



Town of Leicester PLANNING BOARD

3 Washburn Square
Leicester, Massachusetts, 01524-1333
Phone: 508-892-7007 Fax: 508-892-7070
www.leicesterma.org

RECEIVED
2024 MAR -7 PM 4:17
TOWN CLERK'S OFFICE
LEICESTER, MASS.

PLANNING BOARD AGENDA

Tuesday, March 12, 2024, 7 PM
Meeting Room 3

- **Public Hearing**
 - 7:05pm: SPR-2014-01 – Modification: Jack Daige, Central Mass Crane
112 Huntoon Memorial Highway, Rochdale, MA. Map 46 Parcel A1.2-0. Zone:
HB-2. The project includes the construction of a 10,000 s.f. storage/garage
building with a new stormwater management system.
- **Old Business**
 - 700/704 Main St and 694/696 – Cultec system install status
 - Board signatures for Registry of Deeds – Update
- **New Business**
 - Motion(s) to Proceed with Articles for the Town Meeting
- **Administrative**
 - Approval of minutes from February 20, 2024
- **Town Planner Report/General Discussion**
 - 11 Hankey St.
 - Zoning Bylaw
 - Battery Energy Storage Bylaw Introduction
- **Adjourn**

**Note: Agenda times for items that are not public hearings may be taken out of order.*

"The listings of matters are those reasonably anticipated by the Chair 48 hours before said meeting, which may be discussed at the meeting. Not all items listed may in fact be discussed and other items not listed may also be brought up for discussion to the extent permitted by law.

PUBLIC HEARING
CENTRAL MA CRANE-JACK DAIGE
SPR-2014-01 – MODIFICATION
Original Submittal



Town of Leicester PLANNING BOARD

LEICESTER, MASSACHUSETTS, 01524-1333

Phone: 508-892-7007 Fax: 508-892-7070

www.leicesterma.org

RECEIVED
2024 FEB 20 PM 5:47
TOWN CLERK'S OFFICE
LEICESTER, MASS.

LEICESTER PLANNING BOARD PUBLIC HEARING NOTICE SPR-2014-01 - Modification

In accordance with MGL Ch.40A Section 9 the Leicester Planning Board will hold a public hearing on **Tuesday, March 12, 2024 at 7:05 PM** in Meeting Room 3 at the Leicester Town Hall, 3 Washburn Sq., Leicester, MA 01524 to review a Request for Modification of Site Plan (SPR-2014-01) application submitted by Jack Daige, Central Mass Crane Service, 112 Huntoon Memorial Highway, Rochdale, MA 01542.

The project includes the construction of a 10,000 s.f. storage/garage building with a new stormwater management system. **Site Location:** 112 Huntoon Memorial Highway, Rochdale, MA 01542. Said premises being further described in Worcester County Registry of Deeds Book 50079 Page 124. Assessor Parcel 46-A1.2-0, Zone: Highway Business-Industrial District 2 (HB-2).

A copy of the application may be inspected in the Town Clerk's Office during regular business hours or online at leicesterma.org/pb. Any person interested or wishing to be heard on this application should appear at the time and place designated or submit written comments on or before the hearing date by mail or email at planning@leicesterma.org.

Joshua Campbell, Chair
Leicester Planning Board

To be published in the Worcester Telegram & Gazette on:
Wednesday, February 28, 2024 and Wednesday, March 6, 2024

Order Confirmation

Not an Invoice

Account Number:	1377769
Customer Name:	Jack Daige
Customer Address:	Jack Daige 112 Huntoon Memorial HWY Rochdale MA 01542-1307
Contact Name:	Jack Daige
Contact Phone:	508-892-0400
Contact Email:	westwell@leicesterma.org
PO Number:	

Date:	02/22/2024
Order Number:	9881454
Prepayment Amount:	\$ 0.00

Column Count:	1.0000
Line Count:	51.0000
Height in Inches:	0.0000

Print

Product	#Insertions	Start - End	Category
NEO WOR Telegram & Gazette	2	02/28/2024 - 03/06/2024	Public Notices
NEO WOR telegram.com	2	02/28/2024 - 03/06/2024	Public Notices

Order Confirmation Amount

\$240.72

Ad Preview

LEICESTER PLANNING BOARD PUBLIC HEARING NOTICE SPR-2014-01 - Modification

In accordance with MGL Ch.40A Section 9 the Leicester Planning Board will hold a public hearing on Tuesday, March 12, 2024 at 7:05 PM in Meeting Room 3 at the Leicester Town Hall, 3 Washburn Sq., Leicester, MA 01524 to review a Request for Modification of Site Plan (SPR-2014-01) application submitted by Jack Daige, Central Mass Crane Service, 112 Huntoon Memorial Highway, Rochdale, MA 01542.

The project includes the construction of a 10,000 s.f. storage/garage building with a new stormwater management system. Site Location: 112 Huntoon Memorial Highway, Rochdale, MA 01542. Said premises being further described in Worcester County Registry of Deeds Book 50079 Page 124. Assessor Parcel 46-A1.2-0, Zone: Highway Business-Industrial District 2 (HB-2).

A copy of the application may be inspected in the Town Clerk's Office during regular business hours or online at leicesterma.org/pb. Any person interested or wishing to be heard on this application should appear at the time and place designated or submit written comments on or before the hearing date by mail or email at planning@leicesterma.org.

Joshua Campbell, Chair
Leicester Planning Board
2/28/2024

LETTER OF TRANSMITTAL

TO: Kristen Jackson, Town Planner
Town of Leicester
3 Washburn Square
Leicester, MA 01524
508-892-7007

PROJ. NO: 151-3036-O **DATE:** 2-9-2024

PROJECT: Site Plan Modification

LOCATION: 112 Huntoon Memorial Highway
Parcel IDs: 46-A-1.2, 44-A-10

SENT BY WAY OF THE FOLLOWING: Hand Delivery

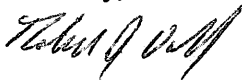
COPIES	DATE	ITEM DESCRIPTION
		SITE PLAN MODIFICATION
1	1-29-2024	Cover Letter
1	1-31-2024	Request for Modification of Approval Site Plan Review Application Form
1	1-31-2024	Land Owner Authorization Form
1	1-31-2024	Billing Authorization Form
1	2-7-2024	Certified Abutters List
1	1-24-2024	Stormwater Report prepared by McClure Engineering, Inc. date 1-24-24
6	1-31-2024	"Site Plan Modification" 112 Huntoon Memorial Highway, Rochdale, MA date 1/31/24 (Size 24x36)
6	1-31-2024	"Site Plan Modification" 112 Huntoon Memorial Highway, Rochdale, MA date 1/31/24 (Size 11x17)
1	2-9-2024	Check for \$200 payable to Town of Leicester for site plan application
1	2-4-20204	Check for \$ 3,124.83 payable to the Town of Leicester for engineering peer review account

REMARKS:

Dear Planning Board Members,

Enclosed are the above listed documents pertaining to the Site Plan Modification for 112 Huntoon Memorial Highway, Rochdale, MA. Please call me with any questions or comments at (508) 248-2005.

Sincerely,

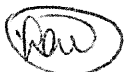


Robert J Duff, P.E.
Senior Engineer

RECEIVED

FEB 12 2024

Town of Leicester
Planning Department



cc: Jack Daige, Central MA Crane Service, Inc., 112 Huntoon Memorial Highway, Rochdale, MA 01542

January 29, 2024

Ms. Kristen Jackson, Town Planner
Town of Leicester Planning Department
3 Washburn Square
Leicester, MA 01524

**Re: Central Mass Crane - 2024 Site Plan Modification: Proposed Storage-Garage Bldg.
112 Huntoon Memorial Highway; Parcel IDs: 44-A-10 and 46-A-1.2**

Dear Planning Board Members,

On behalf of the project Applicant, Central MA Crane Service, Inc., McClure Engineering, Inc. (McClure) is hereby submitting this request for a Site Plan Modification to the 2014 Site Plan Approval for Central Mass Crane located at 112 Huntoon Memorial Highway, Rochdale (Site). The initial site development was approved through Site Plan Review Approval in 2014 (SPR2014-1). The Applicant is proposing to construct a new 100'X100' building on site and a new stormwater management system.

The Property is identified as Assessor's Parcels 46-A-1.2, 44-A-10, and formerly a portion of 44-A-7 and is located within the Highway-Business 2 Zoning District. The Property consists of roughly 9.8 acres +/- and is a developed commercial site with an existing 14,400 s.f. two story building, asphalt parking, a gravel storage, parking yard, and on-site stormwater management system. The Site sits within the Rochdale Water District and the Oxford Rochdale Sewer District and is currently connected to both.

The Applicant's intent of this proposed site plan modification is to construct a new 10,000 S.F. building with gravel parking and storage area. The hours of operation are Monday through Friday (7AM to 4 PM). There is some weekend and evening night operations as needed. No additional employees are anticipated with the construction of the new building. Silt fence and straw wattle erosion control barriers will be installed as depicted on the Erosion and Sedimentation Control Plan. All disturbed areas are proposed to be treated with loam, seed, and clean straw for stabilization. Erosion control blankets will be implemented for slopes greater than 3:1.

Per the Leicester Zoning Bylaw Standards for Site Plan Approval, the proposed site modifications will meet the standards as follows:

A. The use complies with all the provisions of the Leicester Zoning By-Law.

The existing uses of the site are allowed per the Zoning Bylaw and the original 2014 Site Plan Approval. The proposed building is allowed as a by-right use in the HB2 zoning district per Bylaw Section 3.2.04.

B. The use will not materially endanger or constitute a hazard to the public health and safety.

The primary commercial use has been in existence since the 2014 Site Plan Approval. The proposed expansion of use for the storage of commercial equipment and vehicles is allowed per the Zoning Bylaw as stated above. The uses of the Site have not and will not endanger or constitute a hazard to public health and safety.

C. The use will not create undue traffic congestion or unduly impair pedestrian safety.

The Site has been in existence since the development based upon the 2014 Site Plan Approval. The proposed site modifications will not result in adverse impacts to traffic or pedestrian safety.

D. Sufficient off-street parking exists or will be provided to serve the use.

The Site has been in existence since the development based upon the 2014 Site Plan Approval, which included sufficient off-street parking for the use. The proposed site modifications will not result in the need for additional parking spaces on site. The proposed modification will result in a larger gravel parking and storage area for the storage of commercial equipment and vehicles.

E. The use can be adequately served by water, sewer, and other necessary utilities, or if these are unavailable, that they will be brought to the site at the owner's expense; or, the Planning Board is satisfied that the proposed alternatives will comply with all applicable regulations.

The Site has been in existence since the development based upon the 2014 Site Plan Approval and the existing building utilizes both municipal sewer and water services. The proposed accessory building will require water or sewer services.

F. The use will not result in a substantial increase of volume or rate of surface water runoff to neighboring properties and streets, nor will result in pollution or degradation to surface water or groundwater.

The Site has been in existence since the development based upon the 2014 Site Plan Approval which included a stormwater management design for the protection of surface and groundwater sources. The proposed increase in gravel parking and storage area will require additional stormwater management features and modifications to the existing stormwater management system. These modifications are shown on the "Site Plan Modification" plan set and a Stormwater Management Report showing compliance with Massachusetts Stormwater Management Standards is included with the application for the site plan modification.

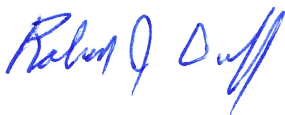
G. The use will not result in any undue disturbance to adjoining property owners or the Town caused by excessive or unreasonable noise, smoke, vapors, fumes, dust, glare, etc.

The Site has been in existence since the development based upon the 2014 Site Plan Approval. The proposed site modifications will not result in adverse impacts related to noise, smoke, vapors, fumes, dust, glare, etc. The existing uses on site will remain along with the expanded storage of commercial equipment and vehicles. The proposed building and storage area expansion is away from any residential abutters as to avoid disturbance to their properties.

The Applicant is requesting a modification to the existing "Site Plan Approval" issued by the Leicester Planning Board in 2014 pursuant to the Leicester Zoning By-Law. McClure is providing details for the proposed modification on the **"Site Plan Modification" 112 Huntoon Memorial Highway, Rochdale, MA 01542," plan set date 1/31/2024.**

Please contact me with any questions or if you need additional information at (508) 248-2005.

Sincerely,



Robert J Duff, P.E.
Senior Engineer

cc: Jack Daige, Central MA Crane Service, Inc., 112 Huntoon Memorial Highway, Rochdale, MA 01542

Planning Board &
Zoning Board of Appeals

Kristen Jacobsen
Town Planner

3 Washburn Square
Leicester MA, 01524
508.892.7000 ext. 120
www.leicesterma.org

Town of Leicester

Planning Department

Request for Modification of Approval Site Plan / Special Permit / Variance



Applicant

Name of Applicant (primary contact): Jack Daige

Company: Central Mass Crane Service

Address: 112 Huntoon Memorial Highway

Phone: 508-892-0400 Cell: 508-635-7044

Email Address: jackd@centralmasscrane.com

Owner

Name of Owner: same

Address: _____

Phone: _____ Cell: _____

Email: _____

Proposal

The undersigned herewith resubmits the accompanying additional plan, materials, information, etc., relative to the previously filed Site Plan Application No. SPR2014-01 and/or Special Permit Application No. _____ and/or Variance Application No. _____ for property located on/at _____ and decision recorded at the Worcester Registry of Deeds, Deed Book _____, Page _____, dated _____ and/or Plan Book _____, Page _____.

With this submission of this form, and any other materials requested by the Planning and Community Development Department, I am hereby requesting a modification of said permit, for good reason, as described here or on additional pages.

SEE NARRATIVE

Signature

Original Owner's Signature (Blue Ink Only): [Signature] Date: 1/31/24

Mailing Address: _____ Town/State/Zip: _____

Phone Number: _____ Email: _____

Office Use only

Meeting Date _____

Board's Decision _____

Town of Leicester
Planning Department
Land Owner
Authorization Form



3 Washburn Square
Leicester MA, 01524
508.892.7007

Applicant

Name of Applicant (primary contact): Jack Daige
Company: Central Mass Crane Service
Address: 112 Huntoon Memorial Highway
Phone: 508-892-0400 Cell: 508-635-7044
Email Address: jackd@centralmasscrane.com

Owner

Name of Owner: same
Address: _____
Phone: _____ Cell: _____
Email: _____

Property

Address of Property: 112 Huntoon Memorial Highway
Assessor's Tax Map/Parcel Number: 44-A-10 46-A-1.2

Proposal

Brief description of the proposed work: 10,000 SQ Ft garage-storage bldg and gravel driveway

Authorization

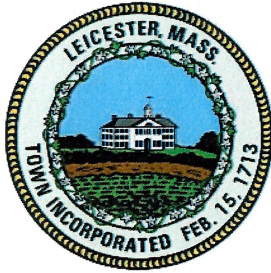
As the owner or authorized agent of the property listed above, I hereby give permission to the Applicant as stated above to perform work at aforementioned property. Said permission includes, but is not limited to, acquiring all required permits and performing all work required to complete the project.

