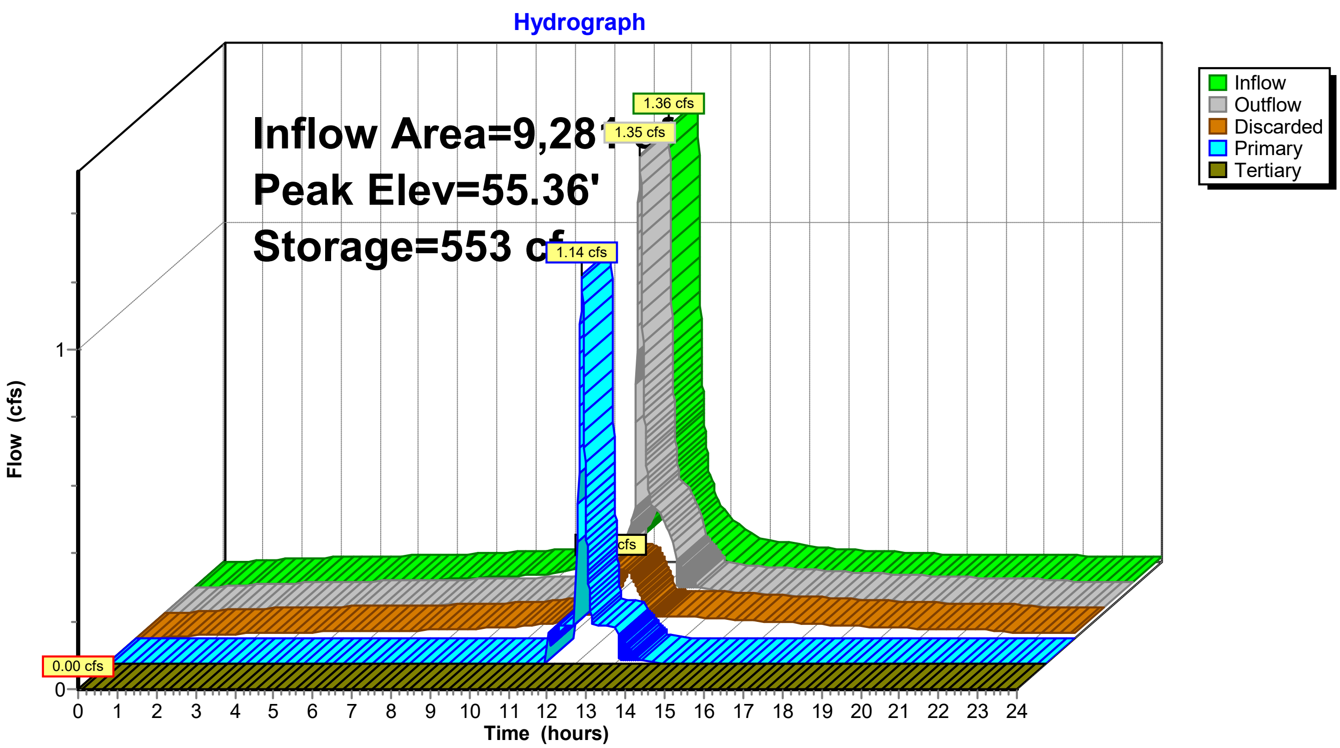
Device	Routing	Invert	Outlet Devices
#1	Primary	50.67'	**12.0" Round Culvert** L= 4.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.67' / 50.55' S= 0.0300 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	55.20'	**18.0" Horiz. Dome Grate (OF-5)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	50.55'	**100.000 in/hr Focal Point Media over Surface area from 50.55' - 52.55'** Excluded Surface area = 117 sf Phase-In= 0.01'
#4	Discarded	47.96'	**8.270 in/hr R-Tank Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#5	Discarded	52.80'	**3.000 in/hr Bowl Exfiltration over Surface area above 52.80'** Excluded Surface area = 165 sf Phase-In= 0.01'
#6	Tertiary	56.33'	**3.5' long x 2.5' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74 2.76 2.89 3.05 3.19 3.32

Discarded OutFlow Max=0.21 cfs @ 12.14 hrs HW=55.36' (Free Discharge)
└**4=R-Tank Exfiltration** (Controls 0.19 cfs)
└**5=Bowl Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=1.14 cfs @ 12.14 hrs HW=55.36' TW=51.38' (Dynamic Tailwater)
└**1=Culvert** (Passes 1.14 cfs of 6.66 cfs potential flow)
└**2=Dome Grate (OF-5)** (Weir Controls 1.03 cfs @ 1.33 fps)
└**3=Focal Point Media** (Exfiltration Controls 0.11 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=47.96' TW=46.63' (Dynamic Tailwater)
└**6=Spillway** (Controls 0.00 cfs)

Pond FP-5: FP-5



Summary for Pond FP-6: FP-6

Inflow Area = 14,693 sf, 51.93% Impervious, Inflow Depth > 3.97" for 50-Year event
Inflow = 1.38 cfs @ 12.13 hrs, Volume= 4,863 cf
Outflow = 1.37 cfs @ 12.14 hrs, Volume= 4,862 cf, Atten= 0%, Lag= 0.3 min
Discarded = 0.14 cfs @ 12.14 hrs, Volume= 3,190 cf
Primary = 1.24 cfs @ 12.14 hrs, Volume= 1,671 cf
  Routed to Pond OF-6 : OF-6
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
  Routed to Pond FP-5 : FP-5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 55.57' @ 12.14 hrs Surf.Area= 365 sf Storage= 398 cf

Plug-Flow detention time= 31.3 min calculated for 4,862 cf (100% of inflow)
Center-of-Mass det. time= 31.2 min (792.3 - 761.1)

Volume	Invert	Avail.Storage	Storage Description
#1	54.92'	857 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#2	53.17'	17 cf	**6.00'W x 8.00'L x 1.75'H FP (mulch/media)**
			84 cf Overall x 20.0% Voids
#3A	48.88'	135 cf	**10.56'W x 11.04'L x 4.29'H Field A**
			500 cf Overall - 164 cf Embedded = 337 cf x 40.0% Voids
#4A	49.13'	155 cf	**Ferguson R-Tank HD 2.5** x 15 Inside #3
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			15 Chambers in 5 Rows
		1,164 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
54.92	86	36.0	0	0	86
56.00	300	65.0	197	197	325
57.00	511	79.0	401	598	501
57.50	525	82.0	259	857	557

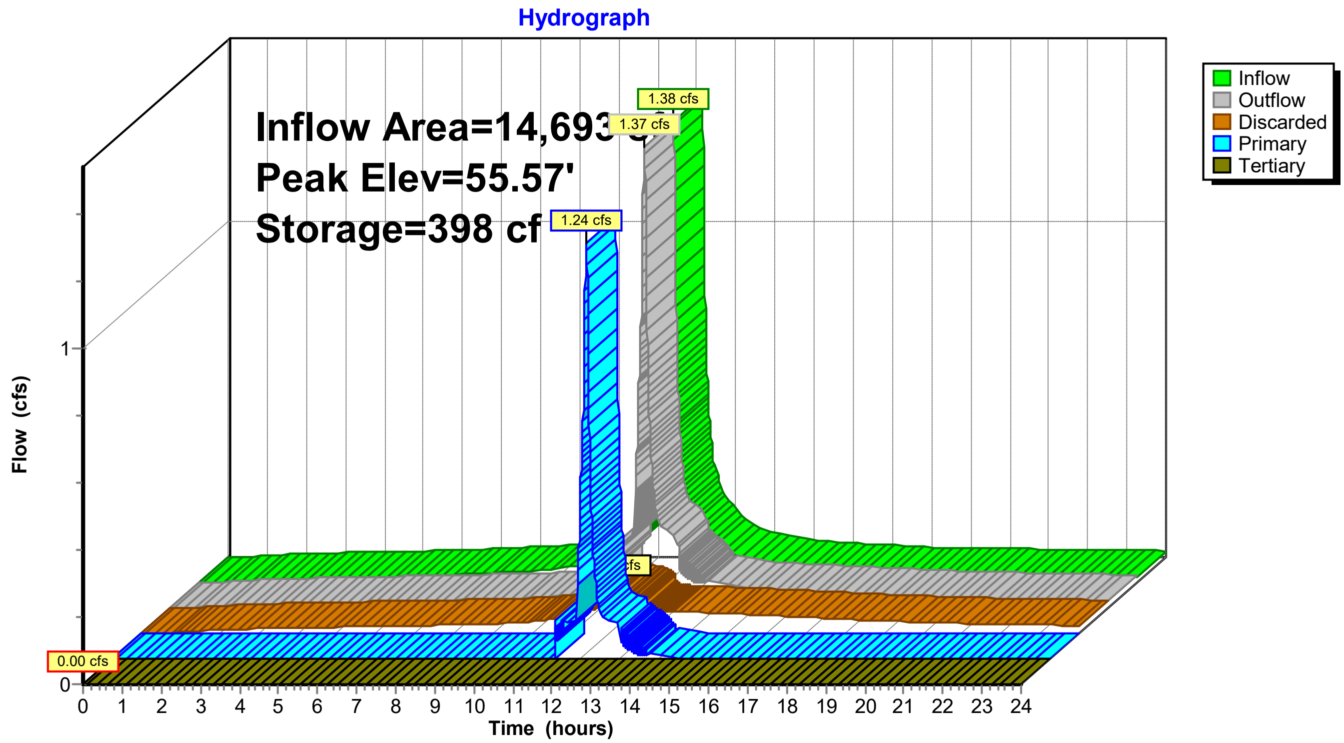
Device	Routing	Invert	Outlet Devices
#1	Primary	51.59'	**12.0" Round Culvert** L= 6.0' CPP, mitered to conform to fill, Ke= 0.700
			Inlet / Outlet Invert= 51.59' / 51.50' S= 0.0150 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	55.40'	**18.0" Horiz. Dome Grate (OF-6)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	52.67'	**100.000 in/hr Focal Point Media over Surface area from 52.67' - 54.67'**
			Excluded Surface area = 117 sf Phase-In= 0.01'
#4	Discarded	48.88'	**8.270 in/hr R-Tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#5	Discarded	54.92'	**3.000 in/hr Bowl Exfiltration over Wetted area above 54.92'**
			Excluded Wetted area = 485 sf Phase-In= 0.01'
#6	Tertiary	57.38'	**3.5' long x 2.0' breadth Spillway**
			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=0.14 cfs @ 12.14 hrs HW=55.57' (Free Discharge)
├─**4=R-Tank Exfiltration** (Controls 0.13 cfs)
└─**5=Bowl Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=1.24 cfs @ 12.14 hrs HW=55.57' TW=52.05' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.24 cfs of 6.23 cfs potential flow)
  ├─**2=Dome Grate (OF-6)** (Weir Controls 1.13 cfs @ 1.37 fps)
  └─**3=Focal Point Media** (Exfiltration Controls 0.11 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=48.88' TW=47.96' (Dynamic Tailwater)
└─**6=Spillway** (Controls 0.00 cfs)

Pond FP-6: FP-6



Summary for Pond FP-7: FP-7/INF-5

Inflow Area = 74,145 sf, 24.19% Impervious, Inflow Depth > 2.55" for 50-Year event
Inflow = 3.32 cfs @ 12.17 hrs, Volume= 15,763 cf
Outflow = 1.08 cfs @ 12.62 hrs, Volume= 15,603 cf, Atten= 68%, Lag= 27.0 min
Discarded = 1.08 cfs @ 12.62 hrs, Volume= 15,603 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond DMH-3 : DMH-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 54.52' @ 12.62 hrs Surf.Area= 6,514 sf Storage= 4,348 cf
Flood Elev= 57.18' Surf.Area= 2,830 sf Storage= 16,463 cf

Plug-Flow detention time= 70.8 min calculated for 15,599 cf (99% of inflow)
Center-of-Mass det. time= 64.6 min (877.0 - 812.4)

Volume	Invert	Avail.Storage	Storage Description
#1	51.90'	14,781 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#2	50.15'	17 cf	**8.00'W x 6.00'L x 1.75'H Media/Mulch**
			84 cf Overall x 20.0% Voids
#3A	45.86'	422 cf	**17.12'W x 32.15'L x 4.29'H Field A**
			2,364 cf Overall - 1,309 cf Embedded = 1,055 cf x 40.0% Voids
#4A	46.11'	1,244 cf	**Ferguson R-Tank HD 2.5** x 120 Inside #3
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			120 Chambers in 10 Rows
		16,463 cf	Total Available Storage

Storage Group A created with Chamber Wizard

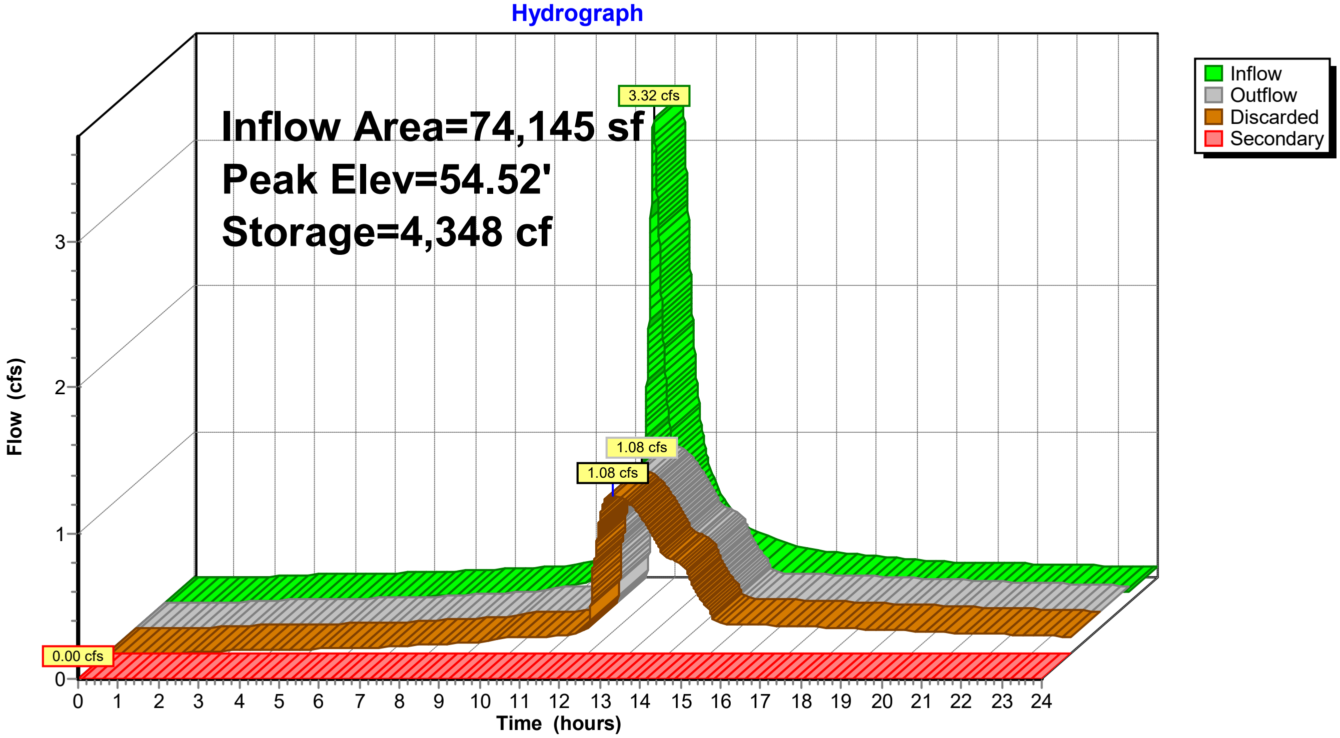
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
51.90	33	22.0	0	0	33
52.00	211	64.0	11	11	320
53.00	549	145.0	367	378	1,672
54.00	874	156.0	705	1,083	1,975
55.00	14,388	179.0	6,269	7,352	2,611
56.00	2,231	200.0	7,428	14,781	3,272

Device	Routing	Invert	Outlet Devices
#1	Discarded	52.00'	**3.000 in/hr RG Exfiltration over Surface area from 52.00' - 54.50'**
			Conductivity to Groundwater Elevation = 10.00'
			Excluded Surface area = 810 sf Phase-In= 0.01'
#2	Discarded	45.86'	**8.270 in/hr R-tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#3	Secondary	55.70'	**32.0" W x 9.0" H Vert. TR-7 (backflow)** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=1.08 cfs @ 12.62 hrs HW=54.52' (Free Discharge)
1=RG Exfiltration (Controls 0.38 cfs)
2=R-tank Exfiltration (Controls 0.70 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=45.86' TW=51.10' (Dynamic Tailwater)
3=TR-7 (backflow) (Controls 0.00 cfs)

Pond FP-7: FP-7/INF-5



Summary for Pond INF-1: INF-1

Inflow Area = 23,899 sf, 71.73% Impervious, Inflow Depth > 5.43" for 50-Year event
Inflow = 2.38 cfs @ 12.09 hrs, Volume= 10,821 cf
Outflow = 1.89 cfs @ 12.14 hrs, Volume= 10,820 cf, Atten= 21%, Lag= 3.1 min
Discarded = 0.25 cfs @ 12.14 hrs, Volume= 8,572 cf
Secondary = 1.64 cfs @ 12.14 hrs, Volume= 2,248 cf
Routed to Pond AB-1 : Attenuation Basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.05' @ 12.14 hrs Surf.Area= 636 sf Storage= 2,036 cf

Plug-Flow detention time= 51.4 min calculated for 10,817 cf (100% of inflow)
Center-of-Mass det. time= 51.3 min (805.9 - 754.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	46.00'	626 cf	**14.50'W x 43.88'L x 4.79'H Field A**
			3,049 cf Overall - 1,483 cf Embedded = 1,566 cf x 40.0% Voids
#2A	46.25'	1,409 cf	**Ferguson R-Tank HD 2.5** x 136 Inside #1
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			136 Chambers in 8 Rows
		2,036 cf	Total Available Storage

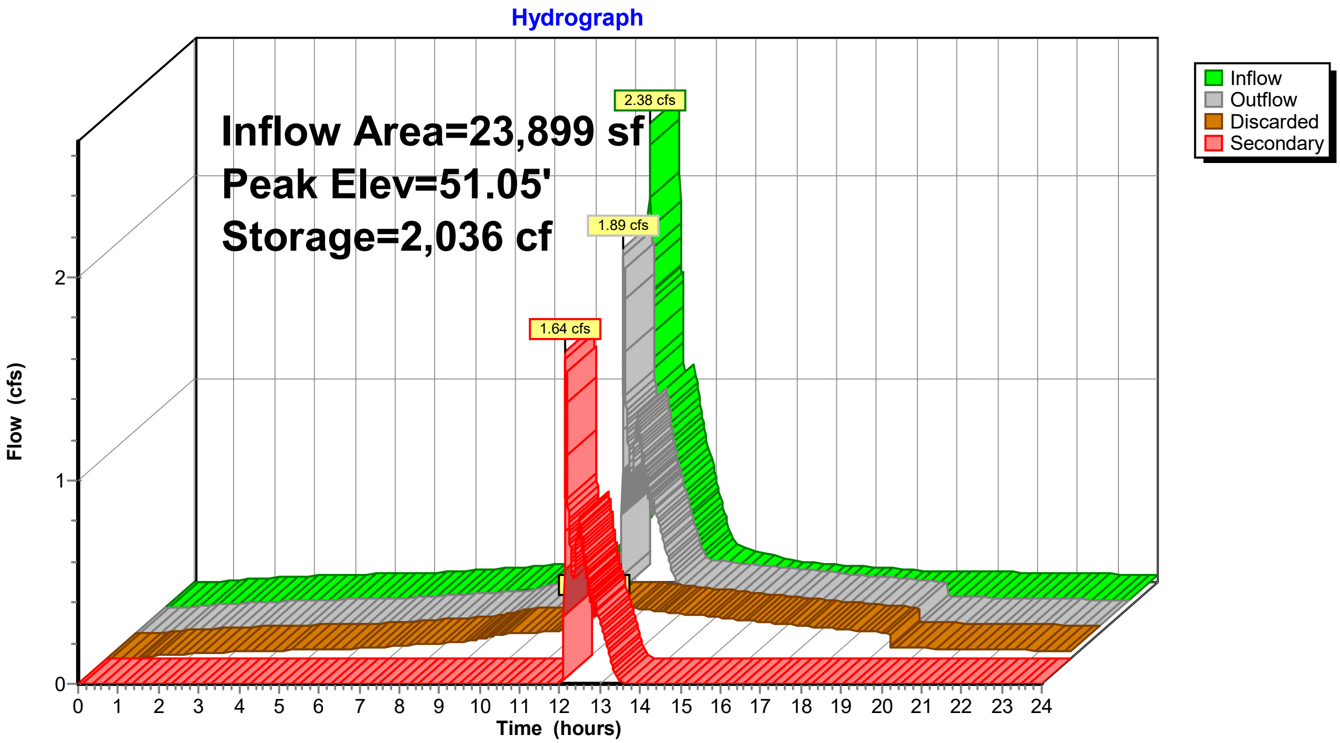
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	46.00'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00'
			Phase-In= 0.01'
#2	Secondary	50.25'	**12.0" Round Overflow** L= 14.0' CPP, mitered to conform to fill, Ke= 0.700
			Inlet / Outlet Invert= 50.25' / 50.10' S= 0.0107 '/' Cc= 0.900
			n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.25 cfs @ 12.14 hrs HW=51.05' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.25 cfs)

Secondary OutFlow Max=1.63 cfs @ 12.14 hrs HW=51.05' TW=49.44' (Dynamic Tailwater)
↑—**2=Overflow** (Barrel Controls 1.63 cfs @ 3.33 fps)

Pond INF-1: INF-1



Summary for Pond INF-2: INF-2

Inflow Area = 104,046 sf, 64.30% Impervious, Inflow Depth = 1.18" for 50-Year event
Inflow = 5.51 cfs @ 12.16 hrs, Volume= 10,268 cf
Outflow = 1.63 cfs @ 12.48 hrs, Volume= 10,268 cf, Atten= 70%, Lag= 19.0 min
Discarded = 0.50 cfs @ 12.48 hrs, Volume= 8,290 cf
Secondary = 1.13 cfs @ 12.48 hrs, Volume= 1,978 cf
Routed to Pond DMH-3 : DMH-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 52.00' @ 12.48 hrs Surf.Area= 1,566 sf Storage= 5,441 cf
Flood Elev= 54.00' Surf.Area= 1,566 sf Storage= 6,187 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 85.3 min (825.9 - 740.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	47.64'	1,398 cf	**21.06'W x 74.37'L x 5.45'H Field A**
			8,536 cf Overall - 5,042 cf Embedded = 3,494 cf x 40.0% Voids
#2A	47.89'	4,790 cf	**Ferguson R-Tank HD 3** x 390 Inside #1
			Inside= 15.7"W x 50.4"H => 5.24 sf x 2.35'L = 12.3 cf
			Outside= 15.7"W x 50.4"H => 5.51 sf x 2.35'L = 12.9 cf
			390 Chambers in 13 Rows
		6,187 cf	Total Available Storage

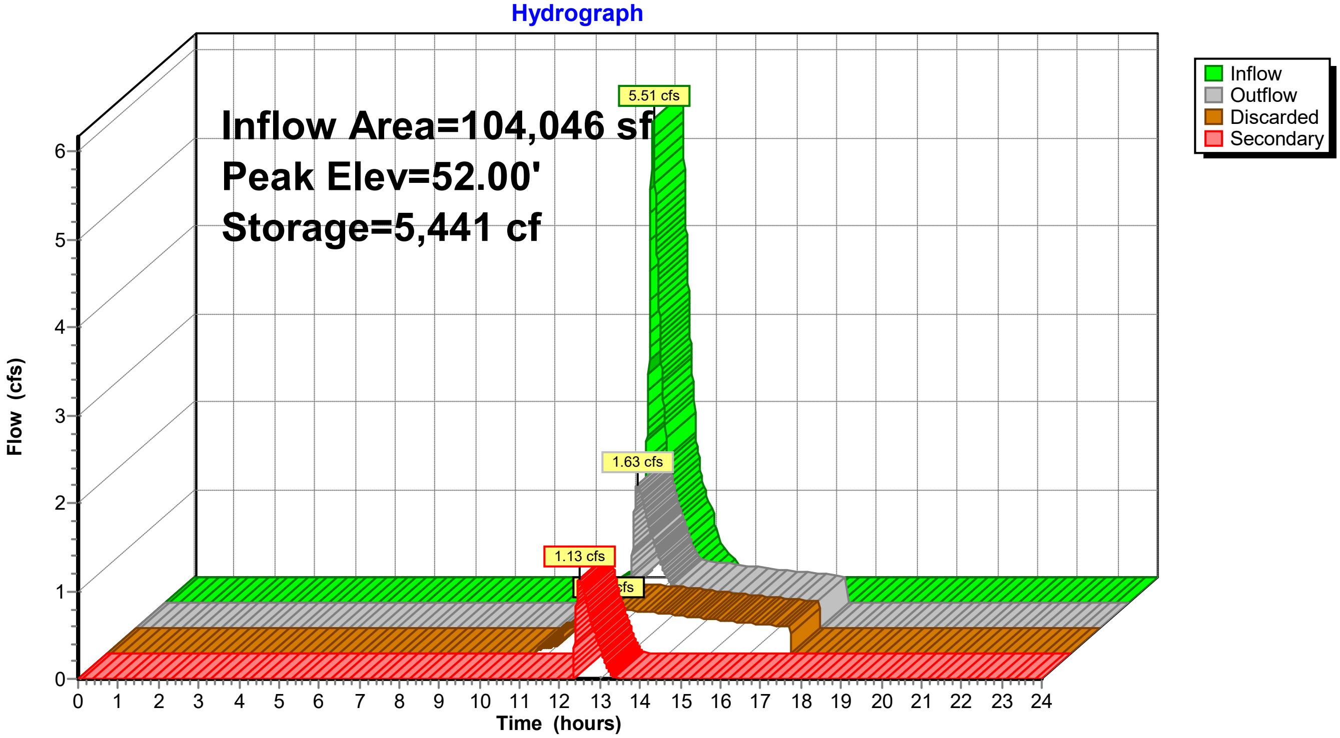
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	47.64'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00'
#2	Secondary	51.35'	**15.0" Round Culvert** L= 24.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 51.35' / 51.10' S= 0.0104 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=0.50 cfs @ 12.48 hrs HW=52.00' (Free Discharge)
1=Exfiltration (Controls 0.50 cfs)

Secondary OutFlow Max=1.13 cfs @ 12.48 hrs HW=52.00' TW=51.77' (Dynamic Tailwater)
2=Culvert (Outlet Controls 1.13 cfs @ 2.56 fps)

Pond INF-2: INF-2



Summary for Pond INF-3: INF-3

Inflow Area = 38,595 sf, 60.69% Impervious, Inflow Depth > 3.12" for 50-Year event
Inflow = 2.81 cfs @ 12.14 hrs, Volume= 10,048 cf
Outflow = 0.38 cfs @ 12.78 hrs, Volume= 10,048 cf, Atten= 86%, Lag= 38.7 min
Discarded = 0.38 cfs @ 12.78 hrs, Volume= 10,048 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond SP 4 : Study Point

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 47.36' @ 12.78 hrs Surf.Area= 1,112 sf Storage= 3,776 cf

Plug-Flow detention time= 76.2 min calculated for 10,045 cf (100% of inflow)
Center-of-Mass det. time= 76.1 min (831.2 - 755.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	43.00'	1,058 cf	**18.44'W x 60.30'L x 5.45'H Field A**
			6,058 cf Overall - 3,413 cf Embedded = 2,645 cf x 40.0% Voids
#2A	43.25'	3,242 cf	**Ferguson R-Tank HD 3** x 264 Inside #1
			Inside= 15.7"W x 50.4"H => 5.24 sf x 2.35'L = 12.3 cf
			Outside= 15.7"W x 50.4"H => 5.51 sf x 2.35'L = 12.9 cf
			264 Chambers in 11 Rows
		4,300 cf	Total Available Storage

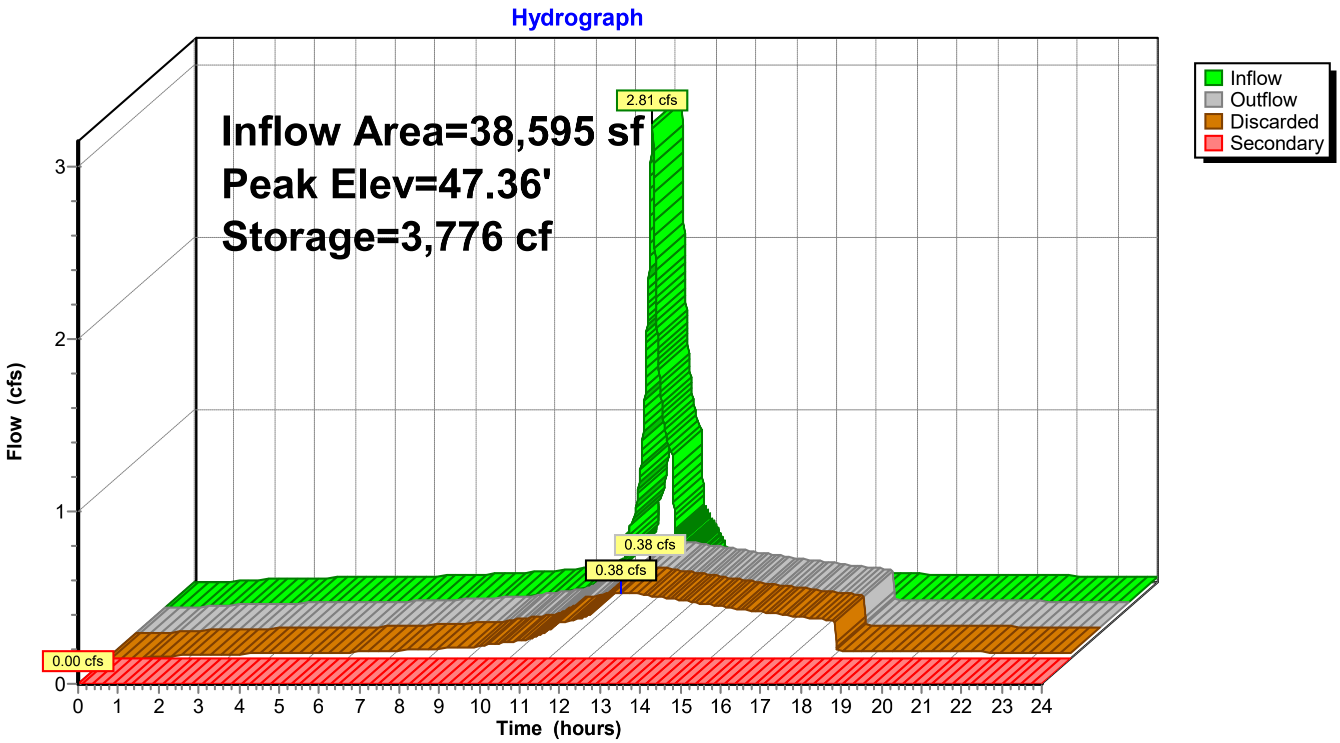
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	43.00'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#2	Secondary	49.80'	**24.0" x 24.0" Horiz. CB-6A** C= 0.600 Limited to weir flow at low heads
#3	Secondary	49.80'	**24.0" x 24.0" Horiz. CB-7** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.38 cfs @ 12.78 hrs HW=47.36' (Free Discharge)
└─**1=Exfiltration** (Controls 0.38 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=43.00' TW=0.00' (Dynamic Tailwater)
├─**2=CB-6A** (Controls 0.00 cfs)
└─**3=CB-7** (Controls 0.00 cfs)

Pond INF-3: INF-3



Summary for Pond INF-4: INF-4

Inflow Area = 45,592 sf, 62.99% Impervious, Inflow Depth > 4.78" for 50-Year event
Inflow = 4.80 cfs @ 12.14 hrs, Volume= 18,154 cf
Outflow = 2.23 cfs @ 12.28 hrs, Volume= 18,153 cf, Atten= 54%, Lag= 8.6 min
Discarded = 0.45 cfs @ 12.28 hrs, Volume= 15,625 cf
Secondary = 1.78 cfs @ 12.28 hrs, Volume= 2,528 cf
Routed to Pond OF-6 : OF-6

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 54.31' @ 12.28 hrs Surf.Area= 1,468 sf Storage= 4,647 cf
Flood Elev= 57.18' Surf.Area= 1,468 sf Storage= 5,494 cf

Plug-Flow detention time= 57.6 min calculated for 18,148 cf (100% of inflow)
Center-of-Mass det. time= 57.5 min (814.0 - 756.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	50.32'	1,023 cf	**21.06'W x 69.68'L x 4.95'H Field A** 7,264 cf Overall - 4,706 cf Embedded = 2,558 cf x 40.0% Voids
#2A	50.57'	4,471 cf	**Ferguson R-Tank HD 3** x 364 Inside #1 Inside= 15.7"W x 50.4"H => 5.24 sf x 2.35'L = 12.3 cf Outside= 15.7"W x 50.4"H => 5.51 sf x 2.35'L = 12.9 cf 364 Chambers in 13 Rows
		5,494 cf	Total Available Storage

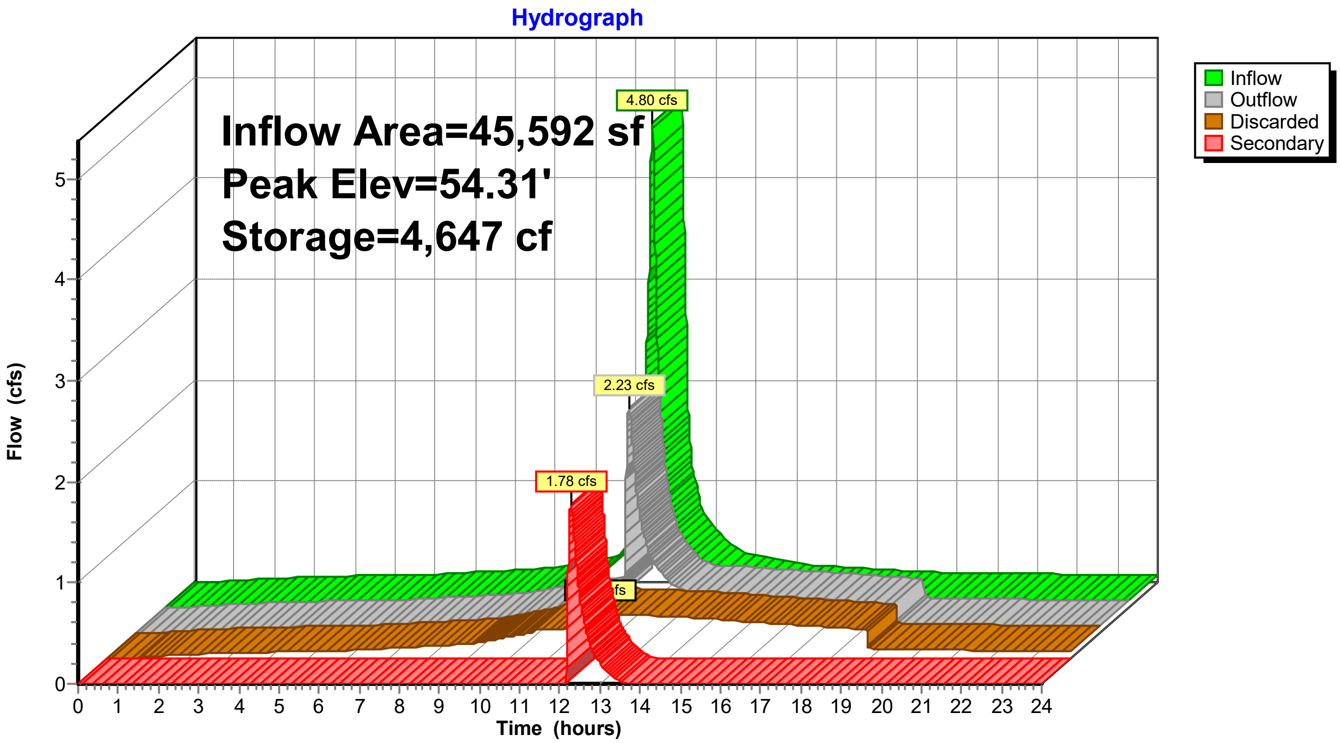
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	50.32'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#2	Secondary	53.52'	**12.0" Round Overflow** L= 86.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 53.52' / 51.40' S= 0.0247 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.45 cfs @ 12.28 hrs HW=54.31' (Free Discharge)
└**1=Exfiltration** (Controls 0.45 cfs)

Secondary OutFlow Max=1.78 cfs @ 12.28 hrs HW=54.31' TW=52.33' (Dynamic Tailwater)
└**2=Overflow** (Inlet Controls 1.78 cfs @ 2.67 fps)

Pond INF-4: INF-4



Summary for Pond INF-6: INF-6

Inflow Area = 19,023 sf, 56.89% Impervious, Inflow Depth > 4.62" for 50-Year event
Inflow = 2.15 cfs @ 12.13 hrs, Volume= 7,322 cf
Outflow = 0.56 cfs @ 12.36 hrs, Volume= 7,321 cf, Atten= 74%, Lag= 13.8 min
Discarded = 0.56 cfs @ 12.36 hrs, Volume= 7,321 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 57.06' @ 12.36 hrs Surf.Area= 2,282 sf Storage= 2,076 cf

Plug-Flow detention time= 54.7 min calculated for 7,319 cf (100% of inflow)
Center-of-Mass det. time= 54.6 min (818.4 - 763.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	50.46'	663 cf	**Ferguson R-Tank HD 2.5** x 64 Inside #2
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			64 Chambers in 8 Rows
#2A	50.21'	288 cf	**14.50'W x 22.77'L x 4.29'H Field A**
			1,417 cf Overall - 698 cf Embedded = 719 cf x 40.0% Voids
#3	56.00'	4,508 cf	**Depression (Irregular)** Listed below (Recalc)
		5,459 cf	Total Available Storage

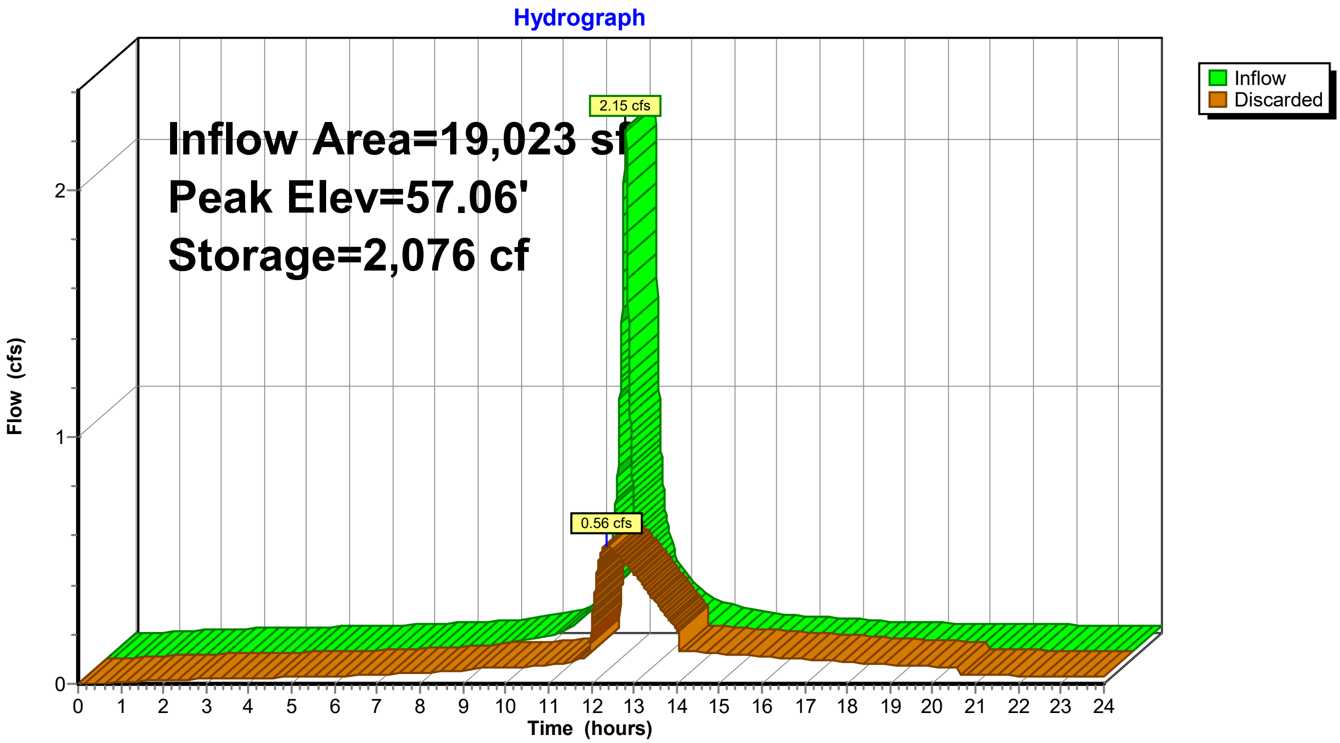
Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
56.00	361	76.0	0	0	361
57.00	1,869	162.0	1,017	1,017	1,994
58.00	3,616	269.0	2,695	3,712	5,670
58.20	4,360	285.0	796	4,508	6,378

Device	Routing	Invert	Outlet Devices
#1	Discarded	50.21'	**8.270 in/hr R Tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'

Discarded OutFlow Max=0.56 cfs @ 12.36 hrs HW=57.06' (Free Discharge)
└**1=R Tank Exfiltration** (Controls 0.56 cfs)

Pond INF-6: INF-6



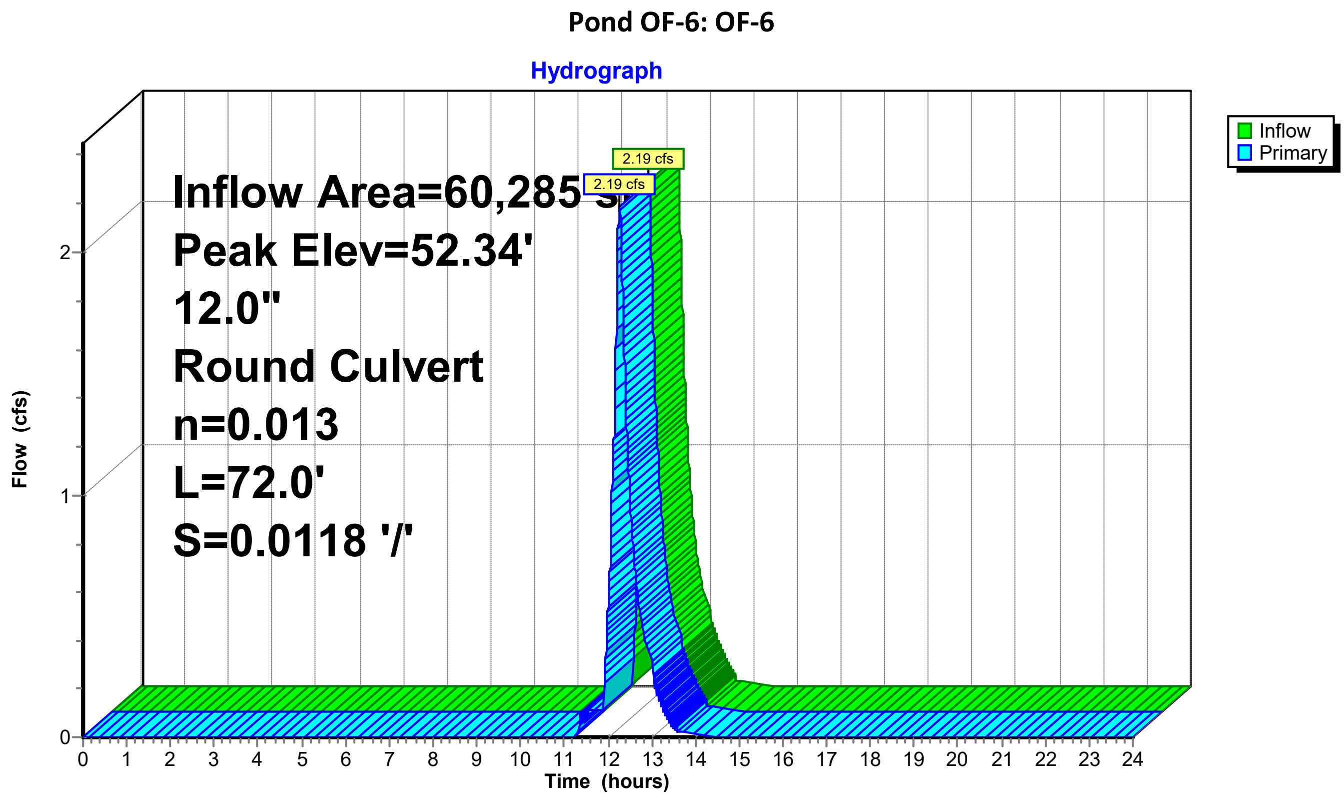
Summary for Pond OF-6: OF-6

Inflow Area = 60,285 sf, 60.30% Impervious, Inflow Depth = 0.84" for 50-Year event
Inflow = 2.19 cfs @ 12.26 hrs, Volume= 4,200 cf
Outflow = 2.19 cfs @ 12.26 hrs, Volume= 4,200 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.19 cfs @ 12.26 hrs, Volume= 4,200 cf
Routed to Pond DB-A : DB-A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 52.34' @ 12.29 hrs
Flood Elev= 54.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.40'	**12.0" Round Culvert** L= 72.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 51.40' / 50.55' S= 0.0118 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.16 cfs @ 12.26 hrs HW=52.32' TW=51.57' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 2.16 cfs @ 3.72 fps)

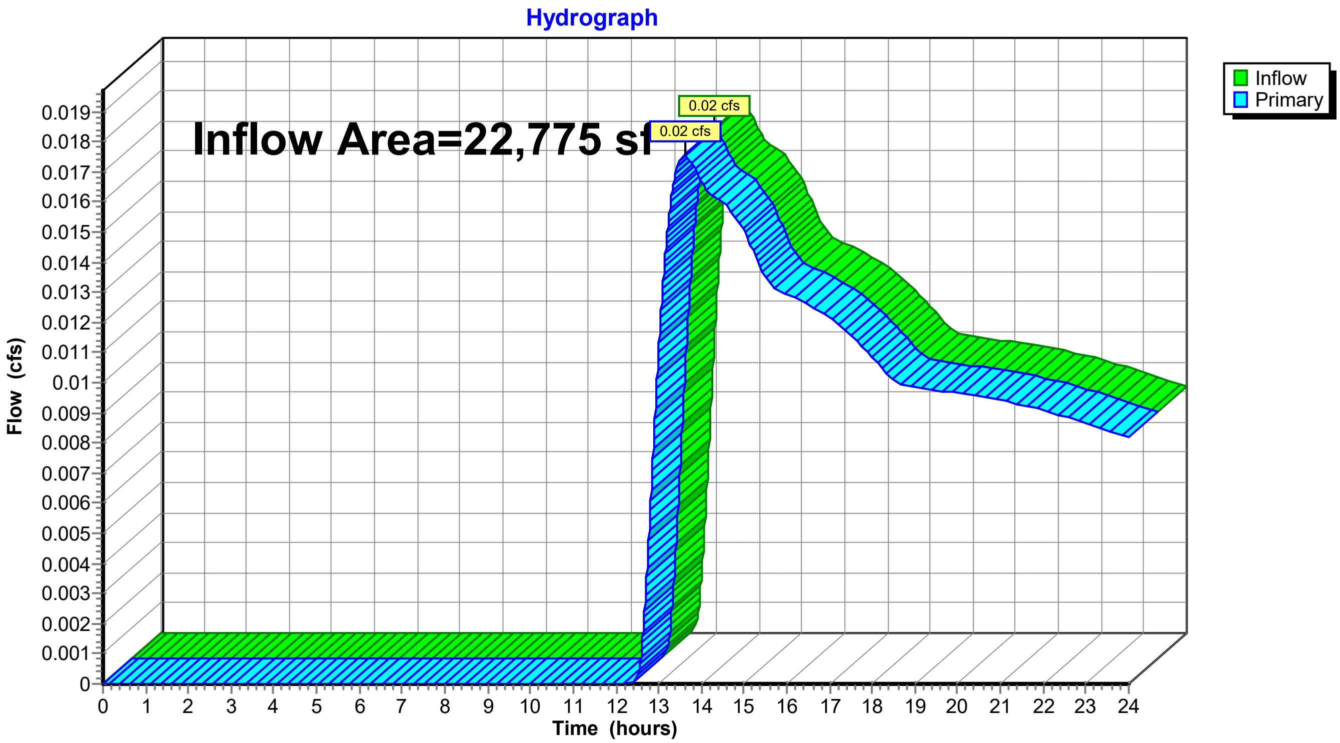


Summary for Pond SP 1: Study Point

Inflow Area = 22,775 sf, 0.00% Impervious, Inflow Depth > 0.24" for 50-Year event
Inflow = 0.02 cfs @ 13.61 hrs, Volume= 462 cf
Primary = 0.02 cfs @ 13.61 hrs, Volume= 462 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3

Pond SP 1: Study Point

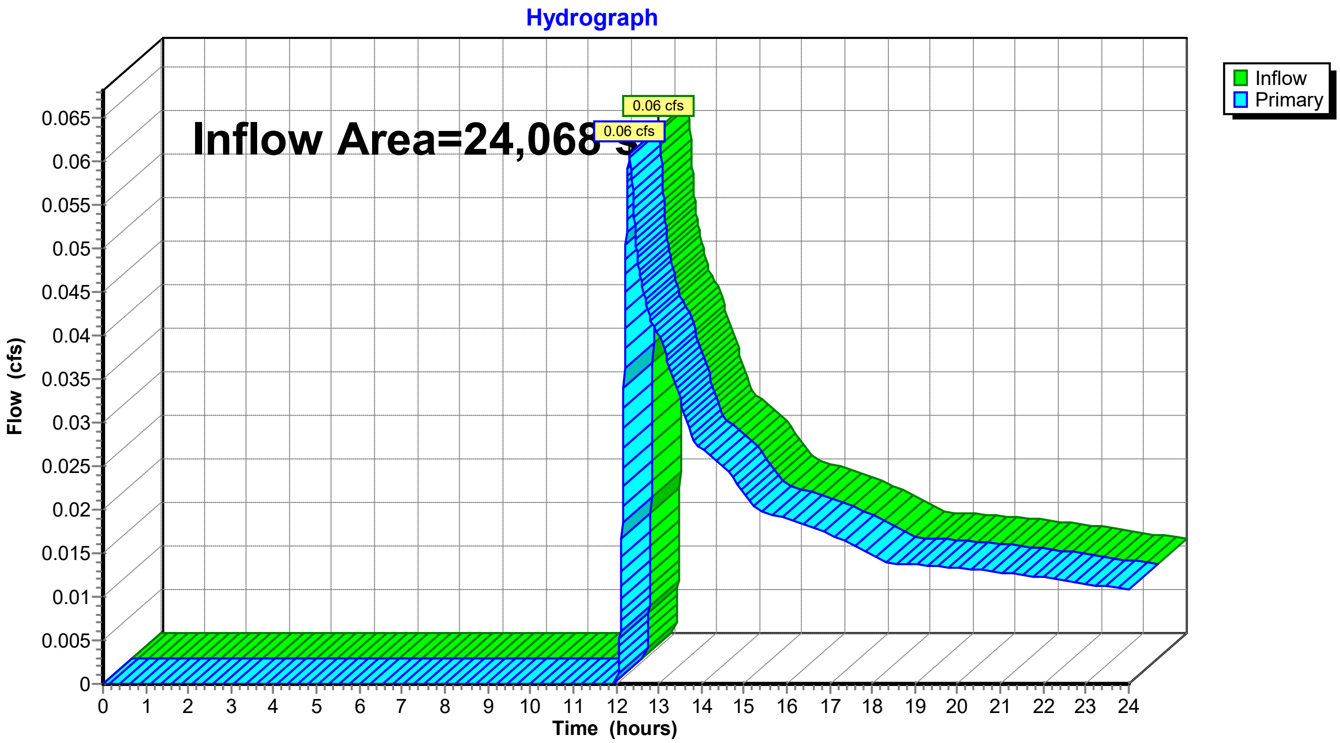


Summary for Pond SP 3: Study Point

Inflow Area = 24,068 sf, 0.00% Impervious, Inflow Depth > 0.41" for 50-Year event
Inflow = 0.06 cfs @ 12.32 hrs, Volume= 819 cf
Primary = 0.06 cfs @ 12.32 hrs, Volume= 819 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3

Pond SP 3: Study Point

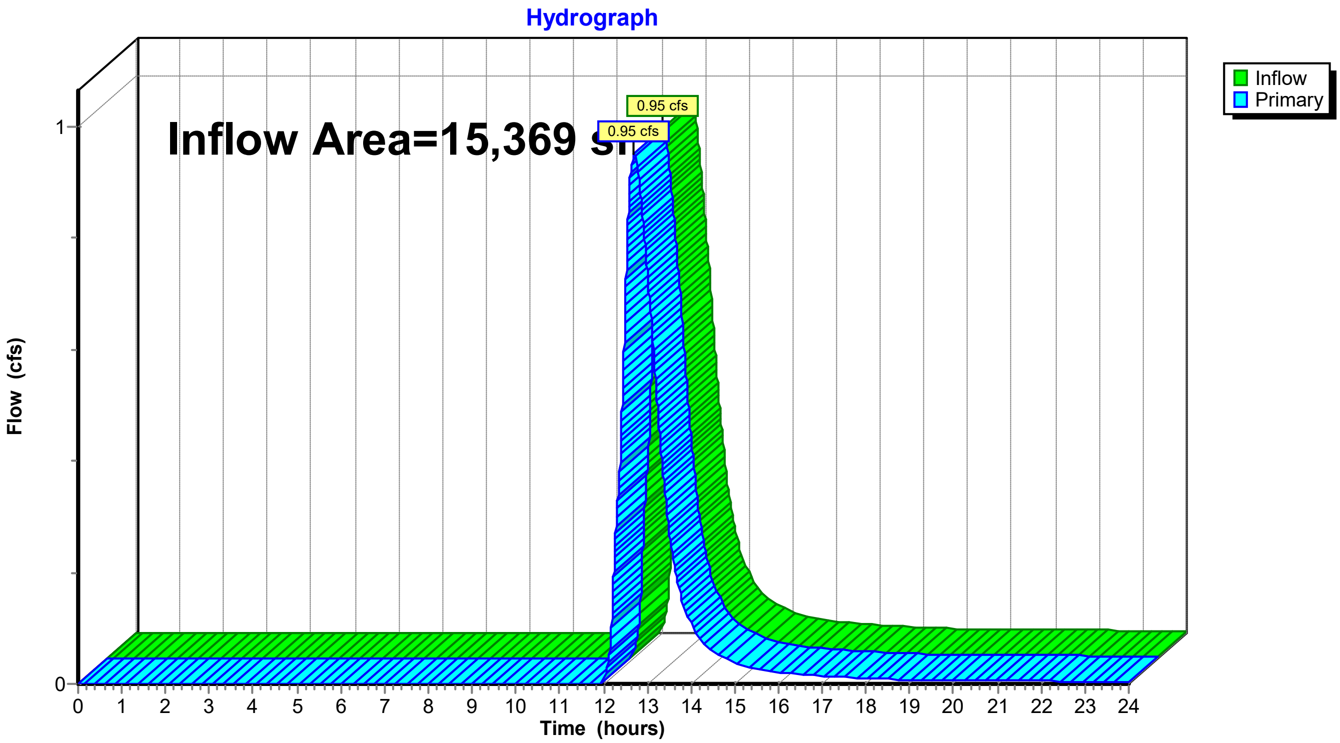


Summary for Pond SP 4: Study Point

Inflow Area = 15,369 sf, 0.00% Impervious, Inflow Depth > 2.94" for 50-Year event
Inflow = 0.95 cfs @ 12.70 hrs, Volume= 3,761 cf
Primary = 0.95 cfs @ 12.70 hrs, Volume= 3,761 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3

Pond SP 4: Study Point

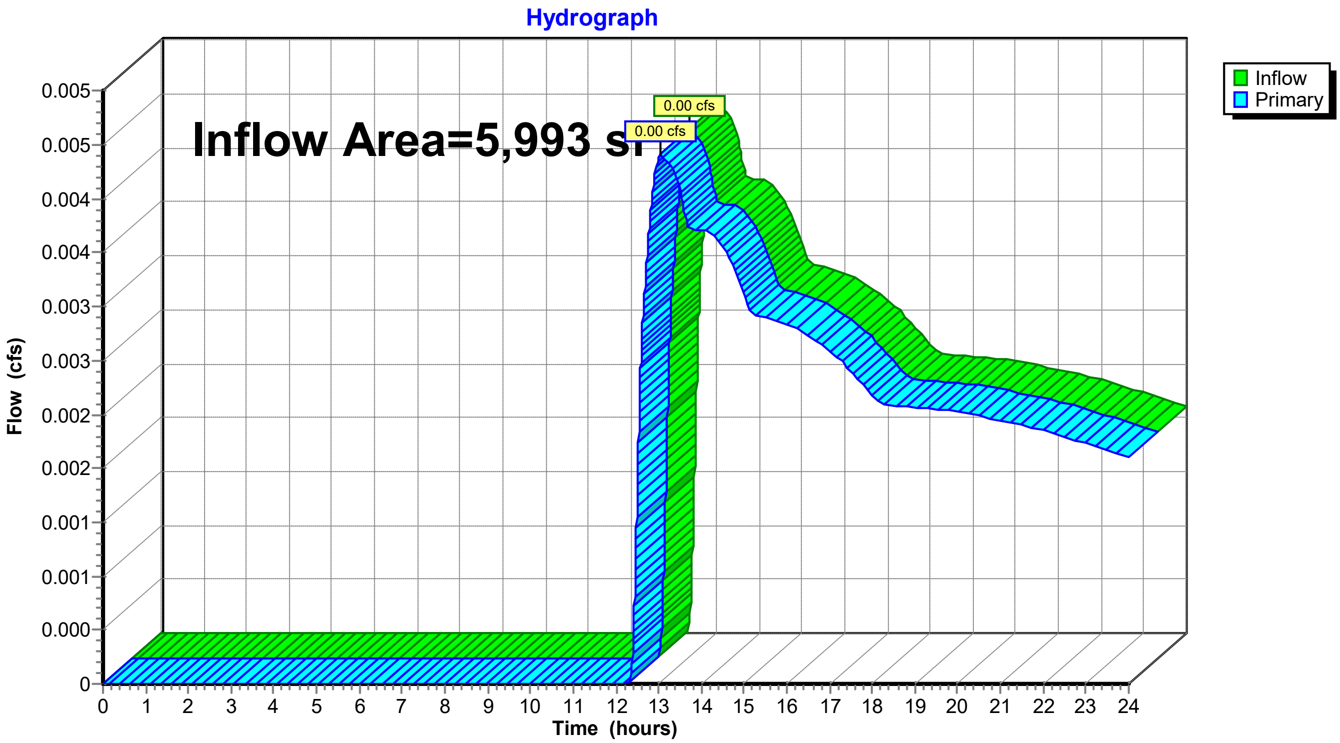


Summary for Pond SP-2: Study Point

Inflow Area = 5,993 sf, 0.00% Impervious, Inflow Depth > 0.25" for 50-Year event
Inflow = 0.00 cfs @ 13.07 hrs, Volume= 125 cf
Primary = 0.00 cfs @ 13.07 hrs, Volume= 125 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3

Pond SP-2: Study Point



Time span=0.00-24.00 hrs, dt=0.006 hrs, 4001 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: RA (partial) Runoff Area=18,019 sf 100.00% Impervious Runoff Depth>8.53"
Tc=6.0 min CN=98 Runoff=3.75 cfs 12,810 cf

Subcatchment 2S: RA (partial) Runoff Area=14,390 sf 100.00% Impervious Runoff Depth>8.53"
Tc=6.0 min CN=98 Runoff=2.99 cfs 10,230 cf

Subcatchment 3S: RA (partial) Runoff Area=10,803 sf 100.00% Impervious Runoff Depth>8.53"
Tc=6.0 min CN=98 Runoff=2.25 cfs 7,680 cf

Subcatchment SCA-1: LSA/FL/IA/PP Runoff Area=52,119 sf 6.80% Impervious Runoff Depth>2.77"
Flow Length=532' Slope=0.0100 '/' Tc=16.6 min CN=WQ Runoff=2.57 cfs 12,025 cf

Subcatchment SCA-10: Runoff Area=9,281 sf 84.56% Impervious Runoff Depth>7.44"
Tc=6.0 min CN=WQ Runoff=1.68 cfs 5,753 cf

Subcatchment SCA-11: Runoff Area=8,047 sf 72.78% Impervious Runoff Depth>6.62"
Tc=6.0 min CN=WQ Runoff=1.29 cfs 4,437 cf

Subcatchment SCA-12: Runoff Area=12,711 sf 69.37% Impervious Runoff Depth>6.34"
Tc=6.0 min CN=WQ Runoff=1.95 cfs 6,710 cf

Subcatchment SCA-13: Runoff Area=9,436 sf 78.35% Impervious Runoff Depth>7.01"
Tc=6.0 min CN=WQ Runoff=1.61 cfs 5,510 cf

Subcatchment SCA-14: Runoff Area=13,982 sf 55.19% Impervious Runoff Depth>5.23"
Tc=6.0 min CN=WQ Runoff=1.74 cfs 6,088 cf

Subcatchment SCA-16: Runoff Area=6,892 sf 58.84% Impervious Runoff Depth>5.64"
Tc=6.0 min CN=WQ Runoff=0.94 cfs 3,236 cf

Subcatchment SCA-17: Runoff Area=4,123 sf 100.00% Impervious Runoff Depth>8.53"
Tc=6.0 min CN=98 Runoff=0.86 cfs 2,931 cf

Subcatchment SCA-18: Runoff Area=9,051 sf 85.55% Impervious Runoff Depth>7.51"
Tc=6.0 min CN=WQ Runoff=1.66 cfs 5,668 cf

Subcatchment SCA-19: Runoff Area=12,142 sf 43.49% Impervious Runoff Depth>4.21"
Flow Length=145' Tc=9.6 min CN=WQ Runoff=1.02 cfs 4,256 cf

Subcatchment SCA-2: LSA/FL Runoff Area=8,220 sf 0.24% Impervious Runoff Depth>2.36"
Flow Length=75' Tc=6.1 min CN=WQ Runoff=0.52 cfs 1,614 cf

Subcatchment SCA-4: Runoff Area=27,573 sf 38.81% Impervious Runoff Depth>4.36"
Flow Length=254' Tc=6.8 min CN=WQ Runoff=2.82 cfs 10,010 cf

Subcatchment SCA-5: Runoff Area=7,636 sf 0.00% Impervious Runoff Depth>1.50"
Tc=6.0 min CN=39 Runoff=0.27 cfs 952 cf

Subcatchment SCA-6.1: Runoff Area=12,884 sf 69.58% Impervious Runoff Depth>6.46"
Tc=6.0 min CN=WQ Runoff=2.03 cfs 6,935 cf

Subcatchment SCA-6.2: Runoff Area=8,059 sf 57.41% Impervious Runoff Depth>6.48"
Tc=6.0 min CN=WQ Runoff=1.33 cfs 4,350 cf

Subcatchment SCA-7: Runoff Area=14,693 sf 51.93% Impervious Runoff Depth>5.07"
Tc=6.0 min CN=WQ Runoff=1.78 cfs 6,204 cf

Subcatchment SCA-8: Runoff Area=3,035 sf 100.00% Impervious Runoff Depth>8.53"
Tc=6.0 min CN=98 Runoff=0.63 cfs 2,158 cf

Subcatchment SCA-9: Runoff Area=5,663 sf 60.09% Impervious Runoff Depth>5.72"
Tc=6.0 min CN=WQ Runoff=0.79 cfs 2,701 cf

Subcatchment UC-1: NA Runoff Area=22,775 sf 0.00% Impervious Runoff Depth>0.60"
Flow Length=434' Tc=34.9 min CN=30 Runoff=0.07 cfs 1,142 cf

Subcatchment UC-2: Runoff Area=24,068 sf 0.00% Impervious Runoff Depth>0.85"
Flow Length=450' Tc=16.6 min CN=WQ Runoff=0.19 cfs 1,699 cf

Subcatchment UC-3: Runoff Area=7,204 sf 0.00% Impervious Runoff Depth>1.50"
Tc=6.0 min CN=39 Runoff=0.26 cfs 898 cf

Subcatchment UC-4: Runoff Area=8,165 sf 0.00% Impervious Runoff Depth>1.02"
Tc=6.0 min CN=WQ Runoff=0.15 cfs 696 cf

Subcatchment UC-5: Runoff Area=2,516 sf 100.00% Impervious Runoff Depth>8.53"
Tc=6.0 min CN=98 Runoff=0.52 cfs 1,789 cf

Subcatchment UC-6: NA Runoff Area=5,993 sf 0.00% Impervious Runoff Depth>0.61"
Flow Length=45' Slope=0.0300 '/' Tc=9.4 min CN=30 Runoff=0.02 cfs 306 cf

Pond AB-1: Attenuation Basin Peak Elev=51.75' Storage=3,890 cf Inflow=7.43 cfs 11,257 cf
Discarded=0.02 cfs 616 cf Primary=3.30 cfs 10,162 cf Outflow=3.32 cfs 10,778 cf

Pond CB-2A: CB 2A Peak Elev=53.01' Inflow=0.86 cfs 2,931 cf
12.0" Round Culvert n=0.013 L=14.0' S=0.0100 '/' Outflow=0.86 cfs 2,931 cf

Pond CB-2B: CB 2B Peak Elev=53.01' Inflow=0.94 cfs 3,236 cf
12.0" Round Culvert n=0.013 L=4.0' S=0.0350 '/' Outflow=0.94 cfs 3,236 cf

Pond CB-3: CB-3 Peak Elev=53.76' Inflow=2.03 cfs 6,935 cf
12.0" Round Culvert x 2.00 n=0.013 L=7.0' S=0.0143 '/' Outflow=2.03 cfs 6,935 cf

Pond CB-4: CB-4 Peak Elev=57.25' Storage=323 cf Inflow=2.82 cfs 10,010 cf
Outflow=2.19 cfs 10,010 cf

Pond CB-6A: CB-6A Peak Elev=49.90' Inflow=1.02 cfs 4,256 cf
12.0" Round Culvert n=0.013 L=25.0' S=0.0120 '/' Outflow=1.02 cfs 4,256 cf

Pond CB-6B,C: CB-6B,6C Peak Elev=49.91' Inflow=1.74 cfs 6,088 cf
12.0" Round Culvert x 2.00 n=0.013 L=19.0' S=0.0553 '/' Outflow=1.74 cfs 6,088 cf

Pond CB-7: CB-7 Peak Elev=47.24' Inflow=1.66 cfs 5,668 cf
12.0" Round Culvert n=0.013 L=37.0' S=0.0095 '/' Outflow=1.66 cfs 5,668 cf

Pond DB-A: DB-A Peak Elev=54.88' Inflow=5.31 cfs 9,570 cf
15.0" Round Culvert n=0.013 L=46.0' S=0.0337 '/' Outflow=5.31 cfs 9,570 cf

Pond DMH-2.1: DMH-2.1 (By-Pass) Peak Elev=52.24' Inflow=7.51 cfs 20,131 cf
Primary=2.02 cfs 13,159 cf Secondary=5.82 cfs 6,972 cf Outflow=7.51 cfs 20,131 cf

Pond DMH-2.2: DMH-2.2 Peak Elev=53.21' Inflow=7.51 cfs 20,131 cf
18.0" Round Culvert n=0.013 L=36.0' S=0.0056 '/' Outflow=7.51 cfs 20,131 cf

Pond DMH-3: DMH-3 Peak Elev=54.19' Inflow=6.91 cfs 13,963 cf
18.0" Round Culvert n=0.013 L=183.0' S=0.0052 '/' Outflow=6.91 cfs 13,963 cf

Pond DMH-4: DMH-4 Peak Elev=54.34' Inflow=2.83 cfs 3,260 cf
12.0" Round Culvert n=0.013 L=20.0' S=0.0100 '/' Outflow=2.83 cfs 3,260 cf

Pond DMH-5: DMH-5 Peak Elev=54.59' Inflow=6.85 cfs 13,295 cf
18.0" Round Culvert n=0.013 L=10.0' S=0.0150 '/' Outflow=6.85 cfs 13,295 cf

Pond DMH-6: DMH-6 Peak Elev=49.90' Inflow=1.74 cfs 6,088 cf
12.0" Round Culvert n=0.013 L=17.0' S=0.0206 '/' Outflow=1.74 cfs 6,088 cf

Pond DMH-7: DMH-7 (bypass) Peak Elev=49.89' Inflow=2.69 cfs 10,344 cf
Primary=2.19 cfs 8,814 cf Secondary=0.54 cfs 1,530 cf Outflow=2.69 cfs 10,344 cf

Pond DMH-8: DMH-8 (bypass) Peak Elev=46.82' Inflow=1.66 cfs 5,668 cf
Primary=1.38 cfs 5,559 cf Secondary=0.27 cfs 109 cf Outflow=1.66 cfs 5,668 cf

Pond DMH-9: DMH-9 (bypass) Peak Elev=58.17' Inflow=2.19 cfs 10,092 cf
Primary=1.53 cfs 8,854 cf Secondary=1.09 cfs 1,238 cf Outflow=2.19 cfs 10,092 cf

Pond DS: Dry Stream Peak Elev=55.42' Storage=560 cf Inflow=4.62 cfs 22,255 cf
Discarded=0.05 cfs 1,420 cf Primary=4.18 cfs 20,787 cf Outflow=4.23 cfs 22,207 cf

Pond FP-1: FP-1 Peak Elev=51.39' Storage=1,260 cf Inflow=2.24 cfs 7,668 cf
Discarded=0.47 cfs 5,205 cf Primary=0.53 cfs 2,567 cf Tertiary=0.00 cfs 0 cf Outflow=1.00 cfs 7,647 cf

Pond FP-2: FP-2 Peak Elev=53.12' Storage=711 cf Inflow=1.29 cfs 4,437 cf
Discarded=0.21 cfs 3,385 cf Primary=1.25 cfs 1,153 cf Tertiary=0.00 cfs 0 cf Outflow=1.25 cfs 4,436 cf

Pond FP-3: FP-3 Peak Elev=53.97' Storage=836 cf Inflow=2.12 cfs 7,051 cf
Discarded=0.32 cfs 4,926 cf Primary=1.77 cfs 2,107 cf Tertiary=0.00 cfs 0 cf Outflow=2.09 cfs 7,023 cf

Pond FP-4: FP-4 Peak Elev=53.65' Storage=417 cf Inflow=1.95 cfs 6,710 cf
Discarded=0.07 cfs 2,987 cf Primary=1.88 cfs 3,725 cf Tertiary=0.00 cfs 0 cf Outflow=1.94 cfs 6,632 cf

Pond FP-5: FP-5 Peak Elev=55.40' Storage=563 cf Inflow=1.68 cfs 5,753 cf
Discarded=0.21 cfs 3,806 cf Primary=1.46 cfs 1,948 cf Tertiary=0.00 cfs 0 cf Outflow=1.67 cfs 5,746 cf

Pond FP-6: FP-6 Peak Elev=55.61' Storage=406 cf Inflow=1.78 cfs 6,204 cf
Discarded=0.14 cfs 3,696 cf Primary=1.64 cfs 2,497 cf Tertiary=0.00 cfs 0 cf Outflow=1.78 cfs 6,153 cf

Pond FP-7: FP-7/INF-5 Peak Elev=54.81' Storage=6,660 cf Inflow=4.40 cfs 21,739 cf
Discarded=1.12 cfs 21,052 cf Secondary=0.00 cfs 0 cf Outflow=1.12 cfs 21,052 cf

Pond INF-1: INF-1
Peak Elev=51.82' Storage=2,036 cf Inflow=2.02 cfs 13,159 cf
Discarded=0.26 cfs 9,771 cf Secondary=1.72 cfs 3,387 cf Outflow=1.97 cfs 13,158 cf

Pond INF-2: INF-2
Peak Elev=54.86' Storage=6,187 cf Inflow=9.62 cfs 16,555 cf
Discarded=0.58 cfs 9,529 cf Secondary=6.23 cfs 7,029 cf Outflow=6.81 cfs 16,557 cf

Pond INF-3: INF-3
Peak Elev=49.88' Storage=4,300 cf Inflow=3.49 cfs 13,020 cf
Discarded=0.44 cfs 12,108 cf Secondary=1.28 cfs 911 cf Outflow=1.72 cfs 13,019 cf

Pond INF-4: INF-4
Peak Elev=58.53' Storage=5,494 cf Inflow=5.76 cfs 22,902 cf
Discarded=0.53 cfs 17,853 cf Secondary=4.18 cfs 5,124 cf Outflow=4.71 cfs 22,900 cf

Pond INF-6: INF-6
Peak Elev=57.33' Storage=2,674 cf Inflow=2.76 cfs 9,294 cf
Outflow=0.73 cfs 9,293 cf

Pond OF-6: OF-6
Peak Elev=57.18' Inflow=4.89 cfs 7,621 cf
12.0" Round Culvert n=0.013 L=72.0' S=0.0118 '/' Outflow=4.89 cfs 7,621 cf

Pond SP 1: Study Point
Inflow=0.07 cfs 1,142 cf
Primary=0.07 cfs 1,142 cf

Pond SP 3: Study Point
Inflow=0.19 cfs 1,699 cf
Primary=0.19 cfs 1,699 cf

Pond SP 4: Study Point
Inflow=4.55 cfs 11,770 cf
Primary=4.55 cfs 11,770 cf

Pond SP-2: Study Point
Inflow=0.02 cfs 306 cf
Primary=0.02 cfs 306 cf

Total Runoff Area = 339,480 sf Runoff Volume = 128,789 cf Average Runoff Depth = 4.55"
56.85% Pervious = 192,995 sf 43.15% Impervious = 146,485 sf

Summary for Subcatchment 1S: RA (partial)

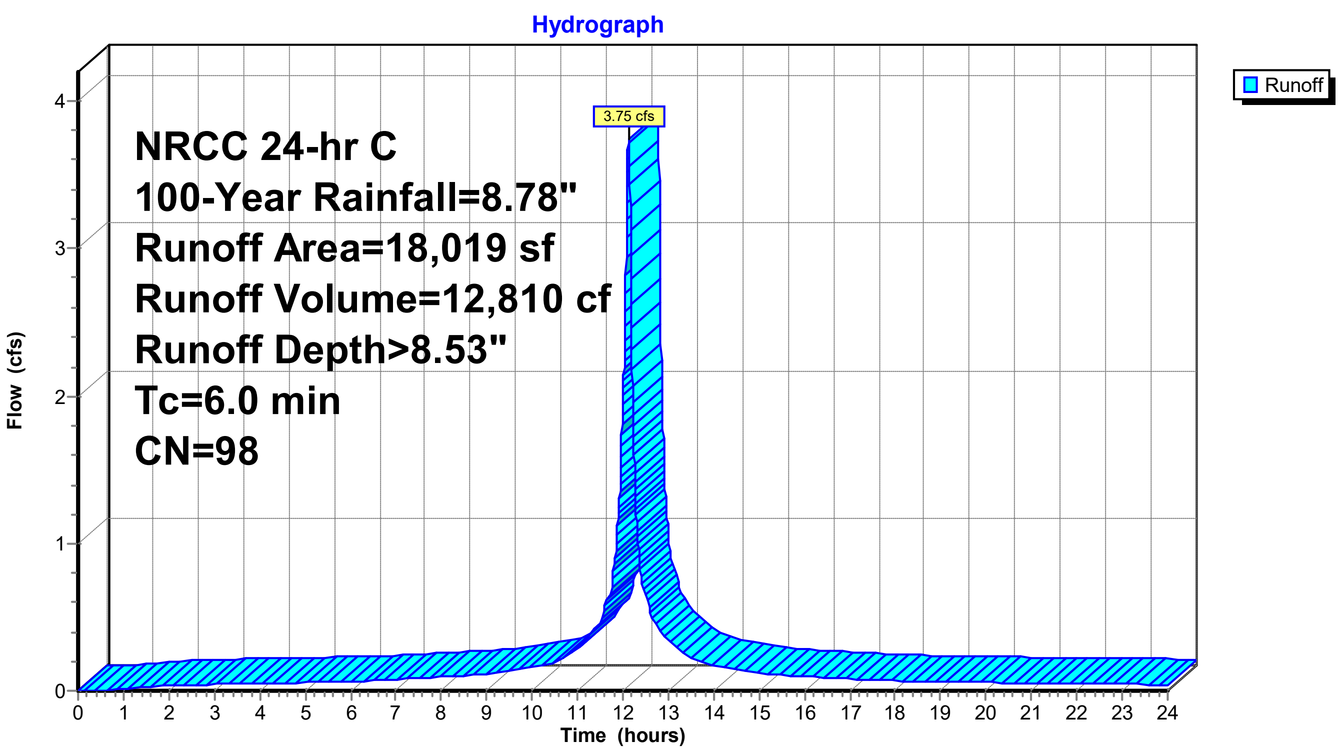
Runoff = 3.75 cfs @ 12.13 hrs, Volume= 12,810 cf, Depth> 8.53"
Routed to Pond INF-4 : INF-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
18,019	98	Roofs, HSG A
18,019	98	100.00% Impervious Area

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

Subcatchment 1S: RA (partial)



Summary for Subcatchment 2S: RA (partial)

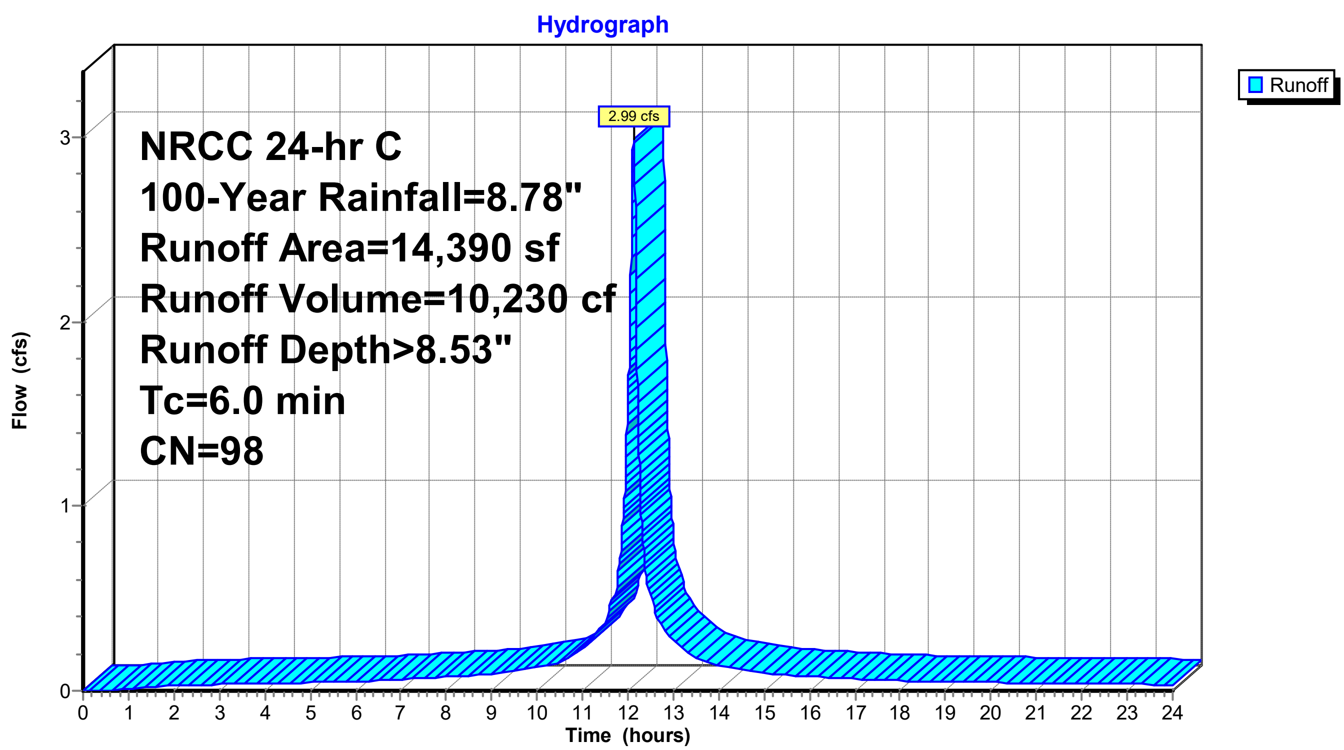
Runoff = 2.99 cfs @ 12.13 hrs, Volume= 10,230 cf, Depth> 8.53"
Routed to Pond DS : Dry Stream

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
14,390	98	Roofs, HSG A
14,390	98	100.00% Impervious Area

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

Subcatchment 2S: RA (partial)



Summary for Subcatchment 3S: RA (partial)

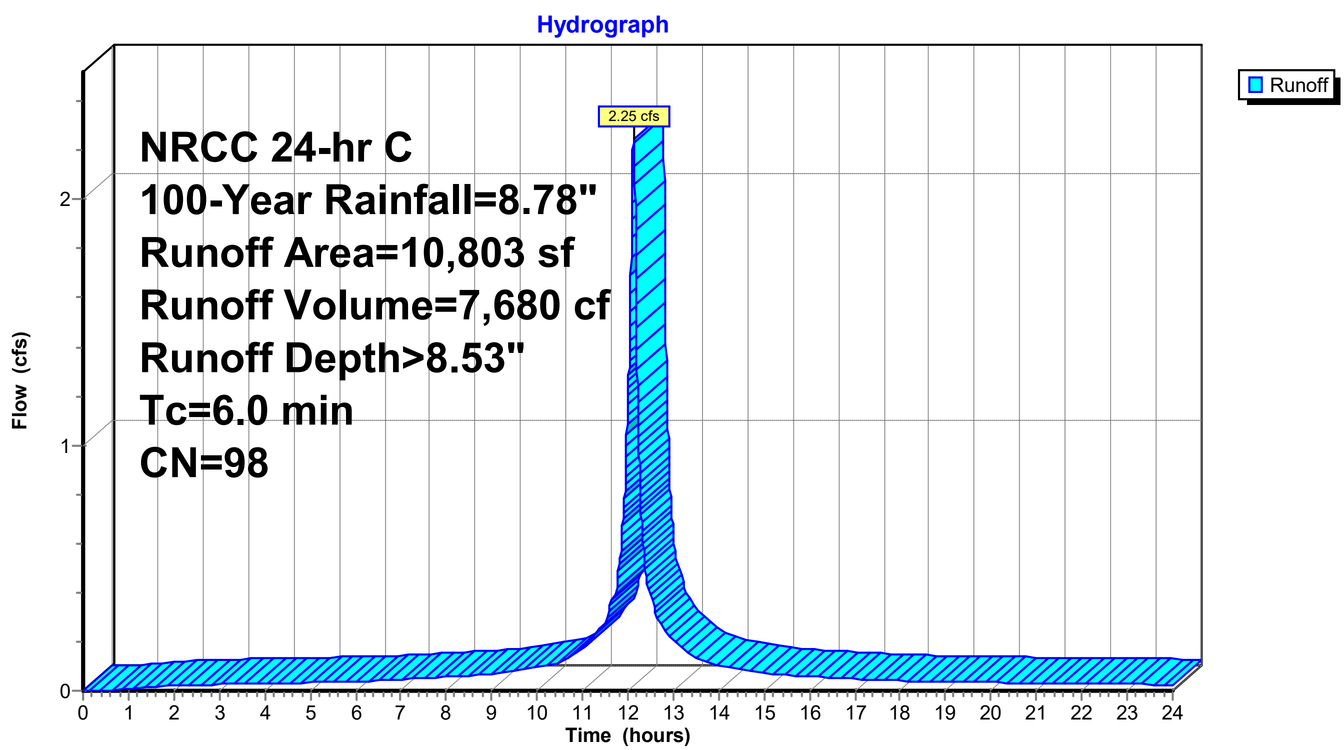
Runoff = 2.25 cfs @ 12.13 hrs, Volume= 7,680 cf, Depth> 8.53"
Routed to Pond INF-6 : INF-6

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
10,803	98	Roofs, HSG A
10,803	98	100.00% Impervious Area

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

Subcatchment 3S: RA (partial)



Summary for Subcatchment SCA-1: LSA/FL/IA/PP

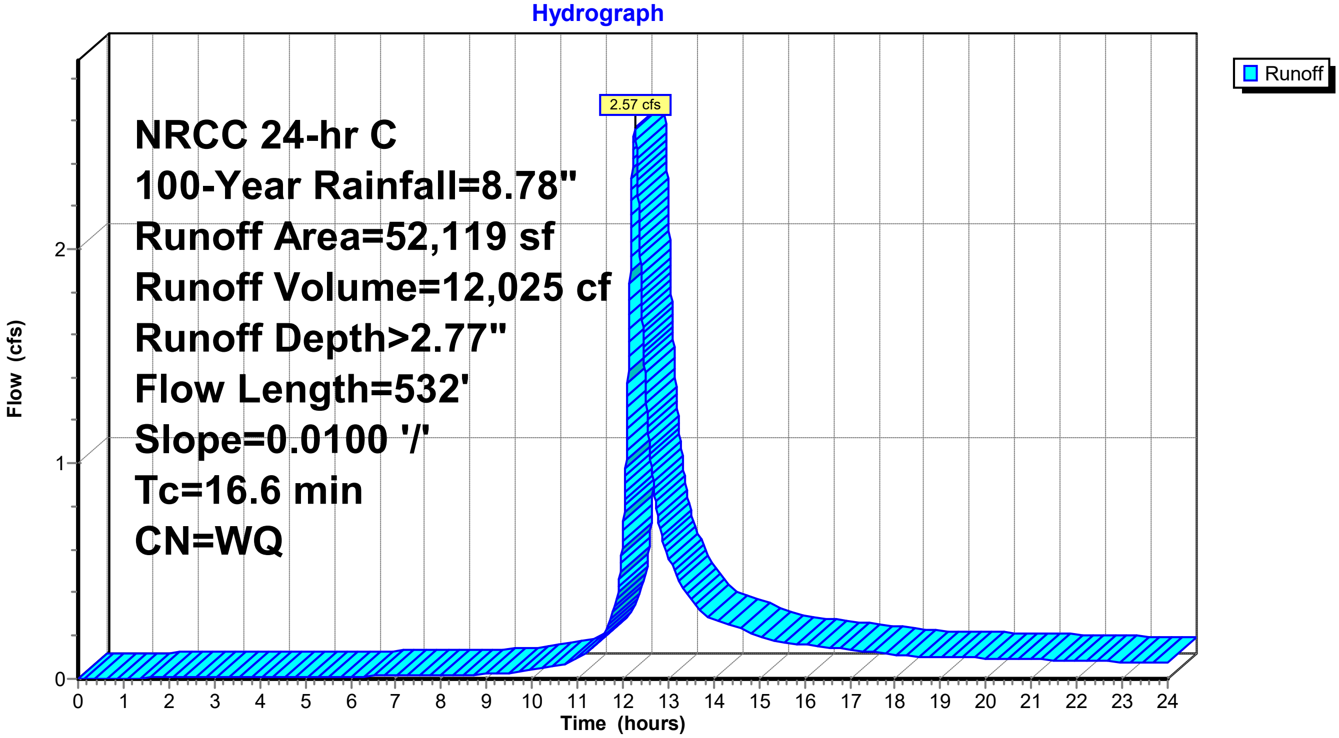
Runoff = 2.57 cfs @ 12.26 hrs, Volume= 12,025 cf, Depth> 2.77"
Routed to Pond DS : Dry Stream

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

	Area (sf)	CN	Description
	31,302	39	>75% Grass cover, Good, HSG A
*	10,136	60	Stone Fire Lane
*	3,036	98	Rubber Play Surface
*	507	98	Concrete Walk
*	7,138	60	Permeable Pavers
	52,119		Weighted Average
	48,576	46	93.20% Pervious Area
	3,543	98	6.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.6	100	0.0100	0.13		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.35"
1.0	42	0.0100	0.70		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.2	22	0.0100	1.61		**Shallow Concentrated Flow, Stone Fire Lane** Unpaved Kv= 16.1 fps
0.7	28	0.0100	0.70		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
2.1	340	0.0100	2.64	7.93	**Channel Flow, Dry Stream Bed** Area= 3.0 sf Perim= 5.0' r= 0.60' n= 0.040 Earth, cobble bottom, clean sides
16.6	532	Total			

Subcatchment SCA-1: LSA/FL/IA/PP



Summary for Subcatchment SCA-10:

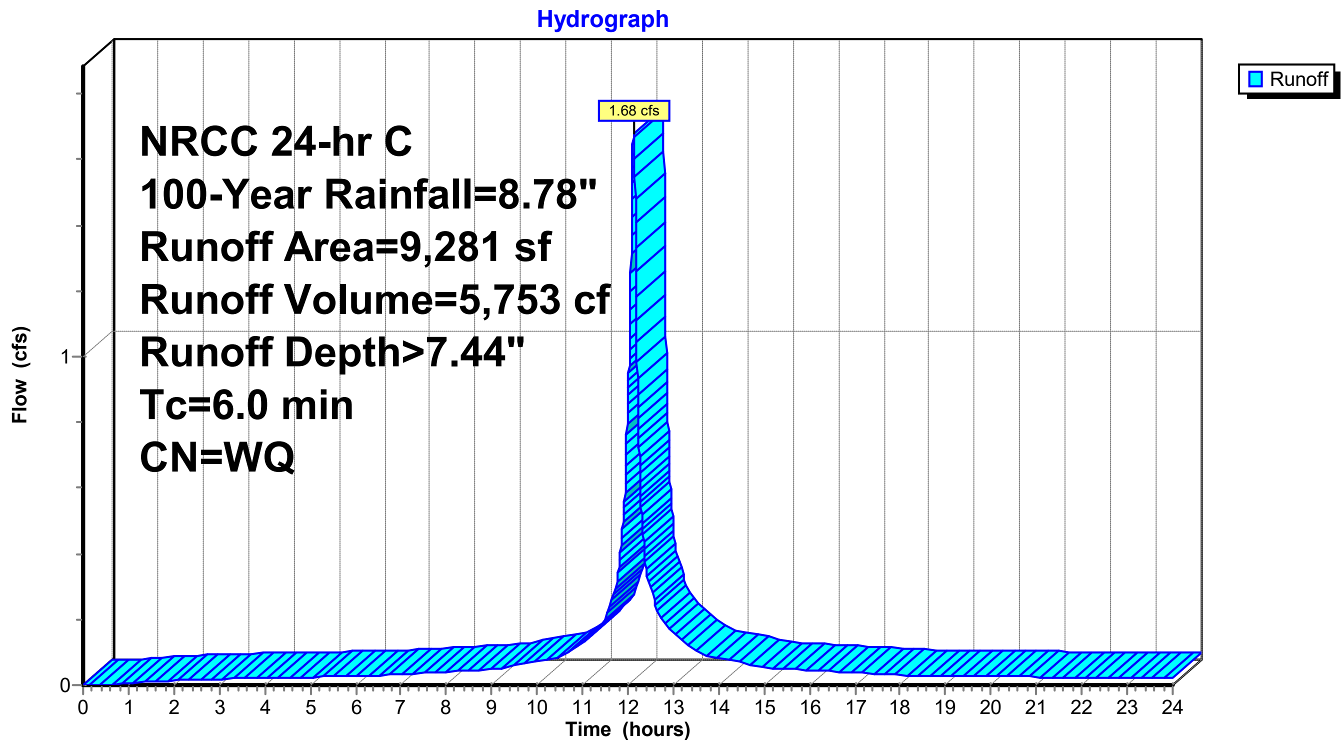
Runoff = 1.68 cfs @ 12.13 hrs, Volume= 5,753 cf, Depth> 7.44"
Routed to Pond FP-5 : FP-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
7,848	98	Paved parking, HSG A
1,372	39	>75% Grass cover, Good, HSG A
61	30	Woods, Good, HSG A
9,281		Weighted Average
1,433	39	15.44% Pervious Area
7,848	98	84.56% Impervious Area

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

Subcatchment SCA-10:



Summary for Subcatchment SCA-11:

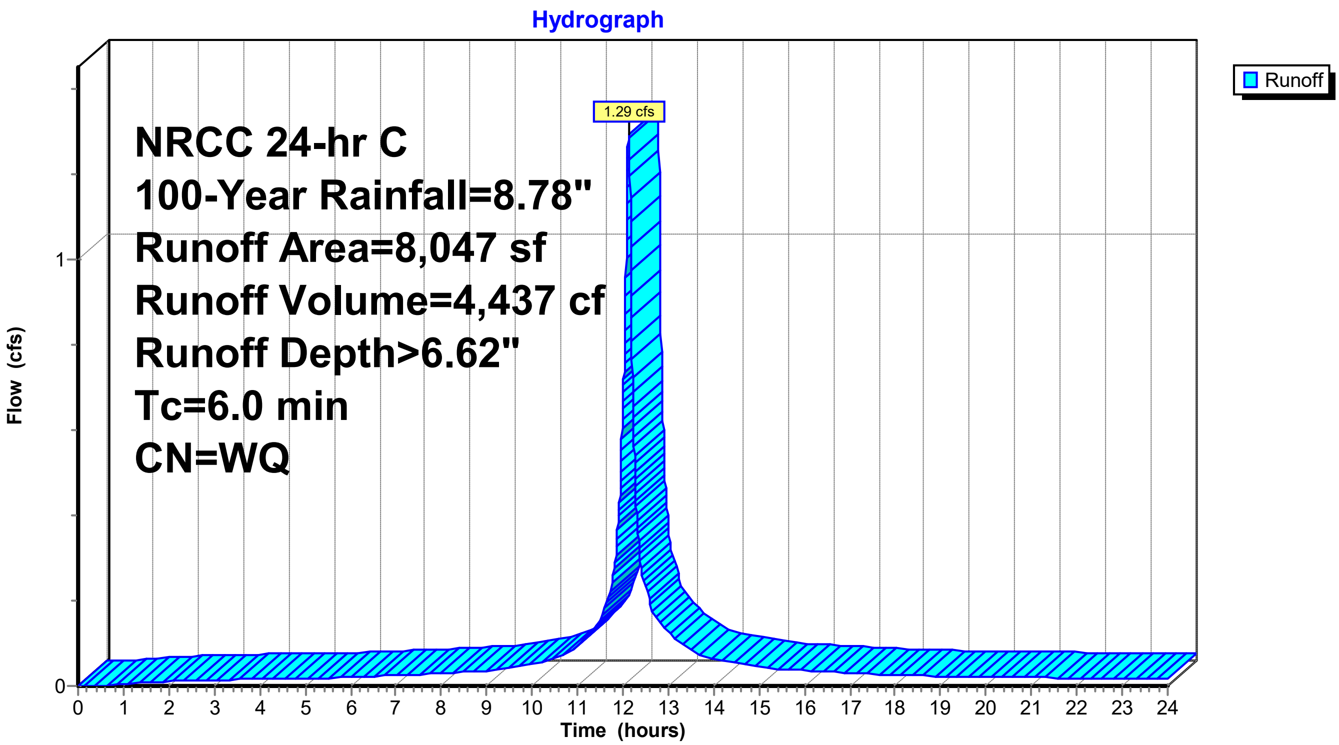
Runoff = 1.29 cfs @ 12.13 hrs, Volume= 4,437 cf, Depth> 6.62"
Routed to Pond FP-2 : FP-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
5,857	98	Paved parking, HSG A
2,190	39	>75% Grass cover, Good, HSG A
8,047		Weighted Average
2,190	39	27.22% Pervious Area
5,857	98	72.78% Impervious Area

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

Subcatchment SCA-11:



Summary for Subcatchment SCA-12:

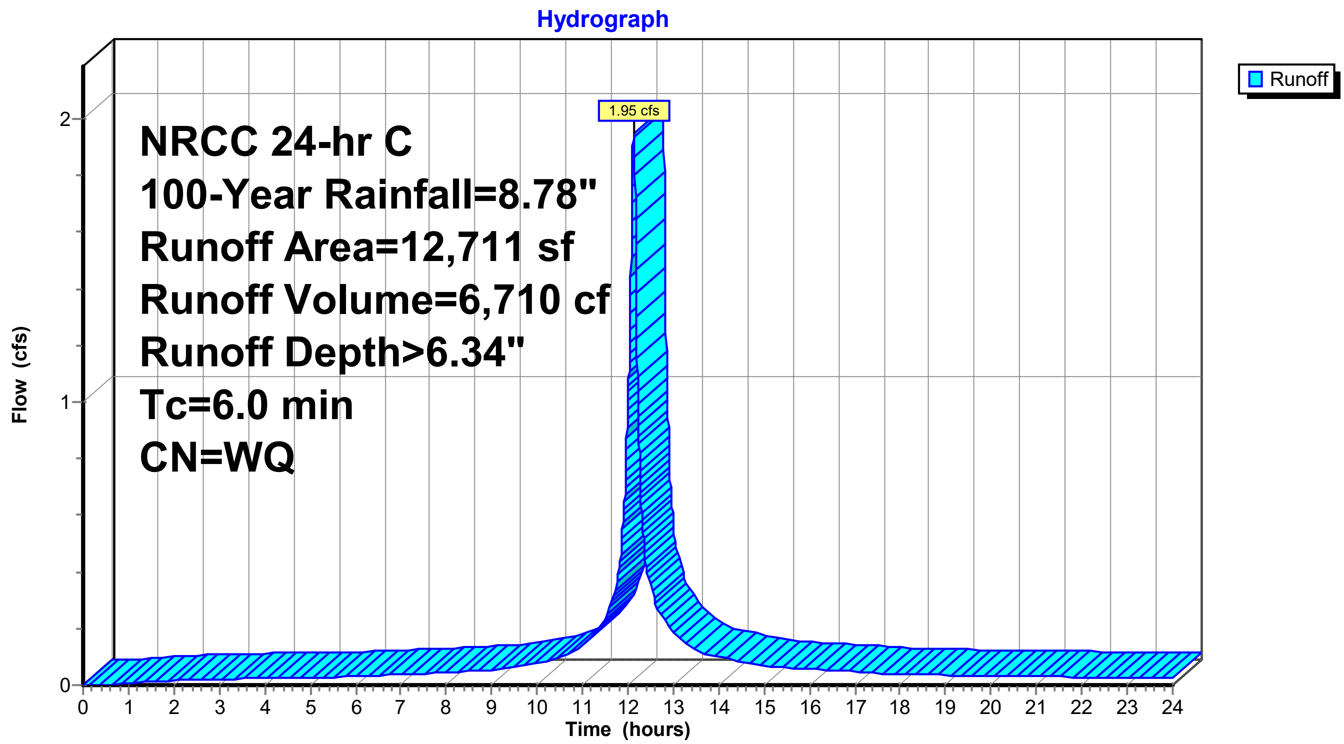
Runoff = 1.95 cfs @ 12.13 hrs, Volume= 6,710 cf, Depth> 6.34"
Routed to Pond FP-4 : FP-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
8,818	98	Paved parking, HSG A
3,298	39	>75% Grass cover, Good, HSG A
595	30	Woods, Good, HSG A
12,711		Weighted Average
3,893	38	30.63% Pervious Area
8,818	98	69.37% Impervious Area

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

Subcatchment SCA-12:



Summary for Subcatchment SCA-13:

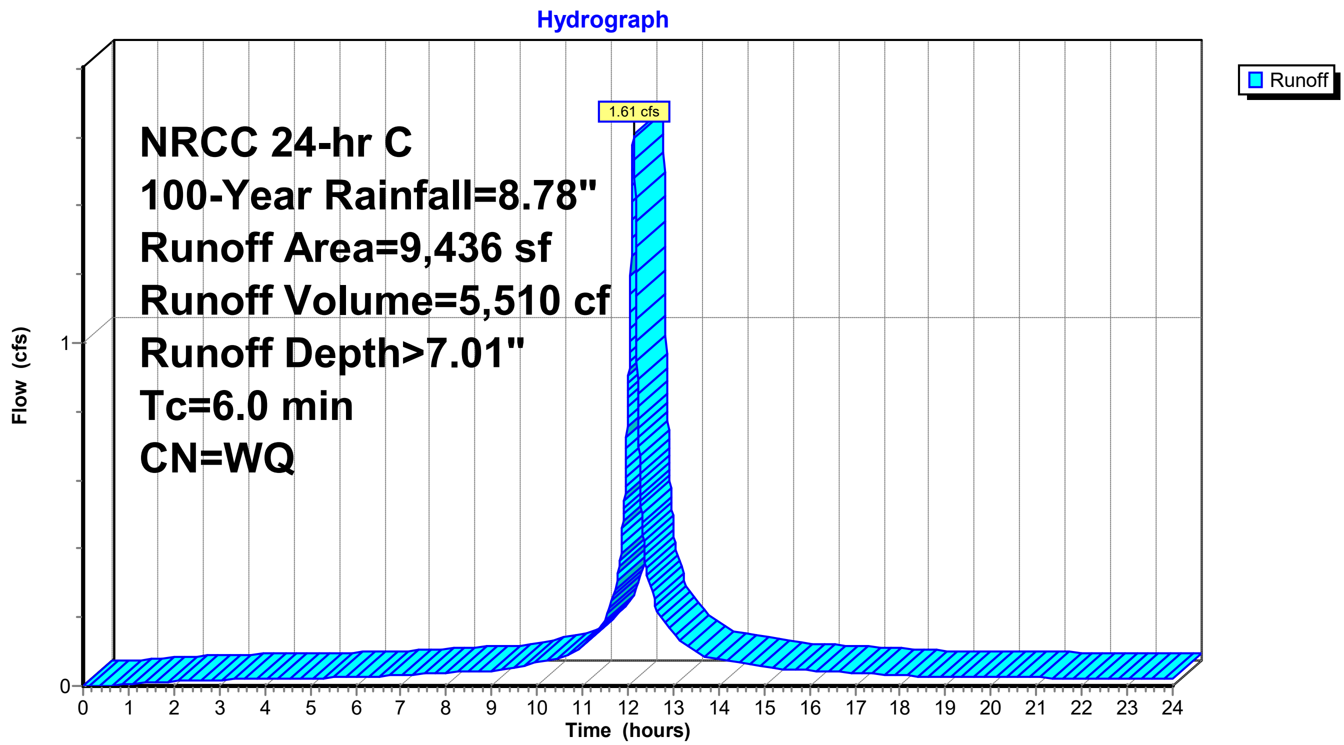
Runoff = 1.61 cfs @ 12.13 hrs, Volume= 5,510 cf, Depth> 7.01"
Routed to Pond FP-1 : FP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
7,393	98	Paved parking, HSG A
2,043	39	>75% Grass cover, Good, HSG A
9,436		Weighted Average
2,043	39	21.65% Pervious Area
7,393	98	78.35% Impervious Area

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

Subcatchment SCA-13:



Summary for Subcatchment SCA-14:

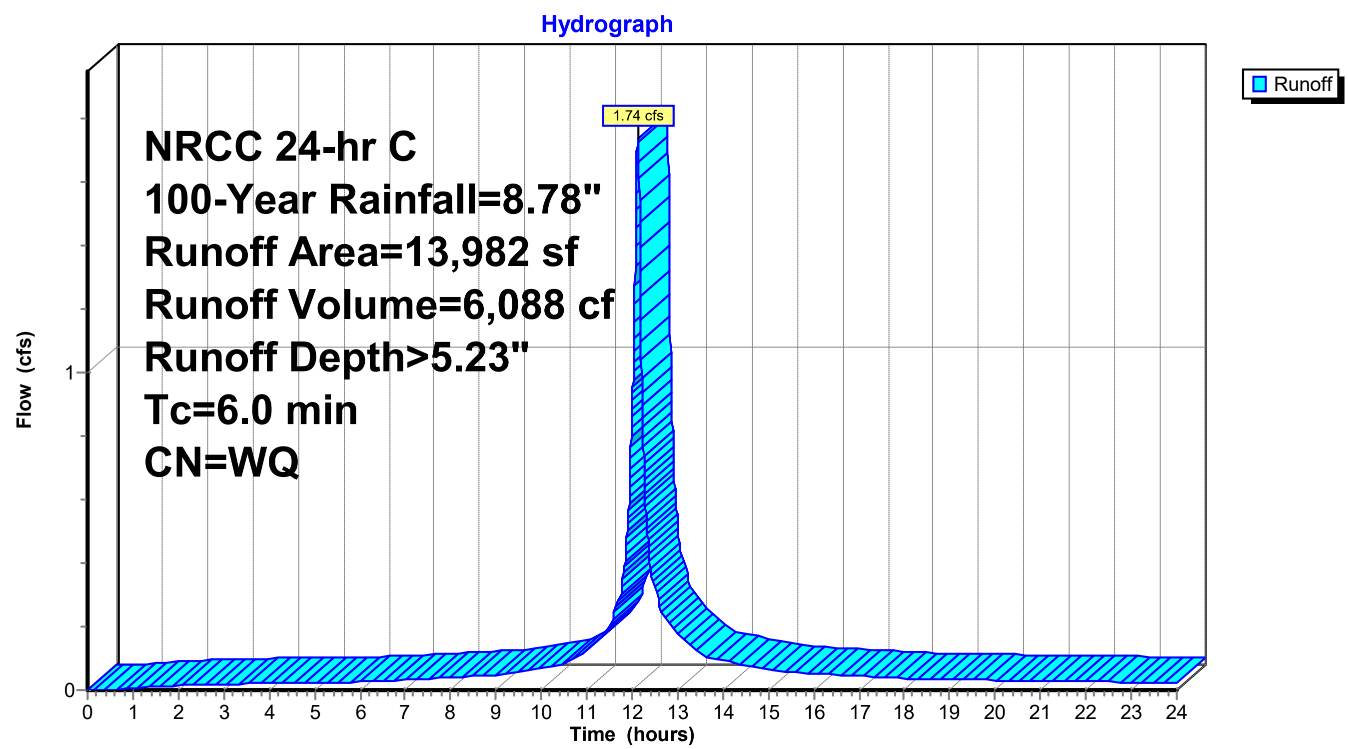
Runoff = 1.74 cfs @ 12.13 hrs, Volume= 6,088 cf, Depth> 5.23"
Routed to Pond CB-6B,C : CB-6B,6C

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
7,717	98	Paved parking, HSG A
3,829	39	>75% Grass cover, Good, HSG A
2,436	30	Woods, Good, HSG A
13,982		Weighted Average
6,265	36	44.81% Pervious Area
7,717	98	55.19% Impervious Area

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

Subcatchment SCA-14:



Summary for Subcatchment SCA-16:

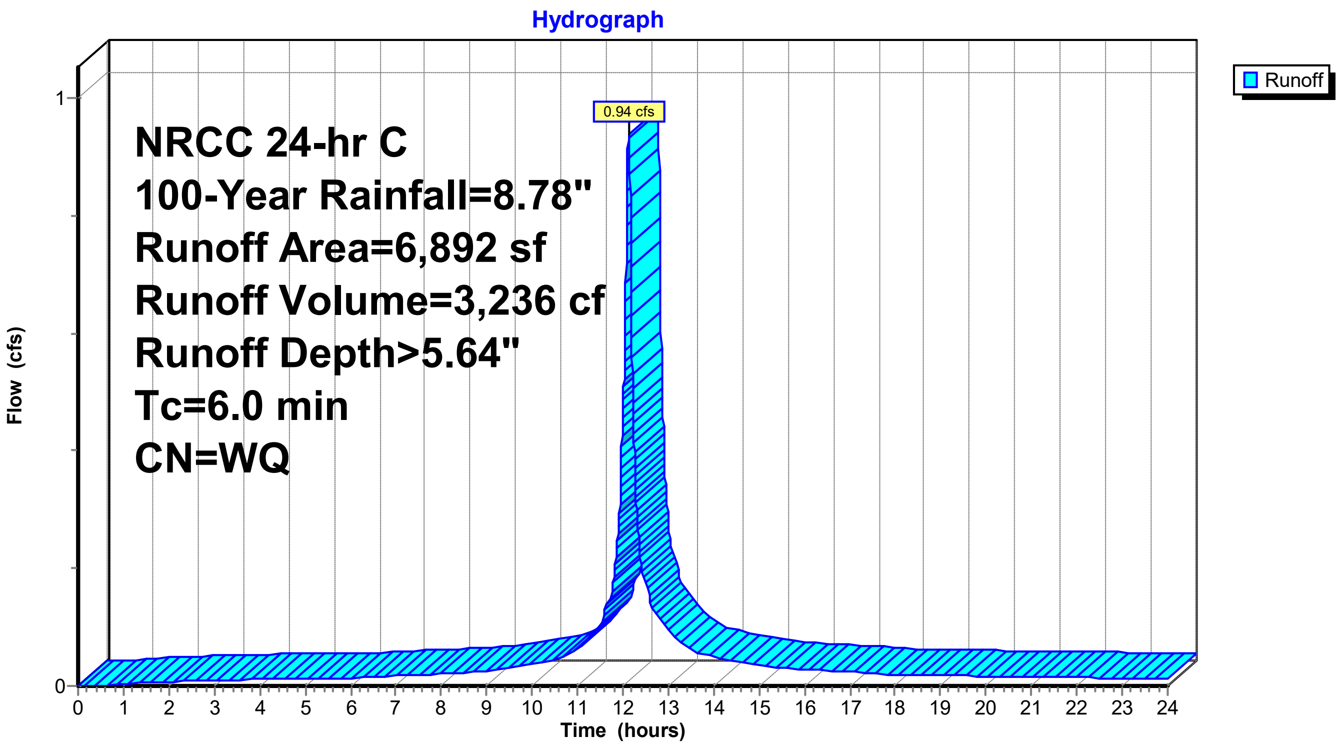
Runoff = 0.94 cfs @ 12.13 hrs, Volume= 3,236 cf, Depth> 5.64"
Routed to Pond CB-2B : CB 2B

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
4,055	98	Paved parking, HSG A
2,837	39	>75% Grass cover, Good, HSG A
6,892		Weighted Average
2,837	39	41.16% Pervious Area
4,055	98	58.84% Impervious Area

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

Subcatchment SCA-16:



Summary for Subcatchment SCA-17:

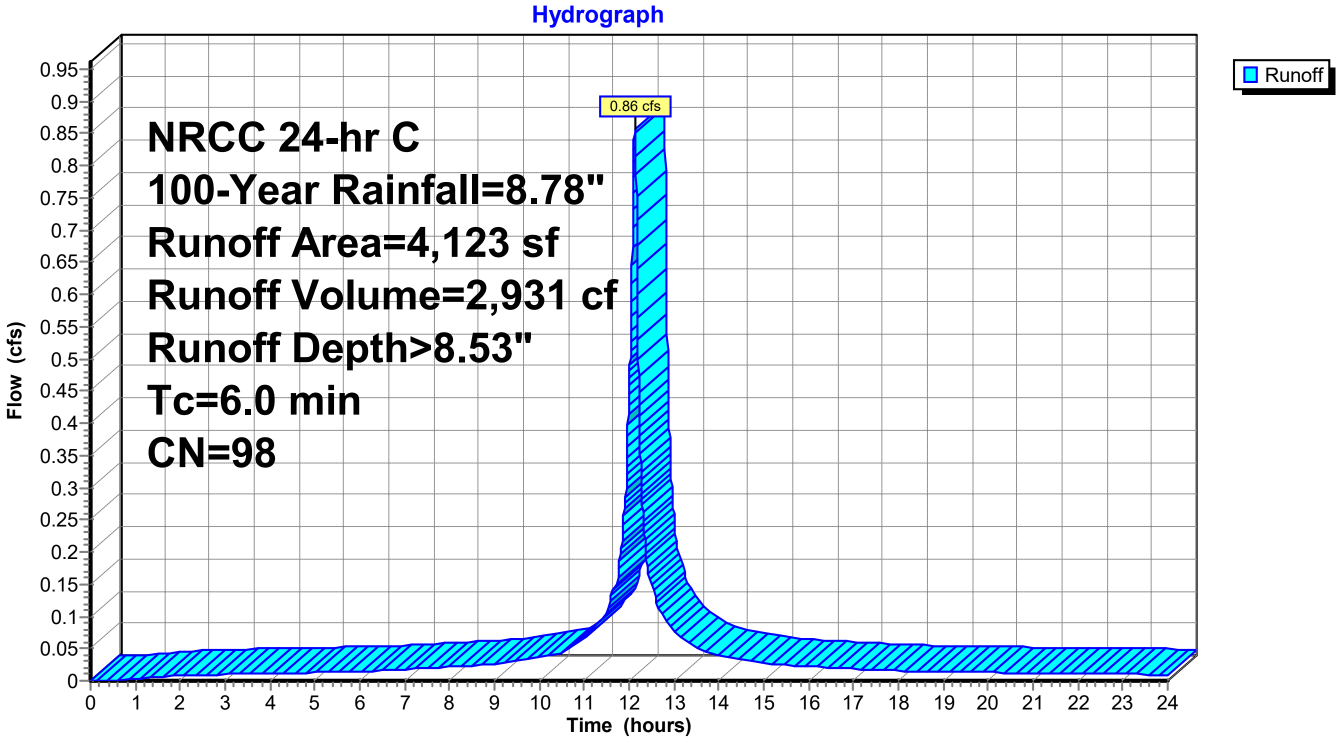
Runoff = 0.86 cfs @ 12.13 hrs, Volume= 2,931 cf, Depth> 8.53"
Routed to Pond CB-2A : CB 2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
4,123	98	Paved parking, HSG A
4,123	98	100.00% Impervious Area

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

Subcatchment SCA-17:



Summary for Subcatchment SCA-18:

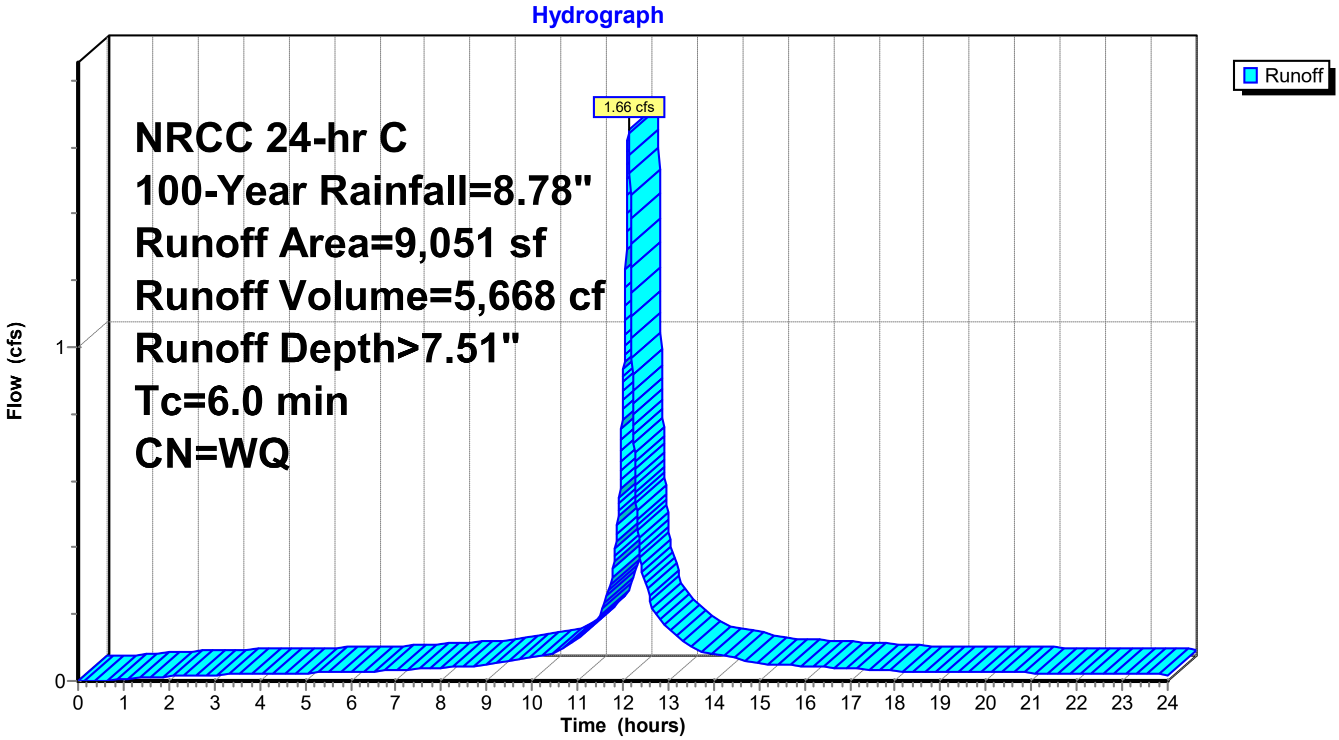
Runoff = 1.66 cfs @ 12.13 hrs, Volume= 5,668 cf, Depth> 7.51"
Routed to Pond CB-7 : CB-7

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
7,743	98	Paved parking, HSG A
1,308	39	>75% Grass cover, Good, HSG A
9,051		Weighted Average
1,308	39	14.45% Pervious Area
7,743	98	85.55% Impervious Area

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

Subcatchment SCA-18:



Summary for Subcatchment SCA-19:

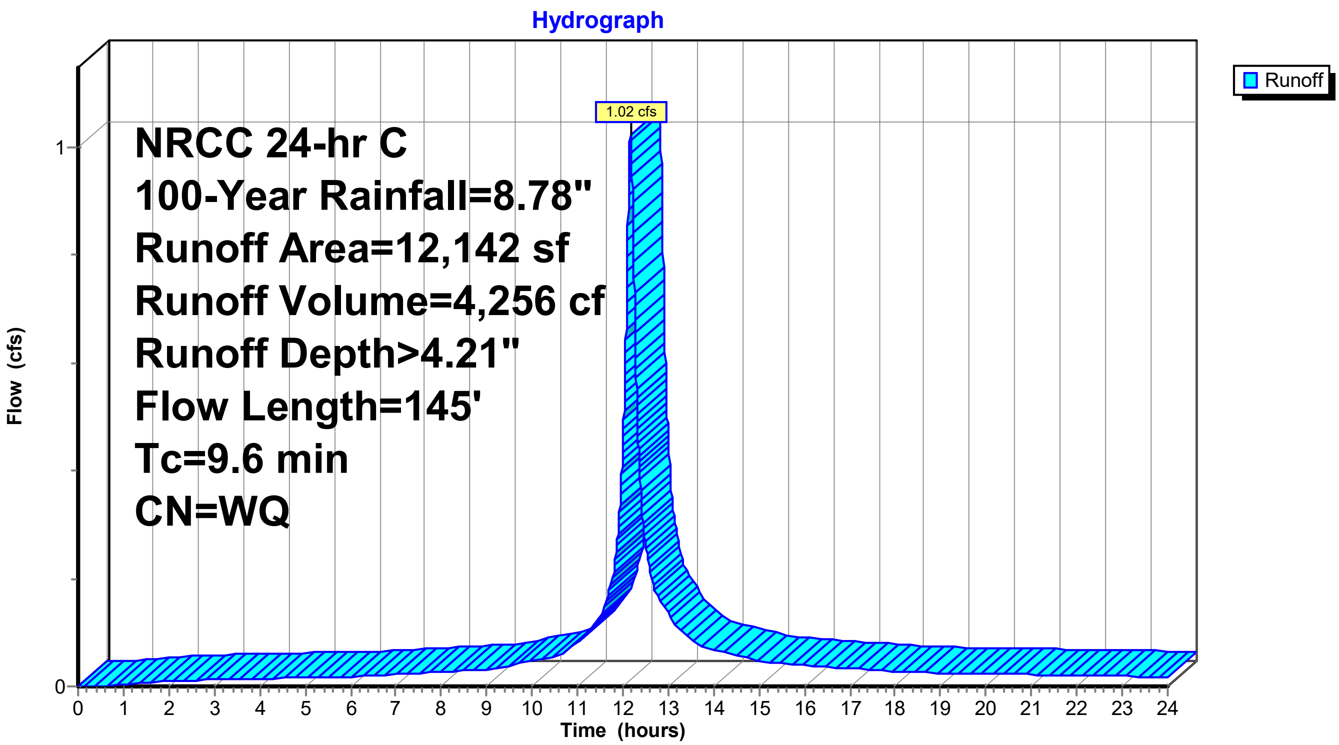
Runoff = 1.02 cfs @ 12.17 hrs, Volume= 4,256 cf, Depth> 4.21"
Routed to Pond CB-6A : CB-6A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
5,280	98	Paved parking, HSG A
5,968	32	Woods/grass comb., Good, HSG A
894	39	>75% Grass cover, Good, HSG A
12,142		Weighted Average
6,862	33	56.51% Pervious Area
5,280	98	43.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	50	0.0500	0.10		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.35"
1.0	70	0.0600	1.22		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.2	25	0.0100	2.03		**Shallow Concentrated Flow, Parking** Paved Kv= 20.3 fps
9.6	145	Total			

Subcatchment SCA-19:



Summary for Subcatchment SCA-2: LSA/FL

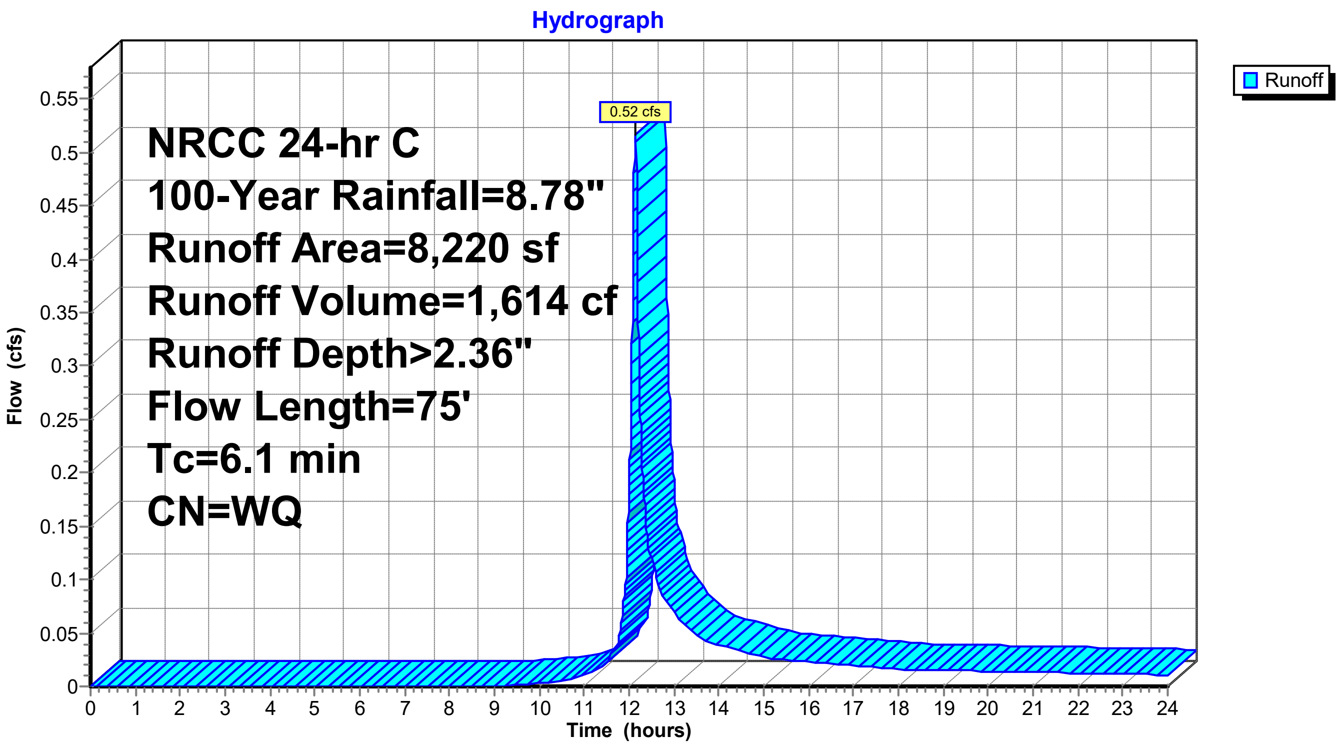
Runoff = 0.52 cfs @ 12.14 hrs, Volume= 1,614 cf, Depth> 2.36"
Routed to Pond INF-6 : INF-6

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

	Area (sf)	CN	Description
*	20	98	Cocncrete step
	5,345	39	>75% Grass cover, Good, HSG A
*	2,855	60	Stone Fire Lane
	8,220		Weighted Average
	8,200	46	99.76% Pervious Area
	20	98	0.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	35	0.0150	0.13		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.35"
1.4	20	0.0100	0.23		**Sheet Flow, Stone Fire Lane** Fallow n= 0.050 P2= 3.35"
0.1	20	0.1500	2.71		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
6.1	75	Total			

Subcatchment SCA-2: LSA/FL



Summary for Subcatchment SCA-4:

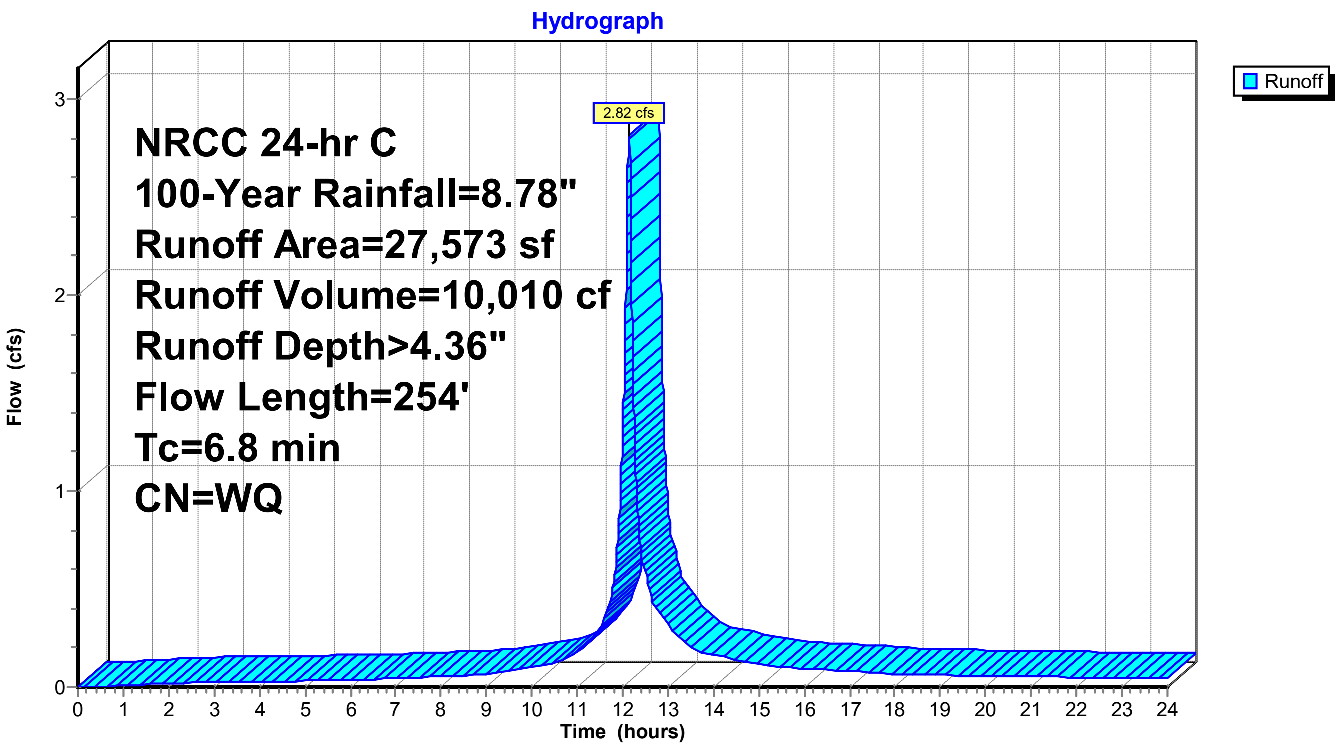
Runoff = 2.82 cfs @ 12.14 hrs, Volume= 10,010 cf, Depth> 4.36"
Routed to Pond CB-4 : CB-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

	Area (sf)	CN	Description
	10,454	98	Paved parking, HSG A
	8,808	39	>75% Grass cover, Good, HSG A
	4,820	30	Woods, Good, HSG A
*	3,245	60	Stone Fire Lane
*	246	98	Shed Roof
	27,573		Weighted Average
	16,873	40	61.19% Pervious Area
	10,700	98	38.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	23	0.0100	0.10		**Sheet Flow, Lawn**
					Grass: Short n= 0.150 P2= 3.35"
2.3	158	0.0050	1.14		**Shallow Concentrated Flow, Stone Fire Lane**
					Unpaved Kv= 16.1 fps
0.6	73	0.0100	2.03		**Shallow Concentrated Flow, Pavement**
					Paved Kv= 20.3 fps
6.8	254	Total			

Subcatchment SCA-4:



Summary for Subcatchment SCA-5:

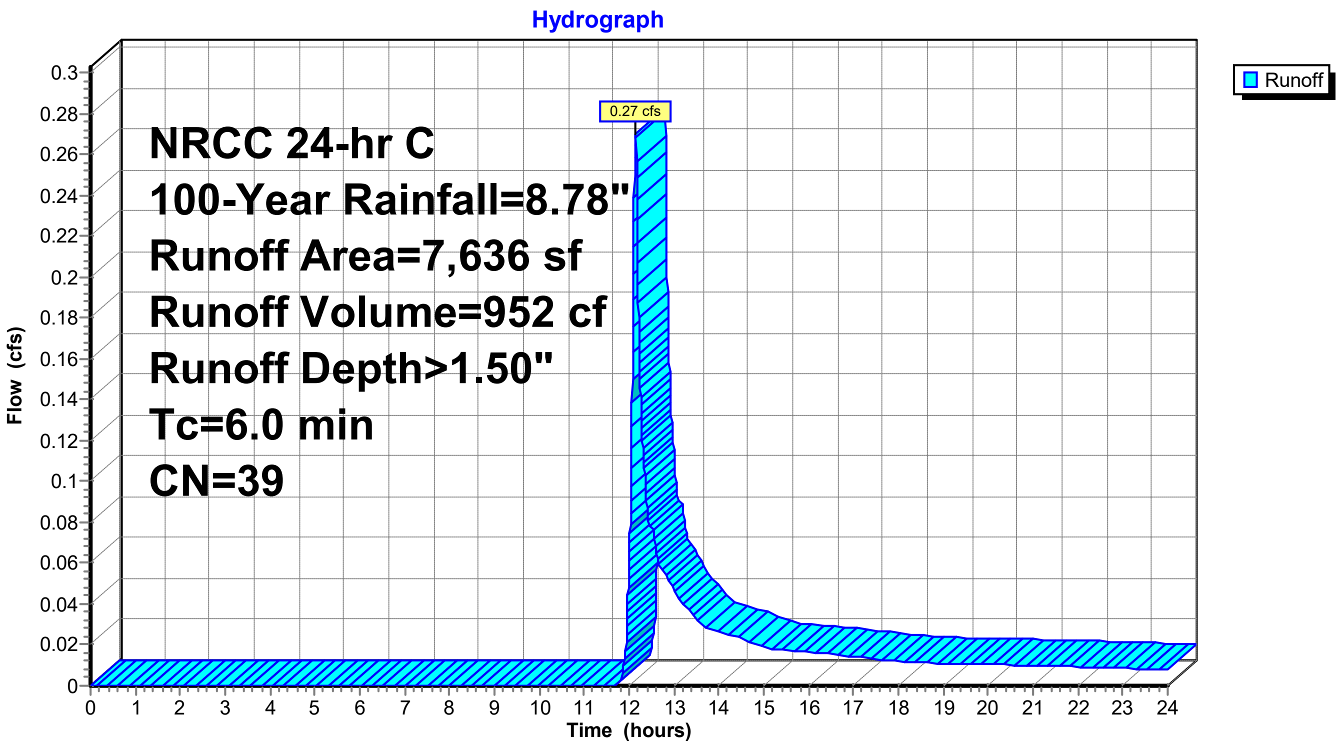
Runoff = 0.27 cfs @ 12.14 hrs, Volume= 952 cf, Depth> 1.50"
Routed to Pond FP-7 : FP-7/INF-5

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
7,636	39	>75% Grass cover, Good, HSG A
7,636	39	100.00% Pervious Area

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

Subcatchment SCA-5:



Summary for Subcatchment SCA-6.1:

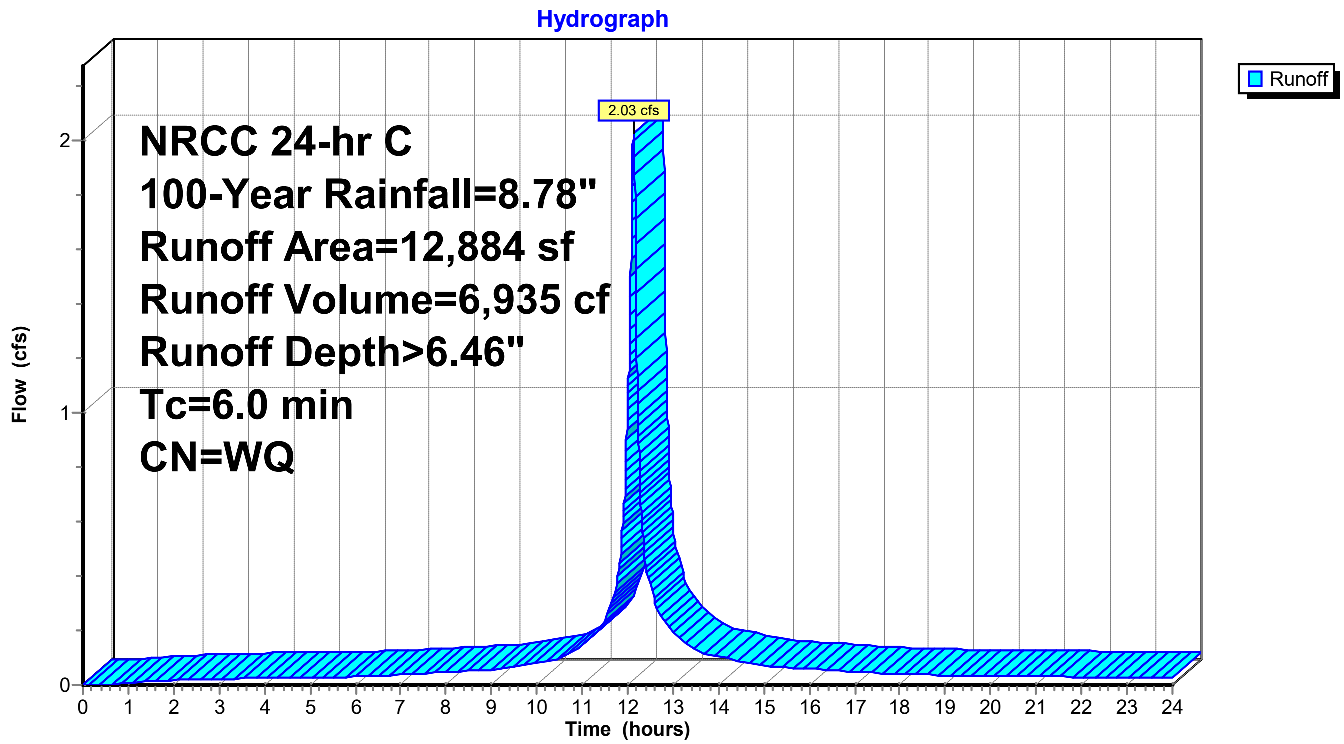
Runoff = 2.03 cfs @ 12.13 hrs, Volume= 6,935 cf, Depth> 6.46"
Routed to Pond CB-3 : CB-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

	Area (sf)	CN	Description
	8,965	98	Paved parking, HSG A
	3,559	39	>75% Grass cover, Good, HSG A
*	360	60	Fire Lane (FL)
	12,884		Weighted Average
	3,919	41	30.42% Pervious Area
	8,965	98	69.58% Impervious Area

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

Subcatchment SCA-6.1:



Summary for Subcatchment SCA-6.2:

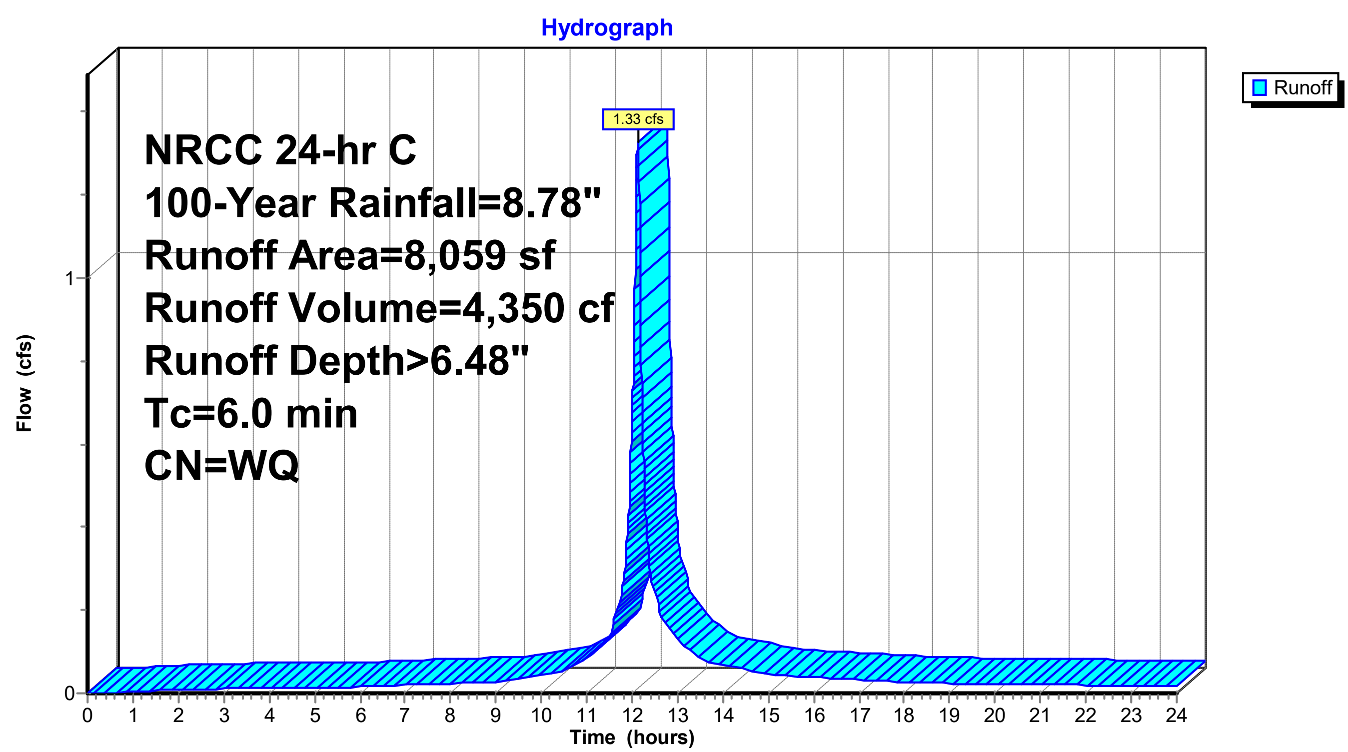
Runoff = 1.33 cfs @ 12.13 hrs, Volume= 4,350 cf, Depth> 6.48"
Routed to Pond FP-3 : FP-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

