

City of Newburyport Planning Board
Application for SITE PLAN REVIEW


Applicant: Low Street Redevelopment LLC, Bernie Chistopher
Address: 231 Sutton Street, Suite 1-B
North Andover, MA 08145
Phone: 978-423-7286

Property Address: 255 R Low Street
Assessor's Map and Lot(s): 109 5C Zoning District: B1
Book and Page(s) or Cert.#: Bk 34532 Pg 79

Type of Project: Major Minor
Brief description of request: 42 New parking spaces in support of the existing Maritime
Medical Office Building.

Engineer: Winter GEC LLC , Stephen B Sawyer
Address: 34 Winter Street
Newburyport, MA 01950
Phone: 978-884-6850

Owner: Low Street Redevelopment LLC
Address: 231 Sutton Street, Suite 1-B
North Andover, MA 08145
Phone: 978-423-7286

Owner's Signature:  MANAGER

BERNARD CHRISTOPHER, JR.
29 DUMPLING COVE
NEWINGTON, NH 03801

53-7150/2113

5364

DATE 10/25/17



PAY TO THE ORDER OF

City of Newburyport \$ 350.⁰⁰
Three hundred + Fifty - ⁰⁰ DOLLARS



MEMO 255 Low St. (rear)

[Handwritten Signature]

⑆ 211371502⑆ 0942 297 3⑈ 5364

GRAYSTONE

BERNARD CHRISTOPHER, JR.
29 DUMPLING COVE
NEWINGTON, NH 03801

53-7150/2113

5363

DATE 10/25/17



PAY TO THE ORDER OF

City of Newburyport \$ 500.⁰⁰
Five hundred - ⁰⁰ DOLLARS



MEMO 255 Low St. (rear)

[Handwritten Signature]

⑆ 211371502⑆ 0942 297 3⑈ 5363

GRAYSTONE

ZONING DENIAL

City APR#: 77

Name: 255 Low St. LLC / Wmnet GEC

Address: 255 Low St. Zoning District: B-1

Request: Create an additional (41) Parking Space Parking lot for existing medical building

ZONING BOARD

Dimensional Variance

- Dimensional Controls (VI)
Lot Area, Lot Coverage, Lot Frontage, Open Space, Front Yard, Height, Side Yard, Lot Width, Rear Yard

- PIOD (XXI)
FAR, 2 1/2 stories

- Parking (VII)

Use Variance

- Not permitted use (V)

- Sign Location/Replacement (VIII)

Special Permit

- Special Permit for Use (V.D), Spacing (VI.D), In-Law Apartment (XIIA), Bonus Provisions for Multifamily Developments (XVI), Personal Wireless Communication Services (XX), Demolition Control Overlay District (XXVIII), Wind Energy Conversion Facilities (XXVI)

Special Permit for Non-Conformities

- Extension or Alteration (IX.B.2)
Parking, Rear Yard, Upward Extension, Lot Coverage, Open Space, Side Yard, Height, Lot Frontage, Lot Area, Front Yard
Over 500 s.f. increase (IX.B.3.c)
Plum Island Overlay District (XXI-G-3)
FAR, Footprint Expansion, Height Increase

PLANNING BOARD

Special Permit

- One residential structure per lot (VI.C), Floodplain (XIII), Open Space Residential Development (XIV), Water Resource Protection District (XIX), Federal Street Overlay District (XXII), Courts and Lanes (XXIII), Waterfront West Overlay District (XXIV), Towle Complex Redev. Overlay District (XXV), Downtown Overlay District (XXVII)

Site Plan Review (XV)

- Major, Minor

CITY COUNCIL

- GACM (X.H.9), Other:

CONSERVATION COMMISSION

HISTORICAL COMMISSION - Demolition Delay

11/7/17 Date

[Signature] Building Commissioner/Zoning Code Enf. Officer

November 6, 2017

Peter Binette, Building Commissioner
Newburyport City Hall
60 Pleasant Street
Newburyport, Massachusetts 01950

RE: Major Site Plan Review
255 Rear Low Street
Newburyport, Massachusetts

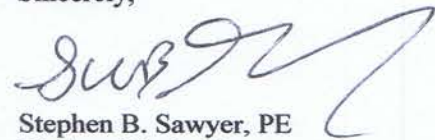
Dear Peter:

On behalf of 255 Low Street LLC, Winer GEC has prepared this letter regarding the construction of a new parking lot in the Business 1 District. We have included a proposed site plan of the proposed building and parking layout.

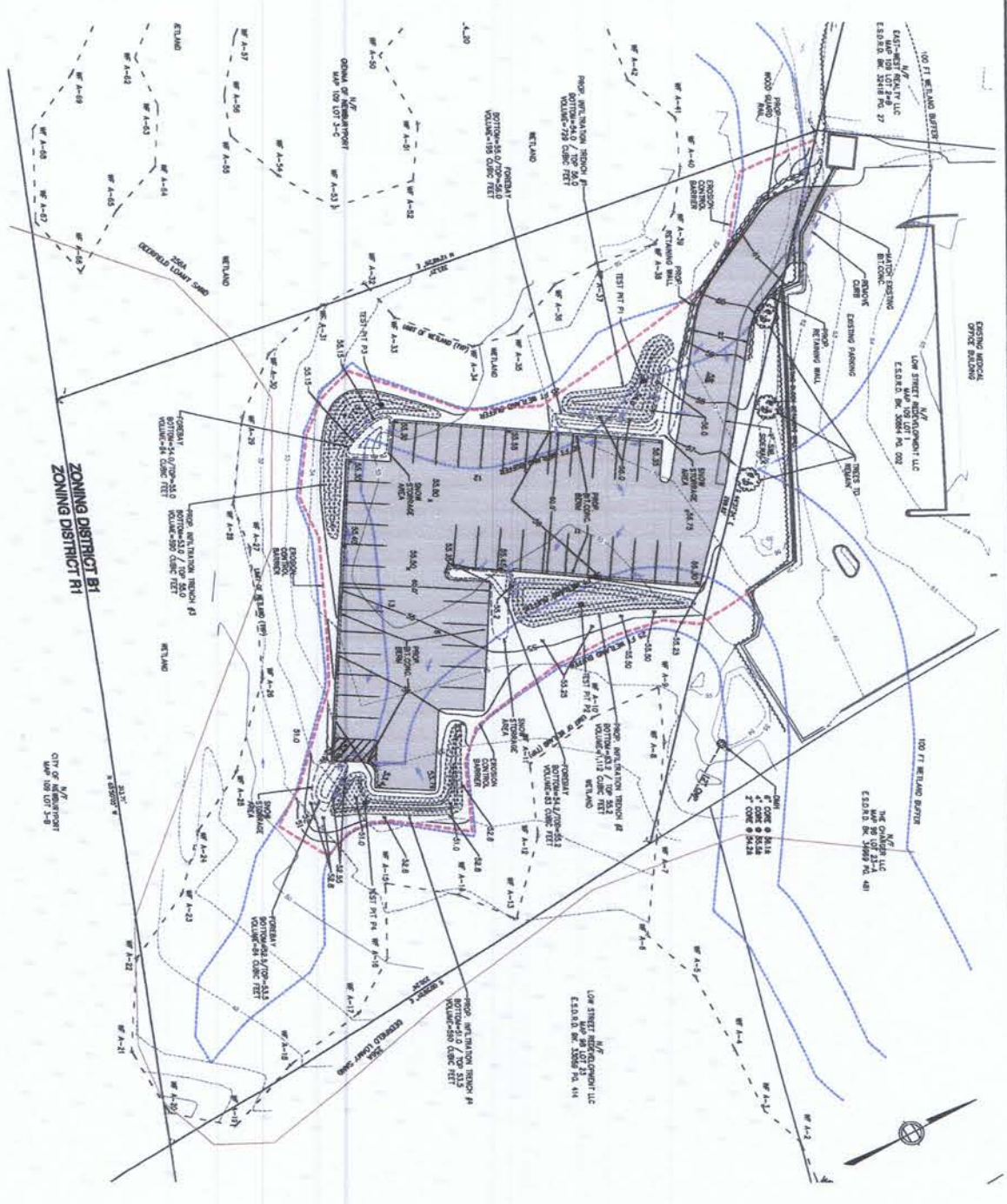
Based on our review of the City of Newburyport Zoning Ordinance we believe the addition of the new 41 parking spaces behind the Maritime Medical Building requires Major Site Plan Review in accordance with Section XV-C of the City of Newburyport Zoning Ordinance.

If you have any further questions or comments please contact me. Thank you in advance for your time and assistance.

Sincerely,



Stephen B. Sawyer, PE
Director of Engineering



EXISTING WETLANDS / PROPOSED WETLANDS SUMMARY TABLE

Field	Perch	Wooded	Water	Shrub	Open	Total
Area (sq ft)	1,200	2,500	1,000	800	500	6,000
Volume (cu ft)	150	300	120	100	60	730
Perch (sq ft)	1,200	2,500	1,000	800	500	6,000
Wooded (sq ft)		2,500				2,500
Water (sq ft)			1,000			1,000
Shrub (sq ft)				800		800
Open (sq ft)					500	500

- TEST PIT LOGS**
- TEST PIT #1: 0'-1" FINE, MED SAND
 - TEST PIT #2: 0'-1" FINE, MED SAND
 - TEST PIT #3: 0'-1" FINE, MED SAND
 - TEST PIT #4: 0'-1" FINE, MED SAND
 - TEST PIT #5: 0'-1" FINE, MED SAND
 - TEST PIT #6: 0'-1" FINE, MED SAND
 - TEST PIT #7: 0'-1" FINE, MED SAND
 - TEST PIT #8: 0'-1" FINE, MED SAND
 - TEST PIT #9: 0'-1" FINE, MED SAND
 - TEST PIT #10: 0'-1" FINE, MED SAND

NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF NEWBURYPORT ZONING ORDINANCES AND REGULATIONS.

2. THE PROPOSED WETLANDS ARE SHOWN ON THIS PLAN AS A RESULT OF AN ON-SITE SURVEY CONDUCTED ON 10/15/17. THE LOCATION AND BOUNDARIES OF THE WETLANDS ARE BASED ON THE SURVEY DATA AND FIELD OBSERVATIONS.

3. THE PROPOSED PAVEMENT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF NEWBURYPORT SPECIFICATIONS FOR PAVEMENT.

4. THE PROPOSED WETLANDS SHALL BE RESTORED TO ORIGINAL OR BETTER CONDITION AFTER CONSTRUCTION IS COMPLETED.

5. THE PROPOSED WETLANDS SHALL BE MONITORED AND MAINTAINED ON A REGULAR BASIS.

6. THE PROPOSED WETLANDS SHALL BE PROTECTED FROM ALL CONSTRUCTION AND DEVELOPMENT ACTIVITIES.

7. THE PROPOSED WETLANDS SHALL BE RESTORED TO ORIGINAL OR BETTER CONDITION AFTER CONSTRUCTION IS COMPLETED.

8. THE PROPOSED WETLANDS SHALL BE MONITORED AND MAINTAINED ON A REGULAR BASIS.

9. THE PROPOSED WETLANDS SHALL BE PROTECTED FROM ALL CONSTRUCTION AND DEVELOPMENT ACTIVITIES.

10. THE PROPOSED WETLANDS SHALL BE RESTORED TO ORIGINAL OR BETTER CONDITION AFTER CONSTRUCTION IS COMPLETED.

LOCAL TITLE INFORMATION

21 STONEY ARCADE
 OWNER: DENNA OF NEWBURYPORT, LLC
 DEED REFERENCE: BOOK 3433 PAGE 79
 ADDRESS: MAP 103 LOTS 30

SCALE
 1" = 50'

PROJECT NO. 2017-000004
DATE: OCT. 15, 2017
SHEET NO. 1 OF 2

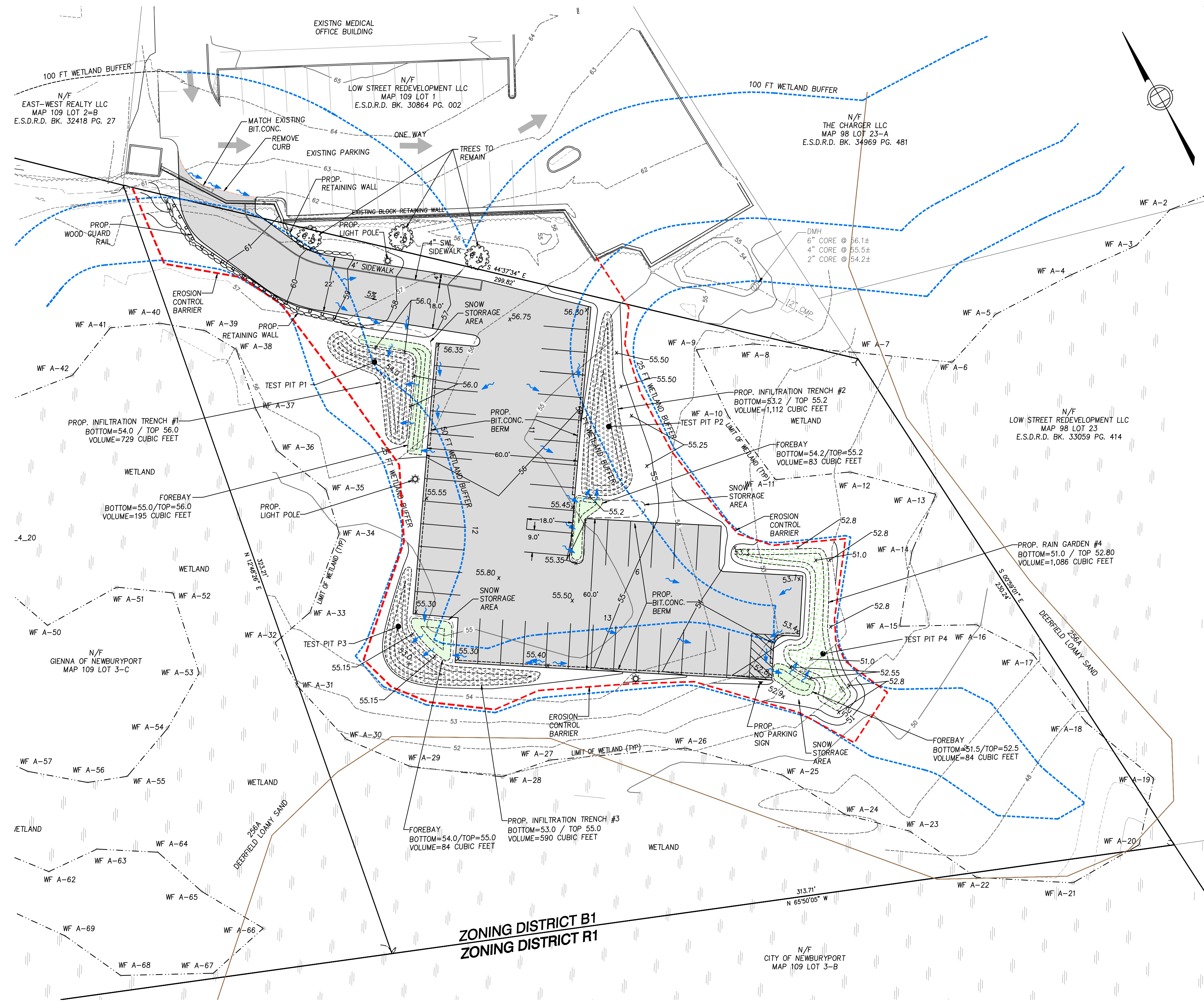
Copyright 2017, DENNA OF NEWBURYPORT, LLC

