

February 26th, 2025

Stormwater Report
Submitted To: Town of Hingham

311 Rockland Street & 210 Hull Street, Hingham MA

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SECTION I

STORMWATER REPORT

Existing and Proposed Conditions

Gerry Rankin (Rankin Residential) of the 210 Hull Street LLC is requesting permission to construct two single family dwellings and a common driveway at 311 Rockland Street and 210 Hull Street. The common portions of the proposed driveway will be gravel but will connect to paved private parking areas. The proposed work will reduce the overall impervious area on site by approximately 3,042 SF and the total disturbance area, including regraded lawn, will be approximately 55,000 SF. The site contains Land Subject to Coastal Storm Flowage and Riverfront.

The entire work area is being considered for analysis, which is approximately 83,951 SF. The properties are bounded by abutting single family residences to the north/south, Rockland Street to the west, and Hull Street to the east. 210 Hull Street currently contains a single family home, paved driveway, garage, and hardscaping / landscaping. 311 Rockland Street is undeveloped. The topography in the work area slopes towards Rockland Street Abutters, Hull Street Abutters, and Hull Street.

NRCS Soil Survey online data identifies the soils in the area of work as Chatfield-Rock outcrop-Canton complex, 8 to 15 percent slopes, very stony (B soils). Test pits done on site also indicated B Soils. Therefore, B soils were used for modeling purposes.

Three subcatchment areas were considered for the stormwater analysis. The HydroCAD results and subcatchment areas are provided in Section IV of this report.

The proposed project complies with the Stormwater Management as follows:

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

The proposed changes to the lot will introduce new stormwater treatment and will improve the quality of the existing stormwater drainage. An 83,951 SF area was considered for stormwater analysis, which includes all proposed areas of disturbance to understand drainage patterns. All the existing and proposed runoff flows towards Hull Street, Hull Street abutters, and Rockland Street Abutters; however, flow rates will be improved with the proposed work. Portions of the proposed dwellings, driveways, and lawn areas will be captured and sent to infiltration basins. These proposed stormwater controls will ensure that peak flows and volumes are reduced or matched for the 2-, 10-, and 100-year design storms.

Standard 2: Peak Rate Attenuation

The overall peak rate and volume of runoff is reduced or matched for all design storm events in the proposed design. This data is summarized below, and the HydroCAD report can be found in section IV.

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.

2.0 OVERVIEW

Merrill inc. has analyzed the existing conditions at the site utilizing the HydroCad Stormwater 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

Stormwater run-off calculations have been computed for the proposed site, for a 2, 10 and 100 year, 24-hour event. The intensity of these rain events is 3.20", 4.65" and 6.80" respectively.

4.0 DRAINAGE ANALYSIS

The following is the summary of the HydroCAD analysis:

Subcatchment 1 – Rockland Abutters

Storm	Existing Conditions (cfs, af)	Post-Development Conditions (cfs, af)
2-Year-24 Hour (3.2")	0.66 cfs, 0.055 af	0.31 cfs, 0.025 af
10-Year-24 Hour (4.65")	1.78 cfs, 0.129 af	0.80 cfs, 0.074 af
100-Year-24 Hour (6.80")	3.80 cfs, 0.263 af	2.69 cfs, 0.214 af

Subcatchment 2 – Hull Abutters

Storm	Existing Conditions (cfs, af)	Post-Development Conditions (cfs, af)
2-Year-24 Hour (3.2")	0.49 cfs, 0.037 af	0.35 cfs, 0.027 af
10-Year-24 Hour (4.65")	1.14 cfs, 0.080 af	0.82 cfs, 0.058 af
100-Year-24 Hour (6.80")	2.27 cfs, 0.156 af	1.63 cfs, 0.112 af

Subcatchment 3 – Hull Street

Storm	Existing Conditions (cfs, af)	Post-Development Conditions (cfs, af)
2-Year-24 Hour (3.2")	0.37 cfs, 0.027 af	0.19 cfs, 0.015 af
10-Year-24 Hour (4.65")	0.81 cfs, 0.057 af	0.48 cfs, 0.036 af
100-Year-24 Hour (6.80")	1.56 cfs, 0.107 af	1.10 cfs, 0.096 af

Standard 3: Recharge and Discharge Volume

The applicant proposes adequate infiltration for the lot as required by the Massachusetts Stormwater Handbook as follows:

Existing Impervious Area = 22,081 SF
Proposed Impervious Area = 19,039 SF
Decrease in impervious area = 3,042 SF

No recharge volume is required due to the decrease in impervious area proposed on site.

Standard 4: Water Quality

The square footage of impervious pavement on site will be reduced to 0 in Subcatchment 2 (Hull Street Abutters) and Subcatchment 3 (Hull Street). Impervious will be increased in Subcatchment 1 (Rockland Street Abutters).

Existing Pavement (Subcatchment 1 – Rockland Street Abutters) = 312 SF
Proposed Pavement (Subcatchment 1 - Rockland Street Abutters) = 2,289 SF

Increase in Pavement = 2,289 – 312 = 1,977 SF

WQV is calculated by multiplying 0.5 inch of runoff by the net increase in paved areas as follows:

$$WQV = (1,977 \text{ ft}^2) \left(\frac{0.5 \text{ in}}{\frac{12 \text{ in}}{1 \text{ ft}}} \right) = 83 \text{ ft}^3$$

All proposed pavement will be pretreated with crushed stone diaphragms before running off into infiltration basins. The total storage volumes of these treatment systems is as follows:

725(Infiltration Basin #1) + 1,130(Infiltration Basin #3) = 1,855 CF

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

The use of the property (residential) does not constitute a higher potential pollutant load use. Thus Standard 5 does not pertain to this project.

Standard 6: Critical Areas

An Area of Critical Environmental Concern Associated with the Weir River is on property, but no work is proposed in this area.

Standard 7: Redevelopment

This project is a mix of redevelopment and new development.

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 the proposed drainage improvements 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.

Improvement Over Existing Conditions

The addition of structural stormwater controls will help improve water quality. The proposed reduction of peak rate of runoff and volume will improve stormwater conditions offsite.

SECTION II

STORMWATER OPERATION AND MAINTENANCE PLAN

Construction Period Sequencing and Stormwater Operation and Maintenance Plans

Last Revised 2/26/25

**Two Proposed Single-Family Dwellings and Common Drive
311 Rockland Street and 210 Hull Street, Hingham, MA 02043
Stormwater Management System's Owner: Gerry Rankin (210 Hull Street LLC)
System Owner's Address: 338 Clapp Road, Scituate, MA 02066
Party responsible for Operations and Maintenance: Owners of 311 Rockland Street and
210 Hull Street**

As part of any infrastructure improvement, the system must be maintained to work properly. The following Construction Sequencing Guideline and Operation and Maintenance plans are provided to upkeep the existing non-structural and structural best performance practices as outlined in the Massachusetts Department of Environmental Protection's Stormwater Management Policy.

Emergency Contact Information:

Gerry Rankin (Rankin Residential)
210 Hull Street LLC
338 Clapp Road
Scituate, MA 02066
Telephone: 617-799-0588
Emergency Telephone: 617-799-0588
Email: gerry@rankinresidential.com

Construction Sequencing:

The following section provides construction details and highlights the construction sequence and timing of earth moving activities.

1. Installation of Erosion Controls

Erosion and sedimentation controls (i.e., silt sock, construction entrance) will be installed as shown on the Site Plan and inspected at the limits of the work area prior to the commencement of earth moving activities. 3/4" – 3.0" crushed stone shall be placed at the existing paved driveway entrance as designated on the Site Plan.

2. Utility Identification & Clearing

All utilities (including stubs) must be identified and marked in the field prior to disturbance. Identify the location of the sewer line that will be relocated to accommodate the proposed work. No large boulders or building materials will be buried on the site. All cleared vegetation, apart from any vegetation that may be deemed appropriate to be replanted, will be removed from the project site or mulched and stockpiled for future use on the site.

3. *Rough Grading*

During this phase of construction, rough grades will be established for the project site. If suitable topsoil is found, it will be removed and stockpiled in an upland area. The stockpiled topsoil will be stored until ready for re-use on site.

4. *Excavation and Utility Relocation*

The area will be carefully excavated to avoid damage to any utility lines and/or pipes located in the area of work. Relocate lines at this time.

5. *Installation of the Dwellings*

During this phase of construction, the proposed dwellings will be constructed.

6. *Utility Installation*

In this phase of construction, any utilities associated with the dwelling will be installed.

7. *Gravel and Paved Driveways Installation*

Once the drainage pipes leading to the infiltration system and the utilities are installed, the driveways will be installed. The location of the drainage pipes, infiltration basins, and utility lines should be marked to avoid heavy equipment/loading over these pipes and lines that can cause damage. The Stone Diaphragms along the paved driveways should also be installed at this time.

8. *Installation of Infiltration Basins, and Buried Drainage Pipes*

The infiltration system shall be installed once the dwelling is constructed. If the contractor prefers to install the infiltration and/or drainage pipe system before the dwelling construction is completed, then the area above the buried infiltration and the drainage pipes should be roped off to avoid heavy equipment load on top of the infiltration and pipe system and to avoid disturbance of the infiltration materials.

9. *Site Stabilization*

The final phase of the project is the restoration and stabilization of all exposed surfaces. Disturbed areas will be landscaped or seeded as necessary only after all other construction is final. In the event that weather conditions prevent final restoration, temporary erosion and sedimentation measures will be employed until the weather is suitable for final cleanup. Should final ground stabilization be postponed due to winter conditions, the exposed ground shall be covered in an erosion control blanket to prevent erosion. A final inspection will ensure that the project site is cleared of all project debris and that erosion and sedimentation controls are functioning properly. Erosion and sedimentation controls will not be removed until the site is stabilized and the final inspection is completed.

Stormwater Operation and Maintenance During Construction:

Sediment and Erosion Control

- Silt socks shall be inspected at least once a week and after each rainfall event. Make any required repairs immediately. Repair damaged areas of the sock at this time to prevent future problems.
- Should the fabric of the silt sock tear, decompose or otherwise become ineffective, replace it within 24 hours of discovery.
- Remove silt deposits once they reach 20 to 30 percent of the height of the silt sock 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 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.
- Any sediment tracked from the construction site onto the street during construction shall be removed immediately.

Infiltration System

Per MA DEP Stormwater Guidelines, the following work shall be done to stabilize the site prior to Infiltration Basins:

- Do not allow runoff from any disturbed areas on the site to flow to the exposed Basins.
- 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 Infiltration Basins 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 infiltration basins and silt socks shall be placed around the perimeter of the infiltration area to prevent the accumulation of sediment within the native soils.

Dust Control

Sprinkle water as necessary to control dust during construction.

Material Stockpiling

Stockpiles of material must be placed within the area confined by the silt sock. If left overnight, material stockpiling must be protected from the weather.

Good Housekeeping

The following good housekeeping BMP's will be implemented in order to prevent pollution during construction:

- Petroleum products will be stored in tightly sealed containers which are clearly labeled.

- Any asphalt substances on site will be applied according to the manufacturer's specifications.
- If portable sanitary units are used, sanitary waste will be removed as necessary to avoid overfilling.
- All paint and other hazardous waste materials will be tightly sealed and stored when not in use. Excess material will not be discharged into the public stormwater system but will be properly disposed of according to the manufacturer's specifications. If spray guns are used, they will be cleaned on a removable tarp.

Long-Term Pollution Prevention Plan
Last Revised 2/26/25

Two Proposed Single-Family Dwellings and Common Drive
311 Rockland Street and 210 Hull Street, Hingham, MA 02043
Stormwater Management System's Owner: Gerry Rankin (210 Hull Street LLC)
System Owner's Address: 338 Clapp Road, Scituate, MA 02066
Party responsible for Operations and Maintenance: Owners of 311 Rockland Street and
210 Hull Street

As part of any infrastructure improvement the system must be maintained in order to work properly. The following is an Operation and Maintenance plan to upkeep the proposed non-structural and structural best performance practices as outlined in the Massachusetts Department of Environmental Protection's Stormwater Management Policy and in accordance with the approved design drawing. The following is an Operation and Maintenance plan to follow after construction activities have been completed.

Emergency Contact Information:

Gerry Rankin (Rankin Residential)
210 Hull Street LLC
338 Clapp Road
Scituate, MA 02066
Telephone: 617-799-0588
Emergency Telephone: 617-799-0588
Email: gerry@rankinresidential.com

Stormwater Operation and Maintenance After Construction:

Stormwater Infiltration Basins

After construction, the stormwater infiltration basins shall be inspected for proper function after every major storm event until the site is completely developed and stabilized. After the site has been stabilized the stormwater infiltration system shall be inspected at least twice per year or if lack of performance is observed and perform necessary corrective measures to maintain infiltration capacity; as required by the Stormwater Management Policy. Inspections shall include checking the water level in the system after a major storm event, and performing necessary corrective action if water is observed 72 hours following the storm.

Disposal of the accumulated sediment must be in accordance with applicable local, state and federal guidelines and regulations.

Inspections shall be performed by qualified professionals of the basin bottoms and outlet control structure. The embankments should also be inspected for signs of settlement, significant erosion, animal burrows, growth of woody vegetation, and other conditions that could affect embankment integrity. Repairs should be made immediately based on these inspections.

The bottoms and sides of the stormwater basin should be mowed, limed, aerated, and overseeded along with the regular maintenance of other loamed & seeded areas on the project site. Liming shall be limited to once per year

Stone Diaphragms:

The stone diaphragms should be inspected after every major storm event. The inspector shall take notice of any water standing after 72 hours after the storm ended. Remove any debris or sediment within reach that may be clogging the system.

Pipes:

All pipe cleanouts shall be inspected to ensure that they are free of all obstructions.

Roof Drains:

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.

Driveway Sweeping:

Driveway shall be swept at least four times a year primarily in spring and fall.

Snow Management:

Any snow and ice buildup on the proposed roof drains will be removed in a timely fashion.

Snow plowed from the driveways or parking area will be temporarily stored in available lawn areas.

Roof Drain Cleaning:

Any buildup of leaves in the roof drains should be cleaned out in the late fall.