By signing this Form, I acknowledge and agree that I am not released from responsibility for:

- (a) the payment of any and all fees associated with the issuance of any: permits, orders, notices or other approvals ("Approvals") by the Town of Ware pursuant to any applications, including taxes, that effect said property;
- (b) the satisfactory completion of all work authorized by such Approvals in compliance with all applicable town, state and federal laws, codes, rules, regulations and requirements; and
- (c) correcting any violations of the terms and conditions of such Approvals issued by the Town of Ware pursuant to any application to effect my property.

Signature

Original Owner's Signature (Blue Ink Only): Date: 1 / 31 / 24
Mailing Address: 112 Huntoon Memorial HWY Town/State/Zip: Rochdale MA 01542
Phone Number: 508-892-0400 Email: jackd@centralmasscrane.com



**Town of Leicester
Planning Department**

3 Washburn Square, Leicester MA 01524
Tel: (508)892-7007 x120

Billing Authorization Form

To:

Town of Leicester

From:

Billing Authorization Form

RE:

In accordance with Massachusetts General Laws (MGL), c. 40A, §11, which reads in part,

"Notice shall be given by publication in a newspaper of general circulation in the city of town once in each of two successive weeks, the first publication to be not less than fourteen days before the day of the hearing..."

I hereby authorize Local I.Q. New England Gannett to bill me directly for the attached Legal Notice(s) to be published for two successive weeks in the **Worcester Telegram** on the following dates:

_____ and _____

For property located at: 112 Huntoon Memorial HWY, Leicester, MA.

Please print legibly:

Bill To: Central Mass Crane Services

Address: 112 Hunton Memorial Highway

City/State/Zip: Rochdale Ma 01542

Telephone: 508-892-0400

Email: jackd@centralmasscrane.com

Signature

Date

1-31-24

Payment to be remitted to: Gannett New England LocalIQ
P.O. Box 631210
Cincinnati, OH 45263-1210

TOWN OF LEICESTER

ASSESSORS HAVE TEN DAYS TO PROCESS YOUR REQUEST, PLEASE PLAN AHEAD!

\$10.00 PREPAID AT TIME OF REQUEST FOR FIRST THREE PAGES, \$5.00 PER PAGE AT
TIME OF PICKUP FOR EACH ADDITIONAL PAGE.

Subject Information

Parcel	Assessors Map: 46	Parcel: A	Deed Ref#: 1.2
Owner(s)	Huntoon Highway LLC		
Street Address	112 Huntoon Memorial Highway		

Requestor Information

Name	Kristin Heybeck		
Telephone	508-248-2005	Email	kheybeck@mcclureengineers.com

	Board/Department	Description of Required Abutters List
	Conservation Commission RDA	Direct abutters, including abutters across any street
	Conservation Commission NOI	Abutters and abutters to abutters within <u>300 feet</u> , including across any street or body of water ¹
<input checked="" type="radio"/>	Planning Board Special Permit, <u>Major</u> Site Plan Review, or Definitive Subdivision	Abutters and abutters to abutters within <u>300 feet</u> , including across any street
	Zoning Board of Appeals Special Permit OR Variance	Abutters and abutters to abutters within <u>300 feet</u> , including across any street
	Board of Health.	Specify Distance (consult with Board of Health Staff to determine the required distance) _____
	Board of Selectmen Class II License	Direct abutters, including abutters across any street
	Board of Selectmen Liquor License	Direct abutters, including abutters across any street AND schools, churches, or hospitals within 500 feet
	Other. Please specify Board/Department _____	Please specify: _____ Direct Abutters _____ feet Other: _____

¹ An applicant who proposes work solely within Land under Water Bodies or Waterways, or solely within a Lot with an area greater than 50 acres, is required to provide notification only to Abutters whose Lot is within three hundred feet from the *Project Site*. An applicant proposing a Linear- shaped Project greater than 1,000 feet in length is required to provide notification only to Abutters whose Lot is within 1,000 feet from the Project Site.



300 feet Abutters List Report

Leicester, MA
February 14, 2024

Subject Property:

Parcel Number: 46-A1.2-0
CAMA Number: 46-A1.2-0
Property Address: 112 HUNTOON MEMORIAL HW

Mailing Address: HUNTOON HIGHWAY LLC
112 HUNTOON MEMORIAL HWY
ROCHDALE, MA 01542-0338

Abutters:

Parcel Number: 44-A10-0
CAMA Number: 44-A10-0
Property Address: 110 HUNTOON MEMORIAL HW

Mailing Address: HUNTOON HIGHWAY LLC
P O BOX 325
ROCHDALE, MA 01542-0338

Parcel Number: 44-A7.1-0
CAMA Number: 44-A7.1-0
Property Address: 104 HUNTOON MEMORIAL HW

Mailing Address: KONCEPTS REALTY LLC
30 MILL STREET/P O BOX 239
ROCHDALE, MA 01542

Parcel Number: 44-A7-0
CAMA Number: 44-A7-0
Property Address: 94 102 HUNTOON MEMORIAL HW

Mailing Address: 94 HUNTOON FEE OWNER LLC
100 GRANDVIEW ROAD SUITE 203
BRAINTREE, MA 02184

Parcel Number: 44-A8-0
CAMA Number: 44-A8-0
Property Address: 106 HUNTOON MEMORIAL HW

Mailing Address: JSAV REALTY LLC
223 WEST STREET
PAXTON, MA 01612

Parcel Number: 44-A9-0
CAMA Number: 44-A9-0
Property Address: 108 HUNTOON MEMORIAL HW

Mailing Address: ESAV REALTY LLC C/O JOHN SAVICKAS
223 WEST STREET
PAXTON, MA 01612

Parcel Number: 44-B5-0
CAMA Number: 44-B5-0
Property Address: 115 HUNTOON MEMORIAL HW

Mailing Address: HENSHAW HOLDINGS LLC
515 HENSHAW ST
ROCHDALE, MA 01542

Parcel Number: 46-A1.1-0
CAMA Number: 46-A1.1-0
Property Address: 982 STAFFORD ST

Mailing Address: DIGUETTE MELISSA M
982 STAFFORDE ST
ROCHDALE, MA 01542

Parcel Number: 46-A1-0
CAMA Number: 46-A1-0
Property Address: 980 STAFFORD ST

Mailing Address: ONEIL NANCY E
980 STAFFORD STREET
ROCHDALE, MA 01542

Parcel Number: 46D-A7-0
CAMA Number: 46D-A7-0
Property Address: 986 STAFFORD ST

Mailing Address: BACHMAN ROBERT BACHMAN GLORIA
986 STAFFORD STREET
ROCHDALE, MA 01542

Parcel Number: 46D-B4-0
CAMA Number: 46D-B4-0
Property Address: 989 A STAFFORD ST

Mailing Address: GILES JENNALYN
989A STAFFORD ST
ROCHDALE, MA 01542

CAI Technologies

www.cai-tech.com

2/14/2024

Data shown on this report is provided for planning and informational purposes only. The municipality and CAI Technologies are not responsible for any use for other purposes or misuse or misrepresentation of this report.

Page 1 of 2



300 feet Abutters List Report

Leicester, MA
February 14, 2024

Parcel Number: 46D-B6.1-0
CAMA Number: 46D-B6.1-0
Property Address: 985 STAFFORD ST

Mailing Address: GAGNON DANIELLE
985 STAFFORD STREET
ROCHDALE, MA 01542-1129

Parcel Number: 46D-B6-0
CAMA Number: 46D-B6-0
Property Address: 2 CARLETON RD

Mailing Address: SMITH VINCENT W SMITH AMANDA C
2 CARLETON RD
ROCHDALE, MA 01542

Parcel Number: 46D-C1-0
CAMA Number: 46D-C1-0
Property Address: 1 CARLETON RD

Mailing Address: PAGAN JESSICA PAGAN GIOVANNI
1 CARLETON RD
ROCHDALE, MA 01542

Parcel Number: 46D-C16-0
CAMA Number: 46D-C16-0
Property Address: 3 CARLETON RD

Mailing Address: HURTON TIMOTHY E HURTON DENISE
3 CARLETON RD
ROCHDALE, MA 01542

Parcel Number: 46D-C2-0
CAMA Number: 46D-C2-0
Property Address: 967 STAFFORD ST

Mailing Address: CRUZ DIEGO CRUZ CARMEN
967 STAFFORD STREET
ROCHDALE, MA 01542

Parcel Number: 46D-C3-0
CAMA Number: 46D-C3-0
Property Address: 961 STAFFORD ST

Mailing Address: DORR CHRISTINE I
961 STAFFORD ST
ROCHDALE, MA 01542

Parcel Number: 46D-C4-0
CAMA Number: 46D-C4-0
Property Address: 957 STAFFORD ST

Mailing Address: PLANTE KEVIN M
957 STAFFORD ST
ROCHDALE, MA 01542

Parcel Number: 46D-C5-0
CAMA Number: 46D-C5-0
Property Address: 120 HUNTOON MEMORIAL HWY

Mailing Address: PELLEGRINO TINA R
120 HUNTOON MEMORIAL HWY
ROCHDALE, MA 01542

Parcel Number: 46D-D1-0
CAMA Number: 46D-D1-0
Property Address: 945 STAFFORD ST

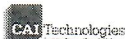
Mailing Address: MACDOUGALL MATHEW K YOST LILY
945 STAFFORD ST
ROCHDALE, MA 01542

Parcel Number: 46D-D14-0
CAMA Number: 46D-D14-0
Property Address: 121 HUNTOON MEMORIAL HWY

Mailing Address: BACHAND SR STEPHEN M BACHAND
DEL-MARIE
121 HUNTOON MEM HWY
ROCHDALE, MA 01542

Above is a certified list of abutters an abutters to abutters within
300 feet including across any street or body of water.
Subject property: 112 Huntoon Memorial Highway Map 46 Lot
A1.2 Deed book 52916 page 330.
Subject owner: Huntoon Highway LLC
Certified by John W Stencel, Assistant Assessor

John Stencel



www.cai-tech.com

2/14/2024

Data shown on this report is provided for planning and informational purposes only. The municipality and CAI Technologies are not responsible for any use for other purposes or misuse or misrepresentation of this report.

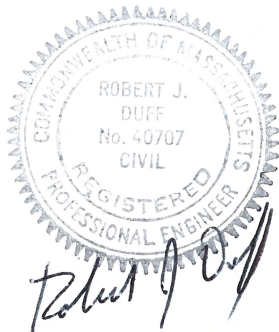
Page 2 of 2

STORMWATER MANAGEMENT REPORT SITE PLAN MODIFICATION

**CENTRAL MA CRANE SERVICE, INC.
112 HUNTOON MEMORIAL HIGHWAY
ROCHDALE, MA 01542**

Prepared for:

Central MA Crane Service, Inc.
112 Huntoon Memorial Highway
Rochdale, MA 01542



January 26, 2024

McCLURE
ENGINEERING, INC

119 Worcester Road - Charlton, Massachusetts 01507 – T: 508.248.2005

151-3036-O

Table of Contents

List of Sections

I. Introduction

- A. Scope of Analysis
- B. Site Description
- C. Proposed Construction

II. Hydrologic Analysis

- A. Purpose
- B. Methodology
- C. Selection of Storm Events
- D. Soils Classification
- E. Pre-Development Model Summary
- F. Post-Development Model Summary
- G. Summary of Peak Stormwater Discharge Rates

III: Compliance with Stormwater Standards

- A. Standard 1 – Computations to Show That Discharge Does Not Cause Scour or Erosion
- B. Standard 2 – Peak Rate Attenuation
- C. Standard 3 – Recharge
- D. Standard 4 – Required Water Quality
- E. Standard 5 – Land Uses with Higher Pollutant Loads
- F. Standard 6 – Critical Areas
- G. Standard 7 – Redevelopment
- H. Standard 8 – Construction Period Controls
- I. Standard 9 – Operation and Maintenance Plan
- J. Standard 10 – Illicit Discharges to Drainage System

List of Appendices

- A. MassDEP Stormwater Checklist
- B. USGS Figure 1
FEMA Map
- C. NCRS Soil Mapping
Original Soil Boring Results - 2004
Rainfall Data for Massachusetts from NOAA Atlas 14, Volume 10, Version 3
Rawls Table
- D. Pre-Post Development HydroCAD Drainage Calculations
- E. Total Suspended Solids Calculations
- F. Construction Period Inspection Report
- G. Stormwater Management System Long-Term Operation & Maintenance (O&M) Plan
Illicit Discharge Compliance Statement

Section I - Introduction

A. Scope of Analysis

This Stormwater Management Report provides the required analysis for the proposed 100'X100' garage-storage building expansion and associated site work at Central MA Crane Service, Inc. located at 112 Huntoon Memorial Highway, Rochdale, MA (Site). This report also documents compliance with the Town of Leicester Planning Board Zoning Bylaws requirements for Site Plan Review, and the Massachusetts Stormwater Requirements. The analysis includes pre- and post- conditions hydrologic modeling, and hydraulic sizing of the conveyance systems, sizing and analysis of Stormwater Best Management Practices (BMPs) of structural or non-structural techniques for managing stormwater to prevent or reduce non-point source pollutants from entering surface waters or ground waters. This report will demonstrate that the stormwater management system as designed and laid out for the site expansion at Central MA Crane Service, Inc. located at 112 Huntoon Memorial Highway, Rochdale, MA, complies with the referenced regulations.

A Stormwater Checklist is included as **Appendix A**.