Wininger GEC, LLC
 25 WINDY STREET
 NEWBURYPORT, MA 01850
 TEL: 978-546-0000

SCALE	DATE	BY	FIELD	DATE	BY
HORIZ. 1" = 50'			DATE	BY	
VERT. 1" = 5'			CHECKED	DATE	
			APPROVED	DATE	

PROPOSED SITE PLAN
255 LOW STREET (REAR)

PLAN OF LAND IN
NEWBURYPORT, MASSACHUSETTS
 PREPARED FOR
LOW STREET REDEVELOPMENT LLC



INFILTRATION TRENCH VOLUME SUMMARY TABLE

	Total Pavement Area (SF)	Forebay Volume 0.1" Required (CF)	Forebay Volume Provided (CF)	Water Quality Volume 1/2" Required (CF)	Water Quality Volume Provided (CF)
INF.TRENCH 1	2487	21	195	104	729
INF.TRENCH 2	5096	42	83	212	1112
INF.TRENCH 3	3314	28	110	138	732
RAIN GARDEN 4	4644	39	84	194	1356

TEST PIT LOGS

- TEST PIT P1**
C LAYER - 23"-43" LOAMY SAND
ESHGW-42"
- TEST PIT P2**
C LAYER - 16"-46" LOAMY SAND
ESHGW - 40"
- TEST PIT P3**
C LAYER - 17"-42" LAOMY SAND
ESHGW-39"
- TEST PIT P4**
C LAYER 20"-40" SANDY LOAM
ESHGW-27"

NOTES

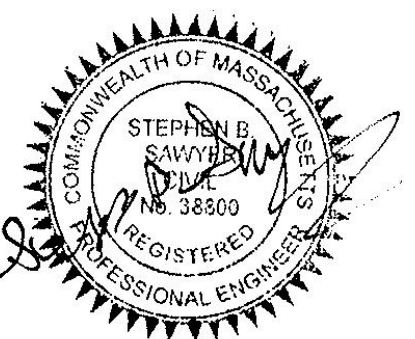
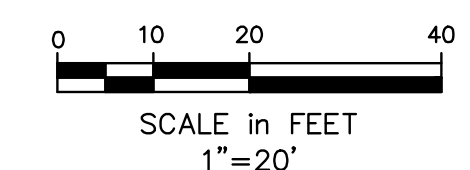
THE EXSITING CONDITIONS ON THE LOT AND IS THE RESULT OF AN ON-THE-GROUND INSTRUMENT SURVEY PERFORMED JULY 19, 2017 THROUGH AUGUST 21, 2017. OWNERSHIP INFORMATION USED IN THE PREPARATION OF THIS PLAN WAS OBTAINED FROM THE CITY OF NEWBURYPORT ASSESSOR'S OFFICES.

ELEVATION DATUM IS NAVD 88.

