STORMWATER REPORT

Prepared For:
Ryder Development Corporation
668 Broad Street – Suite D
Weymouth, Massachusetts 02189

Savanna Drive Subdivision
Weymouth, Massachusetts

March 2022

SITEC
ENGINEERING &
ENVIRONMENTAL
CONSULTANTS, INC.

769 Plain Street, Unit C
Marshfield, MA 02050
Tel. (781) 319-0100 Fax (781) 834-4783

STORMWATER REPORT FOR SAVANNA DRIVE SUBDIVISION
WEYMOUTH, MASSACHUSETTS

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MARCH 2021

SECTION 1

Narrative

NARRATIVE

STORMWATER REPORT
SAVANNA DRIVE SUBDIVISION
WEYMOUTH, MASSACHUSETTS

EXISTING CONDITIONS

The property is comprised of multiple parcels of land under common ownership, including a single-family home located at 65 Narragansett Avenue. With the exception of the 65 Narragansett Avenue lot, the majority of the subject property is wooded. Within the parcels are four paper streets, a municipal water main and a municipal sewer line. The property is generally bound by the Greenbush Line to the north, a salt marsh to the east, Commercial Street to the south, and Narragansett Avenue to the west. The property and abutting properties are zoned Residence (R-1).

The soil types on the property have been mapped by the USDA Natural Resources Conservation Service. The center area of the property is mapped as Rock outcrop-Hollis complex, well drained with a depth to water table of more than 80 inches. It is classified as Hydrologic Soil Group D.

The southwest area of the property is mapped as Hollis-Rock outcrop-Charlton complex, well drained with a depth to water table of more than 80 inches. The southeast area of the property is mapped as Charlton-Hollis-Rock outcrop complex, well drained with a depth to water table of more than 80 inches. These soil types are classified in Hydrologic Soils Groups D for its Hollis component. It should be noted that there is a significant presence of ledge outcrop on the site which confirms that the soils do not have a high capacity for stormwater acceptance.

The salt marsh area to the west is mapped as Ipswich mucky peat, very poorly drained with a depth to water table of about 0 inches. It is classified as Hydrologic Soil Group D.

There are no observed stormwater collection systems on the property. The majority of stormwater runoff flows overland from the property to the north and east, discharging to the salt marsh located in eastern the portion of the property. A relatively small portion of the subject property on the westerly side of the project site, including the 65 Narragansett Avenue lot flows in a westerly direction into the Narragansett Avenue storm drain system.

PROPOSED SITE CONDITIONS

The applicant proposes to subdivide the property into ten (10) single family home residential lots. Access and frontage for the lots will be created from the proposed Savanna Drive subdivision road. Savanna Drive will intersect with Narragansett Avenue and run through the 65 Narragansett Avenue lot to gain access to the lion's share of the project site. Municipal water will be provided from the existing Narragansett Avenue municipal main. Additionally, the proposed Savanna Drive water main will also be looped into the water main that crosses through the property. Sanitary sewer will be discharged to the existing municipal sewer main that crosses through the property. The remainder of utilities will brought in through Narragansett Avenue.

A subsurface stormwater collection system consisting of deep sump catchbasins, drain manholes, a stormwater treatment unit and a rip-rapped outlet is to be installed. The system will collect stormwater from the proposed roadway and its tributary drainage areas. Once collected, the stormwater will be discharged toward the tidally influenced salt marsh.

SECTION 2

USGS Locus Map

BASE IMAGE: USGS TOPOGRAPHIC MAP – WEYMOUTH L REV. 1984

drawing title: LOCUS MAP

scale: AS SHOWN

client: RYDER DEVELOPMENT CORPORATION
741 BROAD STREET
WEYMOUTH, MASSACHUSETTS

SITEC ENGINEERING & ENVIRONMENTAL CONSULTANTS, INC.
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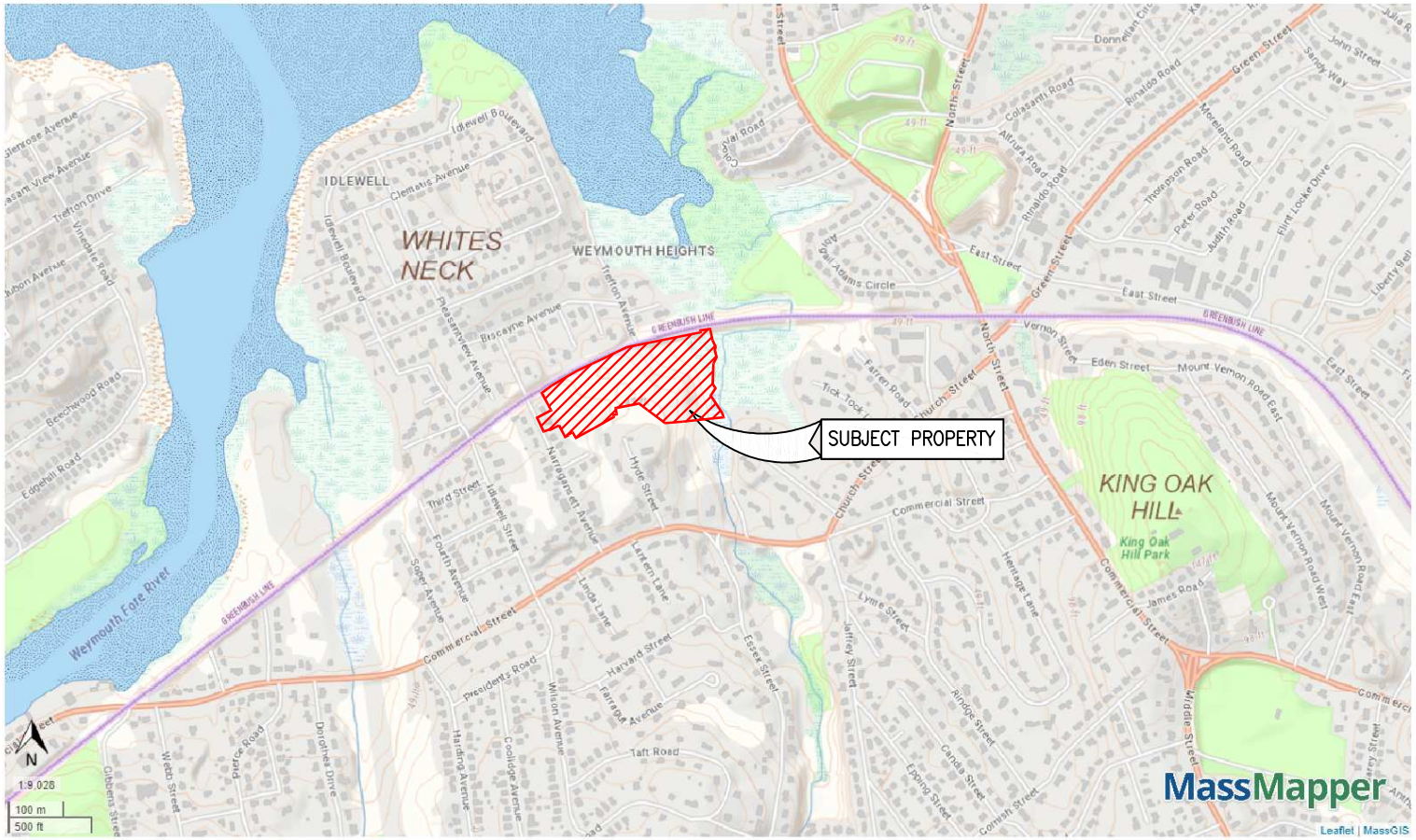
SECTION 3

Natural Heritage Map

NHESP Habitat Map - Savanna Drive Subdivision



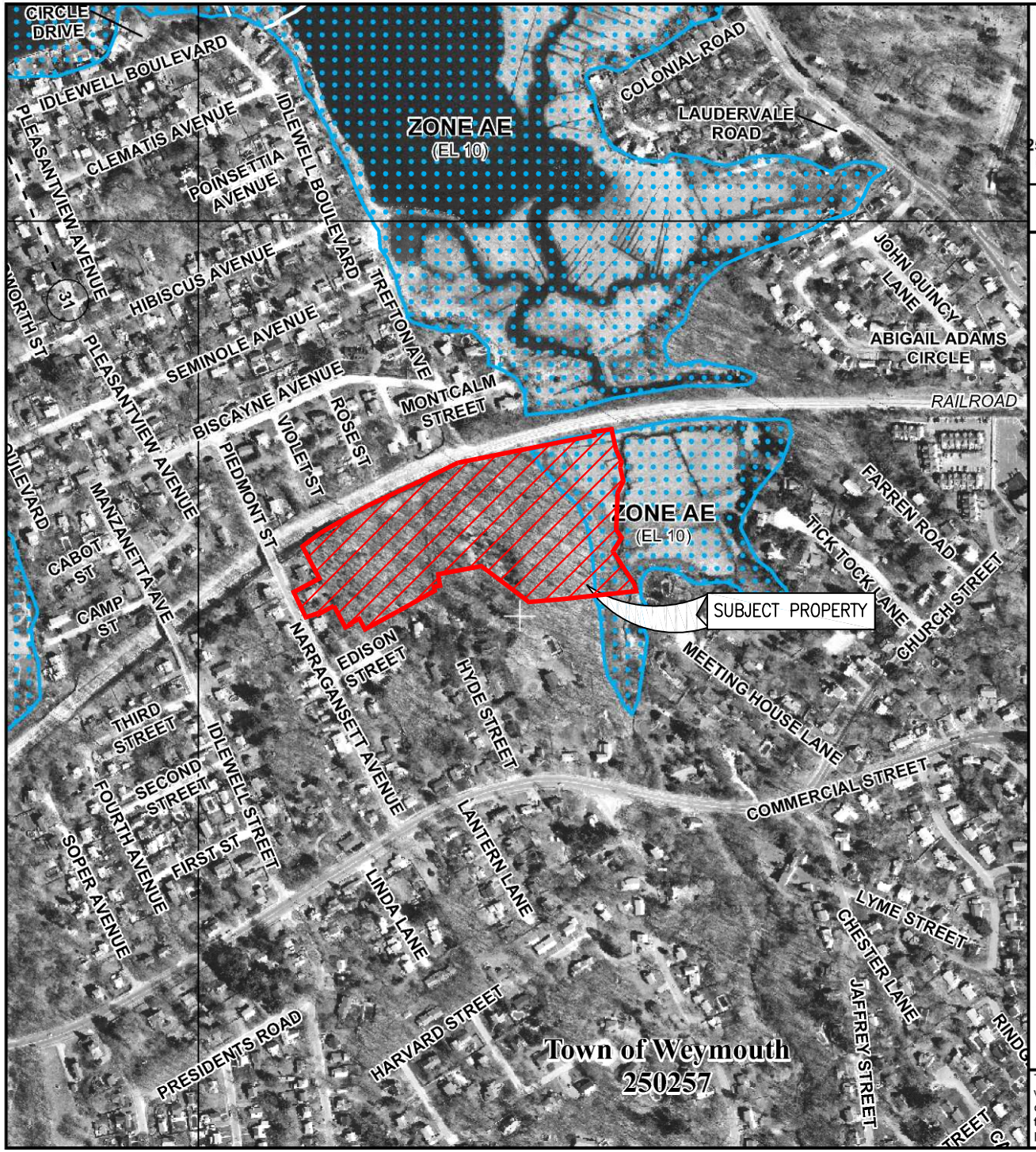
NHESP Certified Vernal Pools

NHESP Priority Habitats of Rare Species

NHESP Estimated Habitats of Rare Wildlife

SECTION 4

FEMA Flood Insurance Rate Map



MAP SCALE 1" = 500'

250 0 500 1000 FEET

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0227F

FIRM

FLOOD INSURANCE RATE MAP

NORFOLK COUNTY, MASSACHUSETTS (ALL JURISDICTIONS)

PANEL 227 OF 430

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BRAINTREE, TOWN OF	250233	0227	F
QUINCY, CITY OF	255219	0227	F
WEYMOUTH, TOWN OF	250257	0227	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
25021C0227F

MAP REVISED
JUNE 9, 2014

Federal Emergency Management Agency

SECTION 5

Soils Map


70° 57' 14" W
70° 56' 57" W
42° 13' 50" N
42° 13' 41" N
338750
338790
338830
338870
338910
338950
338990
339030
339070
339110
339150
4677210
4677170
4677130
4677090
4677050
4677010
4676970
Rose St
Edge St
Hyde St
65
103C
105D
103B
104C
Soil Map may not be valid at this scale.
Map Scale: 1:1,860 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0 25 50 100 150
Feet
0 50 100 200 300
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

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

Special Point Features

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

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 17, Sep 3, 2021

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

Date(s) aerial images were photographed: Aug 10, 2014—Oct 18, 2020

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
65	Ipswich mucky peat, 0 to 2 percent slopes, very frequently flooded	1.2	12.0%
103B	Charlton-Hollis-Rock outcrop complex, 3 to 8 percent slopes	0.0	0.3%
103C	Charlton-Hollis-Rock outcrop complex, 8 to 15 percent slopes	3.7	38.7%
104C	Hollis-Rock outcrop-Charlton complex, 0 to 15 percent slopes	0.5	5.0%
105D	Rock outcrop-Hollis complex, 3 to 25 percent slopes	4.3	44.0%
Totals for Area of Interest		**9.7**	**100.0%**

Norfolk and Suffolk Counties, Massachusetts

65—Ipswich mucky peat, 0 to 2 percent slopes, very frequently flooded

Map Unit Setting

National map unit symbol: 2tyqj
Elevation: 0 to 10 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

Ipswich and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ipswich

Setting

Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Partially- decomposed herbaceous organic material

Typical profile

Oe - 0 to 42 inches: mucky peat
Oa - 42 to 59 inches: muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.14 to 99.90 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Very frequent
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to strongly saline (0.7 to 111.6 mmhos/cm)
Sodium adsorption ratio, maximum: 20.0
Available water supply, 0 to 60 inches: Very high (about 26.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: A/D
Ecological site: R144AY001CT - Tidal Salt Low Marsh mesic very frequently flooded, R144AY002CT - Tidal Salt High Marsh mesic very frequently flooded
Hydric soil rating: Yes

Minor Components

Pawcatuck
Percent of map unit: 5 percent
Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R144AY001CT - Tidal Salt Low Marsh mesic very frequently flooded, R144AY002CT - Tidal Salt High Marsh mesic very frequently flooded
Hydric soil rating: Yes

Westbrook
Percent of map unit: 5 percent
Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R144AY001CT - Tidal Salt Low Marsh mesic very frequently flooded, R144AY002CT - Tidal Salt High Marsh mesic very frequently flooded
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 17, Sep 3, 2021

Norfolk and Suffolk Counties, Massachusetts

103B—Charlton-Hollis-Rock outcrop complex, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: vktd
Elevation: 0 to 480 feet
Mean annual precipitation: 32 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 120 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Charlton and similar soils: 40 percent
Hollis and similar soils: 25 percent
Rock outcrop: 20 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Charlton

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable coarse-loamy ablation till derived from granite

Typical profile

H1 - 0 to 6 inches: fine sandy loam
H2 - 6 to 36 inches: fine sandy loam
H3 - 36 to 60 inches: fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 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: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Hollis

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Shallow, friable loamy ablation till derived from igneous rock

Typical profile

H1 - 0 to 3 inches: fine sandy loam
H2 - 3 to 14 inches: gravelly fine sandy loam
H3 - 14 to 18 inches: unweathered bedrock

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 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: Very low (about 1.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Setting

Parent material: Igneous and metamorphic rock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s
Hydric soil rating: Unranked

Minor Components

Canton
Percent of map unit: 7 percent
Hydric soil rating: No

Chatfield
Percent of map unit: 5 percent
Hydric soil rating: No

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

Whitman
Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 17, Sep 3, 2021

Norfolk and Suffolk Counties, Massachusetts

103C—Charlton-Hollis-Rock outcrop complex, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2wzp1
Elevation: 0 to 1,390 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

Charlton, extremely stony, and similar soils: 50 percent
Hollis, extremely stony, and similar soils: 20 percent
Rock outcrop: 10 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Charlton, Extremely Stony

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
A - 2 to 4 inches: fine sandy loam
Bw - 4 to 27 inches: gravelly fine sandy loam
C - 27 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: 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: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Hollis, Extremely Stony

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 7 inches: gravelly fine sandy loam
Bw - 7 to 16 inches: gravelly fine sandy loam
2R - 16 to 26 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 8 to 23 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 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 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Ridges, hills
Parent material: Igneous and metamorphic rock

Typical profile

R - 0 to 79 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Available water supply, 0 to 60 inches: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Woodbridge, extremely stony

Percent of map unit: 8 percent
Landform: Ground moraines, hills, drumlins
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Canton, extremely stony

Percent of map unit: 5 percent
Landform: Moraines, hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Chatfield, extremely stony

Percent of map unit: 5 percent
Landform: Ridges, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Ridgebury, extremely stony

Percent of map unit: 2 percent
Landform: Hills, drainageways, drumlins, depressions, ground moraines
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Concave
Across-slope shape: Concave

Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 17, Sep 3, 2021

Norfolk and Suffolk Counties, Massachusetts

104C—Hollis-Rock outcrop-Charlton complex, 0 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2w69p
Elevation: 0 to 1,270 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

Hollis, extremely stony, and similar soils: 35 percent
Charlton, extremely stony, and similar soils: 25 percent
Rock outcrop: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hollis, Extremely Stony

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 7 inches: gravelly fine sandy loam
Bw - 7 to 16 inches: gravelly fine sandy loam
2R - 16 to 26 inches: bedrock

Properties and qualities

Slope: 0 to 15 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 8 to 23 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 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 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Charlton, Extremely Stony

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
A - 2 to 4 inches: fine sandy loam
Bw - 4 to 27 inches: gravelly fine sandy loam
C - 27 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 0 to 15 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: 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: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Ridges, hills
Parent material: Igneous and metamorphic rock

Typical profile

R - 0 to 79 inches: bedrock

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Available water supply, 0 to 60 inches: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Canton, extremely stony

Percent of map unit: 7 percent
Landform: Moraines, hills, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Chatfield, extremely stony

Percent of map unit: 6 percent
Landform: Ridges, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Montauk, extremely stony

Percent of map unit: 1 percent
Landform: Hills, recessionial moraines, ground moraines, drumlins
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Scituate, extremely stony

Percent of map unit: 1 percent
Landform: Ground moraines, hills, drumlins
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex

Hydric soil rating: No

Data Source Information

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 17, Sep 3, 2021

Norfolk and Suffolk Counties, Massachusetts

105D—Rock outcrop-Hollis complex, 3 to 25 percent slopes

Map Unit Setting

National map unit symbol: vkxr
Elevation: 0 to 620 feet
Mean annual precipitation: 32 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 120 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Rock outcrop: 65 percent
Hollis and similar soils: 25 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rock Outcrop

Setting

Parent material: Igneous and metamorphic rock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: Unranked

Description of Hollis

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Shallow, friable loamy ablation till

Typical profile

H1 - 0 to 3 inches: fine sandy loam
H2 - 3 to 14 inches: gravelly fine sandy loam
H3 - 14 to 18 inches: unweathered bedrock

Properties and qualities

Slope: 3 to 25 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained

Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 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: Very low (about 1.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Minor Components

Chatfield

Percent of map unit: 7 percent
Hydric soil rating: No

Swansea

Percent of map unit: 2 percent
Landform: Bogs
Hydric soil rating: Yes

Whitman

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 17, Sep 3, 2021

SECTION 6

Wetland Delineation Memo

ECR

Environmental Consulting & Restoration, LLC

WETLAND DELINEATION MEMO

TO: Alexander Trakimas @ SITEC Environmental, Inc.

FROM: Brad Holmes @ ECR, LLC

DATE: September 22, 2017

RE: off Edison Street/Hyde Street, Weymouth

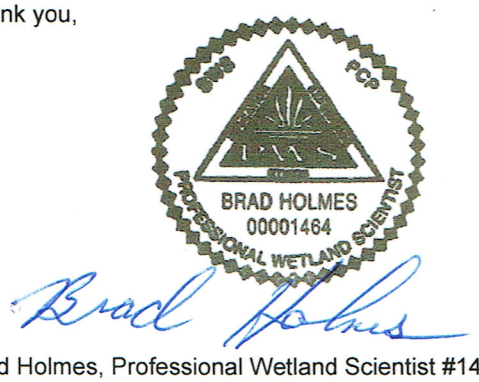
Per your request, Environmental Consulting & Restoration, LLC (ECR) performed a review of the existing conditions at the properties located to the east of Edison Street and Hyde Street in Weymouth (the Site) on September 15, 2017. The purpose of the review was to locate the landward limit of a salt marsh associated with a tidal creek near the site. ECR did not perform a Bordering Vegetated Wetland (BVW) delineation at the site since the BVW was previously delineated by others. ECR placed Salt Marsh Flags #SM1 to #SM31 along the landward limit of the Salt Marsh where it transitions to a BVW. The delineation began along the northern side of the site nearest the train tracks and followed the marsh south until it dissipated and merged into a freshwater wetland.

Also review of the MassGIS wetlands database reveals the following:

1. The site is not located within Estimated/Priority Habitat for Rare Species according to the Massachusetts Natural Heritage & Endangered Species Program (MaNHESP).
2. The site does not contain Certified Vernal Pools according to MaNHESP.
3. The site does abut a U.S.G.S. mapped perennial stream. This stream is a tidal creek and would be measured at the Mean High Water line, which would designate the start of the 200 foot Riverfront Area.
4. The eastern portion of the site is located within an area mapped as Land Subject to Coastal Storm Flowage according to the FEMA Maps (Flood Zone AE).
5. The site is not located within an Area of Critical Environmental Concern (ACEC).

Upon review of this wetland delineation memo, please contact me at (617) 529 – 3792 or brad@ecrholmes.com with any questions or requests for additional information.

Thank you,



Brad Holmes, Professional Wetland Scientist #1464
Manager

SECTION 7

Stormwater Management System & Drainage Report

SITEC ENGINEERING & ENVIRONMENTAL CONSULTANTS, INC.

STORMWATER MANAGEMENT SYSTEM & DRAINAGE REPORT

Ryder Development Corporation
4-Lot Residential Subdivision
Edison Street, Weymouth, MA

EXISTING CONDITIONS

The property is comprised of multiple parcels of land under common ownership, including a single-family home located at 65 Narragansett Avenue. With the exception of the 65 Narragansett Avenue lot, the majority of the subject property is wooded. Within the parcels are four paper streets, a municipal water main and a municipal sewer line. The property is generally bound by the Greenbush Line to the north, a salt marsh to the east, Commercial Street to the south, and Narragansett Avenue to the west. The property and abutting properties are zoned Residence (R-1).

The soil types on the property have been mapped by the USDA Natural Resources Conservation Service. The center area of the property is mapped as Rock outcrop-Hollis complex, well drained with a depth to water table of more than 80 inches. It is classified as Hydrologic Soil Group D.