Estimated Operation and Maintenance Budget:

Maintenance cost is estimated to be around \$1,500.00 per year.

Illicit 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."


Property Owner (Signature) *manager*


Property Owner (Print)
210 Hull St LLC

SECTION IV

FIGURES

USGS LOCUS MAP



311 ROCKLAND STREET, HINGHAM MA



427 Columbia Road
Hanover, MA 02339
781-826-9200

merrillinc.com

CLIENT:

RANKIN RESIDENTIAL
MAIN STREET
HINGHAM, MASS. 02043

MERRILL PROJECT #: 23-360

SCALE: NOT TO SCALE

DATE: 6/7/2024

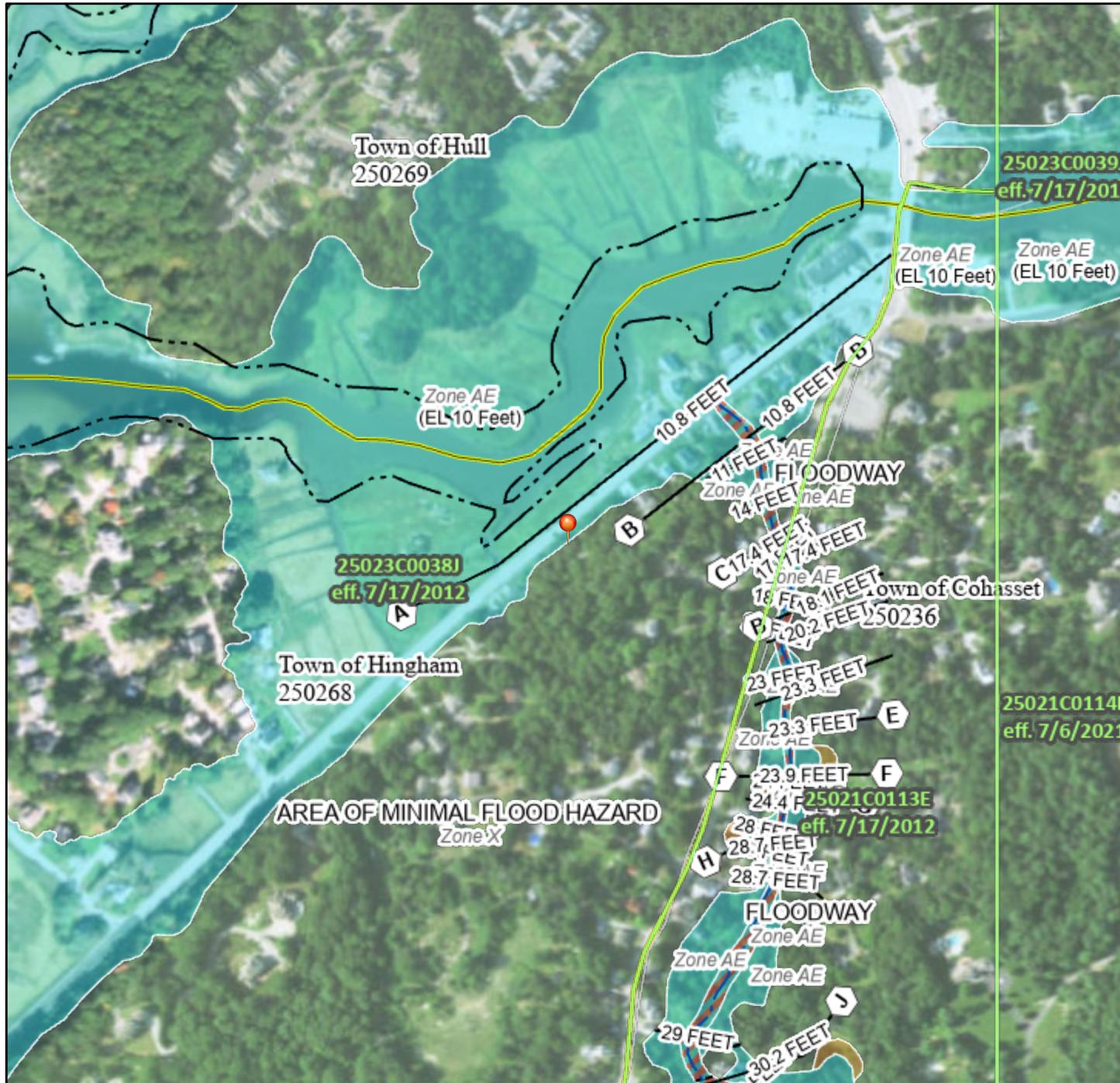
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SHEET 1 of 1
© Merrill Corporation

National Flood Hazard Layer FIRMMette



70°51'11"W 42°15'42"N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
OTHER FEATURES		Levee, Dike, or Floodwall
		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
MAP PANELS		17.5 Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped

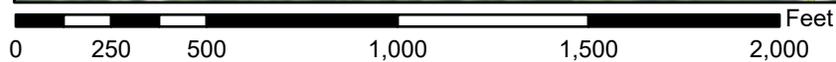


The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/5/2024 at 5:06 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

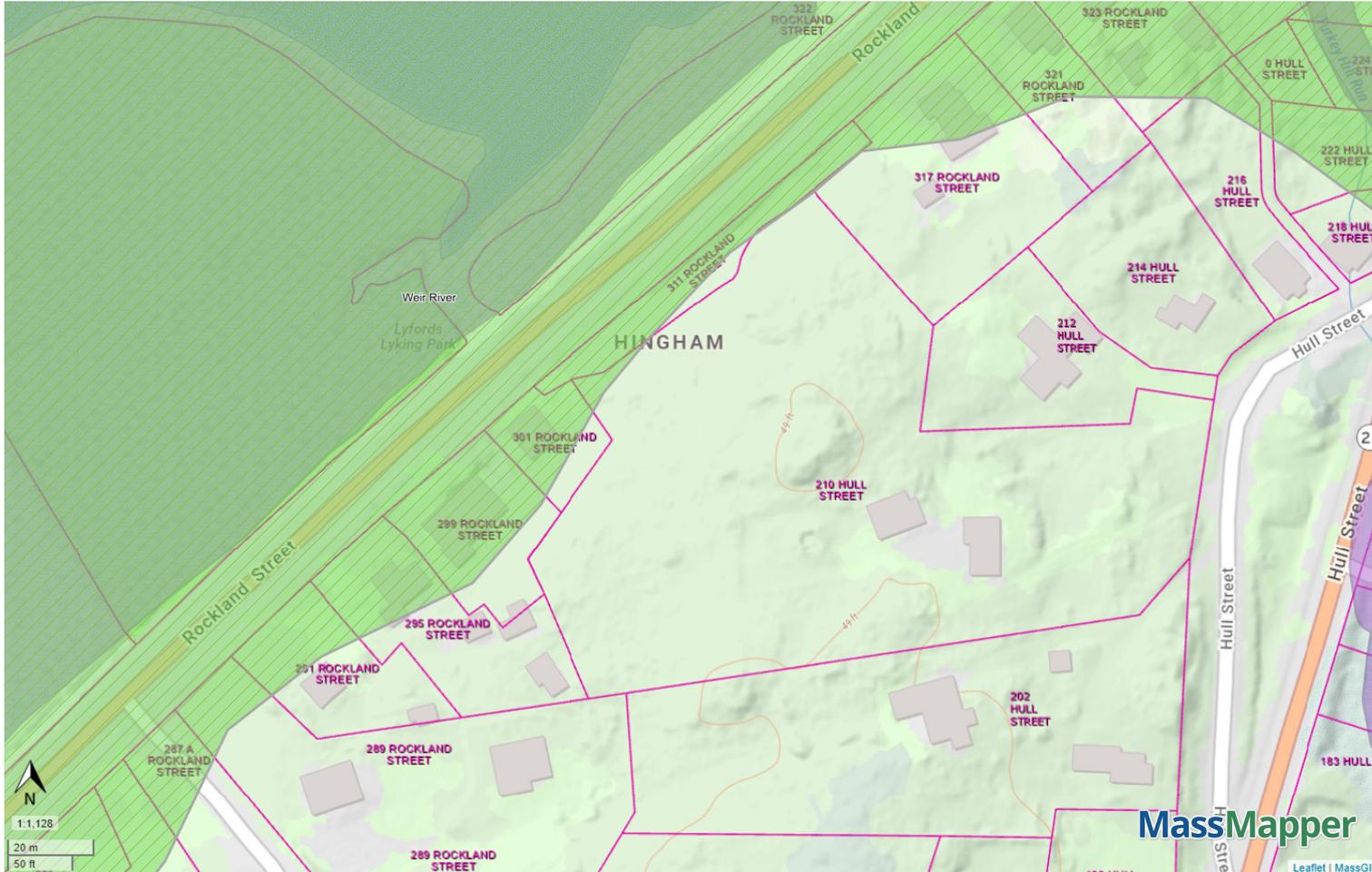


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70°50'33"W 42°15'16"N

Basemap Imagery Source: USGS National Map 2023

311 Rockland Street and 210 Hull Street



Areas of Critical Environmental Concern ACECs Boundaries

- ROAD/RAIL BASED
- RIVER BASED
- WETLAND BASED
- FLOODPLAIN BASED
- TIDAL BASED
- CONTOUR BASED
- POLITICAL BOUNDARY
- PROPERTY LINE BASED
- OTHER
- NOT DEFINED

Areas of Critical Environmental Concern ACECs Transparent Green



Areas of Critical Environmental Concern ACECs



IWPAs



Outstanding Resource Waters

- ACEC
- Cape Cod National Seashore
- Protected Shoreline
- Public Water Supply Watershed
- Retired Public Water Supply
- Scenic/Protected River
- Wildlife Refuge

Zone IIs



Potential Vernal Pools



NHESP Priority Habitats of Rare Species



NHESP Natural Communities



NHESP Estimated Habitats of Rare Wildlife



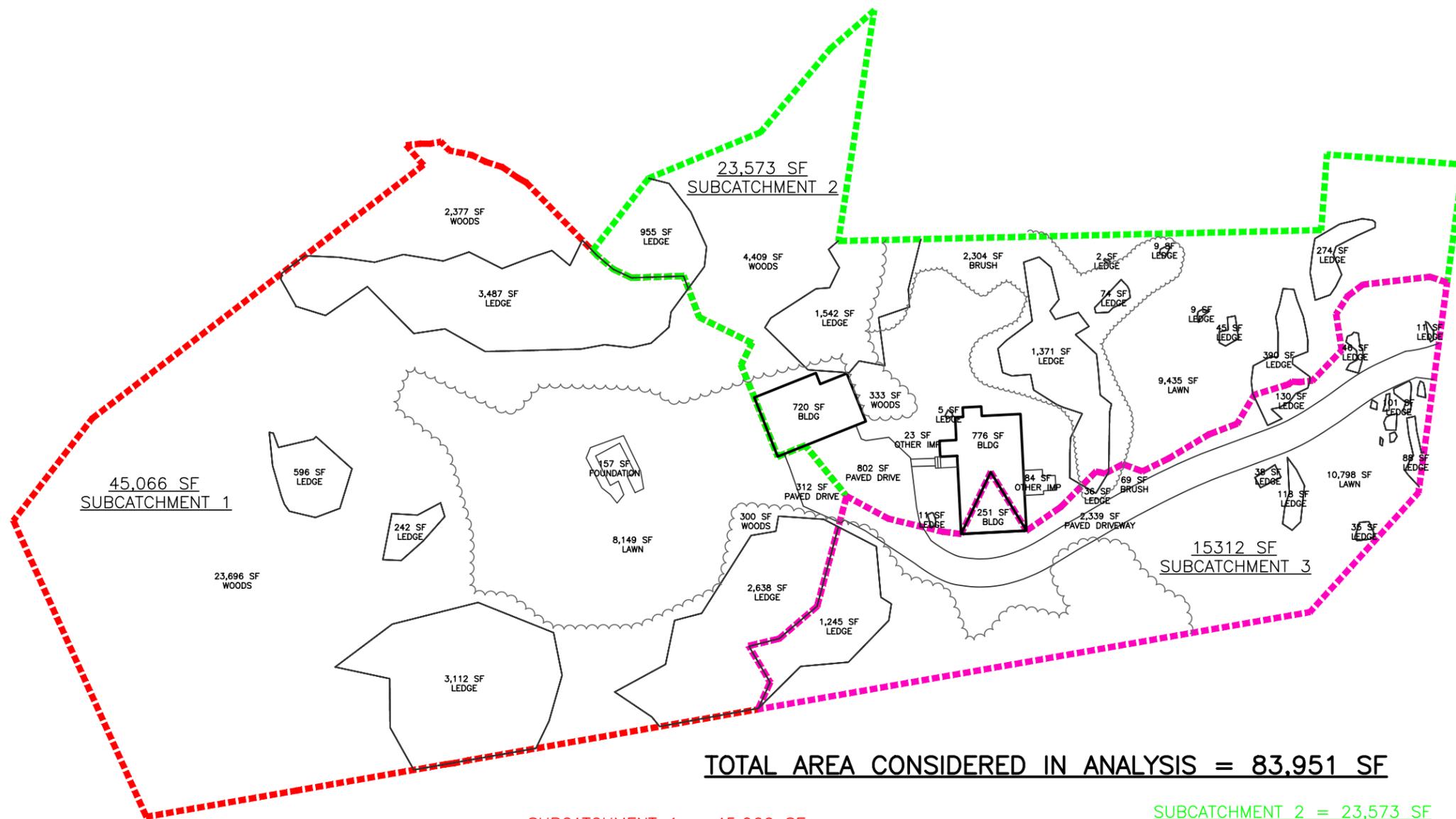
NHESP Certified Vernal Pools



Property Tax Parcels

SECTION V

DRAINAGE CALCULATIONS & SUPPLEMENTAL DRAINAGE INFORMATION



TOTAL AREA CONSIDERED IN ANALYSIS = 83,951 SF

SUBCATCHMENT 1 = 45,066 SF

PAVED DRIVEWAY = 312 SF
 FOUNDATION = 157 SF
 LEDGE = 3,112 + 3,487 + 2,638 + 242 + 596 = 10,075 SF
 TOTAL IMPERVIOUS = 312 + 157 + 10,075 = 10,544
 WOODS = 23,696 + 300 + 2377 = 26,373 SF
 LAWN = 45,066 - 10,544 - 26,373 = 8,149 SF