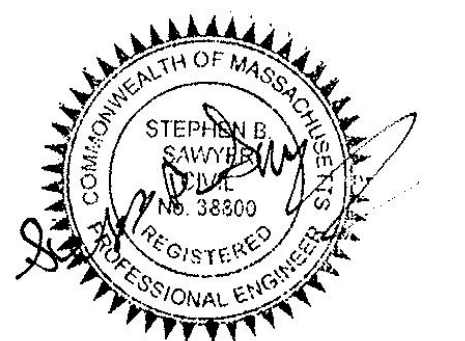
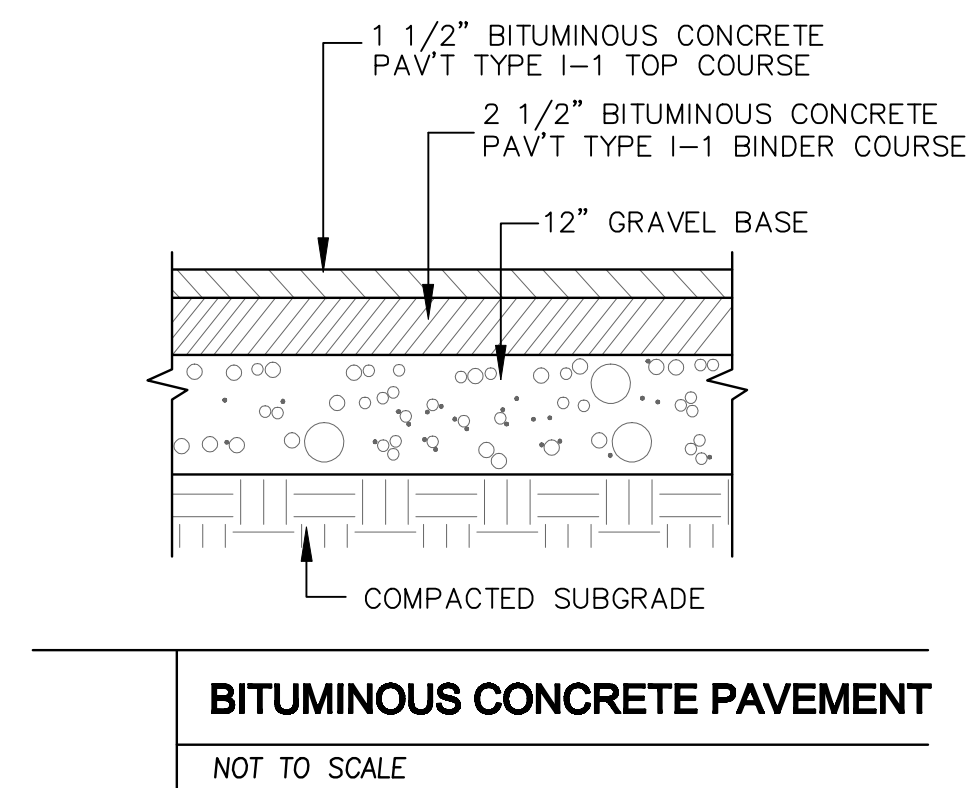
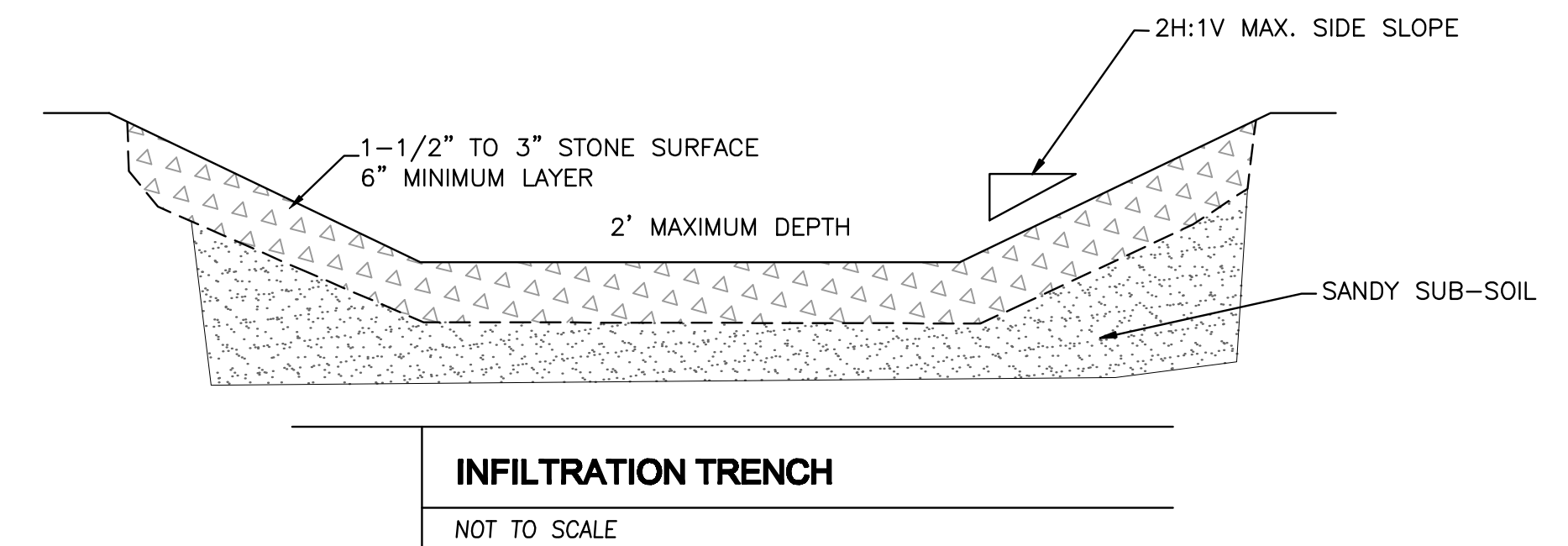
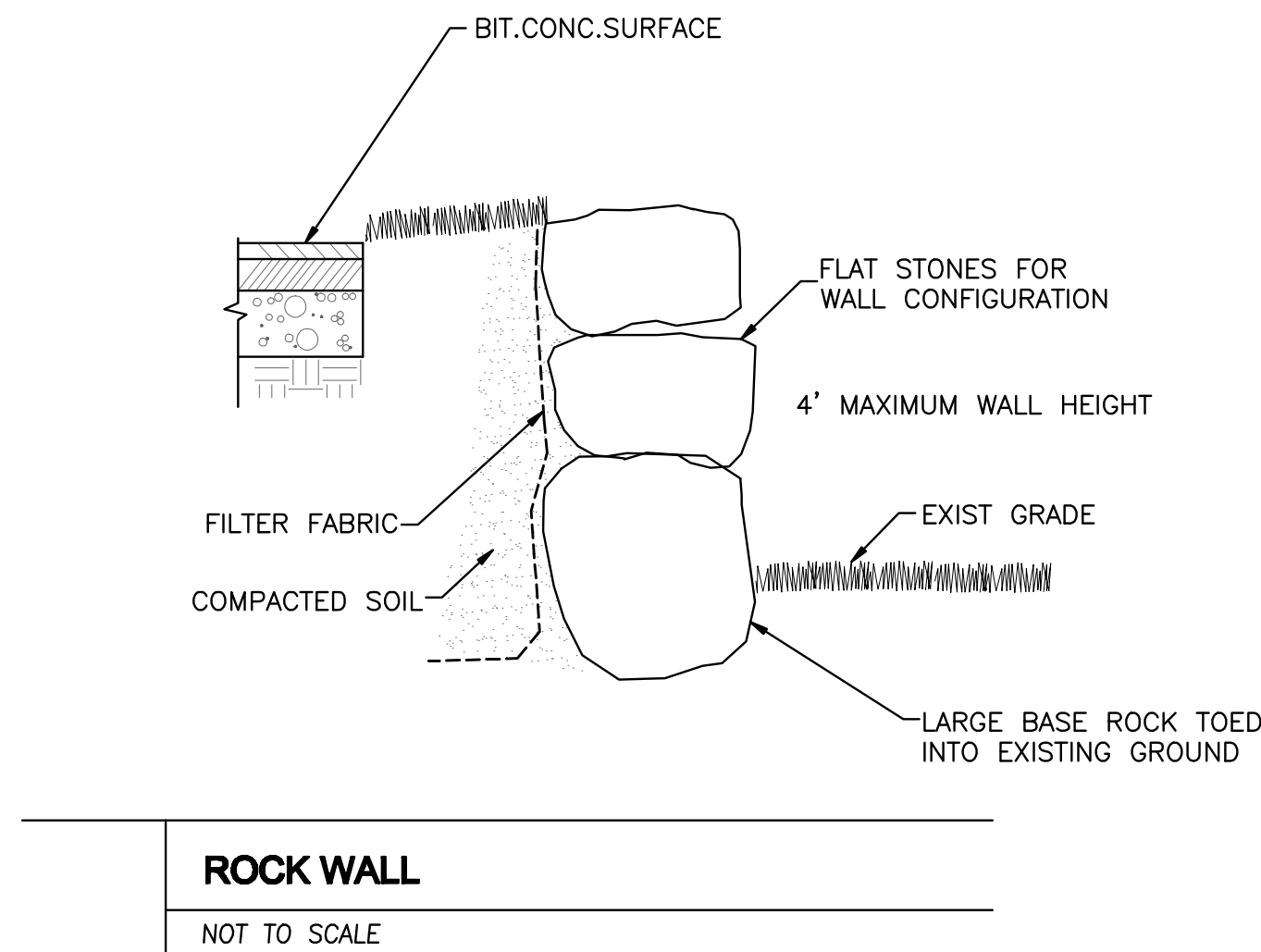
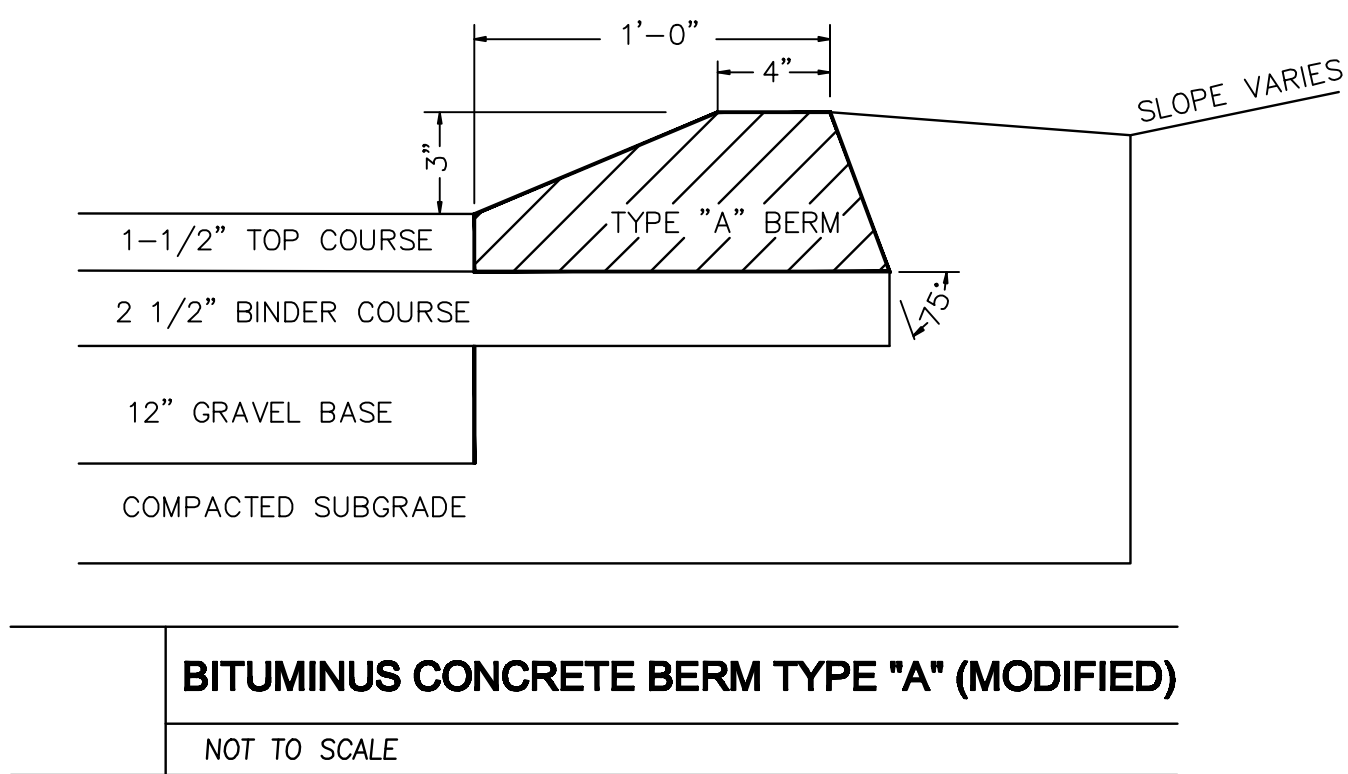
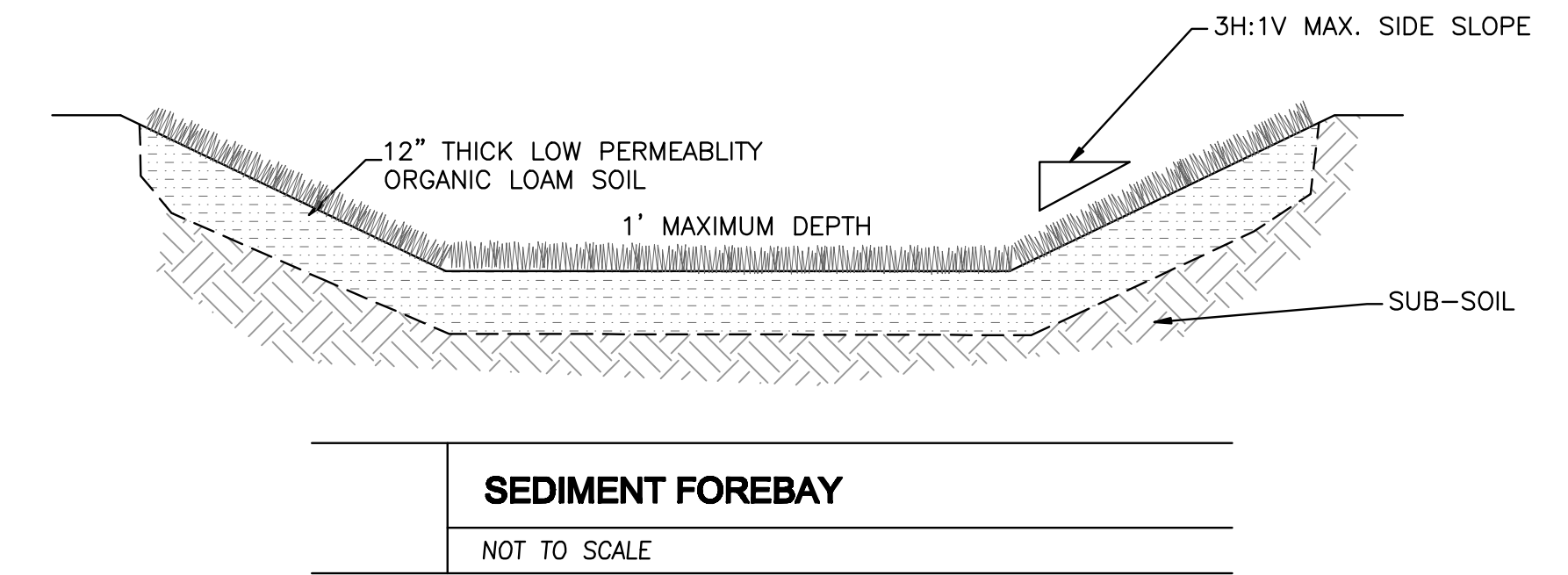
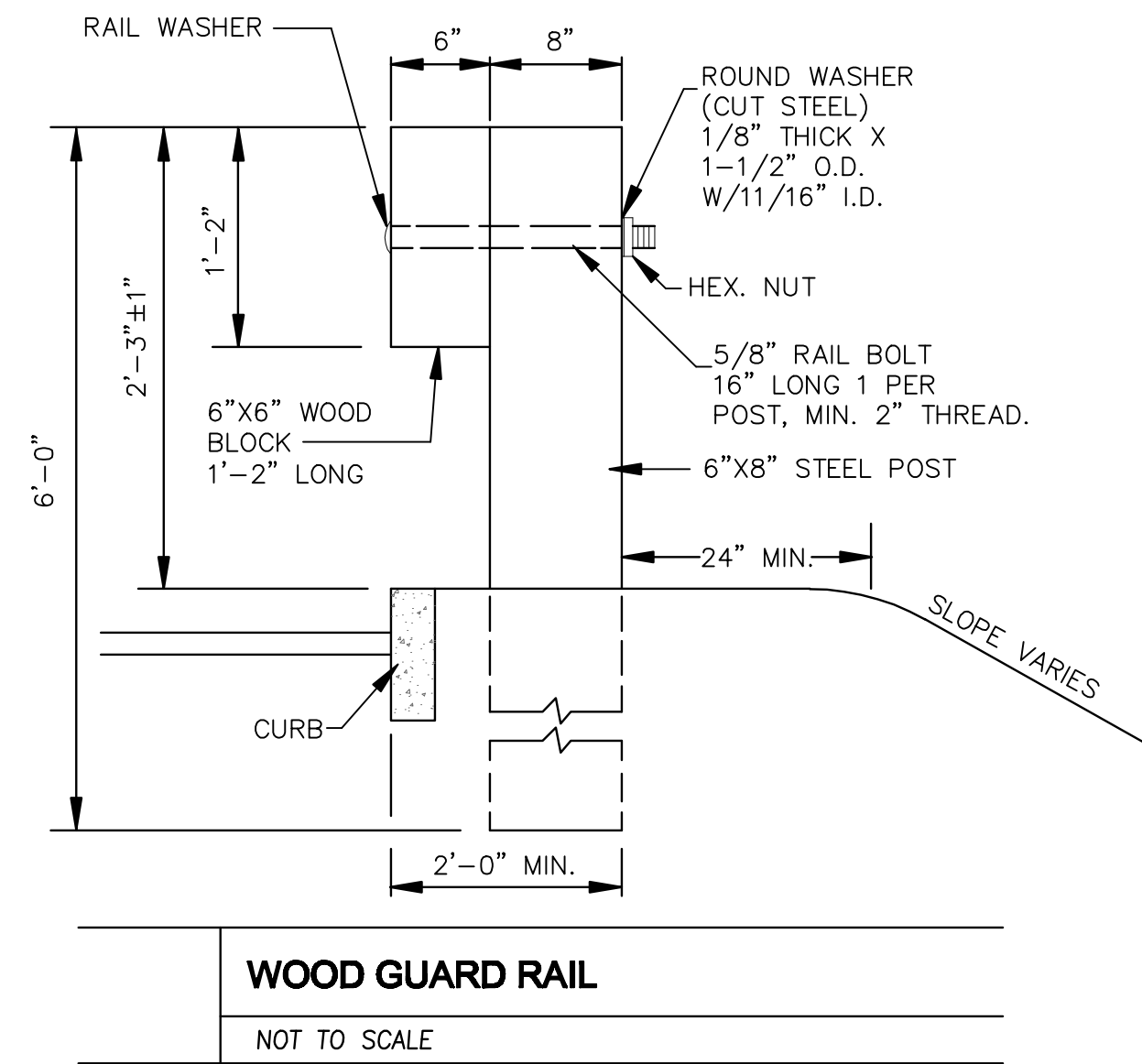
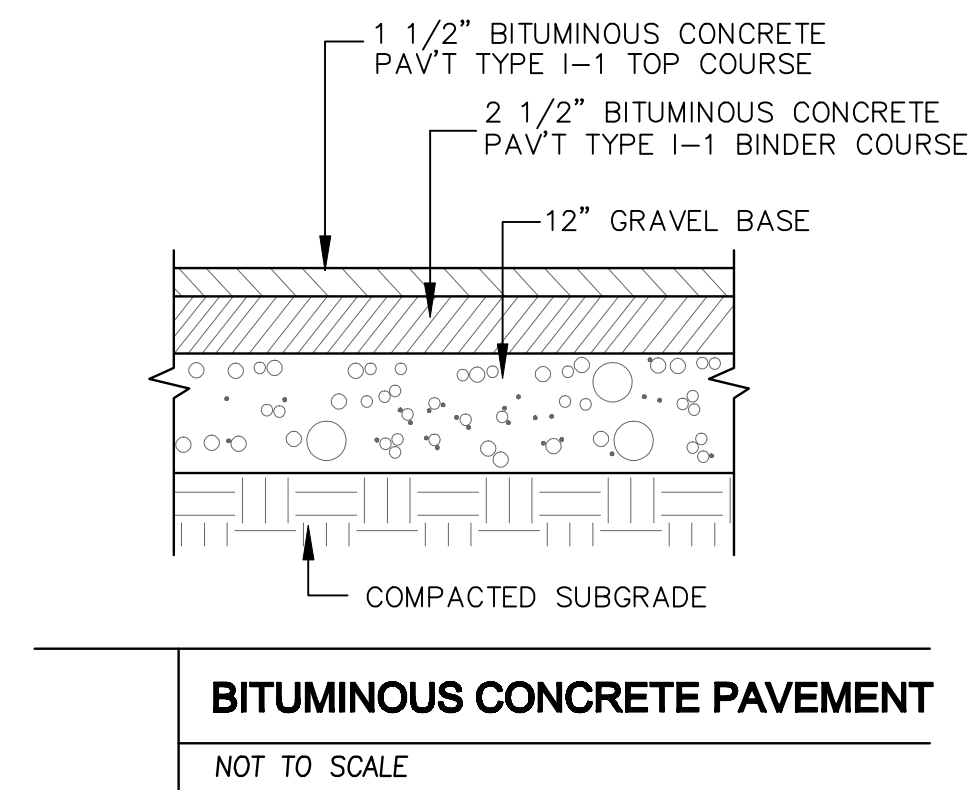
WETLAND DELINEATION DONE BY SEAKAMP ENVIRONMENTAL.

LOCUS TITLE INFORMATION

77 STOREY AVENUE
OWNER: GIENNA OF NEWBURYPORT, LLC
DEED REFERENCE: BOOK 34532 PAGE 79
ASSESSORS: MAP 109 LOTS 3C



<p>Winter GEC, LLC</p> <p>34 WINTER STREET NEWBURYPORT, MA 01950 978-270-8626</p>	<p>SCALE: HORIZ: 1" = 20' VERT: N.A.</p>	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>NO.</th> <th>DATE</th> <th>BY</th> <th>REVISIONS</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	NO.	DATE	BY	REVISIONS													<p>FIELD: <u>I.P.T.</u> CALCS: <u>I.P.T.</u> CHECKED: <u>SBS</u> APPROVED: <u>SBS</u></p>	<p>PROPOSED SITE PLAN</p>	<p>PLAN OF LAND IN NEWBURYPORT, MASSACHUSETTS PREPARED FOR LOW STREET REDEVELOPMENT LLC</p>	<p>PROJECT NO. 2017-MEDICAL</p>
			NO.	DATE	BY	REVISIONS																
<p>255 LOW STREET (REAR)</p>	<p>DATE: OCT. 19, 2017</p>	<p>SHEET NO. 1 OF 2</p>																				



Copyright 2017 Winter GEC, LLC

Winter GEC, LLC

34 WINTER STREET
NEWBURYPORT, MA 01950
978-270-8626

SCALE:			
HORIZ:	1" = 20'		
VERT:	N.A.		
NO.	DATE	BY	REVISIONS

FIELD:	T.P.T.
CALCS:	T.P.T.
CHECKED:	EJC
APPROVED:	EJC

CONSTRUCTION DETAILS

255 LOW STREET (REAR)

PLAN OF LAND IN
NEWBURYPORT, MASSACHUSETTS
PREPARED FOR
LOW STREET REDEVELOPMENT LLC

PROJECT NO.
2017-MEDICAL

DATE: OCT. 19, 2017

SHEET NO.