	Area (sf)	CN	Description
*	3,130	60	Permeable Pavers (PP)
	3,296	98	Paved roads w/curbs & sewers, HSG A
*	1,331	98	Canopy (CP)
	302	39	>75% Grass cover, Good, HSG A
	8,059		Weighted Average
	3,432	58	42.59% Pervious Area
	4,627	98	57.41% Impervious Area

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

Subcatchment SCA-6.2:



Summary for Subcatchment SCA-7:

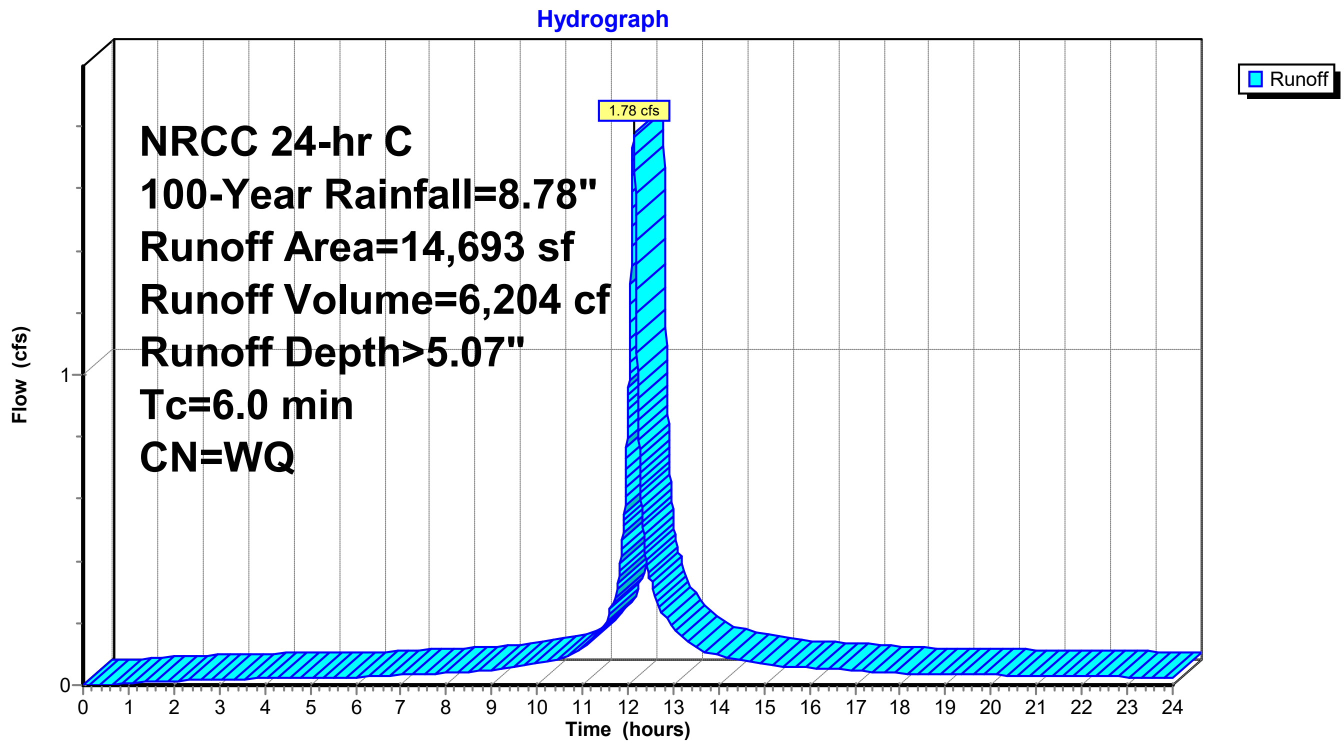
Runoff = 1.78 cfs @ 12.13 hrs, Volume= 6,204 cf, Depth> 5.07"
Routed to Pond FP-6 : FP-6

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
7,630	98	Paved parking, HSG A
5,346	39	>75% Grass cover, Good, HSG A
1,717	32	Woods/grass comb., Good, HSG A
14,693		Weighted Average
7,063	37	48.07% Pervious Area
7,630	98	51.93% Impervious Area

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

Subcatchment SCA-7:



Summary for Subcatchment SCA-8:

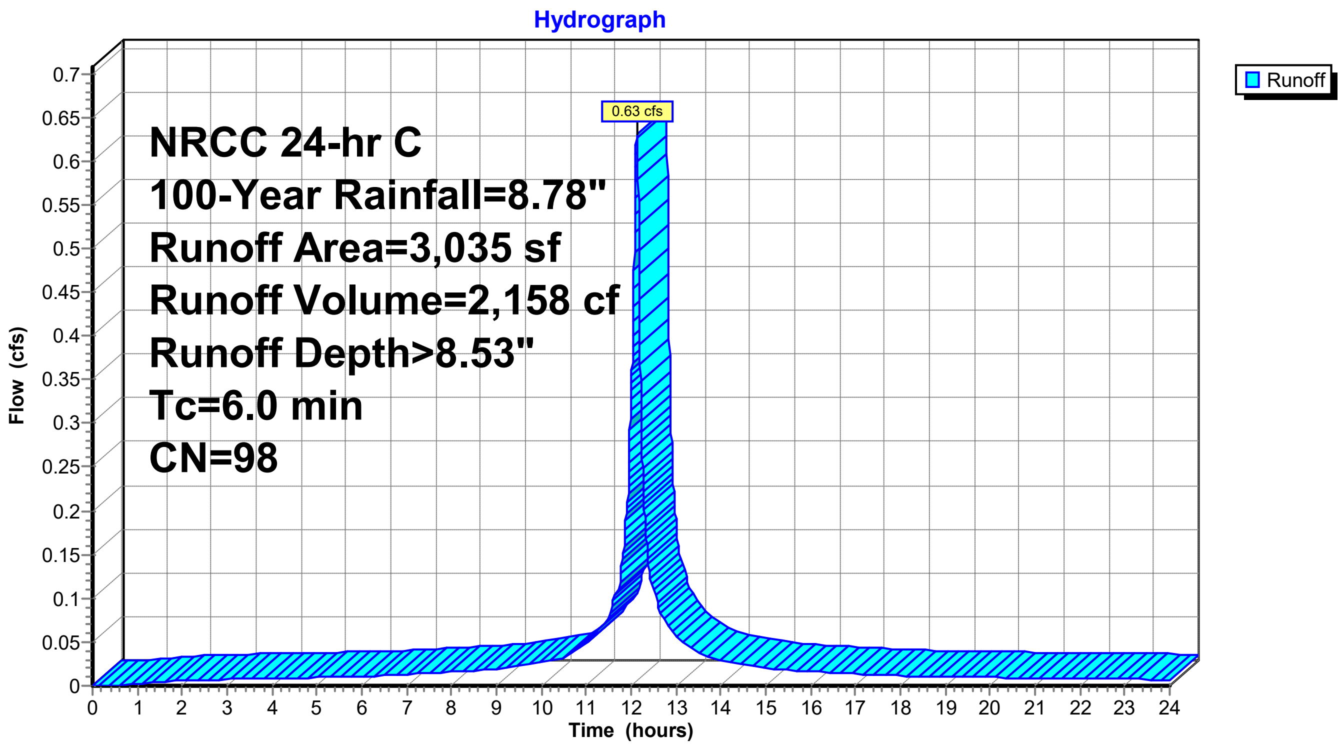
Runoff = 0.63 cfs @ 12.13 hrs, Volume= 2,158 cf, Depth> 8.53"
Routed to Pond FP-1 : FP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
3,035	98	Paved parking, HSG A
3,035	98	100.00% Impervious Area

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

Subcatchment SCA-8:



Summary for Subcatchment SCA-9:

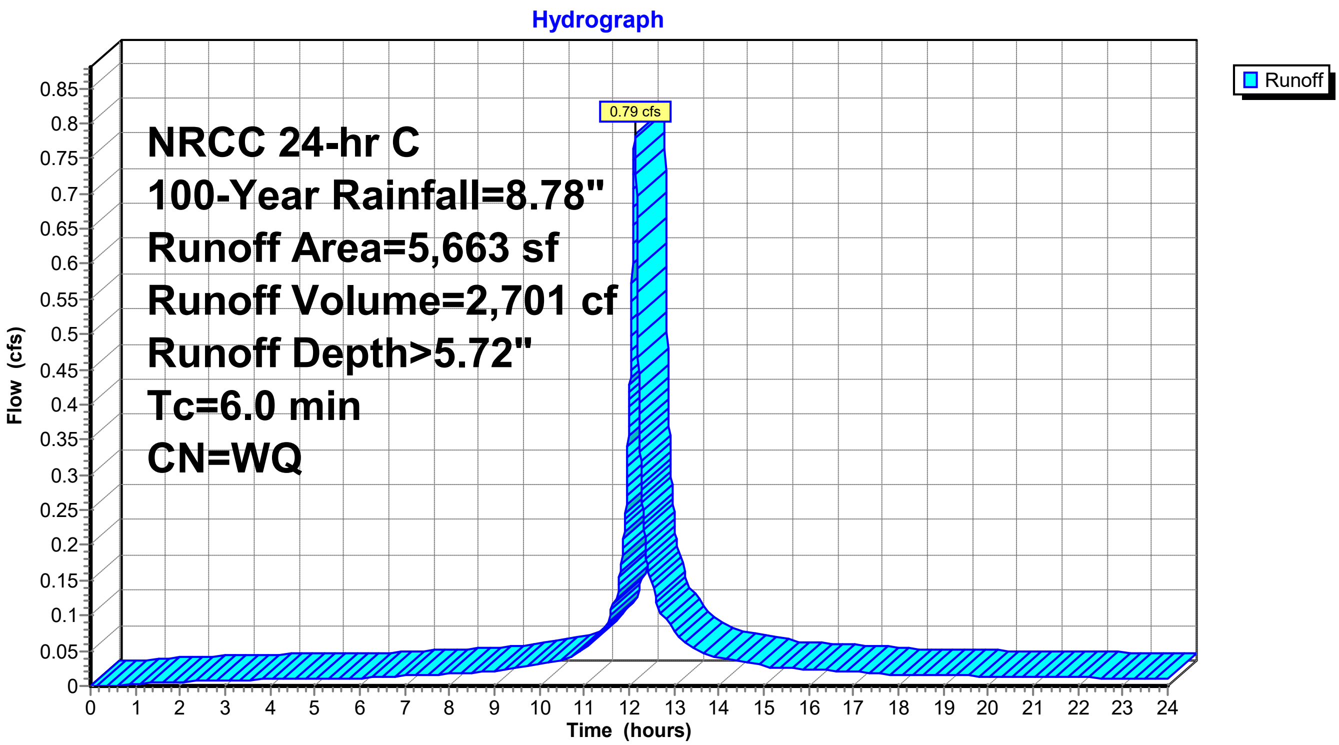
Runoff = 0.79 cfs @ 12.13 hrs, Volume= 2,701 cf, Depth> 5.72"
Routed to Pond FP-3 : FP-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
3,403	98	Paved parking, HSG A
2,260	39	>75% Grass cover, Good, HSG A
5,663		Weighted Average
2,260	39	39.91% Pervious Area
3,403	98	60.09% Impervious Area

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

Subcatchment SCA-9:



Summary for Subcatchment UC-1: NA

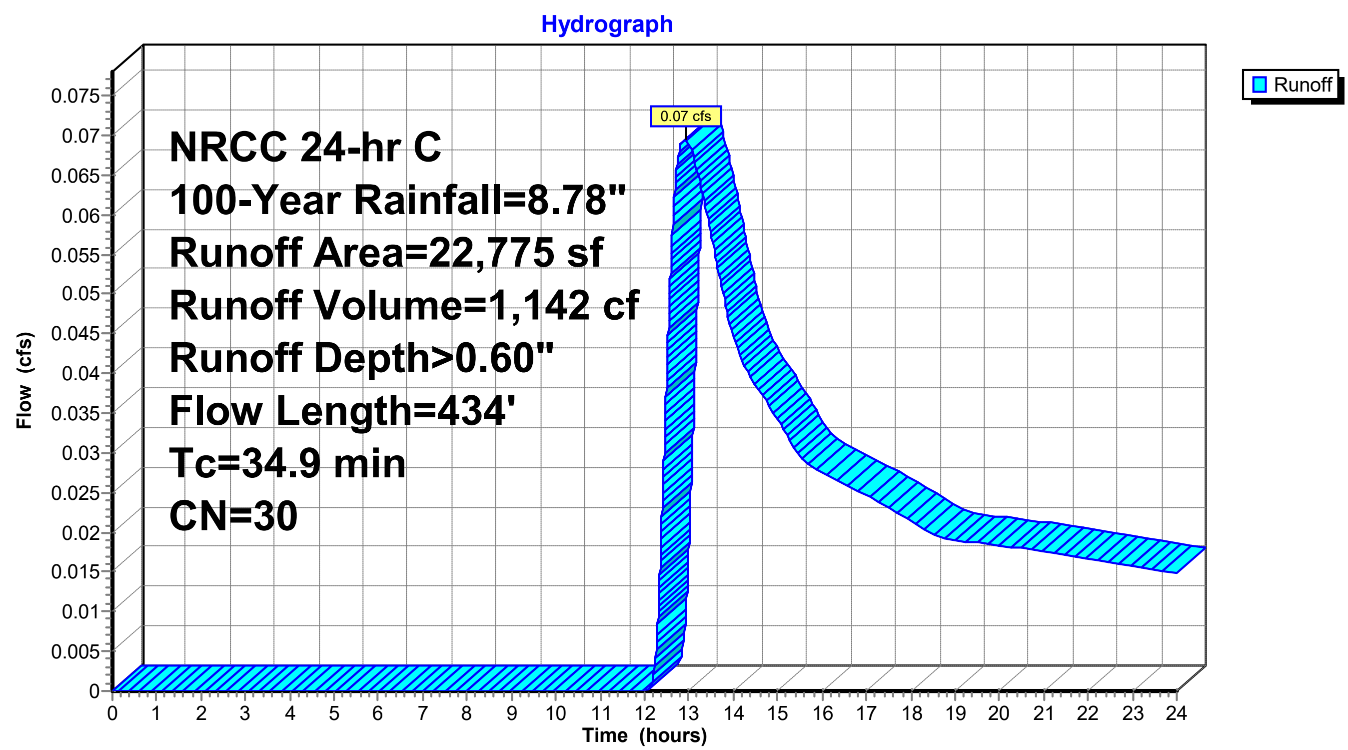
Runoff = 0.07 cfs @ 12.91 hrs, Volume= 1,142 cf, Depth> 0.60"
Routed to Pond SP 1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
22,775	30	Woods, Good, HSG A
22,775	30	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.2	100	0.0250	0.09		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
15.7	334	0.0050	0.35		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
34.9	434	Total			

Subcatchment UC-1: NA



Summary for Subcatchment UC-2:

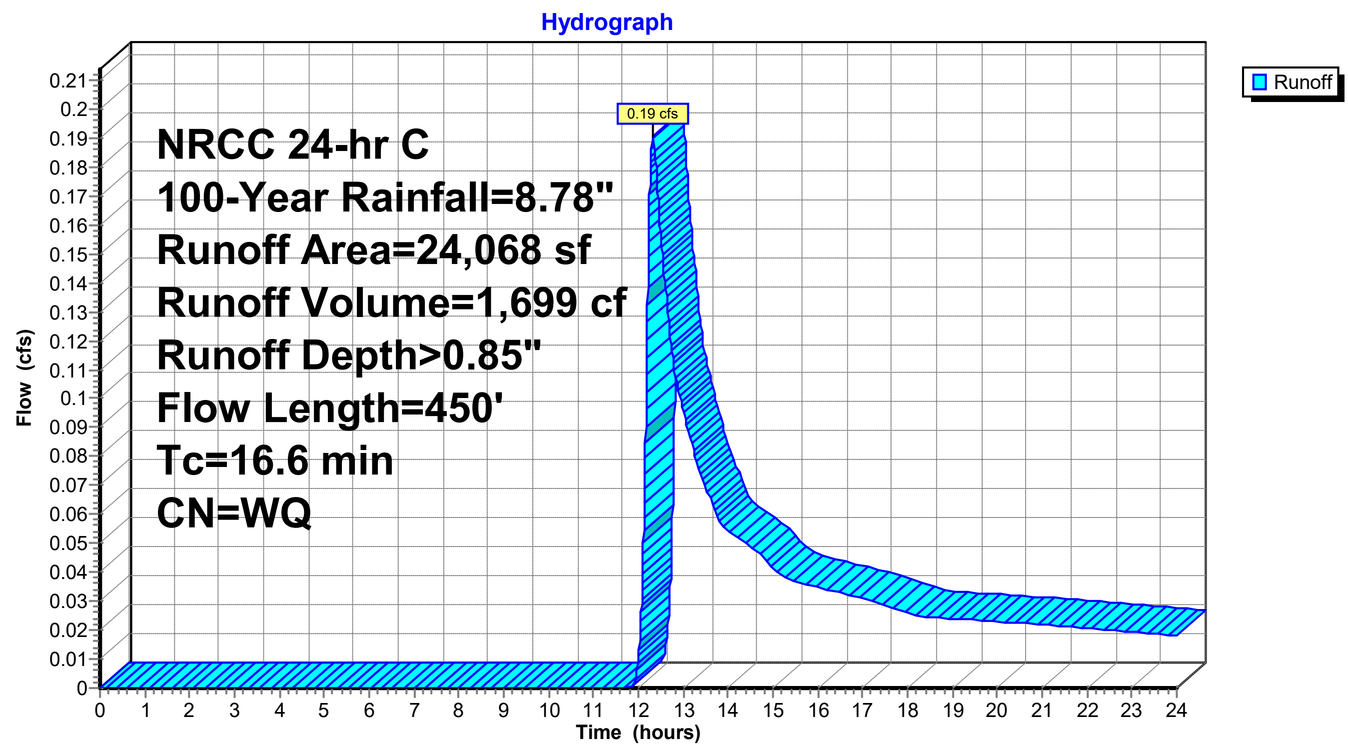
Runoff = 0.19 cfs @ 12.34 hrs, Volume= 1,699 cf, Depth> 0.85"
Routed to Pond SP 3 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
17,559	30	Woods, Good, HSG A
6,509	39	>75% Grass cover, Good, HSG A
24,068		Weighted Average
24,068	32	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	50	0.0590	0.11		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"
6.6	199	0.0100	0.50		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
2.2	201	0.0100	1.50		**Shallow Concentrated Flow, SWALE** Grassed Waterway Kv= 15.0 fps
16.6	450	Total			

Subcatchment UC-2:



Summary for Subcatchment UC-3:

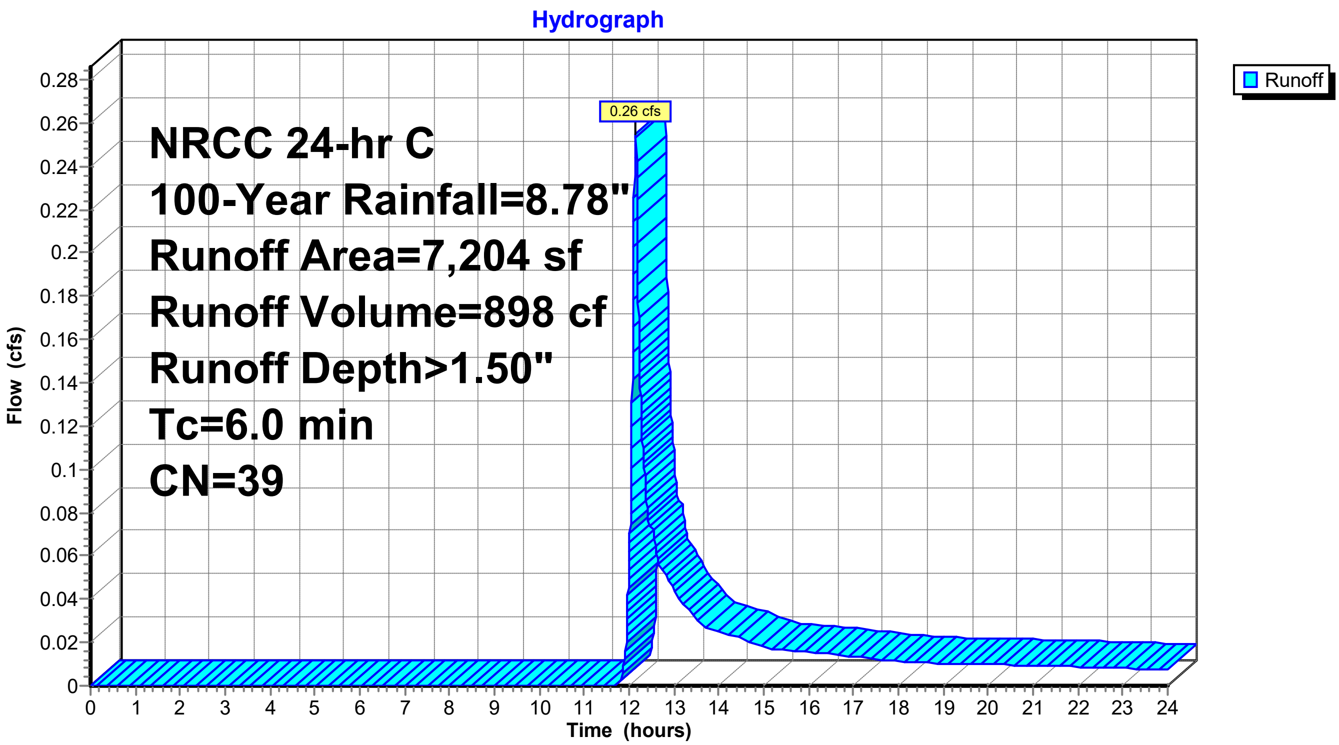
Runoff = 0.26 cfs @ 12.14 hrs, Volume= 898 cf, Depth> 1.50"
Routed to Pond AB-1 : Attenuation Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
7,204	39	>75% Grass cover, Good, HSG A
7,204	39	100.00% Pervious Area

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

Subcatchment UC-3:



Summary for Subcatchment UC-4:

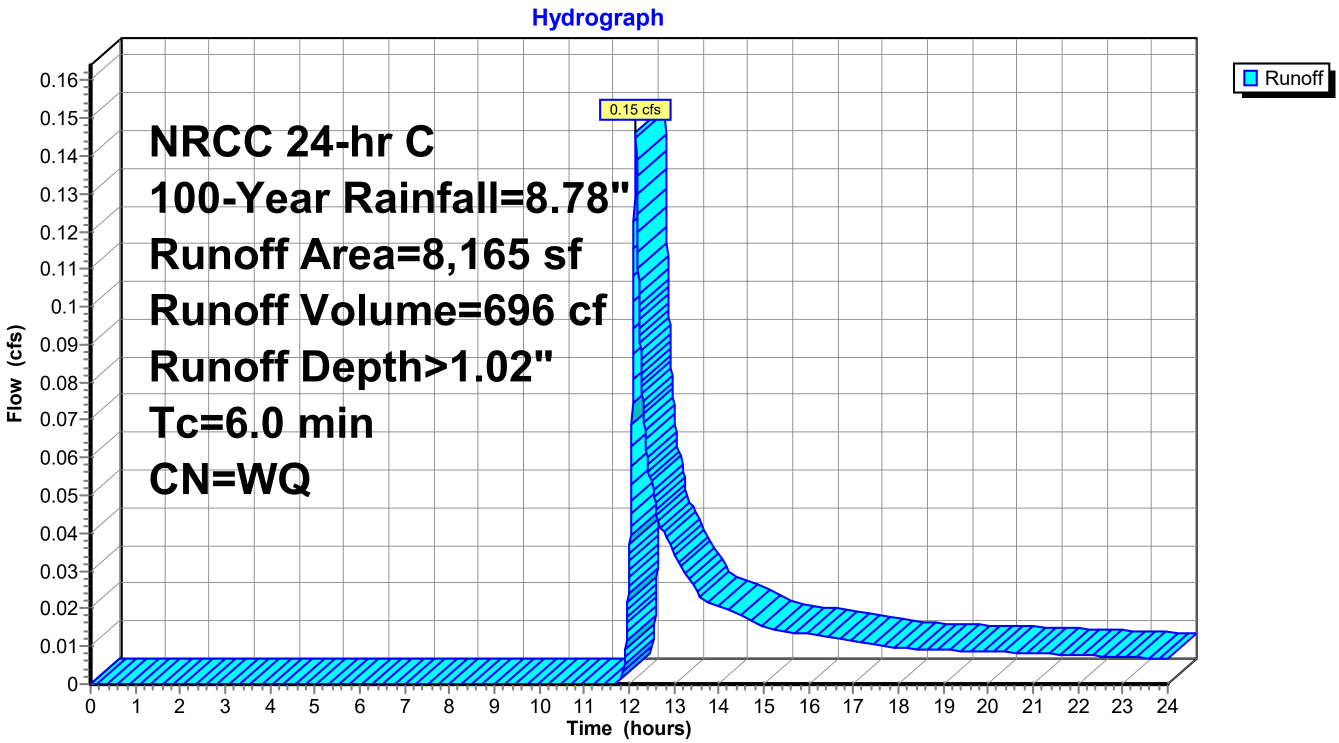
Runoff = 0.15 cfs @ 12.15 hrs, Volume= 696 cf, Depth> 1.02"
Routed to Pond SP 4 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
3,787	39	>75% Grass cover, Good, HSG A
4,378	30	Woods, Good, HSG A
8,165		Weighted Average
8,165	34	100.00% Pervious Area

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

Subcatchment UC-4:



Summary for Subcatchment UC-5:

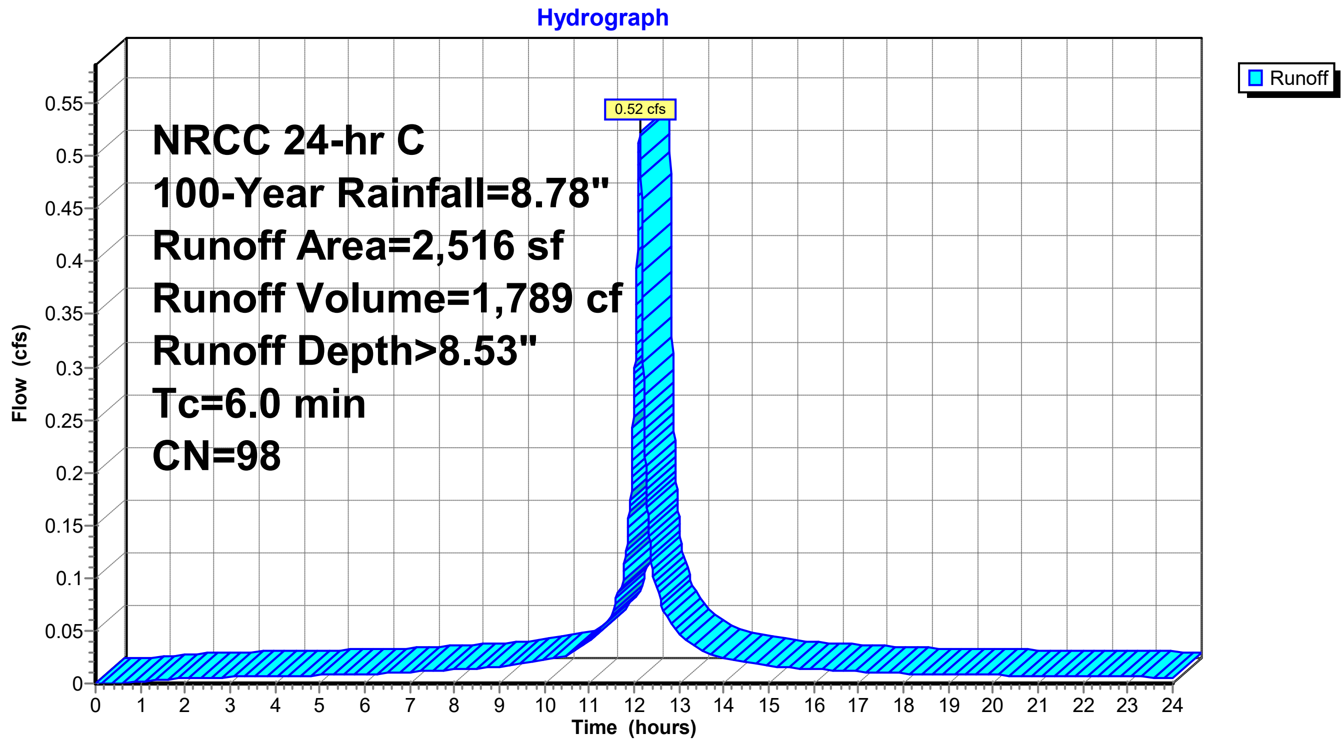
Runoff = 0.52 cfs @ 12.13 hrs, Volume= 1,789 cf, Depth> 8.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
2,516	98	Paved parking, HSG A
2,516	98	100.00% Impervious Area

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

Subcatchment UC-5:



Summary for Subcatchment UC-6: NA

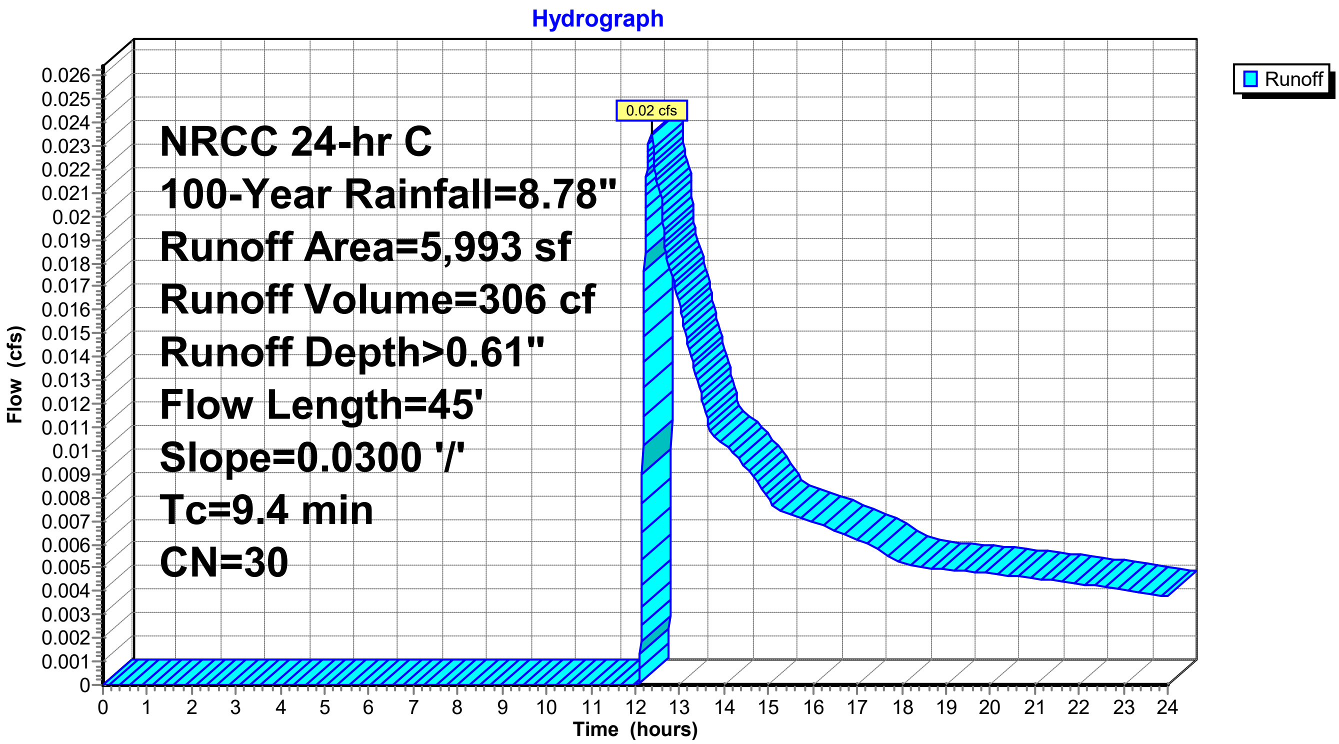
Runoff = 0.02 cfs @ 12.35 hrs, Volume= 306 cf, Depth> 0.61"
Routed to Pond SP-2 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs
NRCC 24-hr C 100-Year Rainfall=8.78"

Area (sf)	CN	Description
5,993	30	Woods, Good, HSG A
5,993	30	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	45	0.0300	0.08		**Sheet Flow, Natural Area (NA)** Woods: Light underbrush n= 0.400 P2= 3.35"

Subcatchment UC-6: NA



Summary for Pond AB-1: Attenuation Basin

Inflow Area =	7,204 sf,	0.00% Impervious, Inflow Depth > 18.75"	for 100-Year event	
Inflow =	7.43 cfs @	12.29 hrs, Volume=	11,257 cf	
Outflow =	3.32 cfs @	12.53 hrs, Volume=	10,778 cf,	Atten= 55%, Lag= 14.7 min
Discarded =	0.02 cfs @	12.12 hrs, Volume=	616 cf	
Primary =	3.30 cfs @	12.53 hrs, Volume=	10,162 cf	

Routed to Pond SP 4 : Study Point

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.75' @ 12.53 hrs Surf.Area= 2,412 sf Storage= 3,890 cf

Plug-Flow detention time= 41.1 min calculated for 10,776 cf (96% of inflow)
Center-of-Mass det. time= 27.9 min (790.0 - 762.1)

Volume	Invert	Avail.Storage	Storage Description
#1	49.00'	4,514 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

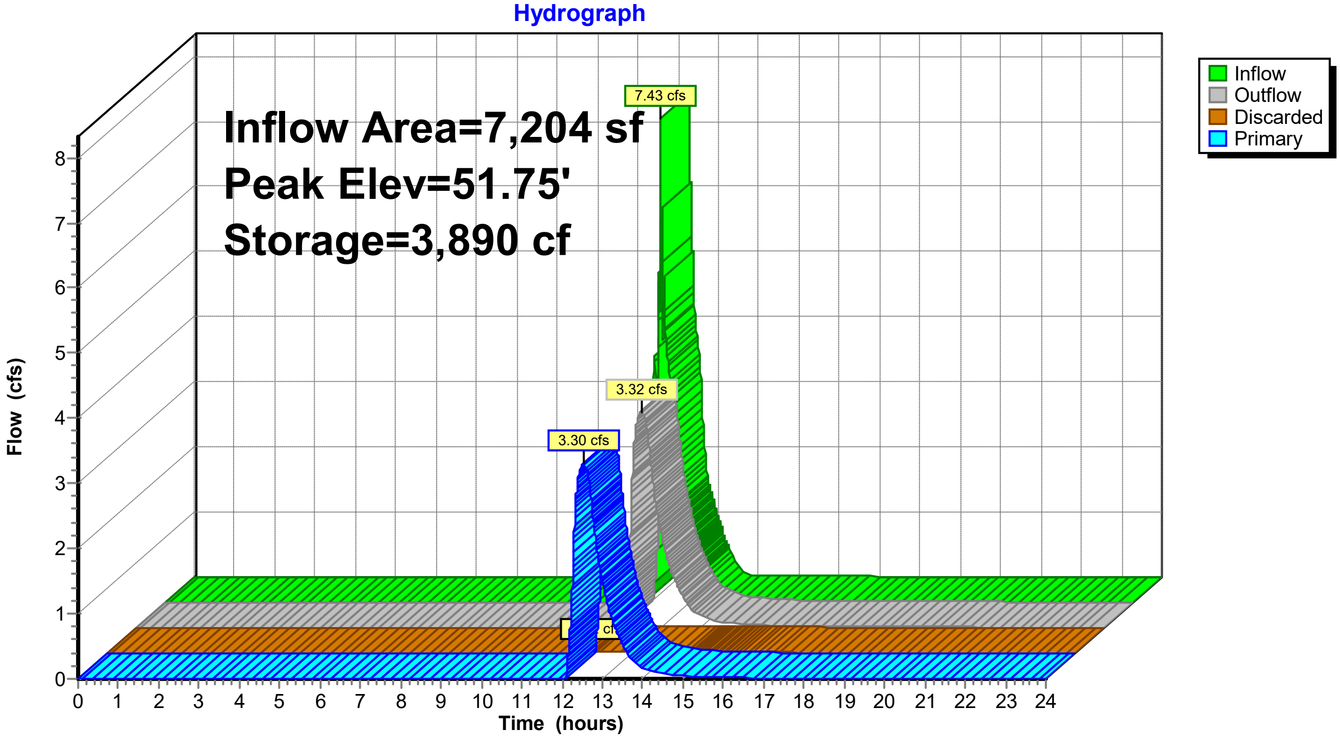
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
49.00	766	147.0	0	0	766
50.00	1,048	206.0	903	903	2,433
51.00	1,801	246.0	1,408	2,311	3,889
52.00	2,632	275.0	2,203	4,514	5,119

Device	Routing	Invert	Outlet Devices
#1	Primary	49.50'	**18.0" Round Culvert** L= 54.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 49.50' / 49.00' S= 0.0093 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	49.50'	**20.0 deg x 2.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.69 (C= 3.36)
#3	Device 1	51.75'	**28.0" x 28.0" Horiz. Bar Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	49.00'	**3.000 in/hr Exfiltration over Surface area from 49.00' - 50.00'** Excluded Surface area = 766 sf Phase-In= 0.01'

Discarded OutFlow Max=0.02 cfs @ 12.12 hrs HW=50.04' (Free Discharge)
└─**4=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=3.30 cfs @ 12.53 hrs HW=51.75' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 3.30 cfs of 10.06 cfs potential flow)
  ├─**2=Sharp-Crested Vee/Trap Weir** (Orifice Controls 3.30 cfs @ 4.67 fps)
  └─**3=Bar Grate** (Weir Controls 0.00 cfs @ 0.16 fps)

Pond AB-1: Attenuation Basin



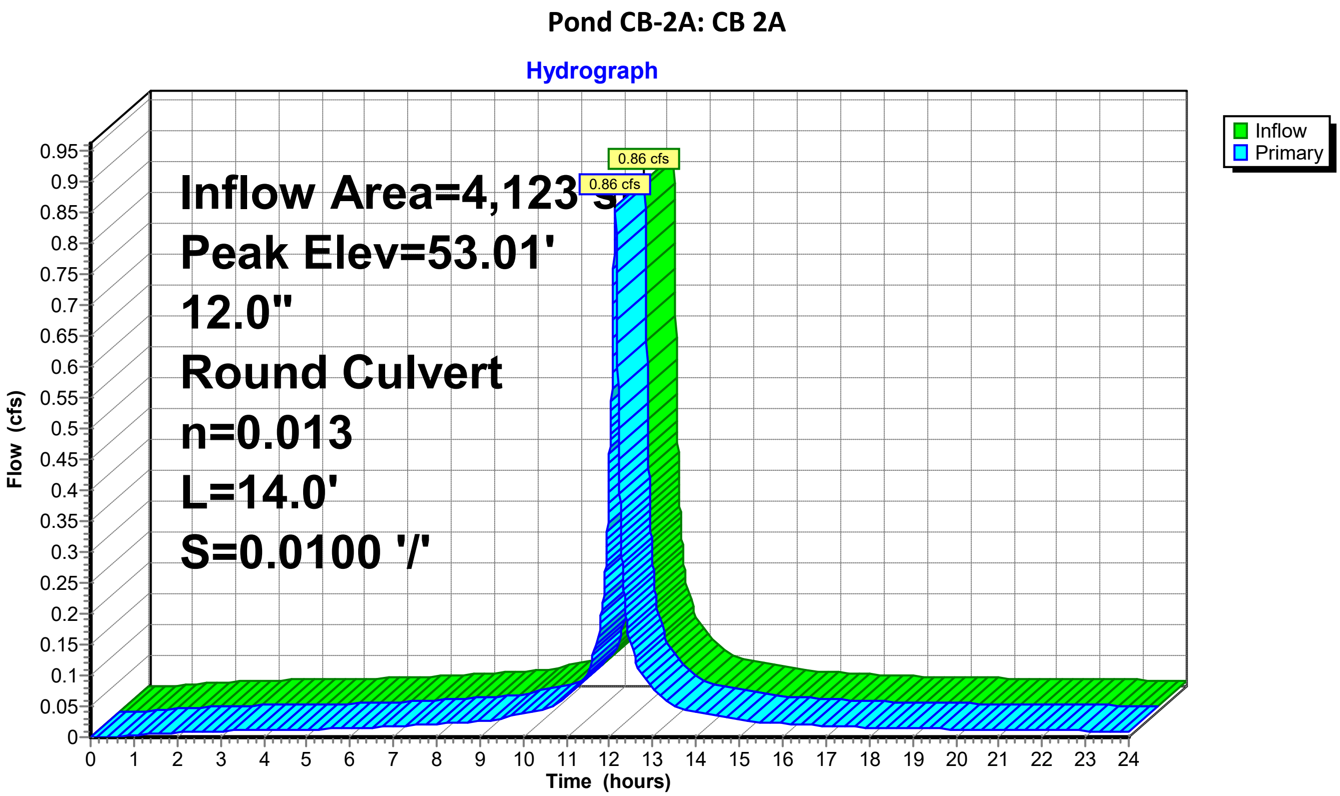
Summary for Pond CB-2A: CB 2A

Inflow Area = 4,123 sf,100.00% Impervious, Inflow Depth > 8.53" for 100-Year event
Inflow = 0.86 cfs @ 12.13 hrs, Volume= 2,931 cf
Outflow = 0.86 cfs @ 12.13 hrs, Volume= 2,931 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.86 cfs @ 12.13 hrs, Volume= 2,931 cf
Routed to Pond DMH-2.2 : DMH-2.2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 53.01' @ 12.29 hrs
Flood Elev= 53.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	50.53'	**12.0" Round Culvert** L= 14.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.53' / 50.39' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.88 cfs @ 12.13 hrs HW=51.56' TW=51.49' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.88 cfs @ 1.12 fps)



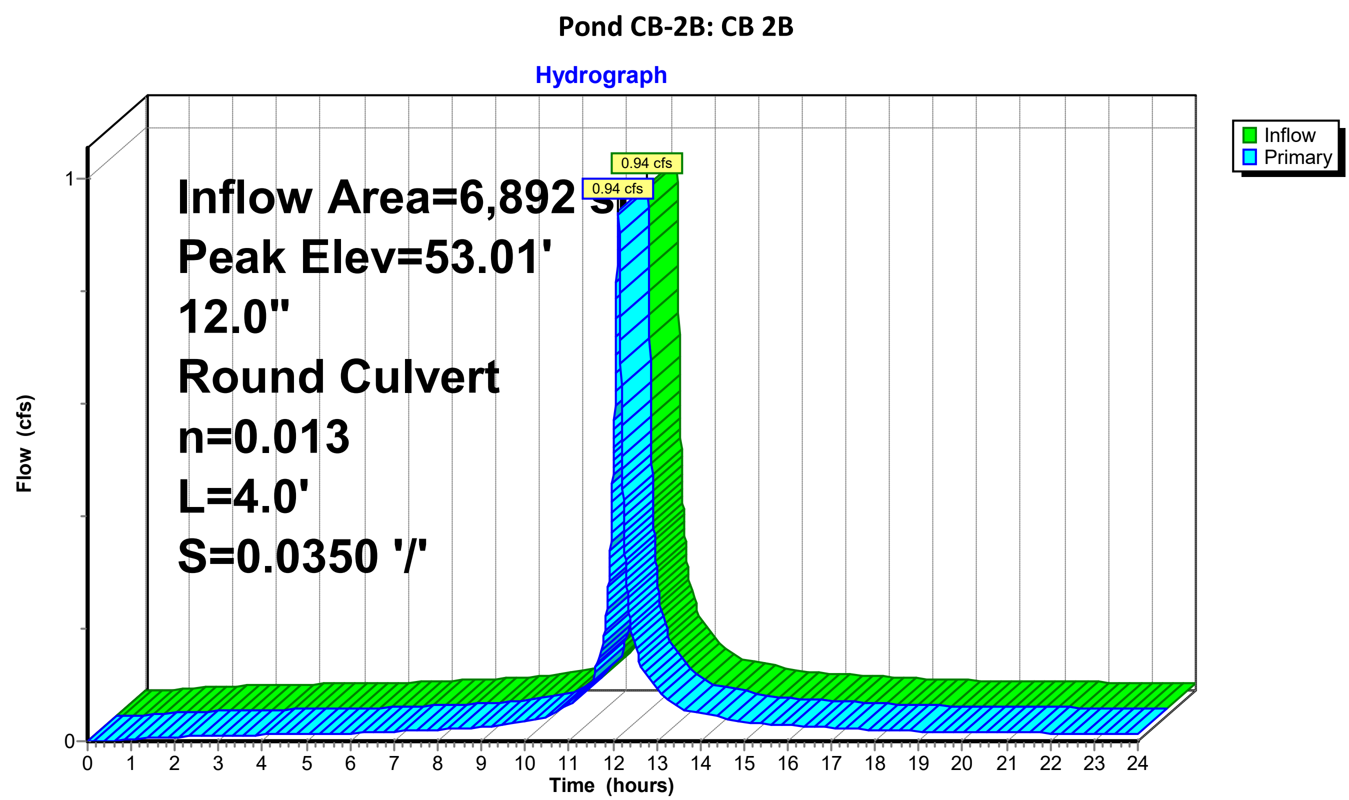
Summary for Pond CB-2B: CB 2B

Inflow Area = 6,892 sf, 58.84% Impervious, Inflow Depth > 5.64" for 100-Year event
Inflow = 0.94 cfs @ 12.13 hrs, Volume= 3,236 cf
Outflow = 0.94 cfs @ 12.13 hrs, Volume= 3,236 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.94 cfs @ 12.13 hrs, Volume= 3,236 cf
Routed to Pond DMH-2.2 : DMH-2.2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 53.01' @ 12.29 hrs
Flood Elev= 53.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	50.53'	**12.0" Round Culvert** L= 4.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.53' / 50.39' S= 0.0350 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.87 cfs @ 12.13 hrs HW=51.56' TW=51.50' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.87 cfs @ 1.11 fps)



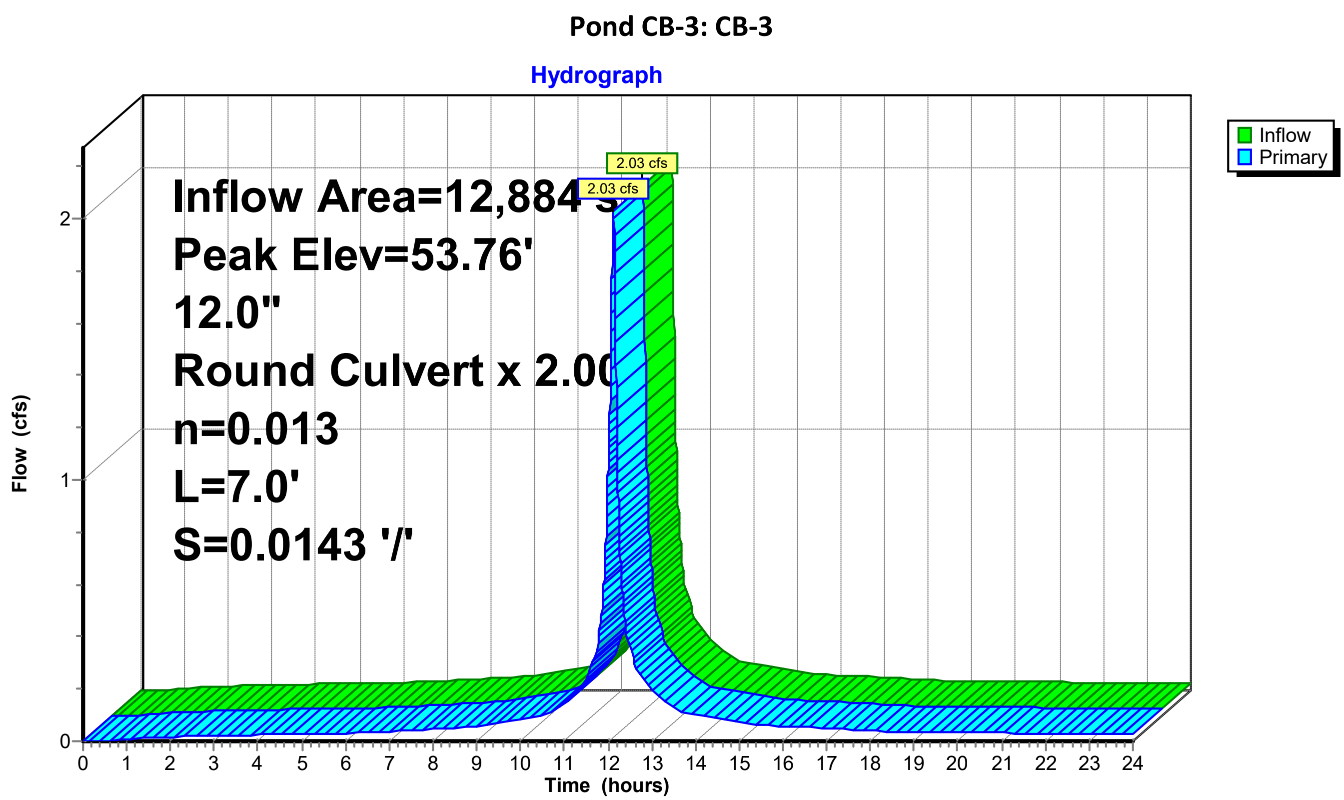
Summary for Pond CB-3: CB-3

Inflow Area = 12,884 sf, 69.58% Impervious, Inflow Depth > 6.46" for 100-Year event
Inflow = 2.03 cfs @ 12.13 hrs, Volume= 6,935 cf
Outflow = 2.03 cfs @ 12.13 hrs, Volume= 6,935 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.03 cfs @ 12.13 hrs, Volume= 6,935 cf
Routed to Pond DMH-3 : DMH-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 53.76' @ 12.29 hrs
Flood Elev= 53.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.55'	**12.0" Round Culvert X 2.00** L= 7.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 51.55' / 51.45' S= 0.0143 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.03 cfs @ 12.13 hrs HW=52.22' TW=52.02' (Dynamic Tailwater)
1=Culvert (Outlet Controls 2.03 cfs @ 2.57 fps)



Summary for Pond CB-4: CB-4

Inflow Area = 27,573 sf, 38.81% Impervious, Inflow Depth > 4.36" for 100-Year event
Inflow = 2.82 cfs @ 12.14 hrs, Volume= 10,010 cf
Outflow = 2.19 cfs @ 12.19 hrs, Volume= 10,010 cf, Atten= 22%, Lag= 3.0 min
Primary = 2.19 cfs @ 12.19 hrs, Volume= 10,092 cf
Routed to Pond DMH-9 : DMH-9 (bypass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 57.25' @ 12.19 hrs Surf.Area= 1,880 sf Storage= 323 cf
Flood Elev= 56.85' Surf.Area= 4 sf Storage= 0 cf

Plug-Flow detention time= 0.4 min calculated for 10,010 cf (100% of inflow)
Center-of-Mass det. time= 0.4 min (778.2 - 777.9)

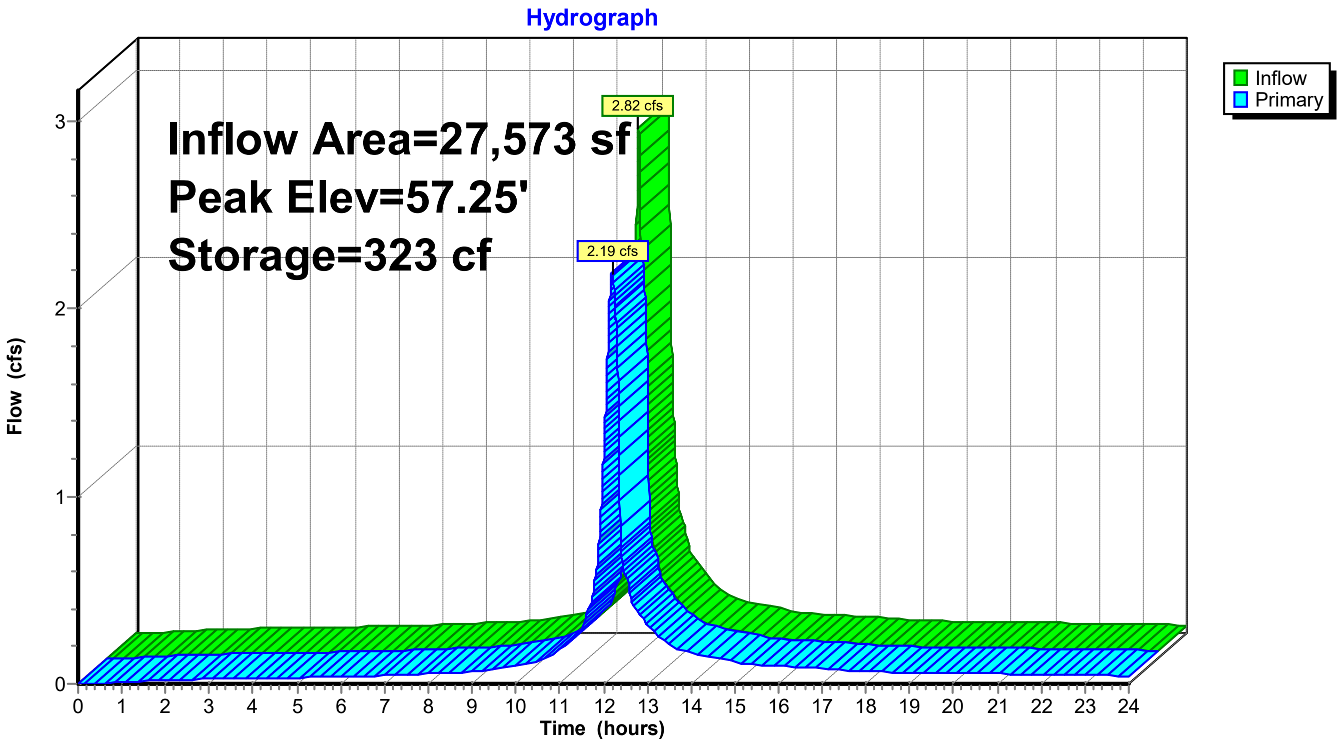
Volume	Invert	Avail.Storage	Storage Description
#1	56.85'	4,465 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
56.85	4	8.0	0	0	4
57.00	589	96.0	32	32	732
58.00	10,253	534.0	4,433	4,465	22,693

Device	Routing	Invert	Outlet Devices
#1	Primary	53.35'	**12.0" Round Culvert** L= 9.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 53.35' / 53.25' S= 0.0111 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	56.85'	**1.2" x 1.2" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 Limited to weir flow at low heads
#3	Device 1	56.85'	**1.2" x 1.2" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.19 cfs @ 12.19 hrs HW=57.25' TW=54.81' (Dynamic Tailwater)
└─**1=Culvert** (Passes 2.19 cfs of 5.21 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 1.09 cfs @ 3.04 fps)
  └─**3=Orifice/Grate** (Orifice Controls 1.09 cfs @ 3.04 fps)

Pond CB-4: CB-4


Hydrograph
Inflow
Primary
2.82 cfs
2.19 cfs
Inflow Area=27,573 sf
Peak Elev=57.25'
Storage=323 cf
Flow (cfs)
0
1
2
3
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Time (hours)

Summary for Pond CB-6A: CB-6A

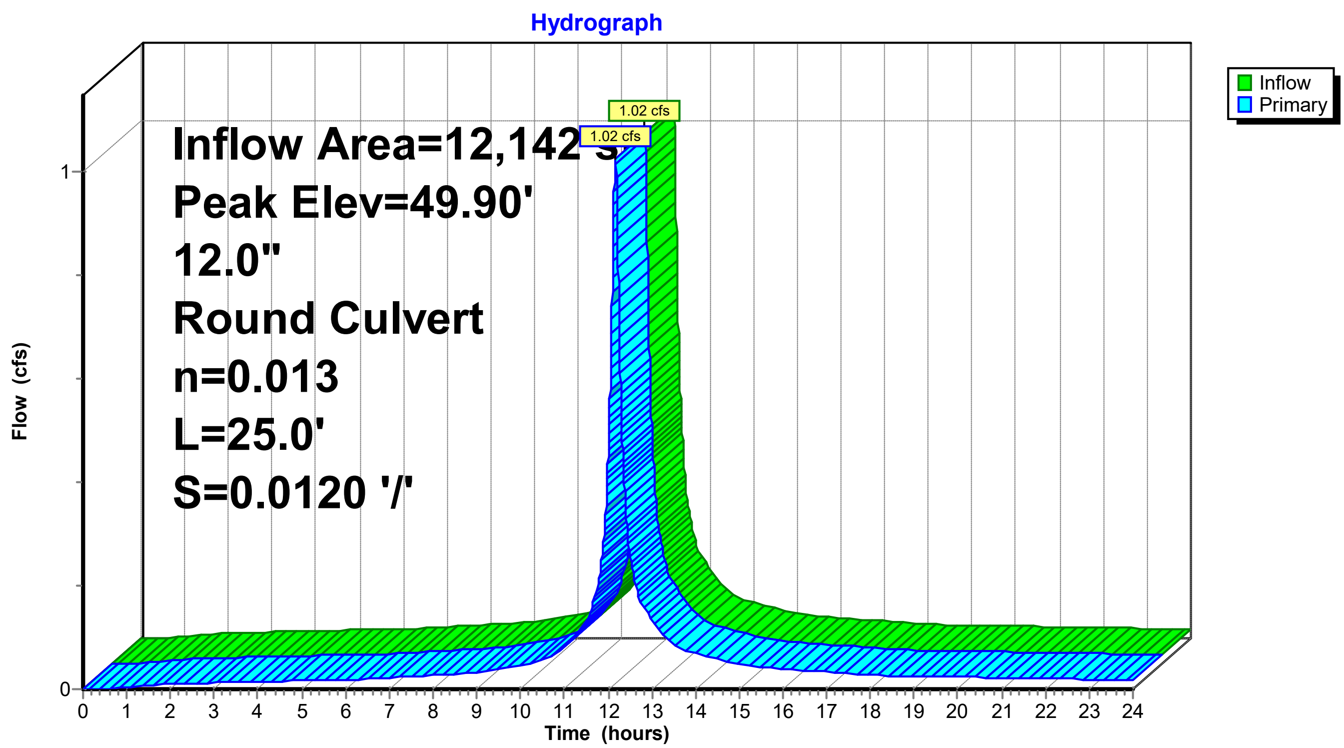
Inflow Area = 12,142 sf, 43.49% Impervious, Inflow Depth > 4.21" for 100-Year event
Inflow = 1.02 cfs @ 12.17 hrs, Volume= 4,256 cf
Outflow = 1.02 cfs @ 12.17 hrs, Volume= 4,256 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.02 cfs @ 12.17 hrs, Volume= 4,256 cf
Routed to Pond DMH-7 : DMH-7 (bypass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 49.90' @ 12.44 hrs
Flood Elev= 49.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.30'	**12.0" Round Culvert** L= 25.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.30' / 46.00' S= 0.0120 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.02 cfs @ 12.17 hrs HW=47.10' TW=46.94' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 1.02 cfs @ 2.08 fps)

Pond CB-6A: CB-6A



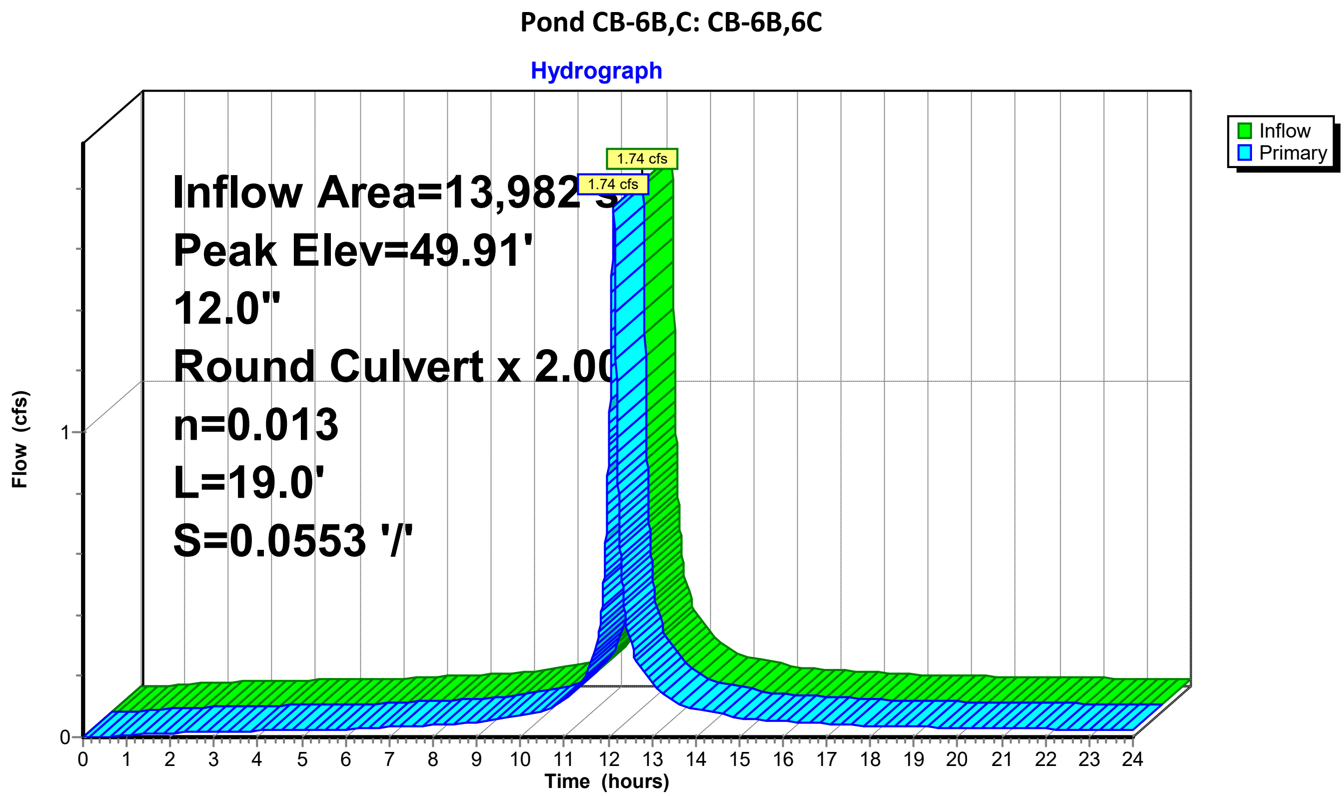
Summary for Pond CB-6B,C: CB-6B,6C

Inflow Area = 13,982 sf, 55.19% Impervious, Inflow Depth > 5.23" for 100-Year event
Inflow = 1.74 cfs @ 12.13 hrs, Volume= 6,088 cf
Outflow = 1.74 cfs @ 12.13 hrs, Volume= 6,088 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.74 cfs @ 12.13 hrs, Volume= 6,088 cf
Routed to Pond DMH-6 : DMH-6

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 49.91' @ 12.45 hrs
Flood Elev= 50.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	47.50'	**12.0" Round Culvert X 2.00** L= 19.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 47.50' / 46.45' S= 0.0553 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.74 cfs @ 12.13 hrs HW=48.01' TW=47.27' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.74 cfs @ 2.15 fps)



Summary for Pond CB-7: CB-7

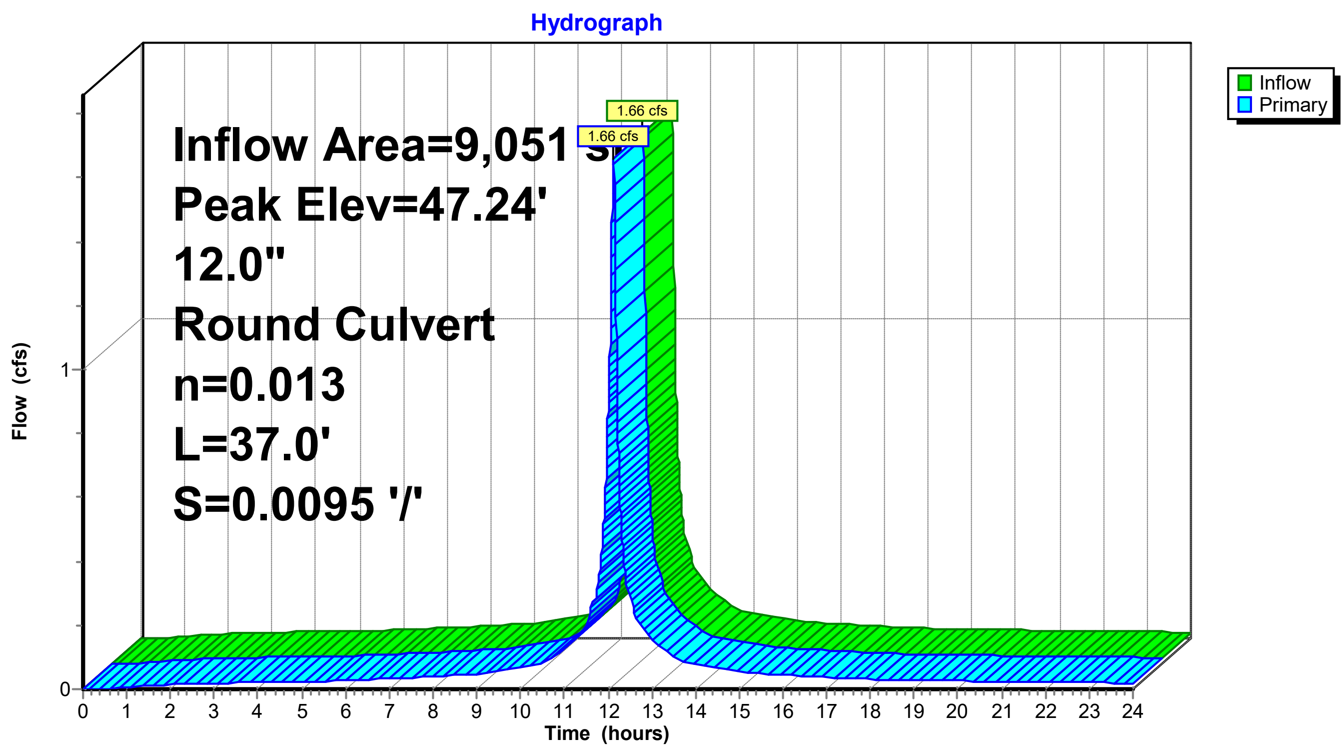
Inflow Area = 9,051 sf, 85.55% Impervious, Inflow Depth > 7.51" for 100-Year event
Inflow = 1.66 cfs @ 12.13 hrs, Volume= 5,668 cf
Outflow = 1.66 cfs @ 12.13 hrs, Volume= 5,668 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.66 cfs @ 12.13 hrs, Volume= 5,668 cf
Routed to Pond DMH-8 : DMH-8 (bypass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 47.24' @ 12.13 hrs
Flood Elev= 49.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.40'	**12.0" Round Culvert** L= 37.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.40' / 46.05' S= 0.0095 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.65 cfs @ 12.13 hrs HW=47.24' TW=46.82' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 1.65 cfs @ 3.17 fps)

Pond CB-7: CB-7



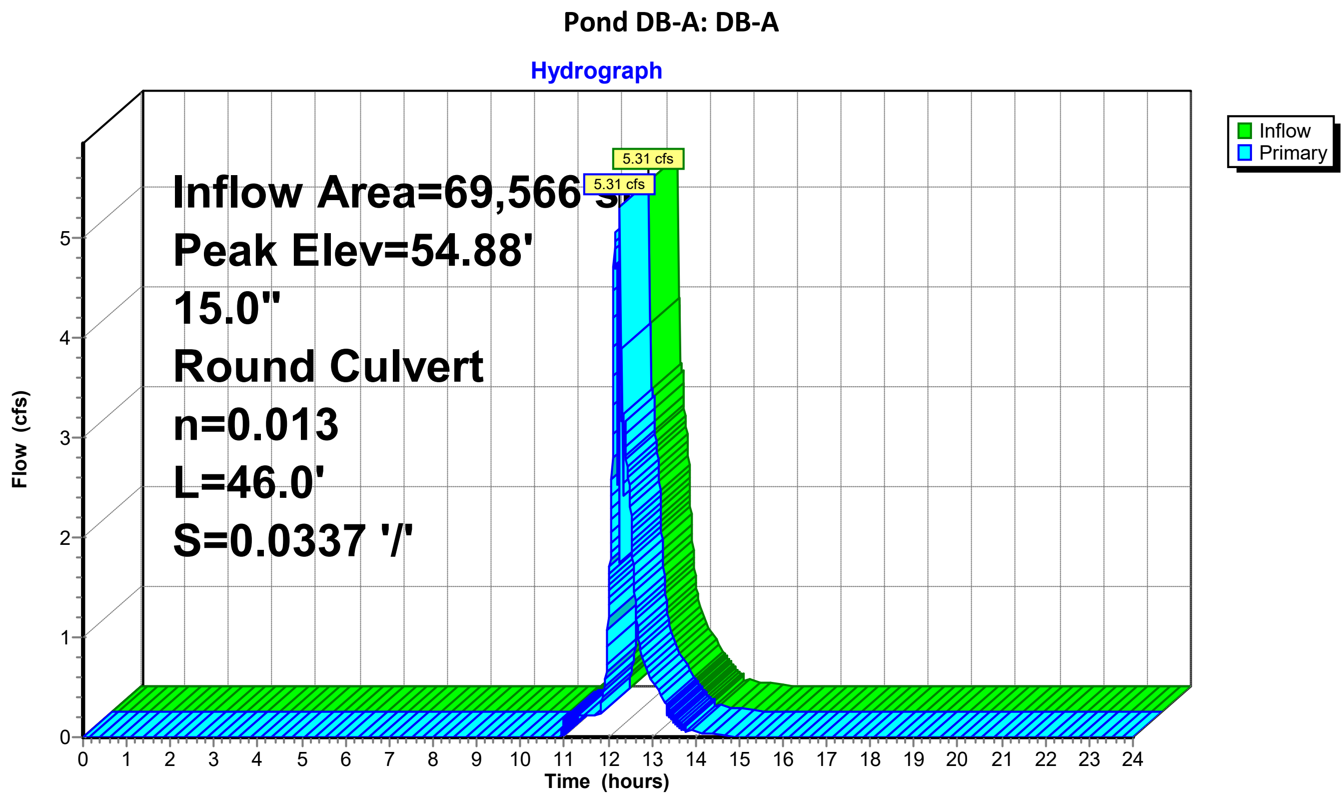
Summary for Pond DB-A: DB-A

Inflow Area = 69,566 sf, 63.53% Impervious, Inflow Depth = 1.65" for 100-Year event
Inflow = 5.31 cfs @ 12.28 hrs, Volume= 9,570 cf
Outflow = 5.31 cfs @ 12.28 hrs, Volume= 9,570 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.31 cfs @ 12.28 hrs, Volume= 9,570 cf
Routed to Pond DMH-5 : DMH-5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 54.88' @ 12.29 hrs
Flood Elev= 54.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	50.55'	**15.0" Round Culvert** L= 46.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.55' / 49.00' S= 0.0337 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=4.97 cfs @ 12.28 hrs HW=54.84' TW=53.93' (Dynamic Tailwater)
1=Culvert (Inlet Controls 4.97 cfs @ 4.05 fps)



Summary for Pond DMH-2.1: DMH-2.1 (By-Pass)

Inflow Area = 23,899 sf, 71.73% Impervious, Inflow Depth > 10.11" for 100-Year event
Inflow = 7.51 cfs @ 12.29 hrs, Volume= 20,131 cf
Outflow = 7.51 cfs @ 12.29 hrs, Volume= 20,131 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.02 cfs @ 12.01 hrs, Volume= 13,159 cf
Routed to Pond INF-1 : INF-1
Secondary = 5.82 cfs @ 12.29 hrs, Volume= 6,972 cf
Routed to Pond AB-1 : Attenuation Basin

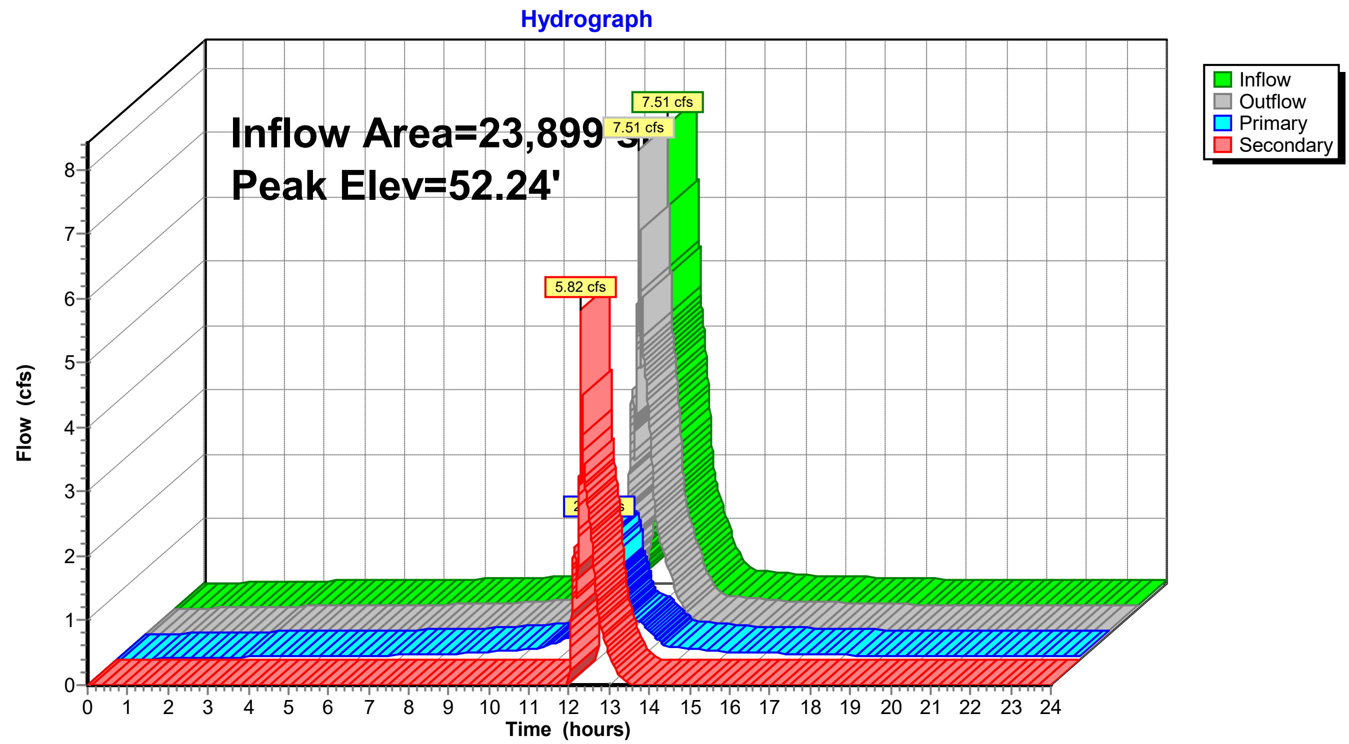
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 52.24' @ 12.29 hrs
Flood Elev= 52.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.60'	**12.0" Round OSG-1** L= 2.3' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.60' / 49.55' S= 0.0217 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	50.50'	**15.0" Round FES** L= 25.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 50.50' / 50.10' S= 0.0160 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.08 cfs @ 12.01 hrs HW=50.60' TW=50.18' (Dynamic Tailwater)
1=OSG-1 (Barrel Controls 2.08 cfs @ 3.31 fps)

Secondary OutFlow Max=5.71 cfs @ 12.29 hrs HW=52.20' TW=51.26' (Dynamic Tailwater)
2=FES (Inlet Controls 5.71 cfs @ 4.65 fps)

Pond DMH-2.1: DMH-2.1 (By-Pass)



Summary for Pond DMH-2.2: DMH-2.2

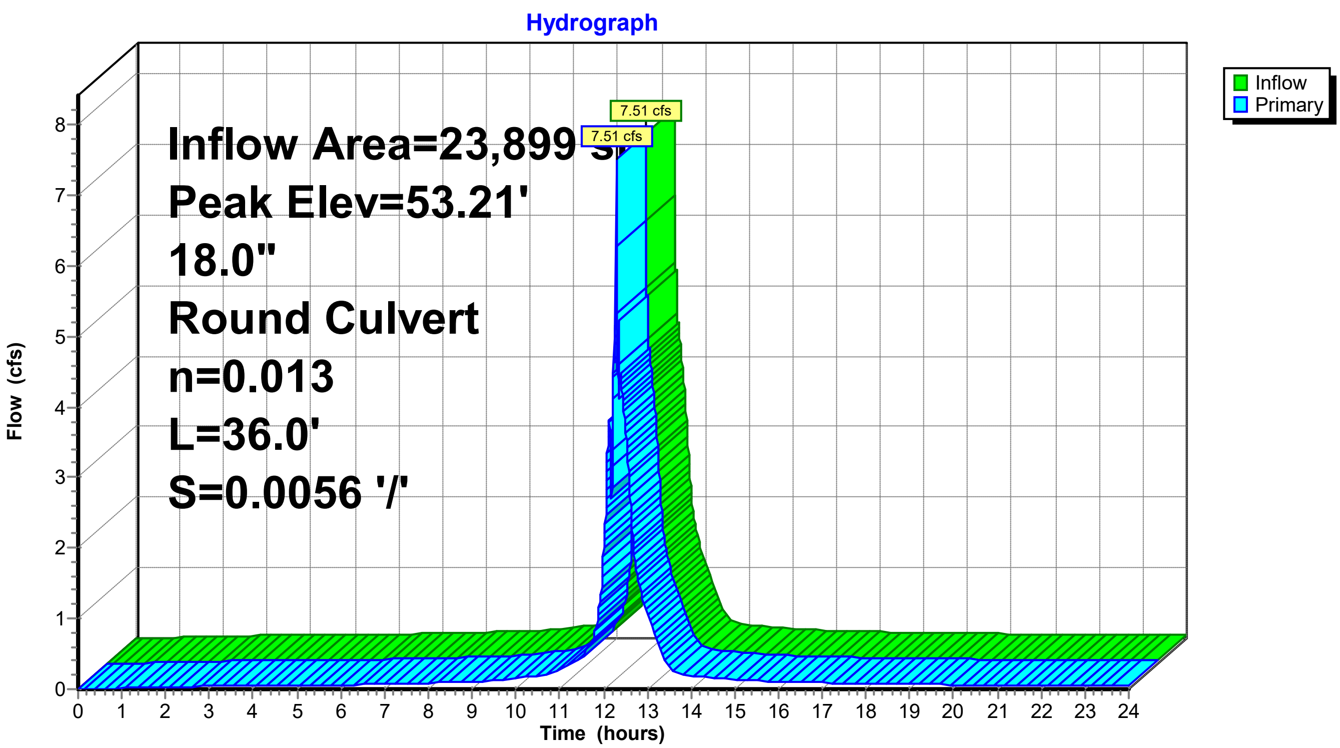
Inflow Area = 23,899 sf, 71.73% Impervious, Inflow Depth > 10.11" for 100-Year event
Inflow = 7.51 cfs @ 12.29 hrs, Volume= 20,131 cf
Outflow = 7.51 cfs @ 12.29 hrs, Volume= 20,131 cf, Atten= 0%, Lag= 0.0 min
Primary = 7.51 cfs @ 12.29 hrs, Volume= 20,131 cf
Routed to Pond DMH-2.1 : DMH-2.1 (By-Pass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 53.21' @ 12.29 hrs
Flood Elev= 53.63'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.80'	**18.0" Round DMH 2.1** L= 36.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.80' / 49.60' S= 0.0056 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=7.37 cfs @ 12.29 hrs HW=53.19' TW=52.22' (Dynamic Tailwater)
1=DMH 2.1 (Inlet Controls 7.37 cfs @ 4.17 fps)

Pond DMH-2.2: DMH-2.2



Summary for Pond DMH-3: DMH-3

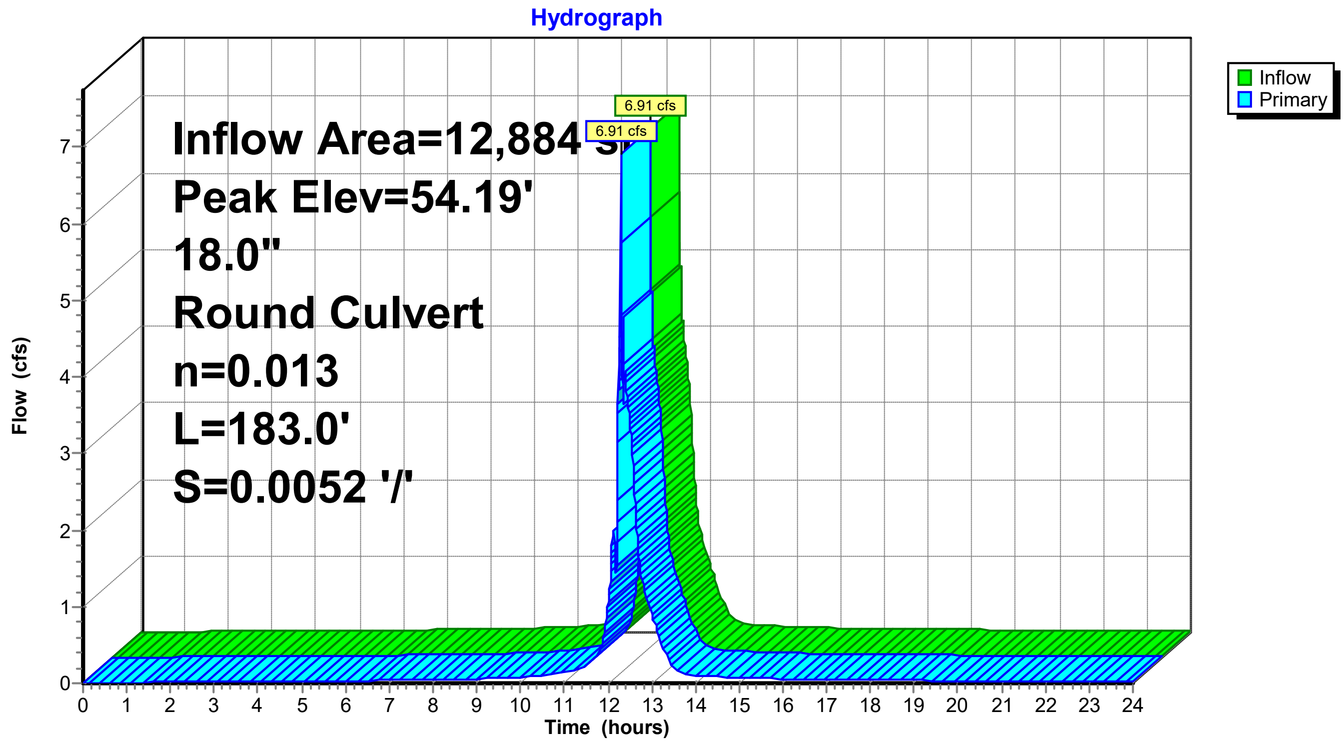
Inflow Area = 12,884 sf, 69.58% Impervious, Inflow Depth > 13.01" for 100-Year event
Inflow = 6.91 cfs @ 12.29 hrs, Volume= 13,963 cf
Outflow = 6.91 cfs @ 12.29 hrs, Volume= 13,963 cf, Atten= 0%, Lag= 0.0 min
Primary = 6.91 cfs @ 12.29 hrs, Volume= 13,963 cf
Routed to Pond DMH-2.2 : DMH-2.2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 54.19' @ 12.29 hrs
Flood Elev= 54.22'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.10'	**18.0" Round Culvert** L= 183.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 51.10' / 50.14' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=6.24 cfs @ 12.29 hrs HW=54.17' TW=53.19' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 6.24 cfs @ 3.53 fps)

Pond DMH-3: DMH-3



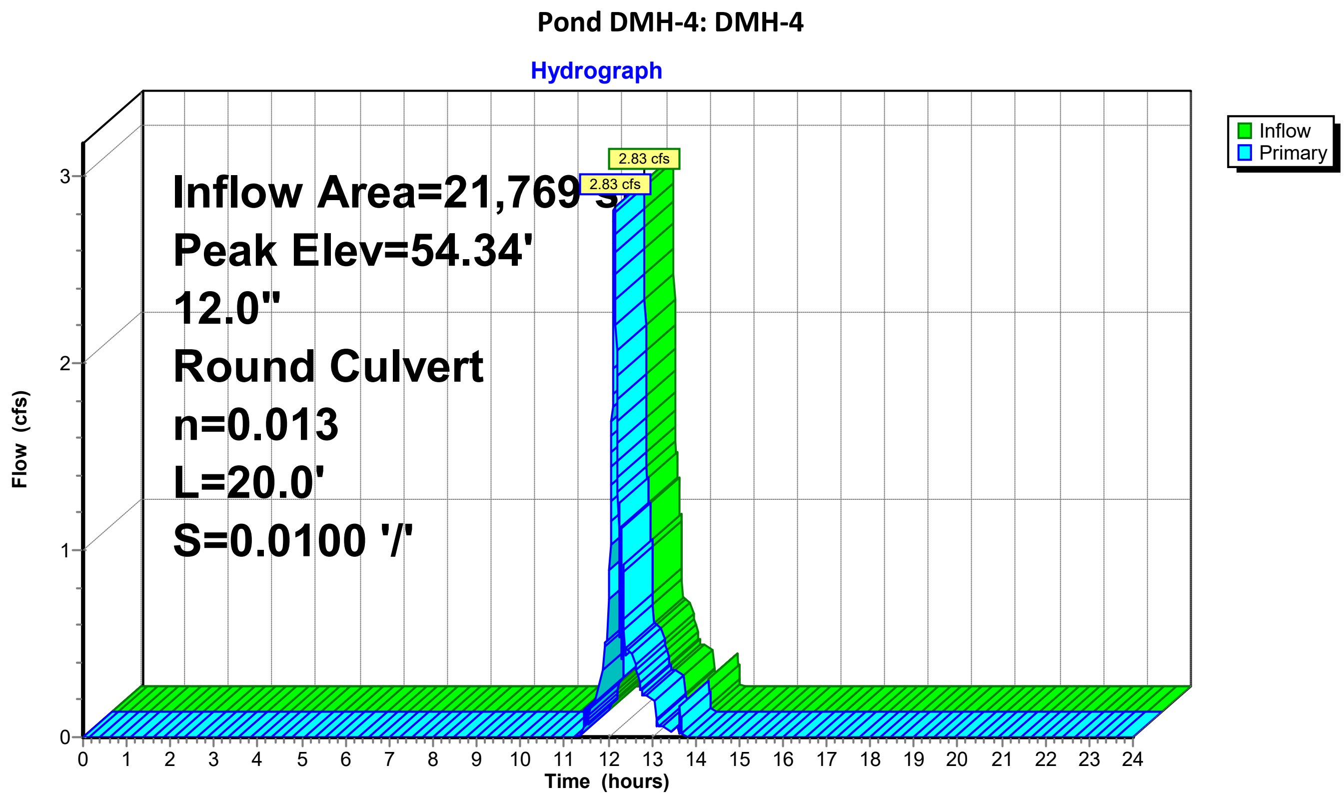
Summary for Pond DMH-4: DMH-4

Inflow Area = 21,769 sf, 63.79% Impervious, Inflow Depth = 1.80" for 100-Year event
Inflow = 2.83 cfs @ 12.14 hrs, Volume= 3,260 cf
Outflow = 2.83 cfs @ 12.14 hrs, Volume= 3,260 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.83 cfs @ 12.14 hrs, Volume= 3,260 cf
Routed to Pond INF-2 : INF-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 54.34' @ 12.29 hrs
Flood Elev= 53.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.15'	**12.0" Round Culvert** L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.15' / 48.95' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.83 cfs @ 12.14 hrs HW=51.41' TW=50.69' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 2.83 cfs @ 3.61 fps)



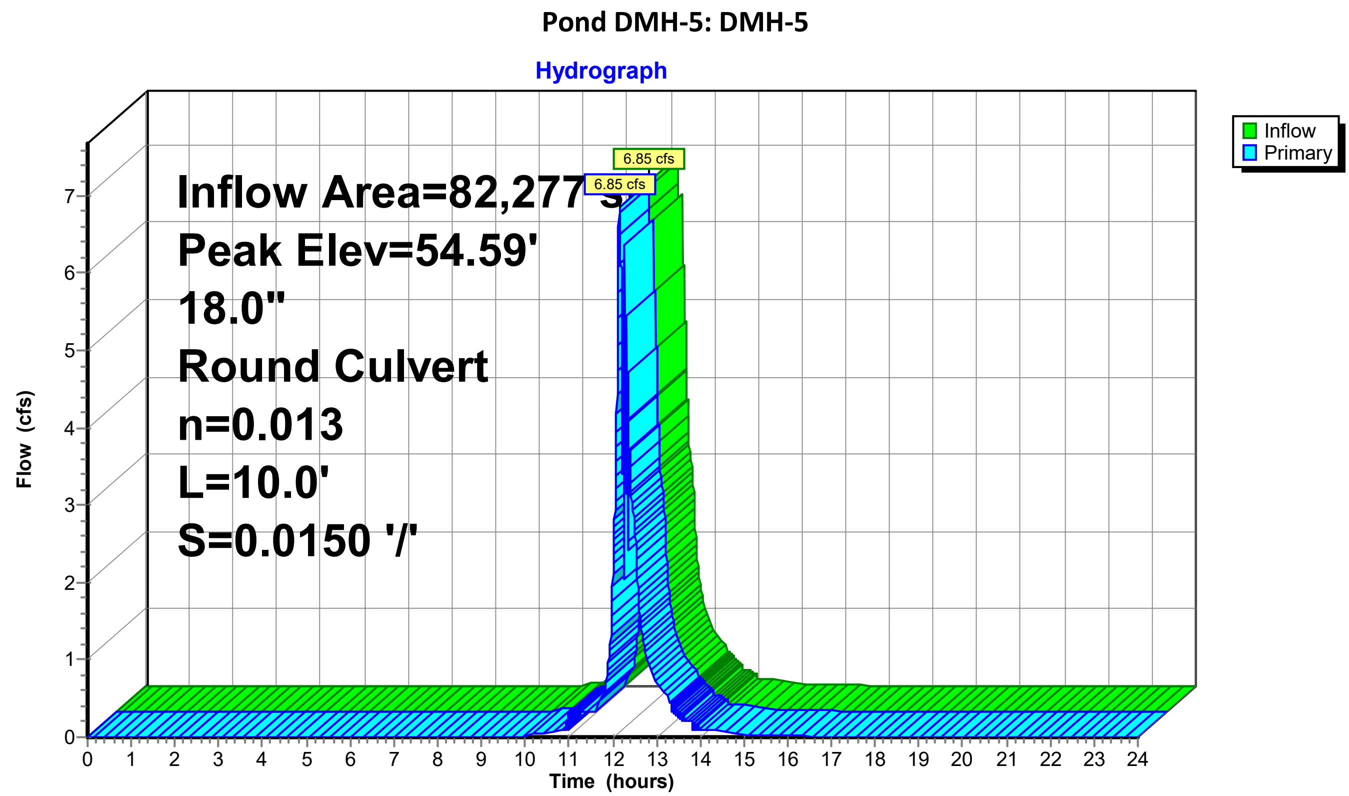
Summary for Pond DMH-5: DMH-5

Inflow Area = 82,277 sf, 64.43% Impervious, Inflow Depth = 1.94" for 100-Year event
Inflow = 6.85 cfs @ 12.15 hrs, Volume= 13,295 cf
Outflow = 6.85 cfs @ 12.15 hrs, Volume= 13,295 cf, Atten= 0%, Lag= 0.0 min
Primary = 6.85 cfs @ 12.15 hrs, Volume= 13,295 cf
Routed to Pond INF-2 : INF-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 54.59' @ 12.29 hrs
Flood Elev= 54.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.00'	**18.0" Round Culvert** L= 10.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.00' / 48.85' S= 0.0150 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=6.82 cfs @ 12.15 hrs HW=51.76' TW=50.94' (Dynamic Tailwater)
1=Culvert (Inlet Controls 6.82 cfs @ 3.86 fps)



Summary for Pond DMH-6: DMH-6

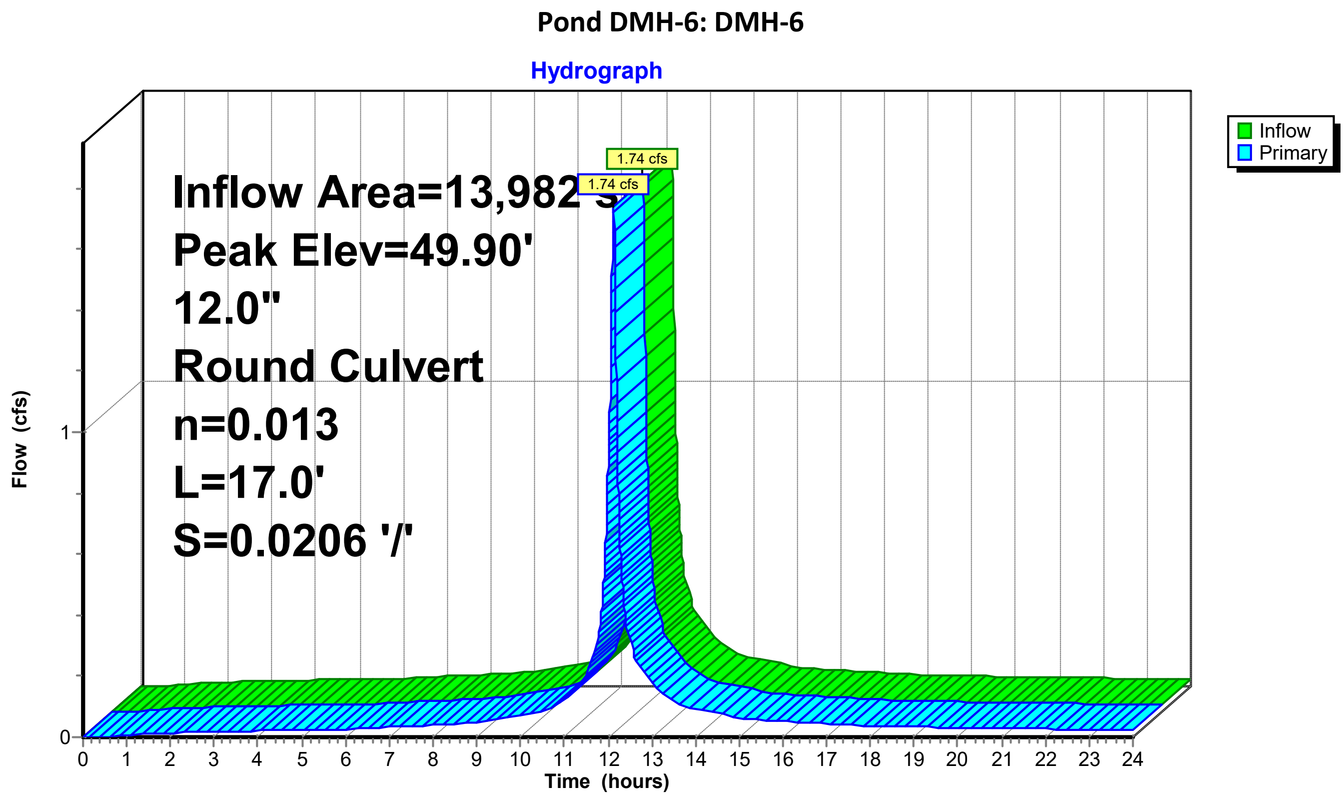
Inflow Area =	13,982 sf,	55.19% Impervious,	Inflow Depth > 5.23"	for 100-Year event
Inflow =	1.74 cfs @	12.13 hrs, Volume=	6,088 cf	
Outflow =	1.74 cfs @	12.13 hrs, Volume=	6,088 cf, Atten= 0%, Lag= 0.0 min	
Primary =	1.74 cfs @	12.13 hrs, Volume=	6,088 cf	

Routed to Pond DMH-7 : DMH-7 (bypass)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 49.90' @ 12.44 hrs
Flood Elev= 50.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.35'	**12.0" Round Culvert** L= 17.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.35' / 46.00' S= 0.0206 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.74 cfs @ 12.13 hrs HW=47.27' TW=46.98' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 1.74 cfs @ 3.00 fps)



Summary for Pond DMH-7: DMH-7 (bypass)

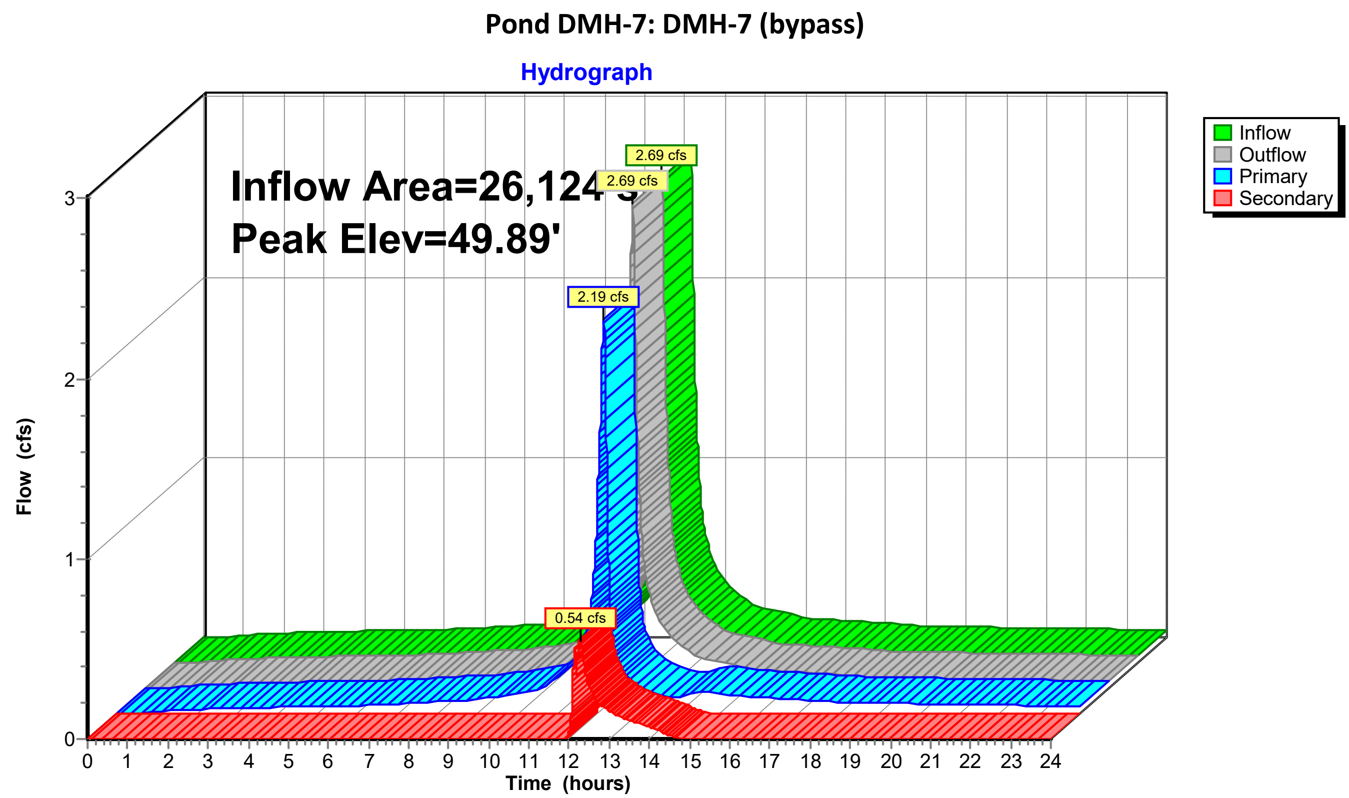
Inflow Area = 26,124 sf, 49.75% Impervious, Inflow Depth > 4.75" for 100-Year event
Inflow = 2.69 cfs @ 12.14 hrs, Volume= 10,344 cf
Outflow = 2.69 cfs @ 12.14 hrs, Volume= 10,344 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.19 cfs @ 12.14 hrs, Volume= 8,814 cf
  Routed to Pond INF-3 : INF-3
Secondary = 0.54 cfs @ 12.26 hrs, Volume= 1,530 cf
  Routed to Pond INF-3 : INF-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 49.89' @ 12.44 hrs
Flood Elev= 50.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.00'	**12.0" Round OGS-2** L= 3.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.00' / 45.90' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	46.60'	**12.0" Round By-Pass** L= 11.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.60' / 45.58' S= 0.0927 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.19 cfs @ 12.14 hrs HW=46.98' TW=46.04' (Dynamic Tailwater)
└─**1=OGS-2** (Barrel Controls 2.19 cfs @ 3.54 fps)

Secondary OutFlow Max=0.54 cfs @ 12.26 hrs HW=47.25' TW=47.18' (Dynamic Tailwater)
└─**2=By-Pass** (Outlet Controls 0.54 cfs @ 1.43 fps)



Summary for Pond DMH-8: DMH-8 (bypass)

Inflow Area = 9,051 sf, 85.55% Impervious, Inflow Depth > 7.51" for 100-Year event
Inflow = 1.66 cfs @ 12.13 hrs, Volume= 5,668 cf
Outflow = 1.66 cfs @ 12.13 hrs, Volume= 5,668 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.38 cfs @ 12.13 hrs, Volume= 5,559 cf
Routed to nonexistent node 5P
Secondary = 0.27 cfs @ 12.13 hrs, Volume= 109 cf
Routed to Pond INF-3 : INF-3

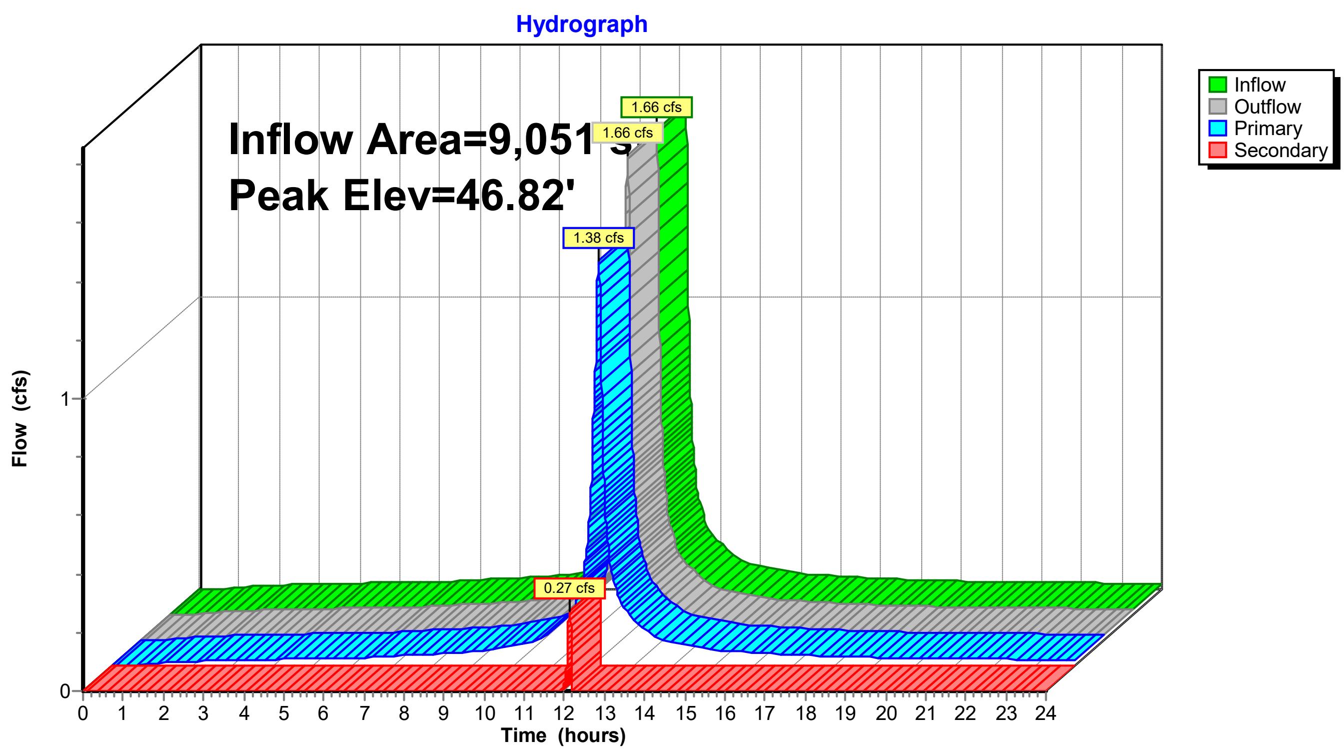
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 46.82' @ 12.13 hrs
Flood Elev= 50.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.05'	**12.0" Round OSG** L= 5.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.05' / 46.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	46.55'	**12.0" Round By-Pass** L= 13.5' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 46.55' / 45.58' S= 0.0719 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.38 cfs @ 12.13 hrs HW=46.82' (Free Discharge)
└**1=OSG** (Barrel Controls 1.38 cfs @ 2.92 fps)

Secondary OutFlow Max=0.27 cfs @ 12.13 hrs HW=46.82' TW=45.91' (Dynamic Tailwater)
└**2=By-Pass** (Inlet Controls 0.27 cfs @ 1.57 fps)

Pond DMH-8: DMH-8 (bypass)



Summary for Pond DMH-9: DMH-9 (bypass)

Inflow Area = 27,573 sf, 38.81% Impervious, Inflow Depth > 4.39" for 100-Year event
Inflow = 2.19 cfs @ 12.19 hrs, Volume= 10,092 cf
Outflow = 2.19 cfs @ 12.19 hrs, Volume= 10,092 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.53 cfs @ 12.09 hrs, Volume= 8,854 cf
Routed to Pond INF-4 : INF-4
Secondary = 1.09 cfs @ 12.19 hrs, Volume= 1,238 cf
Routed to Pond INF-4 : INF-4

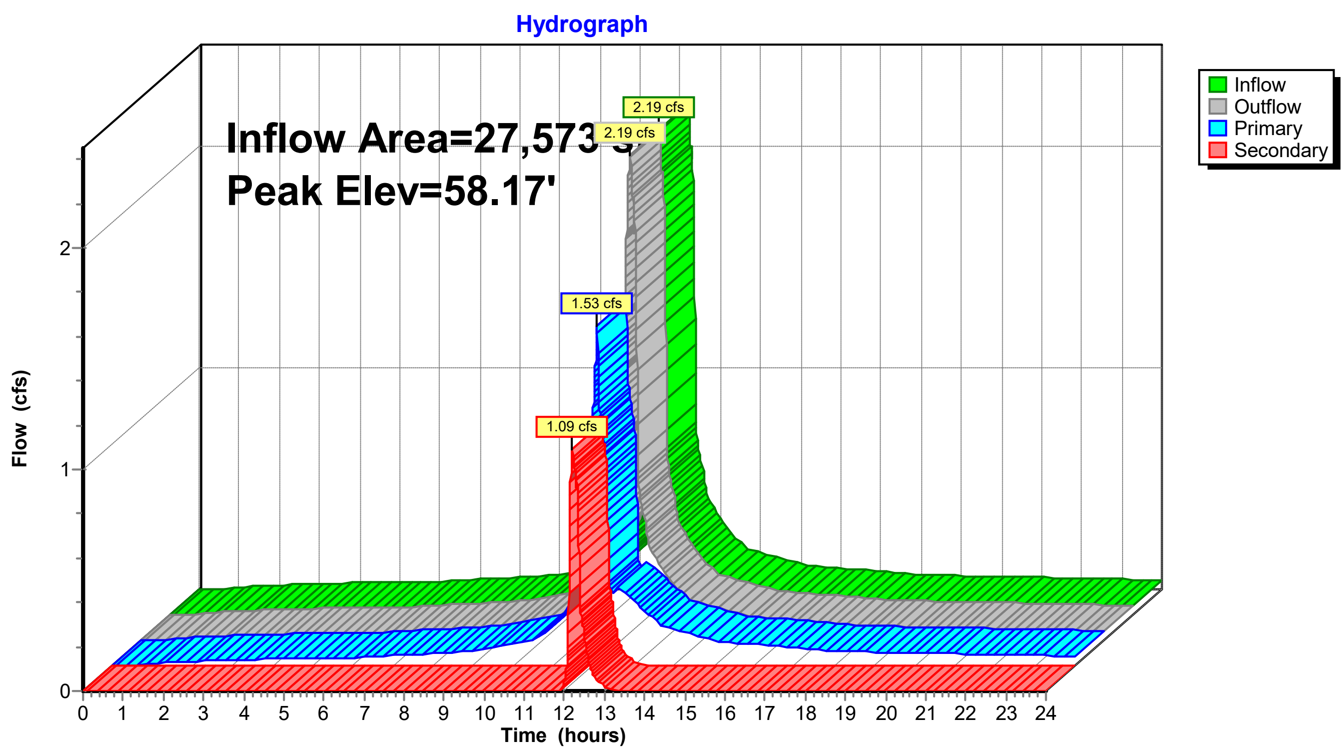
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 58.17' @ 12.28 hrs
Flood Elev= 57.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	53.25'	**12.0" Round OGS-4** L= 3.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 53.25' / 52.90' S= 0.1167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	53.75'	**12.0" Round By-Pass** L= 3.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 53.75' / 52.90' S= 0.2833 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.54 cfs @ 12.09 hrs HW=53.98' TW=53.63' (Dynamic Tailwater)
└**1=OGS-4** (Inlet Controls 1.54 cfs @ 2.52 fps)

Secondary OutFlow Max=1.12 cfs @ 12.19 hrs HW=54.81' TW=54.70' (Dynamic Tailwater)
└**2=By-Pass** (Inlet Controls 1.12 cfs @ 1.43 fps)

Pond DMH-9: DMH-9 (bypass)



Summary for Pond DS: Dry Stream

Inflow Area = 66,509 sf, 26.96% Impervious, Inflow Depth > 4.02" for 100-Year event
Inflow = 4.62 cfs @ 12.15 hrs, Volume= 22,255 cf
Outflow = 4.23 cfs @ 12.19 hrs, Volume= 22,207 cf, Atten= 8%, Lag= 2.6 min
Discarded = 0.05 cfs @ 12.19 hrs, Volume= 1,420 cf
Primary = 4.18 cfs @ 12.19 hrs, Volume= 20,787 cf
Routed to Pond FP-7 : FP-7/INF-5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 55.42' @ 12.19 hrs Surf.Area= 729 sf Storage= 560 cf

Plug-Flow detention time= 4.6 min calculated for 22,207 cf (100% of inflow)
Center-of-Mass det. time= 3.3 min (806.5 - 803.2)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	2,359 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

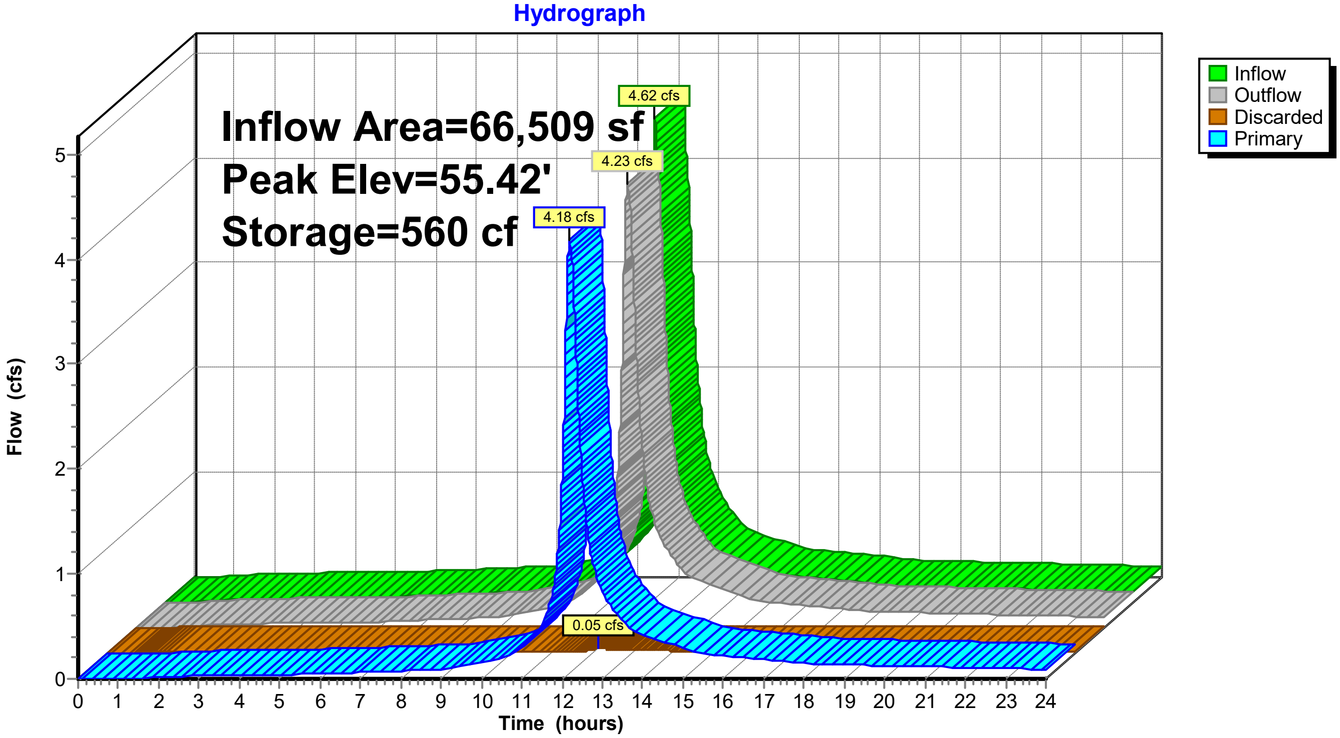
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
54.00	121	64.0	0	0	121
55.00	526	236.0	300	300	4,230
56.00	1,068	524.0	781	1,081	21,652
57.00	1,500	613.0	1,278	2,359	29,725

Device	Routing	Invert	Outlet Devices
#1	Discarded	54.00'	**3.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.10'
#2	Primary	54.15'	**15.0" Round Overflow** L= 48.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 54.15' / 53.75' S= 0.0083 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=0.05 cfs @ 12.19 hrs HW=55.42' (Free Discharge)
└**1=Exfiltration** (Controls 0.05 cfs)

Primary OutFlow Max=4.18 cfs @ 12.19 hrs HW=55.42' TW=54.43' (Dynamic Tailwater)
└**2=Overflow** (Inlet Controls 4.18 cfs @ 3.40 fps)

Pond DS: Dry Stream



Summary for Pond FP-1: FP-1

Inflow Area = 12,471 sf, 83.62% Impervious, Inflow Depth > 7.38" for 100-Year event
Inflow = 2.24 cfs @ 12.13 hrs, Volume= 7,668 cf
Outflow = 1.00 cfs @ 12.24 hrs, Volume= 7,647 cf, Atten= 55%, Lag= 6.7 min
Discarded = 0.47 cfs @ 12.24 hrs, Volume= 5,205 cf
Primary = 0.53 cfs @ 11.95 hrs, Volume= 2,567 cf
Routed to Pond INF-3 : INF-3
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond CB-7 : CB-7

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.39' @ 12.24 hrs Surf.Area= 962 sf Storage= 1,260 cf

Plug-Flow detention time= 36.4 min calculated for 7,645 cf (100% of inflow)
Center-of-Mass det. time= 34.5 min (780.5 - 746.0)

Volume	Invert	Avail.Storage	Storage Description
#1	47.22'	32 cf	**8.00'W x 9.00'L x 2.25'H FP (mulch/media/stone)**
			162 cf Overall x 20.0% Voids
#2	49.47'	1,648 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#3A	43.43'	168 cf	**11.87'W x 13.38'L x 4.29'H Field A**
			682 cf Overall - 262 cf Embedded = 420 cf x 40.0% Voids
#4A	43.68'	249 cf	**Ferguson R-Tank HD 2.5** x 24 Inside #3
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			24 Chambers in 6 Rows
		2,098 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
49.47	68	30.0	0	0	68
50.00	375	76.0	106	106	457
51.00	539	88.0	455	561	634
52.25	1,250	260.0	1,087	1,648	5,402

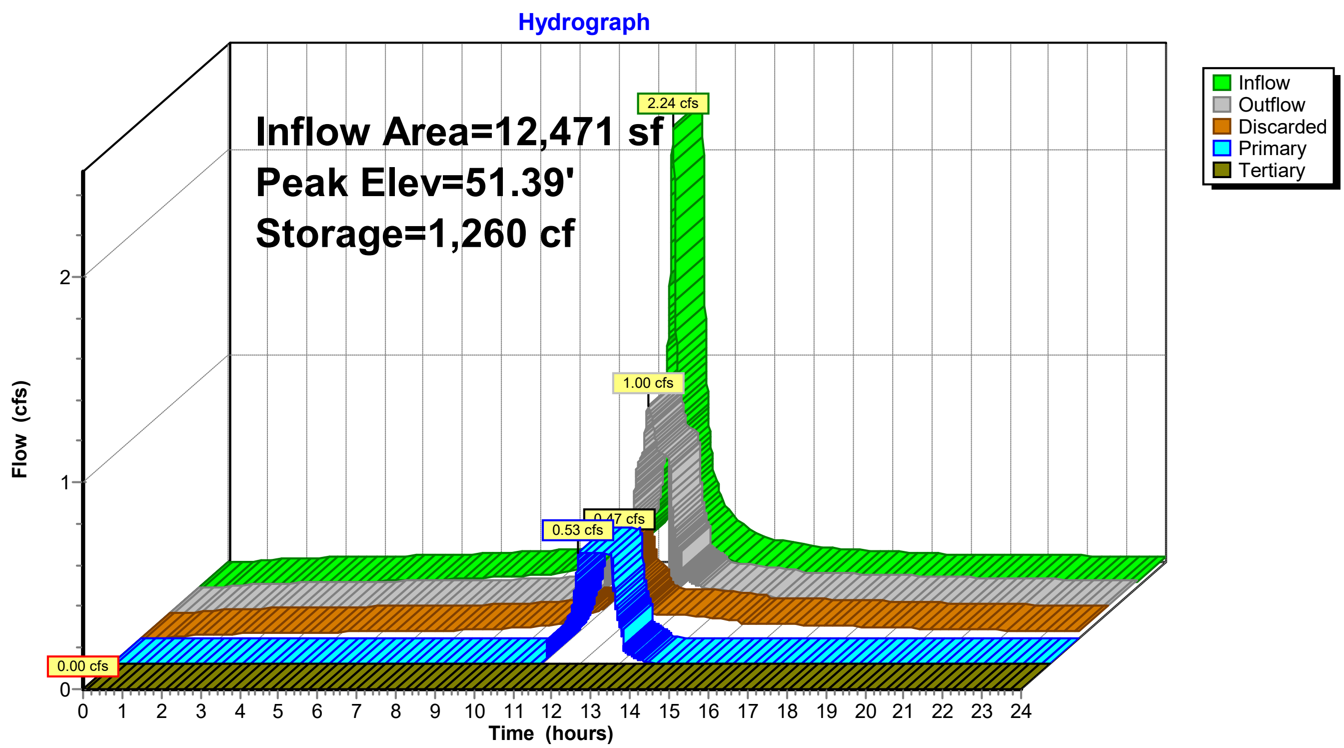
Device	Routing	Invert	Outlet Devices
#1	Primary	46.47'	**12.0" Round Culvert** L= 118.0' CPP, mitered to conform to fill, Ke= 0.700
			Inlet / Outlet Invert= 46.47' / 45.58' S= 0.0075 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	51.50'	**18.0" Horiz. Dome Grate(OF-1)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	47.22'	**100.000 in/hr Focal Point Media over Surface area from 47.22' - 49.80'**
			Excluded Surface area = 231 sf Phase-In= 0.01'
#4	Discarded	49.80'	**2.810 in/hr Bowl Exfiltration over Surface area above 49.80'**
			Excluded Surface area = 461 sf Phase-In= 0.01'
#5	Discarded	43.43'	**8.270 in/hr R Tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#6	Tertiary	52.20'	**3.5' long x 2.0' breadth BSpillway**
			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=0.47 cfs @ 12.24 hrs HW=51.39' (Free Discharge)
4=Bowl Exfiltration (Exfiltration Controls 0.03 cfs)
5=R Tank Exfiltration (Controls 0.43 cfs)

Primary OutFlow Max=0.53 cfs @ 11.95 hrs HW=49.81' TW=44.40' (Dynamic Tailwater)
1=Culvert (Passes 0.53 cfs of 4.87 cfs potential flow)
2=Dome Grate(OF-1) (Controls 0.00 cfs)
3=Focal Point Media (Exfiltration Controls 0.53 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=43.43' TW=46.40' (Dynamic Tailwater)
6=BSpillway (Controls 0.00 cfs)

Pond FP-1: FP-1



Summary for Pond FP-2: FP-2

Inflow Area = 8,047 sf, 72.78% Impervious, Inflow Depth > 6.62" for 100-Year event
Inflow = 1.29 cfs @ 12.13 hrs, Volume= 4,437 cf
Outflow = 1.25 cfs @ 12.15 hrs, Volume= 4,436 cf, Atten= 3%, Lag= 1.0 min
Discarded = 0.21 cfs @ 12.36 hrs, Volume= 3,385 cf
Primary = 1.25 cfs @ 12.29 hrs, Volume= 1,153 cf
Routed to Pond DMH-4 : DMH-4
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond FP-1 : FP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 53.12' @ 12.36 hrs Surf.Area= 606 sf Storage= 711 cf
Flood Elev= 53.75' Surf.Area= 945 sf Storage= 1,046 cf

Plug-Flow detention time= 34.7 min calculated for 4,436 cf (100% of inflow)
Center-of-Mass det. time= 34.7 min (785.7 - 751.0)

Volume	Invert	Avail.Storage	Storage Description
#1	50.05'	25 cf	**8.00'W x 9.00'L x 1.75'H FP (mulch/media)**
			126 cf Overall x 20.0% Voids
#2	51.80'	760 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#3A	45.76'	168 cf	**11.87'W x 13.38'L x 4.29'H Field A**
			682 cf Overall - 262 cf Embedded = 420 cf x 40.0% Voids
#4A	46.01'	249 cf	**Ferguson R-Tank HD 2.5** x 24 Inside #3
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			24 Chambers in 6 Rows
		1,202 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
51.80	69	30.6	0	0	69
52.00	112	38.0	18	18	110
53.00	321	60.0	208	225	288
53.95	845	157.0	534	760	1,967

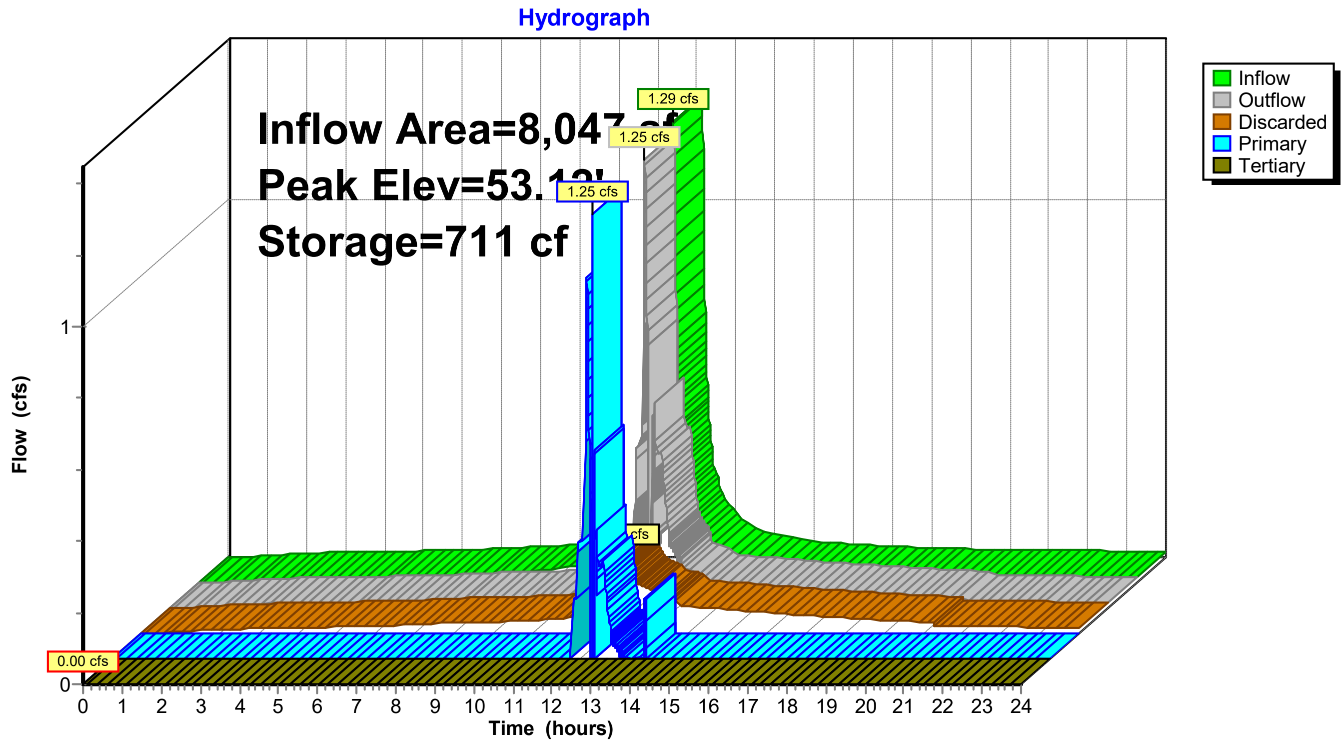
Device	Routing	Invert	Outlet Devices
#1	Primary	49.40'	**12.0" Round Overflow** L= 10.0' CPP, mitered to conform to fill, Ke= 0.700
			Inlet / Outlet Invert= 49.40' / 49.15' S= 0.0250 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	52.85'	**18.0" Horiz. Dome Grate (OF-2)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	49.55'	**100.000 in/hr Focal Point Media over Surface area from 49.55' - 51.80'**
			Excluded Surface area = 159 sf Phase-In= 0.01'
#4	Discarded	45.76'	**8.270 in/hr R Tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#5	Discarded	51.80'	**3.000 in/hr Bowl Exfiltration over Surface area above 51.80'**
			Excluded Surface area = 300 sf Phase-In= 0.01'
#6	Tertiary	53.90'	**3.5' long x 2.0' breadth Spillway**
			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=0.21 cfs @ 12.36 hrs HW=53.12' (Free Discharge)
├**4=R Tank Exfiltration** (Controls 0.19 cfs)
└**5=Bowl Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 12.29 hrs HW=53.04' TW=53.68' (Dynamic Tailwater)
└**1=Overflow** (Controls 0.00 cfs)
 ├**2=Dome Grate (OF-2)** (Controls 0.00 cfs)
 └**3=Focal Point Media** (Passes 0.00 cfs of 0.33 cfs potential flow)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=45.76' TW=43.43' (Dynamic Tailwater)
└**6=Spillway** (Controls 0.00 cfs)

Pond FP-2: FP-2



Summary for Pond FP-3: FP-3

Inflow Area = 13,722 sf, 58.52% Impervious, Inflow Depth > 6.17" for 100-Year event
Inflow = 2.12 cfs @ 12.13 hrs, Volume= 7,051 cf
Outflow = 2.09 cfs @ 12.14 hrs, Volume= 7,023 cf, Atten= 1%, Lag= 0.7 min
Discarded = 0.32 cfs @ 12.14 hrs, Volume= 4,926 cf
Primary = 1.77 cfs @ 12.14 hrs, Volume= 2,107 cf
Routed to Pond DMH-4 : DMH-4
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond FP-1 : FP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 53.97' @ 12.14 hrs Surf.Area= 697 sf Storage= 836 cf
Flood Elev= 54.96' Surf.Area= 1,220 sf Storage= 1,539 cf

Plug-Flow detention time= 35.9 min calculated for 7,023 cf (100% of inflow)
Center-of-Mass det. time= 33.2 min (797.5 - 764.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	46.38'	168 cf	**11.87'W x 13.38'L x 4.29'H Field A**
			682 cf Overall - 262 cf Embedded = 420 cf x 40.0% Voids
#2A	46.63'	249 cf	**Ferguson R-Tank HD 2.5** x 24 Inside #1
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			24 Chambers in 6 Rows
#3	50.17'	34 cf	**8.00'W x 9.00'L x 2.33'H FP (mulch/media/stone)**
			168 cf Overall x 20.0% Voids
#4	52.50'	1,129 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
		1,579 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
52.50	68	30.6	0	0	68
53.00	210	58.0	66	66	262
54.00	476	104.0	334	400	861
55.00	1,015	183.0	729	1,129	2,671

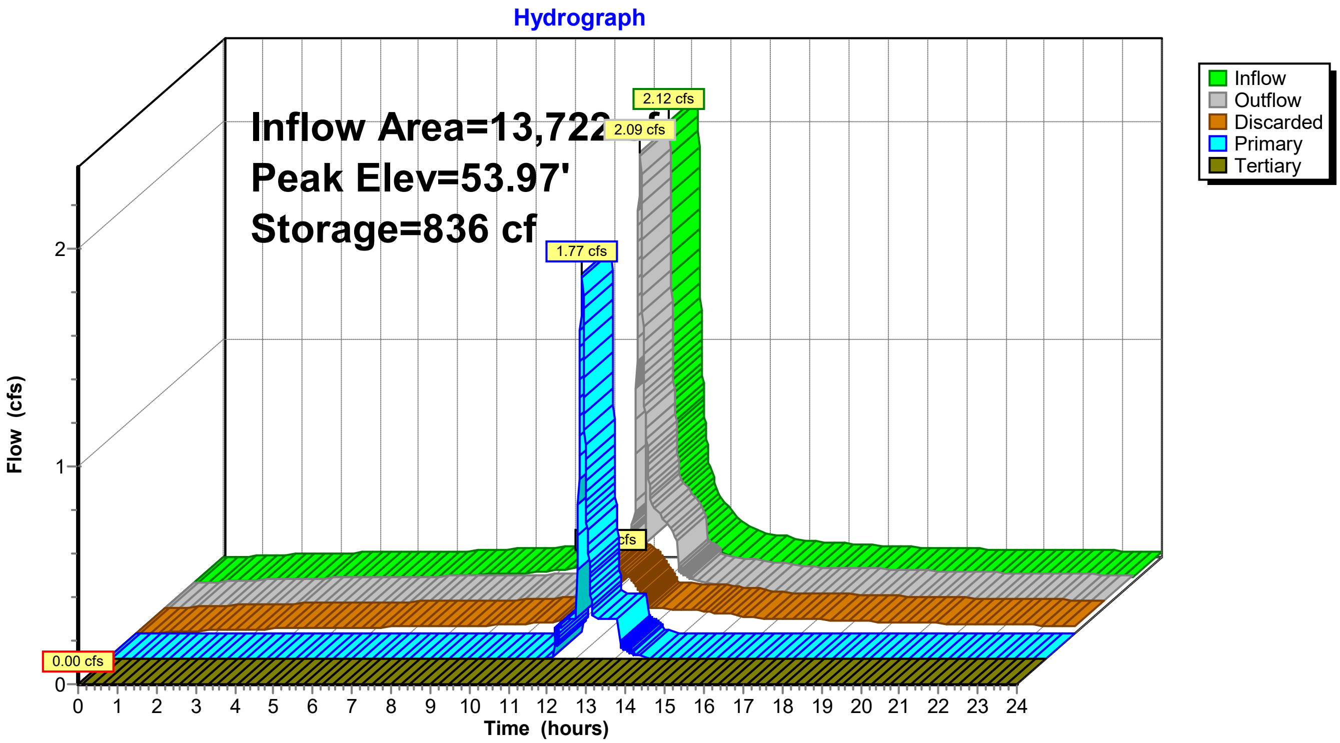
Device	Routing	Invert	Outlet Devices
#1	Primary	49.55'	**12.0" Round Culvert** L= 37.0' CPP, mitered to conform to fill, Ke= 0.700
			Inlet / Outlet Invert= 49.55' / 49.15' S= 0.0108 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	53.75'	**18.0" Horiz. Dome Grate (OF-3)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	50.22'	**100.000 in/hr Focal Point Media over Surface area from 50.22' - 52.55'**
			Excluded Surface area = 231 sf Phase-In= 0.01'
#4	Discarded	46.38'	**8.270 in/hr R tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#5	Discarded	52.80'	**3.000 in/hr Bowl Exfiltration over Wetted area above 52.80'**
			Excluded Wetted area = 697 sf Phase-In= 0.01'
#6	Tertiary	54.90'	**3.0' 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=0.32 cfs @ 12.14 hrs HW=53.97' (Free Discharge)
- **4=R tank Exfiltration** (Controls 0.28 cfs)
- **5=Bowl Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=1.76 cfs @ 12.14 hrs HW=53.97' TW=51.33' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.76 cfs of 5.43 cfs potential flow)
  - **2=Dome Grate (OF-3)** (Weir Controls 1.58 cfs @ 1.53 fps)
  - **3=Focal Point Media** (Exfiltration Controls 0.18 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.38' TW=43.43' (Dynamic Tailwater)
- **6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond FP-3: FP-3



Summary for Pond FP-4: FP-4

Inflow Area = 12,711 sf, 69.37% Impervious, Inflow Depth > 6.34" for 100-Year event
Inflow = 1.95 cfs @ 12.13 hrs, Volume= 6,710 cf
Outflow = 1.94 cfs @ 12.13 hrs, Volume= 6,632 cf, Atten= 0%, Lag= 0.3 min
Discarded = 0.07 cfs @ 12.30 hrs, Volume= 2,987 cf
Primary = 1.88 cfs @ 12.13 hrs, Volume= 3,725 cf
Routed to Pond DMH-5 : DMH-5
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond CB-6B,C : CB-6B,6C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 53.65' @ 12.30 hrs Surf.Area= 385 sf Storage= 417 cf
Flood Elev= 54.25' Surf.Area= 543 sf Storage= 574 cf

Plug-Flow detention time= 33.3 min calculated for 6,632 cf (99% of inflow)
Center-of-Mass det. time= 25.5 min (777.5 - 752.0)

Volume	Invert	Avail.Storage	Storage Description
#1	52.50'	303 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#2	50.75'	17 cf	**6.00'W x 8.00'L x 1.75'H FP (mulch/media)** 84 cf Overall x 20.0% Voids
#3A	46.88'	155 cf	**Ferguson R-Tank HD 2.5** x 15 Inside #4 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 15 Chambers in 5 Rows
#4A	46.63'	98 cf	**10.56'W x 9.04'L x 4.29'H Field A** 410 cf Overall - 164 cf Embedded = 246 cf x 40.0% Voids
		574 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
52.50	45	24.5	0	0	45
53.00	106	37.0	37	37	108
54.00	338	76.0	211	248	463
54.15	400	80.0	55	303	514

Device	Routing	Invert	Outlet Devices
#1	Primary	49.42'	**12.0" Round Culvert** L= 26.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 49.42' / 49.15' S= 0.0104 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	53.25'	**18.0" Horiz. Dome Grate (OF-4)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	47.74'	**100.000 in/hr Focal Point Media over Surface area from 47.74' - 51.50'** Excluded Surface area = 95 sf Phase-In= 0.01'
#4	Discarded	46.63'	**8.700 in/hr R Tank Exfiltration over Wetted area from 45.13' - 48.92'** Conductivity to Groundwater Elevation = 10.00' Excluded Wetted area = 0 sf Phase-In= 0.01'
#5	Discarded	51.50'	**3.000 in/hr Bowl Exfiltration over Wetted area above 51.50'** Conductivity to Groundwater Elevation = 10.00' Excluded Wetted area = 333 sf Phase-In= 0.01'
#6	Tertiary	54.10'	**3.5' long x 2.5' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00

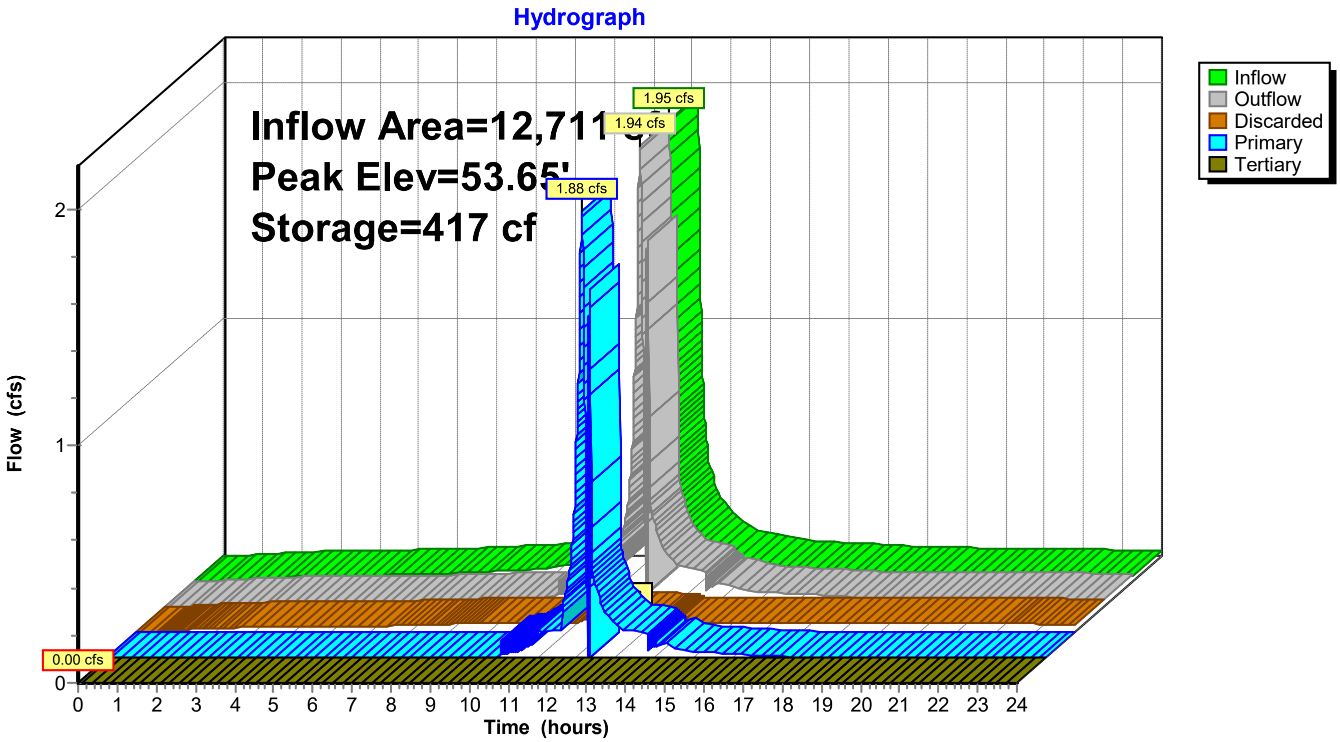
Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74 2.76 2.89 3.05 3.19 3.32

