STORMWATER REPORT TO ACCOMPANY SITE PLAN REVIEW APPLICATION TOWN OF HINGHAM PLANNING BOARD

Proposed Parking Lot Extension and New Visitors Center

World's End Hingham, Massachusetts

APPLICANT:
The Trustees of Reservations
572 Essex Street
Beverly, MA 01915

SUBMITTED TO:
Town of Hingham
Planning Board
210 Central Street
Hingham, MA 02043

PREPARED BY:
Cavanaro Consulting, Inc.
687 Main Street
Norwell, MA 02061

CAVANARO CONSULTING

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SECTION I

STORMWATER REPORT

PROJECT NARRATIVE

EXISTING AND PROPOSED CONDITIONS

World's End is a large tract of land used for recreational purposes that is owned by the Trustess of Reservations. World's End is located in a peninsula abutting Hingham Harbor in the west and the Weir River to the north and east. On the land side, World's End abuts a residential area to the south. There is only one means of access to World's end which is located at the southwest most end of the property on Martin's Lane. The access driveway to World's end at Martin's Lane is approximately 12' which is meant to accommodate only one way traffic. The parking facilities are located immediately north and west of the entrance and consist of four (4) segmented gravel parking areas connected by gravel driveways. The parking facilities are separated from the remaining of the property by Damde Meadows, a tidal marsh that is hydraulically connected to both the Weir River and Hingham Harbor. Gravel paths connect the different parking areas to the bridge that leads to the remaining of the property. The topography of the parking facilities and immediate surrounding area slopes toward Hingham Harbor in the west, Damde Meadows to the north and the Weir River to the east. There are two drainage ditches that collect stormwater runoff from portions of the parking areas and direct runoff toward Damde Meadows and the Weir River respectively.

The Trustees of Reservations would like to expand their parking facilities in order to better accommodate existing parking demand as well as to provide sufficient parking for future demand. They are proposing to widen the entrance to 22' in order to accommodate two way traffic and construct a visitors center. The parking areas and driveways will continue having a gravel surface. Topography will continue flowing toward Hingham Harbor, Damde Meadows and the Weir River and drainage will continue flowing over ground toward these water areas. The two existing ditches will continue being used to convey runoff from portions of the parking facilities toward Damde Meadows and the Weir River. Rip rap is proposed upstream of the existing ditches in order to diffuse and cleanse runoff prior to entering Damde Meadows and the Weir River. A stone trench and native planting area are proposed upstream of Hingham Harbor to provide treatment from parking flow.

The proposed project will conform to the Stormwater Standards as follows:

Standard 1: No New Stormwater Conveyances of Untreated Stormwater or Erosion Offsite

The proposed improvements will introduce stormwater treatment that does not presently exist in the form of riprap upstream of the ditches, a trench and native planting area and the implementation of a stormwater Operation and Maintenance Plan. During construction, a silt fence and silt sock system will provide erosion control .

Standard 2: Peak Rate Attenuation

Because the Flood Plain associated with the site constitutes LSCSF, peak flow control is not critical at the site.

Standard 3: Recharge and Discharge Volume

The applicants are proposing to provide infiltration through the installation of an infiltration system. The required recharge volume will be infiltrated as follows:

Existing Impervious Area = 101 ft^2 (not including ledge)

Proposed Impervious Area = 2023 ft^2

New impervious = 2023-101 = 1922 ft^2

C-Soils require 0.25 inches of stormwater recharge per new impervious area.
(0.25”/12”per ft)(1922 ft^2) = 40 ft^3

The void capacity of the infiltration trench upstream of Hingham Harbor alone is 41 CF. Therefore this requirement is met.

Discharge volume is not critical at the site due to its coastal nature.

Standard 4: Water Quality

No new pavement is proposed within the site. The only impervious areas are roof areas for the new visitor center (1,886± SF footprint), the existing gatehouse and a small 36 SF gatehouse behind the far (west) parking area. The applicant is coordinating matching the width of Martin’s Lane to the width of the new access driveway at World’s End. The increase in pavement in the street layout is expected to be minimal if the Town decides to use pavement to match the widths (approximately 280 SF). The implementation of a Long Term Operation and Maintenance Plan will further improve water quality in the long term.

Standard 5: Land Uses with Higher Pollutant Loads (LUHPPLs)

The current recreational use is not proposed to change as part of this project. The existing recreational use does not constitute a higher potential pollutant load use. Thus Standard 5 does not pertain to this project.

Standard 6: Critical Areas

The Weir River west of the locus site and associated Damde Meadows are shown as part of the Weir River ACEC in MassGIS. However, since the project does not propose any new impervious vehicular areas, no additional treatment is required to comply with Standard 6.

Standard 7: Redevelopment

Portions of the project are considered redevelopment.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

The Operation and Maintenance Plan included with this submittal will ensure proper maintenance of the proposed pollution, erosion and sedimentation measures proposed during construction.

Standard 9: Long Term Operation and Maintenance Plan

The Long Term Operation and Maintenance Plan is included within the Operation and Maintenance Plan enclosed in this submittal to ensure drainage non-structural BMP’s are maintained as intended.

Standard 10: Prohibition of Illicit Discharges

Routine visual inspections are scheduled as part of the Operations and Maintenance Plan to prevent illicit discharges into the stormwater system. Furthermore, an Illicit Compliance Statement is included in this submittal.

SECTION II

CONSTRUCTION PERIOD AND LONG TERM POLLUTION PREVENTION AND EROSION AND SEDIMENTATION CONTROL

ILLICIT DISCHARGE STATEMENT

Construction Period and Long Term Pollution Prevention and Erosion and Sedimentation Control Plan

Proposed Parking Lot Extension and New Visitors Center
World's End
Stormwater Management System's Owner: Trustees of Reservations
System Owner's Address: 572 Essex Street, Beverly, MA 01915
Party responsible for Operations and Maintenance: Owners of World's End

It is most important for a drainage system to be maintained in order for it to work properly. The following is an Operation and Maintenance plan to upkeep the existing non-structural and structural best performance practices as outlined in the Massachusetts Department of Environmental Protection's Stormwater Management Policy.

Operation and Maintenance Plan and Construction Sequencing during Construction:

1) Sediment and Erosion Control

Prior to any construction or disturbance, all proposed erosion and sediment control shall be installed.

A silt fence and silt sock as indicated in the approved plans shall be installed along a section of the proposed work.

Sedimentation control maintenance:

- Siltation fences/socks shall be inspected at least once a week and after each rainfall event. Make any required repairs immediately. Repair scoured areas on the back side of fence at this time to prevent future problems.

- Should the fabric of the silt fence/sock collapse, tear, decompose or otherwise become ineffective, replace it within 24 hours of discovery.

- Remove silt deposits once they reach 30 percent of the height of the fence to provide adequate storage volume for the next rain event and to reduce pressure on the fence. Care should be taken to avoid undermining the fence during cleanout process.

- Silt fences/socks are to be removed upon stabilization of the contributing drainage area. Accumulated sediment may be spread to form a surface for turf or other vegetation establishment, or disposed of elsewhere. The area should be reshaped to permit natural drainage.

2) Infiltration Trench

All infiltration areas shall be excavated and installed after the construction of the foundation. No heavy equipment shall traverse the proposed infiltration areas after installation.

Per MA DEP Stormwater Guidelines the following work shall be done to stabilize the site prior to installing the subsurface structures:

- Do not allow runoff from any disturbed areas on the site to flow to the subsurface structures.
- Rope off the area where the subsurface structures are to be placed.
- Accomplish any required excavation with equipment placed just outside the area. If the size of the area intended for exfiltration is too large to accommodate this approach, use trucks with low-pressure tires to minimize compaction. Do not allow any other vehicles within the area to be excavated.
- Keep the area above and immediately surrounding the subsurface system roped off to all construction vehicles until the final top surface is installed.
- At no time shall the area for the infiltration system be used as a temporary sediment basin. Stockpiles shall be placed away from the subsurface infiltration system and sedimentation fences shall be placed around the perimeter of the infiltration area to prevent the accumulation of sediment within the native soils.

3) Upon completion of construction and permanent stabilization of all disturbed areas the erosion and sediment control may be removed.

Operation and Maintenance Plan After Construction:

Roof Drain Cleaning:

All roof drains shall be cleaned and inspected in late winter or early spring after the snow melts. Inspections should include the gutters, downspouts and all accessible piping.

Infiltration Trench:

Inspect trenches at least twice a year. Remove any debris or sediment that may be clogging the system.

Estimated Operation and Maintenance Budget:

Maintenance cost will be approximately $1,000.00 per year.

Ilicit Discharges:

At no time will the owner or any other individual utilize the stormwater management system for any purpose other than its intended use. The stormwater management system as shown on the attached site plan at no time shall receive discharges other than stormwater, this includes "wastewater discharges and discharges of stormwater contaminated by contact with process wastes, raw materials, raw materials, toxic pollutants, hazardous substances, oil or grease."

TO BE SIGNED PRIOR TO APPROVAL	TO BE SIGNED PRIOR TO APPROVAL
_____	_____
Property Owner (Signature)	Property Owner (Print)

SECTION III

FIGURES

USGS PLAN-WORLD'S END

DRAWING NO.