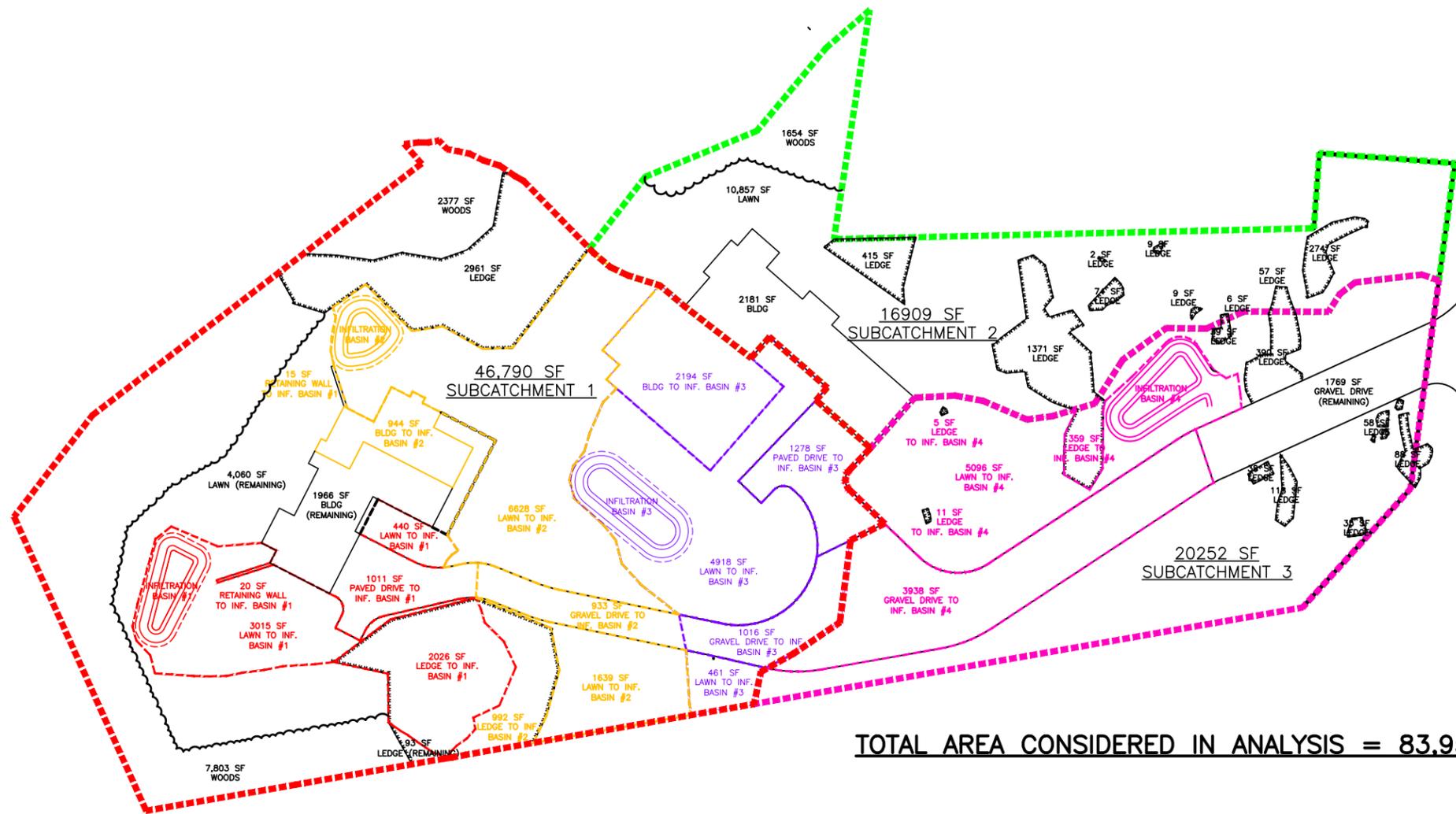
SUBCATCHMENT 3 = 15,312 SF

BUILDING = 251 SF
 PAVED DRIVEWAY = 2,339 SF
 LEDGE = 1,245 + 36 + 38 + 118 + 130 + 46 + 11 + 108 + 88 + 35 = 1,855 SF
 TOTAL IMPERVIOUS = 251 + 2,339 + 1,855 = 4,445 SF
 BRUSH = 69 SF
 LAWN = 15,312 - 4,445 - 69 = 10,798 SF

SUBCATCHMENT 2 = 23,573 SF

BUILDING = 776 + 720 = 1,496 SF
 PAVED DRIVEWAY = 802 SF
 OTHER IMP. = 84 + 23 = 107 SF
 LEDGE = 955 + 11 + 5 + 1371 + 1542 + 74 + 2 + 9 + 9 + 45 + 390 + 274 = 4,687 SF
 TOTAL IMPERVIOUS = 1,496 + 802 + 107 + 4,687 = 7,092 SF
 BRUSH = 2,304 SF
 WOODS = 4,409 + 333 = 4,742 SF
 LAWN = 23,573 - 7,092 - 2,304 - 4,742 = 9,435 SF

TOTAL EXISTING IMPERVIOUS = 10,544 + 4,445 + 7,092 = 22,081 SF



TOTAL AREA CONSIDERED IN ANALYSIS = 83,951 SF

SUBCATCHMENT 1 = 46,790 SF

BUILDING TO INF. BASIN #2 = 944 SF
 BUILDING TO INF. BASIN #3 = 2,194 SF
 BUILDING (REMAINING) = 1,966 SF

PAVED DRIVEWAY TO INF. BASIN #1 = 1,011 SF
 PAVED DRIVEWAY TO INF. BASIN #3 = 1,278 SF

RETAINING WALL TO INF. BASIN #1 = 20 SF
 RETAINING WALL TO INF. BASIN #2 = 15 SF

LEDGE TO INF. BASIN #1 = 2,026 SF
 LEDGE TO INF. BASIN #2 = 992 SF
 LEDGE (REMAINING) = 93 + 2,961 = 3,054 SF

TOTAL IMPERVIOUS = 944 + 2,194 + 1,966 + 1,011 + 1,278 + 20 + 15 + 2,026 + 992 + 3,054 = 13,500 SF

GRAVEL DRIVE TO INF. BASIN #2 = 933 SF
 GRAVEL DRIVE TO INF. BASIN #3 = 1,016 SF

WOODS = 7,803 + 2,377 = 10,180 SF

LAWN TO INF. BASIN #1 = 3015 + 440 = 3,455 SF
 LAWN TO INF. BASIN #2 = 1,639 + 6,628 = 8,267 SF
 LAWN TO INF. BASIN #3 = 461 + 4918 = 5,379 SF

REMAINING LAWN = 46,790 - 13,500 - 933 - 1,016 - 10,180 - 3,455 - 8,267 - 5,379 = 4,060 SF

SUBCATCHMENT 2 = 16,909 SF

BUILDING = 2,181 SF
 LEDGE = 1371 + 415 + 74 + 2 + 9 + 9 + 6 + 57 + 274 = 2,217 SF

TOTAL IMPERVIOUS = 2,181 + 2,217 = 4,398 SF

WOODS = 1,654 SF

LAWN = 16,909 - 4,398 - 1,654 = 10,857 SF

SUBCATCHMENT 3 = 20,252 SF

LEDGE TO INF. BASIN #4 = 11 + 5 + 359 = 375 SF
 LEDGE = 390 + 39 + 38 + 118 + 35 + 88 + 58 = 766 SF

TOTAL IMPERVIOUS = 1,141 SF

GRAVEL DRIVE TO INF. BASIN #4 = 3,938 SF
 GRAVEL DRIVE (REMAINING) = 1,769 SF

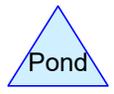
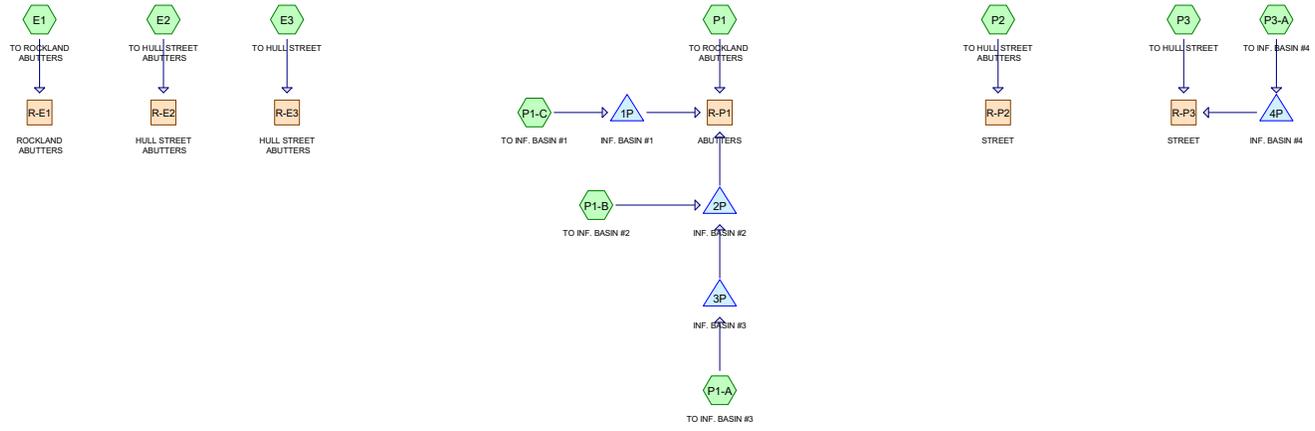
LAWN TO INF. BASIN #4 = 5,096 SF
 LAWN (REMAINING) = 20,252 - 1,141 - 3,938 - 1,769 - 5,096 = 8,308 SF

TOTAL PROPOSED IMPERVIOUS = 13,500 + 4,398 + 1,141 = 19,039 SF

REDUCTION IN IMPERVIOUS = 22,081 - 19,039 = 3,042 SF

EXISTING

PROPOSED



Routing Diagram for Hull Street (Without modeled trenches)
 Prepared by Merrill Associates Inc, Printed 2/26/2025
 HydroCAD® 10.20-3h s/n 02159 © 2024 HydroCAD Software Solutions LLC

Hull Street (Without modeled trenches)

Type III 24-hr 2 Year Event Rainfall=3.20"

Prepared by Merrill Associates Inc

Printed 2/26/2025

HydroCAD® 10.20-3h s/n 02159 © 2024 HydroCAD Software Solutions LLC

Page 2

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 E1: TO ROCKLAND	Runoff Area=45,066 sf 23.40% Impervious Runoff Depth=0.64" Tc=5.0 min CN=66 Runoff=0.66 cfs 0.055 af
Subcatchment E2: TO HULL STREET	Runoff Area=23,573 sf 30.09% Impervious Runoff Depth=0.83" Tc=5.0 min CN=70 Runoff=0.49 cfs 0.037 af
Subcatchment E3: TO HULL STREET	Runoff Area=15,312 sf 29.03% Impervious Runoff Depth=0.93" Tc=5.0 min CN=72 Runoff=0.37 cfs 0.027 af
Subcatchment P1: TO ROCKLAND	Runoff Area=19,260 sf 26.06% Impervious Runoff Depth=0.69" Tc=5.0 min CN=67 Runoff=0.31 cfs 0.025 af
Subcatchment P1-A: TO INF. BASIN #3	Runoff Area=9,867 sf 35.19% Impervious Runoff Depth=1.15" Tc=5.0 min CN=76 Runoff=0.31 cfs 0.022 af
Subcatchment P1-B: TO INF. BASIN #2	Runoff Area=11,151 sf 17.50% Impervious Runoff Depth=0.78" Tc=5.0 min CN=69 Runoff=0.21 cfs 0.017 af
Subcatchment P1-C: TO INF. BASIN #1	Runoff Area=6,512 sf 46.94% Impervious Runoff Depth=1.27" Tc=5.0 min CN=78 Runoff=0.23 cfs 0.016 af
Subcatchment P2: TO HULL STREET	Runoff Area=16,909 sf 26.01% Impervious Runoff Depth=0.83" Tc=5.0 min CN=70 Runoff=0.35 cfs 0.027 af
Subcatchment P3: TO HULL STREET	Runoff Area=10,843 sf 7.06% Impervious Runoff Depth=0.73" Tc=5.0 min CN=68 Runoff=0.19 cfs 0.015 af
Subcatchment P3-A: TO INF. BASIN #4	Runoff Area=9,409 sf 3.99% Impervious Runoff Depth=0.98" Tc=5.0 min CN=73 Runoff=0.24 cfs 0.018 af
Reach R-E1: ROCKLAND ABUTTERS	Inflow=0.66 cfs 0.055 af Outflow=0.66 cfs 0.055 af
Reach R-E2: HULL STREET ABUTTERS	Inflow=0.49 cfs 0.037 af Outflow=0.49 cfs 0.037 af
Reach R-E3: HULL STREET ABUTTERS	Inflow=0.37 cfs 0.027 af Outflow=0.37 cfs 0.027 af
Reach R-P1: ABUTTERS	Inflow=0.31 cfs 0.025 af Outflow=0.31 cfs 0.025 af
Reach R-P2: STREET	Inflow=0.35 cfs 0.027 af Outflow=0.35 cfs 0.027 af
Reach R-P3: STREET	Inflow=0.19 cfs 0.015 af Outflow=0.19 cfs 0.015 af

Hull Street (Without modeled trenches)

Type III 24-hr 2 Year Event Rainfall=3.20"

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Pond 1P: INF. BASIN #1

Peak Elev=34.72' Storage=378 cf Inflow=0.23 cfs 0.016 af
Discarded=0.01 cfs 0.014 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.014 af

Pond 2P: INF. BASIN #2

Peak Elev=36.04' Storage=410 cf Inflow=0.21 cfs 0.017 af
Discarded=0.01 cfs 0.013 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.013 af

Pond 3P: INF. BASIN #3

Peak Elev=46.50' Storage=501 cf Inflow=0.31 cfs 0.022 af
Discarded=0.02 cfs 0.021 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.021 af