B. Site Description

The project is located at 112 Huntoon Memorial Highway, Rochdale, MA, known as assessor's parcel numbers 44-A-10, and 46-A-1.2. It comprised of approximately 9.85 acres +/- . The site is currently home to an existing commercial building and associated asphalt parking and gravel storage areas, located at the corner of Stafford Street and Huntoon Memorial Highway (Route 56). The site is in the Highway Business-Industrial 2 zoning district. The original site plan was developed and approved in 2014, designed by JH Engineering Group LLC. A stormwater drainage analysis was performed at the time, resulting in a design of a stormwater management system consisting of a catch basin and manhole pipe network, two rain gardens, two water quality Stormceptor™ units, and an underground detention system. In 2021, the applicant applied for and received approval to construct a gravel parking area in the northeastern part of the property. This work has been completed at this time.

A wetland resource area delineation was performed by EcoTec, Inc. in November 2012. The original site plan included a wetland crossing for the Site's driveway on Huntoon Memorial Highway, as well as an associated wetland replication area. The proposed construction of the accessory building will not be subject to the Wetlands Protection Act. Flood Insurance Rate Map (FIRM) #25027C0784E was reviewed for this site, as provided in **Appendix B**. This mapping does not show any flood zones mapped on this site.

A Site Locus Map is included as **Appendix B**.

C. Proposed Construction

The Applicant's intent of this proposed site plan modification is to construct a 100'X100' garage-storage building as detailed on the "Site Plan Modification" plans prepared by McClure Engineering, Inc. The construction of this building requires a stormwater management system. Stormwater runoff from the proposed building will be conveyed to a new infiltration basin located in the northern part of the property.

See "Site Plan Modification" 112 Huntoon Memorial Highway, Rochdale, MA date 1-31-24, prepared by McClure Engineering, Inc.

Section II - Hydrologic Analysis

A. Purpose

The purpose of this analysis is to determine the pre and post peak rate of stormwater runoff discharging from the Site and to ensure prevention of an increase in rate of runoff due to development of this area, compared to pre-development conditions. MassDEP Stormwater Management Policy, Standard No. 2, requires that post-development peak stormwater discharge rates shall not exceed pre-development levels.

B. Methodology

The pre- and post-development stormwater runoff has been analyzed using HydroCAD 10.20 4a, a stormwater modeling computer program. HydroCAD is a collection of techniques for the generation and routing of hydrographs, including Soil Conservation Service (SCS) Technical Release No. 20 (TR-20) and SCS Technical Release 55 (TR-55), *Urban Hydrology for Small Watersheds*. The analysis routes completely through one node at a time determining each outflow hydrograph before considering the next node.

Drainage areas are modeled as three components, or nodes: sub catchments, reaches and ponds. A sub catchment is a relatively homogeneous area of land, which produces runoff that drains to a single reach or a pond. A reach is generally a uniform stream, pipe, or other concentrated stormwater flows that conveys water from one point to another reach or pond. A pond is defined as a pond, swamp or other impoundment receiving water from one or more sources.

The sub catchments have been modeled using SCS methods. Curve numbers, which are based upon the type of development and soil classifications, coupled with the time of concentration have been used to generate the peak storm flow for each area. Detailed information and results are provided in this report.

C. Selection of Storm Events

The intensity for each storm event was determined from the NOAA Atlas 14, Volume 10, Version 3, Point Precipitation Frequency Estimates for Leicester, MA (see **Appendix C**).

Rainfall frequency and intensity used in this analysis are as follows:

<u>Design Storm Event</u>	<u>Rainfall Intensity</u>
2 year	3.18 inches
10 year	4.95 inches
25 year	6.05 inches
100 year	7.76 inches

D. Soils Classification

Site soils classifications were obtained from the following sources:

- 1.) Advanced soil mapping performed by the U.S. Department of Agriculture's SCS, "Soil Survey of Worcester County, Massachusetts, Southern Part."

(See **Appendix C** provides a copy of the NRCS soil mapping and respective hydrologic Soil Group (HSG) information).

The soils descriptions are mapped as follows:

315A – Scituate fine sandy loam, 0 to 3 percent slopes – HSG C, estimated depth to water table 17"-36"

Soil Permeability (k):

Site subsurface soils are classified as a "sandy loam" Type C soil.

Design permeability (k) value:

k = 1.02 in / hr (Rawls Rate: Sandy Loam)

E. Pre-Development Model Summary

The pre-development hydrologic model analysis consists of one analysis point and sub catchment. E1 is the sub catchment and analysis point (AP-1) for runoff to the corner of the property. The graphical presentation of the pre-development model is shown in two figures as provided in **Appendix D**.

F. Post-Development Model Summary

The post development model is shown in the figure as provided in **Appendix D**. The post development model includes three sub-catchment areas and one analysis point.

G. Summary of Peak Stormwater Discharge Rates

The following summary table presents results for the pre- and post-development analysis for the 2, 10, 25 and 100 year, 24-hr storm events at analysis point 2 as considered.

The site drainage system has been designed from calculations based upon the 100-year design storm event using the peak flows predicted by the HydroCAD 10-20 4a Dynamic Modelling Program.

Flows to Analysis Point 1	Pre-Development (cfs)	Post-Development (cfs)	Net Change (cfs)
2 Year Storm	2.70	1.61	-1.09
10 Year Storm	6.62	4.31	-2.31
25 Year Storm	9.29	6.31	-2.98
100 Year Storm	13.6	9.26	-4.34

Section III– Stormwater Standards

A. Standard 1 – No New Untreated Discharges

The proposed expansion of the developed site, along with the proposed additional stormwater management features, will not produce any new untreated discharges. All stormwater runoff from the proposed building and gravel parking area expansion is proposed to be treated via a infiltration basin prior to being discharged for peak flow attenuation.

B. Standard 2 – Peak Rate Attenuation

The peak rate attenuation analyses and summaries have been reported in hydrologic analysis provided in **Appendix D & E** of this report. The analysis as submitted indicates that there will be no increase in rate of runoff that would cause an increase of the flood elevation downstream.

C. Standard 3 – Recharge Volume

The recharge volume is determined by calculating the impervious area over the corresponding soils identified in the NRCS Soil Survey. The site consists of fine sandy loam, hydrologic soil group C and associated Rawls Rate (1.02 inches/hour), Groundwater recharge is provided per the following;

Recharge (required) = (.25)/12"/ft x 14,364 s.f. = 300 c.f.

Recharge (provided) = 1,224 c.f.

D. Standard 4 – Water Quality

Water Quality Treatment Volume for the additional impervious area proposed is calculated by:

$$V_{wq} = (D_{wq}/12 \text{ inches/ft}) \times (A_{imp})$$

The additional impervious area proposed is a total of 23,172 s.f. All roof runoff from this new accessory building area is proposed to be conveyed directly to a infiltration basin. This area was subtracted from the total impervious. A one-inch (1") water quality depth will be used as the site is a potential LUHPPL.

Water Quality Volume (required) = (1")/12"/ft x 14,364 s.f. = 1197 c.f.

Water Quality Volume (provided) = 1.197 c.f.

The TSS removal rate of 44% prior to the basin and a total TSS removal of 80% will be provided prior to discharge. (See Summary – **Appendix E**).

E. Standard 5 – Land Uses with Higher Potential Pollutant Loads

The site is considered a potential LUHPPL due to fleet storage of vehicles as well as some outside vehicle maintenance which takes place on site. Therefore, the water quality depth used to calculate the water quality volume is 1".

F. Standard 6 – Critical Areas

Not applicable – the Site does not discharge to critical areas.

G. Standard 7 - Redevelopment

The project is not a redevelopment project. All applicable standards will be met.

H. Standard 8 – Construction Period Controls

The construction period erosion and sedimentation control plan has been outlined on the referenced amended site plans along with the sequence for implementation. The construction period erosion and sedimentation control are shown on the referenced plans and consists of perimeter filter tube. A draft Construction Site Inspection Report is included in **Appendix F**.

Construction of the proposed site improvements does not fall under the overall Site's NPDES Construction General Permit as the project will not disturb greater than 1 Acre (approximately 40,000 s.f. disturbance).

I. Standard 9 – Operation and Maintenance Plan

The Long-Term Operation and Maintenance Plan for the Stormwater Management System provided in **Appendix G**.

J. Standard 10 – Illicit Discharges to Drainage System

All illicit discharges to the stormwater management system are prohibited. To the best of our knowledge, there are no existing discharges from the Site other than from the existing stormwater management system. There are no direct connections between sources containing wastewater, hazardous substances, oils, greases, and the existing/ proposed stormwater management system. An Illicit Discharge Compliance Statement is provided in **Appendix G**.

APPENDIX A

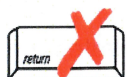
MassDEP STORMWATER CHECKLIST



Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the [Massachusetts Stormwater Handbook](#). The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.¹ This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8²
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

¹ The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

² For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.



Checklist for Stormwater Report

B. Stormwater Checklist and Certification

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

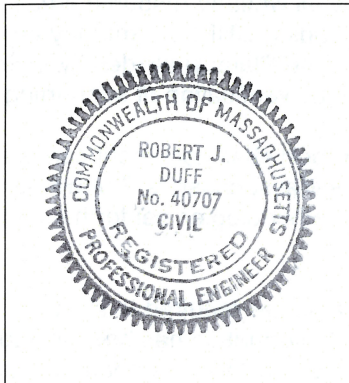
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the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

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

Registered Professional Engineer's Certification

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

Registered Professional Engineer Block and Signature



Robert J. Duff 2-7-2027
Signature and Date

Checklist

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

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



Checklist for Stormwater Report

Checklist (continued)

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

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

Standard 1: No New Untreated Discharges

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



Checklist 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.

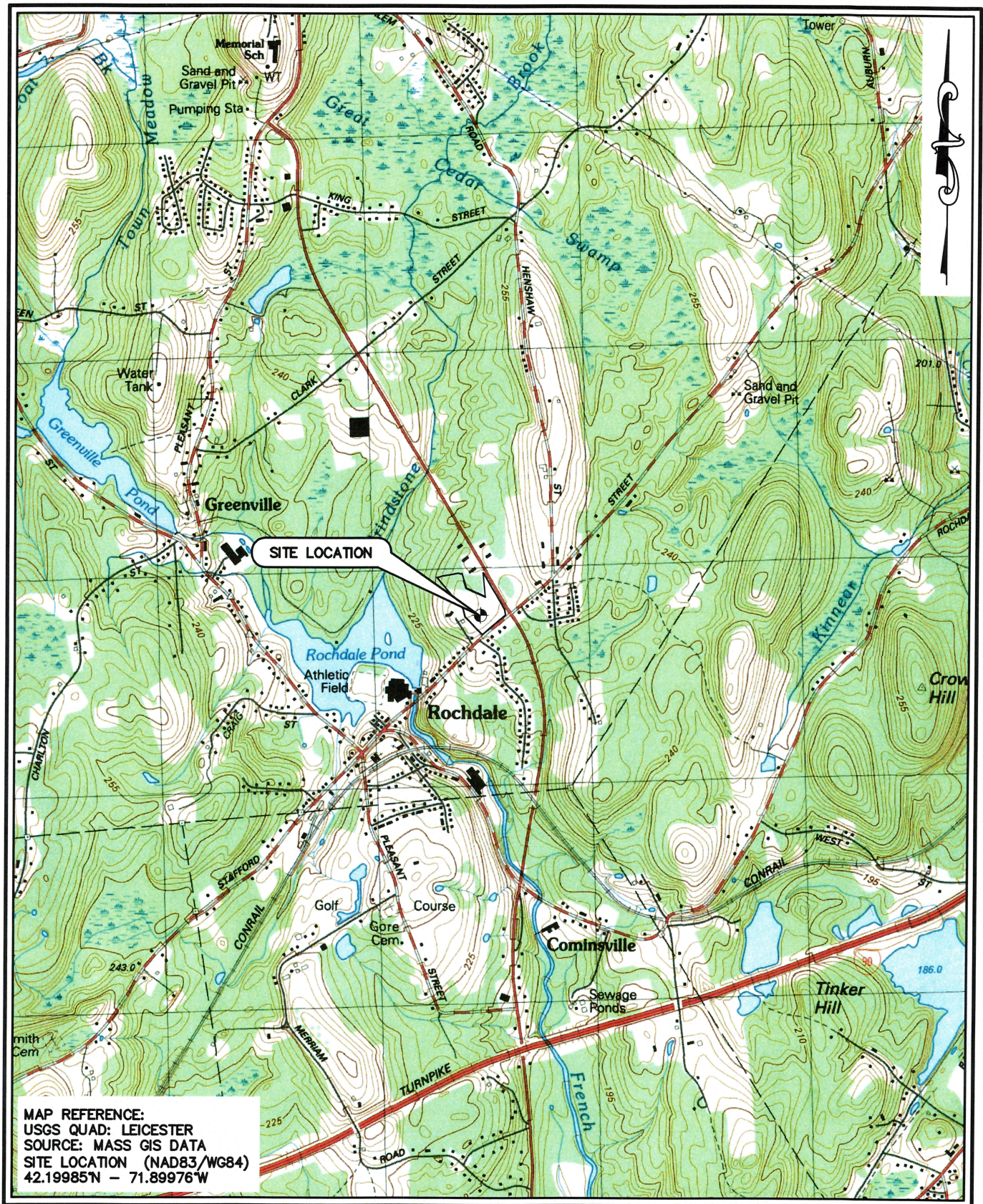
Standard 10: Prohibition of Illicit Discharges


- ☒ 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.