The southwest area of the property is mapped as Hollis-Rock outcrop-Charlton complex, well drained with a depth to water table of more than 80 inches. The southeast area of the property is mapped as Charlton-Hollis-Rock outcrop complex, well drained with a depth to water table of more than 80 inches. These soil types are classified in Hydrologic Soils Groups D for its Hollis component. It should be noted that there is a significant presence of ledge outcrop on the site which confirms that the soils do not have a high capacity for stormwater acceptance.

The salt marsh area to the west is mapped as Ipswich mucky peat, very poorly drained with a depth to water table of about 0 inches. It is classified as Hydrologic Soil Group D.

There are no observed stormwater collection systems on the property. The majority of stormwater runoff flows overland from the property to the north and east, discharging to the salt marsh located in eastern the portion of the property. A relatively small portion of the subject property on the westerly side of the project site, including the 65 Narragansett Avenue lot flows in a westerly direction into the Narragansett Avenue storm drain system.

PROPOSED CONDITIONS
DEP PERFORMANCE STANDARDS AND DESIGN CRITERIA

The DEP Stormwater Management Regulations include ten Stormwater Management Standards. The Standards were established to provide clear and consistent guidelines for stormwater management projects. The Standards address both water quantity and quality by establishing a level of required controls, which can presumptively be achieved through site planning processes, non-structural measures and the use of Best Management Practices (BMPs).

Each of the standards have been evaluated for their applicability to the proposed Definitive Subdivision as follows:

1. **No new stormwater conveyances (outfalls/discharges) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.**

   Stormwater runoff from proposed areas of roadway and driveway pavement shall be treated by the proposed stormwater controls. Surficial grading will convey stormwater runoff from paved areas, as well as other tributary areas including roof and yard runoff, into deep sump / hooded catch basins located in the roadway. Runoff will then flow through a network of piping into a stormwater treatment unit that will discharge runoff onto a rip rap lined velocity dissipating apron.

   The volume of runoff to be treated for this project has been calculated as 1.0 inch of runoff times the total impervious area of the post-development project site. The term impervious area refers to impervious surfaces where 100% runoff would occur excluding roofs. The treatment calculation is attached to this report.

2. **Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.**

   By definition - Land Subject to Coastal Storm Flowage means land subject to any inundation caused by coastal storms up to and including that caused by the 100-year storm, surge of record or storm of record, whichever is greater. The stormwater discharge from the project discharges to land subject to coastal storm flowage.

SITEC Environmental has prepared calculations for pre-development (existing) conditions and for post-development (proposed) conditions after the Definitive Subdivision has been fully constructed. The calculations have been performed for each of the 2, 10, and 100 year 24 hour storm events. One the following page is a summary table of existing and proposed flow rates discharging to land subject to coastal storm flowage (LSCSF).

Stormwater Calculation Table for the 2, 10, and 100-Year Events

		Storm Event		
		2-Year (3.4")	***10-Year (4.7")***	***100-Year (7.0")***
Flow Rates Discharging to LSCSF (cfs)	***Existing Conditions***	11.33	18.56	31.71
	Proposed Conditions	18.46	30.17	50.26

3. Loss of annual recharge to ground water should be minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.

The majority of the site is mapped as D type soil. As such, the following required Volume to Recharge has been calculated based on the entire proposed impervious area for Hydrologic Soil Group D:

Hydrologic Group D Volume to Recharge =

0.10 inches of runoff (0.008 Feet) x Total Impervious Area in SF = CF

HSG-D (0.008 FT) x (46,227 SF of Impervious Area) = 370 CF

As noted in the Massachusetts Stormwater Handbook, Volume 1: Overview of Massachusetts Stormwater Standards, Chapter 1, pages 6 and 7, for sites comprised solely of C and D soils and bedrock at the land surface, proponents are required to infiltrate the required recharge volume only to the maximum extent practicable.

The vast majority of the subdivision project will be graded to promote overland flow from the residential lots to the salt marsh to the east of the project site. In our opinion, the infiltration provided from the overland flow will provide a high degree of infiltration.

In addition, if the soil conditions are appropriate, the applicant proposes to install leaching basins in the locations of the roadway catch basins. In our opinion, the leaching catch basins in conjunction with promoting overland flow using low-impact development surficial grading has provided recharge to groundwater to the maximum amount practicable.

4. **Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This Standard is met when:**

    a. **Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained;**

    b. **Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and,**

    c. **Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.**

BMPs that have been incorporated into stormwater management system and its operation include: pavement sweeping, deep sump and hooded catch basins and a proprietary stormwater treatment unit. DEP has developed a standard methodology for calculating TSS removal rates. This methodology assigns removal efficiencies to the various BMPs to be used on the project. This calculation is presented on a DEP "TSS Removal Calculation Worksheet", which is attached to this report. With the BMPs proposed for this project the calculated 80-percent TSS removal rate has been achieved.

5. **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. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.**

   There are no areas on the project site that may expose stormwater runoff to any higher potential pollutant loads. The structural BMPs that are proposed for control of the site's runoff and sediment demonstrate that the site will comply with this standard.

6. **Stormwater discharges within the Zone II or Interim Wellhead Protection Area 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. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.**

   Based on our research, the proposed Definitive Subdivision is not located within a Zone II or Interim Wellhead Protection Area of a public water supply or to any other critical area.

7. **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.**

   The proposed Definitive Subdivision is not a redevelopment project and the proposed stormwater management system has been designed to meet all performance standards.

8. **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.**

   During the construction phase, non-structural BMPs will be utilized to mitigate possible short term sedimentation. These temporary non-structural BMPs will include a silt barrier consisting of silt socks filled with compost which will be placed on the down gradient sides of roadways to prevent siltation to lower-lying areas. Haybale check dams or supplemental silt socks will also be placed around installed catch basins to prevent sediment from accumulating within the catch basins.

9. **A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.**

   The Stormwater Management System Operation & Maintenance Plan for the project site is attached to this report.

10. **All illicit discharges to the stormwater management system are prohibited.**

    To the best of our professional knowledge and belief no illicit discharges exist on or are proposed on the site.

SECTION 8

Drainage Calculations & Drainage Area Plans

LIMIT OF ANALYSIS

TIME OF CONCENTRATION FLOWPATH

D

E

A

B

C

D

1
TO STREET DRAINS

2
TO SALT MARSH

CHARLTON–HOLLIS ROCK OUTCROP COMPLEX, 8 TO 15 PERCENT SLOPES

ROCK OUTCROP–HOLLIS COMPLEX, 3 TO 25 PERCENT SLOPES

HOLLIS–ROCK OUTCROP–CHARLTON COMPLEX 3 TO 15 PERCENT SLOPES

IPSWICH MUCKY PEAT

CHARLTON–HOLLIS ROCK OUTCROP COMPLEX, 3 TO 8 PERCENT SLOPES

EDGE OF SALT MARSH (310 CMR 10.32)

STREAM

SALT MARSH

CHAIN LINK FENCE

1879 RAIL ROAD ROW LINE

NARRAGANSETT AVENUE

HYDE STREET

9 EDISON STREET

EX.SMH

DH (FD.)

UP#298-5

GRAVEL DRIVEWAY

VERTICAL GRANITE CURB

BIT. CONC. SIDEWALK

BIT. CONC. PAVEMENT

POST & RAIL FENCE

STOCKADE FENCE

SLOPED GRANITE CURB (NO SIDEWALK)

EXPOSED LEDGE (TYP.)

WETLAND RESOURCE AREA DELINEATION FLAG LOCATION AND DESIGNATION (TYP.)

40'-FOOT WIDE SEWER EASEMENT

0 100 200 300

RESIDENTIAL SUBDIVISION
RYDER DEVELOPMENT CORP.
SAVANNA DRIVE
WEYMOUTH, MASSACHUSETTS

DRAINAGE AREA PLAN
EXISTING CONDITIONS

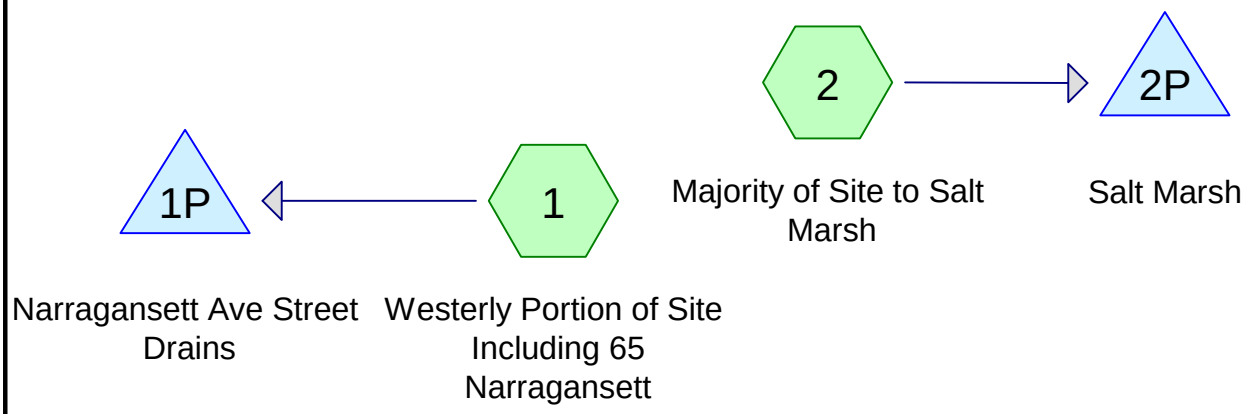
1" = 100'

MAR. 02, 2022

SE14–1047

1 2

SITEC
ENGINEERING & ENVIRONMENTAL CONSULTANTS, INC.
769 Plain Street, Unit C
Marshfield, MA 02050
Tel. (781) 319-0100 Fax (781) 834-4783



Subcat Reach Pond Link

Routing Diagram for Existing Conditions Drainage Calculations
Prepared by {enter your company name here}, Printed 3/9/2022

Summary for Subcatchment 1: Westerly Portion of Site Including 65 Narragansett

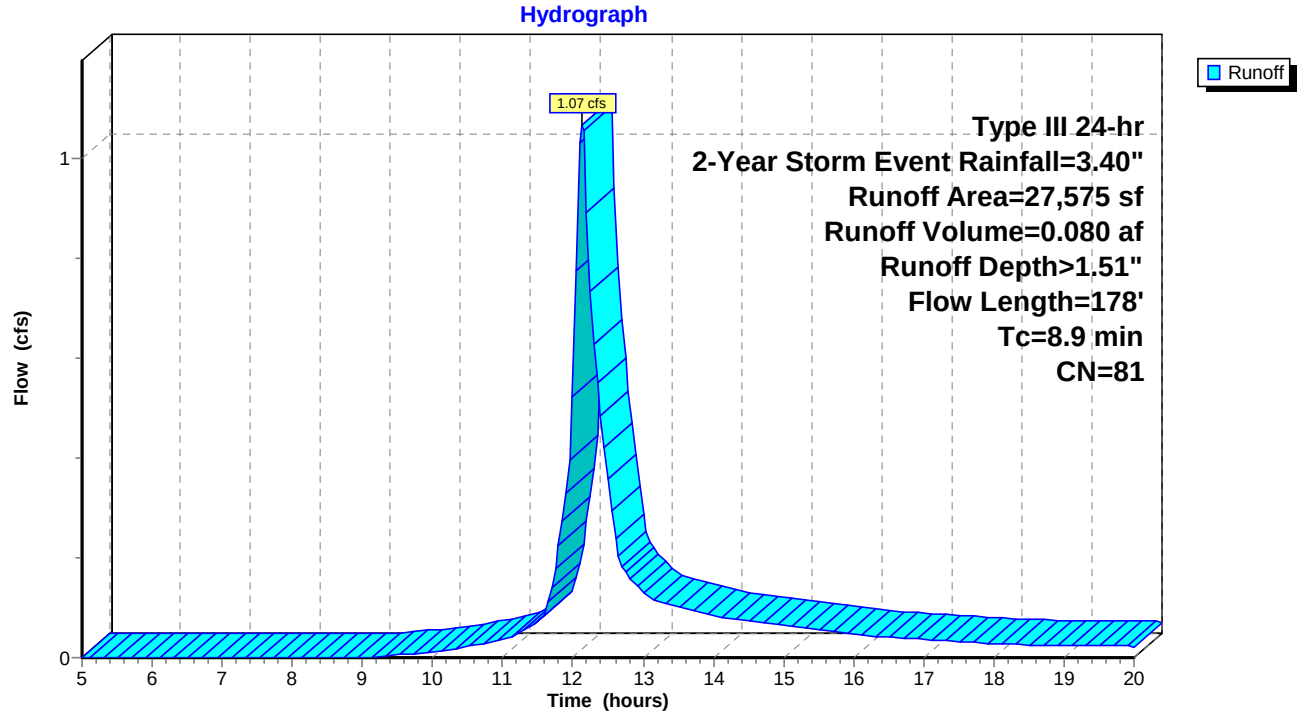
Runoff = 1.07 cfs @ 12.13 hrs, Volume= 0.080 af, Depth> 1.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Event Rainfall=3.40"

	Area (sf)	CN	Description
*	1,382	98	Roofs/Decks, HSG D
*	389	98	Driveway, HSG D
	7,946	80	>75% Grass cover, Good, HSG D
	17,858	79	Woods, Fair, HSG D
	27,575	81	Weighted Average
	25,804		93.58% Pervious Area
	1,771		6.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0070	0.10		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.40"
0.4	60	0.0200	2.28		**Shallow Concentrated Flow, BC** Unpaved Kv= 16.1 fps
0.2	68	0.1307	5.82		**Shallow Concentrated Flow, CD** Unpaved Kv= 16.1 fps
8.9	178	Total			

Subcatchment 1: Westerly Portion of Site Including 65 Narragansett



Summary for Subcatchment 2: Majority of Site to Salt Marsh

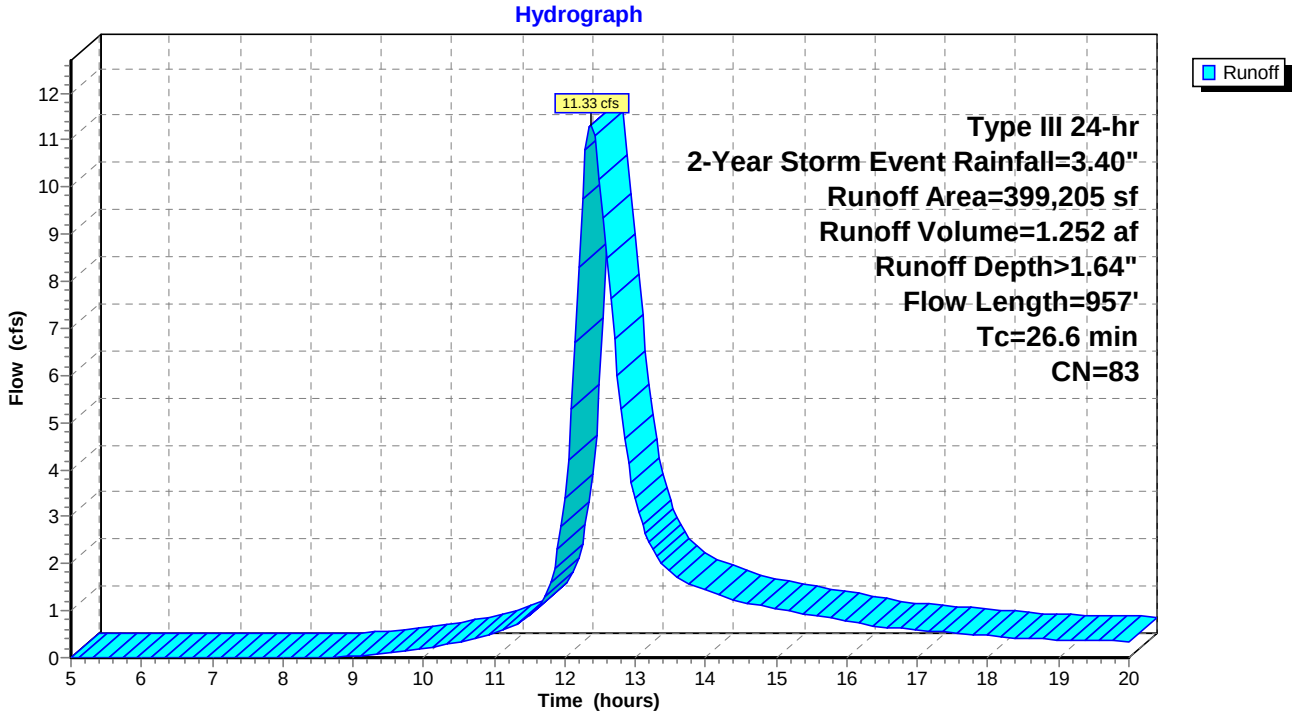
Runoff = 11.33 cfs @ 12.38 hrs, Volume= 1.252 af, Depth> 1.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Event Rainfall=3.40"

Area (sf)	CN	Description
324,786	79	Woods, Fair, HSG D
74,419	98	Water Surface, HSG D
399,205	83	Weighted Average
324,786		81.36% Pervious Area
74,419		18.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	50	0.0221	0.07		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.40"
2.4	199	0.0755	1.37		**Shallow Concentrated Flow, BC** Woodland Kv= 5.0 fps
8.6	325	0.0160	0.63		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
4.1	383	0.0967	1.55		**Shallow Concentrated Flow, DE** Woodland Kv= 5.0 fps
26.6	957	Total			

Subcatchment 2: Majority of Site to Salt Marsh

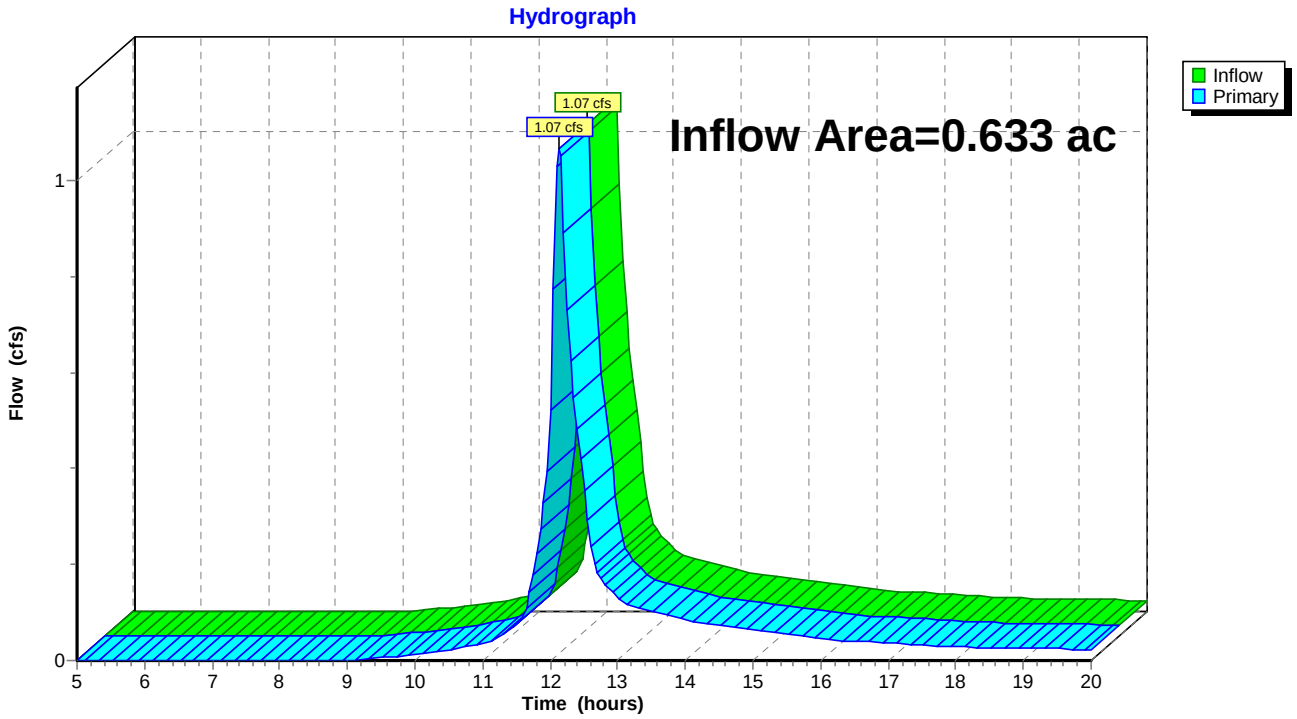


Summary for Pond 1P: Narragansett Ave Street Drains

Inflow Area = 0.633 ac, 6.42% Impervious, Inflow Depth > 1.51" for 2-Year Storm Event event
Inflow = 1.07 cfs @ 12.13 hrs, Volume= 0.080 af
Primary = 1.07 cfs @ 12.13 hrs, Volume= 0.080 af, Atten= 0%, Lag= 0.0 min

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

Pond 1P: Narragansett Ave Street Drains

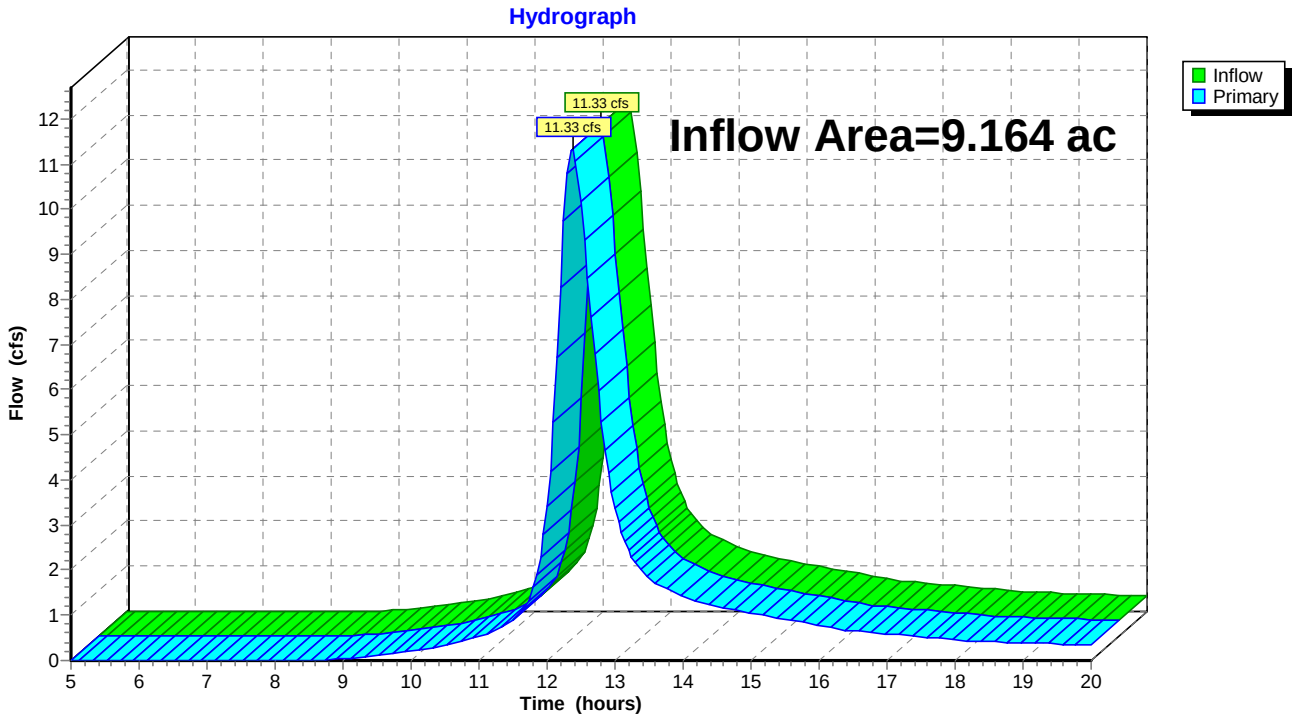


Summary for Pond 2P: Salt Marsh

Inflow Area = 9.164 ac, 18.64% Impervious, Inflow Depth > 1.64" for 2-Year Storm Event event
Inflow = 11.33 cfs @ 12.38 hrs, Volume= 1.252 af
Primary = 11.33 cfs @ 12.38 hrs, Volume= 1.252 af, Atten= 0%, Lag= 0.0 min