2 OF 2

PROJECT NARRATIVE AND STORMWATER ANALYSIS

255 Low Street (Rear)

Newburyport, MA

November 8, 2017

Submitted to:

Newburyport Planning Board & Conservation Commission

City Hall

60 Pleasant Street

Newburyport, MA 01950

Prepared For:

Low Street Redevelopment, LLC

231 Sutton Street

North Andover, MA 01845

Prepared By:

Winter GEC, LLC

34 Winter Street

Newburyport, MA 01950

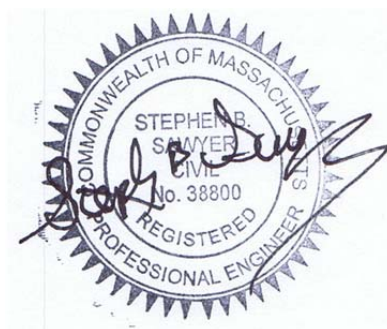


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Introduction

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Appendix D

Figure 1 – Pre & Post Development Drainage Areas

1. DEP Stormwater Checklist



Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



Stephen Sawyer

Oct. 19, 2017

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

- New development
- Redevelopment
- Mix of New Development and Redevelopment



Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- No disturbance to any Wetland Resource Areas
- Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- Reduced Impervious Area (Redevelopment Only)
- Minimizing disturbance to existing trees and shrubs
- LID Site Design Credit Requested:
 - Credit 1
 - Credit 2
 - Credit 3
- Use of "country drainage" versus curb and gutter conveyance and pipe
- Bioretention Cells (includes Rain Gardens)
- Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- Treebox Filter
- Water Quality Swale
- Grass Channel
- Green Roof
- Other (describe): Infiltration Trench with Sediment Forebay

Standard 1: No New Untreated Discharges

- No new untreated discharges
- Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.



Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

- Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.
- Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.
- Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

- Soil Analysis provided.
- Required Recharge Volume calculation provided.
- Required Recharge volume reduced through use of the LID site Design Credits.
- Sizing the infiltration, BMPs is based on the following method: Check the method used.
 - Static
 - Simple Dynamic
 - Dynamic Field¹
- Runoff from all impervious areas at the site discharging to the infiltration BMP.
- Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.
- Recharge BMPs have been sized to infiltrate the Required Recharge Volume.
- Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:
 - Site is comprised solely of C and D soils and/or bedrock at the land surface
 - M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
 - Solid Waste Landfill pursuant to 310 CMR 19.000
 - Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.
- Calculations showing that the infiltration BMPs will drain in 72 hours are provided.
- Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

¹ 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.



Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

- The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.
- Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
 - Provisions for storing materials and waste products inside or under cover;
 - Vehicle washing controls;
 - Requirements for routine inspections and maintenance of stormwater BMPs;
 - Spill prevention and response plans;
 - Provisions for maintenance of lawns, gardens, and other landscaped areas;
 - Requirements for storage and use of fertilizers, herbicides, and pesticides;
 - Pet waste management provisions;
 - Provisions for operation and management of septic systems;
 - Provisions for solid waste management;
 - Snow disposal and plowing plans relative to Wetland Resource Areas;
 - Winter Road Salt and/or Sand Use and Storage restrictions;
 - Street sweeping schedules;
 - Provisions for prevention of illicit discharges to the stormwater management system;
 - Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
 - Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
 - List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.
- A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
 - Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:
 - is within the Zone II or Interim Wellhead Protection Area
 - is near or to other critical areas
 - is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
 - involves runoff from land uses with higher potential pollutant loads.
 - The Required Water Quality Volume is reduced through use of the LID site Design Credits.
 - Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.



Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

- The BMP is sized (and calculations provided) based on:
 - The ½" or 1" Water Quality Volume or
 - The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.
- The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.
- A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

- The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.
- The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted **prior to** the discharge of stormwater to the post-construction stormwater BMPs.
- The NPDES Multi-Sector General Permit does **not** cover the land use.
- LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.
- All exposure has been eliminated.
- All exposure has **not** been eliminated and all BMPs selected are on MassDEP LUHPPL list.
- The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

- The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.
- Critical areas and BMPs are identified in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

- The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:
 - Limited Project
 - Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
 - Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
 - Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
 - Bike Path and/or Foot Path
 - Redevelopment Project
 - Redevelopment portion of mix of new and redevelopment.
- Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.
- The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

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

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
 - Construction Period Operation and Maintenance Plan;
 - Names of Persons or Entity Responsible for Plan Compliance;
 - Construction Period Pollution Prevention Measures;
 - Erosion and Sedimentation Control Plan Drawings;
 - Detail drawings and specifications for erosion control BMPs, including sizing calculations;
 - Vegetation Planning;
 - Site Development Plan;
 - Construction Sequencing Plan;
 - Sequencing of Erosion and Sedimentation Controls;
 - Operation and Maintenance of Erosion and Sedimentation Controls;
 - Inspection Schedule;
 - Maintenance Schedule;
 - Inspection and Maintenance Log Form.
- A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

- The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has **not** been included in the Stormwater Report but will be submitted **before** land disturbance begins.
- The project is **not** covered by a NPDES Construction General Permit.
- The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

- The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
 - Name of the stormwater management system owners;
 - Party responsible for operation and maintenance;
 - Schedule for implementation of routine and non-routine maintenance tasks;
 - Plan showing the location of all stormwater BMPs maintenance access areas;
 - Description and delineation of public safety features;
 - Estimated operation and maintenance budget; and
 - Operation and Maintenance Log Form.
- The responsible party is **not** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
 - A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
 - A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

- The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- An Illicit Discharge Compliance Statement is attached;
- NO Illicit Discharge Compliance Statement is attached but will be submitted **prior to** the discharge of any stormwater to post-construction BMPs.

2. Project Overview

Introduction

This project proposes to build a 15,000 square foot 42 space parking lot in support of the Medical Office Building located at 255 Low Street. The parcel is currently vacant consisting of woodland and brush. The new parking lot will be accessed from the Medical Office Building parking lot.

Existing Conditions

The existing site is comprised of City of Newburyport Assessors tax map, Map 109 Lot 5C in the B1 zoning district. The parcel is 73,526 square feet with 21,616 square feet of bordering vegetated wetland. The parcel is wooded and brush with elevations on the property ranging from 57 to 46 based upon the datum NAVD 1988.

The project site is undeveloped wooded with 21,616 bordering vegetated wetland. Wetland lines have been delineated by Seekamp Environmental Services and were located on July and August, 2017.

The existing stormwater surface drainage runoff flows southerly across the parcel and eventually off the property at the southern corner of the property. The drainage flow line is shown on the existing drainage area figure. The soils on site consist of Deerfield loamy fine sand, hydrologic group A. See Appendix A for NCRS soil information and soil information on the site plan.

Project Description

The proposed development will consist of a 15,000 square feet of new bituminous concrete parking area with access from the existing Medical Office Building located north of the site. A small wall, 3 feet maximum height is required for the access ramp from the parking lot located on 255 Low Street down to new parking lot. Concurrent with this Notice of Intent application the project will be permitted before the Newburyport Planning Board with Major Site Plan review. A stormwater system is proposed for the new development that includes three infiltration trenches and one rain garden. The proposed stormwater system will mitigate peak runoff rates for the 2 and 10 year storm events along with providing a minimum of 80% total suspended solids removal.

3. Stormwater Management

Introduction

The current site consists of one subcatchment area. The total area being analyzed is 30,633 square feet. The existing and proposed area being analyzed consists of wooded upland area up gradient of the 25' buffer line. The entire existing land surface is pervious.

According to the USDA Soil Survey, the majority of on-site soils consist of Deerfield loamy sand with a Hydrologic Soil Group "A".

An on-site soil assessment at the stormwater management areas in conformance with Volume 3, Chapter 1 of the Massachusetts Stormwater Handbook was performed in October, 2017. This

assessment indicated about 12" of loam topsoil over subsoil consisting of naturally occurring fine to medium sands. Groundwater was not found in the hand dug test holes down to 36 to 40 inches.

The proposed project increases impervious areas; multiple BMP's will be implemented. With the use of these BMP's, the project will comply with the ten standards of the DEP Stormwater Handbook.

Consistency with the DEP Stormwater Management Policy

The project is new development and therefore must meet all ten of the Stormwater Management Standards. Each of the standards of the DEP Stormwater Handbook and how the project meets or exceeds them is discussed below.

Standard 1 – Untreated Stormwater

Standard 1 states that *"No new stormwater conveyances (e.g. outfalls) will discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth."*

The proposed drainage system does not include new conveyances that discharge directly without pre-treatment. Several BMP's are proposed to treat stormwater and to prevent any erosion to the surrounding Resource Areas. Since no new conveyances will directly discharge untreated stormwater, the project meets this standard.

Standard 2 – Post Development Peak Discharge Rates

Standard 2 states that *"Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates."*

The site was analyzed under both the existing and proposed conditions to compare the pre and post development peak discharge rates at one design point leaving the property. The discharge point was analyzed to ensure that there is no impact on abutting properties as a result of the project. A detailed description of both the existing and proposed conditions hydrology is described below. A copy of the HydroCAD printouts for both existing and proposed conditions is included in Appendix B.

Existing Conditions Hydrology

The existing hydrology on site is in one subcatchment area. Subcatchments EX 1 flows from a high area flowing downgradient to the surrounding Bordering Vegetated Wetland. With small drainage area consisting of wooded surface area and drainage class "A" soils there is no runoff indicated from the property for the 2 and 10 year storm events.

Proposed Conditions Hydrology

The proposed drainage area is divided into four subcatchment areas directed to the four infiltration trenches. The trenches are very large in order to mitigate the new paved surface. There is a fifth subcatchment area around the new parking lot and the 25' no disturb buffer that will remain wooded

with no stormwater mitigation and allowed to runoff unchecked. All of the new paved areas will be directed to the new infiltration trenches.

Summary

The mitigation measures include four infiltration trenches. These mitigation measures result in a stormwater management system that meets the requirements of Standard 2. The project does not increase flow rate for 2 & 10 year design storm. While there is a slight increase in flow rate for the 100 year storm event the total storm volume is reduced. The calculations are based upon the rainfall rates in the City of Newburyport Drainage regulations. A summary of the pre and post development discharge rates is shown on Table 1 below.

Table 2: Existing and Proposed Peak Discharge Rate Comparison at Design Points

DESIGN POINT 1 – To Offsite

Design Point	2 Year Storm - (3.10 in)		10 Year Storm - (4.70 in)		100 Year Storm - (8.30 in)	
	Existing (cfs)	Proposed (cfs)	Existing (cfs)	Proposed (cfs)	Existing (cfs)	Proposed (cfs)
1	0	0	0	0	0.10	2.39

Since the proposed project is designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates for the 2 and 10 year storm events. There is a 2.29 CFS increase for the 100 year storm event. However the total storm volume is very small with an insignificant increase of 1,537 cubic feet for the 100 year event. Given the total 100 year storm event volume is 2,778 cubic feet and the receiving area is a very large and extensive woodland / wetland system, there is no measurable impact downstream for the 100 year event. Given the above analysis the project is in compliance with Standard 2.

Standard 3 – Recharge to Groundwater

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

The volume of the recharge system was calculated according to the Massachusetts Stormwater Handbook. The proposed site design increases impervious area by 15,887 square feet. For this

calculation, all impervious areas will be counted as being on Hydrologic Group A soils having a volume requirement of 0.6 inch of runoff inches multiply by the new area of impervious cover. **This gives a required recharge volume of 794 cubic feet. The sumps of the three infiltration trenches and rain garden provides 3,163 cubic feet of recharge volume. This volume exceeds the required amount and required to meet Standard 2.**

Standard 4 – Removal of 80% Total Suspended Solids (TSS)

Standard 4 states that “*Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This Standard is met when: (a) Suitable practices for source control and pollution prevention are identified in long-term pollution prevention plan, and thereafter implemented and maintained; (b) Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and (c) Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.*”

Removal of Total Suspended Solids (TSS) is proposed for the developed areas of the site. TSS removal is accomplished by the combination of the following structural and non-structural BMPs:

Below is a summary of each discharge point analyzed and the stormwater treatment provided. The TSS Removal worksheets are also provided in the section. There is a sediment fore bay providing pretreatment prior to entering each of the infiltration trenches/

Infiltration Trench #1 – The runoff to this basin is passed thru a sediment forebay prior to entering the Infiltration Trench. 80% TSS removal is provided for this drainage area. This area requires 1/2” water quality volume (WQV) over the new impervious surfaces. The total impervious surface contributing to this basin is 2,487 sf with a required WQV of 104 cubic feet. Trench #1 provides 792 cubic feet of water quality volume. The required pretreatment volume in the sediment forebay with 0.1” over impervious surface is 21 cubic feet and 195 cubic feet provided.

Infiltration Trench #2 – The runoff to this basin is passed thru a sediment forebay prior to entering the Infiltration Trench. 80% TSS removal is provided for this drainage area. This area requires 1/2” water quality volume (WQV) over the new impervious surfaces. The total impervious surface contributing to this basin is 5,096 sf with a required WQV of 212 cubic feet. Trench #2 provides 1,112 cubic feet of water quality volume. The required pretreatment volume in the sediment forebay with 0.1” over impervious surface is 42 cubic feet and 83 cubic feet provided.