Discarded OutFlow Max=0.07 cfs @ 12.30 hrs HW=53.65' (Free Discharge)
4=R Tank Exfiltration (Controls 0.04 cfs)
5=Bowl Exfiltration (Controls 0.02 cfs)

Primary OutFlow Max=1.88 cfs @ 12.13 hrs HW=53.49' TW=51.19' (Dynamic Tailwater)
1=Culvert (Passes 1.88 cfs of 5.05 cfs potential flow)
2=Dome Grate (OF-4) (Weir Controls 1.77 cfs @ 1.59 fps)
3=Focal Point Media (Exfiltration Controls 0.11 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.63' TW=47.50' (Dynamic Tailwater)
6=Spillway (Controls 0.00 cfs)

Pond FP-4: FP-4



Summary for Pond FP-5: FP-5

Inflow Area = 9,281 sf, 84.56% Impervious, Inflow Depth > 7.44" for 100-Year event
Inflow = 1.68 cfs @ 12.13 hrs, Volume= 5,753 cf
Outflow = 1.67 cfs @ 12.14 hrs, Volume= 5,746 cf, Atten= 1%, Lag= 0.5 min
Discarded = 0.21 cfs @ 12.14 hrs, Volume= 3,806 cf
Primary = 1.46 cfs @ 12.14 hrs, Volume= 1,948 cf
Routed to Pond DB-A : DB-A
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond FP-4 : FP-4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 55.40' @ 12.14 hrs Surf.Area= 478 sf Storage= 563 cf
Flood Elev= 57.00' Surf.Area= 606 sf Storage= 921 cf

Plug-Flow detention time= 31.7 min calculated for 5,745 cf (100% of inflow)
Center-of-Mass det. time= 30.8 min (776.3 - 745.5)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	614 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#2	52.25'	17 cf	**6.00'W x 8.00'L x 1.75'H FP (mulch/media)** 84 cf Overall x 20.0% Voids
#3A	47.96'	135 cf	**10.56'W x 11.04'L x 4.29'H Field A** 500 cf Overall - 164 cf Embedded = 337 cf x 40.0% Voids
#4A	48.21'	155 cf	**Ferguson R-Tank HD 2.5** x 15 Inside #3 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 15 Chambers in 5 Rows
		921 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
54.00	45	24.5	0	0	45
55.00	267	76.7	141	141	468
56.35	441	85.7	473	614	628

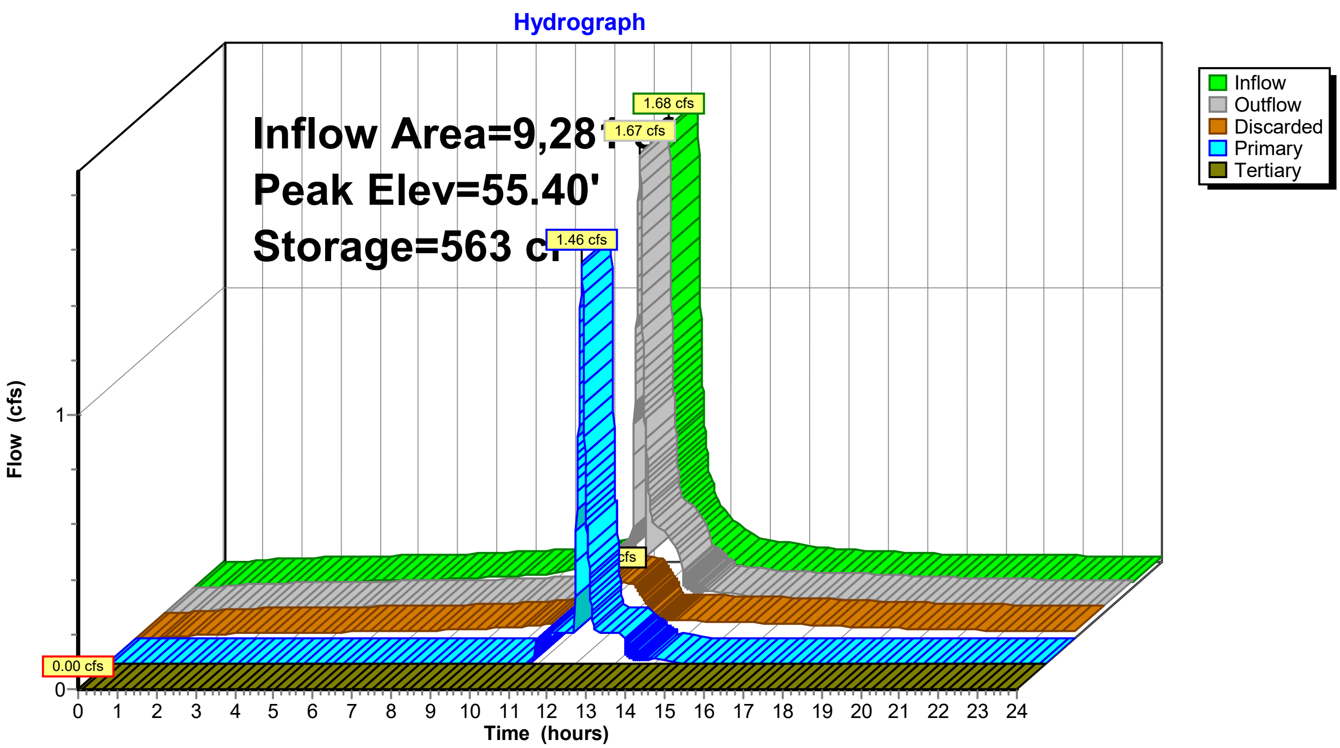
Device	Routing	Invert	Outlet Devices
#1	Primary	50.67'	**12.0" Round Culvert** L= 4.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.67' / 50.55' S= 0.0300 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	55.20'	**18.0" Horiz. Dome Grate (OF-5)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	50.55'	**100.000 in/hr Focal Point Media over Surface area from 50.55' - 52.55'** Excluded Surface area = 117 sf Phase-In= 0.01'
#4	Discarded	47.96'	**8.270 in/hr R-Tank Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#5	Discarded	52.80'	**3.000 in/hr Bowl Exfiltration over Surface area above 52.80'** Excluded Surface area = 165 sf Phase-In= 0.01'
#6	Tertiary	56.33'	**3.5' long x 2.5' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74 2.76 2.89 3.05 3.19 3.32

Discarded OutFlow Max=0.21 cfs @ 12.14 hrs HW=55.40' (Free Discharge)
├─**4=R-Tank Exfiltration** (Controls 0.19 cfs)
└─**5=Bowl Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=1.46 cfs @ 12.14 hrs HW=55.40' TW=52.09' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.46 cfs of 6.07 cfs potential flow)
  ├─**2=Dome Grate (OF-5)** (Weir Controls 1.35 cfs @ 1.45 fps)
  └─**3=Focal Point Media** (Exfiltration Controls 0.11 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=47.96' TW=46.63' (Dynamic Tailwater)
└─**6=Spillway** (Controls 0.00 cfs)

Pond FP-5: FP-5



Summary for Pond FP-6: FP-6

Inflow Area = 14,693 sf, 51.93% Impervious, Inflow Depth > 5.07" for 100-Year event
Inflow = 1.78 cfs @ 12.13 hrs, Volume= 6,204 cf
Outflow = 1.78 cfs @ 12.14 hrs, Volume= 6,153 cf, Atten= 0%, Lag= 0.3 min
Discarded = 0.14 cfs @ 12.14 hrs, Volume= 3,696 cf
Primary = 1.64 cfs @ 12.14 hrs, Volume= 2,497 cf
Routed to Pond OF-6 : OF-6
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond FP-5 : FP-5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 55.61' @ 12.14 hrs Surf.Area= 373 sf Storage= 406 cf

Plug-Flow detention time= 31.7 min calculated for 6,153 cf (99% of inflow)
Center-of-Mass det. time= 26.2 min (789.4 - 763.1)

Volume	Invert	Avail.Storage	Storage Description
#1	54.92'	857 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#2	53.17'	17 cf	**6.00'W x 8.00'L x 1.75'H FP (mulch/media)** 84 cf Overall x 20.0% Voids
#3A	48.88'	135 cf	**10.56'W x 11.04'L x 4.29'H Field A** 500 cf Overall - 164 cf Embedded = 337 cf x 40.0% Voids
#4A	49.13'	155 cf	**Ferguson R-Tank HD 2.5** x 15 Inside #3 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 15 Chambers in 5 Rows
		1,164 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
54.92	86	36.0	0	0	86
56.00	300	65.0	197	197	325
57.00	511	79.0	401	598	501
57.50	525	82.0	259	857	557

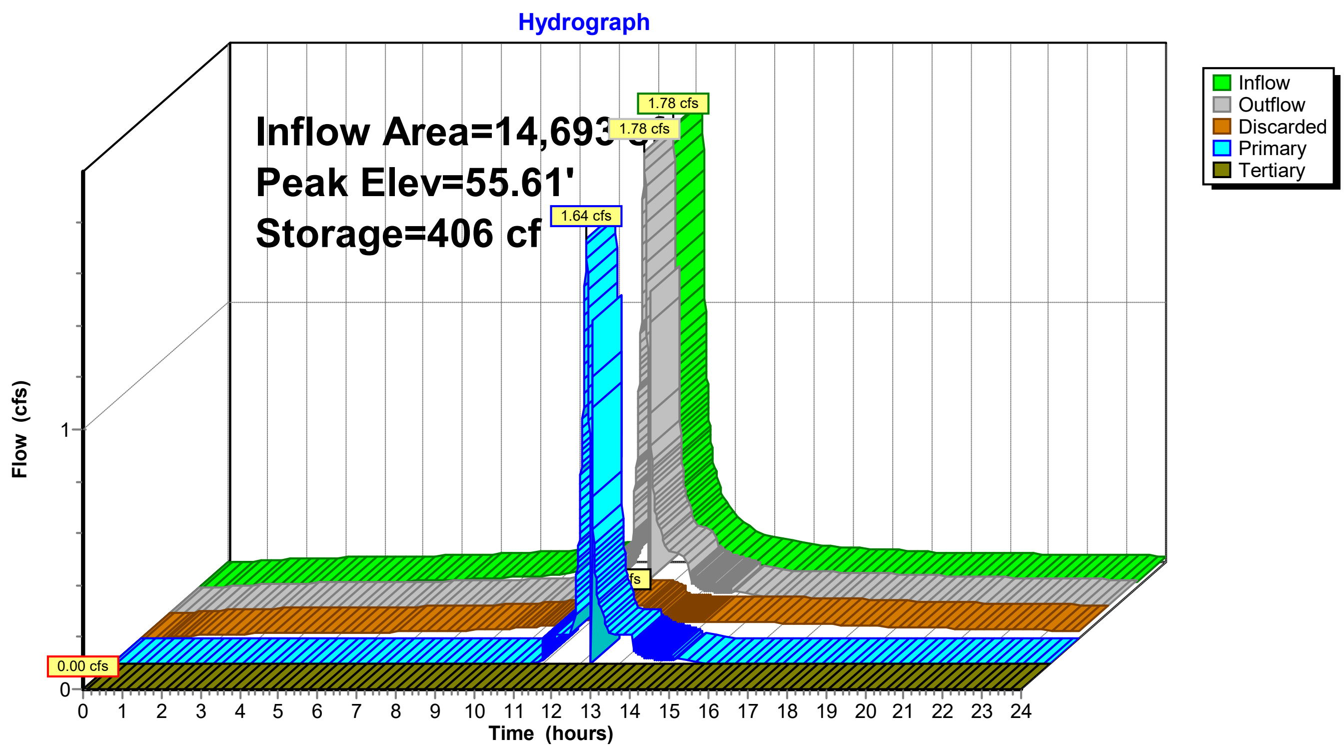
Device	Routing	Invert	Outlet Devices
#1	Primary	51.59'	**12.0" Round Culvert** L= 6.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 51.59' / 51.50' S= 0.0150 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	55.40'	**18.0" Horiz. Dome Grate (OF-6)** C= 0.600 Limited to weir flow at low heads
#3	Device 1	52.67'	**100.000 in/hr Focal Point Media over Surface area from 52.67' - 54.67'** Excluded Surface area = 117 sf Phase-In= 0.01'
#4	Discarded	48.88'	**8.270 in/hr R-Tank Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#5	Discarded	54.92'	**3.000 in/hr Bowl Exfiltration over Wetted area above 54.92'** Excluded Wetted area = 485 sf Phase-In= 0.01'
#6	Tertiary	57.38'	**3.5' long x 2.0' breadth Spillway** 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=0.14 cfs @ 12.14 hrs HW=55.61' (Free Discharge)
4=R-Tank Exfiltration (Controls 0.13 cfs)
5=Bowl Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=1.64 cfs @ 12.14 hrs HW=55.61' TW=52.99' (Dynamic Tailwater)
1=Culvert (Passes 1.64 cfs of 5.40 cfs potential flow)
2=Dome Grate (OF-6) (Weir Controls 1.53 cfs @ 1.51 fps)
3=Focal Point Media (Exfiltration Controls 0.11 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=48.88' TW=47.96' (Dynamic Tailwater)
6=Spillway (Controls 0.00 cfs)

Pond FP-6: FP-6



Summary for Pond FP-7: FP-7/INF-5

Inflow Area = 74,145 sf, 24.19% Impervious, Inflow Depth > 3.52" for 100-Year event
Inflow = 4.40 cfs @ 12.18 hrs, Volume= 21,739 cf
Outflow = 1.12 cfs @ 12.79 hrs, Volume= 21,052 cf, Atten= 74%, Lag= 36.6 min
Discarded = 1.12 cfs @ 12.79 hrs, Volume= 21,052 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond DMH-3 : DMH-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 54.81' @ 12.79 hrs Surf.Area= 11,138 sf Storage= 6,660 cf
Flood Elev= 57.18' Surf.Area= 2,830 sf Storage= 16,463 cf

Plug-Flow detention time= 79.5 min calculated for 21,047 cf (97% of inflow)
Center-of-Mass det. time= 60.9 min (874.5 - 813.7)

Volume	Invert	Avail.Storage	Storage Description
#1	51.90'	14,781 cf	**Graded Bowl (Irregular)** Listed below (Recalc)
#2	50.15'	17 cf	**8.00'W x 6.00'L x 1.75'H Media/Mulch**
			84 cf Overall x 20.0% Voids
#3A	45.86'	422 cf	**17.12'W x 32.15'L x 4.29'H Field A**
			2,364 cf Overall - 1,309 cf Embedded = 1,055 cf x 40.0% Voids
#4A	46.11'	1,244 cf	**Ferguson R-Tank HD 2.5** x 120 Inside #3
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			120 Chambers in 10 Rows
		16,463 cf	Total Available Storage

Storage Group A created with Chamber Wizard

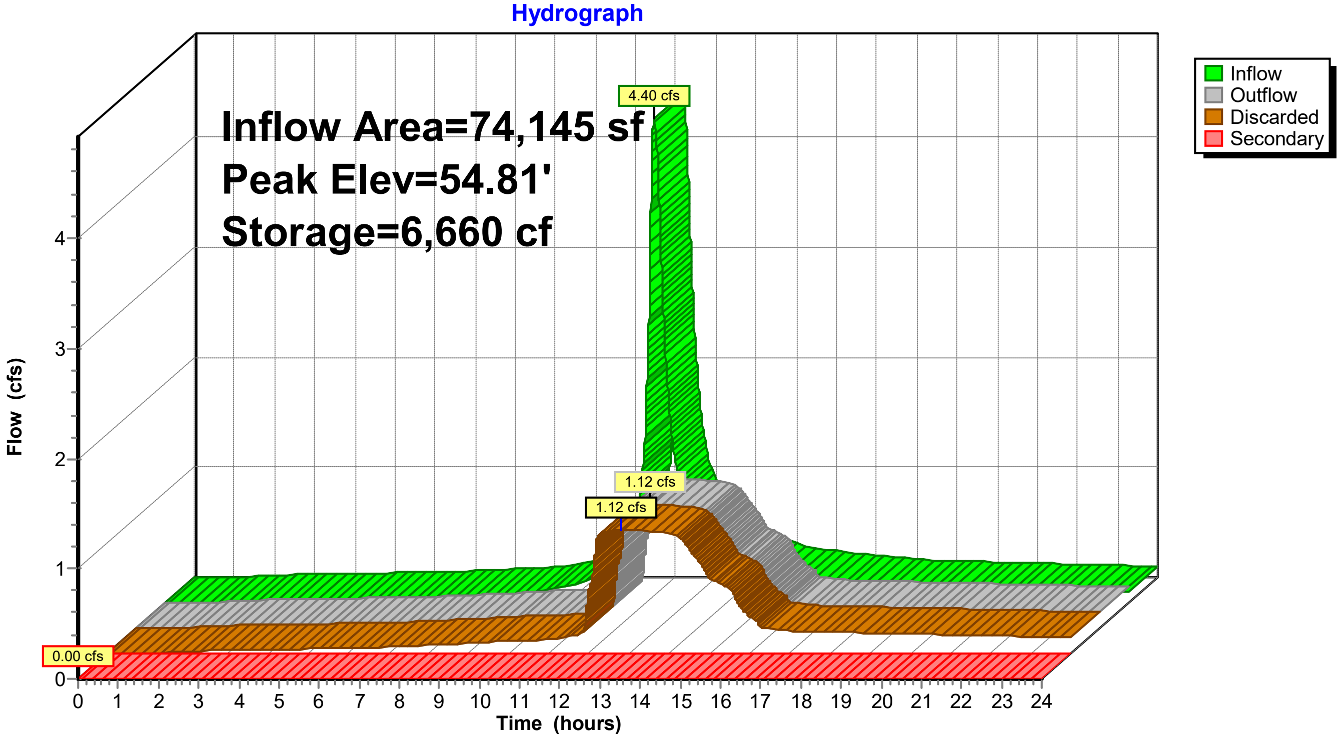
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
51.90	33	22.0	0	0	33
52.00	211	64.0	11	11	320
53.00	549	145.0	367	378	1,672
54.00	874	156.0	705	1,083	1,975
55.00	14,388	179.0	6,269	7,352	2,611
56.00	2,231	200.0	7,428	14,781	3,272

Device	Routing	Invert	Outlet Devices
#1	Discarded	52.00'	**3.000 in/hr RG Exfiltration over Surface area from 52.00' - 54.50'**
			Conductivity to Groundwater Elevation = 10.00'
			Excluded Surface area = 810 sf Phase-In= 0.01'
#2	Discarded	45.86'	**8.270 in/hr R-tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#3	Secondary	55.70'	**32.0" W x 9.0" H Vert. TR-7 (backflow)** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=1.12 cfs @ 12.79 hrs HW=54.81' (Free Discharge)
1=RG Exfiltration (Controls 0.38 cfs)
2=R-tank Exfiltration (Controls 0.74 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=45.86' TW=51.10' (Dynamic Tailwater)
3=TR-7 (backflow) (Controls 0.00 cfs)

Pond FP-7: FP-7/INF-5



Summary for Pond INF-1: INF-1

Inflow Area = 23,899 sf, 71.73% Impervious, Inflow Depth > 6.61" for 100-Year event
Inflow = 2.02 cfs @ 12.01 hrs, Volume= 13,159 cf
Outflow = 1.97 cfs @ 12.23 hrs, Volume= 13,158 cf, Atten= 3%, Lag= 13.1 min
Discarded = 0.26 cfs @ 12.50 hrs, Volume= 9,771 cf
Secondary = 1.72 cfs @ 12.23 hrs, Volume= 3,387 cf
Routed to Pond AB-1 : Attenuation Basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 51.82' @ 12.50 hrs Surf.Area= 636 sf Storage= 2,036 cf

Plug-Flow detention time= 50.4 min calculated for 13,154 cf (100% of inflow)
Center-of-Mass det. time= 50.4 min (805.4 - 755.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	46.00'	626 cf	**14.50'W x 43.88'L x 4.79'H Field A** 3,049 cf Overall - 1,483 cf Embedded = 1,566 cf x 40.0% Voids
#2A	46.25'	1,409 cf	**Ferguson R-Tank HD 2.5** x 136 Inside #1 Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf 136 Chambers in 8 Rows
		2,036 cf	Total Available Storage

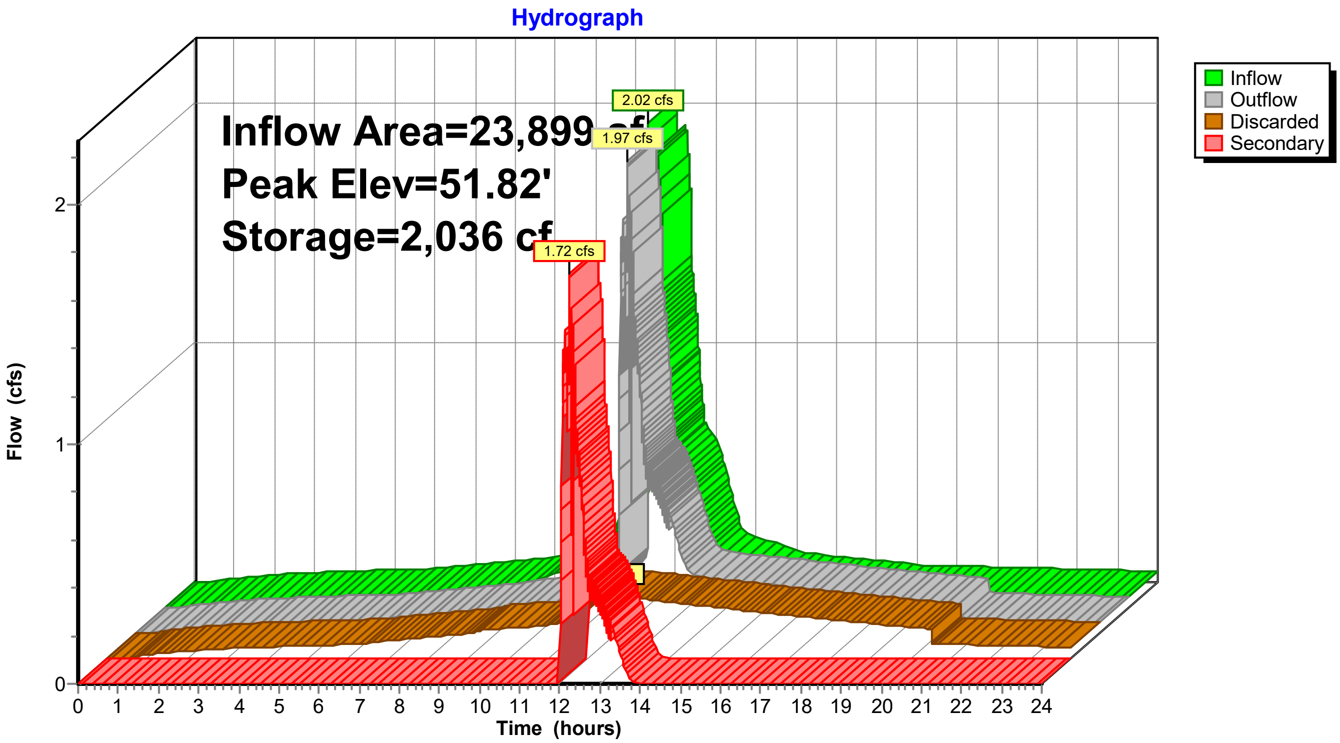
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	46.00'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#2	Secondary	50.25'	**12.0" Round Overflow** L= 14.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 50.25' / 50.10' S= 0.0107 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.26 cfs @ 12.50 hrs HW=51.82' (Free Discharge)
1=Exfiltration (Controls 0.26 cfs)

Secondary OutFlow Max=1.70 cfs @ 12.23 hrs HW=51.15' TW=50.86' (Dynamic Tailwater)
2=Overflow (Inlet Controls 1.70 cfs @ 2.28 fps)

Pond INF-1: INF-1



Summary for Pond INF-2: INF-2

Inflow Area = 104,046 sf, 64.30% Impervious, Inflow Depth = 1.91" for 100-Year event
Inflow = 9.62 cfs @ 12.15 hrs, Volume= 16,555 cf
Outflow = 6.81 cfs @ 12.29 hrs, Volume= 16,557 cf, Atten= 29%, Lag= 8.3 min
Discarded = 0.58 cfs @ 12.29 hrs, Volume= 9,529 cf
Secondary = 6.23 cfs @ 12.29 hrs, Volume= 7,029 cf
Routed to Pond DMH-3 : DMH-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 54.86' @ 12.29 hrs Surf.Area= 1,566 sf Storage= 6,187 cf
Flood Elev= 54.00' Surf.Area= 1,566 sf Storage= 6,187 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 63.0 min (805.2 - 742.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	47.64'	1,398 cf	**21.06'W x 74.37'L x 5.45'H Field A**
			8,536 cf Overall - 5,042 cf Embedded = 3,494 cf x 40.0% Voids
#2A	47.89'	4,790 cf	**Ferguson R-Tank HD 3** x 390 Inside #1
			Inside= 15.7"W x 50.4"H => 5.24 sf x 2.35'L = 12.3 cf
			Outside= 15.7"W x 50.4"H => 5.51 sf x 2.35'L = 12.9 cf
			390 Chambers in 13 Rows
		6,187 cf	Total Available Storage

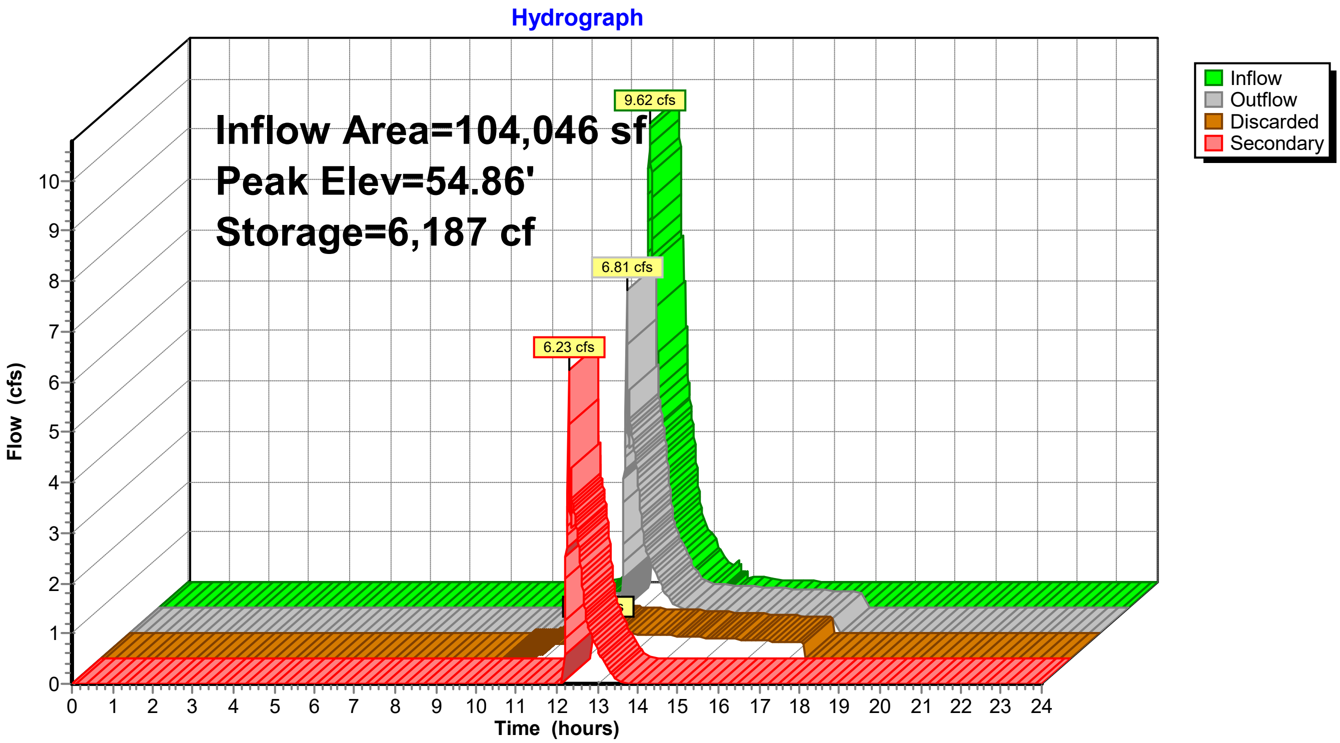
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	47.64'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00'
#2	Secondary	51.35'	**15.0" Round Culvert** L= 24.0' CPP, end-section conforming to fill, Ke= 0.500
			Inlet / Outlet Invert= 51.35' / 51.10' S= 0.0104 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=0.58 cfs @ 12.29 hrs HW=54.81' (Free Discharge)
↑**1=Exfiltration** (Controls 0.58 cfs)

Secondary OutFlow Max=4.86 cfs @ 12.29 hrs HW=54.85' TW=54.18' (Dynamic Tailwater)
↑**2=Culvert** (Inlet Controls 4.86 cfs @ 3.96 fps)

Pond INF-2: INF-2



Summary for Pond INF-3: INF-3

Inflow Area = 38,595 sf, 60.69% Impervious, Inflow Depth > 4.05" for 100-Year event
Inflow = 3.49 cfs @ 12.14 hrs, Volume= 13,020 cf
Outflow = 1.72 cfs @ 12.44 hrs, Volume= 13,019 cf, Atten= 51%, Lag= 18.4 min
Discarded = 0.44 cfs @ 12.44 hrs, Volume= 12,108 cf
Secondary = 1.28 cfs @ 12.44 hrs, Volume= 911 cf
Routed to Pond SP 4 : Study Point

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 49.88' @ 12.44 hrs Surf.Area= 1,112 sf Storage= 4,300 cf

Plug-Flow detention time= 79.6 min calculated for 13,016 cf (100% of inflow)
Center-of-Mass det. time= 79.5 min (837.0 - 757.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	43.00'	1,058 cf	**18.44'W x 60.30'L x 5.45'H Field A** 6,058 cf Overall - 3,413 cf Embedded = 2,645 cf x 40.0% Voids
#2A	43.25'	3,242 cf	**Ferguson R-Tank HD 3** x 264 Inside #1 Inside= 15.7"W x 50.4"H => 5.24 sf x 2.35'L = 12.3 cf Outside= 15.7"W x 50.4"H => 5.51 sf x 2.35'L = 12.9 cf 264 Chambers in 11 Rows
		4,300 cf	Total Available Storage

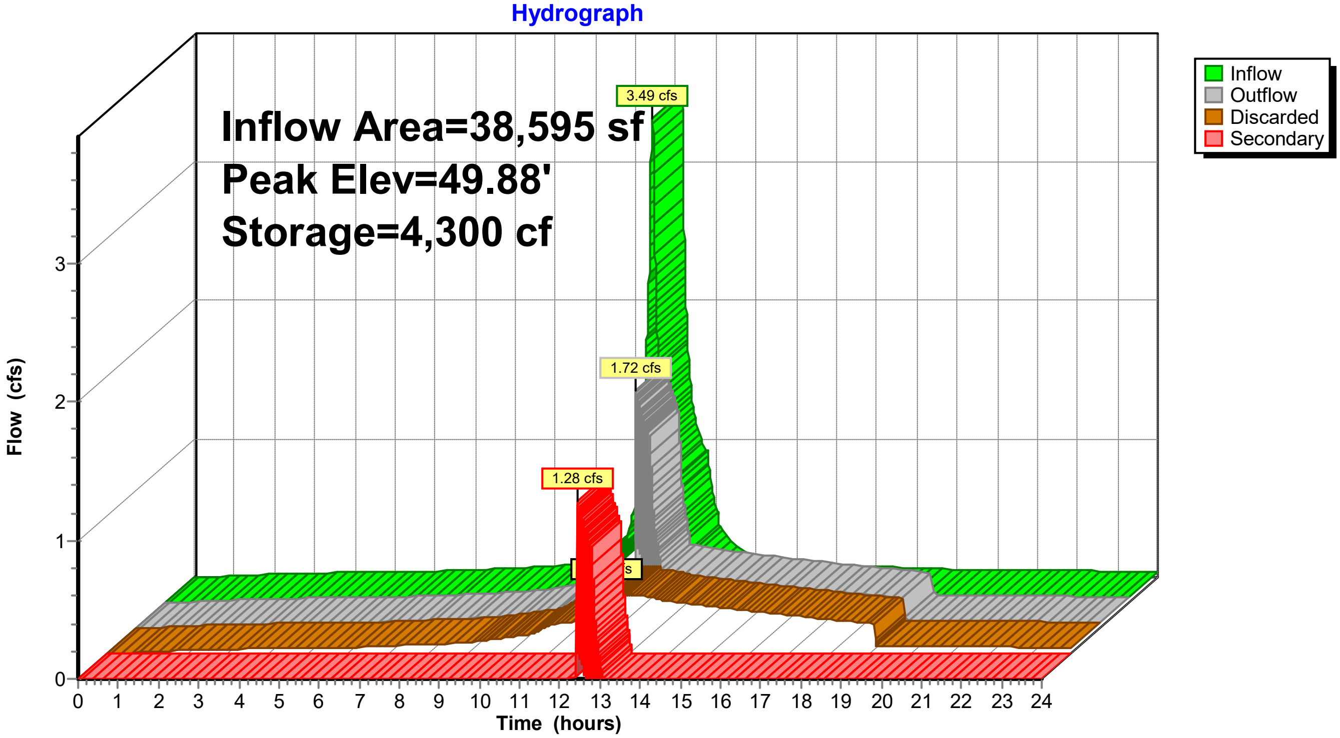
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	43.00'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#2	Secondary	49.80'	**24.0" x 24.0" Horiz. CB-6A** C= 0.600 Limited to weir flow at low heads
#3	Secondary	49.80'	**24.0" x 24.0" Horiz. CB-7** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.44 cfs @ 12.44 hrs HW=49.88' (Free Discharge)
└─**1=Exfiltration** (Controls 0.44 cfs)

Secondary OutFlow Max=1.28 cfs @ 12.44 hrs HW=49.88' TW=0.00' (Dynamic Tailwater)
├─**2=CB-6A** (Weir Controls 0.64 cfs @ 0.95 fps)
└─**3=CB-7** (Weir Controls 0.64 cfs @ 0.95 fps)

Pond INF-3: INF-3



Summary for Pond INF-4: INF-4

Inflow Area = 45,592 sf, 62.99% Impervious, Inflow Depth > 6.03" for 100-Year event
Inflow = 5.76 cfs @ 12.14 hrs, Volume= 22,902 cf
Outflow = 4.71 cfs @ 12.27 hrs, Volume= 22,900 cf, Atten= 18%, Lag= 8.0 min
Discarded = 0.53 cfs @ 12.28 hrs, Volume= 17,853 cf
Secondary = 4.18 cfs @ 12.27 hrs, Volume= 5,124 cf
Routed to Pond OF-6 : OF-6

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 58.53' @ 12.28 hrs Surf.Area= 1,468 sf Storage= 5,494 cf
Flood Elev= 57.18' Surf.Area= 1,468 sf Storage= 5,494 cf

Plug-Flow detention time= 55.0 min calculated for 22,894 cf (100% of inflow)
Center-of-Mass det. time= 54.9 min (811.7 - 756.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	50.32'	1,023 cf	**21.06'W x 69.68'L x 4.95'H Field A** 7,264 cf Overall - 4,706 cf Embedded = 2,558 cf x 40.0% Voids
#2A	50.57'	4,471 cf	**Ferguson R-Tank HD 3** x 364 Inside #1 Inside= 15.7"W x 50.4"H => 5.24 sf x 2.35'L = 12.3 cf Outside= 15.7"W x 50.4"H => 5.51 sf x 2.35'L = 12.9 cf 364 Chambers in 13 Rows
		5,494 cf	Total Available Storage

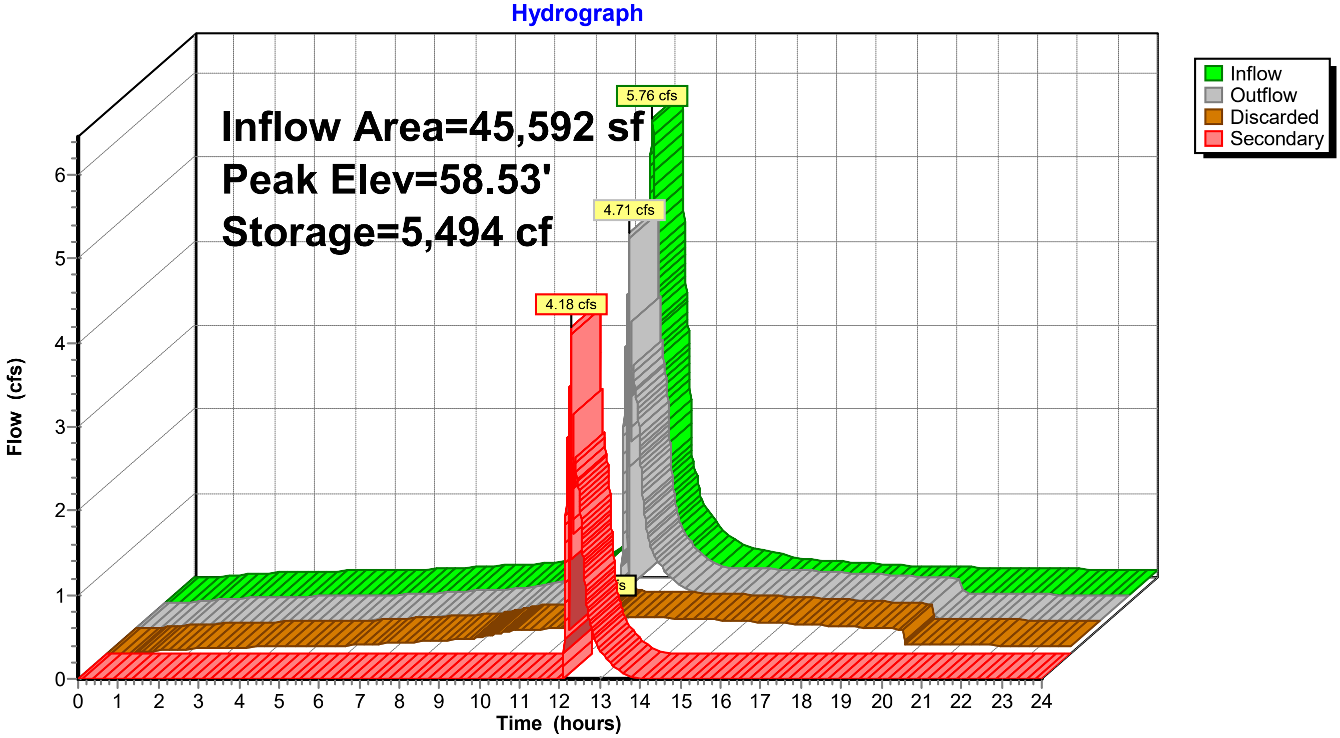
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	50.32'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'
#2	Secondary	53.52'	**12.0" Round Overflow** L= 86.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 53.52' / 51.40' S= 0.0247 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.53 cfs @ 12.28 hrs HW=58.47' (Free Discharge)
└─**1=Exfiltration** (Controls 0.53 cfs)

Secondary OutFlow Max=4.05 cfs @ 12.27 hrs HW=58.18' TW=56.53' (Dynamic Tailwater)
└─**2=Overflow** (Outlet Controls 4.05 cfs @ 5.15 fps)

Pond INF-4: INF-4



Summary for Pond INF-6: INF-6

Inflow Area = 19,023 sf, 56.89% Impervious, Inflow Depth > 5.86" for 100-Year event
Inflow = 2.76 cfs @ 12.13 hrs, Volume= 9,294 cf
Outflow = 0.73 cfs @ 12.36 hrs, Volume= 9,293 cf, Atten= 74%, Lag= 13.6 min
Discarded = 0.73 cfs @ 12.36 hrs, Volume= 9,293 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 57.33' @ 12.36 hrs Surf.Area= 2,717 sf Storage= 2,674 cf

Plug-Flow detention time= 57.2 min calculated for 9,293 cf (100% of inflow)
Center-of-Mass det. time= 57.2 min (821.1 - 764.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	50.46'	663 cf	**Ferguson R-Tank HD 2.5** x 64 Inside #2
			Inside= 15.7"W x 42.5"H => 4.42 sf x 2.35'L = 10.4 cf
			Outside= 15.7"W x 42.5"H => 4.65 sf x 2.35'L = 10.9 cf
			64 Chambers in 8 Rows
#2A	50.21'	288 cf	**14.50'W x 22.77'L x 4.29'H Field A**
			1,417 cf Overall - 698 cf Embedded = 719 cf x 40.0% Voids
#3	56.00'	4,508 cf	**Depression (Irregular)** Listed below (Recalc)
		5,459 cf	Total Available Storage

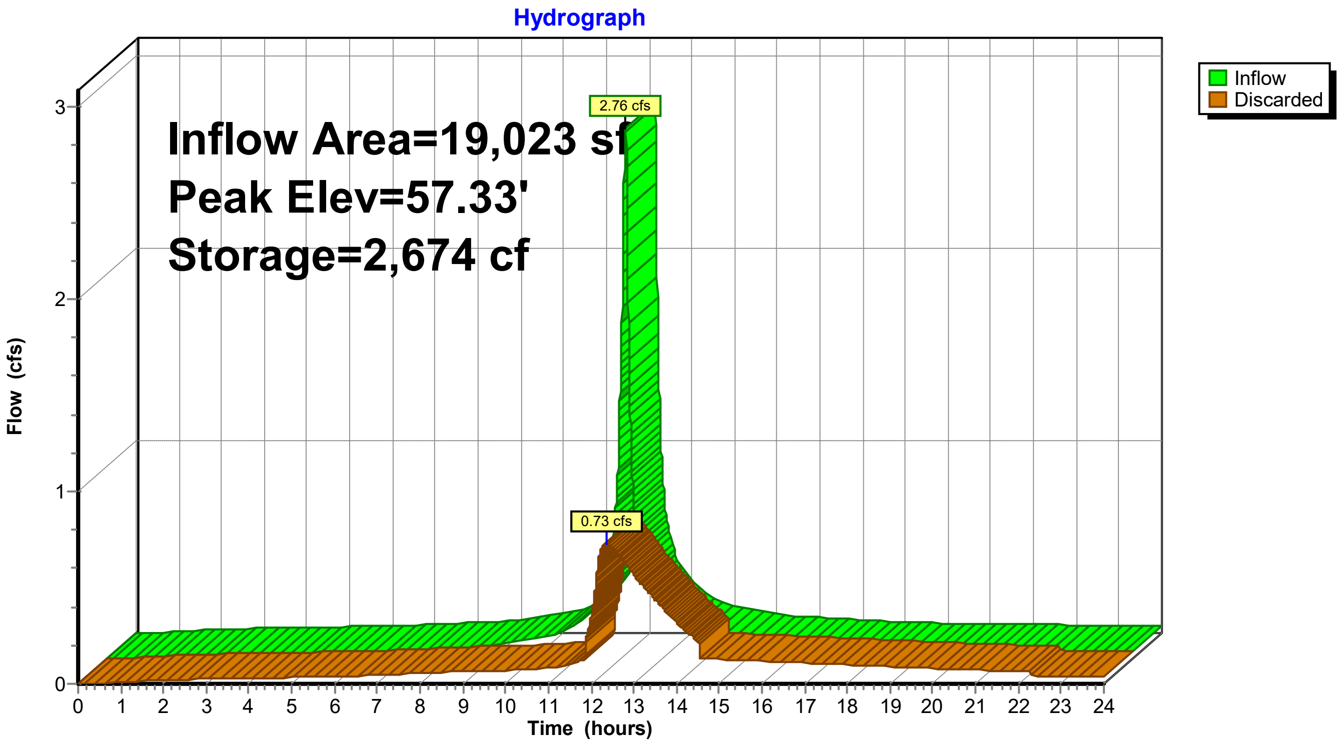
Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
56.00	361	76.0	0	0	361
57.00	1,869	162.0	1,017	1,017	1,994
58.00	3,616	269.0	2,695	3,712	5,670
58.20	4,360	285.0	796	4,508	6,378

Device	Routing	Invert	Outlet Devices
#1	Discarded	50.21'	**8.270 in/hr R Tank Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 10.00' Phase-In= 0.01'

Discarded OutFlow Max=0.73 cfs @ 12.36 hrs HW=57.33' (Free Discharge)
↑**1=R Tank Exfiltration** (Controls 0.73 cfs)

Pond INF-6: INF-6



Summary for Pond OF-6: OF-6

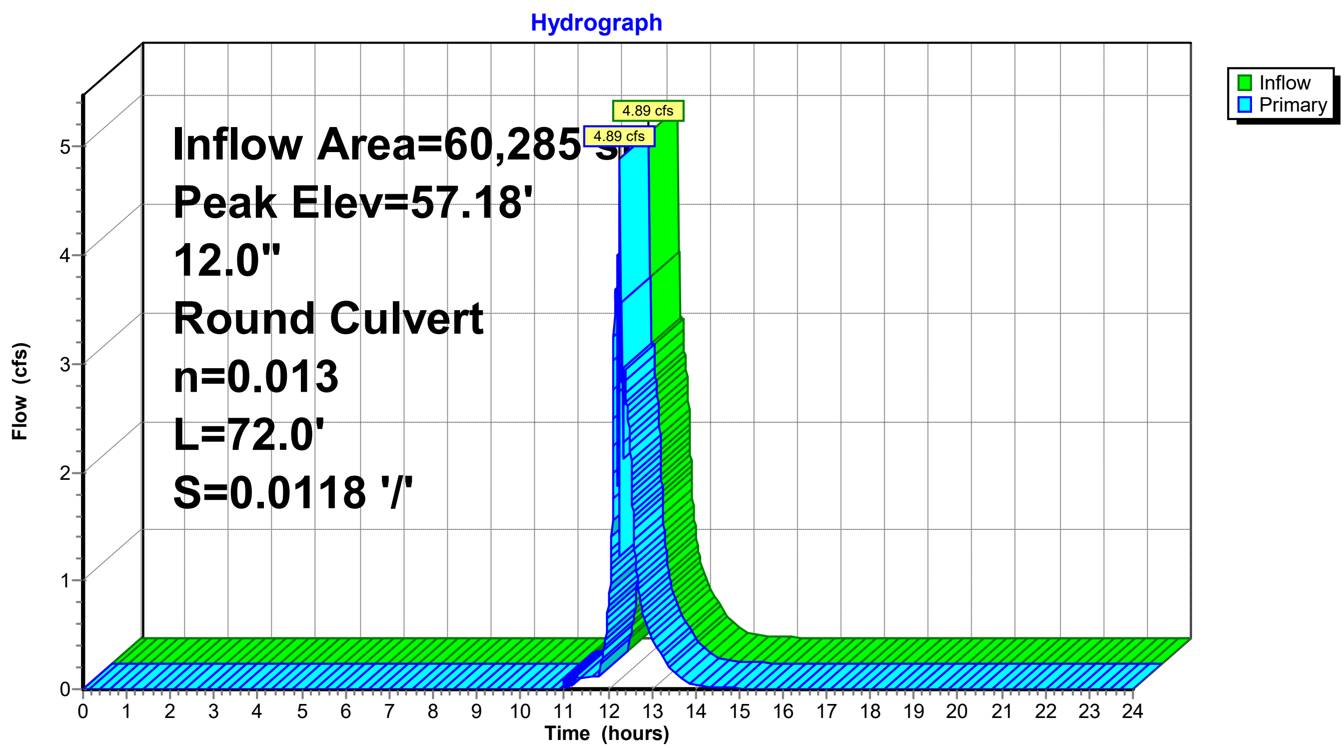
Inflow Area = 60,285 sf, 60.30% Impervious, Inflow Depth = 1.52" for 100-Year event
Inflow = 4.89 cfs @ 12.28 hrs, Volume= 7,621 cf
Outflow = 4.89 cfs @ 12.28 hrs, Volume= 7,621 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.89 cfs @ 12.28 hrs, Volume= 7,621 cf
Routed to Pond DB-A : DB-A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3
Peak Elev= 57.18' @ 12.28 hrs
Flood Elev= 54.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.40'	**12.0" Round Culvert** L= 72.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 51.40' / 50.55' S= 0.0118 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=4.72 cfs @ 12.28 hrs HW=57.06' TW=54.84' (Dynamic Tailwater)
1=Culvert (Outlet Controls 4.72 cfs @ 6.00 fps)

Pond OF-6: OF-6

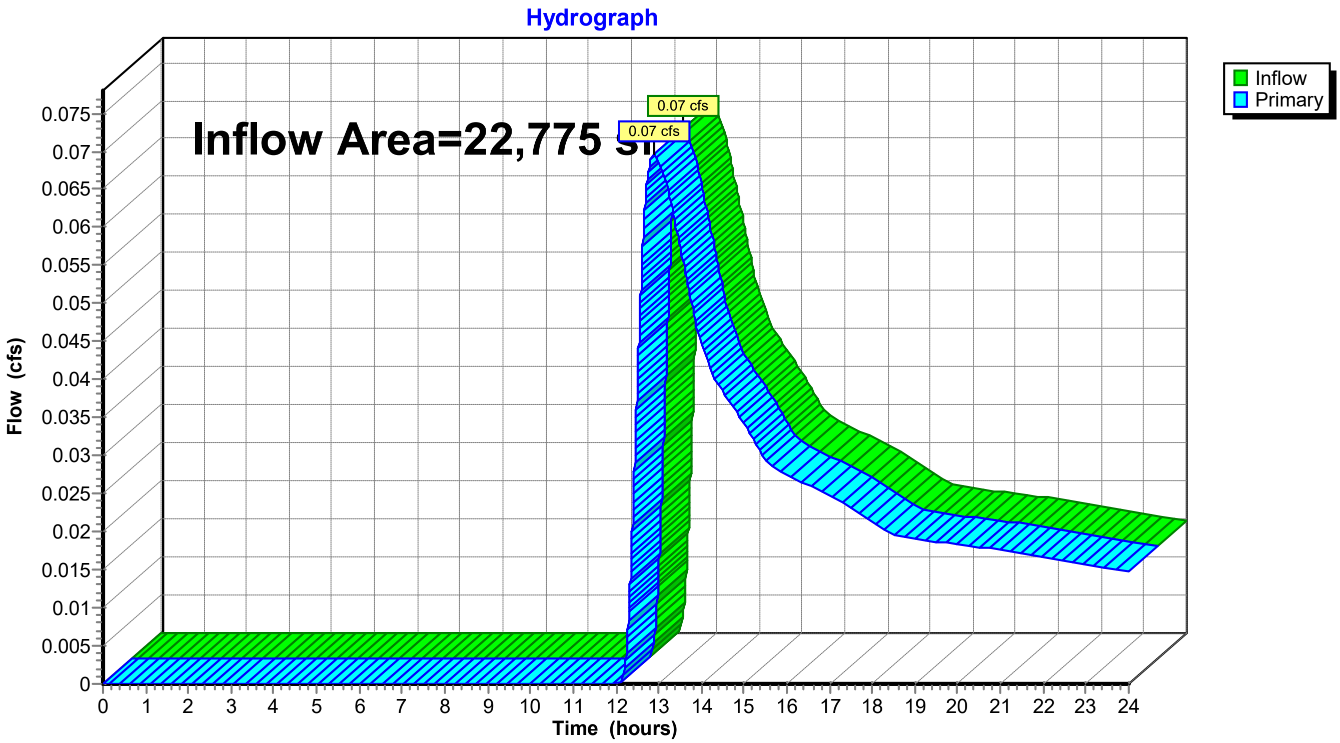


Summary for Pond SP 1: Study Point

Inflow Area = 22,775 sf, 0.00% Impervious, Inflow Depth > 0.60" for 100-Year event
Inflow = 0.07 cfs @ 12.91 hrs, Volume= 1,142 cf
Primary = 0.07 cfs @ 12.91 hrs, Volume= 1,142 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3

Pond SP 1: Study Point

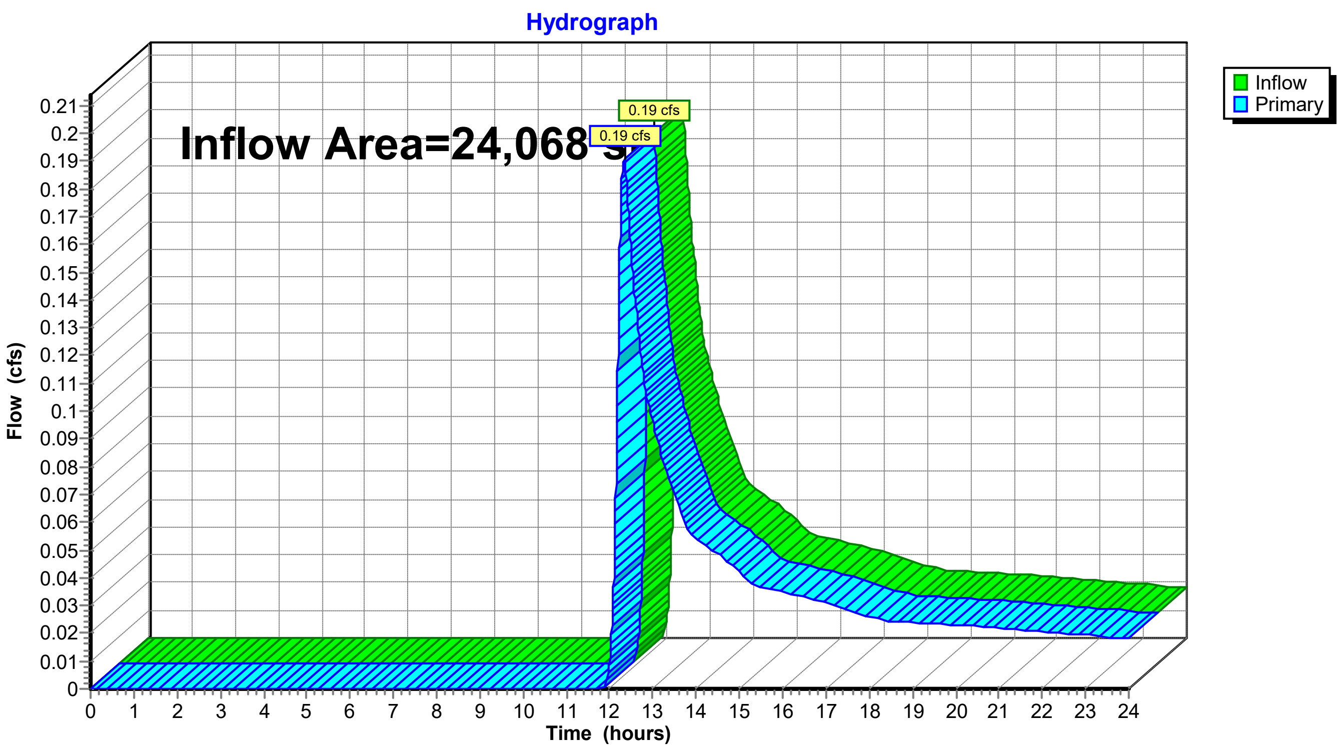


Summary for Pond SP 3: Study Point

Inflow Area = 24,068 sf, 0.00% Impervious, Inflow Depth > 0.85" for 100-Year event
Inflow = 0.19 cfs @ 12.34 hrs, Volume= 1,699 cf
Primary = 0.19 cfs @ 12.34 hrs, Volume= 1,699 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3

Pond SP 3: Study Point

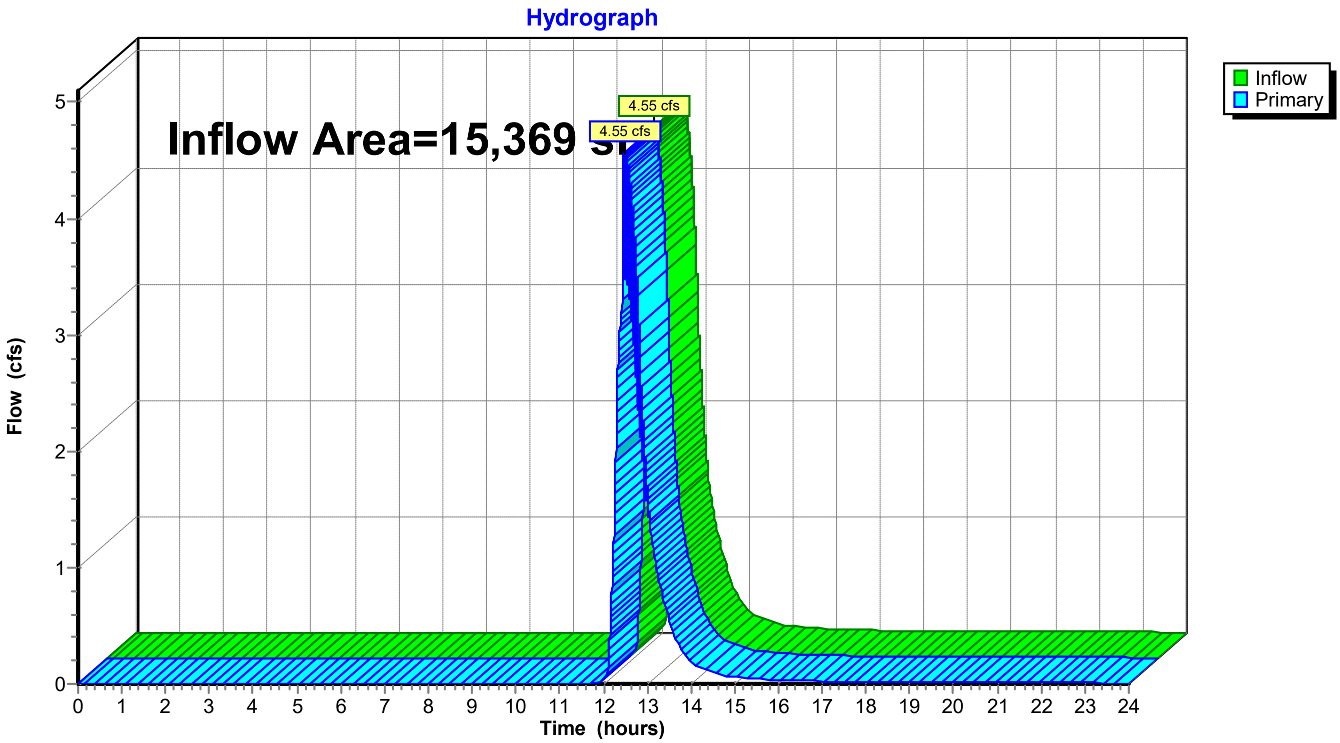


Summary for Pond SP 4: Study Point

Inflow Area =	15,369 sf,	0.00% Impervious, Inflow Depth > 9.19"	for 100-Year event
Inflow =	4.55 cfs @	12.49 hrs, Volume=	11,770 cf
Primary =	4.55 cfs @	12.49 hrs, Volume=	11,770 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3

Pond SP 4: Study Point

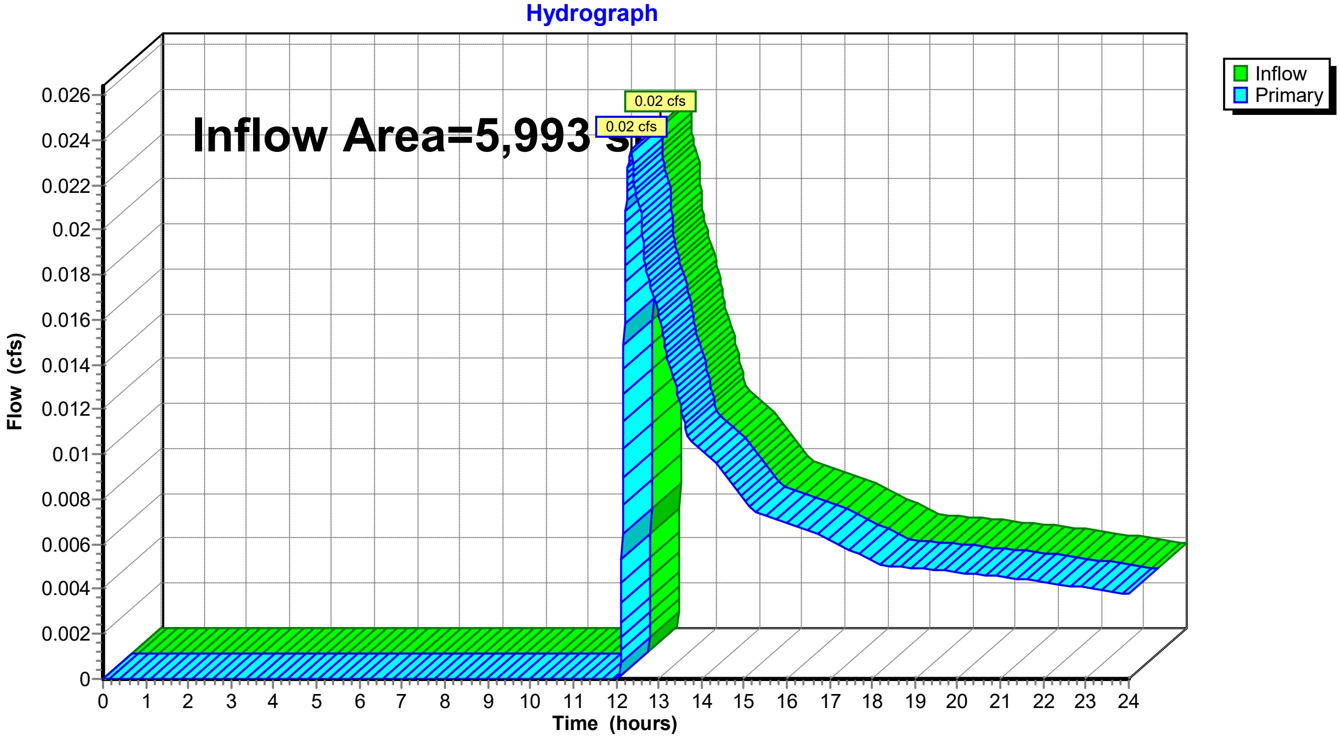


Summary for Pond SP-2: Study Point

Inflow Area = 5,993 sf, 0.00% Impervious, Inflow Depth > 0.61" for 100-Year event
Inflow = 0.02 cfs @ 12.35 hrs, Volume= 306 cf
Primary = 0.02 cfs @ 12.35 hrs, Volume= 306 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.006 hrs / 3

Pond SP-2: Study Point



APPENDIX B

TOTAL SUSPENDED SOLIDS CALCULATIONS

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: Brick Kiln Road, Falmouth, MA

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Street Sweeping - 5%	**0.05**	**1.00**	**0.05**	**0.95**
Deep Sump and Hooded Catch Basin	**0.25**	**0.95**	**0.24**	**0.71**
Oil Grit Separator	**0.25**	**0.71**	**0.18**	**0.53**
Infiltration Basin	**0.80**	**0.53**	**0.43**	**0.11**
	0.00	**0.11**	**0.00**	**0.11**

Total TSS Removal = 89%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **YMCA Facility**
Prepared By: **Stuart Clark, PE**
Date: **10/17/2023**

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

Mass. Dept. of Environmental Protection

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: Brick Kiln Road, Falmouth, MA

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Street Sweeping - 5%	0.05	1.00	0.05	0.95
Proprietary Treatment Practice	0.00	0.95	0.00	0.95
Rain Garden	0.90	0.95	0.86	0.10
Infiltration Basin	0.80	0.10	0.08	0.02
	0.00	0.02	0.00	0.02

Total TSS Removal = 98%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: YMCA Facility
Prepared By: Stuart Clark, PE
Date: 10/17/2023

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

APPENDIX C

LONG TERM OPERATIONS & MAINTENANCE PLAN

FocalPoint

BIOFILTRATION SYSTEMS

Operations & Maintenance

FERGUSON WATERWORKS

Ferguson.com/waterworks | 800.721.2590

GENERAL DESCRIPTION

The following general specifications describe the general operations and maintenance requirements for the FocalPoint® High Performance Modular Biofiltration System (HPMBS). The system utilizes physical, chemical and biological mechanisms of a soil, plant and microbe complex to remove pollutants typically found in urban stormwater runoff. The treatment system is a fully equipped, modular, constructed in place system designed to treat contaminated runoff.

Stormwater enters the HPMBS, is filtered by the High Performance Biofiltration Media and passes through to the underdrain/storage system where the treated water is detained, retained or infiltrated to sub-soils, prior to discharge to the storm sewer system of any remaining flow.

Higher flows bypass the FocalPoint® via a downstream inlet or other overflow conveyance. Maintenance is a simple, inexpensive and safe operation that does not require confined space entry, pumping or vacuum equipment, or specialized tools. Properly trained landscape personnel can effectively maintain FocalPoint® Stormwater systems by following instructions in this manual.

BASIC OPERATIONS

FocalPoint® is a modular, high performance biofiltration system that often works in tandem with other integrated management practices (IMP). Contaminated stormwater runoff enters the biofiltration bed through a conveyance swale, planter box, or directly through a curb cut or false inlet. Energy is dissipated by a rock or vegetative dissipation device and is absorbed by a 3-inch layer of aged, double shreddded hardwood mulch, with fines removed, (when specified) on the surface of the biofiltration media.

As the water passes through the mulch layer, most of the larger sediment particles and heavy metals are removed through sedimentation and chemical reactions with the organic material in the mulch. Water passes through the biofiltration media where the finer particles are removed and numerous chemical reactions take place to immobilize and capture pollutants in the soil media.

The cleansed water passes into the underdrain/storage system and remaining flows are directed to a storm sewer system or other appropriate discharge point. Once the pollutants are in the soil, bacteria begin to break down and metabolize the materials and the plants begin to uptake and metabolize the pollutants. Some pollutants such as heavy metals, which are chemically bound to organic particles in the mulch, are released over time as the organic matter decomposes to release the metals to the feeder roots of the plants and the cells of the bacteria in the soil where they remain and are recycled. Other pollutants such as phosphorus are chemically bound to the soil particles and released slowly back to the plants and bacteria and used in their metabolic processes. Nitrogen goes through a variety of very complex biochemical processes where it can ultimately end up in the plant/bacteria biomass, turned to nitrogen gas or dissolves back into the water column as nitrates depending on soil temperature, pH and the availability of oxygen. The pollutants ultimately are retained in the mulch, soil and biomass with some passing out of the system into the air or back into the water.

DESIGN AND INSTALLATION

Each project presents different scopes for the use of FocalPoint® system. To ensure the safe and specified function of this stormwater BMP, Convergent Water Technologies and/or its Value Added Resellers (VAR) review each application before supply. Information and design assistance is available to the design engineer during the planning process. Correct FocalPoint® sizing is essential to optimum performance. The engineer shall submit calculations for approval by the local jurisdiction when required. The contractor and/or VAR is responsible for the correct installation of FocalPoint units as described in approved plans. A comprehensive installation manual is available at www.convergentwater.com.

MAINTENANCE

Why Maintain?

All stormwater treatment systems require maintenance for effective operation. This necessity is often incorporated in your property's permitting process as a legally binding BMP maintenance agreement. Other reasons for maintenance include:

- Avoid legal challenges from your jurisdiction's maintenance enforcement program.
- Prolong the lifespan of your FocalPoint HPMBS.
- Avoid costly repairs.
- Help reduce pollutant loads leaving your property.

Simple maintenance of the FocalPoint® is required to continue effective pollutant removal from stormwater runoff before any discharge into downstream waters. This procedure will also extend the longevity of the living biofiltration system. The unit will recycle and accumulate pollutants within the biomass, but may also subjected to other materials entering the surface of the system. This may include trash, silt and leaves etc. which will be contained above the mulch and/or biofiltration media layer. Too much silt may inhibit the FocalPoint's® flow rate, which is a primary reason for system maintenance. Removal of accumulated silt/sediment and/or replacement of the mulch layer (when specified), is an important activity that prevents overaccumulation of such silt/sediment.

When to Maintain?

The start of the maintenance plan begins when the system is activated for full operation. Full operation is defined as when the site is appropriately stabilized and the unit is installed and activated (i.e., when mulch and plantings are added).

Activation should be avoided until the site is fully stabilized (full landscaping, grass cover, final paving and street sweeping completed). Maintenance visits are scheduled seasonally; the spring visit aims to clean up after winter loads including salts and sands. The fall visit helps the system by removing excessive leaf litter.

A first inspection to determine if maintenance is necessary should be performed at least twice annually after storm events of greater than (1) one inch total depth (subject to regional climate). Please refer to the maintenance checklist for specific conditions that indicate if maintenance is necessary.

It has been found that in regions which receive between 30-50 inches of annual rainfall, (2) two visits are generally required. Regions with less rainfall often only require (1) one visit per annum. Varying land uses can affect maintenance frequency.

Some sites may be subjected to extreme sediment or trash loads, requiring more frequent maintenance visits. This is the reason for detailed notes of maintenance actions per unit, helping the VAR/Maintenance contractor and Owner predict future maintenance frequencies, reflecting individual site conditions.

Owners must promptly notify the VAR/Maintenance contractor of any damage to the plant(s), which constitute(s) an integral part of the biofiltration technology. Owners should also advise other landscape or maintenance contractors to leave all maintenance of the HPMBS to the VAR/Maintenance contractor (i.e. no pruning or fertilizing).

EXCLUSION OF SERVICES

It is the responsibility of the owner to provide adequate irrigation when necessary to the plant(s) in the FocalPoint® system.

Clean up due to major contamination such as oils, chemicals, toxic spills, etc. will result in additional costs and are not covered under the VAR/Maintenance contractor maintenance contract. Should a major contamination event occur, the Owner must block off the outlet pipe of the FocalPoint® (where the cleaned runoff drains to, such as drop-inlet) and block off the point where water enters of the FocalPoint®. The VAR/Maintenance contractor should be informed immediately.

MAINTENANCE VISIT SUMMARY

Each maintenance visit consists of the following simple tasks (detailed instructions below).

1. Inspection of FocalPoint® and surrounding area

2. Removal of debris, trash and mulch

3. Mulch replacement

4. Plant health evaluation (including measurements) and pruning or replacement as necessary

5. Clean area around FocalPoint®

6. Complete paperwork, including date stamped photos of the tasks listed above.

MAINTENANCE TOOLS, SAFETY EQUIPMENT AND SUPPLIES

Ideal tools include: camera, bucket, shovel, broom, pruners, hoe/rake, and tape measure. Appropriate Personal Protective Equipment (PPE) should be used in accordance with local or company procedures. This may include impervious gloves where the type of trash is unknown, high visibility clothing and barricades when working in close proximity to traffic and also safety hats and shoes.

Inspection of FocalPoint® and surrounding area

Record individual unit before maintenance with photograph (numbered). Record on Maintenance Report (see example in this document) the following:

Standing Water	yes | no	Damage to HPMBS System to Overflow conveyance	yes | no
Is Bypass Inlet Clear?	yes | no		yes | no

Removal of Silt / Sediment / Clay

Dig out silt (if any) and mulch and remove trash & foreign items.

Silt / Clay Found?	yes | no	Leaves?	yes | no
Cups / Bags Found?	yes | no	Volume of material removed ________	(volume or weight)

Removal of debris, trash and mulch

After removal of mulch and debris, measure distance from the top of the FocalPoint® engineered media soil to the flow line elevation of the adjacent overflow conveyance. If this distance is greater than that specified on the plans (typ. 6" - 12"), add FocalPoint® media (not top soil or other) to recharge to the distance specified.

- Distance to media surface to flow line of overflow conveyance (inches) ____________
- # of Buckets of Media Added _________

Mulch Replacement

Most maintenance visits require only replacement mulch (if utilized). Bags of clean, double shredded hardwood mulch are typically used for smaller biofiltration beds, however larger systems may require truck loads of mulch. For smaller projects, one cubic foot of mulch will cover four square feet of biofiltration bed, and for larger projects, one cubic yard of mulch will cover 108 square feet of biofiltration bed. Some visits may require additional FocalPoint® engineered soil media available from the VAR/Contractor.

- Add double shredded, aged hardwood mulch which has been screened to remove fines, evenly across the entire biofiltration media bed to a depth of 3".
- Clean accumulated sediment from energy dissipation system at the inlet to the FocalPoint® system to allow for entry of trash during a storm event.

Plant health evaluation and pruning or replacement as necessary

Examine the plant's health and replace if dead or dying.
Prune as necessary to encourage growth in the correct directions

Height above Grate (feet) _______		Health	alive | dead
Width at Widest point (feet) _______		Damage to Plant	yes | no

Clean area around FocalPoint®

- Clean area around unit and remove all refuse to be disposed of appropriately.

Complete paperwork

- Deliver Maintenance Report and photographs as appropriate.
- Some jurisdictions may require submission of maintenance reports in accordance with approvals.
- It is the responsibility of the Owner to comply with local regulations.

FocalPoint

BIOFILTRATION SYSTEM

FocalPoint Warranty

Seller warrants goods sold hereunder against defects in materials and workmanship only, for a period of (1) year from date the Seller activates the system into service. Seller makes no other warranties, express or implied.

Seller's liability hereunder shall be conditioned upon the Buyer's installation, maintenance, and service of the goods in strict compliance with the written instructions and specifications provided by the Seller. Any deviation from Seller's instructions and specifications or any abuse or neglect shall void warranties.

In the event of any claim upon Seller's warranty, the burden shall be upon the Buyer to prove strict compliance with all instructions and specifications provided by the Seller.

Seller's liability hereunder shall be limited only to the cost or replacement of the goods. Buyer agrees that Seller shall not be liable for any consequential losses arising from the purchase, installation, and/or use of the goods.

Maintenance Checklist

Element	Problem	What To Check	Should Exist	Action
Inlet	Excessiver sediment or trash accumulation	Accumulation of sediment or trash impair free flow of water into FocalPoint	Inlet free of obstructions allowing free flow into FocalPoint System	Sediments or trash should be removed
Mulch Cover	Trash and floatable debris accumulation	Excessive trash or debris accumulation.	Minimal trash or other debris on mulch cover	Trash and debris should be removed and mulch cover raked level. Ensure that bark nugget
Mulch Cover	Ponding of water on mulch cover	Ponding in unit could be indicative of clogging due to excessive fine sediment accumulation or spill of petroleum oils	Stormwater should drain freely and evenly over mulch cover.	Contact VAR for advice.
Plants	Plants not growing, or in poor condition	Soil/mulch too wet, evidence of spill. Pest infestation. Vandalism to plants.	Plants should be healthy and pest free.	Contact VAR for advice.
Plants	Plant growth excessive	Plants should be appropriate to the species and location of FocalPoint		Trim/prune plants in accordance with typical landscaping and

RAIN GUARDIAN

U.S. PATENT NOS. 8,501,016 AND 8,858,804


TURRET


FOXHOLE


BUNKER

PRETREATMENT FOR BIORETENTION

Rain Gardens • Swales • Filtration Basins • Infiltration Basins

Maintenance Guide

Rain Guardian pretreatment chambers simplify bioretention maintenance by collecting sand, leaves, grass clippings, and other debris in an easy to clean, confined location. Regularly maintaining the Rain Guardian sustains its functionality by maximizing storage and filtration capacities. Maintenance frequency is variable and depends on many factors such as rainfall frequency, drainage area size and land use type, and season of the year. The general cleaning process is similar for all Rain Guardian models (i.e. Bunker, Foxhole, and Turret).

Following rain events, inspect the pretreatment chamber for debris on the top grate, within the chamber, and on the vertical, drop-in filter wall. The maintenance steps described below should be completed if areas of the top grate are clogged, the chamber is >75% full, or the vertical filter wall is clogged. Maintenance should be completed when stormwater has completely drained from the bioretention practice. The filter wall allows the chamber to dry between rain events, which further simplifies maintenance by ensuring removed debris is largely dry. Ensure all debris collected during cleaning of the chamber is completely removed from the site and properly disposed of according to local environmental rules. Once cleaning is complete, reinstall the filter wall with filter fabric facing the inside of the chamber and replace the top grate. For the Foxhole, reinstall the top lid, including optional lid anchor screws if equipped.

Clear Debris from Top Grate

- Foxhole only—remove top lid, including optional lid anchor screws if equipped
- Leaf litter and garbage commonly accumulate on the top grate
- Simply remove and dispose of debris by hand or with a shovel prior to removing top grate

Remove Debris from Inside Chamber

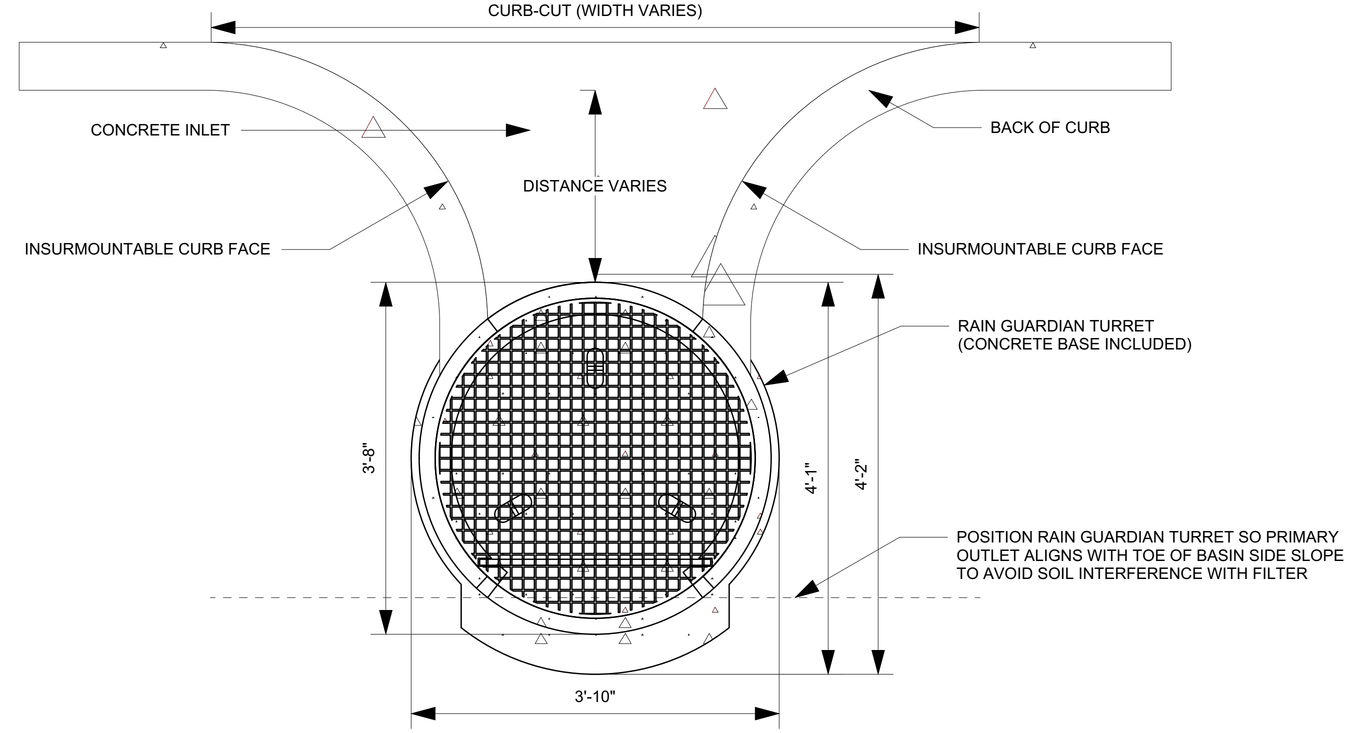
- Remove top grate and place on paved inlet to avoid damage to nearby plants
- Remove and dispose of accumulated debris within chamber using a shovel

Clean Filter Wall

- Remove drop-in filter by lifting vertically
- Clean filter wall with a stiff bristled broom or rinse clean with pressurized water

ANOKA CONSERVATION DISTRICT
1318 McKay Dr. NE, Suite 300
Ham Lake, MN 55304
(763) 434-2030 (M-F 8:00-4:30)

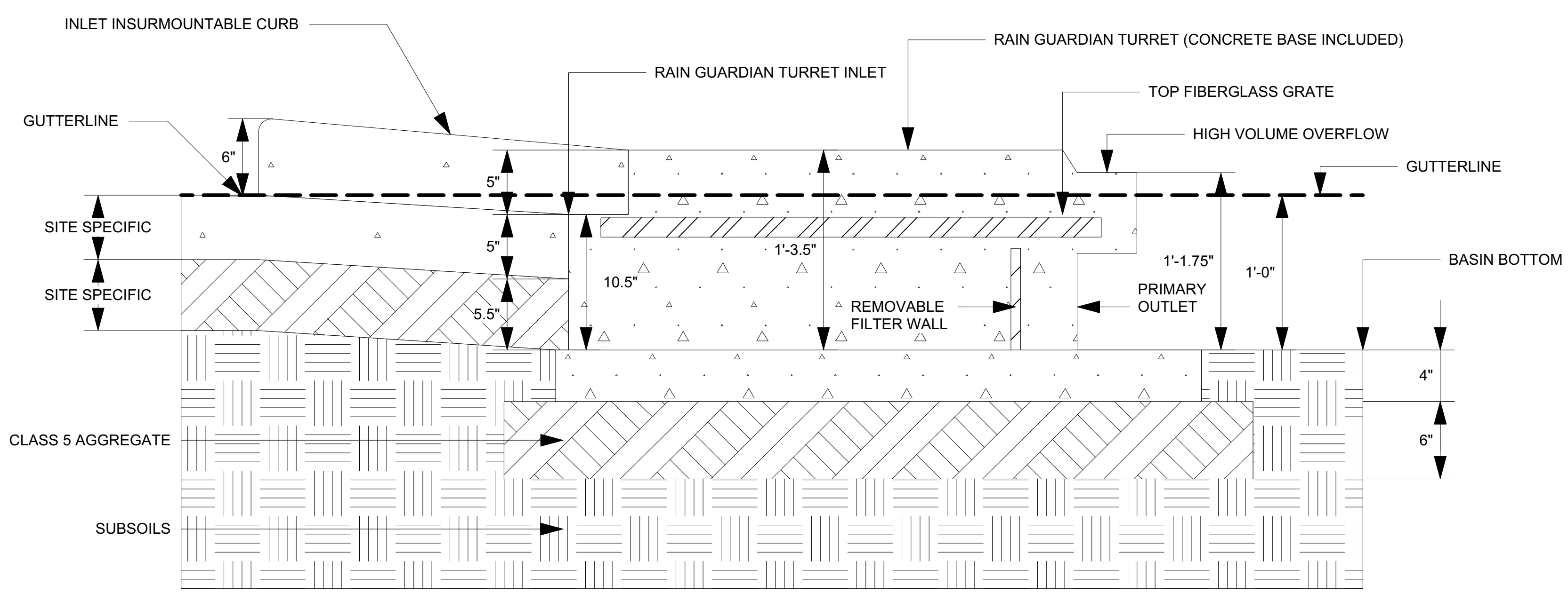
PLAN VIEW



PLAN VIEW NOTES

1. INLET WIDTH AND DISTANCE BETWEEN BACK OF CURB AND RAIN GUARDIAN TURRET MAY VARY WITH SITE CONDITIONS.
2. CONCRETE BASE EXTENDS BEYOND THE FILTER WALL OF THE RAIN GUARDIAN TURRET TO SERVE AS A SPLASH DISSIPATOR.

ELEVATION VIEW



3D VIEWS

ELEVATION VIEW NOTES

1. THE TOP OF THE CLASS 5 BASE (COMPACTED TO 95% STANDARD PROCTOR) IS PRECISELY 1' 4" BELOW THE GUTTERLINE ELEVATION.

SPECIFICATIONS

1. STEEL REINFORCED, COLD JOINT SECURED MONOLITHIC CONCRETE STRUCTURE (1,030 LBS). CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,500 PSI AT 28 DAYS. CONCRETE AIR ENTRAINED (5% TO 8.5% BY VOLUME). MANUFACTURED AND DESIGNED TO ASTM C858.

2. THREE-POINT PICK USING RECESSED LIFTING POCKETS WITH A STANDARD HOOK.

3. FIBERGLASS TOP GRATE (32 LBS, 1-1/2" THICK) - 1,760 LB CONCENTRATED LOAD OR 409 LB/SQ-FT UNIFORM LOAD.

INSTALLATION NOTES

1. INSTALL THE CLASS 5 BASE (COMPACTED TO 95% STANDARD PROCTOR). THE DISTANCE FROM THE BACK OF THE CURB MAY VARY BASED ON SITE CONDITIONS, BUT CONSIDERATIONS SHOULD INCLUDE SLOPE OF THE INLET AND BASIN SIDE SLOPES ADJACENT TO THE RAIN GUARDIAN TURRET. POSITION RAIN GUARDIAN TURRET SO PRIMARY OUTLET ALIGNS WITH TOE OF BASIN SIDE SLOPE TO AVOID SOIL INTERFERENCE WITH REMOVABLE FILTER WALL. EXCAVATE 1' 10" BELOW THE GUTTERLINE ELEVATION (I.E. THE BIORETENTION OVERFLOW ELEVATION) TO ACCOMMODATE THE 1' PONDING DEPTH, 6" CLASS 5 AGGREGATE, AND 4" RAIN GUARDIAN TURRET BASE (INCLUDED). THEREFORE, THE TOP OF THE CLASS 5 COMPACTED BASE IS PRECISELY 1' 4" BELOW THE GUTTERLINE ELEVATION. THE INLET TO THE RAIN GUARDIAN TURRET WILL BE 10-1/2" ABOVE THE TOP OF THE CONCRETE BASE AND 1-1/2" BELOW THE GUTTERLINE ELEVATION TO ACCOMMODATE A SLOPED INLET FROM THE GUTTER TO THE RAIN GUARDIAN TURRET.

2. SET RAIN GUARDIAN TURRET ON THE PREPARED CLASS 5 BASE.

3. INSTALL FRAMING FOR INLET BETWEEN RAIN GUARDIAN TURRET AND BACK OF CURB. TOP ELEVATIONS OF THE FRAMING SHOULD MATCH THE TOP OF THE CURB ON THE STREET SIDE AND THE TOP OF THE RAIN GUARDIAN TURRET ON THE BIORETENTION SIDE.

4. INSTALL EXPANSION/CONTRACTION JOINT MATERIAL OR A SHEET OF POLY TO SERVE AS A BOND BREAK BETWEEN RAIN GUARDIAN TURRET AND CONCRETE INLET BEFORE POURING INLET.

5. SIDE CURBS OF THE POURED INLET MUST HAVE AN INSURMOUNTABLE PROFILE TO PREVENT WATER FLOW FROM OVERTOPPING THE DOWNSTREAM SIDE OF THE INLET.

6. REMOVABLE FILTER WALL SHOULD BE INSTALLED WITH FILTER FABRIC ON THE INTERIOR SIDE OF THE RAIN GUARDIAN TURRET.

RAIN GUARDIAN
U.S. PATENT NOS. 8,501,016 AND 8,858,804
PRETREATMENT FOR BIORETENTION
Rain Gardens • Swales • Filtration Basins • Infiltration Basins
www.RainGuardian.biz

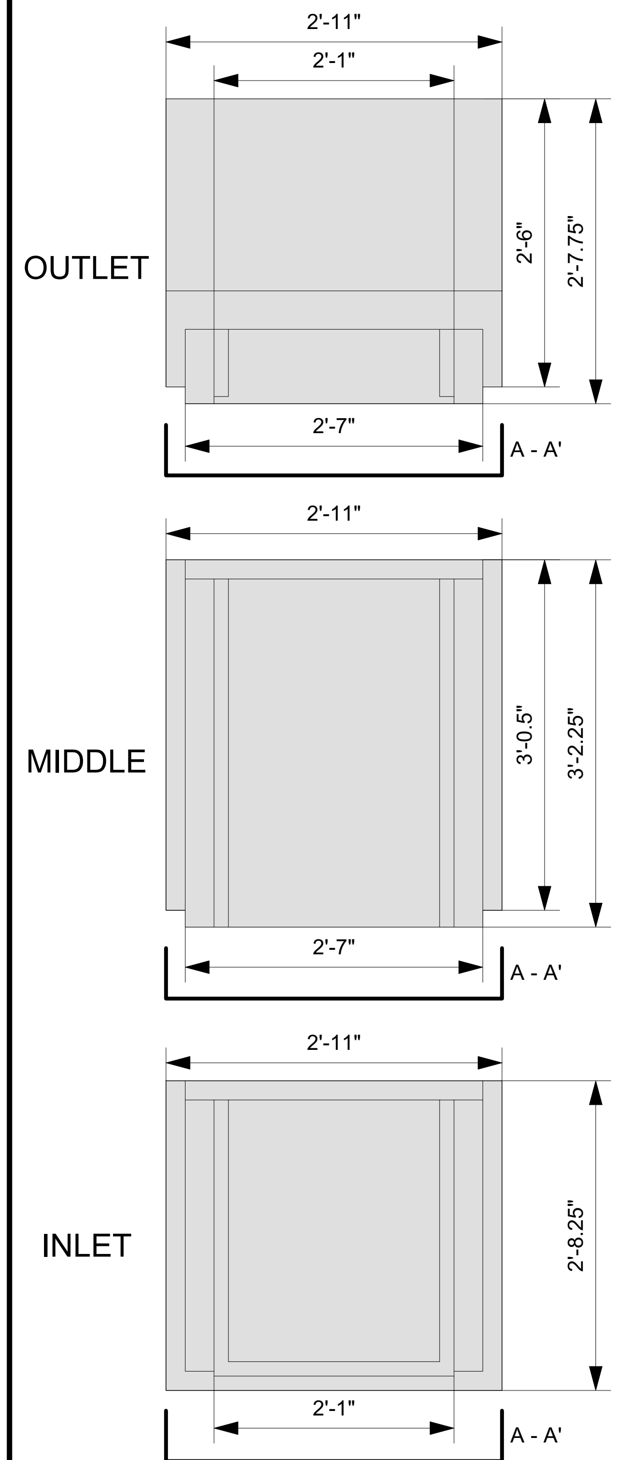
RAIN GUARDIAN TURRET
PRETREATMENT CHAMBER
BIORETENTION PONDING DEPTH: 1'
TYPICAL DETAIL

REVISION HISTORY

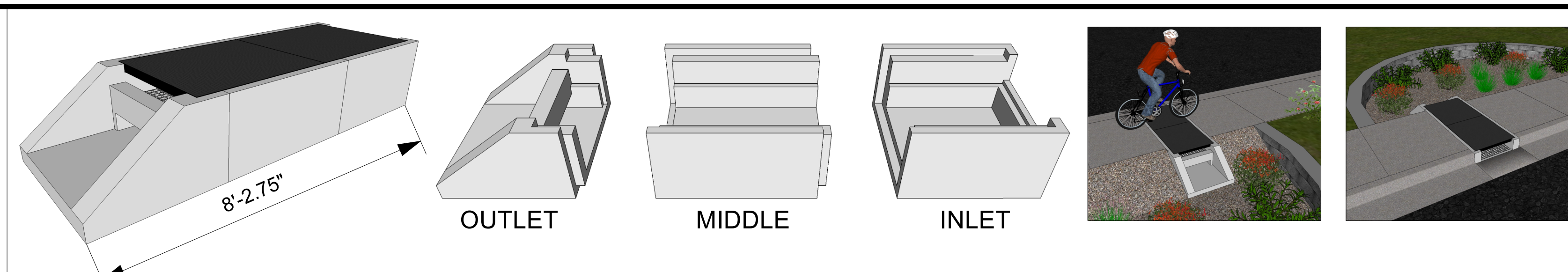
REV	BY	DATE	DESCRIPTION
A	MDH	11/16/2022	TURRET - 1'
SCALE	VARIABLE		
U.S. PATENT NOS.	8,501,016 AND 8,858,804		

DEVELOPED BY:
ANOKA CONSERVATION DISTRICT

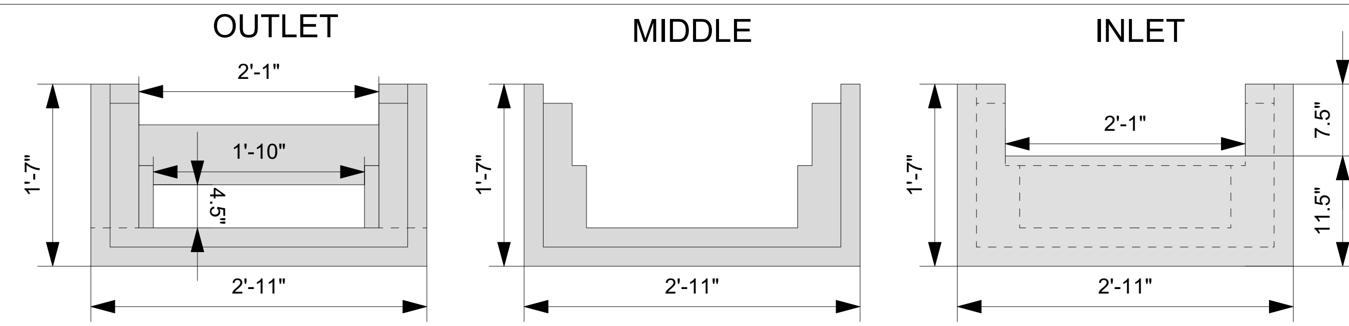
MANUFACTURED BY:
Stoneworks
ARCHITECTURAL PRECAST / CAST STONE
NATIONAL PRECAST CONCRETE ASSOCIATION CERTIFIED PLANT



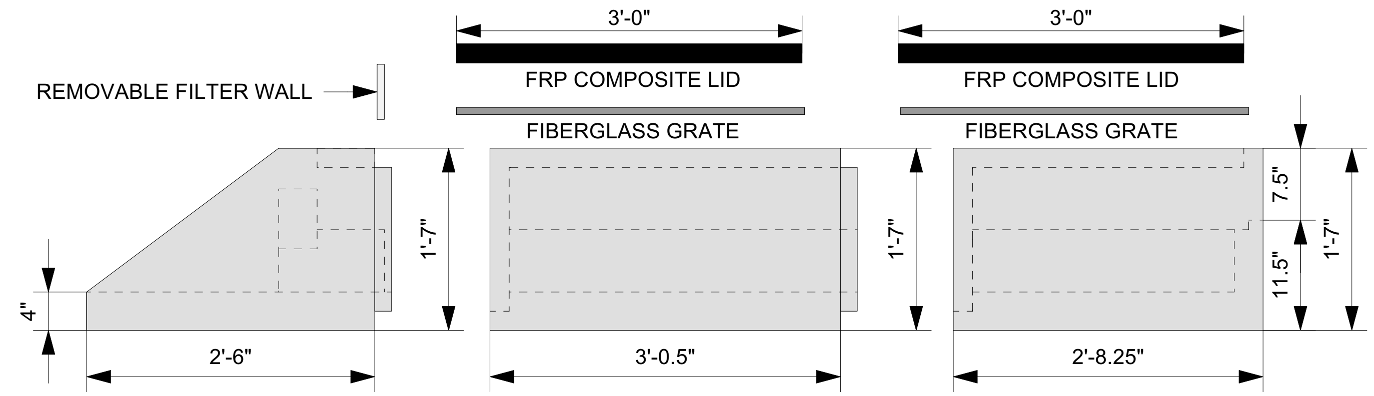
PLAN VIEW



3D VIEW

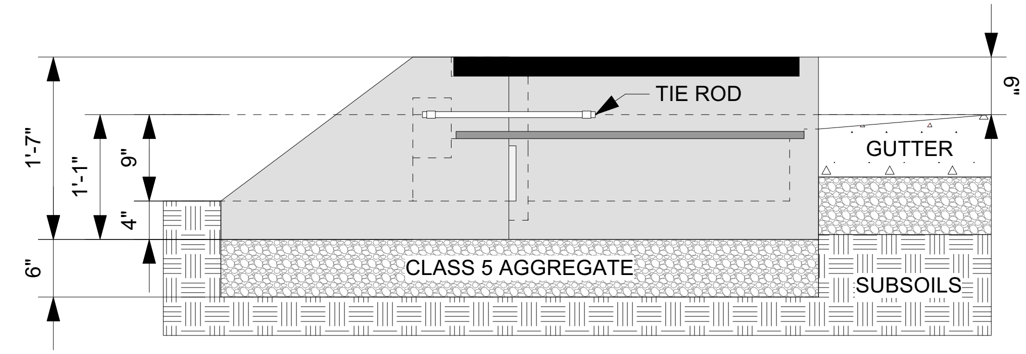


END A-A' VIEW



ELEVATION VIEW

INSTALLED PLAN VIEW - INLET ONLY



INSTALLED ELEVATION VIEW - INLET/OUTLET ONLY

SPECIFICATIONS

1. STEEL REINFORCED, COLD JOINT SECURED MONOLITHIC CONCRETE STRUCTURES (INLET 875 LBS, MIDDLE 965 LBS, AND OUTLET 730 LBS). CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,500 PSI AT 28 DAYS. CONCRETE AIR ENTRAINED (5% TO 8.5% BY VOLUME). MANUFACTURED AND DESIGNED TO ASTM C858.
2. 2-POINT PICK USING RECESSED LIFTING POCKETS WITH A STANDARD HOOK.
3. FIBERGLASS GRATE (11 LBS/PIECE).
4. FRP COMPOSITE LID (38 LBS/PIECE) WITH CONCENTRATED LOAD CAPACITY OF 11,200 LBS.

INSTALLATION NOTES

1. INSTALL A CLASS 5 BASE (COMPACTED TO 95% STANDARD PROCTOR). IT IS CRITICAL THAT THE CLASS 5 BASE IS EVEN TO ENSURE THE FOXHOLE PIECES ALIGN VERTICALLY SUCH THAT THE TOP LIDS LAY FLUSH WITH THE TOP OF THE FOXHOLE PIECES AND ADJACENT BOULEVARD, SIDEWALK, OR PATH. THE DISTANCE FROM THE BACK OF THE CURB MAY VARY BASED ON SITE CONDITIONS. EXCAVATE 1' 7" BELOW THE GUTTERLINE ELEVATION (I.E. THE BIORETENTION OVERFLOW ELEVATION) TO ACCOMMODATE THE 9" PONDING DEPTH, 6" CLASS 5 AGGREGATE, AND 4" RAIN GUARDIAN FOXHOLE BASE (INCLUDED). THEREFORE, THE TOP OF THE CLASS 5 COMPACTED BASE IS PRECISELY 1' 1" BELOW THE GUTTERLINE ELEVATION. THE TOP OF THE RAIN GUARDIAN FOXHOLE INLET POINT WILL BE 7-1/2" ABOVE THE TOP OF THE CONCRETE BASE AND 1-1/2" BELOW THE GUTTERLINE ELEVATION TO ACCOMMODATE A SLOPED INLET FROM THE GUTTER TO THE RAIN GUARDIAN FOXHOLE.

2. SET RAIN GUARDIAN FOXHOLE INLET FIRST, FOLLOWED BY MIDDLE SECTION(S), AND FINALLY THE OUTLET ON THE PREPARED CLASS 5 BASE. POSITION RAIN GUARDIAN FOXHOLE OUTLET PIECE SO PRIMARY OUTLET ALIGNS WITH TOE OF BASIN SIDE SLOPE TO AVOID SOIL INTERFERENCE WITH REMOVABLE FILTER WALL.

3. SECURE MODULAR FOXHOLE PIECES AT EACH JOINT USING PROVIDED GALVANIZED TIE RODS.

4. INSTALL EXPANSION/CONTRACTION JOINT MATERIAL OR A SHEET OF POLY TO SERVE AS A BOND BREAK BETWEEN RAIN GUARDIAN FOXHOLE AND CONCRETE INLET BEFORE POURING INLET.

5. REMOVABLE FILTER WALL SHOULD BE INSTALLED WITH FILTER FABRIC FACING THE RAIN GUARDIAN FOXHOLE INLET.

RAIN GUARDIAN

U.S. PATENT NOS. 8,501,016 AND 8,858,804

PRETREATMENT FOR BIORETENTION

Rain Gardens • Swales • Filtration Basins • Infiltration Basins

www.RainGuardian.biz

RAIN GUARDIAN FOXHOLE
MODULAR PRETREATMENT CHAMBER
BIORETENTION PONDING DEPTH: 9"
TYPICAL DETAIL

REVISION HISTORY

REV	BY	DATE	DESCRIPTION
A	MDH	11/16/2022	MODULAR FOXHOLE
SCALE	VARIABLE		
U.S. PATENT NOS.	8,501,016 AND 8,858,804		

DEVELOPED BY:

ANOKA CONSERVATION DISTRICT

MANUFACTURED BY:

Stoneworks ARCHITECTURAL PRECAST / CAST STONE

NATIONAL PRECAST CONCRETE ASSOCIATION CERTIFIED PLANT

R-TANK® OPERATION, INSPECTION AND MAINTENANCE

Operation
Your R-Tank System has been designed to function in conjunction with the engineered drainage system on your site, the existing municipal infrastructure, and/or the existing soils and geography of the receiving watershed. Unless your site included certain unique and rare features, the operation of your R-Tank System will be driven by naturally occurring systems and will function autonomously. However, upholding a proper schedule of Inspection & Maintenance is critical to ensuring continued functionality and optimum performance of the system.

Inspection
Both the R-Tank and all stormwater pre-treatment features incorporated into your site must be inspected regularly. Inspections should be done every six months for the first year of operation, and at least yearly thereafter. Inspections may be required more frequently for pre-treatment systems. You should refer to the manufacturer requirements for the proper inspection schedule.

With the right equipment most inspections and measurements can be accomplished from the surface without physically entering any confined spaces. If your inspection does require confined space entry, you must follow all local, regional, and OSHA requirements.

All maintenance features of your system can be accessed through a covering at the surface. With the lid removed, you can visually inspect each component to identify sediment, trash, and other contaminants within the structure. Check you construction plans to identify the maintenance features engineered into your R-Tank system, which may include:

Upstream Pipes, Inlets, and Manholes
- Working from the structures adjacent the R-Tank toward those farther away, check for debris and sediment in both the structures and the pipes. Be sure to Include all structures that contain pre- treatment systems. Some structures may include a sump.

Maintenance Ports
- Located near the inlet and outlet connections and throughout the system, check sediment depth at each port.

Inspection Ports

- Less common, inspection ports are primarily located within the Treatment Row of an R-Tank System. These should be used to check for sediment deposits but are typically too small to access for backflushing.

Treatment Row

- On installations in 2018 or later, inlet pipes may connect to a row of modules with 12" diameter access holes running horizontally through the module that can be jet vacuumed. Check these rows for accumulation of sediment and debris.

All observations and measurements should be recorded on an Inspection Log kept on file. We've included a form you can use at the end of this guide.

Maintenance

For modules taller than 40" the R-Tank System should be back-flushed once sediment accumulation has reached 6". For modules less than 40" tall, perform maintenance when sediment depths are greater than 15% of the total system height.

If your system includes a Treatment Row with linear access through the modules from the inlet pipe, backflush this area when sediment depths reach 6".

BEFORE ANY MAINTENANCE IS PERFORMED ON YOUR SYSTEM - PLUG THE OUTLET PIPE TO PREVENT CONTAMINATION OF THE DOWNSTREAM SYSTEMS.

Begin by cleaning all upstream structures, pipes, and pre-treatment systems containing sediment and/or debris. If your system includes a Treatment Row, this portion of the system should be cleaned with traditional jet-vac equipment. Add a centralizer to the jet for easiest access through the modules.

To back-flush the R-Tank, water is pumped into the system through the Maintenance Ports as rapidly as possible. The turbulent action of the water moving through the R-Tank will suspend sediments which may then be pumped out. If your system includes an Outlet Structure, this will be the ideal location to pump contaminated water out of the system. However, removal of back-flush water may be accomplished through the Maintenance Ports, as well.

For systems with large footprints that would require extensive volumes of water to properly flush the system, you should consider performing your maintenance within 24 hours of a rain event. Stormwater entering the system will aid in the suspension of sediments and reduce the volume of water required to properly flush the system.

STEP BY STEP INSTRUCTIONS FOR INSPECTION AND MAINTENANCE CAN BE FOUND ON THE NEXT PAGE, WITH A MAINTENANCE LOG ON THE LAST PAGE.

INSPECTION

1. Upstream Structures
    a. Remove cover
    b. Use flashlight to detect sediment deposits If present, measure sediment depth
    c. Inspect pipes connecting to R-Tank
        i. If inlet pipes connect to Treatment Row, check sediment depth within these modules
        ii. If access for measurement inside the Treatment Row is difficult, sediment depth can be estimated based on the coverage of the round, 12” opening of the module
    d. Inspect pre-treatment systems (if present)
    e. Record results on Maintenance Log
    f. Replace cover
    g. Repeat for ALL Manholes upstream of R-Tank until no sedimentation is observed and all pre- treatment systems have been checked
2. Maintenance Ports
    a. Remove cap
    b. Use flashlight to detect sediment deposits
    c. If present, measure sediment depth with stadia rod
    d. Record results on maintenance log
    e. Replace cap
    f. Repeat for ALL Maintenance Ports
3. Inspection Port
    a. Remove cap
    b. Use flashlight to detect sediment deposits
    c. If present, measure sediment depth with stadia rod
    d. Record results on Maintenance Log
    e. Replace cap

MAINTENANCE

1. Plug system outlet to prevent discharge of back-flush water
2. Vacuum all upstream structures, inlet pipes, and stormwater pre-treatment systems
3. If a Treatment Row is present, vacuum this row of modules
4. Determine best location to pump out back-flush water. Typically, the outlet structure will work best, but sometimes the Maintenance Ports must be used.
5. Remove cap from Maintenance Port and pump water as rapidly as possible into system through port to suspend sediments, pumping dirty water out of the system from the outlet or nearby Maintenance Port
6. Repeat at all Maintenance Ports until sediment levels are reduced to a satisfactory level
7. Sediment-laden water shall be disposed of per local regulations
8. Replace any remaining caps or covers and remove outlet plug
9. Record the back-flushing event in your Maintenance Log with any relevant specifics

FERGUSON WATERWORKS

R-Tank® Maintenance Log

Site Name:		Company:	
Location:		Contact:	
City and State:		Phone:	
System Owner:		Email:	

Date	Location	Sediment Depth	Observations / Notes	Initials

Stormwater Maintenance Log
Upper Cape YMCA

Inspection Date________________

Q1 ___ Q2 ___ Q3 ___ Q4 ___

Oil/Grit Separator (OGS)

Maintenace Items	OGS-1	OGS-2	OGS-3	OGS-4	Notes/Comments
Does the frame or cover show damage?					
What is the estimated depth of the sediment accumulation in Chamber 1?					
What is the estimated depth of the oil accumulation in Chamber 2?					
Is outlet tee in place and functioning?					
Is maintenance required?					

Instructions

1. Refer to Development Site Plans for component identification.
2. Inspect each component for visual damage and assess functionality.
3. After inspection is complete keep one copy of the completed Maintenance Logs for facility maintenance records.

Stormwater Maintenance Log
Upper Cape YMCA

Inspection Date________________

Q1 ___ Q2 ___ Q3 ___ Q4 ___

Focal Point Rain Gardens

Maintenance Item	FP-1	FP-2	FP-3	FP-4	FP-5	FP-6	FP-7	Comments/Notes
Is waterway functioning correctly?								
What is the sediment depth in the Rain Garden? Does it require cleaning?								
Does the Rain garden appear to be level and distributing water evenly?								
Does the rain garden have litter or debris in it?								
Are all side slopes, rip rap and curbing intact?								
Does mulch show evidence of sediment carryover?								
Is there any dead vegetation or invasive species?								
Is there standing water in central sediment trap or in the rain garden?								
Is maintenance required?								

Stormwater Maintenance Log

Upper Cape YMCA

Inspection Date________________

Q1 ___ Q2 ___ Q3 ___ Q4 ___

Catch Basins

Maintenance Item	CB-1	CB-2A	CB-2B	CB-4	CB-5	CB-6A	CB-6B	CB-6C	Comments/Notes
Does the frame or grate show damage?									
Is Outlet Hood/Tee in place and functioning?									
Is there debris floating on the water surface?									
If there an apparent oil layer, what is its estimated thickness?									
What is the estimated depth of the sediment accumulation?									
Is maintenance required?									

Stormwater Maintenance Log
Upper Cape YMCA

Inspection Date_______________

Q1 ___ Q2 ___ Q3 ___ Q4 ___

Turret Inlets

Maintenance Item	TR-1	TR-2	TR-3	TR-4	TR-5	TR-6	TR-7	Comments/Notes
Does the grates show damage?								
Are grates blocked by debris?								
Does the Turret Body show damage?								
Has sediment accumulated in the turret?								
Is there oil staining in the turret?								
Is maintenance required?								

Stormwater Maintenance Log

Upper Cape YMCA

Inspection Date________________

Q1 ___ Q2 ___ Q3 ___ Q4 ___

Drain Manholes

Maintenance Item	DMH-1	DMH-2	DMH-3	DMH-4	DMH-5	DMH-6	DMH-7	DMH-8	DMH-9	Comments/Notes
Does the frame or cover show damage?										
Is there visible floating debris?										
If there is visible sediment, what is the estimated thickness?										
Are inlet and outlet pipes in good condition?										
Are there apparent leaks?										
Is the structure damaged?										
Is maintenance required?										

Stormwater Maintenance Log
Upper Cape YMCA

Inspection Date________________

Q1 ___ Q2 ___ Q3 ___ Q4 ___

Drain Basin

Maintenance Item	DB-1	Comments/Notes
Does the plastic frame or grate show damage?		
Is there visible floating debris?		
If there is visible sediment, what is the estimated thickness?		
Is the outlet pipe in good condition?		
Are there apparent leaks?		
Is the structure damaged?		
Is maintenance required?		

Stormwater Maintenance Log
Upper Cape YMCA

Inspection Date________________

Q1 ___ Q2 ___ Q3 ___ Q4 ___

Foxhole Inlets

Maintenance Item	Foxhole-1	Foxhole-2	Comments/Notes
Does the cover or grate show damage?			
If there is visible sediment?			
Is the outlet in good condition?			
Are there apparent leaks?			
Is the structure damaged?			
Is maintenance required?			

Stormwater Maintenance Log
Upper Cape YMCA

Inspection Date_______________

Q1 ___ Q2 ___ Q3 ___ Q4 ___

Drain Manholes

Maintenance Item	OF-1	OF-2	OF-3	OF-4	OF-5	Comments/Notes
Does the grate show damage?						
Is the grate blocked by debris?						
Are inlet and outlet pipes in good condition?						
Are there apparent leaks?						
Is the structure damaged?						
Is maintenance required?						

Stormwater Maintenance Log
Upper Cape YMCA

Inspection Date________________

Q1 ___ Q2 ___ Q3 ___ Q4 ___

Flared Ends

Maintenance Item	OF-1	OF-2	Comments/Notes
Does structure show damage?			
Are there visible leaks?			
Is debris caught in the rip rap?			
Is visible sediment caught in the rip rap? Is it impairing function?			
Is maintenance required?			

Stormwater Maintenance Log
Upper Cape YMCA

Inspection Date________________

Q1 ___ Q2 ___ Q3 ___ Q4 ___

Oil/Grit Separator (OGS)

Maintenace Items	OGS-1	OGS-2	OGS-3	OGS-4	Notes/Comments
Does the frame or cover show damage?					
What is the estimated depth of the sediment accumulation in Chamber 1?					
What is the estimated depth of the oil accumulation in Chamber 2?					
Is outlet tee in place and functioning?					
Is maintenance required?					

Instructions

1. Refer to Development Site Plans for component identification.
2. Inspect each component for visual damage and assess functionality.
3. After inspection is complete keep one copy of the completed Maintenance Logs for facility maintenance records.

Stormwater Maintenance Log
Upper Cape YMCA

Inspection Date________________

Q1 ___ Q2 ___ Q3 ___ Q4 ___

Focal Point Rain Gardens

Maintenance Item	FP-1	FP-2	FP-3	FP-4	FP-5	FP-6	FP-7	Comments/Notes
Is waterway functioning correctly?								
What is the sediment depth in the Rain Garden? Does it require cleaning?								
Does the Rain garden appear to be level and distributing water evenly?								
Does the rain garden have litter or debris in it?								
Are all side slopes, rip rap and curbing intact?								
Does mulch show evidence of sediment carryover?								
Is there any dead vegetation or invasive species?								
Is there standing water in central sediment trap or in the rain garden?								
Is maintenance required?								

Stormwater Maintenance Log
Upper Cape YMCA

Inspection Date________________

Q1 ___ Q2 ___ Q3 ___ Q4 ___

Catch Basins

Maintenance Item	CB-1	CB-2A	CB-2B	CB-4	CB-5	CB-6A	CB-6B	CB-6C	Comments/Notes
Does the frame or grate show damage?									
Is Outlet Hood/Tee in place and functioning?									
Is there debris floating on the water surface?									
If there an apparent oil layer, what is its estimated thickness?									
What is the estimated depth of the sediment accumulation?									
Is maintenance required?									

Stormwater Maintenance Log

Upper Cape YMCA

Inspection Date________________

Q1 ___ Q2 ___ Q3 ___ Q4 ___

Turret Inlets

Maintenance Item	TR-1	TR-2	TR-3	TR-4	TR-5	TR-6	TR-7	Comments/Notes
Does the grates show damage?								
Are grates blocked by debris?								
Does the Turret Body show damage?								
Has sediment accumulated in the turret?								
Is there oil staining in the turret?								
Is maintenance required?								

Stormwater Maintenance Log

Upper Cape YMCA

Inspection Date________________

Q1 ___ Q2 ___ Q3 ___ Q4 ___

Drain Manholes

Maintenance Item	DMH-1	DMH-2	DMH-3	DMH-4	DMH-5	DMH-6	DMH-7	DMH-8	DMH-9	Comments/Notes
Does the frame or cover show damage?										
Is there visible floating debris?										
If there is visible sediment, what is the estimated thickness?										
Are inlet and outlet pipes in good condition?										
Are there apparent leaks?										
Is the structure damaged?										
Is maintenance required?										

Stormwater Maintenance Log

Upper Cape YMCA

Inspection Date________________

Q1 ___ Q2 ___ Q3 ___ Q4 ___

Drain Basin

Maintenance Item	DB-1	Comments/Notes
Does the plastic frame or grate show damage?		
Is there visible floating debris?		
If there is visible sediment, what is the estimated thickness?		
Is the outlet pipe in good condition?		
Are there apparent leaks?		
Is the structure damaged?		
Is maintenance required?		

Stormwater Maintenance Log
Upper Cape YMCA

Inspection Date________________

Q1 ___ Q2 ___ Q3 ___ Q4 ___

Foxhole Inlets

Maintenance Item	Foxhole-1	Foxhole-2	Comments/Notes
Does the cover or grate show damage?			
If there is visible sediment?			
Is the outlet in good condition?			
Are there apparent leaks?			
Is the structure damaged?			
Is maintenance required?			

Stormwater Maintenance Log
Upper Cape YMCA

Inspection Date________________

Q1 ___ Q2 ___ Q3 ___ Q4 ___

Drain Manholes

Maintenance Item	OF-1	OF-2	OF-3	OF-4	OF-5	Comments/Notes
Does the grate show damage?						
Is the grate blocked by debris?						
Are inlet and outlet pipes in good condition?						
Are there apparent leaks?						
Is the structure damaged?						
Is maintenance required?						

Stormwater Maintenance Log
Upper Cape YMCA

Inspection Date________________

Q1 ___ Q2 ___ Q3 ___ Q4 ___

Flared Ends

Maintenance Item	OF-1	OF-2	Comments/Notes
Does structure show damage?			
Are there visible leaks?			
Is debris caught in the rip rap?			
Is visible sediment caught in the rip rap? Is it impairing function?			
Is maintenance required?			

APPENDIX D

CONSTRUCTION PERIOD EROSION, SEDIMENTATION, AND POLLUTION PREVENTION PLAN

CONSTRUCTION PERIOD EROSION, SEDIMENTATION, AND POLLUTION PREVENTION PLAN (CPESPPP)

FOR CONSTRUCTION ACTIVITIES AT:

Upper Cape YMCA
Brick Kiln Road
Falmouth, MA

September 2023

Estimated Project Dates:
Project Start Date: TBD
Project Completion Date: TBD

Prepared For:
YMCA Cape Cod
2245 Iyannough Road
West Barnstable, MA 02668

Green Seal Environmental, LLC

114 State Road, Building B, Sagamore Beach, MA 02562 | Tel: (508) 888-6034 | Fax: (508) 888-1506 | www.gseenv.com

Table of Contents

SITE PLANS

Site Plans entitled "Upper Cape YMCA – Site Development Plans" prepared by Green Seal Environmental, LLC, dated 9/20/2023.

FIGURES

ATTACHMENTS

INTRODUCTION

This Construction Period Erosion, Sedimentation, and Pollution Prevention Plan (CPESPPP) has been developed in accordance with the requirements of the Massachusetts Stormwater Handbook and Standards and has been designed to mirror the applicable requirements of the Environmental Protection Agency's (EPA) National Pollutant Discharge Elimination System (NPDES) 2022 Construction General Permit (2022 CGP) for Stormwater Discharges from Construction Activities.

This CPESPPP has been prepared for work associated with the Upper Cape YMCA in Falmouth, Massachusetts (the Site).

YMCA Cape Cod is constructing a new recreation and health care facility at a newly subdivided parcel of undeveloped land on Brick Kiln Road. The general scope of work will include the construction of a new recreation building and a shed-type support building, parking facilities, pedestrian walkways, a new stormwater management system, utilities, and associated appurtenances.

Discharges authorized under the 2022 CGP include stormwater, snowmelt, and surface runoff and drainage associated with construction and support activities as well as other non-stormwater related discharges including those outlined in Massachusetts Stormwater Management Standard 8.

This document has been prepared based on best available information and review of the following:

- Plans entitled "Site Development Plans – Upper Cape YMCA" prepared by Green Seal Environmental, LLC., dated September 2023.

Portions of this document have been derived from the above.

The 2022 CGP and referenced documents, and Massachusetts Stormwater Management Standards are hereby made a part of this CPESPPP. All parties responsible for implementation of this CPESPPP are required to review and become familiar with the CPESPPP and referenced documents.

Where discrepancies between this and other referenced documents exist, the more stringent shall apply.

If approval conditions require modifications to this CPESPPP, revisions will be made and noted in the CPESPPP Amendment Log, included as Attachment D of this document.

Modifications to the CPESPPP

The CPESPPP is intended to outline minimum requirements for controlling erosion and sedimentation and preventing pollution that may occur during construction activities as a result of stormwater or other potential conveyances. Modifications to the CPESPPP may be necessary to accommodate changing Site constraints or unforeseen circumstances as the project progresses. The following items, at a minimum, will require significant modifications to the CPESPPP:

- Change in, or addition of, operators active in construction activities;
- Transfer of operational control;
- Changes to construction plans, stormwater control measures, pollution prevention measures, or other activities not accurately reflected in the current CPESPPP;
- Action required at the direction of officials of regulatory agencies;
- Any change in chemical treatment systems or controls if applicable;
- Action required due to revision of any regulatory requirements that may affect stormwater controls at the Site.

Where modifications to the CPESPPP are required, they will be completed within seven (7) calendar days following the occurrence of any conditions listed above. Records will be kept of all modifications to the CPESPPP in a running amendment log, which is included as Attachment D. Records will include, at minimum, the following:

- Date of modification;
- Reason for modification;
- Description of modification;
- Person authorizing the modification;
- Representative photographs of the modification.

Site plans will be updated as appropriate to reflect changes to or use of additional controls. If modifications are required, all operators will be notified immediately.

Availability of CPESPPP

A current copy of the CPESPPP will be kept on site. The CPESPPP will be kept in a format that is easily accessible and can be made readily available to regulatory agencies upon request.

1.0 CONTACT INFORMATION / RESPONSIBLE PARTIES

1.1 Operator(s) / Subcontractors

Operator(s):

Contact: **TBD**
Phone:
Email:

Subcontractor(s):

TBD

Emergency 24-Hour Contact:

TBD

1.2 Stormwater Team

The Stormwater Team includes individuals who are responsible for the design, installation, maintenance, and/or repair of stormwater controls, the application and storage of treatment chemicals (if applicable), conducting inspections and taking corrective actions as required. Each member of the stormwater team must have access to this CPESPPP and understand the requirements of the CPESPPP and their specific responsibilities with respect to those requirements.

Personnel conducting Site inspections pursuant on the Site must, at a minimum:

- Be knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention,
- Possess the appropriate skills and training in conditions at the construction site that could impact stormwater quality, and
- Possess the appropriate skills and training in the effectiveness of any stormwater controls selected and installed.

Please see Attachment F for a list of the individuals on the stormwater team, their responsibilities, and qualifications.

2.0 SITE EVALUATION, ASSESSMENT, AND PLANNING

2.1 Project Site / Information

Project Name and Address

Project/Site Name: Upper Cape YMCA
Street/Location: 485 Brick Kiln Road
City: Falmouth
State: Massachusetts
ZIP Code: 02540
County or Similar Government Division: Barnstable

Project Latitude/Longitude

Latitude: 41.588603° N **Longitude:** -70.610853° W

Latitude/longitude data source: ☒ Map ☐ GPS
Horizontal Reference Datum: ☐ NAD 27 ☐ NAD 83 ☒ WGS 84

2.2 Discharge Information

Does your project/Site discharge stormwater into a Municipal Separate Storm Sewer System (MS4)?	☐ Yes ☒ No
Are there any waters of the U.S. within 50 feet of your project's earth disturbances?	☐ Yes ☒ No

There are no unauthorized non-stormwater discharges proposed as part of this project. Non-stormwater discharges that may occur in association with this project include water used to control dust and uncontaminated, non-turbid discharges of ground water as well as those allowed under the MA Stormwater Handbook, Standard 10.

The nearest wetland or water body to the site is approximately 1,450 feet south, southeast at its closest point. The nearest surface water body is Long Pond, which is located approximately 1,820 feet south, southwest at its closest point. The nearest drinking water supply is also Long Pond. No groundwater drinking water supplies are located in the general area of the proposed development.

The Site is not located within a FEMA flood hazard area, an Area of Critical Environmental Concern, or within the vicinity of an Outstanding Resource Water.

Stormwater runoff from the Site will be infiltrated on-site during Construction. In the case of stormwater escaping the site, it will be captured by the Brick Kiln Road stormwater system, which does not discharge to a surface water body.

2.3 Nature of the Construction Activities

General Description of the Project

YMCA Cape Cod is constructing a new recreation and health care facility at a newly subdivided parcel of undeveloped land on Brick Kiln Road. The general scope of work will include the construction of a new recreation building and a shed-type support building, parking facilities, pedestrian walkways, a new stormwater management system, utilities, and associated appurtenances.

Are you conducting earth-disturbing activities in response to a public emergency (e.g., mud slides, earthquake, extreme flooding conditions, etc.)?	☐ Yes ☒ No

Size of Construction Site

Size of Property (acres):	Approximately 7.51 acres
Total Area Expected to be Disturbed by Construction Activities:	Approximately 5.7 acres
Maximum Area Expected to be Disturbed at Any One Time:	Approximately 5 acres

Type of Construction Site

☐ Single-Family Residential ☐ Multi-Family Residential ☒ Commercial ☐ Industrial

☐ Institutional ☐ Highway or Road ☐ Utility ☐ Other ______________________

Will you be discharging dewatering water from your Site?	☐ Yes ☒ No
If yes, will you be discharging dewatering water from a current or former Federal or State remediation site?	☐ Yes ☒ No

Construction Support Activities

Construction support activities will include designated stockpiling and storage areas. At no time will construction areas (where clearing or disturbed soil is located) and staging areas exceed five acres. Final staging area locations will be determined with the Owner prior to construction. The Contractor is responsible for security of all materials and equipment left on-site. Any existing pavement or landscaped areas (within construction or staging areas) disturbed during construction will be restored to equal or better condition at no additional cost to the Owner.

2.4 Sequence and Estimated Dates of Construction Activities

Contact Dig Safe (811 or 1-888-344-7233) and obtain clearance at least 72 hours before initiating any excavation. The anticipated construction start date is **TBD**. The anticipated completion date is **TBD**.
Work will be sequenced in accordance with the Contractor's Construction Schedule as prepared per the Project Specifications. The order of work activities for each construction phase will be generally as follows:

Phase 1 – Site Preparation

1. Pre-construction meeting;
2. Staking of site area;
3. Install perimeter erosion and sedimentation control measures, as needed;
4. Install tree protection around trees adjacent to contractor staging and construction areas;
5. Clear site of trees, brush, and other vegetation,
6. Strip & stage topsoil for future re-use;
7. Install temporary interior Site construction period erosion and sedimentation controls;

Phase 2 – Rough Grading

1. Cuts to Subgrade (Site area & building foundation)
2. Rough road and parking area grading;

Phase 3 – Construction

1. Excavate and install on-site soil absorption system;
2. Backfill building foundation;
3. Install utilities and rough grade rain gardens;
4. Install permanent stormwater controls and septic system components;
5. Install driveway retaining wall;
6. Fine grade access drive and parking area, install curbing;
7. Remove temporary interior Site erosion and sedimentation controls;
8. Fine grade and install loam, seed, and plantings for landscaping and stormwater features;
9. Pave access driveway and parking area;
10. Install Site furnishings and signage;
11. Clean accumulated sediment from permanent stormwater controls;
12. Complete final landscaping and restoration;
13. Remove perimeter erosion and sedimentation controls when Site is stabilized.

2.5 Authorized Non-Stormwater Discharges

List of authorized non-stormwater discharges present at the Site:

Authorized Non-Stormwater Discharge	Will or May Occur at Your Site?
Discharges from emergency fire-fighting activities	☐ Yes ☒ No
Fire hydrant flushing	☒ Yes ☐ No
Landscape irrigation	☐ Yes ☒ No
Water used to wash vehicles and equipment	☐ Yes ☒ No
Water used to control dust	☒ Yes ☐ No
Potable water including uncontaminated water line flushing	☒ Yes ☐ No
External building washdown (soaps/solvents are not used and external surfaces do not contain hazardous substances)	☒ Yes ☐ No
Pavement wash waters	☒ Yes ☐ No
Uncontaminated air conditioning or compressor condensate	☒ Yes ☐ No
Uncontaminated, non-turbid discharges of groundwater or spring water	☐ Yes ☒ No
Foundation or footing drains	☒ Yes ☐ No
Uncontaminated construction dewatering water	☐ Yes ☒ No
Flows from riparian habitats and wetlands	☐ Yes ☒ No
Dechlorinated water from swimming pools	☐ Yes ☒ No
Water used for street washing	☒ Yes ☐ No
Water used to clean residential buildings without detergents	☐ Yes ☒ No

2.6 Site Maps and Plans

Site maps, plans, details, and other pertinent information are shown on the attached maps and plans included in Attachment A.

3.0 DOCUMENTATION OF COMPLIANCE WITH OTHER REQUIREMENTS

3.1 Endangered Species Protection

The National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Services (USFWS) lists of Endangered Species Act-listed (ESA-listed) species and designated critical habitat were examined for information pertaining to sensitive habitats as they may exist within this project's action area. None were found on-site or in the immediate area.

The Massachusetts Natural Heritage and Endangered Species Program lists state-listed endangered, threatened, and special concern species, and priority habitats of rare species. Figure 5 presents a NHESP Priority Habitats of Rare species. Please note that these habitats do not appear on the Site.

3.2 Historic Property Screening Process

The following stormwater controls that require subsurface earth disturbance are proposed to be installed as part of this project:

☐ Dike	☐ Pond	☒ Constructed Site Drainage Feature (e.g., ditch, trench, perimeter drain, swale, etc.)
☐ Berm	☐ Culvert	
☒ Catch Basin	☒ Channel	☒ Other type of ground-disturbing stormwater control: subsurface infiltration structures, rain gardens

The Massachusetts Cultural Resource Information System (MACRIS) was examined for information pertaining to historic properties and cultural resources as they may exist within this project's action area.

According to a review of the Inventory of Historic and Archaeological Assets of the Commonwealth, there are no existing historic properties or documented archaeologically sensitive sites within the project area.

3.3 Safe Drinking Water Act Underground Injection Control Requirements

Per the CGP and Safe Drinking Water Act Underground Injection Control (UIC) requirements, if any of the following controls are to be installed as part of the proposed project, coordination with the MassDEP or EPA regional office is required:

- Infiltration trenches (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system).
- Commercially manufactured pre-cast or pre-built proprietary subsurface detention vaults, chambers, or other devices designed to capture and infiltrate stormwater flow.

If the following controls are being installed as part of this project, the requirements for Underground Injection Control must be met:

- Infiltration galleries

4.0 EROSION AND SEDIMENT CONTROLS

A stormwater Best Management Practice (BMP) is defined as any program, technology, process, siting criteria, operating method and measure of device that controls, removes, or reduces pollution. Appropriate BMPs are selected based upon an assessment of the construction operations and potential stormwater impacts. Areas of actual or potential pollutant contact are evaluated and applicable BMPs are implemented to eliminate or minimize the release and transport of pollutants.

This project has been designed to minimize earth disturbances to the fullest extent practicable. Tree, vegetation, and soil removal have been designed to be minimized wherever possible. Necessary Structural BMPs will be installed prior to earth-moving activities to ensure sediment will not be transported off-Site. This project is designed to maintain natural stormwater drainage patterns wherever possible and practicable.

The Contractor's approach will emphasize preventing erosion before it occurs rather than treating sediment-laden stormwater runoff. A minimum surplus of 25-feet of erosion control barrier (silt fence, straw/hay bale, and/or silt sock with biodegradable casings, if feasible) will be stored on-Site at all times.

Specific BMPs to be used for the project are provided in the sections below. See Attachment A for the Site Plan that depicts proposed construction period BMPs. Certain BMPs will require routine inspections to verify suitable operational conditions. Instructions for Site inspections and qualifications for inspection personnel are included in Section 6 of this document. A Site Inspection Report template is included as Attachment B.

4.1 Natural Buffers or Equivalent Sediment Controls

In areas of earth disturbance, an undisturbed natural buffer will be maintained to the maximum extent practicable and will be supplemented by additional erosion and sediment controls, as necessary.

Maintaining a 50-foot natural buffer is not feasible for the entire perimeter of the Site. A natural buffer, less than 50 feet in width, will be supplemented with erosion and sediment controls to achieve sediment load reduction.

4.2 Perimeter Controls

Specific Perimeter Control # 1 - Compost Filter Tubes, or "Silt Socks"

Compost filter tubes ("silt socks,") or silt fencing will be used to prevent the migration of soil and silt from the work Site. These erosion controls will define the limit of work in areas where they are installed, and no construction activities will occur outside of the erosion controls, except for where impacts are permitted (e.g., subsurface utility installations).

- **Installation**
  Prior to construction commencement, the Contractor will stake or flag the limits of work areas.

- **Maintenance Requirements**
  The erosion and sedimentation controls will be visually inspected weekly and within 24 hours of a precipitation event that produces 0.25 inches of rain or more during a 24-hour period. Sediment accumulations will be removed as necessary and will not be allowed to exceed one half the perimeter erosion control device height. In addition to sediment accumulation, close inspection will be made for undercutting beneath perimeter controls. Any repairs or replacement of damaged controls will be noted in the inspection report. If erosion issues occur, the Contractor must repair the erosion immediately and consider different or additional erosion controls for that area.

Specific Perimeter Control # 2- Silt Fence

Silt fencing may be used to prevent the migration of soil and silt from the work Site. Filter fabric for silt fencing will consist of woven polypropylene, nylon, polyester, or ethylene yarn fabric. The filter fabric will contain a carbon black stabilizer to make the filaments resistant to deterioration resulting from exposure to sunlight or heat.

- **Installation**
  Prior to construction commencement, the Contractor will stake or flag the limits of work areas.

- **Maintenance Requirements**
  The erosion and sedimentation controls will be visually inspected weekly and within 24 hours of a precipitation event that produces 0.25 inches of rain or more during a 24-hour period. Sediment accumulations will be removed as necessary and will not be allowed to exceed one half the perimeter erosion control device height. In addition to sediment accumulation, close inspection will be made for undercutting beneath perimeter controls. Any repairs or replacement of damaged controls will be noted in the inspection report. If erosion issues occur, the Contractor must repair the erosion immediately and consider different or additional erosion controls for that area.

Specific Perimeter Control # 3 - Vegetated Buffer Strips

Vegetated buffer strips will be maintained beyond the limits of the project to act as living sediment filters that intercept and detain stormwater runoff. Vegetation will be left wherever practicable during construction. All efforts will be made to revegetate disturbed areas as soon as practicable. If conditions or time of year do not allow final revegetation, wood chips or mulch will be used to stabilize disturbed slopes. Any temporarily placed mulch or wood chips will be removed and the ground surface re-seeded at the beginning of the following growing season.

- **Installation**
  Not required/Pre-existing

- **Maintenance Requirements**
  The vegetated buffers will be inspected weekly and post-rain events to ensure there is no wash-out or accumulation of sediment. Washed out areas will be dressed with clean soil and straw or natural biodegradable blankets will be placed over the washed-out areas. Any areas of accumulated sediment will be removed and all areas of exposed soil from sediment or washouts will be seeded with an appropriate native seed mix as directed by the Engineer.

Specific Perimeter Control # 4 – Soil Stabilization

Stabilization measures including seeding will be initiated as soon as practicable on portions of the Site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the Site has temporarily or permanently ceased. These measures may include soil roughening, hydroseeding, mulching, and/or erosion control blankets. Outside the growing season, exposed soil will be covered with mulch or straw until conditions allow for seeding.

- **Installation**
  As necessary

- **Maintenance Requirements**
  Temporarily stabilized areas will be inspected to assess the effectiveness of temporary stabilization BMPs and replace/repair them as necessary.

4.3 Sediment Track-Out

An anti-tracking pad is to be utilized by exiting trucks and construction equipment to minimize sediment track-out. Contractor ingress and egress will be limited to the stabilized construction entrance/exit at the location designated on the plan. The Contractor is to coordinate truck access and anti-tracking pad location.

Specific Track-Out Control # 1- Good Housekeeping

Any sediment tracked out of the work area will be removed by sweeping, shoveling, vacuuming, or other effective method. Tracked-out sediments will not be hosed into any stormwater conveyances, storm drain inlets, or waterbody/resource areas, as it is prohibited.

- **Installation**

  N/A

- **Maintenance Requirements**

  Good housekeeping activities should be conducted a minimum of once per day, at the end of the working day. If excessive piles of sediment are created and cause a nuisance condition, they will be managed immediately.

Specific Track-Out Control # 2 – Vehicle Monitoring

Trucks delivering or removing soils, materials, and/or equipment to and from the Site must be cleaned of any excess soil prior to leaving the Site to ensure that no significant amount of sediment is carried off-site. Debris, excess soil, and sediment will be removed from sideboards and wheel flaps of all vehicles leaving the project site in a designated location. Every effort will be made to adequately remove sediment and debris without the use of water. Debris and sediment dry-removed from vehicles and equipment should be cleaned and disposed of immediately to prevent further tracking. Trucks must close and lock dump body gate prior to leaving the Site.

- **Installation**

  N/A

- **Maintenance Requirements**

  Monitoring of trucks leaving construction site.

Specific Track-Out Control # 3 – Anti-Tracking Pad (Construction Entrance/Exit)

A stabilized pad of stone at the construction egress will be installed to remove debris from tires as vehicles leave the work area.

- **Installation**

  Prior to the start of any earth disturbing activities.

- **Maintenance Requirements**

  Construction entry stone pads will, at a minimum, be inspected weekly and within 24 hours of a precipitation even that produces 0.25 inches of rain or more during a 24-hour period. A minimum 6-inch-thick pad will be maintained and top-dressed as needed to prevent tracking or flow of mud onto public roads.

4.4 Stockpiled Soil

Potential soil stockpile areas are identified on the project plan included in Attachment A and will be established after the start of the project. Stockpile areas will not interfere with construction equipment and will be located away from any areas of concentrated flow or pavement. The slopes of the stockpiles will be roughened by equipment tracking and will not exceed 2H:1V to prevent erosion. All soil, aggregate, debris, fill, excavated material, construction material, and building material stockpiling will occur far enough from designated wetlands or other resource areas, and at a location to prevent sediment from surface runoff entering these resource areas. At no time will any debris or other material be buried or disposed outside the limit of work referenced plans. At no time will soil or sediments be swept or hosed into any stormwater conveyance systems, storm drain inlets, or surface water/resource areas.

Specific Stockpile Control # 1
Stockpiling of soils will be minimized to the maximum extent possible. All stockpiles will be a minimum of 100 feet from rain gardens or infiltration structure, preserving a 50-foot natural buffer. Perimeter erosion and sedimentation controls will be installed surrounding the boundary of stockpiled materials on the downgradient sides to prevent downgradient sedimentation.

- **Installation**
  Ongoing throughout construction, as needed.

- **Maintenance Requirements**
  Stockpiles will be inspected prior to and immediately after a storm event to assess if erosion is occurring. Areas of erosion will be stabilized immediately. Temporary seeding, mulching, or the covering of soil stockpiles with plastic tarps may be required as directed by the Contractor.

Specific Stockpile Control # 2
When it is anticipated that any stockpile will remain inactive for an extended period of time, stockpiles will be covered or temporarily stabilized to avoid direct contact with precipitation and to minimize soil discharge.

- **Installation**
  Ongoing throughout construction, as needed.

- **Maintenance Requirements**
  During routine stormwater inspection, temporary seeding, mulching, or the covering of soil stockpiles with plastic tarp may be directed by the Contractor.

4.5 Dust Control

BMP's will be installed to treat, trap, and remove sediment from runoff. Street sweeping may be necessary to supplement sediment removal after its deposited.

Dust control using a minimal water spray will be implemented as needed after ground disturbance has begun and during windy conditions (forecasted or actual wind conditions of 20 mph or greater) while ground disturbance is occurring.

Specific Dust Control # 1 - Water
The Contractor will have on-site or immediate access to water for the duration of the project to control dust. Paved areas will be sprayed to minimize dust, as needed.

Specific Dust Control # 2 - Street Sweeping
Paved areas will be swept at a minimum of once per week or more frequently as necessary or directed by the Engineer. Any soil left on the pavement at the end of the day from work activities must be swept and removed from the roadway. Frequency changes of sweeping should be agreed upon by all members of the Stormwater Team.

Specific Dust Control # 3 - Other
Soil delivery trucks entering the Site will be required to have tarpaulins and appropriate tailgates. Tarpaulins must not be retracted until the truck loads out and must be in place prior to leaving the Site. Tailgates must be closed and secured upon arriving and prior to leaving the Site.

4.6 Steep Slope Disturbances

The general definition of a "steep slope" is as follows.

> Steep slopes are generally defined as those that are 15 percent or greater in grade.

Generally, the existing topography of the Site where work is to occur does not contain steep slopes. The northern portion of the Site access drive will create a steep slope during grading requiring installation of a retaining wall in that location. Installations in steeply sloping areas will be mitigated by the installation of temporary erosion control immediately after disturbance. A combination of silt fence with silt sock and erosion control blankets may be used to provide temporary stabilization and erosion control when these areas are disturbed and until they are permanently stabilized.