Pond 4P: INF. BASIN #4

Peak Elev=38.59' Storage=410 cf Inflow=0.24 cfs 0.018 af
Discarded=0.01 cfs 0.016 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.016 af

Total Runoff Area = 3.854 ac Runoff Volume = 0.259 af Average Runoff Depth = 0.81"
75.51% Pervious = 2.911 ac 24.49% Impervious = 0.944 ac

Hull Street (Without modeled trenches)

Type III 24-hr 2 Year Event Rainfall=3.20"

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Summary for Subcatchment E1: TO ROCKLAND ABUTTERS

Runoff = 0.66 cfs @ 12.09 hrs, Volume= 0.055 af, Depth= 0.64"
 Routed to Reach R-E1 : ROCKLAND ABUTTERS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2 Year Event Rainfall=3.20"

Area (sf)	CN	Description
312	98	Paved parking, HSG B
* 157	98	FOUNDATION
* 10,075	98	LEDGE
26,373	55	Woods, Good, HSG B
8,149	61	>75% Grass cover, Good, HSG B
45,066	66	Weighted Average
34,522		76.60% Pervious Area
10,544		23.40% Impervious Area

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

Summary for Subcatchment E2: TO HULL STREET ABUTTERS

Runoff = 0.49 cfs @ 12.09 hrs, Volume= 0.037 af, Depth= 0.83"
 Routed to Reach R-E2 : HULL STREET ABUTTERS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2 Year Event Rainfall=3.20"

Area (sf)	CN	Description
1,496	98	Roofs, HSG A
802	98	Paved parking, HSG A
* 107	98	OTHER IMP
* 4,687	98	LEDGE
2,304	48	Brush, Good, HSG B
4,742	55	Woods, Good, HSG B
9,435	61	>75% Grass cover, Good, HSG B
23,573	70	Weighted Average
16,481		69.91% Pervious Area
7,092		30.09% Impervious Area

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

Hull Street (Without modeled trenches)

Type III 24-hr 2 Year Event Rainfall=3.20"

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Summary for Subcatchment E3: TO HULL STREET

Runoff = 0.37 cfs @ 12.08 hrs, Volume= 0.027 af, Depth= 0.93"
 Routed to Reach R-E3 : HULL STREET ABUTTERS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2 Year Event Rainfall=3.20"

Area (sf)	CN	Description
251	98	Roofs, HSG A
2,339	98	Paved parking, HSG A
* 1,855	98	LEDGE
69	48	Brush, Good, HSG B
10,798	61	>75% Grass cover, Good, HSG B
15,312	72	Weighted Average
10,867		70.97% Pervious Area
4,445		29.03% Impervious Area

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

Summary for Subcatchment P1: TO ROCKLAND ABUTTERS

Runoff = 0.31 cfs @ 12.09 hrs, Volume= 0.025 af, Depth= 0.69"
 Routed to Reach R-P1 : ABUTTERS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2 Year Event Rainfall=3.20"

Area (sf)	CN	Description
1,966	98	Roofs, HSG B
* 3,054	98	LEDGE
10,180	55	Woods, Good, HSG B
4,060	61	>75% Grass cover, Good, HSG B
19,260	67	Weighted Average
14,240		73.94% Pervious Area
5,020		26.06% Impervious Area

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

Summary for Subcatchment P1-A: TO INF. BASIN #3

Runoff = 0.31 cfs @ 12.08 hrs, Volume= 0.022 af, Depth= 1.15"
 Routed to Pond 3P : INF. BASIN #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2 Year Event Rainfall=3.20"

Hull Street (Without modeled trenches)

Type III 24-hr 2 Year Event Rainfall=3.20"

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Area (sf)	CN	Description
2,194	98	Roofs, HSG B
1,278	98	Paved parking, HSG B
1,016	85	Gravel roads, HSG B
5,379	61	>75% Grass cover, Good, HSG B
9,867	76	Weighted Average
6,395		64.81% Pervious Area
3,472		35.19% Impervious Area

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

Summary for Subcatchment P1-B: TO INF. BASIN #2

Runoff = 0.21 cfs @ 12.09 hrs, Volume= 0.017 af, Depth= 0.78"
 Routed to Pond 2P : INF. BASIN #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2 Year Event Rainfall=3.20"

Area (sf)	CN	Description
* 944	98	DWELLING
* 15	98	RETAINING WALL
* 992	98	LEDGE
933	85	Gravel roads, HSG B
8,267	61	>75% Grass cover, Good, HSG B
11,151	69	Weighted Average
9,200		82.50% Pervious Area
1,951		17.50% Impervious Area

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

Summary for Subcatchment P1-C: TO INF. BASIN #1

Runoff = 0.23 cfs @ 12.08 hrs, Volume= 0.016 af, Depth= 1.27"
 Routed to Pond 1P : INF. BASIN #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2 Year Event Rainfall=3.20"

Hull Street (Without modeled trenches)

Type III 24-hr 2 Year Event Rainfall=3.20"

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Area (sf)	CN	Description
* 20	98	RETAINING WALL
1,011	98	Paved parking, HSG B
* 2,026	98	LEDGE
3,455	61	>75% Grass cover, Good, HSG B
6,512	78	Weighted Average
3,455		53.06% Pervious Area
3,057		46.94% Impervious Area

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

Summary for Subcatchment P2: TO HULL STREET ABUTTERS

Runoff = 0.35 cfs @ 12.09 hrs, Volume= 0.027 af, Depth= 0.83"
 Routed to Reach R-P2 : STREET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2 Year Event Rainfall=3.20"

Area (sf)	CN	Description
2,181	98	Roofs, HSG B
* 2,217	98	LEDGE
1,654	55	Woods, Good, HSG B
10,857	61	>75% Grass cover, Good, HSG B
16,909	70	Weighted Average
12,511		73.99% Pervious Area
4,398		26.01% Impervious Area

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

Summary for Subcatchment P3: TO HULL STREET

Runoff = 0.19 cfs @ 12.09 hrs, Volume= 0.015 af, Depth= 0.73"
 Routed to Reach R-P3 : STREET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2 Year Event Rainfall=3.20"

Area (sf)	CN	Description
* 766	98	LEDGE
1,769	85	Gravel roads, HSG B
8,308	61	>75% Grass cover, Good, HSG B
10,843	68	Weighted Average
10,077		92.94% Pervious Area
766		7.06% Impervious Area

Hull Street (Without modeled trenches)

Type III 24-hr 2 Year Event Rainfall=3.20"

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

Summary for Subcatchment P3-A: TO INF. BASIN #4

Runoff = 0.24 cfs @ 12.08 hrs, Volume= 0.018 af, Depth= 0.98"
 Routed to Pond 4P : INF. BASIN #4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2 Year Event Rainfall=3.20"

Area (sf)	CN	Description
*	375	98 LEDGE
	3,938	85 Gravel roads, HSG B
	5,096	61 >75% Grass cover, Good, HSG B
	9,409	73 Weighted Average
	9,034	96.01% Pervious Area
	375	3.99% Impervious Area

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

Summary for Reach R-E1: ROCKLAND ABUTTERS

Inflow Area = 1.035 ac, 23.40% Impervious, Inflow Depth = 0.64" for 2 Year Event event
 Inflow = 0.66 cfs @ 12.09 hrs, Volume= 0.055 af
 Outflow = 0.66 cfs @ 12.09 hrs, Volume= 0.055 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Reach R-E2: HULL STREET ABUTTERS

Inflow Area = 0.541 ac, 30.09% Impervious, Inflow Depth = 0.83" for 2 Year Event event
 Inflow = 0.49 cfs @ 12.09 hrs, Volume= 0.037 af
 Outflow = 0.49 cfs @ 12.09 hrs, Volume= 0.037 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Reach R-E3: HULL STREET ABUTTERS

Inflow Area = 0.352 ac, 29.03% Impervious, Inflow Depth = 0.93" for 2 Year Event event
 Inflow = 0.37 cfs @ 12.08 hrs, Volume= 0.027 af
 Outflow = 0.37 cfs @ 12.08 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Reach R-P1: ABUTTERS

Inflow Area = 1.074 ac, 28.85% Impervious, Inflow Depth = 0.28" for 2 Year Event event
 Inflow = 0.31 cfs @ 12.09 hrs, Volume= 0.025 af
 Outflow = 0.31 cfs @ 12.09 hrs, Volume= 0.025 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Reach R-P2: STREET

Inflow Area = 0.388 ac, 26.01% Impervious, Inflow Depth = 0.83" for 2 Year Event event
 Inflow = 0.35 cfs @ 12.09 hrs, Volume= 0.027 af
 Outflow = 0.35 cfs @ 12.09 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Reach R-P3: STREET

Inflow Area = 0.465 ac, 5.63% Impervious, Inflow Depth = 0.39" for 2 Year Event event
 Inflow = 0.19 cfs @ 12.09 hrs, Volume= 0.015 af
 Outflow = 0.19 cfs @ 12.09 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Pond 1P: INF. BASIN #1

Inflow Area = 0.149 ac, 46.94% Impervious, Inflow Depth = 1.27" for 2 Year Event event
 Inflow = 0.23 cfs @ 12.08 hrs, Volume= 0.016 af
 Outflow = 0.01 cfs @ 15.46 hrs, Volume= 0.014 af, Atten= 95%, Lag= 202.8 min
 Discarded = 0.01 cfs @ 15.46 hrs, Volume= 0.014 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routed to Reach R-P1 : ABUTTERS

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 34.72' @ 15.46 hrs Surf.Area= 464 sf Storage= 378 cf

Plug-Flow detention time= 398.5 min calculated for 0.014 af (89% of inflow)
 Center-of-Mass det. time= 346.9 min (1,195.1 - 848.2)

Volume	Invert	Avail.Storage	Storage Description
#1	33.50'	825 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
33.50	167	0	0
34.00	277	111	111
35.00	537	407	518
35.50	689	307	825

Hull Street (Without modeled trenches)

Type III 24-hr 2 Year Event Rainfall=3.20"

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Device	Routing	Invert	Outlet Devices
#1	Discarded	33.50'	1.020 in/hr Exfiltration over Surface area
#2	Primary	35.35'	4.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Discarded OutFlow Max=0.01 cfs @ 15.46 hrs HW=34.72' (Free Discharge)

↳1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=33.50' (Free Discharge)

↳2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 2P: INF. BASIN #2

Inflow Area = 0.483 ac, 25.80% Impervious, Inflow Depth = 0.41" for 2 Year Event event
 Inflow = 0.21 cfs @ 12.09 hrs, Volume= 0.017 af
 Outflow = 0.01 cfs @ 16.75 hrs, Volume= 0.013 af, Atten= 95%, Lag= 279.8 min
 Discarded = 0.01 cfs @ 16.75 hrs, Volume= 0.013 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach R-P1 : ABUTTERS

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 4

Peak Elev= 36.04' @ 16.75 hrs Surf.Area= 411 sf Storage= 410 cf

Plug-Flow detention time= 444.4 min calculated for 0.013 af (78% of inflow)

Center-of-Mass det. time= 354.9 min (1,233.3 - 878.4)

Volume	Invert	Avail.Storage	Storage Description
#1	34.50'	626 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.50	138	0	0
35.00	212	88	88
36.00	403	308	395
36.50	520	231	626

Device	Routing	Invert	Outlet Devices
#1	Discarded	34.50'	1.020 in/hr Exfiltration over Surface area
#2	Primary	36.20'	4.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Hull Street (Without modeled trenches)

Type III 24-hr 2 Year Event Rainfall=3.20"

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Discarded OutFlow Max=0.01 cfs @ 16.75 hrs HW=36.04' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=34.50' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 3P: INF. BASIN #3

Inflow Area = 0.227 ac, 35.19% Impervious, Inflow Depth = 1.15" for 2 Year Event event
 Inflow = 0.31 cfs @ 12.08 hrs, Volume= 0.022 af
 Outflow = 0.02 cfs @ 15.49 hrs, Volume= 0.021 af, Atten= 95%, Lag= 204.4 min
 Discarded = 0.02 cfs @ 15.49 hrs, Volume= 0.021 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 2P : INF. BASIN #2

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 46.50' @ 15.49 hrs Surf.Area= 655 sf Storage= 501 cf

Plug-Flow detention time= 379.8 min calculated for 0.021 af (94% of inflow)
 Center-of-Mass det. time= 350.0 min (1,204.7 - 854.7)

Volume	Invert	Avail.Storage	Storage Description
#1	45.50'	1,322 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.50	358	0	0
46.00	496	214	214
47.00	815	656	869
47.50	995	453	1,322

Device	Routing	Invert	Outlet Devices
#1	Discarded	45.50'	1.020 in/hr Exfiltration over Surface area
#2	Primary	47.35'	4.0' long x 4.0' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00			
2.50 3.00 3.50 4.00 4.50 5.00 5.50			
Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66			
2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32			

Discarded OutFlow Max=0.02 cfs @ 15.49 hrs HW=46.50' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=45.50' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Hull Street (Without modeled trenches)

Type III 24-hr 2 Year Event Rainfall=3.20"

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Summary for Pond 4P: INF. BASIN #4

Inflow Area = 0.216 ac, 3.99% Impervious, Inflow Depth = 0.98" for 2 Year Event event
 Inflow = 0.24 cfs @ 12.08 hrs, Volume= 0.018 af
 Outflow = 0.01 cfs @ 15.72 hrs, Volume= 0.016 af, Atten= 95%, Lag= 218.1 min
 Discarded = 0.01 cfs @ 15.72 hrs, Volume= 0.016 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach R-P3 : STREET

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 38.59' @ 15.72 hrs Surf.Area= 523 sf Storage= 410 cf

Plug-Flow detention time= 391.8 min calculated for 0.016 af (91% of inflow)
 Center-of-Mass det. time= 345.9 min (1,210.4 - 864.5)

Volume	Invert	Avail.Storage	Storage Description
#1	37.50'	1,006 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
37.50	239	0	0
38.00	358	149	149
39.00	637	498	647
39.50	800	359	1,006