Infiltration Trench #3 – The runoff to this basin is passed thru a sediment forebay prior to entering the Infiltration Trench. 80% TSS removal is provided for this drainage area. This area requires 1/2” water quality volume (WQV) over the new impervious surfaces. The total impervious surface contributing to this basin is 3,314 sf with a required WQV of 138 cubic feet. Trench #3 provides 732 cubic feet of water quality volume. The required pretreatment volume in the sediment forebay with 0.1” over impervious surface is 28 cubic feet and 110 cubic feet provided.

Rain Garden #4 – The runoff to this basin is passed thru a sediment forebay prior to entering the Infiltration Trench. 80% TSS removal is provided for this drainage area. This area requires 1/2” water quality volume (WQV) over the new impervious surfaces. The total impervious surface contributing to

this basin is 4,644 sf with a required WQV of 194 cubic feet. Rain Garden #4 provides 1,086 cubic feet of water quality volume. The required pretreatment volume in the sediment forebay with 0.1" over impervious surface is 39 cubic feet and 84 cubic feet provided.

Standard 5 – Land Uses with Higher Potential Pollutant Loads

Standard 5 states that *"For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook."*

The project use is not a Land Use with Higher Potential Pollutant Loads. Therefore, Standard 5 is not applicable to this project.

Standard 6 – Critical Areas

Standard 6 states that *"Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply and stormwater discharges near or to any other critical area require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas as provided in the Massachusetts Stormwater Handbook."*

The project's is not located in estimated habitat or any critical area.

Standard 7 - Redevelopment

Standard 7 states that *"A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5 and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions."*

The proposed project is in undeveloped area and therefore it does not meet the definition of a redevelopment, Standard 7 does not apply.

Standard 8 – Erosion and Sedimentation Controls

Standard 8 states that *"A plan to control construction related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented."*

A Stormwater Pollution Prevention Plan for the Project will be submitted prior to any land disturbance on the site.

Standard 9 – Operation and Maintenance Plans

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

A long-term operation and maintenance plan is included in Appendix C. The Plan includes provisions for Construction-Phase measures, as well as long term maintenance and inspections. Therefore the Project complies with Standard 9.

Standard 10 – Illicit Discharges to Drainage System

Standard 10 states: “All illicit discharges to the stormwater management system are prohibited.”

There are no known or suspected illicit discharges to the stormwater management system at the project site. Therefore the Project complies with Standard 10.

Appendix A

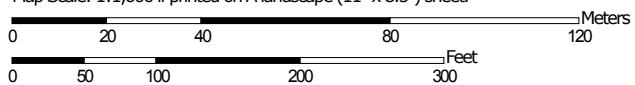
USDA NRCS Soil Map & Soil Descriptions

Soil Map—Essex County, Massachusetts, Northern Part



Soil Map may not be valid at this scale.

Map Scale: 1:1,600 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

Essex County, Massachusetts, Northern Part

256A—Deerfield loamy fine sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: vj7g

Elevation: 0 to 1,000 feet

Mean annual precipitation: 45 to 54 inches

Mean annual air temperature: 43 to 54 degrees F

Frost-free period: 145 to 240 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Deerfield and similar soils: 80 percent

Minor components: 20 percent

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

Description of Deerfield

Setting

Landform: Terraces

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Tread

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Loose sandy glaciofluvial deposits derived from granite and gneiss

Typical profile

H1 - 0 to 9 inches: loamy fine sand

H2 - 9 to 33 inches: loamy fine sand

H3 - 33 to 60 inches: stratified sand

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)

Depth to water table: About 12 to 36 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: A

Hydric soil rating: No

Minor Components

Windsor

Percent of map unit: 15 percent

Hydric soil rating: No

Wareham

Percent of map unit: 5 percent

Landform: Depressions

Hydric soil rating: Yes


Data Source Information

Soil Survey Area: Essex County, Massachusetts, Northern Part


Survey Area Data: Version 12, Sep 14, 2016


MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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: Essex County, Massachusetts, Northern Part

Survey Area Data: Version 12, Sep 14, 2016

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

Date(s) aerial images were photographed: Dec 31, 2009—Sep 12, 2016

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

Essex County, Massachusetts, Northern Part (MA605)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
6A	Scarboro mucky fine sandy loam, 0 to 3 percent slopes	1.5	15.5%
12A	Maybid silt loam, 0 to 3 percent slopes	0.3	3.3%
32A	Wareham loamy sand, 0 to 3 percent slopes	0.3	2.9%
255B	Windsor loamy sand, 3 to 8 percent slopes	3.0	30.6%
256A	Deerfield loamy fine sand, 0 to 3 percent slopes	4.3	43.8%
275B	Agawam fine sandy loam, 3 to 8 percent slopes	0.2	2.1%
651	Udorthents, smoothed	0.2	1.8%
Totals for Area of Interest		9.9	100.0%

TP17-1 DEEP OBSERVATION HOLE

255 Low Street, Newburyport, Massachusetts

Date: November 04, 2017 Time: 10:45 Weather: Partly cloudy, ~53°F, calm
 Position on landscape: Toeslope; tread Slope aspect: Southerly Land cover: Brush and trees; lightly wooded
 Property line: 10⁺ feet Drainage way: 50⁺ feet Drinking water well: 100⁺ feet
 Wetlands: 50⁺ feet Open water body: 400⁺ feet Neighboring septic system: 50⁺ feet
 Public water supply reservoir: 400⁺ feet Tributary to reservoir: 200⁺ feet
 Hydrologic Soil Group: A Drainage Class: Moderately well drained Soil Moisture Status: Damp
 Soil map unit: 256A – Deerfield loamy fine sand (sandy, mixed, mesic Aquic Udipsamments), 0-3% slopes
 Depth to bedrock: >43" Seasonal High Groundwater Table: 42" Apparent water table (weep): N.O.

SOIL PROFILE ► TP17-1

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (EarthColors)	Redoxomorphic Features from ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00 → 15"	A	Sandy Loam	10YR 3/2 very dark grayish brown	<i>none observed</i>	Very friable; moderate-grade fine-to-medium subangular granular structure; somewhat cohesive matrix; fine grained mineral content; damp; nonplastic; nonsticky; many brush, shrub and tree roots; free of clasts; clear wavy boundary.
15 → 23"	B _w	Loamy Sand	10YR4/4 dark yellow brown	<i>none observed</i>	Very friable; weak-grade fine-to-medium blocky structure; weak cohesive matrix; slightly gritty; mixed very fine-to-fine grained mineral content; damp; free of clasts; nonsticky; nonplastic; diffuse wavy boundary.
23 → 43"	2C	Loamy Sand	2.5Y5/6 lite olive brown	@ 42" m,2,p 7.5R5/8 10Y7/1	Loose; structurless; unstable; mixed fine-to-medium grained mineral content; damp matrix; nonplastic; nonsticky; well stratified and poorly graded; free of clasts; stratified beds gently dipping to the Southeast; no apparent water observed and no refusal at test hole depth.

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker License #1848

Printed name of evaluator & license number

June 1998

Date of Soil Evaluator Certification

10/04/17

Date of soil testing

TP17-2 DEEP OBSERVATION HOLE

255 Low Street, Newburyport, Massachusetts

Date: November 04, 2017 Time: 10:58 Weather: Partly cloudy, ~53°F, calm
 Position on landscape: Toeslope; tread Slope aspect: Southerly Land cover: Brush and trees; lightly wooded
 Property line: 10⁺ feet Drainage way: 50⁺ feet Drinking water well: 100⁺ feet
 Wetlands: 50⁺ feet Open water body: 400⁺ feet Neighboring septic system: 50⁺ feet
 Public water supply reservoir: 400⁺ feet Tributary to reservoir: 200⁺ feet
 Hydrologic Soil Group: A Drainage Class: Moderately well drained Soil Moisture Status: Damp
 Soil map unit: 256A – Deerfield loamy fine sand (sandy, mixed, mesic Aquic Udipsamments), 0-3% slopes
 Depth to bedrock: >46" Seasonal High Groundwater Table: 40" Apparent water table (weep): N.O.

SOIL PROFILE ► TP17-2

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (EarthColors)	Redoxomorphic Features from ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00 → 10"	A	Sandy Loam	10YR 3/2 very dark grayish brown	<i>none observed</i>	Very friable; moderate-grade fine-to-medium subangular granular structure; somewhat cohesive matrix; fine grained mineral content; damp; nonplastic; nonsticky; many brush, shrub and tree roots; free of clasts; clear wavy boundary.
10 → 16"	B _w	Loamy Sand	10YR4/4 dark yellow brown	<i>none observed</i>	Very friable; weak-grade fine-to-medium blocky structure; weak cohesive matrix; slightly gritty; mixed very fine-to-fine grained mineral content; damp; free of clasts; nonsticky; nonplastic; diffuse wavy boundary.
16 → 46"	2C	Loamy Sand	2.5Y5/6 lite olive brown	@ 40" m,2,p 7.5R5/8 10Y7/1	Loose; structurless; unstable; mixed fine-to-medium grained mineral content; damp matrix; nonplastic; nonsticky; well stratified and poorly graded; free of clasts; stratified beds gently dipping to the Southeast; no apparent water observed and no refusal at test hole depth.

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker License #1848

Printed name of evaluator & license number

June 1998

Date of Soil Evaluator Certification

10/04/17

Date of soil testing

TP17-3 DEEP OBSERVATION HOLE

255 Low Street, Newburyport, Massachusetts

Date: November 04, 2017 Time: 11:11 Weather: Partly cloudy, ~53°F, calm
 Position on landscape: Toeslope; tread Slope aspect: Southerly Land cover: Brush and trees; lightly wooded
 Property line: 10⁺ feet Drainage way: 50⁺ feet Drinking water well: 100⁺ feet
 Wetlands: 50⁺ feet Open water body: 400⁺ feet Neighboring septic system: 50⁺ feet
 Public water supply reservoir: 400⁺ feet Tributary to reservoir: 200⁺ feet
 Hydrologic Soil Group: A Drainage Class: Moderately well drained Soil Moisture Status: Damp
 Soil map unit: 256A – Deerfield loamy fine sand (sandy, mixed, mesic Aquic Udipsamments), 0-3% slopes
 Depth to bedrock: >42" Seasonal High Groundwater Table: 39" Apparent water table (weep): N.O.

SOIL PROFILE ► TP17-3

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (EarthColors)	Redoxomorphic Features from ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00 → 10"	A	Sandy Loam	10YR 3/2 very dark grayish brown	<i>none observed</i>	Very friable; moderate-grade fine-to-medium subangular granular structure; somewhat cohesive matrix; fine grained mineral content; damp; nonplastic; nonsticky; many brush, shrub and tree roots; free of clasts; clear wavy boundary.
10 → 17"	B _w	Loamy Sand	10YR4/4 dark yellow brown	<i>none observed</i>	Very friable; weak-grade fine-to-medium blocky structure; weak cohesive matrix; slightly gritty; mixed very fine-to-fine grained mineral content; damp; free of clasts; nonsticky; nonplastic; diffuse wavy boundary.
17 → 42"	2C	Loamy Sand	2.5Y5/6 lite olive brown	@ 39" m,2,p 7.5R5/8 10Y7/1	Loose; structurless; unstable; mixed fine-to-medium grained mineral content; damp matrix; nonplastic; nonsticky; well stratified and poorly graded; free of clasts; stratified beds gently dipping to the Southeast; no apparent water observed and no refusal at test hole depth.

Certification

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Alexander F. Parker License #1848

Printed name of evaluator & license number

June 1998

Date of Soil Evaluator Certification

10/04/17

Date of soil testing

TP17-4 DEEP OBSERVATION HOLE

255 Low Street, Newburyport, Massachusetts

Date: November 04, 2017 Time: 11:19 Weather: Partly cloudy, ~53°F, calm
 Position on landscape: Toeslope; tread Slope aspect: Southerly Land cover: Brush and trees; lightly wooded
 Property line: 10⁺ feet Drainage way: 50⁺ feet Drinking water well: 100⁺ feet
 Wetlands: 50⁺ feet Open water body: 400⁺ feet Neighboring septic system: 50⁺ feet
 Public water supply reservoir: 400⁺ feet Tributary to reservoir: 200⁺ feet
 Hydrologic Soil Group: A Drainage Class: Moderately well drained Soil Moisture Status: Damp
 Soil map unit: 256A – Deerfield loamy fine sand (sandy, mixed, mesic Aquic Udipsamments), 0-3% slopes
 Depth to bedrock: >40" Seasonal High Groundwater Table: 27" Apparent water table (weep): N.O.

SOIL PROFILE ► TP17-4

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (EarthColors)	Redoxomorphic Features from ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00 → 09"	A	Sandy Loam	10YR 3/2 very dark grayish brown	<i>none observed</i>	Very friable; moderate-grade fine-to-medium subangular granular structure; somewhat cohesive matrix; fine grained mineral content; damp; nonplastic; nonsticky; many brush, shrub and tree roots; free of clasts; clear wavy boundary.
09 → 20"	B _w	Loamy Sand	10YR4/4 dark yellow brown	<i>none observed</i>	Very friable; weak-grade fine-to-medium blocky structure; weak cohesive matrix; slightly gritty; mixed very fine-to-fine grained mineral content; damp; free of clasts; nonsticky; nonplastic; diffuse wavy boundary.
20 → 40"	2C	Sandy loam	2.5Y5/4 lite olive brown	@ 27" m,2,p 7.5R5/8 10Y7/1	Very friable; massive; mixed very fine-to-fine grained mineral content; damp matrix; nonplastic; nonsticky; somewhat stratified and poorly graded; somewhat dense matrix; free of clasts; no apparent water observed and no refusal at test hole depth.