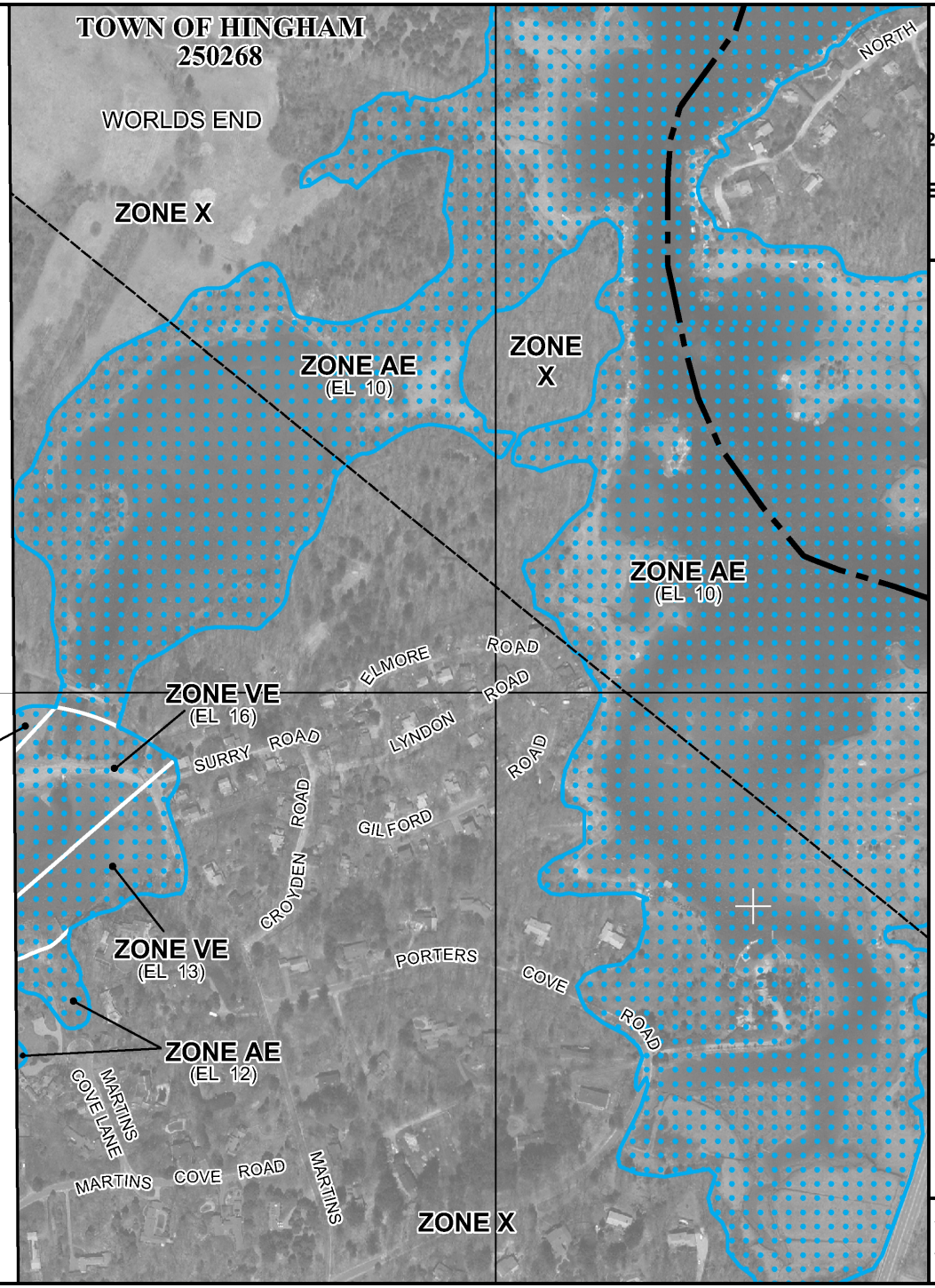
CAVANARO CONSULTING
687 MAIN STREET
P.O. BOX 5175
NORWELL, MASSACHUSETTS 02061
PHONE: 781.659.8187
FAX: 781.659.8186

PREPARED FOR:
TRUSTEES OF RESERVATIONS
572 ESSEX STREET
BEVERLY, MA 01915

PROJECT NO. : 16026
DATE : 9/23/16
DRAWN BY : CCH
CHECKED BY : JCC

USGS

SHEET NO. 1 OF 1
FILENAME:
X:\PR\2016\16094\DWG\9-21-16/LOC



MAP SCALE 1" = 500'

250 0 500 1000

FEET

METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0038J

FIRM

FLOOD INSURANCE RATE MAP

PLYMOUTH COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

PANEL 38 OF 650

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
HINGHAM, TOWN OF	250268	0038	J
HULL, TOWN OF	250269	0038	J

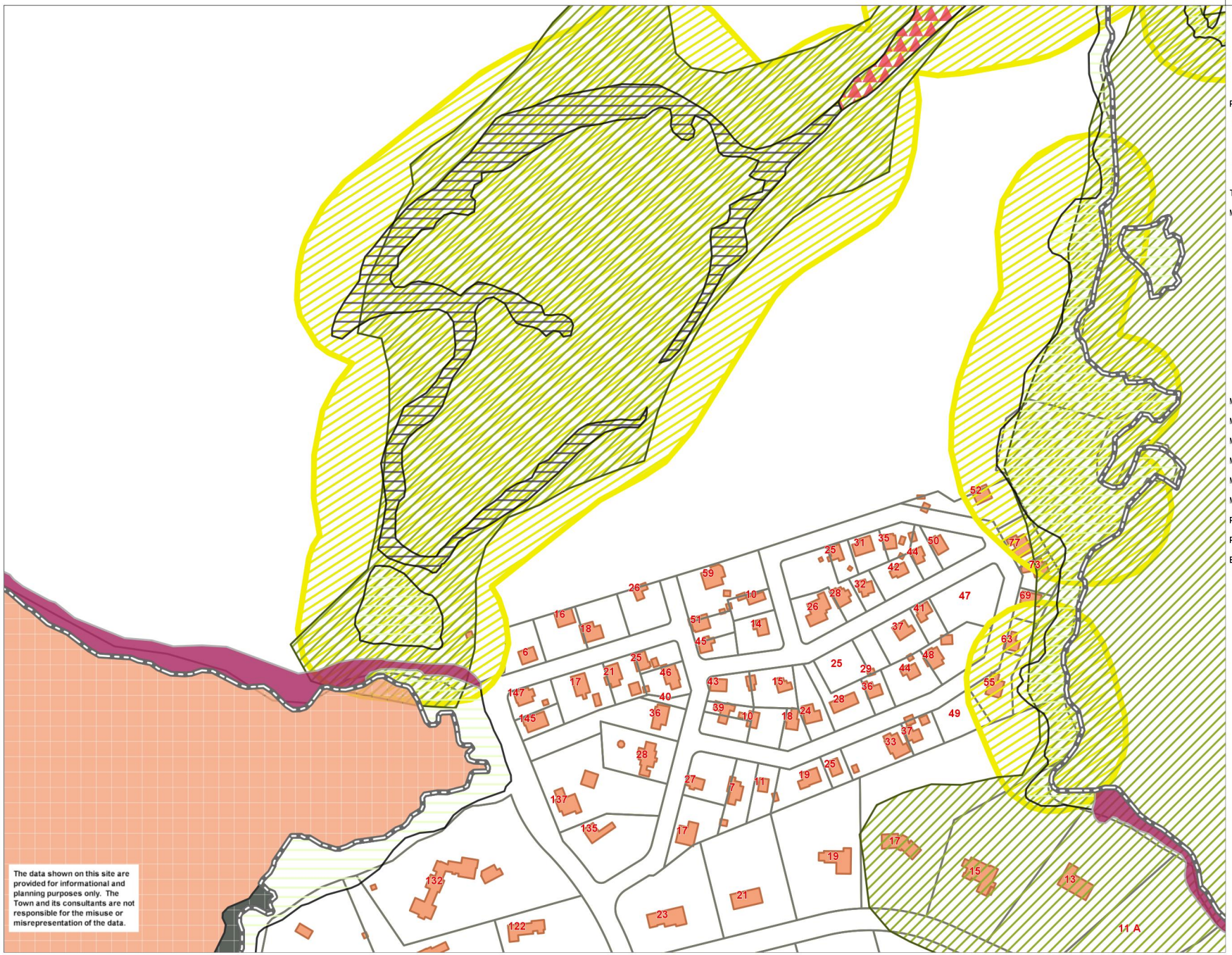
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
25023C0038J

EFFECTIVE DATE
JULY 17, 2012

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



0 400 800 ft

Printed on 07/14/2016 at 11:08 AM

Hingham MapsOnline

SECTION IV

DRAINAGE CALCULATIONS & SUPPLEMENTAL DRAINAGE INFORMATION

1.0 METHODOLOGY

The adequacy of the proposed drainage structures and their ability to function properly were analyzed to minimize detrimental effects due to stormwater conditions. The impacts of storm water are mitigated through several mechanisms such as infiltration, transportation and evaporation. The remaining runoff was quantified through developed and accepted methods. By determining the characteristics of site specific stormwater conditions, mitigating efforts have been taken to avoid floodwater damage by constructing control devices. Design and analysis of these facilities included the evaluation of site data through observations, computer modeling of the watershed, and the interpretation and application of the calculated values.

2.0 OVERVIEW

Cavanaro Consulting, Inc. (CC) has analyzed the existing conditions at the site utilizing the HydroCad Storm water modeling program. Storm rainfall, run-off curve numbers, and other site characteristics are input into the program. The results of calculations are output into tables and graphs for each area and control structure.

3.0 DESIGN STORMS

CC has computed storm water run-off calculations for the proposed site, for a 2, 10 and 100 year, 24-hour extreme storm events (Cornell Numbers). This results in 3.4", 5.1" and 9.0" rain events respectively.