Device	Routing	Invert	Outlet Devices
#1	Discarded	37.50'	1.020 in/hr Exfiltration over Surface area
#2	Primary	39.35'	4.0' long x 4.0' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00			
2.50 3.00 3.50 4.00 4.50 5.00 5.50			
Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66			
2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32			

Discarded OutFlow Max=0.01 cfs @ 15.72 hrs HW=38.59' (Free Discharge)
 ↑1=**Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=37.50' (Free Discharge)
 ↑2=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Hull Street (Without modeled trenches)

Type III 24-hr 10 Year Event Rainfall=4.65"

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Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 E1: TO ROCKLAND	Runoff Area=45,066 sf 23.40% Impervious Runoff Depth=1.49" Tc=5.0 min CN=66 Runoff=1.78 cfs 0.129 af
Subcatchment E2: TO HULL STREET	Runoff Area=23,573 sf 30.09% Impervious Runoff Depth=1.78" Tc=5.0 min CN=70 Runoff=1.14 cfs 0.080 af
Subcatchment E3: TO HULL STREET	Runoff Area=15,312 sf 29.03% Impervious Runoff Depth=1.93" Tc=5.0 min CN=72 Runoff=0.81 cfs 0.057 af
Subcatchment P1: TO ROCKLAND	Runoff Area=19,260 sf 26.06% Impervious Runoff Depth=1.56" Tc=5.0 min CN=67 Runoff=0.80 cfs 0.058 af
Subcatchment P1-A: TO INF. BASIN #3	Runoff Area=9,867 sf 35.19% Impervious Runoff Depth=2.25" Tc=5.0 min CN=76 Runoff=0.62 cfs 0.042 af
Subcatchment P1-B: TO INF. BASIN #2	Runoff Area=11,151 sf 17.50% Impervious Runoff Depth=1.71" Tc=5.0 min CN=69 Runoff=0.51 cfs 0.036 af
Subcatchment P1-C: TO INF. BASIN #1	Runoff Area=6,512 sf 46.94% Impervious Runoff Depth=2.42" Tc=5.0 min CN=78 Runoff=0.44 cfs 0.030 af
Subcatchment P2: TO HULL STREET	Runoff Area=16,909 sf 26.01% Impervious Runoff Depth=1.78" Tc=5.0 min CN=70 Runoff=0.82 cfs 0.058 af
Subcatchment P3: TO HULL STREET	Runoff Area=10,843 sf 7.06% Impervious Runoff Depth=1.63" Tc=5.0 min CN=68 Runoff=0.48 cfs 0.034 af
Subcatchment P3-A: TO INF. BASIN #4	Runoff Area=9,409 sf 3.99% Impervious Runoff Depth=2.01" Tc=5.0 min CN=73 Runoff=0.52 cfs 0.036 af
Reach R-E1: ROCKLAND ABUTTERS	Inflow=1.78 cfs 0.129 af Outflow=1.78 cfs 0.129 af
Reach R-E2: HULL STREET ABUTTERS	Inflow=1.14 cfs 0.080 af Outflow=1.14 cfs 0.080 af
Reach R-E3: HULL STREET ABUTTERS	Inflow=0.81 cfs 0.057 af Outflow=0.81 cfs 0.057 af
Reach R-P1: ABUTTERS	Inflow=0.80 cfs 0.074 af Outflow=0.80 cfs 0.074 af
Reach R-P2: STREET	Inflow=0.82 cfs 0.058 af Outflow=0.82 cfs 0.058 af
Reach R-P3: STREET	Inflow=0.48 cfs 0.036 af Outflow=0.48 cfs 0.036 af

Hull Street (Without modeled trenches)

Type III 24-hr 10 Year Event Rainfall=4.65"

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Pond 1P: INF. BASIN #1 Peak Elev=35.36' Storage=734 cf Inflow=0.44 cfs 0.030 af
Discarded=0.02 cfs 0.021 af Primary=0.02 cfs 0.002 af Outflow=0.03 cfs 0.023 af

Pond 2P: INF. BASIN #2 Peak Elev=36.28' Storage=517 cf Inflow=0.51 cfs 0.036 af
Discarded=0.01 cfs 0.016 af Primary=0.22 cfs 0.015 af Outflow=0.23 cfs 0.030 af

Pond 3P: INF. BASIN #3 Peak Elev=47.30' Storage=1,132 cf Inflow=0.62 cfs 0.042 af
Discarded=0.02 cfs 0.031 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.031 af

Pond 4P: INF. BASIN #4 Peak Elev=39.36' Storage=900 cf Inflow=0.52 cfs 0.036 af
Discarded=0.02 cfs 0.025 af Primary=0.02 cfs 0.002 af Outflow=0.03 cfs 0.027 af

Total Runoff Area = 3.854 ac Runoff Volume = 0.560 af Average Runoff Depth = 1.74"
75.51% Pervious = 2.911 ac 24.49% Impervious = 0.944 ac

Hull Street (Without modeled trenches)

Type III 24-hr 10 Year Event Rainfall=4.65"

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Summary for Subcatchment E1: TO ROCKLAND ABUTTERS

Runoff = 1.78 cfs @ 12.08 hrs, Volume= 0.129 af, Depth= 1.49"
 Routed to Reach R-E1 : ROCKLAND ABUTTERS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10 Year Event Rainfall=4.65"

Area (sf)	CN	Description
312	98	Paved parking, HSG B
* 157	98	FOUNDATION
* 10,075	98	LEDGE
26,373	55	Woods, Good, HSG B
8,149	61	>75% Grass cover, Good, HSG B
45,066	66	Weighted Average
34,522		76.60% Pervious Area
10,544		23.40% Impervious Area

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

Summary for Subcatchment E2: TO HULL STREET ABUTTERS

Runoff = 1.14 cfs @ 12.08 hrs, Volume= 0.080 af, Depth= 1.78"
 Routed to Reach R-E2 : HULL STREET ABUTTERS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10 Year Event Rainfall=4.65"

Area (sf)	CN	Description
1,496	98	Roofs, HSG A
802	98	Paved parking, HSG A
* 107	98	OTHER IMP
* 4,687	98	LEDGE
2,304	48	Brush, Good, HSG B
4,742	55	Woods, Good, HSG B
9,435	61	>75% Grass cover, Good, HSG B
23,573	70	Weighted Average
16,481		69.91% Pervious Area
7,092		30.09% Impervious Area

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

Hull Street (Without modeled trenches)

Type III 24-hr 10 Year Event Rainfall=4.65"

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Summary for Subcatchment E3: TO HULL STREET

Runoff = 0.81 cfs @ 12.08 hrs, Volume= 0.057 af, Depth= 1.93"
 Routed to Reach R-E3 : HULL STREET ABUTTERS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10 Year Event Rainfall=4.65"

Area (sf)	CN	Description
251	98	Roofs, HSG A
2,339	98	Paved parking, HSG A
* 1,855	98	LEDGE
69	48	Brush, Good, HSG B
10,798	61	>75% Grass cover, Good, HSG B
15,312	72	Weighted Average
10,867		70.97% Pervious Area
4,445		29.03% Impervious Area

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

Summary for Subcatchment P1: TO ROCKLAND ABUTTERS

Runoff = 0.80 cfs @ 12.08 hrs, Volume= 0.058 af, Depth= 1.56"
 Routed to Reach R-P1 : ABUTTERS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10 Year Event Rainfall=4.65"

Area (sf)	CN	Description
1,966	98	Roofs, HSG B
* 3,054	98	LEDGE
10,180	55	Woods, Good, HSG B
4,060	61	>75% Grass cover, Good, HSG B
19,260	67	Weighted Average
14,240		73.94% Pervious Area
5,020		26.06% Impervious Area

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

Summary for Subcatchment P1-A: TO INF. BASIN #3

Runoff = 0.62 cfs @ 12.08 hrs, Volume= 0.042 af, Depth= 2.25"
 Routed to Pond 3P : INF. BASIN #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10 Year Event Rainfall=4.65"

Hull Street (Without modeled trenches)

Type III 24-hr 10 Year Event Rainfall=4.65"

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Area (sf)	CN	Description
2,194	98	Roofs, HSG B
1,278	98	Paved parking, HSG B
1,016	85	Gravel roads, HSG B
5,379	61	>75% Grass cover, Good, HSG B
9,867	76	Weighted Average
6,395		64.81% Pervious Area
3,472		35.19% Impervious Area

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

Summary for Subcatchment P1-B: TO INF. BASIN #2

Runoff = 0.51 cfs @ 12.08 hrs, Volume= 0.036 af, Depth= 1.71"
 Routed to Pond 2P : INF. BASIN #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10 Year Event Rainfall=4.65"

Area (sf)	CN	Description
* 944	98	DWELLING
* 15	98	RETAINING WALL
* 992	98	LEDGE
933	85	Gravel roads, HSG B
8,267	61	>75% Grass cover, Good, HSG B
11,151	69	Weighted Average
9,200		82.50% Pervious Area
1,951		17.50% Impervious Area

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

Summary for Subcatchment P1-C: TO INF. BASIN #1

Runoff = 0.44 cfs @ 12.08 hrs, Volume= 0.030 af, Depth= 2.42"
 Routed to Pond 1P : INF. BASIN #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10 Year Event Rainfall=4.65"

Hull Street (Without modeled trenches)

Type III 24-hr 10 Year Event Rainfall=4.65"

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	Area (sf)	CN	Description
*	20	98	RETAINING WALL
	1,011	98	Paved parking, HSG B
*	2,026	98	LEDGE
	3,455	61	>75% Grass cover, Good, HSG B
	6,512	78	Weighted Average
	3,455		53.06% Pervious Area
	3,057		46.94% Impervious Area

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

Summary for Subcatchment P2: TO HULL STREET ABUTTERS

Runoff = 0.82 cfs @ 12.08 hrs, Volume= 0.058 af, Depth= 1.78"
 Routed to Reach R-P2 : STREET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10 Year Event Rainfall=4.65"

	Area (sf)	CN	Description
	2,181	98	Roofs, HSG B
*	2,217	98	LEDGE
	1,654	55	Woods, Good, HSG B
	10,857	61	>75% Grass cover, Good, HSG B
	16,909	70	Weighted Average
	12,511		73.99% Pervious Area
	4,398		26.01% Impervious Area

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

Summary for Subcatchment P3: TO HULL STREET

Runoff = 0.48 cfs @ 12.08 hrs, Volume= 0.034 af, Depth= 1.63"
 Routed to Reach R-P3 : STREET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10 Year Event Rainfall=4.65"

	Area (sf)	CN	Description
*	766	98	LEDGE
	1,769	85	Gravel roads, HSG B
	8,308	61	>75% Grass cover, Good, HSG B
	10,843	68	Weighted Average
	10,077		92.94% Pervious Area
	766		7.06% Impervious Area

Hull Street (Without modeled trenches)

Type III 24-hr 10 Year Event Rainfall=4.65"

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

Summary for Subcatchment P3-A: TO INF. BASIN #4

Runoff = 0.52 cfs @ 12.08 hrs, Volume= 0.036 af, Depth= 2.01"
 Routed to Pond 4P : INF. BASIN #4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10 Year Event Rainfall=4.65"

Area (sf)	CN	Description
*	375	98 LEDGE
	3,938	85 Gravel roads, HSG B
	5,096	61 >75% Grass cover, Good, HSG B
	9,409	73 Weighted Average
	9,034	96.01% Pervious Area
	375	3.99% Impervious Area

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

Summary for Reach R-E1: ROCKLAND ABUTTERS

Inflow Area = 1.035 ac, 23.40% Impervious, Inflow Depth = 1.49" for 10 Year Event event
 Inflow = 1.78 cfs @ 12.08 hrs, Volume= 0.129 af
 Outflow = 1.78 cfs @ 12.08 hrs, Volume= 0.129 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Reach R-E2: HULL STREET ABUTTERS

Inflow Area = 0.541 ac, 30.09% Impervious, Inflow Depth = 1.78" for 10 Year Event event
 Inflow = 1.14 cfs @ 12.08 hrs, Volume= 0.080 af
 Outflow = 1.14 cfs @ 12.08 hrs, Volume= 0.080 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Reach R-E3: HULL STREET ABUTTERS

Inflow Area = 0.352 ac, 29.03% Impervious, Inflow Depth = 1.93" for 10 Year Event event
 Inflow = 0.81 cfs @ 12.08 hrs, Volume= 0.057 af
 Outflow = 0.81 cfs @ 12.08 hrs, Volume= 0.057 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Reach R-P1: ABUTTERS

Inflow Area = 1.074 ac, 28.85% Impervious, Inflow Depth = 0.83" for 10 Year Event event
 Inflow = 0.80 cfs @ 12.08 hrs, Volume= 0.074 af
 Outflow = 0.80 cfs @ 12.08 hrs, Volume= 0.074 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Reach R-P2: STREET

Inflow Area = 0.388 ac, 26.01% Impervious, Inflow Depth = 1.78" for 10 Year Event event
 Inflow = 0.82 cfs @ 12.08 hrs, Volume= 0.058 af
 Outflow = 0.82 cfs @ 12.08 hrs, Volume= 0.058 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Reach R-P3: STREET

Inflow Area = 0.465 ac, 5.63% Impervious, Inflow Depth = 0.93" for 10 Year Event event
 Inflow = 0.48 cfs @ 12.08 hrs, Volume= 0.036 af
 Outflow = 0.48 cfs @ 12.08 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Pond 1P: INF. BASIN #1

Inflow Area = 0.149 ac, 46.94% Impervious, Inflow Depth = 2.42" for 10 Year Event event
 Inflow = 0.44 cfs @ 12.08 hrs, Volume= 0.030 af
 Outflow = 0.03 cfs @ 13.61 hrs, Volume= 0.023 af, Atten= 93%, Lag= 92.1 min
 Discarded = 0.02 cfs @ 13.61 hrs, Volume= 0.021 af
 Primary = 0.02 cfs @ 13.61 hrs, Volume= 0.002 af

Routed to Reach R-P1 : ABUTTERS

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Peak Elev= 35.36' @ 13.61 hrs Surf.Area= 648 sf Storage= 734 cf

Plug-Flow detention time= 423.6 min calculated for 0.023 af (77% of inflow)

Center-of-Mass det. time= 338.7 min (1,168.2 - 829.5)