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker License #1848

Printed name of evaluator & license number

June 1998

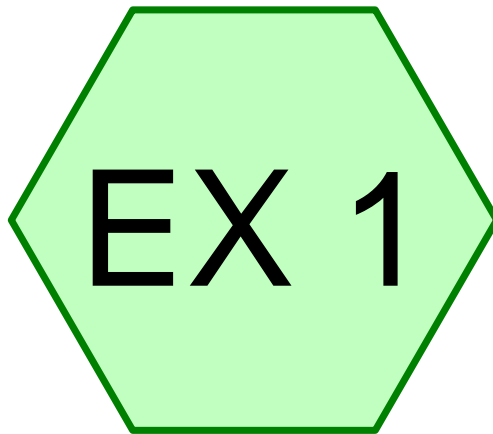
Date of Soil Evaluator Certification

10/04/17

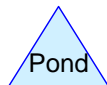
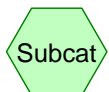
Date of soil testing

Appendix B

HydroCAD Hydrology Printout



EXIST



255 Low Exist

Prepared by Microsoft

HydroCAD® 9.10 s/n 00884 © 2010 HydroCAD Software Solutions LLC

Printed 11/8/2017

Page 2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
30,633	30	Woods, Good, HSG A (EX 1)

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Type III 24-hr 2 Year Rainfall=3.10"

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Summary for Subcatchment EX 1: EXIST

Runoff = 0.00 cfs @ 1.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 1.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Description
30,633	30	Woods, Good, HSG A
30,633	30	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
2.5	128	0.0300	0.87		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
13.0	178	Total			

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Type III 24-hr 10 Year Rainfall=4.70"

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Summary for Subcatchment EX 1: EXIST

Runoff = 0.00 cfs @ 24.00 hrs, Volume= 0 cf, Depth> 0.00"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 1.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.70"

Area (sf)	CN	Description
30,633	30	Woods, Good, HSG A
30,633	30	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
2.5	128	0.0300	0.87		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
13.0	178	Total			

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Type III 24-hr 100 Year Rainfall=8.30"

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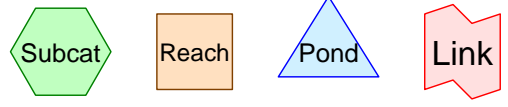
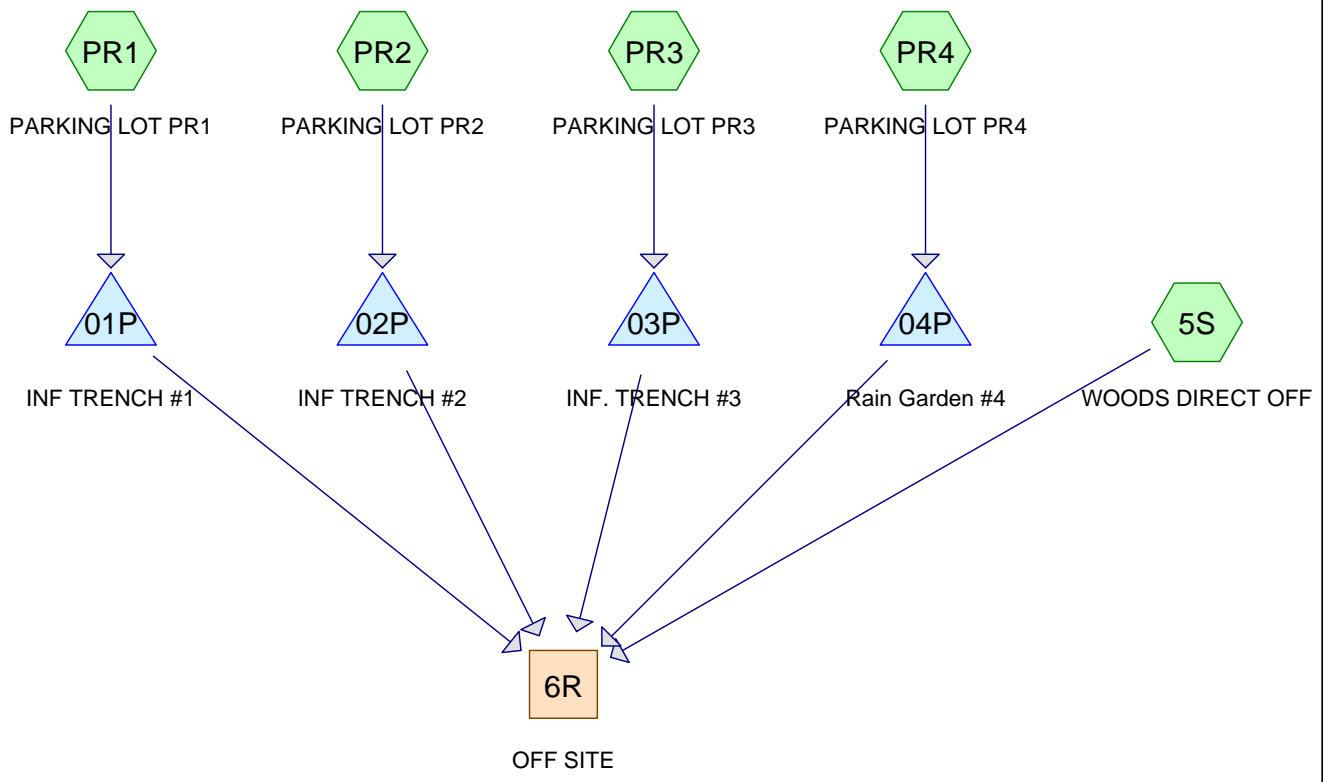
Summary for Subcatchment EX 1: EXIST

Runoff = 0.10 cfs @ 12.50 hrs, Volume= 1,241 cf, Depth> 0.49"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 1.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.30"

Area (sf)	CN	Description
30,633	30	Woods, Good, HSG A
30,633	30	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
2.5	128	0.0300	0.87		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
13.0	178	Total			



Drainage Diagram for 255 Low Prop
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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
6,881	30	Brush, Good, HSG A (PR1, PR2, PR3, PR4)
7,865	30	Woods, Good, HSG A (5S)
15,887	98	Paved parking, HSG A (PR1, PR2, PR3, PR4)

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Type III 24-hr 2 Year Rainfall=3.10"

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Summary for Subcatchment 5S: WOODS DIRECT OFF

Runoff = 0.00 cfs @ 2.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Description
7,865	30	Woods, Good, HSG A
7,865	30	100.00% Pervious Area

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

Summary for Subcatchment PR1: PARKING LOT PR1

Runoff = 0.21 cfs @ 12.08 hrs, Volume= 719 cf, Depth> 1.71"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Description
3,013	98	Paved parking, HSG A
2,044	30	Brush, Good, HSG A
5,057	71	Weighted Average
2,044	30	40.42% Pervious Area
3,013	98	59.58% Impervious Area

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

Summary for Subcatchment PR2: PARKING LOT PR2

Runoff = 0.35 cfs @ 12.08 hrs, Volume= 1,216 cf, Depth> 2.16"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Description
5,096	98	Paved parking, HSG A
1,647	30	Brush, Good, HSG A
6,743	81	Weighted Average
1,647	30	24.43% Pervious Area
5,096	98	75.57% Impervious Area

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Type III 24-hr 2 Year Rainfall=3.10"

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

Summary for Subcatchment PR3: PARKING LOT PR3

Runoff = 0.22 cfs @ 12.08 hrs, Volume= 748 cf, Depth> 1.82"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Description
3,134	98	Paved parking, HSG A
1,786	30	Brush, Good, HSG A
4,920	73	Weighted Average
1,786	30	36.30% Pervious Area
3,134	98	63.70% Impervious Area

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

Summary for Subcatchment PR4: PARKING LOT PR4

Runoff = 0.32 cfs @ 12.08 hrs, Volume= 1,108 cf, Depth> 2.20"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Description
4,644	98	Paved parking, HSG A
1,404	30	Brush, Good, HSG A
6,048	82	Weighted Average
1,404	30	23.21% Pervious Area
4,644	98	76.79% Impervious Area

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

Summary for Reach 6R: OFF SITE

Inflow Area = 30,633 sf, 51.86% Impervious, Inflow Depth = 0.00" for 2 Year event

Inflow = 0.00 cfs @ 2.00 hrs, Volume= 0 cf

Outflow = 0.00 cfs @ 2.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 2.00-24.00 hrs, dt= 0.01 hrs

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Type III 24-hr 2 Year Rainfall=3.10"

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Summary for Pond 01P: INF TRENCH #1

Inflow Area = 5,057 sf, 59.58% Impervious, Inflow Depth > 1.71" for 2 Year event
 Inflow = 0.21 cfs @ 12.08 hrs, Volume= 719 cf
 Outflow = 0.02 cfs @ 12.79 hrs, Volume= 718 cf, Atten= 90%, Lag= 42.6 min
 Discarded = 0.02 cfs @ 12.79 hrs, Volume= 718 cf
 Primary = 0.00 cfs @ 2.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 55.12' @ 12.79 hrs Surf.Area= 387 sf Storage= 289 cf

Plug-Flow detention time= 124.4 min calculated for 718 cf (100% of inflow)
 Center-of-Mass det. time= 123.7 min (880.5 - 756.9)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	729 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
54.00	134	0	0
55.00	358	246	246
56.00	607	483	729

Device	Routing	Invert	Outlet Devices
#1	Discarded	54.00'	2.410 in/hr Exfiltration over Surface area
#2	Primary	55.90'	20.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.02 cfs @ 12.79 hrs HW=55.12' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=54.00' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 02P: INF TRENCH #2

Inflow Area = 6,743 sf, 75.57% Impervious, Inflow Depth > 2.16" for 2 Year event
 Inflow = 0.35 cfs @ 12.08 hrs, Volume= 1,216 cf
 Outflow = 0.03 cfs @ 12.92 hrs, Volume= 1,215 cf, Atten= 91%, Lag= 49.9 min
 Discarded = 0.03 cfs @ 12.92 hrs, Volume= 1,215 cf
 Primary = 0.00 cfs @ 2.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 54.33' @ 12.92 hrs Surf.Area= 581 sf Storage= 487 cf

Plug-Flow detention time= 133.9 min calculated for 1,215 cf (100% of inflow)
 Center-of-Mass det. time= 133.2 min (890.0 - 756.9)

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Type III 24-hr 2 Year Rainfall=3.10"

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Volume	Invert	Avail.Storage	Storage Description
#1	53.20'	1,155 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.20	288	0	0
54.20	540	414	414
55.20	855	698	1,112
55.25	900	44	1,155

Device	Routing	Invert	Outlet Devices
#1	Discarded	53.20'	2.410 in/hr Exfiltration over Surface area
#2	Primary	55.20'	20.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.03 cfs @ 12.92 hrs HW=54.33' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=53.20' (Free Discharge)

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

Summary for Pond 03P: INF. TRENCH #3

Inflow Area = 4,920 sf, 63.70% Impervious, Inflow Depth > 1.82" for 2 Year event
 Inflow = 0.22 cfs @ 12.08 hrs, Volume= 748 cf
 Outflow = 0.02 cfs @ 12.73 hrs, Volume= 747 cf, Atten= 89%, Lag= 39.1 min
 Discarded = 0.02 cfs @ 12.73 hrs, Volume= 747 cf
 Primary = 0.00 cfs @ 2.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 54.25' @ 12.73 hrs Surf.Area= 425 sf Storage= 311 cf

Plug-Flow detention time= 134.3 min calculated for 747 cf (100% of inflow)
 Center-of-Mass det. time= 133.6 min (890.5 - 756.9)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	732 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	98	0	0
54.00	334	216	216
55.00	698	516	732

Device	Routing	Invert	Outlet Devices
#1	Discarded	53.00'	2.410 in/hr Exfiltration over Surface area
#2	Primary	55.00'	20.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

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Type III 24-hr 2 Year Rainfall=3.10"

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2.50 3.00 3.50
 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88
 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.02 cfs @ 12.73 hrs HW=54.25' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=53.00' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 04P: Rain Garden #4

Inflow Area = 6,048 sf, 76.79% Impervious, Inflow Depth > 2.20" for 2 Year event
 Inflow = 0.32 cfs @ 12.08 hrs, Volume= 1,108 cf
 Outflow = 0.02 cfs @ 14.35 hrs, Volume= 822 cf, Atten= 95%, Lag= 136.2 min
 Discarded = 0.02 cfs @ 14.35 hrs, Volume= 822 cf
 Primary = 0.00 cfs @ 2.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 52.09' @ 14.35 hrs Surf.Area= 646 sf Storage= 570 cf

Plug-Flow detention time= 266.5 min calculated for 822 cf (74% of inflow)
 Center-of-Mass det. time= 179.7 min (936.6 - 756.9)

Volume	Invert	Avail.Storage	Storage Description
#1	51.00'	1,177 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
51.00	402	0	0
52.80	805	1,086	1,086
52.90	1,005	90	1,177

Device	Routing	Invert	Outlet Devices
#1	Discarded	51.00'	1.020 in/hr Exfiltration over Surface area
#2	Primary	52.80'	20.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.02 cfs @ 14.35 hrs HW=52.09' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=51.00' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type III 24-hr 10 Year Rainfall=4.70"

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Summary for Subcatchment 5S: WOODS DIRECT OFF

Runoff = 0.00 cfs @ 24.00 hrs, Volume= 0 cf, Depth> 0.00"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.70"

Area (sf)	CN	Description
7,865	30	Woods, Good, HSG A
7,865	30	100.00% Pervious Area

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

Summary for Subcatchment PR1: PARKING LOT PR1

Runoff = 0.32 cfs @ 12.08 hrs, Volume= 1,118 cf, Depth> 2.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.70"

Area (sf)	CN	Description
3,013	98	Paved parking, HSG A
2,044	30	Brush, Good, HSG A
5,057	71	Weighted Average
2,044	30	40.42% Pervious Area
3,013	98	59.58% Impervious Area

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

Summary for Subcatchment PR2: PARKING LOT PR2

Runoff = 0.54 cfs @ 12.08 hrs, Volume= 1,890 cf, Depth> 3.36"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.70"

Area (sf)	CN	Description
5,096	98	Paved parking, HSG A
1,647	30	Brush, Good, HSG A
6,743	81	Weighted Average
1,647	30	24.43% Pervious Area
5,096	98	75.57% Impervious Area

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Type III 24-hr 10 Year Rainfall=4.70"

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

Summary for Subcatchment PR3: PARKING LOT PR3

Runoff = 0.33 cfs @ 12.08 hrs, Volume= 1,162 cf, Depth> 2.84"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.70"