4.0 DRAINAGE ANALYSIS

The following is the summary of the HydroCAD analysis:

To Hingham Harbor

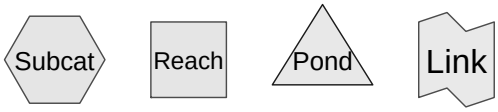
Storm	Existing Conditions	Post-development Conditions
2–Year-24Hour (3.4")	1.70 cfs 0.12 af	1.81 cfs 0.13 af
10–Year-24Hour (5.1")	3.33 cfs 0.24 af	3.53 cfs 0.25 af
100–Year-24Hour (9.0")	7.34 cfs 0.53 af	7.78 cfs 0.56 af

To Damde Meadows

Storm	Existing Conditions	Post-development Conditions
2–Year-24Hour (3.4")	5.83 cfs 0.42 af	7.46 cfs 0.54 af
10–Year-24Hour (5.1")	12.0 cfs 0.85 af	14.68 cfs 1.04 af
100–Year-24Hour (9.0")	27.57 cfs 1.97 af	32.50 cfs 2.34 af

To Weir River

Storm	Existing Conditions	Post-development Conditions
2–Year-24Hour (3.4")	2.23 cfs 0.16 af	1.33 cfs 0.10 af
10–Year-24Hour (5.1")	4.53 cfs 0.32 af	2.70 cfs 0.19 af
100–Year-24Hour (9.0")	10.29 cfs 0.74 af	6.13 cfs 0.44 af



Routing Diagram for WORLDS END- Cornell numbers
Prepared by Microsoft, Printed 9/23/2016
HydroCAD® 10.00 s/n 01769 © 2013 HydroCAD Software Solutions LLC

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: EXISTING DCP1 Runoff Area=42,873 sf 1.78% Impervious Runoff Depth=1.49"
Tc=5.0 min CN=79 Runoff=1.70 cfs 0.12 af

Subcatchment 2S: EXISTING DCP2 Runoff Area=48,802 sf 0.00% Impervious Runoff Depth=1.17"
Tc=5.0 min CN=74 Runoff=1.48 cfs 0.11 af

Subcatchment 3S: EXISTING DCP3 Runoff Area=63,506 sf 12.35% Impervious Runoff Depth=1.49"
Tc=5.0 min CN=79 Runoff=2.53 cfs 0.18 af

Subcatchment 4S: EXISTING DCP4 Runoff Area=56,672 sf 15.30% Impervious Runoff Depth=1.23"
Tc=5.0 min CN=75 Runoff=1.83 cfs 0.13 af

Subcatchment 5S: EXISTING DCP5 Runoff Area=62,125 sf 11.28% Impervious Runoff Depth=1.36"
Tc=5.0 min CN=77 Runoff=2.23 cfs 0.16 af

Subcatchment 8S: PROPOSED DCP1 Runoff Area=45,454 sf 2.29% Impervious Runoff Depth=1.49"
Tc=5.0 min CN=79 Runoff=1.81 cfs 0.13 af

Subcatchment 9S: PROPOSED DCP2 Runoff Area=46,522 sf 4.05% Impervious Runoff Depth=1.17"
Tc=5.0 min CN=74 Runoff=1.41 cfs 0.10 af

Subcatchment 10S: PROPOSED DCP3 Runoff Area=61,432 sf 12.66% Impervious Runoff Depth=1.56"
Tc=5.0 min CN=80 Runoff=2.56 cfs 0.18 af

Subcatchment 11S: PROPOSED DCP4 Runoff Area=83,552 sf 14.61% Impervious Runoff Depth=1.56"
Tc=5.0 min CN=80 Runoff=3.49 cfs 0.25 af

Subcatchment 12S: PROPOSED DCP5 Runoff Area=37,018 sf 9.61% Impervious Runoff Depth=1.36"
Tc=5.0 min CN=77 Runoff=1.33 cfs 0.10 af

Reach 1R: HINGHAM HARBOR Inflow=1.70 cfs 0.12 af
Outflow=1.70 cfs 0.12 af

Reach 2R: DAMDE MEADOWS Inflow=5.83 cfs 0.42 af
Outflow=5.83 cfs 0.42 af

Reach 3R: WEIR RIVER WATERSHED Inflow=2.23 cfs 0.16 af
Outflow=2.23 cfs 0.16 af

Reach 13R: HINGHAM HARBOR Inflow=1.81 cfs 0.13 af
Outflow=1.81 cfs 0.13 af

Reach 14R: DAMDE MEADOWS Inflow=7.46 cfs 0.54 af
Outflow=7.46 cfs 0.54 af

Reach 15R: WEIR RIVER WATERSHED Inflow=1.33 cfs 0.10 af
Outflow=1.33 cfs 0.10 af

Total Runoff Area = 12.579 ac Runoff Volume = 1.47 af Average Runoff Depth = 1.40"
90.74% Pervious = 11.414 ac 9.26% Impervious = 1.165 ac

Summary for Subcatchment 1S: EXISTING DCP1

Runoff = 1.70 cfs @ 12.08 hrs, Volume= 0.12 af, Depth= 1.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Event Rainfall=3.40"

Area (sf)	CN	Description
101	98	Roofs, HSG C
662	98	Paved parking, HSG C
350	89	Gravel roads, HSG C
9,105	89	Gravel roads, HSG C
22,645	77	Woods, Poor, HSG C
5,433	70	Woods, Good, HSG C
4,577	74	>75% Grass cover, Good, HSG C
42,873	79	Weighted Average
42,110		98.22% Pervious Area
763		1.78% Impervious Area

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

Summary for Subcatchment 2S: EXISTING DCP2

Runoff = 1.48 cfs @ 12.09 hrs, Volume= 0.11 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Event Rainfall=3.40"

	Area (sf)	CN	Description
	7,871	77	Woods, Poor, HSG C
	38,297	72	Woods/grass comb., Good, HSG C
*	2,634	86	GRAVEL PATH
	48,802	74	Weighted Average
	48,802		100.00% Pervious Area

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

Summary for Subcatchment 3S: EXISTING DCP3

Runoff = 2.53 cfs @ 12.08 hrs, Volume= 0.18 af, Depth= 1.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Event Rainfall=3.40"

	Area (sf)	CN	Description
	5,850	77	Woods, Poor, HSG C
	32,036	70	Woods, Good, HSG C
	15,859	89	Gravel roads, HSG C
*	1,917	86	GRAVEL PATH
*	7,844	98	LEDGE
	63,506	79	Weighted Average
	55,662		87.65% Pervious Area
	7,844		12.35% Impervious Area

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

Summary for Subcatchment 4S: EXISTING DCP4

Runoff = 1.83 cfs @ 12.08 hrs, Volume= 0.13 af, Depth= 1.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Event Rainfall=3.40"

	Area (sf)	CN	Description
	45,816	70	Woods, Good, HSG C
	268	89	Gravel roads, HSG C
*	1,916	86	GRAVEL PATH
*	8,672	98	LEDGE
	56,672	75	Weighted Average
	48,000		84.70% Pervious Area
	8,672		15.30% Impervious Area

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

Summary for Subcatchment 5S: EXISTING DCP5

Runoff = 2.23 cfs @ 12.08 hrs, Volume= 0.16 af, Depth= 1.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Event Rainfall=3.40"

	Area (sf)	CN	Description
	41,717	70	Woods, Good, HSG C
	13,371	89	Gravel roads, HSG C
*	29	86	GRAVEL PATH
*	7,008	98	LEDGE
	62,125	77	Weighted Average
	55,117		88.72% Pervious Area
	7,008		11.28% Impervious Area

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

Summary for Subcatchment 8S: PROPOSED DCP1

Runoff = 1.81 cfs @ 12.08 hrs, Volume= 0.13 af, Depth= 1.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Event Rainfall=3.40"

	Area (sf)	CN	Description
	101	98	Roofs, HSG C
	941	98	Paved parking, HSG C
	132	89	Gravel roads, HSG C
	13,085	89	Gravel roads, HSG C
	15,649	77	Woods, Poor, HSG C
	5,927	70	Woods, Good, HSG C
	4,285	74	>75% Grass cover, Good, HSG C
*	5,209	70	NATIVE PLANTS
*	125	86	GRAVEL PATH
	45,454	79	Weighted Average
	44,412		97.71% Pervious Area
	1,042		2.29% Impervious Area

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

Summary for Subcatchment 9S: PROPOSED DCP2

Runoff = 1.41 cfs @ 12.09 hrs, Volume= 0.10 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Event Rainfall=3.40"

	Area (sf)	CN	Description
	6,018	77	Woods, Poor, HSG C
	36,328	72	Woods/grass comb., Good, HSG C
*	2,290	86	GRAVEL PATH
	1,886	98	Roofs, HSG C
	46,522	74	Weighted Average
	44,636		95.95% Pervious Area
	1,886		4.05% Impervious Area

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

Summary for Subcatchment 10S: PROPOSED DCP3

Runoff = 2.56 cfs @ 12.08 hrs, Volume= 0.18 af, Depth= 1.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Event Rainfall=3.40"

	Area (sf)	CN	Description
	30,636	70	Woods, Good, HSG C
	17,083	89	Gravel roads, HSG C
*	3,103	86	GRAVEL PATH
*	7,778	98	LEDGE
*	2,832	70	NATIVE PLANTS
	61,432	80	Weighted Average
	53,654		87.34% Pervious Area
	7,778		12.66% Impervious Area

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

Summary for Subcatchment 11S: PROPOSED DCP4

Runoff = 3.49 cfs @ 12.08 hrs, Volume= 0.25 af, Depth= 1.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Event Rainfall=3.40"