APPENDIX B

USGS LOCUS – FIGURE 1

FEMA MAP



DATE:	8/19/2021	
DRAWN BY:	MM	
APPROVED BY:	CPM	
SCALE:		
HORIZ:	1"=2000'	
VERT:		
0	1000'	2000'
		

McCLURE
 ENGINEERING, INC

119 Worcester Road
 Charlton, MA 01507

Email: chris@mcclureengineers.com

Tel: (508) 248-2005
 Fax (508) 248-4887

USGS SITE LOCATION
112 HUNTOON MEMORIAL HIGHWAY
ROCHDALE, MA 01542
 PREPARED FOR
HUNTOON HIGHWAY, LLC

PROJ. NO. 135-2415-M
 DWG. GIS

FIG
1



NATIONAL FLOOD INSURANCE
FLOOD INSURANCE RATE

WORCESTER COUNTY, MASSACHUSETTS
All Jurisdictions



PANEL 784 of 1075

FEMA

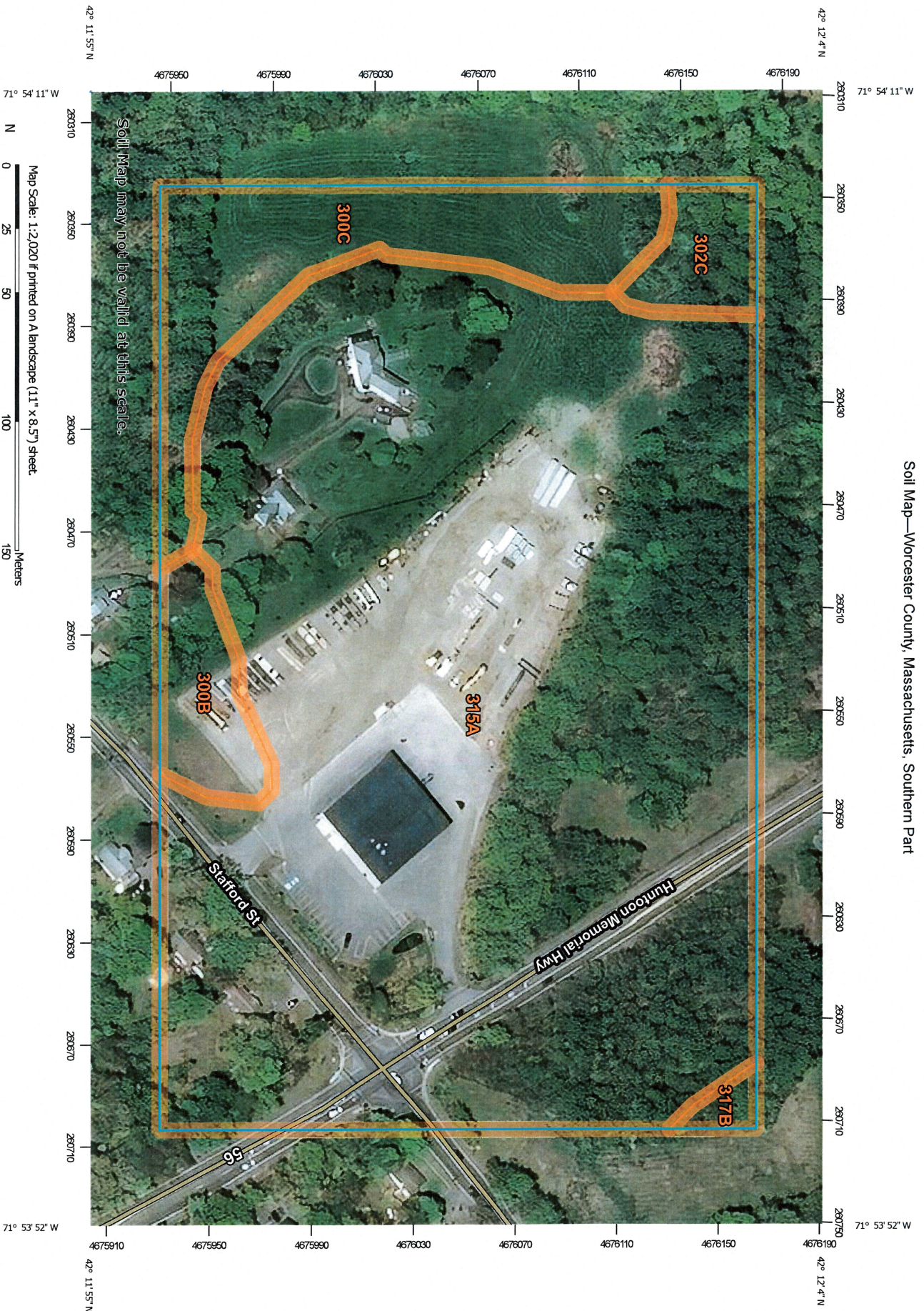
Panel Contains:			
COMMUNITY	NUMBER	PANEL	SUFFIX
AUBURN, TOWN OF	250292	0784	F
LEICESTER, TOWN OF	250313	0784	F
OXFORD, TOWN OF	250325	0784	F

VERSION NUMBER
2.6.3.6
MAP NUMBER
25027C0784F
MAP REVISED
JUNE 21, 2023

This is an official FIRMette showing a portion of the above-referenced flood map created from the MSC FIRMette Web tool. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For additional information about how to make sure the map is current, please see the Flood Hazard Mapping Updates Overview Fact Sheet available on the FEMA Flood Map Service Center home page at <https://msc.fema.gov>.

APPENDIX C
NCRS SOIL MAPPING
PRECIPITATION DATA FROM NOAA
RAWLS TABLE

Soil Map—Worcester County, Massachusetts, Southern Part



Soil Map may not be valid at this scale.








































Map Scale: 1:2,020 if printed on A landscape (11" x 8.5") sheet.



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



MAP LEGEND

Area of Interest (AOI)		Area of Interest (AOI)		Spill Area
Soils		Soil Map Unit Polygons		Stony Spot
		Soil Map Unit Lines		Very Stony Spot
		Soil Map Unit Points		Wet Spot
Special Point Features				Other
		Blowout		Special Line Features
		Borrow Pit		Water Features
		Clay Spot		Streams and Canals
		Closed Depression		Transportation
		Gravel Pit		Rails
		Gravelly Spot		Interstate Highways
		Landfill		US Routes
		Lava Flow		Major Roads
		Marsh or swamp		Local Roads
		Mine or Quarry		Background
		Miscellaneous Water		Aerial Photography
		Perennial Water		
		Rock Outcrop		
		Saline Spot		
		Sandy Spot		
		Severely Eroded Spot		
		Sinkhole		
		Slide or Slip		
		Sodic Spot		

MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Worcester County, Massachusetts, Southern Part

Survey Area Data: Version 13, Jun 11, 2020

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

Date(s) aerial images were photographed: May 18, 2019—Jul 9, 2019

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
300B	Montauk fine sandy loam, 3 to 8 percent slopes	0.7	3.3%
300C	Montauk fine sandy loam, 8 to 15 percent slopes	2.3	10.7%
302C	Montauk fine sandy loam, 8 to 15 percent slopes, extremely stony	0.5	2.5%
315A	Scituate fine sandy loam, 0 to 3 percent slopes	17.8	83.0%
317B	Scituate fine sandy loam, 3 to 8 percent slopes, extremely stony	0.1	0.6%
Totals for Area of Interest		21.4	100.0%

Worcester County, Massachusetts, Southern Part

315A—Scituate fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9p08
Elevation: 280 to 930 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Scituate and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scituate

Setting

Landform: Till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Friable coarse-loamy eolian deposits over dense sandy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 4 inches: sandy loam
H2 - 4 to 16 inches: gravelly sandy loam
H3 - 16 to 30 inches: loamy sand
H4 - 30 to 65 inches: gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 20 to 30 inches to densic material
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 17 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F144AY037MA - Moist Dense Till Uplands

Hydric soil rating: No

Minor Components

Montauk

Percent of map unit: 10 percent

Hydric soil rating: No

Whitman

Percent of map unit: 5 percent

Landform: Depressions

Hydric soil rating: Yes

Ridgebury

Percent of map unit: 5 percent

Landform: Depressions

Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Worcester County, Massachusetts, Southern Part
Survey Area Data: Version 13, Jun 11, 2020



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps & aeriels](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.341 (0.273-0.420)	0.401 (0.321-0.495)	0.499 (0.398-0.618)	0.581 (0.460-0.726)	0.694 (0.529-0.911)	0.780 (0.580-1.05)	0.868 (0.623-1.22)	0.964 (0.656-1.40)	1.10 (0.715-1.66)	1.21 (0.763-1.87)
10-min	0.482 (0.387-0.595)	0.568 (0.454-0.701)	0.708 (0.564-0.877)	0.824 (0.652-1.03)	0.983 (0.750-1.29)	1.10 (0.822-1.49)	1.23 (0.883-1.72)	1.37 (0.928-1.98)	1.56 (1.01-2.36)	1.71 (1.08-2.65)
15-min	0.568 (0.455-0.700)	0.668 (0.535-0.825)	0.832 (0.663-1.03)	0.969 (0.767-1.21)	1.16 (0.882-1.52)	1.30 (0.967-1.75)	1.45 (1.04-2.03)	1.61 (1.09-2.33)	1.83 (1.19-2.77)	2.01 (1.27-3.12)
30-min	0.775 (0.621-0.955)	0.912 (0.730-1.13)	1.14 (0.907-1.41)	1.32 (1.05-1.65)	1.58 (1.21-2.08)	1.78 (1.32-2.39)	1.98 (1.42-2.78)	2.20 (1.49-3.19)	2.50 (1.63-3.79)	2.75 (1.74-4.27)
60-min	0.982 (0.787-1.21)	1.16 (0.926-1.43)	1.44 (1.15-1.79)	1.68 (1.33-2.10)	2.01 (1.53-2.63)	2.25 (1.68-3.03)	2.51 (1.80-3.52)	2.79 (1.89-4.05)	3.18 (2.07-4.81)	3.49 (2.21-5.42)
2-hr	1.25 (1.01-1.53)	1.48 (1.19-1.81)	1.85 (1.49-2.28)	2.17 (1.73-2.68)	2.59 (1.99-3.39)	2.91 (2.19-3.91)	3.25 (2.36-4.57)	3.65 (2.48-5.26)	4.22 (2.76-6.36)	4.71 (2.99-7.26)
3-hr	1.43 (1.16-1.75)	1.70 (1.38-2.08)	2.14 (1.73-2.63)	2.51 (2.01-3.09)	3.01 (2.33-3.93)	3.38 (2.56-4.54)	3.79 (2.77-5.33)	4.26 (2.91-6.14)	4.98 (3.26-7.47)	5.59 (3.56-8.59)
6-hr	1.78 (1.46-2.16)	2.14 (1.75-2.60)	2.73 (2.21-3.32)	3.21 (2.59-3.94)	3.88 (3.02-5.04)	4.38 (3.33-5.85)	4.92 (3.62-6.90)	5.57 (3.82-7.96)	6.57 (4.30-9.79)	7.42 (4.73-11.3)
12-hr	2.18 (1.80-2.63)	2.66 (2.18-3.20)	3.43 (2.80-4.15)	4.07 (3.31-4.96)	4.95 (3.88-6.40)	5.61 (4.29-7.44)	6.31 (4.68-8.81)	7.18 (4.94-10.2)	8.49 (5.58-12.6)	9.62 (6.16-14.6)
24-hr	2.59 (2.15-3.10)	3.18 (2.63-3.81)	4.15 (3.42-4.99)	4.95 (4.05-5.99)	6.05 (4.77-7.77)	6.87 (5.29-9.07)	7.76 (5.79-10.8)	8.84 (6.11-12.5)	10.5 (6.93-15.5)	11.9 (7.66-18.0)
2-day	2.98 (2.49-3.54)	3.68 (3.06-4.37)	4.82 (4.00-5.74)	5.76 (4.75-6.92)	7.06 (5.60-9.01)	8.02 (6.22-10.5)	9.06 (6.81-12.5)	10.4 (7.18-14.5)	12.4 (8.19-18.1)	14.1 (9.09-21.1)
3-day	3.25 (2.72-3.84)	4.00 (3.35-4.73)	5.23 (4.36-6.22)	6.26 (5.18-7.49)	7.67 (6.11-9.75)	8.70 (6.77-11.4)	9.84 (7.42-13.6)	11.3 (7.82-15.7)	13.5 (8.93-19.6)	15.4 (9.92-22.9)
4-day	3.48 (2.93-4.10)	4.28 (3.59-5.05)	5.58 (4.66-6.61)	6.66 (5.53-7.95)	8.15 (6.51-10.3)	9.24 (7.21-12.1)	10.4 (7.89-14.3)	11.9 (8.31-16.6)	14.3 (9.48-20.7)	16.3 (10.5-24.2)
7-day	4.14 (3.51-4.86)	5.02 (4.24-5.89)	6.46 (5.43-7.61)	7.65 (6.38-9.07)	9.29 (7.46-11.7)	10.5 (8.22-13.6)	11.8 (8.95-16.1)	13.4 (9.40-18.6)	15.9 (10.6-23.0)	18.1 (11.7-26.7)
10-day	4.81 (4.08-5.61)	5.73 (4.86-6.70)	7.24 (6.11-8.50)	8.49 (7.11-10.0)	10.2 (8.22-12.8)	11.5 (9.01-14.8)	12.9 (9.74-17.4)	14.5 (10.2-20.0)	17.0 (11.4-24.5)	19.2 (12.4-28.2)
20-day	6.88 (5.89-7.97)	7.86 (6.71-9.12)	9.46 (8.04-11.0)	10.8 (9.11-12.7)	12.6 (10.2-15.6)	14.0 (11.0-17.7)	15.4 (11.6-20.4)	17.0 (12.0-23.2)	19.2 (12.9-27.4)	21.0 (13.7-30.7)
30-day	8.62 (7.40-9.94)	9.62 (8.26-11.1)	11.3 (9.62-13.1)	12.6 (10.7-14.8)	14.5 (11.7-17.7)	16.0 (12.5-20.0)	17.4 (13.1-22.6)	18.9 (13.4-25.6)	20.8 (14.0-29.5)	22.3 (14.5-32.4)
45-day	10.8 (9.29-12.4)	11.8 (10.2-13.6)	13.5 (11.6-15.6)	14.9 (12.7-17.3)	16.8 (13.7-20.4)	18.4 (14.4-22.8)	19.8 (14.8-25.5)	21.2 (15.1-28.6)	22.9 (15.5-32.2)	24.0 (15.7-34.8)
60-day	12.6 (10.9-14.4)	13.6 (11.8-15.6)	15.4 (13.2-17.7)	16.8 (14.3-19.5)	18.8 (15.3-22.7)	20.4 (16.1-25.1)	21.8 (16.4-27.9)	23.1 (16.5-31.1)	24.7 (16.7-34.6)	25.6 (16.8-37.0)

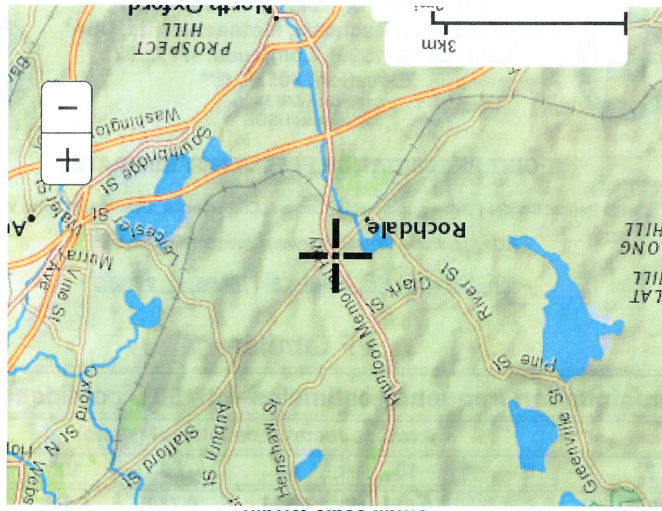
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