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

Pond 2P: Salt Marsh



Summary for Subcatchment 1: Westerly Portion of Site Including 65 Narragansett

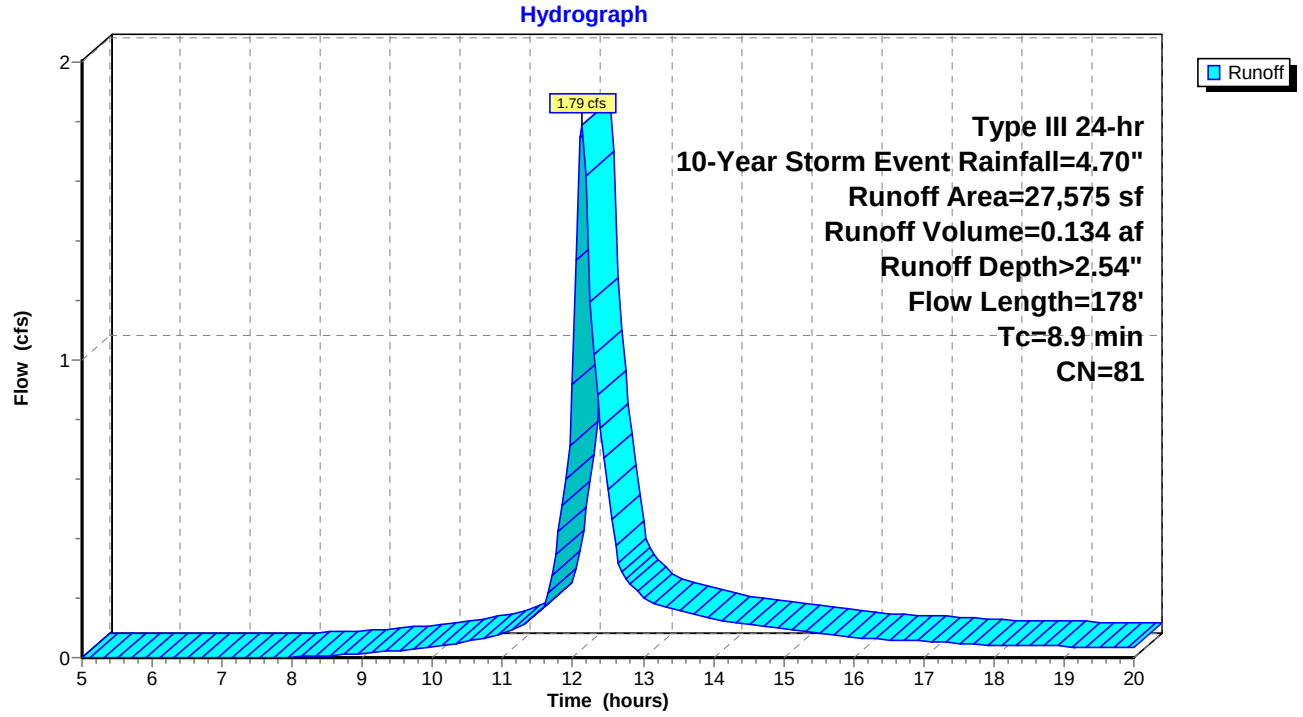
Runoff = 1.79 cfs @ 12.13 hrs, Volume= 0.134 af, Depth> 2.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Event Rainfall=4.70"

	Area (sf)	CN	Description
*	1,382	98	Roofs/Decks, HSG D
*	389	98	Driveway, HSG D
	7,946	80	>75% Grass cover, Good, HSG D
	17,858	79	Woods, Fair, HSG D
	27,575	81	Weighted Average
	25,804		93.58% Pervious Area
	1,771		6.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0070	0.10		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.40"
0.4	60	0.0200	2.28		**Shallow Concentrated Flow, BC** Unpaved Kv= 16.1 fps
0.2	68	0.1307	5.82		**Shallow Concentrated Flow, CD** Unpaved Kv= 16.1 fps
8.9	178	Total			

Subcatchment 1: Westerly Portion of Site Including 65 Narragansett



Summary for Subcatchment 2: Majority of Site to Salt Marsh

Runoff = 18.56 cfs @ 12.37 hrs, Volume= 2.064 af, Depth> 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Event Rainfall=4.70"

Area (sf)	CN	Description
324,786	79	Woods, Fair, HSG D
74,419	98	Water Surface, HSG D
399,205	83	Weighted Average
324,786		81.36% Pervious Area
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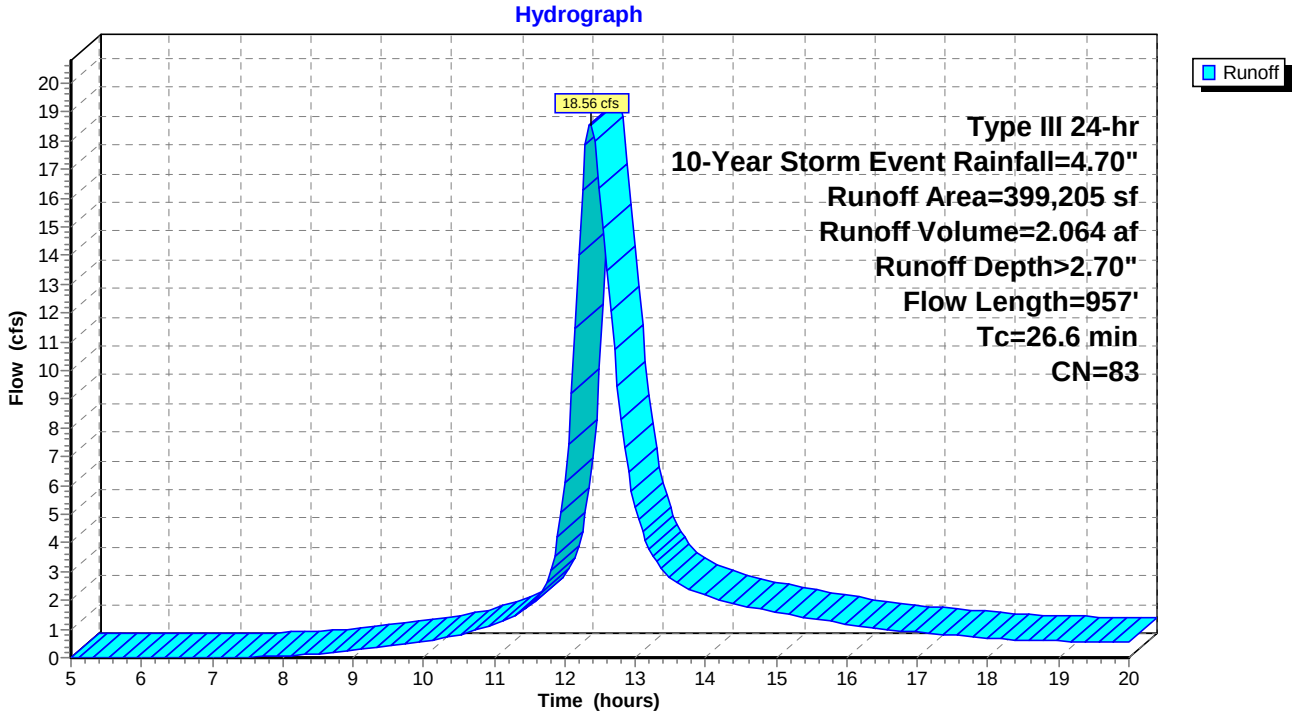
11.5	50	0.0221	0.07		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.40"
2.4	199	0.0755	1.37		**Shallow Concentrated Flow, BC** Woodland Kv= 5.0 fps
8.6	325	0.0160	0.63		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
4.1	383	0.0967	1.55		**Shallow Concentrated Flow, DE** Woodland Kv= 5.0 fps
26.6	957	Total			

Subcatchment 2: Majority of Site to Salt Marsh

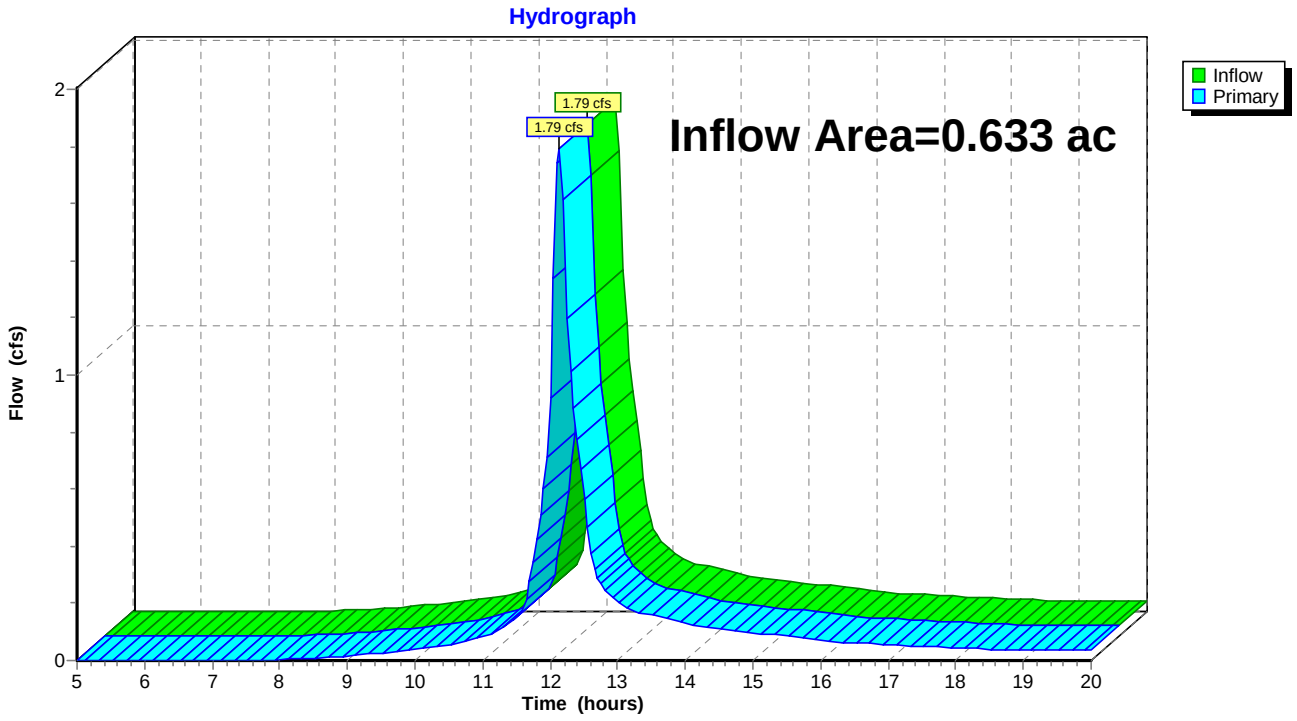


Summary for Pond 1P: Narragansett Ave Street Drains

Inflow Area = 0.633 ac, 6.42% Impervious, Inflow Depth > 2.54" for 10-Year Storm Event event
Inflow = 1.79 cfs @ 12.13 hrs, Volume= 0.134 af
Primary = 1.79 cfs @ 12.13 hrs, Volume= 0.134 af, Atten= 0%, Lag= 0.0 min

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

Pond 1P: Narragansett Ave Street Drains

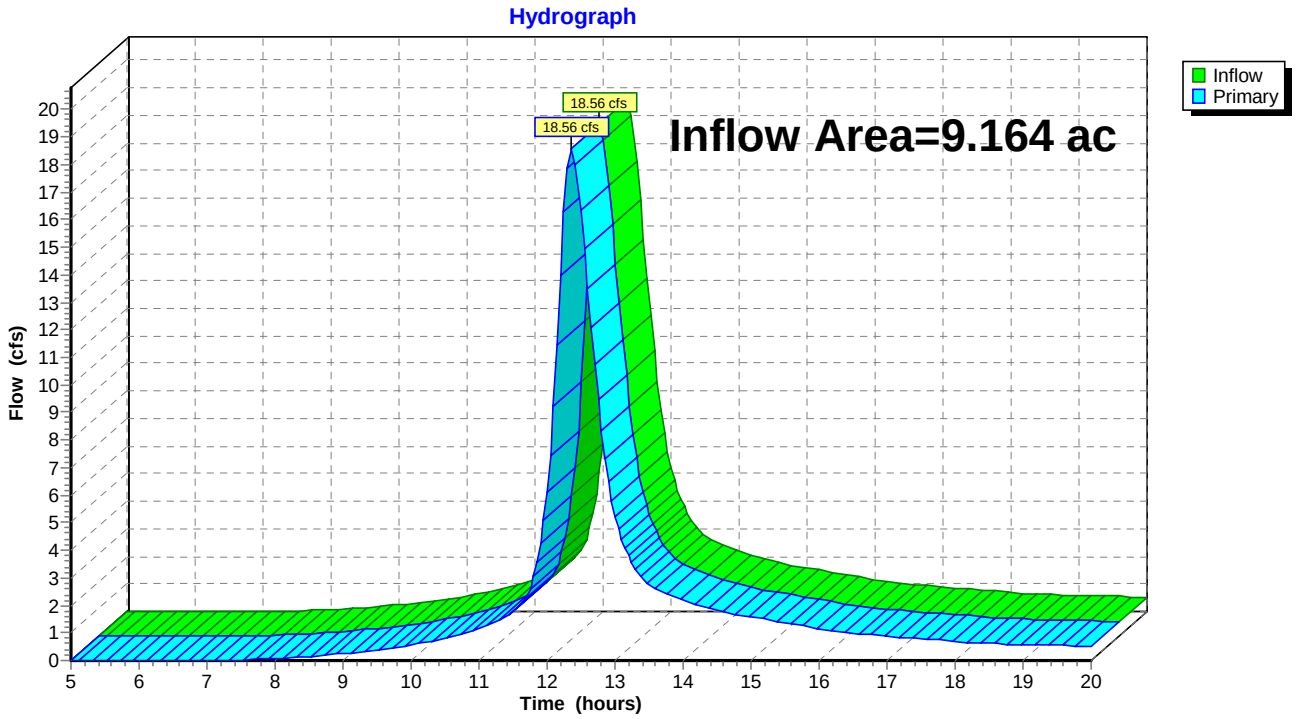


Summary for Pond 2P: Salt Marsh

Inflow Area = 9.164 ac, 18.64% Impervious, Inflow Depth > 2.70" for 10-Year Storm Event event
Inflow = 18.56 cfs @ 12.37 hrs, Volume= 2.064 af
Primary = 18.56 cfs @ 12.37 hrs, Volume= 2.064 af, Atten= 0%, Lag= 0.0 min

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

Pond 2P: Salt Marsh



Summary for Subcatchment 1: Westerly Portion of Site Including 65 Narragansett

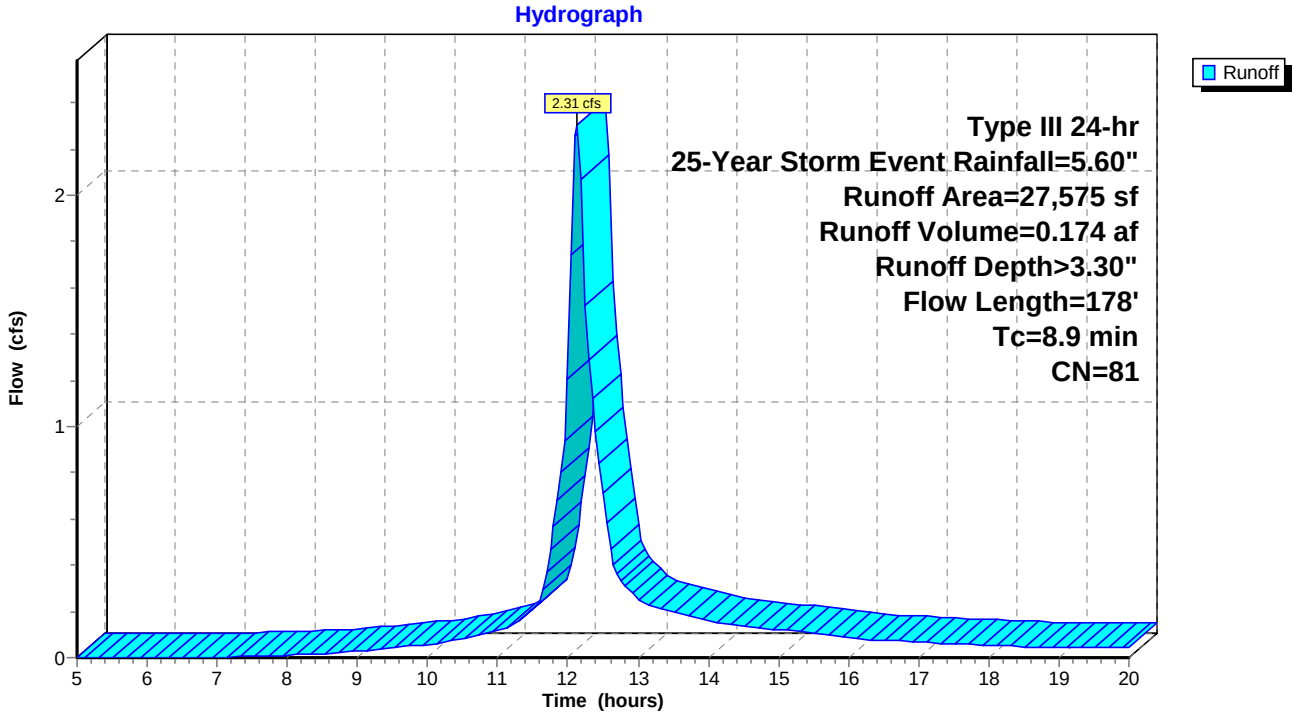
Runoff = 2.31 cfs @ 12.13 hrs, Volume= 0.174 af, Depth> 3.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Event Rainfall=5.60"

	Area (sf)	CN	Description
*	1,382	98	Roofs/Decks, HSG D
*	389	98	Driveway, HSG D
	7,946	80	>75% Grass cover, Good, HSG D
	17,858	79	Woods, Fair, HSG D
	27,575	81	Weighted Average
	25,804		93.58% Pervious Area
	1,771		6.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0070	0.10		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.40"
0.4	60	0.0200	2.28		**Shallow Concentrated Flow, BC** Unpaved Kv= 16.1 fps
0.2	68	0.1307	5.82		**Shallow Concentrated Flow, CD** Unpaved Kv= 16.1 fps
8.9	178	Total			

Subcatchment 1: Westerly Portion of Site Including 65 Narragansett



Summary for Subcatchment 2: Majority of Site to Salt Marsh

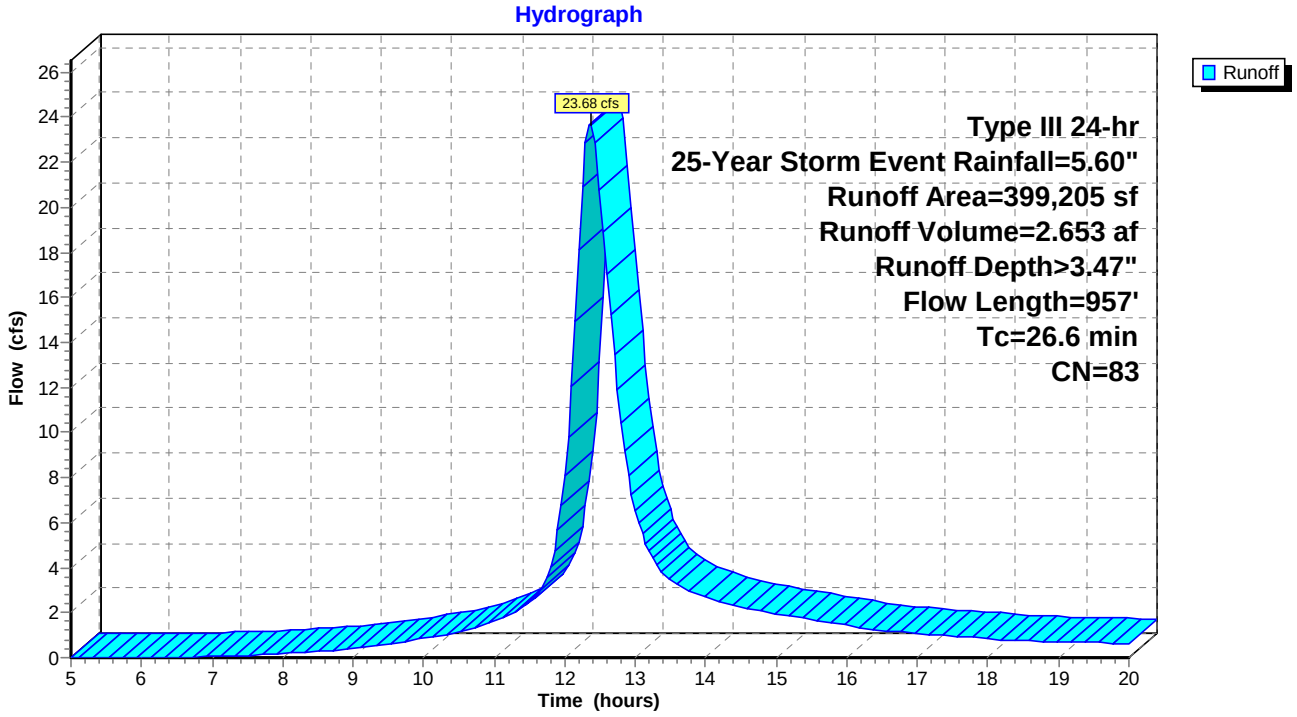
Runoff = 23.68 cfs @ 12.36 hrs, Volume= 2.653 af, Depth> 3.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Event Rainfall=5.60"

Area (sf)	CN	Description
324,786	79	Woods, Fair, HSG D
74,419	98	Water Surface, HSG D
399,205	83	Weighted Average
324,786		81.36% Pervious Area
74,419		18.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	50	0.0221	0.07		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.40"
2.4	199	0.0755	1.37		**Shallow Concentrated Flow, BC** Woodland Kv= 5.0 fps
8.6	325	0.0160	0.63		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
4.1	383	0.0967	1.55		**Shallow Concentrated Flow, DE** Woodland Kv= 5.0 fps
26.6	957	Total			