	Area (sf)	CN	Description
	46,716	70	Woods, Good, HSG C
	21,616	89	Gravel roads, HSG C
*	3,010	86	GRAVEL PATH
*	12,210	98	LEDGE
	83,552	80	Weighted Average
	71,342		85.39% Pervious Area
	12,210		14.61% Impervious Area

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

Summary for Subcatchment 12S: PROPOSED DCP5

Runoff = 1.33 cfs @ 12.08 hrs, Volume= 0.10 af, Depth= 1.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Event Rainfall=3.40"

	Area (sf)	CN	Description
	25,047	70	Woods, Good, HSG C
	7,446	89	Gravel roads, HSG C
	36	98	Roofs, HSG C
*	3,521	98	LEDGE
	968	89	Gravel roads, HSG C
	37,018	77	Weighted Average
	33,461		90.39% Pervious Area
	3,557		9.61% Impervious Area

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

Summary for Reach 1R: HINGHAM HARBOR

Inflow Area = 0.984 ac, 1.78% Impervious, Inflow Depth = 1.49" for 2 Year Event event
Inflow = 1.70 cfs @ 12.08 hrs, Volume= 0.12 af
Outflow = 1.70 cfs @ 12.08 hrs, Volume= 0.12 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach 2R: DAMDE MEADOWS

Inflow Area = 3.879 ac, 9.77% Impervious, Inflow Depth = 1.31" for 2 Year Event event
Inflow = 5.83 cfs @ 12.08 hrs, Volume= 0.42 af
Outflow = 5.83 cfs @ 12.08 hrs, Volume= 0.42 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach 3R: WEIR RIVER WATERSHED

Inflow Area = 1.426 ac, 11.28% Impervious, Inflow Depth = 1.36" for 2 Year Event event
Inflow = 2.23 cfs @ 12.08 hrs, Volume= 0.16 af
Outflow = 2.23 cfs @ 12.08 hrs, Volume= 0.16 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach 13R: HINGHAM HARBOR

Inflow Area = 1.043 ac, 2.29% Impervious, Inflow Depth = 1.49" for 2 Year Event event
Inflow = 1.81 cfs @ 12.08 hrs, Volume= 0.13 af
Outflow = 1.81 cfs @ 12.08 hrs, Volume= 0.13 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach 14R: DAMDE MEADOWS

Inflow Area = 4.396 ac, 11.42% Impervious, Inflow Depth = 1.46" for 2 Year Event event
Inflow = 7.46 cfs @ 12.08 hrs, Volume= 0.54 af
Outflow = 7.46 cfs @ 12.08 hrs, Volume= 0.54 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach 15R: WEIR RIVER WATERSHED

Inflow Area = 0.850 ac, 9.61% Impervious, Inflow Depth = 1.36" for 2 Year Event event
Inflow = 1.33 cfs @ 12.08 hrs, Volume= 0.10 af
Outflow = 1.33 cfs @ 12.08 hrs, Volume= 0.10 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: EXISTING DCP1 Runoff Area=42,873 sf 1.78% Impervious Runoff Depth=2.89"
Tc=5.0 min CN=79 Runoff=3.33 cfs 0.24 af

Subcatchment 2S: EXISTING DCP2 Runoff Area=48,802 sf 0.00% Impervious Runoff Depth=2.44"
Tc=5.0 min CN=74 Runoff=3.20 cfs 0.23 af

Subcatchment 3S: EXISTING DCP3 Runoff Area=63,506 sf 12.35% Impervious Runoff Depth=2.89"
Tc=5.0 min CN=79 Runoff=4.94 cfs 0.35 af

Subcatchment 4S: EXISTING DCP4 Runoff Area=56,672 sf 15.30% Impervious Runoff Depth=2.53"
Tc=5.0 min CN=75 Runoff=3.86 cfs 0.27 af

Subcatchment 5S: EXISTING DCP5 Runoff Area=62,125 sf 11.28% Impervious Runoff Depth=2.71"
Tc=5.0 min CN=77 Runoff=4.53 cfs 0.32 af

Subcatchment 8S: PROPOSED DCP1 Runoff Area=45,454 sf 2.29% Impervious Runoff Depth=2.89"
Tc=5.0 min CN=79 Runoff=3.53 cfs 0.25 af

Subcatchment 9S: PROPOSED DCP2 Runoff Area=46,522 sf 4.05% Impervious Runoff Depth=2.44"
Tc=5.0 min CN=74 Runoff=3.05 cfs 0.22 af

Subcatchment 10S: PROPOSED DCP3 Runoff Area=61,432 sf 12.66% Impervious Runoff Depth=2.98"
Tc=5.0 min CN=80 Runoff=4.93 cfs 0.35 af

Subcatchment 11S: PROPOSED DCP4 Runoff Area=83,552 sf 14.61% Impervious Runoff Depth=2.98"
Tc=5.0 min CN=80 Runoff=6.70 cfs 0.48 af

Subcatchment 12S: PROPOSED DCP5 Runoff Area=37,018 sf 9.61% Impervious Runoff Depth=2.71"
Tc=5.0 min CN=77 Runoff=2.70 cfs 0.19 af

Reach 1R: HINGHAM HARBOR Inflow=3.33 cfs 0.24 af
Outflow=3.33 cfs 0.24 af

Reach 2R: DAMDE MEADOWS Inflow=12.00 cfs 0.85 af
Outflow=12.00 cfs 0.85 af

Reach 3R: WEIR RIVER WATERSHED Inflow=4.53 cfs 0.32 af
Outflow=4.53 cfs 0.32 af

Reach 13R: HINGHAM HARBOR Inflow=3.53 cfs 0.25 af
Outflow=3.53 cfs 0.25 af

Reach 14R: DAMDE MEADOWS Inflow=14.68 cfs 1.04 af
Outflow=14.68 cfs 1.04 af

Reach 15R: WEIR RIVER WATERSHED Inflow=2.70 cfs 0.19 af
Outflow=2.70 cfs 0.19 af

Total Runoff Area = 12.579 ac Runoff Volume = 2.90 af Average Runoff Depth = 2.77"
90.74% Pervious = 11.414 ac 9.26% Impervious = 1.165 ac

Summary for Subcatchment 1S: EXISTING DCP1

Runoff = 3.33 cfs @ 12.08 hrs, Volume= 0.24 af, Depth= 2.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Event Rainfall=5.10"

Area (sf)	CN	Description
101	98	Roofs, HSG C
662	98	Paved parking, HSG C
350	89	Gravel roads, HSG C
9,105	89	Gravel roads, HSG C
22,645	77	Woods, Poor, HSG C
5,433	70	Woods, Good, HSG C
4,577	74	>75% Grass cover, Good, HSG C
42,873	79	Weighted Average
42,110		98.22% Pervious Area
763		1.78% Impervious Area

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

Summary for Subcatchment 2S: EXISTING DCP2

Runoff = 3.20 cfs @ 12.08 hrs, Volume= 0.23 af, Depth= 2.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Event Rainfall=5.10"

	Area (sf)	CN	Description
	7,871	77	Woods, Poor, HSG C
	38,297	72	Woods/grass comb., Good, HSG C
*	2,634	86	GRAVEL PATH
	48,802	74	Weighted Average
	48,802		100.00% Pervious Area

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

Summary for Subcatchment 3S: EXISTING DCP3

Runoff = 4.94 cfs @ 12.08 hrs, Volume= 0.35 af, Depth= 2.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Event Rainfall=5.10"

	Area (sf)	CN	Description
	5,850	77	Woods, Poor, HSG C
	32,036	70	Woods, Good, HSG C
	15,859	89	Gravel roads, HSG C
*	1,917	86	GRAVEL PATH
*	7,844	98	LEDGE
	63,506	79	Weighted Average
	55,662		87.65% Pervious Area
	7,844		12.35% Impervious Area

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

Summary for Subcatchment 4S: EXISTING DCP4

Runoff = 3.86 cfs @ 12.08 hrs, Volume= 0.27 af, Depth= 2.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Event Rainfall=5.10"

	Area (sf)	CN	Description
	45,816	70	Woods, Good, HSG C
	268	89	Gravel roads, HSG C
*	1,916	86	GRAVEL PATH
*	8,672	98	LEDGE
	56,672	75	Weighted Average
	48,000		84.70% Pervious Area
	8,672		15.30% Impervious Area

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

Summary for Subcatchment 5S: EXISTING DCP5

Runoff = 4.53 cfs @ 12.08 hrs, Volume= 0.32 af, Depth= 2.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Event Rainfall=5.10"

	Area (sf)	CN	Description
	41,717	70	Woods, Good, HSG C
	13,371	89	Gravel roads, HSG C
*	29	86	GRAVEL PATH
*	7,008	98	LEDGE
	62,125	77	Weighted Average
	55,117		88.72% Pervious Area
	7,008		11.28% Impervious Area

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

Summary for Subcatchment 8S: PROPOSED DCP1

Runoff = 3.53 cfs @ 12.08 hrs, Volume= 0.25 af, Depth= 2.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Event Rainfall=5.10"

	Area (sf)	CN	Description
	101	98	Roofs, HSG C
	941	98	Paved parking, HSG C
	132	89	Gravel roads, HSG C
	13,085	89	Gravel roads, HSG C
	15,649	77	Woods, Poor, HSG C
	5,927	70	Woods, Good, HSG C
	4,285	74	>75% Grass cover, Good, HSG C
*	5,209	70	NATIVE PLANTS
*	125	86	GRAVEL PATH
	45,454	79	Weighted Average
	44,412		97.71% Pervious Area
	1,042		2.29% Impervious Area

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

Summary for Subcatchment 9S: PROPOSED DCP2

Runoff = 3.05 cfs @ 12.08 hrs, Volume= 0.22 af, Depth= 2.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Event Rainfall=5.10"