4.7 Topsoil

Topsoil stripped from the immediate area of construction will be reused on-site to the maximum extent practicable. Topsoil will be stockpiled in a designated staging area until reused. The stockpile will be located in an area that will not interfere with construction equipment and away from any areas of concentrated flow or pavement. Slopes of the topsoil stockpile, or any other stockpile, will not exceed 2H:1V to minimize the potential for erosion. All soils, aggregate, debris, fill, excavated material, construction material, and building material stockpiling will be stockpiled far enough from surface waters and at a location to prevent sediment from surface runoff from entering these resource areas.

4.8 Soil Compaction

During construction, heavily compacting soils around the construction site will be avoided to the maximum extent possible, especially within areas of proposed infiltration and where landscaping is to be installed. Construction within areas of undisturbed soils will be minimized. Specific soil compaction control measures will be selected by the Contractor during construction.

Specific Soil Compaction Control
Insofar as possible, construction activities will be confined to those areas defined by the plans and specifications. The Contractor will limit the traffic of construction vehicles and avoid the use of areas outside of these agreed upon areas for equipment storage, material storage, and vehicle parking to prevent excessive compaction, especially in areas of proposed infiltration and where landscaping is to be installed.

- **Installation**
  N/A

- **Maintenance Requirements**
  Areas sensitive to excessive compaction will be monitored for construction vehicle traffic, stockpiling, equipment and material storage, and other construction related activities that would compact underlying soils by the Contractor. If soil is compacted to the point where infiltration is infeasible, the Contractor may consider the use of aeration machines such as coulters or “sheep’s foot” rollers with spikes to mechanically roughen the soil and allow infiltration. If excessive compaction occurs in areas where topsoil has been spread, prior to planting, the area will be raked and scored to a minimum 2-inch depth prior to seeding or planting.

4.9 Permanent Catch Basin (Storm Drain) and Other Stormwater Structure Inlets

Specific Inlet Control # 1- Inlet Protection

Catch Basins and other stormwater structure inlets will be fitted with inlet protection consisting of fabric silt bags to trap any sediment generated from construction activities as soon as the structure is installed. Inlet protection will remain in place until the Site has been stabilized post construction.

- **Installation**
  Install according to the construction sequence per the manufacturer's instructions.

- **Maintenance Requirements**
  Inspect silt bags weekly and within 24 hours of a significant rain event, defined as a precipitation even that produces 0.25 inches of rain or more during a 24-hour period. Remove sediment when the bag is half full and replace bags when wear becomes evident to avoid rips and tears.

Specific Inlet Control # 2 – Compost Filter Tubes/Wattles

Prior to anticipated extreme storm events or when there is increased potential for sediment loading at the catch basins and other inlet structures, compost filter tubes can be temporarily placed them to provide additional sediment filtering.

- **Installation**
  Install as needed in addition to silt bags prior to extreme storm events or when there is an increased potential for sediment loading. Overlap ends by at least one foot.

- **Maintenance Requirements**
  Inspect compost filter tubes/ wattles weekly within 24 hours of a precipitation even that produces 0.25 inches of rain or more during a 24-hour period. Remove sediment when accumulation height reaches approximately one-half the height of the erosion control device. Replace when wear becomes evident to avoid breaches.

4.10 Constructed Site Drainage Features

Constructed stormwater conveyance ridges, channels, or a combination to direct runoff away from unstabilized areas, building and utility excavations and to reduce erosion. The Contractor will modify or adjust stormwater conveyance channel locations based on their construction approach, the amount of disturbed area at the time, and as directed by the Engineer.

4.11 Chemical Treatment

The use of treatment chemicals (e.g., polymers, flocculants, coagulants) is not proposed at the Site.

4.12 Dewatering Practices

Dewatering is not proposed at the Site.

4.13 Other Stormwater Controls

In addition to the previously described controls, construction will conform to all specifications as designated in the project specifications, on the Site plans, and in other associated contract documents or permits.

The following control measures and best practices will be implemented:

- The smallest area of land practicable will be exposed at any one time by phasing the construction.
- Wherever feasible, existing vegetation will be retained and protected.
- All on-site drainage systems/BMPs and adjacent roadway drainage systems/BMPs will be maintained in proper working condition during and after construction.
- The Contractor will attend a pre-construction meeting to discuss the erosion and sedimentation control plan and how it relates to the Contractor's intended construction schedule.
- If other stormwater control types are planned to be implemented, this CPESPPP will be amended as necessary.

4.14 Site Stabilization

The project is not located in an arid, semi-arid, or drought-stricken area and is not discharging directly to a sediment- or nutrient-impaired water. The stabilization practices will include vegetative and non-vegetative methods for both temporary and permanent stabilization.

Site stabilization is required to be conducted when work in an area of the Site has permanently or temporarily stopped (for a period of 14 or more consecutive calendar days) and to complete stabilization activities within 14 calendar days. Vegetative practices will be used to stabilize exposed soils where construction activities have temporarily or permanently ceased. Stabilization activities will be logged in Attachment E.

Specific Site Stabilization Control # 1- Seeding

Seeding will be initiated immediately after earth-disturbing activities have permanently or temporarily ceased (where construction will not resume for a period of 14 or more consecutive calendar days) in all pervious landscaped Site areas to provide either temporary or permanent stabilization. When stabilization is required outside of the growing season, temporary controls such as hay mulch, erosion control blankets, sod, or other control approved by the Engineer or Owner will be applied and maintained until the weather allows vegetative stabilization.

- **Installation**
  Ongoing throughout construction, as needed.

- **Maintenance Requirements**
  Areas will be inspected regularly as a part of the stormwater inspections to ensure erosion is minimized. Re-seeding will occur as necessary to ensure stabilization.

Specific Site Stabilization Control # 2 – Erosion Control Blankets

Installation of erosion control blankets (e.g., straw mats, jute netting) will occur in conjunction with permanent seeding on slopes steeper than 3H:1V immediately after earth disturbing activities have permanently or temporarily ceased. Where construction will not resume for a period of 14 or more consecutive calendar days and seeding is not feasible due to weather conditions, erosion control blankets can be installed as a soil stabilization and erosion control measure in all pervious Site areas on steep slopes to provide either temporary or permanent stabilization.

- **Installation**
  Ongoing throughout construction, as needed.

- **Maintenance Requirements**
  Areas will be inspected regularly as a part of the stormwater inspections to ensure erosion is minimized. Damaged erosion control blankets will be replaced as necessary to ensure stabilization.

5.0 POLLUTION PREVENTION STANDARDS

5.1 Potential Sources of Pollution

Construction Site Pollutants

The following sections provide a description of pollution prevention measures used to control litter, construction chemicals, and construction debris from becoming a pollutant source to stormwater discharges. Storage practices to minimize the exposure of materials to stormwater and spill prevention and response measures are described in this section.

Personnel responsible for the oversight of the petroleum products and hazardous or controlled substances include the following:

a. Contractor

b. Project site coordinators designated by the Contractor

The Contractor will be responsible for overseeing all the requirements of this plan and all efforts described herein to prevent spills, as well as be responsible to address the timely remediation of any accidental spill in accordance with applicable federal, state, and local regulations. The Contractor will identify appropriately an trained Site employee involved with day-to-day Site operations to be the spill prevention and cleanup coordinator. The name of the responsible spill prevention and cleanup coordinators will be posted in the on-site office. Each employee will be instructed that spills are to be reported to the spill prevention and cleanup coordinator.

Will this pollutant-generating activity occur at the Site?	Areas of Work		Other Pollutants					
		Sediment	Nutrients	PAHs	pH	Oil & Grease	Bacteria	Trash, Debris and Solids
☒ Yes ☐ No	Clearing, grading, excavating and presence of unstabilized areas	√	√		√			√
☒ Yes ☐ No	Paving operations	√	√	√		√		√
☒ Yes ☐ No	Concrete washout and waste	√			√			√
☒ Yes ☐ No	Structure construction/painting							√
☒ Yes ☐ No	Demolition and debris disposal	√						√
☐ Yes ☒ No	Dewatering operations							
☒ Yes ☐ No	Material delivery and storage	√						√
☒ Yes ☐ No	Material used during construction process	√						

Will this pollutant-generating activity occur at the Site?	Areas of Work		Other Pollutants					
		Sediment	Nutrients	PAHs	pH	Oil & Grease	Bacteria	Trash, Debris and Solids
☒ Yes ☐ No	Solid waste (trash and debris)							√
☒ Yes ☐ No	Sanitary/septic waste		√				√	
☒ Yes ☐ No	Vehicle/equipment use and storage	√				√		
☒ Yes ☐ No	Vehicle/equipment fueling and maintenance	√				√		
☒ Yes ☐ No	Landscaping operations	√	√					√
☒ Yes ☐ No	Stockpiles of materials (gravel, loam, etc.)	√	√					

5.2 Spill Prevention and Response

The Contractor will use the utmost care in minimizing the risk of spills at the construction site. The potential risk for spills will be minimized by storing chemicals and petroleum products in locked, labeled, and properly ventilated storage containers. In the unlikely event of a spill, the Contractor will immediately clean up any and all spills of fuel, oil, or other potentially hazardous materials. Any and all reportable spills will be reported to the proper authorities within the required timeframe(s). The appropriate materials to respond to and clean up a spill will be maintained on-site at all times by the Contractor. Appropriate equipment for a spill kit may include oil booms, gloves, goggles, oil absorption materials, sand, sawdust, plastic and metal containers, rags, and mops.

Pollution Prevention Practice # 1 – Spill Kit

A spill kit will be located at a strategic place on the construction site near potential pollutant storage areas. All construction workers will be notified of the location of spill kits. If a reportable spill occurs, proper notifications will be made in accordance with the local Fire Department and the Massachusetts Contingency Plan (310 CMR 40.000). The Contractor will be responsible for complete cleanup of any accidental spills.

- **Installation**
  As part of pre-construction Site activities.

- **Maintenance Requirements**
  Spill kits will be inspected as part of the regularly scheduled stormwater inspections and will be restocked as needed.

Pollution Prevention Practice # 2- Storage Requirements

All fuels, oil, solvents, and chemicals will be stored in original containers or in comparable containers manufactured for storing such material in the temporary staging areas and away from stormwater structures. Containers will be clearly labeled as to the contents. Portable secondary containment will be used.

- **Installation**
  Ongoing throughout construction, as needed.

- **Maintenance Requirements**
  Potential pollutants/chemicals will be inspected as part of the regularly scheduled stormwater inspections and any defective containers will be replaced immediately.

Pollution Prevention Practice # 3 - Training

All employees will be trained on how to properly prevent spills and how to contain one in the unlikely event of a spill.

- **Installation**
  As part of pre-construction Site activities.

- **Maintenance Requirements**
  Additional training will be given to employees as needed or deemed necessary by the Contractor.

5.3 Fueling and Maintenance of Equipment or Vehicles

Maintenance and cleaning of construction vehicles (beyond removal of loose soil) is not anticipated to be conducted at the project site. All major equipment/vehicle maintenance or repairs will be performed off-site. Construction equipment will be inspected daily to minimize risk of an accidental discharge of oil or fuel at the Site. Routine equipment refueling activities will not be conducted within 50 feet of a stormwater structure. A spill kit will be nearby and easily accessible during refueling activities. Drip pans and absorbents will be used under and/or around leaky vehicles. All recycled oil and oily waste will be disposed of in accordance with Federal, State, and local requirements. The ground surface in the vicinity of refueling activities should be inspected following refueling. Any spills will be cleaned up immediately.

Pollution Prevention Practice # 1- Storage Requirements

Fuel, oil, and other potentially hazardous materials needed for equipment maintenance will be kept secured and have secondary containment (e.g., spill berms, decks, spill containment pallets). Properly contain, label, and store all petroleum products off the ground. Any fuel or other lubricants stored overnight will be covered and secured. Take all necessary precautions to avoid leakage and spillage of all petroleum products.

- **Installation**
  Ongoing throughout construction, as needed.

- **Maintenance Requirements**
  Secondary containment should be kept clean and inspected daily or more frequently if necessary.

Pollution Prevention Practice # 2 – Secondary Containment

Secondary containment is required for any on-site vehicle and equipment refueling. No maintenance activities will occur within 50 feet of a stormwater structure.

- **Installation**
  Ongoing throughout construction, as needed.

- **Maintenance Requirements**
  Secondary containment should be kept clean and inspected daily or more frequently if necessary.

Pollution Prevention Practice # 3 – Spill Kits

At each vehicle staging area, spill clean-up equipment (shovels, mats, booms, absorbent pads, and materials) will be maintained for use in the event of an accidental spill.

- **Installation**
  Prior to construction commencement.

- **Maintenance Requirements**
  Spill kits will be inspected as part of the regularly scheduled stormwater inspections and will be restocked as needed.

5.4 Washing of Equipment and Vehicles

All major equipment and vehicle washing, and maintenance will be performed off-site. Minor cleaning of equipment and vehicles (i.e., removal of loose dirt) is to be performed in a designated staging/storage area away from stormwater structures. Soaps and detergents will be stored under a cover (e.g., plastic sheeting, temporary roofs) to minimize exposure of these materials to precipitation and stormwater. The Contractor will provide an effective means of minimizing discharge of pollutants from equipment and vehicle washing, wheel wash water, and other types of wash waters and ensure there is no discharge of soaps or detergents in any wash water.

5.5 Storage, Handling, and Disposal of Building Products, Materials, and Wastes

5.5.1 Building Materials and Building Products

Materials and temporary equipment will be stored in the designated staging areas. A continuous line of compost filter tubes (or equivalent) will be placed around stockpiles of soil or other earth material, as needed. Construction products will be kept in sealed containers and stockpiles will be adequately covered to minimize the exposure of these materials to precipitation and to stormwater so as to minimize the discharge of pollutants from these areas. Any stockpile that is not used will be stabilized with polyethylene sheeting or mulch as a temporary cover to prevent run-off and wind erosion of material. These materials will be properly stored and routinely inspected. Storage and covering of building products will be ongoing throughout construction.

Pollution Prevention Practice # 1- Proper Storage
All construction products which contain asphalt and sealants will be stored in weatherproof areas. This will include within temporary structures erected to support construction, or within vehicles at designated staging areas.

- **Maintenance Requirements**
  Regular inspections will assess containment and check for any leaks or other impacts.

5.5.2 Pesticides, Herbicides, Insecticides, Fertilizers, and Landscape Materials

The storage of pesticides, herbicides, and insecticides on-Site is prohibited. The storage and handling of fertilizers and landscape materials will be kept to a minimum. These products will be stored or covered in a manner that will prevent rainwater from coming into contact with them until ready for use. Use of fertilizers, if necessary, will be limited to slow release, low nitrogen (<5%), organic-based fertilizers of a 5-5-5 formulation or similar. Fertilizer storage requires sealed bins under cover from weather.

Specific Pollution Prevention Practices
Refer to Section 5.2 herein for pollution prevention practices relevant to pollutant storage.

5.5.3 Diesel Fuel, Oil, Hydraulic Fluids, Other Petroleum Products, and Other Chemicals

Diesel fuel, motor oil, hydraulic oil, gasoline, machine grease, other petroleum products, and other related pollutants will be stored temporarily on a daily basis in appropriate water-tight and clearly marked containers, segregated from other non-water materials, covered from precipitation by roof or plastic sheeting, and will have secondary containment (e.g., spill berms, decks, spill containment pallets). These materials will be stored in accordance with all local, state, and federal regulations and placed in secondary containment such as on a commercially available spill pallet. Proper storage, covering, and inspection of these materials will be ongoing throughout construction. Any spills must be cleaned immediately using dry clean-up methods where possible. Used materials must be properly disposed. Do not clean surfaces or spills by flushing the area with water. Eliminate the source of the spill to prevent further release.

Specific Pollution Prevention Practices
Refer to Section 5.3 herein for pollution prevention practices relevant to diesel/oil/hydraulic fluids, etc.

5.5.4 Construction and Domestic Waste

All construction and domestic waste materials, including but not limited to packaging, scrap construction materials, masonry, timber, pipe, electrical, plastics, styrofoam, and concrete will be collected and stored securely in covered metal dumpsters. Dumpsters must be kept closed when not in use and closed at the end of each business day. Cover (e.g., tarps) must be provided for dumpsters without lids to minimize exposure to precipitation. Dumpsters will meet local and state solid waste management regulations and will be emptied as necessary. A company licensed in accordance with applicable federal, state, and local regulations will transport the waste. No trash, stumps, or construction debris will be buried on-Site. Individuals working on the Site will be informed of the appropriate procedure for waste disposal. The Contractor will be responsible for seeing that these procedures are followed properly.

Pollution Prevention Practice # 1- Proper Collection and Storage
Construction and Demolition Debris (C&D) will be stored on-site in closed-top dumpsters or roll-off dumpsters where closed tops are not feasible due to debris size. Domestic solid waste generated from construction activities will be collected and stored in secure dumpsters at the Site separate from C&D debris. The dumpsters will meet all local and state solid waste management regulations. The dumpsters will be located at the temporary staging areas. Only construction debris and trash will be deposited in their respective dumpsters. No construction materials will be buried on-site. All personnel will be instructed, during training sessions, regarding the correct disposal of trash and construction debris and anti-littering policies. Notices that state these practices will be posted in the office trailer and the individual who manages day-to-day Site operations will be responsible for enforcing these practices.

- **Installation**
  Dumpsters will be provided prior to construction commencement.

- **Maintenance Requirements**
  Debris storage areas will be inspected as part of the regularly scheduled stormwater inspections and after storm events. Dumpsters will be emptied when full. Windblown litter will be collected as necessary.

5.5.5 Sanitary Waste

Portable sanitary facilities will be provided for project staff. They shall be accessible for maintenance and general use and located in an area that is generally out of the way of construction activities and pose the least impact to potential receptors. Portable sanitary facilities will be serviced weekly, kept clean, and supplied throughout the course of the work. If required, additional BMPs may be implemented (such as sandbags around the base) to prevent wastes from contributing to stormwater discharges. The portable facilities will be stabilized to prevent overturning during storms or due to vandalism. The Contractor will enforce proper use of sanitary facilities.

5.6 Washing of Applicators and Containers used for Paint, Concrete, or Other Materials

Concrete trucks will be allowed to wash out or discharge surplus concrete or drum wash water on the Site, but only in a specifically designated diked area that will be constructed to prevent contact between stormwater and the concrete and/or washout water.

Hardened residue from the concrete washout station will be disposed of in the same manner as other non-hazardous construction waste materials or may be broken up and used on-site as deemed appropriate by the Engineer. The Contractor will be responsible for seeing that these procedures are followed.

The concrete washout area will be located where the likelihood of the area contributing to stormwater discharges is negligible. The actual layout of the concrete washout station is to be determined during construction. If required, additional BMPs may be implemented to prevent concrete wastes from contributing to stormwater discharges. No discharges will be allowed in work areas within the buffer zones to or within any resource areas.

5.7 Fertilizers

If fertilizers are required on-site, they will be applied at a rate and in an amount consistent with the manufacturer's specifications and at the appropriate time of year, timed to coincide as closely as possible to the period of maximum vegetation uptake and growth. The Contractor will avoid applying fertilizers prior to forecasted heavy rains that could cause excess nutrients to be discharge. Never apply to frozen ground or within constructed or natural Site drainage features. Follow all applicable Federal, State, and local requirements regarding fertilizer application.

5.8 Contaminated Soil / Urban Fill

If contaminated soil and /or urban fill soils are encountered during trenching and excavation activities, these soils will be handled in accordance with the Massachusetts Contingency Plan (MCP, 310 CMR 40.000) and the Solid Waste Management Regulations (SWMR, 310 CMR 19.000). Impacted soil stockpiling must be conducted in accordance with stockpiling requirements set forth in Section 4.5 of this CPESPPP and be covered with polyethylene sheeting to prevent contact with precipitation. Stormwater that may contact oil or hazardous materials, polychlorinated biphenyls (PCBs), lead, asbestos, or other types of contaminated soil will be collected within the immediate area of the contact, treated (as determined by sampling and testing), and disposed of in accordance with all local, state, and federal regulations.

5.9 Asbestos Containing Materials Removal and Disposal

The excavation of soil, fill, and waste containing potential asbestos-containing material will be handled in accordance with project specifications, Massachusetts Division of Occupational Safety (MassDOS) regulations (The Removal, Containment, or Encapsulation of Asbestos; 453 CMR 6.00), and Massachusetts Department of Environmental Protection (MassDEP) Asbestos Regulations (310 CMR 7.00), Asbestos Disposal Regulations (310 CMR 19.061), and the Massachusetts Contingency Plan (310 CMR 40.000).

No off-site staging of asbestos cement pipe, asbestos materials, or asbestos containing soils will be allowed. Storage of removed asbestos containing material is not permitted without prior MassDEP approval. Asbestos cement pipe that has been properly wetted, sealed, and labeled is permitted to be stored for up to 30 days on-site with prior approval from MassDEP.

5.10 Other Pollution Prevention Practices

If other pollution prevention practices are deemed necessary during the Project, the CPESPPP will be amended to include these added practices.

6.0 INSPECTION, MAINTENANCE, AND CORRECTIVE ACTION

6.1 Inspection Personnel and Procedures

All pollution prevention controls, and equipment will be inspected to maintain such controls and equipment in effective operating conditions and to protect them from activities that may reduce their effectiveness.

Personnel Responsible for Inspections
Inspections will be conducted by a "qualified person" who is knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention. The qualified person will possess appropriate skills and training to assess conditions at the construction site that could impact stormwater quality and the ability to assess the effectiveness of any stormwater control measures selected and installed for the project.

Inspection Frequency
Site inspections will occur at least once every 7 calendar days or once every 14 calendar days; *and* 1) within 24 hours of the occurrence of a storm event that produces 0.25 inches or more of rain within a 24-hour period, or 2) after a discharge caused by snowmelt from a storm event that produces 3.25 inches or more of snow within a 24-hour period.

The Stormwater Team for this project will inspect stormwater management and erosion control BMPs once every 7 calendar days.

Rain Gauge Location (if applicable)
A rain gauge from the local weather station will be used for rainfall data.

Reductions in Inspection Frequency
Reductions in inspection frequencies can occur under the following circumstances:

1. Inspections may be suspended when all disturbed areas of the Site have been adequately stabilized.
2. Inspections can be temporarily suspended during frozen conditions where construction activities are suspended.

The Stormwater Team should agree upon making any reductions in accordance with these conditions. Any inspection reduction periods must be documented with start and end date in the CPESPPP.

Inspection Report Forms
Inspection Report Forms are located in Attachment B.

6.2 Corrective Action

Per Section 5 of the 2022 Construction General Permit, on the same day a condition requiring corrective action is identified, all reasonable steps to minimize or prevent the discharge of pollutants will be made until a permanent solution is implemented and made operational. However, if the problem identified does not require a new or replacement control or significant repair and is identified at the end of a work day, the initiation of corrective action will begin on the following work day.

All corrective actions must be documented in the Corrective Action Log, provided in Attachment C.

6.3 Delegation of Authority

The Contractor will be responsible for signing inspection reports, certifications, or other information for this project. The Contractor will act as the Operator and may assign a duly authorized representative to act in this role during the project work. Both Contractor and assigned duly authorized representative must complete and sign the Delegation of Authority form, provided in Attachment G.

Duly Authorized Representative:
TBD

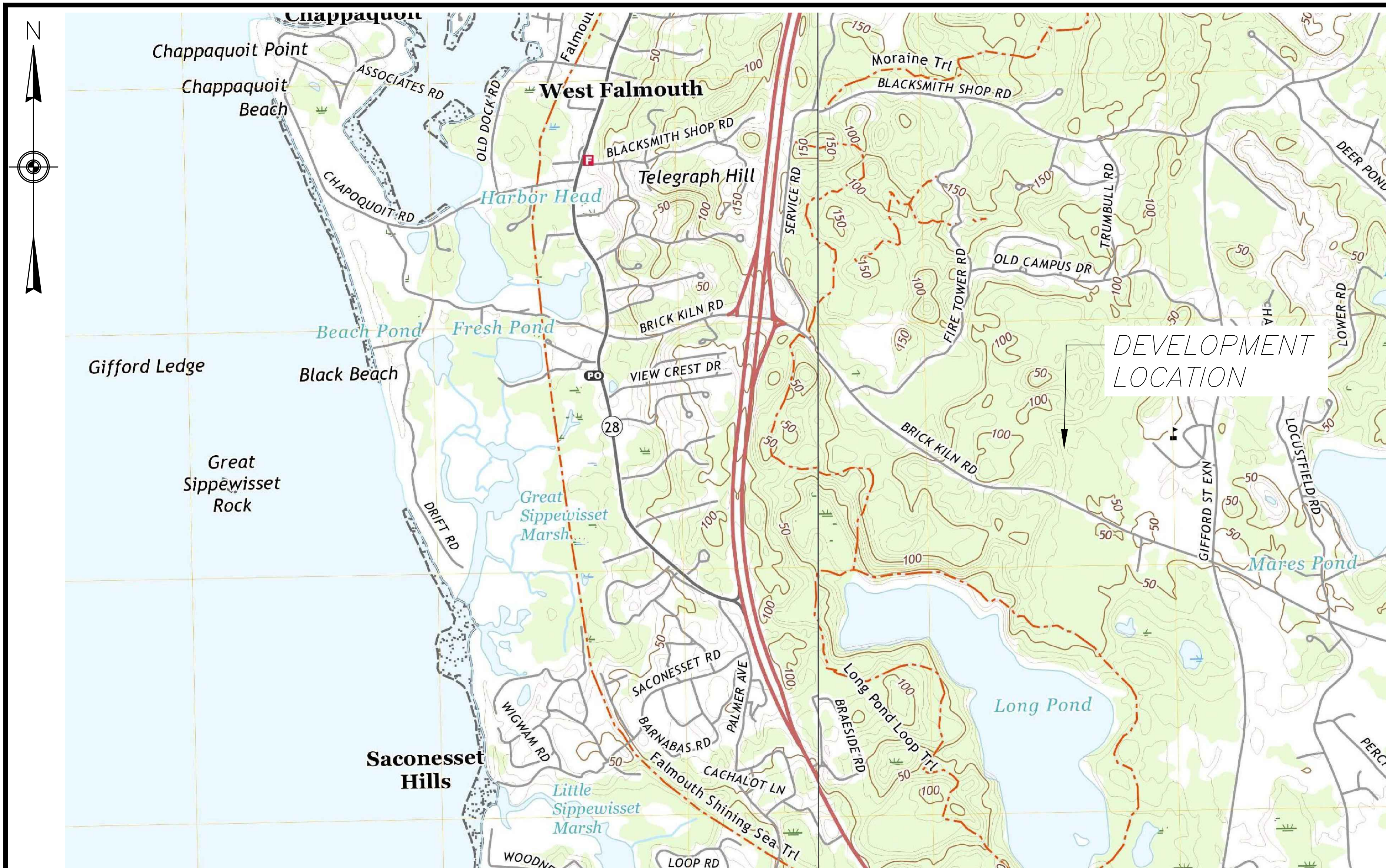
7.0 CERTIFICATION AND NOTIFICATION

I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete.

Name:_____________________________________ **Title:** _______________________
(Contractor Printed)

Signature: __________________________________ **Date:** _______________________

FIGURES



DRAWING TITLE:		PREPARED FOR:	LOCUS:	DATE:	SCALE:	MAP:	
FIGURE 1 LOCUS MAP		UPPER CAPE YMCA CPESPP PLAN	BRICK KILN ROAD FALMOUTH, MA	09/21/2023	NOT TO SCALE	1 OF 5	Green Seal Environmental, LLC 114 State Road, Building B Sagamore Beach, MA 02562 Tel: (508) 888-6034 Fax: (508) 888-1506 www.gseenv.com
				CAD TECH: MJW PM: TB			

\\GREEN-SEAL5\DATA\CLIENTS\YMCA - CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAPE COD COMMISSION\DRI\EXHIBIT 22 - STORMWATER REPORT\APPENDICES\D - CPESPPP\FIGURES\CPESPP FIGURES.DWG 9/21/2023 1:27 PM

N

MassDEP Online Map Viewer

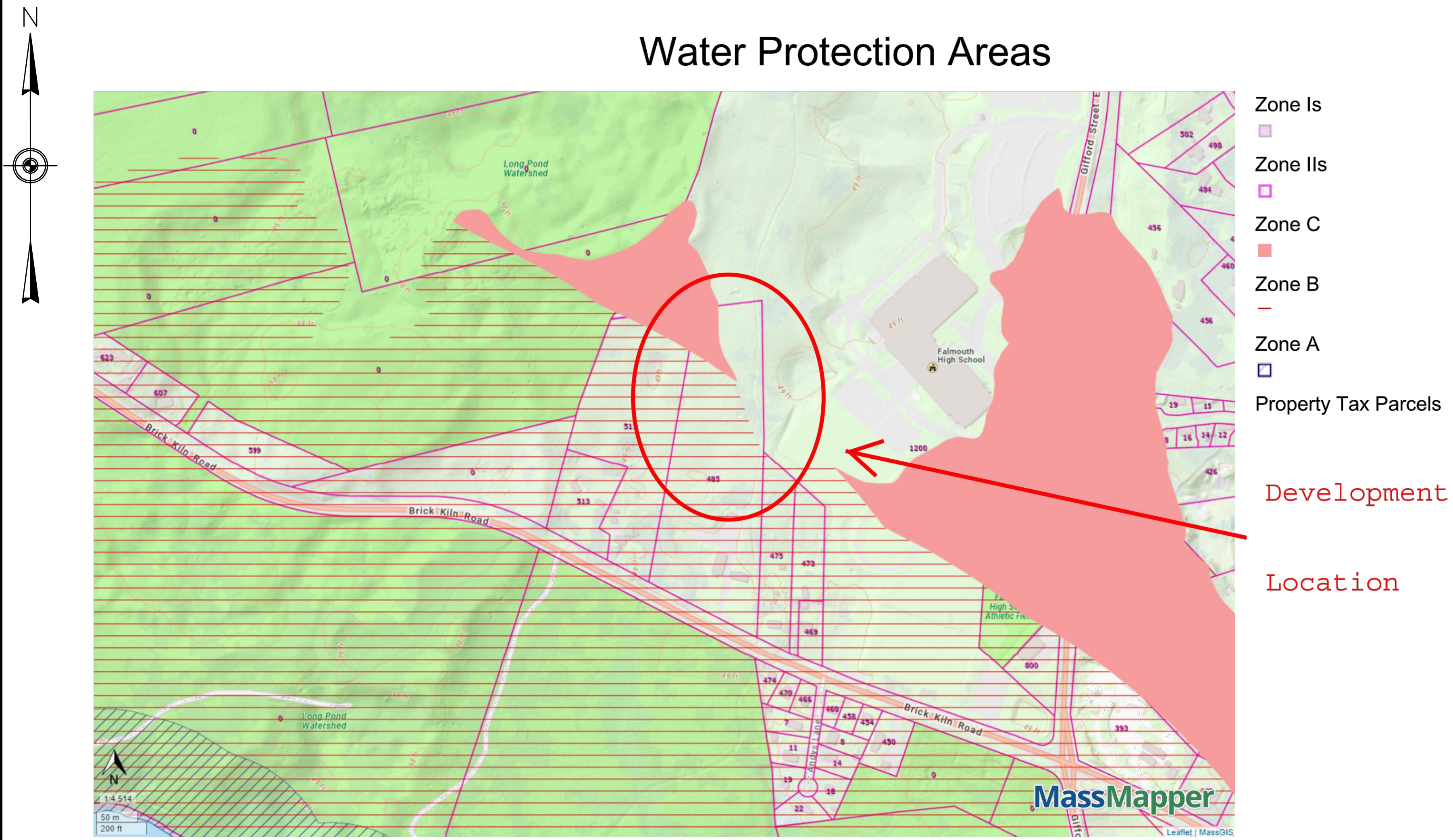
Wetland and Wetland Change Areas Map

Mass.Gov

DRAWING TITLE:	NOTES:	PREPARED FOR:	LOCUS:	DATE:	SCALE:	MAP:	
FIGURE 2 MASSDEP WETLAND AREAS MAP	1. MAP DOWNLOADED ON 9/14/2023.	UPPER CAPE YMCA CPESPP PLAN	BRICK KILN ROAD FALMOUTH, MA	09/21/2023 CAD TECH: MJW PM: TB	NOT TO SCALE	2 OF 5	Green Seal Environmental, LLC 114 State Road, Building B Sagamore Beach, MA 02562 Tel: (508) 888-6034 Fax: (508) 888-1506 www.gseenv.com

\\GREEN-SEAL5\DATA\CLIENTS\YMCA - CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAPE COD COMMISSION\DRI\EXHIBIT 22 - STORMWATER REPORT\APPENDICES\D - CPESPPP\FIGURES\CPESPP FIGURES.DWG 9/21/2023 1:27 PM

Water Protection Areas

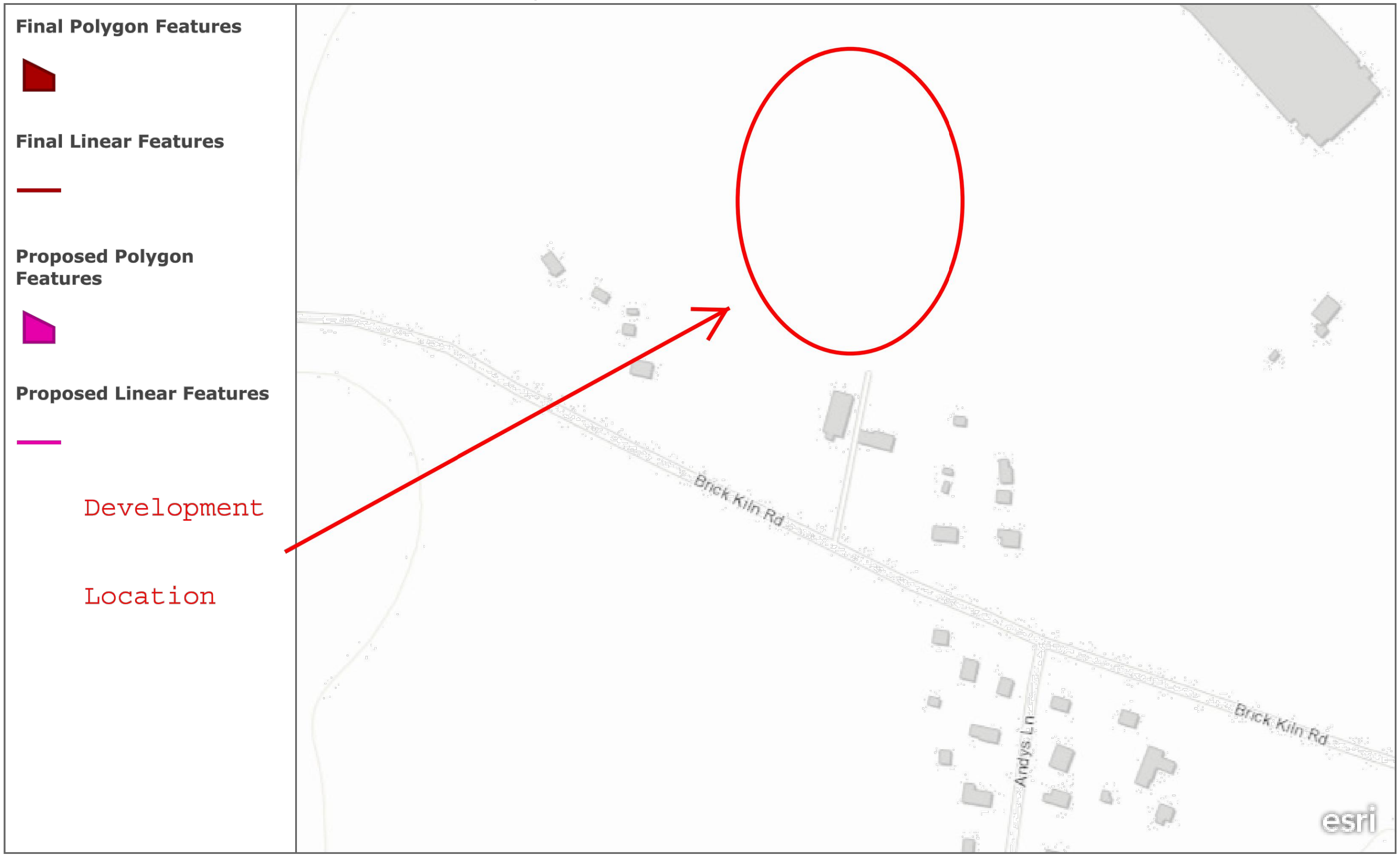


DRAWING TITLE:	NOTES:	PREPARED FOR:	LOCUS:	DATE:	SCALE:	MAP:
FIGURE 3 WATER PROTECTION AREAS	1. MAP DOWNLOADED ON 9/14/2023.	UPPER CAPE YMCA CPESPP PLAN	BRICK KILN ROAD FALMOUTH, MA	09/21/2023 CAD TECH: MJW PM: TB	NOT TO SCALE	3 OF 5

Green Seal Environmental, LLC
114 State Road, Building B
Sagamore Beach, MA 02562
Tel: (508) 888-6034
Fax: (508) 888-1506
www.gseenv.com

N

Critical Habitat for Threatened & Endangered Species [USFWS]



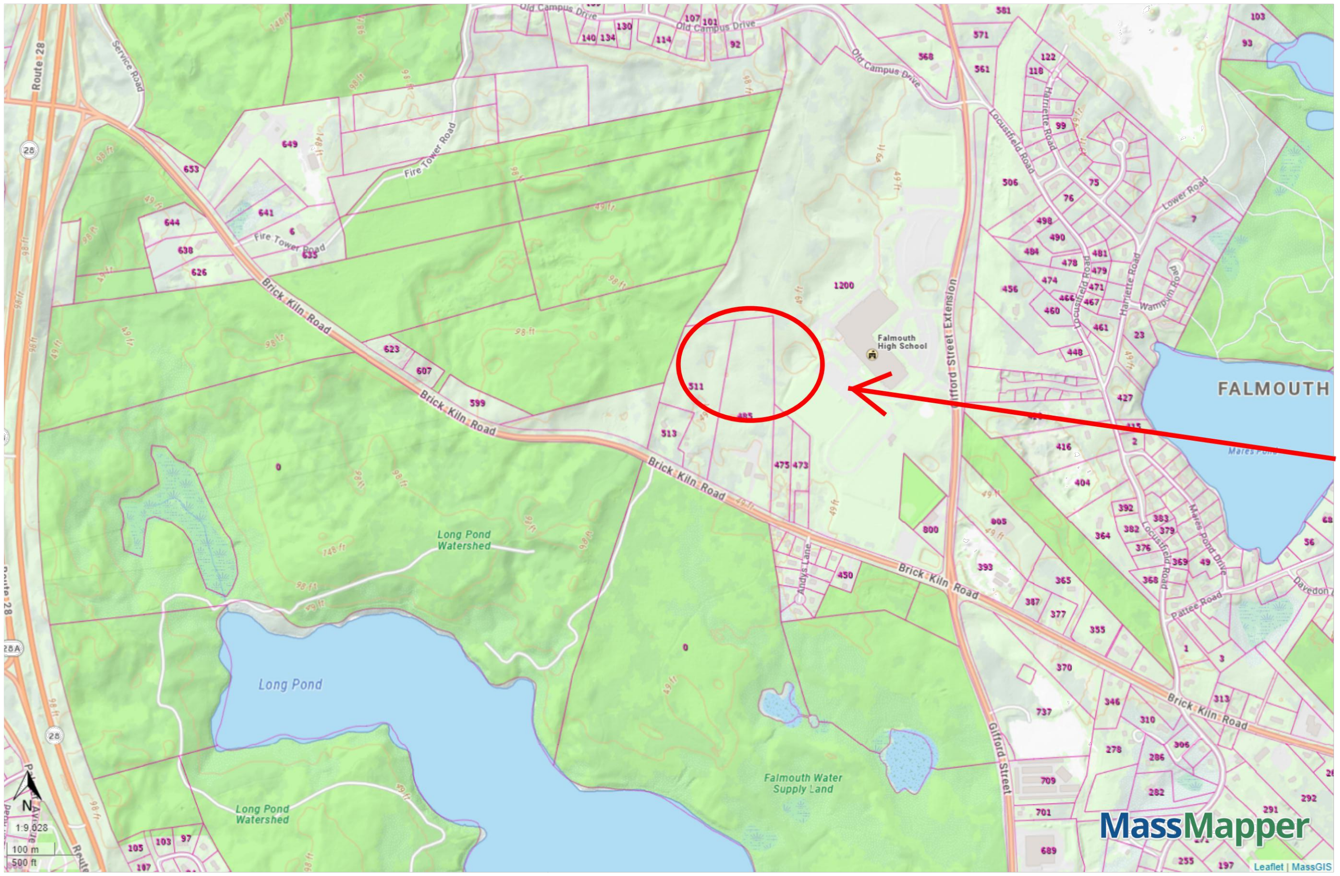
A specific geographic area(s) that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection.

MassGIS, Esri, HERE, Garmin, INCREMENT P, USGS, EPA, USDA

DRAWING TITLE: FIGURE 4 FEDERAL THREATENED AND ENDANGERED SPECIES MAP		PREPARED FOR: UPPER CAPE YMCA CPESPP PLAN	LOCUS: BRICK KILN ROAD FALMOUTH, MA	DATE: 09/21/2023 CAD TECH: MJW PM: TB	SCALE: NOT TO SCALE	MAP: 4 OF 5	

Green Seal Environmental, LLC
114 State Road, Building B
Sagamore Beach, MA 02562
Tel: (508) 888-6034
Fax: (508) 888-1506
www.gseenv.com

NHESP Map



NHESP Priority Habitats of Rare Species

NHESP Estimated Habitats of Rare Wildlife

Property Tax Parcels

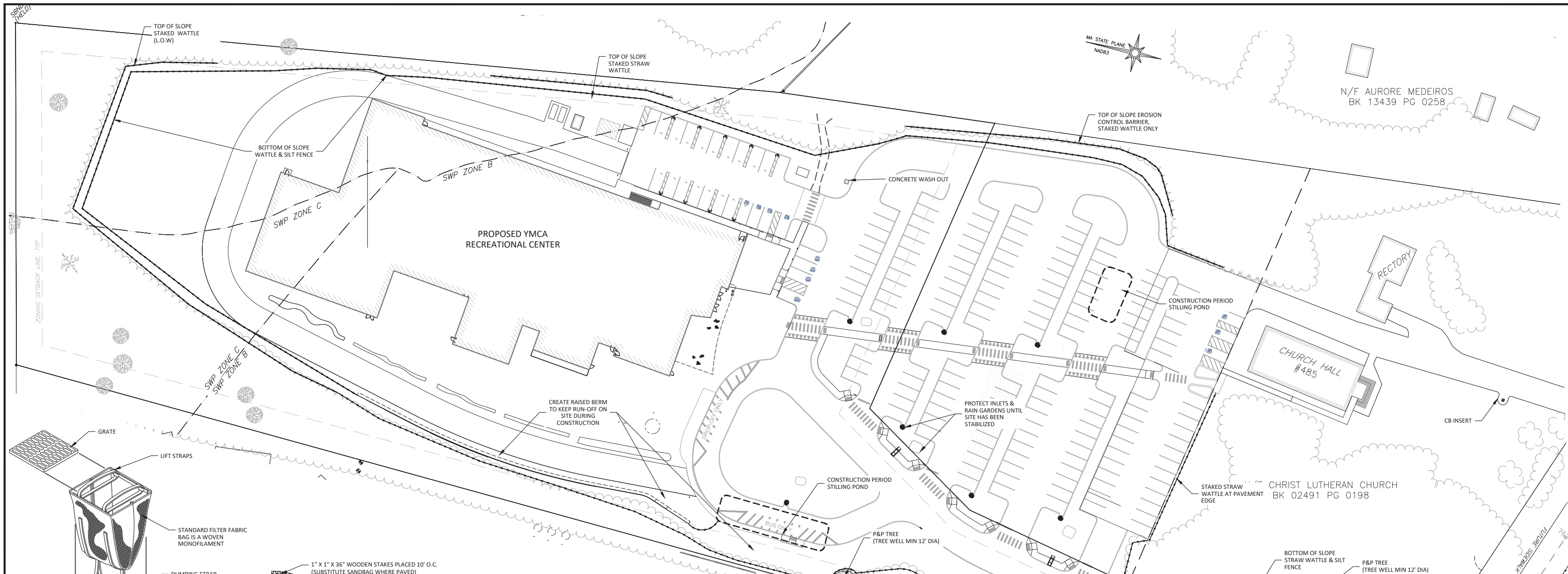
Proposed Development

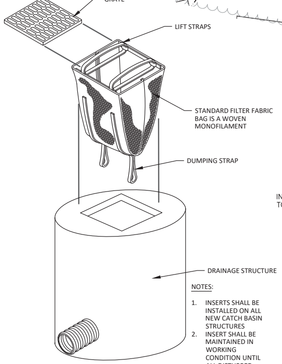
DRAWING TITLE:	NOTES:	PREPARED FOR:	LOCUS:	DATE:	SCALE:	MAP:	
FIGURE 5 NHESP PRIORITY HABITATS MAP	1. MAP DOWNLOADED ON 9/14/2023.	UPPER CAPE YMCA CPESPP PLAN	BRICK KILN ROAD FALMOUTH, MA	09/21/2023 CAD TECH: MJW PM: TB	NOT TO SCALE	5 OF 5	Green Seal Environmental, LLC 114 State Road, Building B Sagamore Beach, MA 02562 Tel: (508) 888-6034 Fax: (508) 888-1506 www.gseenv.com

\\GREEN-SEAL5\DATA\CLIENTS\YMCA – CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAPE COD COMMISSION\DRI\EXHIBIT 22 – STORMWATER REPORT\APPENDICES\D – CPESPPP\FIGURES\CPESPP FIGURES.DWG 9/21/2023 1:27 PM

ATTACHMENT A

SITE PLAN – TEMPORARY EROSION & SEDIMENTATION CONTROLS



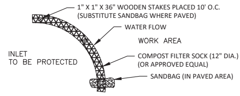


NOTES:

1. INSERTS SHALL BE INSTALLED ON ALL NEW CATCH BASIN STRUCTURES
2. INSERT SHALL BE MAINTAINED IN WORKING CONDITION UNTIL ALL DISTURBED AREAS ARE STABILIZED.

INLET PROTECTION AT CATCH BASIN (SILT SACK)

NOT TO SCALE



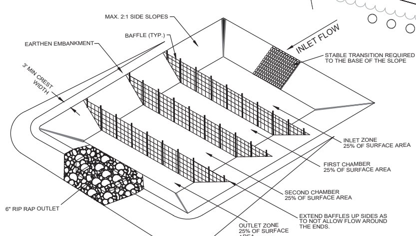
INLET OTHER THAN CATCH BASIN

NOTES:

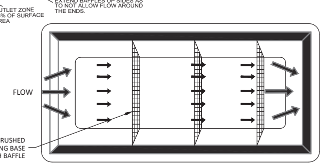
1. OVERLAP ENDS OF SOCK PER MANUFACTURERS RECOMMENDATIONS – ONE FOOT MINIMUM, 3 FEET MAXIMUM.
2. USE 8"–12" DIA. SOCK IN CURBSIDE OR TRAFFICKED AREAS.
3. USE 12"–18" DIA. SOCK IN NON–TRAFFICKED AREAS.
4. INSPECT AND MAINTAIN THROUGHOUT CONSTRUCTION.
5. SOCK AND COMPOST MATERIAL TO BE REMOVED FROM SITE WHEN CONSTRUCTION IS COMPLETE.

INLET PROTECTION - SILT SOCK

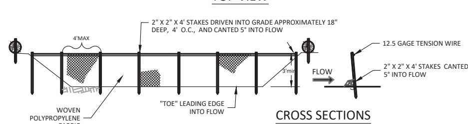
NOT TO SCALE



PERSPECTIVE VIEW



TOP VIEW



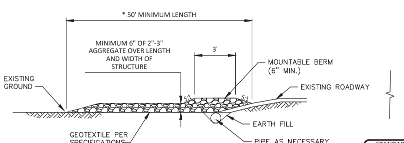
CROSS SECTIONS

CONSTRUCTION PERIOD STILLING BASIN DETAIL

NOT TO SCALE

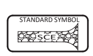
NOTES:

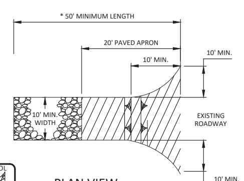
1. 3 BAFFLES (MIN) BETWEEN INLET & OUTLET. 5. TRAPS MUST BE STABILIZED IMMEDIATELY UPON CONSTRUCTION
2. LOCATE SEDIMENT INFLOW TO THE BASIN AWAY FROM THE DAM TO PREVENT SHORT CIRCUITS FROM INLETS TO OUTLETS
3. SEED, STRAW & TACK APPLICATION
4. MAINTENANCE: REPAIR/REPLACE BAFFLES WHEN THEY COLLAPSE, TEAR OR DECOMPOSE. REMOVE SEDIMENT WHEN CELL IS 1/2 FULL



PROFILE

NOT TO SCALE



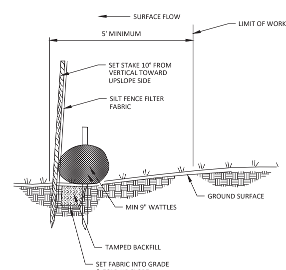


PLAN VIEW

STABILIZED CONSTRUCTION ENTRANCE (SCE)

NOT TO SCALE

1. LENGTH - MINIMUM OF 50'.
2. WIDTH - 10' MINIMUM, SHOULD BE FLARED AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
3. GEOTEXTILE FABRIC (MIRAFI 180N OR EQUAL) SHALL BE PLACED OVER THE EXISTING GROUND PRIOR TO PLACING STONE.
4. STONE - CRUSHED AGGREGATE (2" TO 3") OR RECLAIMED OR RECYCLED CONCRETE OR EQUIVALENT SHALL BE PLACED AT LEAST 6" DEEP OVER THE LENGTH AND WIDTH OF THE ENTRANCE.
5. SURFACE WATER - ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED THROUGH THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PIPE INSTALLED THROUGH THE STABILIZED CONSTRUCTION ENTRANCE SHALL BE PROTECTED WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 6" OF STONE OVER THE PIPE. WHEN THE SCE IS LOCATED AT A HIGH SPOT ALONG THE ROADWAY, DRAINAGE PIPE WILL NOT BE NECESSARY. PIPE SHOULD BE SIZED ACCORDING TO THE AMOUNT OF RUNOFF TO BE CONVEYED. A 12" MINIMUM WILL BE REQUIRED.
6. LOCATION - A STABILIZED CONSTRUCTION ENTRANCE SHALL BE LOCATED AT EVERY POINT WHERE CONSTRUCTION TRAFFIC ENTERS OR LEAVES A CONSTRUCTION SITE. VEHICLES LEAVING THE SITE MUST TRAVEL OVER THE ENTIRE LENGTH OF THE STABILIZED CONSTRUCTION ENTRANCE.
7. ALL EFFORTS SHALL BE MADE TO REDUCE MATERIAL IN THE ROADWAY.

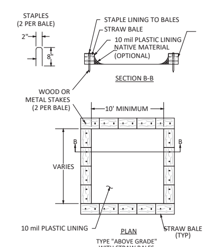


EROSION CONTROL BARRIER DETAIL

NOT TO SCALE

NOTES:

1. SILT FENCE AND POSTS FROM APPROVED MANUFACTURER/SUPPLIER SET TO MANUFACTURERS SPECIFICATION.
2. WATTLE AND SILT FENCE COMBINATION TO BE INSTALLED AS PERIMETER EROSION CONTROL DEVICE IN PROXIMITY TO WETLAND AND RESOURCE AREAS.
3. WATTLES MAY BE SUBSTITUTED WITH STRAW BALES.
4. WATTLE CONTENTS SHALL BE MULCH OR STRAW



CONCRETE WASHOUT STATION

NOT TO SCALE

NOTES:

1. ACTUAL LAYOUT TO BE DETERMINED IN THE FIELD.
2. MATERIALS USED TO CONSTRUCT TEMPORARY CONCRETE WASHOUT FACILITIES SHALL BE REMOVED FROM THE SITE OF THE WORK AND DISPOSED OF OR RECYCLED.
3. HOLES, DEPRESSIONS OR OTHER GROUND DISTURBANCE CAUSED BY THE REMOVAL OF THE TEMPORARY CONCRETE WASHOUT FACILITIES SHALL BE BACKFILLED, REPAIRED, AND STABILIZED TO PREVENT EROSION.
4. MUST BE LOCATED >50 FT AWAY FROM INLETS/WATERWAYS UNLESS THERE IS NO OTHER PRACTICAL ALTERNATIVE.

LOCUS MAP

NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

DIMENSIONS ARE AS INDICATED.

USE OF THIS PLAN CONSTITUTES ACCEPTANCE OF TERMS AND CONDITIONS SET FORTH IN ACCOMPANYING PROJECT DOCUMENTATION.

IT IS THE RESPONSIBILITY OF THE USER TO CONFIRM DISCREPANCIES WITH THE ENGINEER PRIOR TO USE.

REVISIONS

NO.	DATE	COMMENT
1	8/16/23	ISSUED FOR PERMITTING

NOT FOR CONSTRUCTION
FOR PERMITTING
PURPOSES ONLY

PURPOSE:

SPECIAL PERMIT WITH SITE PLAN REVIEW

LOCUS:

487 BRICK KILN ROAD
WEST FALMOUTH, MA

PREPARED FOR:

YMCA CAPE COD

DRAWING TITLE:

SEDIMENT & EROSION CONTROL PLAN

CAD TECH:	CHECKED BY:
SDC	JDO
ENGINEER:	DATE:
SDC	8/16/23
	SCALE:
	1"=40'
	SHEET:
	C-109

COMMONWEALTH OF MASSACHUSETTS
STUART D. CLARK
CIVIL
No. 40697
REGISTERED PROFESSIONAL ENGINEER

S:\CLIENTS\YMCA - CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAD\00 SITE PLANS.DWG 9/14/2023 4:17 PM

ATTACHMENT B

SITE INSPECTION REPORT

Site Inspection Report

Section A – General Information (If necessary, complete additional inspection reports for each separate inspection location.)	
Inspector Information	
Inspector Name:	Title:
Company Name:	Email:
Address:	Phone Number:
Inspection Details	
Inspection Date:	Inspection Location:
Inspection Start Time:	Inspection End Time:
Current Phase of Construction:	Weather Conditions During Inspection:
Did you determine that any portion of your site was unsafe for inspection ☐ Yes ☐ No **If "Yes," provide the following information:** Location of unsafe conditions: The conditions that prevented you inspecting this location:	
Indicate the required inspection frequency: *(Check all that apply. You may be subject to different inspection frequencies in different areas of the site.)*	
Standard Frequency: ☐ At least once every 7 calendar days; **OR** ☐ Once every 14 calendar days *and* within 24 hours of the occurrence of either: • A storm event that produces 0.25 inches or more of rain within a 24-hour period, or • A snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period	

Reduced Frequency:

- ☐ For stabilized areas: Twice during first month, no more than 14 calendar days apart; then once per month after first month until permit coverage is terminated
- ☐ For stabilized areas on "linear construction sites": Twice during first month, no more than 14 calendar days apart; then once more within 24 hours of the occurrence of either:
  - A storm event that produces 0.25 inches or more of rain within a 24-hour period, or
  - A snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period
- ☐ For arid, semi-arid, or drought-stricken areas during seasonally dry periods or during drought: Once per month and within 24 hours of the occurrence of either:
  - A storm event that produces 0.25 inches or more of rain within a 24-hour period, or
  - A snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period
- ☐ For frozen conditions where construction activities are being conducted: Once per month

Was this inspection triggered by a storm event producing 0.25 inches or more of rain within a 24-hour period? ☐ Yes ☐ No

If "Yes," how did you determine whether the storm produced 0.25 inches or more of rain?

- ☐ On-site rain gauge
- ☐ Weather station representative of site.
  Weather station location:

Total rainfall amount that triggered the inspection (inches):

Was this inspection triggered by a snowmelt discharge from a storm event producing 3.25 inches or more of snow within a 24-hour period? ☐ Yes ☐ No

If "Yes," how did you determine whether the storm produced 3.25 inches or more of snow?

- ☐ On-site rain gauge
- ☐ Weather station representative of site.
  Weather station location:

Total snowfall amount that triggered the inspection (inches):

Section B – Condition and Effectiveness of Erosion and Sediment (E&S) Controls					
Type and Location of E&S Control	**Conditions Requiring Routine Maintenance?[1]**	**If "Yes," How Many Times (Including This One) Has This Condition Been Identified?**	**Conditions Requiring Corrective Action?[2, 3]**	**Date First Observed?**	**Description of Conditions Observed**
1.	☐ Yes ☐ No		☐ Yes ☐ No		
2.	☐ Yes ☐ No		☐ Yes ☐ No		
3.	☐ Yes ☐ No		☐ Yes ☐ No		
4.	☐ Yes ☐ No		☐ Yes ☐ No		
5.	☐ Yes ☐ No		☐ Yes ☐ No		
If the same routine maintenance was found to be necessary three or more times for the same control at the same location (including this occurrence), follow the corrective action requirements and record the required information in your corrective action log, or describe here why you believe the specific condition should still be addressed as routine maintenance:					

Section C – Condition and Effectiveness of Pollution Prevention Practices and Controls					
Type and Location of Practices and Controls	**Conditions Requiring Routine Maintenance?[1]**	**If "Yes," How Many Times (Including This One) Has This Condition Been Identified?**	**Conditions Requiring Corrective Action?[2, 3]**	**Date First Observed?**	**Description of Conditions Observed**
1.	☐ Yes ☐ No		☐ Yes ☐ No		
2.	☐ Yes ☐ No		☐ Yes ☐ No		
3.	☐ Yes ☐ No		☐ Yes ☐ No		
4.	☐ Yes ☐ No		☐ Yes ☐ No		
5.	☐ Yes ☐ No		☐ Yes ☐ No		
If the same routine maintenance was found to be necessary three or more times for the same control at the same location (including this occurrence), follow the corrective action requirements and record the required information in your corrective action log, or describe here why you believe the specific condition should still be addressed as routine maintenance:					

Section D – Stabilization of Exposed Soil					
Specific Location That Has Been or Will Be Stabilized	**Stabilization Method and Applicable Deadline**	**Stabilization Initiated?**	**Final Stabilization Criteria Met?**	**Final Stabilization Photos Taken?**	**Notes**
1.		☐ Yes ☐ No If "Yes," date initiated:	☐ Yes ☐ No If "Yes," date criteria met:	☐ Yes ☐ No	
2.		☐ Yes ☐ No If "Yes," date initiated:	☐ Yes ☐ No If "Yes," date criteria met:	☐ Yes ☐ No	
3.		☐ Yes ☐ No If "Yes," date initiated:	☐ Yes ☐ No If "Yes," date criteria met:	☐ Yes ☐ No	
4.		☐ Yes ☐ No If "Yes," date initiated:	☐ Yes ☐ No If "Yes," date criteria met:	☐ Yes ☐ No	
5.		☐ Yes ☐ No If "Yes," date initiated:	☐ Yes ☐ No If "Yes," date criteria met:	☐ Yes ☐ No	

Section E – Description of Discharges	
Was a discharge (not including dewatering) occurring from any part of your site at the time of the inspection?[4] ☐ Yes ☐ No **If "Yes," for each point of discharge, document the following:** • The visual quality of the discharge. • The characteristics of the discharge, including color; odor; floating, settled, or suspended solids; foam; oil sheen; and other indicators of stormwater pollutants. • Signs of the above pollutant characteristics are visible from your site and attributable to your discharge in receiving waters or in other constructed or natural site drainage features.	
Discharge Location	**Observations**
1.	
2.	
3.	
4.	
5.	

Section F – Signature and Certification	
"I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."	
Signature of Operator or "Duly Authorized Representative:"	
Signature:	**Date:**
Printed Name:	**Affiliation:**
Signature of Contractor or Subcontractor	
Signature:	**Date:**
Printed Name:	**Affiliation:**

ATTACHMENT C

CORRECTIVE ACTION LOG

Corrective Action Log

Section A – Individual Completing this Log	
Name:	Title:
Company Name:	Email:
Address:	Phone Number:
Section B – Details of the Problem Complete this section <u>within 24 hours</u> of discovering the condition that triggered corrective action.	
Date problem was first identified:	Time problem was first identified:
What site conditions triggered this corrective action? *(Check the box that applies. See instructions for a description of each triggering condition (1 thru 6).)* ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5a ☐ 5b ☐ 6	
Specific location where problem identified:	
Provide a description of the specific condition that triggered the need for corrective action and the cause (if identifiable):	
Section C – Corrective Action Completion Complete this section <u>within 24 hours</u> after completing the corrective action.	
For site condition # 1, 2, 3, 4, or 6 (those not related to a dewatering discharge) confirm that you met the following deadlines (CGP Part 5.2.1):	
☐ Immediately took all reasonable steps to address the condition, including cleaning up any contaminated surfaces so the material will not discharge in subsequent storm events. **AND**	
☐ Completed corrective action by the close of the next business day, unless a new or replacement control, or significant repair, was required. **OR**	
☐ Completed corrective action within seven (7) calendar days from the time of discovery because a new or replacement control, or significant repair, was necessary to complete the installation of the new or modified control or complete the repair. **OR**	
☐ It was infeasible to complete the installation or repair within 7 calendar days from the time of discovery. Provide the following additional information: Explain why 7 calendar days was infeasible to complete the installation or repair:	
Provide your schedule for installing the stormwater control and making it operational as soon as feasible after the 7 calendar days:	

For site condition # 5a, 5b, or 6 (those related to a dewatering discharge), confirm that you met the following deadlines:

- ☐ Immediately took all reasonable steps to minimize or prevent the discharge of pollutants until a solution could be implemented, including shutting off the dewatering discharge as soon as possible depending on the severity of the condition taking safety considerations into account.
- ☐ Determined whether the dewatering controls were operating effectively and whether they were causing the conditions.
- ☐ Made any necessary adjustments, repairs, or replacements to the dewatering controls to lower the turbidity levels below the benchmark or remove the visible plume or sheen.

Describe any modification(s) made as part of corrective action:	Date of completion:	SWPPP update necessary?	If yes, date SWPPP was updated:
1.		☐ Yes ☐ No	
2.		☐ Yes ☐ No	
3.		☐ Yes ☐ No	

Section D - Signature and Certification

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

MANDATORY: Signature of Operator or "Duly Authorized Representative:"	
Signature:	**Date:**
Printed Name:	**Affiliation:**

OPTIONAL: Signature of Contractor or Subcontractor	
Signature:	**Date:**
Printed Name:	**Affiliation:**

ATTACHMENT D

CPESPPP AMENDMENT LOG

CPESPPP Amendment Log

Instructions:

- Create a log here of changes and updates to the CPESPPP. You may use the table below to track these modifications.
- CEPSPPP modifications are required in the following circumstances:
  - ✓ Whenever new operators become active in construction activities on your site, or you make changes to your construction plans, stormwater controls, or other activities at your site that are no longer accurately reflected in your CPESPPP (this includes changes made in response to corrective actions;
  - ✓ To reflect areas on your site map where operational control has been transferred (and the date of transfer) since initiating permit coverage;
  - ✓ If inspections or investigations determine that CPESPPP modifications are necessary for compliance with this permit;
  - ✓ *Where a permitting government agency determines it is necessary to install and/or implement additional controls at your site in order to meet requirements of the permit;*
  - ✓ To reflect any revisions to Local, County or State, requirements that affect the stormwater control measures implemented at the site; and
  - ✓ If applicable, if a change in chemical treatment systems or chemically enhanced stormwater control is made, including use of a different treatment chemical, different dosage rate, or different area of application.

No.	Description of the Amendment	Date of Amendment	Amendment Prepared By (Name(s) and Title)

Subcontractor Certification

Project Number:	
Project Title:	
Operator(s):	
As a subcontractor, you are required to comply with the Construction Period Erosion, Sedimentation Pollution Prevention Plan (CPESPPP) for any work that you perform on-site. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the CPESPPP. A copy of the CPESPPP is available for your review at the office trailer.	
Company:	Address:
Telephone Number:	Email:
Description of Construction Service to be Provided:	
Signature and Certification	
Each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement: "I certify that I have read and understand the terms and conditions of the CPESPPP for the above designated project and agree to follow the practices described in the CPESPPP."	
Signature:	**Date:**
Printed Name:	**Title:**

ATTACHMENT E

GRADING & STABILIZATION ACTIVITIES LOG

Grading and Stabilization Activities Log

Date Grading Activity Initiated	Description of Grading Activity	Description of Stabilization Measure(s) and Location	Date Grading Activity Ceased	Date Stabilization Measures Initiated
			☐ Temporary ☐ Permanent	
			☐ Temporary ☐ Permanent	
			☐ Temporary ☐ Permanent	
			☐ Temporary ☐ Permanent	
			☐ Temporary ☐ Permanent	
			☐ Temporary ☐ Permanent	

ATTACHMENT F

STORMWATER TRAINING & CERTIFICATIONS

CPESPP Team Member Training and Certifications

Instructions:

- Identify the individuals (by name and position) that you have made part of the project's stormwater team, their individual responsibilities, and which members are responsible for inspections. At a minimum the stormwater team is comprised of individuals who are responsible for the design, installation, maintenance, and/or repair of stormwater controls; the application and storage of treatment chemicals (if applicable); conducting inspections as required; and taking corrective actions..
- Each member of the stormwater team must have ready access to either an electronic or paper copy of applicable portions of the CPESPPP.
- Each member of the stormwater team must understand the requirements of their specific responsibilities.
- Include documentation showing completion of on-site training.
- For this any personnel conducting site inspections on your site must, at a minimum:
  - ✓ Be knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention,
  - ✓ Possess the appropriate skills and training in conditions at the construction site that could impact stormwater quality, and
  - ✓ Possess the appropriate skills and training in the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit.

Team Member Responsible for Inspections	
SW Team Member Name/ Title:	
SW Team Member Responsibilities:	

Stormwater Training Topic: *(Check as appropriate)*

- ☐ Sediment and Erosion Controls
- ☐ Emergency Procedures
- ☐ Stabilization Controls
- ☐ Inspections / Corrective Actions
- ☐ Pollution Prevention Measures

List Specific Training Objective(s):

Team Member	
SW Team Member Name/ Title:	
SW Team Member Responsibilities:	

Stormwater Training Topic: *(Check as appropriate)*

- ☐ Sediment and Erosion Controls
- ☐ Emergency Procedures
- ☐ Stabilization Controls
- ☐ Inspections / Corrective Actions
- ☐ Pollution Prevention Measures

List Specific Training Objective(s):

Stormwater Team Member	
SW Team Member Name/ Title:	
SW Team Member Responsibilities:	

Stormwater Training Topic: *(Check as appropriate)*

- ☐ Sediment and Erosion Controls
- ☐ Emergency Procedures
- ☐ Stabilization Controls
- ☐ Inspections / Corrective Actions
- ☐ Pollution Prevention Measures

List Specific Training Objective(s):

Stormwater Team Member	
SW Team Member Name/ Title:	
SW Team Member Responsibilities:	

Stormwater Training Topic: *(Check as appropriate)*

- ☐ Sediment and Erosion Controls
- ☐ Emergency Procedures
- ☐ Stabilization Controls
- ☐ Inspections / Corrective Actions
- ☐ Pollution Prevention Measures

List Specific Training Objective(s):

ATTACHMENT G

DELEGATION OF AUTHORITY

Delegation of Authority

I, _____________________________ (name), hereby designate the person or specifically described position below to be a duly authorized representative for the purpose of overseeing compliance with erosion and sedimentation control requirements at the ____________________________ construction site. The designee is authorized to sign any reports, stormwater pollution prevention plans and all other documents required by the permit.	
Name of Person or Position:	Company:
Address:	Phone:
Signature and Certification	
By signing this authorization, I confirm that I meet the requirements to make such a designation as set forth in the CPESPPP and that the designee above meets the definition of a "duly authorized representative." "I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete."	
Signature:	**Date:**
Printed Name:	**Title:**

EXHIBIT 23

LANDSCAPE MANAGEMENT PLAN

Upper Cape YMCA
Falmouth, MA

the YMCA
CAPE COD

LANDSCAPE MANAGEMENT PLAN

PREPARED BY

BSC GROUP

August 2023

CONTENTS

Introduction

The YMCA is embarking on a significant capital project with the development of the Falmouth YMCA facility. The new building and the services it provides coupled with a supportive landscape will be an asset to the community.

The Landscape Management Plan (LMP) will aid the YMCA in allocating its resources to achieve the desired maintenance standards, which should be consistent with other YMCA properties.

The LMP is intended to:

- Define the maintenance activities specific to the landscape types.
- Provide an easy to follow schedule for implementation.
- Work towards a more sustainable and ecologically beneficial landscape that is less labor intensive but sometimes more specialized.

Landscape Management Plan Components

- LMP Diagram, which defines the limits of landscape management areas.
- Landscape Narrative.
- Recommended Best Practices.

Landscape Narrative

The landscape design for the Falmouth YMCA is ecologically based with the goals of encouraging varied experiences and adaptation through subtle layering of space, to envision nature and human activity as complimentary and connected, and use of adapted native plant communities with dynamic seasonal and generational change.

On approaching the site, the intention is to provide an attractive presence from the street, focusing on the larger landscape with framed views of the building. The first impression will be of extensive areas of a less manicured, more natural landscape. Existing dense vegetation of evergreens and shade trees will be maintained as visual screening for the parking areas. A series of shrub beds at the end of each parking aisle will screen parked cars as viewed from the entry drive while adding a sense of layering between the building and the street.

On the west side of the property the emphasis will be on maintaining existing vegetation between the site and an adjacent housing development. The existing wooded buffer along the property line will be augmented with shade trees (Sweetgum and Honeylocust) as well as native shrub plantings (Staghorn Sumac) to fill in the understory.

As you move towards the buildings, various strategies are used to balance the scale of the structure and to start weaving together exterior and interior spaces.

The undulating west facing facade breaks up the building form while creating 3 outdoor rooms that become an extension of the interior of the building. Large deciduous trees create a ceiling to the space balancing the massing of the building as viewed from the front.

Progressing from the more extensive natural areas of the larger landscape, smaller islands of plantings closer to the building break up the facades and add layering between vehicular areas, amenity spaces and the building. Arrival and entry areas are designated by highly designed landscape zones with clear spatial definition, changes in paving materials, and more uniform plantings. The selection of paving materials and furniture signal a transition to interior spaces.

Environmental Considerations

The site is organized into 2 main plant habitat types. The perimeter of the site primarily consists of open, sunny meadow and lawn areas, interspersed with pockets of shrub plantings and scattered shade trees. Here the canopy is mostly open, and conditions are drier. The center of the site will be highly programmed denser plantings consisting of oaks, dogwoods, understory shrubs and pollinator friendly species. Within either of these larger zones are storm water features that require plant species that will tolerate occasionally moist to wet conditions.

In all areas proposed plantings are adapted native species that have been selected for appropriateness to any given habitat: sun vs. shade, dry vs, wet, etc. Native species are used throughout and have been chosen for drought tolerance as well as pest and disease resistance. Native species will be lower maintenance than exotic species, requiring less water, fertilizer and pesticides. Any fertilizer that is used will be an organic, slow release, water insoluble product. If pest or disease issues do occur, Integrated Pest Management (IPM) and Best Management Practice (BMP) protocols, including bio-rational pesticides will be utilized.

In areas closest to the building, trees have been selected for micro-climate enhancement and heat island reduction. Deciduous shade trees in the parking lot and courtyard will provide shade in summer and allow sunlight in winter. They will also filter light and minimize glare in the courtyards and south facing building areas. Sunny seating pockets in the courtyards will encourage 3 season use of these outdoor spaces.

A strong emphasis has been placed on erosion control & storm water management in this project. The site is heavily planted on slopes and in bio-swale areas to prevent erosion and minimize storm water runoff. In addition to several storm water infiltration areas on site, the courtyards are designed with permeable pavement so that all water is pitched into a bio-swale, planted with native species, to minimize storm water runoff to the area beyond.

The use of native, drought tolerant species will decrease the amount of irrigation needed, especially once the new plantings get established. Where irrigation is used, mainly at the front portion of the building, it is intended to incorporate water efficient irrigation components and to design the overall system to make use of current weather information and soil sensors to adjust water schedules based on changing moisture conditions as opposed to a strictly clock-based control system. Perimeter areas of meadow will not need to be irrigated in the long term.

Management Areas

All Outdoor Areas

Clean Up:

- Remove biodegradable landscape debris to a yard waste recycling facility, including turf clippings (limited to only those times when mulch mowing is not possible), leaves, branches, annuals, dead plant material, potting soil, etc. Acceptable facilities include composting facilities, topsoil producing facilities or other facilities permitted by the MassDEP which utilize yard waste for landscape purposes. No biodegradable material should be disposed of in garbage that ends up in landfill sites.
- All trash and sticks are to be picked up from lawn strips and bed areas prior to mowing.
- A weekly general clean-up program will be performed. The clean-up program shall include a policing of all maintained areas for the removal of trash (paper, cans, bottles etc.) and landscape waste such as fallen sticks and limbs.
- All trash and landscape debris shall be removed and disposed of off site.
- Mulch is to be maintained clear of building foundations and paved areas, and off utility covers.
- Debris shall not be carried into patios, entryways or doorways.
- Debris deposited by typical weather occurrences will be cleaned up.
- Patios and sidewalks shall be swept weekly.

Fall Leaf Removal: October thru December

- On a weekly basis remove leaves from lawn areas to prevent heavy build-up and damage to turf by smothering. A single layer of leaves may be mulch-mowed into the turf. Thicker accumulations should be removed.
- Leaves may be raked or shredded by mower and blown into shrub beds for mulch as directed by the Owner's Agent, or accumulated leaves will be raked and/or blown from lawn, plants, high maintenance bed areas and collected and removed from property and disposed of off site.
- Sweep leaves from patio at least weekly, to avoid clogging paver joints.
- Catch basin sumps and other stormwater facilities should be cleaned of leaves to ensure proper function.

Pruning: Trees, Shrubs, and Groundcovers

Trees:

- Trees shall be maintained in a healthy, vigorous growing condition, free from disease and large concentrations of pests.
- Prune trees only to remove dead, diseased, broken, dangerous, or crossing branches, and as required below.
- Prune in accordance with generally accepted standards for proper pruning. Use of a certified arborist, particularly with significant trees, is recommended.

- Discard all tree trimmings off-site using a legal method.
- Any tree found to be dead or missing shall be replaced with plant material of identical species. Replacement trees shall be approved for size and appearance by the owner's authorized representative prior to planting.
- Remove tree stakes from trees after two growing seasons. Check tree ties to adjust and loosen as needed after the first growing season. Remove stakes from site and dispose of by a legal method. Recycle used stakes if possible.
- Once a year, prune all trees to encourage a high-branching structure. Remove all non-structural branches between the ground and a point half the tree's total height (for tall trees don't remove branches higher than 20' above the ground). Exception to the above: trees planted for screening purposes shall not be pruned except as needed to remove dead, diseased, broken, dangerous, or crossing branches.
- All sucker growth from trunk and base of trees shall be removed monthly or as required up to 12' from the ground to maintain a clean appearance.
- The cutting blades on pruning shears, clippers, blades, saws, etc. shall be sterilized after pruning each tree to minimize the possibility of spreading disease. When pruning trees known or suspected to be diseased, cutting blades shall be sterilized (with 10% bleach solution or equal) after each tree.
- A vertical clearance of 9.5' is required above all parking spaces. A vertical clearance of 7' is required above all walkways. Trim trees to remove all limbs within these areas.

Shrubs

- Shrubs shall be kept in a healthy, vigorous condition, free from disease and large concentrations of pests.
- Shrubs shall be pruned monthly only as needed to remove branches that are dead, broken, extending beyond the face of curbs or sidewalks, or are climbing building walls (not applicable to specified vines). Hedges around the playground shall be regularly pruned to maintain a uniform height and width. Except as noted previously, allow the shrubs to grow in their natural form to their mature sizes.
- All shrubs shall be pruned only as required for safety, visibility, and plant health, and allowed to develop into the natural shapes expected of the plant variety. Do not shear shrubs into topiary shapes unless specifically instructed.
- Allow shrubs two (2) months to rejuvenate following a hard frost prior to pruning or replacing.
- Any shrub found to be dead or missing shall be replaced with plant material of identical species.

Groundcovers:

- Groundcover shall be maintained in a healthy, vigorous growing condition.
- Any groundcover found to be dead or missing shall be replaced with plant material of identical species at the landscape maintenance contractor's expense, unless the loss was due to excluded damage.
- Keep groundcover trimmed to edge of sidewalks, curbs, and paved areas on a monthly basis. Do not create vertical edges when pruning groundcover. Cut the edges at an angle /--\ for a more natural appearance and healthier plants. Prune so groundcover just overlaps adjoining paving;

an open mulch strip here allows weeds to take hold and trash to accumulate.

- If regular foot traffic through a planter is preventing the groundcover from reaching full coverage of the soil, contact the owner's authorized representative to discuss options for redirecting the foot traffic. Consider installing pavers, stepping stones, a concrete walk, a gravel path, and/or barriers to redirect pedestrians.

Fertilizer:

- Do not fertilize plantings in the swales or rain gardens.
- Fertilizers shall be organically derived slow-release products, to minimize water pollution and feed plants over a longer period of time.
- Granular slow release organic fertilizer shall be 5-5-5 formulation or similar, applied per label rate for plant type. Water immediately after applying to move the fertilizer into the soil and wash the fertilizer off of plant surfaces.
- When applying granular fertilizers to drip-irrigated areas, the fertilizer must be washed in by hand or rainfall before turning on the drip system. Running the drip system immediately after application will push the fertilizer away from the emitters, resulting in a high concentration of fertilizer at the edge of the wetted zone. This highly-concentrated fertilizer can kill or damage plants. It is recommended that granular fertilizers be applied to drip-irrigated areas only in early spring, just prior to a moderate rainfall.

Mulching:

Maintaining a deep layer of mulch greatly reduces the labor and materials needed to control weeds, reduces water use, and helps the plants stay healthy.

- Add additional mulch regularly to maintain a layer no less than 2 inches deep at all times in shrub planters, tree wells, and beds where plants have not yet closed in over the soil surface. Decomposition of organic mulch is considered normal wear and tear, and replacement of decomposed mulch is required seasonally. Mulch is not required in areas where plant foliage completely covers the soil surface, such that the soil is not visible through the foliage. Any mulch found outside planter areas shall be returned to the planter on a weekly basis.
- Mulch shall be uniform in color and appearance, and free of sticks or trash. Mulch shall be shredded bark. When replacing existing mulch, use a mulch product that is similar in appearance to that already at the site.

Turf Care

Mowing

- Mowing schedule: Mow weekly during active growth periods (April-October). Keep mower blades sharp.
- Clippings should always be left on lawn areas ("mulch-mowing" or "grass cycling"), except if this will create a large surface buildup, for instance if saturated soft soils have prevented mowing for several weeks in spring and the grass is very tall. Grass cycling returns about 2 lb. nitrogen per 1000 sq. ft. per year, and improves resistance to drought damage and weed invasion.
- Modern "mulching" mowers are preferred because they chop clippings finely and blow the resulting mulch down to ground level, leaving a clean surface which is preferable, especially around building entrances where track-in can be a problem. Effective mulching requires about

20% more engine power, and it may be necessary to slow down in heavy areas or wet weather to get the best mulching results. For these reasons, equipment that converts easily from mulching to side-throw (leaving clippings on surface) is the most adaptable to varying conditions and mowing schedules.

- Mowing height: 2.5 to 3.5 inches high.
- Mowing frequency: To cause the least stress on the grass plant, mow often enough to remove only one-third of the blade length (e.g., when the grass is 3" high mow it down to 2"). Also, mow un-irrigated summer-dormant turf regularly enough to remove weed seed heads before they mature. Start mowing in late winter as soon as grass begins to grow. On most lawn areas these rules will result in mowing every 5-7 days through the height of the spring growth spurt, tapering to weekly on irrigated summer lawn or 10 days to 2 weeks on dormant lawn, and weekly through the fall growth spurt. Avoiding over fertilization and soluble "quick release" fertilizers is key to reducing mowing frequency.

Turf Fertilization

- Natural organic slow-release fertilizers shall be used. Soluble fertilizers, though less expensive, wash off site, volatilize, require more frequent application, and are toxic to beneficial soil life, and have the potential to impact groundwater quality, so tend to be more expensive over time.
- Mid to late fall applications are the key to building carbohydrate reserves in the grass root system over the winter. Early spring applications should be avoided because they promote rapid top growth (requiring more mowing) and can exhaust stored nutrient reserves. If spring applications are desired, they should be in late spring.

Aeration and Dethatching

- While aeration is most important on high-use areas (such as playfields and building entrance areas) any lawn area should be considered for annual or more frequent aeration if it shows signs of thin turf, weed invasion, poor irrigation penetration, or soil compaction.
- Thatch buildup (beyond the 1/2 inch that is healthy) is usually a sign of over-fertilization, over use of broadcast pesticides, over-watering, soil compaction, or other causes of diminished soil biota to break down thatch. Excess thatch prevents water penetration and promotes shallow rooting. Good maintenance practices will generally prevent thatch buildup, but where present it should by reduced by regular aeration or a vertical mowing (de-thatching), followed by adjusting cultural practices to prevent recurrence.

Overseeding

- In addition to aeration, spring or fall lawn renovations should include overseeding of thin or weed infested areas, or entire areas subject to heavy wear. This is a key weed control practice.
- Select certified seed appropriate for the site (perennial rye for sport lawn, rye and fescue blends for general lawn: contact the Cooperative Extension Service for site-adapted varieties, or buy from a reputable local supplier).
- Generally overseeding is practiced after aeration and before topdressing. A slice-seeding machine allows seed to be placed in the ground at the end of the dry season to await fall rains, and greatly improves seed germination and survival.

Topdressing

- After aeration and overseeding, high-use or worn lawn areas should be topdressed in spring or fall for greatest improvement.

- General lawn should be topdressed with pure compost or a compost-sand mixture, 1/4 to 1/2 inch thick, to improve both drainage and soil fertility. Use a weed-free mature compost from a reputable supplier, screened to 3/8 inch minus particle size. Dragging or raking after application can help get compost down into the aeration holes and break up aeration cores and compost clumps.
- Take soil plugs annually to verify that the compost is being incorporated into the soil profile below the aeration depth by earthworms and other soil biota, rather than accumulating on the surface where it could limit water infiltration. (This is a possible problem in cases of low soil biota due to overuse of fertilizers, poor drainage, or conditions of acidic or compacted soils. Correct these problems to improve compost incorporation.)

Special Landscape Areas

Meadows

- Maintain and establish conservation mix areas by watering, weeding, mowing, trimming, replanting, and performing other operations as required to establish a healthy, viable meadow. Roll, regrade, and replant bare or eroded areas and re-mulch. Provide materials and installation the same as those used in the original installation.
- Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and meadow damaged or lost in areas of subsidence.
- Apply treatments as required to keep meadow and soil free invasive plant species. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

First Growing Season Maintenance:

- Whenever overall vegetation reaches a height of 18”-24”, use brush hog mower or string trimmer to trim vegetation to a height of 8”. Do not use a lawn mower.
- Mowing shall cease by mid-September.
- Problem weeds should be hand pulled or spot sprayed with an approved herbicide.

Second & Subsequent Growing Season Maintenance:

- Prior to new spring growth reaching a height of 2”, cut any standing material from the previous year to approximately 2”.

- Problem weeds should be hand pulled or spot-sprayed.
- If heavy infestation of weeds occurs in the second growing season, cut vegetation to a height of 8”. Cutting shall cease by mid-September.

Rain Gardens and Bioswales

- Bio-retention swales (i.e. rain gardens), designed to capture and hold roof runoff, will not maintain optimal drainage rates if soils become compacted. Minimize foot traffic in this area, although occasional walking for maintenance is fine.
- Regular applications of mulch, in addition to preventing weeds, will maximize the swale’s ability to capture and break down contaminants. Rain garden plantings shall not be fertilized in order to prevent runoff of excess nutrients. Plant selection, a rich soil mix at time of installation, and regular mulching should provide sufficient nutrients to plantings in these areas.

Permeable Pavers

- The permeable paving or patio areas need periodic maintenance to avoid getting clogged with debris over time. Regular sweeping and low-pressure washing 3-4 times a year will keep the area free of organic material and fine particles, maintaining permeability.
- Similarly, avoid using salt and sand on this area in the winter (in any case, permeable paving does not tend to accumulate ice since it does not hold puddles).
- Additional gravel may occasionally be necessary to refill the pores between pavers. Migration of gravel away from the site depends on how heavily the area is used, and given that cars will not be on the patio, a bucket of gravel every few years is probably all that will be necessary.

Integrated Pest Management

Integrated Pest Management (IPM) is a management and decision-making system that uses cultural practices to promote healthy turfgrass and plants that has a competitive advantage against pests and environmental stress. The IPM system will make use of an inspection and monitoring approach, along with biorational methods that provide a variety of pest control measures to maintain pest populations below levels that can cause significant damage or loss to installed landscapes.

The IPM system will focus on:

- Turf Grass and Plant establishment
- Prevention methods
- Identify/know the pest life cycle
- Set action thresholds

- Monitor regularly
- When pests exceed thresholds, use control methods with least non-target impact
- Keep records of control methods
- Replace problem plants with more resistant varieties

Weed Control Methods – General Guidelines:

- Crowd out weeds with dense healthy plantings, ground covers and shade canopies.
- Accept a few weeds – target the problem ones.
- Mulch beds in fall, winter, or early spring.
- Control weeds before they go to seed.
- Hoe, pull, mow, or till (mulch makes hoeing easier).
- Use flame or radiant heat weeders over pavement, cracks, fence lines, and building edges, or over mulch on rainy days (use fire precautions as per equipment labeling).
- Use barriers: newspaper or cardboard covered with mulch, root barriers for spreading plants. Landscape fabric can create problems as weeds grow through it – paper or cardboard is better.
- Don't over-fertilize – it promotes weeds and pests.
- Spot apply the least-toxic chemical (e.g. soap and vinegar-based weed killers, or cut-and-paint stems with systemic herbicides) to minimize non-weed impacts.
- If a pesticide must be used, post signs for at least 24 hours stating: area affected; date/time applied; specific pesticide used; re-entry cautions (from label); and phone number to call with questions. Always follow label for application and protection. Professional appliers (including users of "weed & feed," or even low-risk herbicides like vinegar) must be licensed by State law,

Weed Control for Trees, Shrubs, Vines, and Groundcovers

• Weeds in planted areas, sidewalks, curbs, gutters, or pavement shall be removed or killed weekly as the weeds emerge. Weeds shall be removed (not just killed) if they are larger than 2 inches in height or diameter. Dispose of weeds off-site. Regular maintenance of the mulch layer will help minimize weeds in shrub and groundcover areas.

- Contractor is to use Integrated Pest Management techniques for controlling weeds. Techniques include mulching, pulling, allowing plantings to grow densely and shade ground, heat and hot water controls. If herbicides must be used, choose the least toxic available and spot apply on weeds. Pre-emergent herbicides are not allowed – maintaining a thick mulch layer combined with mechanical weeding is as effective.

Weed, Insect, and Disease Control for Turf

- Weed invasion can be effectively prevented or reversed by growing dense lawn, through the above recommended practices. Tolerate some broad-leaved plants in lawn areas. Identify problem (invasive) weeds and target only those species.
- Control weeds in turf by removal where practical (long-handled weed-pullers do this quickly), and remove them regularly before they go to seed. If weeds have over-run an area, spot-application of the least-toxic herbicide is permitted.

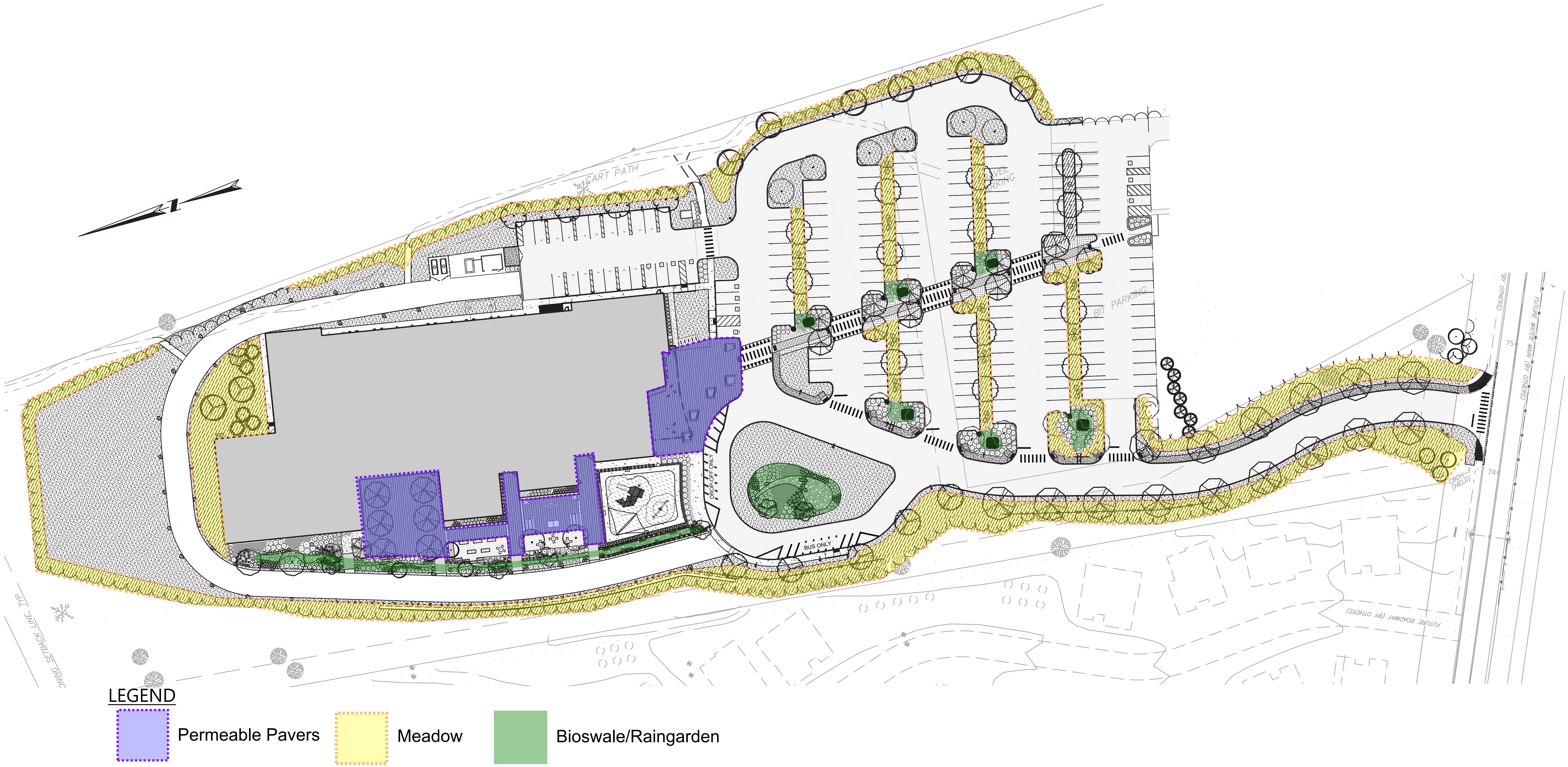


Fig. 1 Special Landscape Areas Diagram

- No broadcast herbicide or “weed-and-feed” products may be applied.
- Moderately fertilized turf on well drained organic-rich soils rarely has serious disease problems. Correcting poor soil conditions or cultural practices (like over-watering or over fertilization) will prevent diseases.

Appendix

UMass Extension Bio-Rational Pesticides

Center for Agriculture, Food, and the Environment (/)

UMass Extension Landscape, Nursery and Urban Forestry Program (/landscape)

Bio-Rational Pesticides

Bio-Rational Pesticides

Traditionally, landscape managers have viewed daily pest management situations through the eyes of "control" or "eradication." Ideally, the best strategy would be to identify and remove only the pest, causing minimal disruption to the system. Until recently, insect pest managers did not have the necessary tools to achieve this goal, but within the last decade, even within the last few years, many new and exciting products have emerged or have greatly improved in efficacy. We classify many of them as "bio-rational" pesticides. These compounds achieve several currently desired goals of pest managers and the greater public: they are very selective (targeting just the pest, usually do not persist in the environment, are much safer to handle and apply when compared to most chemical pesticides, and tend to preserve beneficial organisms. Some of the more commonly used and effective bio-rational pesticides are Insect (and mite) Growth Regulators (IGR's), *Bacillus thuringiensis* (Kurstaki) (B.t.), horticultural oils, insecticidal soaps, entomopathogenic nematodes, and NEEM.

Insect Growth Regulators (IGR's)

Insects, being arthropods, must go through a molting process ("shedding their skin") in order to become larger and to mature; their rigid exoskeleton does not stretch and grow along with them. There are complex, specialized chemicals within the insect's body that regulate this process. Some of these chemicals have been identified and synthesized (or imitated) and are available commercially for management of certain pests. Applications disrupt the carefully orchestrated natural molting process and are lethal to target insects.

Bacillus thuringiensis (Kurstaki)

Commonly known as B.t., this bacterium has been available as an insecticide for many years. There are several strains of B.t. available and each acts on different groups of insects. Kurstaki is effective against Lepidopteran caterpillars and therefore is the most widely used type of B.t. in the Green Industry. The product is tank mixed with water and applied to foliage where Lepidopteran caterpillars are feeding. Caterpillar-type larvae are also found in other insect orders, such as the Hymenoptera, which we recognize as sawfly caterpillars. It is well known that B.t. is not effective against these caterpillars and other methods of management must be chosen for sawflies.

B.t. works best on the younger Lepidopteran caterpillars and is not recommended for older larvae. It must be ingested to be effective. Once inside the insect's gut, B.t. becomes active due to the "preferred" alkaline environment, and begins to multiply. Endotoxins are produced by the bacterium, which then kill the caterpillar. Once B.t. is ingested, the caterpillar will cease to feed within minutes. However, it may remain alive for several days, often making it difficult to convince clients that no further plant injury is occurring even though the insect is still present.

B.t should not be stored for long periods of time due to loss of efficacy. Also, once tank-mixed, it should be applied in a timely fashion. Care should be taken not to use high pH water (alkaline) in the spray tank because this may induce the bacterium to become active in the tank prior to being ingested by the caterpillar. This will reduce the efficacy of the product. Sticker-spreaders can be added to the spray tank to increase the persistence of the product on the foliage.

B.t has been the main choice for use against the Gypsy moth for decades in the Northeast and it has been a very effective tool in this regard. More recently, researchers have discovered an entomopathogenic fungus that occurs naturally (now) and which has been keeping gypsy moth populations very low in much of the Northeast in recent years. This fungus, like plant parasitic fungi, requires water to be active and successfully invade caterpillars. It has been suggested that the Northeast may not have to worry about massive and destructive gypsy moth outbreaks again due to the activity of this fungus (*Entomophaga maimaiga*). However, unusually dry weather in early summer can reduce the activity of the fungus and lead to increased gypsy moth populations.

Horticultural Oils

These products have been available for decades and were originally used by orchardists for insect pests that over-wintered exposed on the trees, such as scale pests. The majority of these products are highly refined petroleum based oils. Originally, they could only be applied when the tree was dormant; typically in late winter. Consequently these products were known as "dormant oil sprays". Now, horticultural oils have become so highly refined that, depending on tank-mix concentrations, they can be applied to trees and shrubs during the dormant and growing seasons, with some limitations.

Oils work primarily by covering and suffocating the pest organism. In some cases, they can disrupt certain membranes of the exoskeleton. The target pest must be present and exposed at the time of application and the oil must cover the pest in order to be effective. Once oil sprays are dry (as little as 15-20 minutes after application) they have no insecticidal qualities whatsoever. Therefore, oils work best on pests such as scale insects, spider mites, certain adelgids, and others with limited mobility. One attractive feature of oils is that they can kill all life stages, including eggs. Many other pesticide products only kill the immatures and adults. Oils should not be applied near open water sources in order to prevent contamination.

Extra care should be taken when applying horticultural oils (in this case, a summer-weight oil) when new foliage is just emerging from the buds. Phytotoxic reactions may occur on this tender new foliage. Also, oils should not be applied if freezing temperatures are predicted 24-48 hours after application; this also increases the chance of plant injury. In more southern states where high summer humidity is sometimes a harsh reality, care should be taken to avoid oil use at the times of peak heat and humidity. This includes both the time of day and the time of season. Some applicators in these areas do not apply oils during much of July and August. Note also that some plants are sensitive to oil application. Among oil sensitive plants are: beech, black walnut, maples, hickory, smoketree, azaleas, Japanese holly, redbud, spruces and Douglas fir. Always read the label for information on sensitive species.

A specific example of the usefulness of horticultural oils is in the case of the hemlock woolly adelgid. HWA or *Adelges tsugae* is an introduced species along much of the eastern seaboard where *Tsuga canadensis* (Canada hemlock) has its native range. This pest is quite destructive and can kill host plants, especially if additional stresses such as drought or soil compaction are present. Entomologists working in the range of HWA receive countless inquiries about this pest and its management. Horticultural oils are one of the best management tools for this pest, where application is practical. Total coverage is extremely important in controlling the HWA; any missed individuals will quickly re-establish the population to damaging levels. Larger trees, therefore, become a challenge and multiple applications of oil may be required. It is difficult to discern when an oil application has been effective against this pest. Normally, the HWA is not very visibly active or mobile. Pest managers must carefully inspect the insect under magnification and take note of what live hemlock woolly adelgids look like: nymphs and adults will be somewhat plump and should produce liquid when pierced with a fine probe. Viable eggs will be turgid (plump with moisture) and shiny. Two to three weeks after an oil application, affected nymphs, adults and eggs should appear more dull, produce little or no liquid when probed, and eggs in particular may appear shrunken. These distictions can be very subtle and making them is a challenge.

Insecticidal Soap

These commercial products are literally what their name states: soap. Or, more scientifically, potassium salts of fatty acids. They work best on soft bodied insects (and some spider mites) but usually are not effective against the egg stage. Like oils, the target pest needs to be present and exposed at the time of application. Once the material has dried, they have no insecticidal qualities. Soaps kill arthropods by disrupting the membranes in the inter-segmental folds of the exoskeleton and cause the organism to lose a lethal amount of body fluid (blood). Common targets for soap sprays are aphids, spider mites, mealybugs, some adelgids (including the hemlock woolly adelgid), and relatively young caterpillars (including sawflies). Older caterpillars may be annoyed by a soap application but they will rarely be killed by it. Stout bodied insects such as beetles should be managed in some other fashion.

One factor to consider when using insecticidal soap is that of water hardness. This relates to the amount of minerals in the water. Most municipal water is "soft water" (low in mineral content). Water with high mineral content such as most well water, is conversely known as "hard water." Insecticidal soap will not mix well in hard water and therefore will not be very effective as an product into a quart of water in a clear glass container. Cover and shake the mixture, then observe. If the water is of low mineral content (soft water) then the mixture should be sudsy on the top and somewhat clear throughout. However, if few suds are produced and the mixture is milky throughout, then the water has a high mineral content (hard water) and another water source must be found for tank mixing.

Entomopathogenic Nematodes

Most people think of nematodes (if they think of them at all) as being plant parasites and causing symptoms similar to that of plant pathogens. However, some nematodes attack and kill insects. "Entomo" refers to insects (as in the word entomology) and "pathogenic", of course, means "to create disease symptoms within." These nematodes do not directly kill the insect. They enter the insect via natural openings such as the mouth, anus, or spiracles (openings for respiration), carrying a bacterium. Once inside the host insect, the bacterium becomes active. The nematode feeds on this bacterium, and the waste by-products of the bacterium become lethal to the insect, killing it by bacterial septicemia. Nematodes require an aqueous environment or they become inactive. Entomopathogenic nematodes work well on wood boring larvae that keep their tunnels open, thus creating a perfect environment for the nematodes (dark and moist). Such wood borers include the clear-winged borers (family: Sesiidae) like the peach tree borer and the dogwood borer. Many nematode products are labeled for soil inhabiting pests such as beetle grubs and black vine weevil larvae. However, obtaining and maintaining the correct amount of soil moisture for several days is difficult and the desired level of management may not always be achieved. It is important to keep soil moist enough to allow the nematodes to "swim" towards their intended target. These nematodes require a moisture film around the soil particles in order to stay active and to be mobile. But if the soil is too wet, they cannot achieve traction on the soil particles and they will float helplessly in the saturated soil. If it is too dry they will become dormant.

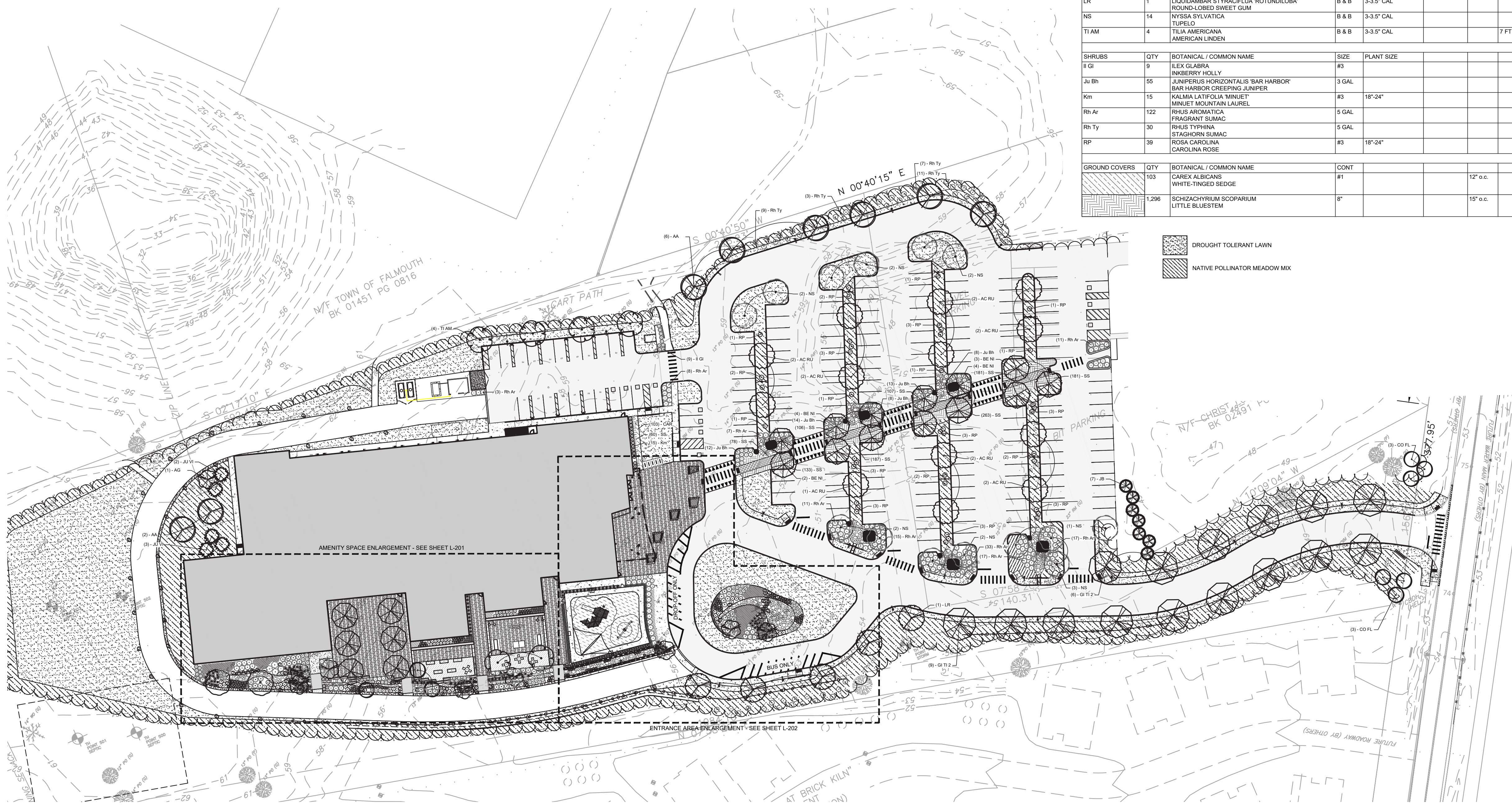
NEEM

NEEM (azadirachtin) is an extract of the Neem tree (*Azadirachta indica*) that grows in India, Africa and elsewhere. It has had many uses for centuries, one of those as an insecticide. It can work in several ways: as a sterilant, a deterrent, an anti-feedant, and as an insect growth regulator. However, it is relatively recent as a commercially available product and its effectiveness is not yet at the level of the other bio-rationals discussed above. It works best when insect populations are low to moderate in size. The product needs to be applied as soon as the pest appears and then re-applied, as often as every week, as long as the pest is active. This becomes time-consuming (at the commercial level) and not necessarily cost effective. It is expected that more effective Neem products will eventually appear.

In the early 1990's, a new pest was introduced into the Boston area from Europe: the lily leaf beetle (*Lilioceris lilii*). This bright red adult beetle and it's larvae are voracious feeders of all true lilies, Solomon's-seal and fritillaria, among others. It is a devastating pest. Neem has been effective against this pest when utilized as described above.

Written by: Robert Childs
Revised: 10/2011

Overall Planting Plan



PLANT SCHEDULE SITE

TREES	QTY	BOTANICAL / COMMON NAME	ROOT	CALIPER	PLANT SIZE		REMARKS
AC RU	13	ACER RUBRUM RED MAPLE	B & B	3-3.5" CAL			
AA	8	ACER RUBRUM 'ARMSTRONG' ARMSTRONG RED MAPLE	B & B	3-3.5" CAL			
AG	1	AMELANCHIER X GRANDIFLORA 'AUTUMN BRILLIANCE' AUTUMN BRILLIANCE APPLE SERVICEBERRY	B & B				
BE NI	13	BETULA NIGRA RIVER BIRCH MULTI-TRUNK	B & B	10-12` HT. CLUMP			MULTI-STEMS
CO FL	6	CORNUS FLORIDA FLOWERING DOGWOOD	B & B	7-8` HT.			
GI TI 2	15	GLEDITSIA TRIACANTHOS F. INERMIS THORNLESS HONEY LOCUST	B & B	4-4.5" CAL			
JU VI	5	JUNIPERUS VIRGINIANA EASTERN REDCEDAR	B & B	6-7` HT			
JB	7	JUNIPERUS VIRGINIANA 'BRODIE' BRODIE EASTERN REDCEDAR	#15		5-6`		
LR	1	LIQUIDAMBAR STYRACIFLUA 'ROTUNDILOBA' ROUND-LOBED SWEET GUM	B & B	3-3.5" CAL			
NS	14	NYSSA SYLVATICA TUPELO	B & B	3-3.5" CAL			
TI AM	4	TILIA AMERICANA AMERICAN LINDEN	B & B	3-3.5" CAL			7 FT. CLEAR
SHRUBS	QTY	BOTANICAL / COMMON NAME	SIZE	PLANT SIZE			
Il Gl	9	ILEX GLABRA INKBERRY HOLLY	#3				
Ju Bh	55	JUNIPERUS HORIZONTALIS 'BAR HARBOR' BAR HARBOR CREEPING JUNIPER	3 GAL				
Km	15	KALMIA LATIFOLIA 'MINUET' MINUET MOUNTAIN LAUREL	#3	18"-24"			
Rh Ar	122	RHUS AROMATICA FRAGRANT SUMAC	5 GAL				
Rh Ty	30	RHUS TYPHINA STAGHORN SUMAC	5 GAL				
RP	39	ROSA CAROLINA CAROLINA ROSE	#3	18"-24"			
GROUND COVERS	QTY	BOTANICAL / COMMON NAME	CONT				
	103	CAREX ALBICANS WHITE-TINGED SEDGE	#1			12" o.c.	
	1,296	SCHIZACHYRIUM SCOPARIUM LITTLE BLUESTEM	8"			15" o.c.	

DROUGHT TOLERANT LAWN

NATIVE POLLINATOR MEADOW MIX

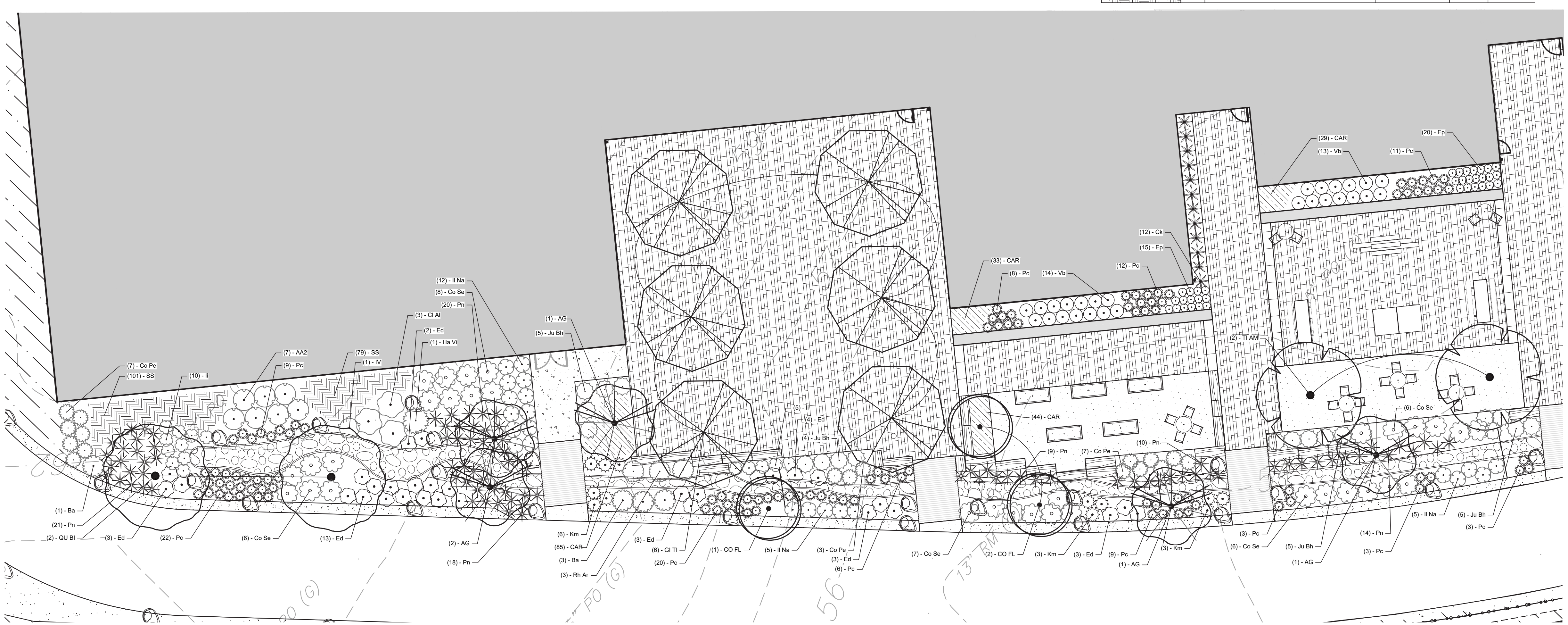
Planting Plan - Amenity Space Enlargement

PLANT SCHEDULE AMENTITY SPACE

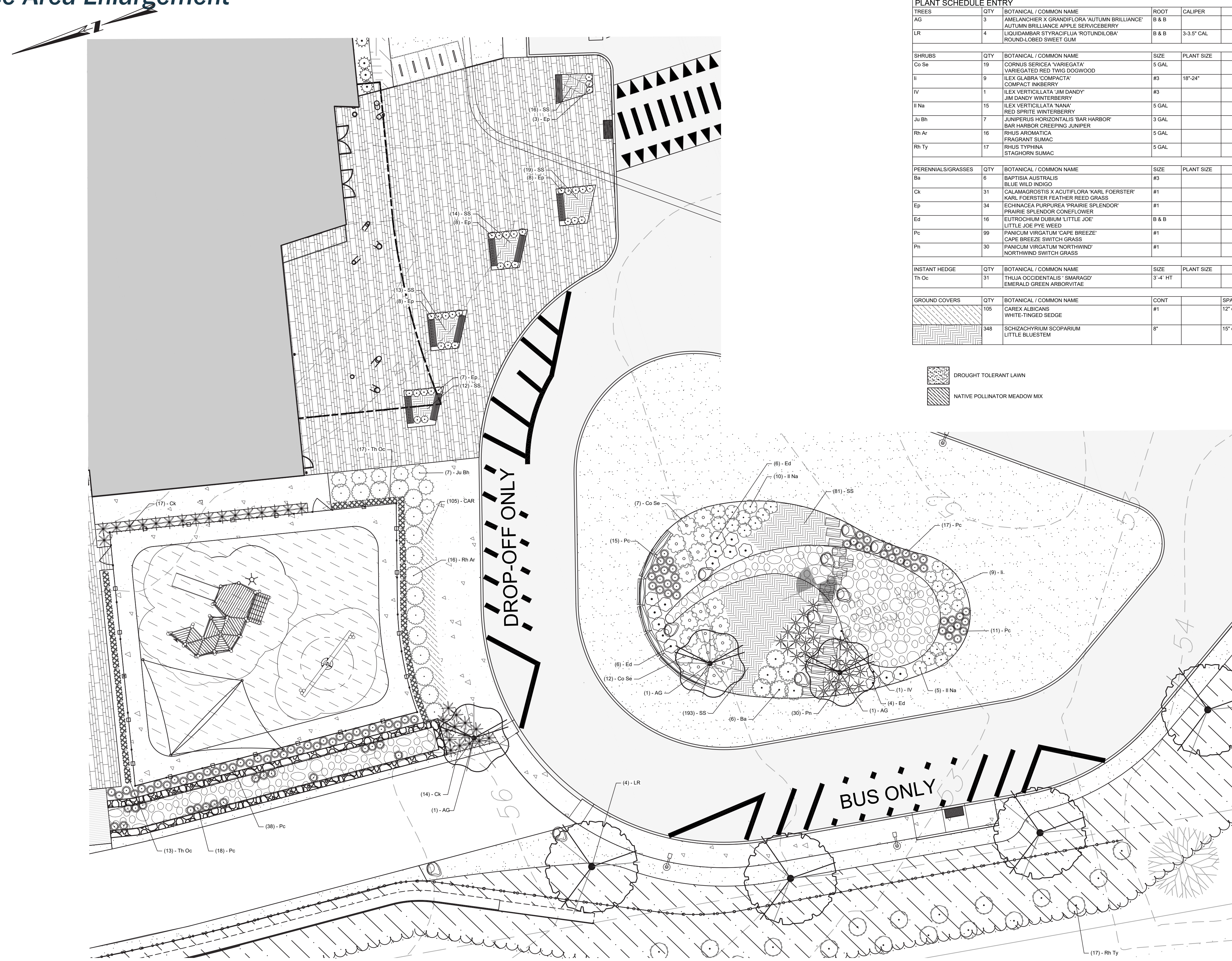
TREES	QTY	BOTANICAL / COMMON NAME	ROOT	CALIPER		REMARKS
AG	5	AMELANCHIER X GRANDIFLORA 'AUTUMN BRILLIANCE' AUTUMN BRILLIANCE APPLE SERVICEBERRY	B & B			
CO FL	3	CORNUS FLORIDA FLOWERING DOGWOOD	B & B	7-8` HT.		
GI TI	6	GLEDITSIA TRIACANTHOS F. INERMIS THORNLESS HONEY LOCUST	B & B	3-3.5" CAL		
QU BI	2	QUERCUS BICOLOR SWAMP WHITE OAK	B & B	3-3.5" CAL		
TI AM	2	TILIA AMERICANA AMERICAN LINDEN	B & B	3-3.5" CAL		7 FT. CLEAR
SHRUBS	QTY	BOTANICAL / COMMON NAME	SIZE	PLANT SIZE		REMARKS
AA2	7	ARONIA ARBUTIFOLIA RED CHOKEBERRY	5 GAL			
Cl Al	3	CLETHRA ALNIFOLIA SUMMERSWEET	7 GAL			
Co Pe	17	COMPTONIA PEREGRINA SWEET FERN	3 GAL			
Co Se	33	CORNUS SERICEA 'VARIEGATA' VARIEGATED RED TWIG DOGWOOD	5 GAL			
Ha Vi	1	HAMAMELIS VIRGINIANA COMMON WITCH HAZEL	7 GAL			
Ii	15	ILEX GLABRA 'COMPACTA' COMPACT INKBERRY	#3	18"-24"		
IV	1	ILEX VERTICILLATA 'JIM DANDY' JIM DANDY WINTERBERRY	#3			
Il Na	22	ILEX VERTICILLATA 'NANA' RED SPRITE WINTERBERRY	5 GAL			
Ju Bh	19	JUNIPERUS HORIZONTALIS 'BAR HARBOR' BAR HARBOR CREEPING JUNIPER	3 GAL			
Km	12	KALMIA LATIFOLIA 'MINUET' MINUET MOUNTAIN LAUREL	#3	18"-24"		
Rh Ar	3	RHUS AROMATICA FRAGRANT SUMAC	5 GAL			
Vb	27	VACCINIUM ANGUSTIFOLIUM 'BRUNSWICK' BRUNSWICK LOWBUSH BLUEBERRY	#1			
PERENNIALS/GRASSES	QTY	BOTANICAL / COMMON NAME	SIZE	PLANT SIZE		REMARKS
Ba	4	BAPTISIA AUSTRALIS BLUE WILD INDIGO	#3			
Ck	12	CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER' KARL FOERSTER FEATHER REED GRASS	#1			
Ep	35	ECHINACEA PURPUREA 'PRAIRIE SPLENDOR' PRAIRIE SPLENDOR CONEFLOWER	#1			
Ed	31	EUTROCHIUM DUBIUM 'LITTLE JOE' LITTLE JOE PYE WEED	B & B			
Pc	106	PANICUM VIRGATUM 'CAPE BREEZE' CAPE BREEZE SWITCH GRASS	#1			
Pn	92	PANICUM VIRGATUM 'NORTHWIND' NORTHWIND SWITCH GRASS	#1			
GROUND COVERS	QTY	BOTANICAL / COMMON NAME	CONT		SPACING	
	191	CAREX ALBICANS WHITE-TINGED SEDGE	#1		12" o.c.	
	180	SCHIZACHYRIUM SCOPARIUM LITTLE BLUESTEM	8"		15" o.c.	

DROUGHT TOLERANT LAWN

NATIVE POLLINATOR MEADOW MIX



Planting Plan - Entrance Area Enlargement



PLANT SCHEDULE ENTRY

TREES	QTY	BOTANICAL / COMMON NAME	ROOT	CALIPER		REMARKS
AG	3	AMELANCHIER X GRANDIFLORA 'AUTUMN BRILLIANCE' AUTUMN BRILLIANCE APPLE SERVICEBERRY	B & B			
LR	4	LIQUIDAMBAR STYRACIFLUA 'ROTUNDILOBA' ROUND-LOBED SWEET GUM	B & B	3-3.5" CAL		
SHRUBS	QTY	BOTANICAL / COMMON NAME	SIZE	PLANT SIZE		REMARKS
Co Se	19	CORNUS SERICEA 'VARIEGATA' VARIEGATED RED TWIG DOGWOOD	5 GAL			
Ii	9	ILEX GLABRA 'COMPACTA' COMPACT INKBERRY	#3	18"-24"		
IV	1	ILEX VERTICILLATA 'JIM DANDY' JIM DANDY WINTERBERRY	#3			
Il Na	15	ILEX VERTICILLATA 'NANA' RED SPRITE WINTERBERRY	5 GAL			
Ju Bh	7	JUNIPERUS HORIZONTALIS 'BAR HARBOR' BAR HARBOR CREEPING JUNIPER	3 GAL			
Rh Ar	16	RHUS AROMATICA FRAGRANT SUMAC	5 GAL			
Rh Ty	17	RHUS TYPHINA STAGHORN SUMAC	5 GAL			
PERENNIALS/GRASSES	QTY	BOTANICAL / COMMON NAME	SIZE	PLANT SIZE		REMARKS
Ba	6	BAPTISIA AUSTRALIS BLUE WILD INDIGO	#3			
Ck	31	CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER' KARL FOERSTER FEATHER REED GRASS	#1			
Ep	34	ECHINACEA PURPUREA 'PRAIRIE SPLENDOR' PRAIRIE SPLENDOR CONEFLOWER	#1			
Ed	16	EUTROCHIUM DUBIUM 'LITTLE JOE' LITTLE JOE PYE WEED	B & B			
Pc	99	PANICUM VIRGATUM 'CAPE BREEZE' CAPE BREEZE SWITCH GRASS	#1			
Pn	30	PANICUM VIRGATUM 'NORTHWIND' NORTHWIND SWITCH GRASS	#1			
INSTANT HEDGE	QTY	BOTANICAL / COMMON NAME	SIZE	PLANT SIZE		REMARKS
Th Oc	31	THUJA OCCIDENTALIS ' SMARAGD' EMERALD GREEN ARBORVITAE	3`-4` HT			40" LENGTH*
GROUND COVERS	QTY	BOTANICAL / COMMON NAME	CONT		SPACING	
	105	CAREX ALBICANS WHITE-TINGED SEDGE	#1		12" o.c.	
	348	SCHIZACHYRIUM SCOPARIUM LITTLE BLUESTEM	8"		15" o.c.	

DROUGHT TOLERANT LAWN

NATIVE POLLINATOR MEADOW MIX

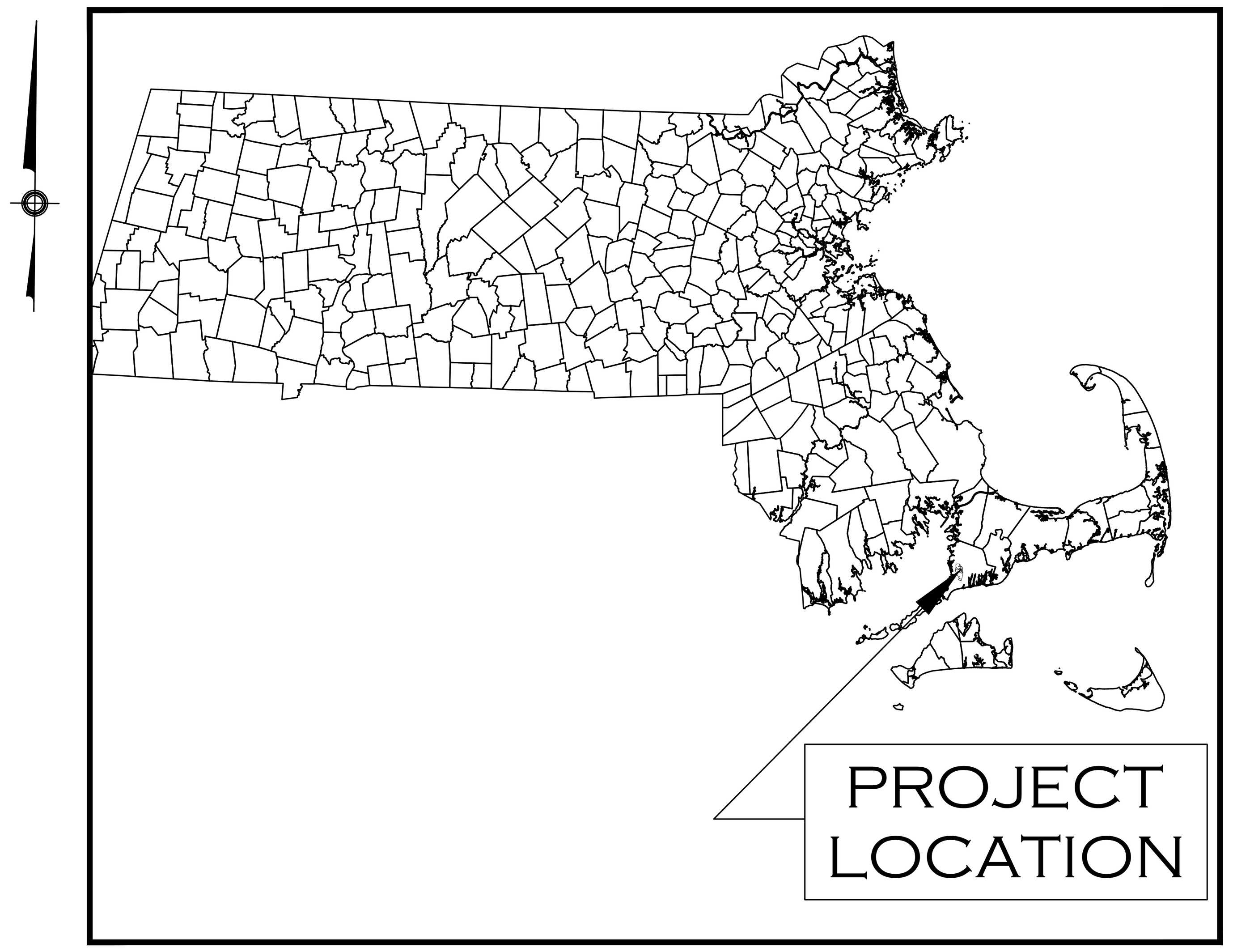
EXHIBIT 24

CIVIL ENGINEERING PLANS

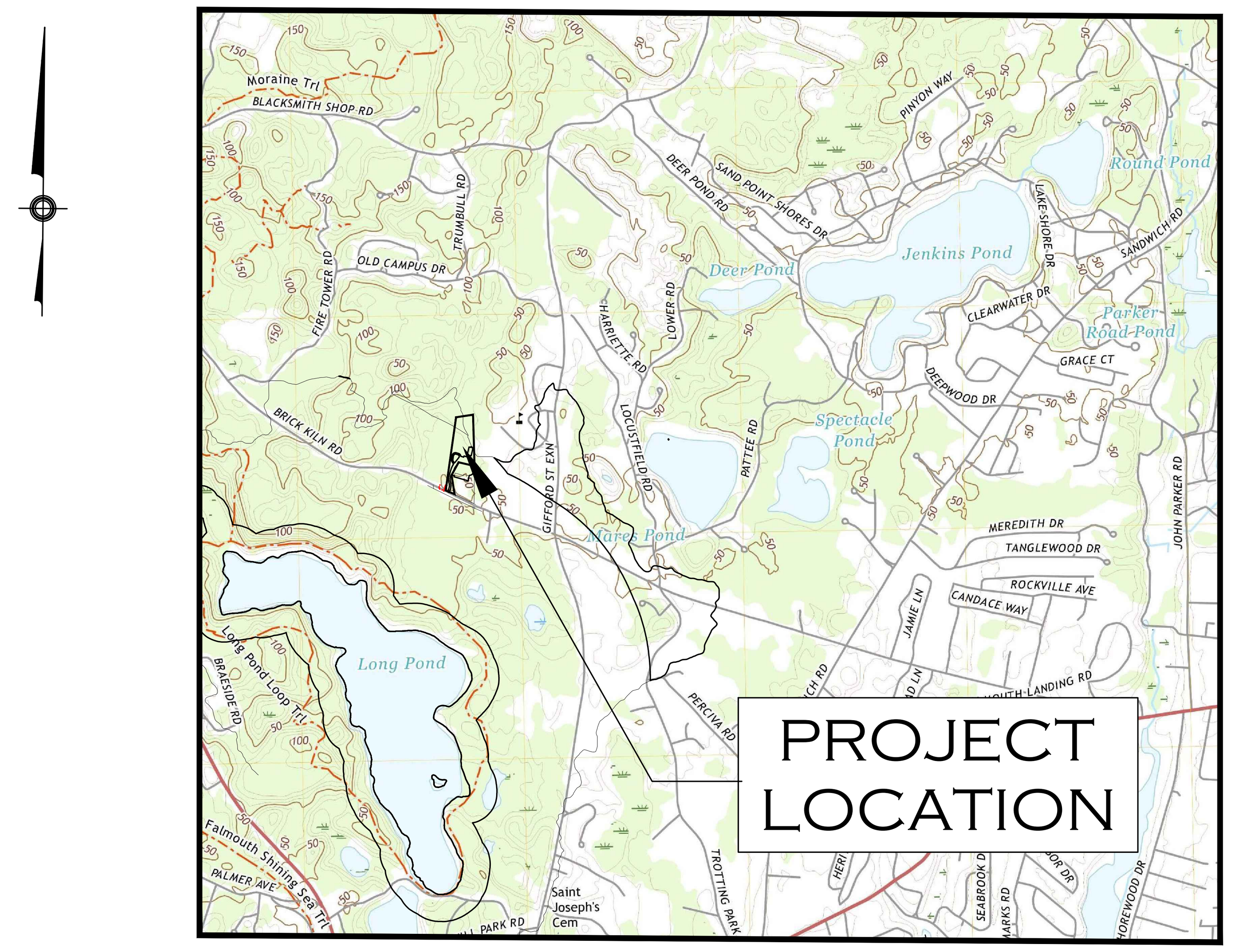
YMCA-CAPE COD

487 BRICK KILN ROAD
WEST FALMOUTH, MA

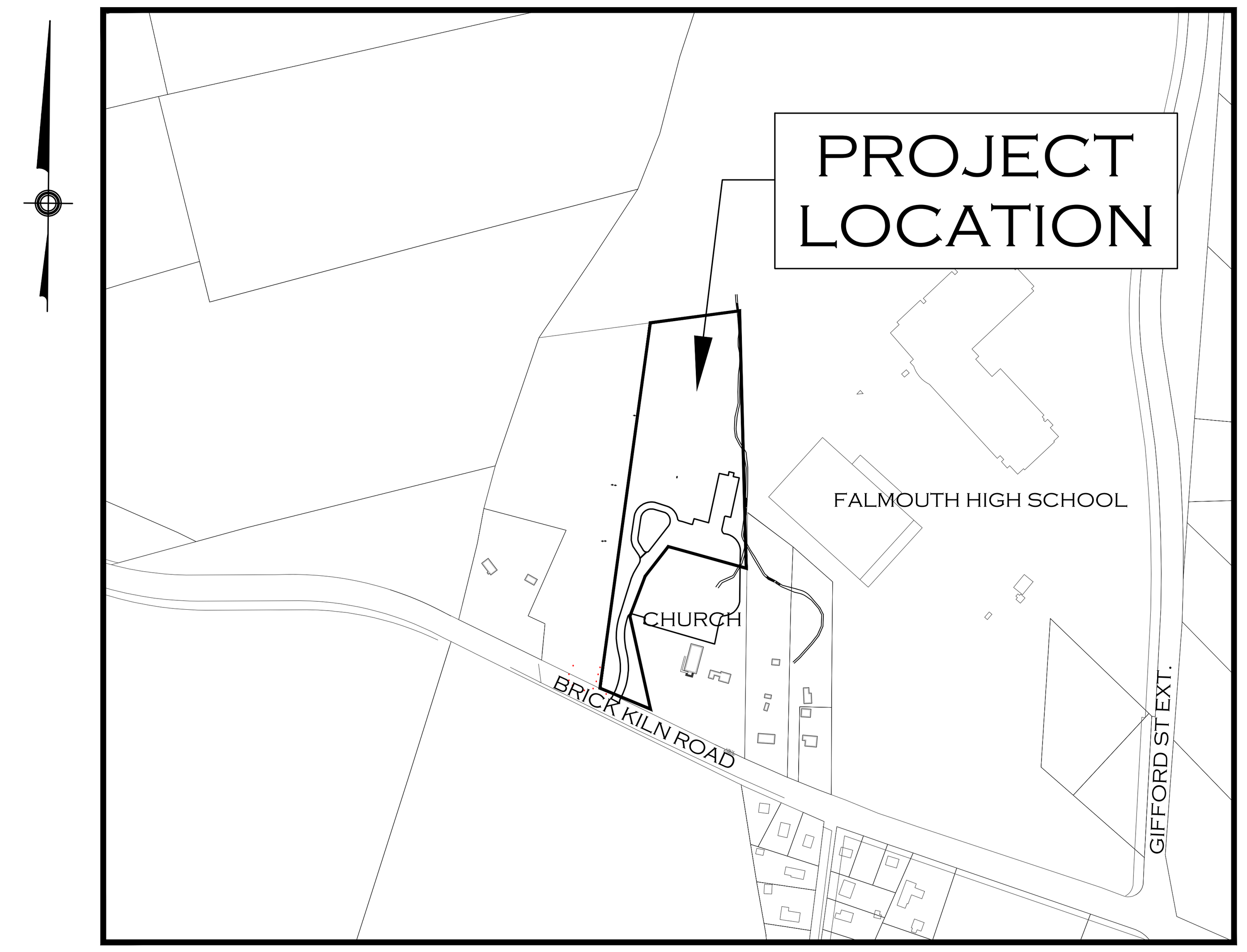
SITE DEVELOPMENT PLANS



VICINITY MAP
NOT TO SCALE



USGS TOPOGRAPHIC MAP
1"=2000'



LOCATION MAP
1"=400'

JANUARY 2024

ARCHITECT

SV DESIGN
693 MAIN STREET
CHATHAM, MA 02633
508-348-5485

CIVIL ENGINEER

GREEN SEAL ENVIRONMENTAL, LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: 508-888-6034 FAX: 508-888-1506
WWW.GSEENV.COM

LANDSCAPE ARCHITECT

BSC GROUP
803 Summer Street Boston, Massachusetts 02127
617-896-4300

APPLICANT/OWNER:
YMCA CAPE COD
2245 IYANNOUGH ROAD
WEST BARNSTABLE, MA 02668
TEL: 508-362-6500

COMMONWEALTH OF MASSACHUSETTS
STUART D. CLARK
CIVIL
No. 40697
REGISTERED PROFESSIONAL ENGINEER

STUART CLARK, P.E.
GREEN SEAL ENVIRONMENTAL, LLC

LIST OF DRAWINGS

SHEET	NUMBER
COVER SHEET	G-001
GENERAL NOTES	G-002
EXISTING CONDITIONS PLAN	V-100
SOIL LOG AND TREE INFORMATION	V-600
SITE PLAN OVERALL	C-100
MATERIALS & LAYOUT PLAN	C-101, C-102
ZONING COMPLIANCE PLAN	C-103
SITE UTILITIES PLAN	C-104
GRADING PLAN	C-105, C-106
STORMWATER DRAINAGE PLAN	C-107, C-108
SEDIMENT & EROSION CONTROL PLAN	C-109
ENTRANCE DRIVE PROFILE	C-300
WASTEWATER TREATMENT	C-401 TO C-403
SWEPT PATH PLAN	F-100
LIGHTING PLAN	EL-100
DETAILS	C-500 TO C-506
LANDSCAPE PLANS, ENLARGEMENTS & DETAILS	L-100 TO L-304
ARCHITECTURAL RENDERINGS	P1.0, P1.1
FLOOR PLANS & ROOF PLAN	A1.01 - A1.03
ARCHITECTURAL ELEVATIONS	A2.1 -A2.3

SHEET:
G-001

GENERAL CONSTRUCTION NOTES

1. ALL SITE PREPARATIONS NECESSARY TO COMPLETE THIS PROJECT ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
2. THE CONTRACTOR SHALL COORDINATE ALL NECESSARY POLICE DETAILS WITH THE LOCAL POLICE DEPARTMENT, AS NEEDED.
3. THE CONTRACTOR SHALL MAKE ALL REQUIRED CONSTRUCTION NOTIFICATIONS AND APPLY FOR AND OBTAIN ALL REQUIRED CONSTRUCTION PERMITS. ALL FEES INCLUDING POLICE DETAILS AND POSTING OF BONDS, ARE TO BE PAID BY THE CONTRACTOR, AS NEEDED, AND COORDINATED WITH THE OWNER AND THE ENGINEER.
4. ALL EXISTING CONDITIONS SHOWN SHALL BE CONSIDERED APPROXIMATE AND ARE BASED ON THE BEST INFORMATION AVAILABLE AT THE TIME OF DESIGN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THAT THE PROPOSED CONDITIONS SHOWN ON THE PLANS DO NOT CONFLICT WITH KNOWN EXISTING OR OTHER PROPOSED IMPROVEMENTS. IF CONFLICTS ARE DISCOVERED, THE CONTRACTOR SHALL NOTIFY THE OWNER AND THE ENGINEER PRIOR TO INSTALLING ANY WORK.
5. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AND STRUCTURES AS SHOWN ON THESE PLANS ARE BASED ON RECORDS OF PREVIOUS OWNERS, VARIOUS UTILITY COMPANIES, AND WHEREVER PRACTICABLE, MEASUREMENTS TAKEN IN THE FIELD. THIS INFORMATION IS NOT GUARANTEED AS BEING EXACT OR COMPLETE. THE LOCATION OF ALL UNDERGROUND UTILITIES NECESSARY FOR CONSTRUCTION AND STRUCTURES SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR MUST CONTACT THE APPROPRIATE UTILITY COMPANIES, GOVERNING PERMITTING AUTHORITIES, AND "DIGSAFE" AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION WORK IN PREVIOUSLY UNALTERED AREAS TO REQUEST EXACT FIELD LOCATION OF UTILITIES. DIGSAGE FIELD MARKINGS SHALL BE UPDATED EVERY 30 DAYS, AS REQUIRED. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RESOLVE CONFLICTS BETWEEN THE PROPOSED UTILITIES AND FIELD-LOCATED UTILITIES AND SHALL REPORT DISCREPANCIES TO THE ENGINEER IMMEDIATELY. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES OMITTED, INCOMPLETELY OR INACCURATELY SHOWN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ACCURATE RECORDS OF THE LOCATION AND ELEVATION OF ALL WORK INSTALLED AND EXISTING UTILITIES FOUND DURING CONSTRUCTION FOR THE PREPARATION OF AN AS-BUILT PLAN.
6. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL EXISTING UTILITIES IN WORKING ORDER AND FREE FROM DAMAGE DURING THE ENTIRE DURATION OF THE PROJECT. ALL COSTS RELATED TO THE REPAIR OF UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. EXCAVATION REQUIRED WITHIN THE PROXIMITY OF EXISTING UTILITY LINES SHALL BE DONE BY HAND. CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING UTILITY LINES OR STRUCTURES INCURRED DURING CONSTRUCTION OPERATIONS AT NO COST TO THE OWNER.
7. THE CONTRACTOR SHALL UTILIZE PRECAUTIONS AND MEASURES TO ENSURE THE SAFETY OF THE PUBLIC, SITE PERSONNEL AND PROPERTY DURING CONSTRUCTION IN ACCORDANCE WITH OSHA STANDARDS, INCLUDING BARRICADES, SAFETY LIGHTING, CONES, POLICE DETAIL AND/OR FLAGMEN AS DETERMINED NECESSARY BY THE ENGINEER AND/OR OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF POLICE DETAILS AND FOR COORDINATING WITH THE LOCAL OR STATE POLICE DEPARTMENT FOR REQUIRED POLICE DETAILS.
8. TRENCHING WORK WITHIN A PUBLIC OR PRIVATE ROADWAY SHALL BE COORDINATED WITH THE OWNER AND/OR PROPER LOCAL & STATE AGENCIES. OSHA TRENCH SAFETY AND RELATED PERMITS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THIS WORK MAY BE REQUIRED TO TAKE PLACE OUTSIDE OF NORMAL HOURS OF OPERATION FOR THE FACILITY.
9. TRENCH WORK WITHIN EXISTING PAVEMENT SHALL BE NEATLY SAWCUT PER THE APPLICABLE DETAILS. TRENCH WORK BACKFILL SHALL BE PLACED AND COMPACTED IN 8-INCH LIFTS OR AS OTHERWISE INDICATED ON PLANS. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY SETTLING DUE TO INADEQUATE COMPACTION AS DETERMINED BY THE ENGINEER WITHIN THE 12 MONTH WARRANTY PERIOD.
10. THE CONTRACTOR SHALL MAKE ALL CONNECTION ARRANGEMENTS WITH UTILITY COMPANIES, AS NECESSARY.
11. IMPORTED MATERIAL SHALL BE CLEAN AND FREE OF HAZARDOUS WASTE OR OTHER CHEMICAL CONTAMINATION. NO MATERIAL WILL BE ACCEPTED FROM AN EXISTING OR FORMER 21E SITE AS DEFINED BY THE MASSACHUSETTS CONTINGENCY PLAN 310 CMR 40.0000.
12. SITE LAYOUT SURVEY REQUIRED FOR CONSTRUCTION WILL BE PROVIDED BY THE CONTRACTOR AND SHALL BE CONDUCTED BY A MASSACHUSETTS LICENSED PROFESSIONAL LAND SURVEYOR. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE SURVEYOR FOR ALL SITE SURVEY WORK. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING AN AS-BUILT PLAN OF THE SITE CONDUCTED BY A LICENSED PROFESSIONAL LAND SURVEYOR AND APPROVED BY THE ENGINEER.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING HORIZONTAL AND VERTICAL CONTROL POINTS DURING CONSTRUCTION INCLUDING BENCHMARK LOCATIONS AND ELEVATIONS AT CRITICAL AREAS. THE LOCATION OF CONTROL POINTS AND BENCHMARKS SHALL BE COORDINATED WITH THE ENGINEER.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING GRADE STAKES AND MONUMENTATION. GRADE STAKES SHALL REMAIN IN PLACE UNTIL A FINAL INSPECTION OF THE SITE HAS BEEN COMPLETED BY THE ENGINEER. ANY RE-STAKING OF PREVIOUSLY SURVEYED SITE FEATURES SHALL BE THE RESPONSIBILITY (INCLUDING COST) OF THE CONTRACTOR.
15. UNLESS OTHERWISE SPECIFIED ON THE PLANS AND DETAILS/SPECIFICATIONS, SITE CONSTRUCTION MATERIALS AND METHODOLOGIES ARE TO CONFORM TO THE MOST RECENT VERSION OF THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES".
16. CONSTRUCTION AND/OR DEMOLITION SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE LAWS AND REGULATIONS REGARDING NOISE, VIBRATION, DUST, SEDIMENTATION CONTAINMENT, HAZARDOUS WASTES AND TRENCH WORK.
17. SOLID WASTES AND/OR CONSTRUCTION OR DEMOLITION DEBRIS SHALL BE COLLECTED AND STORED IN SECURED DUMPSTERS. THE DUMPSTERS SHALL MEET ALL LOCAL AND STATE SOLID WASTE MANAGEMENT REGULATIONS.
18. THE CONTRACTOR SHALL RESTORE SITE SURFACES EQUAL TO THEIR ORIGINAL CONDITION AFTER CONSTRUCTION IS COMPLETE. AREAS NOT DISTURBED BY CONSTRUCTION SHALL BE LEFT NATURAL. THE CONTRACTOR SHALL TAKE CARE TO PREVENT DAMAGE TO SHRUBS, TREES, OTHER LANDSCAPING AND/OR NATURAL FEATURES. IF THE PLANS FAIL TO IDENTIFY LANDSCAPE FEATURES, EXISTING CONDITIONS MUST BE VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF WORK.
19. UNPAVED AREAS DISTURBED BY THE WORK SHALL HAVE A MINIMUM OF 4-INCHES OF LOAM AND HYDROSEED INSTALLED AS SHOWN ON THE PLAN AND/OR DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR WATERING LOAM AND SEEDED AREAS UNTIL GROWTH IS ESTABLISHED AND APPROVED BY THE ENGINEER AND/OR OWNER.
20. ALL PROPOSED STRUCTURES AND COMPONENTS SHALL BE DESIGNED BY THEIR MANUFACTURERS TO WITHSTAND AASHTO H-20 LOADING. PRECAST CONCRETE SHALL HAVE A MINIMUM 28-DAY STRENGTH OF 4,000 PSI UNLESS OTHERWISE SPECIFIED BY THE ENGINEER.
21. THE CONTRACTOR SHALL PROVIDE A UNIT PRICE COST IN CUBIC YARD MEASURE FOR LEDGE AND/OR BOULDER REMOVAL. LEDGE AND/OR BOULDERS LESS THAN 1 CUBIC YARD IN SIZE BASED ON THE AVERAGE DIMENSIONS WILL NOT BE CONSIDERED PAYABLE ROCK. UNIT PRICE SHALL BE GIVEN FOR BOTH ON AND OFF SITE DISPOSAL. COST OF REPLACEMENT MATERIAL SHALL BE INCLUDED IF ADDITIONAL FILL MATERIAL IS REQUIRED.
22. DEVIATION OR ALTERATION OF THE PROPOSED WORK IS TO BE VERIFIED BY THE ENGINEER AND OWNER PRIOR TO CONDUCTING THE WORK.
23. AT THE END OF CONSTRUCTION, THE CONTRACTOR SHALL REMOVE CONSTRUCTION DEBRIS AND SURPLUS MATERIALS FROM THE SITE. A THOROUGH INSPECTION OF THE WORK SITE AND PERIMETER IS TO BE MADE AND DISCARDED MATERIALS AND WIND BLOWN OR WATER CARRIED DEBRIS, SHALL BE COLLECTED, AND REMOVED FROM THE SITE.
24. CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE AND PLOWING DURING CONSTRUCTION. (INCLUDES ALL TRAVEL WAYS ON SITE).