Subcatchment 2: Majority of Site to Salt Marsh

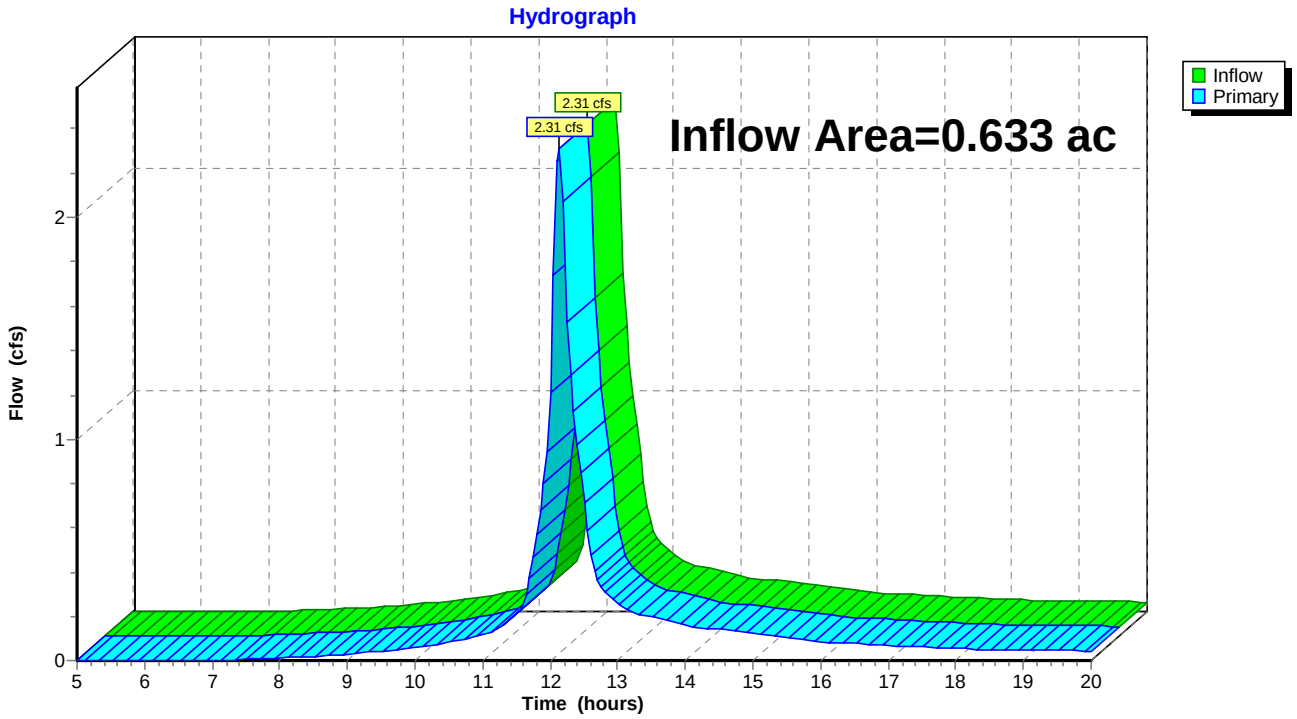


Summary for Pond 1P: Narragansett Ave Street Drains

Inflow Area = 0.633 ac, 6.42% Impervious, Inflow Depth > 3.30" for 25-Year Storm Event event
Inflow = 2.31 cfs @ 12.13 hrs, Volume= 0.174 af
Primary = 2.31 cfs @ 12.13 hrs, Volume= 0.174 af, Atten= 0%, Lag= 0.0 min

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

Pond 1P: Narragansett Ave Street Drains

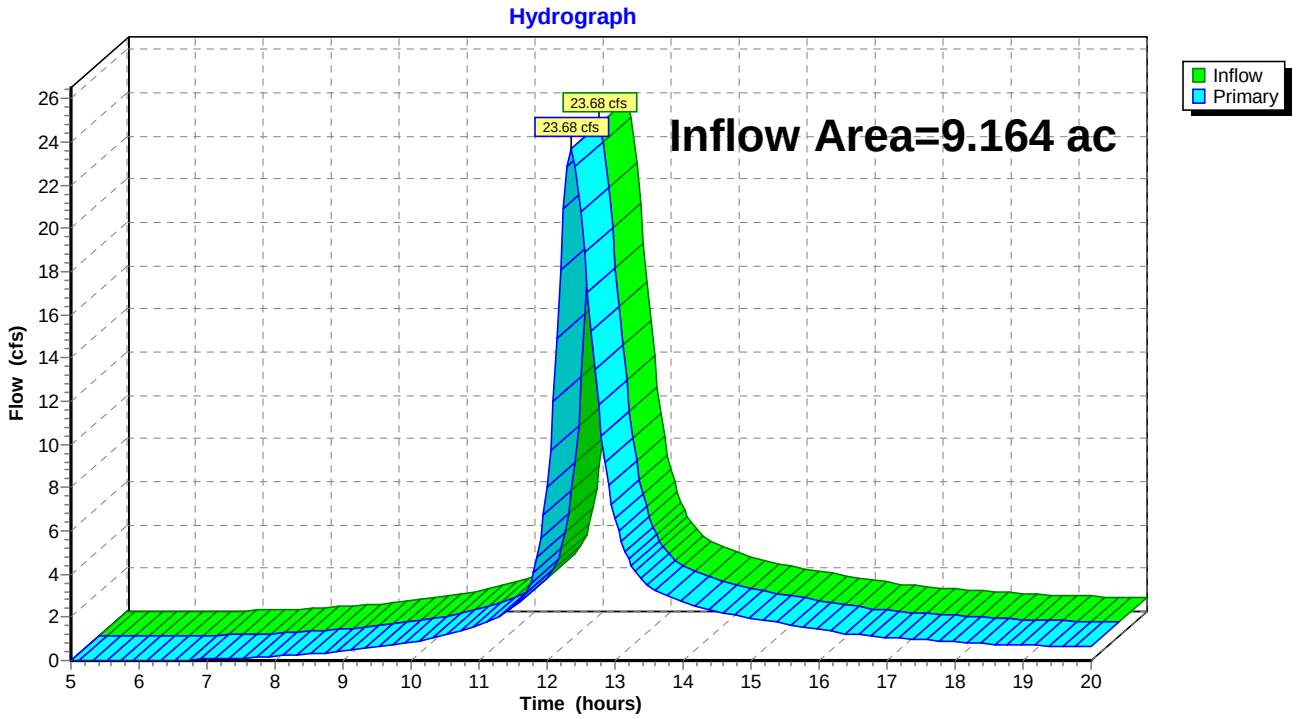


Summary for Pond 2P: Salt Marsh

Inflow Area = 9.164 ac, 18.64% Impervious, Inflow Depth > 3.47" for 25-Year Storm Event event
Inflow = 23.68 cfs @ 12.36 hrs, Volume= 2.653 af
Primary = 23.68 cfs @ 12.36 hrs, Volume= 2.653 af, Atten= 0%, Lag= 0.0 min

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

Pond 2P: Salt Marsh



Summary for Subcatchment 1: Westerly Portion of Site Including 65 Narragansett

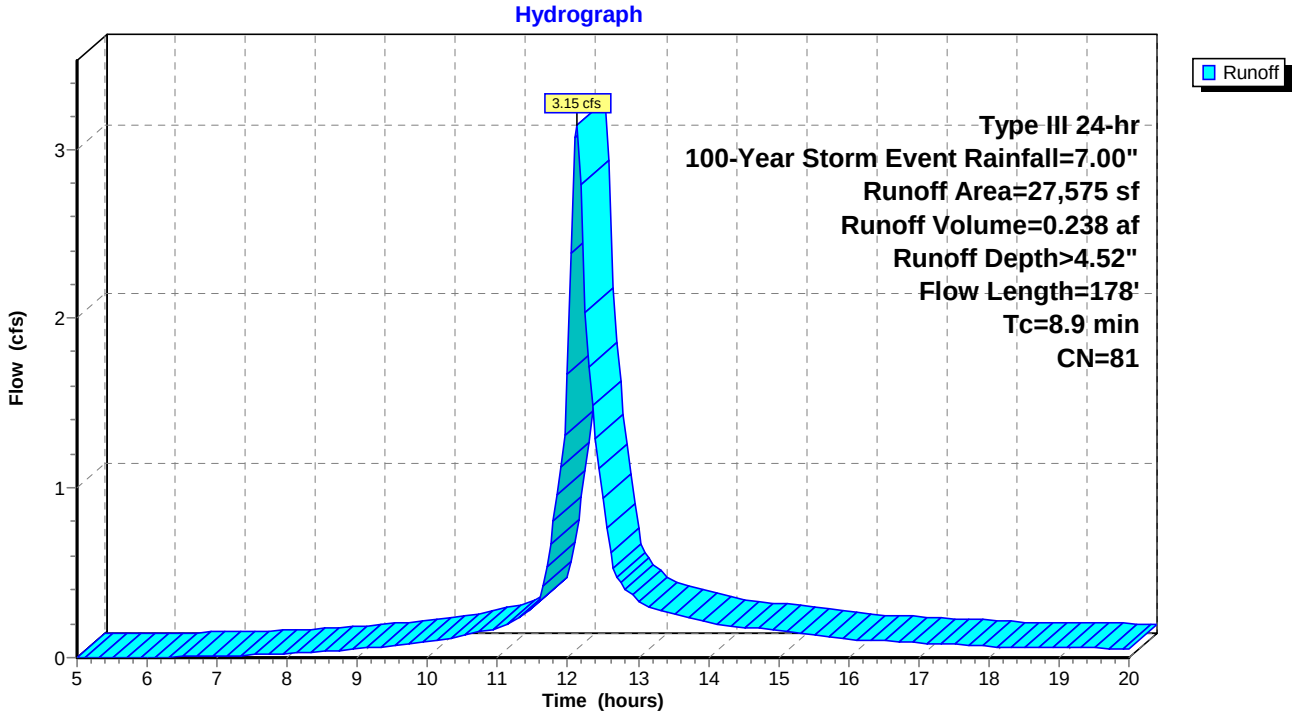
Runoff = 3.15 cfs @ 12.12 hrs, Volume= 0.238 af, Depth> 4.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Storm Event Rainfall=7.00"

	Area (sf)	CN	Description
*	1,382	98	Roofs/Decks, HSG D
*	389	98	Driveway, HSG D
	7,946	80	>75% Grass cover, Good, HSG D
	17,858	79	Woods, Fair, HSG D
	27,575	81	Weighted Average
	25,804		93.58% Pervious Area
	1,771		6.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0070	0.10		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.40"
0.4	60	0.0200	2.28		**Shallow Concentrated Flow, BC** Unpaved Kv= 16.1 fps
0.2	68	0.1307	5.82		**Shallow Concentrated Flow, CD** Unpaved Kv= 16.1 fps
8.9	178	Total			

Subcatchment 1: Westerly Portion of Site Including 65 Narragansett



Summary for Subcatchment 2: Majority of Site to Salt Marsh

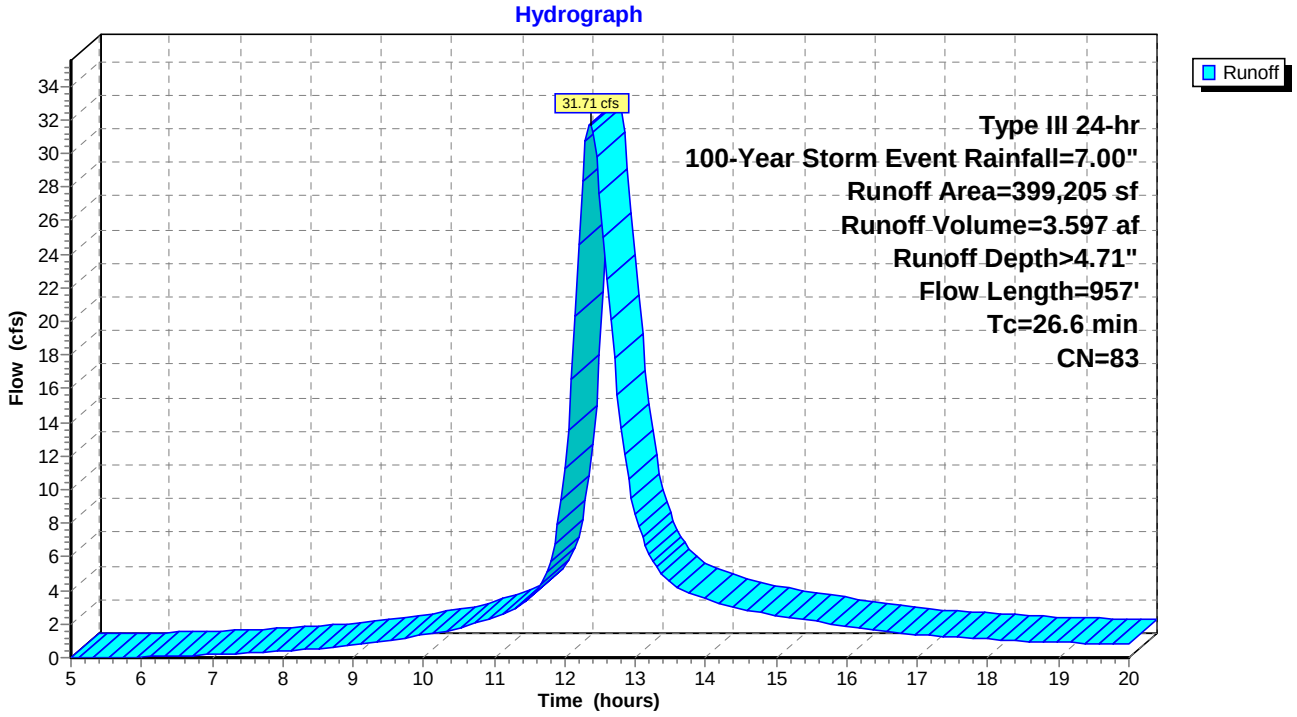
Runoff = 31.71 cfs @ 12.36 hrs, Volume= 3.597 af, Depth> 4.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Storm Event Rainfall=7.00"

Area (sf)	CN	Description
324,786	79	Woods, Fair, HSG D
74,419	98	Water Surface, HSG D
399,205	83	Weighted Average
324,786		81.36% Pervious Area
74,419		18.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	50	0.0221	0.07		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.40"
2.4	199	0.0755	1.37		**Shallow Concentrated Flow, BC** Woodland Kv= 5.0 fps
8.6	325	0.0160	0.63		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
4.1	383	0.0967	1.55		**Shallow Concentrated Flow, DE** Woodland Kv= 5.0 fps
26.6	957	Total			

Subcatchment 2: Majority of Site to Salt Marsh

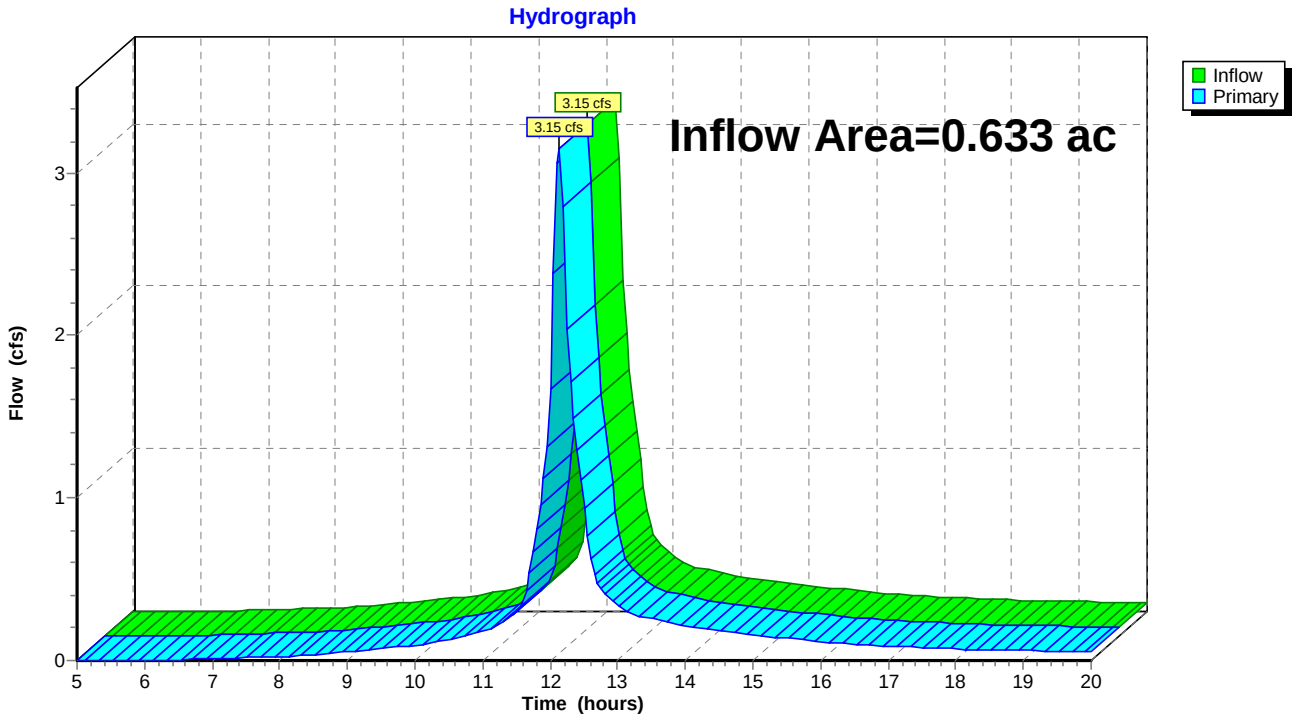


Summary for Pond 1P: Narragansett Ave Street Drains

Inflow Area = 0.633 ac, 6.42% Impervious, Inflow Depth > 4.52" for 100-Year Storm Event event
Inflow = 3.15 cfs @ 12.12 hrs, Volume= 0.238 af
Primary = 3.15 cfs @ 12.12 hrs, Volume= 0.238 af, Atten= 0%, Lag= 0.0 min

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

Pond 1P: Narragansett Ave Street Drains

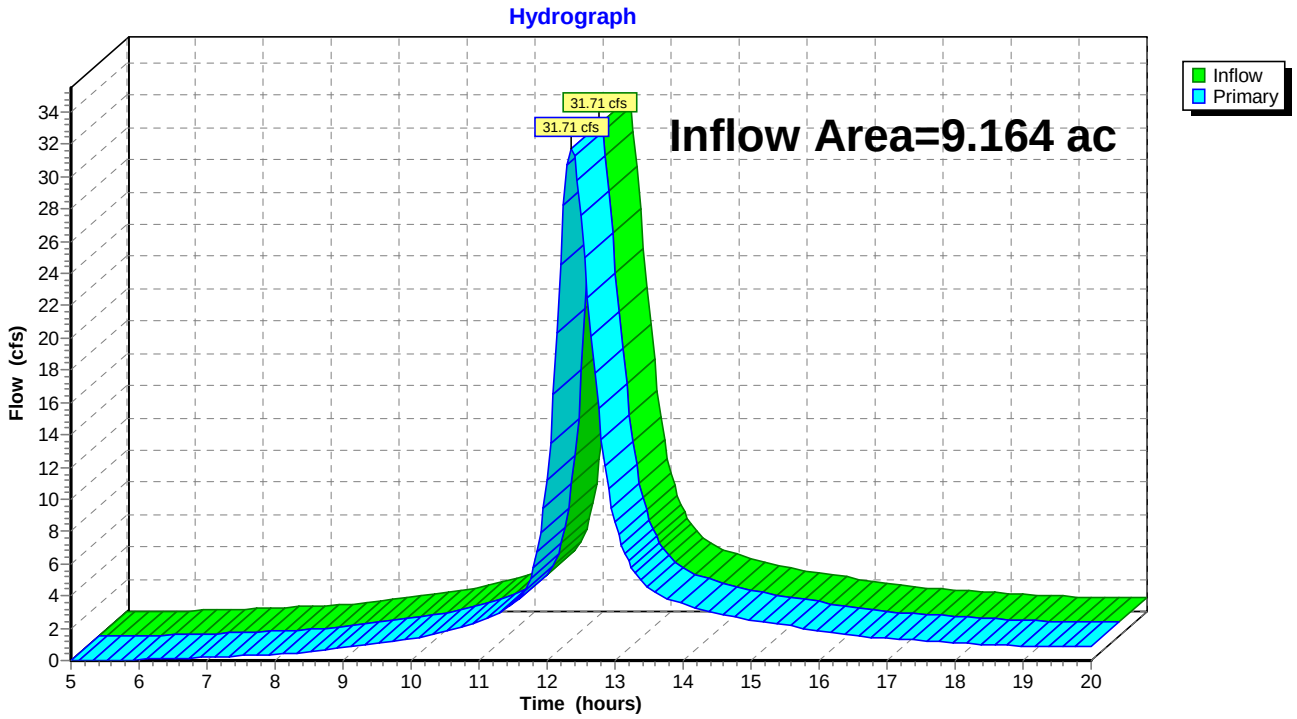


Summary for Pond 2P: Salt Marsh

Inflow Area = 9.164 ac, 18.64% Impervious, Inflow Depth > 4.71" for 100-Year Storm Event event
Inflow = 31.71 cfs @ 12.36 hrs, Volume= 3.597 af
Primary = 31.71 cfs @ 12.36 hrs, Volume= 3.597 af, Atten= 0%, Lag= 0.0 min

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

Pond 2P: Salt Marsh



LIMIT OF ANALYSIS

1 TO STREET DRAINS

2 TO SALT MARSH

TIME OF CONCENTRATION FLOWPATH

IPSWICH MUCKY PEAT

CHARLTON–HOLLIS ROCK OUTCROP COMPLEX, 8 TO 15 PERCENT SLOPES

CHARLTON–HOLLIS ROCK OUTCROP COMPLEX, 3 TO 8 PERCENT SLOPES

HOLLIS–ROCK OUTCROP–CHARLTON COMPLEX 3 TO 15 PERCENT SLOPES

EDGE OF SALT MARSH (310 CMR 10.32)

STREAM

CHAIN LINK FENCE

1879 RAIL ROAD ROW LINE

40' FOOT WIDE SEWER EASEMENT

SALT MARSH

FLARED END WITH RIP RAP SLOPE PROTECTION

STORMWATER TREATMENT UNIT

4' WIDE BITUMINOUS CONCRETE SIDEWALK (THIS SIDE ONLY)

8+02.85 (END SIDEWALK)

EX.SMH

DH (FD.)

LIMIT OF 100' SALT MARSH BUFFER ZONE

WETLAND RESOURCE AREA DELINEATION FLAG LOCATION AND DESIGNATION (TYP.)

EXPOSED LEDGE (TYP.)