[Back to Top](#)

PF graphical

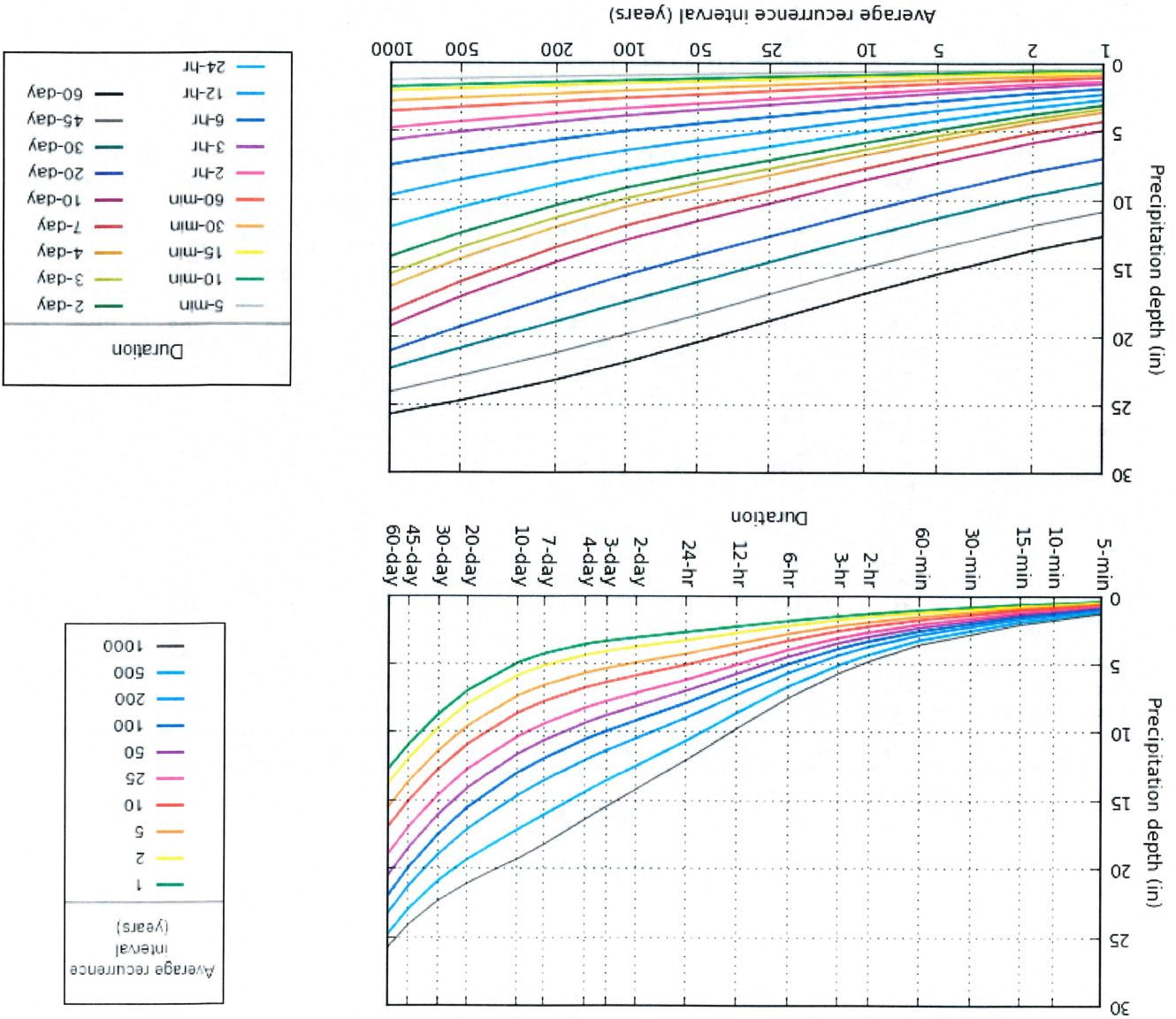


Maps & aerials

[Back to Top](#)

Created (GMT): Wed Jul 7 20:24:25 2021

NOAA Atlas 14, Volume 10, Version 3



PDS-based depth-duration-frequency (DDF) curves
Latitude: 42.1999°, Longitude: -71.8992°

Table 2.3.3. 1982 Rawls Rates¹⁸

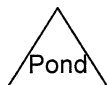
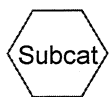
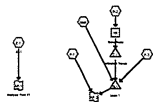
Texture Class	NRCS Hydrologic Soil Group (HSG)	Infiltration Rate Inches/Hour
Sand	A	8.27
Loamy Sand	A	2.41
Sandy Loam	B	1.02
Loam	B	0.52
Silt Loam	C	0.27
Sandy Clay Loam	C	0.17
Clay Loam	D	0.09
Silty Clay Loam	D	0.06
Sandy Clay	D	0.05
Silty Clay	D	0.04
Clay	D	0.02

¹⁸ Rawls, Brakensiek and Saxton, 1982

APPENDIX D

PRE-POST DEVELOPMENT HYDROCAD DRAINAGE CALCULATIONS

PRE & POST DEVELOPMENT AREAS PLANS



Project Notes

Rainfall events imported from "NRCS-Rain.txt" for 4150 MA Leicester Worcester County Central
Rainfall events imported from "NRCS-Rain.txt" for 4150 MA Leicester Worcester County Central
Rainfall events imported from "Atlas-14-Rain.txt" for 6682 MA Worcester South
Rainfall events imported from "Atlas-14-Rain.txt" for 6682 MA Worcester South
Rainfall events imported from "Atlas-14-Rain.txt" for 6682 MA Worcester South
Rainfall events imported from "Atlas-14-Rain.txt" for 6682 MA Worcester South
Rainfall events imported from "NRCS-Rain.txt" for 4150 MA Leicester Worcester County Central
Rainfall events imported from "NRCS-Rain.txt" for 4150 MA Leicester Worcester County Central
Rainfall events imported from "NRCS-Rain.txt" for 4150 MA Leicester Worcester County Central

Pre-Post_Development_1-30-24

Prepared by McClure Engineering

Printed 2/2/2024

HydroCAD® 10.20-4a s/n 03362 © 2023 HydroCAD Software Solutions LLC

Page 3

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year A	NRCC 24-hr	D	Default	24.00	1	3.18	2
2	10-Year A	NRCC 24-hr	D	Default	24.00	1	4.95	2
3	25-Year A	NRCC 24-hr	D	Default	24.00	1	6.05	2
4	100-Year A	NRCC 24-hr	D	Default	24.00	1	7.76	2

Pre-Post_Development_1-30-24

Prepared by McClure Engineering

HydroCAD® 10.20-4a s/n 03362 © 2023 HydroCAD Software Solutions LLC

Printed 2/2/2024

Page 4

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.574	74	>75% Grass cover, Good, HSG C (P-1, P-2, P-3)
0.353	89	Gravel roads, HSG C (P-2, P-3)
0.014	98	Paved parking, HSG C (P-2, P-3)
0.230	98	Roofs, HSG D (roof)
0.108	98	Water Surface, HSG C (P-2)
0.436	70	Woods, Good, HSG C (E-1, P-1, P-3)
2.419	72	Woods/grass comb., Good, HSG C (E-1)
5.133	75	TOTAL AREA

Pre-Post_Development_1-30-24

Prepared by Mcclure Engineering
HydroCAD® 10.20-4a s/n 03362 © 2023 HydroCAD Software Solutions LLC

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
4.904	HSG C	E-1, P-1, P-2, P-3
0.230	HSG D	roof
0.000	Other	
5.133		TOTAL AREA

Pre-Post_Development_1-30-24

Prepared by McClure Engineering

HydroCAD® 10.20-4a s/n 03362 © 2023 HydroCAD Software Solutions LLC

Printed 2/2/2024

Page 6

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	1.574	0.000	0.000	1.574	>75% Grass cover, Good	P-1, P-2, P-3
0.000	0.000	0.353	0.000	0.000	0.353	Gravel roads	P-2, P-3
0.000	0.000	0.014	0.000	0.000	0.014	Paved parking	P-2, P-3
0.000	0.000	0.000	0.230	0.000	0.230	Roofs	roof
0.000	0.000	0.108	0.000	0.000	0.108	Water Surface	P-2
0.000	0.000	0.436	0.000	0.000	0.436	Woods, Good	E-1, P-1, P-3
0.000	0.000	2.419	0.000	0.000	2.419	Woods/grass comb., Good	E-1
0.000	0.000	4.904	0.230	0.000	5.133	TOTAL AREA	

Pre-Post_Development_1-30-24

Prepared by Mcclure Engineering

HydroCAD® 10.20-4a s/n 03362 © 2023 HydroCAD Software Solutions LLC

Printed 2/2/2024

Page 7

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	B-1	806.00	804.00	20.0	0.1000	0.011	0.0	12.0	0.0	
2	T-1	809.00	807.50	40.0	0.0375	0.013	0.0	12.0	0.0	

Pre-Post_Development_1-30-24

NRCC 24-hr D 2-Year A Rainfall=3.18"

Prepared by McClure Engineering

Printed 2/2/2024

HydroCAD® 10.20-4a s/n 03362 © 2023 HydroCAD Software Solutions LLC

Page 8

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E-1: EX-1	Runoff Area=114,395 sf 0.00% Impervious Runoff Depth=0.92" Tc=5.0 min CN=72 Runoff=2.70 cfs 0.201 af
Subcatchment P-1:	Runoff Area=42,715 sf 0.00% Impervious Runoff Depth=0.97" Tc=5.0 min CN=73 Runoff=1.08 cfs 0.079 af
Subcatchment P-2:	Runoff Area=25,584 sf 19.60% Impervious Runoff Depth=1.90" Tc=5.0 min CN=87 Runoff=1.29 cfs 0.093 af
Subcatchment P-3:	Runoff Area=30,920 sf 0.97% Impervious Runoff Depth=1.02" Tc=5.0 min CN=74 Runoff=0.83 cfs 0.061 af
Subcatchment roof:	Runoff Area=10,000 sf 100.00% Impervious Runoff Depth=2.95" Tc=6.0 min CN=98 Runoff=0.66 cfs 0.056 af
Reach 1R: Stone Swale	Avg. Flow Depth=0.39' Max Vel=1.39 fps Inflow=1.29 cfs 0.093 af n=0.069 L=220.0' S=0.0273 ' Capacity=1.99 cfs Outflow=1.19 cfs 0.093 af
Pond B-1: basin 1	Peak Elev=807.90' Storage=2,362 cf Inflow=2.57 cfs 0.208 af Discarded=0.07 cfs 0.106 af Primary=1.10 cfs 0.102 af Outflow=1.17 cfs 0.208 af
Pond IT-1: Interceptor Trench	Peak Elev=0.00' Storage=0 cf Primary=0.00 cfs 0.000 af
Pond T-1: Infiltration Trench	Peak Elev=809.65' Storage=204 cf Inflow=1.19 cfs 0.093 af 12.0" Round Culvert n=0.013 L=40.0' S=0.0375 ' Outflow=1.16 cfs 0.091 af
Link AP-1: Analysis Point #1	Inflow=2.70 cfs 0.201 af Primary=2.70 cfs 0.201 af
Link AP-2:	Inflow=1.67 cfs 0.181 af Primary=1.67 cfs 0.181 af

Total Runoff Area = 5.133 ac Runoff Volume = 0.490 af Average Runoff Depth = 1.15"
93.15% Pervious = 4.782 ac 6.85% Impervious = 0.352 ac

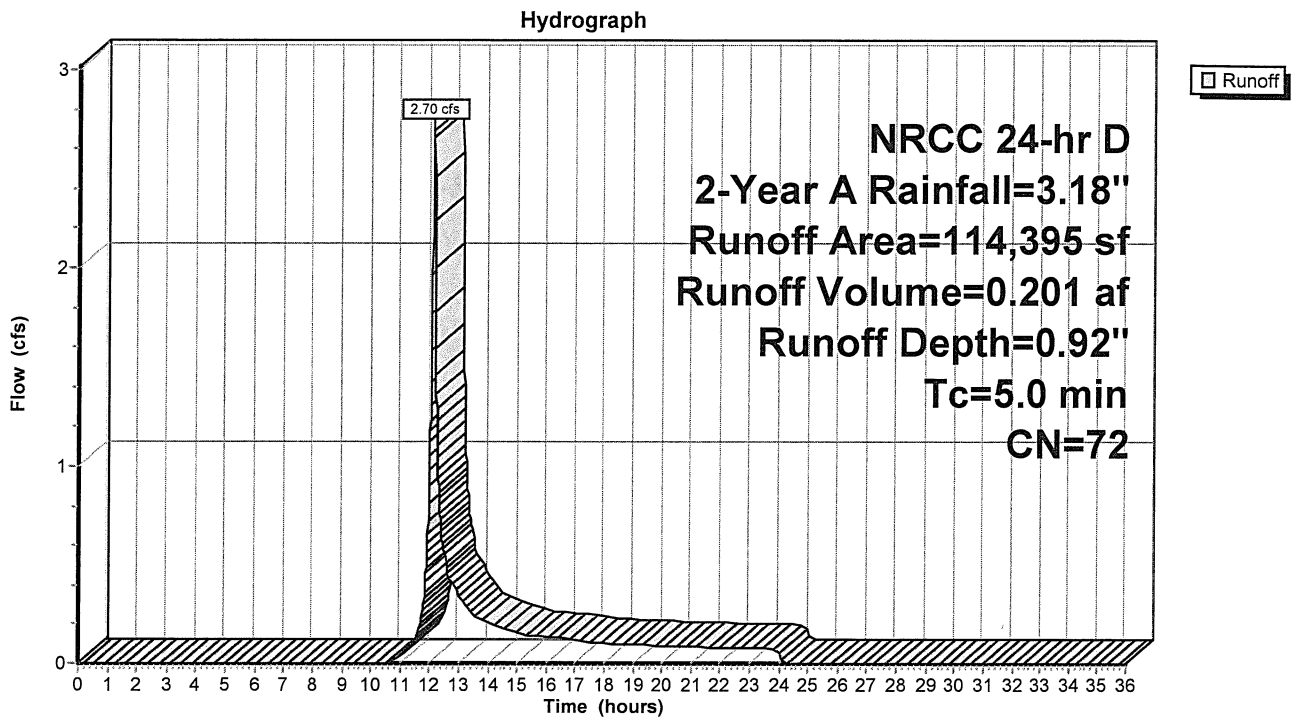
Summary for Subcatchment E-1: EX-1

Runoff = 2.70 cfs @ 12.13 hrs, Volume= 0.201 af, Depth= 0.92"
 Routed to Link AP-1 : Analysis Point #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NRCC 24-hr D 2-Year A Rainfall=3.18"