	Area (sf)	CN	Description
	6,018	77	Woods, Poor, HSG C
	36,328	72	Woods/grass comb., Good, HSG C
*	2,290	86	GRAVEL PATH
	1,886	98	Roofs, HSG C
	46,522	74	Weighted Average
	44,636		95.95% Pervious Area
	1,886		4.05% Impervious Area

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

Summary for Subcatchment 10S: PROPOSED DCP3

Runoff = 4.93 cfs @ 12.08 hrs, Volume= 0.35 af, Depth= 2.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Event Rainfall=5.10"

	Area (sf)	CN	Description
	30,636	70	Woods, Good, HSG C
	17,083	89	Gravel roads, HSG C
*	3,103	86	GRAVEL PATH
*	7,778	98	LEDGE
*	2,832	70	NATIVE PLANTS
	61,432	80	Weighted Average
	53,654		87.34% Pervious Area
	7,778		12.66% Impervious Area

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

Summary for Subcatchment 11S: PROPOSED DCP4

Runoff = 6.70 cfs @ 12.08 hrs, Volume= 0.48 af, Depth= 2.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Event Rainfall=5.10"

	Area (sf)	CN	Description
	46,716	70	Woods, Good, HSG C
	21,616	89	Gravel roads, HSG C
*	3,010	86	GRAVEL PATH
*	12,210	98	LEDGE
	83,552	80	Weighted Average
	71,342		85.39% Pervious Area
	12,210		14.61% Impervious Area

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

Summary for Subcatchment 12S: PROPOSED DCP5

Runoff = 2.70 cfs @ 12.08 hrs, Volume= 0.19 af, Depth= 2.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Event Rainfall=5.10"

	Area (sf)	CN	Description
	25,047	70	Woods, Good, HSG C
	7,446	89	Gravel roads, HSG C
	36	98	Roofs, HSG C
*	3,521	98	LEDGE
	968	89	Gravel roads, HSG C
	37,018	77	Weighted Average
	33,461		90.39% Pervious Area
	3,557		9.61% Impervious Area

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

Summary for Reach 1R: HINGHAM HARBOR

Inflow Area = 0.984 ac, 1.78% Impervious, Inflow Depth = 2.89" for 10 Year Event event
Inflow = 3.33 cfs @ 12.08 hrs, Volume= 0.24 af
Outflow = 3.33 cfs @ 12.08 hrs, Volume= 0.24 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach 2R: DAMDE MEADOWS

Inflow Area = 3.879 ac, 9.77% Impervious, Inflow Depth = 2.64" for 10 Year Event event
Inflow = 12.00 cfs @ 12.08 hrs, Volume= 0.85 af
Outflow = 12.00 cfs @ 12.08 hrs, Volume= 0.85 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach 3R: WEIR RIVER WATERSHED

Inflow Area = 1.426 ac, 11.28% Impervious, Inflow Depth = 2.71" for 10 Year Event event
Inflow = 4.53 cfs @ 12.08 hrs, Volume= 0.32 af
Outflow = 4.53 cfs @ 12.08 hrs, Volume= 0.32 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach 13R: HINGHAM HARBOR

Inflow Area = 1.043 ac, 2.29% Impervious, Inflow Depth = 2.89" for 10 Year Event event
Inflow = 3.53 cfs @ 12.08 hrs, Volume= 0.25 af
Outflow = 3.53 cfs @ 12.08 hrs, Volume= 0.25 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach 14R: DAMDE MEADOWS

Inflow Area = 4.396 ac, 11.42% Impervious, Inflow Depth = 2.85" for 10 Year Event event
Inflow = 14.68 cfs @ 12.08 hrs, Volume= 1.04 af
Outflow = 14.68 cfs @ 12.08 hrs, Volume= 1.04 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach 15R: WEIR RIVER WATERSHED

Inflow Area = 0.850 ac, 9.61% Impervious, Inflow Depth = 2.71" for 10 Year Event event
Inflow = 2.70 cfs @ 12.08 hrs, Volume= 0.19 af
Outflow = 2.70 cfs @ 12.08 hrs, Volume= 0.19 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: EXISTING DCP1 Runoff Area=42,873 sf 1.78% Impervious Runoff Depth=6.45"
Tc=5.0 min CN=79 Runoff=7.34 cfs 0.53 af

Subcatchment 2S: EXISTING DCP2 Runoff Area=48,802 sf 0.00% Impervious Runoff Depth=5.83"
Tc=5.0 min CN=74 Runoff=7.65 cfs 0.54 af

Subcatchment 3S: EXISTING DCP3 Runoff Area=63,506 sf 12.35% Impervious Runoff Depth=6.45"
Tc=5.0 min CN=79 Runoff=10.87 cfs 0.78 af

Subcatchment 4S: EXISTING DCP4 Runoff Area=56,672 sf 15.30% Impervious Runoff Depth=5.95"
Tc=5.0 min CN=75 Runoff=9.05 cfs 0.65 af

Subcatchment 5S: EXISTING DCP5 Runoff Area=62,125 sf 11.28% Impervious Runoff Depth=6.20"
Tc=5.0 min CN=77 Runoff=10.29 cfs 0.74 af

Subcatchment 8S: PROPOSED DCP1 Runoff Area=45,454 sf 2.29% Impervious Runoff Depth=6.45"
Tc=5.0 min CN=79 Runoff=7.78 cfs 0.56 af

Subcatchment 9S: PROPOSED DCP2 Runoff Area=46,522 sf 4.05% Impervious Runoff Depth=5.83"
Tc=5.0 min CN=74 Runoff=7.29 cfs 0.52 af

Subcatchment 10S: PROPOSED DCP3 Runoff Area=61,432 sf 12.66% Impervious Runoff Depth=6.57"
Tc=5.0 min CN=80 Runoff=10.68 cfs 0.77 af

Subcatchment 11S: PROPOSED DCP4 Runoff Area=83,552 sf 14.61% Impervious Runoff Depth=6.57"
Tc=5.0 min CN=80 Runoff=14.53 cfs 1.05 af

Subcatchment 12S: PROPOSED DCP5 Runoff Area=37,018 sf 9.61% Impervious Runoff Depth=6.20"
Tc=5.0 min CN=77 Runoff=6.13 cfs 0.44 af

Reach 1R: HINGHAM HARBOR Inflow=7.34 cfs 0.53 af
Outflow=7.34 cfs 0.53 af

Reach 2R: DAMDE MEADOWS Inflow=27.57 cfs 1.97 af
Outflow=27.57 cfs 1.97 af

Reach 3R: WEIR RIVER WATERSHED Inflow=10.29 cfs 0.74 af
Outflow=10.29 cfs 0.74 af

Reach 13R: HINGHAM HARBOR Inflow=7.78 cfs 0.56 af
Outflow=7.78 cfs 0.56 af

Reach 14R: DAMDE MEADOWS Inflow=32.50 cfs 2.34 af
Outflow=32.50 cfs 2.34 af

Reach 15R: WEIR RIVER WATERSHED Inflow=6.13 cfs 0.44 af
Outflow=6.13 cfs 0.44 af

Total Runoff Area = 12.579 ac Runoff Volume = 6.58 af Average Runoff Depth = 6.28"
90.74% Pervious = 11.414 ac 9.26% Impervious = 1.165 ac

Summary for Subcatchment 1S: EXISTING DCP1

Runoff = 7.34 cfs @ 12.07 hrs, Volume= 0.53 af, Depth= 6.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Event Rainfall=9.00"

Area (sf)	CN	Description
101	98	Roofs, HSG C
662	98	Paved parking, HSG C
350	89	Gravel roads, HSG C
9,105	89	Gravel roads, HSG C
22,645	77	Woods, Poor, HSG C
5,433	70	Woods, Good, HSG C
4,577	74	>75% Grass cover, Good, HSG C
42,873	79	Weighted Average
42,110		98.22% Pervious Area
763		1.78% Impervious Area

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

Summary for Subcatchment 2S: EXISTING DCP2

Runoff = 7.65 cfs @ 12.07 hrs, Volume= 0.54 af, Depth= 5.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Event Rainfall=9.00"

	Area (sf)	CN	Description
	7,871	77	Woods, Poor, HSG C
	38,297	72	Woods/grass comb., Good, HSG C
*	2,634	86	GRAVEL PATH
	48,802	74	Weighted Average
	48,802		100.00% Pervious Area

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

Summary for Subcatchment 3S: EXISTING DCP3

Runoff = 10.87 cfs @ 12.07 hrs, Volume= 0.78 af, Depth= 6.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Event Rainfall=9.00"

	Area (sf)	CN	Description
	5,850	77	Woods, Poor, HSG C
	32,036	70	Woods, Good, HSG C
	15,859	89	Gravel roads, HSG C
*	1,917	86	GRAVEL PATH
*	7,844	98	LEDGE
	63,506	79	Weighted Average
	55,662		87.65% Pervious Area
	7,844		12.35% Impervious Area

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

Summary for Subcatchment 4S: EXISTING DCP4

Runoff = 9.05 cfs @ 12.07 hrs, Volume= 0.65 af, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Event Rainfall=9.00"

	Area (sf)	CN	Description
	45,816	70	Woods, Good, HSG C
	268	89	Gravel roads, HSG C
*	1,916	86	GRAVEL PATH
*	8,672	98	LEDGE
	56,672	75	Weighted Average
	48,000		84.70% Pervious Area
	8,672		15.30% Impervious Area

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

Summary for Subcatchment 5S: EXISTING DCP5

Runoff = 10.29 cfs @ 12.07 hrs, Volume= 0.74 af, Depth= 6.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Event Rainfall=9.00"