NARRAGANSETT AVENUE

GRAVEL DRIVEWAY

STOCKADE FENCE

POST & RAIL FENCE

VERTICAL GRANITE CURB

BIT. CONC. SIDEWALK

BIT. CONC. PAVEMENT

SLOPED GRANITE CURB (NO SIDEWALK)

UP #298-5

0 100 200 300

1"=100'

MAR. 02, 2022

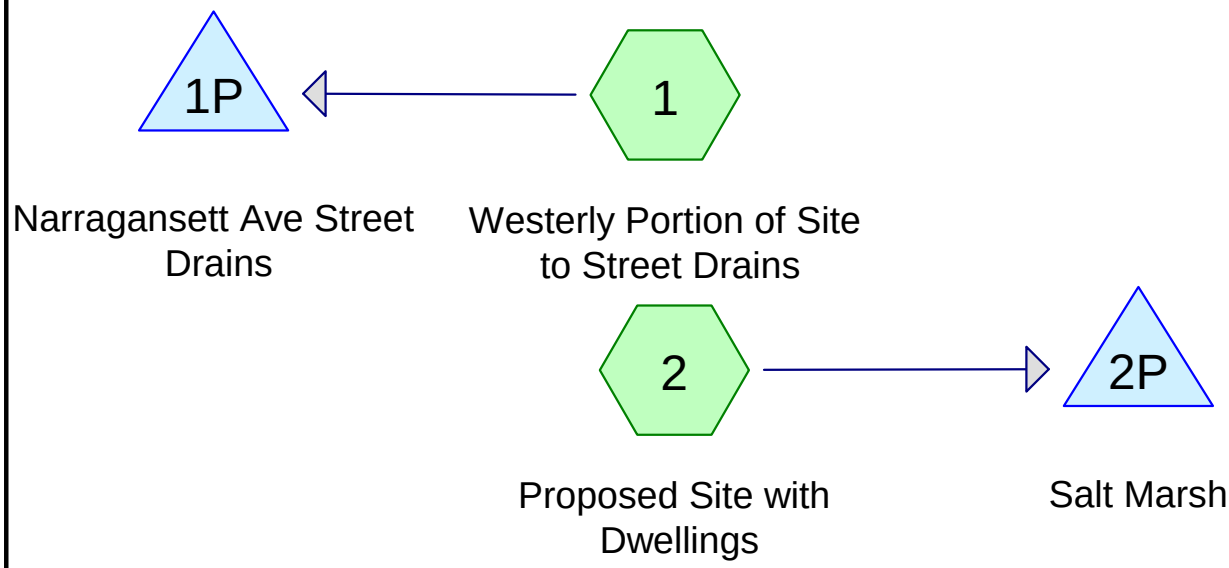
SE14-1047

RESIDENTIAL SUBDIVISION
RYDER DEVELOPMENT CORP.
SAVANNA DRIVE
WEYMOUTH, MASSACHUSETTS

DRAINAGE AREA PLAN
PROPOSED CONDITIONS

2 2

SITEC ENGINEERING & ENVIRONMENTAL CONSULTANTS, INC.
769 Plain Street, Unit C
Marshfield, MA 02050
Tel. (781) 319-0100 Fax (781) 834-4783



Subcat Reach Pond Link

Routing Diagram for Proposed Conditions Drainage Calculations
Prepared by {enter your company name here}, Printed 3/9/2022

Summary for Subcatchment 1: Westerly Portion of Site to Street Drains

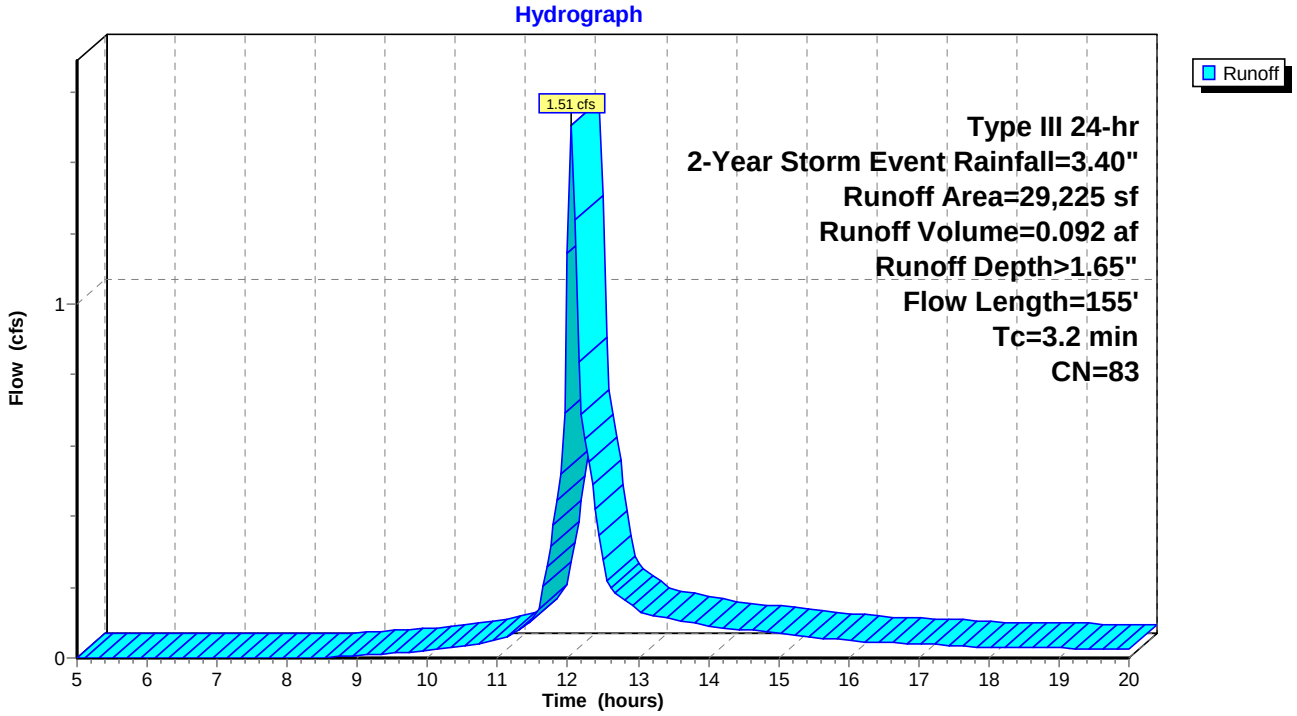
Runoff = 1.51 cfs @ 12.05 hrs, Volume= 0.092 af, Depth> 1.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Event Rainfall=3.40"

Area (sf)	CN	Description
5,549	98	Paved roads w/curbs & sewers, HSG D
23,676	80	>75% Grass cover, Good, HSG D
29,225	83	Weighted Average
23,676		81.01% Pervious Area
5,549		18.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1200	0.31		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.40"
0.1	31	0.2289	7.70		**Shallow Concentrated Flow, BC** Unpaved Kv= 16.1 fps
0.4	74	0.0271	3.34		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
3.2	155	Total			

Subcatchment 1: Westerly Portion of Site to Street Drains



Summary for Subcatchment 2: Proposed Site with Dwellings

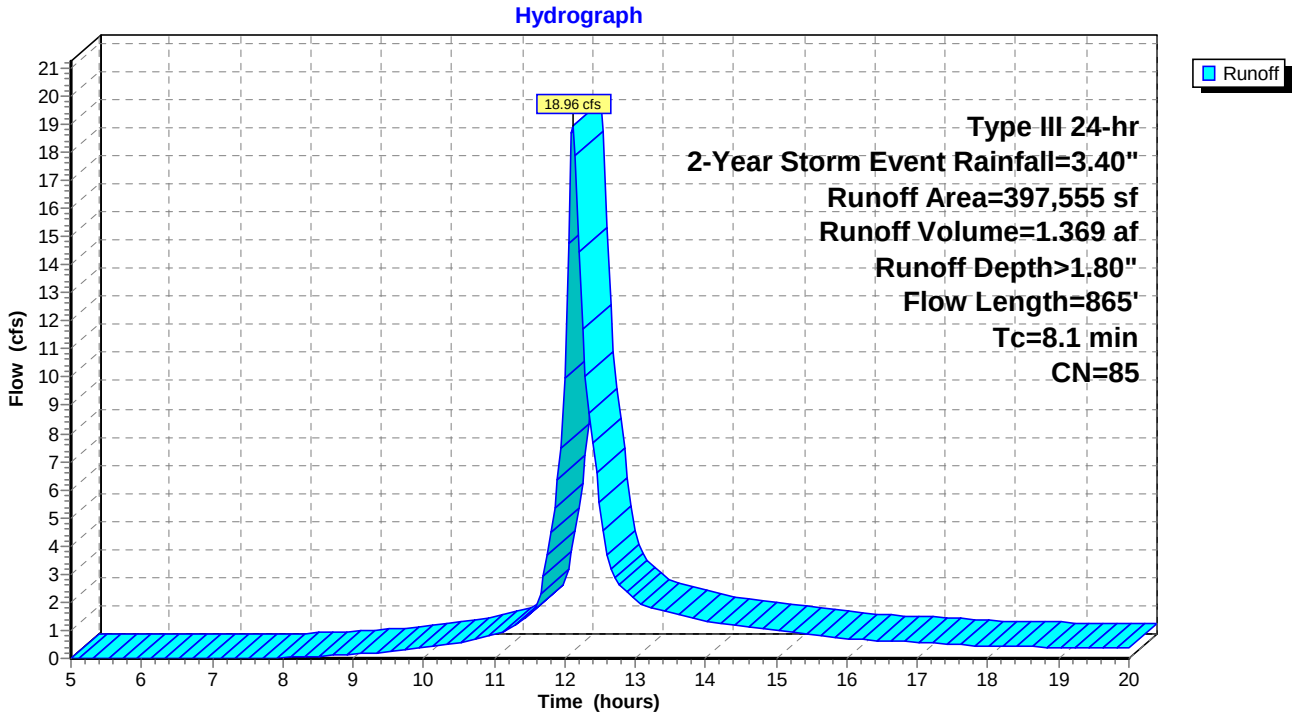
Runoff = 18.96 cfs @ 12.12 hrs, Volume= 1.369 af, Depth> 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Event Rainfall=3.40"

	Area (sf)	CN	Description
	20,678	98	Paved roads w/curbs & sewers, HSG D
	200,459	80	>75% Grass cover, Good, HSG D
	81,999	79	Woods, Fair, HSG D
*	20,000	98	Roofs & Driveways, HSG D
	74,419	98	Water Surface, HSG D
	397,555	85	Weighted Average
	282,458		71.05% Pervious Area
	115,097		28.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	50	0.0800	0.27		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.40"
0.6	161	0.0869	4.75		**Shallow Concentrated Flow, BC** Unpaved Kv= 16.1 fps
3.1	297	0.0101	1.62		**Shallow Concentrated Flow, CD** Unpaved Kv= 16.1 fps
0.1	27	0.1882	6.98		**Shallow Concentrated Flow, DE** Unpaved Kv= 16.1 fps
0.3	71	0.0282	3.41		**Shallow Concentrated Flow, EF** Paved Kv= 20.3 fps
0.1	40	0.0200	6.42	5.04	**Pipe Channel, FG** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.2	170	0.1400	16.97	13.33	**Pipe Channel, GH** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
0.6	49	0.0815	1.43		**Shallow Concentrated Flow, HI** Woodland Kv= 5.0 fps
8.1	865	Total			

Subcatchment 2: Proposed Site with Dwellings

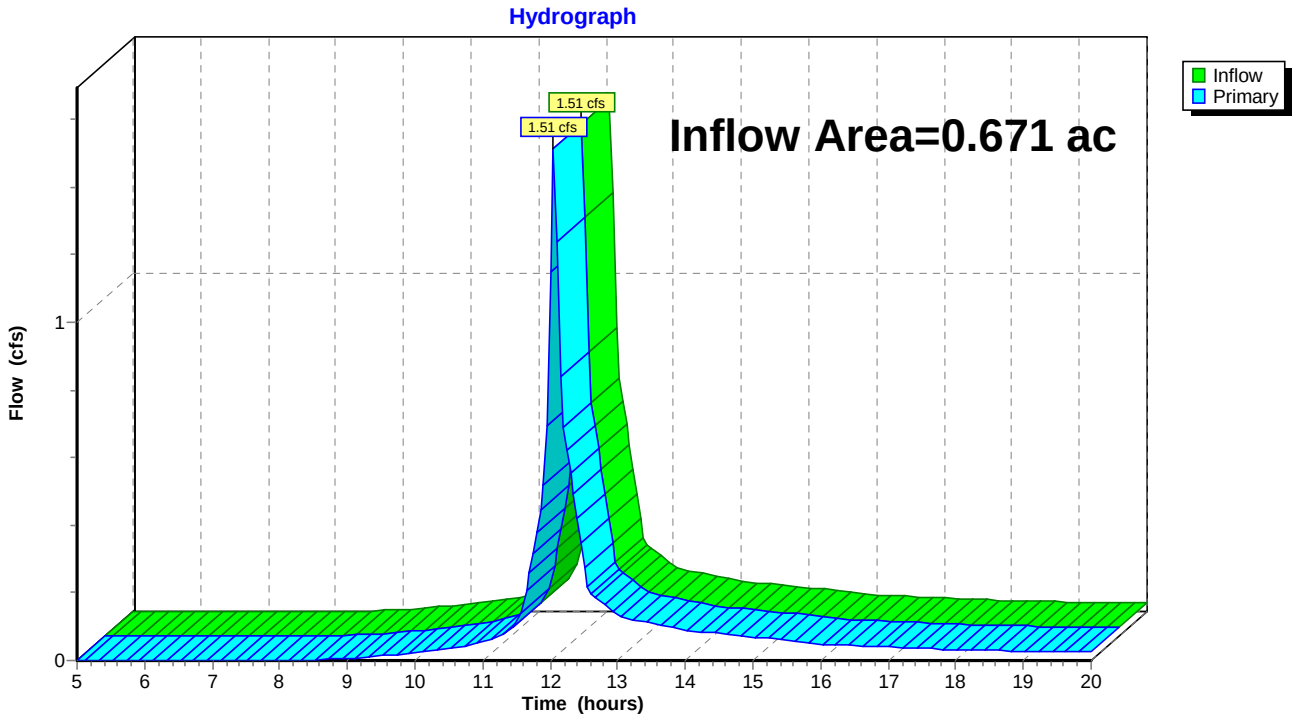


Summary for Pond 1P: Narragansett Ave Street Drains

Inflow Area = 0.671 ac, 18.99% Impervious, Inflow Depth > 1.65" for 2-Year Storm Event event
Inflow = 1.51 cfs @ 12.05 hrs, Volume= 0.092 af
Primary = 1.51 cfs @ 12.05 hrs, Volume= 0.092 af, Atten= 0%, Lag= 0.0 min

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

Pond 1P: Narragansett Ave Street Drains

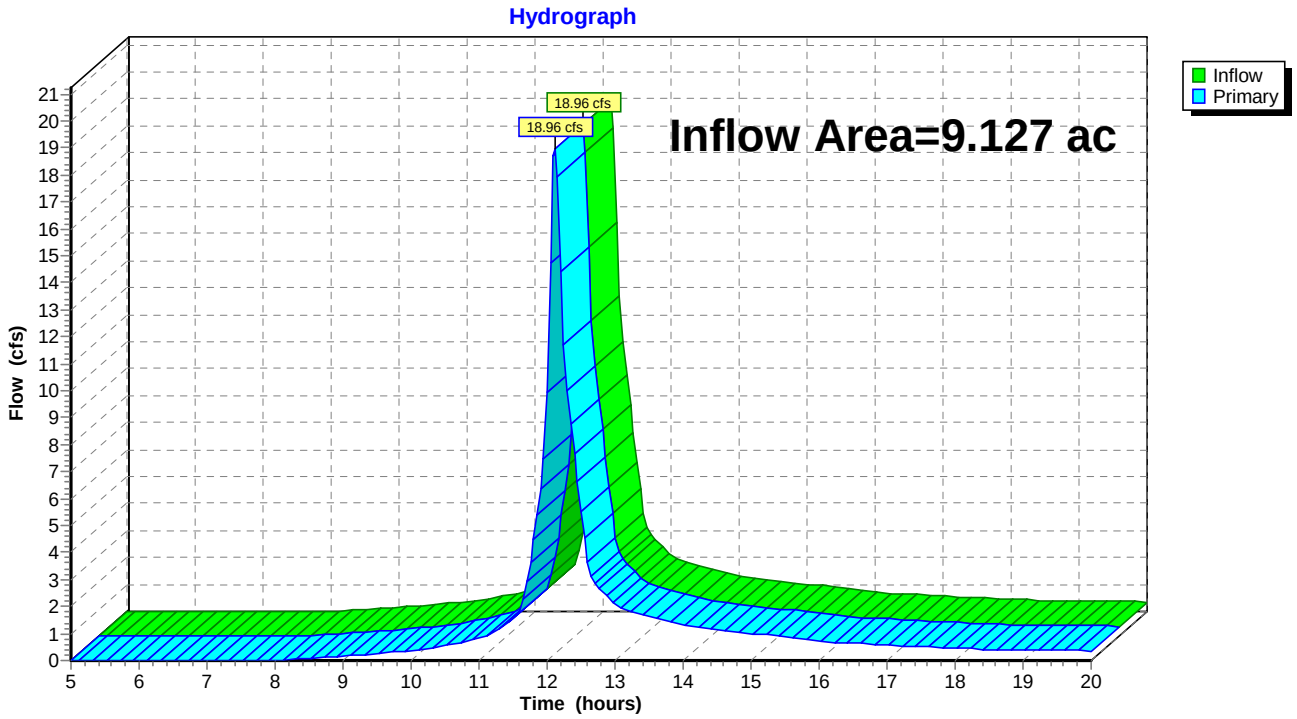


Summary for Pond 2P: Salt Marsh

Inflow Area = 9.127 ac, 28.95% Impervious, Inflow Depth > 1.80" for 2-Year Storm Event event
Inflow = 18.96 cfs @ 12.12 hrs, Volume= 1.369 af
Primary = 18.96 cfs @ 12.12 hrs, Volume= 1.369 af, Atten= 0%, Lag= 0.0 min

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

Pond 2P: Salt Marsh



Summary for Subcatchment 1: Westerly Portion of Site to Street Drains

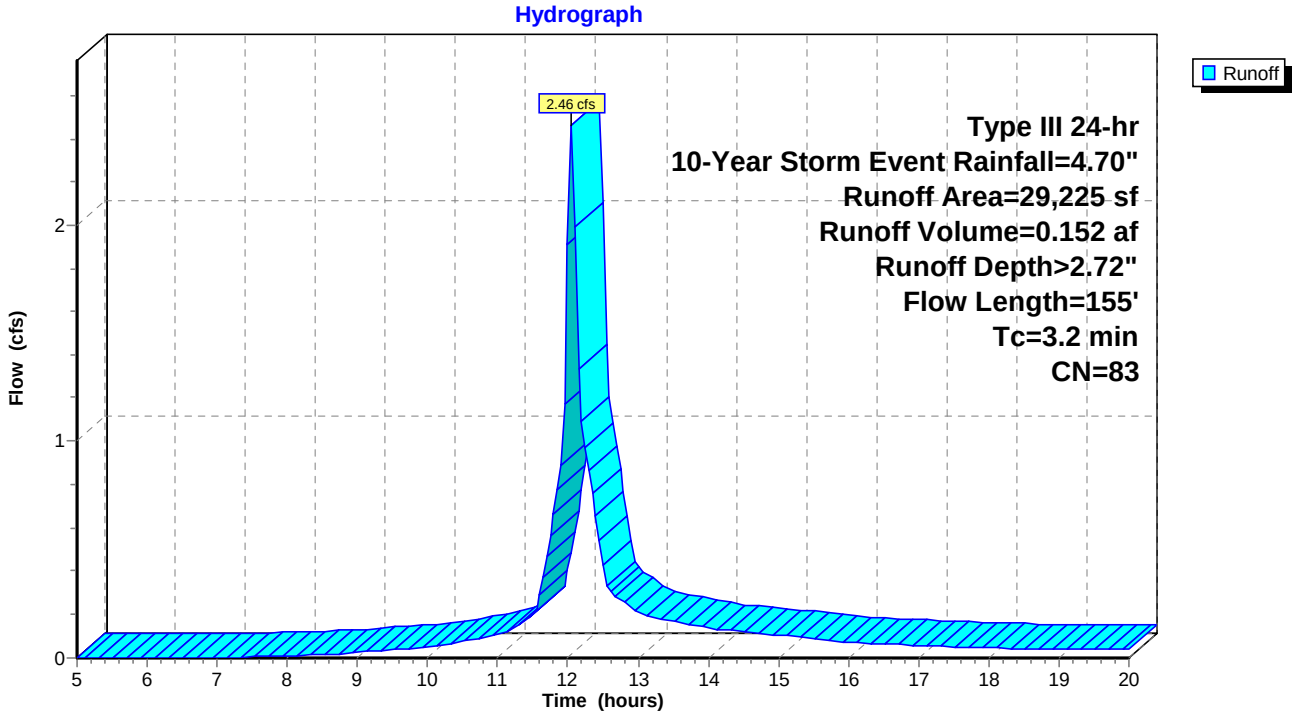
Runoff = 2.46 cfs @ 12.05 hrs, Volume= 0.152 af, Depth> 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Event Rainfall=4.70"

Area (sf)	CN	Description
5,549	98	Paved roads w/curbs & sewers, HSG D
23,676	80	>75% Grass cover, Good, HSG D
29,225	83	Weighted Average
23,676		81.01% Pervious Area
5,549		18.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1200	0.31		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.40"
0.1	31	0.2289	7.70		**Shallow Concentrated Flow, BC** Unpaved Kv= 16.1 fps
0.4	74	0.0271	3.34		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
3.2	155	Total			