BASIC SITE CONSTRUCTION SEQUENCE

1. SURVEY AND DELINEATE THE PROPOSED LIMIT OF DISTURBANCE AND LIMIT OF SEDIMENTATION BARRIERS.
2. STAKE OUT THE LOCATIONS FOR SEDIMENTATION BARRIERS (STRAW BALES, SILT FENCE, ETC.) AND INSTALL ACCORDING TO THE PLANS. IN NO CASE IS THE LIMIT OF WORK TO EXTEND BEYOND THE SEDIMENTATION BARRIERS/LIMIT OF DISTURBANCE AS SHOWN ON THE PROJECT APPROVED PLANS.
3. INSTALL TEMPORARY CONSTRUCTION ENTRANCES ONLY IN LOCATIONS INDICATED ON PLANS. NO OTHER ENTRANCES SHALL BE USED TO GAIN ACCESS TO THE SITE BY ANY CONSTRUCTION OR DELIVERY VEHICLES. INSTALL ANY OTHER REQUIRED OR NECESSARY EROSION AND SEDIMENT CONTROLS.
4. BEGIN NECESSARY CLEARING AND MARK EXISTING WORK AREA UTILITIES WITH DIGSAFE AND OTHER UTILITY MARKING SERVICES AS REQUIRED.
5. BEGIN NECESSARY DEMOLITION.
6. SURVEY AND STAKE OUT CLEARING LIMITS, ROADWAY/ACCESS DRIVE CENTERLINE, AND PARKING AREAS.
7. EXCAVATE AND ROUGH GRADE THE PROPOSED DRAINAGE BASINS AND ANY ADDITIONAL TEMPORARY BASINS NECESSARY TO CONTROL SITE RUNOFF AND SEDIMENTS. PERMANENT DRAINAGE BASINS SHALL BE TEMPORARILY SEEDED. PERMANENT DRAINAGE BASIN SEEDING AND PLANTING SHALL BE COMPLETED AFTER THE CONTRIBUTING AREA TO THE BASIN HAS REACHED A MINIMUM OF 80% STABILIZATION AND IS NO LONGER REQUIRED TO BE USED AS A CONSTRUCTION SEDIMENTATION BASIN.
8. BEGIN CLEARING AND GRUBBING IN AREA OF ROADWAYS/DRIVES, DRAINAGE BASINS AND PARKING AREAS. TOPSOIL IS TO BE STRIPPED AND STOCKPILED IN APPROVED LOCATIONS ON-SITE. TOPSOIL STOCKPILES ARE TO BE PROTECTED BY A SEDIMENT BARRIER.
9. INSTALL TEMPORARY CONVEYANCE DEVICES (SWALES, CHECK DAMS, PIPES, ETC.) AS NECESSARY TO CONVEY RUNOFF TO TREATMENT AREAS.
10. BEGIN ROUGH GRADING AREAS FOR ROADS AND PARKING. BRING ROUGH GRADING TO PROPER ELEVATIONS AS SOON AS PRACTICABLE. WORK SHALL PROGRESS DILIGENTLY TO MINIMIZE TIME SOILS ARE NOT STABILIZED.
11. BEGIN BUILDINGS AND UTILITY CONSTRUCTION. CONTRACTOR SHALL BE FREE TO INSTALL UTILITIES IN ANY ORDER HE/SHE CHOOSES. ANY EROSION CONTROL DEVICE DISTURBED DURING THE UNDERGROUND UTILITY CONSTRUCTION SHALL BE IMMEDIATELY REPAIRED OR REPLACED IN KIND AND STABILIZED. MODIFY TEMPORARY CONVEYANCE DEVICES AS NECESSARY TO CONVEY RUNOFF TO TREATMENT AREAS.
12. INSTALL DRAINAGE PIPES, DRAINAGE MANHOLES AND CATCH BASINS, AND UNDERGROUND DRAINAGE STRUCTURES. THE DRAINAGE NETWORK IS TO BE PROTECTED FROM SEDIMENTATION WITH SILT FENCE AND STRAW BALES UNTIL ALL NOT STABILIZED AREAS ARE STABILIZED WITH STONE SUB-BASE OR VEGETATION. INSTALL SEDIMENT BARRIERS AT POINTS OF ENTRY INTO THE DRAINAGE NETWORK. PARTICULAR CARE SHALL BE TAKEN TO PROTECT THE UNDERGROUND DRAINAGE BASINS FROM SEDIMENT.
13. PERMANENTLY SEED DISTURBED AREAS OUTSIDE OF THE AREA TO BE PAVED.
14. ONCE ALL UNDERGROUND UTILITIES HAVE BEEN CONSTRUCTED, PLACE COMPACTED GRAVEL FOUNDATION AND ROUGH GRADE THE ROADWAYS/PARKING AREAS IN ACCORDANCE WITH THE SITE PLANS AND IN ACCORDANCE WITH APPLICABLE STATE AND LOCAL REGULATIONS AS SOON AS POSSIBLE.
15. BEGIN ROAD AND PARKING CONSTRUCTION PER SITE PLANS AND IN ACCORDANCE WITH APPLICABLE STATE AND LOCAL REGULATIONS. ROADS AND PARKING AREAS ARE NOT TO BE PAVED UNTIL THE ENTIRE PERMANENT DRAINAGE SYSTEM HAS BEEN INSTALLED AND ALL PIPE CONNECTIONS ARE COMPLETE.
16. FINISH PERMANENT STABILIZATION. SWEEP THE ROADWAY TO REMOVE SEDIMENTS. THE CONTRACTOR SHALL CLEAN AND FLUSH THE DRAINAGE STRUCTURES AND PIPES AT THE END OF CONSTRUCTION. CONTRACTOR SHALL INSPECT THE DRAINAGE NETWORK AND REPAIR DAMAGE IMMEDIATELY.
17. COMPLETE ALL REMAINING PLANTING AND SEEDING.
18. REMOVAL OF ALL TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROL MEASURES FOLLOWING VEGETATIVE ESTABLISHMENT OF ALL DISTURBED AREAS SHALL BE APPROVED BY THE ENGINEER AND WHEN THE CONTRIBUTING AREA HAS REACHED A MINIMUM OF 80% STABILIZATION.
19. ENGINEER WILL MAKE REGULAR INSPECTIONS OF THE SITE DURING CONSTRUCTION.

LINETYPES

EXISTING

LINETYPE	DESCRIPTION
	TREE LINE
	EASEMENT
5	EXISTING MAJOR CONTOUR
7	EXISTING MINOR CONTOUR
	EXISTING EDGE OF PAVEMENT
D	EXISTING DRAIN
	EXISTING GUARDRAIL
	LAYOUT LINE
	LOT LINE (SUBJECT PARCEL)
	LOT LINE (ABUTTERS)
E	OVERHEAD ELECTRIC
OHW	OVERHEAD WIRE
	RUNNING PATH
	SURFACE WATER PROTECTION ZONE
W	WATER
	ZONING SETBACK LINE

PROPOSED

LINETYPE	DESCRIPTON
	TREE LINE
	UNDERGROUND ELECTRIC
	EDGE OF PAVEMENT
	DRAIN
	WOOD FENCE
	LAYOUT LINE
	WATER
	SEWER
	SLOPE EROSION CONTROL BARRIER
5	PROPOSED CONTOUR

SYMBOLS

THESE SYMBOLS MAY BE FOUND IN THE DRAWINGS.

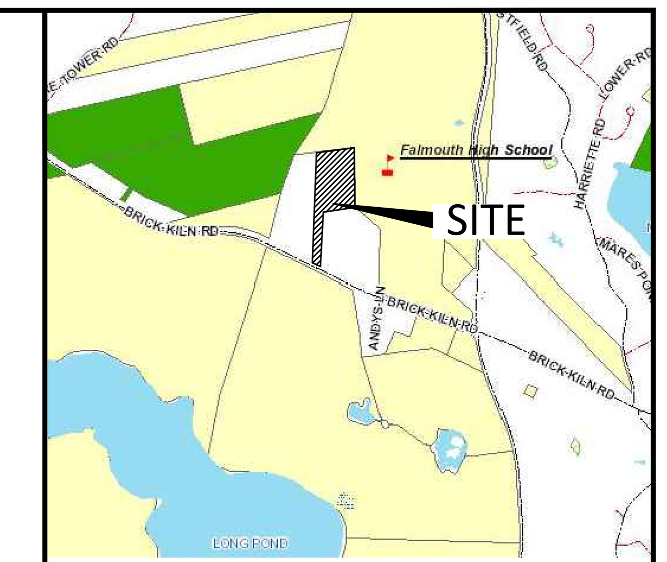
Symbol	Description
#504	TEST PIT
	DRAIN MANHOLE
	CATCH BASIN
	ELECTRIC MANHOLE
	GATE VALVE
	HYDRANT
	ACCESSIBLE PAVEMENT MARKING
	TRAFFIC SIGN

ABBREVIATIONS

THESE STANDARD ABBREVIATIONS MAY BE FOUND IN THE DRAWINGS.

AB	ATTENUATION BASIN
AC	ACRE
ACR	ACCESSIBLE CURB RAMP
ADA	AMERICAN DISABILITY ACT
BIT	BITUMINOUS
BC	BOTTOM OF CURB
BK	BOOK
BM	BENCHMARK
CB	CATCH BASIN
CBDH	CONCRETE BOUND DRILL HOLE (FOUND)
CCB	CAPE COD BERM
CLDI	CEMENT LINED DUCTILE IRON
HDPE	HIGH DENSITY POLYETHYLENE (ADS N-12)
DB	DISTRIBUTION BOX
DI	DUCTILE IRON
DMH	DRAINAGE MANHOLE
EL	ELEVATION
EOP	EDGE OF PAVEMENT
EOS	EDGE OF STONE
EX	EXISTING
F&I	FURNISH & INSTALL
FDC	FIRE DEPARTMENT CONNECTION
FES	FLARED END SECTION
FFE	FINISH FLOOR ELEVATION
HYD	HYDRANT
INV	INVERT
L.O.W	LIMIT OF WORK
LP	LIGHT POLE
LSA	LANDSCAPED AREA
MAAB	MASSACHUSETTS ARCHITECTURAL ACCESS BOARD
NAD83	NORTH AMERICAN DATUM OF 1983
NAVD88	NORTH AMERICAN VERTICAL DATUM OF 1988
N/F	NOW OR FORMERLY
P&P	PROTECT & PRESERVE
PG	PAGE
SBB	SLOPED BITUMINOUS BERM
SMH	SEWER MANHOLE
SWP	SURFACE WATER PROTECTION
SBND-F	STONE BOUND (FOUND)
TC	TOP OF CURB
TP	TEST PIT
TYP	TYPICAL
UP	UTILITY POLE
VGC	VERTICAL GRANITE CURB
WSO	WATER SHUT-OFF
WV	WATER VALVE

CONTRACTOR TO VERIFY ACTUAL LOCATION OF EXISTING UTILITY SERVICES IN THE FIELD PRIOR TO CONSTRUCTION.



LOCUS MAP
NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

DIMENSIONS ARE AS INDICATED.

USE OF THIS PLAN CONSTITUTES ACCEPTANCE OF TERMS AND CONDITIONS SET FORTH IN ACCOMPANYING PROJECT DOCUMENTATION.

IT IS THE RESPONSIBILITY OF THE USER TO CONFIRM DISCREPANCIES WITH THE ENGINEER PRIOR TO USE.

REVISIONS

NO.	DATE	COMMENT
1	10/23/23	ISSUED FOR INTERNAL REVIEW

NOT FOR CONSTRUCTION
FOR PERMITTING
PURPOSES ONLY

PURPOSE:
SPECIAL PERMIT WITH SITE PLAN REVIEW

LOCUS:
487 BRICK KILN ROAD
WEST FALMOUTH, MA

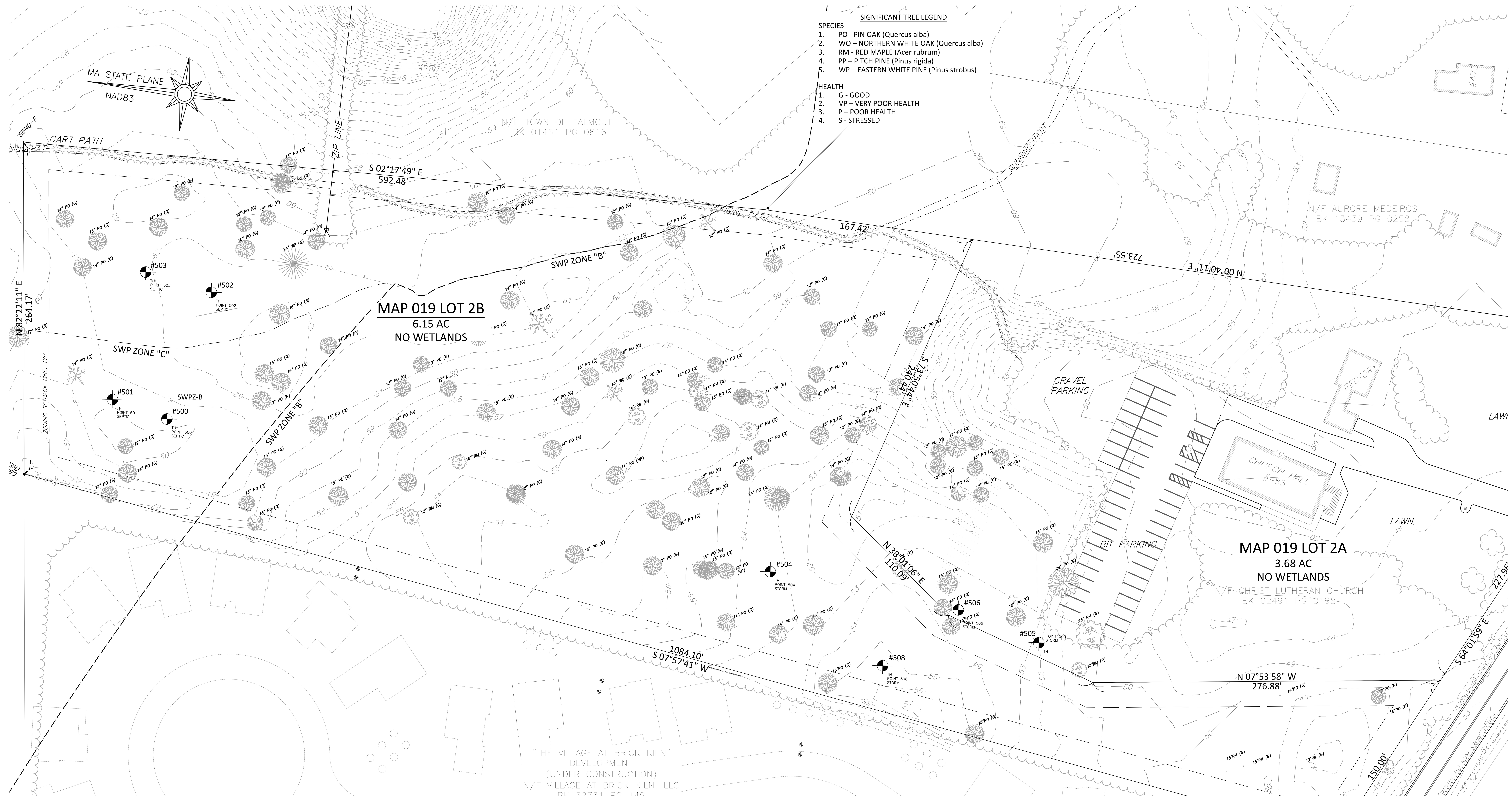
PREPARED FOR:
YMCA
CAPE COD

DRAWING TITLE:
NOTES

CAD TECH:	CHECKED BY:
SDC	JDO
ENGINEER: SDC	DATE: 01/19/24
	SCALE:
	SHEET: G-002

STUART D. CLARK
CIVIL
No. 40697

S:\CLIENTS\YMCA – CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAD\00 SITE PLANS.DWG 1/8/2024 11:21 AM



NOTES

1. HORIZONTAL DATUM IS BASED UPON MASSACHUSETTS MAINLAND STATE PLANE COORDINATE SYSTEM, NAD83, IN US SURVEY FEET.
2. VERTICAL DATUM IS BASED UPON NAVD88, IN US SURVEY FEET.
3. UNDERGROUND UTILITIES DEPICTED HEREON ARE BASED UPON VISIBLE, ABOVE GROUND EVIDENCE AND RECORD INFORMATION AND ARE ONLY APPROXIMATE. CONTRACTOR IS RESPONSIBLE FOR TAKING ALL NECESSARY PRECAUTIONS BEFORE BEGINNING ANY EXCAVATION. (DIGSAFE 1-888-344-7233)
4. SUBJECT PROPERTY LINE DATA IS THE RESULT OF AN ON THE GROUND SURVEY PERFORMED BY GREEN SEAL ENVIRONMENTAL, INC. IN OCTOBER 2020. PORTIONS OF THE PLAN HAVE BEEN AUGMENTED WITH INFORMATION TAKEN FROM THE MASSACHUSETTS GEOGRAPHIC INFORMATION SYSTEM (GIS) AND TOWN OF FALMOUTH GIS INCLUDING ABUTTING PROPERTY LINES, BUILDINGS, TOPOGRAPHICAL CONTOURS AND UTILITY DATA.
5. THE SITE IS LOCATED IN FEMA FLOOD ZONE X AS SHOWN ON FIRM 25001CO728 J, EFFECTIVE JULY 16, 2014.
6. THE PROPERTY LINES SHOWN ON THIS PLAN ARE THE LINES DIVIDING EXISTING OWNERSHIPS, AND THE LINES OF THE STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED, AND THAT NO NEW LINES FOR DIVISION OF EXISTING OWNERSHIP OR FOR NEW WAYS ARE SHOWN.
7. ACCORDING TO THE MASSMAPPER GIS ONLINE MAPPING TOOL, THE SUBJECT PROPERTY DOES NOT CONTAIN, NOR IS WITHIN 500-FT OF, MASSACHUSETTS NATURAL HERITAGE & ENDANGERED SPECIES PROGRAM ESTIMATED OR PRIORITY HABITATS OR CERTIFIED VERNAL POOLS.

APPLICANT/OWNER:
YMCA CAPE COD
2245 IYANNOUGH RD
WEST BARNSTABLE MA 02688

ASSESSORS REFERENCE:
PARCEL ID: 26 01 019 002
MAP 19 LOT 002B

DEED REFERENCE:
BOOK XXXX PAGE XX (TBD)
BARNSTABLE COUNTY REGISTRY

PLAN REFERENCES:
"PLAN OF LAND FOR #485 BRICK KILN ROAD PREPARED FOR CHRIST LUTHERAN CHURCH IN FALMOUTH MA" SCALE 1"=40', DATED NOVEMBER 12, 2018 AND ENDORSED BY THE FALMOUTH PLANNING BOARD ON DECEMBER 4, 2018. THIS PLAN IS UNRECORDED AND IS LOCATED IN THE PRIVATE RECORDS OF YMCA CAPE COD.

BOOK 77 PAGE 105
BARNSTABLE COUNTY REGISTRY

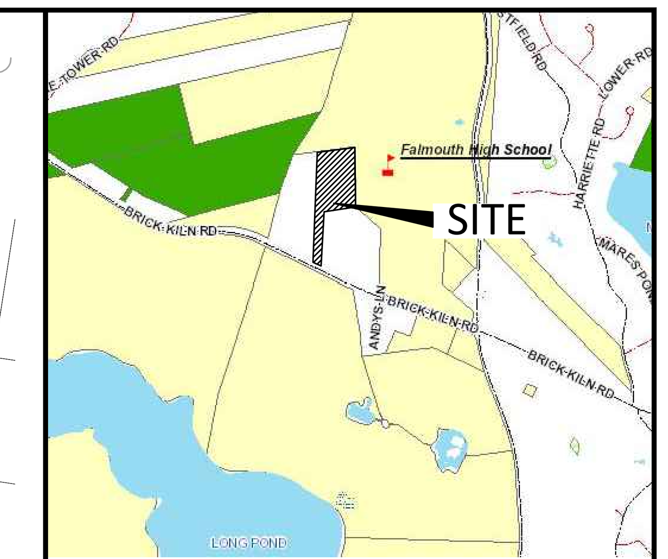
N 07°53'58" W
276.88'

BM: GRATE 53.73 (NAVD88)

BM: GRATE 53.83 (NAVD88)

PATRICK & CELIA DONNELLAN
BK 0849 PG 242

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.



LOCUS MAP
NOT TO SCALE

GREEN SEAL ENVIRONMENTAL, LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

REVISIONS

NO.	DATE	COMMENT
1	10/23/23	ISSUED FOR INTERNAL REVIEW

NOT FOR CONSTRUCTION
FOR PERMITTING
PURPOSES ONLY

PURPOSE:
SPECIAL PERMIT WITH SITE PLAN REVIEW

LOCUS:
487 BRICK KILN ROAD
WEST FALMOUTH, MA

PREPARED FOR:
YMCA CAPE COD

DRAWING TITLE:
EXISTING CONDITIONS PLAN

CAD TECH:	CHECKED BY:
SDC	JDO
ENGINEER: SDC	DATE: 01/19/24
	SCALE: 1"=40'
	SHEET: V-100

COMMONWEALTH OF MASSACHUSETTS
STUARD D. CLARK
CIVIL
No. 40697
REGISTERED PROFESSIONAL ENGINEER

TEST HOLE 500 (SEPTIC)

DATE: 1/17/23
SE: JACK O'LEARY
WITNESS: BERNIE SULLIVAN
GROUND ELEVATION 60.2

DEPTH	LAYER/HORZ	TEXTURE	COLOR	STRUCTURE	COMMENT
1-0"	Oi	FIBRIC	10YR 3/3		ORGANIC MAT
0 - 6"	Ap	SANDY LOAM	7.5YR 4 /4	MASSIVE/FIRM	TOP SOIL
6" - 21"	Bw	SANDY LOAM	7.5 YR 5/3	MASSIVE/FIRM	SUB-SOIL
21" - 88"	C_1	V.F. SAND	2.5 Y 5/4	MASSIVE/FIRM	
88" - 141"	C_2	C. SAND	2.5 Y 7/4	SINGLE GRAIN	

GROUNDWATER: NONE ENCOUNTERED

TEST HOLE 501 (SEPTIC)

DATE: 1/17/23
SE: JACK O'LEARY
WITNESS: BERNIE SULLIVAN
GROUND ELEVATION 60.2

DEPTH	LAYER/HORZ	TEXTURE	COLOR	STRUCTURE	COMMENT
1-0"	Oi	FIBRIC	10YR 3/3		ORGANIC MAT
0 - 6"	Ap	SANDY LOAM	7.5YR 4 /4	MASSIVE/FIRM	TOP SOIL
6" - 21"	Bw	SANDY LOAM	7.5 YR 5/3	MASSIVE/FIRM	SUB-SOIL
21" - 88"	C_1	V.F. SAND	2.5 Y 5/4	MASSIVE/FIRM	
88" - 141"	C_2	C. SAND	2.5 Y 7/4	SINGLE GRAIN	

GROUNDWATER: NONE ENCOUNTERED

PERCOLATION DEPTH: 48" RATE < 2 MPI

TEST HOLE 502 (SEPTIC)

DATE: 1/17/23
SE: JACK O'LEARY
WITNESS: BERNIE SULLIVAN
GROUND ELEVATION 62.2

DEPTH	LAYER/HORZ	TEXTURE	COLOR	STRUCTURE	COMMENT
1-0"	Oi	FIBRIC	10YR 3/3		ORGANIC MAT
0 - 5"	Ap	SANDY LOAM	7.5YR 4 /4	MASSIVE/FIRM	TOP SOIL
5" - 21"	Bw	SANDY LOAM	7.5 YR 5/3	MASSIVE/FIRM	SUB-SOIL
21" - 55"	C_1	LAOMY SAND	2.5 Y 7/3	MASSIVE/FIRM	SILT LOAM LENSES
55" - 96"	C_2	GRAVELY SAND	10 YR 6/6	FIRM	LOOSE AFTER EXCAVATION
96" - 135"	C_3	C. SAND	2.5Y 7/3	SINGLE GRAIN	

GROUNDWATER: NONE ENCOUNTERED

PERCOLATION DEPTH: 46" RATE: 4 MPI

TEST HOLE 503 (SEPTIC)

DATE: 1/17/23
SE: JACK O'LEARY
WITNESS: BERNIE SULLIVAN
GROUND ELEVATION 61.5

DEPTH	LAYER/HORZ	TEXTURE	COLOR	STRUCTURE	COMMENT
1-0"	Oi	FIBRIC	10YR 3/3		ORGANIC MAT
0 - 7"	Ap	SANDY LOAM	7.5YR 4 /4	MASSIVE/FIRM	TOP SOIL
7" - 20"	Bw	SANDY LOAM	7.5YR 5/3	MASSIVE/FIRM	SUB-SOIL
20" - 50"	C_1	SANDY LOAM	2.5Y 7/3	MASSIVE/FIRM	SILT LOAM LENSES
50" - 97"	C_2	GRAVELY SAND	10YR 6/6	FIRM	LOOSE AFTER EXCAVATION
97" - 125"	C_3	SAND	2.5Y 7/3	SINGLE GRAIN	

GROUNDWATER: NONE ENCOUNTERED

TEST HOLE 504 (STORMWATER)

DATE: 1/17/23
SE: JACK O'LEARY
GROUND ELEVATION 54.1

DEPTH	LAYER/HORZ	TEXTURE	COLOR	STRUCTURE	COMMENT
1-0"	Oi	FIBRIC	10YR 3/3		ORGANIC MAT
0 - 6"	Ap	SANDY LOAM	7.5YR 4 /4	MASSIVE/FIRM	TOP SOIL
6" - 32"	Bw	SANDY LOAM	7.5 YR 5/3	MASSIVE/FIRM	SUB-SOIL
32" - 75"	C_1	V.F. SAND	2.5 Y 5/4	MASSIVE/FIRM	
75" - 124"	C_2	SAND	2.5 Y 7/4	SINGLE GRAIN	

GROUNDWATER: NONE ENCOUNTERED

TEST HOLE 505 (STORMWATER)

DATE: 1/17/23
SE: JACK O'LEARY
GROUND ELEVATION 52.5

DEPTH	LAYER/HORZ	TEXTURE	COLOR	STRUCTURE	COMMENT
3-0"	Oi	FIBRIC	10YR 3/3		ORGANIC MAT
0 - 8"	Ap	SANDY LOAM	7.5YR 4 /4	MASSIVE/FIRM	TOP SOIL
8" - 21"	Bw	SANDY LOAM	7.5 YR 5/3	MASSIVE/FIRM	SUB-SOIL
21" - 57"	C_1	V.F. SAND	2.5 Y 5/4	MASSIVE/FIRM	
57" - 92"	C_2	SAND	2.5 Y 7/4	SINGLE GRAIN	

GROUNDWATER: NONE ENCOUNTERED

TEST HOLE 505 (STORMWATER)

DATE: 1/17/23
SE: JACK O'LEARY
GROUND ELEVATION 60.8

DEPTH	LAYER/HORZ	TEXTURE	COLOR	STRUCTURE	COMMENT
4-0"	Oi	FIBRIC	10YR 3/3		ORGANIC MAT
0 - 5"	Ap	SANDY LOAM	7.5YR 4 /4	MASSIVE/FIRM	TOP SOIL
5" - 21"	Bw	SANDY LOAM	7.5 YR 5/3	MASSIVE/FIRM	SUB-SOIL
21" - 48"	C_1	LOAMY SAND	2.5 Y 5/4	MASSIVE/FIRM	SILT LOAM LENSES
48" - 56"	C_2	GRAVELY SAND	10YR 6/6	MASSIVE/FIRM	LOOSE AFTER EXCAVATION
56" - 108"	C_3	C. SAND	2.5Y 7/3	SINGLE GRAIN	

GROUNDWATER: NONE ENCOUNTERED

TEST HOLE 508 (STORMWATER)

DATE: 1/17/23
SE: JACK O'LEARY
GROUND ELEVATION 56.5

DEPTH	LAYER/HORZ	TEXTURE	COLOR	STRUCTURE	COMMENT
1-0"	Oi	FIBRIC	10YR 3/3		ORGANIC MAT
0 - 5"	Ap	SANDY LOAM	7.5YR 4 /4	MASSIVE/FIRM	TOP SOIL
5" - 21"	Bw	SANDY LOAM	7.5 YR 5/3	MASSIVE/FIRM	SUB-SOIL
21" - 44"	C_1	LOAMY SAND	2.5 Y 5/4	MASSIVE/FIRM	SILT LOAM LENSES
44" - 56"	C_2	GRAVELY SAND	10YR 6/6	MASSIVE/FIRM	LOOSE AFTER EXCAVATION
56" - 77"	C_3	C. SAND	2.5Y 7/3	SINGLE GRAIN	

GROUNDWATER: NONE ENCOUNTERED

SIGNIFICANT TREE INVENTORY

BOTANIST: GARRETT TUNISION

HARDWOOD: > 12" DBH SOFTWOOD > 14" DBH

SYMBOL	ID	SPECIES	QTY
	PO	PIN OAK (Quercus palustris)	104
	WO	WHITE OAK (Quercus alba)	4
	RM	RED MAPLE (Acer rubrum)	13
	WP	EASTERN WHITE PINE (Pinus strobus)	2

LOCUS MAP
NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

DIMENSIONS ARE AS INDICATED.

USE OF THIS PLAN CONSTITUTES ACCEPTANCE OF TERMS AND CONDITIONS SET FORTH IN ACCOMPANYING PROJECT DOCUMENTATION.

IT IS THE RESPONSIBILITY OF THE USER TO CONFIRM DISCREPANCIES WITH THE ENGINEER PRIOR TO USE.

REVISIONS

NO.	DATE	COMMENT
1	10/23/23	ISSUED FOR INTERNAL REVIEW

NOT FOR CONSTRUCTION
FOR PERMITTING
PURPOSES ONLY

PURPOSE:

SPECIAL PERMIT WITH SITE PLAN REVIEW

LOCUS:

487 BRICK KILN ROAD
WEST FALMOUTH, MA

PREPARED FOR:

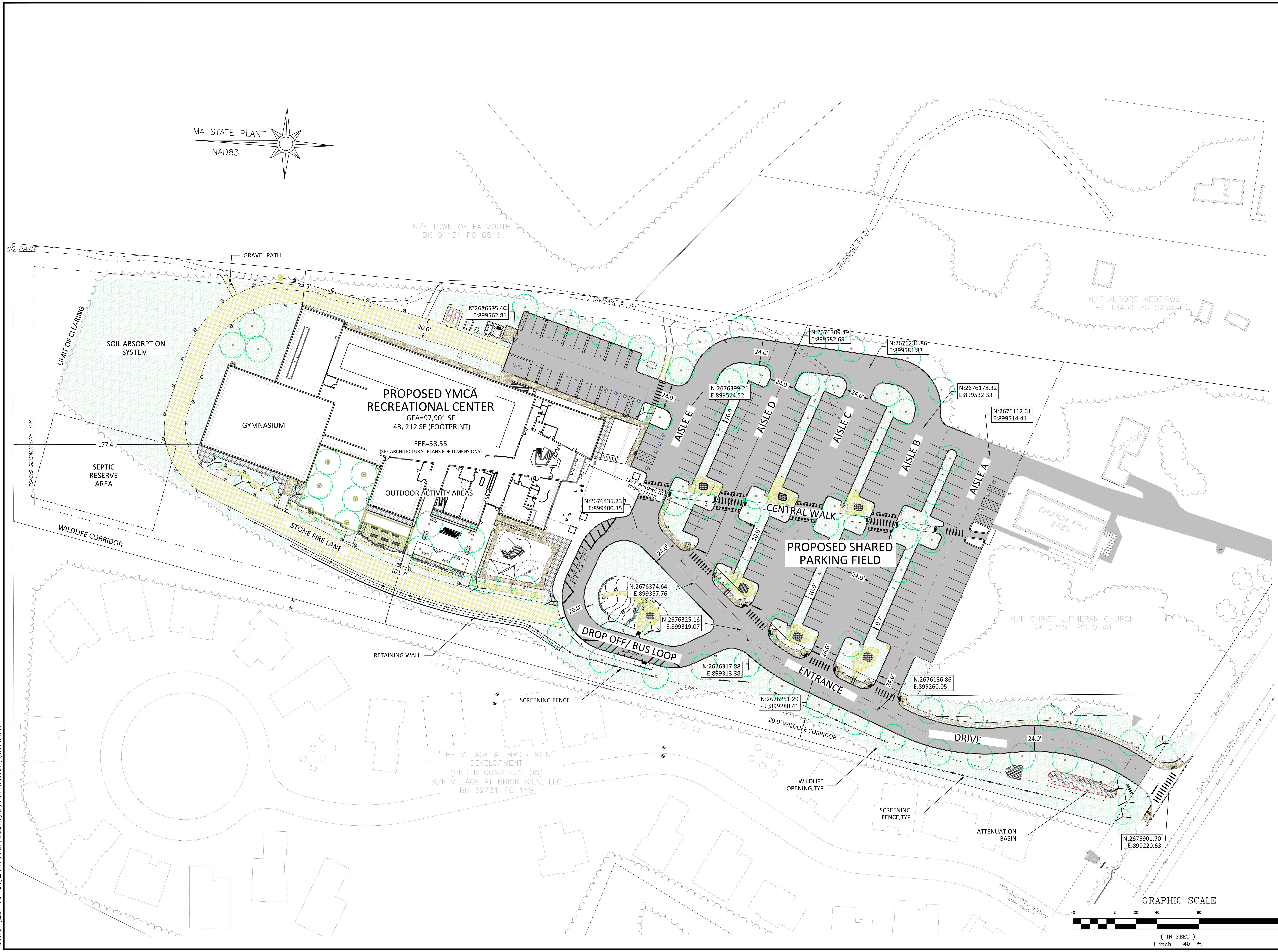
YMCA CAPE COD

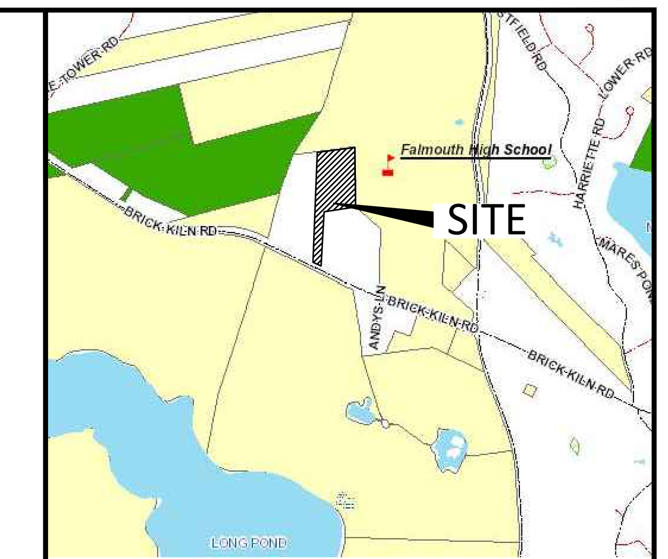
DRAWING TITLE:

SOIL LOGS & TREE INFORMATION

CAD TECH:	CHECKED BY:
SDC	JDO
ENGINEER: SDC	DATE: 01/19/24
	SCALE: 1"=20'
	SHEET: V-600

COMMONWEALTH OF MASSACHUSETTS
STUART D. CLARK
CIVIL
No. 40697
REGISTERED PROFESSIONAL ENGINEER





LOCUS MAP

NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

REVISIONS

NO.	DATE	COMMENT
1	10/23/23	ISSUED FOR INTERNAL REVIEW

NOT FOR CONSTRUCTION
FOR PERMITTING
PURPOSES ONLY

PURPOSE:

SPECIAL PERMIT WITH
SITE PLAN REVIEW

LOCUS:

487 BRICK KILN ROAD
WEST FALMOUTH, MA

PREPARED FOR:

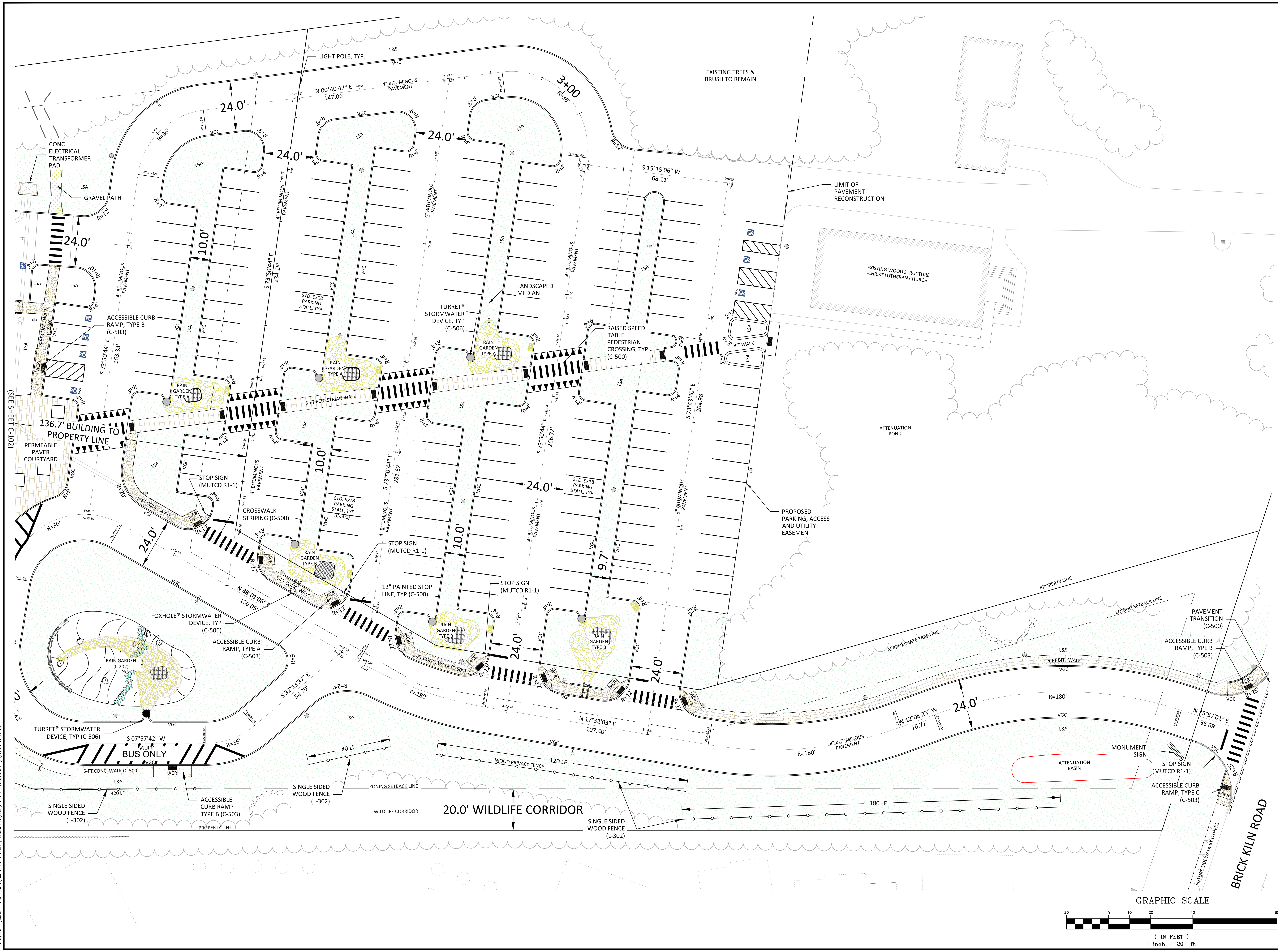
YMCA
CAPE COD

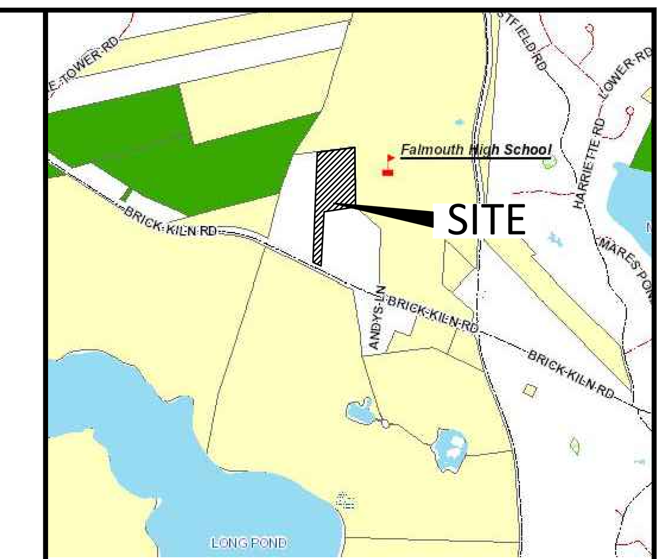
DRAWING TITLE:

SITE PLAN
(OVERALL)

CAD TECH:	CHECKED BY:
SDC	JDO
ENGINEER:	DATE:
SDC	01/19/24
	SCALE:
	1"=40'
	SHEET:
	C-100

COMMONWEALTH OF MASSACHUSETTS
STUART D. CLARK
CIVIL
No. 40697
REGISTERED PROFESSIONAL ENGINEER





LOCUS MAP
NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

DIMENSIONS ARE AS INDICATED.

USE OF THIS PLAN CONSTITUTES ACCEPTANCE OF TERMS AND CONDITIONS SET FORTH IN ACCOMPANYING PROJECT DOCUMENTATION.

IT IS THE RESPONSIBILITY OF THE USER TO CONFIRM DISCREPANCIES WITH THE ENGINEER PRIOR TO USE.

REVISIONS

NO.	DATE	COMMENT
1	10/23/23	ISSUED FOR INTERNAL REVIEW

NOT FOR CONSTRUCTION FOR PERMITTING PURPOSES ONLY

PURPOSE:
SPECIAL PERMIT WITH SITE PLAN REVIEW

LOCUS:
487 BRICK KILN ROAD
WEST FALMOUTH, MA

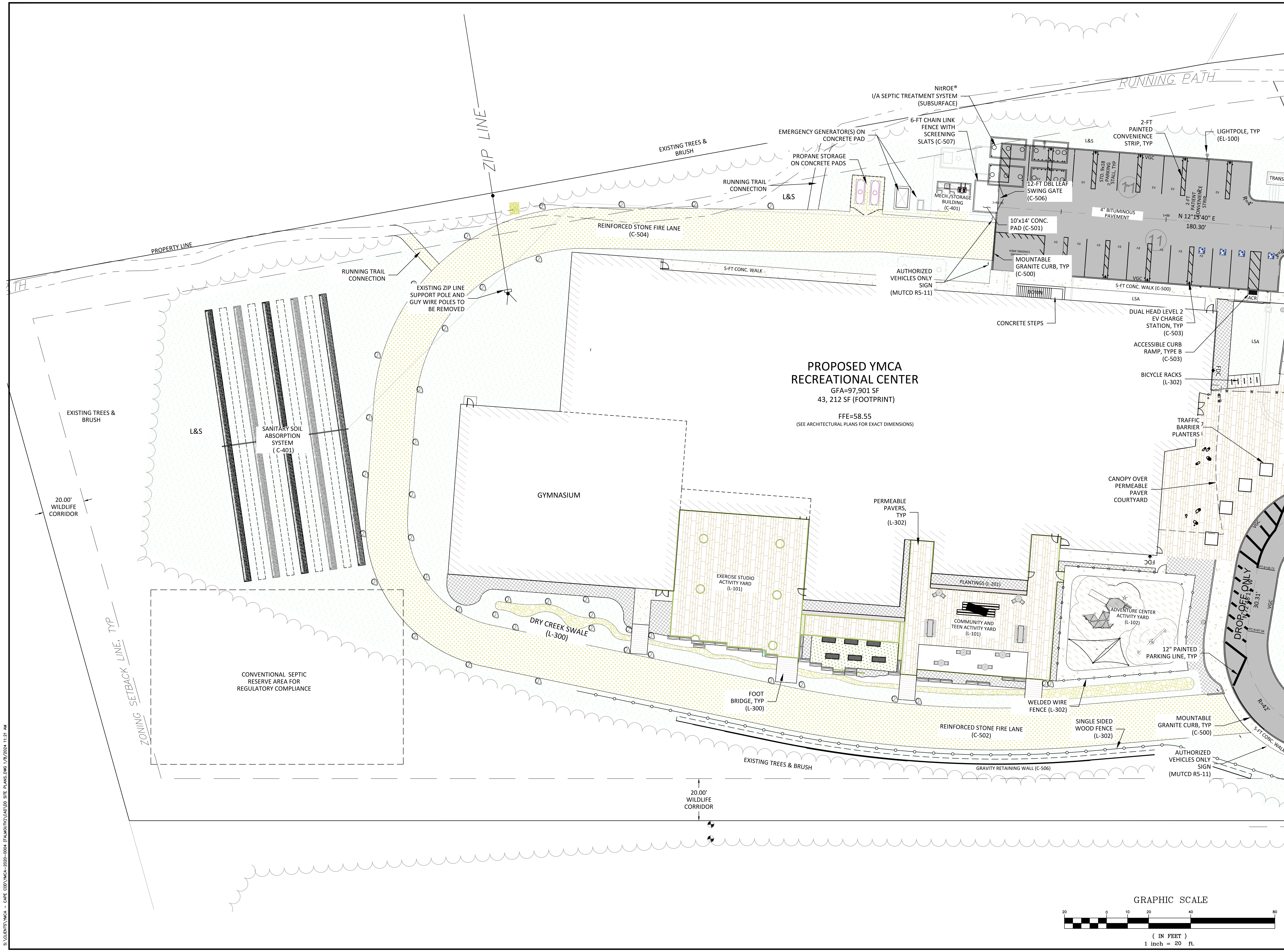
PREPARED FOR:
the YMCA CAPE COD

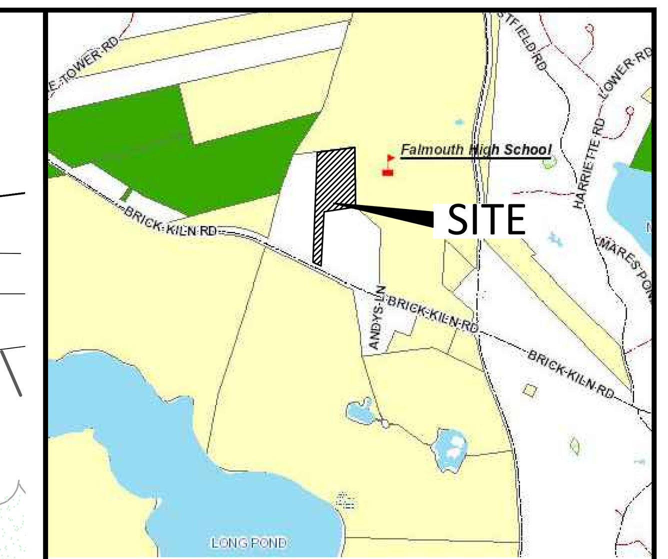
DRAWING TITLE:
MATERIAL & LAYOUT PLAN

CAD TECH: SDC	CHECKED BY: JDO
ENGINEER: SDC	DATE: 01/19/24
	SCALE: 1"=20'
	SHEET: C-101

COMMONWEALTH OF MASSACHUSETTS STUART D. CLARK CIVIL No. 40697 REGISTERED PROFESSIONAL ENGINEER

S:\CLIENTS\YMCA - CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAD\00 SITE PLANS.DWG 1/8/2024 11:21 AM





LOCUS MAP

NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

REVISIONS

NO.	DATE	COMMENT
1	10/23/23	ISSUED FOR INTERNAL REVIEW

NOT FOR CONSTRUCTION FOR PERMITTING PURPOSES ONLY

PURPOSE:

SPECIAL PERMIT WITH SITE PLAN REVIEW

LOCUS:

487 BRICK KILN ROAD
WEST FALMOUTH, MA

PREPARED FOR:

YMCA CAPE COD

DRAWING TITLE:

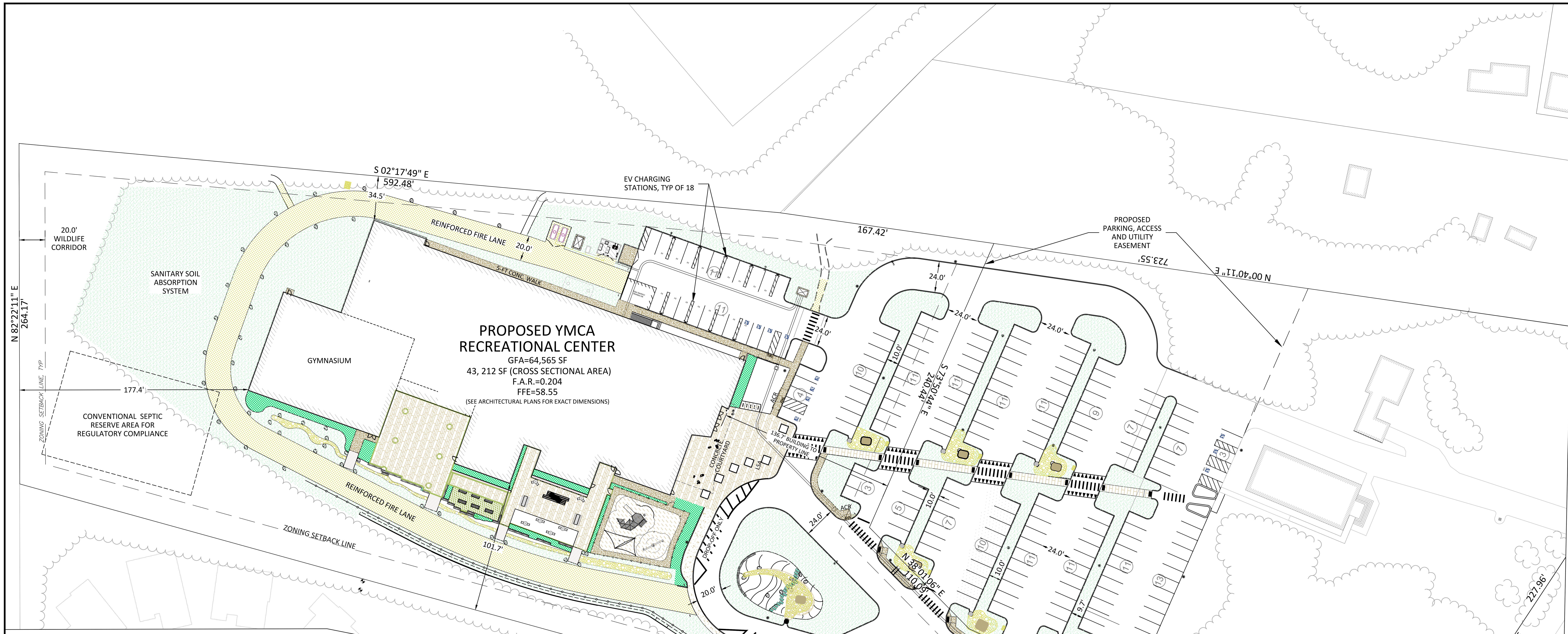
MATERIAL & LAYOUT PLAN

CAD TECH:	CHECKED BY:
SDC	JDO
ENGINEER:	DATE:
SDC	01/19/24

COMMONWEALTH OF MASSACHUSETTS
STUART D. CLARK
CIVIL
No. 40697
REGISTERED PROFESSIONAL ENGINEER

SCALE: 1"=20'

SHEET: C-102



ZONING TABLE

ZONE: AGRICULTURE AA (AGAA) (ARTICLE VIII)
OVERLAY: WATER RESOURCE PROTECTION OVERLAY DISTRICT (§240-7.7)
WILDLIFE CORRIDOR: MIGRATION AREA 1 (§240-7.8)
PROPOSED USE: PRIVATE CLUB NOT CONDUCTED FOR PROFIT
(ZBA SPECIAL PERMIT REQ'D §240-6.1B)

§240-11.2B & 11.3A	REQUIRED	PROPOSED
MIN AREA	80,000 SF	267,940 SF
MIN FRONTAGE	150'	150.00'
MIN LOT WIDTH	200'	362'
FRONT YARD SETBACK	20'	136.7'
SIDE YARD SETBACK	20'	34.5'
REAR YARD SETBACK	20'	177.4'
MAX LOT COVERAGE BY IMPERVIOUS SURFACES WITHOUT SPECIAL PERMIT (WRPOD §240-7.2.5B(4)	20%	37.9%
MAX LOT COVERAGE (STRUCTURES)	20%	16.2%
MAX LOT COVERAGE WITH SPECIAL PERMIT* (STRUCTURES/PAVING/PARKING)	40%	37.2%
MIN LANDSCAPE BUFFER	15'	26.8'
MAXIMUM BUILDING HEIGHT	35'	35'
MIN OPEN SPACE	20%	20%

* PER WRPOD §240-7.6B- ANY USE THAT WILL RENDER IMPERVIOUS MORE THAN 15% OR 2,500 SQUARE FEET OF ANY LOT, WHICHEVER IS GREATER, SHALL REQUIRE A SPECIAL PERMIT SUBJECT TO THE FOLLOWING:

1. A SYSTEM FOR GROUNDWATER RECHARGE SHALL BE PROVIDED THAT DOES NOT DEGRADE GROUNDWATER QUALITY.
2. FOR NONRESIDENTIAL USES, RECHARGE SHALL BE BY STORMWATER INFILTRATION BASINS OR SIMILAR SYSTEMS COVERED WITH NATURAL VEGETATION. DRY WELLS SHALL BE USED ONLY WHERE OTHER METHODS ARE INFEASIBLE.
3. FOR ALL NONRESIDENTIAL USES, ALL BASINS AND WELLS SHALL HAVE OIL, GREASE, AND SEDIMENTATION TRAPS TO REMOVE CONTAMINATION.
4. ANY AND ALL RECHARGE AREAS SHALL BE PERMANENTLY MAINTAINED BY THE OWNER. ACCORDING TO ESTABLISHED BEST MANAGEMENT PRACTICES.

ZONING CONSTRAINTS

ZONE: AGAA

PROPOSED USE: PRIVATE CLUB NOT CONDUCTED FOR PROFIT (ALLOWED BY SPECIAL PERMIT)

ISSUE	BY-LAW SECTION	REQUIRED	PROVIDED
INTERIOR PARKING ISLANDS	LANDSCAPING §240-14.3D(8)	40 SF/STALL =7280 SF	>20,000 SF
RESIDENTIAL BUFFER	LANDSCAPING §240-14.3D(10)	YES	YES
IMPERVIOUS AREA	WATER RESOURCE PROTECTION DISTRICT §240-7.6B(6)	MAX 40%	37.2%
MAX LOT COVERAGE (STRUCTURE)	DIMENSIONAL REGULATIONS §240-11.3A	MAX 20%	16.2%
WILDLIFE CORRIDOR	WILDLIFE CORRIDOR §240-7.7	YES	YES
NON-RESIDENTIAL SEPTIC HYDRAULIC LOADING	WATER RESOURCE PROTECTION DISTRICT §240-76.B(6)	62.5 GPD/1000 SF*	27 GPD

* §240-7.6B USES A 7.5 GPD/1000 SF HYDRAULIC LOADING RATE FOR *STANDARD* SEPTIC EFFLUENT WHICH CONTAINS ON AVERAGE 250 mg/l TSS AND BOD. THE APPLICANT IS PROPOSING I/A TREATMENT SYSTEM WHICH WILL ACHIEVE 30 mg/l TSS & BOD WHICH IS 8.3 TIMES GREATER REMOVAL RATE THAN A STANDARD SEPTIC . APPLYING THIS TO THE 7.5 GPD/1000SF REQUIREMENT, THE MAXIMUM EQUIVALENT HYDRAULIC LOADING RATE IS 62.5 GPD/1000 SF

POST - CONSTRUCTION IMPERVIOUS AREA CALCULATION

YMCA LOT SIZE (LOT 2B)= 267,940 EASEMENT AREA=72,657 SF
DEVELOPMENT AREA=340,597 SF

	YMCA	EASEMENT AREA	CHURCH
WALKS/PLAY AREA	9,673 SF	10,295 SF	1,097 SF
PAVEMENT	43,653 SF	36,645 SF	52,863 SF
STRUCTURES	43,404 SF	43,404 SF	4,845 SF (EX)
TOTALS	96,730 SF	90,344 SF	58,805 SF
PERCENT IMPERVIOUS COVER (STRUCTURES)	16.2%	N/A	3%
PERCENT IMPERVIOUS COVER (STRUCTURES/PAVING/PARKING)	36.1%	N/A	37%

* DEVELOPMENT AREA INCLUDES LOT 2B AND THE EASEMENT AREA

PARKING ANALYSIS

ZONE: AGAA

PROPOSED USE: SPORTS CLUB

§240-14.1E	STANDARD	CALCULATION	REQUIRED	ON-SITE SPACES	SHARED SPACES	TOTAL SPACES FOR YMCA	CHURCH SPACES	TOTAL SPACES
SPORTS/HEALTH CLUB	1 PER 200 SF OF BUILDING AREA*	43,213 SF/ 200=216 216 x 75% = 162	162 SPACES **	50 SPACES	92 SPACES	142 SPACES***	34 SPACES	176 SPACES
MAAB /ADA: 151-200 SPACES	6 REQUIRED 1 VAN	---	---	7 SPACES 1 VAN			3 SPACES	10 SPACES 1 VAN

* §240-13 DEFINES BUILDING AREA AS:
THE AGGREGATE OF THE MAXIMUM HORIZONTAL CROSS-SECTION AREA OF THE BUILDING ON A LOT EXCLUDING CORNICES, EAVES, GUTTERS OR CHIMNEYS PROJECTING NOT MORE THAN 24 INCHES, STEPS, ONE-STORY OPEN PORCHES AND BALCONIES AND TERRACES, BUT INCLUDING ACCESSORY BUILDINGS

**§240-14.1F(2)- ALLOWS A 25% REDUCTION IN OFF-STREET PARKING BY RIGHT

***§240-14.1F(3)(B) ALLOWS A FURTHER REDUCTION IN OFF-STREET PARKING BY SPECIAL PERMIT

§240-14.11F(7) REQUIRES ONE BICYCLE PER 20 PARKING SPACES - (9 REQUIRED, 10 PROVIDED)

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

LOCUS MAP
NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

REVISIONS

NO.	DATE	COMMENT
1	10/23/23	ISSUED FOR INTERNAL REVIEW

NOT FOR CONSTRUCTION
FOR PERMITTING
PURPOSES ONLY

PURPOSE:
SPECIAL PERMIT WITH SITE PLAN REVIEW

LOCUS:
487 BRICK KILN ROAD
WEST FALMOUTH, MA

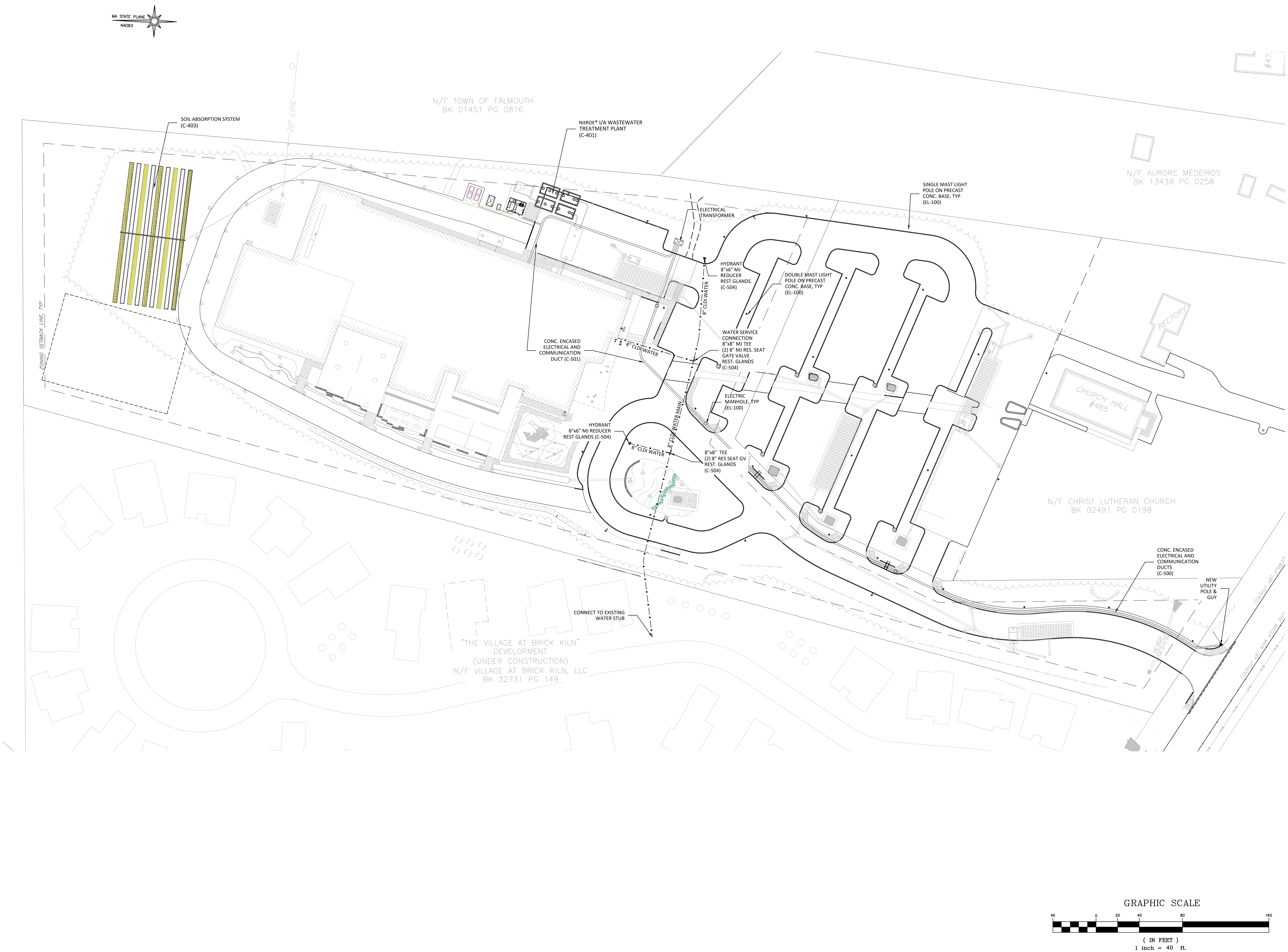
PREPARED FOR:
YMCA CAPE COD

DRAWING TITLE:
ZONING COMPLIANCE PLAN

CAD TECH:	CHECKED BY:
SDC	JDO
ENGINEER: SDC	DATE: 01/19/24
	SCALE: 1"=40'
	SHEET: C-103

COMMONWEALTH OF MASSACHUSETTS
STUART D. CLARK
CIVIL
No. 40697
REGISTERED PROFESSIONAL ENGINEER

S:\CLIENTS\YMCA – CAPE COD\YMCA–2020–0004 (FALMOUTH)\CAD\DWG SITE PLANS.DWG 1/8/2024 11:21 AM



LOCUS MAP

NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562

TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

DIMENSIONS ARE AS INDICATED.

USE OF THIS PLAN CONSTITUTES ACCEPTANCE OF TERMS AND CONDITIONS SET FORTH IN ACCOMPANYING PROJECT DOCUMENTATION.

IT IS THE RESPONSIBILITY OF THE USER TO CONFIRM DISCREPANCIES WITH THE ENGINEER PRIOR TO USE.

REVISIONS

NO.	DATE	COMMENT
1	10/23/23	ISSUED FOR INTERNAL REVIEW

NOT FOR CONSTRUCTION
FOR PERMITTING
PURPOSES ONLY

PURPOSE:

SPECIAL PERMIT WITH SITE PLAN REVIEW

LOCUS:

487 BRICK KILN ROAD
WEST FALMOUTH, MA

PREPARED FOR:

YMCA CAPE COD

DRAWING TITLE:

SITE UTILITIES PLAN

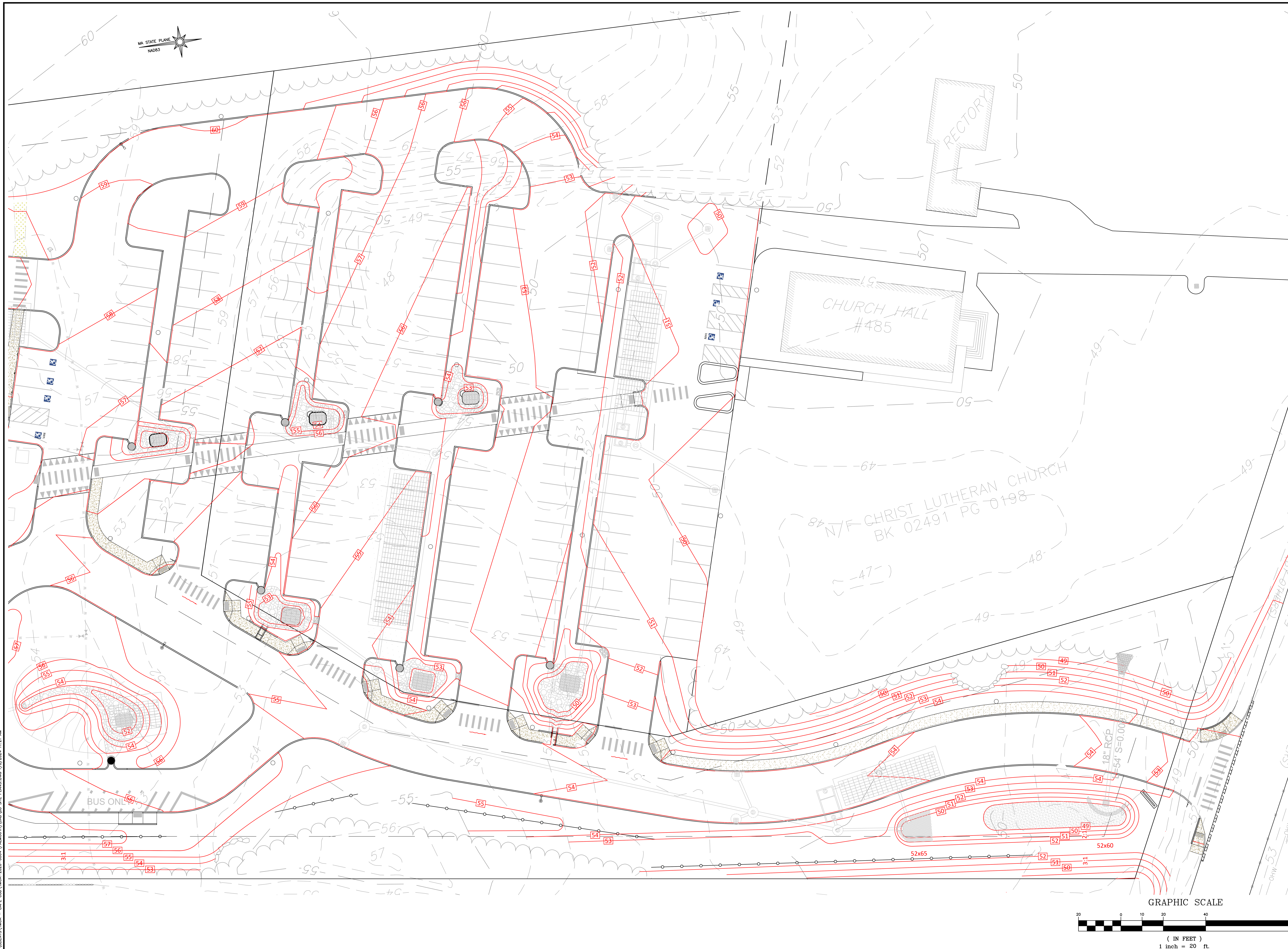
CAD TECH:	CHECKED BY:
SDC	JDO
ENGINEER:	DATE:
SDC	01/19/24

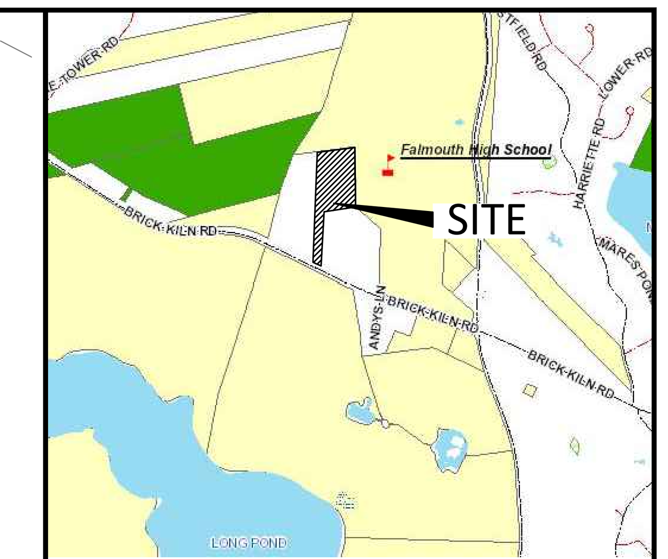
COMMONWEALTH OF MASSACHUSETTS
STUART D. CLARK
CIVIL
No. 40697
REGISTERED PROFESSIONAL ENGINEER

SCALE: 1"=40'

SHEET: C-104

S:\CLIENTS\YMCA - CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAD\00 SITE PLANS.DWG 1/8/2024 11:21 AM





LOCUS MAP
NOT TO SCALE

GREEN SEAL ENVIRONMENTAL, LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

DIMENSIONS ARE AS INDICATED.

USE OF THIS PLAN CONSTITUTES ACCEPTANCE OF TERMS AND CONDITIONS SET FORTH IN ACCOMPANYING PROJECT DOCUMENTATION.

IT IS THE RESPONSIBILITY OF THE USER TO CONFIRM DISCREPANCIES WITH THE ENGINEER PRIOR TO USE.

REVISIONS

NO.	DATE	COMMENT
1	10/23/23	ISSUED FOR INTERNAL REVIEW

NOT FOR CONSTRUCTION
FOR PERMITTING
PURPOSES ONLY

PURPOSE:
SPECIAL PERMIT WITH
SITE PLAN REVIEW

LOCUS:
487 BRICK KILN ROAD
WEST FALMOUTH, MA

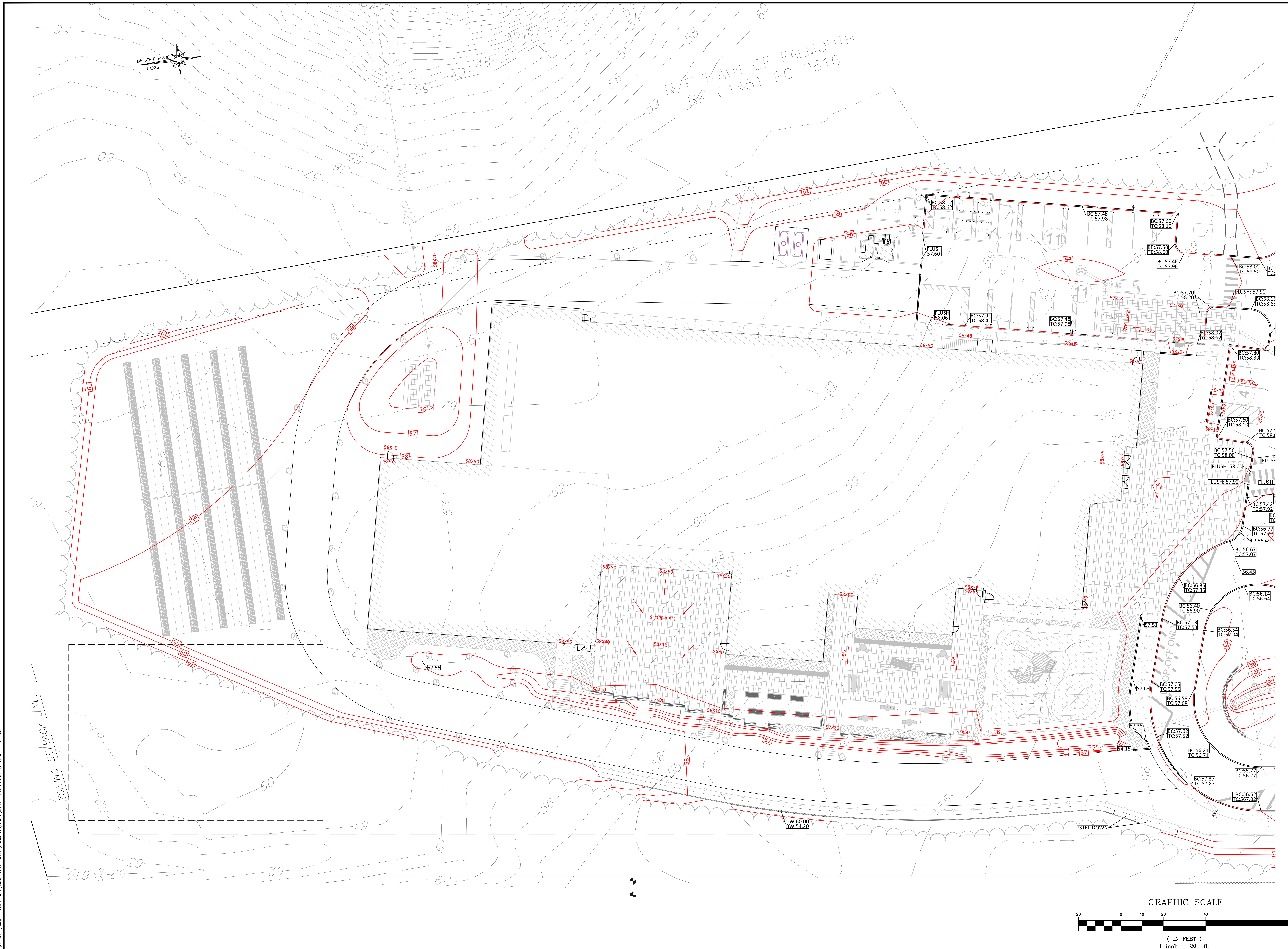
PREPARED FOR:
YMCA
CAPE COD

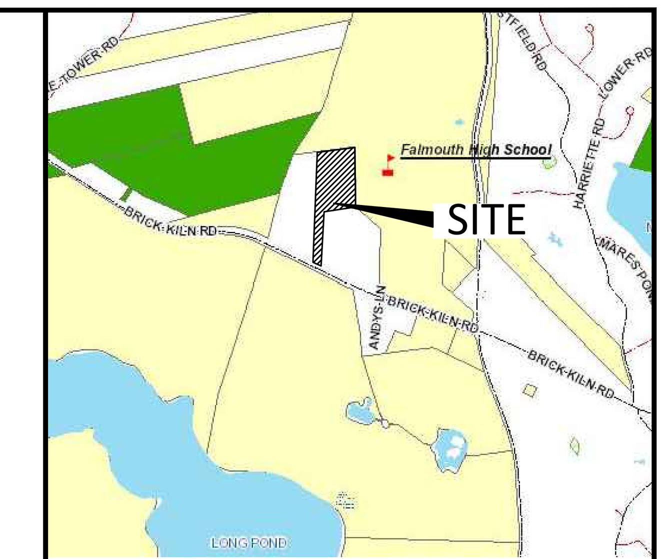
DRAWING TITLE:
GRADING PLAN

CAD TECH:	CHECKED BY:
SDC	JDO
ENGINEER:	DATE:
SDC	01/19/24
	SCALE:
	1"=20'
	SHEET:
	C-105

COMMONWEALTH OF MASSACHUSETTS
STUART D. CLARK
CIVIL
No. 40697
REGISTERED PROFESSIONAL ENGINEER

S:\CLIENTS\YMCA - CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAD\00 SITE PLANS.DWG 1/8/2024 11:21 AM





LOCUS MAP

NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562

TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

REVISIONS

NO.	DATE	COMMENT
1	10/23/23	ISSUED FOR INTERNAL REVIEW

NOT FOR CONSTRUCTION
FOR PERMITTING
PURPOSES ONLY

PURPOSE:

SPECIAL PERMIT WITH
SITE PLAN REVIEW

LOCUS:

487 BRICK KILN ROAD
WEST FALMOUTH, MA

PREPARED FOR:

YMCA
CAPE COD

DRAWING TITLE:

GRADING PLAN

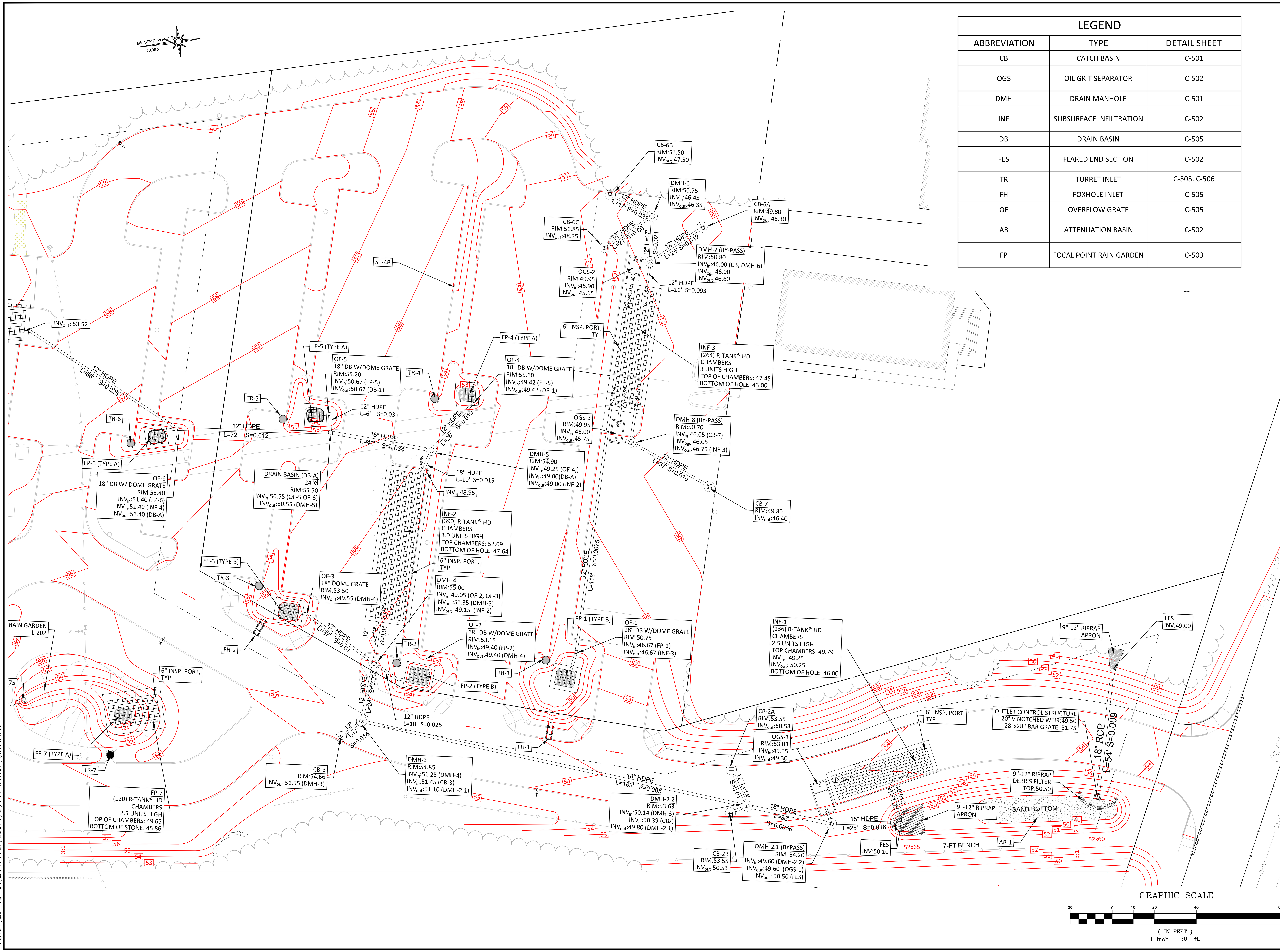
CAD TECH:	CHECKED BY:
SDC	JDO
ENGINEER:	DATE:
SDC	01/19/24

COMMONWEALTH OF MASSACHUSETTS
STUART D. CLARK
CIVIL
No. 40697
REGISTERED PROFESSIONAL ENGINEER

SCALE:
1"=20'

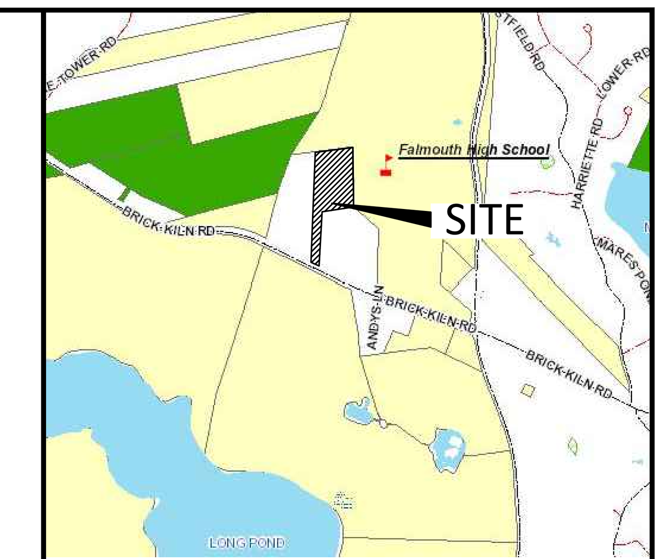
SHEET:
C-106

S:\CLIENTS\YMCA - CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAD\00 SITE PLANS.DWG 1/8/2024 11:21 AM



LEGEND

ABBREVIATION	TYPE	DETAIL SHEET
CB	CATCH BASIN	C-501
OGS	OIL GRIT SEPARATOR	C-502
DMH	DRAIN MANHOLE	C-501
INF	SUBSURFACE INFILTRATION	C-502
DB	DRAIN BASIN	C-505
FES	FLARED END SECTION	C-502
TR	TURRET INLET	C-505, C-506
FH	FOXHOLE INLET	C-505
OF	OVERFLOW GRATE	C-505
AB	ATTENUATION BASIN	C-502
FP	FOCAL POINT RAIN GARDEN	C-503



LOCUS MAP
NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

REVISIONS

NO.	DATE	COMMENT
1	10/23/23	ISSUED FOR INTERNAL REVIEW

NOT FOR CONSTRUCTION
FOR PERMITTING
PURPOSES ONLY

PURPOSE:
SPECIAL PERMIT WITH SITE PLAN REVIEW

LOCUS:
487 BRICK KILN ROAD
WEST FALMOUTH, MA

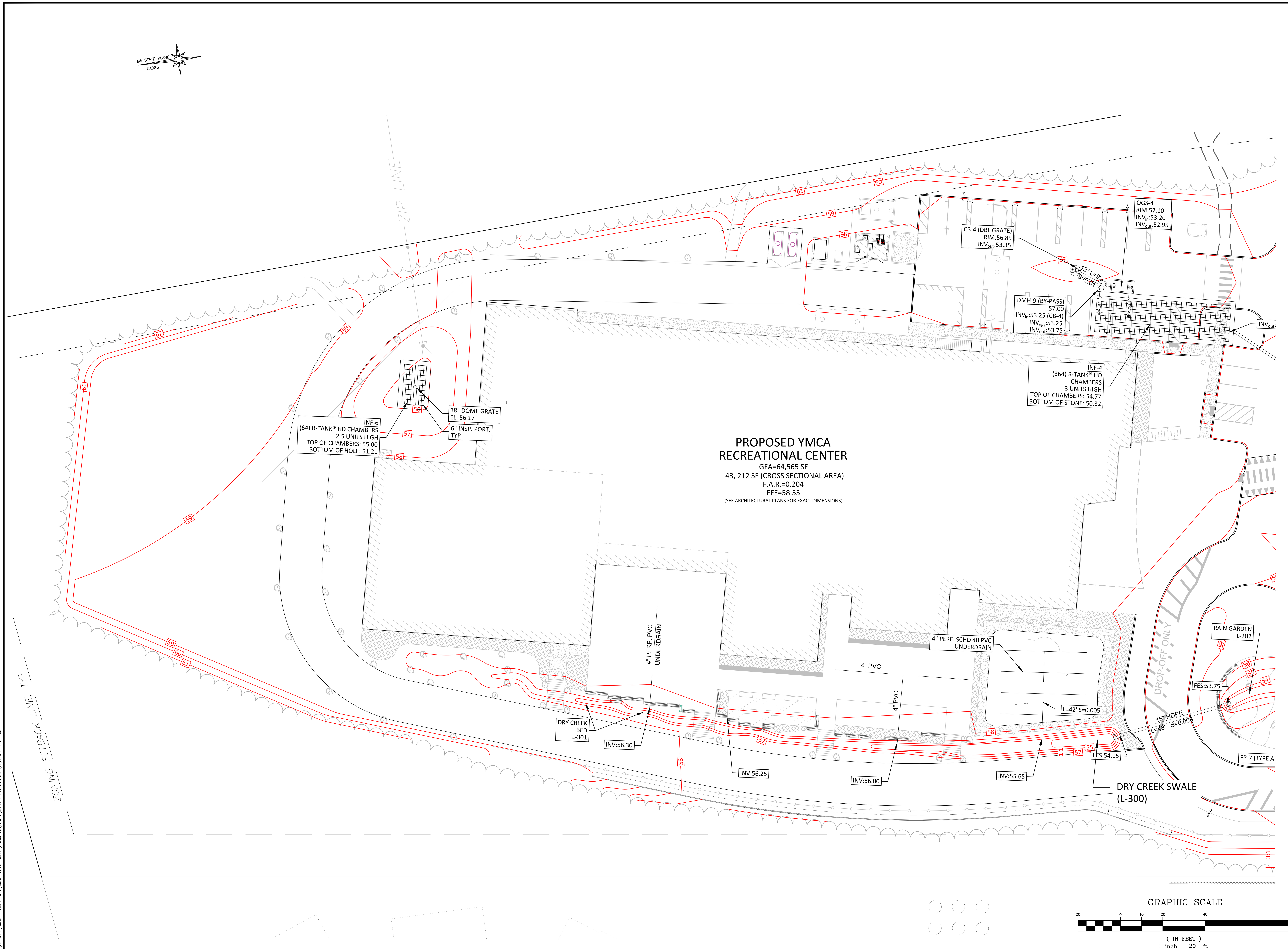
PREPARED FOR:
YMCA CAPE COD

DRAWING TITLE:
STORMWATER DRAINAGE PLAN

CAD TECH: SDC	CHECKED BY: JDO
ENGINEER: SDC	DATE: 01/19/24
	SCALE: 1"=20'
	SHEET: C-107

STUART D. CLARK CIVIL No. 40697

S:\CLIENTS\YMCA - CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAD\00 SITE PLANS.DWG 1/8/2024 11:21 AM



LOCUS MAP
NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

REVISIONS

NO.	DATE	COMMENT
1	10/23/23	ISSUED FOR INTERNAL REVIEW

NOT FOR CONSTRUCTION
FOR PERMITTING
PURPOSES ONLY

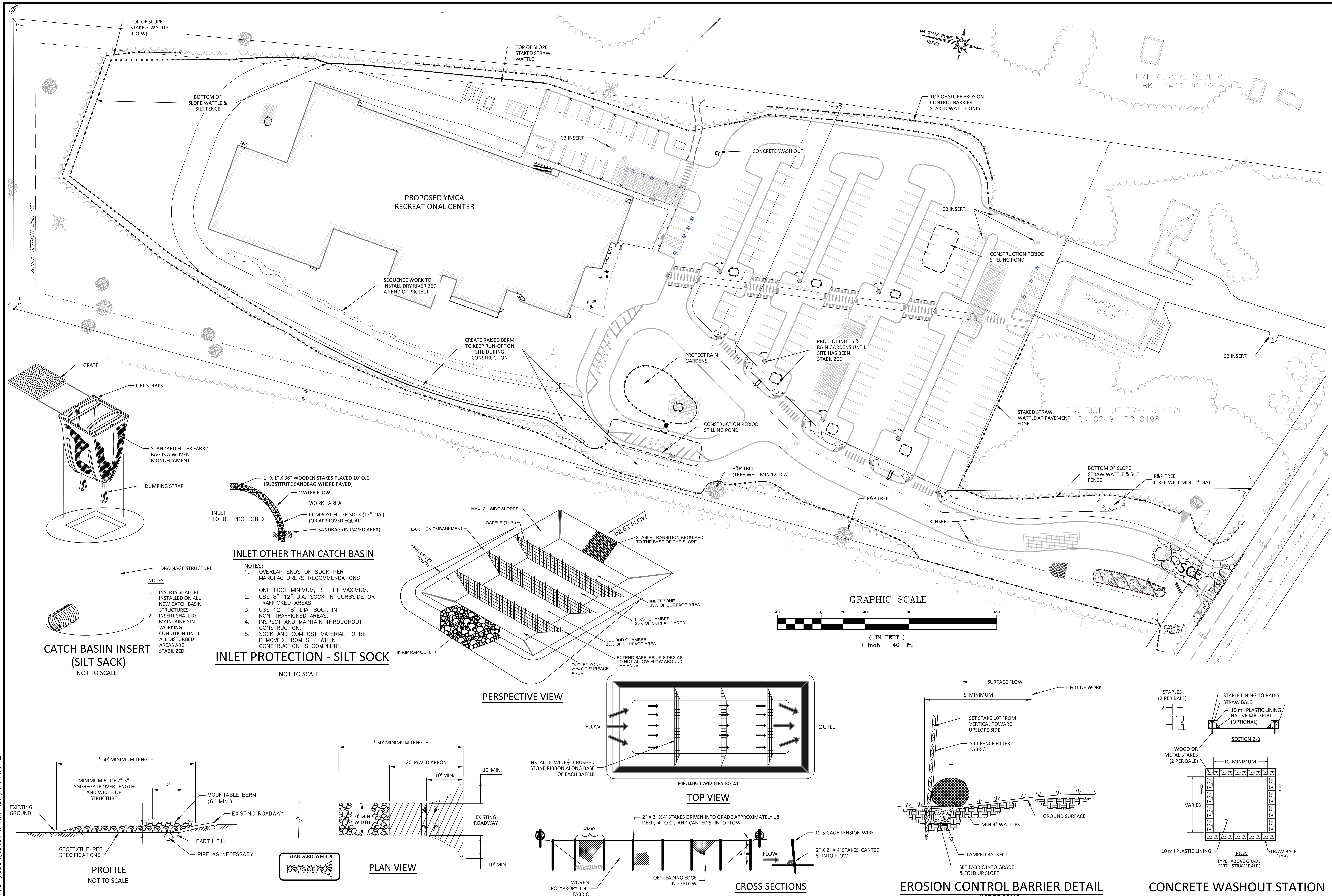
PURPOSE:
SPECIAL PERMIT WITH
SITE PLAN REVIEW

LOCUS:
487 BRICK KILN ROAD
WEST FALMOUTH, MA

PREPARED FOR:
the YMCA
YMCA
CAPE COD

DRAWING TITLE:
STORMWATER DRAINAGE PLAN

CAD TECH:	CHECKED BY:
SDC	JDO
ENGINEER: SDC	DATE: 01/19/24
COMMONWEALTH OF MASSACHUSETTS STUART D. CLARK CIVIL No. 40697 REGISTERED PROFESSIONAL ENGINEER	SCALE: 1"=20'
	SHEET: C-108



CATCH BASIIN INSERT (SILT SACK)

NOT TO SCALE

NOTES:

1. INSERTS SHALL BE INSTALLED ON ALL NEW CATCH BASIN STRUCTURES
2. INSERT SHALL BE MAINTAINED IN WORKING CONDITION UNTIL ALL DISTURBED AREAS ARE STABILIZED.

INLET PROTECTION - SILT SOCK

NOT TO SCALE

NOTES:

1. OVERLAP ENDS OF SOCK PER MANUFACTURERS RECOMMENDATIONS – ONE FOOT MINIMUM, 3 FEET MAXIMUM.
2. USE 8"–12" DIA. SOCK IN CURBSIDE OR TRAFFICKED AREAS.
3. USE 12"–18" DIA. SOCK IN NON–TRAFFICKED AREAS.
4. INSPECT AND MAINTAIN THROUGHOUT CONSTRUCTION.
5. SOCK AND COMPOST MATERIAL TO BE REMOVED FROM SITE WHEN CONSTRUCTION IS COMPLETE.

STABILIZED CONSTRUCTION ENTRANCE (SCE)

NOT TO SCALE

1. LENGTH - MINIMUM OF 50'.
2. WIDTH - 10' MINIMUM, SHOULD BE FLARED AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
3. GEOTEXTILE FABRIC (MIRAFI 180N OR EQUAL) SHALL BE PLACED OVER THE EXISTING GROUND PRIOR TO PLACING STONE.
4. STONE - CRUSHED AGGREGATE (2" TO 3") OR RECLAIMED OR RECYCLED CONCRETE OR EQUIVALENT SHALL BE PLACED AT LEAST 6" DEEP OVER THE LENGTH AND WIDTH OF THE ENTRANCE.
5. SURFACE WATER - ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED THROUGH THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PIPE INSTALLED THROUGH THE STABILIZED CONSTRUCTION ENTRANCE SHALL BE PROTECTED WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 6" OF STONE OVER THE PIPE. WHEN THE SCE IS LOCATED AT A HIGH SPOT ALONG THE ROADWAY, DRAINAGE PIPE WILL NOT BE NECESSARY. PIPE SHOULD BE SIZED ACCORDING TO THE AMOUNT OF RUNOFF TO BE CONVEYED. A 12" MINIMUM WILL BE REQUIRED.
6. LOCATION - A STABILIZED CONSTRUCTION ENTRANCE SHALL BE LOCATED AT EVERY POINT WHERE CONSTRUCTION TRAFFIC ENTERS OR LEAVES A CONSTRUCTION SITE. VEHICLES LEAVING THE SITE MUST TRAVEL OVER THE ENTIRE LENGTH OF THE STABILIZED CONSTRUCTION ENTRANCE.
7. ALL EFFORTS SHALL BE MADE TO REDUCE MATERIAL IN THE ROADWAY.

CONSTRUCTION PERIOD STILLING BASIN DETAIL

NOT TO SCALE

NOTES:
1. 3 BAFFLES (MIN) BETWEEN INLET & OUTLET. 5. TRAPS MUST BE STABILIZED IMMEDIATELY UPON CONSTRUCTION
2. LOCATE SEDIMENT INFLOW TO THE BASIN AWAY FROM THE DAM TO PREVENT SHORT CIRCUITS FROM INLETS TO OUTLETS
3. SEED, STRAW & TACK APPLICATION
4. MAINTENANCE: REPAIR/REPLACE BAFFLES WHEN THEY COLLAPSE, TEAR OR DECOMPOSE. REMOVE SEDIMENT WHEN CELL IS 1/2 FULL

EROSION CONTROL BARRIER DETAIL

NOT TO SCALE

NOTES:

1. SILT FENCE AND POSTS FROM APPROVED MANUFACTURER/SUPPLIER SET TO MANUFACTURERS SPECIFICATION.
2. WATTLE AND SILT FENCE COMBINATION TO BE INSTALLED AS PERIMETER EROSION CONTROL DEVICE IN PROXIMITY TO WETLAND AND RESOURCE AREAS.
3. WATTLES MAY BE SUBSTITUTED WITH STRAW BALES.
4. WATTLE CONTENTS SHALL BE MULCH OR STRAW

CONCRETE WASHOUT STATION

NOT TO SCALE

NOTES:
1. ACTUAL LAYOUT TO BE DETERMINED IN THE FIELD.
2. MATERIALS USED TO CONSTRUCT TEMPORARY CONCRETE WASHOUT FACILITIES SHALL BE REMOVED FROM THE SITE OF THE WORK AND DISPOSED OF OR RECYCLED.
3. HOLES, DEPRESSIONS OR OTHER GROUND DISTURBANCE CAUSED BY THE REMOVAL OF THE TEMPORARY CONCRETE WASHOUT FACILITIES SHALL BE BACKFILLED, REPAIRED, AND STABILIZED TO PREVENT EROSION.
4. MUST BE LOCATED >50 FT AWAY FROM INLETS/WATERWAYS UNLESS THERE IS NO OTHER PRACTICAL ALTERNATIVE.

S:\CLIENTS\YMCA – CAPE COD\YMCA–2020–0004 (FALMOUTH)\CAD\00 SITE PLANS.DWG 1/8/2024 11:21 AM

LOCUS MAP

NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

REVISIONS

NO.	DATE	COMMENT
1	10/23/23	ISSUED FOR INTERNAL REVIEW

NOT FOR CONSTRUCTION
FOR PERMITTING
PURPOSES ONLY

PURPOSE:
SPECIAL PERMIT WITH SITE PLAN REVIEW

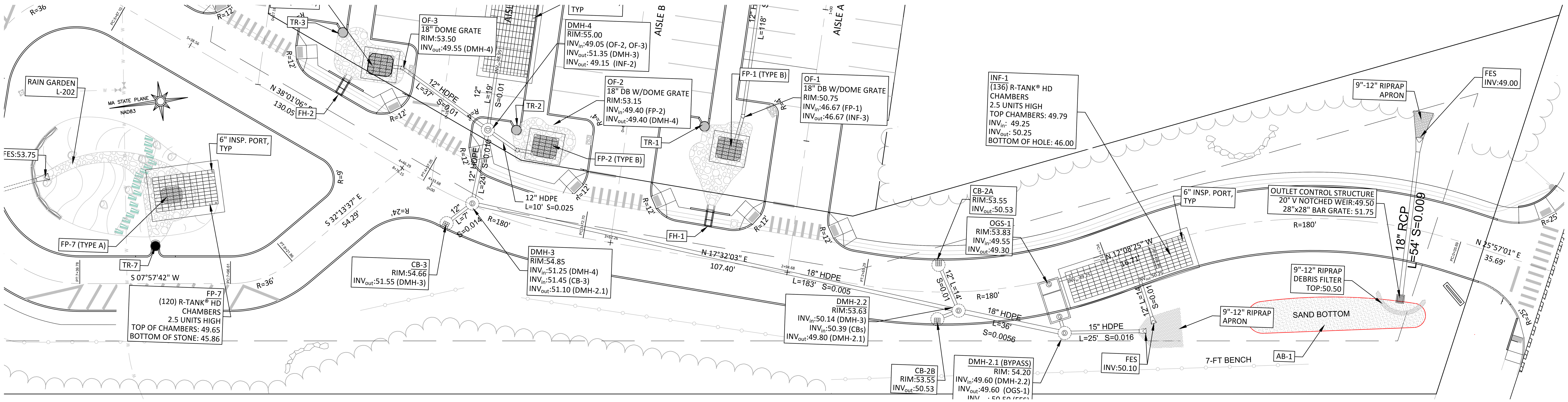
LOCUS:
487 BRICK KILN ROAD
WEST FALMOUTH, MA

PREPARED FOR:
YMCA CAPE COD

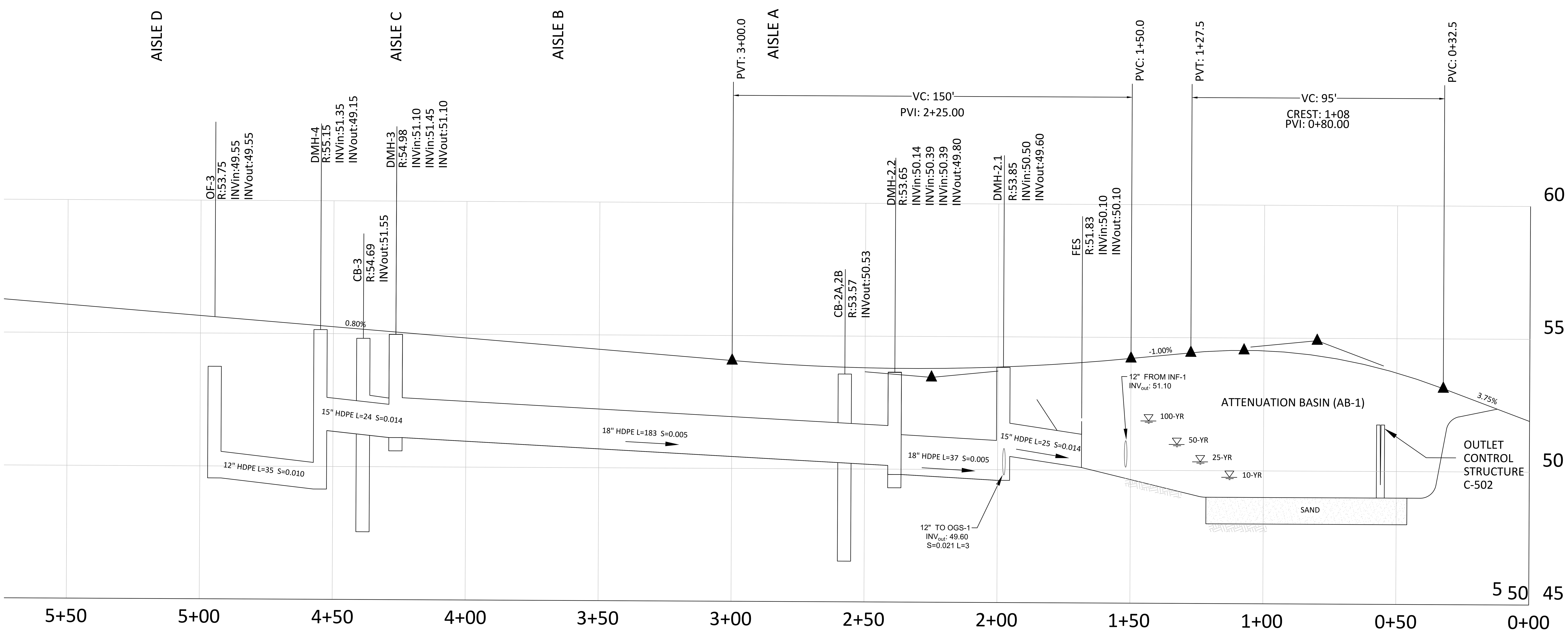
DRAWING TITLE:
SEDIMENT & EROSION CONTROL PLAN

CAD TECH:	CHECKED BY:
SDC	JDO
ENGINEER:	DATE:
SDC	01/19/24
	SCALE: 1"=40'
	SHEET: C-109

COMMONWEALTH OF MASSACHUSETTS
STUART D. CLARK
CIVIL
No. 40697
REGISTERED PROFESSIONAL ENGINEER

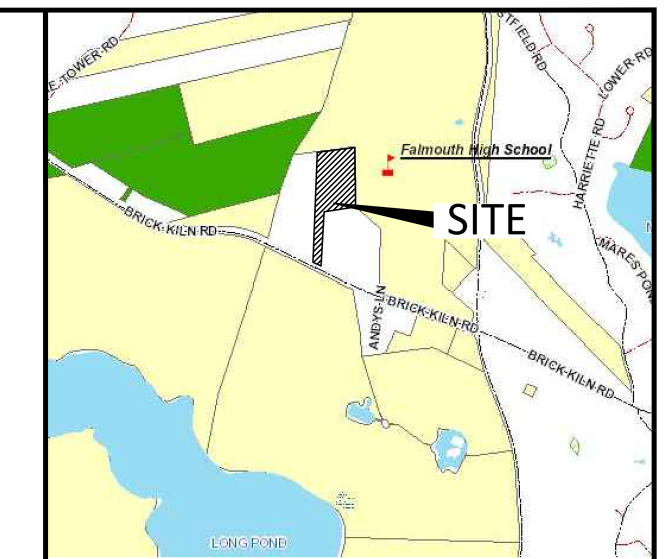


PLAN VIEW
1"=40'



PROFILE
V: 1:5 H: 1:50

GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft.



LOCUS MAP
NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

REVISIONS

NO.	DATE	COMMENT
1	10/23/23	ISSUED FOR INTERNAL REVIEW

NOT FOR CONSTRUCTION FOR PERMITTING PURPOSES ONLY

PURPOSE:
SPECIAL PERMIT WITH SITE PLAN REVIEW

LOCUS:
487 BRICK KILN ROAD
WEST FALMOUTH, MA

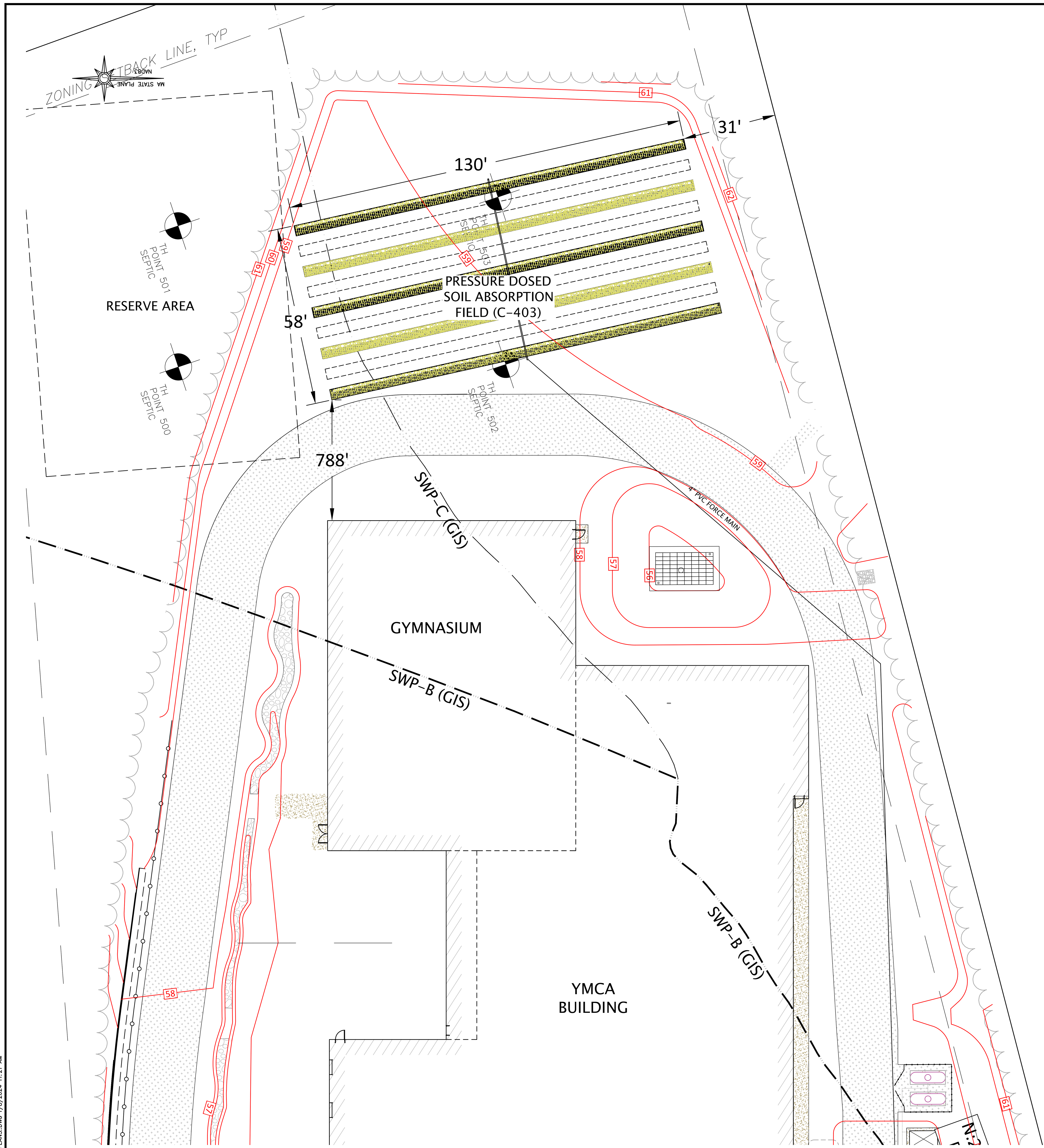
PREPARED FOR:
YMCA CAPE COD

DRAWING TITLE:
PROFILE ENTRANCE DRIVE

CAD TECH:	CHECKED BY:
SDC	JDO
ENGINEER: SDC	DATE: 01/19/24
	SCALE: 1"=20'
	SHEET: C-300

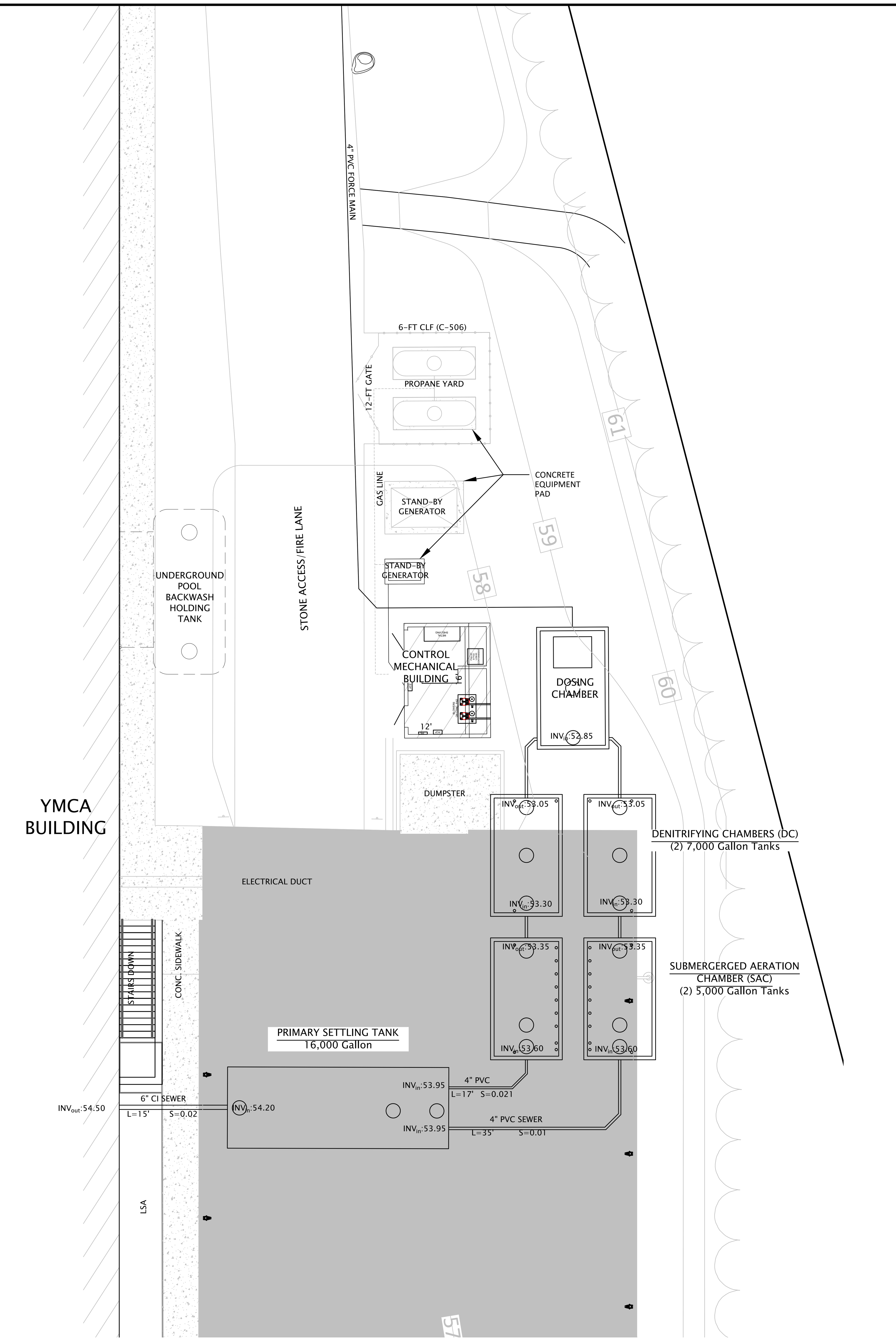
COMMONWEALTH OF MASSACHUSETTS STUART D. CLARK CIVIL No. 40697 REGISTERED PROFESSIONAL ENGINEER

S:\CLIENTS\YMCA – CAPE COD\YMCA–2020–0004 (FALMOUTH)\CAD\00 SITE PLANS.DWG 1/8/2024 11:21 AM



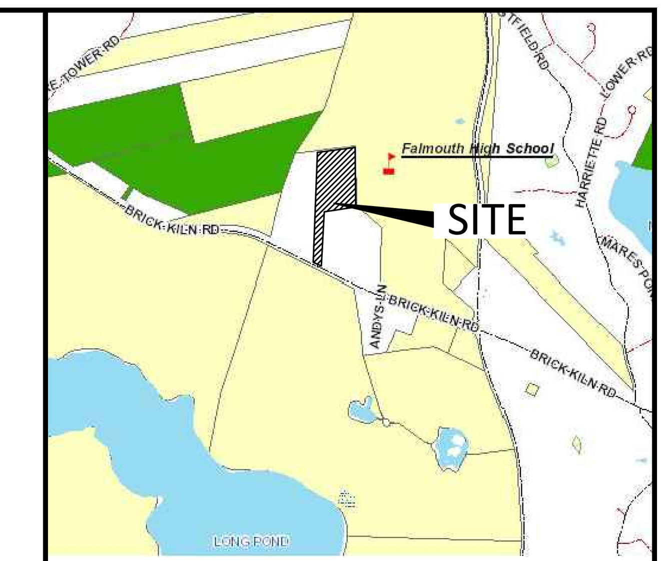
PRESSURE DOSED SOIL ABSORPTION SYSTEM (PLAN VIEW)

1"=20'



WASTEWATER TREAMENT SYSTEM

1"=10'



LOCUS MAP

NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562

TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

DIMENSIONS ARE AS INDICATED.

USE OF THIS PLAN CONSTITUTES ACCEPTANCE OF TERMS AND CONDITIONS SET FORTH IN ACCOMPANYING PROJECT DOCUMENTATION.

IT IS THE RESPONSIBILITY OF THE USER TO CONFIRM DISCREPANCIES WITH THE ENGINEER PRIOR TO USE.

REVISIONS

NO.	DATE	COMMENT
1	10/23/23	ISSUED FOR INTERNAL REVIEW

NOT FOR CONSTRUCTION
FOR PERMITTING
PURPOSES ONLY

PURPOSE:

SPECIAL PERMIT WITH SITE PLAN REVIEW

LOCUS:

487 BRICK KILN ROAD
WEST FALMOUTH, MA

PREPARED FOR:

YMCA
CAPE COD

DRAWING TITLE:

NitROE WASTEWATER TREATMENT PLANT LAYOUT

CAD TECH:	CHECKED BY:
SDC	JDO
ENGINEER: SDC	DATE: 01/19/24
	SCALE: AS NOTED
	SHEET: C-401

COMMONWEALTH OF MASSACHUSETTS
STUART D. CLARK
CIVIL
No. 40697
REGISTERED PROFESSIONAL ENGINEER

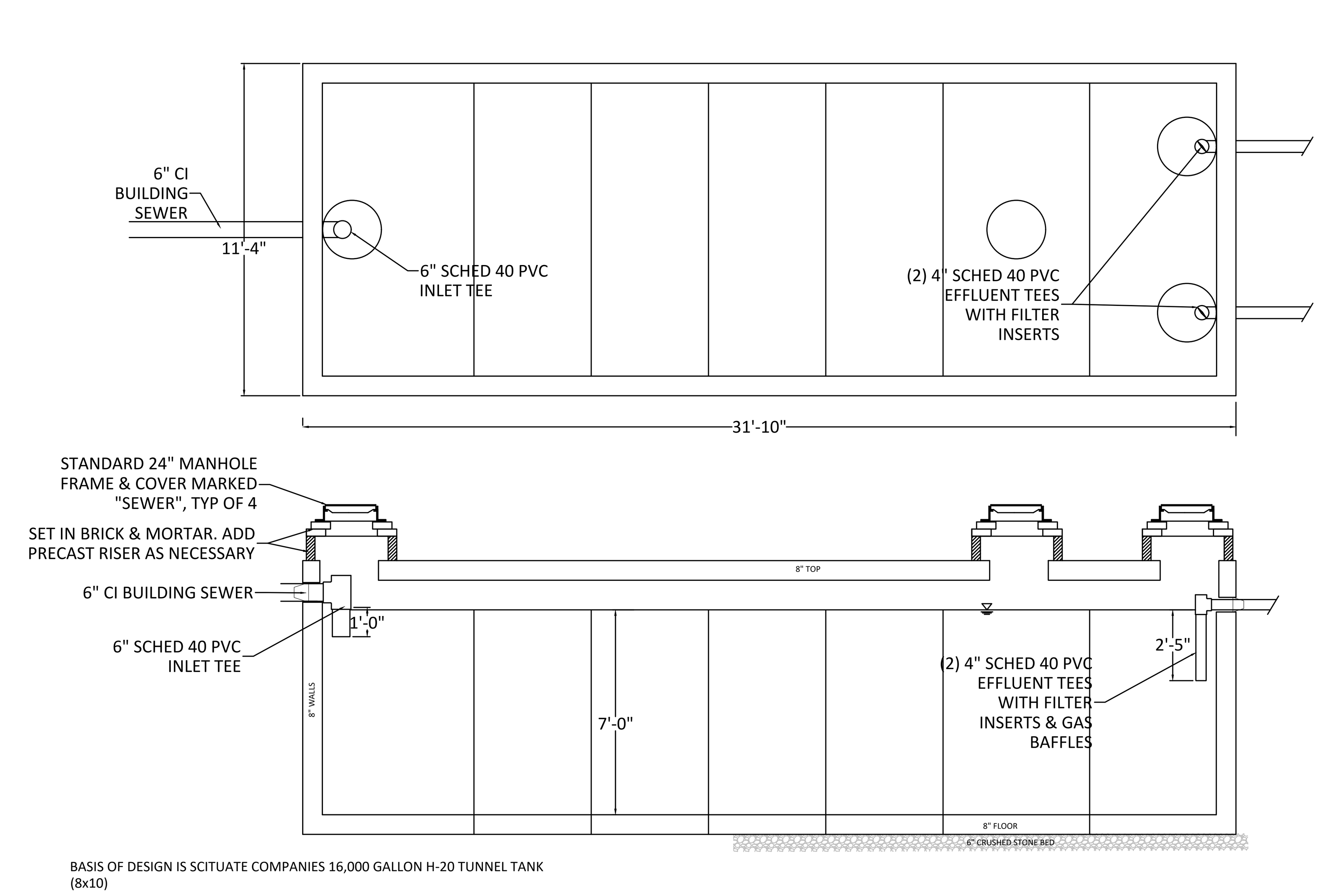
S:\CLIENTS\YMCA - CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAD\3D SITE PLANS.DWG 1/9/2024 11:21 AM

GENERAL SEPTIC NOTES

1. ALL RISERS TO BE WATERTIGHT.
2. ALL JOINTS TO BE WATERTIGHT.
3. ALL PIPES TO BE SCHEDULE 40 PVC OR AS SPECIFIED.
4. THE SYSTEM WILL BE AGGREGATE FREE.
5. ALL COMPONENTS TO HAVE A MINIMUM OF 12" AND A MAXIMUM OF 36" OF COVER.
6. CONTRACTOR TO VERIFY ELEVATIONS AND UTILITY LOCATIONS PRIOR TO CONSTRUCTION. DIFFERENCES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
7. SEPTIC SYSTEM COMPONENTS TO BE MARKED WITH MAGNETIC MARKING TAPE.
8. THERE ARE NO KNOWN CONFLICTS WITH TITLE V, SECTION 15.220(4)(K) (LOCATION OF PUBLIC AND PRIVATE WATER SUPPLIES).
9. AN EFFLUENT TEE FILTER IS TO BE INSTALLED AT THE OUTLET OF THE PRIMARY SETTLING TANK(S).
10. THE FILTER IS TO BE CLEANED ON AN ANNUAL BASIS.
11. USE (140) ARC 36-HC (H-20) ON AN AGGREGATE FREE BED. (SEE DEP APPROVAL LETTER X264258) DATED JUNE 12, 2015.
12. COMPONENTS NOT TO BE BACKFILLED OR CONCEALED WITHOUT INSPECTION BY BOH AND PERMISSION OBTAINED FROM BOH.
13. THE UTILITY INFORMATION SHOWN ON THIS PLAN HAS BEEN COMPILED FROM SURFACE EVIDENCE AND RECORD PLANS. BEFORE CONSTRUCTION, THE APPROPRIATE UTILITY COMPANY AND DIG-SAFE 888-DIG-SAFE SHOULD BE CONTACTED.
14. SYSTEM AREA TO BE STAKE AND FLAGGED UNTIL A CERTIFICATE OF COMPLIANCE IS ISSUED.
15. BASIS OF DESIGN:
    PRIMARY SETTING- SCITUATE PRECAST SRP 9'X16' - 8000 GALLON SEPTIC TANK
    SAC CHAMBER - SCITUATE PRECAST SRP 9'X16' -5000 GALLON SEPTIC TANK
    DENITRIFYING CHAMBER -SCITUATE PRECAST SRP 9'X16' - 7000 GALLON SEPTIC TANK
    DOSING CHAMBER- SCITUATE PRECAST SRP 9'X16' - 8000 GALLON SEPTIC TANK.

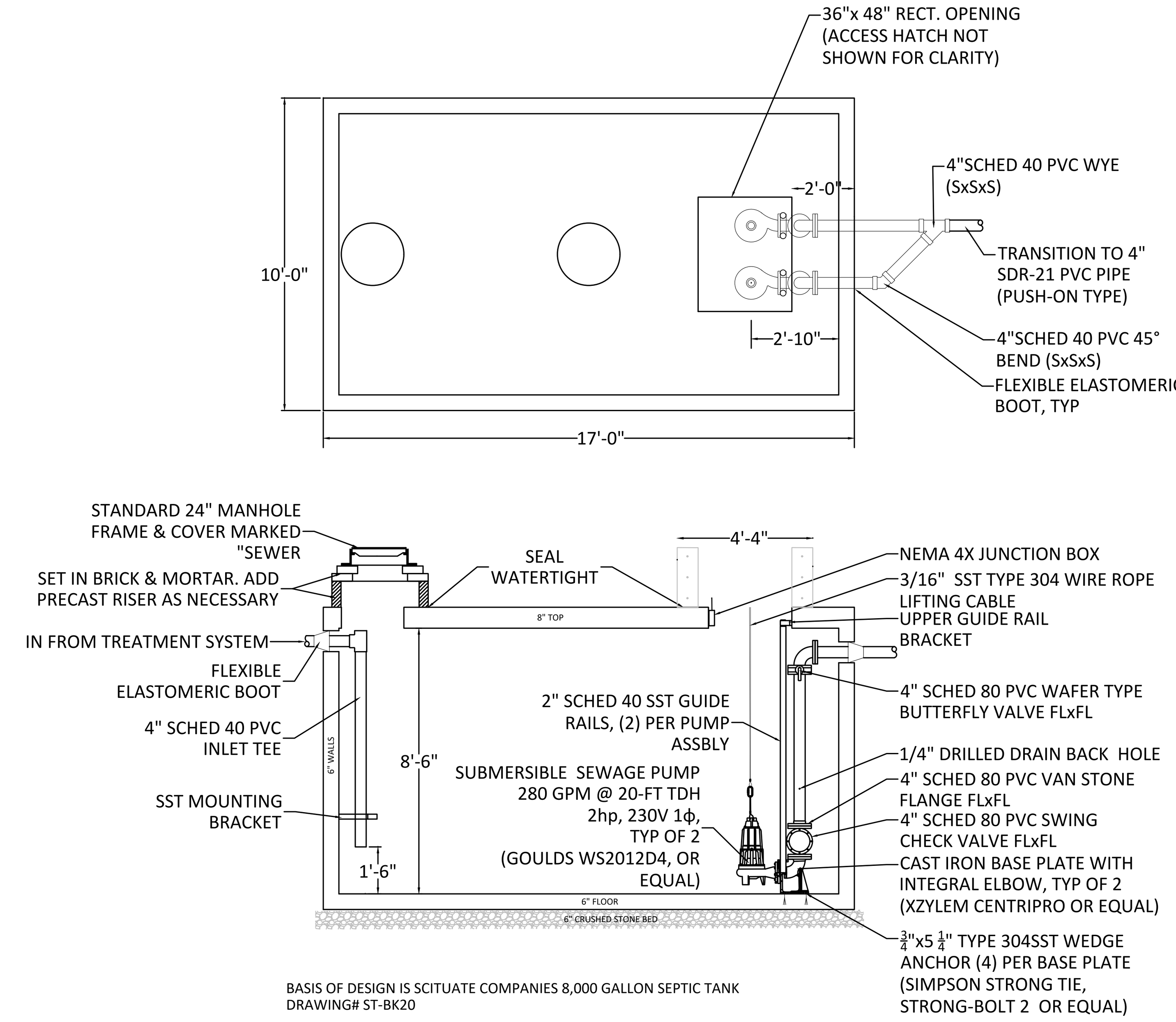
PRECAST CONCRETE NOTES:

1. STRUCTURES SHALL BE SET LEVEL ON A COMPACT CRUSHED STONE BED
2. CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS.
3. DESIGN CONFORMS WITH 310 CMR 15.00 DEP TITLE 5 REGS FOR SEPTIC TANKS.
4. ALL REINFORCEMENT PER ASTM C1227
5. DESIGNED FOR AASHTO HS-20 LOADING, COVER 1-5 FT.
6. TONGUE AND GROOVE JOINT SEALED WITH BUTYL RESIN, INLET HEIGHT MAY INCREASE SLIGHTLY DUE TO THE BUTYL RESIN USED.



PRIMARY SETTLING TANK DETAIL

1"=4'



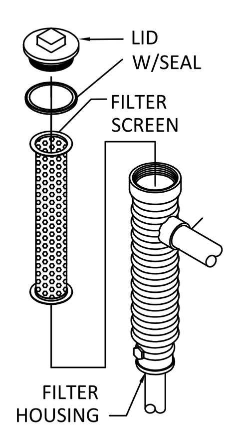
DOSING CHAMBER DETAIL

1"=4'

DUPLEX PUMPS SHALL ALTERNATE OPERATION. SUBMERSIBLE SEWAGE PUMP(S) SHALL BE CAPABLE OF PUMPING 168 GPM AGAINST THE TOTAL DYNAMIC HEAD (TDH) AND SHALL BE CAPABLE OF PASSING A 3" SOLID.

PUMP ELEVATION SCHEDULE

	ELEV.
CHAMBER FLOOR	47.50
LEAD/LAG PUMP OFF	49.00
LEAD PUMP ON	50.30
LAG PUMP ON	51.30
HIGH-WATER ALARM	51.80
EMERGENCY STORAGE (PUMP ON TO INV$_{IN}$)	3770 GAL
DOSE VOLUME	1342 GAL
DOSES PER DAY	5.7
APPROXIMATE PUMP RUN TIME	8 MIN
TDH	16'



EFFLUENT TEE FILTER

NOT TO SCALE

DESIGN CALCULATIONS

DESIGN FLOW ;ESTIMATED FROM WATER USE RECORDS AT TWO SIMILAR YMCA FACILITIES

63 N. MAIN, ATTLEBORO

BUILDING SIZE:	59,118 SF
WATER USE (2017-2021):	5189 GPD
WATER USE RATE	0.088 GPD/SF

537 PLEASANT ST, ATTLEBORO

BUILDING SIZE:	27,553 SF
WATER USE (2017-2021):	2444 GPD
WATER USE RATE	0.088 GPD/SF

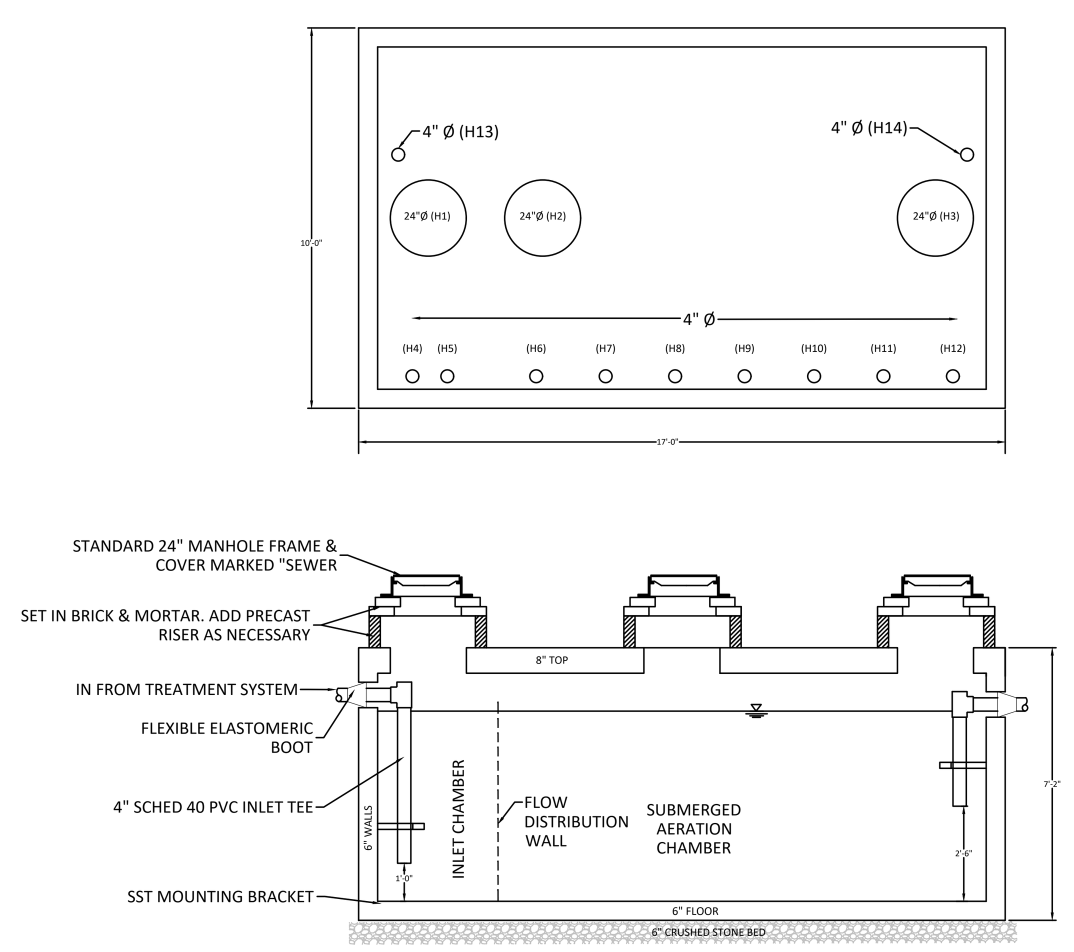
SEWAGE FLOW DESIGN:
WATER USE x200% = (0.088 GPD/SF)x43,212 SFx200% = 7612 GPD

SOIL ABSORPTION SYSTEM:

DESIGN PERCOLATION RATE:	4 MPI
SOIL TEXTURAL CLASS :	SANDY LOAM CLASS I
LONG TERM ACCEPTANCE RATE (LTAR):	0.74 GPD/SF
AREA REQUIRED: 7612 GPD/0.74 GPD/SF=	10,286 SF

GST 3724 TRENCH (11.69 SF/LF)
10,286 SF/11.69=651 LF OF TRENCH

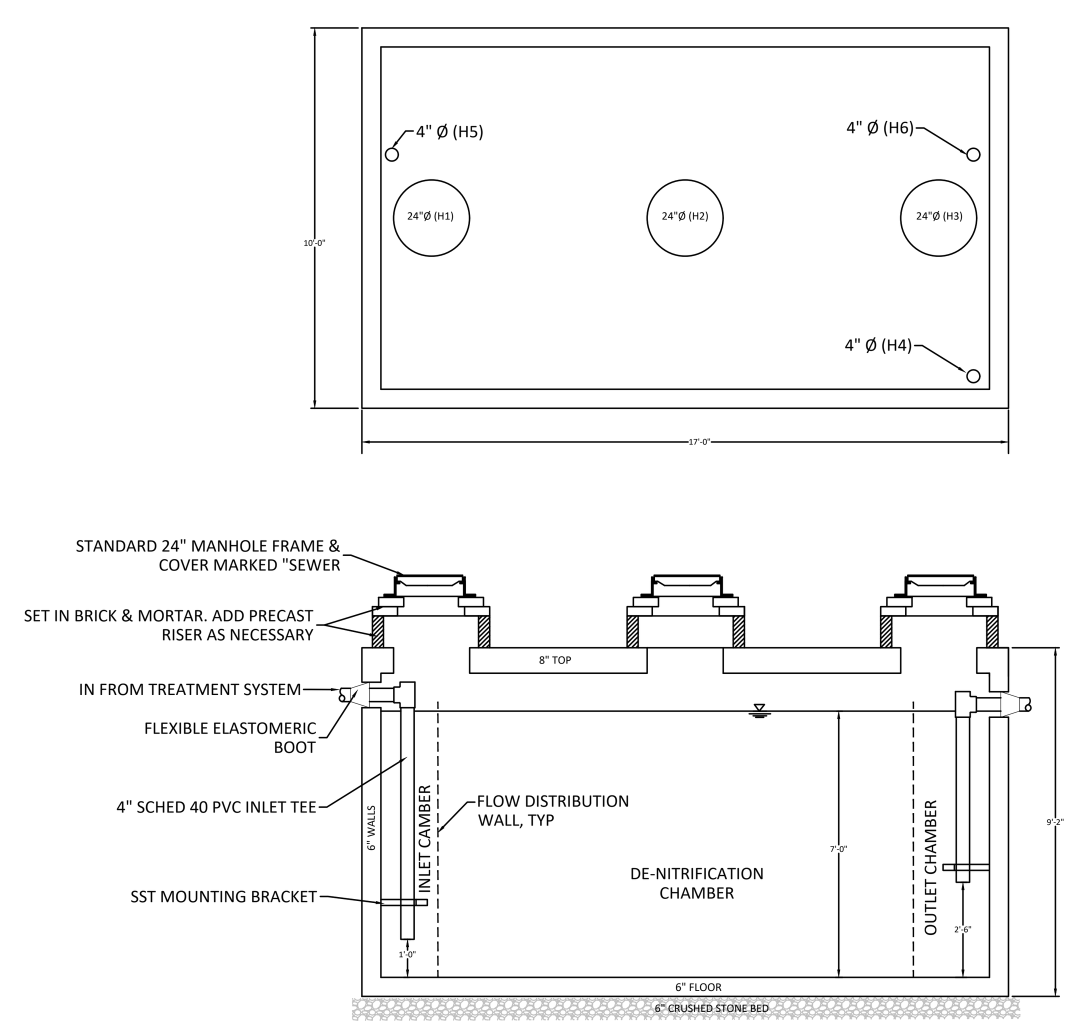
USE (10) 65-FT x 2' TRENCHES, 2' DEEP



5000 GALLON

SUBMERGED AERATION TANK

1"=4'



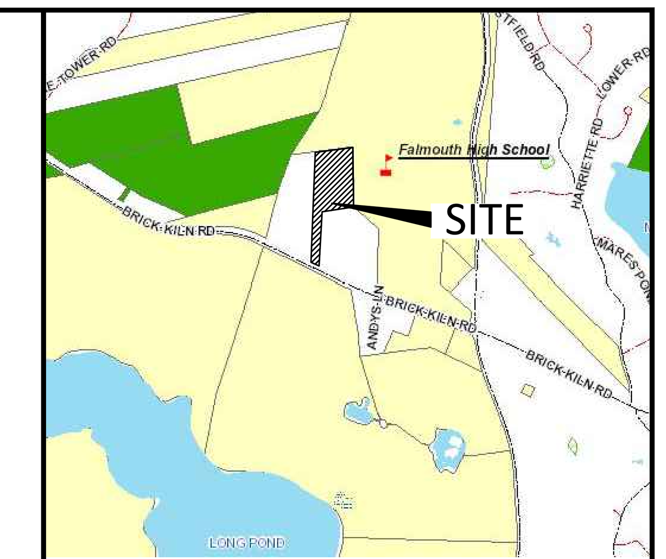
7000 GALLON

DE-NITRIFICATION TANK

1"=4'

GENERAL NOTES:
1. ALL MEASUREMENTS FROM OUTSIDE EDGE OF TANK TOP.
2. CONFIRM ALL HOLE LOCATIONS PRIOR TO INSTALLATION.
3. HS-20 LOADING
4. NitTOE SAC TANK TOP TO HAVE THREE-24" AND MULTIPLE 4" DIAMETER ACCESS HOLES WITH RISERS AND COVERS FOR MAINTENANCE AND SAMPLING.
5. FOR THE 24" HOLES; PROVIDE 24" DIA. ADS PIPE (CORRUGATED) WITH POLYLOK (OR EQUIVALENT 24" CONCRETE RISER) COVER TO 6" BELOW GROUND SURFACE. SECURED TO TANK TOP.
6. INSTALL 4" DIA. PIPE (3" BELOW GROUND SURFACE) WITH FERNCO RUBBER CAP. INSTALL WITH A 6" ROUND VALVE BOX AND COVER TO BE FLUSH WITH THE GROUND SURFACE.
7. HOLES H4 THROUGH H12 ARE 4" DIAMETER HOLES FOR AERATION TUBING AND PULL CORDS. INSTALL 4" DIA. PIPE (6" BELOW GROUND SURFACE) WITH PVC CAP.
8. HOLE H11 IS A 4" DIAMETER ACCESS HOLE FOR SAMPLING. HOLE TO BE EXTENDED TO GROUND SURFACE.
9. FOR EXISTING SEPTIC TANK; PROVIDE 2" DIA. SAMPLING PIPE THAT IS CEMENTED OR ANCHORED TO THE TANK TOP AND EXTEND 2" BELOW THE TANK TOP AND BE POSITIONED 6-12" FROM THE EDGE OF THE OUTLET END OF THE SEPTIC TANK OR IN THE SEPTIC TANK CONCRETE OUTLET COVER. ON THE TOP SIDE OF THE SEPTIC TANK, THE 2" DIA. SAMPLING PIPE SHOULD EXTEND TO 2" BELOW THE GROUND SURFACE AND HAVE A 6" DIA. PLASTIC ROUND BOX AND COVER AT GROUND SURFACE.
10. HOLES H1, H2 AND H4 ARE 24" DIAMETER ACCESS HOLES WITH NO TAPER.
11. HOLES H4 THROUGH H12 ARE 4" DIAMETER COUPLINGS FOR 4" RISERS AND COVERS.
12. PROVIDE RUBBER GASKETS ON ALL INFLUENT AND EFFLUENT HOLES; SIDES AND ENDS OF TANK.