	Area (sf)	CN	Description
	41,717	70	Woods, Good, HSG C
	13,371	89	Gravel roads, HSG C
*	29	86	GRAVEL PATH
*	7,008	98	LEDGE
	62,125	77	Weighted Average
	55,117		88.72% Pervious Area
	7,008		11.28% Impervious Area

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

Summary for Subcatchment 8S: PROPOSED DCP1

Runoff = 7.78 cfs @ 12.07 hrs, Volume= 0.56 af, Depth= 6.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Event Rainfall=9.00"

	Area (sf)	CN	Description
	101	98	Roofs, HSG C
	941	98	Paved parking, HSG C
	132	89	Gravel roads, HSG C
	13,085	89	Gravel roads, HSG C
	15,649	77	Woods, Poor, HSG C
	5,927	70	Woods, Good, HSG C
	4,285	74	>75% Grass cover, Good, HSG C
*	5,209	70	NATIVE PLANTS
*	125	86	GRAVEL PATH
	45,454	79	Weighted Average
	44,412		97.71% Pervious Area
	1,042		2.29% Impervious Area

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

Summary for Subcatchment 9S: PROPOSED DCP2

Runoff = 7.29 cfs @ 12.07 hrs, Volume= 0.52 af, Depth= 5.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Event Rainfall=9.00"

	Area (sf)	CN	Description
	6,018	77	Woods, Poor, HSG C
	36,328	72	Woods/grass comb., Good, HSG C
*	2,290	86	GRAVEL PATH
	1,886	98	Roofs, HSG C
	46,522	74	Weighted Average
	44,636		95.95% Pervious Area
	1,886		4.05% Impervious Area

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

Summary for Subcatchment 10S: PROPOSED DCP3

Runoff = 10.68 cfs @ 12.07 hrs, Volume= 0.77 af, Depth= 6.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Event Rainfall=9.00"

	Area (sf)	CN	Description
	30,636	70	Woods, Good, HSG C
	17,083	89	Gravel roads, HSG C
*	3,103	86	GRAVEL PATH
*	7,778	98	LEDGE
*	2,832	70	NATIVE PLANTS
	61,432	80	Weighted Average
	53,654		87.34% Pervious Area
	7,778		12.66% Impervious Area

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

Summary for Subcatchment 11S: PROPOSED DCP4

Runoff = 14.53 cfs @ 12.07 hrs, Volume= 1.05 af, Depth= 6.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Event Rainfall=9.00"

	Area (sf)	CN	Description
	46,716	70	Woods, Good, HSG C
	21,616	89	Gravel roads, HSG C
*	3,010	86	GRAVEL PATH
*	12,210	98	LEDGE
	83,552	80	Weighted Average
	71,342		85.39% Pervious Area
	12,210		14.61% Impervious Area

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

Summary for Subcatchment 12S: PROPOSED DCP5

Runoff = 6.13 cfs @ 12.07 hrs, Volume= 0.44 af, Depth= 6.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Event Rainfall=9.00"

	Area (sf)	CN	Description
	25,047	70	Woods, Good, HSG C
	7,446	89	Gravel roads, HSG C
	36	98	Roofs, HSG C
*	3,521	98	LEDGE
	968	89	Gravel roads, HSG C
	37,018	77	Weighted Average
	33,461		90.39% Pervious Area
	3,557		9.61% Impervious Area

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

Summary for Reach 1R: HINGHAM HARBOR

Inflow Area = 0.984 ac, 1.78% Impervious, Inflow Depth = 6.45" for 100 Year Event event
Inflow = 7.34 cfs @ 12.07 hrs, Volume= 0.53 af
Outflow = 7.34 cfs @ 12.07 hrs, Volume= 0.53 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach 2R: DAMDE MEADOWS

Inflow Area = 3.879 ac, 9.77% Impervious, Inflow Depth = 6.10" for 100 Year Event event
Inflow = 27.57 cfs @ 12.07 hrs, Volume= 1.97 af
Outflow = 27.57 cfs @ 12.07 hrs, Volume= 1.97 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach 3R: WEIR RIVER WATERSHED

Inflow Area = 1.426 ac, 11.28% Impervious, Inflow Depth = 6.20" for 100 Year Event event
Inflow = 10.29 cfs @ 12.07 hrs, Volume= 0.74 af
Outflow = 10.29 cfs @ 12.07 hrs, Volume= 0.74 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach 13R: HINGHAM HARBOR

Inflow Area = 1.043 ac, 2.29% Impervious, Inflow Depth = 6.45" for 100 Year Event event
Inflow = 7.78 cfs @ 12.07 hrs, Volume= 0.56 af
Outflow = 7.78 cfs @ 12.07 hrs, Volume= 0.56 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach 14R: DAMDE MEADOWS

Inflow Area = 4.396 ac, 11.42% Impervious, Inflow Depth = 6.39" for 100 Year Event event
Inflow = 32.50 cfs @ 12.07 hrs, Volume= 2.34 af
Outflow = 32.50 cfs @ 12.07 hrs, Volume= 2.34 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

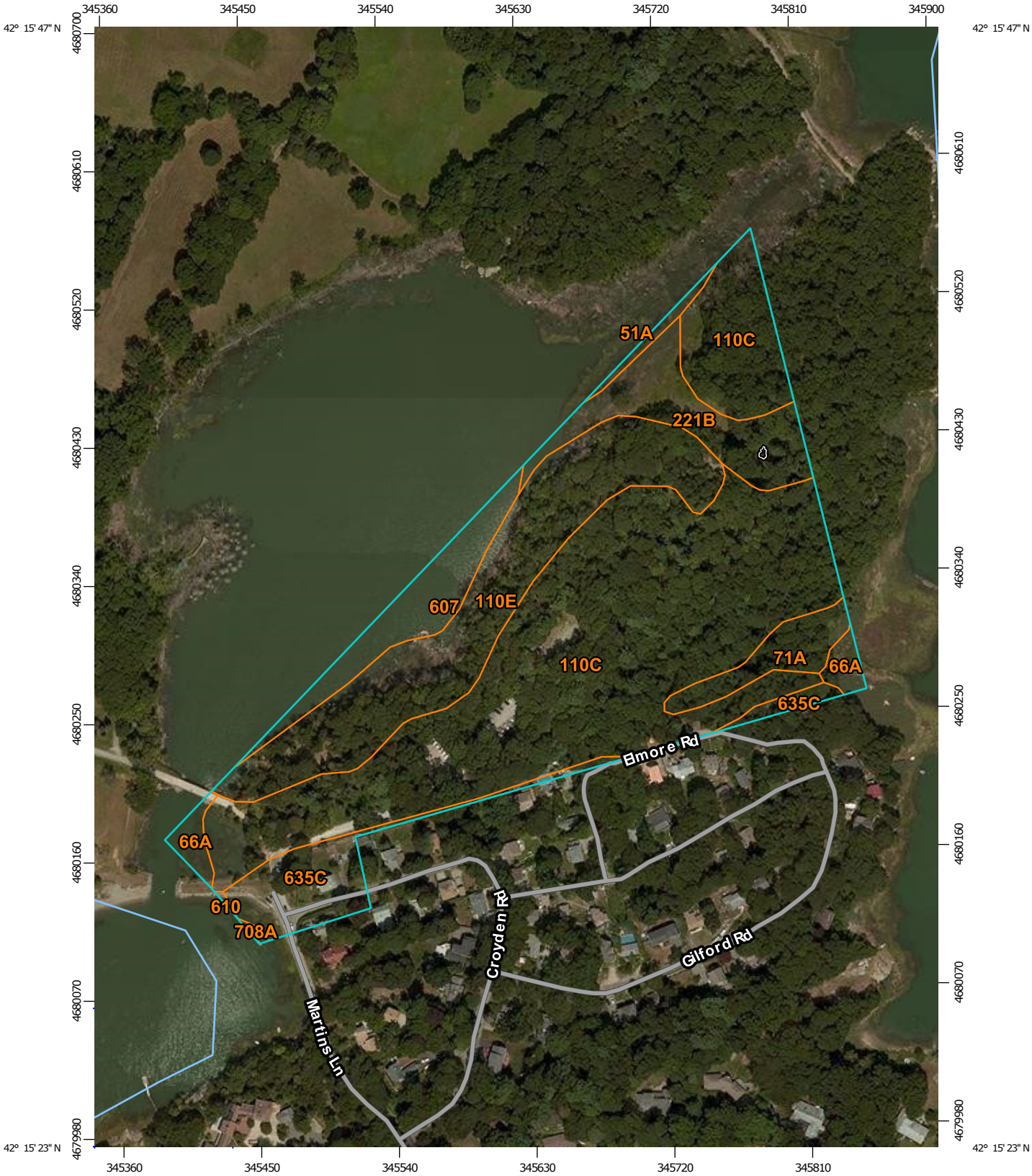
Summary for Reach 15R: WEIR RIVER WATERSHED

Inflow Area = 0.850 ac, 9.61% Impervious, Inflow Depth = 6.20" for 100 Year Event event
Inflow = 6.13 cfs @ 12.07 hrs, Volume= 0.44 af
Outflow = 6.13 cfs @ 12.07 hrs, Volume= 0.44 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

SUPPLEMENTAL INFORMATION

Soil Map—Plymouth County, Massachusetts
(WORLD'S END)



Map Scale: 1:3,550 if printed on A portrait (8.5" x 11") sheet.

N

0 50 100 200 300 Meters

0 150 300 600 900 Feet

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 1:12,000.