Subcatchment 1: Westerly Portion of Site to Street Drains



Summary for Subcatchment 2: Proposed Site with Dwellings

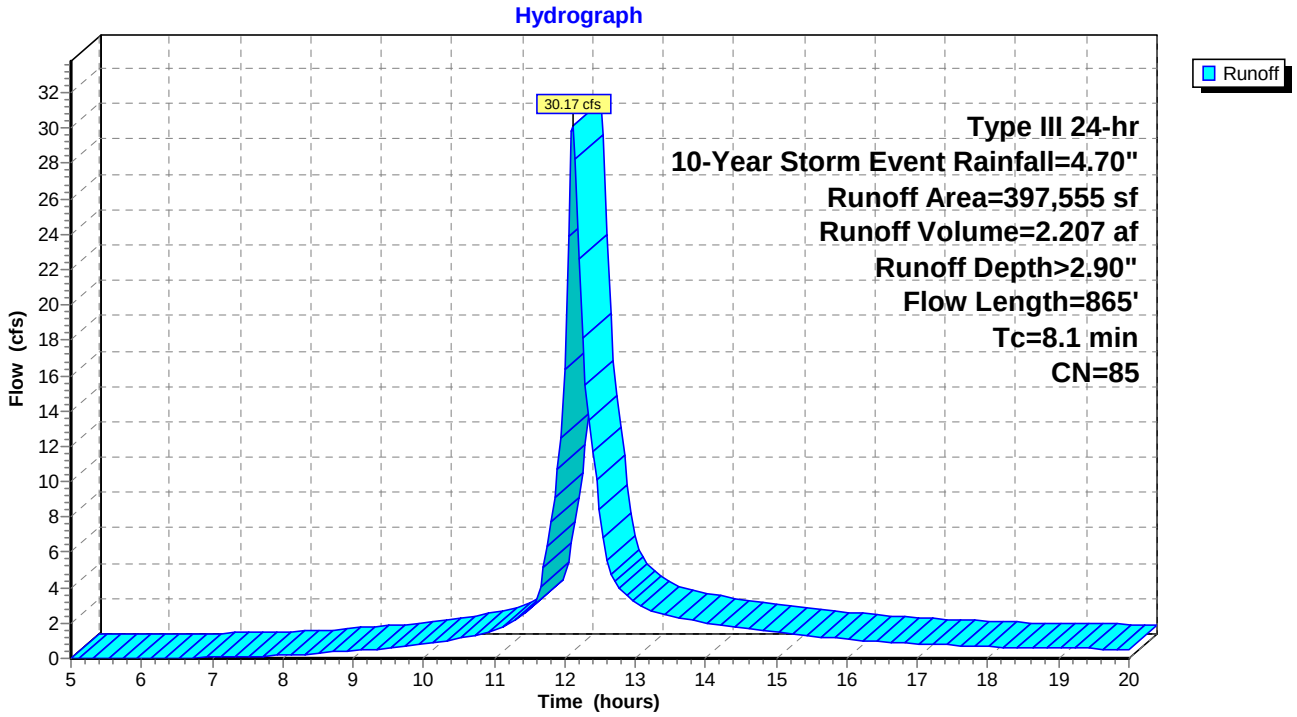
Runoff = 30.17 cfs @ 12.11 hrs, Volume= 2.207 af, Depth> 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Event Rainfall=4.70"

	Area (sf)	CN	Description
	20,678	98	Paved roads w/curbs & sewers, HSG D
	200,459	80	>75% Grass cover, Good, HSG D
	81,999	79	Woods, Fair, HSG D
*	20,000	98	Roofs & Driveways, HSG D
	74,419	98	Water Surface, HSG D
	397,555	85	Weighted Average
	282,458		71.05% Pervious Area
	115,097		28.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	50	0.0800	0.27		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.40"
0.6	161	0.0869	4.75		**Shallow Concentrated Flow, BC** Unpaved Kv= 16.1 fps
3.1	297	0.0101	1.62		**Shallow Concentrated Flow, CD** Unpaved Kv= 16.1 fps
0.1	27	0.1882	6.98		**Shallow Concentrated Flow, DE** Unpaved Kv= 16.1 fps
0.3	71	0.0282	3.41		**Shallow Concentrated Flow, EF** Paved Kv= 20.3 fps
0.1	40	0.0200	6.42	5.04	**Pipe Channel, FG** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.2	170	0.1400	16.97	13.33	**Pipe Channel, GH** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
0.6	49	0.0815	1.43		**Shallow Concentrated Flow, HI** Woodland Kv= 5.0 fps
8.1	865	Total			

Subcatchment 2: Proposed Site with Dwellings

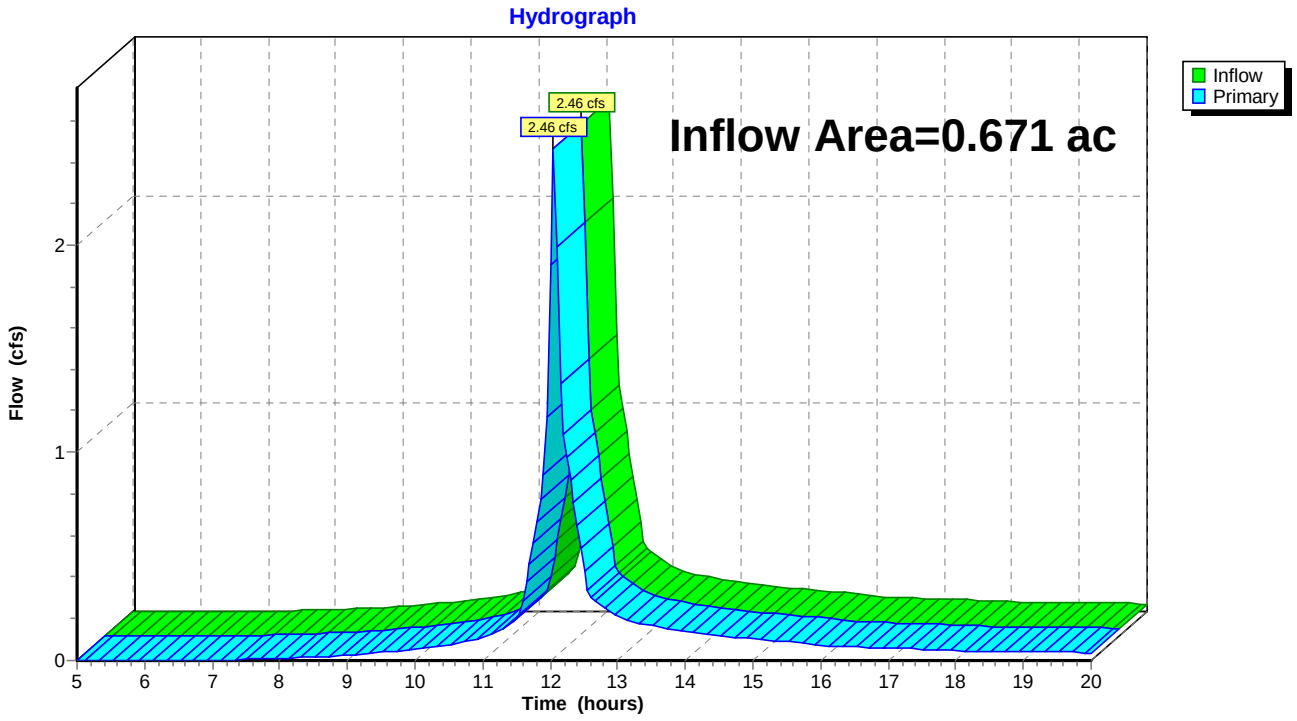


Summary for Pond 1P: Narragansett Ave Street Drains

Inflow Area = 0.671 ac, 18.99% Impervious, Inflow Depth > 2.72" for 10-Year Storm Event event
Inflow = 2.46 cfs @ 12.05 hrs, Volume= 0.152 af
Primary = 2.46 cfs @ 12.05 hrs, Volume= 0.152 af, Atten= 0%, Lag= 0.0 min

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

Pond 1P: Narragansett Ave Street Drains

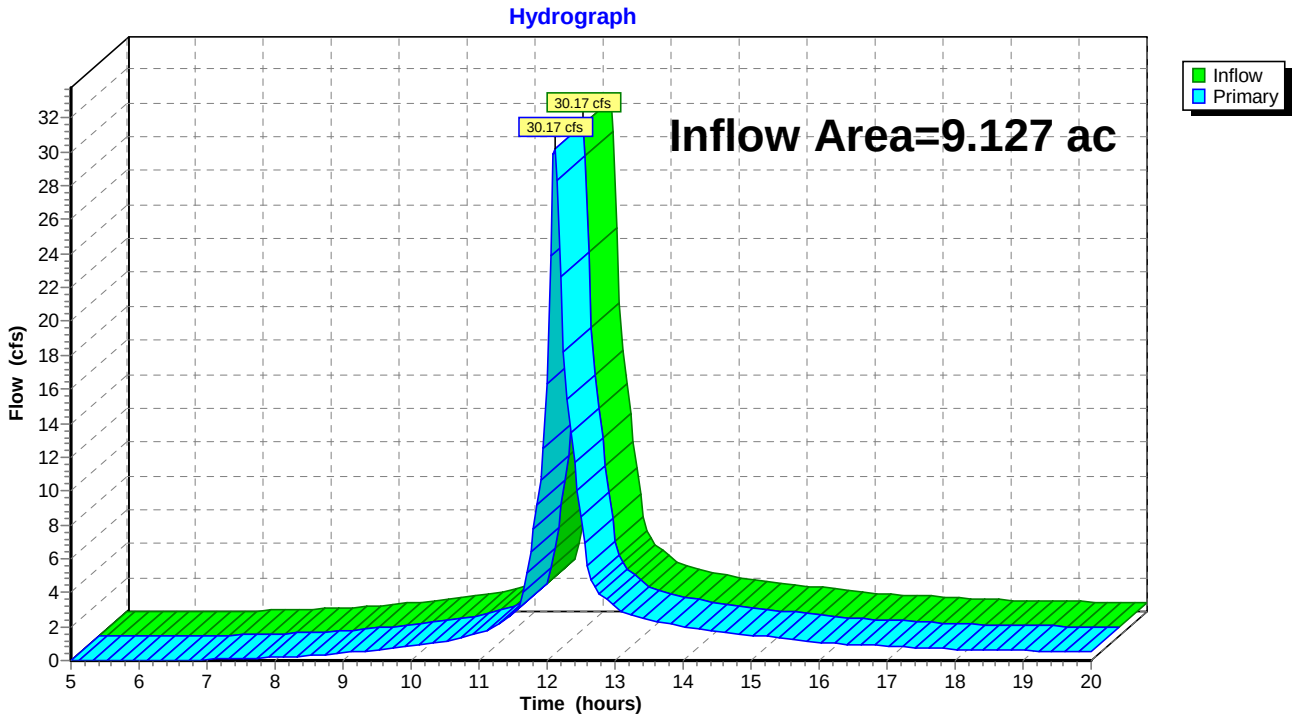


Summary for Pond 2P: Salt Marsh

Inflow Area = 9.127 ac, 28.95% Impervious, Inflow Depth > 2.90" for 10-Year Storm Event event
Inflow = 30.17 cfs @ 12.11 hrs, Volume= 2.207 af
Primary = 30.17 cfs @ 12.11 hrs, Volume= 2.207 af, Atten= 0%, Lag= 0.0 min

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

Pond 2P: Salt Marsh



Summary for Subcatchment 1: Westerly Portion of Site to Street Drains

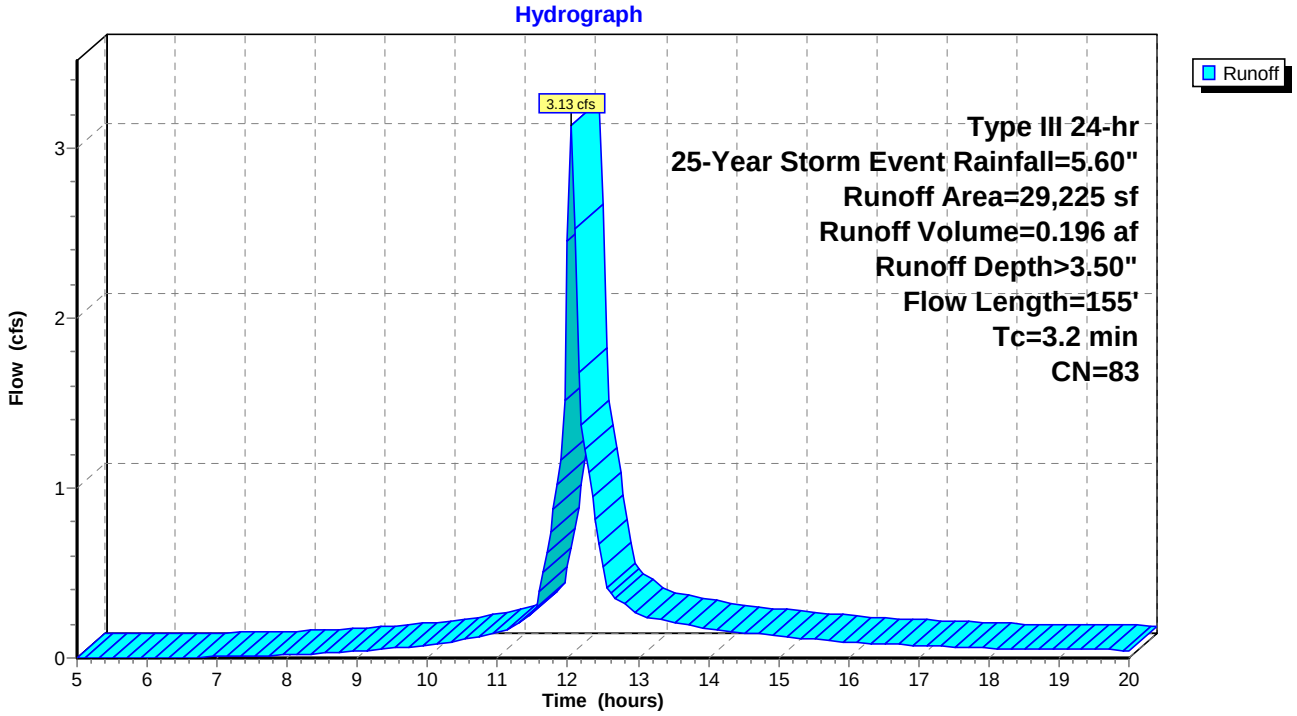
Runoff = 3.13 cfs @ 12.05 hrs, Volume= 0.196 af, Depth> 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Event Rainfall=5.60"

Area (sf)	CN	Description
5,549	98	Paved roads w/curbs & sewers, HSG D
23,676	80	>75% Grass cover, Good, HSG D
29,225	83	Weighted Average
23,676		81.01% Pervious Area
5,549		18.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1200	0.31		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.40"
0.1	31	0.2289	7.70		**Shallow Concentrated Flow, BC** Unpaved Kv= 16.1 fps
0.4	74	0.0271	3.34		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
3.2	155	Total			

Subcatchment 1: Westerly Portion of Site to Street Drains



Summary for Subcatchment 2: Proposed Site with Dwellings

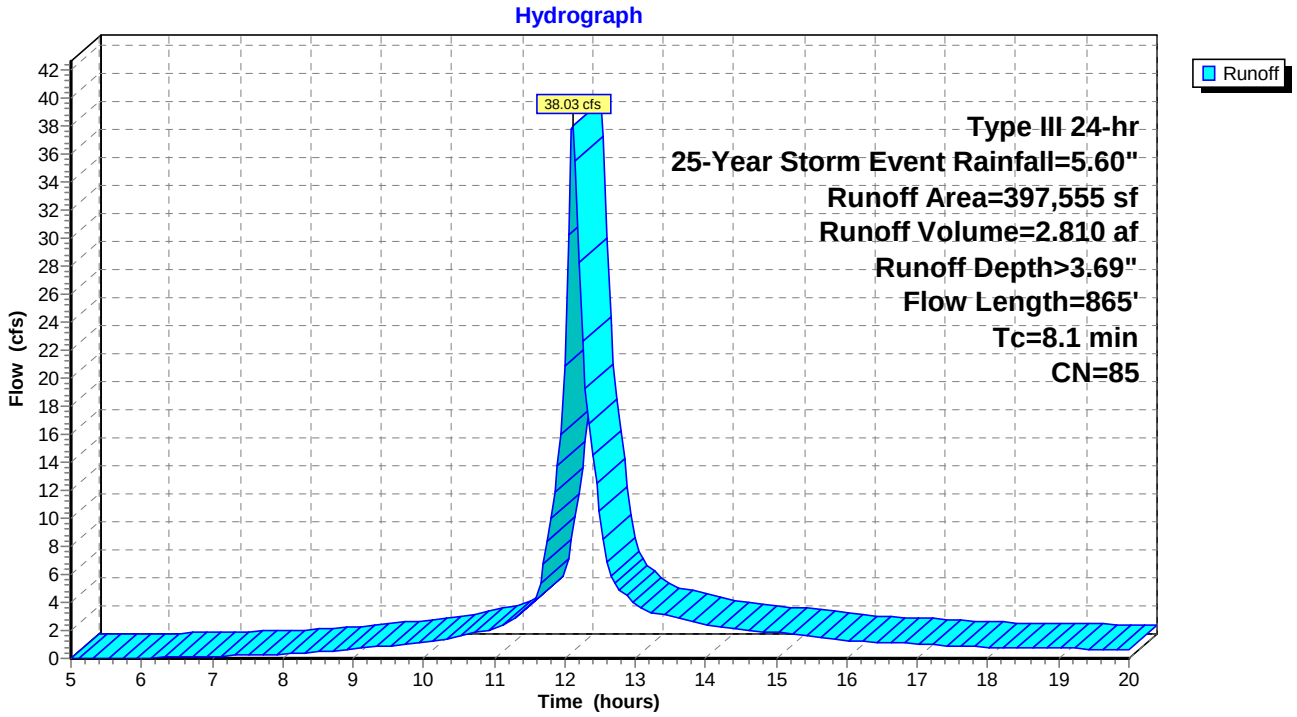
Runoff = 38.03 cfs @ 12.11 hrs, Volume= 2.810 af, Depth> 3.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Event Rainfall=5.60"

	Area (sf)	CN	Description
	20,678	98	Paved roads w/curbs & sewers, HSG D
	200,459	80	>75% Grass cover, Good, HSG D
	81,999	79	Woods, Fair, HSG D
*	20,000	98	Roofs & Driveways, HSG D
	74,419	98	Water Surface, HSG D
	397,555	85	Weighted Average
	282,458		71.05% Pervious Area
	115,097		28.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	50	0.0800	0.27		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.40"
0.6	161	0.0869	4.75		**Shallow Concentrated Flow, BC** Unpaved Kv= 16.1 fps
3.1	297	0.0101	1.62		**Shallow Concentrated Flow, CD** Unpaved Kv= 16.1 fps
0.1	27	0.1882	6.98		**Shallow Concentrated Flow, DE** Unpaved Kv= 16.1 fps
0.3	71	0.0282	3.41		**Shallow Concentrated Flow, EF** Paved Kv= 20.3 fps
0.1	40	0.0200	6.42	5.04	**Pipe Channel, FG** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.2	170	0.1400	16.97	13.33	**Pipe Channel, GH** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
0.6	49	0.0815	1.43		**Shallow Concentrated Flow, HI** Woodland Kv= 5.0 fps
8.1	865	Total			

Subcatchment 2: Proposed Site with Dwellings

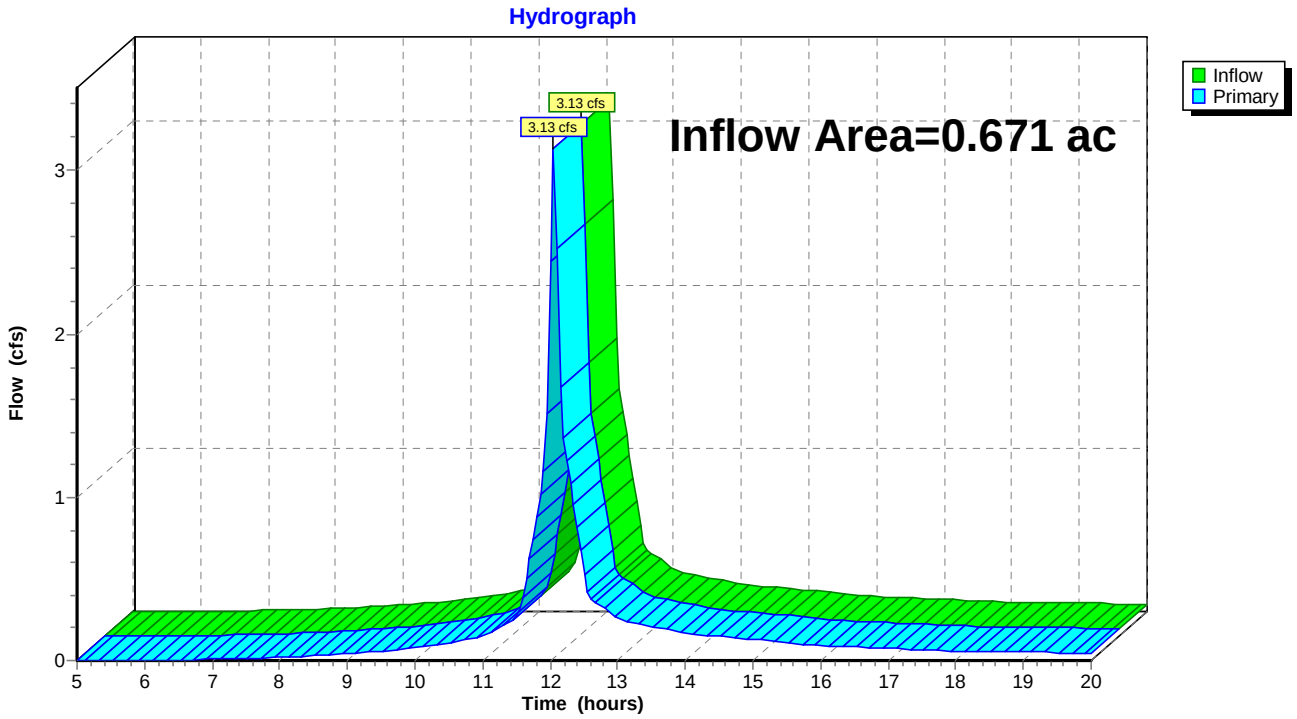


Summary for Pond 1P: Narragansett Ave Street Drains

Inflow Area = 0.671 ac, 18.99% Impervious, Inflow Depth > 3.50" for 25-Year Storm Event event
Inflow = 3.13 cfs @ 12.05 hrs, Volume= 0.196 af
Primary = 3.13 cfs @ 12.05 hrs, Volume= 0.196 af, Atten= 0%, Lag= 0.0 min

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

Pond 1P: Narragansett Ave Street Drains

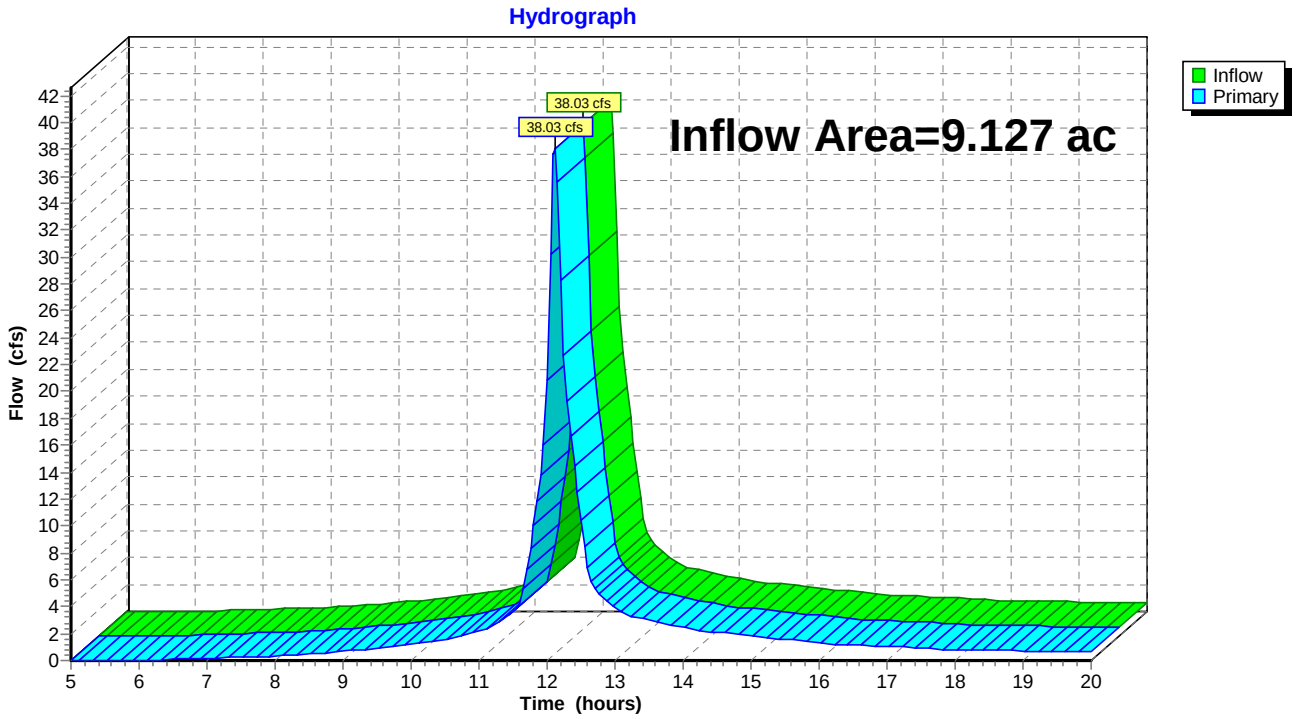


Summary for Pond 2P: Salt Marsh

Inflow Area = 9.127 ac, 28.95% Impervious, Inflow Depth > 3.69" for 25-Year Storm Event event
Inflow = 38.03 cfs @ 12.11 hrs, Volume= 2.810 af
Primary = 38.03 cfs @ 12.11 hrs, Volume= 2.810 af, Atten= 0%, Lag= 0.0 min