Area (sf)	CN	Description
3,134	98	Paved parking, HSG A
1,786	30	Brush, Good, HSG A
4,920	73	Weighted Average
1,786	30	36.30% Pervious Area
3,134	98	63.70% Impervious Area

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

Summary for Subcatchment PR4: PARKING LOT PR4

Runoff = 0.49 cfs @ 12.08 hrs, Volume= 1,722 cf, Depth> 3.42"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.70"

Area (sf)	CN	Description
4,644	98	Paved parking, HSG A
1,404	30	Brush, Good, HSG A
6,048	82	Weighted Average
1,404	30	23.21% Pervious Area
4,644	98	76.79% Impervious Area

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

Summary for Reach 6R: OFF SITE

Inflow Area = 30,633 sf, 51.86% Impervious, Inflow Depth > 0.00" for 10 Year event

Inflow = 0.00 cfs @ 24.00 hrs, Volume= 0 cf

Outflow = 0.00 cfs @ 24.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 2.00-24.00 hrs, dt= 0.01 hrs

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Type III 24-hr 10 Year Rainfall=4.70"

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Summary for Pond 01P: INF TRENCH #1

Inflow Area = 5,057 sf, 59.58% Impervious, Inflow Depth > 2.65" for 10 Year event
 Inflow = 0.32 cfs @ 12.08 hrs, Volume= 1,118 cf
 Outflow = 0.03 cfs @ 12.96 hrs, Volume= 1,093 cf, Atten= 91%, Lag= 52.3 min
 Discarded = 0.03 cfs @ 12.96 hrs, Volume= 1,093 cf
 Primary = 0.00 cfs @ 2.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 55.58' @ 12.96 hrs Surf.Area= 502 sf Storage= 494 cf

Plug-Flow detention time= 181.3 min calculated for 1,093 cf (98% of inflow)
 Center-of-Mass det. time= 167.4 min (917.3 - 749.9)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	729 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
54.00	134	0	0
55.00	358	246	246
56.00	607	483	729

Device	Routing	Invert	Outlet Devices
#1	Discarded	54.00'	2.410 in/hr Exfiltration over Surface area
#2	Primary	55.90'	20.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.03 cfs @ 12.96 hrs HW=55.58' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=54.00' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 02P: INF TRENCH #2

Inflow Area = 6,743 sf, 75.57% Impervious, Inflow Depth > 3.36" for 10 Year event
 Inflow = 0.54 cfs @ 12.08 hrs, Volume= 1,890 cf
 Outflow = 0.04 cfs @ 13.07 hrs, Volume= 1,801 cf, Atten= 92%, Lag= 59.1 min
 Discarded = 0.04 cfs @ 13.07 hrs, Volume= 1,801 cf
 Primary = 0.00 cfs @ 2.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 54.87' @ 13.07 hrs Surf.Area= 750 sf Storage= 843 cf

Plug-Flow detention time= 201.7 min calculated for 1,800 cf (95% of inflow)
 Center-of-Mass det. time= 173.9 min (923.8 - 749.9)

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Type III 24-hr 10 Year Rainfall=4.70"

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Volume	Invert	Avail.Storage	Storage Description
#1	53.20'	1,155 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.20	288	0	0
54.20	540	414	414
55.20	855	698	1,112
55.25	900	44	1,155

Device	Routing	Invert	Outlet Devices
#1	Discarded	53.20'	2.410 in/hr Exfiltration over Surface area
#2	Primary	55.20'	20.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.04 cfs @ 13.07 hrs HW=54.87' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=53.20' (Free Discharge)

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

Summary for Pond 03P: INF. TRENCH #3

Inflow Area = 4,920 sf, 63.70% Impervious, Inflow Depth > 2.84" for 10 Year event
 Inflow = 0.33 cfs @ 12.08 hrs, Volume= 1,162 cf
 Outflow = 0.03 cfs @ 12.86 hrs, Volume= 1,131 cf, Atten= 90%, Lag= 46.4 min
 Discarded = 0.03 cfs @ 12.86 hrs, Volume= 1,131 cf
 Primary = 0.00 cfs @ 2.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 54.67' @ 12.86 hrs Surf.Area= 577 sf Storage= 520 cf

Plug-Flow detention time= 179.1 min calculated for 1,131 cf (97% of inflow)

Center-of-Mass det. time= 161.9 min (911.8 - 749.9)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	732 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	98	0	0
54.00	334	216	216
55.00	698	516	732

Device	Routing	Invert	Outlet Devices
#1	Discarded	53.00'	2.410 in/hr Exfiltration over Surface area
#2	Primary	55.00'	20.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

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Type III 24-hr 10 Year Rainfall=4.70"

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2.50 3.00 3.50
 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88
 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.03 cfs @ 12.86 hrs HW=54.67' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=53.00' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 04P: Rain Garden #4

Inflow Area = 6,048 sf, 76.79% Impervious, Inflow Depth > 3.42" for 10 Year event
 Inflow = 0.49 cfs @ 12.08 hrs, Volume= 1,722 cf
 Outflow = 0.02 cfs @ 15.18 hrs, Volume= 1,029 cf, Atten= 96%, Lag= 186.1 min
 Discarded = 0.02 cfs @ 15.18 hrs, Volume= 1,029 cf
 Primary = 0.00 cfs @ 2.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 52.68' @ 15.18 hrs Surf.Area= 778 sf Storage= 991 cf

Plug-Flow detention time= 282.4 min calculated for 1,029 cf (60% of inflow)
 Center-of-Mass det. time= 172.6 min (922.5 - 749.9)

Volume	Invert	Avail.Storage	Storage Description
#1	51.00'	1,177 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
51.00	402	0	0
52.80	805	1,086	1,086
52.90	1,005	90	1,177

Device	Routing	Invert	Outlet Devices
#1	Discarded	51.00'	1.020 in/hr Exfiltration over Surface area
#2	Primary	52.80'	20.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.02 cfs @ 15.18 hrs HW=52.68' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=51.00' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type III 24-hr 100 Year Rainfall=8.30"

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Summary for Subcatchment 5S: WOODS DIRECT OFF

Runoff = 0.03 cfs @ 12.39 hrs, Volume= 320 cf, Depth> 0.49"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.30"

Area (sf)	CN	Description
7,865	30	Woods, Good, HSG A
7,865	30	100.00% Pervious Area

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

Summary for Subcatchment PR1: PARKING LOT PR1

Runoff = 0.56 cfs @ 12.08 hrs, Volume= 2,095 cf, Depth> 4.97"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.30"

Area (sf)	CN	Description
3,013	98	Paved parking, HSG A
2,044	30	Brush, Good, HSG A
5,057	71	Weighted Average
2,044	30	40.42% Pervious Area
3,013	98	59.58% Impervious Area

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

Summary for Subcatchment PR2: PARKING LOT PR2

Runoff = 0.95 cfs @ 12.08 hrs, Volume= 3,469 cf, Depth> 6.17"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.30"

Area (sf)	CN	Description
5,096	98	Paved parking, HSG A
1,647	30	Brush, Good, HSG A
6,743	81	Weighted Average
1,647	30	24.43% Pervious Area
5,096	98	75.57% Impervious Area

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Type III 24-hr 100 Year Rainfall=8.30"

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

Summary for Subcatchment PR3: PARKING LOT PR3

Runoff = 0.59 cfs @ 12.08 hrs, Volume= 2,165 cf, Depth> 5.28"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.30"

Area (sf)	CN	Description
3,134	98	Paved parking, HSG A
1,786	30	Brush, Good, HSG A
4,920	73	Weighted Average
1,786	30	36.30% Pervious Area
3,134	98	63.70% Impervious Area

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

Summary for Subcatchment PR4: PARKING LOT PR4

Runoff = 0.87 cfs @ 12.08 hrs, Volume= 3,157 cf, Depth> 6.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.30"

Area (sf)	CN	Description
4,644	98	Paved parking, HSG A
1,404	30	Brush, Good, HSG A
6,048	82	Weighted Average
1,404	30	23.21% Pervious Area
4,644	98	76.79% Impervious Area

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

Summary for Reach 6R: OFF SITE

Inflow Area = 30,633 sf, 51.86% Impervious, Inflow Depth > 1.09" for 100 Year event

Inflow = 2.39 cfs @ 12.15 hrs, Volume= 2,778 cf

Outflow = 2.39 cfs @ 12.15 hrs, Volume= 2,778 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 2.00-24.00 hrs, dt= 0.01 hrs

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Type III 24-hr 100 Year Rainfall=8.30"

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Summary for Pond 01P: INF TRENCH #1

Inflow Area = 5,057 sf, 59.58% Impervious, Inflow Depth > 4.97" for 100 Year event
 Inflow = 0.56 cfs @ 12.08 hrs, Volume= 2,095 cf
 Outflow = 0.41 cfs @ 12.16 hrs, Volume= 1,910 cf, Atten= 28%, Lag= 4.6 min
 Discarded = 0.03 cfs @ 12.16 hrs, Volume= 1,528 cf
 Primary = 0.37 cfs @ 12.16 hrs, Volume= 383 cf

Routing by Stor-Ind method, Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 55.94' @ 12.16 hrs Surf.Area= 591 sf Storage= 690 cf

Plug-Flow detention time= 177.0 min calculated for 1,909 cf (91% of inflow)
 Center-of-Mass det. time= 130.6 min (883.5 - 752.9)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	729 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
54.00	134	0	0
55.00	358	246	246
56.00	607	483	729

Device	Routing	Invert	Outlet Devices
#1	Discarded	54.00'	2.410 in/hr Exfiltration over Surface area
#2	Primary	55.90'	20.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.03 cfs @ 12.16 hrs HW=55.94' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.37 cfs @ 12.16 hrs HW=55.94' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 0.37 cfs @ 0.51 fps)

Summary for Pond 02P: INF TRENCH #2

Inflow Area = 6,743 sf, 75.57% Impervious, Inflow Depth > 6.17" for 100 Year event
 Inflow = 0.95 cfs @ 12.08 hrs, Volume= 3,469 cf
 Outflow = 0.80 cfs @ 12.15 hrs, Volume= 3,083 cf, Atten= 17%, Lag= 4.0 min
 Discarded = 0.05 cfs @ 12.15 hrs, Volume= 2,387 cf
 Primary = 0.75 cfs @ 12.15 hrs, Volume= 696 cf

Routing by Stor-Ind method, Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 55.26' @ 12.15 hrs Surf.Area= 900 sf Storage= 1,155 cf

Plug-Flow detention time= 180.4 min calculated for 3,083 cf (89% of inflow)
 Center-of-Mass det. time= 126.0 min (874.2 - 748.2)

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Type III 24-hr 100 Year Rainfall=8.30"

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Volume	Invert	Avail.Storage	Storage Description
#1	53.20'	1,155 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.20	288	0	0
54.20	540	414	414
55.20	855	698	1,112
55.25	900	44	1,155

Device	Routing	Invert	Outlet Devices
#1	Discarded	53.20'	2.410 in/hr Exfiltration over Surface area
#2	Primary	55.20'	20.0' long x 1.0' 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			
Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31			
3.30 3.31 3.32			

Discarded OutFlow Max=0.05 cfs @ 12.15 hrs HW=55.26' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.73 cfs @ 12.15 hrs HW=55.26' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Weir Controls 0.73 cfs @ 0.64 fps)

Summary for Pond 03P: INF. TRENCH #3

Inflow Area = 4,920 sf, 63.70% Impervious, Inflow Depth > 5.28" for 100 Year event
 Inflow = 0.59 cfs @ 12.08 hrs, Volume= 2,165 cf
 Outflow = 0.62 cfs @ 12.15 hrs, Volume= 1,996 cf, Atten= 0%, Lag= 4.0 min
 Discarded = 0.04 cfs @ 12.14 hrs, Volume= 1,657 cf
 Primary = 0.58 cfs @ 12.15 hrs, Volume= 339 cf

Routing by Stor-Ind method, Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 55.05' @ 12.15 hrs Surf.Area= 698 sf Storage= 732 cf

Plug-Flow detention time= 179.0 min calculated for 1,995 cf (92% of inflow)
 Center-of-Mass det. time= 136.8 min (888.3 - 751.5)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	732 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	98	0	0
54.00	334	216	216
55.00	698	516	732

Device	Routing	Invert	Outlet Devices
#1	Discarded	53.00'	2.410 in/hr Exfiltration over Surface area
#2	Primary	55.00'	20.0' long x 2.0' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00			

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Type III 24-hr 100 Year Rainfall=8.30"

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2.50 3.00 3.50
 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88
 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.04 cfs @ 12.14 hrs HW=55.03' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.56 cfs @ 12.15 hrs HW=55.05' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 0.56 cfs @ 0.56 fps)

Summary for Pond 04P: Rain Garden #4

Inflow Area = 6,048 sf, 76.79% Impervious, Inflow Depth > 6.26" for 100 Year event
 Inflow = 0.87 cfs @ 12.08 hrs, Volume= 3,157 cf
 Outflow = 0.77 cfs @ 12.13 hrs, Volume= 2,226 cf, Atten= 11%, Lag= 2.6 min
 Discarded = 0.02 cfs @ 12.13 hrs, Volume= 1,186 cf
 Primary = 0.75 cfs @ 12.13 hrs, Volume= 1,040 cf

Routing by Stor-Ind method, Time Span= 2.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 52.86' @ 12.13 hrs Surf.Area= 925 sf Storage= 1,138 cf

Plug-Flow detention time= 180.1 min calculated for 2,225 cf (70% of inflow)
 Center-of-Mass det. time= 83.6 min (831.5 - 747.9)

Volume	Invert	Avail.Storage	Storage Description
#1	51.00'	1,177 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
51.00	402	0	0
52.80	805	1,086	1,086
52.90	1,005	90	1,177

Device	Routing	Invert	Outlet Devices
#1	Discarded	51.00'	1.020 in/hr Exfiltration over Surface area
#2	Primary	52.80'	20.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.02 cfs @ 12.13 hrs HW=52.86' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.74 cfs @ 12.13 hrs HW=52.86' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 0.74 cfs @ 0.62 fps)

|

Appendix C

Operation & Maintenance Plan

STORMWATER MANAGEMENT OPERATION AND MAINTENANCE PLAN

255R Low Street
Newburyport, Massachusetts

The following Stormwater Management Operation and Maintenance (O&M) Plan has been prepared to operate and maintain the stormwater management system for the proposed parking located at 255R Low Street

Owner/Operator: Low Street Redevelopment
#255 Low Street

Inspection and Maintenance Schedule

Personnel entrusted by the owner/operator with stormwater maintenance shall inspect the stormwater management system on a routine basis not less than once per month for the first 6 months of operation and semi-annually thereafter. Refer to the Design Plans for stormwater measure information. Inspection and maintenance shall be performed as follows:

1. Landscaped Areas shall be inspected and maintained on a monthly basis. Areas which may be subject to erosion will be stabilized and reseeded immediately. These operations will be performed as part of ongoing routine grounds maintenance operations.
2. Street Sweeping of drives and parking areas shall be conducted bimonthly between the months of April and November. Removed sediment will be disposed off site by a qualified waste disposal contractor in accordance with state and federal regulations.
3. Infiltration Trench: Trenches shall be inspected yearly for accumulation of sediment. Remove trash and sediment from trench. If upper layer of stone is clogged remove compromised crushed stone and replace with new clean crushed stone.
4. Sediment Forebay- Sediment forebays are to be cleaned at least once per year. Rake and clean and sediment from the grass area. Cut grass and remove clipping monthly during the growing season. Also remove sediment from the stone inlet channel.
5. Snow Removal and Storage: During the winter months, snow shall be plowed from the parking lot and not stored or piled in the infiltration trenches. Special care shall be taken to ensure snow is plowed into the sedimentation forebays.