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
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: Plymouth County, Massachusetts
Survey Area Data: Version 8, Sep 28, 2015

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

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

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

Map Unit Legend

Plymouth County, Massachusetts (MA023)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
51A	Swansea muck, 0 to 1 percent slopes	0.1	0.6%
66A	Ipswich - Pawcatuck - Matunuck complex, 0 to 2 percent slopes, very frequently flooded	0.4	1.9%
71A	Ridgebury fine sandy loam, 0 to 3 percent slopes, extremely stony	0.7	3.3%
110C	Canton - Chatfield - Rock outcrop complex, 8 to 15 percent slopes	11.4	54.6%
110E	Canton - Chatfield - Rock outcrop complex, 15 to 35 percent slopes	4.2	20.0%
221B	Eldridge fine sandy loam, 3 to 8 percent slopes	1.6	7.4%
607	Water, saline	1.2	5.6%
610	Beaches, sandy	0.0	0.1%
635C	Canton - Urban land - Rock outcrop complex, 3 to 15 percent slopes	1.3	6.4%
708A	Beaches, tidal flats	0.0	0.1%
Totals for Area of Interest		**20.9**	**100.0%**

Plymouth County, Massachusetts

635C—Canton - Urban land - Rock outcrop complex, 3 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9y4x
Elevation: 0 to 400 feet
Mean annual precipitation: 41 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Canton and similar soils: 35 percent
Rock outcrop: 30 percent
Urban land: 25 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton

Setting

Landform: Hills, ridges, till plains
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Coarse-loamy eolian deposits over sandy and gravelly supraglacial meltout till

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
Oe - 1 to 2 inches: moderately decomposed plant material
A - 2 to 3 inches: very fine sandy loam
E - 3 to 4 inches: very fine sandy loam
Bw1 - 4 to 5 inches: very fine sandy loam
Bw2 - 5 to 15 inches: very fine sandy loam
Bw3 - 15 to 24 inches: fine sandy loam
BC - 24 to 28 inches: gravelly loamy sand
2C1 - 28 to 49 inches: gravelly coarse sand
2C2 - 49 to 73 inches: gravelly loamy coarse sand

Properties and qualities

Slope: 3 to 15 percent
Depth to restrictive feature: 20 to 36 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Hydric soil rating: No

Description of Rock Outcrop

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s

Minor Components

Gloucester

Percent of map unit: 5 percent
Landform: Hills, ground moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Udorthents, loamy

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

Data Source Information

Soil Survey Area: Plymouth County, Massachusetts
Survey Area Data: Version 8, Sep 28, 2015

Plymouth County, Massachusetts

110E—Canton - Chatfield - Rock outcrop complex, 15 to 35 percent slopes

Map Unit Setting

National map unit symbol: 9y4t
Elevation: 30 to 400 feet
Mean annual precipitation: 41 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Canton and similar soils: 40 percent
Chatfield 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 Canton

Setting

Landform: Hills, till plains, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy and gravelly supraglacial meltout till derived from granite and/or schist and/or gneiss

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
Oe - 1 to 2 inches: moderately decomposed plant material
A - 2 to 3 inches: very fine sandy loam
E - 3 to 4 inches: very fine sandy loam
Bw1 - 4 to 5 inches: very fine sandy loam
Bw2 - 5 to 15 inches: very fine sandy loam
Bw3 - 15 to 24 inches: fine sandy loam
BC - 24 to 28 inches: gravelly loamy sand
2C1 - 28 to 49 inches: gravelly coarse sand
2C2 - 49 to 73 inches: gravelly loamy coarse sand

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: 20 to 36 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Hydric soil rating: No

Description of Chatfield

Setting

Landform: Hills, ridges, till plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Coarse-loamy supraglacial meltout till derived from granite and/or schist and/or gneiss

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
Oe - 1 to 2 inches: moderately decomposed plant material
Oa - 2 to 3 inches: highly decomposed plant material
A - 3 to 6 inches: very fine sandy loam
Bw1 - 6 to 16 inches: very fine sandy loam
Bw2 - 16 to 28 inches: very fine sandy loam
2R - 28 to 80 inches: bedrock

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: 20 to 39 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Rock Outcrop

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s

Minor Components

Hollis

Percent of map unit: 10 percent
Landform: Hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Newfields

Percent of map unit: 5 percent
Landform: Till plains, hills, moraines
Landform position (two-dimensional): Footslope, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Data Source Information

Soil Survey Area: Plymouth County, Massachusetts
Survey Area Data: Version 8, Sep 28, 2015

Plymouth County, Massachusetts

110C—Canton - Chatfield - Rock outcrop complex, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2myzb
Elevation: 30 to 400 feet
Mean annual precipitation: 41 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Canton and similar soils: 40 percent
Chatfield 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 Canton

Setting

Landform: Hills, ridges, till plains
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Coarse-loamy eolian deposits over sandy and gravelly supraglacial meltout till

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
Oe - 1 to 2 inches: moderately decomposed plant material
A - 2 to 3 inches: very fine sandy loam
E - 3 to 4 inches: very fine sandy loam
Bw1 - 4 to 5 inches: very fine sandy loam
Bw2 - 5 to 15 inches: very fine sandy loam
Bw3 - 15 to 24 inches: fine sandy loam
BC - 24 to 28 inches: gravelly loamy sand
2C1 - 28 to 49 inches: gravelly coarse sand
2C2 - 49 to 73 inches: gravelly loamy coarse sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 36 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Hydric soil rating: No

Description of Chatfield

Setting

Landform: Till plains, hills, ridges
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Coarse-loamy supraglacial meltout till

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
Oe - 1 to 2 inches: moderately decomposed plant material
Oa - 2 to 3 inches: highly decomposed plant material
A - 3 to 6 inches: very fine sandy loam
Bw1 - 6 to 16 inches: very fine sandy loam
Bw2 - 16 to 28 inches: very fine sandy loam
2R - 28 to 80 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 39 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat):
Moderately low to high (0.14 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Rock Outcrop

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s

Minor Components

Newfields

Percent of map unit: 10 percent
Landform: Till plains, hills, moraines
Landform position (two-dimensional): Footslope, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Hollis

Percent of map unit: 5 percent
Landform: Hills, ridges
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Data Source Information

Soil Survey Area: Plymouth County, Massachusetts
Survey Area Data: Version 8, Sep 28, 2015

Plymouth County, Massachusetts

71A—Ridgebury fine sandy loam, 0 to 3 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: bczh
Elevation: 10 to 330 feet
Mean annual precipitation: 41 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Ridgebury, Extremely Stony

Setting

Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-loamy lodgment till

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
Oe - 1 to 3 inches: moderately decomposed plant material
Ap - 3 to 10 inches: fine sandy loam
Bg - 10 to 20 inches: sandy loam
Cd1 - 20 to 32 inches: fine sandy loam
Cd2 - 32 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 3 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 20 to 33 inches to densic material
Natural drainage class: Poorly drained
Runoff class: Medium
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: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Occasional
Available water storage in profile: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Hydric soil rating: Yes

Minor Components

Whitman, extremely stony
Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Woodbridge, very stony
Percent of map unit: 4 percent
Landform: Drumlins, hills, till plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

Scituate, very stony
Percent of map unit: 3 percent
Landform: Ridges, drumlins
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

Norwell, extremely stony
Percent of map unit: 2 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Plymouth County, Massachusetts
Survey Area Data: Version 8, Sep 28, 2015

SECTION V

LOCUS DEED
EASEMENT STATEMENT

Transfer Certificate of Title.

207/85
Doc. 116650
No. 41485

From Certificate No. 10609 , Originally Registered May 21, 1946 , in

Registration Book 53 Page 9 for the Registry District of Plymouth County.

This is to Certify that The Trustees of Reservations, a corporation organized and existing under the laws of the Commonwealth of Massachusetts and having its principal office in

~~of~~ Milton in the County of Norfolk and Commonwealth of Massachusetts,

~~married to~~

is the owner in fee simple,

of that certain parcel of land situate in Hingham,

in the County of Plymouth and said Commonwealth, bounded and described as follows:

Southerly by the end of Martin's Lane and by land of sundry adjoining owners as shown on the plan hereinafter mentioned, measuring on the upland about eighteen hundred forty-seven (1847) feet;
Southwesterly by Hingham Harbor;
Westerly and Northwesterly by Hingham Bay; and
Easterly, Northerly, Westerly and Easterly by Weir River.

All of said boundaries, except the water lines, are determined by the Court to be located as shown on plan #13575A, drawn by Walter B. Foster, C. E., dated January 6, 1927, as modified and approved by the Court, filed in the Land Registration Office, a copy of a portion of which is filed with Certificate of Title No. 4304; and the above described land is shown as Lot A on said plan.

So much of the above described land as by implication of law is included within the limits of said Martin's Lane is subject to the rights of all persons lawfully entitled thereto in and over the same.

Address of Owner: 224 Adams Street, Milton, Mass.

And it is further certified that said land is under the operation and provisions of Chapter 185 of the General Laws, and that the title of said

The Trustees of Reservations

to said land is registered under said Chapter, subject, however, to any of the encumbrances mentioned in Section forty-six of said Chapter, which may be subsisting, and subject also as aforesaid; and to any and all public rights legally existing in and over the same below mean high water mark.

WITNESS, ELWOOD H. HETTRICK, Esquire, Judge of the Land Court, at Plymouth, in said County of Plymouth, the twenty-eighth day of December in the year nineteen hundred and sixty-seven, at 11 o'clock and 55 minutes in the fore-noon.

Attest, with the Seal of said Court,

Richard W. Holm
Assistant Recorder.