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

Pond 2P: Salt Marsh



Summary for Subcatchment 1: Westerly Portion of Site to Street Drains

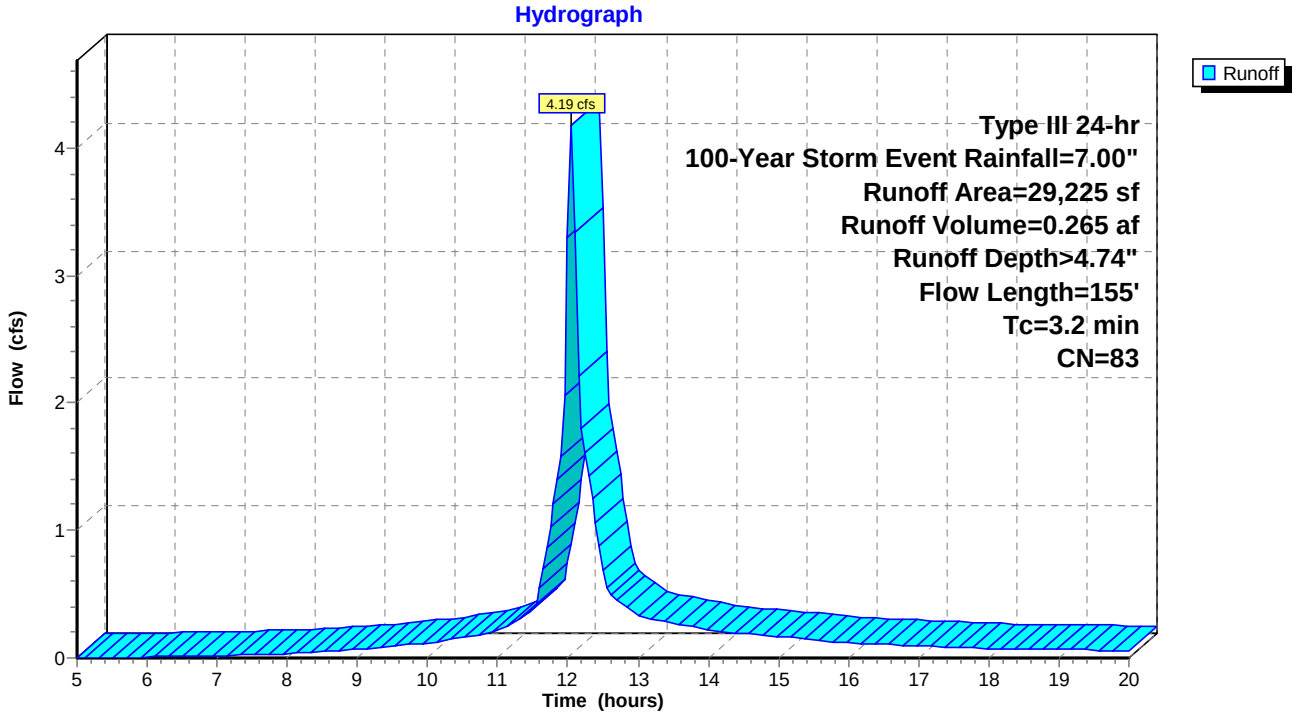
Runoff = 4.19 cfs @ 12.05 hrs, Volume= 0.265 af, Depth> 4.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Storm Event Rainfall=7.00"

Area (sf)	CN	Description
5,549	98	Paved roads w/curbs & sewers, HSG D
23,676	80	>75% Grass cover, Good, HSG D
29,225	83	Weighted Average
23,676		81.01% Pervious Area
5,549		18.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1200	0.31		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.40"
0.1	31	0.2289	7.70		**Shallow Concentrated Flow, BC** Unpaved Kv= 16.1 fps
0.4	74	0.0271	3.34		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
3.2	155	Total			

Subcatchment 1: Westerly Portion of Site to Street Drains



Summary for Subcatchment 2: Proposed Site with Dwellings

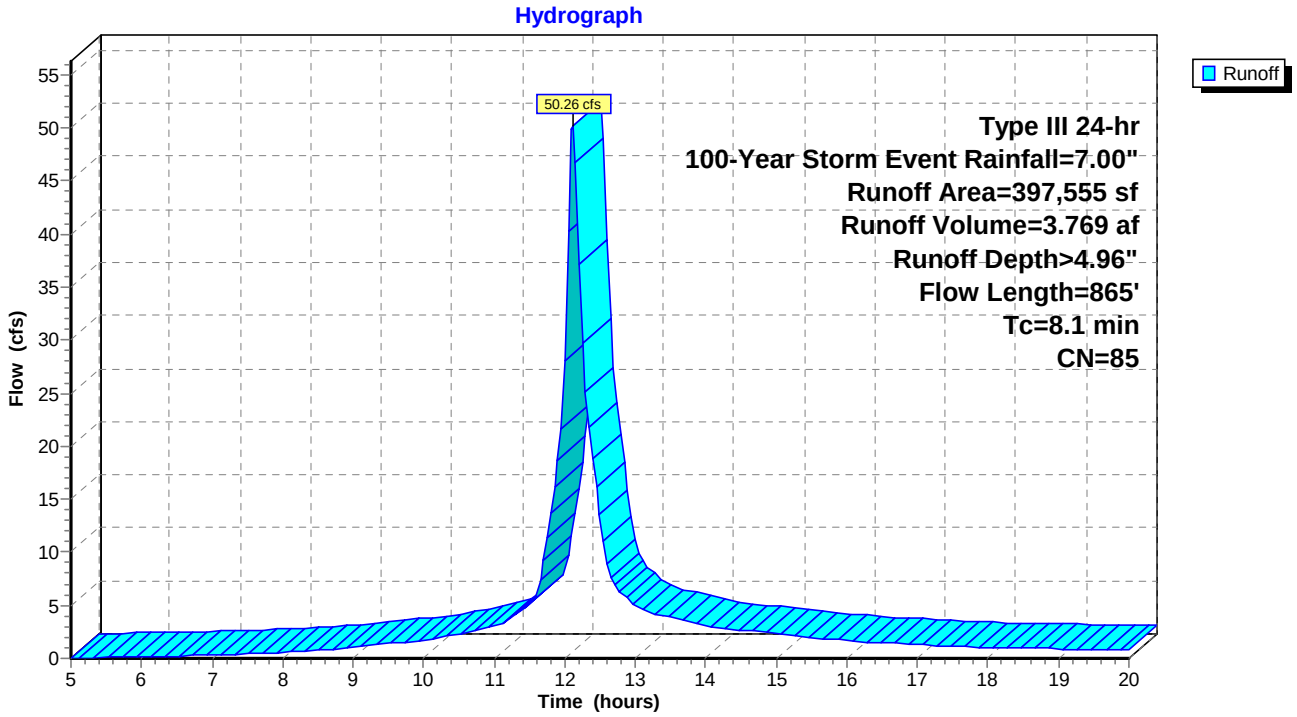
Runoff = 50.26 cfs @ 12.11 hrs, Volume= 3.769 af, Depth> 4.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Storm Event Rainfall=7.00"

	Area (sf)	CN	Description
	20,678	98	Paved roads w/curbs & sewers, HSG D
	200,459	80	>75% Grass cover, Good, HSG D
	81,999	79	Woods, Fair, HSG D
*	20,000	98	Roofs & Driveways, HSG D
	74,419	98	Water Surface, HSG D
	397,555	85	Weighted Average
	282,458		71.05% Pervious Area
	115,097		28.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	50	0.0800	0.27		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.40"
0.6	161	0.0869	4.75		**Shallow Concentrated Flow, BC** Unpaved Kv= 16.1 fps
3.1	297	0.0101	1.62		**Shallow Concentrated Flow, CD** Unpaved Kv= 16.1 fps
0.1	27	0.1882	6.98		**Shallow Concentrated Flow, DE** Unpaved Kv= 16.1 fps
0.3	71	0.0282	3.41		**Shallow Concentrated Flow, EF** Paved Kv= 20.3 fps
0.1	40	0.0200	6.42	5.04	**Pipe Channel, FG** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.2	170	0.1400	16.97	13.33	**Pipe Channel, GH** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
0.6	49	0.0815	1.43		**Shallow Concentrated Flow, HI** Woodland Kv= 5.0 fps
8.1	865	Total			

Subcatchment 2: Proposed Site with Dwellings

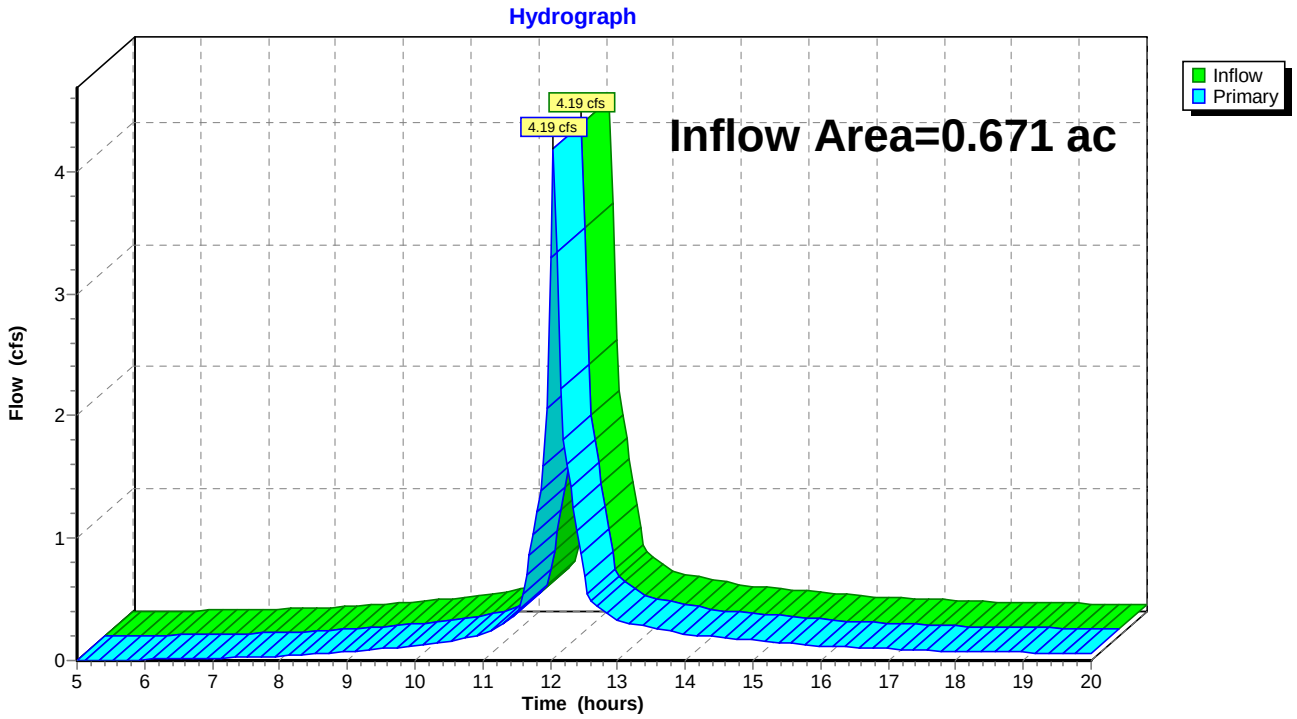


Summary for Pond 1P: Narragansett Ave Street Drains

Inflow Area = 0.671 ac, 18.99% Impervious, Inflow Depth > 4.74" for 100-Year Storm Event event
Inflow = 4.19 cfs @ 12.05 hrs, Volume= 0.265 af
Primary = 4.19 cfs @ 12.05 hrs, Volume= 0.265 af, Atten= 0%, Lag= 0.0 min

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

Pond 1P: Narragansett Ave Street Drains

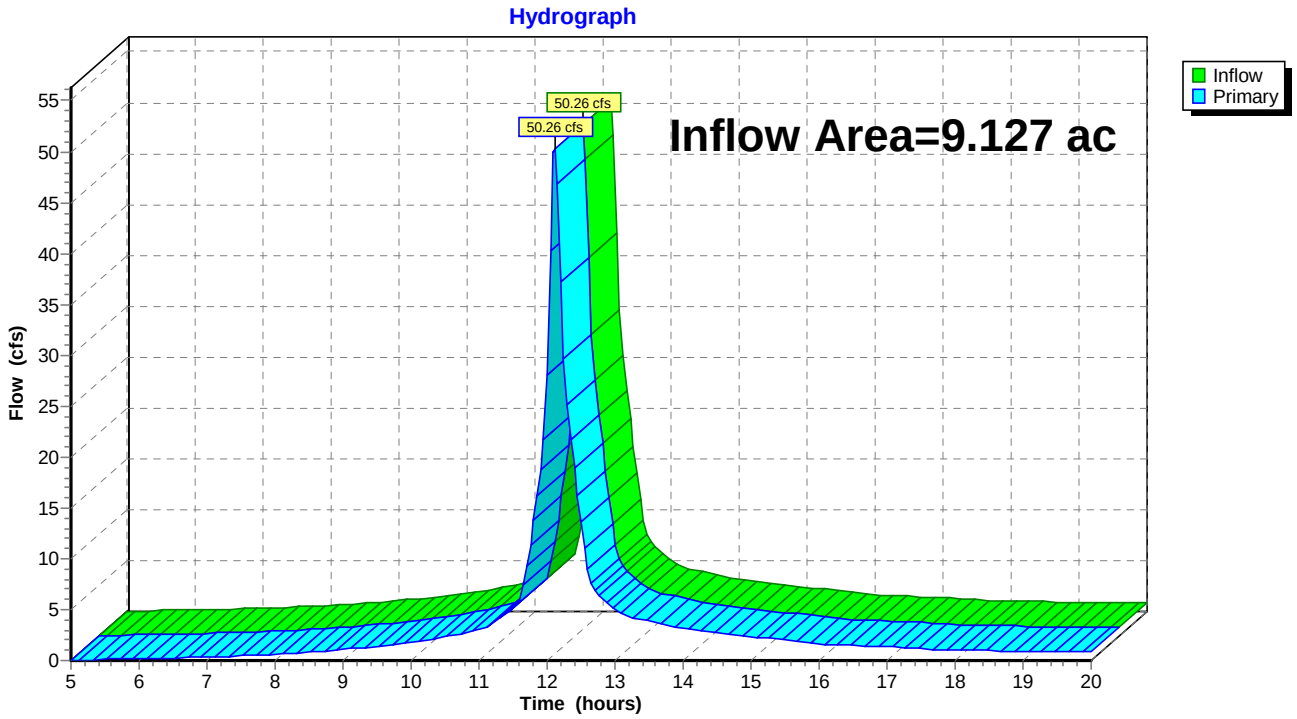


Summary for Pond 2P: Salt Marsh

Inflow Area = 9.127 ac, 28.95% Impervious, Inflow Depth > 4.96" for 100-Year Storm Event event
Inflow = 50.26 cfs @ 12.11 hrs, Volume= 3.769 af
Primary = 50.26 cfs @ 12.11 hrs, Volume= 3.769 af, Atten= 0%, Lag= 0.0 min

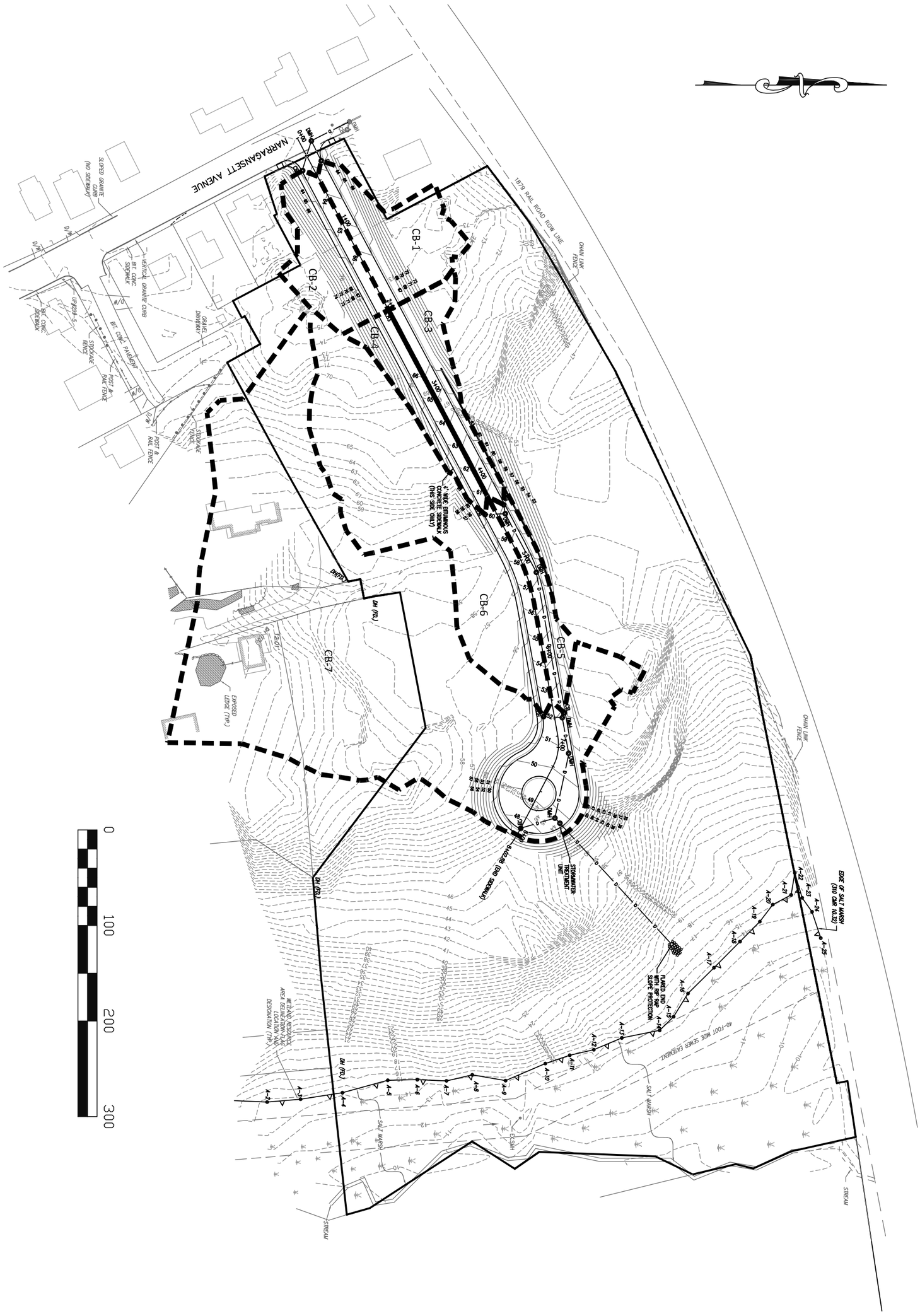
Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 2P: Salt Marsh



SECTION 9

Storm Drain Capacity Calculations



SITEC ENGINEERING & ENVIRONMENTAL CONSULTANTS, INC.
769 Plain Street, Unit C
Marshfield, MA 02050
Tel. (781) 319-0100 Fax (781) 834-4783

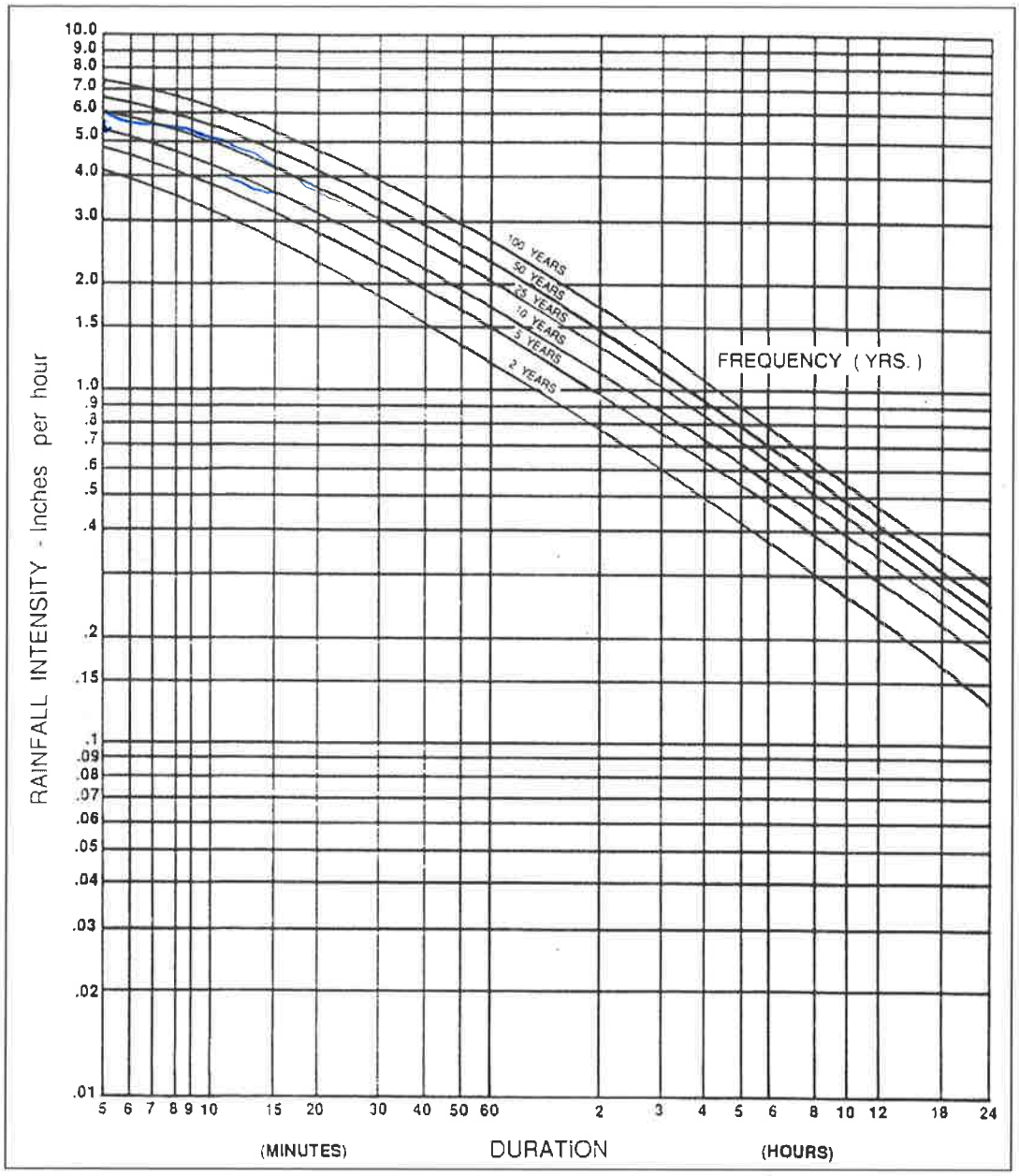
RESIDENTIAL SUBDIVISION
RYDER DEVELOPMENT CORP.
SAVANNA DRIVE
WEYMOUTH, MASSACHUSETTS

DRAINAGE AREA PLAN
CATCH BASIN AREAS

1"=100'

MAR. 02, 2022

SE14-1047



Intensity – Duration – Frequency
Curve for Boston, MA

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ENVIRONMENTAL
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STORM DRAIN CAPACITY CALCULATIONS
for
SAVANNA DRIVE SUBDIVISION
WEYMOUTH, MASSACHUSETTS
March 2022

METHODOLOGY:

1)
Calculate Peak Discharges for Subcatchment Areas using Rational Method (10-Year Design Flood Frequency):

$$Q = C\ i\ A$$

where:

Q = Peak Discharge Flowrate (ft.^{3} / second)
C = Runoff Coefficient
i = Average Rainfall Intensity (in. / hr.) for a Storm Duration Equal to the Time of Concentration, T_c
A = Drainage Area (acres)

2)
Calculate Storm Drain Diameter Assuming Full Flow Conditions using Manning Equation:

$$D = 1.335\ \left(\frac{n\ Q}{\sqrt{S}}\right)^{\frac{3}{8}}$$

where:

D = Storm Drain Diameter (ft.)
n = Manning Roughness Coefficient
Q = Flowrate (ft.^{3} / sec.)
S = Slope of Storm Drain (ft. / ft.)