Area (sf)	CN	Description
105,390	72	Woods/grass comb., Good, HSG C
9,005	70	Woods, Good, HSG C
114,395	72	Weighted Average
114,395		100.00% Pervious Area

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

Subcatchment E-1: EX-1

Summary for Subcatchment P-1:

Runoff = 1.08 cfs @ 12.13 hrs, Volume= 0.079 af, Depth= 0.97"
 Routed to Link AP-2 :

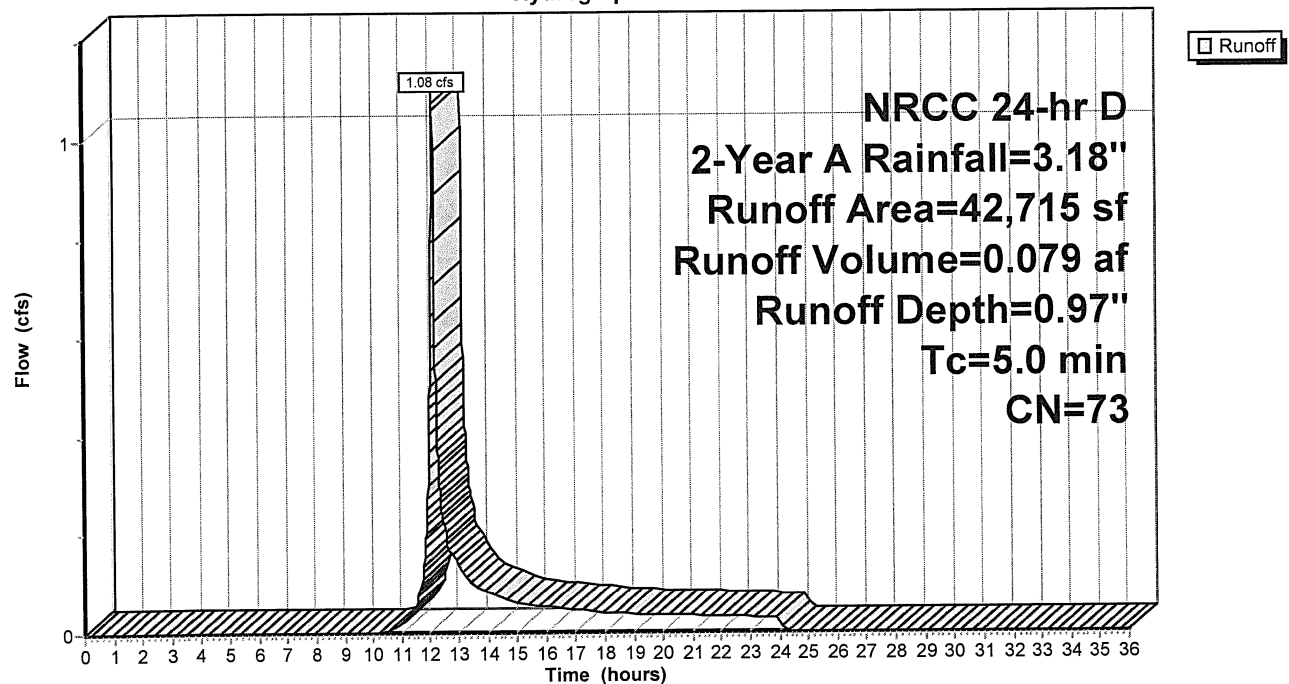
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NRCC 24-hr D 2-Year A Rainfall=3.18"

Area (sf)	CN	Description
35,024	74	>75% Grass cover, Good, HSG C
7,691	70	Woods, Good, HSG C
42,715	73	Weighted Average
42,715		100.00% Pervious Area

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

Subcatchment P-1:

Hydrograph



Summary for Subcatchment P-2:

Runoff = 1.29 cfs @ 12.12 hrs, Volume= 0.093 af, Depth= 1.90"
 Routed to Reach 1R : Stone Swale

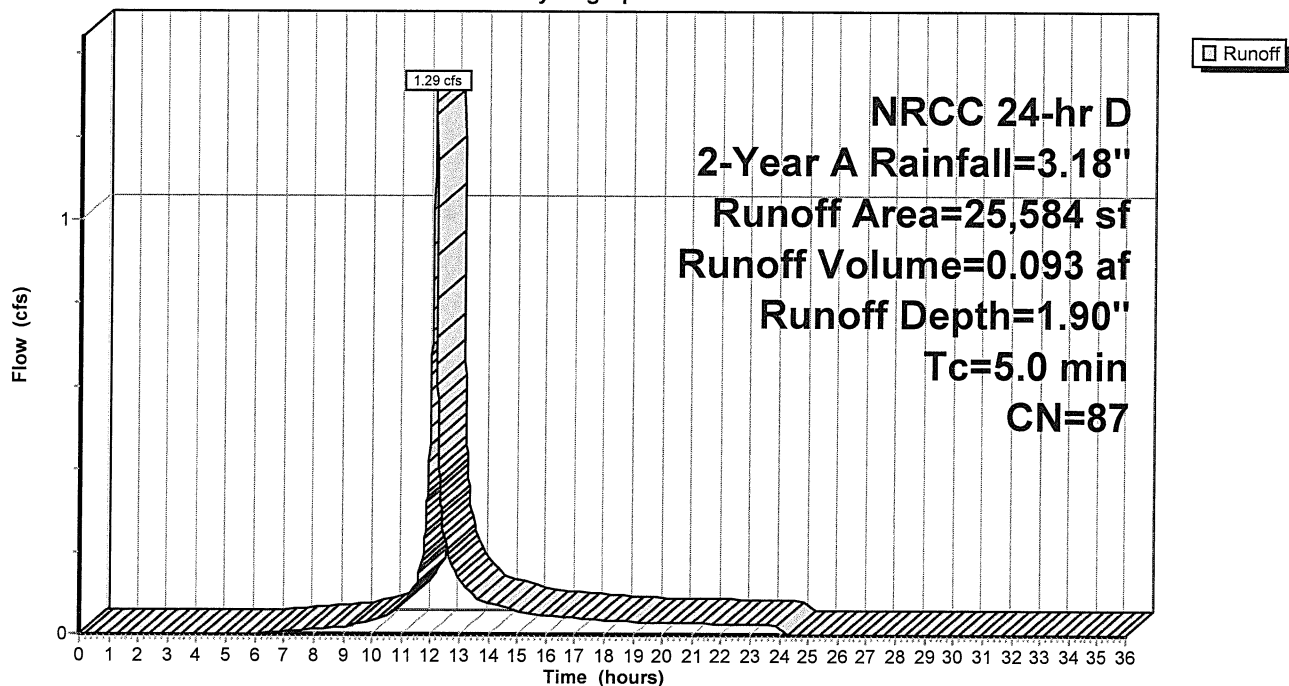
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NRCC 24-hr D 2-Year A Rainfall=3.18"

Area (sf)	CN	Description
14,364	89	Gravel roads, HSG C
300	98	Paved parking, HSG C
6,205	74	>75% Grass cover, Good, HSG C
4,715	98	Water Surface, HSG C
25,584	87	Weighted Average
20,569		80.40% Pervious Area
5,015		19.60% Impervious Area

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

Subcatchment P-2:

Hydrograph



Summary for Subcatchment P-3:

Runoff = 0.83 cfs @ 12.13 hrs, Volume= 0.061 af, Depth= 1.02"
 Routed to Pond B-1 : basin 1

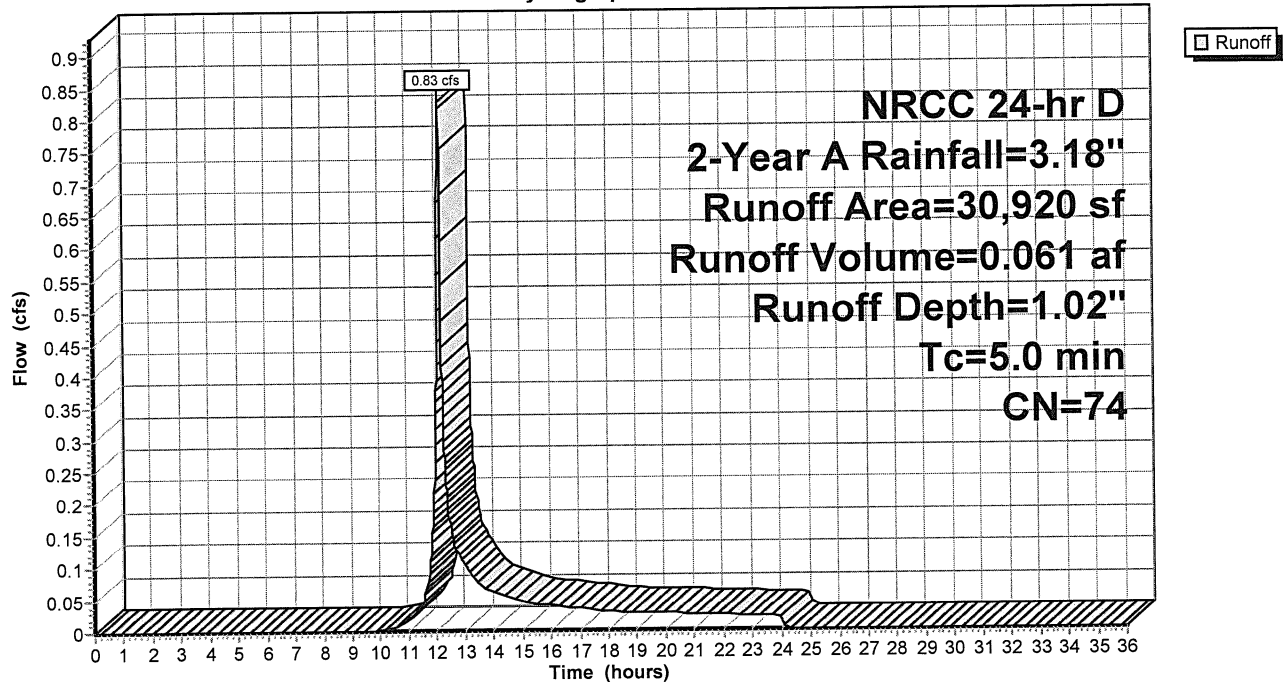
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NRCC 24-hr D 2-Year A Rainfall=3.18"

Area (sf)	CN	Description
1,000	89	Gravel roads, HSG C
300	98	Paved parking, HSG C
27,345	74	>75% Grass cover, Good, HSG C
2,275	70	Woods, Good, HSG C
30,920	74	Weighted Average
30,620		99.03% Pervious Area
300		0.97% Impervious Area

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

Subcatchment P-3:

Hydrograph



Summary for Subcatchment roof:

Runoff = 0.66 cfs @ 12.13 hrs, Volume= 0.056 af, Depth= 2.95"
 Routed to Pond B-1 : basin 1

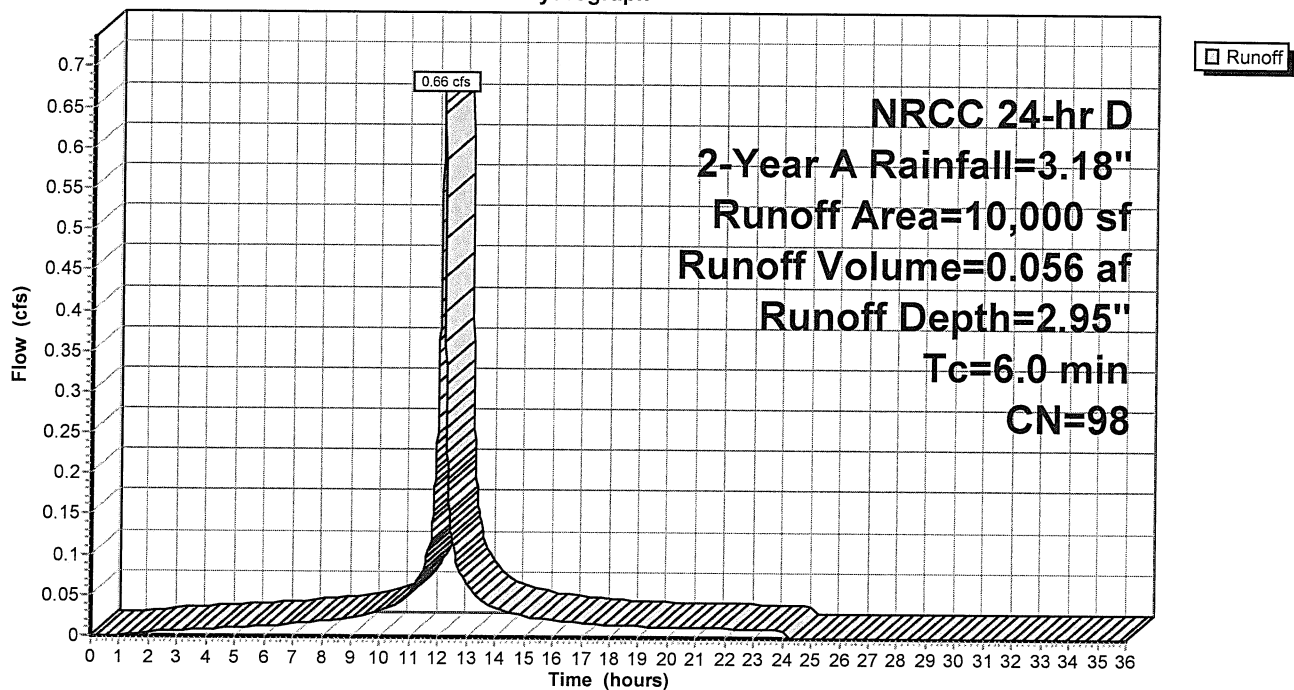
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NRCC 24-hr D 2-Year A Rainfall=3.18"