GENERAL NOTES:
1. ALL MEASUREMENTS FROM OUTSIDE EDGE OF TANK TOP.
2. CONFIRM ALL HOLE LOCATIONS PRIOR TO INSTALLATION.
3. HS-20 LOADING
4. NITROE DC TANK TOP TO HAVE THREE-24" AND MULTIPLE 4" DIAMETER ACCESS HOLES WITH RISERS AND COVERS FOR MAINTENANCE AND SAMPLING.
5. FOR THE 24" HOLES; PROVIDE 24" DIA. ADS PIPE (CORRUGATED) WITH POLYLOK (OR EQUIVALENT) COVER (OR EQUIVALENT CONCRETE RISER TO GRADE AND SECURED TO TANK TOP.
6. INSTALL 4" DIA. PIPE (3" BELOW GROUND
7. SURFACE) WITH FERNCO RUBBER CAP. INSTALL
8. WITH A 6" ROUND VALVE BOX AND COVER TO BE
9. FLUSH WITH THE GROUND SURFACE.
10. HOLE H4 IS A 4" DIAMETER HOLE FOR AERATION
11. TUBING AND PULL CORDS. INSTALL 4" DIA. PIPE
12. (6" BELOW GROUND SURFACE) WITH PVC CAP.
13. HOLES H5 AND H6 ARE 4" DIAMETER ACCESS
14. HOLES FOR SAMPLING. HOLES TO BE EXTENDED TO GROUND SURFACE.
15. HOLES H1, H2 AND H3 ARE 24" DIAMETER ACCESS HOLES WITH NO TAPER.
16. HOLES H4, H5 AND H6 ARE 4" DIAMETER COUPLINGS FOR 4" RISERS AND COVERS.
17. PROVIDE RUBBER GASKETS ON ALL INFLUENT AND EFFLUENT HOLES; SIDES AND ENDS OF TANK.



LOCUS MAP

NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

REVISIONS

NO.	DATE	COMMENT
1	10/23/23	ISSUED FOR INTERNAL REVIEW

NOT FOR CONSTRUCTION FOR PERMITTING PURPOSES ONLY

PURPOSE:
SPECIAL PERMIT WITH SITE PLAN REVIEW

LOCUS:
487 BRICK KILN ROAD
WEST FALMOUTH, MA

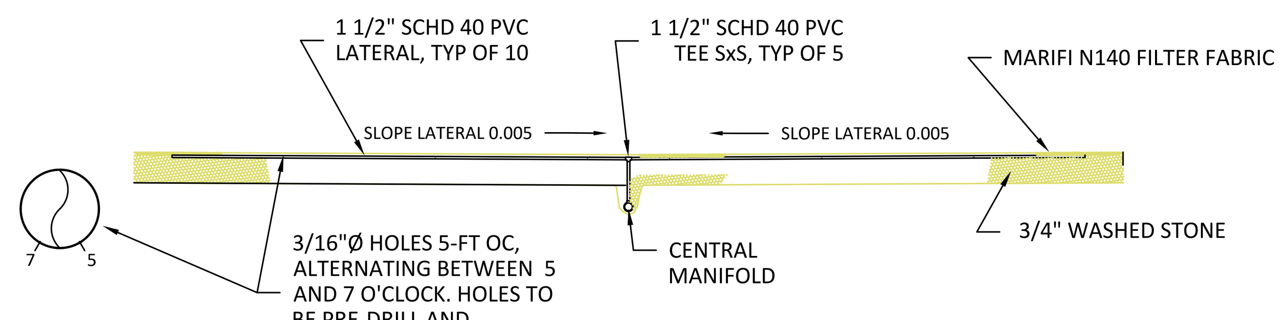
PREPARED FOR:
YMCA CAPE COD

DRAWING TITLE:
NitROE TREATMENT AND DOSING DETAILS

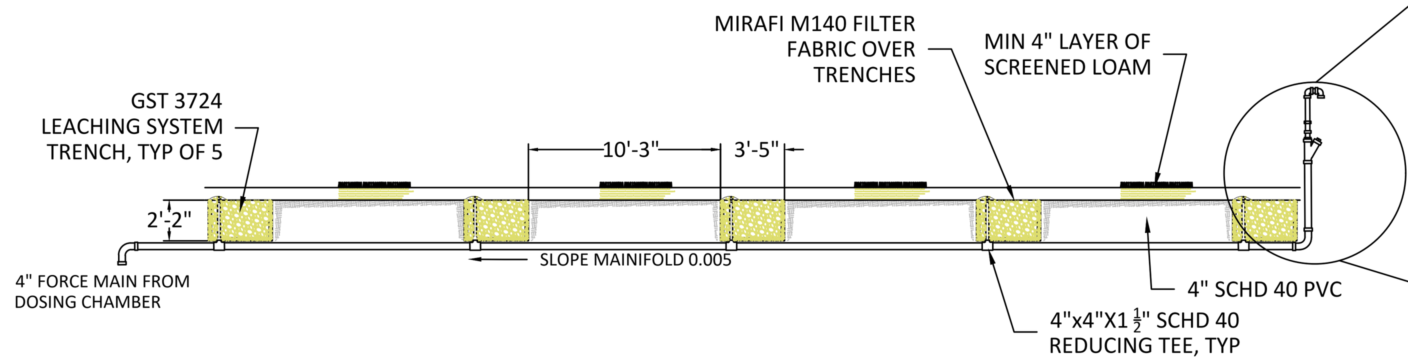
CAD TECH:	CHECKED BY:
SDC	JDO
ENGINEER: SDC	DATE: 01/19/24
	SCALE: AS NOTED
	SHEET: C-402

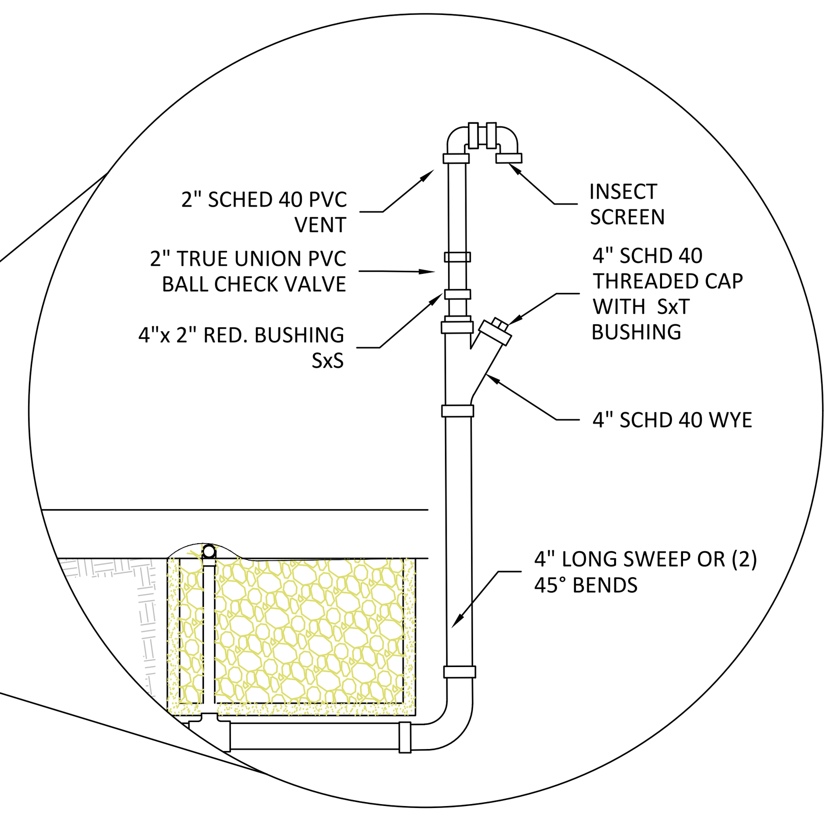
COMMONWEALTH OF MASSACHUSETTS
STUART D. CLARK
CIVIL
No. 40697
REGISTERED PROFESSIONAL ENGINEER

S:\CLIENTS\YMCA - CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAD\00 SITE PLANS.DWG 1/8/2024 11:21 AM



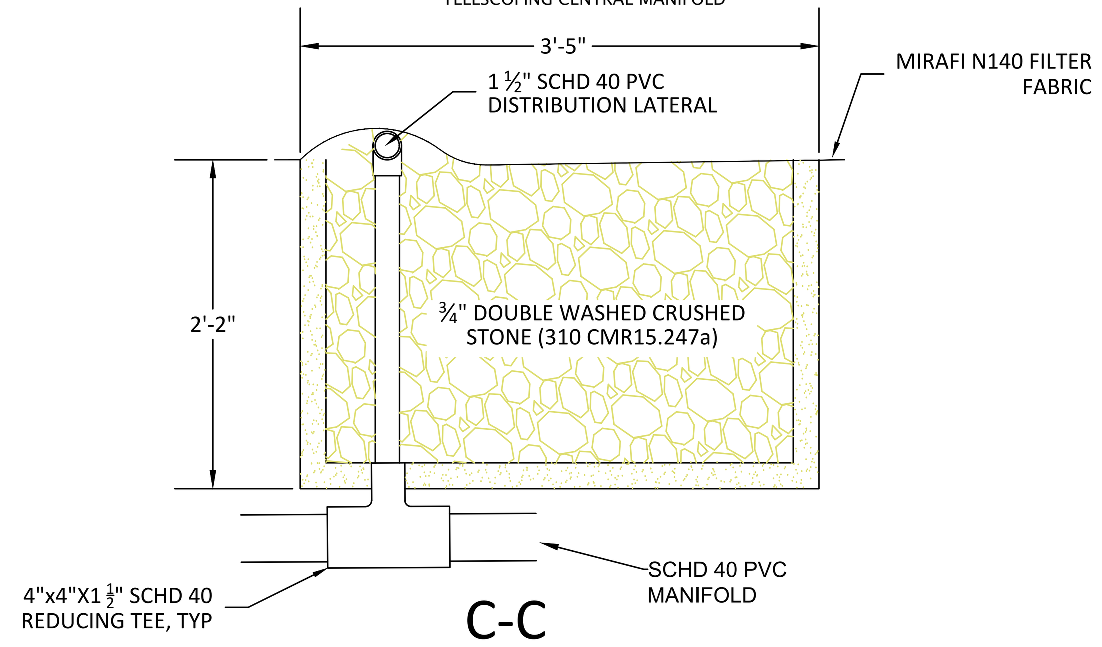
A-A





B-B

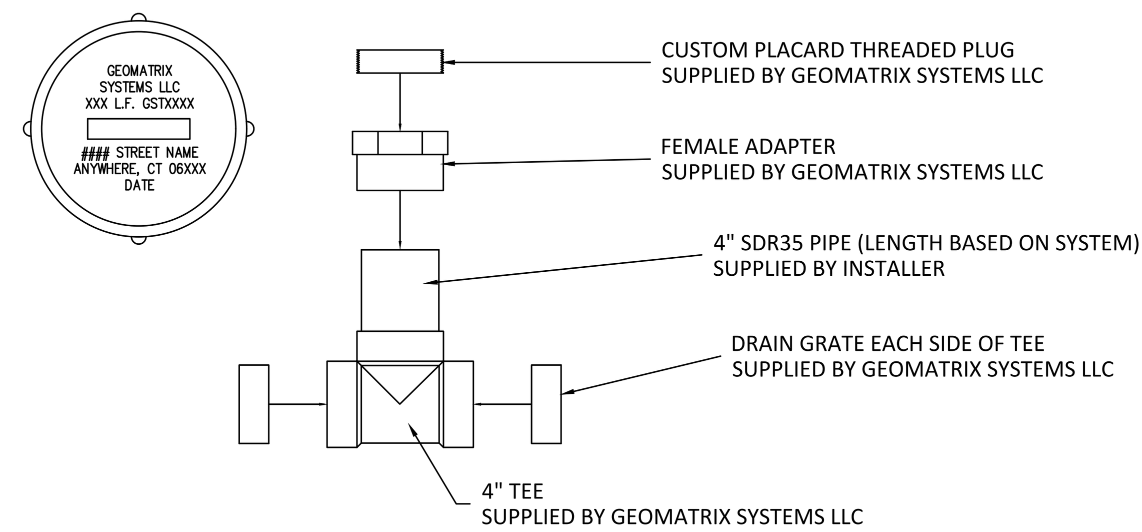
TELESCOPING CENTRAL MANIFOLD



C-C

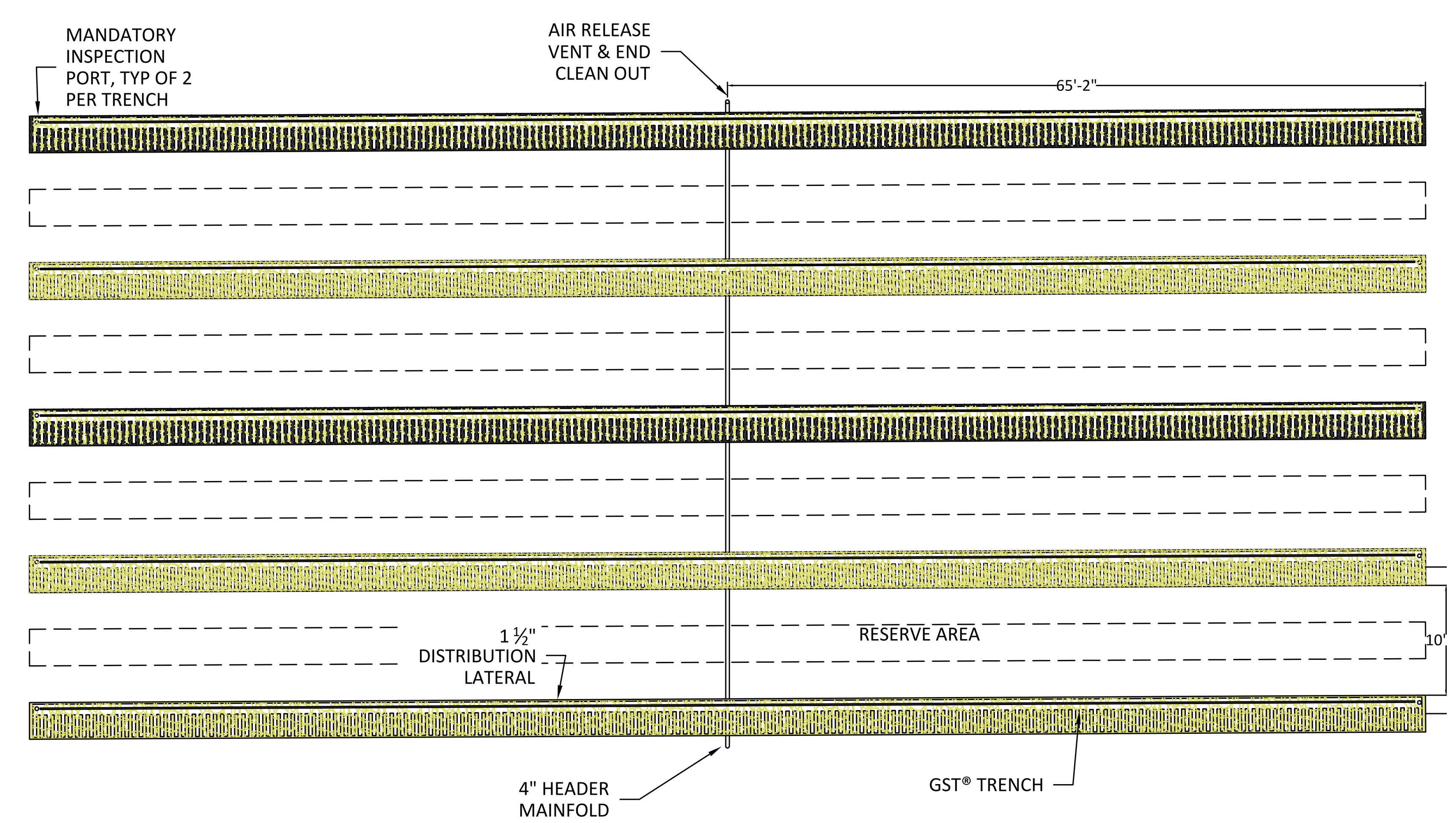
GEOMATRIX® GST-3724 SOIL ABSORPTION SYSTEM (SECTION)

1"=10'



GEOMATRIX® INSPECTION PORT DETAIL

1"=10'



GEOMATRIX® GST MODEL 3724 SOIL ABSORPTION SYSTEM (LAYOUT)

1"=12'

1. GST® 3724 SYSTEM SHALL BE INSTALLED IN STRICT CONFORMANCE WITH MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTIONS GENERAL USE CERTIFICATION DATED DECEMBER 4, 2018, UNDER TRANSMITTAL #x280163.
2. GST® 3724 SYSTEM SHALL BE INSTALLED BY COMPANY TRAINED AND CERTIFIED INSTALLER.

LOCUS MAP

NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

DIMENSIONS ARE AS INDICATED.

USE OF THIS PLAN CONSTITUTES ACCEPTANCE OF TERMS AND CONDITIONS SET FORTH IN ACCOMPANYING PROJECT DOCUMENTATION.

IT IS THE RESPONSIBILITY OF THE USER TO CONFIRM DISCREPANCIES WITH THE ENGINEER PRIOR TO USE.

REVISIONS

NO.	DATE	COMMENT
1	10/23/23	ISSUED FOR INTERNAL REVIEW

NOT FOR CONSTRUCTION
FOR PERMITTING
PURPOSES ONLY

PURPOSE:

SPECIAL PERMIT WITH
SITE PLAN REVIEW

LOCUS:

487 BRICK KILN ROAD
WEST FALMOUTH, MA

PREPARED FOR:

YMCA
CAPE COD

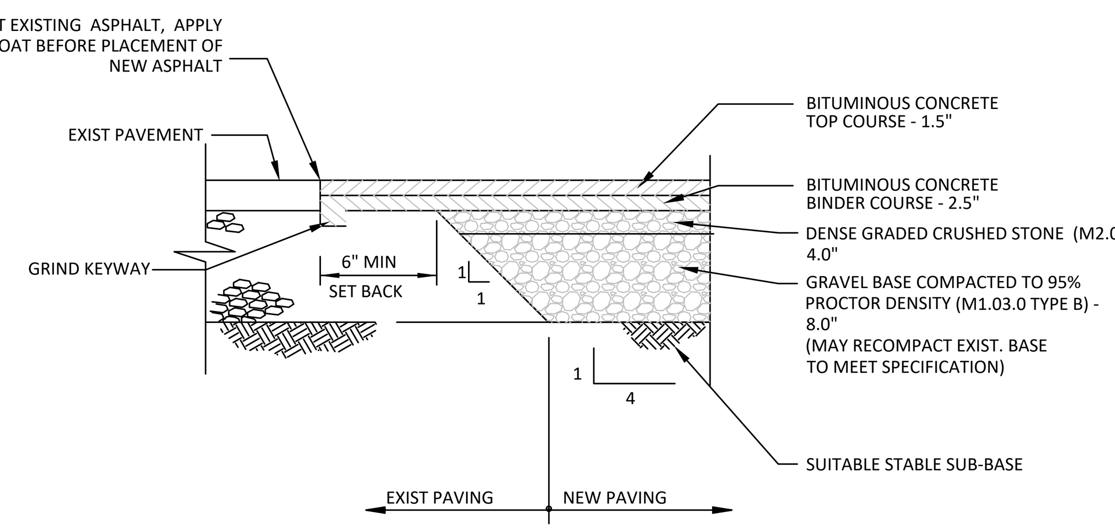
DRAWING TITLE:

GEOMATRIX SOIL
ABSORPTION SYSTEM
DETAILS & LAYOUT

CAD TECH:	CHECKED BY:
SDC	JDO
ENGINEER: SDC	DATE: 01/19/24
	SCALE: AS NOTED
	SHEET: C-403

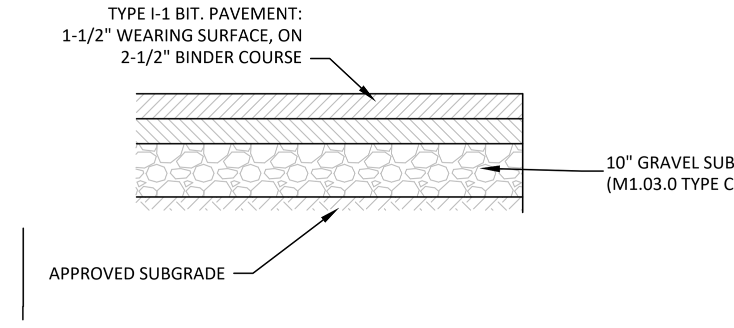
COMMONWEALTH OF MASSACHUSETTS
STUART D. CLARK
CIVIL
No. 40697
REGISTERED PROFESSIONAL ENGINEER

S:\CLIENTS\YMCA - CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAD\DD SITE PLANS..DWG 1/8/2024 11:21 AM



PAVEMENT TRANSITION BETWEEN NEW AND EXISTING ASPHALT PAVEMENTS

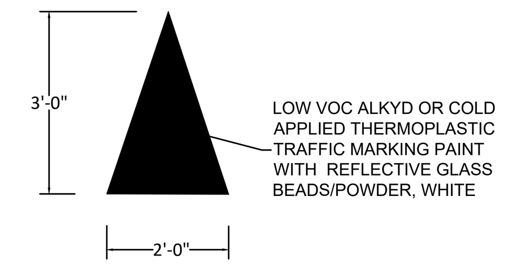
NOT TO SCALE



NOTES:
1. SANDY-LOAM AND/OR LOAMY-SAND TOPSOIL MATERIAL SHALL BE EXCAVATED FROM ALL PAVED AREAS PRIOR TO SUB-BASE INSTALLATION.
2. SUBGRADE (EXISTING MATERIAL) SHALL CONSIST OF INERT MATERIAL THAT IS HARD, DURABLE STONE AND/OR COARSE SAND, FREE FROM LOAM AND CLAY TO A DEPTH NOT LESS THAN 4-FT BELOW THE FINISH PAVEMENT SURFACE.
3. SUBGRADE FILL SHALL BE COMPACTED TO 95% COMPACTION.

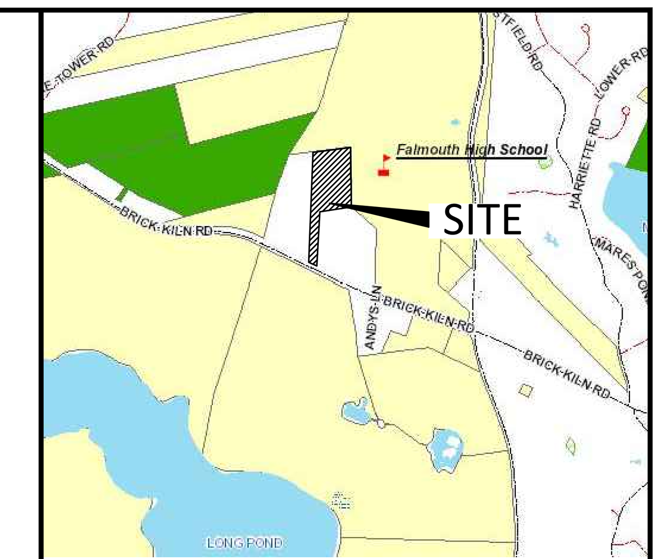
TYPICAL ROAD/PARKING AREA PAVEMENT DETAIL

NOT TO SCALE



YIELD ARROW

NOT TO SCALE



LOCUS MAP

NOT TO SCALE

GREEN SEAL ENVIRONMENTAL, LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

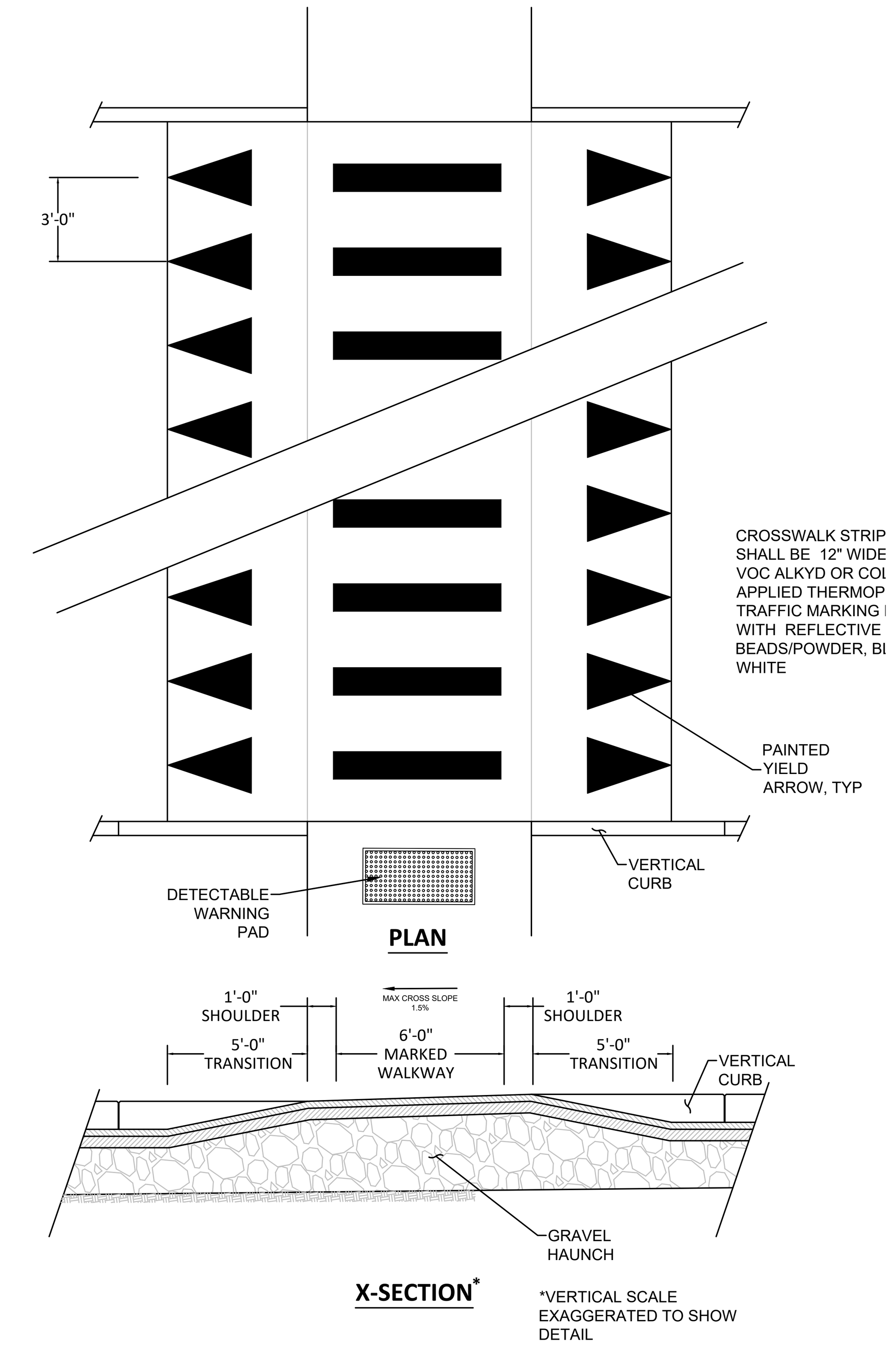
DIMENSIONS ARE AS INDICATED.

USE OF THIS PLAN CONSTITUTES ACCEPTANCE OF TERMS AND CONDITIONS SET FORTH IN ACCOMPANYING PROJECT DOCUMENTATION.

IT IS THE RESPONSIBILITY OF THE USER TO CONFIRM DISCREPANCIES WITH THE ENGINEER PRIOR TO USE.

REVISIONS

NO.	DATE	COMMENT
1	10/23/23	ISSUED FOR INTERNAL REVIEW



RAISED SPEED TABLE DETAIL

NOT TO SCALE

NOT FOR CONSTRUCTION FOR PERMITTING PURPOSES ONLY

PURPOSE:

SPECIAL PERMIT WITH SITE PLAN REVIEW

LOCUS:

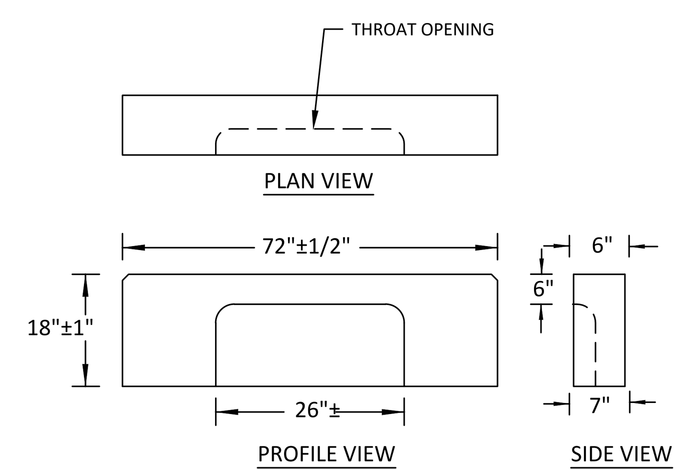
487 BRICK KILN ROAD WEST FALMOUTH, MA

PREPARED FOR:

YMCA CAPE COD

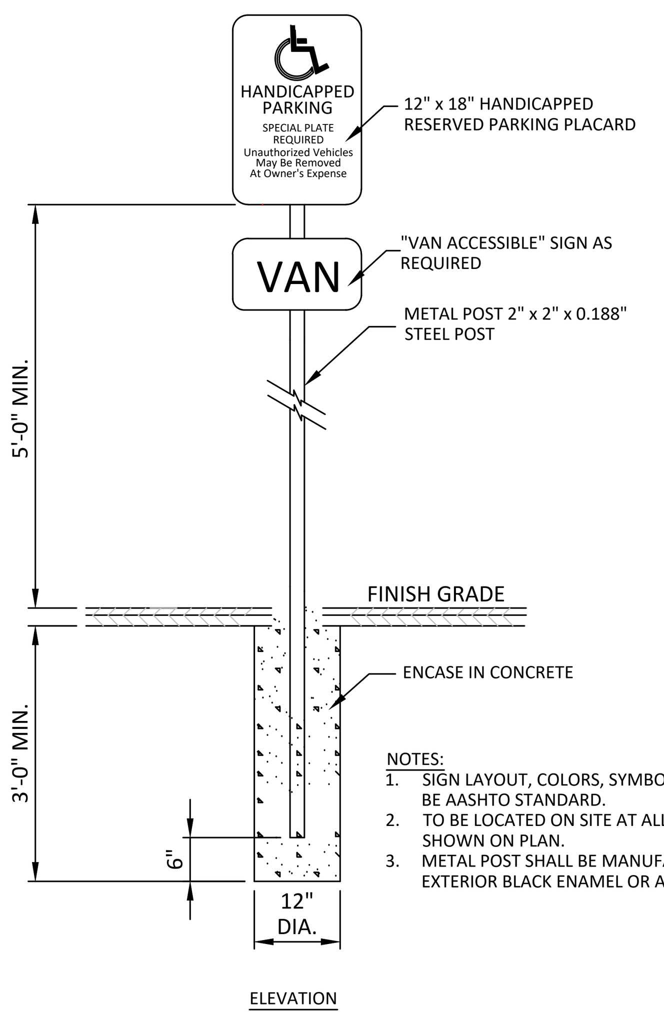
DRAWING TITLE:

DETAILS



CURB INLET DETAIL

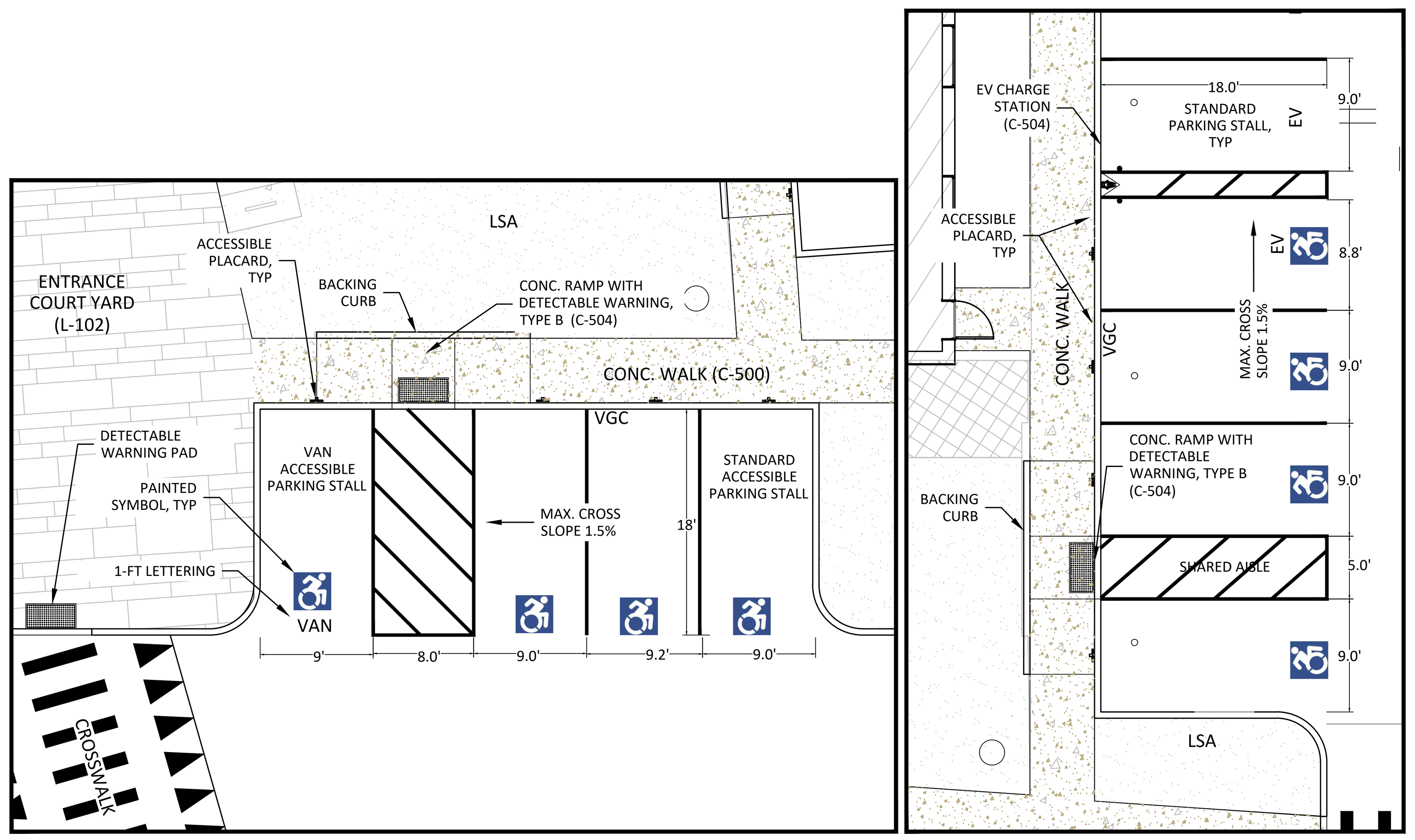
NOT TO SCALE



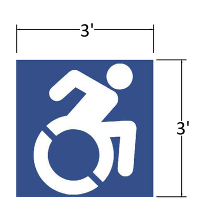
NOTES:
1. SIGN LAYOUT, COLORS, SYMBOL AND LETTERING SHALL BE AASHTO STANDARD.
2. TO BE LOCATED ON SITE AT ALL HANDICAP SPACES AS SHOWN ON PLAN.
3. METAL POST SHALL BE MANUFACTURER PAINTED WITH EXTERIOR BLACK ENAMEL OR APPROVED EQUAL.

ACCESSIBLE PLACARD DETAIL

NOT TO SCALE



ACCESSIBLE & STANDARD PARKING STALL GEOMETRY

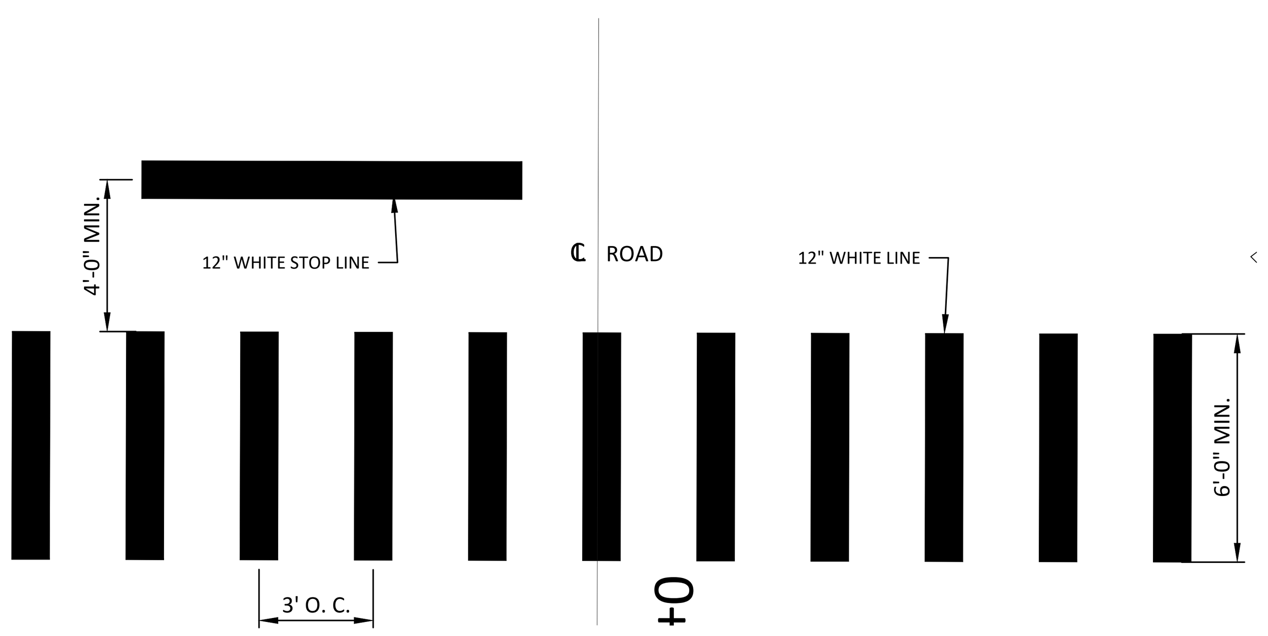


INTERNATIONAL SYMBOL OF ACCESSIBILITY WHITE ON BLUE BACKGROUND

NOTES:
1. ACCESSIBLE PARKING STALLS SHALL BE STRIPED WHITE (OR BLUE) WITH A 4" WIDTH AND SHALL MEET MASSACHUSETTS ARCHITECTURAL ACCESS BOARD ACCESSIBILITY STANDARDS.
2. STANDARD PARKING STALLS SHALL BE 4" WIDE WHITE
3. STANDARD PARKING STALL SHALL BE 9-FT WIDE x 18-FT LONG.

ACCESSIBLE & STANDARD PARKING STALL LAYOUT

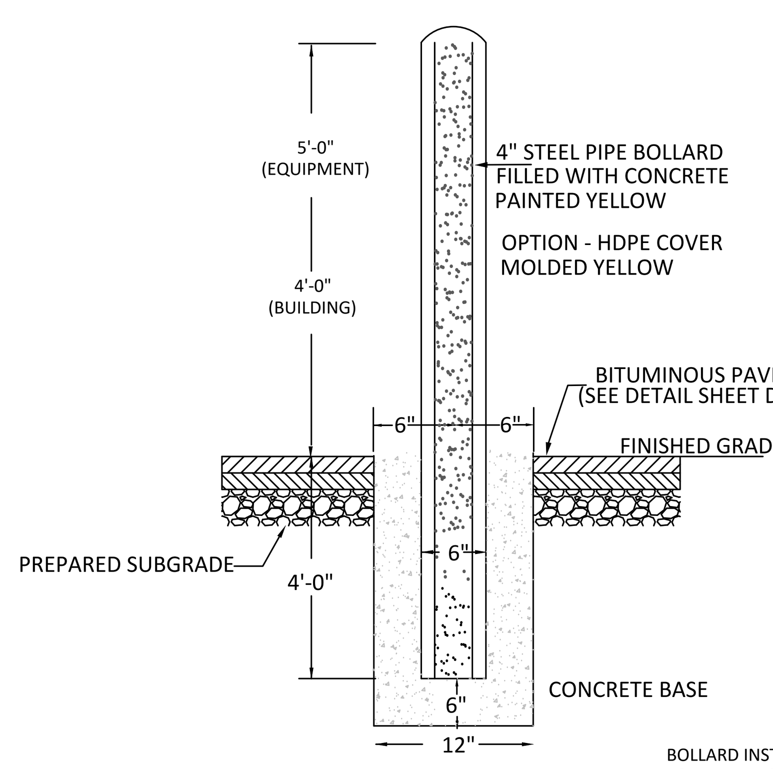
SCALE: 1"=10'



CROSSWALK STRIPING DETAIL

NOT TO SCALE

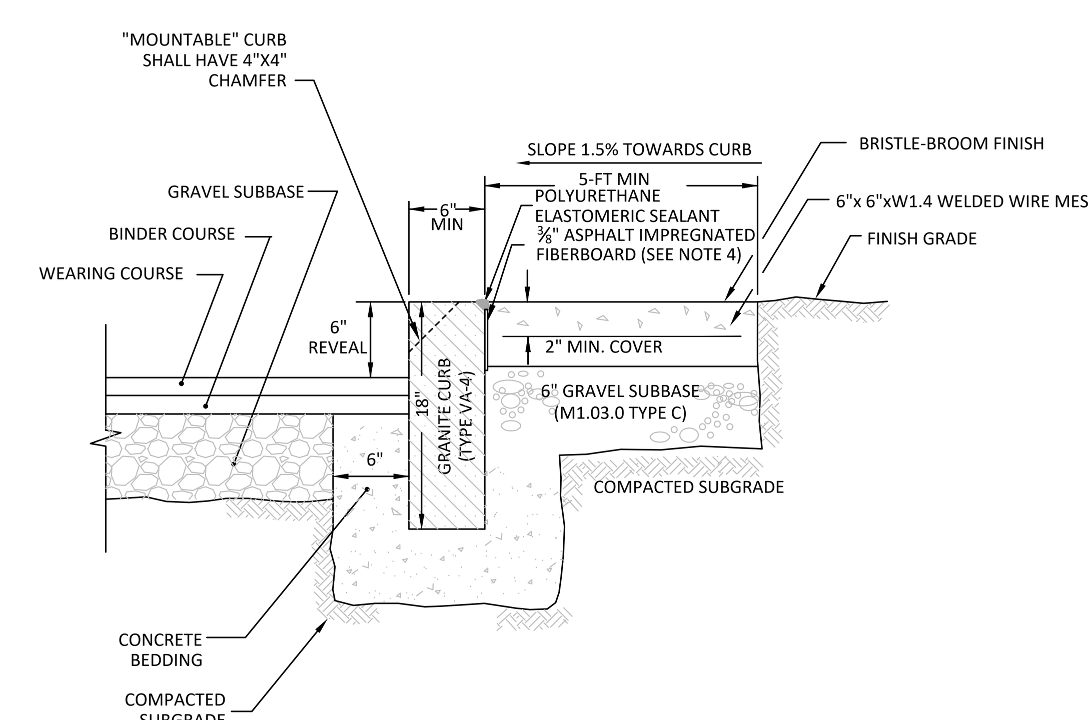
NOTES:
1. STRIPING SHALL BE 12" WIDE LOW VOC ALKYD OR COLD APPLIED THERMOPLASTIC TRAFFIC MARKING PAINT WITH REFLECTIVE GLASS BEADS/POWDER, BLUE OR WHITE.
2. STRIPING SHALL CONFORM WITH MUTCD 7C.03



BOLLARD INSTALLATION AT ELECTRICAL EQUIPMENT SHALL MEET UTILITY SPECIFICATIONS

BOLLARD DETAIL

NOT TO SCALE



VERTICAL GRANITE CURB (VGC) & CONCRETE SIDEWALK DETAIL

NOT TO SCALE

NOTES:
1. CONCRETE SHALL HAVE MIN 5-7% AIR ENTRAINMENT AND SHALL REACH 4000 PSI @28 DAYS. (MADOT 4.02.00)
2. MAXIMUM SLUMP SHALL BE 4"
3. 1-½" DEEP CONTRACTION CONTROL JOINTS SHALL BE INSTALLED MAXIMUM 6-FT O.C. BY TROWEL OR SAW CUT.
4. ⅜" ASPHALT-IMPREGNATED FIBERBOARD ISOLATION JOINTS SHALL BE PLACED AT ALL SIDEWALK-SIDEWALK, BUILDING-SIDEWALK, CURB-SIDEWALK INTERSECTIONS AND AROUND ANY SIDEWALK PENETRATION.
5. SURFACE SHALL NOT BE FINISHED OR WORKED WHILE BLEED WATER IS VISIBLE. ALL SURFACE SHALL HAVE A BROOM FINISH.
6. A ⅜" TRANSVERSE ASPHALT-IMPREGNATED FIBERBOARD ISOLATION JOINT SHALL BE PROVIDED EVERY 50-FT OF CONTINUOUS SIDEWALK.
7. POLYURETHANE ELASTOMERIC SEALANT SHALL BE APPLIED ON ALL ISOLATION JOINTS (SIKAFLEX 2C NS EZ MIX OR EQUAL)

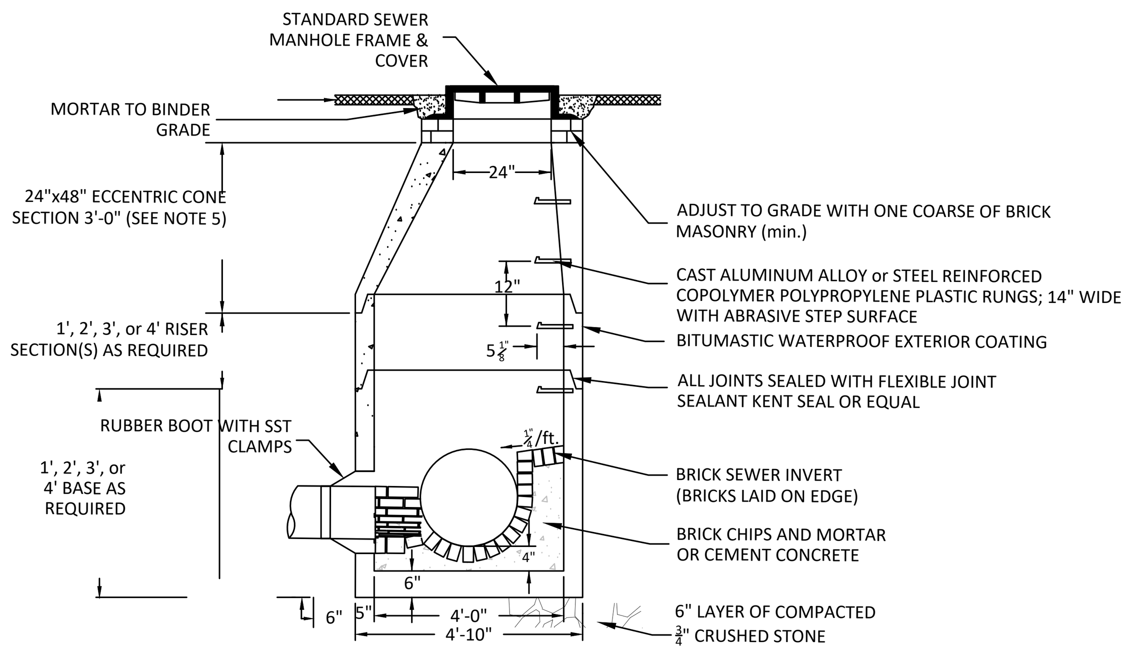
CAD TECH:	CHECKED BY:
SDC	JDO
ENGINEER:	DATE:
SDC	01/19/24

COMMONWEALTH OF MASSACHUSETTS STUART D. CLARK CIVIL No. 40697 REGISTERED PROFESSIONAL ENGINEER

SCALE: AS NOTED

SHEET: C-500

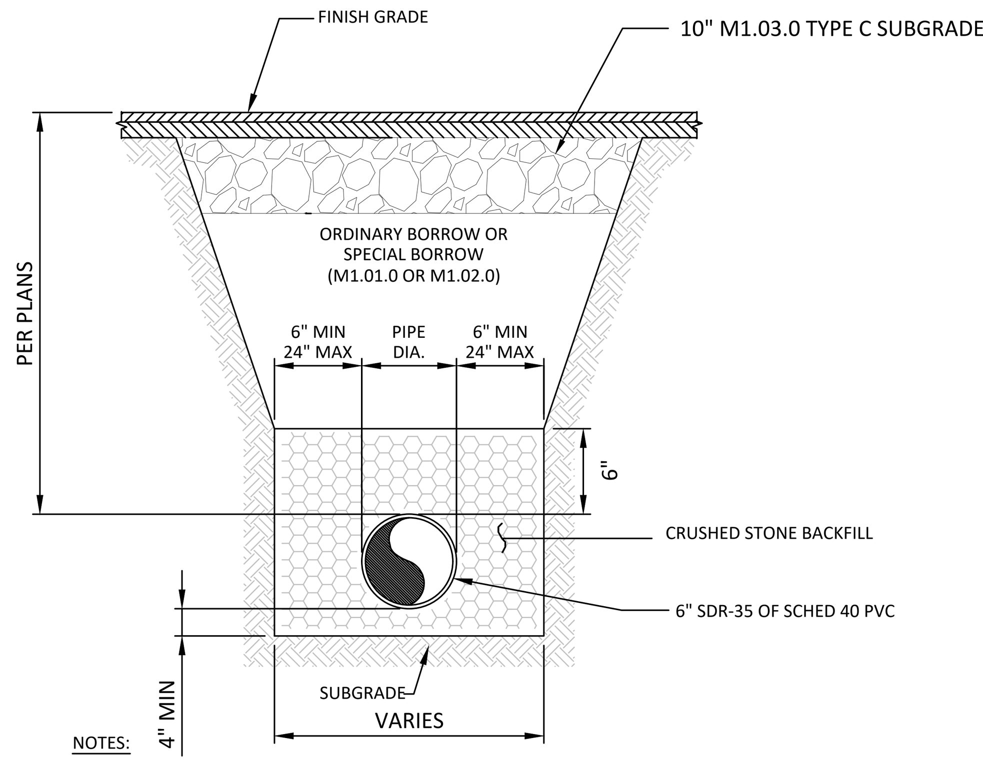
S:\CLIENTS\YMCA – CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAD\00 SITE PLANS.DWG 1/8/2024 11:21 AM



SEWER MANHOLE DETAIL

NOT TO SCALE

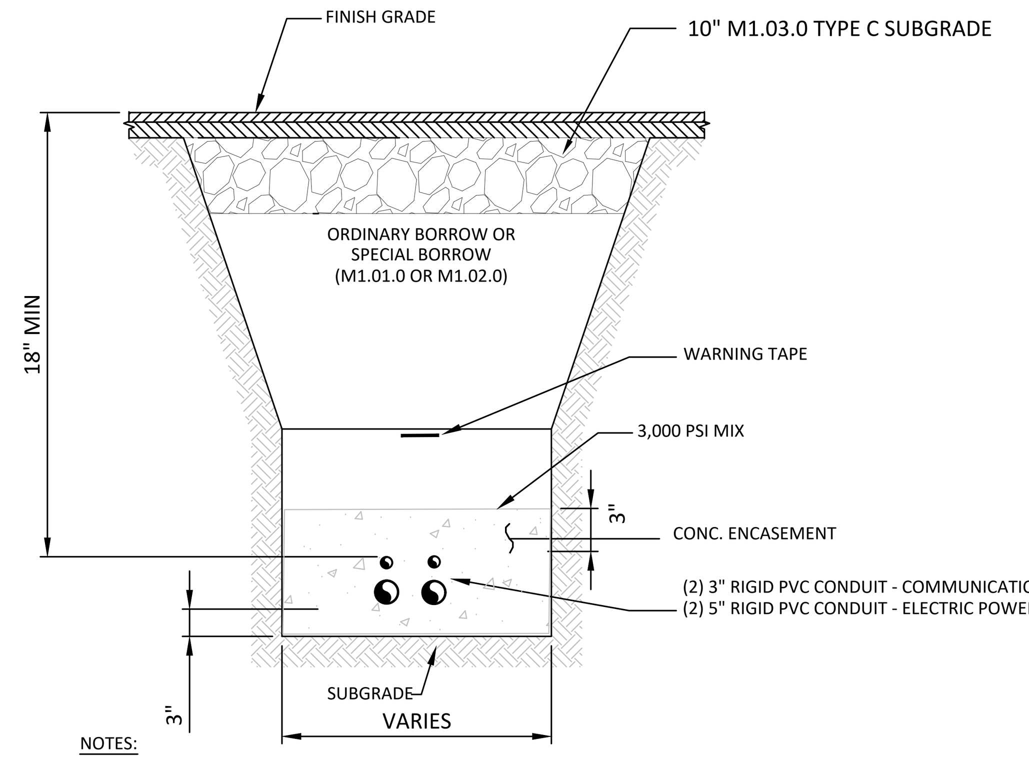
NOTE:
1) CONCRETE STRENGTH 4,000 PSI @ 28 DAYS.
2) CEMENT: PORTLAND TYPE II PER ASTM C150.
3) STEEL REINFORCING: ASTM A-615, Grade 60.
4) DESIGN LOAD: AASHTO HS-20.
5) USE ECCENTRIC FLAT TOP WITH 24" OPENING WHERE DEPTH TO INVERT IS LESS THAN 5-FT
6) MORTAR PARGE ALL LIFTING HOLES & SECTION JOINTS



NOTES:
1. SAFETY STANDARDS MAY DICTATE A MODIFICATION IN TRENCH SIDE SLOPES. CONTRACTOR IS RESPONSIBLE FOR MEETING ALL APPLICABLE SAFETY STANDARDS.

SEWER LINE TRENCH DETAIL

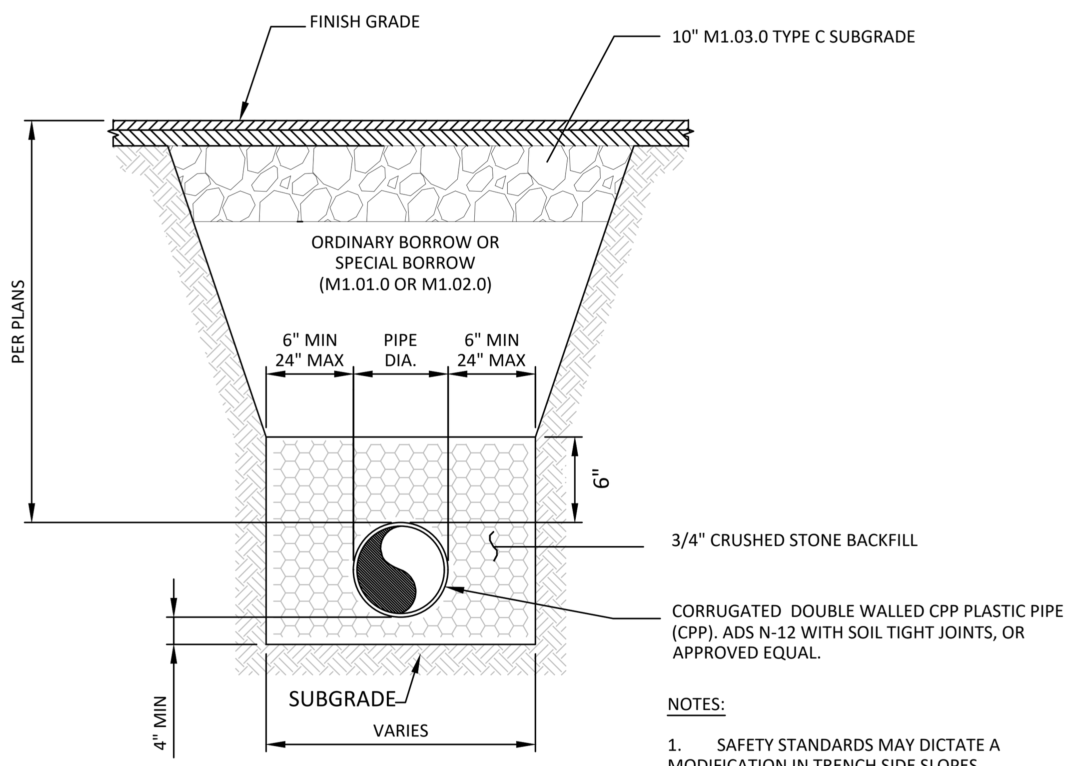
NOT TO SCALE



NOTES:
1. SAFETY STANDARDS MAY DICTATE A MODIFICATION IN TRENCH SIDE SLOPES. CONTRACTOR IS RESPONSIBLE FOR MEETING ALL APPLICABLE SAFETY STANDARDS.

ELECTRICAL DUCT TRENCH DETAIL

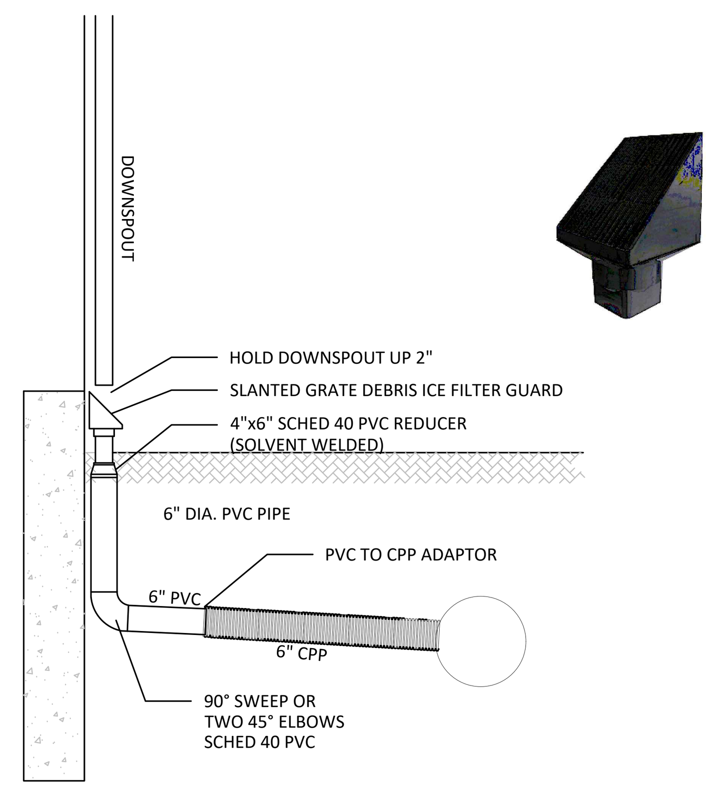
NOT TO SCALE



NOTES:
1. SAFETY STANDARDS MAY DICTATE A MODIFICATION IN TRENCH SIDE SLOPES. CONTRACTOR IS RESPONSIBLE FOR MEETING ALL APPLICABLE SAFETY STANDARDS.

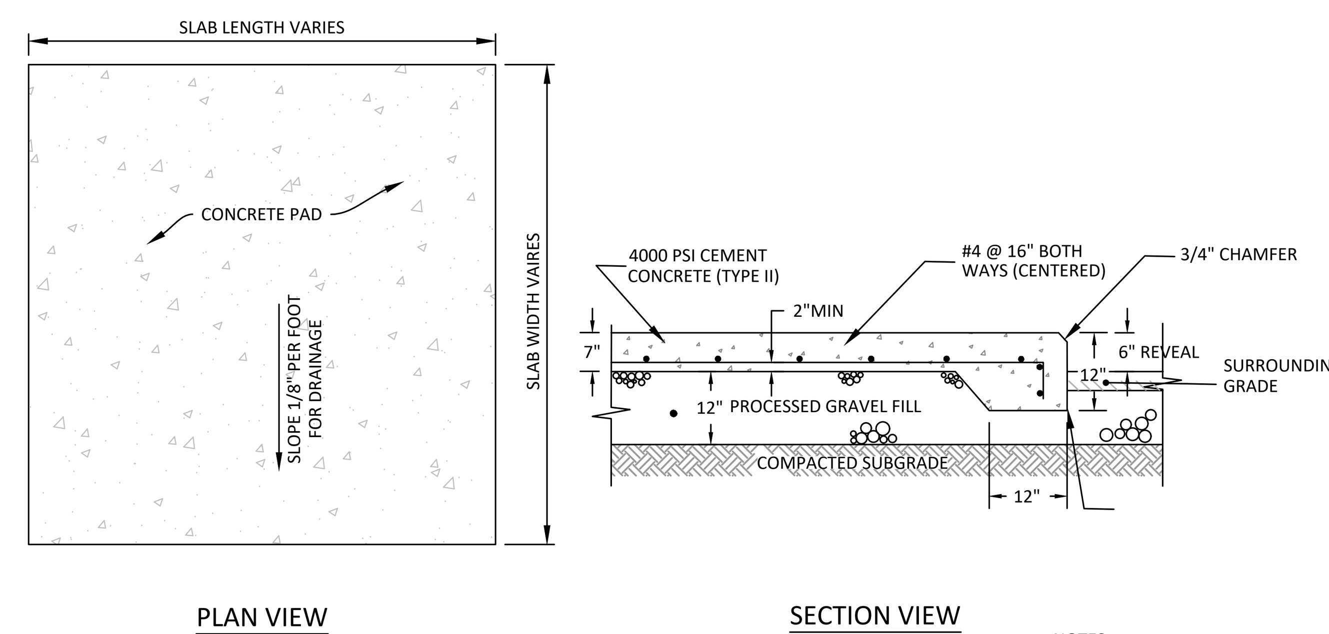
DRAIN LINE TRENCH DETAIL

NOT TO SCALE



GUTTER DOWNSPOUT DETAIL

NOT TO SCALE



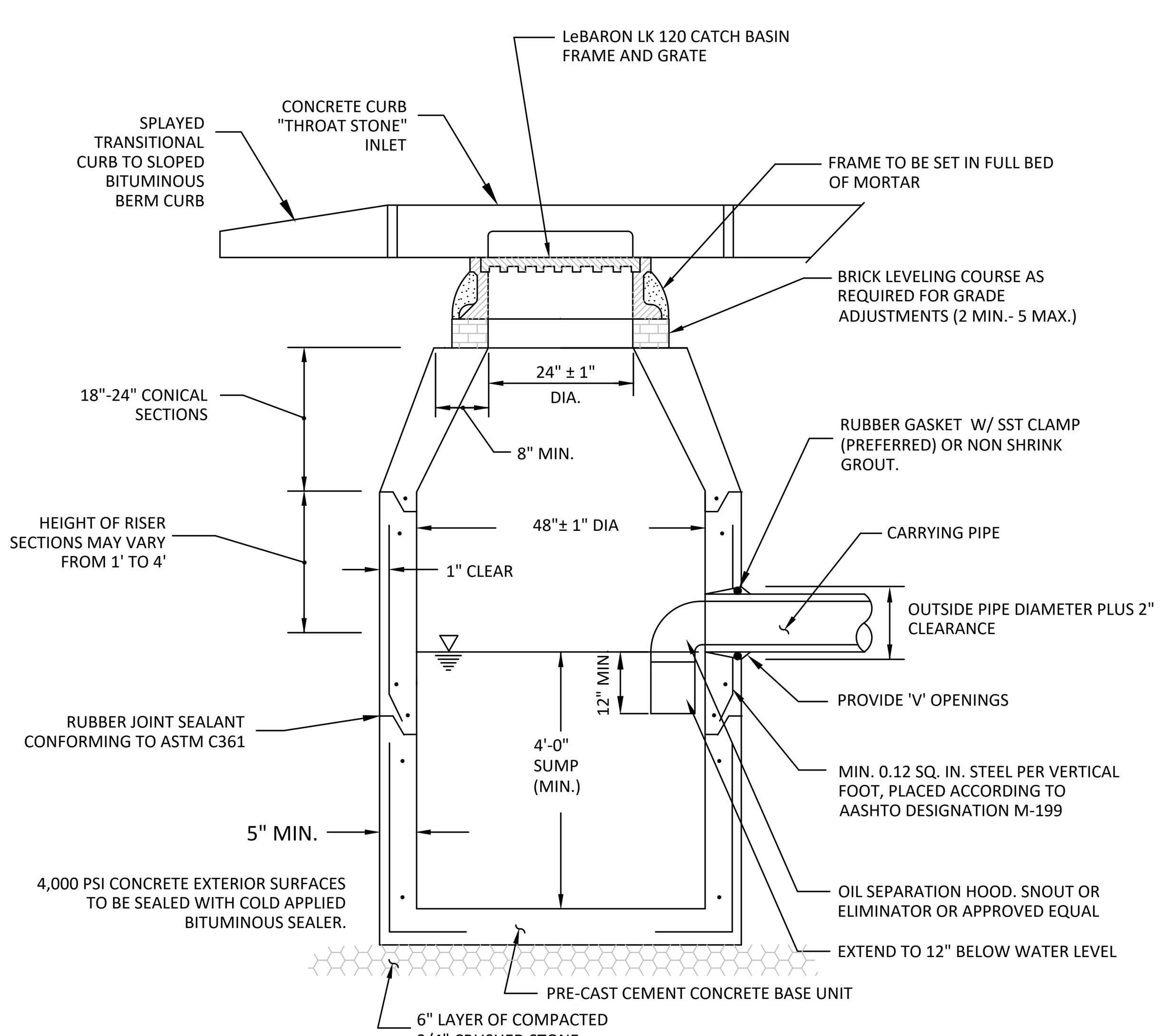
PLAN VIEW

SECTION VIEW

NOTES:
1. PROVIDE CONSTRUCTION JOINTS PER SPECIFICATIONS.
2. PROVIDE BROOM FINISH PER SPECIFICATIONS.
3. PROCESSED GRAVEL FILL PER GEOTECHNICAL REPORT.
4. COMPACT SUBGRADE PER GEOTECHNICAL REPORT.

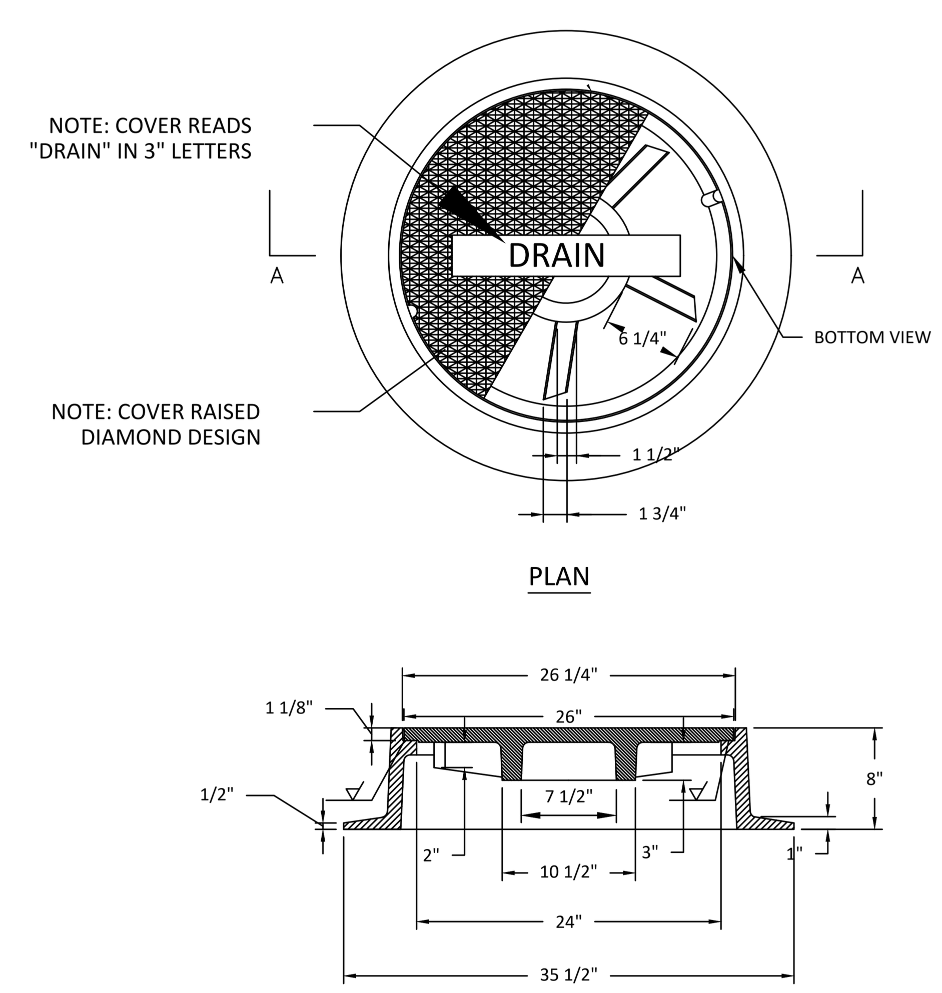
CONCRETE EQUIPMENT PAD DETAIL

NOT TO SCALE



PRECAST CONCRETE CATCH BASIN WITH HOOD

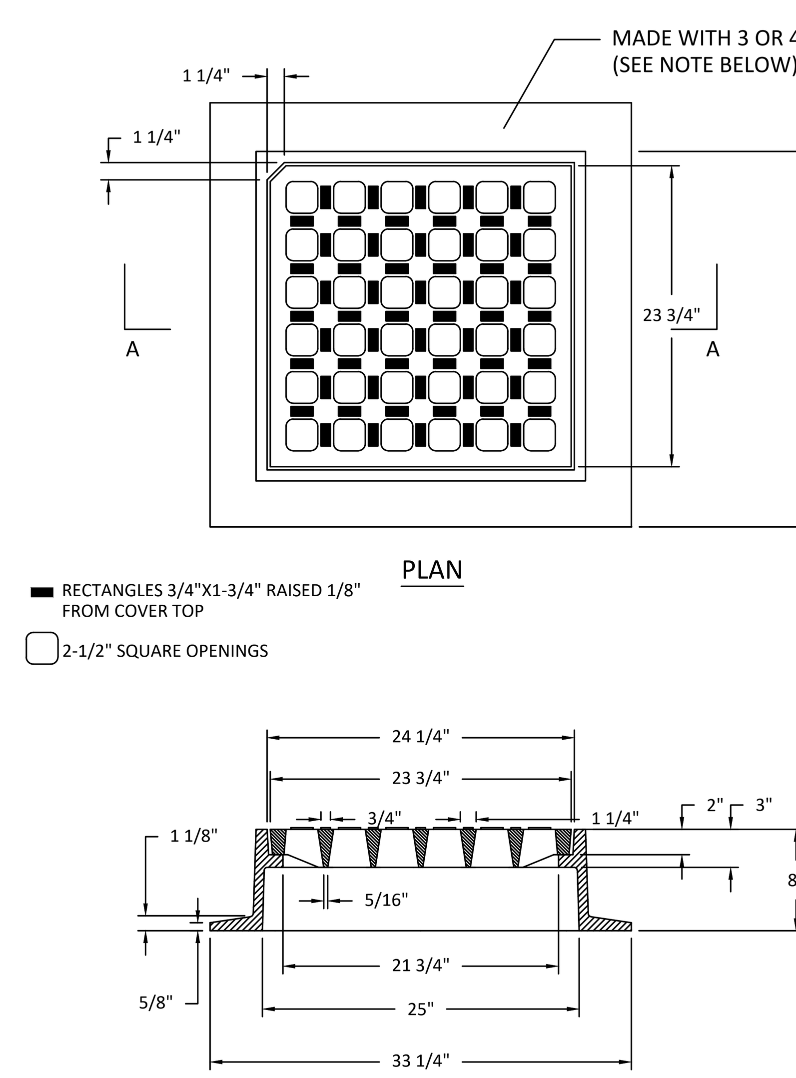
NOT TO SCALE



NOTES:
1. ALL DMH FRAME AND COVERS TO BE LEBARON FOUNDRY MODEL NO. LK110A DRAIN OR EQUAL.
2. MANHOLE FRAME AND COVER TO BE H-20 LOAD RATED.

DMH FRAME AND COVER

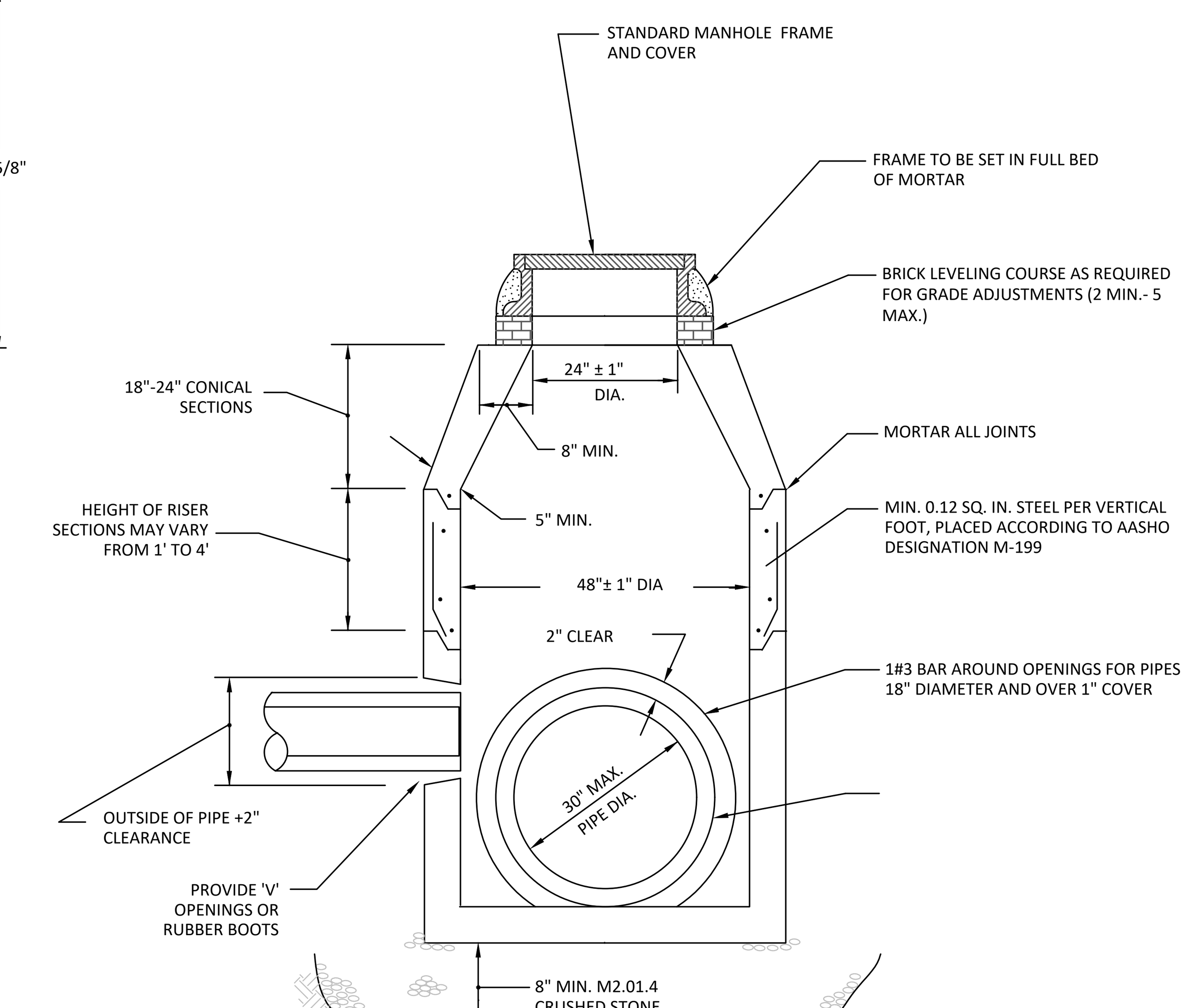
NOT TO SCALE



NOTE:
1. ALL CATCH BASIN FRAME AND GRATES TO BE EJ IRON WORKS 5548Z 5520M GR FLG4 LF248-5 OR EQUAL WITH 4 FLANGES, UNLESS OTHERWISE NOTED

CB FRAME AND GRATE

NOT TO SCALE



PRECAST CONCRETE DRAIN MANHOLE

9 FEET OR LESS IN DEPTH

NOT TO SCALE

LOCUS MAP

NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

DIMENSIONS ARE AS INDICATED.

USE OF THIS PLAN CONSTITUTES ACCEPTANCE OF TERMS AND CONDITIONS SET FORTH IN ACCOMPANYING PROJECT DOCUMENTATION.

IT IS THE RESPONSIBILITY OF THE USER TO CONFIRM DISCREPANCIES WITH THE ENGINEER PRIOR TO USE.

REVISIONS

NO.	DATE	COMMENT
1	10/23/23	ISSUED FOR INTERNAL REVIEW

NOT FOR CONSTRUCTION
FOR PERMITTING
PURPOSES ONLY

PURPOSE:
SPECIAL PERMIT WITH SITE PLAN REVIEW

LOCUS:
487 BRICK KILN ROAD
WEST FALMOUTH, MA

PREPARED FOR:
YMCA CAPE COD

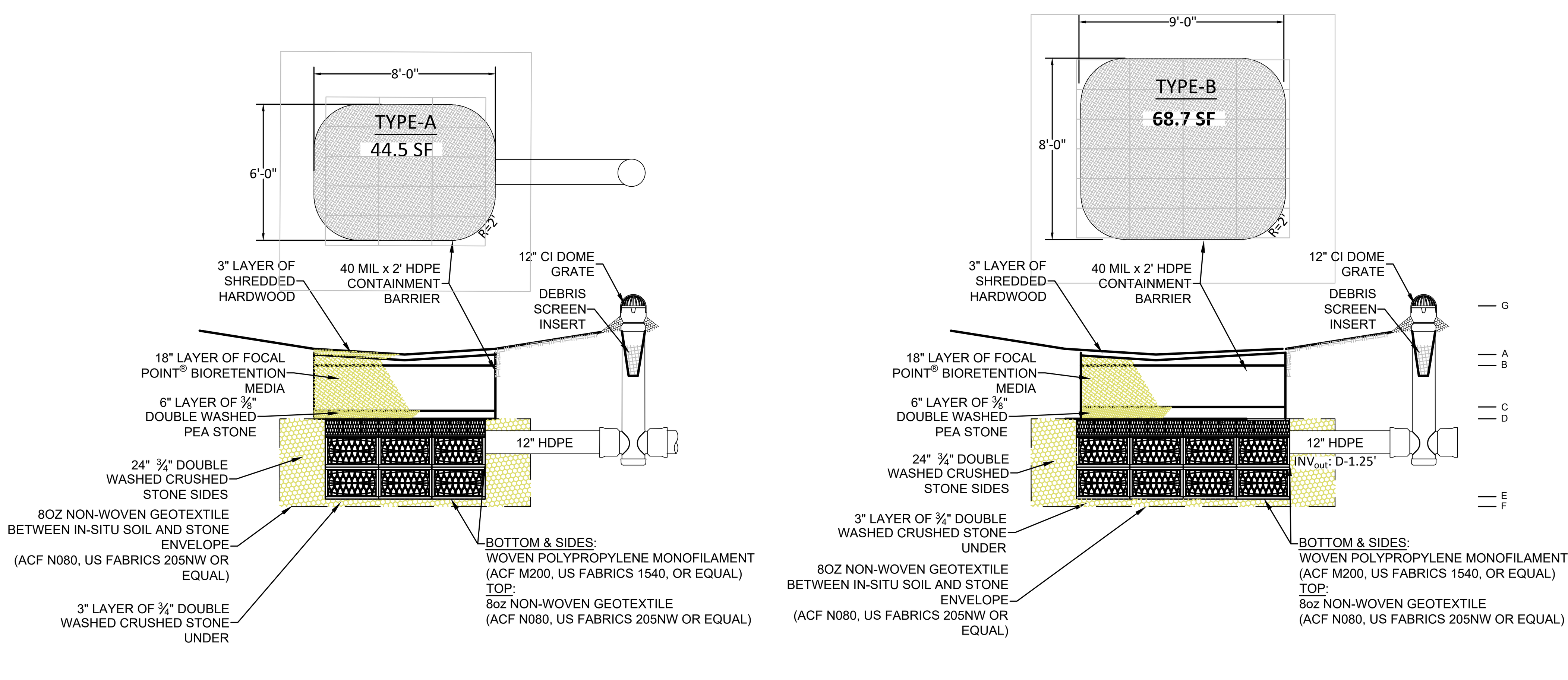
DRAWING TITLE:
DETAILS

CAD TECH: SDC
CHECKED BY: JDO
ENGINEER: SDC
DATE: 01/19/24

COMMONWEALTH OF MASSACHUSETTS
STUART D. CLARK
CIVIL
No. 40697
REGISTERED PROFESSIONAL ENGINEER

SCALE: AS NOTED
SHEET: C-501

S:\CLIENTS\YMCA – CAPE COD\YMCA–2020–0004 (FALMOUTH)\CAD\00 SITE PLANS.DWG 1/8/2024 11:21 AM



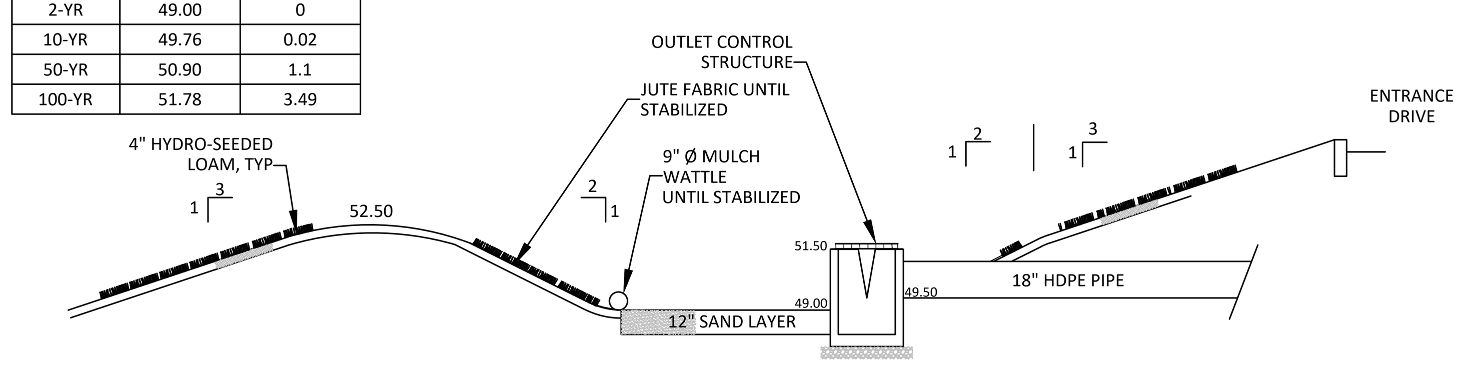
FOCAL POINT RAIN GARDEN (FP)

NOT TO SCALE

RAIN GARDEN ELEVATION SCHEDULE								
ELEVATION	DEPTH	FP-1	FP-2	FP-3	FP-4	FP-5	FP-6	FP-7
SURFACE (A)	0"	49.80	51.80	52.75	52.50	54.00	54.92	51.90
TOP OF MEDIA (B)	3"	49.55	51.55	52.50	52.25	53.75	54.67	51.65
BOTTOM OF MEDIA (C)	18"	48.05	50.55	51.00	50.75	52.25	53.17	50.15
PEA STONE/ MICROMESH (D)	6"	47.55	50.05	50.50	50.25	51.75	52.67	49.65
INVERT OUT	15"	46.47	48.47	49.42	49.17	50.67	51.42	N/A
BOTTOM OF R-TANK (E)	42.5"	44.01	46.01	46.96	46.71	48.21	49.13	46.11
BOTTOM OF HOLE (F)	3"	43.76	45.76	46.71	46.46	47.96	48.88	45.86
DOME GRATE RIM (G)		51.50	52.85	53.75	53.25	55.20	55.40	55.45 (FH)

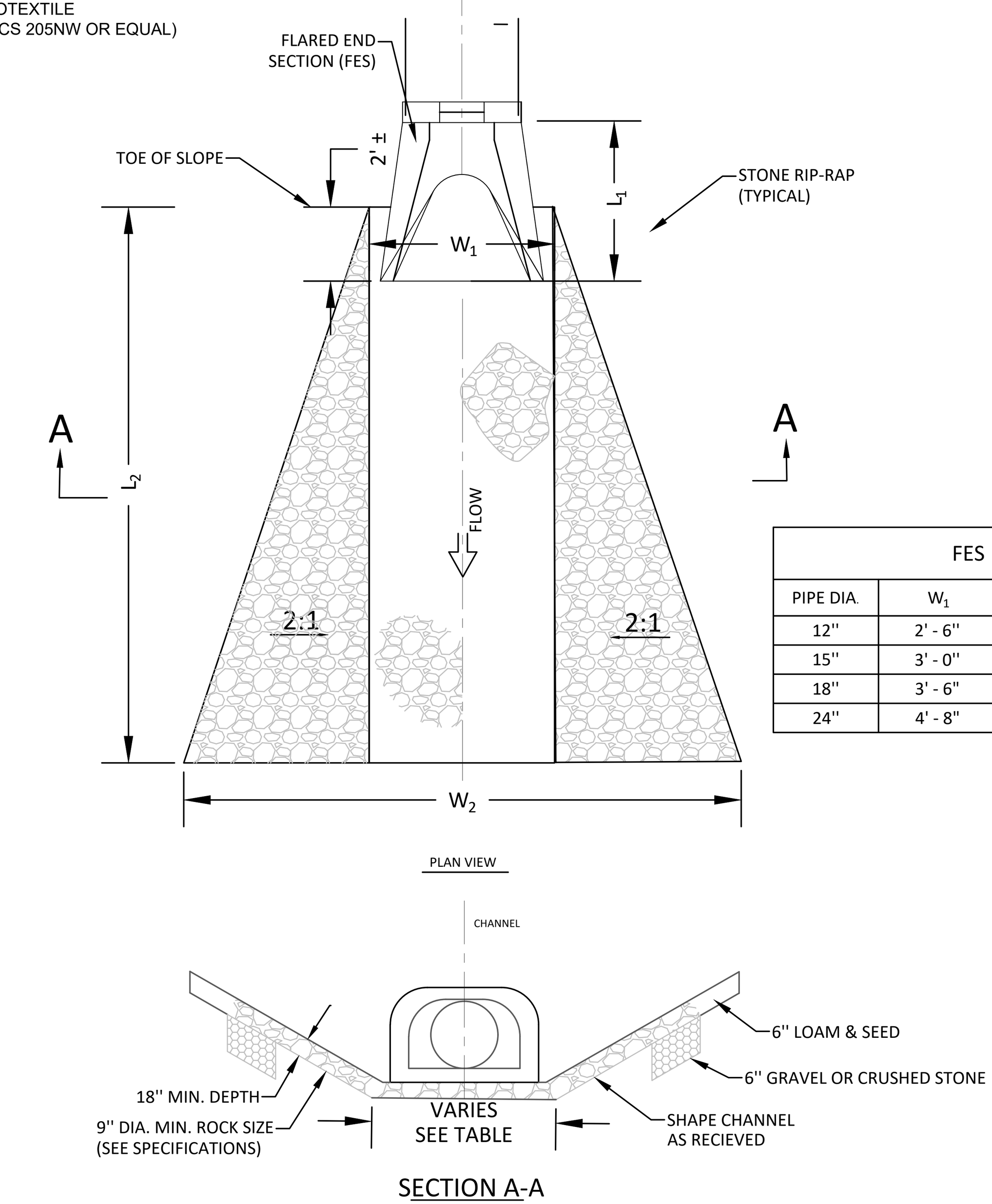
NOTES:
1. RAIN GARDEN MEDIA SHALL BE PROTECTED FROM SEDIMENT ACCUMULATION UNTIL ALL DISTURBED SURFACE ARE STABILIZED.
2. CONTRACTOR SHALL SUPPLY FOCAL POINT MEDIA ONLY. SUBSTITUTIONS ARE NOT ALLOWED

POND FUNCTION TABLE		
STORM	ELEVATION	WEIR FLOW (CFS)
2-YR	49.00	0
10-YR	49.76	0.02
50-YR	50.90	1.1
100-YR	51.78	3.49



ATTENUATION BASIN X-SECTION

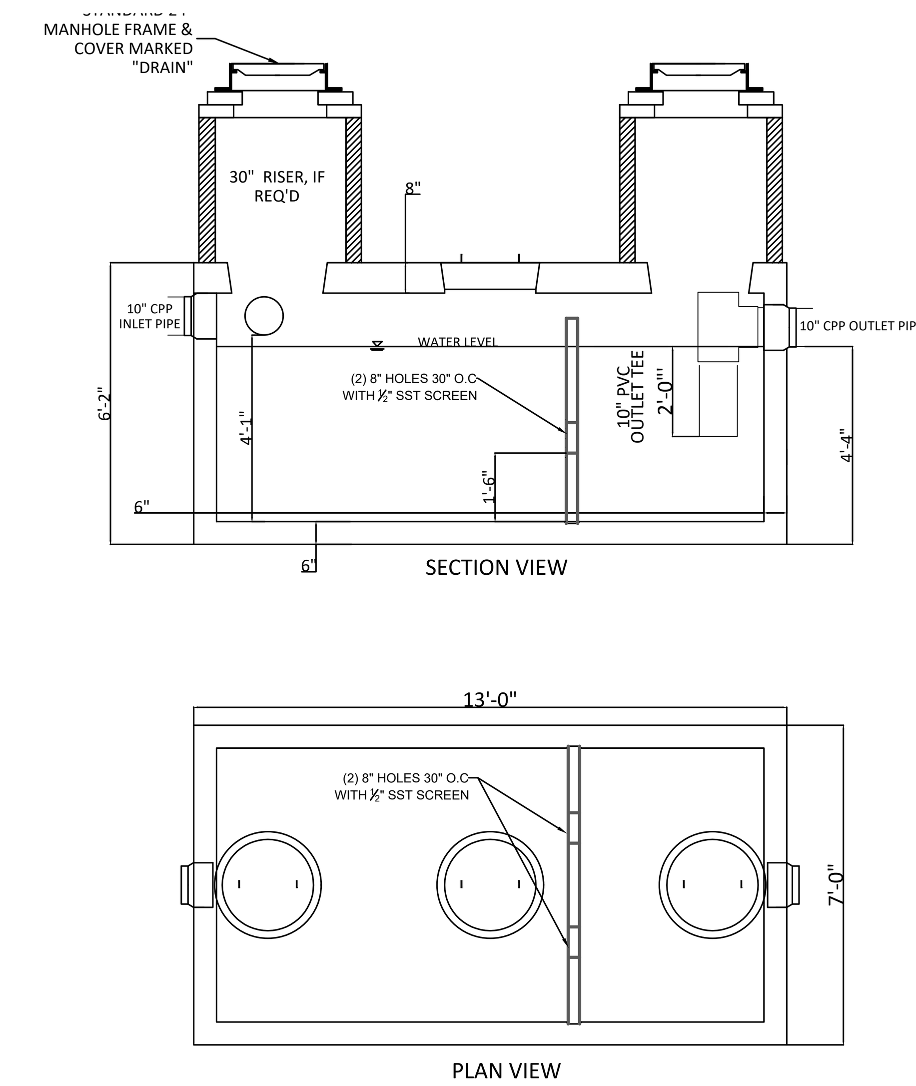
NOT TO SCALE



FES DIMENSION TABLE				
PIPE DIA.	W_1	W_2	L1	L_2
12''	2' - 6''	14'	25"	10'
15''	3' - 0''	18'	25"	12'
18''	3' - 6"	22'	32"	15'
24''	4' - 8"	26'	36"	20'

FLARED END SECTION/OUTLET SCOUR PROTECTION DETAIL

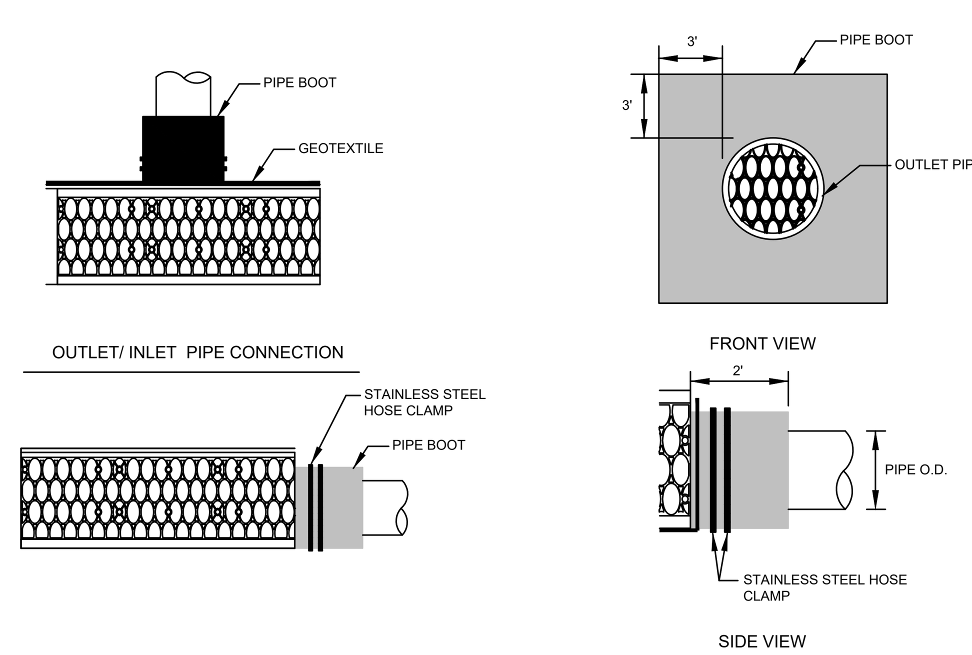
NOT TO SCALE

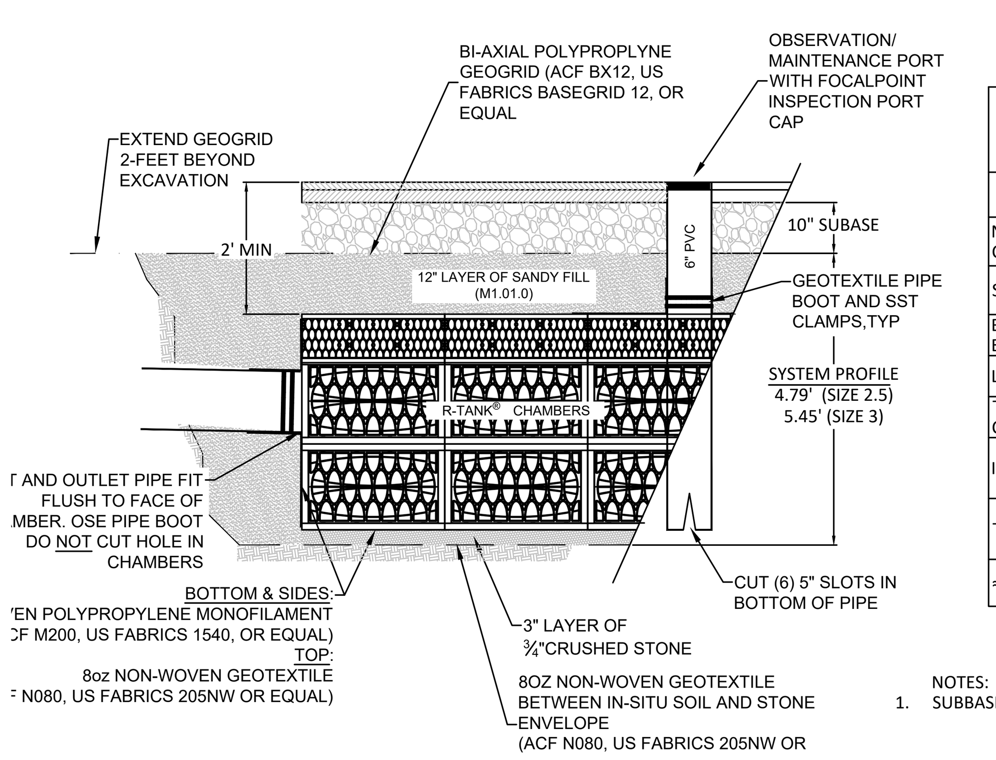


2000 GAL OIL/GRIT SEPARATOR (OGS)

NOT TO SCALE

NOTES:
1. CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS.
2. ALL PENETRATIONS/CORES SHALL BE SEALED WATERTIGHT WITH SNAP BOOTS OR NON SHRINK GROUT.
3. ALL REINFORCEMENT PER ASTM C1227
4. DESIGNED FOR AASHTO HS-20 LOADING, COVER 1-5 FT.
5. TONGUE AND GROOVE JOINT SEALED WITH BUTYL RESIN,
6. TANKS MAY BE ORDERED WITHOUT INLET AND OUTLET PENETRATIONS AND MAY REQUIRE FIELD CORING AS NECESSARY. NOTE CORES WILL ALTER DIMENSION "C".
7. CHAMBERS DIMENSIONS ARE TAKEN FROM SCITUATE RAY PRECAST. ALTERNATE TANKS WITH SIMILAR VOLUMES MAY BE CONSIDERED.



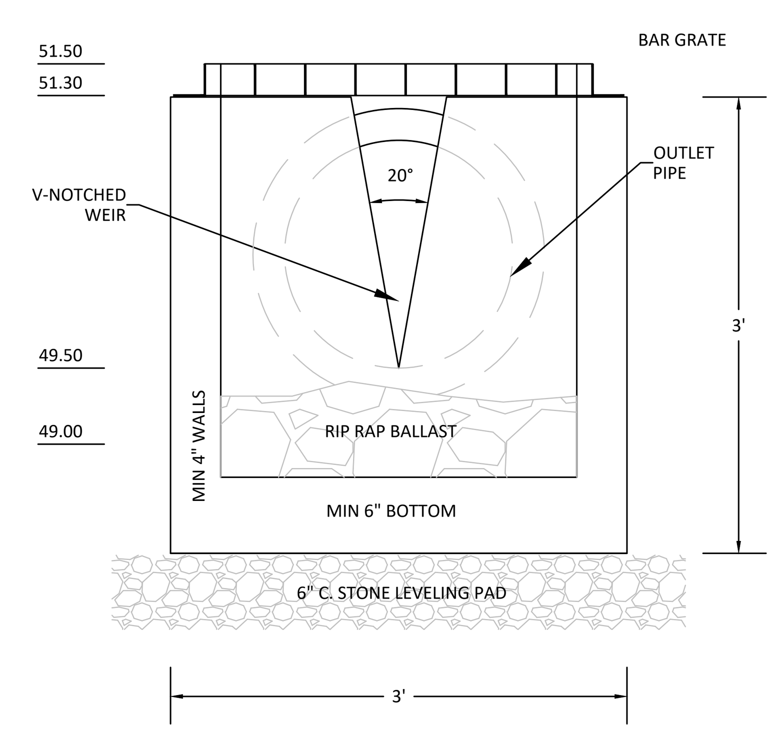


R-TANK DETAILS

NOT TO SCALE

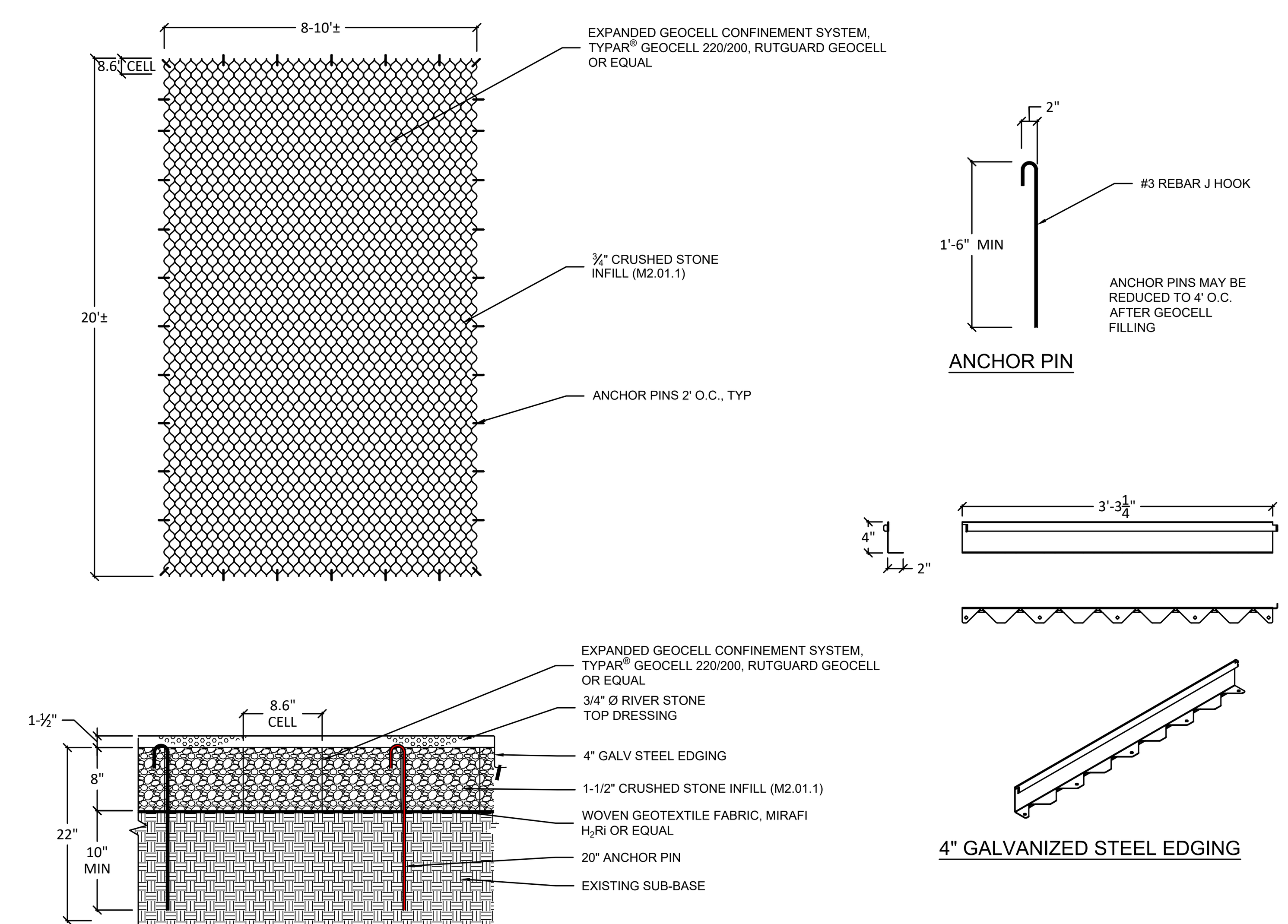
R-TANK® ELEVATION SCHEDULE							
	INF-1	INF-2	INF-3	INF-4	INF-5	INF-6	INF-7
NUMBER OF CHAMBERS	136	330	240	240	160	204	64
SIZE	2.5	30.0	3.0	3.0	2.5	2.5	2.5
BOTTOM OF EXVACATION	46.00	47.64	42.34	50.29	50.00	47.21	51.00
LEVELING STONE	46.25	47.89	42.59	50.54	50.25	47.48	51.25
TOP OF CHAMBERS	49.79	52.29	46.79	54.74	54.79	52.00	55.79
INVERT IN	45.54	50.84					
TOP OF STONE	50.79	53.09	47.79	55.74	NR	NR	NR
≈SURFACE	53.85	54.50	51.10	57.18	57.50	53.00	57.00

NOTES:
1. SUBBASE GRAVEL AND BI-AXIAL GEOGRID CAN BE OMITTED WHEN NOT UNDER PAVEMENT



OUTLET CONTROL STRUCTRURE DETAIL

NOT TO SCALE



REINFORCED STONE FIRE LANE DETAIL

NOT TO SCALE

LOCUS MAP

NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

DIMENSIONS ARE AS INDICATED.

USE OF THIS PLAN CONSTITUTES ACCEPTANCE OF TERMS AND CONDITIONS SET FORTH IN ACCOMPANYING PROJECT DOCUMENTATION.

IT IS THE RESPONSIBILITY OF THE USER TO CONFIRM DISCREPANCIES WITH THE ENGINEER PRIOR TO USE.

REVISIONS

NO.	DATE	COMMENT
1	10/23/23	ISSUED FOR INTERNAL REVIEW

NOT FOR CONSTRUCTION FOR PERMITTING PURPOSES ONLY

PURPOSE: SPECIAL PERMIT WITH SITE PLAN REVIEW

LOCUS: 487 BRICK KILN ROAD WEST FALMOUTH, MA

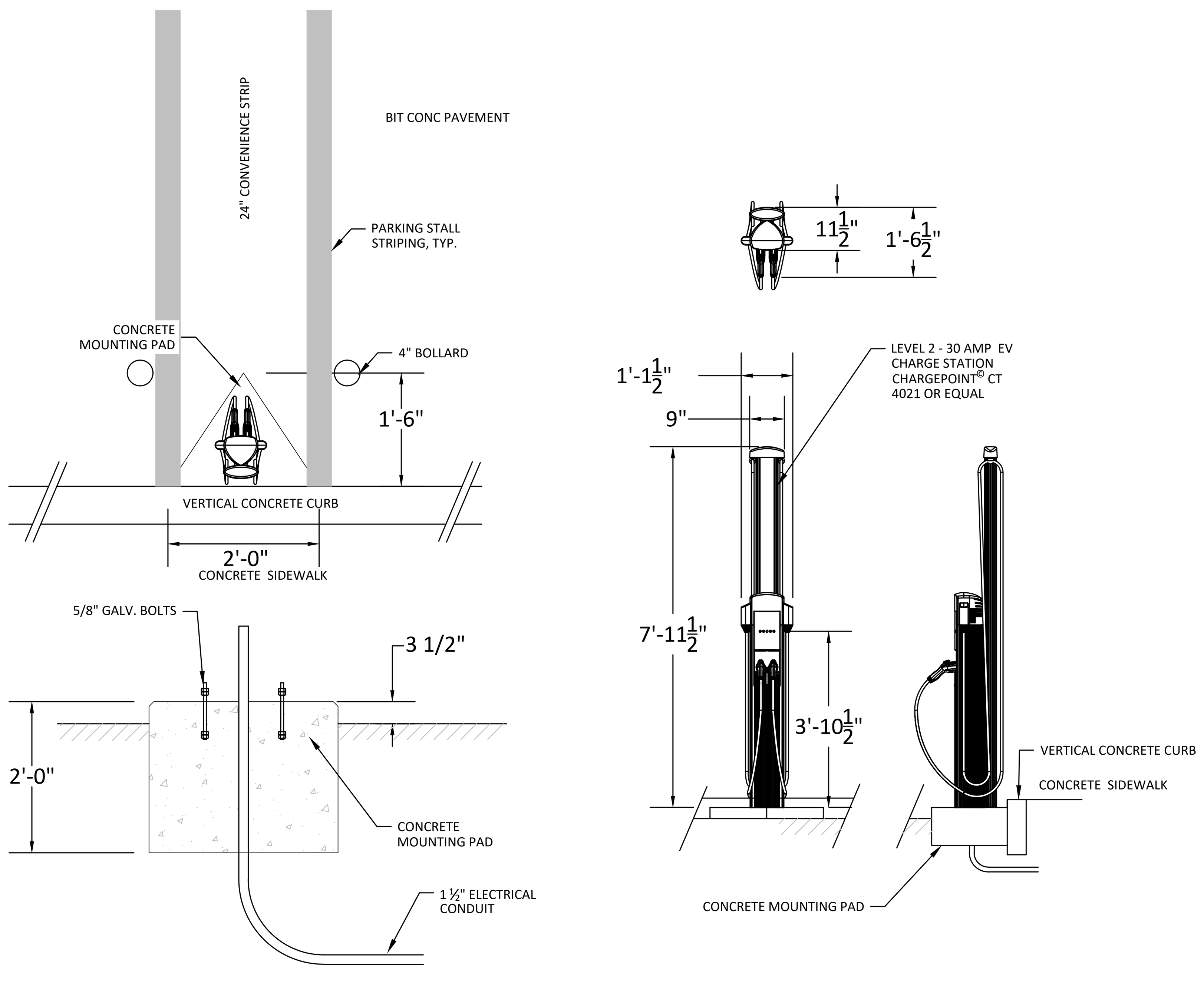
PREPARED FOR: YMCA CAPE COD

DRAWING TITLE: DETAILS

CAD TECH: SDC	CHECKED BY: JDO
ENGINEER: SDC	DATE: 01/19/24
	SCALE: AS NOTED
	SHEET: C-502

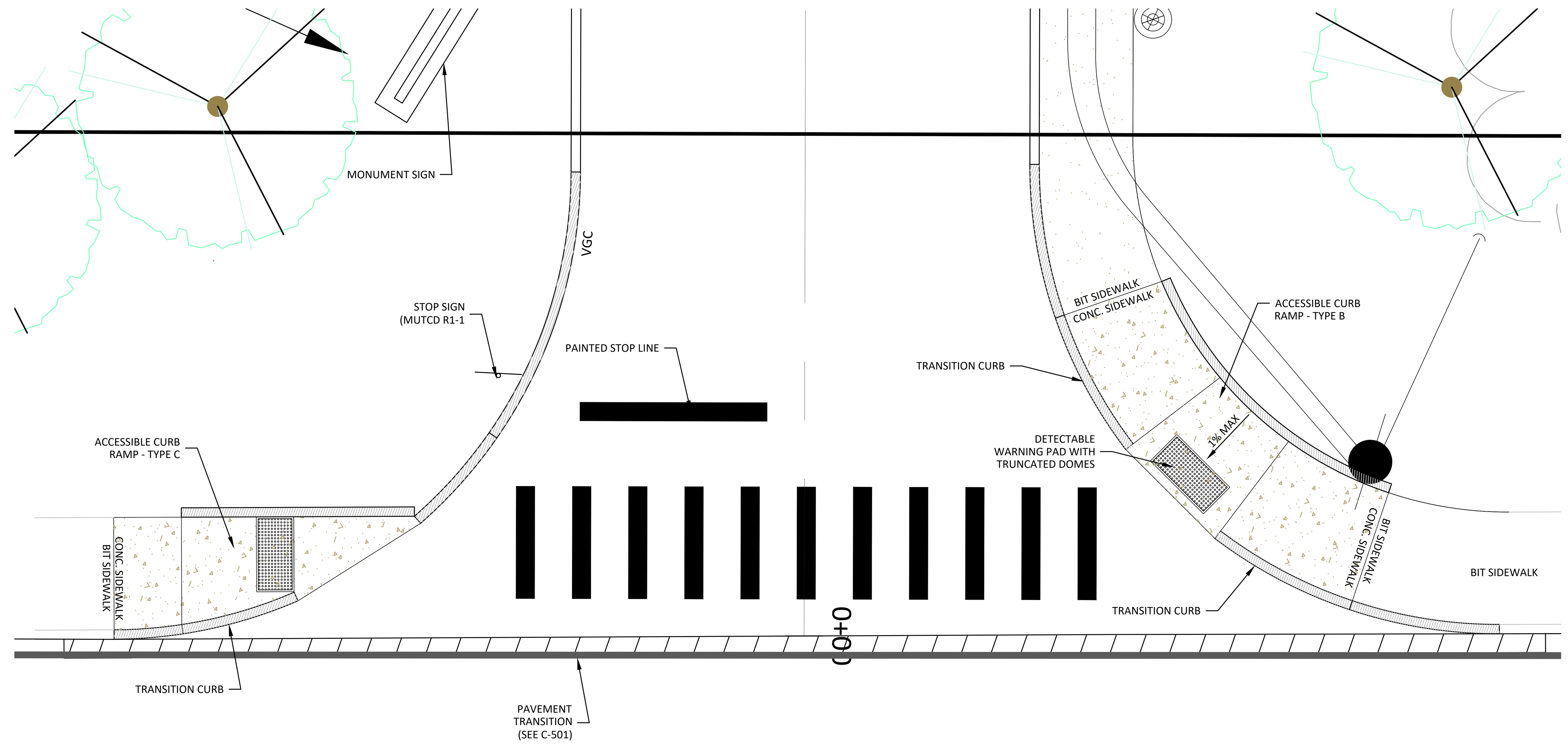
COMMONWEALTH OF MASSACHUSETTS STUART D. CLARK CIVIL No. 40697 REGISTERED PROFESSIONAL ENGINEER

S:\CLIENTS\YMCA - CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAD\ZD SITE PLANS.DWG 1/8/2024 11:21 AM



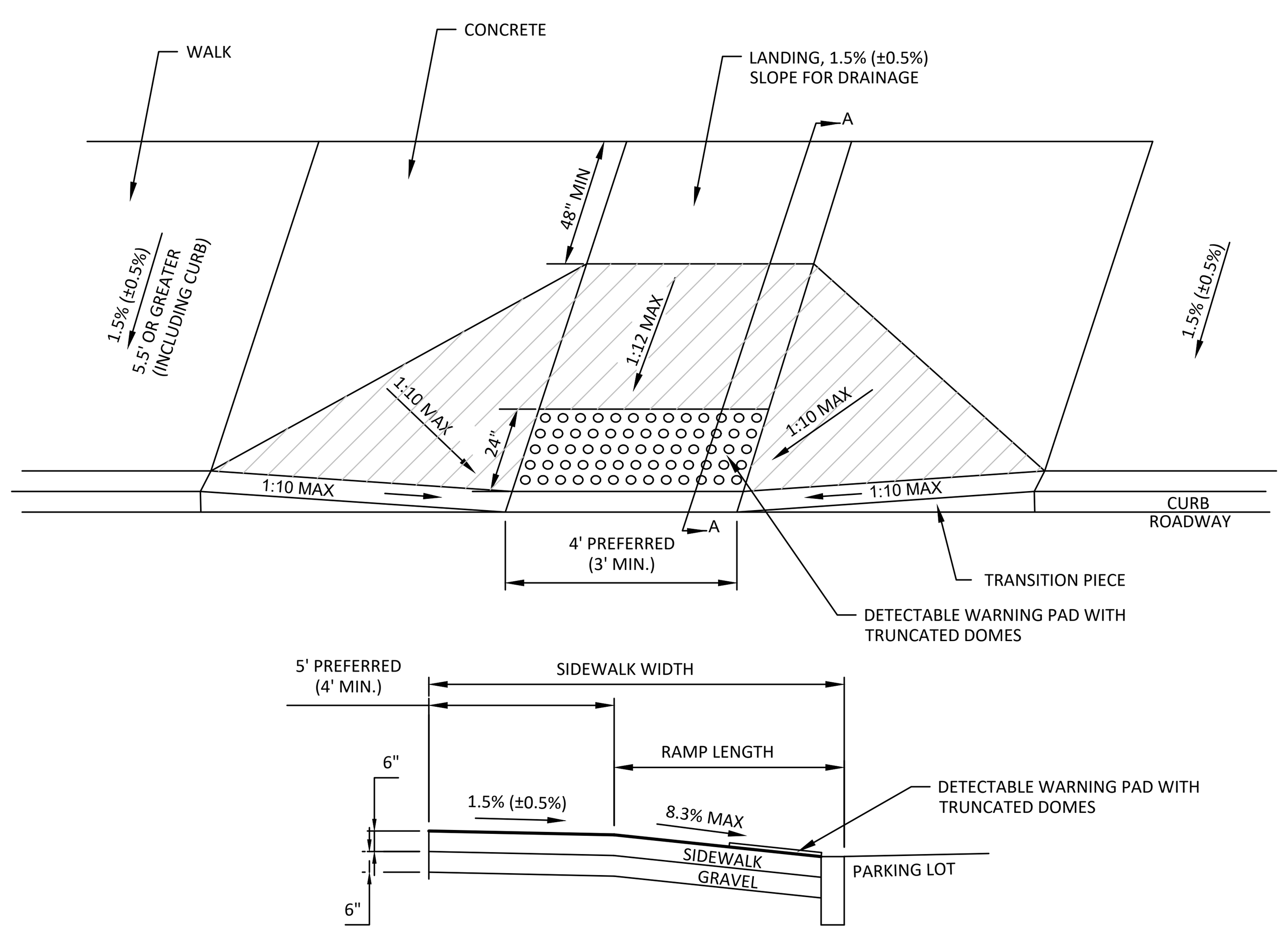
DUAL PORT EV CHARGE STATION

NOT TO SCALE



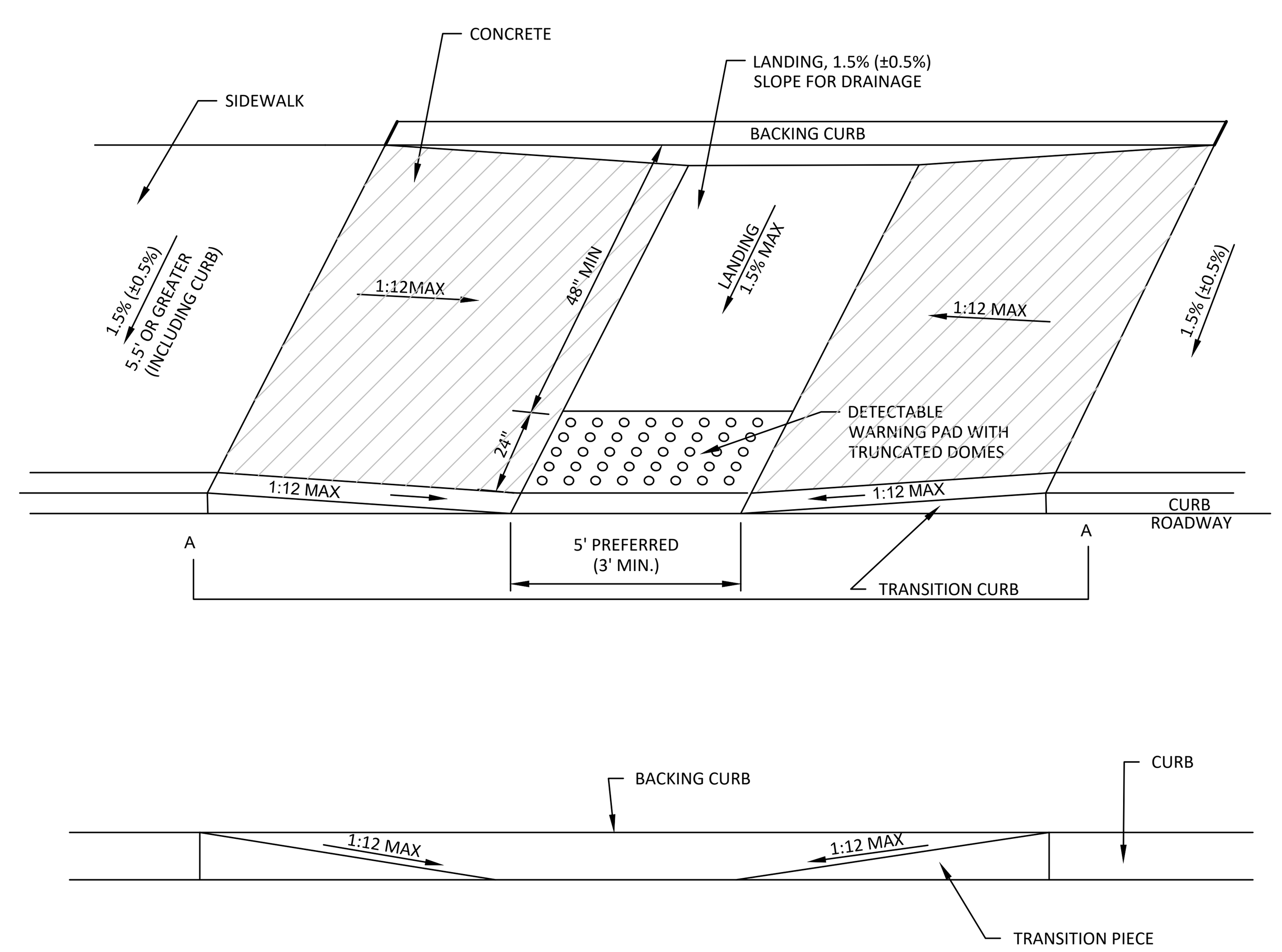
CURB CUT/ENTRANCE DETAIL

1"=5'



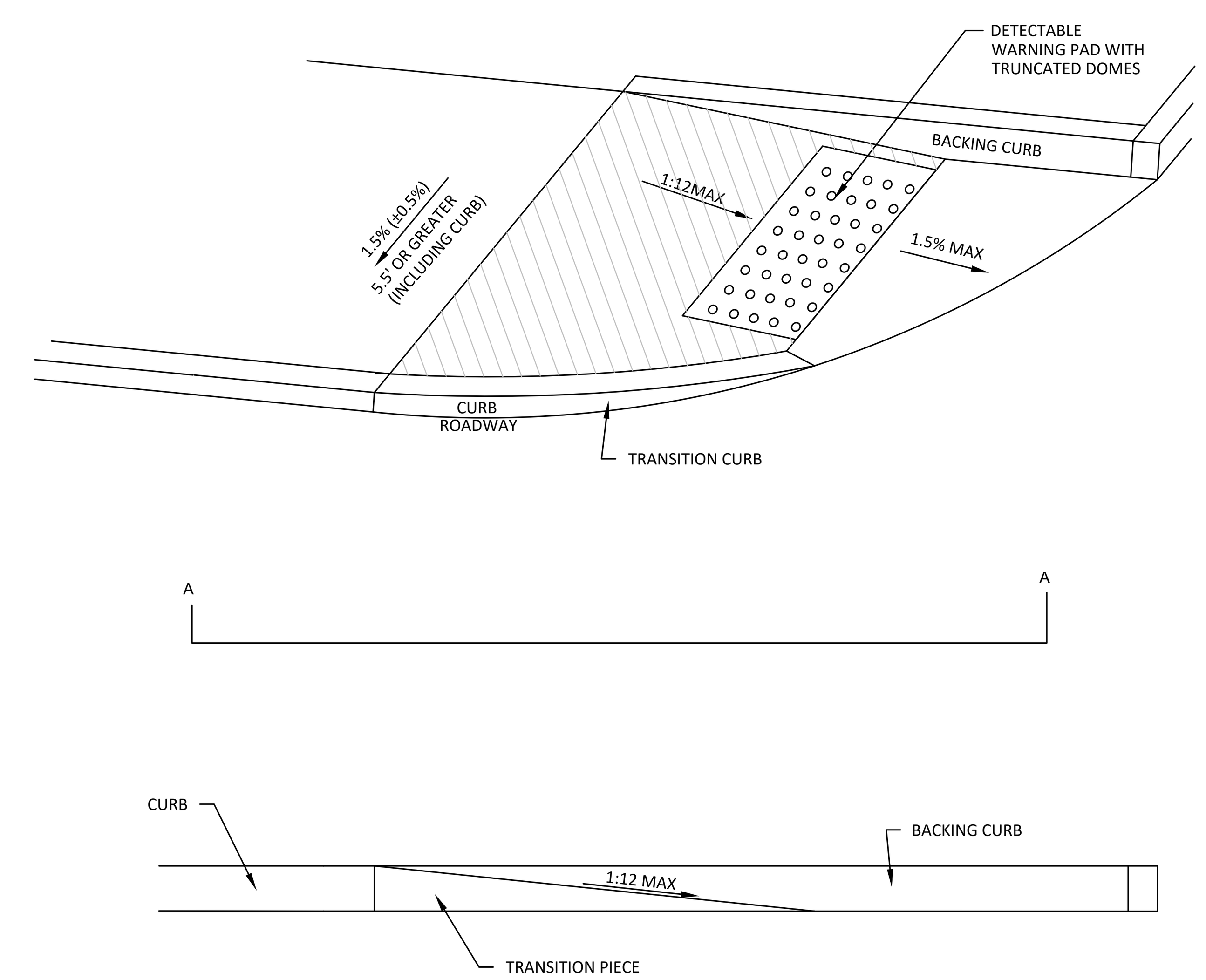
TYPE A - ACCESSIBLE CURB RAMP DETAIL (ACR)

NOT TO SCALE



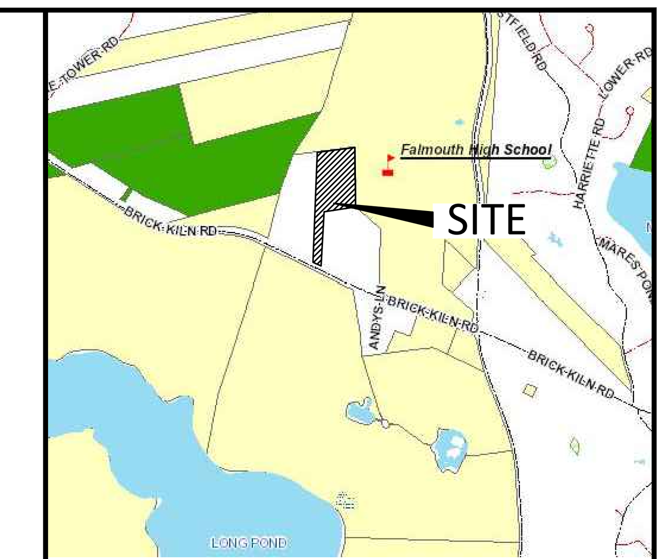
TYPE B - ACCESSIBLE CURB RAMP DETAIL (ACR)

NOT TO SCALE



TYPE C - ACCESSIBLE CURB RAMP DETAIL (ACR)

NOT TO SCALE



LOCUS MAP

NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

DIMENSIONS ARE AS INDICATED.

USE OF THIS PLAN CONSTITUTES ACCEPTANCE OF TERMS AND CONDITIONS SET FORTH IN ACCOMPANYING PROJECT DOCUMENTATION.

IT IS THE RESPONSIBILITY OF THE USER TO CONFIRM DISCREPANCIES WITH THE ENGINEER PRIOR TO USE.

REVISIONS

NO.	DATE	COMMENT
1	10/23/23	ISSUED FOR INTERNAL REVIEW

NOT FOR CONSTRUCTION
FOR PERMITTING
PURPOSES ONLY

PURPOSE:

SPECIAL PERMIT WITH SITE PLAN REVIEW

LOCUS:

487 BRICK KILN ROAD
WEST FALMOUTH, MA

PREPARED FOR:

YMCA
CAPE COD

DRAWING TITLE:

DETAILS

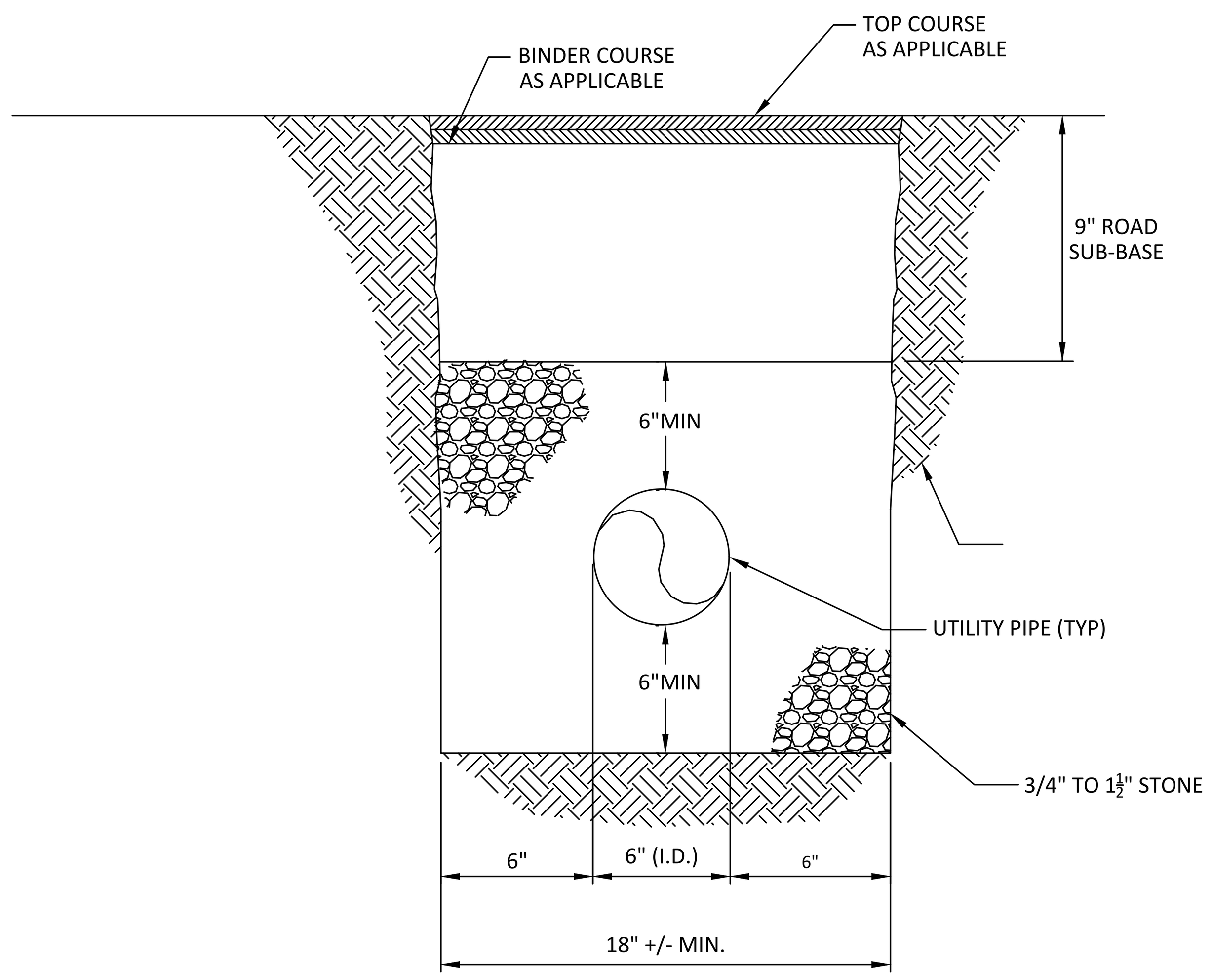
CAD TECH:	CHECKED BY:
SDC	JDO
ENGINEER:	DATE:
SDC	01/19/24

COMMONWEALTH OF MASSACHUSETTS
STUART D. CLARK
CIVIL
No. 40697
REGISTERED PROFESSIONAL ENGINEER

SCALE: AS NOTED

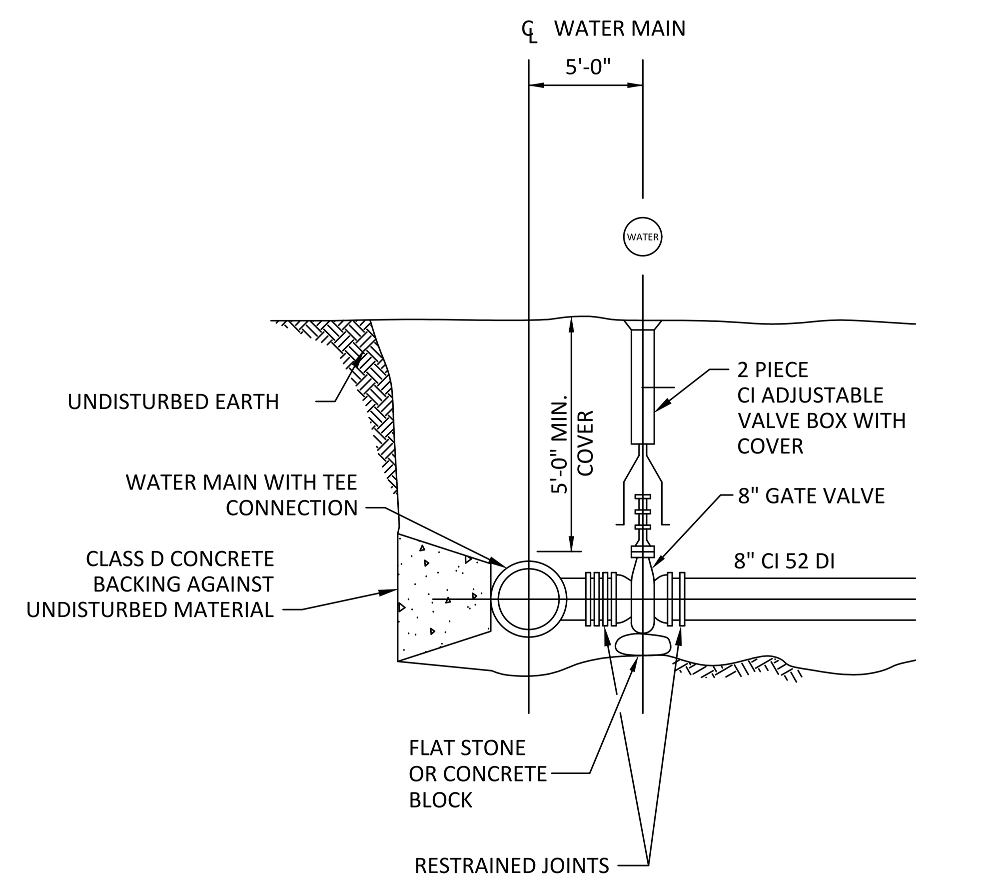
SHEET: C-503

S:\CLIENTS\YMCA - CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAD\00 SITE PLANS.DWG 1/8/2024 11:21 AM



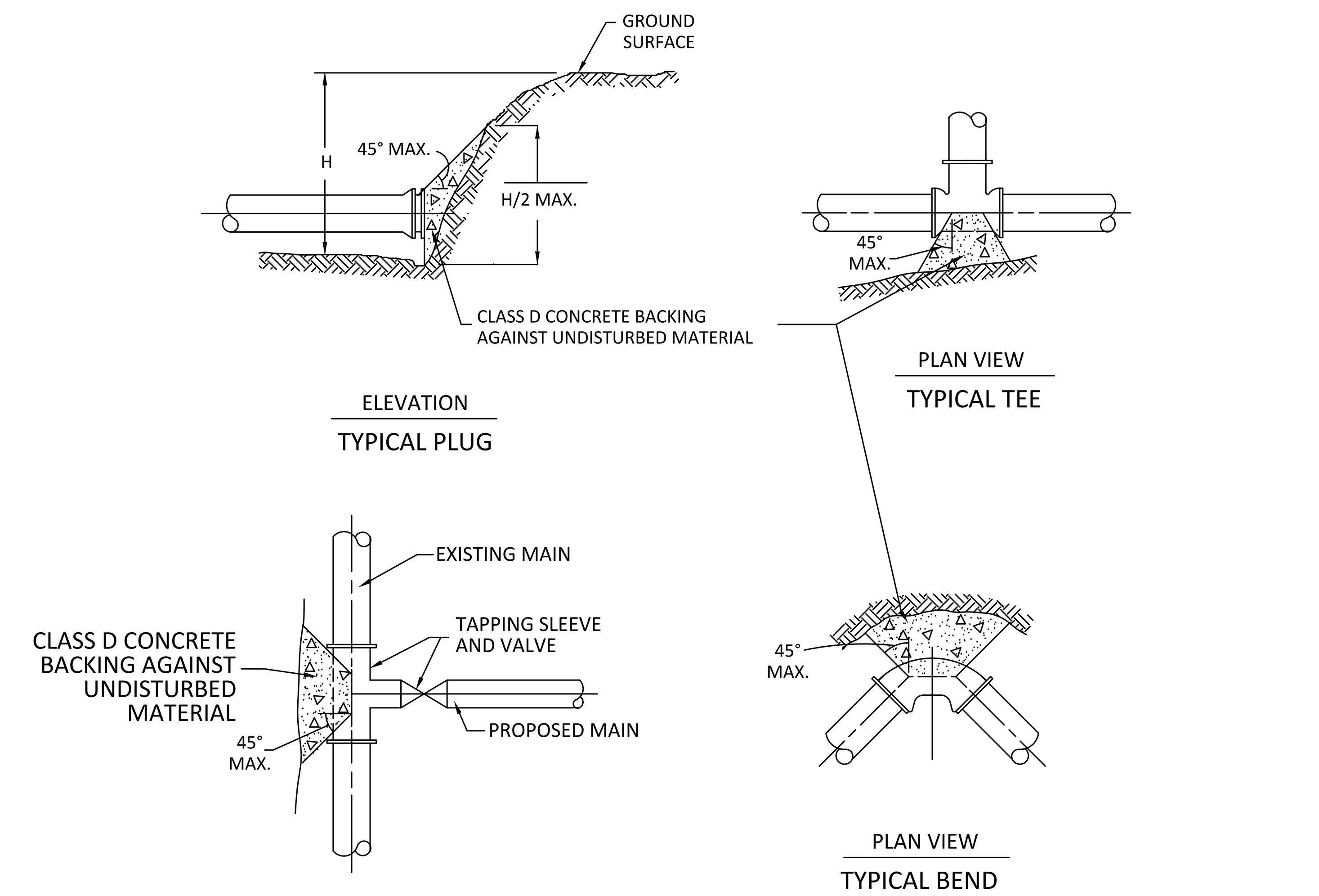
UTILITY TRENCH SECTION

NOT TO SCALE



POTABLE WATER SERVICE CONNECTION DETAIL

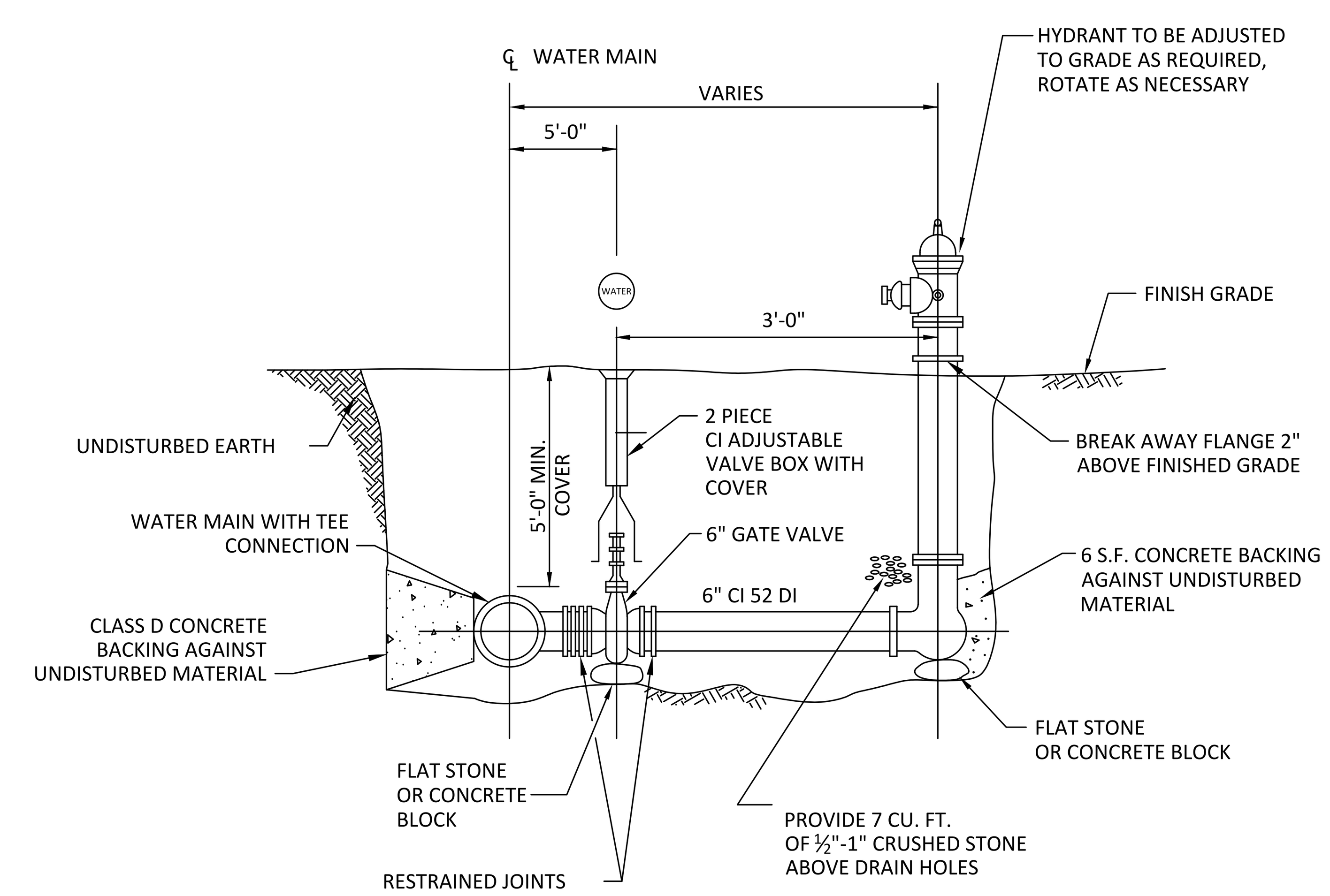
NOT TO SCALE



NOTE:
IF CONTRACTOR WISHES TO USE MEGALUG® INSTEAD OF THRUST BLOCK, APPROVAL IS REQUIRED FROM THE WATER DEPARTMENT DISTRICT HAVING JURISDICTION.