CB-1 to DMH-1:

CRITERIA:
A = 11,595 ft.^{2} = 0.27 acres

T_c = <5 minutes
i = 5.3 in / hr. (See attached Intensity – Duration – Frequency Curve for Boston, MA)

$C_{impervious}$ = 0.90
C_{grass} = 0.30

$$C_{avg} = \frac{(0.05\ acres)(0.9) + (0.22\ acres)(0.3)}{0.27\ acres} = 0.41$$

ANALYSIS:

$$Q = (0.41)\left(5.3\frac{in.}{hr.}\right)(0.27\ acres) = 0.59\frac{ft.^3}{sec.}$$

$$D = 1.335\ \left(\frac{n\ Q}{\sqrt{S}}\right)^{\frac{3}{8}} = \ 1.335\left(\frac{0.013\ (0.59)}{\sqrt{0.02}}\right)^{\frac{3}{8}} \ = \ 0.45\ ft. \ = \ 5.4\ inches$$

USE 12" RCP Storm Drain with S = 0.020
Maximum Capacity = 5.04 ft.^{3} / sec.

CB-2 to DMH-1:

CRITERIA:

A = 10,164 ft.^{2} = 0.23 acres
T_c = < 5 minutes
i = 5.3 in / hr. (See attached Intensity – Duration – Frequency Curve for Boston, MA)

$C_{impervious}$ = 0.90
C_{grass} = 0.30

$$C_{avg} = \frac{(0.07\ acres)(0.9) + (0.16\ acres)(0.3)}{0.23\ acres} = 0.48$$

ANALYSIS:

$$Q = (0.48)\left(5.3\frac{in.}{hr.}\right)(0.23\ acres) = 0.59\frac{ft.^3}{sec.}$$

$$D = 1.335\ \left(\frac{n\ Q}{\sqrt{S}}\right)^{\frac{3}{8}} = \ 1.335\left(\frac{0.013\ (0.59)}{\sqrt{0.020}}\right)^{\frac{3}{8}} \ = \ 0.45ft. \ = \ 5.4\ inches$$

USE 12" RCP Storm Drain with S = 0.020
Maximum Capacity = 5.04 ft.^{3} / sec.

DMH-1 TO EXISTING DMH IN NARRAGANSETT AVENUE
Combined Flows from CB-1 and CB-2

Q = 0.59 ft.^{3} / sec. + 0.59 ft.^{3} / sec. = 1.18 ft.^{3} / sec.
USE 12" RCP Storm Drain with S = 0.010
Maximum Capacity = 3.56 ft.^{3} / sec.

CB-3 to DMH-2:

CRITERIA:

A = 7,572 ft.^{2} = 0.17 acres
T_c = < 5 minutes
i = 5.3 in / hr. (See attached Intensity – Duration – Frequency Curve for Boston, MA)

$C_{impervious}$ = 0.90
C_{grass} = 0.30

$$C_{avg} = \frac{(0.08\ acres)(0.9) + (0.09\ acres)(0.3)}{0.17\ acres} = 0.58$$

ANALYSIS:

$$Q = (0.58)\left(5.3\frac{in.}{hr.}\right)(0.17\ acres) = 0.52\frac{ft.^3}{sec.}$$

$$D = 1.335\ \left(\frac{n\ Q}{\sqrt{S}}\right)^{\frac{3}{8}} = \ 1.335\left(\frac{0.013\ (0.52)}{\sqrt{0.020}}\right)^{\frac{3}{8}} \ = \ 0.43\ ft. \ = \ 5.1\ inches$$

USE 12" RCP Storm Drain with S = 0.020
Maximum Capacity = 5.04 ft.^{3} / sec.

CB-4 to DMH-4:

CRITERIA:

A = 6,750 ft.^{2} = 0.15 acres
T_c = < 5 minutes
i = 5.3 in / hr. (See attached Intensity – Duration – Frequency Curve for Boston, MA)

$C_{impervious}$ = 0.90
C_{grass} = 0.30

$$C_{avg} = \frac{(0.11\ acres)(0.9) + (0.04\ acres)(0.3)}{0.15\ acres} = 0.74$$

ANALYSIS:

$$Q = (0.74)\left(5.3\frac{in.}{hr.}\right)(0.15\ acres) = 0.59\frac{ft.^3}{sec.}$$

$$D = 1.335\ \left(\frac{n\ Q}{\sqrt{S}}\right)^{\frac{3}{8}} = \ 1.335\left(\frac{0.013\ (0.59)}{\sqrt{0.020}}\right)^{\frac{3}{8}} \ = \ 0.45\ ft. \ = \ 5.4\ inches$$

USE 12" RCP Storm Drain with S = 0.020
Maximum Capacity = 5.04 ft.^{3} / sec.

DMH-2 TO DMH-3 AND DMH-3 TO DMH-4
Combined Flows from CB-3 and CB-4

Q = 0.52 ft.^{3} / sec. + 0.59 ft.^{3} / sec. = 1.11 ft.^{3} / sec.
USE 12" RCP Storm Drain with S = 0.036
Maximum Capacity = 6.76 ft.^{3} / sec.

CB-5 to DMH-4:

CRITERIA:

A = 5,122 ft.^{2} = 0.12 acres
T_c = < 5 minutes
i = 5.3 in / hr. (See attached Intensity – Duration – Frequency Curve for Boston, MA)

$C_{impervious}$ = 0.90
C_{grass} = 0.30

$$C_{avg} = \frac{(0.08\ acres)(0.9) + (0.04\ acres)(0.3)}{0.12\ acres} = 0.70$$

ANALYSIS:

$$Q = (0.70)\left(5.3\frac{in.}{hr.}\right)(0.12\ acres) = 0.45\frac{ft.^3}{sec.}$$

$$D = 1.335\ \left(\frac{n\ Q}{\sqrt{S}}\right)^{\frac{3}{8}} = \ 1.335\left(\frac{0.013\ (0.45)}{\sqrt{0.020}}\right)^{\frac{3}{8}} \ = \ 0.40\ ft. \ = \ 4.9\ inches$$

USE 12" RCP Storm Drain with S = 0.020
Maximum Capacity = 5.04 ft.^{3} / sec.

CB-6 to DMH-4:

CRITERIA:

A = 37,590 ft.^{2} = 0.86 acres
T_c = 5.9 minutes
i = 5.0 in / hr. (See attached Intensity – Duration – Frequency Curve for Boston, MA)

$C_{impervious}$ = 0.90
C_{grass} = 0.30

$$C_{avg} = \frac{(0.22\ acres)(0.9) + (0.64\ acres)(0.3)}{0.86\ acres} = 0.45$$

ANALYSIS:

$$Q = (0.45)\left(5.0\,\frac{in.}{hr.}\right)(0.86\ acres) = 1.93\,\frac{ft.^3}{sec.}$$

$$D = 1.335\ \left(\frac{n\ Q}{\sqrt{S}}\right)^{\frac{3}{8}} = \ \ 1.335\left(\frac{0.013\ (1.93)}{\sqrt{0.020}}\right)^{\frac{3}{8}} \ = \ 0.70\ ft. \ = \ 8.4\ inches$$

USE 12" RCP Storm Drain with S = 0.020
Maximum Capacity = 5.04 ft.^{3} / sec.

DMH-4 TO DMH-5
Combined Flows from DMH-3, CB-5 and CB-6

Q = 1.11 ft.^{3} / sec. + 0.45 ft.^{3} / sec. + 1.93 ft.^{3} / sec = 3.49 ft.^{3} / sec.
USE 12" RCP Storm Drain with S = 0.036
Maximum Capacity = 6.76 ft.^{3} / sec.

DMH-5 TO DMH-6
Combined Flows from DMH-3, CB-5 and CB-6

Q = 1.11 ft.^{3} / sec. + 0.45 ft.^{3} / sec. + 1.93 ft.^{3} / sec = 3.49 ft.^{3} / sec.
USE 12" RCP Storm Drain with S = 0.020
Maximum Capacity = 5.04 ft.^{3} / sec.

CB-7 to DMH-6:

CRITERIA:

A = 111,476 ft.^{2} = 2.56 acres

T_c = 7.9 minutes
i = 4.8 in / hr. (See attached Intensity – Duration – Frequency Curve for Boston, MA)

$C_{impervious}$ = 0.90
C_{grass} = 0.30
C_{wooded} = 0.20

$$C_{avg} = \frac{(0.47\ acres)(0.9) + (1.84\ acres)(0.3) + (0.25\ acres)(0.2)}{2.56\ acres} = 0.40$$

ANALYSIS:

$$Q = (0.40)\left(4.8\frac{in.}{hr.}\right)(2.56\ acres) = 4.92\frac{ft.^3}{sec.}$$

$$D = 1.335\ \left(\frac{n\ Q}{\sqrt{S}}\right)^{\frac{3}{8}} = \ 1.335\left(\frac{0.013\ (4.92)}{\sqrt{0.020}}\right)^{\frac{3}{8}} \ = \ 0.99\ ft. \ = \ 11.90\ inches$$

USE 15" RCP Storm Drain with S = 0.020
Maximum Capacity = 9.13 ft.^{3} / sec.

DMH-6 to STORMWATER TREATMENT UNIT:
Combined Flows CB-7 AND DMH-5

Q = 3.49 ft.^{3} / sec. + 4.92 ft.^{3} / sec. ft.^{3} / sec = 8.41 ft.^{3} / sec.
USE 15" RCP Storm Drain with S = 0.020
Maximum Capacity = 9.13 ft.^{3} / sec.

SECTION 10

Stormwater Treatment Unit Water Quality & TSS Removal Calculations

Project: Savanna Drive
Location: Weymouth, MA
Prepared For: SITEC / Jeff Couture

Purpose: To calculate the water quality flow rate (WQF) over a given site area. In this situation the WQF is derived from the first 1" of runoff from the contributing impervious surface.

Reference: Massachusetts Dept. of Environmental Protection Wetlands Program / United States Department of Agriculture Natural Resources Conservation Service TR-55 Manual

Procedure: Determine unit peak discharge using Figure 1 or 2. Figure 2 is in tabular form so is preferred. Using the tc, read the unit peak discharge (qu) from Figure 1 or Table in Figure 2. qu is expressed in the following units: cfs/mi^2/watershed inches (csm/in).

Compute Q Rate using the following equation:

$$Q = (qu)\ (A)\ (WQV)$$

where:

Q = flow rate associated with first 1" of runoff
qu = the unit peak discharge, in csm/in.
A = impervious surface drainage area (in square miles)
WQV = water quality volume in watershed inches (1" in this case)

Structure Name	Impv. (acres)	A (miles^2)	t_c (min)	t_c (hr)	WQV (in)	qu (csm/in.)	Q (cfs)
STU 1	0.73	0.0011406	5.0	0.083	1.00	795.00	0.91

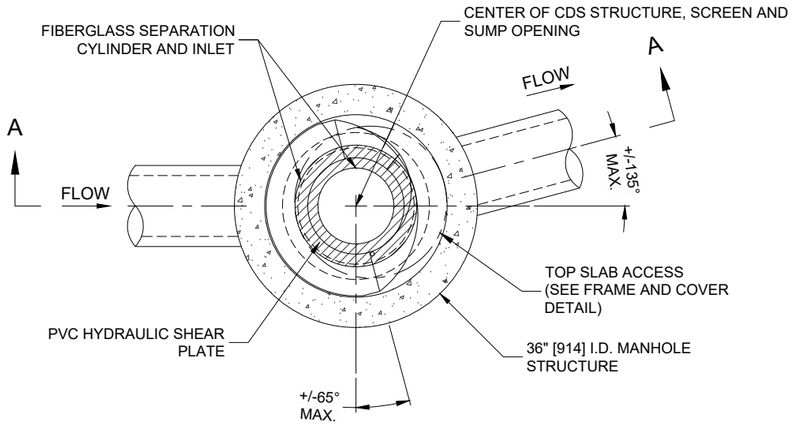
CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD

SAVANNA DRIVE
WEYMOUTH, MA

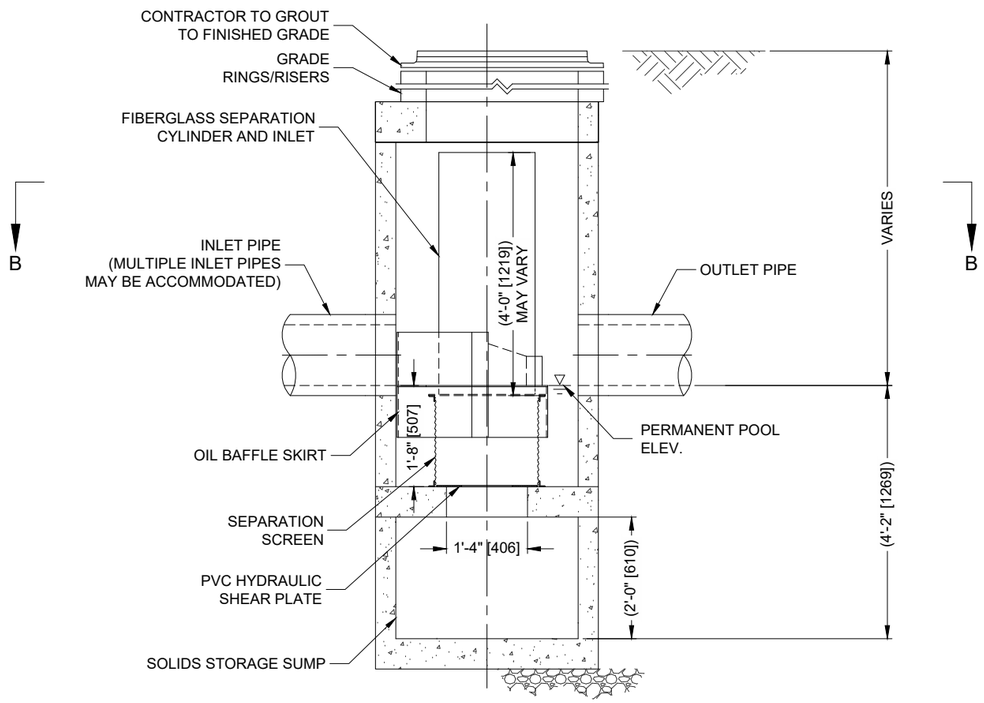
Area	**0.73 ac**	Unit Site Designation	**STU 1**
Weighted C	**0.9**	Rainfall Station #	**69**
t_c	**5 min**		
CDS Model	**1515-3**	CDS Treatment Capacity	**1.0 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	10.2%	10.2%	0.01	0.01	10.2
0.04	9.6%	19.8%	0.03	0.03	9.6
0.06	9.4%	29.3%	0.04	0.04	9.4
0.08	7.7%	37.0%	0.05	0.05	7.6
0.10	8.6%	45.6%	0.07	0.07	8.4
0.12	6.3%	51.9%	0.08	0.08	6.1
0.14	4.7%	56.5%	0.09	0.09	4.5
0.16	4.6%	61.2%	0.11	0.11	4.5
0.18	3.5%	64.7%	0.12	0.12	3.4
0.20	4.3%	69.1%	0.13	0.13	4.1
0.25	8.0%	77.1%	0.16	0.16	7.5
0.30	5.6%	82.7%	0.20	0.20	5.1
0.35	4.4%	87.0%	0.23	0.23	3.9
0.40	2.5%	89.5%	0.26	0.26	2.3
0.45	2.5%	92.1%	0.30	0.30	2.2
0.50	1.4%	93.5%	0.33	0.33	1.2
0.75	5.0%	98.5%	0.49	0.49	3.9
1.00	1.0%	99.5%	0.66	0.66	0.7
1.50	0.0%	99.5%	0.99	0.99	0.0
2.00	0.0%	99.5%	1.31	1.00	0.0
3.00	0.5%	100.0%	1.97	1.00	0.1
					95.0
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.3%
				Predicted Net Annual Load Removal Efficiency =	**88.5%**

1 - Based on 10 years of hourly precipitation data from NCDC Station 770, Boston WSFO AP, Suffolk County, MA
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.



PLAN VIEW B-B
N.T.S.

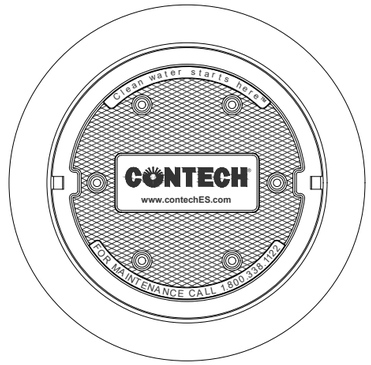


ELEVATION A-A
N.T.S.

CDS1515-3-C DESIGN NOTES

CDS1515-3-C RATED TREATMENT CAPACITY IS 1.0 CFS, OR PER LOCAL REGULATIONS.

THE STANDARD CDS1515-3-C CONFIGURATION IS SHOWN.



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

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (CFS OR L/s)			*
PEAK FLOW RATE (CFS OR L/s)			*
RETURN PERIOD OF PEAK FLOW (YRS)			*
SCREEN APERTURE (2400 OR 4700)			*
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*
ANTI-FLOTATION BALLAST		WIDTH	HEIGHT
		*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

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

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

CONTECH ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CDS1515-3-C
ONLINE CDS
STANDARD DETAIL

SECTION 11

Total Suspended Solids Removal Calculation Worksheet

Total Suspended Solid Removal Calculation Worksheet 1 of 1

TSS Removal Calculation Worksheet

Location: **Savanna Drive**
Weymouth, Massachusetts

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BxC)	E Remaining Load (C-D)
Pavement Sweeping	5%	1.00*	0.05	0.95
Hooded Deep Sump Catch Basin	25%	0.90	0.23	0.68
Stormwater Treatment Unit	89%	0.68	0.60	0.07

Total TSS Removal= 88%

Project: Definitive Subdivision

Prepared By: SITEC Environmental, Inc.

Date: 3.7.22

* Equals remaining load from previous BMP (E) which enters the BMP

SECTION 12

Stormwater Management System Operation & Maintenance Plan

Stormwater Management System
OPERATION AND MAINTENANCE PLAN
March 2022

SAVANNA DRIVE SUBDIVISION
Weymouth, MA

An important element of the overall stormwater management system is the regular maintenance of the control components. Specifically, the effectiveness of the sediment control components is dependent upon their continued maintenance and repair. These structures are particularly important in locations where upgradient areas are not fully stabilized and may be subject to erosion. As natural deterioration of these barriers occurs, replacement and/or repair efforts must be coordinated by removing the accumulated sediment and extending the barrier laterally, as required.

Extreme weather conditions can serve to highlight the need for a vigorous maintenance program as well as a need to fine-tune and improve upon the system's design. The following section outlines a recommended plan for long term maintenance and immediate repair and improvement of the sediment controls.

The performance of the proposed maintenance program shall include the following responsibilities and authorities:

During Construction

The erosion control barrier consisting of silt socks filled with compost installed along the down-gradient side of all construction shall be inspected frequently by the contractor. Should there be indications of damage or deterioration of these devices, they shall be removed and replaced immediately.

Supplemental silt socks or haybale check dams shall be placed around installed catch basins. These will discourage the transmission of sediments into stormwater controls while vegetation is being established. Any accumulated sediments within these controls shall be removed.

In order for the contractor to respond to the performance requirements outlined above, the contractor shall be required to maintain an ample supply of silt socks or haybales for emergency stabilization and repair work. The implementation of the recommended repair work and maintenance program will improve the long-term effectiveness of the stormwater control structures.

Routine System Maintenance

After the completion of construction, the roadways and stormwater management system shall be inspected and maintained by the applicant until the Town accepts responsibility for the roadways. Bi-annual inspections shall be conducted on the catch basins, drainage manholes and stormwater treatment unit. Accumulated sediment shall be removed from the catch basins in accordance with Weymouth Department of Public Works biannual maintenance schedule, if accumulated sediment meets or exceeds a sump depth of 2-feet, or if accumulated sediment affects the performance of the stormwater management system. Accumulated sediment shall be removed from the stormwater treatment unit in accordance with the manufacturer's guidelines. Disposal of the accumulated sediment must be in accordance with applicable local, state and federal guidelines and regulations.

Sweeping of the pavement shall be conducted in accordance with Weymouth Department of Public Works biannual maintenance schedule, unless more frequent sweeping is required. This will further limit sediment accumulation in the stormwater control structures.