Land Court Case No. 13575

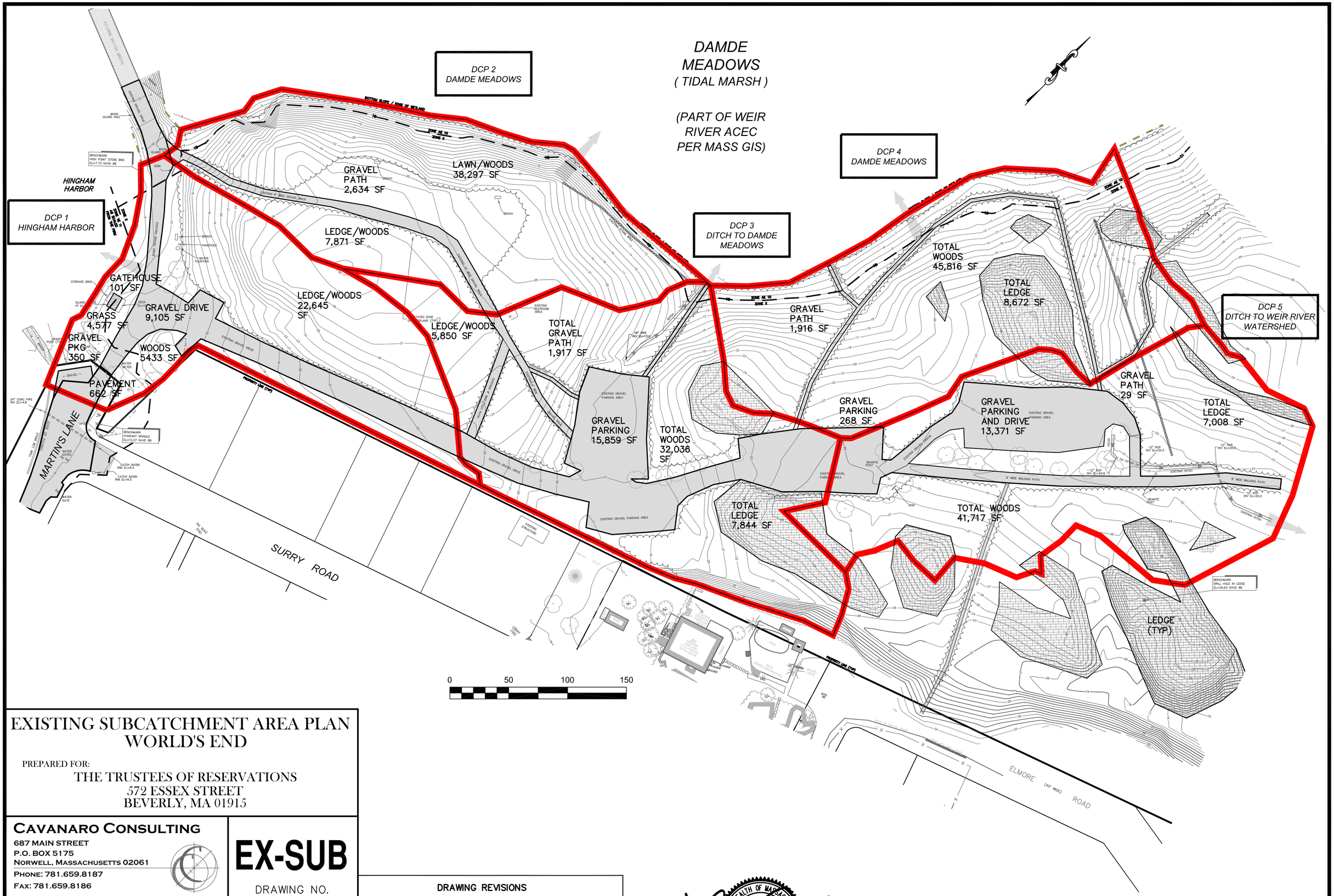
FORM T-1

Easement Statement

There are no known recorded existing or proposed stormwater easements in the area of proposed work.

SECTION VI

PROJECT PLANS
See Attached



EXISTING SUBCATCHMENT AREA PLAN
WORLD'S END

PREPARED FOR:
THE TRUSTEES OF RESERVATIONS
572 ESSEX STREET
BEVERLY, MA 01915

CAVANARO CONSULTING
687 MAIN STREET
P.O. BOX 5175
NORWELL, MASSACHUSETTS 02061
PHONE: 781.659.8187
FAX: 781.659.8186

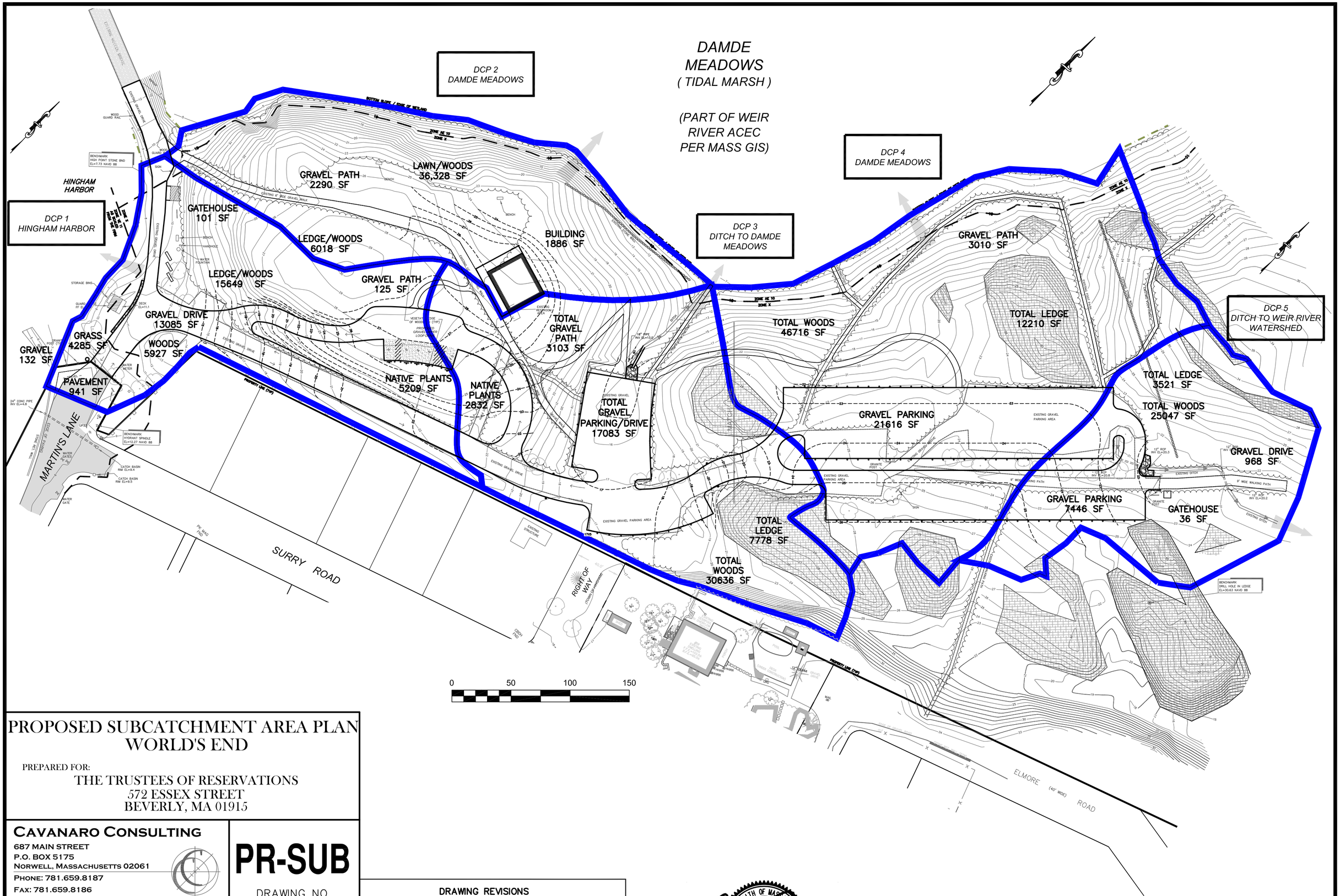
EX-SUB
DRAWING NO.

SCALE : AS SHOWN	DESIGNED BY : CCH	PROJECT NO. : 16.094
DATE : 9/23/16	DRAWN BY : CCH	FILENAME: X:\PR\16094\DWG\SUB 9-3-16.DWG
SURVEY : –	CHECKED BY : JCC	SHEET NO. 1 OF 2

DRAWING REVISIONS

ACTION	DATE	DESCRIPTION

COMMONWEALTH OF MASSACHUSETTS
JOHN C. CAVANARO
CIVIL
No. 39770
REGISTERED PROFESSIONAL ENGINEER



PROPOSED SUBCATCHMENT AREA PLAN
WORLD'S END

PREPARED FOR:
THE TRUSTEES OF RESERVATIONS
572 ESSEX STREET
BEVERLY, MA 01915

CAVANARO CONSULTING
687 MAIN STREET
P.O. BOX 5175
NORWELL, MASSACHUSETTS 02061
PHONE: 781.659.8187
FAX: 781.659.8186

PR-SUB
DRAWING NO.

SCALE : AS SHOWN	DESIGNED BY : CCH	PROJECT NO. : 16.094
DATE : 9/23/16	DRAWN BY : CCH	FILENAME: X:\PR\16094\DWG\SUB 9-3-16.DWG
SURVEY : –	CHECKED BY : JCC	SHEET NO. 1 OF 2

DRAWING REVISIONS

ACTION	DATE	DESCRIPTION

COMMONWEALTH OF MASSACHUSETTS
JOHN C. CAVANARO
CIVIL
No. 39770
REGISTERED PROFESSIONAL ENGINEER