Volume	Invert	Avail.Storage	Storage Description
#1	33.50'	825 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
33.50	167	0	0
34.00	277	111	111
35.00	537	407	518
35.50	689	307	825

Hull Street (Without modeled trenches)

Type III 24-hr 10 Year Event Rainfall=4.65"

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Device	Routing	Invert	Outlet Devices
#1	Discarded	33.50'	1.020 in/hr Exfiltration over Surface area
#2	Primary	35.35'	4.0' long x 4.0' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00			
2.50 3.00 3.50 4.00 4.50 5.00 5.50			
Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66			
2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32			

Discarded OutFlow Max=0.02 cfs @ 13.61 hrs HW=35.36' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.02 cfs @ 13.61 hrs HW=35.36' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Weir Controls 0.02 cfs @ 0.28 fps)

Summary for Pond 2P: INF. BASIN #2

Inflow Area = 0.483 ac, 25.80% Impervious, Inflow Depth = 0.91" for 10 Year Event event
 Inflow = 0.51 cfs @ 12.08 hrs, Volume= 0.036 af
 Outflow = 0.23 cfs @ 12.31 hrs, Volume= 0.030 af, Atten= 56%, Lag= 13.8 min
 Discarded = 0.01 cfs @ 12.31 hrs, Volume= 0.016 af
 Primary = 0.22 cfs @ 12.31 hrs, Volume= 0.015 af
 Routed to Reach R-P1 : ABUTTERS

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 4

Peak Elev= 36.28' @ 12.31 hrs Surf.Area= 469 sf Storage= 517 cf

Plug-Flow detention time= 243.0 min calculated for 0.030 af (83% of inflow)

Center-of-Mass det. time= 171.6 min (1,025.0 - 853.4)

Volume	Invert	Avail.Storage	Storage Description
#1	34.50'	626 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.50	138	0	0
35.00	212	88	88
36.00	403	308	395
36.50	520	231	626

Device	Routing	Invert	Outlet Devices
#1	Discarded	34.50'	1.020 in/hr Exfiltration over Surface area
#2	Primary	36.20'	4.0' long x 4.0' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00			
2.50 3.00 3.50 4.00 4.50 5.00 5.50			
Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66			
2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32			

Hull Street (Without modeled trenches)

Type III 24-hr 10 Year Event Rainfall=4.65"

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Discarded OutFlow Max=0.01 cfs @ 12.31 hrs HW=36.28' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.22 cfs @ 12.31 hrs HW=36.28' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Weir Controls 0.22 cfs @ 0.67 fps)

Summary for Pond 3P: INF. BASIN #3

Inflow Area = 0.227 ac, 35.19% Impervious, Inflow Depth = 2.25" for 10 Year Event event
 Inflow = 0.62 cfs @ 12.08 hrs, Volume= 0.042 af
 Outflow = 0.02 cfs @ 16.03 hrs, Volume= 0.031 af, Atten= 96%, Lag= 237.3 min
 Discarded = 0.02 cfs @ 16.03 hrs, Volume= 0.031 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 2P : INF. BASIN #2

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 47.30' @ 16.03 hrs Surf.Area= 924 sf Storage= 1,132 cf

Plug-Flow detention time= 465.3 min calculated for 0.031 af (73% of inflow)
 Center-of-Mass det. time= 371.5 min (1,206.4 - 834.8)

Volume	Invert	Avail.Storage	Storage Description
#1	45.50'	1,322 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.50	358	0	0
46.00	496	214	214
47.00	815	656	869
47.50	995	453	1,322

Device	Routing	Invert	Outlet Devices
#1	Discarded	45.50'	1.020 in/hr Exfiltration over Surface area
#2	Primary	47.35'	4.0' long x 4.0' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00			
2.50 3.00 3.50 4.00 4.50 5.00 5.50			
Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66			
2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32			

Discarded OutFlow Max=0.02 cfs @ 16.03 hrs HW=47.30' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=45.50' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 4P: INF. BASIN #4

Inflow Area = 0.216 ac, 3.99% Impervious, Inflow Depth = 2.01" for 10 Year Event event
 Inflow = 0.52 cfs @ 12.08 hrs, Volume= 0.036 af
 Outflow = 0.03 cfs @ 14.22 hrs, Volume= 0.027 af, Atten= 94%, Lag= 128.8 min
 Discarded = 0.02 cfs @ 14.22 hrs, Volume= 0.025 af
 Primary = 0.02 cfs @ 14.22 hrs, Volume= 0.002 af
 Routed to Reach R-P3 : STREET

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 39.36' @ 14.22 hrs Surf.Area= 755 sf Storage= 900 cf

Plug-Flow detention time= 439.2 min calculated for 0.027 af (74% of inflow)
 Center-of-Mass det. time= 346.2 min (1,189.0 - 842.8)

Volume	Invert	Avail.Storage	Storage Description
#1	37.50'	1,006 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
37.50	239	0	0
38.00	358	149	149
39.00	637	498	647
39.50	800	359	1,006

Device	Routing	Invert	Outlet Devices
#1	Discarded	37.50'	1.020 in/hr Exfiltration over Surface area
#2	Primary	39.35'	4.0' long x 4.0' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00			
2.50 3.00 3.50 4.00 4.50 5.00 5.50			
Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66			
2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32			

Discarded OutFlow Max=0.02 cfs @ 14.22 hrs HW=39.36' (Free Discharge)
 ↑1=**Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.01 cfs @ 14.22 hrs HW=39.36' (Free Discharge)
 ↑2=**Broad-Crested Rectangular Weir** (Weir Controls 0.01 cfs @ 0.27 fps)

Hull Street (Without modeled trenches)

Type III 24-hr 100 Year Event Rainfall=6.80"

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Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 E1: TO ROCKLAND	Runoff Area=45,066 sf 23.40% Impervious Runoff Depth=3.05" Tc=5.0 min CN=66 Runoff=3.80 cfs 0.263 af
Subcatchment E2: TO HULL STREET	Runoff Area=23,573 sf 30.09% Impervious Runoff Depth=3.45" Tc=5.0 min CN=70 Runoff=2.27 cfs 0.156 af
Subcatchment E3: TO HULL STREET	Runoff Area=15,312 sf 29.03% Impervious Runoff Depth=3.66" Tc=5.0 min CN=72 Runoff=1.56 cfs 0.107 af
Subcatchment P1: TO ROCKLAND	Runoff Area=19,260 sf 26.06% Impervious Runoff Depth=3.15" Tc=5.0 min CN=67 Runoff=1.68 cfs 0.116 af
Subcatchment P1-A: TO INF. BASIN #3	Runoff Area=9,867 sf 35.19% Impervious Runoff Depth=4.08" Tc=5.0 min CN=76 Runoff=1.12 cfs 0.077 af
Subcatchment P1-B: TO INF. BASIN #2	Runoff Area=11,151 sf 17.50% Impervious Runoff Depth=3.35" Tc=5.0 min CN=69 Runoff=1.04 cfs 0.071 af
Subcatchment P1-C: TO INF. BASIN #1	Runoff Area=6,512 sf 46.94% Impervious Runoff Depth=4.29" Tc=5.0 min CN=78 Runoff=0.78 cfs 0.053 af
Subcatchment P2: TO HULL STREET	Runoff Area=16,909 sf 26.01% Impervious Runoff Depth=3.45" Tc=5.0 min CN=70 Runoff=1.63 cfs 0.112 af
Subcatchment P3: TO HULL STREET	Runoff Area=10,843 sf 7.06% Impervious Runoff Depth=3.25" Tc=5.0 min CN=68 Runoff=0.98 cfs 0.067 af
Subcatchment P3-A: TO INF. BASIN #4	Runoff Area=9,409 sf 3.99% Impervious Runoff Depth=3.76" Tc=5.0 min CN=73 Runoff=0.99 cfs 0.068 af
Reach R-E1: ROCKLAND ABUTTERS	Inflow=3.80 cfs 0.263 af Outflow=3.80 cfs 0.263 af
Reach R-E2: HULL STREET ABUTTERS	Inflow=2.27 cfs 0.156 af Outflow=2.27 cfs 0.156 af
Reach R-E3: HULL STREET ABUTTERS	Inflow=1.56 cfs 0.107 af Outflow=1.56 cfs 0.107 af
Reach R-P1: ABUTTERS	Inflow=2.69 cfs 0.214 af Outflow=2.69 cfs 0.214 af
Reach R-P2: STREET	Inflow=1.63 cfs 0.112 af Outflow=1.63 cfs 0.112 af
Reach R-P3: STREET	Inflow=1.10 cfs 0.096 af Outflow=1.10 cfs 0.096 af

Hull Street (Without modeled trenches)

Type III 24-hr 100 Year Event Rainfall=6.80"

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Pond 1P: INF. BASIN #1

Peak Elev=35.48' Storage=811 cf Inflow=0.78 cfs 0.053 af
Discarded=0.02 cfs 0.023 af Primary=0.45 cfs 0.022 af Outflow=0.47 cfs 0.045 af

Pond 2P: INF. BASIN #2

Peak Elev=36.42' Storage=585 cf Inflow=1.04 cfs 0.099 af
Discarded=0.01 cfs 0.016 af Primary=0.99 cfs 0.076 af Outflow=1.00 cfs 0.093 af

Pond 3P: INF. BASIN #3

Peak Elev=47.48' Storage=1,301 cf Inflow=1.12 cfs 0.077 af
Discarded=0.02 cfs 0.034 af Primary=0.44 cfs 0.028 af Outflow=0.46 cfs 0.062 af

Pond 4P: INF. BASIN #4

Peak Elev=39.49' Storage=999 cf Inflow=0.99 cfs 0.068 af
Discarded=0.02 cfs 0.027 af Primary=0.51 cfs 0.029 af Outflow=0.53 cfs 0.056 af

Total Runoff Area = 3.854 ac Runoff Volume = 1.091 af Average Runoff Depth = 3.40"
75.51% Pervious = 2.911 ac 24.49% Impervious = 0.944 ac

Hull Street (Without modeled trenches)

Type III 24-hr 100 Year Event Rainfall=6.80"

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Summary for Subcatchment E1: TO ROCKLAND ABUTTERS

Runoff = 3.80 cfs @ 12.08 hrs, Volume= 0.263 af, Depth= 3.05"
 Routed to Reach R-E1 : ROCKLAND ABUTTERS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100 Year Event Rainfall=6.80"

Area (sf)	CN	Description
312	98	Paved parking, HSG B
* 157	98	FOUNDATION
* 10,075	98	LEDGE
26,373	55	Woods, Good, HSG B
8,149	61	>75% Grass cover, Good, HSG B
45,066	66	Weighted Average
34,522		76.60% Pervious Area
10,544		23.40% Impervious Area

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

Summary for Subcatchment E2: TO HULL STREET ABUTTERS

Runoff = 2.27 cfs @ 12.08 hrs, Volume= 0.156 af, Depth= 3.45"
 Routed to Reach R-E2 : HULL STREET ABUTTERS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100 Year Event Rainfall=6.80"

Area (sf)	CN	Description
1,496	98	Roofs, HSG A
802	98	Paved parking, HSG A
* 107	98	OTHER IMP
* 4,687	98	LEDGE
2,304	48	Brush, Good, HSG B
4,742	55	Woods, Good, HSG B
9,435	61	>75% Grass cover, Good, HSG B
23,573	70	Weighted Average
16,481		69.91% Pervious Area
7,092		30.09% Impervious Area

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

Hull Street (Without modeled trenches)

Type III 24-hr 100 Year Event Rainfall=6.80"

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Summary for Subcatchment E3: TO HULL STREET

Runoff = 1.56 cfs @ 12.08 hrs, Volume= 0.107 af, Depth= 3.66"
 Routed to Reach R-E3 : HULL STREET ABUTTERS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100 Year Event Rainfall=6.80"

Area (sf)	CN	Description
251	98	Roofs, HSG A
2,339	98	Paved parking, HSG A
* 1,855	98	LEDGE
69	48	Brush, Good, HSG B
10,798	61	>75% Grass cover, Good, HSG B
15,312	72	Weighted Average
10,867		70.97% Pervious Area
4,445		29.03% Impervious Area

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

Summary for Subcatchment P1: TO ROCKLAND ABUTTERS

Runoff = 1.68 cfs @ 12.08 hrs, Volume= 0.116 af, Depth= 3.15"
 Routed to Reach R-P1 : ABUTTERS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100 Year Event Rainfall=6.80"

Area (sf)	CN	Description
1,966	98	Roofs, HSG B
* 3,054	98	LEDGE
10,180	55	Woods, Good, HSG B
4,060	61	>75% Grass cover, Good, HSG B
19,260	67	Weighted Average
14,240		73.94% Pervious Area
5,020		26.06% Impervious Area

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

Summary for Subcatchment P1-A: TO INF. BASIN #3

Runoff = 1.12 cfs @ 12.07 hrs, Volume= 0.077 af, Depth= 4.08"
 Routed to Pond 3P : INF. BASIN #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100 Year Event Rainfall=6.80"

Hull Street (Without modeled trenches)

Type III 24-hr 100 Year Event Rainfall=6.80"

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Area (sf)	CN	Description
2,194	98	Roofs, HSG B
1,278	98	Paved parking, HSG B
1,016	85	Gravel roads, HSG B
5,379	61	>75% Grass cover, Good, HSG B
9,867	76	Weighted Average
6,395		64.81% Pervious Area
3,472		35.19% Impervious Area

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

Summary for Subcatchment P1-B: TO INF. BASIN #2

Runoff = 1.04 cfs @ 12.08 hrs, Volume= 0.071 af, Depth= 3.35"
 Routed to Pond 2P : INF. BASIN #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100 Year Event Rainfall=6.80"

Area (sf)	CN	Description
* 944	98	DWELLING
* 15	98	RETAINING WALL
* 992	98	LEDGE
933	85	Gravel roads, HSG B
8,267	61	>75% Grass cover, Good, HSG B
11,151	69	Weighted Average
9,200		82.50% Pervious Area
1,951		17.50% Impervious Area

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

Summary for Subcatchment P1-C: TO INF. BASIN #1

Runoff = 0.78 cfs @ 12.07 hrs, Volume= 0.053 af, Depth= 4.29"
 Routed to Pond 1P : INF. BASIN #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100 Year Event Rainfall=6.80"