Stormwater System Inspection Report

General Information			
Location: 255R Low Street, Newburyport			
Date of Inspection		Start/End Time	
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Contact Information			
Purpose of Inspection			
Weather Information			
Has it rained since the last inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Weather at time of this inspection?			

Site-Specific Stormwater Devices

	Description	Installed and Operating Properly?	Corrective Action Needed	Date for Corrective Action/Responsible Person
1		<input type="checkbox"/> Yes <input type="checkbox"/> No		
2		<input type="checkbox"/> Yes <input type="checkbox"/> No		
3		<input type="checkbox"/> Yes <input type="checkbox"/> No		
4		<input type="checkbox"/> Yes <input type="checkbox"/> No		
5		<input type="checkbox"/> Yes <input type="checkbox"/> No		
6		<input type="checkbox"/> Yes <input type="checkbox"/> No		
7		<input type="checkbox"/> Yes <input type="checkbox"/> No		
8		<input type="checkbox"/> Yes <input type="checkbox"/> No		
9		<input type="checkbox"/> Yes <input type="checkbox"/> No		

Overall Site Issues

	Description		Corrective Action	Date for Corrective Action/Responsible Person
1	Are all slopes properly stabilized?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
2	Are natural resource areas (e.g., streams, wetlands, etc.) being subjected to erosion?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
3	Are discharge points free of sediment deposits?	<input type="checkbox"/> Yes <input type="checkbox"/> No		

Certification Statement:

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

Print name: _____

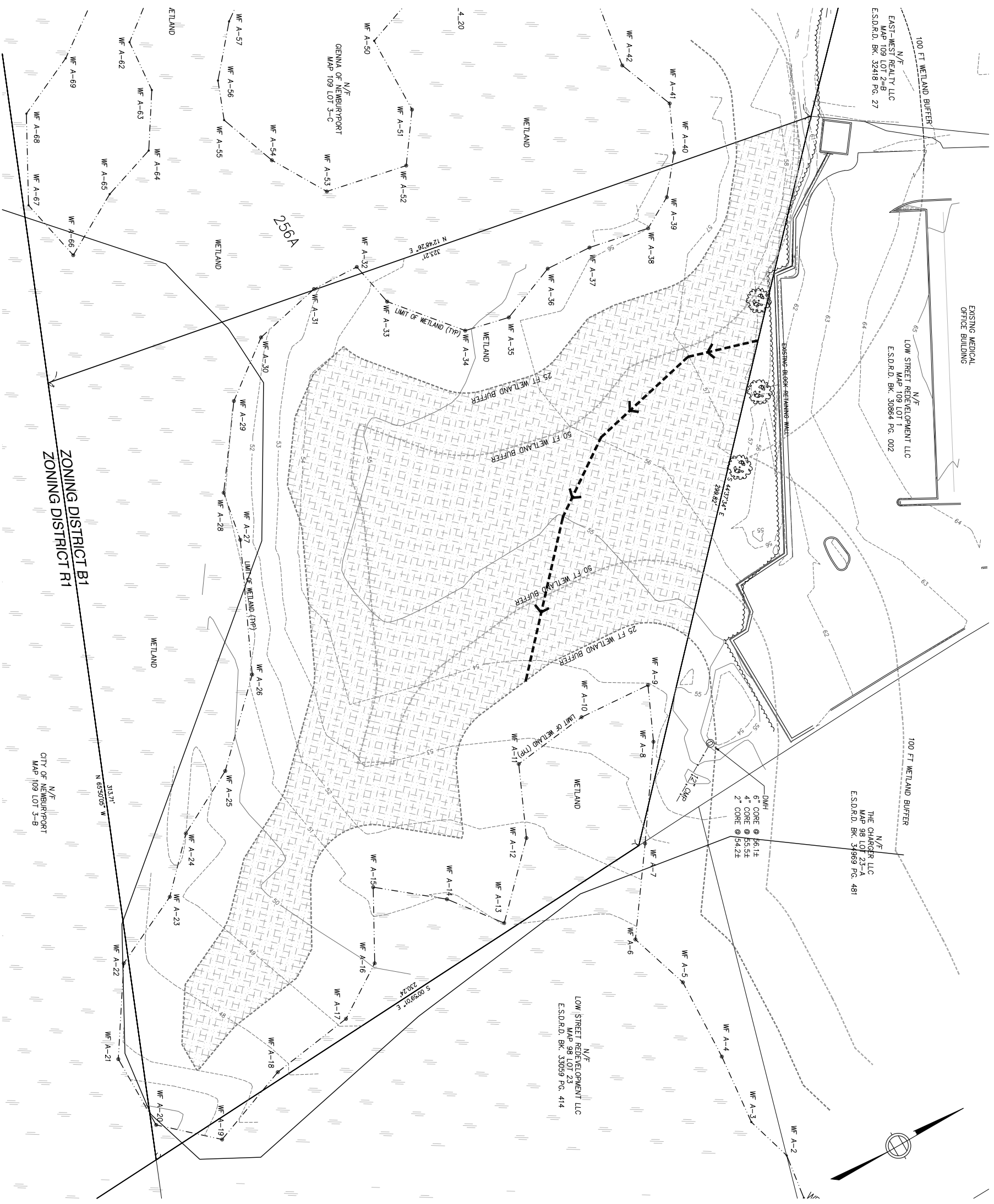
Signature: _____

Date: _____

Appendix D



Figure 1 – Pre & Post Development Drainage Areas



EXISTING MEDICAL OFFICE BUILDING

N/F LOW STREET REDEVELOPMENT LLC
MAP 109 LOT 1
ES.D.R.D. BK. 30864 PG. 002

N/F THE CHARGE LLC
MAP 98 LOT 23-A
ES.D.R.D. BK. 34969 PG. 481

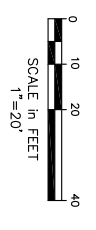
N/F LOW STREET REDEVELOPMENT LLC
MAP 98 LOT 23
ES.D.R.D. BK. 33059 PG. 414

N/F EAST-WEST REALTY LLC
MAP 109 LOT 2-B
ES.D.R.D. BK. 32418 PG. 27

N/F GENNA OF NEWBURYPORT
MAP 109 LOT 3-C

ZONING DISTRICT B1
ZONING DISTRICT R1

N/F CITY OF NEWBURYPORT
MAP 109 LOT 3-B



EXISTING DRAINAGE AREAS
DRAINAGE CLASS "A" WOODS GOOD CONDITION-30,633 SF

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Winter GEC, LLC
34 WINTER STREET
NEWBURYPORT, MA 01950
978-270-8826

SCALE:

HORIZ: 1"=20'

VERT: N.A.

NO.	DATE	BY	REVISIONS

FIELD:	I.P.L.
CALCS:	I.P.L.
CHECKED:	SBS
APPROVED:	SBS

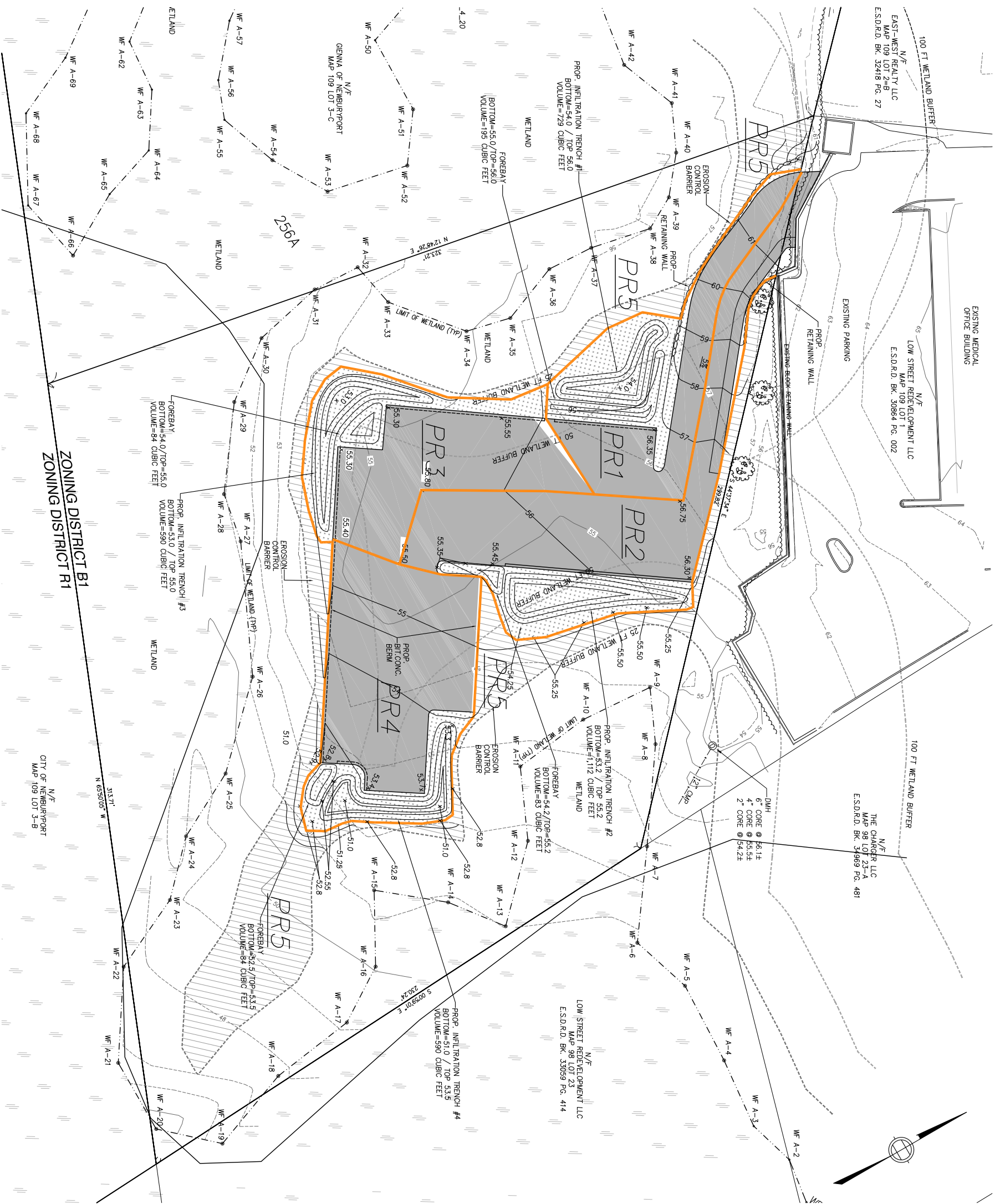
EXISTING DRAINAGE AREAS
255 LOW STREET (REAR)

PLAN OF LAND IN
NEWBURYPORT, MASSACHUSETTS
PREPARED FOR
LOW STREET REDEVELOPMENT LLC

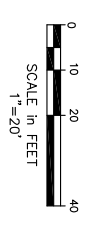
PROJECT NO.
2017-MEDICAL

DATE: OCT. 19, 2017

SHEET NO.
1 OF 1



- EXISTING DRAINAGE AREAS**
- PR1 - 3,013 SF PAVEMENT / 2,044 SF BRUSH
 - PR2 - 5,096 SF PAVEMENT / 1,647 SF BRUSH
 - PR3 - 3,134 SF PAVEMENT / 1,786 SF BRUSH
 - PR4 - 4,644 SF PAVEMENT / 1,404 SF BRUSH
 - PR5 - 7,865 SF WOODS



Copyright 2017 Winter GEC, LLC Winter GEC, LLC 34 WINTER STREET NEWBURYPORT, MA 01950 978-270-8626		SCALE: HORIZ: 1" = 20' VERT: N.A.		FIELD: I.P.T. CALCS: I.P.T. CHECKED: SBS APPROVED: SBS	
NO.	DATE	BY	REVISIONS	PROPOSED DRAINAGE AREAS 255 LOW STREET (REAR)	
ZONING DISTRICT B1 ZONING DISTRICT R1				PLAN OF LAND IN NEWBURYPORT, MASSACHUSETTS PREPARED FOR LOW STREET REDEVELOPMENT LLC	
CITY OF NEWBURYPORT MAP 109 LOT 3-B N/E 313.71' N 65°57'05" W				PROJECT NO. 2017-MEDICAL DATE: OCT. 19, 2017 SHEET NO. 1 OF 1	