THRUST BLOCK DETAIL

NOT TO SCALE



NOTES:

1. CENTERLINE OF LOWEST NOZZLE TO BE 15" TO 18" ABOVE FINISHED GRADE.
2. HYDRANT RISER SHALL BE INSTALLED PLUMB.
3. HYDRANT SHALL BE LOCATED BEHIND SIDEWALK WHERE APPLICABLE.
4. HYDRANT PER FALMOUTH FIRE DEPARTMENT SPECIFICATIONS

TYPICAL HYDRANT AND VALVE DETAIL

NOT TO SCALE

GENERAL WATER SYSTEM NOTES:

1. ALL WATER DISTRIBUTION COMPONENTS SHALL CONFORM WITH "TOWN OF FALMOUTH DEPARTMENT OF PUBLIC WORKS, UTILITY DIVISION, STANDARD PLANS AND SPECIFICATION FOR CONSTRUCTION AND INSTALLATION OF WATER DISTRIBUTION AND WASTEWATER COLLECTION SYSTEMS" DATE JULY 3, 1995 AND REVISED THROUGH AUGUST 23, 1999.

A. GENERAL: ALL MATERIALS SHALL BE OF DOMESTIC MANUFACTURE AND SHALL CONFORM TO ALL APPLICABLE AWWA STANDARDS OF CONSTRUCTION AND INSTALLATION. MATERIALS SHALL BE OF A TYPE AS SPECIFIED BY THE UTILITIES DIVISION.

B. MAINS AND EXTENSIONS 4" IN DIAMETER AND GREATER SHALL BE CEMENT LINED DUCTILE IRON PIPE (C.L.D.I.P.), CLASS 52, TYTON JOINT AS PER AWWA C151/CL11 STANDARDS.

C. SERVICE LATERALS AND EXTENSIONS OF 1" OR 2" IN DIAMETER SHALL BE POLYETHYLENE ERIDOPURE™ PE-CLASS 200 OR TYPE "K" COPPER TUBING, AS PER AWWA C800 STANDARD (ENDOPURE REQUIRED AS OF AUGUST 2000).

D. VALVES - MAIN VALVES AND SERVICE VALVES GREATER THAN 211 SHALL BE GATE TYPE, MECHANICAL JOINT, RESILIENT SEATED, EPOXY COATED, OPEN RIGHT VALVES MEETING AWWA C509 STANDARDS AND OFA TYPE AS SPECIFIED BY THE UTILITIES DIVISION. STANDARD MODEL IN USE IS MUELLER TYPE A2360. ALL OTHER VALVES TO BE AS SPECIFIED BY THE UTILITIES DIVISION.

E. FIRE HYDRANTS - SHALL BE NATIONAL STANDARD THREAD, OPEN RIGHT, WITH A 5 1/4 INCH MAIN VALVE, TWO 2 1/2" HOSE CONNECTIONS AND ONE 4 1/2" STEAMER CONNECTION AND BE OF BREAKAWAY DESIGN IN ACCORDANCE WITH AWWA C502 STANDARDS. STANDARD MODEL IN USE IS MUELLER TYPE A423 WITH 811 BOOT.

F. FITTINGS (MAIN) - SHALL BE COMPACT, M.J., CEMENT-LINED, DUCTILE IRON FITTINGS PER AWWA C-153 STANDARDS.

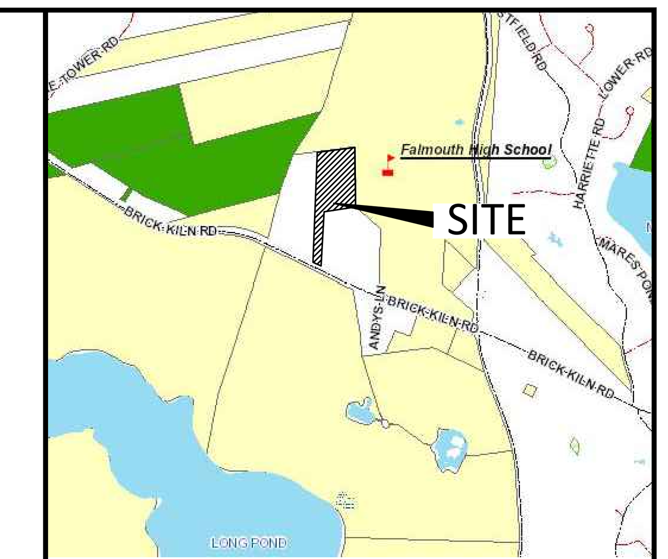
G. VALVE BOXES - SHALL BE 2-PIECE SLIDE-TYPE OF CAST IRON CONSTRUCTION AS APPROVED BY THE UTILITIES DIVISION.

H. CURB BOXES - SHALL BE CAST IRON. 2-PIECE SLIDE-TYPE WITH L PIECE LID. MUST HAVE STATIONARY ROD TO ATTACH TO CURB STOP. STANDARD MODEL IN USE IS MUELLER H-10334 OR H-10310.

I. CURB STOPS - FOR 1 INCH AND 2 INCH SERVICE LATERALS SHALL BE OF ALL BRASS CONSTRUCTION, COMPRESSION-TYPE CONNECTION, WITH A I-PIECE CLOSED-BOTTOM BODY AND O RING SEALS MEETING AWWA C.800 STANDARDS. STANDARD MODEL IN USE IS MUELLER B-25209.

J. CORPORATION STOPS - FOR I-INCH SERVICE CONNECTIONS SHALL BE OF BRASS ALLOY CONSTRUCTION USING AWWA TAPER (11CC11) THREAD AT INLET CONNECTION AND CTS COMPRESSION CONNECTION AT OUTLET. MUST MEET AWWA C-800 STANDARDS. STANDARD MODEL IN USE IS MUELLER B-25008

K. CORPORATION STOPS - FOR 2-INCH SERVICE CONNECTIONS SHALL BE OF 1 PIECE BRONZE BODY CONSTRUCTION, USING O RING TYPE SEALS WITH AWWA TAPER ("CC") THREADS AT INLET CONNECTION AND CTS COMPRESSION CONNECTION AT OUTLET. MUST MEET A WWA C-8O0 STANDARDS. STANDARD MODEL IN USE IS MUELLER B-25008.



LOCUS MAP

NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

DIMENSIONS ARE AS INDICATED.

USE OF THIS PLAN CONSTITUTES ACCEPTANCE OF TERMS AND CONDITIONS SET FORTH IN ACCOMPANYING PROJECT DOCUMENTATION.

IT IS THE RESPONSIBILITY OF THE USER TO CONFIRM DISCREPANCIES WITH THE ENGINEER PRIOR TO USE.

REVISIONS

NO.	DATE	COMMENT
1	10/23/23	ISSUED FOR INTERNAL REVIEW

NOT FOR CONSTRUCTION
FOR PERMITTING
PURPOSES ONLY

PURPOSE:

SPECIAL PERMIT WITH
SITE PLAN REVIEW

LOCUS:

487 BRICK KILN ROAD
WEST FALMOUTH, MA

PREPARED FOR:

YMCA
CAPE COD

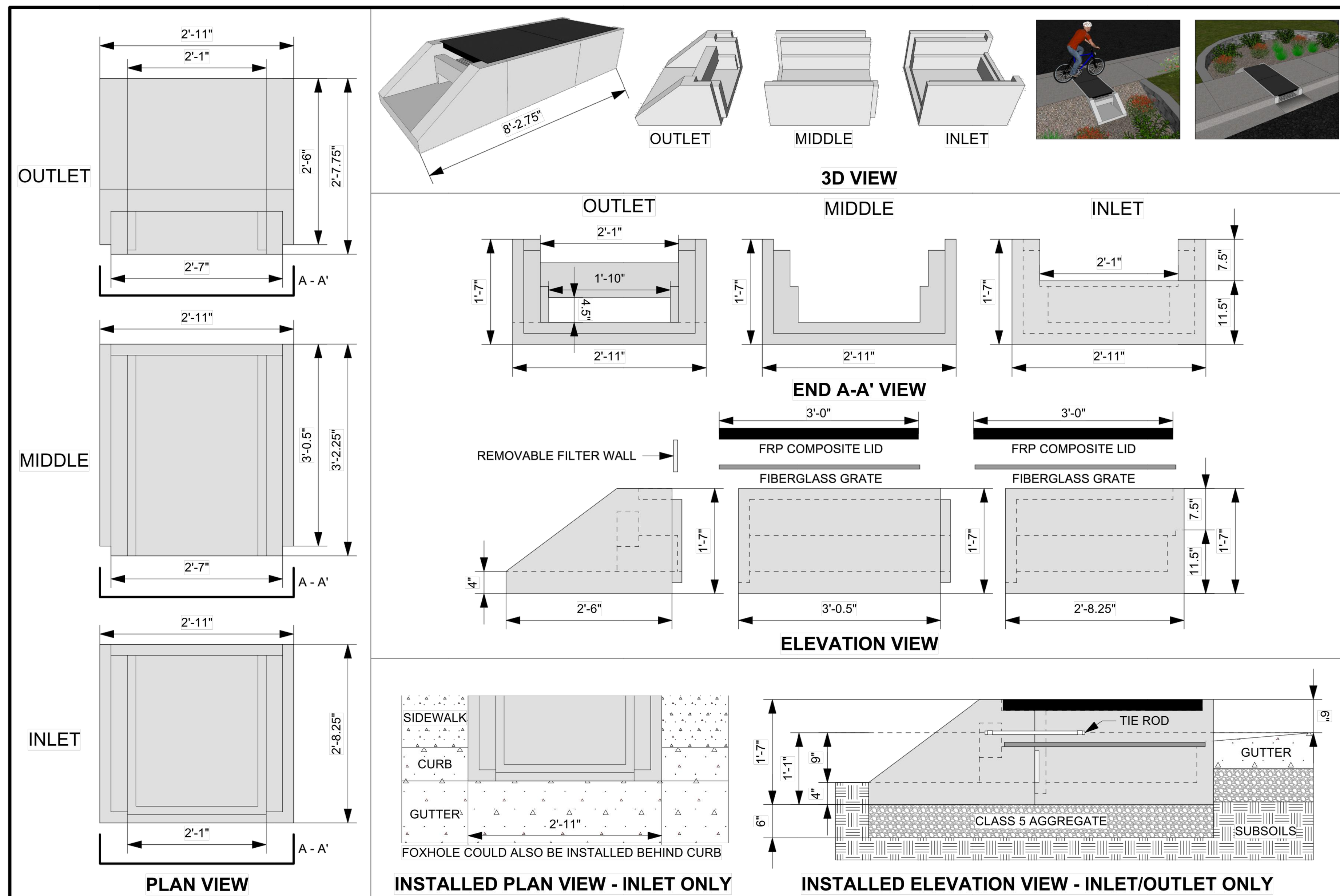
DRAWING TITLE:

DETAILS

CAD TECH:	CHECKED BY:
SDC	JDO
ENGINEER:	DATE:
SDC	01/19/24
	SCALE:
	AS NOTED
	SHEET:
	C-504

COMMONWEALTH OF MASSACHUSETTS
STUART D. CLARK
CIVIL
No. 40697
REGISTERED
PROFESSIONAL ENGINEER

S:\CLIENTS\YMCA - CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAD\00 SITE PLANS.DWG 1/8/2024 11:21 AM



SPECIFICATIONS
1. STEEL REINFORCED, COLD JOINT SECURED MONOLITHIC CONCRETE STRUCTURES (INLET 875 LBS, MIDDLE 965 LBS, AND OUTLET 730 LBS). CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,500 PSI AT 28 DAYS. CONCRETE AIR ENTRAINED (5% TO 8.5% BY VOLUME). MANUFACTURED AND DESIGNED TO ASTM C858.
2. 2-POINT PICK USING RECESSED LIFTING POCKETS WITH A STANDARD HOOK.
3. FIBERGLASS GRATE (11 LBS/PIECE).
4. FRP COMPOSITE LID (38 LBS/PIECE) WITH CONCENTRATED LOAD CAPACITY OF 11,200 LBS.

INSTALLATION NOTES
1. INSTALL A CLASS 5 BASE (COMPACTED TO 95% STANDARD PROCTOR). IT IS CRITICAL THAT THE CLASS 5 BASE IS EVEN TO ENSURE THE FOXHOLE PIECES ALIGN VERTICALLY SUCH THAT THE TOP LIDS LAY FLUSH WITH THE TOP OF THE FOXHOLE PIECES AND ADJACENT BOULEVARD, SIDEWALK, OR PATH. THE DISTANCE FROM THE BACK OF THE CURB MAY VARY BASED ON SITE CONDITIONS. EXCAVATE 1' 7" BELOW THE GUTTERLINE ELEVATION (I.E. THE BIORETENTION OVERFLOW ELEVATION) TO ACCOMMODATE THE 9" PONDING DEPTH, 6" CLASS 5 AGGREGATE, AND 4" RAIN GUARDIAN FOXHOLE BASE (INCLUDED). THEREFORE, THE TOP OF THE CLASS 5 COMPACTED BASE IS PRECISELY 1' 1" BELOW THE GUTTERLINE ELEVATION. THE TOP OF THE RAIN GUARDIAN FOXHOLE INLET POINT WILL BE 7-1/2" ABOVE THE TOP OF THE CONCRETE BASE AND 1-1/2" BELOW THE GUTTERLINE ELEVATION TO ACCOMMODATE A SLOPED INLET FROM THE GUTTER TO THE RAIN GUARDIAN FOXHOLE.

2. SET RAIN GUARDIAN FOXHOLE INLET FIRST, FOLLOWED BY MIDDLE SECTION(S), AND FINALLY THE OUTLET ON THE PREPARED CLASS 5 BASE. POSITION RAIN GUARDIAN FOXHOLE OUTLET PIECE SO PRIMARY OUTLET ALIGNS WITH TOE OF BASIN SIDE SLOPE TO AVOID SOIL INTERFERENCE WITH REMOVABLE FILTER WALL.

3. SECURE MODULAR FOXHOLE PIECES AT EACH JOINT USING PROVIDED GALVANIZED TIE RODS.

4. INSTALL EXPANSION/CONTRACTION JOINT MATERIAL OR A SHEET OF POLY TO SERVE AS A BOND BREAK BETWEEN RAIN GUARDIAN FOXHOLE AND CONCRETE INLET BEFORE POURING INLET.

5. REMOVABLE FILTER WALL SHOULD BE INSTALLED WITH FILTER FABRIC FACING THE RAIN GUARDIAN FOXHOLE INLET.

RAIN GUARDIAN
U.S. PATENT NOS. 8,501,016 AND 8,858,804
PRETREATMENT FOR BIORETENTION
Rain Gardens • Swales • Filtration Basins • Infiltration Basins
www.RainGuardian.biz

RAIN GUARDIAN FOXHOLE
MODULAR PRETREATMENT CHAMBER
BIORETENTION PONDING DEPTH: 9"
TYPICAL DETAIL

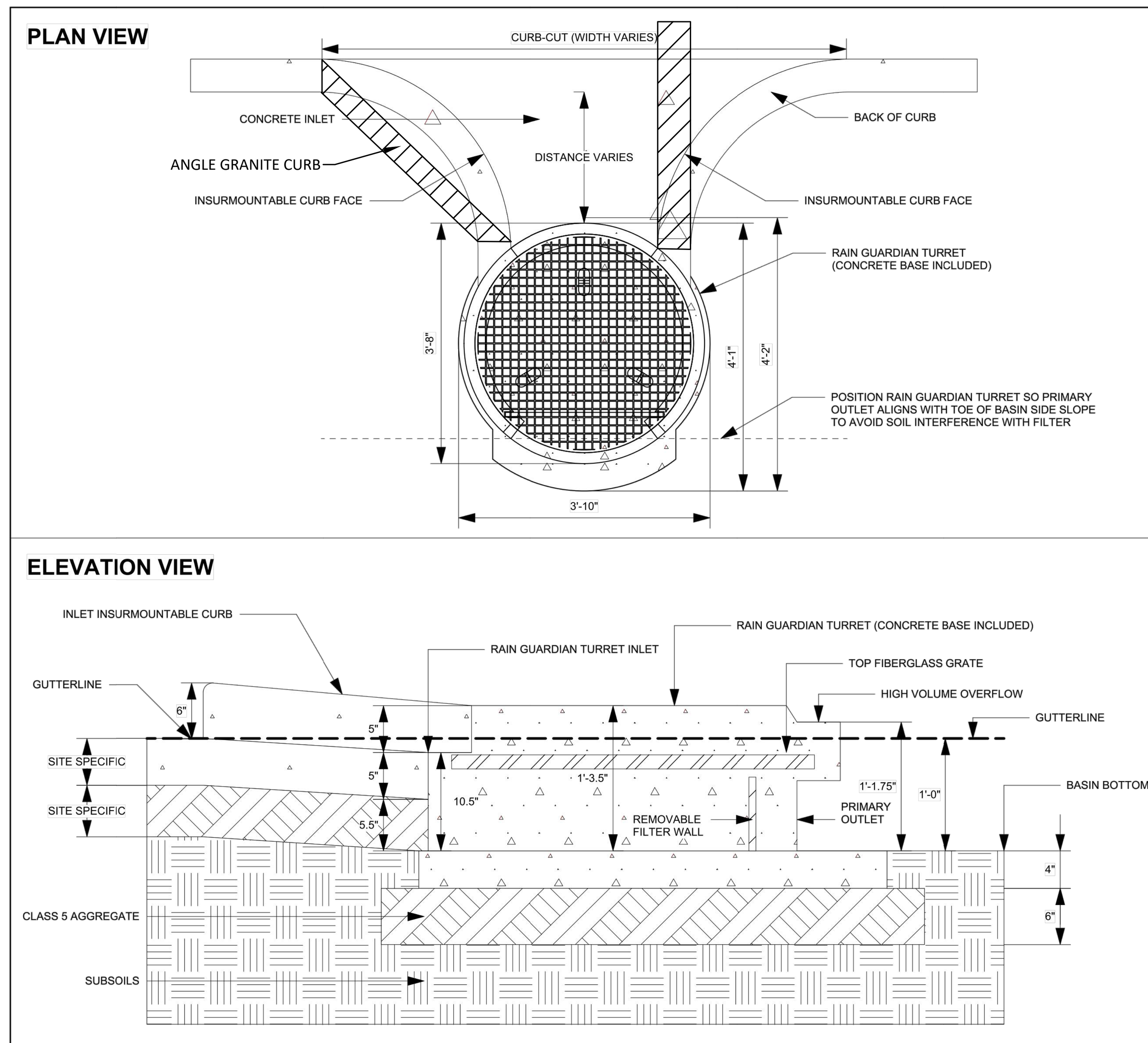
REVISION HISTORY

REV	BY	DATE	DESCRIPTION
A	MDH	11/16/2022	MODULAR FOXHOLE
SCALE		VARIABLE	
U.S. PATENT NOS.		8,501,016 AND 8,858,804	

DEVELOPED BY: ANOKA CONSERVATION DISTRICT

MANUFACTURED BY: Stoneworks ARCHITECTURAL PRECAST / CAST STONE

NATIONAL PRECAST CONCRETE ASSOCIATION CERTIFIED PLANT



PLAN VIEW NOTES
1. INLET WIDTH AND DISTANCE BETWEEN BACK OF CURB AND RAIN GUARDIAN TURRET MAY VARY WITH SITE CONDITIONS.
2. CONCRETE BASE EXTENDS BEYOND THE FILTER WALL OF THE RAIN GUARDIAN TURRET TO SERVE AS A SPLASH DISSIPATOR.

3D VIEWS

ELEVATION VIEW NOTES
1. THE TOP OF THE CLASS 5 BASE (COMPACTED TO 95% STANDARD PROCTOR) IS PRECISELY 1' 4" BELOW THE GUTTERLINE ELEVATION.

SPECIFICATIONS
1. STEEL REINFORCED, COLD JOINT SECURED MONOLITHIC CONCRETE STRUCTURE (1,030 LBS). CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,500 PSI AT 28 DAYS. CONCRETE AIR ENTRAINED (5% TO 8.5% BY VOLUME). MANUFACTURED AND DESIGNED TO ASTM C858.

2. THREE-POINT PICK USING RECESSED LIFTING POCKETS WITH A STANDARD HOOK.

3. FIBERGLASS TOP GRATE (32 LBS, 1-1/2" THICK) - 1,760 LB CONCENTRATED LOAD OR 409 LB/SQ-FT UNIFORM LOAD.

INSTALLATION NOTES
1. INSTALL THE CLASS 5 BASE (COMPACTED TO 95% STANDARD PROCTOR). THE DISTANCE FROM THE BACK OF THE CURB MAY VARY BASED ON SITE CONDITIONS, BUT CONSIDERATIONS SHOULD INCLUDE SLOPE OF THE INLET AND BASIN SIDE SLOPES ADJACENT TO THE RAIN GUARDIAN TURRET. POSITION RAIN GUARDIAN TURRET SO PRIMARY OUTLET ALIGNS WITH TOE OF BASIN SIDE SLOPE TO AVOID SOIL INTERFERENCE WITH REMOVABLE FILTER WALL. EXCAVATE 1' 10" BELOW THE GUTTERLINE ELEVATION (I.E. THE BIORETENTION OVERFLOW ELEVATION) TO ACCOMMODATE THE 1' PONDING DEPTH, 6" CLASS 5 AGGREGATE, AND 4" RAIN GUARDIAN TURRET BASE (INCLUDED). THEREFORE, THE TOP OF THE CLASS 5 COMPACTED BASE IS PRECISELY 1' 4" BELOW THE GUTTERLINE ELEVATION. THE INLET TO THE RAIN GUARDIAN TURRET WILL BE 10-1/2" ABOVE THE TOP OF THE CONCRETE BASE AND 1-1/2" BELOW THE GUTTERLINE ELEVATION TO ACCOMMODATE A SLOPED INLET FROM THE GUTTER TO THE RAIN GUARDIAN TURRET.

2. SET RAIN GUARDIAN TURRET ON THE PREPARED CLASS 5 BASE.

3. INSTALL FRAMING FOR INLET BETWEEN RAIN GUARDIAN TURRET AND BACK OF CURB. TOP ELEVATIONS OF THE FRAMING SHOULD MATCH THE TOP OF THE CURB ON THE STREET SIDE AND THE TOP OF THE RAIN GUARDIAN TURRET ON THE BIORETENTION SIDE.

4. INSTALL EXPANSION/CONTRACTION JOINT MATERIAL OR A SHEET OF POLY TO SERVE AS A BOND BREAK BETWEEN RAIN GUARDIAN TURRET AND CONCRETE INLET BEFORE POURING INLET.

5. SIDE CURBS OF THE POURED INLET MUST HAVE AN INSURMOUNTABLE PROFILE TO PREVENT WATER FLOW FROM OVERTOPPING THE DOWNSTREAM SIDE OF THE INLET.

6. REMOVABLE FILTER WALL SHOULD BE INSTALLED WITH FILTER FABRIC ON THE INTERIOR SIDE OF THE RAIN GUARDIAN TURRET.

RAIN GUARDIAN
U.S. PATENT NOS. 8,501,016 AND 8,858,804
PRETREATMENT FOR BIORETENTION
Rain Gardens • Swales • Filtration Basins • Infiltration Basins
www.RainGuardian.biz

RAIN GUARDIAN TURRET
PRETREATMENT CHAMBER
BIORETENTION PONDING DEPTH: 1'
TYPICAL DETAIL

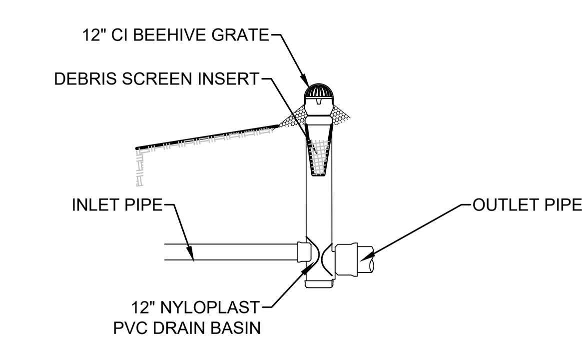
REVISION HISTORY

REV	BY	DATE	DESCRIPTION
A	MDH	11/16/2022	TURRET - 1'
SCALE		VARIABLE	
U.S. PATENT NOS.		8,501,016 AND 8,858,804	

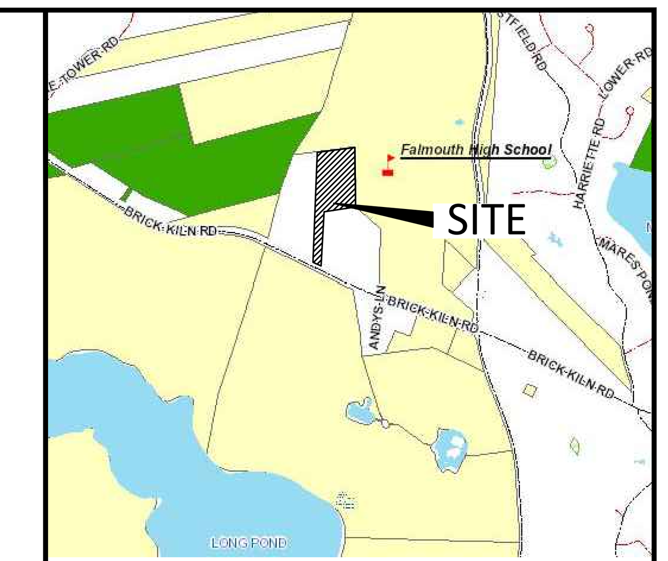
DEVELOPED BY: ANOKA CONSERVATION DISTRICT

MANUFACTURED BY: Stoneworks ARCHITECTURAL PRECAST / CAST STONE

NATIONAL PRECAST CONCRETE ASSOCIATION CERTIFIED PLANT



TYPICAl OVERFLOW (OF) DRAIN DETAIL
NOT TO SCALE



LOCUS MAP
NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

DIMENSIONS ARE AS INDICATED.

USE OF THIS PLAN CONSTITUTES ACCEPTANCE OF TERMS AND CONDITIONS SET FORTH IN ACCOMPANYING PROJECT DOCUMENTATION.

IT IS THE RESPONSIBILITY OF THE USER TO CONFIRM DISCREPANCIES WITH THE ENGINEER PRIOR TO USE.

REVISIONS

NO.	DATE	COMMENT
1	10/23/23	ISSUED FOR INTERNAL REVIEW

NOT FOR CONSTRUCTION
FOR PERMITTING
PURPOSES ONLY

PURPOSE:
SPECIAL PERMIT WITH SITE PLAN REVIEW

LOCUS:
487 BRICK KILN ROAD
WEST FALMOUTH, MA

PREPARED FOR:
the YMCA
YMCA CAPE COD

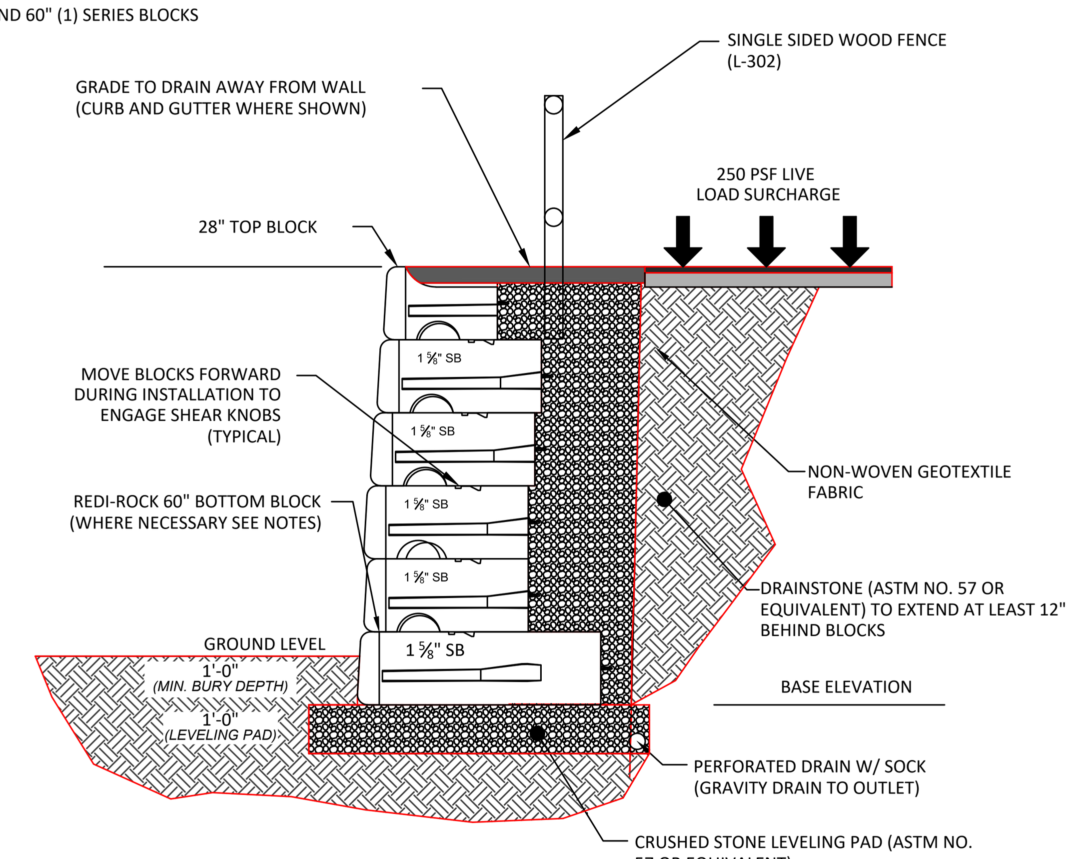
DRAWING TITLE:
DETAILS

CAD TECH:	CHECKED BY:
SDC	JDO
ENGINEER: SDC	DATE: 01/19/24
	SCALE: AS NOTED
	SHEET: C-505

COMMONWEALTH OF MASSACHUSETTS
STUART D. CLARK
CIVIL
No. 40697
REGISTERED PROFESSIONAL ENGINEER

S:\CLIENTS\YMCA – CAPE COD\YMCA–2020–0004 (FALMOUTH)\CAD\00 SITE PLANS.DWG 1/8/2024 11:21 AM

PRELIMINARY DESIGN NOTES:
DENSE WELL GRADED SAND, SAND & GRAVEL -
INTERNAL ANGLE OF FRICTION (Φ) = 34°
CONDITION B - NO BACK SLOPE, NO FRONT SLOPE, 250
PSF LIVE LOAD SURCHARGE
12'-0" STANDARD BATTER WALL
41" AND 60" (1) SERIES BLOCKS



DETAIL PROVIDED BY:

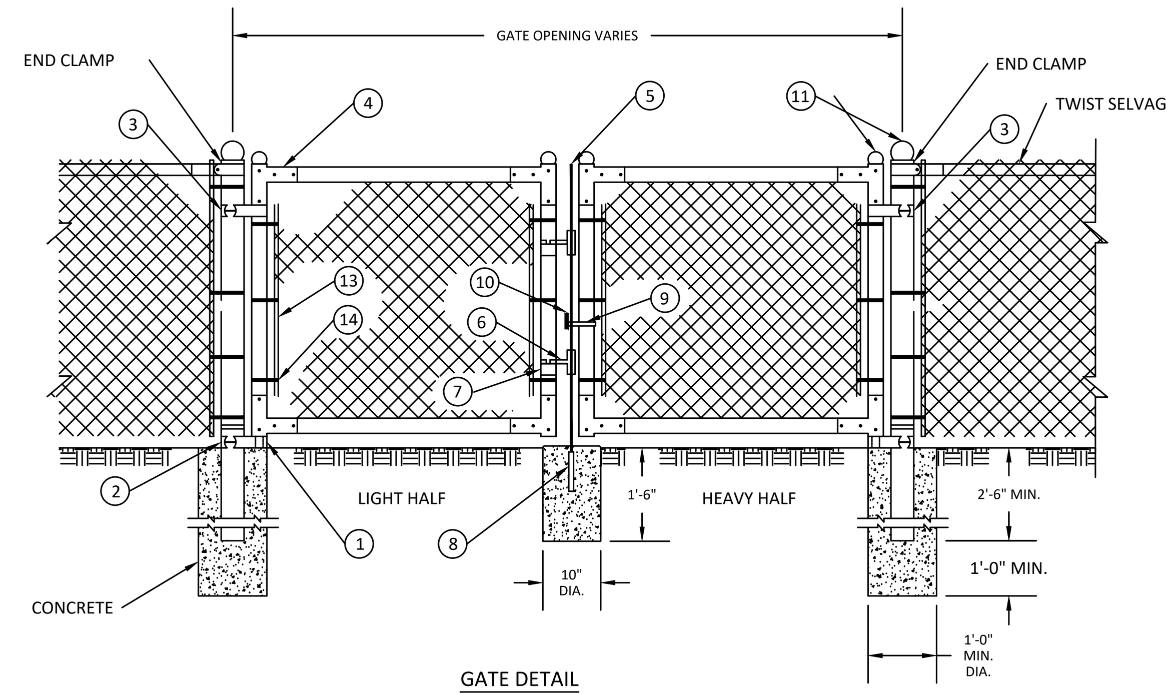
REDI-ROCK™ INTERNATIONAL LLC
05481 US 31 SOUTH CHARLEVOIX, MI 49720
866-222-8400 • 231-237-9521 Fax • www.redi-rock.com

PRELIMINARY SECTION

• THIS DRAWING PROVIDED BY REDIROCK INTERNATIONAL AND IS FOR REFERENCE ONLY. DESIGN PARAMETERS, BLOCK SIZE, BLOCK CONFIGURATION ARE SUBJECT TO THE STRUCTURAL ENGINEER AT NOT ADDITION COST TO THE PROJECT.
• FINAL DESIGNS FOR CONSTRUCTION MUST BE PROVIDED BY THE CONTRACTOR AND PREPARED BY A REGISTERED PROFESSIONAL STRUCTURAL ENGINEER USING THE ACTUAL CONDITIONS OF THE PROPOSED SITE.
• FINAL WALL DESIGN MUST ADDRESS BOTH INTERNAL AND EXTERNAL DRAINAGE AND SHALL BE EVALUATED BY THE PROFESSIONAL ENGINEER WHO IS RESPONSIBLE FOR THE WALL DESIGN.

TYPICAL SEGMENTAL CONCRETE BLOCK RETAINING WALL DETAIL

NOT TO SCALE

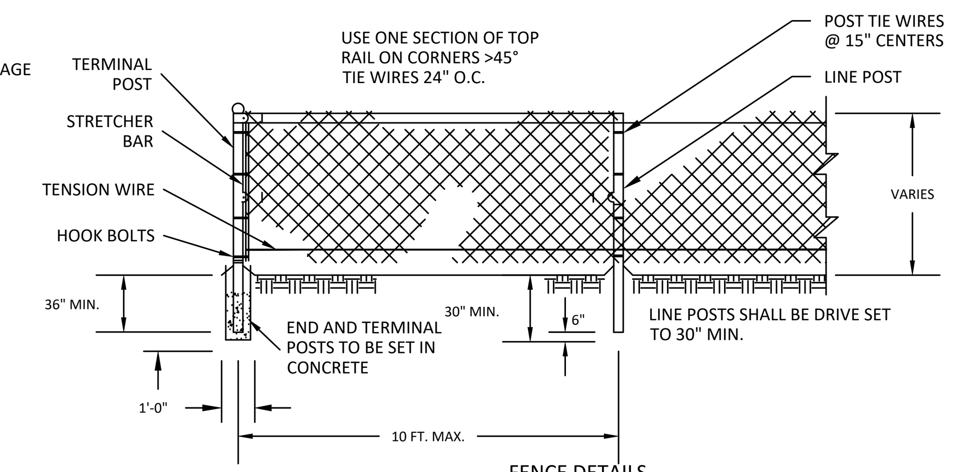


GATE DETAIL

LEGEND

PART NO.	DESCRIPTION	QUANTITY
1	STRAIGHT PLUG	2
2	BOTTOM HINGE	2
3	TOP HINGE	2
4	CORNER ELBOW	8
5	PLUNGER ROD	1
6	LATCH FORK	2
7	FORK CATCH	2
8	PLUNGER ROD CATCH	1
9	LOCK KEEPER GUIDE	1
10	LOCK KEEPER	1
11	ORNAMENTAL TOPS	6
12	TRUSS RODS	4
13	STRETCHER BAR	4
14	HOOK BOLTS	12

NOTE:
THE FENCING FABRIC, SHALL BE #9 GAGE GALVANIZED WITH STANDARD 2-INCH MESH SIZE OPENINGS. ALL POST AND RAILS SHALL BE GALVANIZED TO MATCH FABRIC



FENCE DETAILS

SHAPE, SIZE AND WEIGHT REQUIREMENTS FOR FENCE POSTS AND RAILS			
ITEM	SHAPE	OUTSIDE DIMENSIONS INCHES	WEIGHT LBS./LIN. FT.
** TERMINAL POSTS	ROUND *ROUND	2.375 2.375	3.65 3.12
LINE POSTS	ROUND *ROUND	1.90 1.90	2.72 2.28
TOP & BRACE RAILS	ROUND *ROUND	1.66 1.66	2.27 1.84
* GRADE B HIGH STRENGTH STEEL ** INCLUDES END, CORNER, ANGLE, INTERSECTION AND INTERMEDIATE BRACED POSTS			

GATE FRAME MEMBERS SIZE AND WEIGHT		
GATE FRAME	OUTSIDE DIMENSIONS INCHES	WEIGHT LBS./LIN. FT.
ROUND *ROUND	1.66 1.66	2.27 1.84
* GRADE B HIGH STRENGTH STEEL		

GATE POST SIZE AND WEIGHT		
GATE LEAF WIDTH OF 6 FT. OR LESS	OUTSIDE DIMENSIONS INCHES	WEIGHT LBS./LIN. FT.
ROUND *ROUND	2.875 2.875	5.79 4.64
* GRADE B HIGH STRENGTH STEEL		

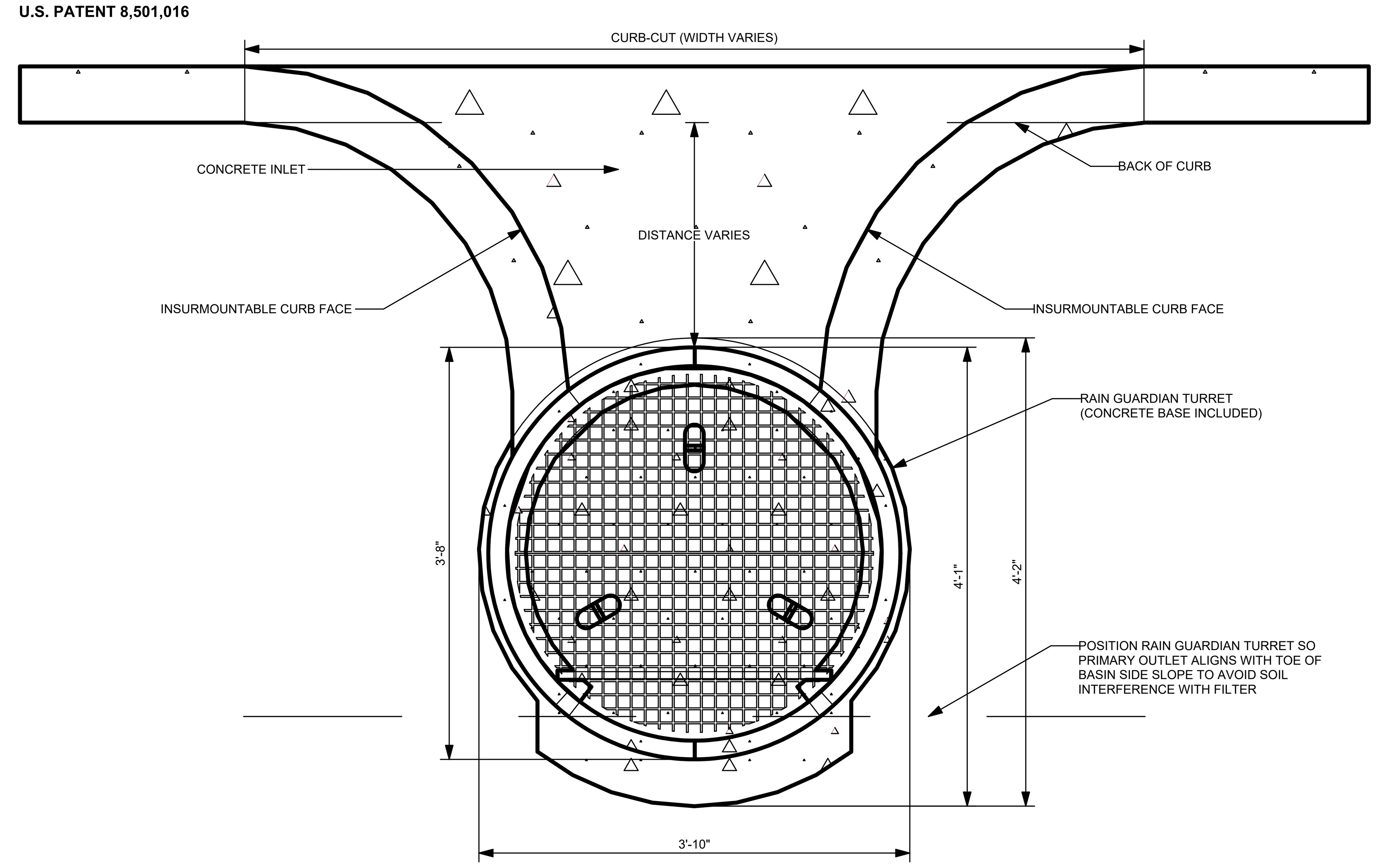
CONSTRUCTION NOTES

1. MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE MANUFACTURER'S SPECIFICATIONS.
2. ALL POSTS SHALL BE INSTALLED VERTICALLY. WHERE POSTS ARE INSTALLED ON AN INCLINED SURFACE, THE ANGLE OF THE POST SHALL BE ADJUSTED SO THAT THE POST WILL BE VERTICAL.
3. THE FENCING SHALL BE #9 GAGE FENCE FABRIC, STANDARD 2-INCH CHAIN LINK DIAMOND MESH.

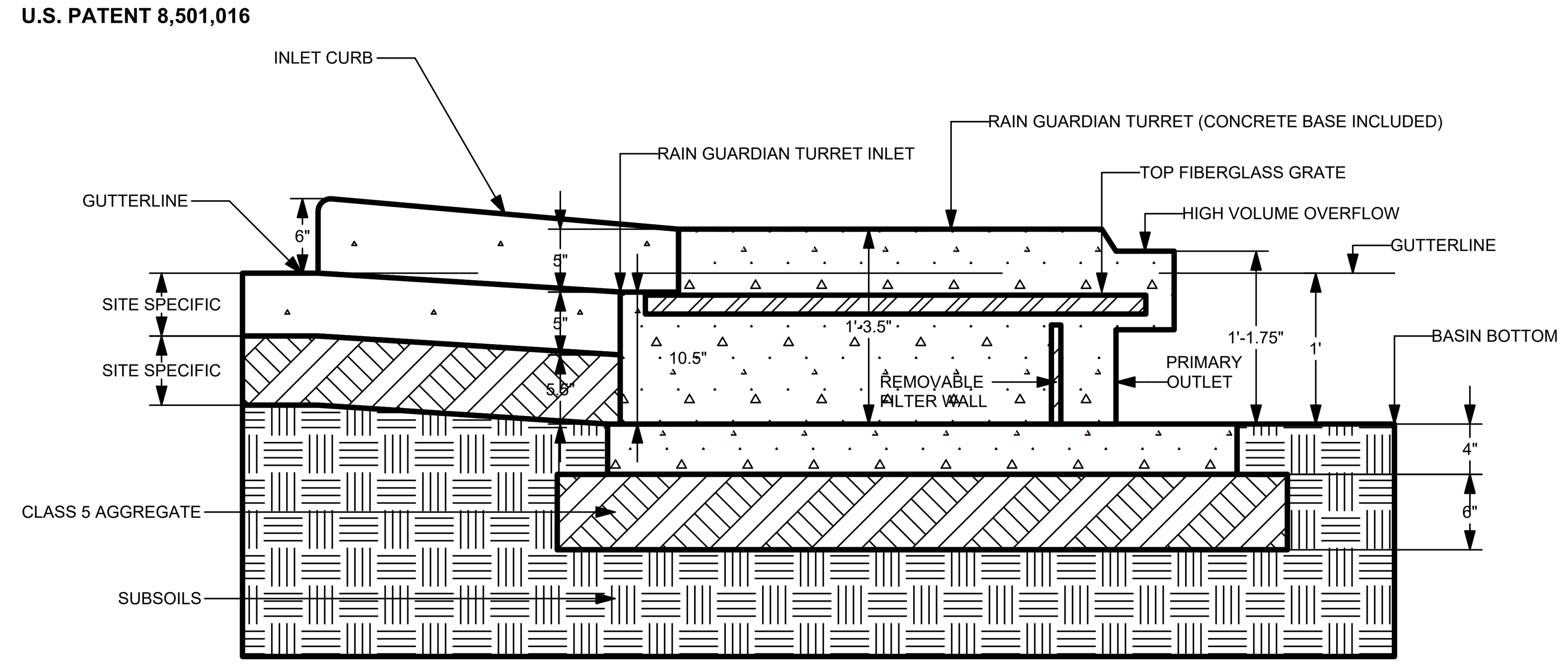
CHAIN LINK FENCE DETAIL

NOT TO SCALE

RAIN GUARDIAN TURRET PLAN VIEW
U.S. PATENT 8,501,016



RAIN GUARDIAN TURRET CROSS-SECTION VIEW
U.S. PATENT 8,501,016



TURRET STORMWATER DEVICE

NOT TO SCALE

LOCUS MAP
NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

REVISIONS

NO.	DATE	COMMENT
1	10/23/23	ISSUED FOR INTERNAL REVIEW

NOT FOR CONSTRUCTION
FOR PERMITTING
PURPOSES ONLY

PURPOSE:
SPECIAL PERMIT WITH SITE PLAN REVIEW

LOCUS:
487 BRICK KILN ROAD
WEST FALMOUTH, MA

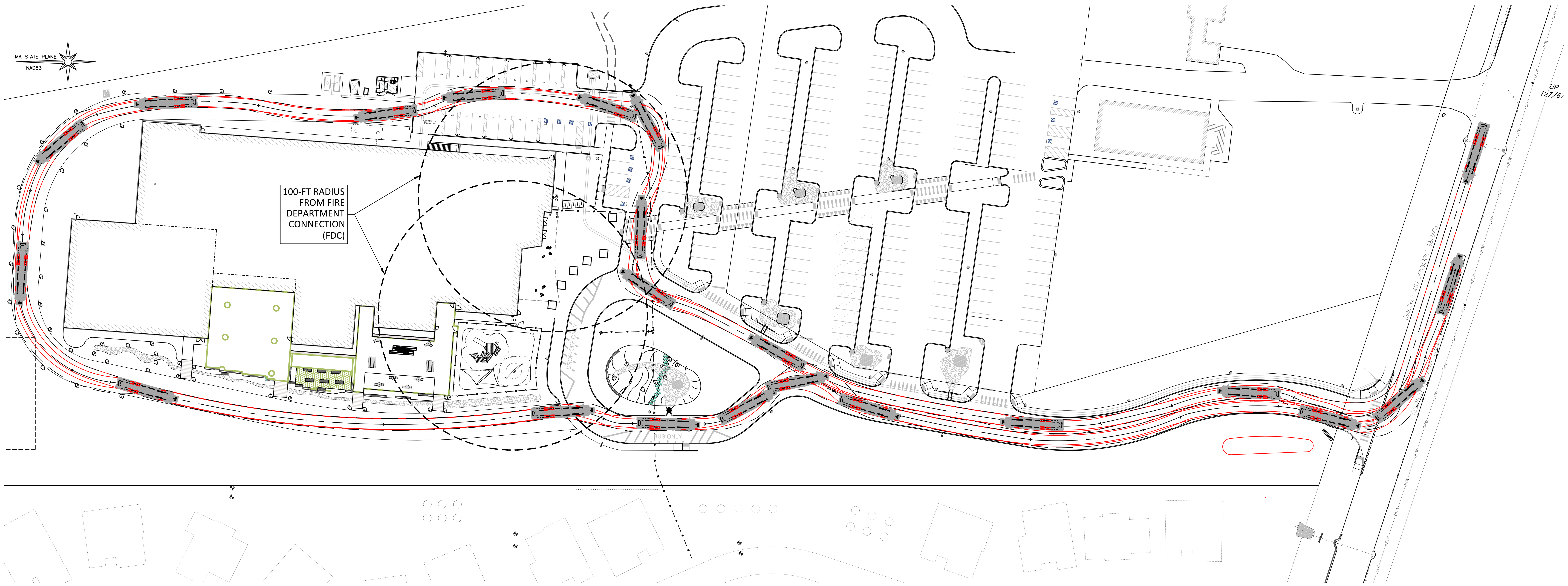
PREPARED FOR:
YMCA
CAPE COD

DRAWING TITLE:
DETAILS

CAD TECH:	CHECKED BY:
SDC	JDO
ENGINEER:	DATE:
SDC	01/19/24
	SCALE: AS NOTED
	SHEET: C-506

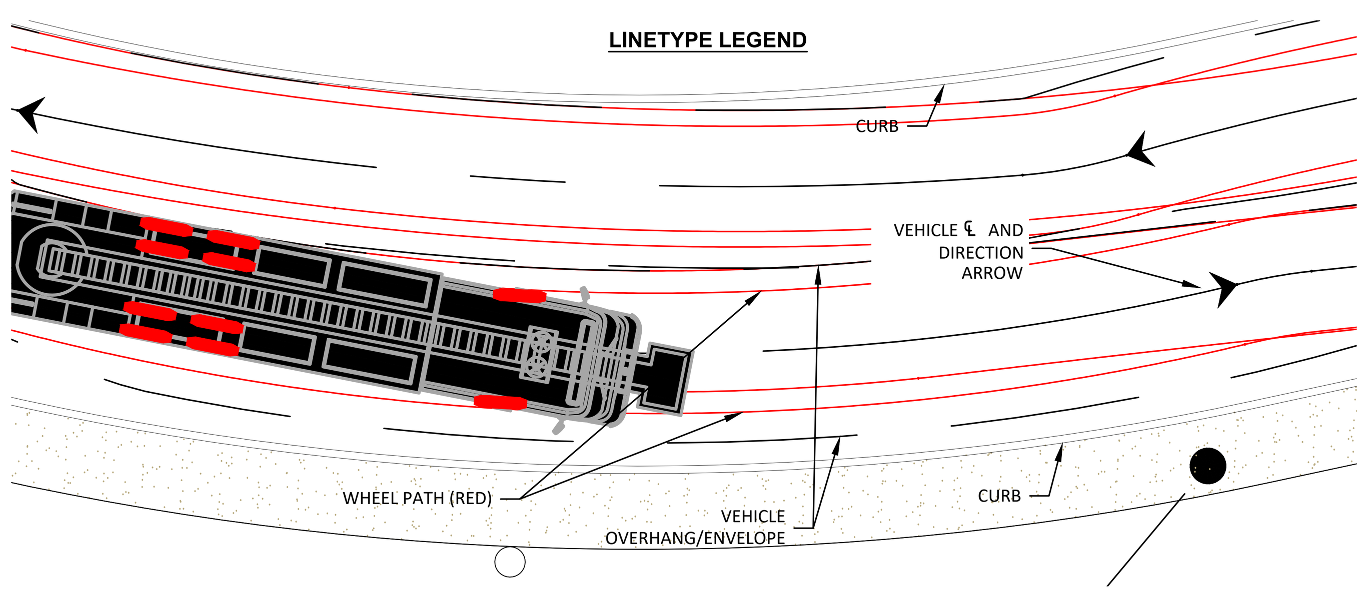
COMMONWEALTH OF MASSACHUSETTS
STUART D. CLARK
CIVIL
No. 40697
REGISTERED PROFESSIONAL ENGINEER

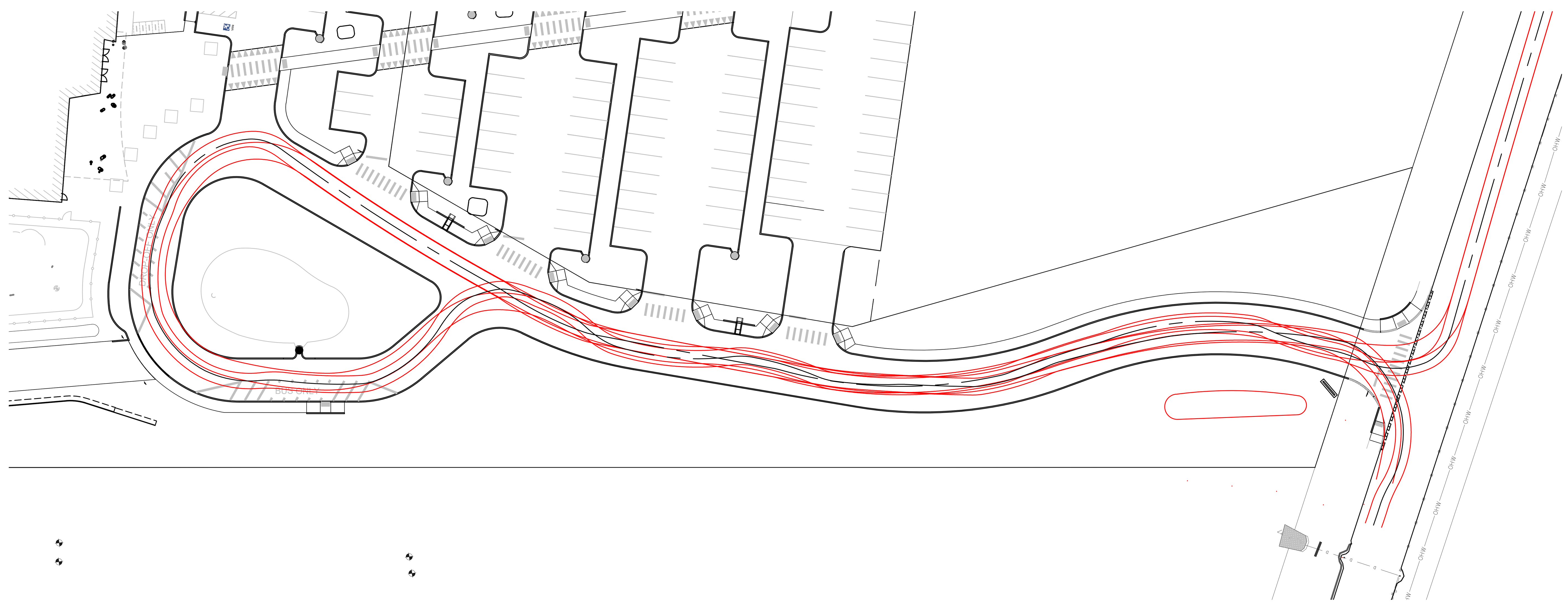
S:\CLIENTS\YMCA - CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAD\00 SITE PLANS.DWG 1/8/2024 11:21 AM



SIMULATION #1 (BUILDING LOOP)

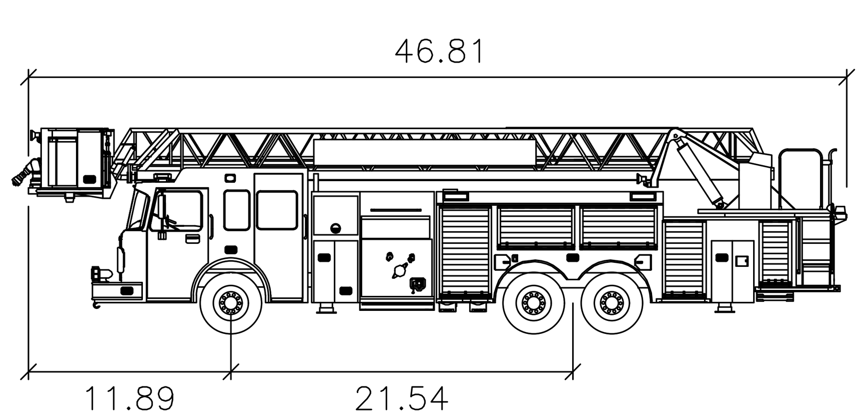
1"=40'





SIMULATION #2 (BUS LOOP)

1"=40'



MFPD 100' Aerial Platform Pierce Arrow XT

feet

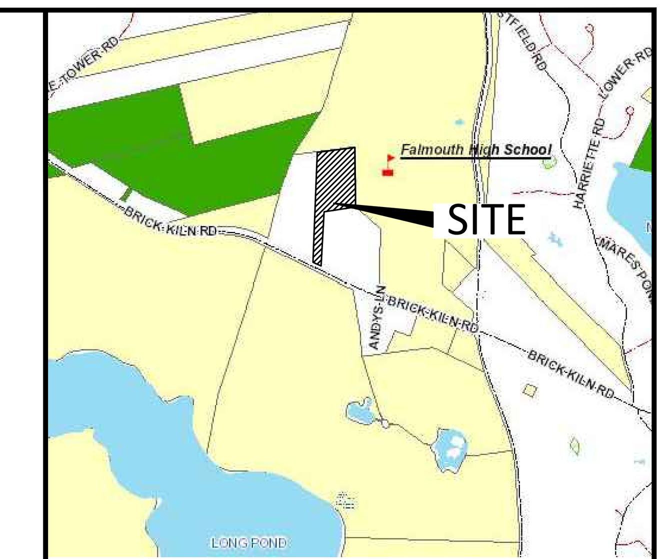
Width : 8.00
Track : 8.00
Lock to Lock Time : 6.0
Steering Angle : 45.0

VEHICLE TRACKING SIMULATIONS WERE DEVELOPED USING AUTOTURN SOFTWARE

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.



LOCUS MAP

NOT TO SCALE

GREEN SEAL ENVIRONMENTAL, LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

REVISIONS

NO.	DATE	COMMENT
1	10/23/23	ISSUED FOR INTERNAL REVIEW

NOT FOR CONSTRUCTION
FOR PERMITTING
PURPOSES ONLY

PURPOSE:

SPECIAL PERMIT WITH SITE PLAN REVIEW

LOCUS:

487 BRICK KILN ROAD
WEST FALMOUTH, MA

PREPARED FOR:

YMCA
CAPE COD

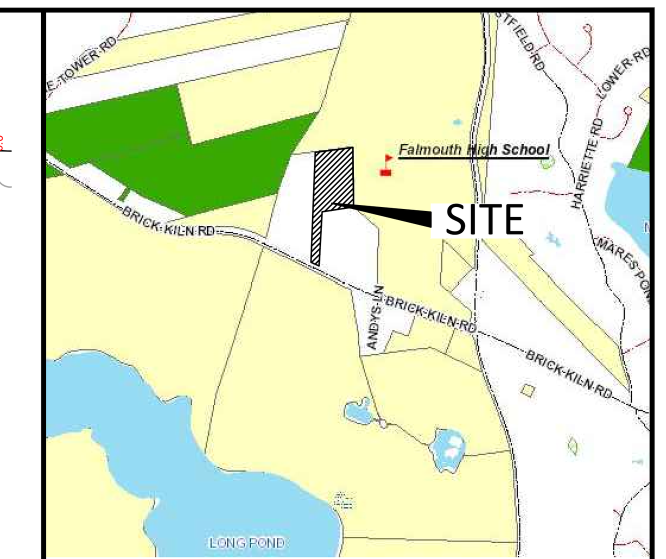
DRAWING TITLE:

SWEPT PATH PLAN

CAD TECH:	CHECKED BY:
SDC	JDO
ENGINEER:	DATE:
SDC	01/19/24
	SCALE: 1"=40'
	SHEET: F-100

COMMONWEALTH OF MASSACHUSETTS
STUART D. CLARK
CIVIL
No. 40697
REGISTERED PROFESSIONAL ENGINEER

S:\CLIENTS\YMCA - CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAD\00 SITE PLANS.DWG 1/8/2024 11:21 AM



LOCUS MAP

NOT TO SCALE

GREEN SEAL ENVIRONMENTAL,LLC
114 STATE ROAD, BUILDING B
SAGAMORE BEACH, MA 02562
TEL: 508-888-6034
FAX: 508-888-1506
WWW.GSEENV.COM

DIMENSIONS ARE AS INDICATED.

USE OF THIS PLAN CONSTITUTES ACCEPTANCE OF TERMS AND CONDITIONS SET FORTH IN ACCOMPANYING PROJECT DOCUMENTATION.

IT IS THE RESPONSIBILITY OF THE USER TO CONFIRM DISCREPANCIES WITH THE ENGINEER PRIOR TO USE.

REVISIONS

NO.	DATE	COMMENT
1	10/23/23	ISSUED FOR INTERNAL REVIEW

NOT FOR CONSTRUCTION
FOR PERMITTING
PURPOSES ONLY

PURPOSE:

SPECIAL PERMIT WITH SITE PLAN REVIEW

LOCUS:

487 BRICK KILN ROAD
WEST FALMOUTH, MA

PREPARED FOR:

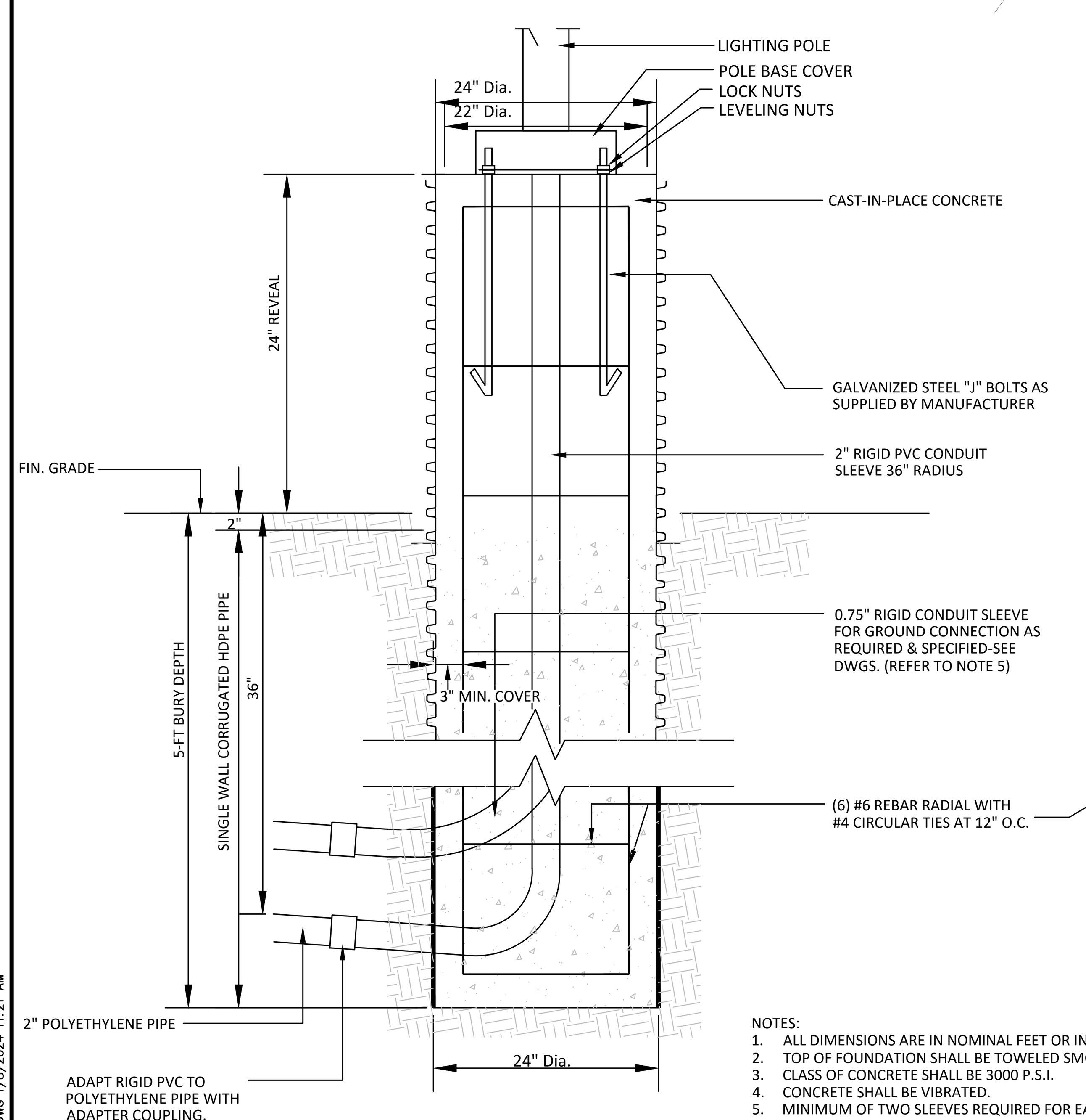
YMCA CAPE COD

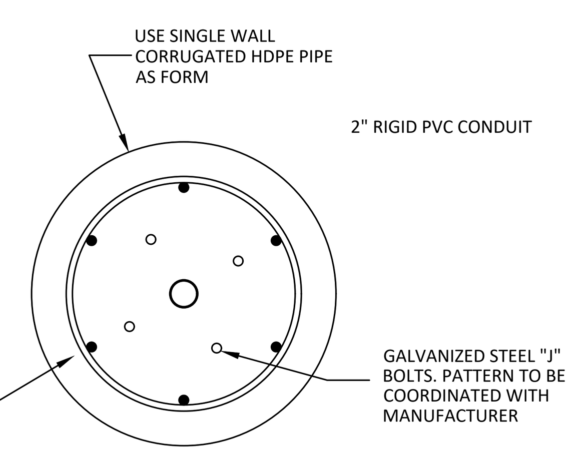
DRAWING TITLE:

LIGHTING PLAN

CAD TECH:	CHECKED BY:
SDC	JDO
ENGINEER: SDC	DATE: 01/19/24
	SCALE: 1"=30'
	SHEET: EL-100

COMMONWEALTH OF MASSACHUSETTS STUART D. CLARK CIVIL No. 40697 REGISTERED PROFESSIONAL ENGINEER



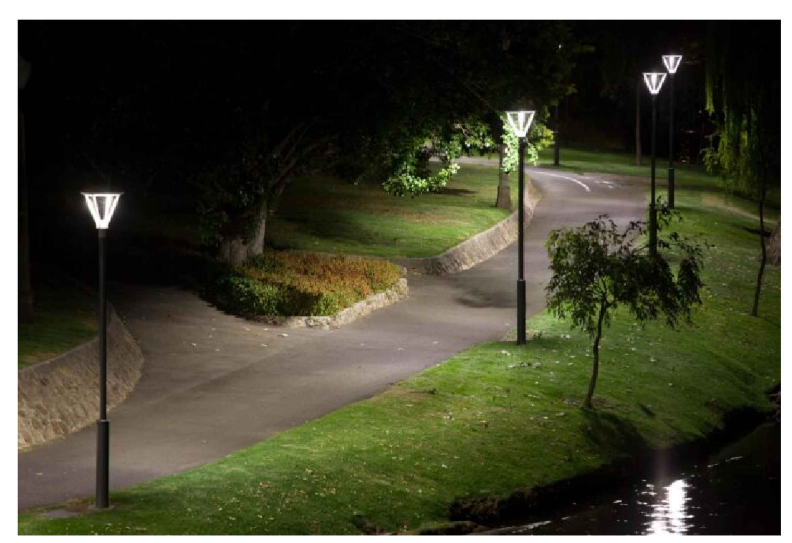


TOP VIEW

NOTES:
1. ALL DIMENSIONS ARE IN NOMINAL FEET OR INCHES
2. TOP OF FOUNDATION SHALL BE TOWELED SMOOTH & LEVEL.
3. CLASS OF CONCRETE SHALL BE 3000 P.S.I.
4. CONCRETE SHALL BE VIBRATED.
5. MINIMUM OF TWO SLEEVES REQUIRED FOR EACH CONC. FOUNDATION UNLESS OTHERWISE SHOWN.
6. PROVIDE GROUND ROD ADJACENT TO POLES IN ACCORDANCE WITH NEC CODE.
7. CONTRACTOR TO VERIFY OPENING SIZE IN POLE BASE PLATE PRIOR TO SETTING CONDUIT SLEEVES.
8. PRECAST CONCRETE BASES MAY BE SUBSTITUTED.

LIGHT POLE BASE DETAIL

SCALE: NTS

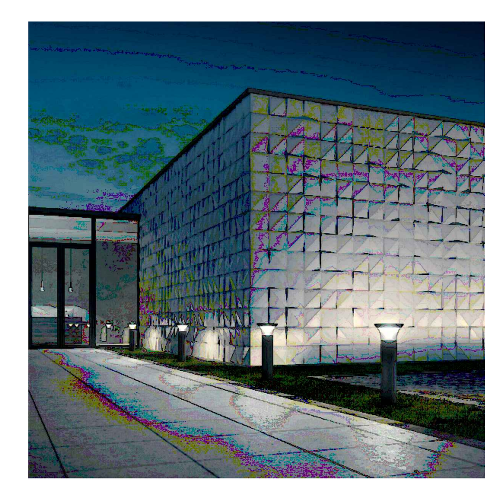


AREA LIGHT IMAGE

SCALE: NTS

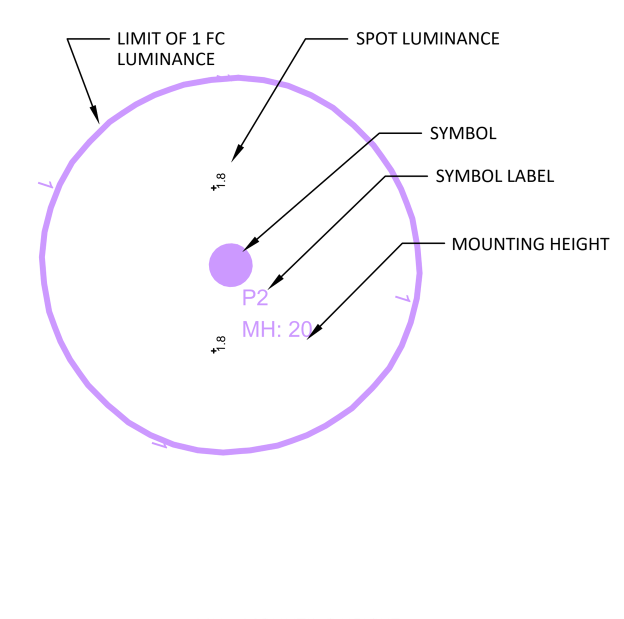
WALLPACK IMAGE

SCALE: NTS



BOLLARD IMAGE

SCALE: NTS



SYMBOL LEGEND

SCALE: NTS

Luminaire Schedule

Symbol	Qty	Label	Arrangement	Lum. Lumens	LLF	Description	MANUFACTURER	Lum. Watts	Total Watts
	4	B	Single	1838	0.900	99856K4_BEGA_IES	BEGA, OR EQUAL	19.8	79.2
	13	P2	Single	10405	0.900	ARE-EDR-5M-x-8L-E-UL-x- 350mA-x	CREE EDGE SERIES, OR EQUAL	90	1170
	2	P1	Single	9891	0.900	ARE-EDR-4M-x-8L-E-UL-x- 350mA-x	CREE EDGE SERIES, OR EQUAL	90	180
	11	P3	Single	9891	0.900	ARE-EDR-2M-x-8L-E-UL-x- 350mA-x	CREE EDGE SERIES, OR EQUAL	90	990
	2	WP	Single	4270	0.900	XSPW-B-xx-2ME-4L-40K-UL	KITCHNER 11310BKTLED, OR EQUAL	31	62

Calculation Summary

Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
PL	Illuminance	Fc	0.12	2.7	0.0	N.A.	N.A.
Site	Illuminance	Fc	1.46	23.4	0.1	14.60	234.00
Parking-Drive	Illuminance	Fc	1.47	3.0	0.5	2.94	6.00

EXHIBIT 25

ARCHITECTURAL PLANS AND RENDERINGS

VIEW FROM FRONT APPROACH

Revisions		
Issue Date:	Description	Issued To
	SCHEMATIC DESIGN	July 11, 2023

RENDERED VIEWS

Scale:
Drawn By: Author
Checked By: Checker
Date: July 11, 2023
Project #: 11.6122.007

Falmouth YMCA
487 Brick Kiln Rd, Falmouth, MA

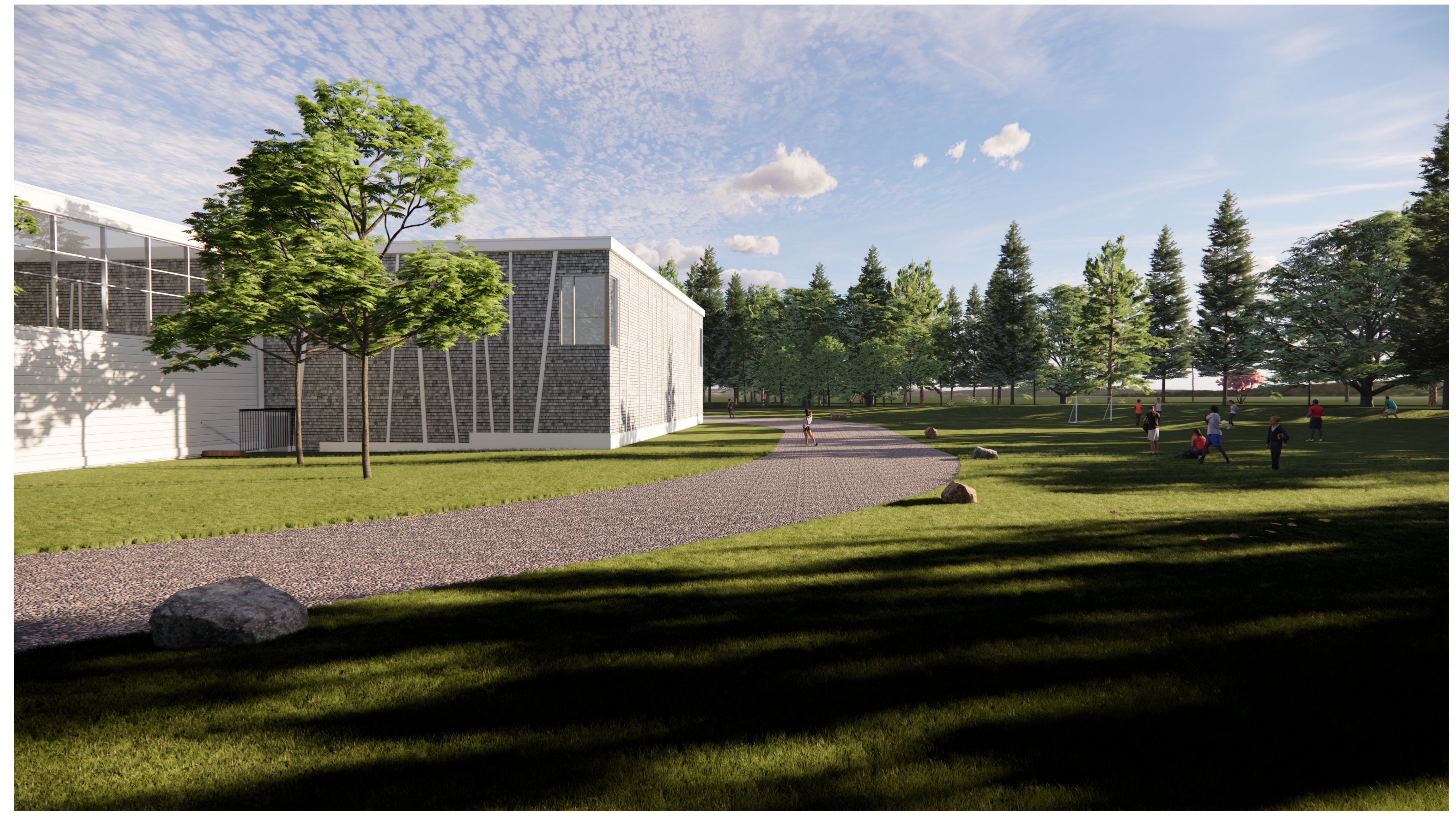
SV DESIGN 126 Dodge Street Beverly, MA 01915 www.svdesign.com t 978.927.3745

SV DESIGN

RENDERED VIEWS

P1.0

VIEW UNDER ENTRY CANOPY


VIEW TOWARDS BACK OF GYM & OPEN FIELD


VIEW TOWARDS ACTIVITY YARDS


VIEW TOWARDS POOL

Issue Date:	Description	Issued To
July 11, 2023	SCHEMATIC DESIGN	

Revisions

RENDERED VIEWS

Scale:
Drawn By: Author
Checked By: Checker
Date: July 11, 2023
Project #: 11.6122.007

Falmouth YMCA
487 Brick Kiln Rd, Falmouth, MA

SV DESIGN 126 Dodge Street Beverly, MA 01915 www.svdesign.com t 978.927.3745

SV DESIGN

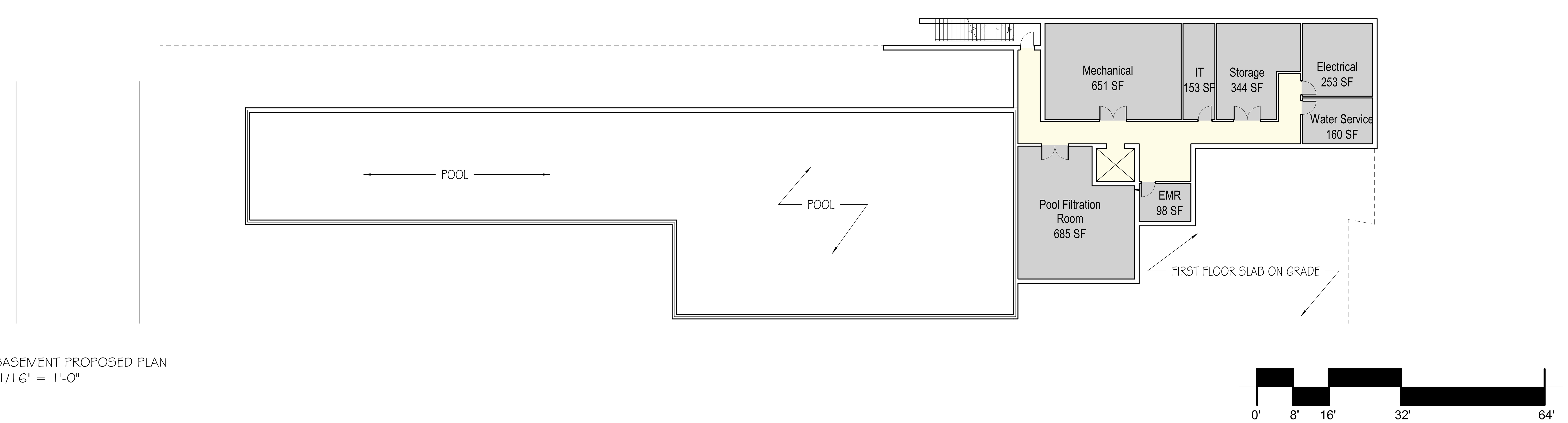
RENDERED VIEWS

P1.1

AREAS:

BASEMENT GROSS AREA:	3,355 SF
FLOOR 1 GROSS AREA:	43,755 SF
FLOOR 2 GROSS AREA:	21,360 SF
TOTAL GROSS AREA:	68,470 SF

1 FLOOR 1 PROPOSED PLAN WITH PHASES
1/16" = 1'-0"



2 BASEMENT PROPOSED PLAN
1/16" = 1'-0"

Revisions
Issue Date: | Description: SCHEMATIC DESIGN | July 11, 2023 | Issued To

PHASED FLOOR PLAN - LEVEL 1

Scale: 1/16" = 1'-0"
Drawn By: Author
Checked By: Checker
Date: July 11, 2023
Project #: 11.6122.007

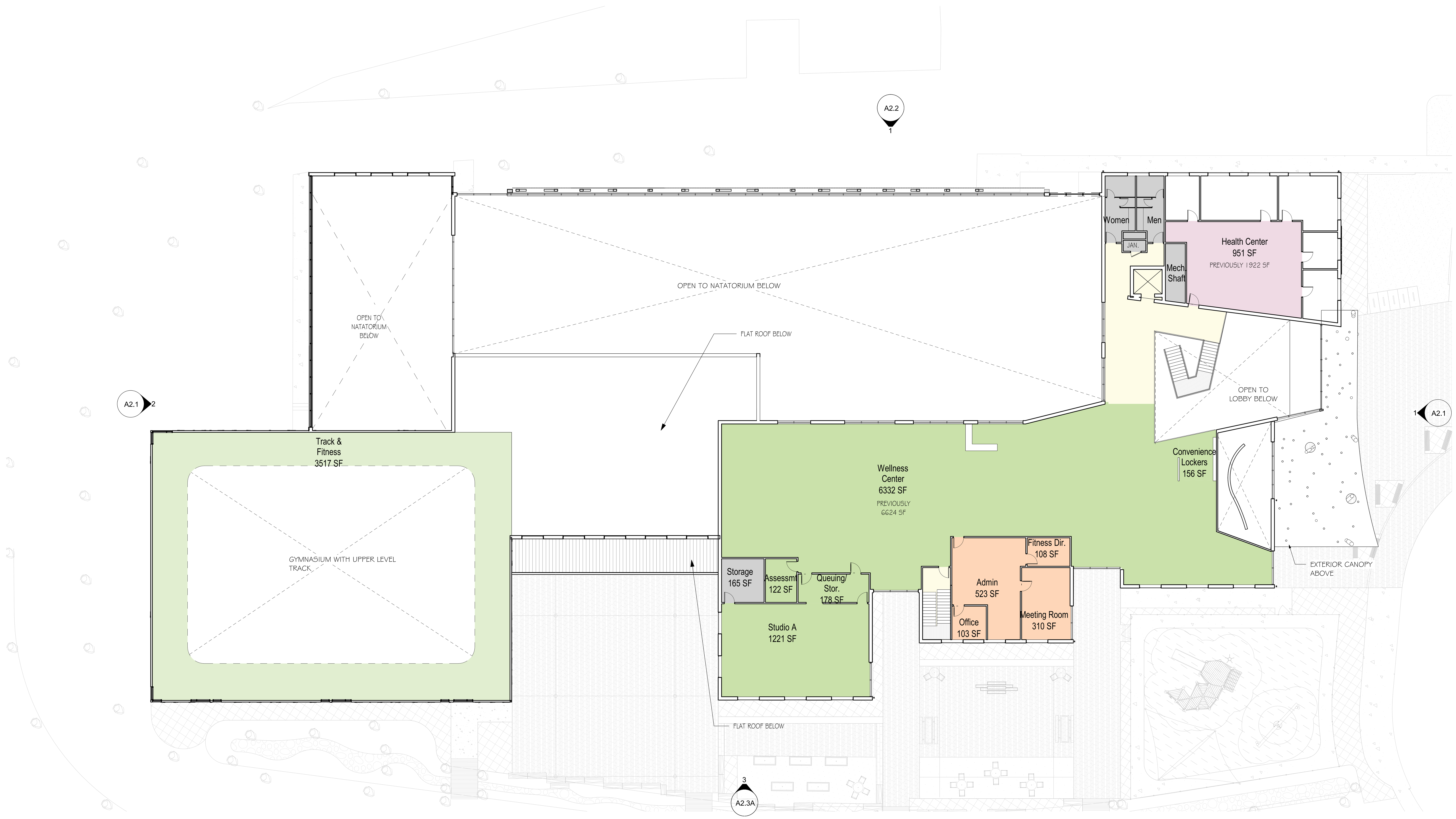
Falmouth YMCA
487 Brick Kiln Rd, Falmouth, MA

SV DESIGN 126 Dodge Street Beverly, MA 01915 www.svdesign.com t 978.927.3745

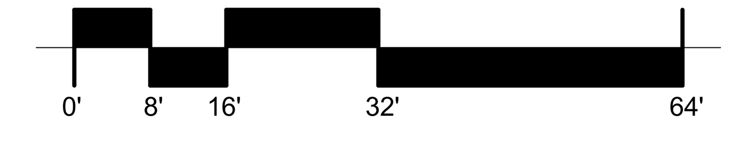
SV DESIGN

PHASED FLOOR PLAN - LEVEL 1

A1.01



1 FLOOR 2 PROPOSED PLAN WITH PHASES
1/16" = 1'-0"



Revisions
Issue Date: July 11, 2023
Description: SCHEMATIC DESIGN
Issued To

PHASED FLOOR PLAN - LEVEL 2

Scale: 1/16" = 1'-0"
Drawn By: Author
Checked By: Checker
Date: July 11, 2023
Project #: 11.6122.007

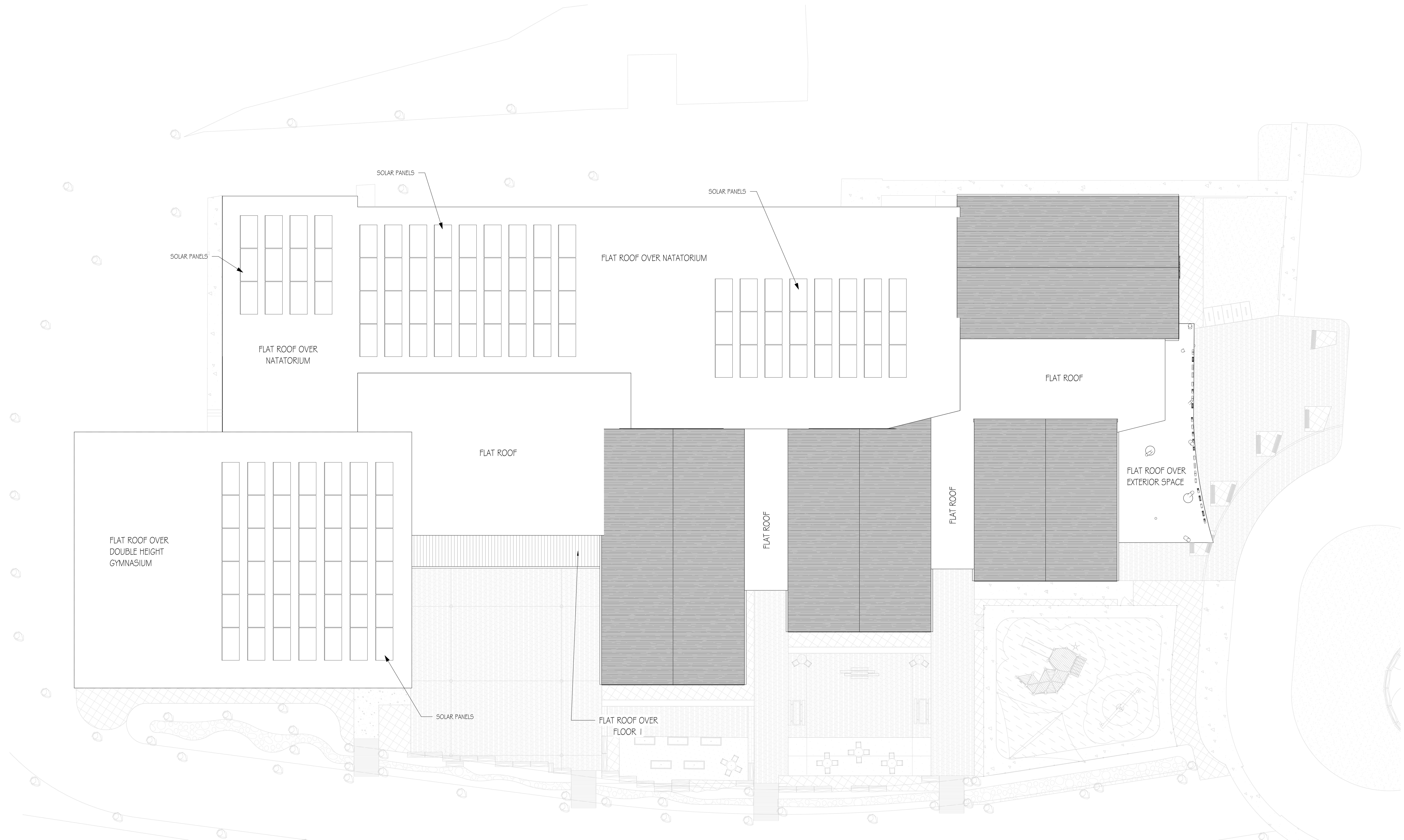
Falmouth YMCA
487 Brick Kiln Rd, Falmouth, MA

SV DESIGN 126 Dodge Street Beverly, MA 01915 www.svdesign.com t 978.927.3745

SV DESIGN

PHASED FLOOR PLAN - LEVEL 2

A1.02



1 ROOF PLAN
1/16" = 1'-0"

0' 8' 16' 32' 64'

Ref. North

Revisions

Issue	Date:	Description	Issued To
	July 11, 2023	SCHEMATIC DESIGN	

ROOF PLAN

Scale: 1/16" = 1'-0"
Drawn By: KR
Date: July 11, 2023
Checked By: JH
Project #: 11.6122.007

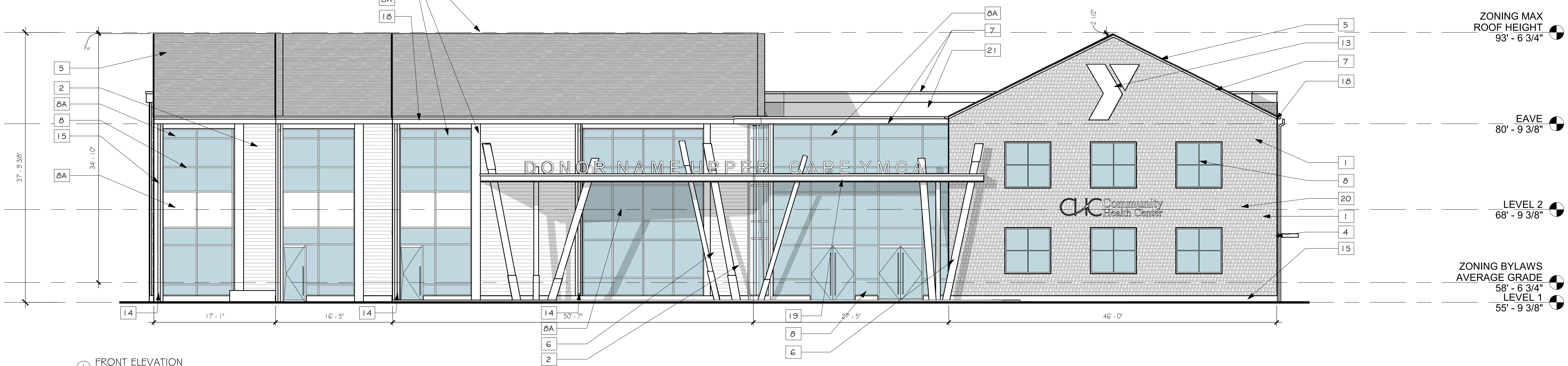
Falmouth YMCA
487 Brick Kiln Rd, Falmouth, MA

SV DESIGN 126 Dodge Street Beverly, MA 01915 www.svdesign.com t 978.927.3745

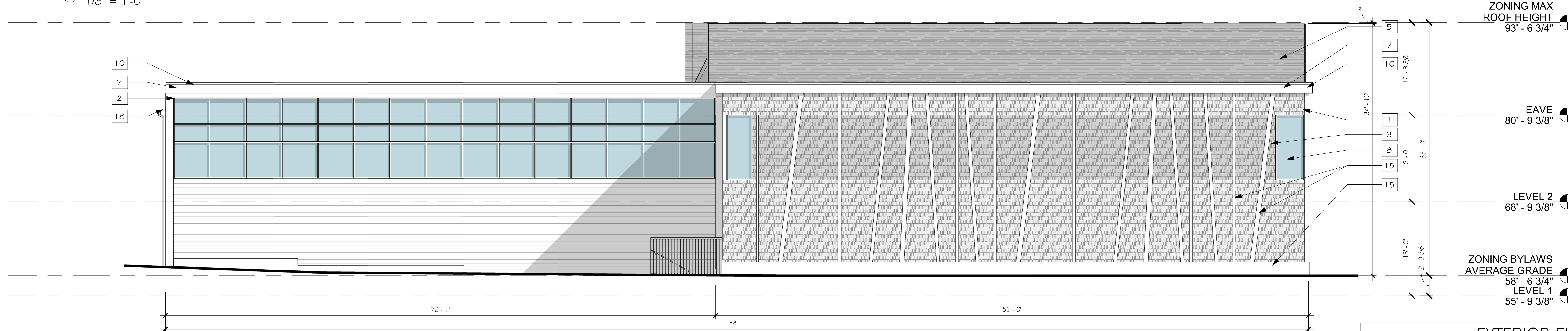
SV DESIGN

ROOF PLAN

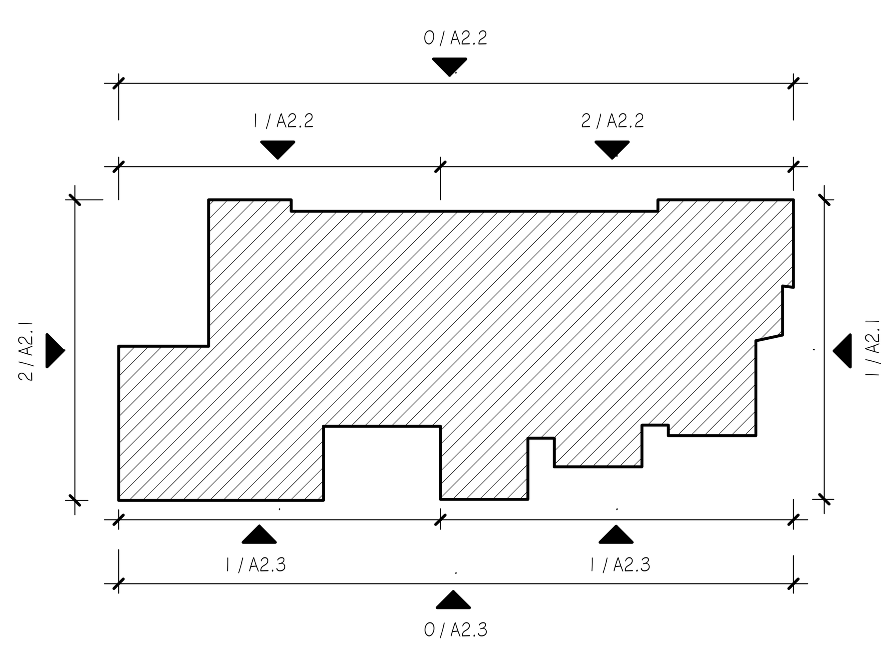
A1.03



1 FRONT ELEVATION
1/8" = 1'-0"



2 BACK ELEVATION
1/8" = 1'-0"



Elevation Key Plan
1" = 80'-0"

MATERIAL COLOR IMAGES

GAF TIMBERLINE FOX HOLLOW GRAY ROOF SHINGLES

HARDIE SHINGLE SIDING - ANOINTED GRAY

HARDIE LAP SIDING - ARCTIC WHITE

EXTERIOR FINISHES

	TYPE	MANUFACTURER	STYLE / COLOR
1	CEMENTITIOUS SHINGLE SIDING 6"	JAMES HARDIE	ANOINTED GRAY 0603
2	CEMENTITIOUS LAP SIDING 6"	JAMES HARDIE	ARCTIC WHITE
3	CEMENTITIOUS SHINGLE SIDING 6"	JAMES HARDIE	MONTEREY TAUPE
4	XTREME TRIM CORNER REVEAL	XTREME TRIM	ANODIZED ALUMINUM
5	ASPHALT SHINGLE ROOF	GAF ARCHITECTURAL SERIES	FOX HOLLOW GRAY
6	ROUND WOOD SLANTED COLUMNS WITH METAL BASE		WOOD FINISH WITH COLORED METAL BASE
7	1X PVC FASCIA BOARD WITH DRIP EDGE		TO MATCH SHINGLE SIDING COLOR
8	ALUMINUM STOREFRONT SYSTEM	KAWNEER	ANODIZED ALUMINUM. GLASS BY OLD CASTLE GLASS - SOLARBAN 70 CLEAR
8A	SPANDREL GLASS PANEL	OLD CASTLE GLASS	WARM GRAY
9	EXTERIOR PAINTED METAL DOOR		TO MATCH SIDING COLOR
10	TPO FLAT ROOF	FIRESTONE OR EQUAL	WHITE
11	SCREENING SYSTEM, METAL (PERFORATED)	HENDRICK PERFORATED METAL PANELS	WHITE
12	12" X 18" ANGLED COLUMNS		WHITE
13	EDGELIT STAINLESS STEEL YMCA LOGO		BY OWNER
14	DOWNSPOUT		GRAY
15	5/4 X PVC TRIM	AZEK	WHITE
16	EXTERIOR SIGNAGE - PREFINISHED METAL		DARK BLUE
17	STANDING SEAM METAL ROOF	FIRESTONE UNA-CLAD	SLATE GRAY
18	HALF ROUND 7" GUTTER	LEAD COATED COPPER GUTTER	GRAY
19	FLAT ROOF WITH WOOD UNDERSIDE		TBD
20	CAPE COD HEALTH CENTER SIGN	TBD	TBD
21	CEMENTITIOUS SMOOTH PANEL SIDING	JAMES HARDIE	ARCTIC WHITE

Revisions
Issue Date: July 11, 2023
Description: SCHEMATIC DESIGN
Issued To

ELEVATIONS

Scale: As indicated
Drawn By: Author
Date: July 11, 2023
Checked By: Checker
Project #: 11.6122.007

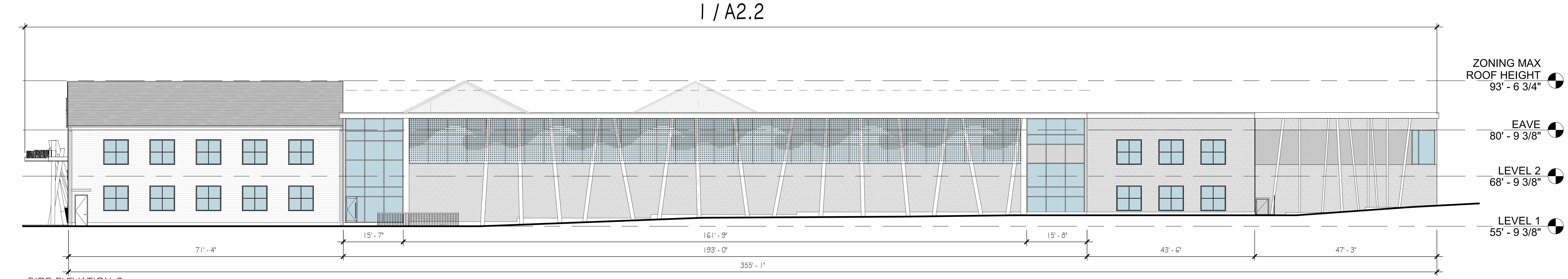
Falmouth YMCA
487 Brick Kiln Rd, Falmouth, MA

SV DESIGN 126 Dodge Street Beverly, MA 01915 www.svdesign.com t 978.927.3745

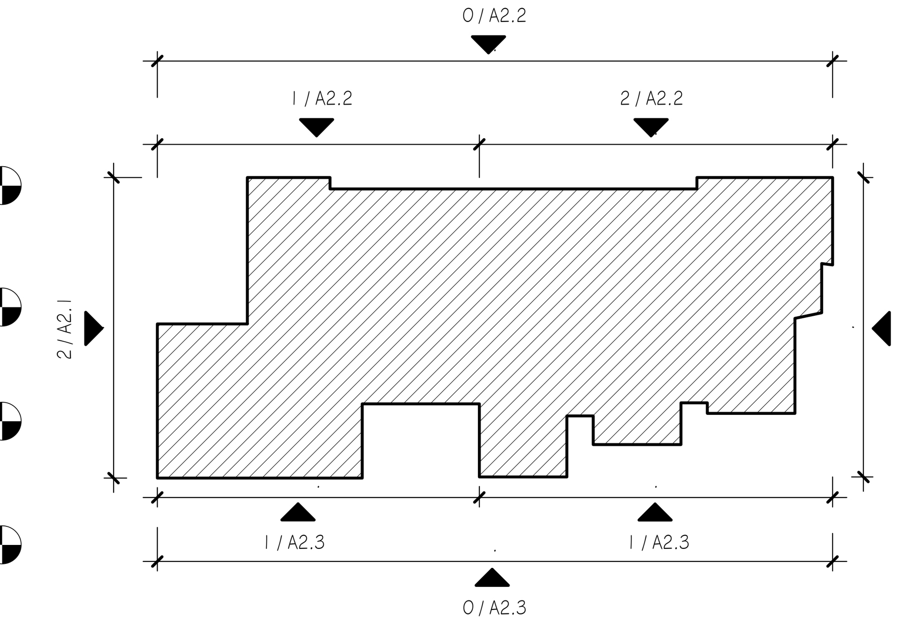
SV DESIGN

ELEVATIONS

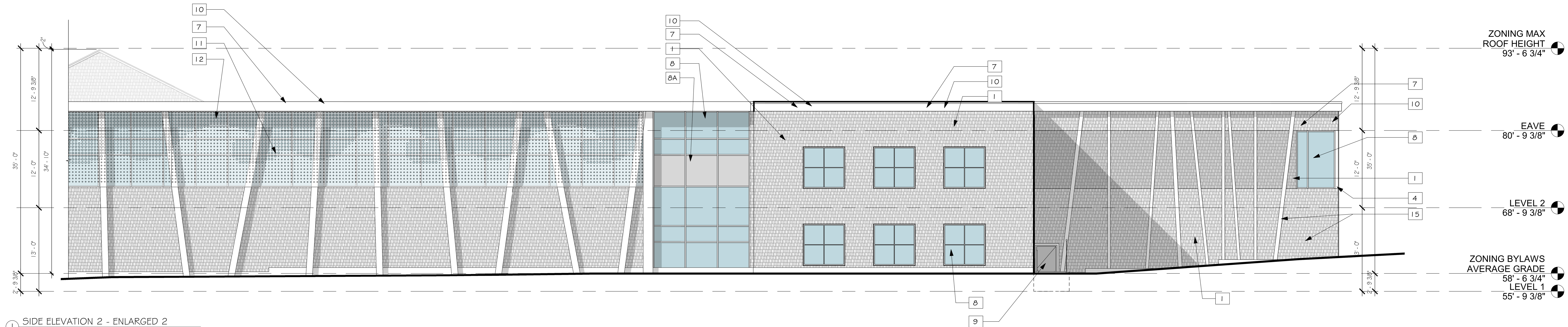
A2.1



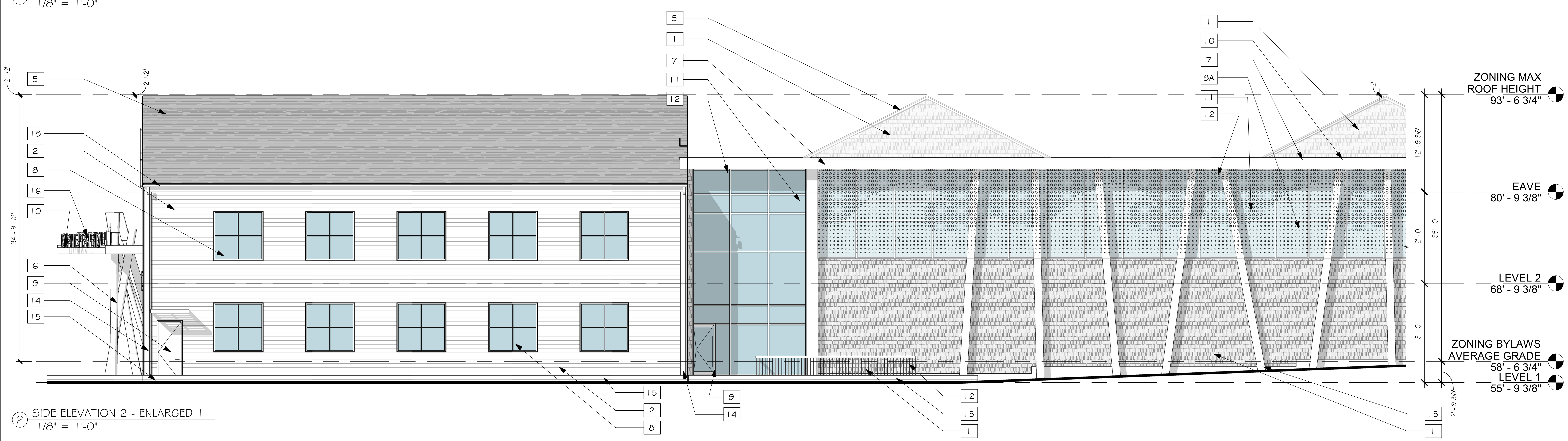
0 SIDE ELEVATION 2
1/16" = 1'-0"



Elevation Key Plan
1" = 80'-0"

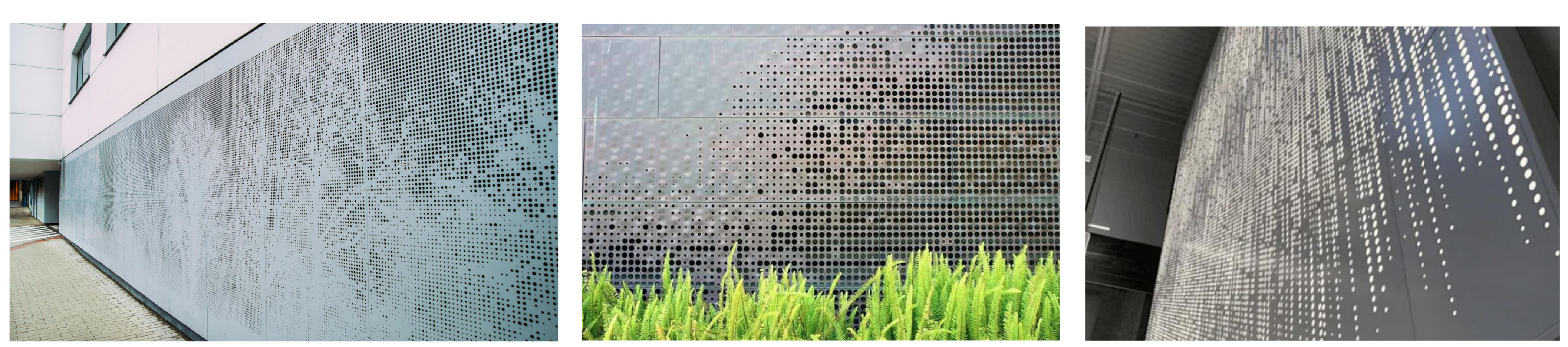


1 SIDE ELEVATION 2 - ENLARGED 2
1/8" = 1'-0"



2 SIDE ELEVATION 2 - ENLARGED 1
1/8" = 1'-0"

PERFORATED METAL PANEL INSPIRATION



EXTERIOR FINISHES

	TYPE	MANUFACTURER	STYLE / COLOR
1	CEMENTITIOUS SHINGLE SIDING 6"	JAMES HARDIE	ANOINTED GRAY 0603
2	CEMENTITIOUS LAP SIDING 6"	JAMES HARDIE	ARCTIC WHITE
3	CEMENTITIOUS SHINGLE SIDING 6"	JAMES HARDIE	MONTEREY TAUPE
4	XTREME TRIM CORNER REVEAL	XTREME TRIM	ANODIZED ALUMINUM
5	ASPHALT SHINGLE ROOF	GAF ARCHITECTURAL SERIES	FOX HOLLOW GRAY
6	ROUND WOOD SLANTED COLUMNS WITH METAL BASE		WOOD FINISH WITH COLORED METAL BASE
7	1X PVC FASCIA BOARD WITH DRIP EDGE		TO MATCH SHINGLE SIDING COLOR
8	ALUMINUM STOREFRONT SYSTEM	KAWNEER	ANODIZED ALUMINUM. GLASS BY OLD CASTLE GLASS - SOLARBAN 70 CLEAR
8A	SPANDREL GLASS PANEL	OLD CASTLE GLASS	WARM GRAY
9	EXTERIOR PAINTED METAL DOOR		TO MATCH SIDING COLOR
10	TPO FLAT ROOF	FIRESTONE OR EQUAL	WHITE
11	SCREENING SYSTEM, METAL (PERFORATED)	HENDRICK PERFORATED METAL PANELS	WHITE
12	12" X 18" ANGLED COLUMNS		WHITE
13	EDGELIT STAINLESS STEEL YMCA LOGO		BY OWNER
14	DOWNSPOUT		GRAY
15	5/4 X PVC TRIM	AZEK	WHITE
16	EXTERIOR SIGNAGE - PREFINISHED METAL		DARK BLUE
17	STANDING SEAM METAL ROOF	FIRESTONE UNA-CLAD	SLATE GRAY
18	HALF ROUND 7" GUTTER	LEAD COATED COPPER GUTTER	GRAY
19	FLAT ROOF WITH WOOD UNDERSIDE		TBD
20	CAPE COD HEALTH CENTER SIGN	TBD	TBD
21	CEMENTITIOUS SMOOTH PANEL SIDING	JAMES HARDIE	ARCTIC WHITE

July 11, 2023 Issued To
SCHEMATIC DESIGN
Revisions
Issue Date: Description

ELEVATIONS

Scale: As indicated
Drawn By: Author
Date: July 11, 2023
Checked By: Checker
Project #: 11.6122.007

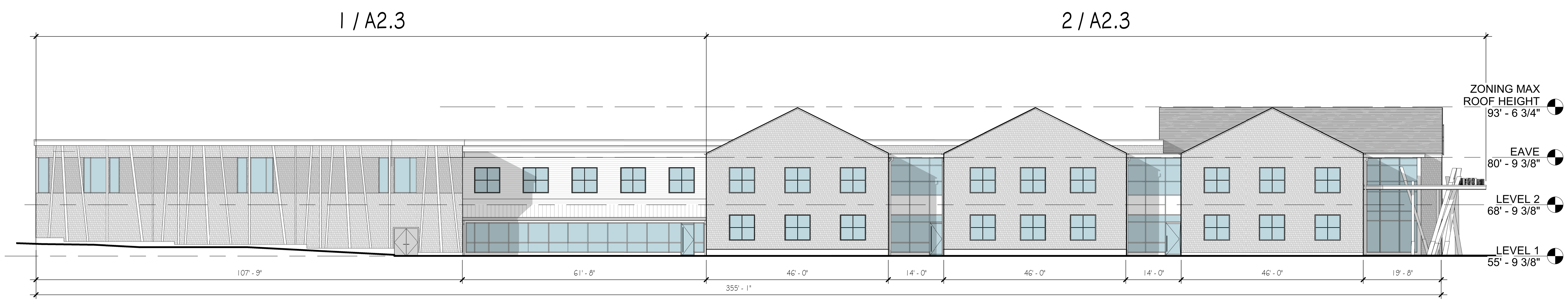
Falmouth YMCA
487 Brick Kiln Rd, Falmouth, MA

SV DESIGN 126 Dodge Street Beverly, MA 01915 www.svdesign.com t 978.927.3745

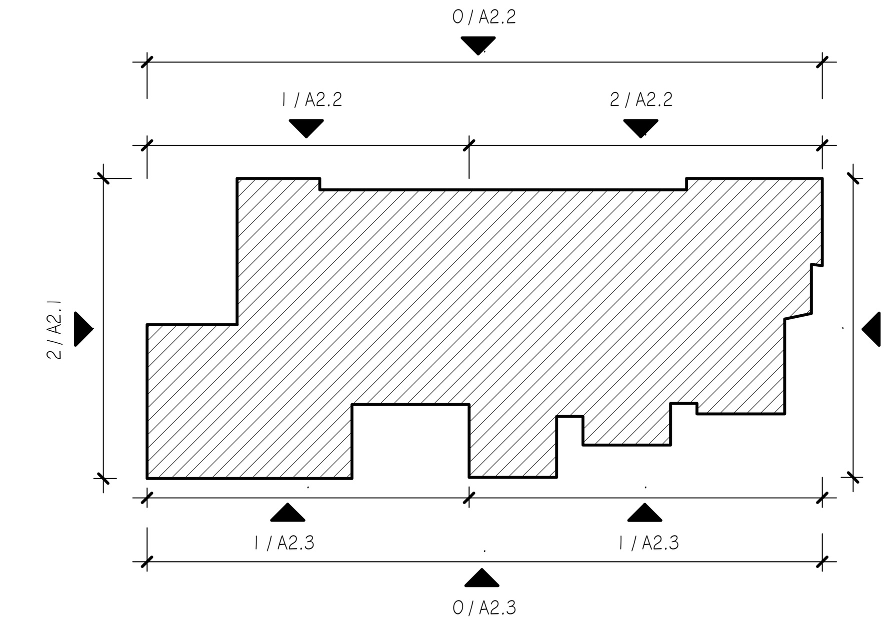
SV DESIGN

ELEVATIONS

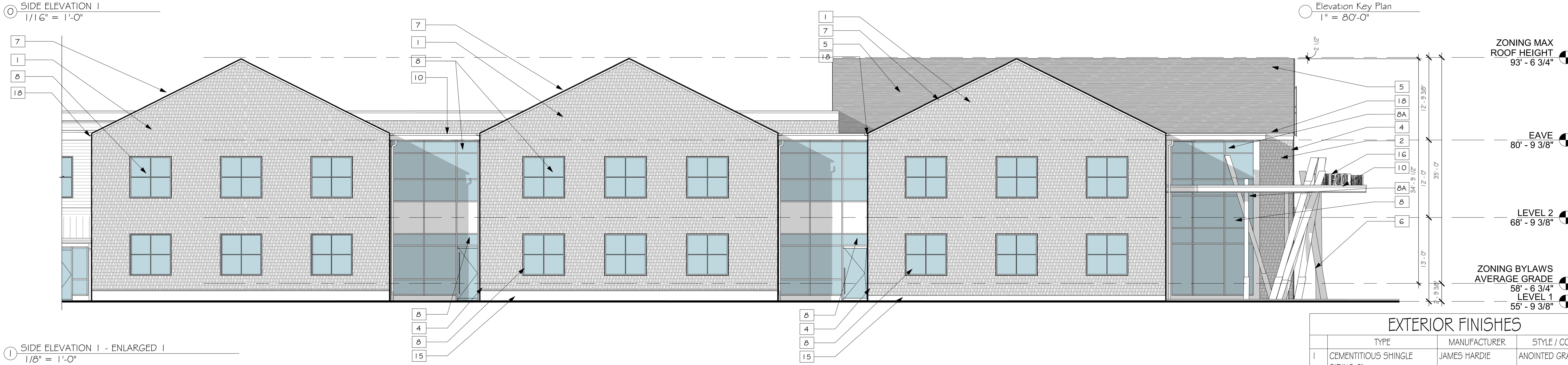
A2.2



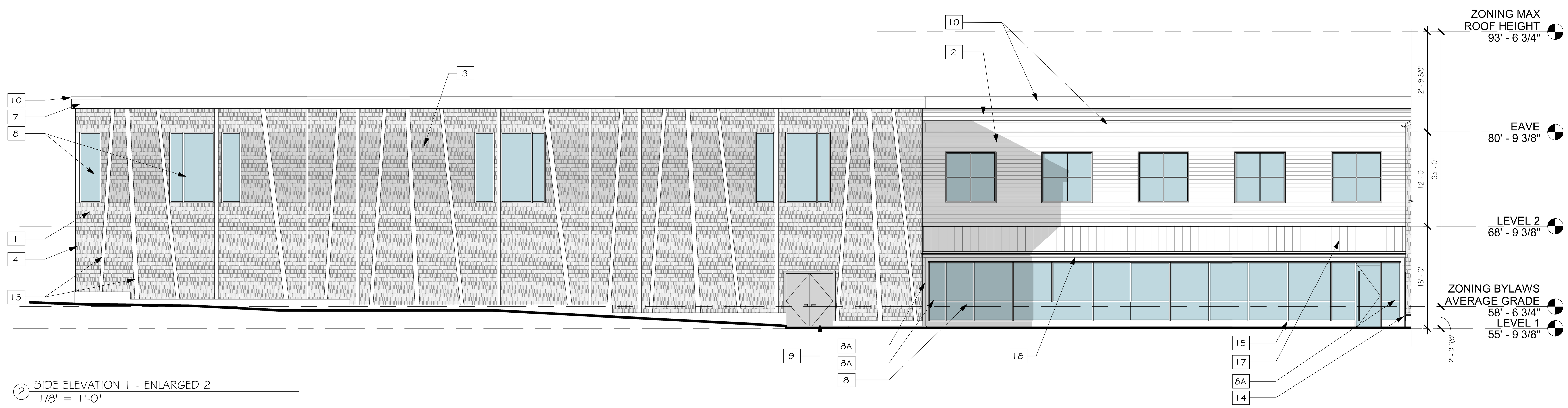
0 SIDE ELEVATION 1
1/16" = 1'-0"



Elevation Key Plan
1" = 80'-0"



1 SIDE ELEVATION 1 - ENLARGED 1
1/8" = 1'-0"



2 SIDE ELEVATION 1 - ENLARGED 2
1/8" = 1'-0"

0' 4' 8' 16' 32'

EXTERIOR FINISHES

	TYPE	MANUFACTURER	STYLE / COLOR
1	CEMENTITIOUS SHINGLE SIDING 6"	JAMES HARDIE	ANOINTED GRAY 0603
2	CEMENTITIOUS LAP SIDING 6"	JAMES HARDIE	ARCTIC WHITE
3	CEMENTITIOUS SHINGLE SIDING 6"	JAMES HARDIE	MONTEREY TAUPE
4	XTREME TRIM CORNER REVEAL	XTREME TRIM	ANODIZED ALUMINUM
5	ASPHALT SHINGLE ROOF	GAF ARCHITECTURAL SERIES	FOX HOLLOW GRAY
6	ROUND WOOD SLANTED COLUMNS WITH METAL BASE		WOOD FINISH WITH COLORED METAL BASE
7	1X PVC FASCIA BOARD WITH DRIP EDGE		TO MATCH SHINGLE SIDING COLOR
8	ALUMINUM STOREFRONT SYSTEM	KAWNEER	ANODIZED ALUMINUM. GLASS BY OLD CASTLE GLASS - SOLARBAN 70 CLEAR
8A	SPANDREL GLASS PANEL	OLD CASTLE GLASS	WARM GRAY
9	EXTERIOR PAINTED METAL DOOR		TO MATCH SIDING COLOR
10	TPO FLAT ROOF	FIRESTONE OR EQUAL	WHITE
11	SCREENING SYSTEM, METAL (PERFORATED)	HENDRICK PERFORATED METAL PANELS	WHITE
12	12" X 18" ANGLED COLUMNS		WHITE
13	EDGELIT STAINLESS STEEL YMCA LOGO		BY OWNER
14	DOWNSPOUT		GRAY
15	5/4 X PVC TRIM	AZEK	WHITE
16	EXTERIOR SIGNAGE - PREFINISHED METAL		DARK BLUE
17	STANDING SEAM METAL ROOF	FIRESTONE UNA-CLAD	SLATE GRAY
18	HALF ROUND 7" GUTTER	LEAD COATED COPPER GUTTER	GRAY
19	FLAT ROOF WITH WOOD UNDERSIDE		TBD
20	CAPE COD HEALTH CENTER SIGN	TBD	TBD
21	CEMENTITIOUS SMOOTH PANEL SIDING	JAMES HARDIE	ARCTIC WHITE

July 11, 2023 | Issued To
SCHEMATIC DESIGN | Description
Revisions | Issue | Date:

ELEVATIONS

Scale: As indicated
Drawn By: Author
Date: July 11, 2023
Checked By: Checker
Project #: 11.6122.007

Falmouth YMCA
487 Brick Kiln Rd, Falmouth, MA

SV DESIGN 126 Dodge Street Beverly, MA 01915 www.svdesign.com t 978.927.3745

SV DESIGN

ELEVATIONS

A2.3

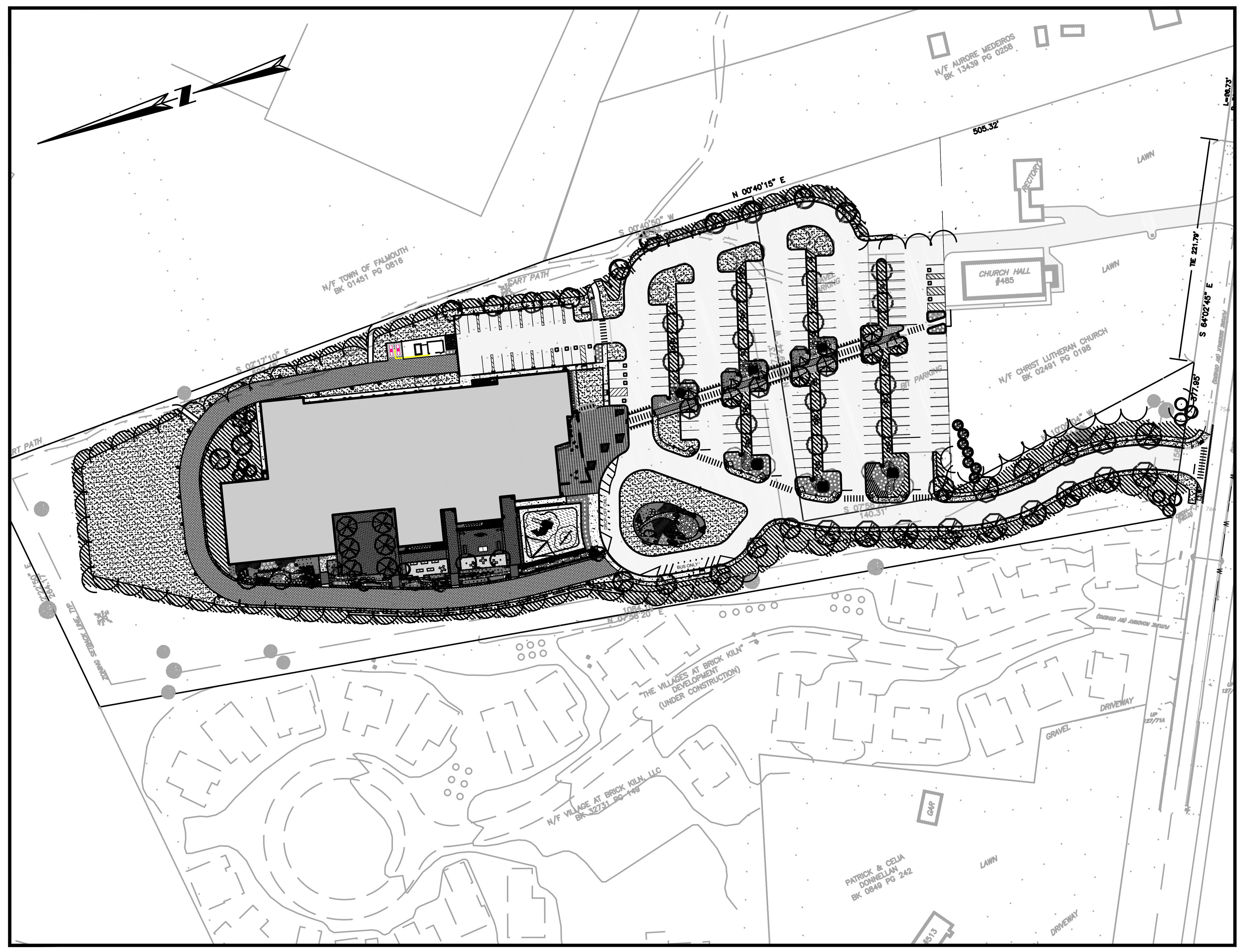
EXHIBIT 26

LANDSCAPE ARCHITECTURAL PLANS

UPPER CAPE YMCA

BRICK KILN ROAD
FALMOUTH, MASSACHUSETTS

AUGUST 17, 2023



SITE MAP

50 0 100 200 300 feet

SCALE: 1=100_XREF

INDEX OF DRAWINGS

Sheet Number	Sheet Title
L-000	COVER SHEET
L-100	OVERALL LANDSCAPE MATERIALS PLAN
L-101	AMENTITY SPACE ENLARGEMENT
L-102	ENTRANCE AREA ENLARGEMENT
L-200	OVERALL PLANTING PLAN
L-201	PLANTING PLAN - AMENTITY SPACE ENLARGEMENT
L-202	PLANTING PLAN - ENTRANCE AREA ENLARGEMENT
L-300	LANDSCAPE DETAILS
L-301	LANDSCAPE DETAILS
L-302	LANDSCAPE DETAILS
L-303	LANDSCAPE DETAILS
L-304	LANDSCAPE DETAILS

PREPARED FOR:

YMCA CAPE COD
100 INDEPENDENCE DRIVE, SUITE 2
HYANNIS, MA 02601

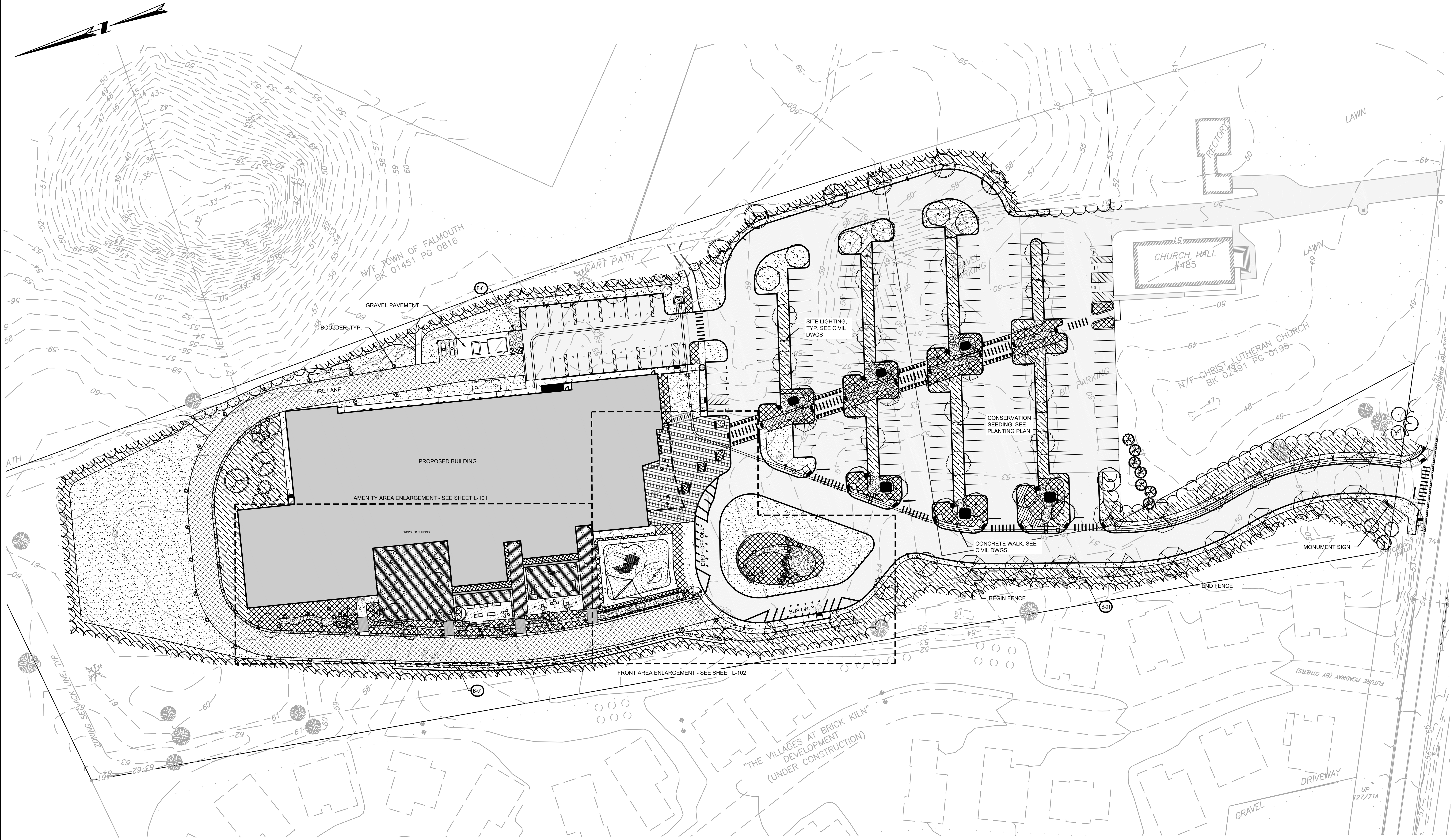
ISSUED FOR PERMITTING

PREPARED BY:

BSC GROUP
803 Summer Street
Boston, Massachusetts 02127
617 896 4300

JOB NO: 83898.00 DWG NO:

SHEET L-000



REFERENCE NOTES SCHEDULE SITE						
	PAVING & EDGING					
CODE	DESCRIPTION	MANUFACTURER	FINISH	COLOR	NOTES	
A-01	CONCRETE				SEE CIVIL DRAWINGS	
A-02	ROUNDED RIVER STONE					
A-03	CONCRETE UNIT PAVERS	UNILOCK HOLLANDSTONE	TBD	TBD	RUNNING BOND PATTERN	
	WALLS, STEPS & FENCES					
CODE	DESCRIPTION	MANUFACTURER	MATERIAL	FINISH	COLOR	NOTES
B-01	WOOD PRIVACY FENCE					
	BIOSWALE & VEGETATION					
CODE	DESCRIPTION					
D-01	PLANTING AREA. SEE PLANTING PLAN					

ISSUED FOR PERMITTING

UPPER CAPE YMCA - AUGUST 17, 2023

RICARDO AUSTRICH, PLA

UPPER CAPE YMCA

BRICK KILN ROAD
IN
FALMOUTH
MASSACHUSETTS

OVERALL LANDSCAPE MATERIALS PLAN

AUGUST 17, 2023

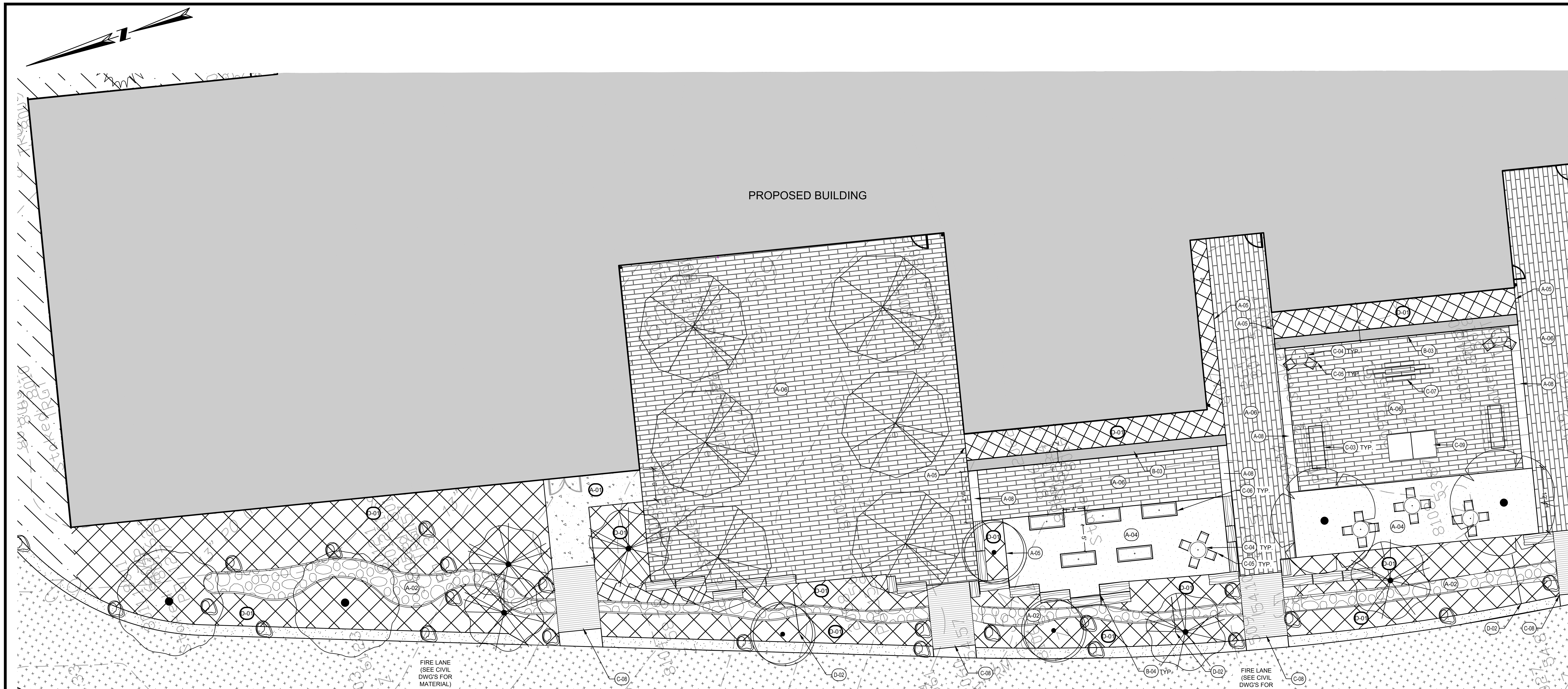
REVISIONS:

PREPARED FOR:
YMCA CAPE COD
100 INDEPENDENCE DRIVE, SUITE 2
HYANNIS, MA 02601

BSC GROUP
803 Summer Street
Boston, Massachusetts 02127
617 896 4300

SCALE: 1" = 40'
0 20 40 80 FEET

FILE: 8389800-LM.DWG
DWG. NO:
JOB. NO: 83898.00
L-100



REFERENCE NOTES SCHEDULE AMENTITY AREA						
	PAVING & EDGING					
CODE	DESCRIPTION	MANUFACTURER	FINISH	COLOR	NOTES	
A-01	CONCRETE				SEE CIVIL DRAWINGS	
A-02	ROUNDED RIVER STONE					
A-03	PERMEABLE SLAB PAVERS	TBD	TBD	TBD		
A-04	STABILIZED STONEDUST	READ CUSTOM SOILS		NICKEL		
A-05	WEATHERING STEEL EDGING	COR-TEN-STEEL USA	A588		12" HIGH X 11GA	
A-06	GRANITE PAVERS		HONED	GREY	2-INCH THICK	
A-07	PERMEABLE PAVERS	UNILOCK PROMENADE, 8X24			PATTERN "A", RUNNING BOND	
	WALLS, STEPS & FENCES					
CODE	DESCRIPTION	MANUFACTURER	MATERIAL	FINISH	COLOR	NOTES
B-01	SEAT WALL	TBD	PRE-CAST CONCRETE	HONED	TBD	
B-02	STONE BLOCK		GRANITE, LIMESTONE, GOSHEN STONE	NATURAL CLEFT	TBD	
	AMENITIES					
CODE	DESCRIPTION	MFG./SUPPLIER	MODEL	FINISH	COLOR	NOTES
C-01	PICNIC TABLE	COLUMBIA CASCADE	TIMBERFORM COLOSSUS, NO. 2225			SURFACE MOUNT
C-02	DINING TABLE	LANDSCAPE FORMS	CAT-36D-C	POWDER COATED	STEEL METALIC	FREESTANDING/SURFACE MOUNT SUPPORT
C-03	DINING CHAIR	LANDSCAPE FORMS	TRVS-GD	POWDER COATED	STEEL METALLIC	
C-04	GARDEN PLANTER	KORNEGAY DESIGN	ASP-24 - ASPECT PRECAST CONCRETE PLANTER		NATURAL GRAY	
C-05	MULTI-TIERED SEATING	STREETLIFE	DRIFTER STRUCTURE-SM	FSC HARWOOD, COR-TEN STEEL		
C-06	WOOD PEDESTRIAN BRIDGE					
C-07	PING PONG TABLE	CORNILLEAU	510M		TBD	
	BIOSWALE & VEGETATION					
CODE	DESCRIPTION					
D-01	PLANTING AREA. SEE PLANTING PLAN					
D-02	WEATHERING STEEL WEIR					

ISSUED FOR PERMITTING

UPPER CAPE YMCA - AUGUST 17, 2023

RICARDO AUSTRICH, PLA

UPPER CAPE YMCA

BRICK KILN ROAD

IN

FALMOUTH
MASSACHUSETTS

AMENTITY SPACE
ENLARGEMENT

AUGUST 17, 2023

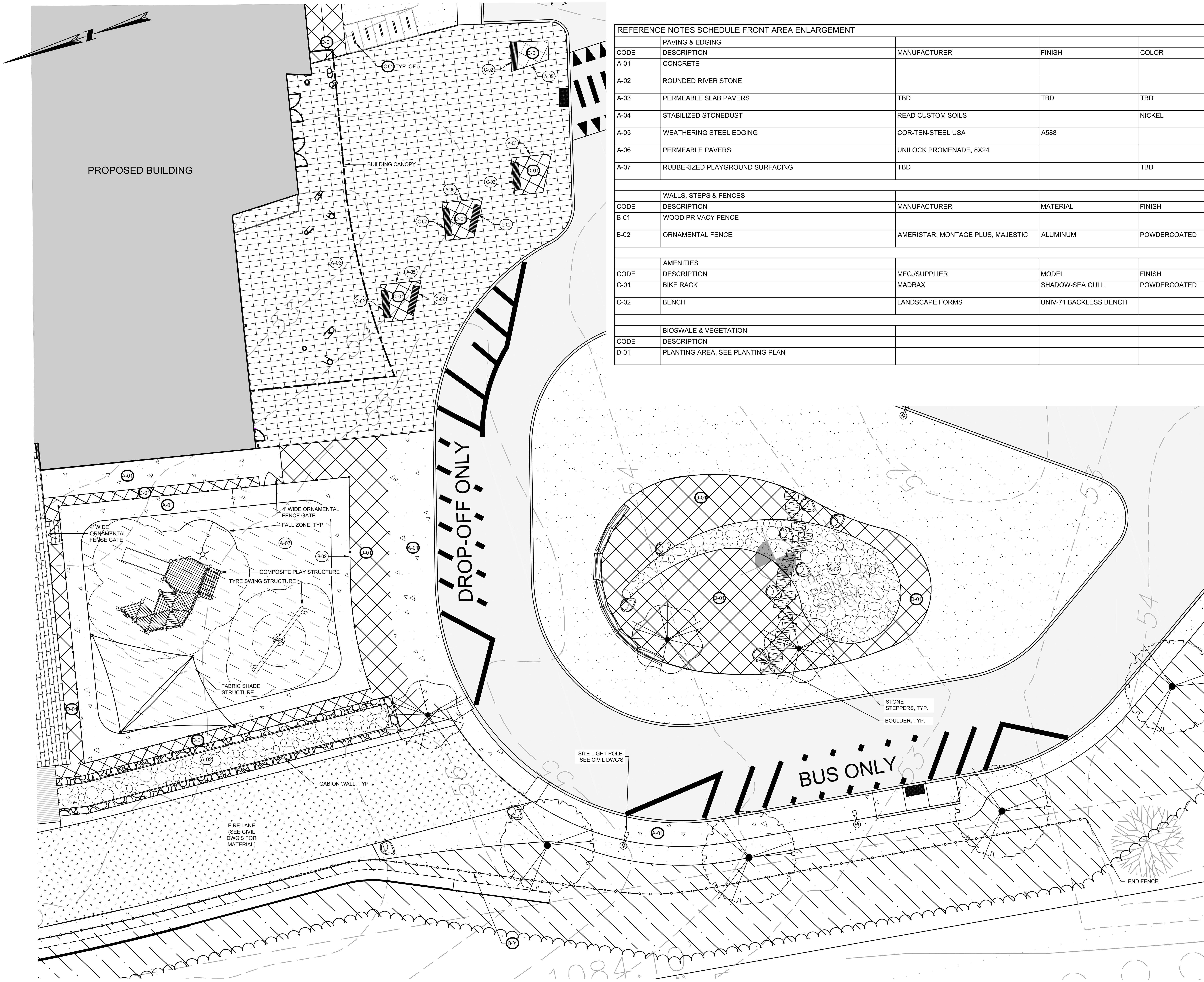
REVISIONS:

PREPARED FOR:
YMCA CAPE COD
100 INDEPENDENCE DRIVE, SUITE 2
HYANNIS, MA 02601

BSC GROUP
803 Summer Street
Boston, Massachusetts 02127
617 896 4300

SCALE: 1" = 10'
0 5 10 20 FEET

FILE: 8389800-LM.DWG
DWG. NO:
JOB. NO: 83898.00
L-101



REFERENCE NOTES SCHEDULE FRONT AREA ENLARGEMENT						
	PAVING & EDGING					
CODE	DESCRIPTION	MANUFACTURER	FINISH	COLOR	NOTES	
A-01	CONCRETE				SEE CIVIL DRAWINGS	
A-02	ROUNDED RIVER STONE					
A-03	PERMEABLE SLAB PAVERS	TBD	TBD	TBD		
A-04	STABILIZED STONEDUST	READ CUSTOM SOILS		NICKEL		
A-05	WEATHERING STEEL EDGING	COR-TEN-STEEL USA	A588		12" HIGH X 11GA	
A-06	PERMEABLE PAVERS	UNILOCK PROMENADE, 8X24			PATTERN "A", RUNNING BOND	
A-07	RUBBERIZED PLAYGROUND SURFACING	TBD		TBD		
	WALLS, STEPS & FENCES					
CODE	DESCRIPTION	MANUFACTURER	MATERIAL	FINISH	COLOR	NOTES
B-01	WOOD PRIVACY FENCE					
B-02	ORNAMENTAL FENCE	AMERISTAR, MONTAGE PLUS, MAJESTIC	ALUMINUM	POWDERCOATED	BLACK	
	AMENITIES					
CODE	DESCRIPTION	MFG./SUPPLIER	MODEL	FINISH	COLOR	NOTES
C-01	BIKE RACK	MADRAX	SHADOW-SEA GULL	POWDERCOATED	GUN METAL	IN GROUND MOUNTED
C-02	BENCH	LANDSCAPE FORMS	UNIV-71 BACKLESS BENCH			
	BIOSWALE & VEGETATION					
CODE	DESCRIPTION					
D-01	PLANTING AREA. SEE PLANTING PLAN					

ISSUED FOR PERMITTING

UPPER CAPE YMCA • AUGUST 17, 2023

RICARDO AUSTRICH, PLA ----

UPPER CAPE YMCA

BRICK KILN ROAD

IN

FALMOUTH
MASSACHUSETTS

ENTRANCE AREA ENLARGEMENT

AUGUST 17, 2023

REVISIONS:

PREPARED FOR:
YMCA CAPE COD
100 INDEPENDENCE DRIVE, SUITE 2
HYANNIS, MA 02601

BSC GROUP
803 Summer Street
Boston, Massachusetts 02127
617 896 4300

SCALE: 1" = 10'

0 5 10 20 FEET

FILE: 8389800-LM.DWG
DWG. NO:
JOB. NO: 83898.00

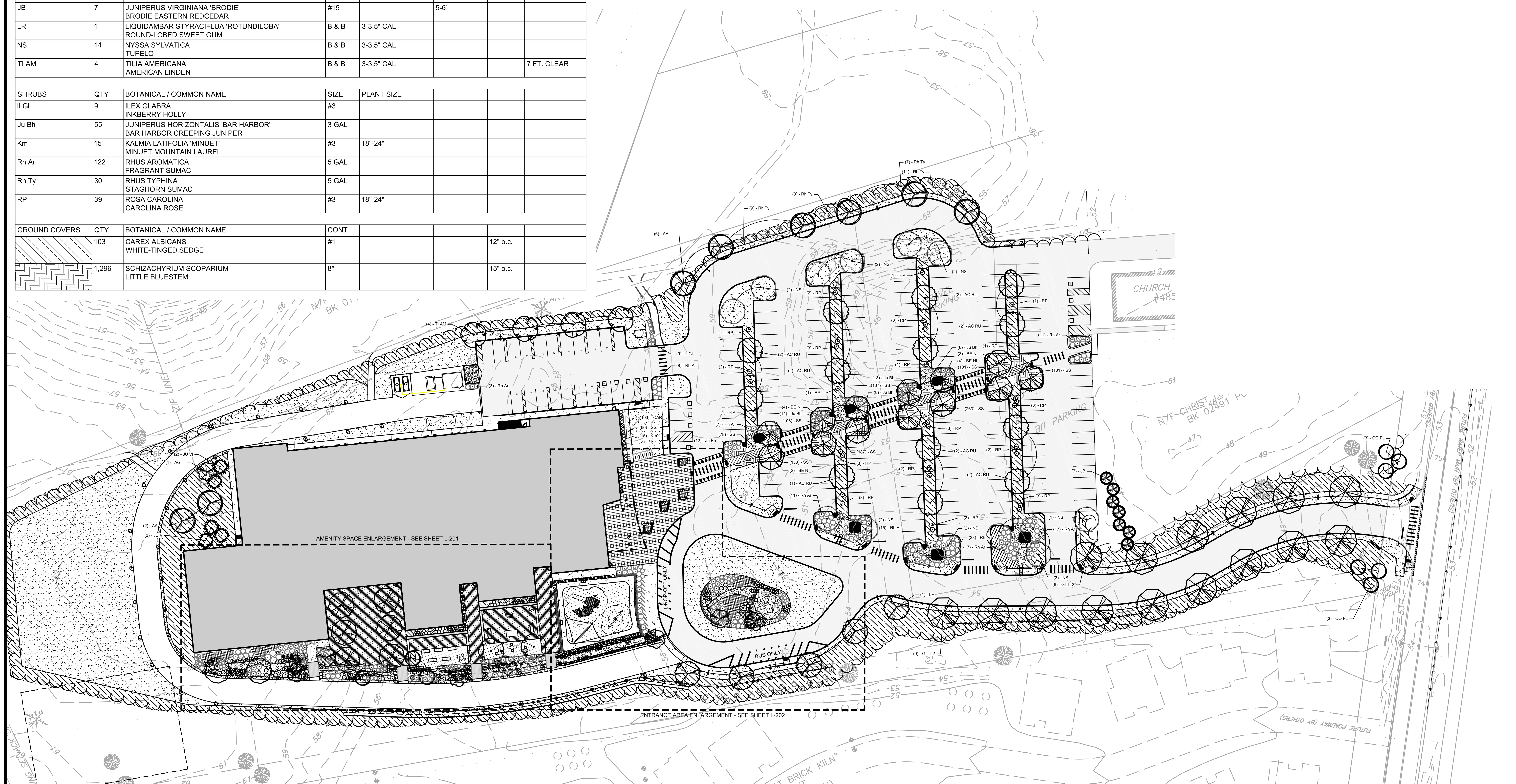
L-102

PLANT SCHEDULE SITE

TREES	QTY	BOTANICAL / COMMON NAME	ROOT	CALIPER	PLANT SIZE		REMARKS
AC RU	13	ACER RUBRUM RED MAPLE	B & B	3-3.5" CAL			
AA	8	ACER RUBRUM 'ARMSTRONG' ARMSTRONG RED MAPLE	B & B	3-3.5" CAL			
AG	1	AMELANCHIER X GRANDIFLORA 'AUTUMN BRILLIANCE' AUTUMN BRILLIANCE APPLE SERVICEBERRY	B & B				
BE NI	13	BETULA NIGRA RIVER BIRCH MULTI-TRUNK	B & B	10-12` HT. CLUMP			MULTI-STEMS
CO FL	6	CORNUS FLORIDA FLOWERING DOGWOOD	B & B	7-8` HT.			
GI TI 2	15	GLEDITSIA TRIACANTHOS F. INERMIS THORNLESS HONEY LOCUST	B & B	4-4.5" CAL			
JU VI	5	JUNIPERUS VIRGINIANA EASTERN REDCEDAR	B & B	6-7` HT			
JB	7	JUNIPERUS VIRGINIANA 'BRODIE' BRODIE EASTERN REDCEDAR	#15		5-6`		
LR	1	LIQUIDAMBAR STYRACIFLUA 'ROTUNDILOBA' ROUND-LOBED SWEET GUM	B & B	3-3.5" CAL			
NS	14	NYSSA SYLVATICA TUPELO	B & B	3-3.5" CAL			
TI AM	4	TILIA AMERICANA AMERICAN LINDEN	B & B	3-3.5" CAL			7 FT. CLEAR
SHRUBS	QTY	BOTANICAL / COMMON NAME	SIZE	PLANT SIZE			
Il Gl	9	ILEX GLABRA INKBERRY HOLLY	#3				
Ju Bh	55	JUNIPERUS HORIZONTALIS 'BAR HARBOR' BAR HARBOR CREEPING JUNIPER	3 GAL				
Km	15	KALMIA LATIFOLIA 'MINUET' MINUET MOUNTAIN LAUREL	#3	18"-24"			
Rh Ar	122	RHUS AROMATICA FRAGRANT SUMAC	5 GAL				
Rh Ty	30	RHUS TYPHINA STAGHORN SUMAC	5 GAL				
RP	39	ROSA CAROLINA CAROLINA ROSE	#3	18"-24"			
GROUND COVERS	QTY	BOTANICAL / COMMON NAME	CONT				
	103	CAREX ALBICANS WHITE-TINGED SEDGE	#1			12" o.c.	
	1,296	SCHIZACHYRIUM SCOPARIUM LITTLE BLUESTEM	8"			15" o.c.	