Hull Street (Without modeled trenches)

Type III 24-hr 100 Year Event Rainfall=6.80"

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	Area (sf)	CN	Description
*	20	98	RETAINING WALL
	1,011	98	Paved parking, HSG B
*	2,026	98	LEDGE
	3,455	61	>75% Grass cover, Good, HSG B
	6,512	78	Weighted Average
	3,455		53.06% Pervious Area
	3,057		46.94% Impervious Area

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

Summary for Subcatchment P2: TO HULL STREET ABUTTERS

Runoff = 1.63 cfs @ 12.08 hrs, Volume= 0.112 af, Depth= 3.45"
 Routed to Reach R-P2 : STREET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100 Year Event Rainfall=6.80"

	Area (sf)	CN	Description
	2,181	98	Roofs, HSG B
*	2,217	98	LEDGE
	1,654	55	Woods, Good, HSG B
	10,857	61	>75% Grass cover, Good, HSG B
	16,909	70	Weighted Average
	12,511		73.99% Pervious Area
	4,398		26.01% Impervious Area

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

Summary for Subcatchment P3: TO HULL STREET

Runoff = 0.98 cfs @ 12.08 hrs, Volume= 0.067 af, Depth= 3.25"
 Routed to Reach R-P3 : STREET

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100 Year Event Rainfall=6.80"

	Area (sf)	CN	Description
*	766	98	LEDGE
	1,769	85	Gravel roads, HSG B
	8,308	61	>75% Grass cover, Good, HSG B
	10,843	68	Weighted Average
	10,077		92.94% Pervious Area
	766		7.06% Impervious Area

Hull Street (Without modeled trenches)

Type III 24-hr 100 Year Event Rainfall=6.80"

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

Summary for Subcatchment P3-A: TO INF. BASIN #4

Runoff = 0.99 cfs @ 12.07 hrs, Volume= 0.068 af, Depth= 3.76"
 Routed to Pond 4P : INF. BASIN #4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100 Year Event Rainfall=6.80"

Area (sf)	CN	Description
*	375	98 LEDGE
	3,938	85 Gravel roads, HSG B
	5,096	61 >75% Grass cover, Good, HSG B
	9,409	73 Weighted Average
	9,034	96.01% Pervious Area
	375	3.99% Impervious Area

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

Summary for Reach R-E1: ROCKLAND ABUTTERS

Inflow Area = 1.035 ac, 23.40% Impervious, Inflow Depth = 3.05" for 100 Year Event event
 Inflow = 3.80 cfs @ 12.08 hrs, Volume= 0.263 af
 Outflow = 3.80 cfs @ 12.08 hrs, Volume= 0.263 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Reach R-E2: HULL STREET ABUTTERS

Inflow Area = 0.541 ac, 30.09% Impervious, Inflow Depth = 3.45" for 100 Year Event event
 Inflow = 2.27 cfs @ 12.08 hrs, Volume= 0.156 af
 Outflow = 2.27 cfs @ 12.08 hrs, Volume= 0.156 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Reach R-E3: HULL STREET ABUTTERS

Inflow Area = 0.352 ac, 29.03% Impervious, Inflow Depth = 3.66" for 100 Year Event event
 Inflow = 1.56 cfs @ 12.08 hrs, Volume= 0.107 af
 Outflow = 1.56 cfs @ 12.08 hrs, Volume= 0.107 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Reach R-P1: ABUTTERS

Inflow Area = 1.074 ac, 28.85% Impervious, Inflow Depth = 2.39" for 100 Year Event event
 Inflow = 2.69 cfs @ 12.11 hrs, Volume= 0.214 af
 Outflow = 2.69 cfs @ 12.11 hrs, Volume= 0.214 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Reach R-P2: STREET

Inflow Area = 0.388 ac, 26.01% Impervious, Inflow Depth = 3.45" for 100 Year Event event
 Inflow = 1.63 cfs @ 12.08 hrs, Volume= 0.112 af
 Outflow = 1.63 cfs @ 12.08 hrs, Volume= 0.112 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Reach R-P3: STREET

Inflow Area = 0.465 ac, 5.63% Impervious, Inflow Depth = 2.49" for 100 Year Event event
 Inflow = 1.10 cfs @ 12.16 hrs, Volume= 0.096 af
 Outflow = 1.10 cfs @ 12.16 hrs, Volume= 0.096 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Pond 1P: INF. BASIN #1

Inflow Area = 0.149 ac, 46.94% Impervious, Inflow Depth = 4.29" for 100 Year Event event
 Inflow = 0.78 cfs @ 12.07 hrs, Volume= 0.053 af
 Outflow = 0.47 cfs @ 12.17 hrs, Volume= 0.045 af, Atten= 40%, Lag= 5.9 min
 Discarded = 0.02 cfs @ 12.17 hrs, Volume= 0.023 af
 Primary = 0.45 cfs @ 12.17 hrs, Volume= 0.022 af

Routed to Reach R-P1 : ABUTTERS

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Peak Elev= 35.48' @ 12.17 hrs Surf.Area= 683 sf Storage= 811 cf

Plug-Flow detention time= 244.3 min calculated for 0.045 af (84% of inflow)

Center-of-Mass det. time= 176.9 min (989.9 - 813.0)

Volume	Invert	Avail.Storage	Storage Description
#1	33.50'	825 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
33.50	167	0	0
34.00	277	111	111
35.00	537	407	518
35.50	689	307	825

Hull Street (Without modeled trenches)

Type III 24-hr 100 Year Event Rainfall=6.80"

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Device	Routing	Invert	Outlet Devices
#1	Discarded	33.50'	1.020 in/hr Exfiltration over Surface area
#2	Primary	35.35'	4.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Discarded OutFlow Max=0.02 cfs @ 12.17 hrs HW=35.48' (Free Discharge)
 ↳1=Exfiltration (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.45 cfs @ 12.17 hrs HW=35.48' (Free Discharge)
 ↳2=Broad-Crested Rectangular Weir (Weir Controls 0.45 cfs @ 0.86 fps)

Summary for Pond 2P: INF. BASIN #2

Inflow Area = 0.483 ac, 25.80% Impervious, Inflow Depth = 2.46" for 100 Year Event event
 Inflow = 1.04 cfs @ 12.08 hrs, Volume= 0.099 af
 Outflow = 1.00 cfs @ 12.10 hrs, Volume= 0.093 af, Atten= 4%, Lag= 1.3 min
 Discarded = 0.01 cfs @ 12.10 hrs, Volume= 0.016 af
 Primary = 0.99 cfs @ 12.10 hrs, Volume= 0.076 af
 Routed to Reach R-P1 : ABUTTERS

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 4
 Peak Elev= 36.42' @ 12.10 hrs Surf.Area= 501 sf Storage= 585 cf

Plug-Flow detention time= 89.3 min calculated for 0.093 af (93% of inflow)
 Center-of-Mass det. time= 57.2 min (880.8 - 823.6)

Volume	Invert	Avail.Storage	Storage Description
#1	34.50'	626 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.50	138	0	0
35.00	212	88	88
36.00	403	308	395
36.50	520	231	626

Device	Routing	Invert	Outlet Devices
#1	Discarded	34.50'	1.020 in/hr Exfiltration over Surface area
#2	Primary	36.20'	4.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Hull Street (Without modeled trenches)

Type III 24-hr 100 Year Event Rainfall=6.80"

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Discarded OutFlow Max=0.01 cfs @ 12.10 hrs HW=36.42' (Free Discharge)

↳ **1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.99 cfs @ 12.10 hrs HW=36.42' (Free Discharge)

↳ **2=Broad-Crested Rectangular Weir** (Weir Controls 0.99 cfs @ 1.12 fps)

Summary for Pond 3P: INF. BASIN #3

Inflow Area = 0.227 ac, 35.19% Impervious, Inflow Depth = 4.08" for 100 Year Event event
 Inflow = 1.12 cfs @ 12.07 hrs, Volume= 0.077 af
 Outflow = 0.46 cfs @ 12.28 hrs, Volume= 0.062 af, Atten= 59%, Lag= 12.6 min
 Discarded = 0.02 cfs @ 12.28 hrs, Volume= 0.034 af
 Primary = 0.44 cfs @ 12.28 hrs, Volume= 0.028 af
 Routed to Pond 2P : INF. BASIN #2

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 47.48' @ 12.28 hrs Surf.Area= 987 sf Storage= 1,301 cf

Plug-Flow detention time= 270.5 min calculated for 0.062 af (81% of inflow)
 Center-of-Mass det. time= 194.8 min (1,012.5 - 817.7)

Volume	Invert	Avail.Storage	Storage Description
#1	45.50'	1,322 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.50	358	0	0
46.00	496	214	214
47.00	815	656	869
47.50	995	453	1,322

Device	Routing	Invert	Outlet Devices
#1	Discarded	45.50'	1.020 in/hr Exfiltration over Surface area
#2	Primary	47.35'	4.0' long x 4.0' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00			
2.50 3.00 3.50 4.00 4.50 5.00 5.50			
Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66			
2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32			

Discarded OutFlow Max=0.02 cfs @ 12.28 hrs HW=47.48' (Free Discharge)

↳ **1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.44 cfs @ 12.28 hrs HW=47.48' (Free Discharge)

↳ **2=Broad-Crested Rectangular Weir** (Weir Controls 0.44 cfs @ 0.85 fps)

Summary for Pond 4P: INF. BASIN #4

Inflow Area = 0.216 ac, 3.99% Impervious, Inflow Depth = 3.76" for 100 Year Event event
 Inflow = 0.99 cfs @ 12.07 hrs, Volume= 0.068 af
 Outflow = 0.53 cfs @ 12.20 hrs, Volume= 0.056 af, Atten= 47%, Lag= 7.4 min
 Discarded = 0.02 cfs @ 12.20 hrs, Volume= 0.027 af
 Primary = 0.51 cfs @ 12.20 hrs, Volume= 0.029 af
 Routed to Reach R-P3 : STREET

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
 Peak Elev= 39.49' @ 12.20 hrs Surf.Area= 797 sf Storage= 999 cf

Plug-Flow detention time= 235.8 min calculated for 0.056 af (83% of inflow)
 Center-of-Mass det. time= 165.2 min (989.7 - 824.6)

Volume	Invert	Avail.Storage	Storage Description
#1	37.50'	1,006 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
37.50	239	0	0
38.00	358	149	149
39.00	637	498	647
39.50	800	359	1,006

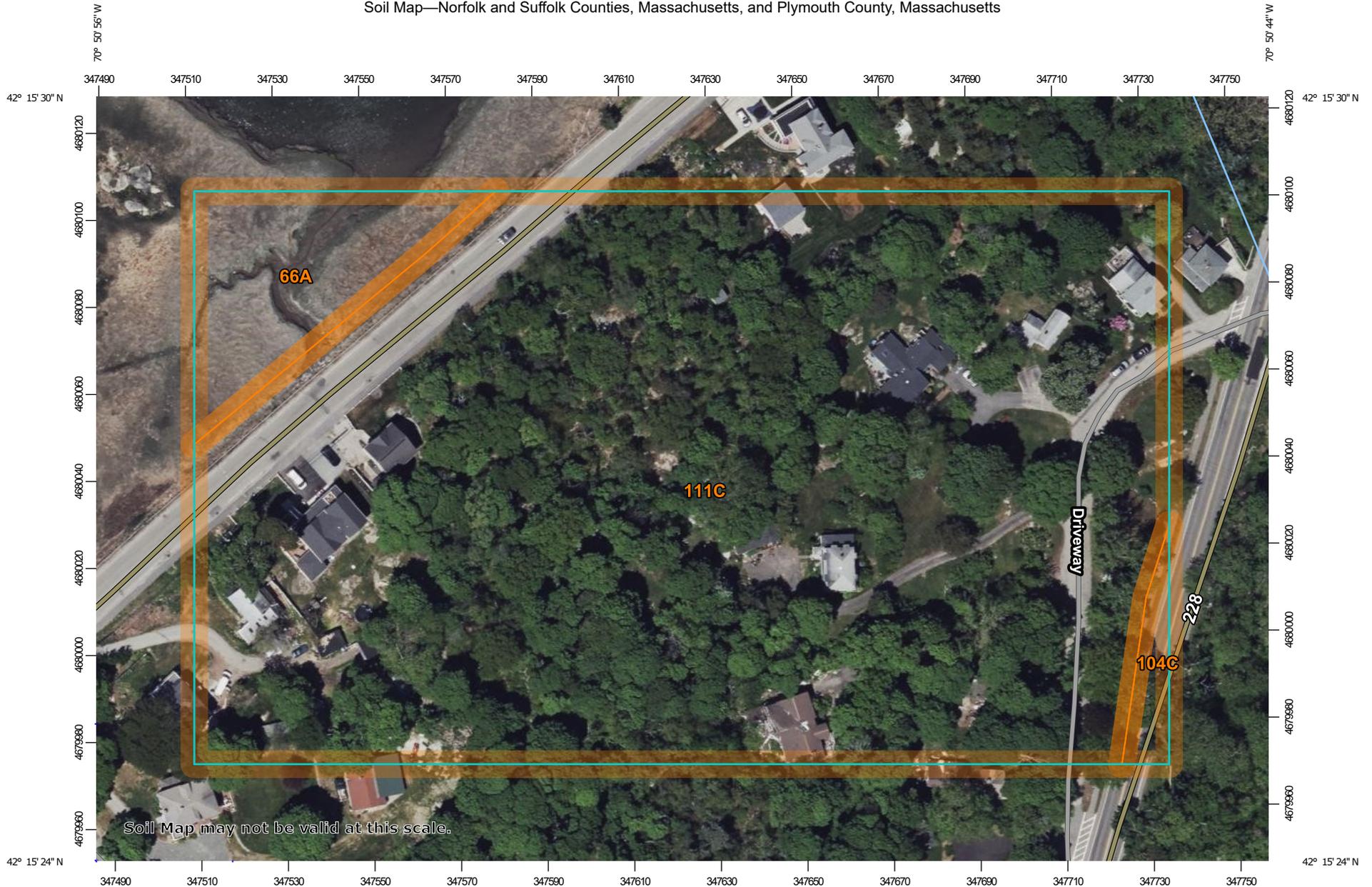
Device	Routing	Invert	Outlet Devices
#1	Discarded	37.50'	1.020 in/hr Exfiltration over Surface area
#2	Primary	39.35'	4.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Discarded OutFlow Max=0.02 cfs @ 12.20 hrs HW=39.49' (Free Discharge)
 ↑1=**Exfiltration** (Exfiltration Controls 0.02 cfs)

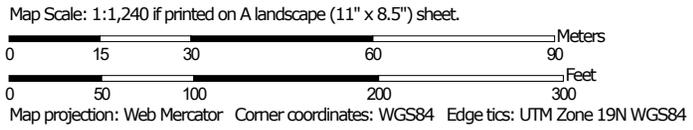
Primary OutFlow Max=0.51 cfs @ 12.20 hrs HW=39.49' (Free Discharge)
 ↑2=**Broad-Crested Rectangular Weir** (Weir Controls 0.51 cfs @ 0.90 fps)

**SUPPLEMENTAL
INFORMATION**

Soil Map—Norfolk and Suffolk Counties, Massachusetts, and Plymouth County, Massachusetts



Soil Map may not be valid at this scale.



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 scales ranging from 1:12,000 to 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 19, Sep 10, 2023

Soil Survey Area: Plymouth County, Massachusetts

Survey Area Data: Version 16, Sep 10, 2023

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: May 22, 2022—Jun 5, 2022

MAP LEGEND

MAP INFORMATION

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
104C	Hollis-Rock outcrop-Charlton complex, 0 to 15 percent slopes	0.1	1.2%
Subtotals for Soil Survey Area		0.1	1.2%
Totals for Area of Interest		7.4	100.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
66A	Ipswich - Pawcatuck - Matunuck complex, 0 to 2 percent slopes, very frequently flooded	0.5	6.9%
111C	Chatfield-Rock outcrop-Canton complex, 8 to 15 percent slopes, very stony	6.8	91.9%
Subtotals for Soil Survey Area		7.3	98.8%
Totals for Area of Interest		7.4	100.0%

Plymouth County, Massachusetts

111C—Chatfield-Rock outcrop-Canton complex, 8 to 15 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2w82v

Elevation: 0 to 230 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

Chatfield, very stony, and similar soils: 40 percent

Rock outcrop: 25 percent

Canton, very stony, and similar soils: 20 percent

Minor components: 15 percent

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

Description of Chatfield, Very 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 1 inches: slightly decomposed plant material

A - 1 to 2 inches: fine sandy loam

Bw - 2 to 30 inches: gravelly fine sandy loam

2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent

Surface area covered with cobbles, stones or boulders: 1.6 percent

Depth to restrictive feature: 20 to 41 inches to lithic bedrock

Drainage class: Well drained

Runoff class: 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 to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

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: 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

Hydric soil rating: No

Description of Canton, Very Stony

Setting

Landform: Moraines, hills, ridges

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Convex, linear

Across-slope shape: Convex

Parent material: Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material

A - 2 to 5 inches: fine sandy loam

Bw1 - 5 to 16 inches: fine sandy loam

Bw2 - 16 to 22 inches: gravelly fine sandy loam

2C - 22 to 67 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent

Surface area covered with cobbles, stones or boulders: 1.6 percent

Depth to restrictive feature: 19 to 39 inches to strongly contrasting textural stratification

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 to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

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

Minor Components

Newfields, very stony

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

Hollis, very 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

Data Source Information

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 19, Sep 10, 2023

Soil Survey Area: Plymouth County, Massachusetts
Survey Area Data: Version 16, Sep 10, 2023

SECTION VI

*LOCUS DEED
EASEMENT STATEMENT*

*** Electronic Recording ***
Doc#: 00082981
Bk: 58549 Pg: 105 Page: 1 of 4
Recorded: 12/21/2023 10:36 AM
ATTEST: John R. Buckley, Jr. Register
Plymouth County Registry of Deeds

After Recording Return To:
Gerry Rankin
210 Hull Street
Hingham, MA 02043

MASSACHUSETTS EXCISE TAX
Plymouth District ROD #11 001
Date: 12/21/2023 10:36 AM
Ctrl# 169968 31190
Fee: \$3,123.60 Cons: \$685,000.00

Quitclaim Deed

We, **Donald C. Lincoln and Brian D. Lincoln, Trustees of the Lincoln Family Irrevocable Trust dated March 6, 2014**, as evidenced by a Trustee Certificate recorded with the Plymouth County Registry of Deeds as Book 44359 Page 226 for consideration paid and in full consideration of **SIX HUNDRED EIGHTY FIVE THOUSAND AND 00/100 DOLLARS (\$685,000.00)**, hereby grant to **210 Hull Street LLC, a Massachusetts limited liability company with an address of 41 Brewster Road, Hingham MA 02043 with QUITCLAIM COVENANTS:**

A certain parcel of land with the buildings situated on the Westerly side of Hull Street in Hingham, Plymouth County, Massachusetts, and being shown as Lot containing 2.56, more or less, acres on a Plan entitled "Compiled Plan of Land, Hull Street, Hingham, Massachusetts, prepared for Mrs. C. Warren Lincoln" dated February 17, 1967, Lewis W. Perkins & Son, Engineers, said plan recorded in the Plymouth Registry of Deeds in Book 03351, Page 528. Said lot being more particularly bounded and described as follows, according to said plan:

EASTERLY by Hull Street, one hundred seventeen and 73/100 (117.73)

NORTHERLY, WESTERLY by land now or formerly of Robert B. and Violet O'Quin by four courses,

NORTHERLY, EASTERLY forty-eight and 77/100 (48.77) feet, twenty-seven (27.00) feet, one hundred seventy-two and 30/100 (172.30) feet, and eighty three (83.00) feet respectively; .

NORTHEASTERLY by land now or formerly of Dwight L. and Katherin E. Mayo, one hundred thirty-five (135.00) feet, more or less;

NORTHWESTERLY by land now or formerly of Robert A. Batson et al by varying courses, two hundred thirty-five (235.00) feet, more or less;

SOUTHWESTERLY by land now or formerly of Charles H. Rines, Jr. and Edith M. Rines, fifty-five (55.00) feet;

NORTHWESTERLY by land now or formerly of said Rines and land of Mary E. and Lawrence F. Gilbert, one hundred thirteen and 07/100 (113.07) feet;

SOUTHWESTERLY of land now or formerly of said Gilbert and land now or formerly of Louis Infusino, one hundred fifteen and 50/100 (115.50) feet;

SOUTHERLY by land now or formerly James M. and Helen E. Downey and land of Kenneth E. Boden by two courses, twenty-eight and 88/100 (28.88) feet and three hundred ninety-two and 58/100 (392.58) feet; and

SOUTHEASTERLY of land of said Boden fifty-seven and 48/100 (57.48) feet.

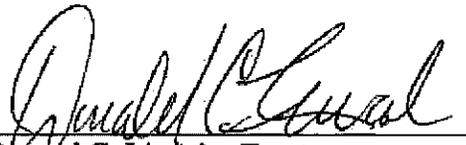
Subject to and together with any and all easements, restrictions and conditions of record insofar as now in force and applicable.

For Grantor's title, see deed dated March 6, 2014 and recorded on August 25, 2014, in the Plymouth County Registry of Deeds at Book 44672, Page 270.

We, the Grantors named herein, do hereby voluntarily release any and all rights of homestead, if any, as set forth in M.G.L. Chapter 188, and state under the pains and penalties of perjury that there are no other persons or person entitled to any homestead rights.

Executed under seal this 19th day of SEPTEMBER, 2023.

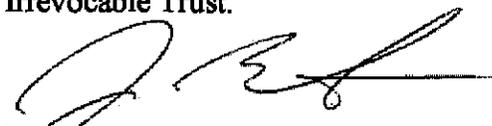
Lincoln Family Irrevocable Trust

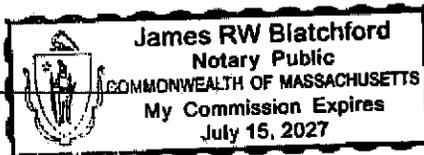
By: 
Donald C. Lincoln, Trustee

COMMONWEALTH OF MASSACHUSETTS

COUNTY OF Essex

On this 19 day of September, 2023, before me, the undersigned notary public, personally appeared the above-named, Donald C. Lincoln, Trustee of the Lincoln Family Irrevocable Trust u/d/t dated March 6, 2014, proved to me through satisfactory evidence of identification, which was/were Mass Drivers License, to be the person(s) who signed the preceding or attached document in my presence, and acknowledged to me that he/she/they signed it voluntarily for its stated purpose, as Trustee of the Lincoln Family Irrevocable Trust.

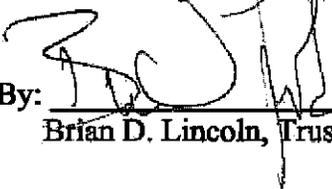

Notary Public Signature



My Commission Expires: 7/15/27

Executed under seal this 20th day of September 2023.

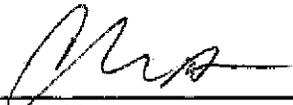
Lincoln Family Irrevocable Trust

By: 
Brian D. Lincoln, Trustee

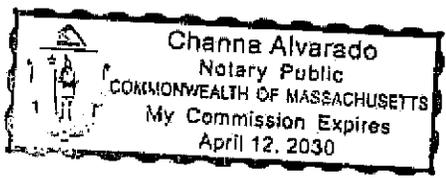
COMMONWEALTH OF MASSACHUSETTS

COUNTY OF Essex

On this 20 day of September, 2023, before me, the undersigned notary public, personally appeared the above-named, Brian D. Lincoln, Trustee of the Lincoln Family Irrevocable Trust u/d/t dated March 6, 2014, proved to me through satisfactory evidence of identification, which was/were drivers license, to be the person(s) who signed the preceding or attached document in my presence, and acknowledged to me that he/she/they signed it voluntarily for its stated purpose, as Trustee of the Lincoln Family Irrevocable Trust.


Notary Public Signature

My Commission Expires: April 12 2030



MASSACHUSETTS EXCISE TAX
Plymouth District ROD #11 001
Date: 08/22/2024 12:08 PM
Ctrl#
Fee: \$.00 Cons: \$1.00

QUITCLAIM DEED

Thomas Roby and Alisha Roby, a married couple, of 301 Rockland Street Hingham, MA 02043, for nominal consideration of less than One Hundred Dollars (\$100.00), the receipt and sufficiency of which is hereby acknowledged, grants to 210 Hull Street LLC, a Massachusetts limited liability company with a principal place of business located at 41 Brewster Road Hingham, MA 02043,

With quitclaim covenants,

A certain parcel of land situated in Hingham, Plymouth County, MA, described as follows:

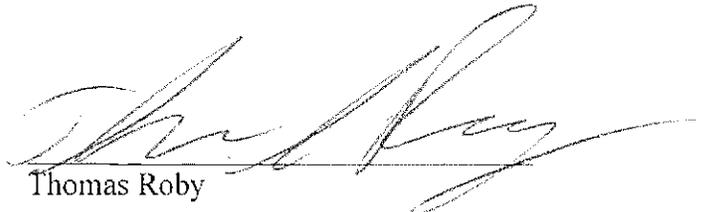
Parcel C as shown on "Plan of Land Assessor's Parcels 23-10 & 33-7 311 Rockland Street and 210 Hull Street Hingham, Massachusetts Prepared for Rankin Residential by Merrill Engineering dated March 26, 2024 and recorded with the Plymouth County Registry of Deeds as Plan Book 67, Page 1080. Said Parcel "C" contains 4,410 square feet of land, more or less. Said Parcel "C" being a portion of the premises known as and numbered 311 Rockland Street Hingham, MA as more particularly described as Parcel 2 in a deed dated December 21, 2018 and recorded with the Plymouth County Registry of Deeds in Book 50662 Page 258.

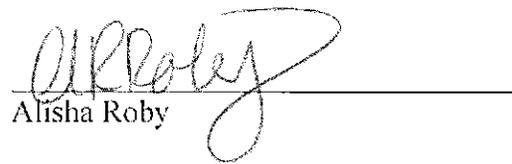
Being a portion of Parcel 2 as described in the deed dated December 21, 2018 and recorded with the Plymouth County Registry of Deeds in Book 50662, Page 258.

Grantors hereby release any and all rights of Homestead. Grantors further state under pains and penalties of perjury that no other person or entity is entitled to claim a Homestead in said property other than those executing this deed.

Property Address: Parcel C, 311 Rockland Street Hingham, MA

WITNESS our hands and seals this 10th day of July, 2024.

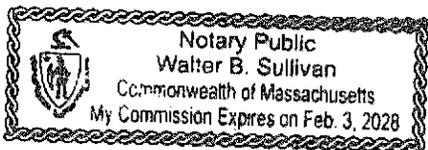

Thomas Roby


Alisha Roby

COMMONWEALTH OF MASSACHUSETTS

PLYMOUTH, SS

On this 10th day of July, 2024, before me, the undersigned notary public, personally appeared Thomas Roby, and proved to me through satisfactory evidence of identification, which was a MA Driver's License, to be the person whose name is signed on the within document, and acknowledged to me that he signed it voluntarily for its stated purpose.



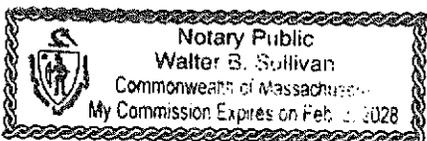

Notary Public

My Commission Expires: _____

COMMONWEALTH OF MASSACHUSETTS

PLYMOUTH, SS

On this 15th day of July, 2024, before me, the undersigned notary public, personally appeared Alisha Roby, and proved to me through satisfactory evidence of identification, which was a MA Driver's License, to be the person whose name is signed on the within document, and acknowledged to me that she signed it voluntarily for its stated purpose.




Notary Public

My Commission Expires: _____

Easement Statement

There are no proposed or known existing **stormwater** easements on the locus site.

SECTION VII

*PROJECT PLANS
SEE ATTACHED*