DROUGHT TOLERANT LAWN

NATIVE POLLINATOR MEADOW MIX



ISSUED FOR PERMITTING

UPPER CAPE YMCA - AUGUST 17, 2023

RICARDO AUSTRICH, PLA

UPPER CAPE YMCA

BRICK KILN ROAD

IN

FALMOUTH
MASSACHUSETTS

OVERALL PLANTING PLAN

AUGUST 17, 2023

REVISIONS:

PREPARED FOR:
YMCA CAPE COD
100 INDEPENDENCE DRIVE, SUITE 2
HYANNIS, MA 02601

BSC GROUP
803 Summer Street
Boston, Massachusetts 02127
617 896 4300

SCALE: 1" = 40'

0 20 40 80 FEET

FILE: 8389800-PLNT-1.DWG

DWG. NO:

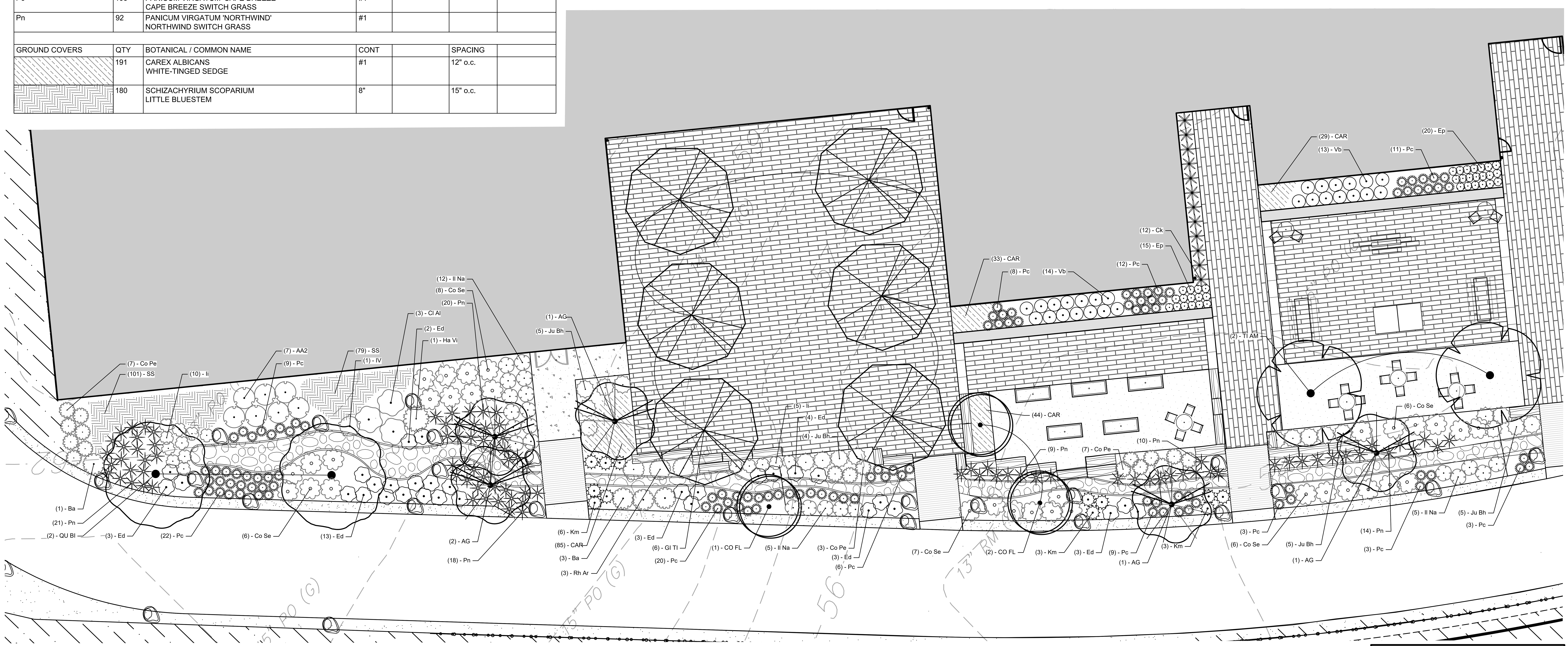
JOB. NO: 83898.00

L-200

PLANT SCHEDULE AMENTITY SPACE						
TREES	QTY	BOTANICAL / COMMON NAME	ROOT	CALIPER		REMARKS
AG	5	AMELANCHIER X GRANDIFLORA 'AUTUMN BRILLIANCE' AUTUMN BRILLIANCE APPLE SERVICEBERRY	B & B			
CO FL	3	CORNUS FLORIDA FLOWERING DOGWOOD	B & B	7-8` HT.		
GI TI	6	GLEDITSIA TRIACANTHOS F. INERMIS THORNLESS HONEY LOCUST	B & B	3-3.5" CAL		
QU BI	2	QUERCUS BICOLOR SWAMP WHITE OAK	B & B	3-3.5" CAL		
TI AM	2	TILIA AMERICANA AMERICAN LINDEN	B & B	3-3.5" CAL		7 FT. CLEAR
SHRUBS	QTY	BOTANICAL / COMMON NAME	SIZE	PLANT SIZE		REMARKS
AA2	7	ARONIA ARBUTIFOLIA RED CHOKEBERRY	5 GAL			
Cl Al	3	CLETHRA ALNIFOLIA SUMMERSWEET	7 GAL			
Co Pe	17	COMPTONIA PEREGRINA SWEET FERN	3 GAL			
Co Se	33	CORNUS SERICEA 'VARIEGATA' VARIEGATED RED TWIG DOGWOOD	5 GAL			
Ha Vi	1	HAMAMELIS VIRGINIANA COMMON WITCH HAZEL	7 GAL			
Ii	15	ILEX GLABRA 'COMPACTA' COMPACT INKBERRY	#3	18"-24"		
IV	1	ILEX VERTICILLATA 'JIM DANDY' JIM DANDY WINTERBERRY	#3			
Il Na	22	ILEX VERTICILLATA 'NANA' RED SPRITE WINTERBERRY	5 GAL			
Ju Bh	19	JUNIPERUS HORIZONTALIS 'BAR HARBOR' BAR HARBOR CREEPING JUNIPER	3 GAL			
Km	12	KALMIA LATIFOLIA 'MINUET' MINUET MOUNTAIN LAUREL	#3	18"-24"		
Rh Ar	3	RHUS AROMATICA FRAGRANT SUMAC	5 GAL			
Vb	27	VACCINIUM ANGUSTIFOLIUM 'BRUNSWICK' BRUNSWICK LOWBUSH BLUEBERRY	#1			
PERENNIALS/GRASSES	QTY	BOTANICAL / COMMON NAME	SIZE	PLANT SIZE		REMARKS
Ba	4	BAPTISIA AUSTRALIS BLUE WILD INDIGO	#3			
Ck	12	CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER' KARL FOERSTER FEATHER REED GRASS	#1			
Ep	35	ECHINACEA PURPUREA 'PRAIRIE SPLENDOR' PRAIRIE SPLENDOR CONEFLOWER	#1			
Ed	31	EUTROCHIUM DUBIUM 'LITTLE JOE' LITTLE JOE PYE WEED	B & B			
Pc	106	PANICUM VIRGATUM 'CAPE BREEZE' CAPE BREEZE SWITCH GRASS	#1			
Pn	92	PANICUM VIRGATUM 'NORTHWIND' NORTHWIND SWITCH GRASS	#1			
GROUND COVERS	QTY	BOTANICAL / COMMON NAME	CONT		SPACING	
	191	CAREX ALBICANS WHITE-TINGED SEDGE	#1		12" o.c.	
	180	SCHIZACHYRIUM SCOPARIUM LITTLE BLUESTEM	8"		15" o.c.	

DROUGHT TOLERANT LAWN

NATIVE POLLINATOR MEADOW MIX



ISSUED FOR PERMITTING

UPPER CAPE YMCA - AUGUST 17, 2023

RICARDO AUSTRICH, PLA ----

UPPER CAPE YMCA

BRICK KILN ROAD

IN

FALMOUTH
MASSACHUSETTS

PLANTING PLAN - AMENTITY SPACE ENLARGEMENT

AUGUST 17, 2023

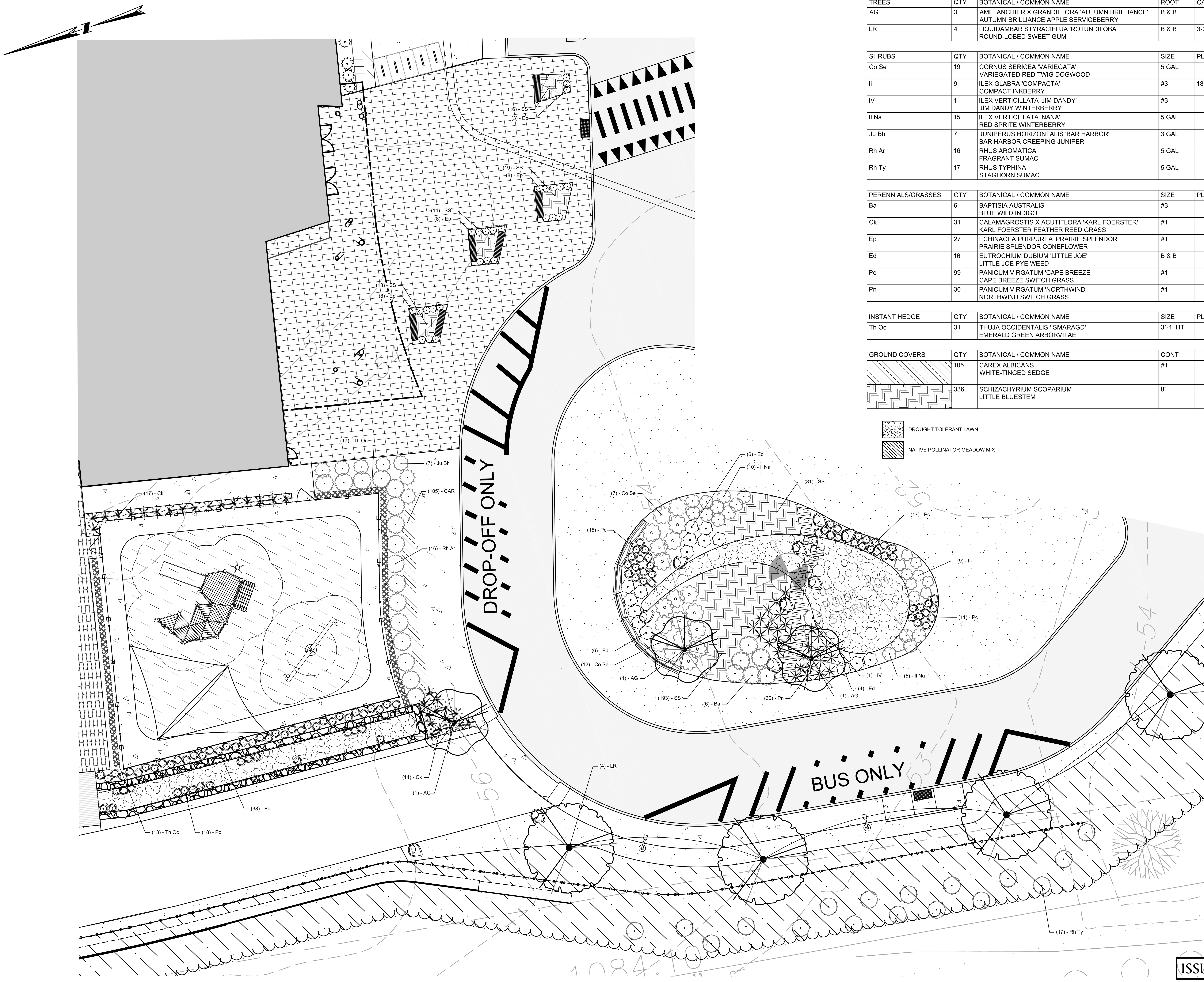
REVISIONS:

PREPARED FOR:
YMCA CAPE COD
100 INDEPENDENCE DRIVE, SUITE 2
HYANNIS, MA 02601

BSC GROUP
803 Summer Street
Boston, Massachusetts 02127
617 896 4300

SCALE: 1" = 10'
0 5 10 20 FEET

FILE: 8389800-PLNT-1.DWG
DWG. NO:
JOB. NO: 83898.00
L-201



PLANT SCHEDULE ENTRY						
TREES	QTY	BOTANICAL / COMMON NAME	ROOT	CALIPER		REMARKS
AG	3	AMELANCHIER X GRANDIFLORA 'AUTUMN BRILLIANCE' AUTUMN BRILLIANCE APPLE SERVICEBERRY	B & B			
LR	4	LIQUIDAMBAR STYRACIFLUA 'ROTUNDILOBA' ROUND-LOBED SWEET GUM	B & B	3-3.5" CAL		
SHRUBS	QTY	BOTANICAL / COMMON NAME	SIZE	PLANT SIZE		REMARKS
Co Se	19	CORNUS SERICEA 'VARIEGATA' VARIEGATED RED TWIG DOGWOOD	5 GAL			
Ii	9	ILEX GLABRA 'COMPACTA' COMPACT INKBERRY	#3	18"-24"		
IV	1	ILEX VERTICILLATA 'JIM DANDY' JIM DANDY WINTERBERRY	#3			
Il Na	15	ILEX VERTICILLATA 'NANA' RED SPRITE WINTERBERRY	5 GAL			
Ju Bh	7	JUNIPERUS HORIZONTALIS 'BAR HARBOR' BAR HARBOR CREEPING JUNIPER	3 GAL			
Rh Ar	16	RHUS AROMATICA FRAGRANT SUMAC	5 GAL			
Rh Ty	17	RHUS TYPHINA STAGHORN SUMAC	5 GAL			
PERENNIALS/GRASSES	QTY	BOTANICAL / COMMON NAME	SIZE	PLANT SIZE		REMARKS
Ba	6	BAPTISIA AUSTRALIS BLUE WILD INDIGO	#3			
Ck	31	CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER' KARL FOERSTER FEATHER REED GRASS	#1			
Ep	27	ECHINACEA PURPUREA 'PRAIRIE SPLENDOR' PRAIRIE SPLENDOR CONEFLOWER	#1			
Ed	16	EUTROCHIUM DUBIUM 'LITTLE JOE' LITTLE JOE PYE WEED	B & B			
Pc	99	PANICUM VIRGATUM 'CAPE BREEZE' CAPE BREEZE SWITCH GRASS	#1			
Pn	30	PANICUM VIRGATUM 'NORTHWIND' NORTHWIND SWITCH GRASS	#1			
INSTANT HEDGE	QTY	BOTANICAL / COMMON NAME	SIZE	PLANT SIZE		REMARKS
Th Oc	31	THUJA OCCIDENTALIS ' SMARAGD' EMERALD GREEN ARBORVITAE	3`-4` HT			40" LENGTH*
GROUND COVERS	QTY	BOTANICAL / COMMON NAME	CONT		SPACING	
	105	CAREX ALBICANS WHITE-TINGED SEDGE	#1		12" o.c.	
	336	SCHIZACHYRIUM SCOPARIUM LITTLE BLUESTEM	8"		15" o.c.	

DROUGHT TOLERANT LAWN

NATIVE POLLINATOR MEADOW MIX

ISSUED FOR PERMITTING

UPPER CAPE YMCA • AUGUST 17, 2023

RICARDO AUSTRICH, PLA

UPPER CAPE YMCA

BRICK KILN ROAD

IN

FALMOUTH
MASSACHUSETTS

PLANTING PLAN - ENTRANCE AREA ENLARGEMENT

AUGUST 17, 2023

REVISIONS:

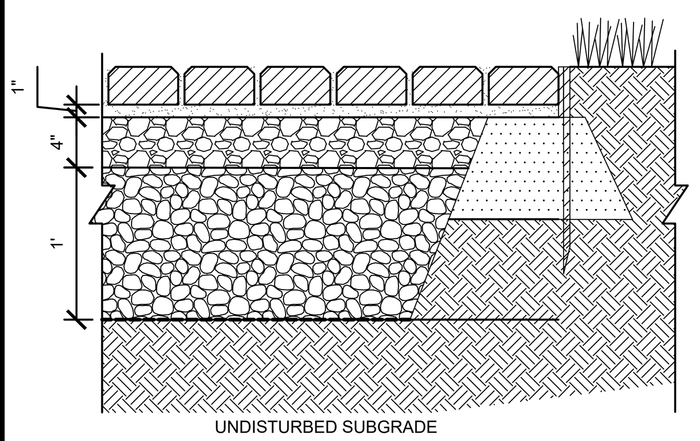
PREPARED FOR:
YMCA CAPE COD
100 INDEPENDENCE DRIVE, SUITE 2
HYANNIS, MA 02601

BSC GROUP
803 Summer Street
Boston, Massachusetts 02127
617 896 4300

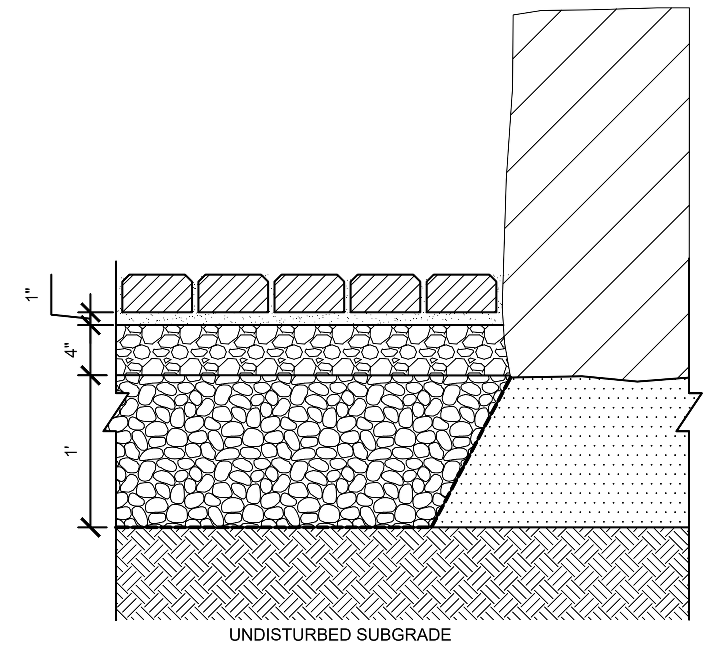
SCALE: 1" = 10'
0 5 10 20 FEET

FILE: 8389800-PLNT-1.DWG
DWG. NO:
JOB. NO: 83898.00

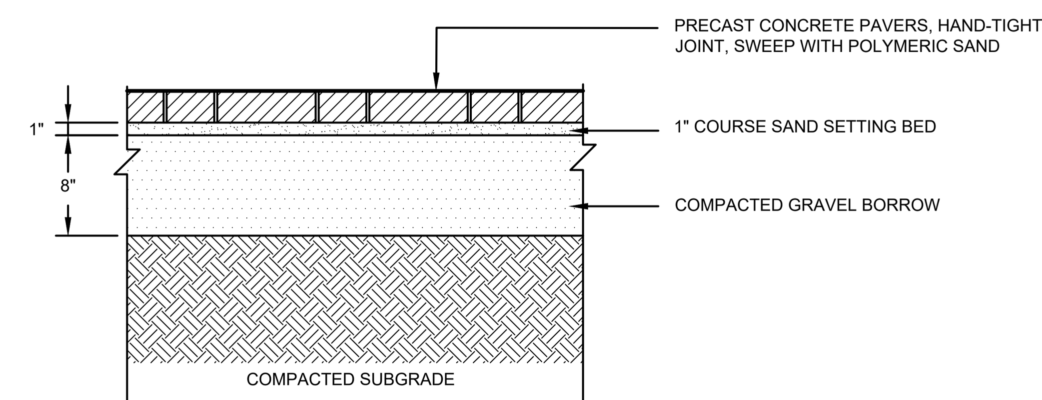
L-202



LANDSCAPE EDGE CONDITION

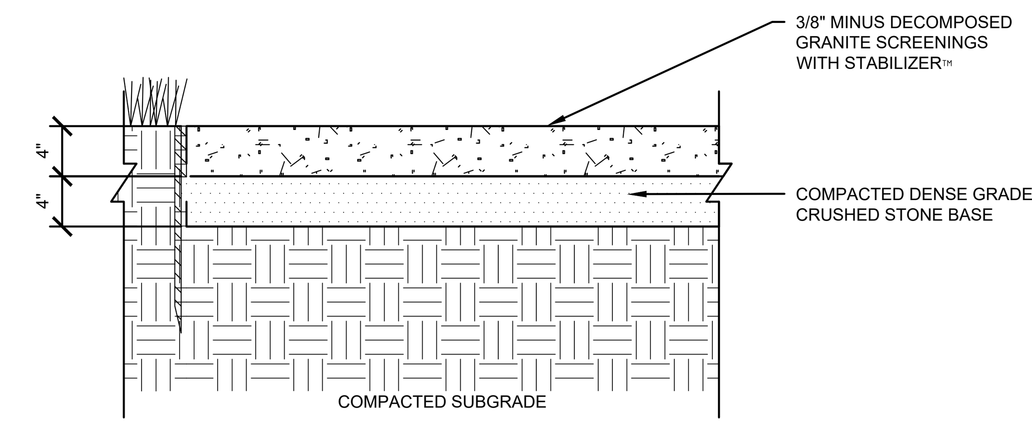


STONE BLOCK EDGE CONDITION



NOTES:

1. PAVER SETTING BED SHALL BE SCREENED AND PITCHED TO GRADE PRIOR TO PAVER INSTALLATION.
2. CONTRACTOR SHALL CONSTRUCT MOCKUP FOR REVIEW AND APPROVAL.
3. SEE DRAWINGS FOR PAVER TYPE, SIZE, PATTERN, FINISH AND COLOR.



NOTES:

1. INSTALL STABILIZER MATERIAL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

1 PERMEABLE PRECAST CONCRETE PAVERS AT LANDSCAPE EDGE
SCALE: NONE

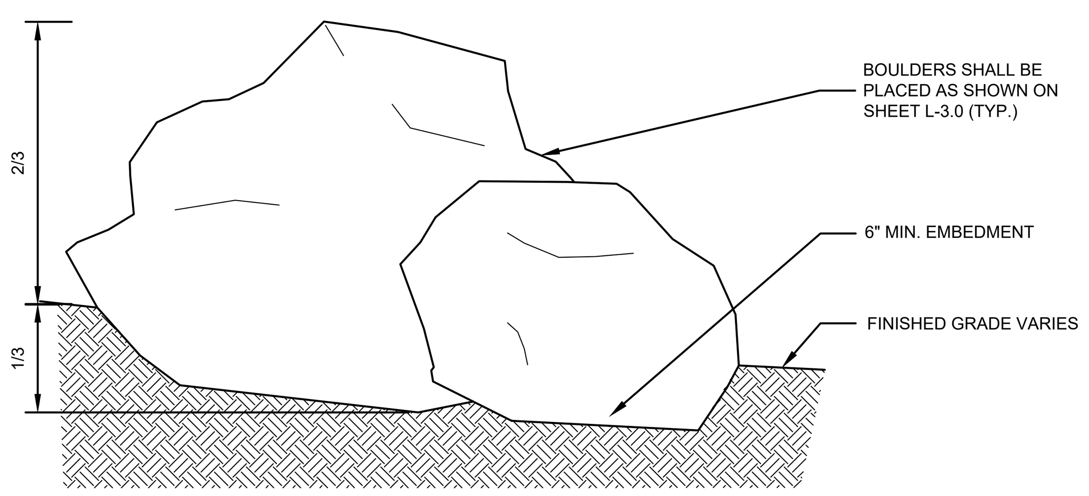
2 PERMEABLE PRECAST CONCRETE PAVERS AT STONE BLOCK
SCALE: NONE

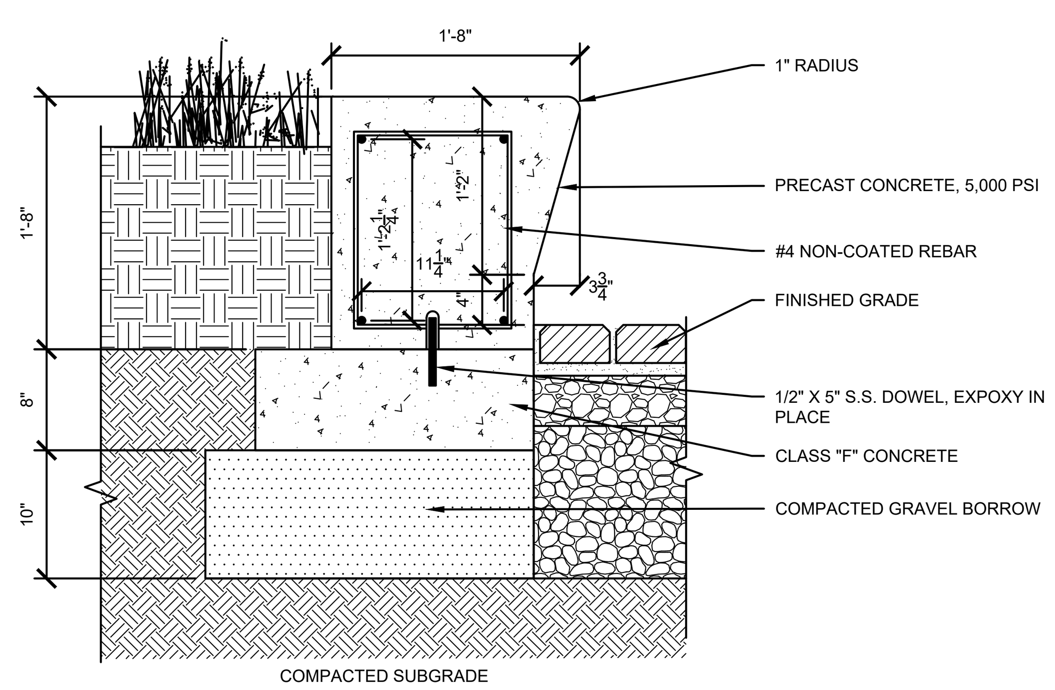
3 PRECAST CONCRETE UNIT PAVERS
SCALE: NONE

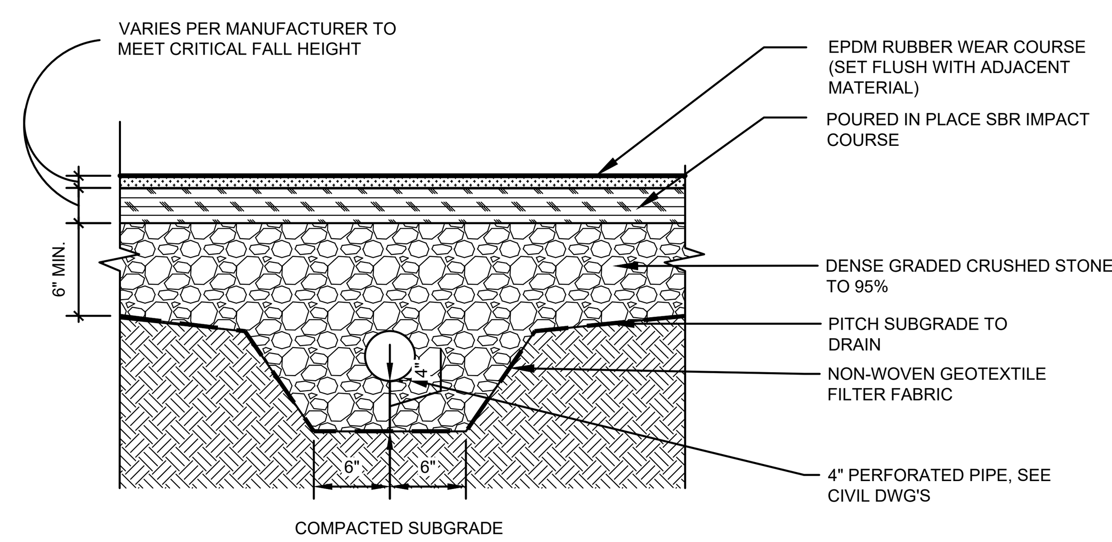
4 STABILIZED DECOMPOSED GRANITE
SCALE: NONE

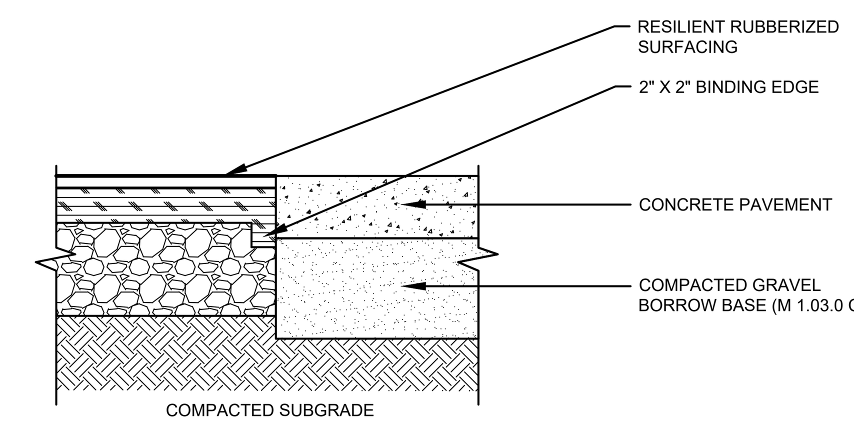
NOTES

1. CONTRACTOR SHALL PROVIDE DETAILED SHOP DRAWINGS FOR APPROVAL WHICH INCLUDE PLANS, ELEVATIONS, CROSS SECTIONS, REINFORCEMENT, FINISHES, JOINT PLACEMENT AND OTHER PERTINENT DETAILS.CONCRETE: CLASS "F"
2. CONCRETE SHALL BE TREATED WITH AN ANTI-GRAFFITI COATING SUCH AS PERMASHIELD, OR APPROVED EQUAL.
3. EXPOSED EDGES: EXPOSED EDGES SHALL BE BEVELED UNLESS NOTED OTHERWISE.
4. CONCRETE COVER: ALL REINFORCEMENT SHALL HAVE TWO INCHES OF COVER.
5. INTEGRAL COLOR: TO BE SELECTED BY OWNER FROM MANUFACTURER'S STANDARD COLORS.
6. REINFORCEMENT: SHALL BE ASTM A615 GRADE 60 - EPOXY COATED.
7. FINISH: ACID ETCHED ON TOP BACK AND FRONT.
8. PROVIDE STAKE STOPS AT EACH JOINT.
9. PROVIDE COLOR CHART FOR GROUT SELECTION.







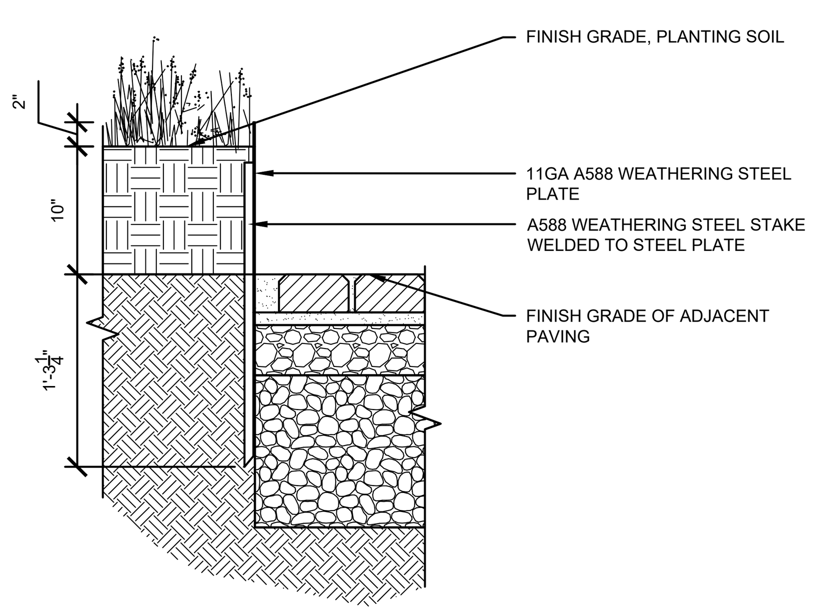


5 BOULDER
SCALE: NONE

6 PRECAST CONCRETE SEAT WALL
SCALE: NONE

7 RESILIENT RUBBERIZED SURFACING
SCALE: NONE

8 RESILIENT RUBBERIZED SURFACING AT CONCRETE
SCALE: NONE



9 WEATHERING STEEL EDGING
SCALE: NONE

ISSUED FOR PERMITTING

UPPER CAPE YMCA • AUGUST 17, 2023

RICARDO AUSTRICH, PLA

UPPER CAPE YMCA

BRICK KILN ROAD

IN

FALMOUTH
MASSACHUSETTS

LANDSCAPE DETAILS

AUGUST 17, 2023

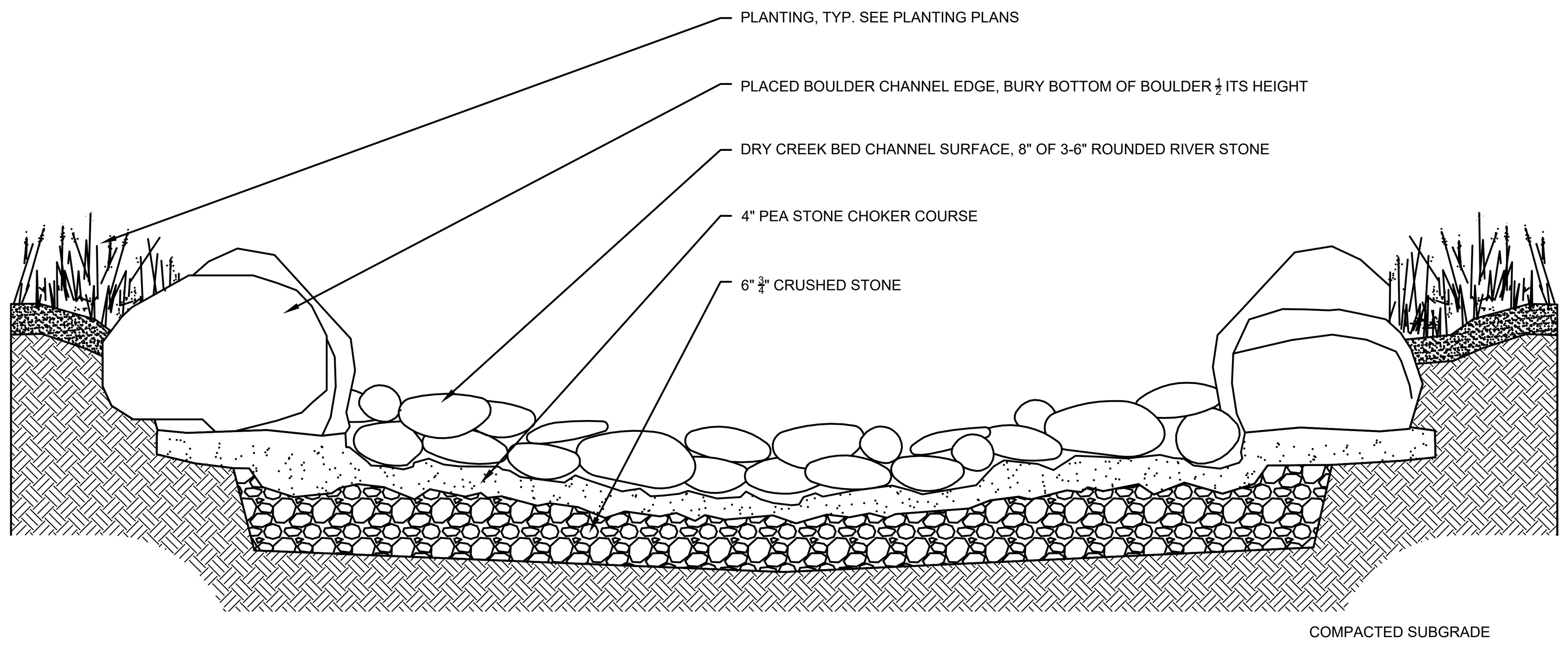
YMCA CAPE COD
100 INDEPENDENCE DRIVE, SUITE 2
HYANNIS, MA 02601

BSC GROUP
803 Summer Street
Boston, Massachusetts 02127
617 896 4300

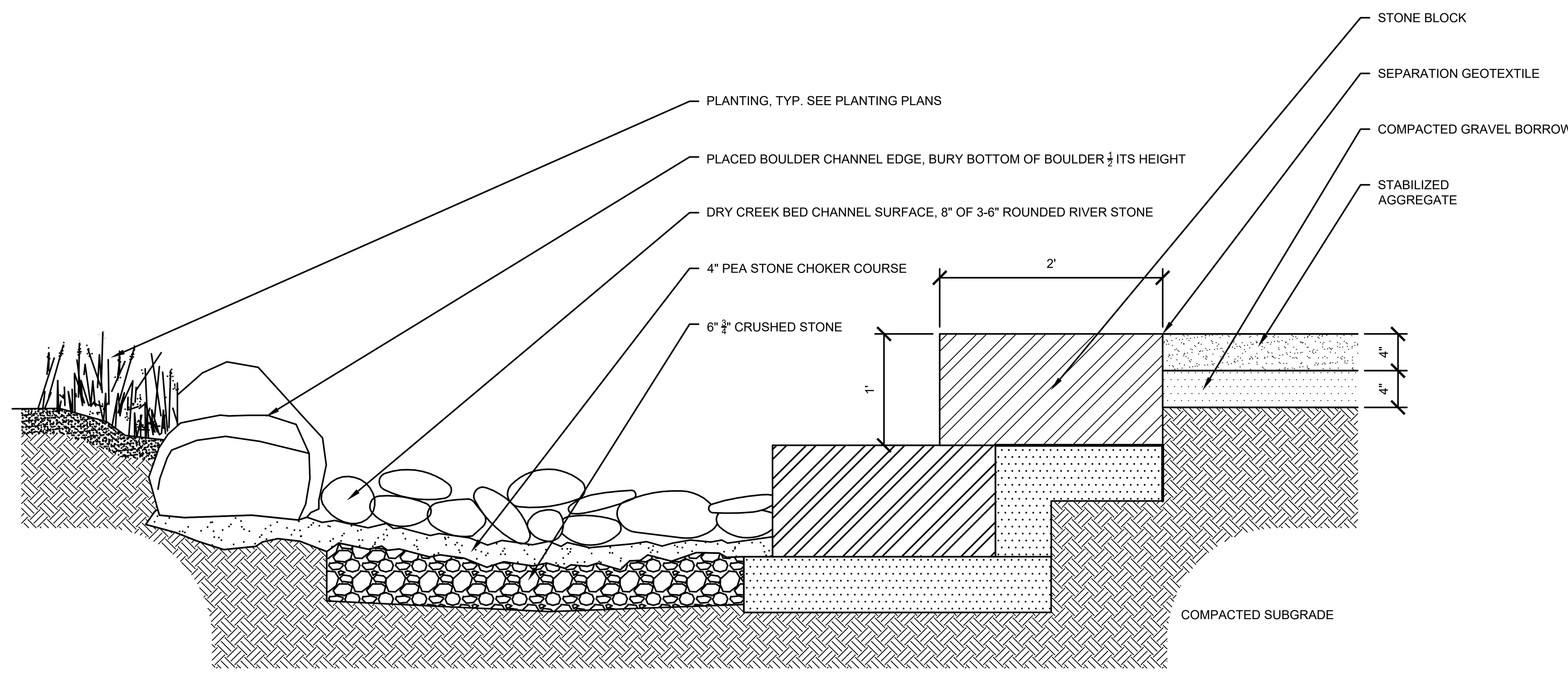
8389800_DETAILS_MG.DWG

83898.00

L-300

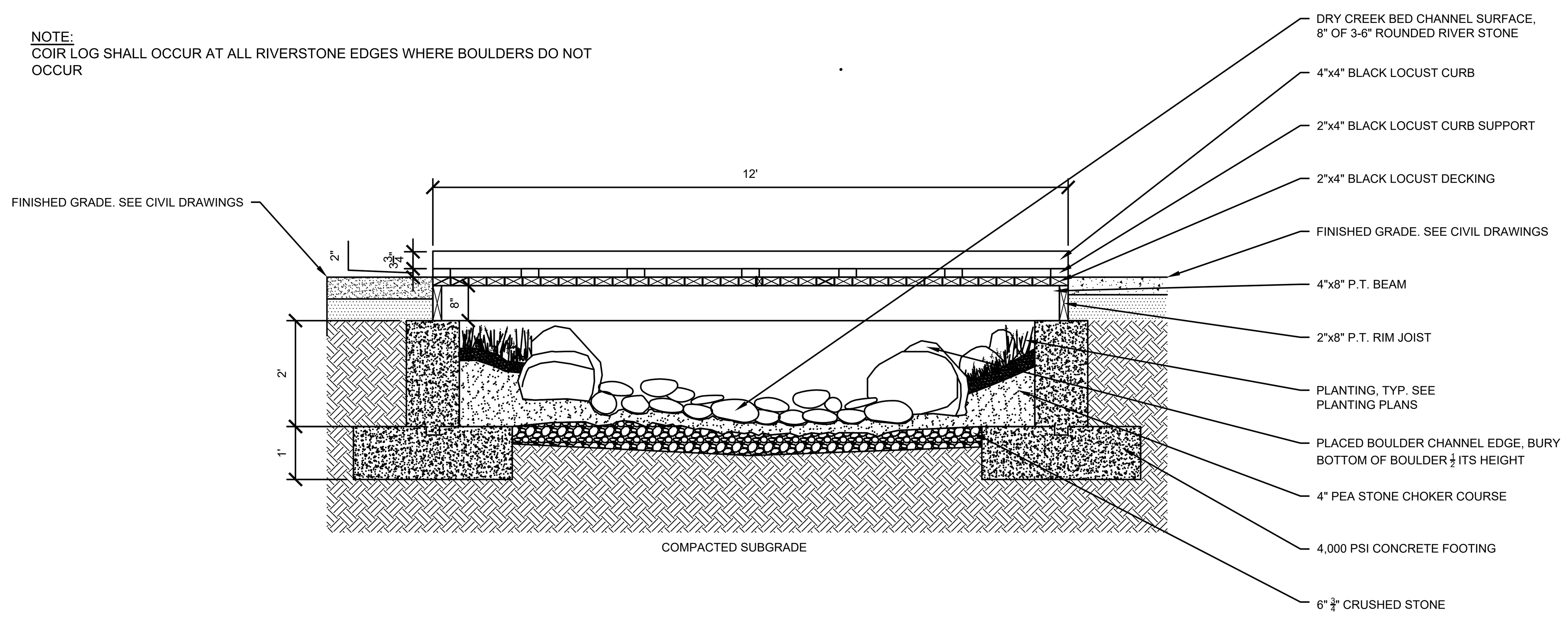


1 SECTION AT DRY CREEK BED
SCALE: NONE

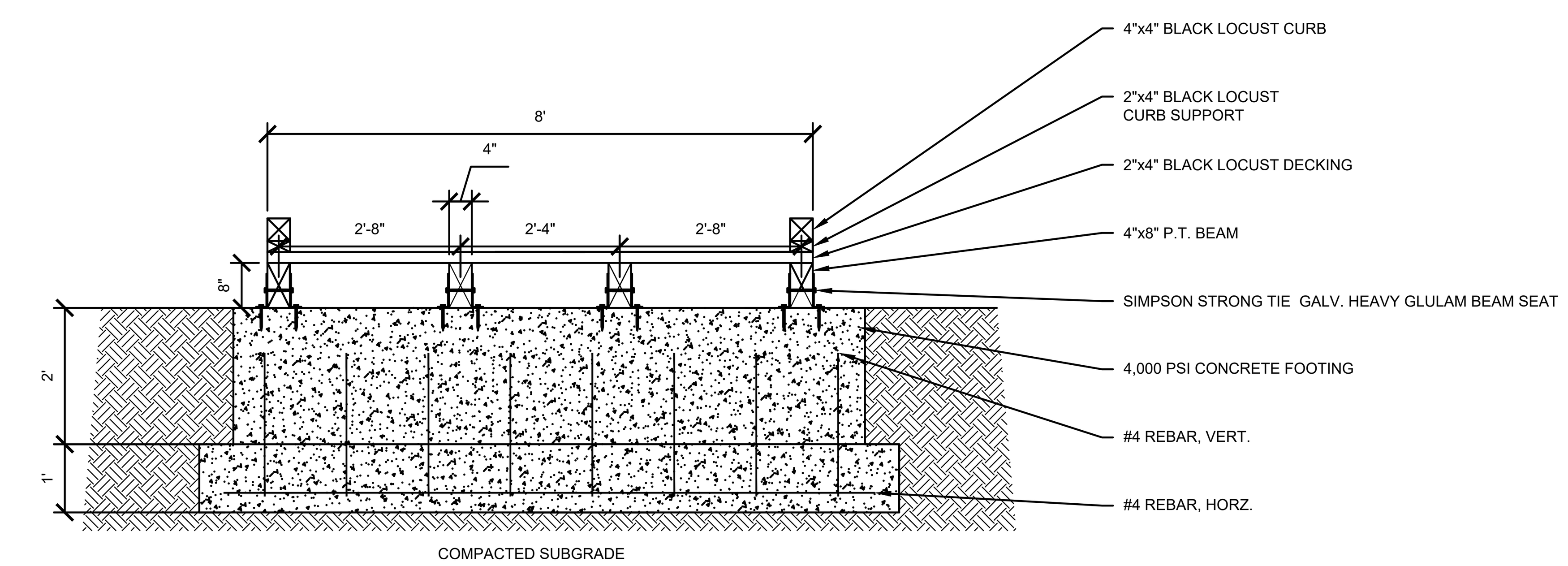


2 SECTION AT DRY CREEK BED
SCALE: NONE

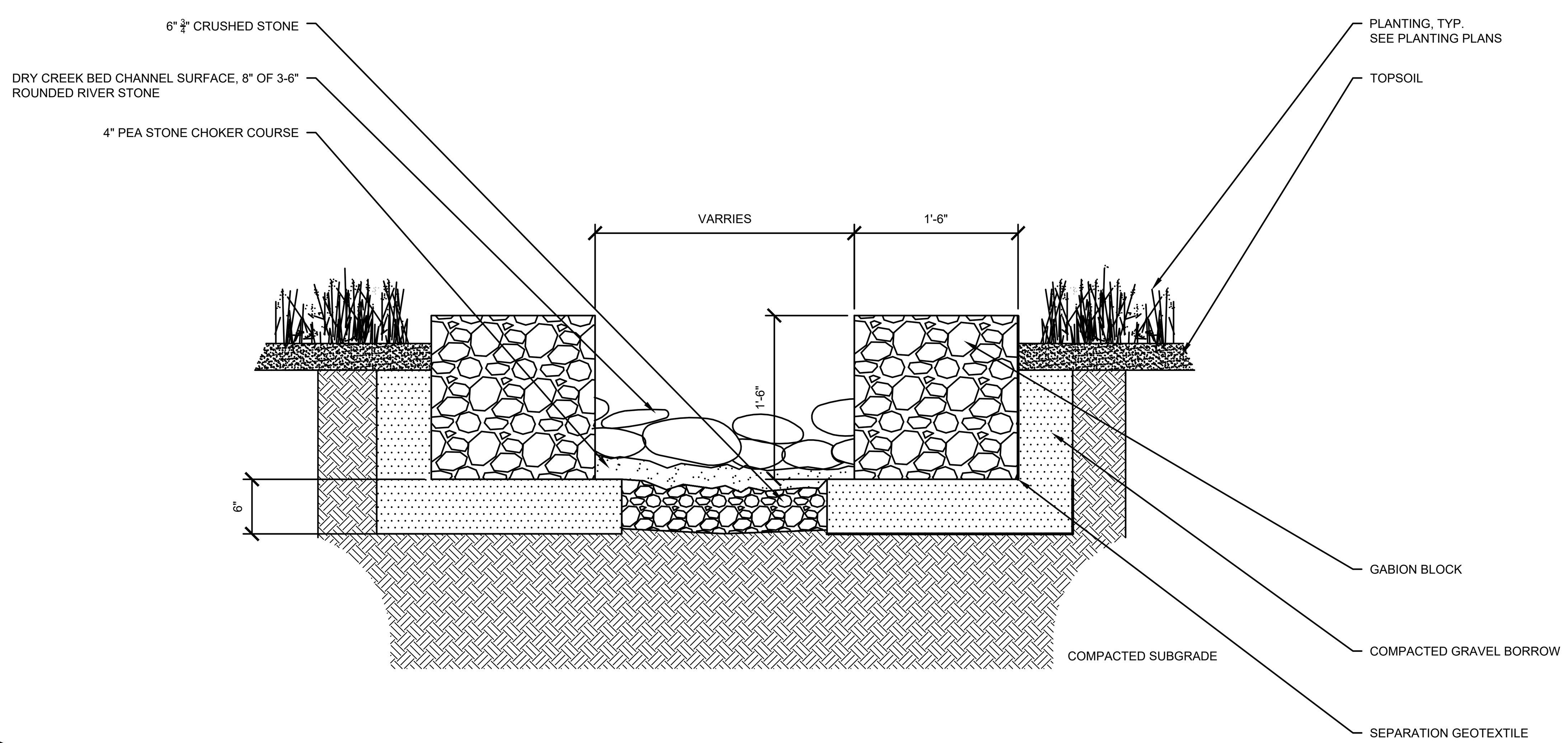
NOTE:
COIR LOG SHALL OCCUR AT ALL RIVERSTONE EDGES WHERE BOULDERS DO NOT OCCUR



3 PEDESTRIAN BRIDGE AT DRY CREEK BED
SCALE: NONE



4 SECTION OF PEDESTRIAN BRIDGE
SCALE: NONE



5 SECTION AT DRY CREEK BED
SCALE: NONE

ISSUED FOR PERMITTING

UPPER CAPE YMCA • AUGUST 17, 2023

RICARDO AUSTRICH, PLA

UPPER CAPE YMCA

BRICK KILN ROAD
IN
FALMOUTH MASSACHUSETTS

LANDSCAPE DETAILS

AUGUST 17, 2023

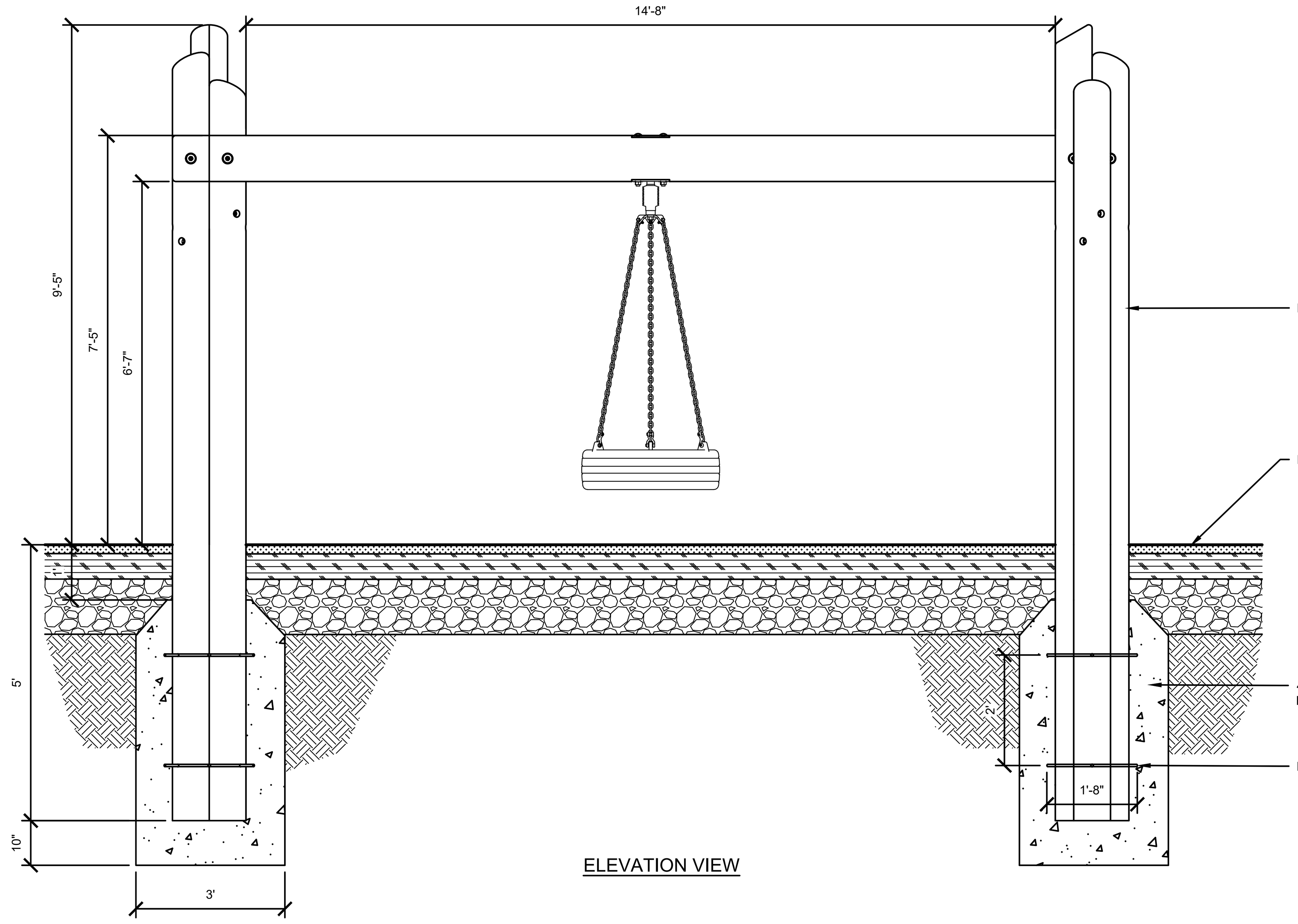
YMCA CAPE COD
100 INDEPENDENCE DRIVE, SUITE 2
HYANNIS, MA 02601

BSC GROUP
803 Summer Street
Boston, Massachusetts 02127
617 896 4300

8389800_DETAILS_MG.DWG

83898.00

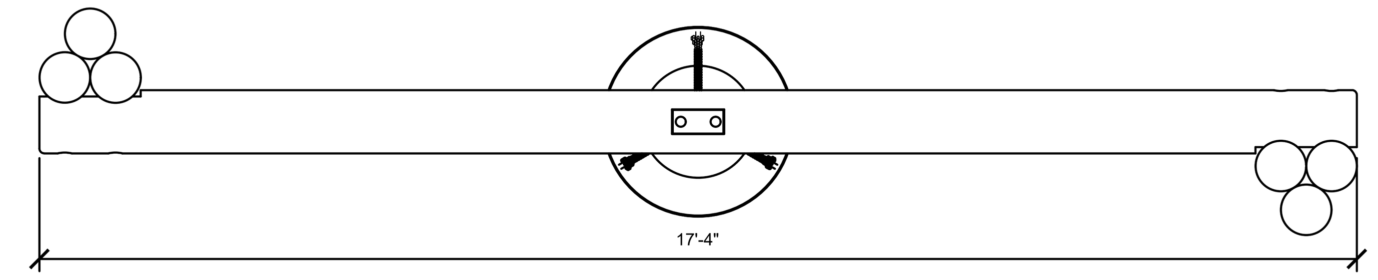
L-301

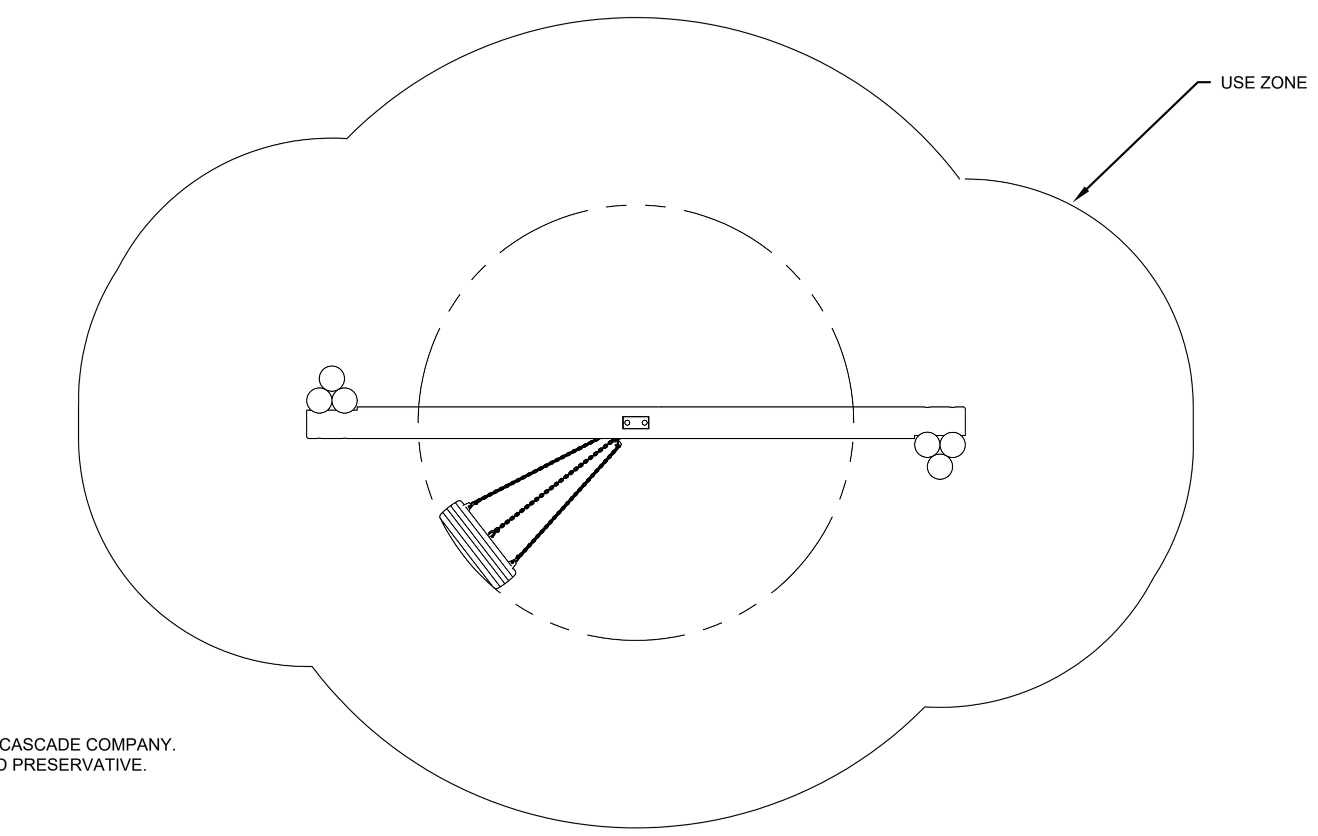


ELEVATION VIEW

NOTES:

1. TYRE SWING SHALL BE MODEL NO. 4500-150 AS MANUFACTURED BY COLUMBIA CASCADE COMPANY.
2. WOOD SHALL BE HAND-HEWN DOUGLAS FIR TREATED WITH A NON-TOXIC WOOD PRESERVATIVE.





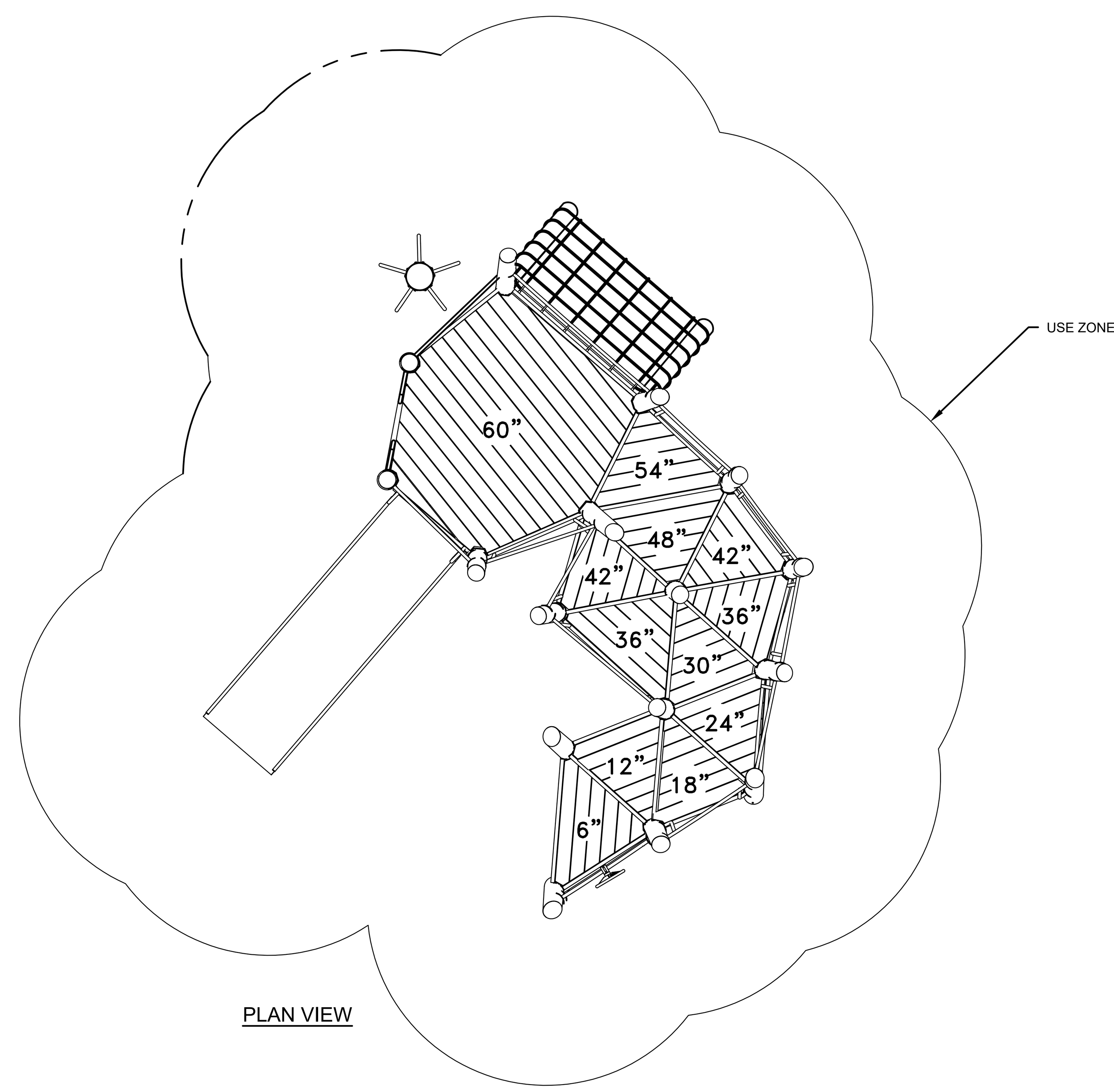
PLAN VIEW

1 TYRE SWING

SCALE:

NOTES:

1. NET CLIMBER STRUCTURE SHALL BE MODEL NO. 4500-112 AS MANUFACTURED BY COLUMBIA CASCADE COMPANY.
2. WOOD SHALL BE HAND-HEWN DOUGLAS FIR TREATED WITH A NON-TOXIC WOOD PRESERVATIVE.



PLAN VIEW

2 NET CLIMBER STRUCTURE

SCALE:

ISSUED FOR PERMITTING

RICARDO AUSTRICH, PLA

UPPER CAPE YMCA

BRICK KILN ROAD

IN

FALMOUTH
MASSACHUSETTS

LANDSCAPE DETAILS

AUGUST 17, 2023

YMCA CAPE COD
100 INDEPENDENCE DRIVE, SUITE 2
HYANNIS, MA 02601

BSC GROUP
803 Summer Street
Boston, Massachusetts 02127
617 896 4300

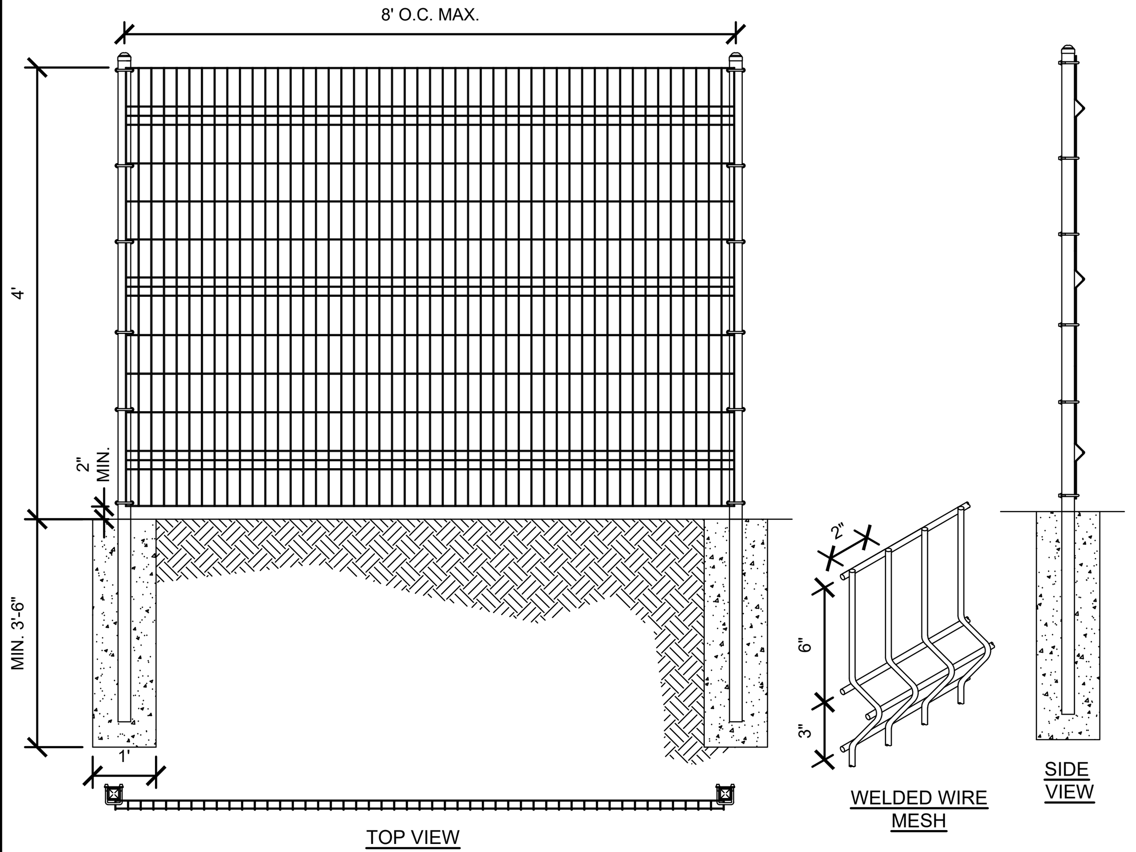
8389800_DETAILS_MG.DWG

83898.00

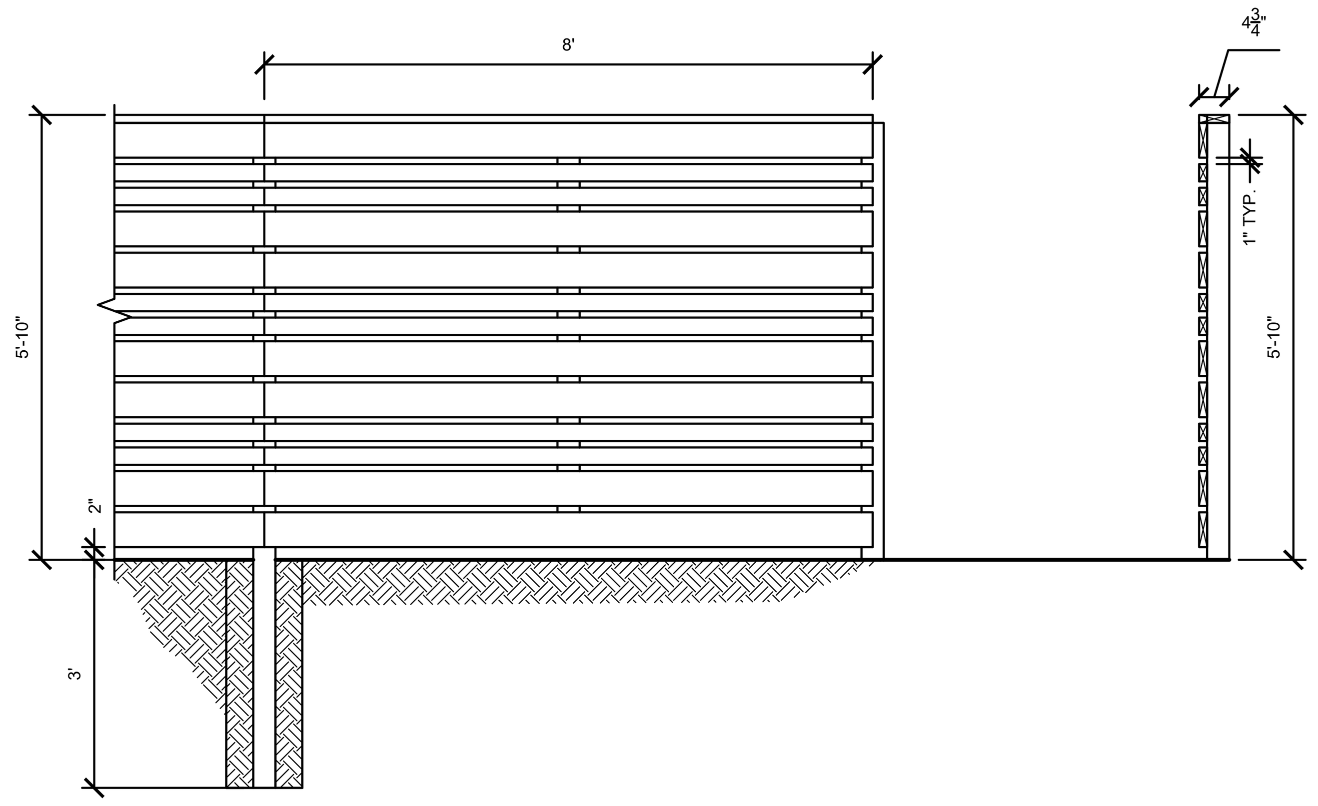
NOTES:
1. INSTALL PER MANUFACTURER'S INSTRUCTIONS.
2. ALL FENCE SHALL BE GROUNDED.
3. INSTALL FABRIC ON PLAYGROUND SIDE.

WELDED WIRE FENCE FRAMEWORK SCHEDULE

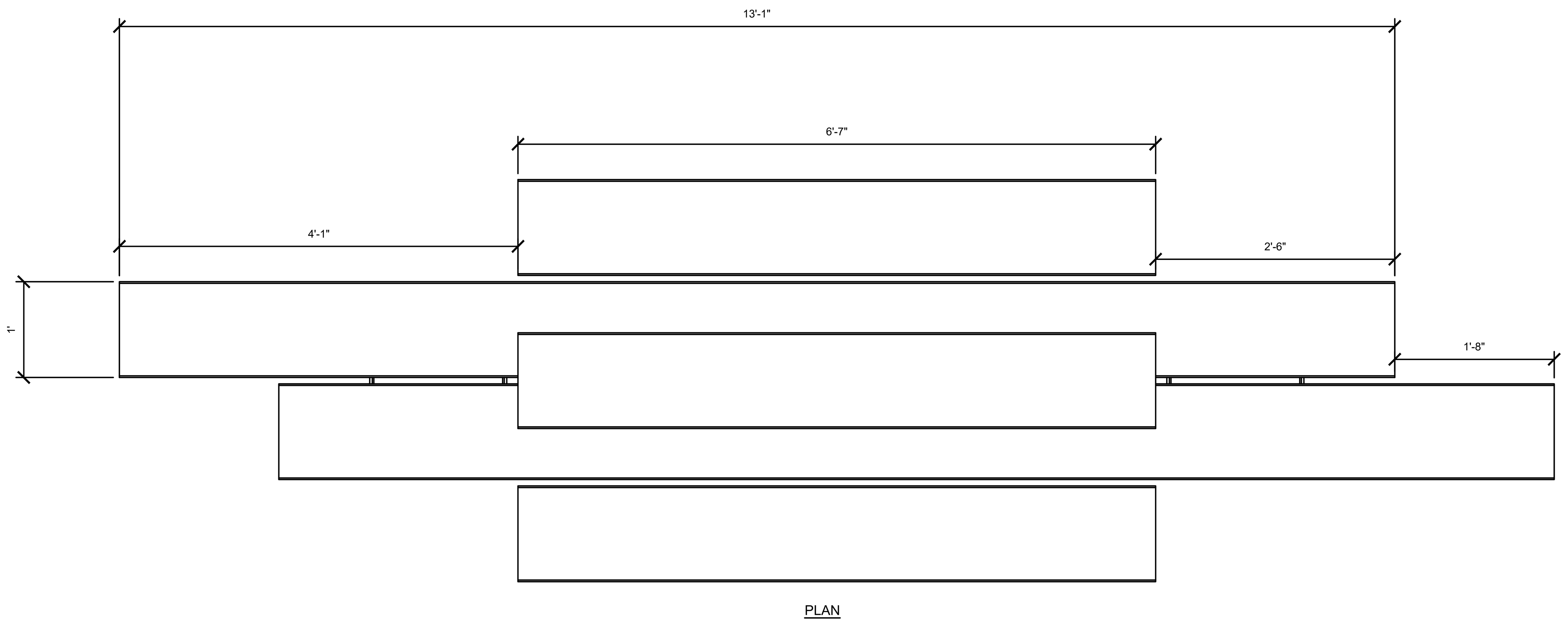
FABRIC HEIGHT	UP TO 6'
POST	2" SQ. 16 GA.
FABRIC MESH	6 GA.- 2"x6"
NUMBER OF PANELS	2-3
FOOTING	12" DIA.

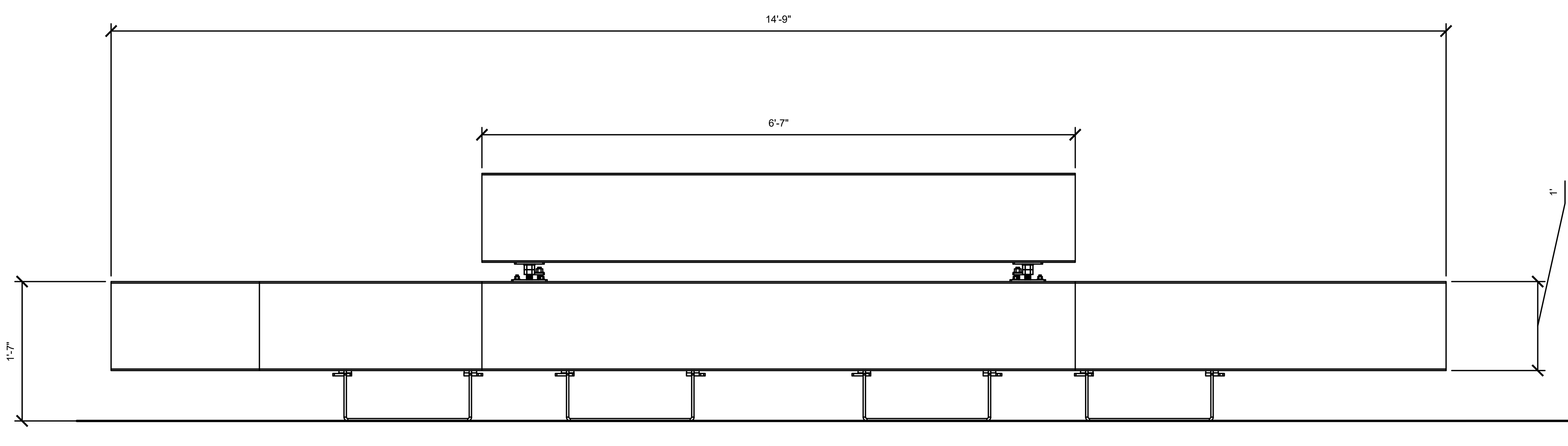


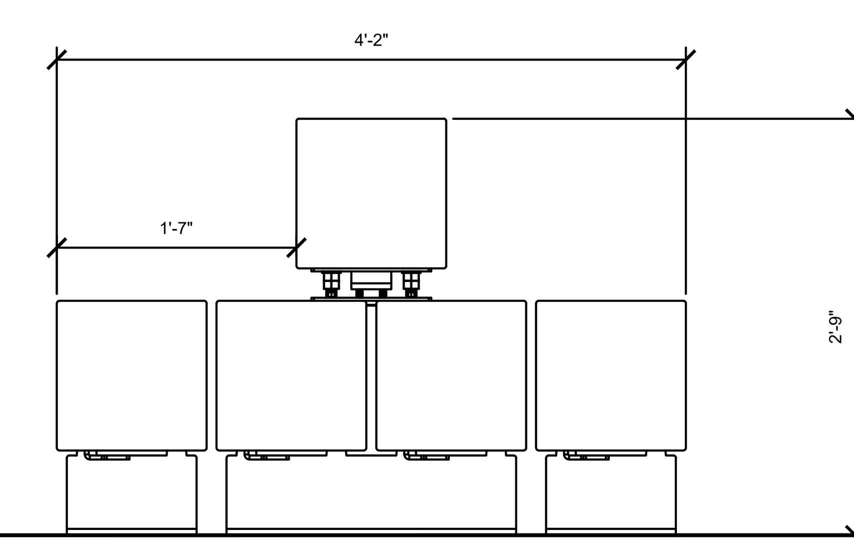
1 WELDED WIRE FENCE
SCALE: NONE



2 WOOD FENCE
SCALE: NONE







3 MULTI-TIERED SEATING
SCALE: NONE

ISSUED FOR PERMITTING

UPPER CAPE YMCA - AUGUST 17, 2023

RICARDO AUSTRICH, PLA

UPPER CAPE YMCA

BRICK KILN ROAD
IN
FALMOUTH
MASSACHUSETTS

LANDSCAPE DETAILS

AUGUST 17, 2023

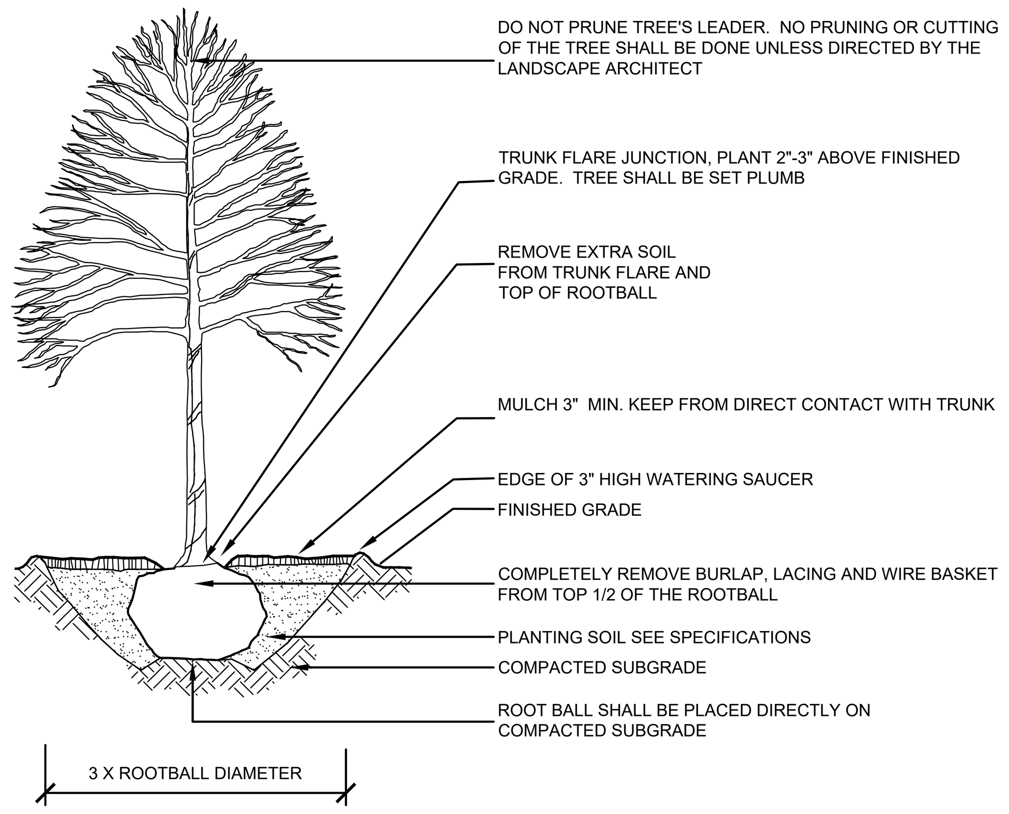
YMCA CAPE COD
100 INDEPENDENCE DRIVE, SUITE 2
HYANNIS, MA 02601

BSC GROUP
803 Summer Street
Boston, Massachusetts 02127
617 896 4300

8389800_DETAILS_MG.DWG

83898.00

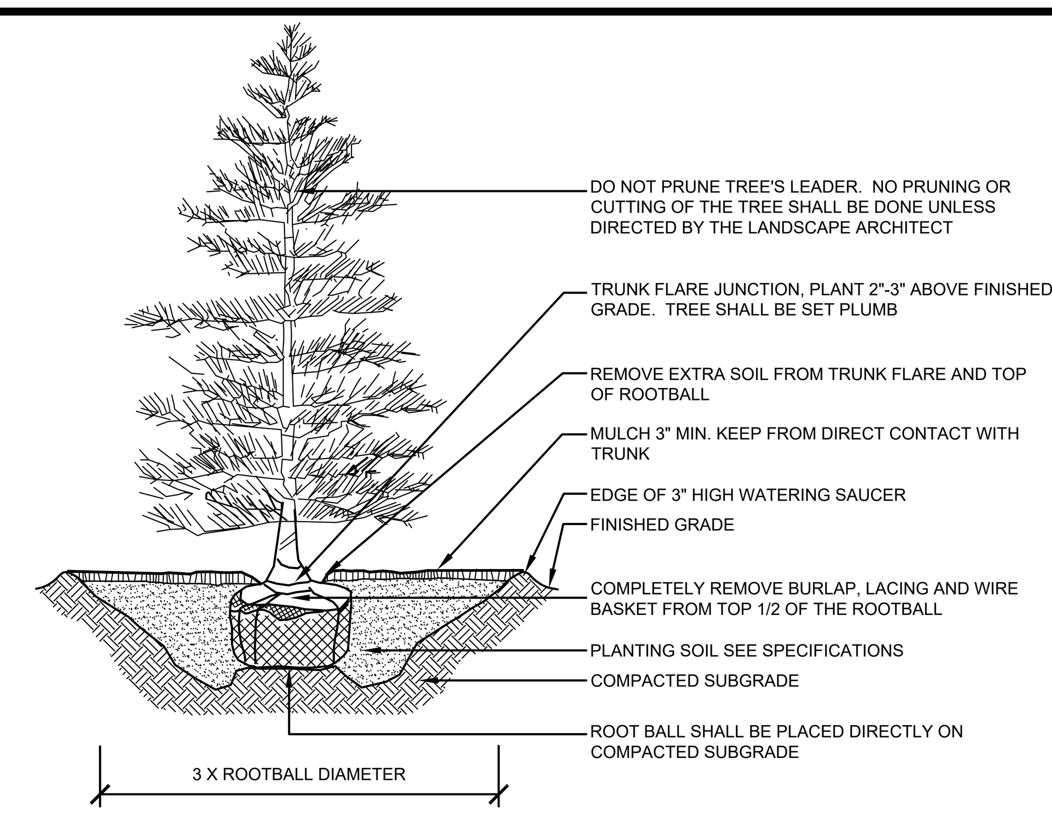
L-303



NOTES:

1. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
2. SAUCER SHALL BE FLOODED TWICE DURING THE FIRST 24 HOURS AFTER PLANTING.
3. DO NOT STAKE OR WRAP TREE UNLESS NOTED OTHERWISE.

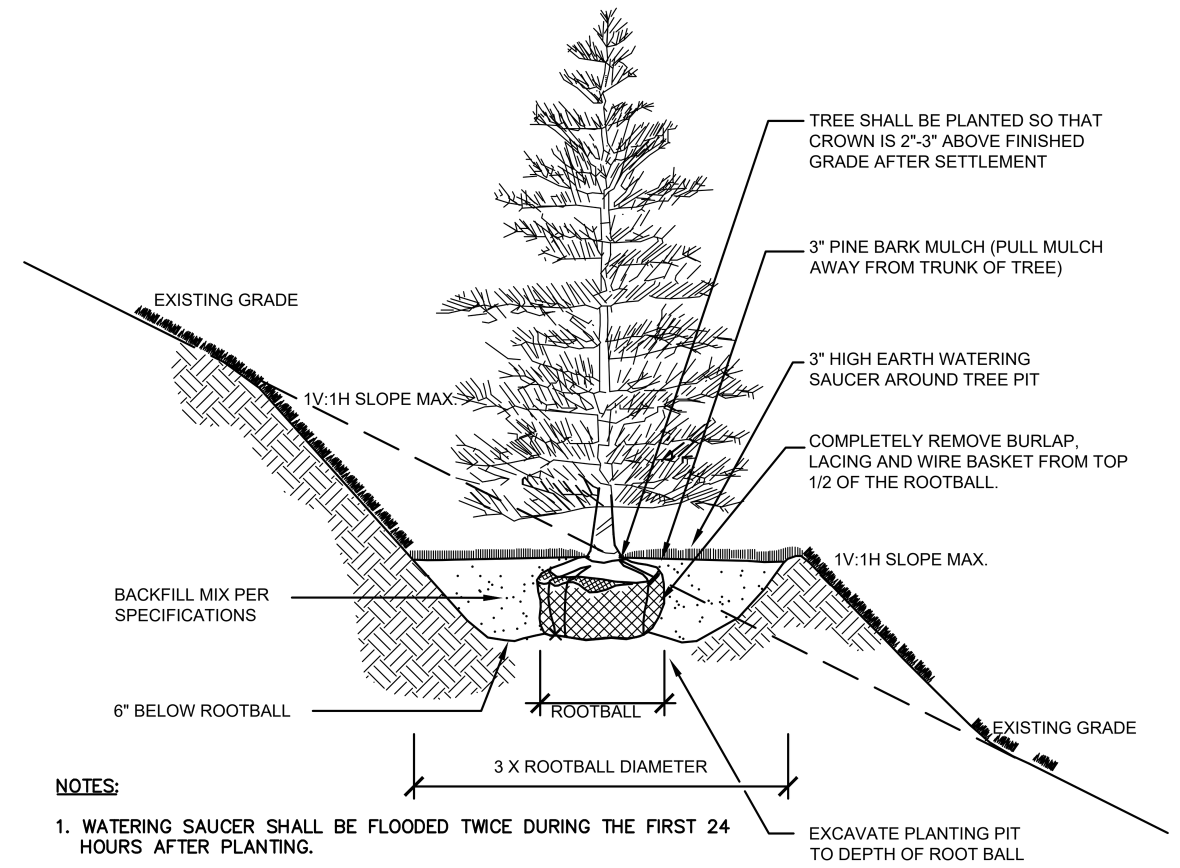
1 DECIDUOUS TREE PLANTING
SCALE: NONE



NOTES:

1. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
2. SAUCER SHALL BE FLOODED TWICEDURING THE FIRST 24 HOURS AFTER PLANTING.

2 EVERGREEN TREE PLANTING
SCALE: NONE



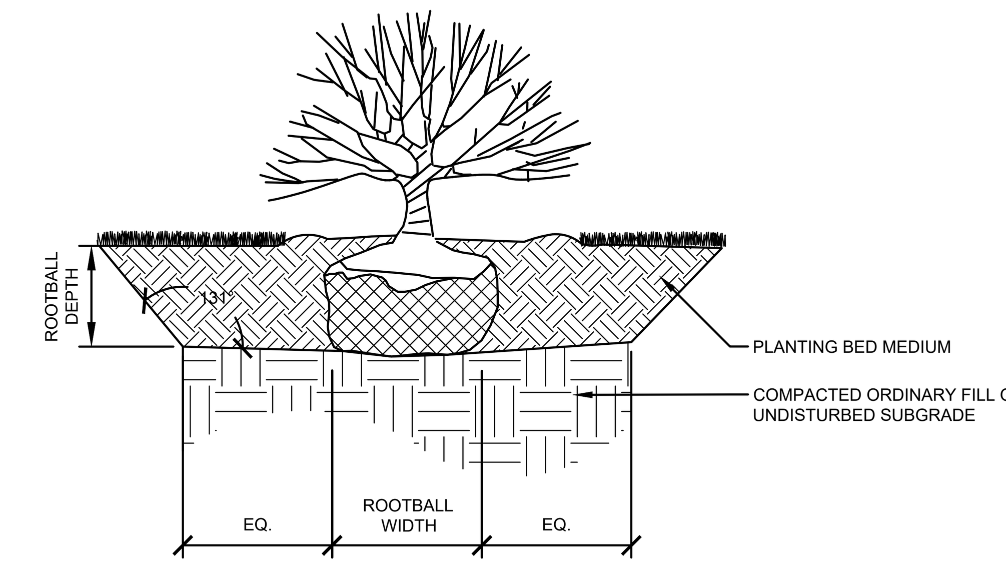
NOTES:

1. WATERING SAUCER SHALL BE FLOODED TWICE DURING THE FIRST 24 HOURS AFTER PLANTING.
2. DO NOT CUT LEADER.
3. TREE SHALL BE SET PLUMB.

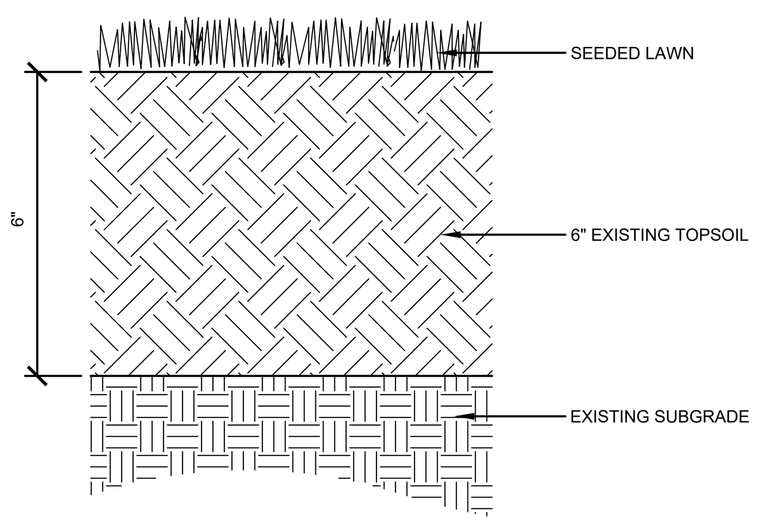
3 TREE PLANTING ON SLOPE
SCALE: NONE

NOTES:

1. LOOSE OR CRACKED ROOT BALLS ARE UNACCEPTABLE.
2. EXCAVATE TO REQUIRED DEPTH AND DO NOT EXCAVATE BELOW ROOT BALL DEPTH.
3. SET SHRUBS PLUMB WITH ROOT FLARE 1" ABOVE FINISHED GRADE, BACKFILL WITH PLANTING MIX.
4. FLOOD WATERING SAUCER TWICE IN FIRST 24 HOURS AFTER PLANTING.
5. RAISE AND REPLANT ANY SHRUBS THAT SETTLE AFTER PLANTING & WATERING.
6. REMOVE 1/3 BURLAP PRIOR TO BACKFILL. SYNTHETIC BURLAP UNACCEPTABLE.
7. 2" DEPTH MULCH (KEEP MULCH 1" AWAY FROM SHRUB BASE) 3" HIGH EARTH WATERING SAUCER 1'-0" BEYOND ROOT BALL PLANTING MIXTURE.
8. FOR CONTAINERIZED PLANTS: REMOVE CONTAINER PRIOR TO PLANTING, SCARIFY ROOT BALL BELOW EDGE 1/2" DEEP IN FOUR LOCATIONS.



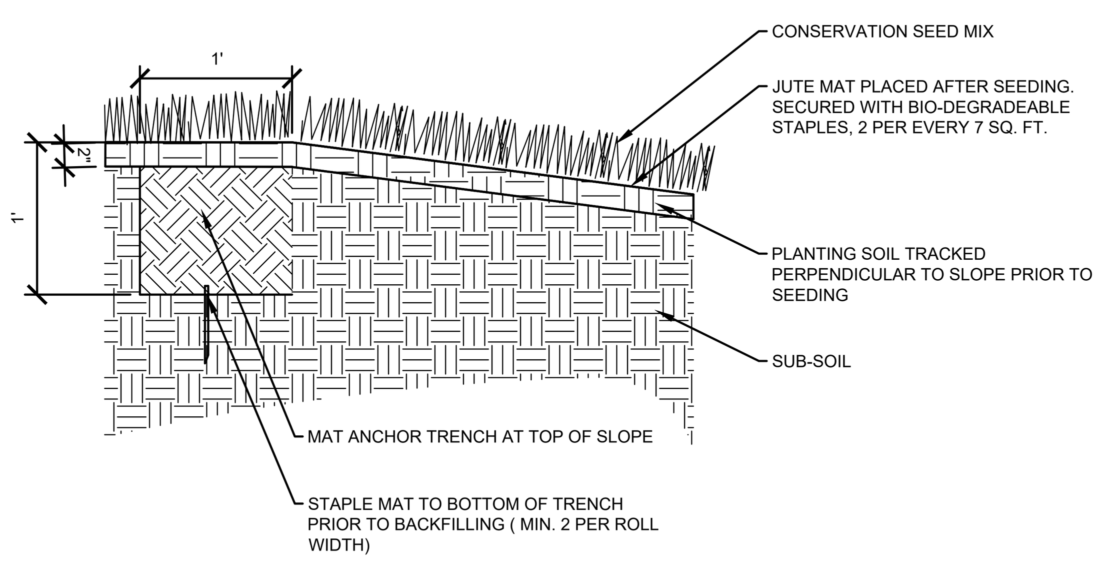
4 SHRUB PLANTING
SCALE: NONE



NOTES:

1. CONTRACTOR SHALL PREPARE SOILS IN ALL DISTURBED AREAS AND AREAS USED FOR EQUIPMENT ACCESS.

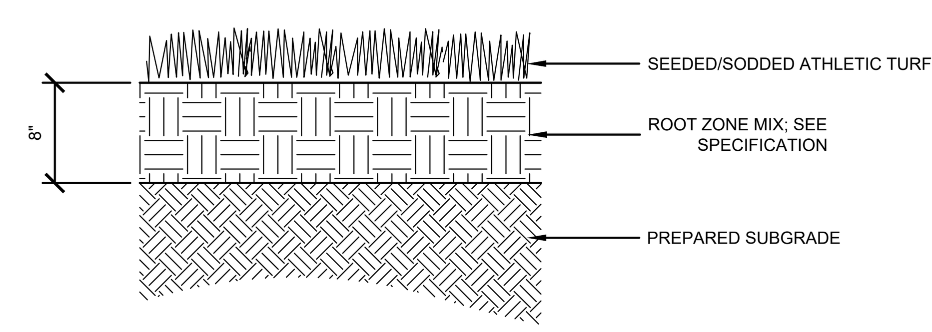
5 LAWN
SCALE: NONE



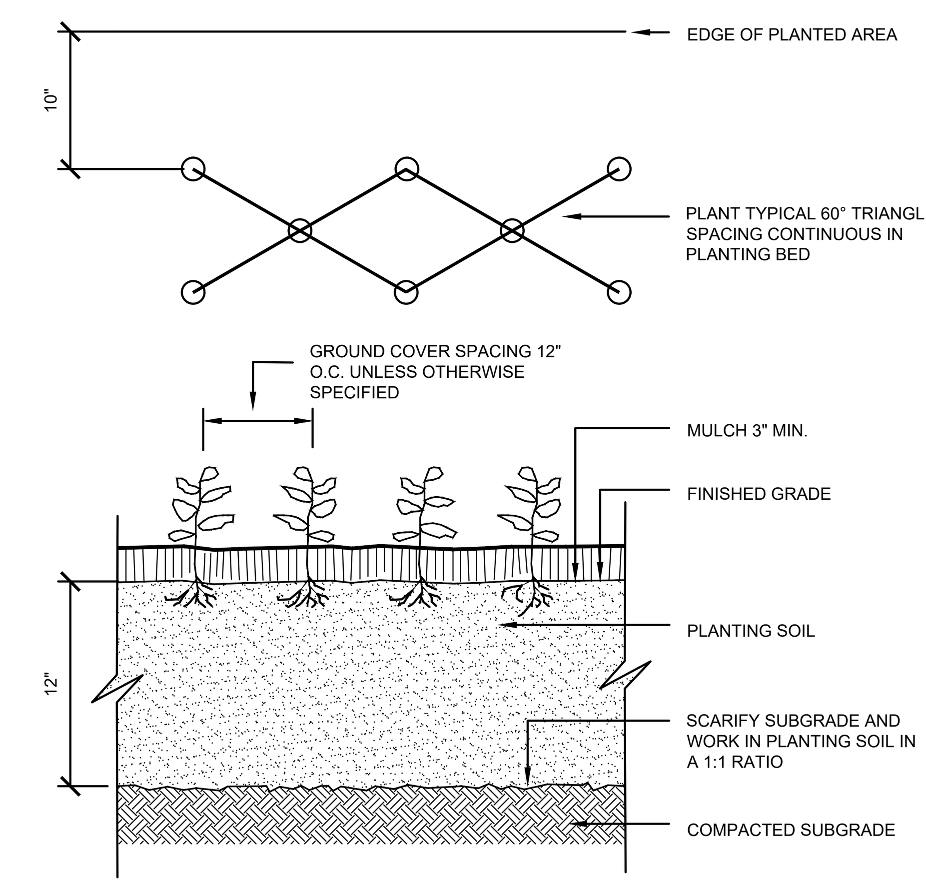
NOTES:

1. JUTE MAT SHALL BE PLACED ON ALL SLOPES GREATER THAN 3.5:1.

6 CONSERVATION SEED/VEGETATED SLOPE
SCALE: NONE



7 ROOT ZONE MIX
SCALE: NONE



NOTES:

1. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS

8 GROUNDCOVER PLANTING
SCALE: NONE

ISSUED FOR PERMITTING

UPPER CAPE YMCA - AUGUST 17, 2023

RICARDO AUSTRICH, PLA ----

UPPER CAPE YMCA

BRICK KILN ROAD

IN

FALMOUTH
MASSACHUSETTS

LANDSCAPE DETAILS

AUGUST 17, 2023

YMCA CAPE COD
100 INDEPENDENCE DRIVE, SUITE 2
HYANNIS, MA 02601

BSC GROUP
803 Summer Street
Boston, Massachusetts 02127
617 896 4300

8389800_DETAILS_MG.DWG

83898.00

L-304

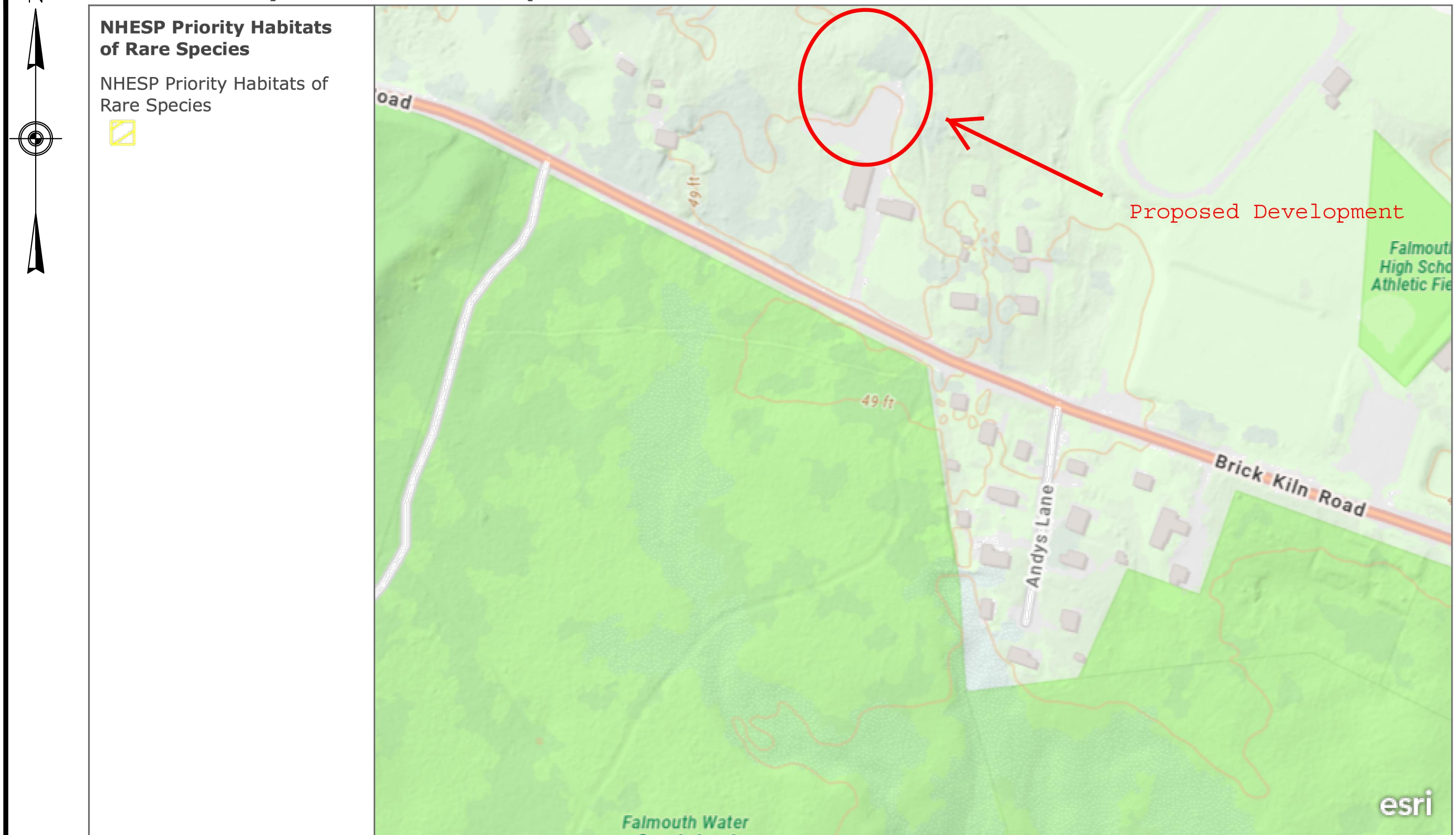
EXHIBIT 27

CONTEXTUAL AREA MAPS

NHESP Priority Habitats of Rare Species

NHESP Priority Habitats of Rare Species

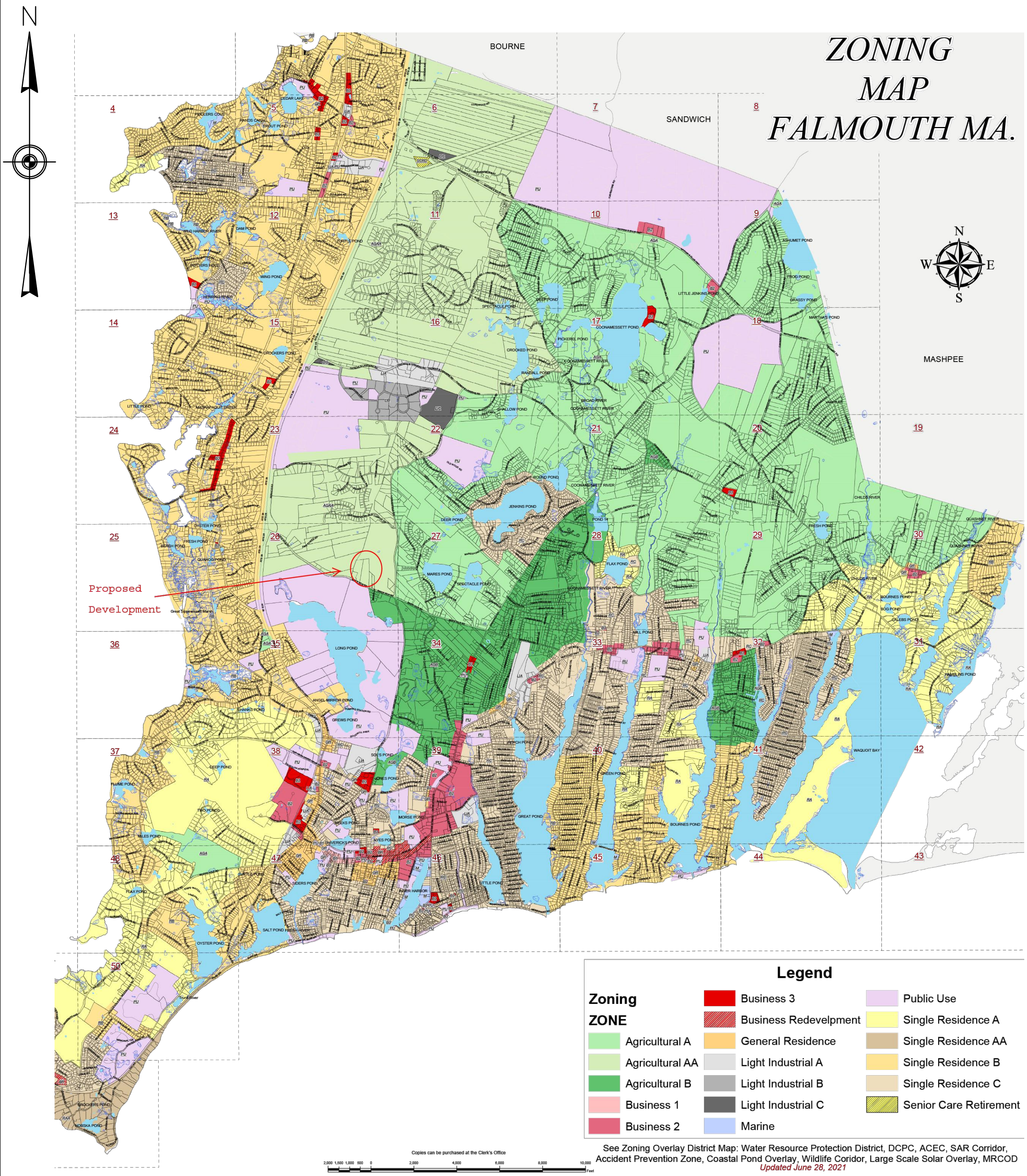
NHESP Priority Habitats of Rare Species



Areas delineated as Priority Habitats in Massachusetts are protected and can include wetlands, uplands, and marine habitats. Published as a map service by MassGIS.

DRAWING TITLE:		PREPARED FOR:	LOCUS:	DATE:	SCALE:	MAP:	
MAP C-01 NHESP PRIORITY HABITATS MAP		UPPER CAPE YMCA DRI SUBMITTAL	BRICK KILN ROAD FALMOUTH, MA	09/14/2023 CAD TECH: MJW PM: TB	NOT TO SCALE	1 OF 5	Green Seal Environmental, LLC 114 State Road, Building B Sagamore Beach, MA 02562 Tel: (508) 888-6034 Fax: (508) 888-1506 www.gseenv.com

S:\CLIENTS\YMCA – CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAPE COD COMMISSION\DRI\EXHIBIT 27 – CONTEXTUAL AREA MAPS\YMCA-22-04.5-5.DWG 9/14/2023 10:51 AM



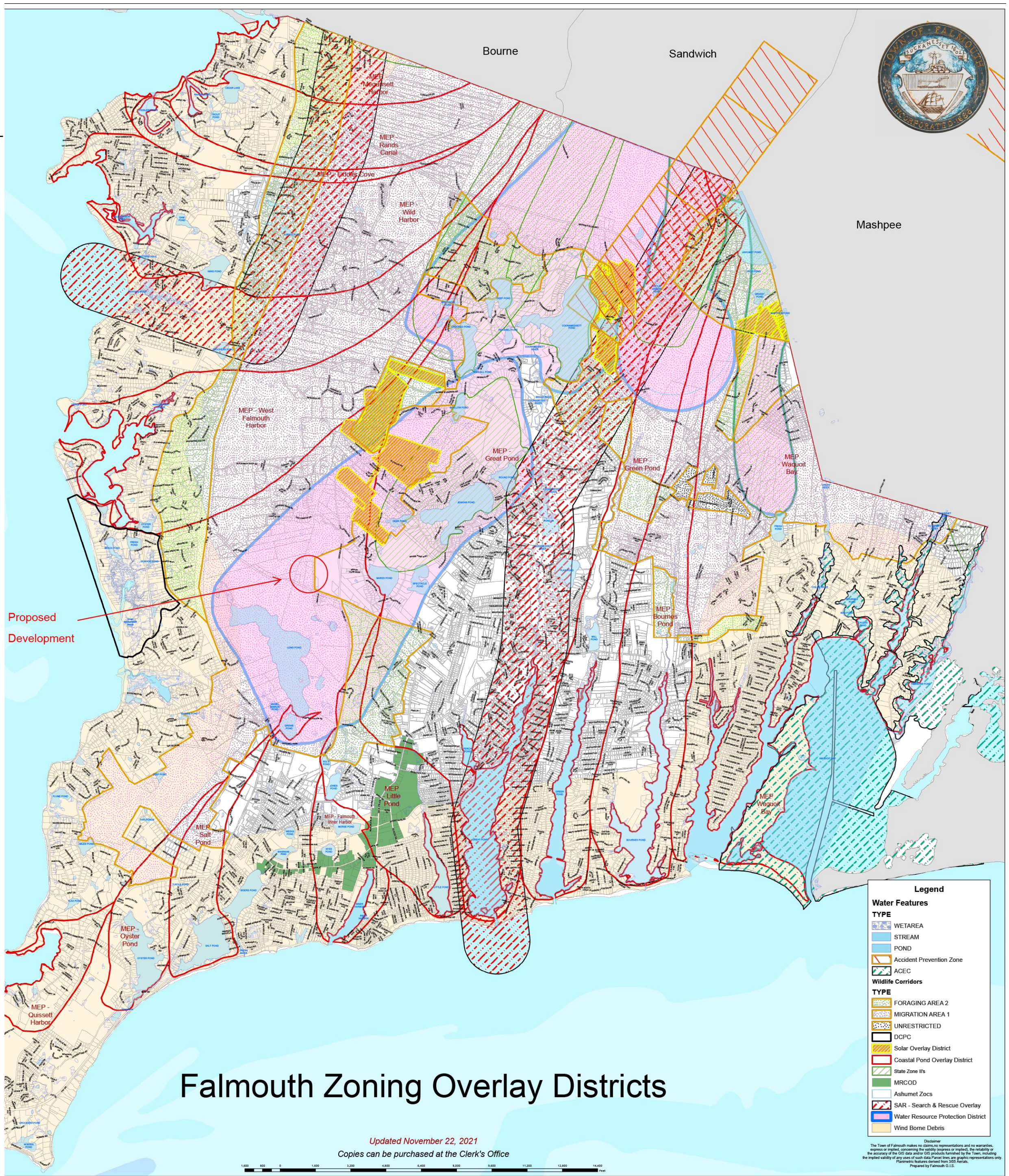
NOTES:

1. ZONING MAP IS DATED 2021.

DRAWING TITLE:	PREPARED FOR:	
MAP C-02 FALMOUTH ZONING MAP	UPPER CAPE YMCA DRI SUBMITTAL	Green Seal Environmental, LLC 114 State Road, Building B Sagamore Beach, MA 02562 Tel: (508) 888-6034 Fax: (508) 888-1506 www.gseenv.com
DATE: 09/14/2023 CAD TECH: MJW PM: TB	LOCUS: BRICK KILN ROAD FALMOUTH, MA	SCALE: NOT TO SCALE MAP: 2 OF 5

S:\CLIENTS\YMCA - CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAPE COD COMMISSION\DRI\EXHIBIT 27 - CONTEXTUAL AREA MAPS\YMCA-22-04.5-5.DWG 9/14/2023 10:51 AM

N



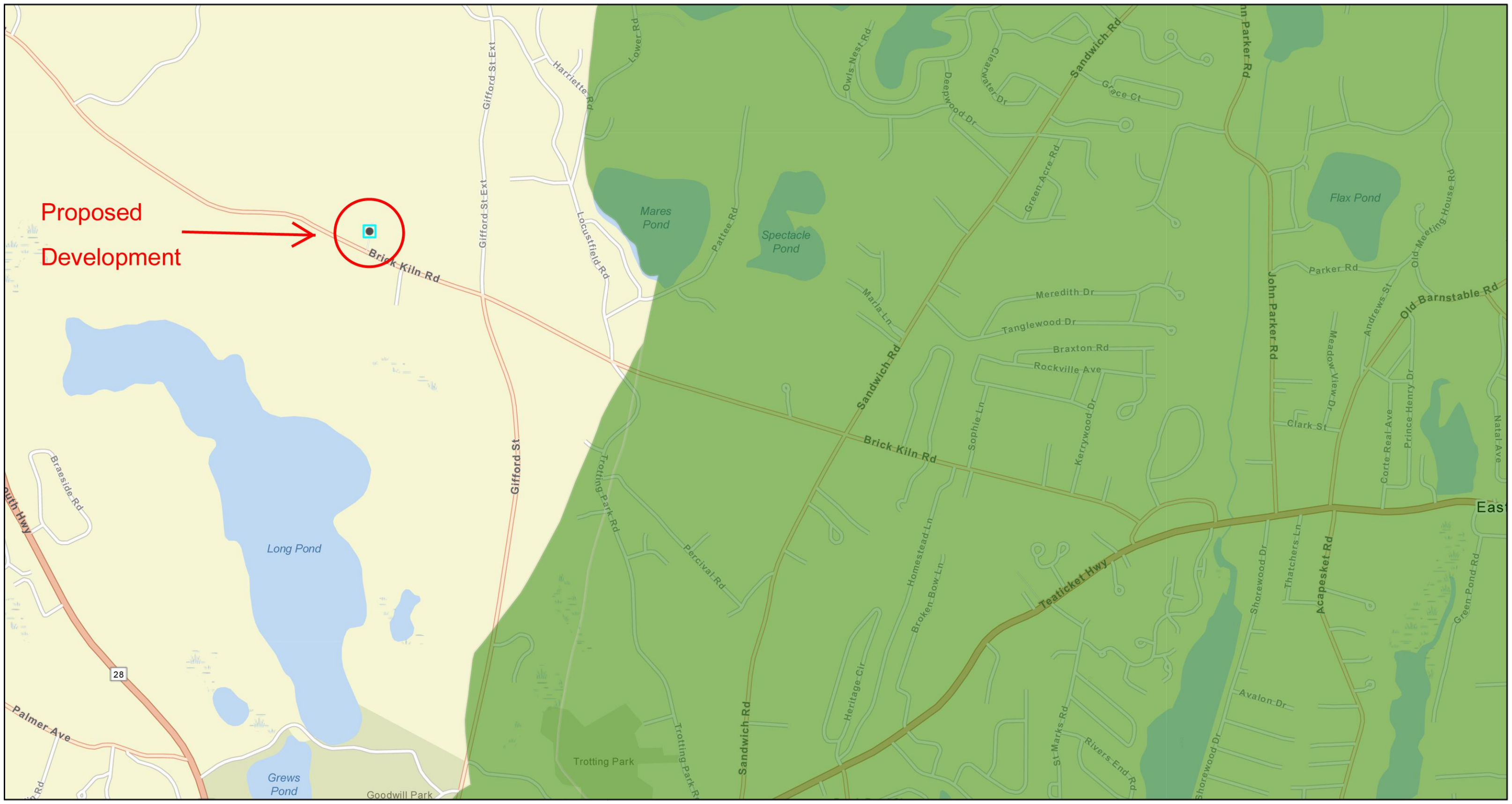
NOTES:

1. OVERLAY MAP IS DATED 2021.

DRAWING TITLE: MAP C-03 FALMOUTH ZONING OVERLAY DISTRICTS MAP	PREPARED FOR: UPPER CAPE YMCA DRI SUBMITTAL		Green Seal Environmental, LLC 114 State Road, Building B Sagamore Beach, MA 02562 Tel: (508) 888-6034 Fax: (508) 888-1506 www.gseenv.com	
DATE: 09/14/2023	LOCUS: BRICK KILN ROAD FALMOUTH, MA		SCALE: NOT TO SCALE	MAP: 3 OF 5
CAD TECH: MJW / PM: TB				

S:\CLIENTS\YMCA - CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAPE COD COMMISSION\DRI\EXHIBIT 27 - CONTEXTUAL AREA MAPS\YMCA-22-04.5-5.DWG 9/14/2023 10:51 AM

MassDEP Nitrogen Sensitive Areas



5/4/2023, 8:25:43 AM

MassDEP Natural Resource Area: Nitrogen Sensitive Area

Watershed with final total nitrogen TMDLs that MassDEP will automatically designate as Natural Resource Area Nitrogen Sensitive Area upon promulgation of the proposed Title 5 amendments

1:18,056

0 0.15 0.3 0.6 mi

0 0.28 0.55 1.1 km

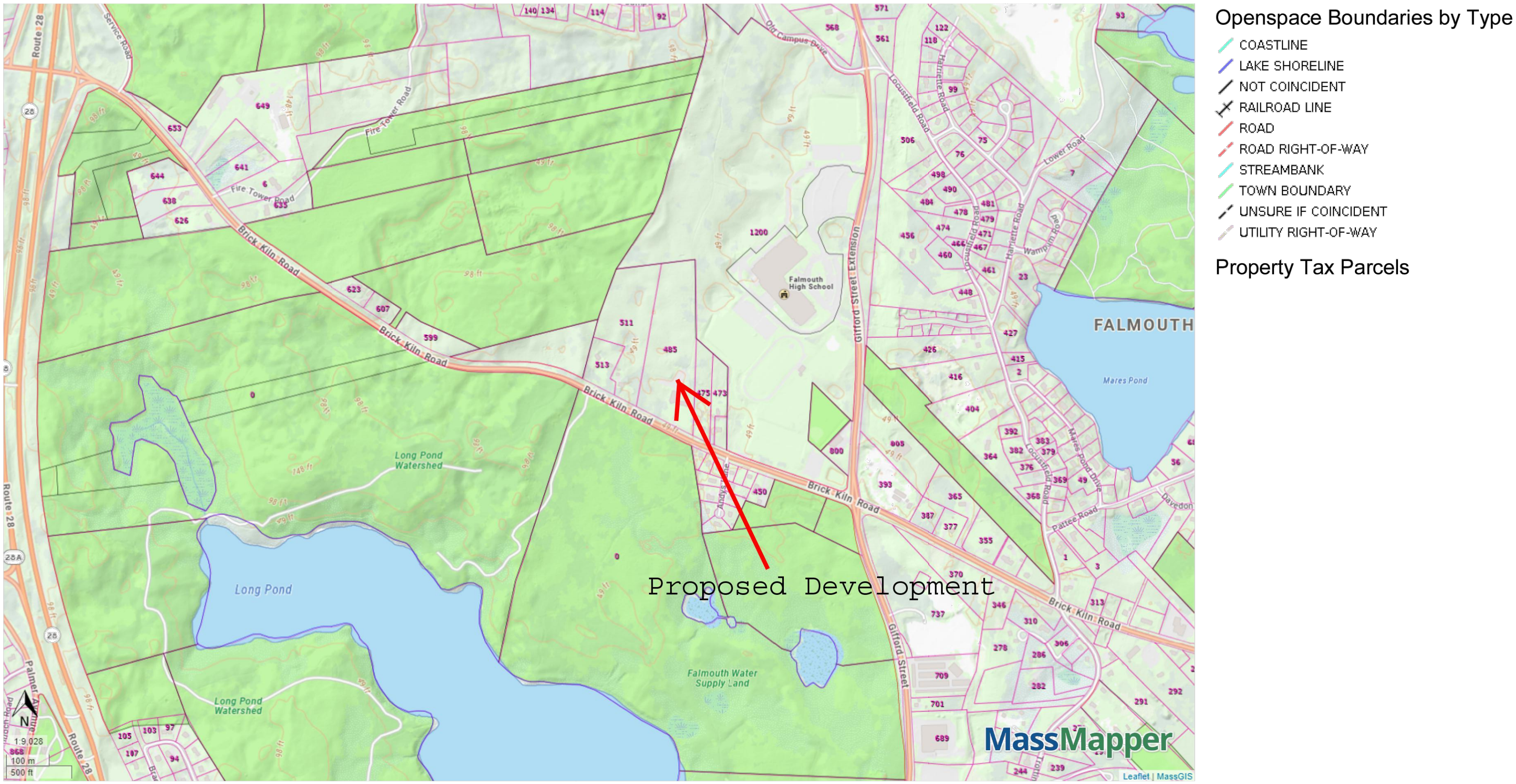
Esri Community Maps Contributors, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA

MassDEP Nitrogen Sensitive Areas Address Lookup WebApp
Esri Community Maps Contributors, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA | MassGIS | Commonwealth of Massachusetts Office of Geographic Information (MassGIS) |

DRAWING TITLE:	PREPARED FOR:	LOCUS:	DATE:	SCALE:	MAP:	
MAP C-04 MASS DEP NITROGEN SENSITIVE AREAS MAP	UPPER CAPE YMCA DRI SUBMITTAL	BRICK KILN ROAD FALMOUTH, MA	09/14/2023 CAD TECH: MJW PM: TB	NOT TO SCALE	4 OF 5	Green Seal Environmental, LLC 114 State Road, Building B Sagamore Beach, MA 02562 Tel: (508) 888-6034 Fax: (508) 888-1506 www.gseenv.com

S:\CLIENTS\YMCA – CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAPE COD COMMISSION\DRI\EXHIBIT 27 – CONTEXTUAL AREA MAPS\YMCA-22-04.5-5.DWG 9/14/2023 10:51 AM

Open Space Map



DRAWING TITLE:	NOTES:	PREPARED FOR:	LOCUS:	DATE:	SCALE:	MAP:	
MAP C-05 MASSGIS OPEN SPACE MAP	1. MAP DOWNLOADED ON 9/14/2023.	UPPER CAPE YMCA DRI SUBMITTAL	BRICK KILN ROAD FALMOUTH, MA	09/14/2023 CAD TECH: MJW PM: TB	NOT TO SCALE	5 OF 5	Green Seal Environmental, LLC 114 State Road, Building B Sagamore Beach, MA 02562 Tel: (508) 888-6034 Fax: (508) 888-1506 www.gseenv.com

S:\CLIENTS\YMCA – CAPE COD\YMCA-2020-0004 (FALMOUTH)\CAPE COD COMMISSION\DRI\EXHIBIT 27 – CONTEXTUAL AREA MAPS\YMCA-22-04.5-5.DWG 9/14/2023 10:51 AM