Area (sf)	CN	Description
10,000	98	Roofs, HSG D
10,000		100.00% Impervious Area

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

Subcatchment roof:

Hydrograph



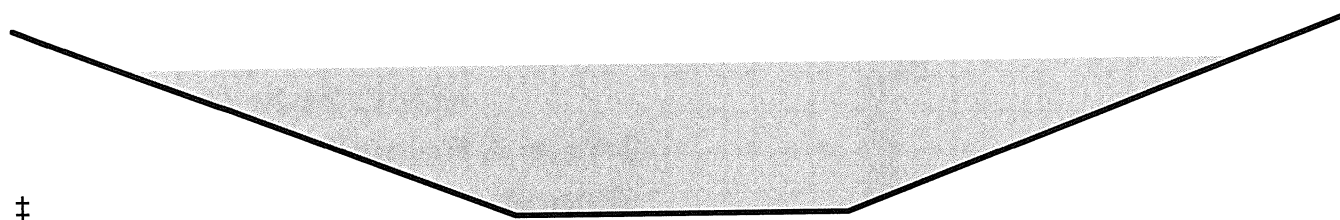
Summary for Reach 1R: Stone Swale

Inflow Area = 0.587 ac, 19.60% Impervious, Inflow Depth = 1.90" for 2-Year A event
 Inflow = 1.29 cfs @ 12.12 hrs, Volume= 0.093 af
 Outflow = 1.19 cfs @ 12.15 hrs, Volume= 0.093 af, Atten= 7%, Lag= 1.3 min
 Routed to Pond T-1 : Infiltration Trench

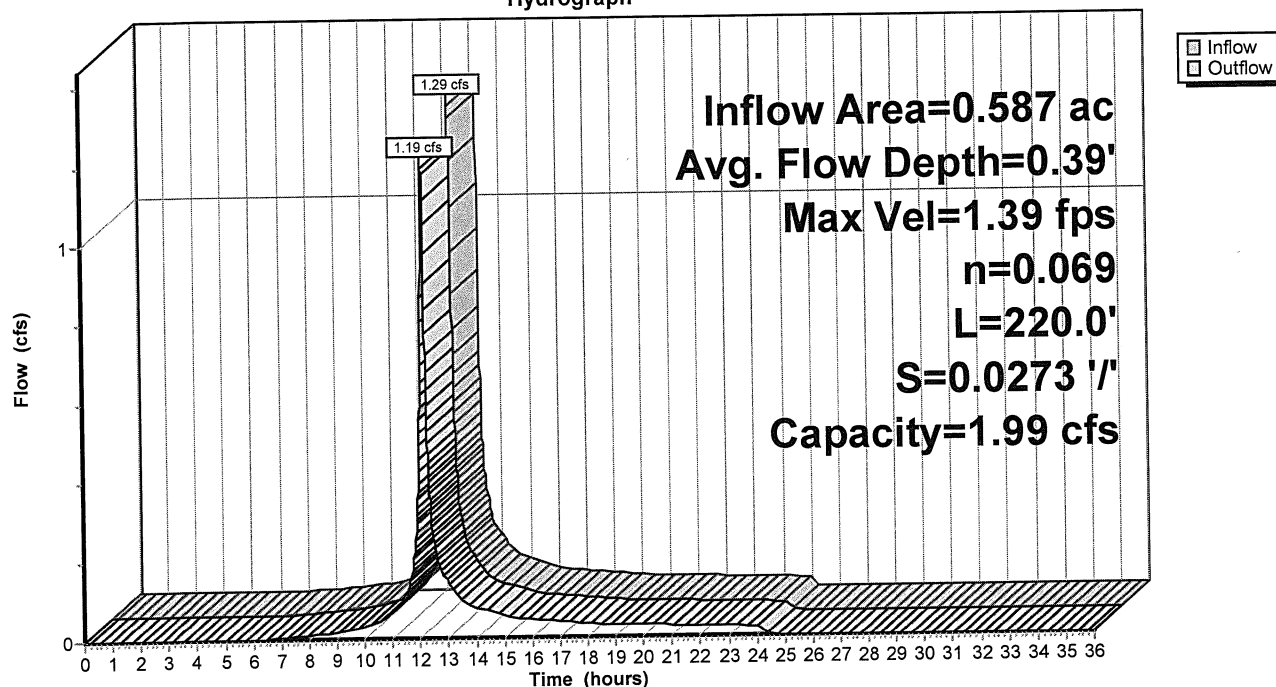
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.39 fps, Min. Travel Time= 2.6 min
 Avg. Velocity = 0.45 fps, Avg. Travel Time= 8.2 min

Peak Storage= 188 cf @ 12.15 hrs
 Average Depth at Peak Storage= 0.39' , Surface Width= 3.35'
 Bank-Full Depth= 0.50' Flow Area= 1.3 sf, Capacity= 1.99 cfs

1.00' x 0.50' deep channel, n= 0.069 Riprap, 6-inch
 Side Slope Z-value= 3.0 '/' Top Width= 4.00'
 Length= 220.0' Slope= 0.0273 '/'
 Inlet Invert= 816.50', Outlet Invert= 810.50'

**Reach 1R: Stone Swale**

Hydrograph



Summary for Pond B-1: basin 1

Inflow Area = 1.527 ac, 23.03% Impervious, Inflow Depth = 1.63" for 2-Year A event
 Inflow = 2.57 cfs @ 12.14 hrs, Volume= 0.208 af
 Outflow = 1.17 cfs @ 12.27 hrs, Volume= 0.208 af, Atten= 54%, Lag= 8.0 min
 Discarded = 0.07 cfs @ 12.27 hrs, Volume= 0.106 af
 Primary = 1.10 cfs @ 12.27 hrs, Volume= 0.102 af
 Routed to Link AP-2 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 807.90' @ 12.27 hrs Surf.Area= 2,812 sf Storage= 2,362 cf
 Flood Elev= 809.00' Surf.Area= 3,648 sf Storage= 5,940 cf

Plug-Flow detention time= 145.8 min calculated for 0.208 af (100% of inflow)
 Center-of-Mass det. time= 145.8 min (987.8 - 842.0)

Volume	Invert	Avail.Storage	Storage Description
#1	807.00'	155 cf	Custom Stage Data (Prismatic) Listed below (Recalc) -Impervious
#2	807.00'	95 cf	Custom Stage Data (Prismatic) Listed below (Recalc) -Impervious
#3	807.00'	9,728 cf	Custom Stage Data (Irregular) Listed below (Recalc)
		9,978 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
807.00	105	0	0
808.00	205	155	155

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
807.00	80	0	0
808.00	110	95	95

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
807.00	1,953	183.0	0	0	1,953
808.00	2,912	236.0	2,417	2,417	3,733
809.00	3,648	256.0	3,273	5,690	4,553
810.00	4,441	274.0	4,038	9,728	5,357

Device	Routing	Invert	Outlet Devices
#1	Primary	806.00'	12.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 806.00' / 804.00' S= 0.1000 ' /' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Discarded	807.00'	1.020 in/hr Exfiltration over Surface area Phase-In= 0.01'
#3	Device 1	807.50'	6.0" Vert. Orifice/Grate X 3.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	808.00'	4.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#5	Device 1	808.75'	2.0" x 2.0" Horiz. Orifice/Grate C= 0.600 in 24.0" x 24.0" Grate (1% open area) Limited to weir flow at low heads

Pre-Post_Development_1-30-24

Prepared by McClure Engineering

HydroCAD® 10.20-4a s/n 03362 © 2023 HydroCAD Software Solutions LLC

NRCC 24-hr D 2-Year A Rainfall=3.18"

Printed 2/2/2024

Page 16

#6 Primary 809.00' **10.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.07 cfs @ 12.27 hrs HW=807.90' (Free Discharge)

↑ **2=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=1.10 cfs @ 12.27 hrs HW=807.90' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 1.10 cfs of 4.48 cfs potential flow)

↑ **3=Orifice/Grate** (Orifice Controls 1.10 cfs @ 2.16 fps)

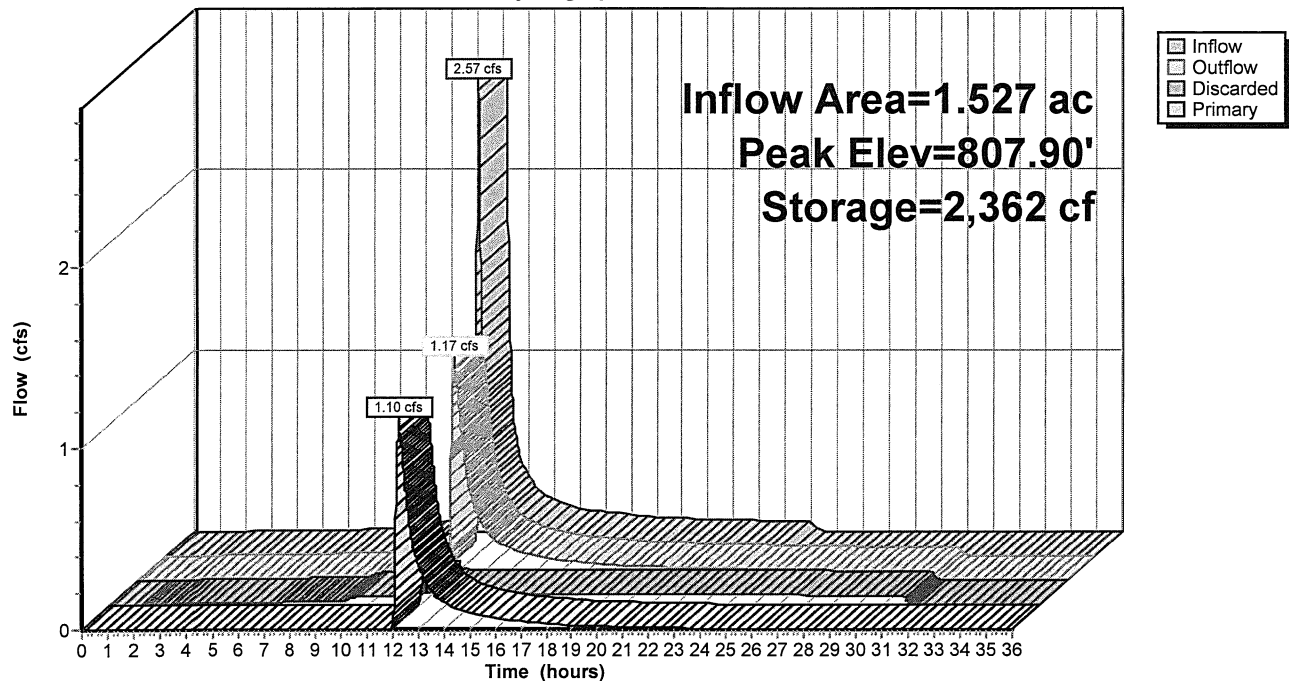
↑ **4=Orifice/Grate** (Controls 0.00 cfs)

↑ **5=Orifice/Grate** (Controls 0.00 cfs)

↑ **6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond B-1: basin 1

Hydrograph



Summary for Pond IT-1: Interceptor Trench

[43] Hint: Has no inflow (Outflow=Zero)

Volume	Invert	Avail.Storage	Storage Description
#1	669.00'	1,625 cf	3.00'W x 700.00'L x 2.00'H Prismatic 4,200 cf Overall - 137 cf Embedded = 4,063 cf x 40.0% Voids
#2	669.00'	137 cf	6.0" Round Pipe Storage Inside #1 L= 700.0'
		1,762 cf	Total Available Storage

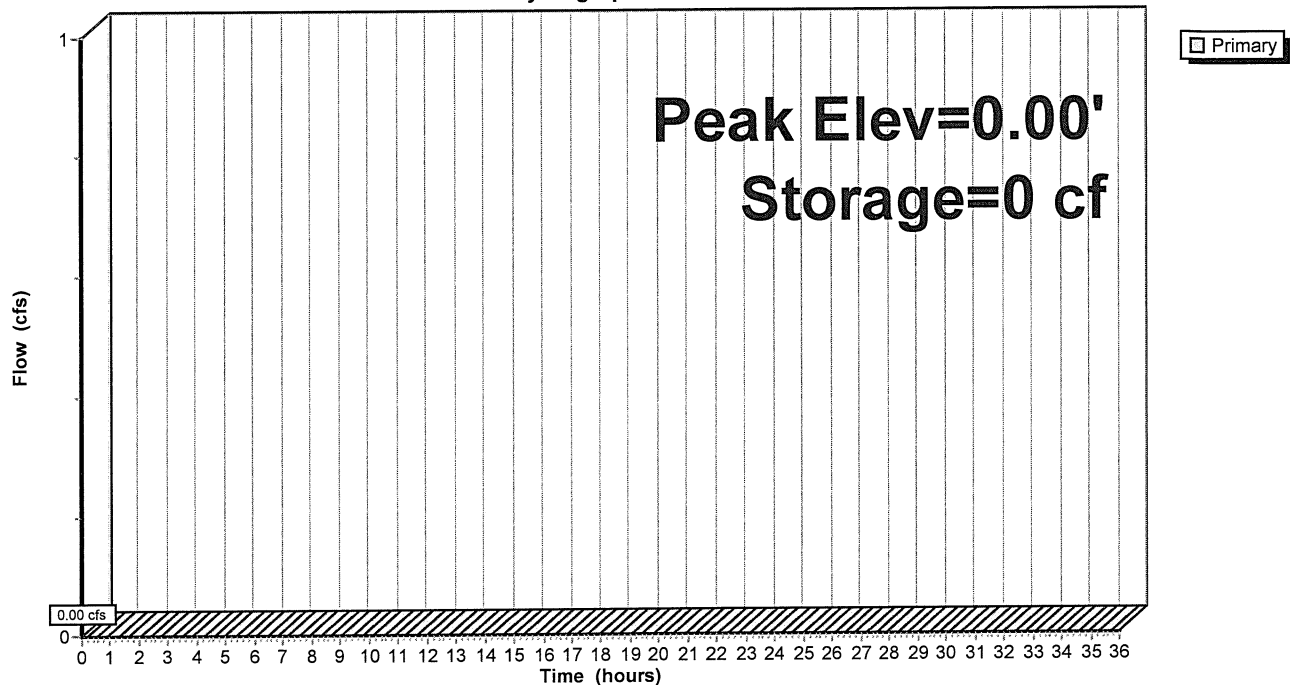
Device	Routing	Invert	Outlet Devices
#1	Primary	669.00'	6.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads

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

└─1=Orifice/Grate (Controls 0.00 cfs)

Pond IT-1: Interceptor Trench

Hydrograph



Summary for Pond T-1: Infiltration Trench

Inflow Area = 0.587 ac, 19.60% Impervious, Inflow Depth = 1.90" for 2-Year A event
 Inflow = 1.19 cfs @ 12.15 hrs, Volume= 0.093 af
 Outflow = 1.16 cfs @ 12.16 hrs, Volume= 0.091 af, Atten= 3%, Lag= 0.9 min
 Primary = 1.16 cfs @ 12.16 hrs, Volume= 0.091 af
 Routed to Pond B-1 : basin 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 809.65' @ 12.16 hrs Surf.Area= 400 sf Storage= 204 cf
 Flood Elev= 810.50' Surf.Area= 400 sf Storage= 341 cf

Plug-Flow detention time= 24.5 min calculated for 0.091 af (98% of inflow)
 Center-of-Mass det. time= 12.8 min (857.5 - 844.6)

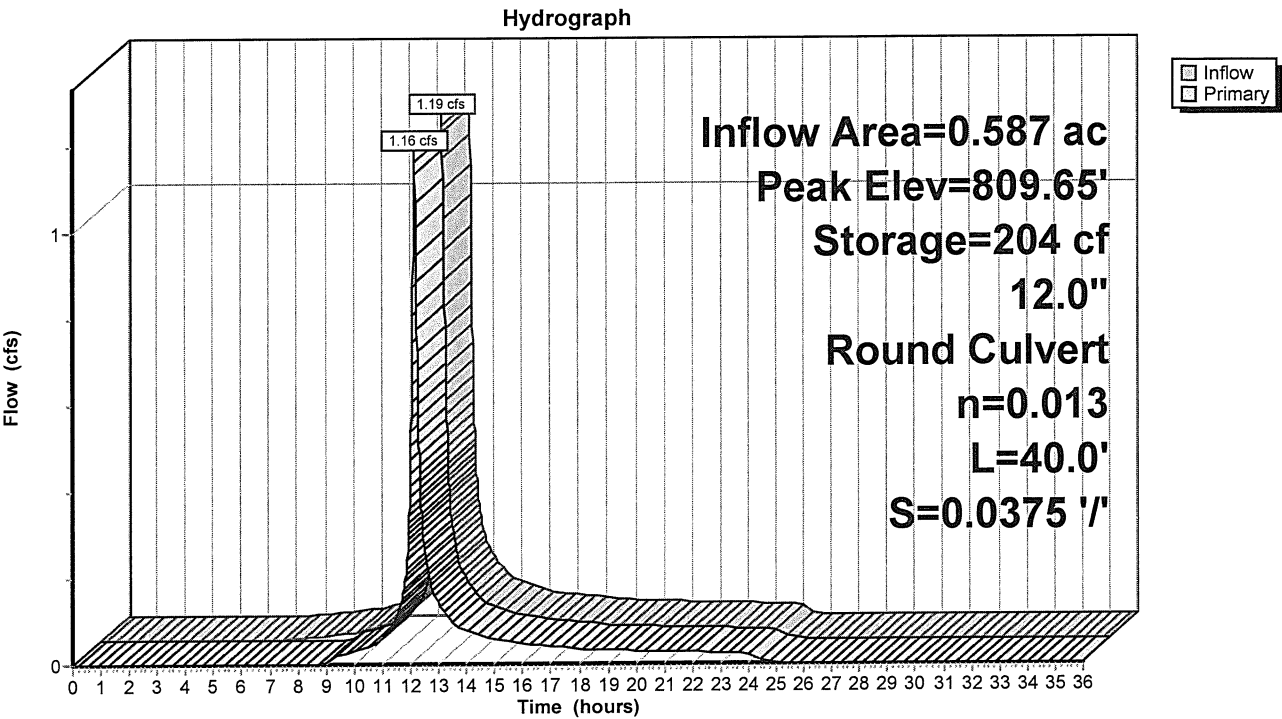
Volume	Invert	Avail.Storage	Storage Description
#1	808.50'	306 cf	4.00'W x 100.00'L x 2.00'H Prismatic 800 cf Overall - 35 cf Embedded = 765 cf x 40.0% Voids
#2	809.00'	35 cf	8.0" Round Pipe Storage Inside #1 L= 100.0'
341 cf			Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	809.00'	12.0" Round Culvert L= 40.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 809.00' / 807.50' S= 0.0375 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.16 cfs @ 12.16 hrs HW=809.65' TW=807.82' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 1.16 cfs @ 2.16 fps)

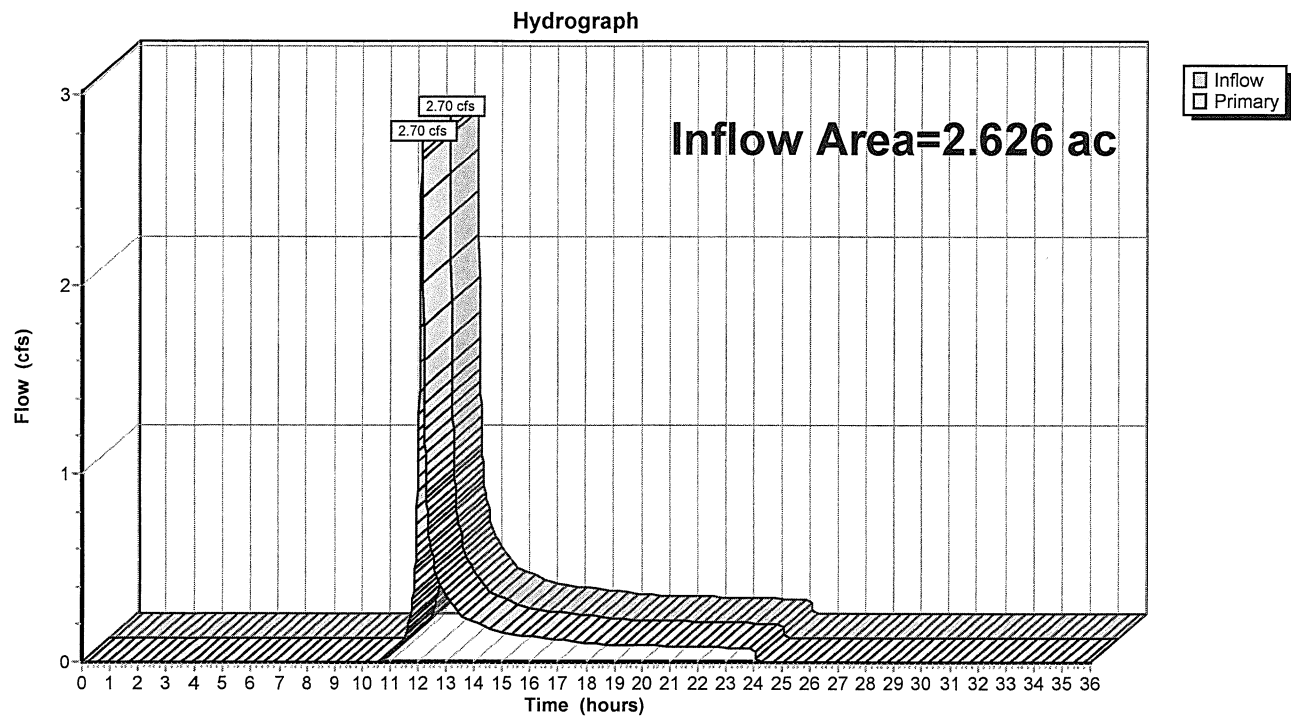
Pond T-1: Infiltration Trench



Summary for Link AP-1: Analysis Point #1

Inflow Area = 2.626 ac, 0.00% Impervious, Inflow Depth = 0.92" for 2-Year A event
Inflow = 2.70 cfs @ 12.13 hrs, Volume= 0.201 af
Primary = 2.70 cfs @ 12.13 hrs, Volume= 0.201 af, Atten= 0%, Lag= 0.0 min

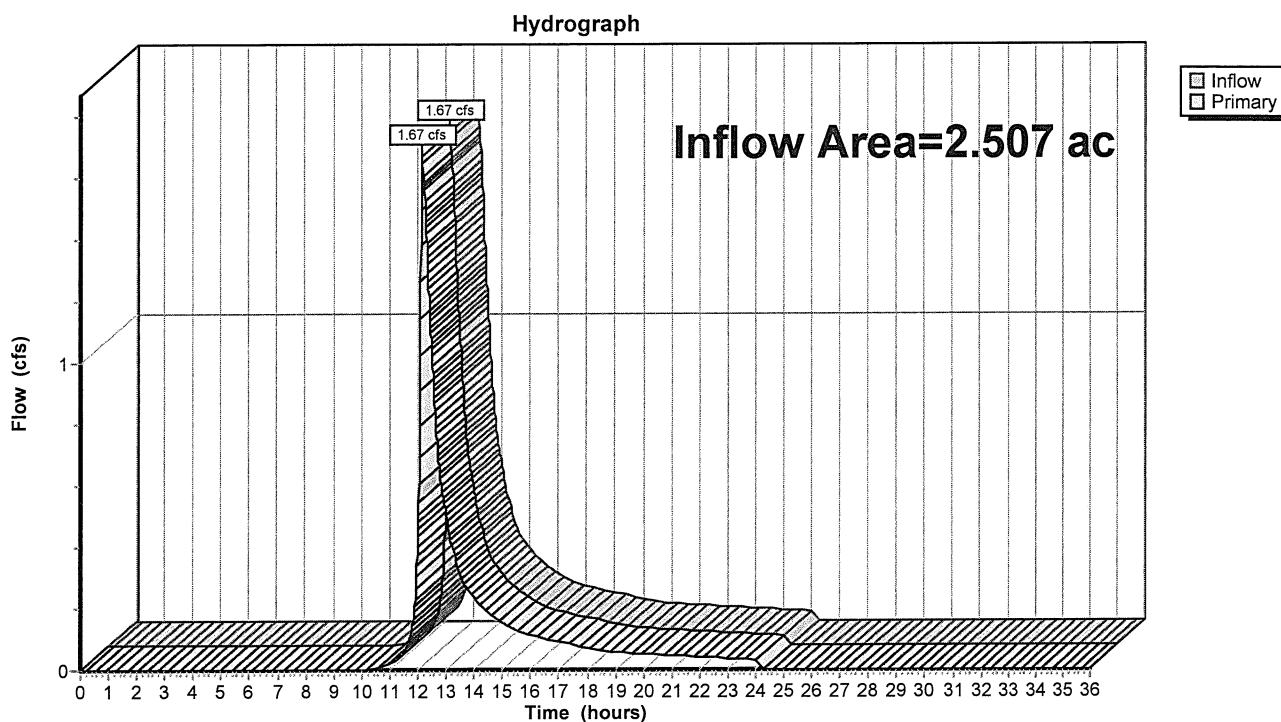
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link AP-1: Analysis Point #1

Summary for Link AP-2:

Inflow Area = 2.507 ac, 14.02% Impervious, Inflow Depth = 0.87" for 2-Year A event
Inflow = 1.67 cfs @ 12.15 hrs, Volume= 0.181 af
Primary = 1.67 cfs @ 12.15 hrs, Volume= 0.181 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 4L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link AP-2:

Pre-Post_Development_1-30-24

NRCC 24-hr D 10-Year A Rainfall=4.95"

Prepared by McClure Engineering

Printed 2/2/2024

HydroCAD® 10.20-4a s/n 03362 © 2023 HydroCAD Software Solutions LLC

Page 22

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E-1: EX-1 Runoff Area=114,395 sf 0.00% Impervious Runoff Depth=2.16"
Tc=5.0 min CN=72 Runoff=6.62 cfs 0.473 af

Subcatchment P-1: Runoff Area=42,715 sf 0.00% Impervious Runoff Depth=2.24"
Tc=5.0 min CN=73 Runoff=2.57 cfs 0.183 af

Subcatchment P-2: Runoff Area=25,584 sf 19.60% Impervious Runoff Depth=3.52"
Tc=5.0 min CN=87 Runoff=2.32 cfs 0.172 af

Subcatchment P-3: Runoff Area=30,920 sf 0.97% Impervious Runoff Depth=2.32"
Tc=5.0 min CN=74 Runoff=1.92 cfs 0.137 af

Subcatchment roof: Runoff Area=10,000 sf 100.00% Impervious Runoff Depth=4.71"
Tc=6.0 min CN=98 Runoff=1.03 cfs 0.090 af

Reach 1R: Stone Swale Avg. Flow Depth=0.52' Max Vel=1.63 fps Inflow=2.32 cfs 0.172 af
n=0.069 L=220.0' S=0.0273 '/' Capacity=1.99 cfs Outflow=2.19 cfs 0.172 af

Pond B-1: basin 1 Peak Elev=808.38' Storage=3,814 cf Inflow=4.96 cfs 0.398 af
Discarded=0.08 cfs 0.121 af Primary=2.63 cfs 0.278 af Outflow=2.71 cfs 0.398 af

Pond IT-1: Interceptor Trench Peak Elev=0.00' Storage=0 cf
Primary=0.00 cfs 0.000 af

Pond T-1: Infiltration Trench Peak Elev=810.00' Storage=261 cf Inflow=2.19 cfs 0.172 af
12.0" Round Culvert n=0.013 L=40.0' S=0.0375 '/' Outflow=2.12 cfs 0.170 af

Link AP-1: Analysis Point #1 Inflow=6.62 cfs 0.473 af
Primary=6.62 cfs 0.473 af

Link AP-2: Inflow=4.70 cfs 0.461 af
Primary=4.70 cfs 0.461 af

Total Runoff Area = 5.133 ac Runoff Volume = 1.056 af Average Runoff Depth = 2.47"
93.15% Pervious = 4.782 ac 6.85% Impervious = 0.352 ac

Summary for Subcatchment E-1: EX-1

Runoff = 6.62 cfs @ 12.13 hrs, Volume= 0.473 af, Depth= 2.16"
 Routed to Link AP-1 : Analysis Point #1

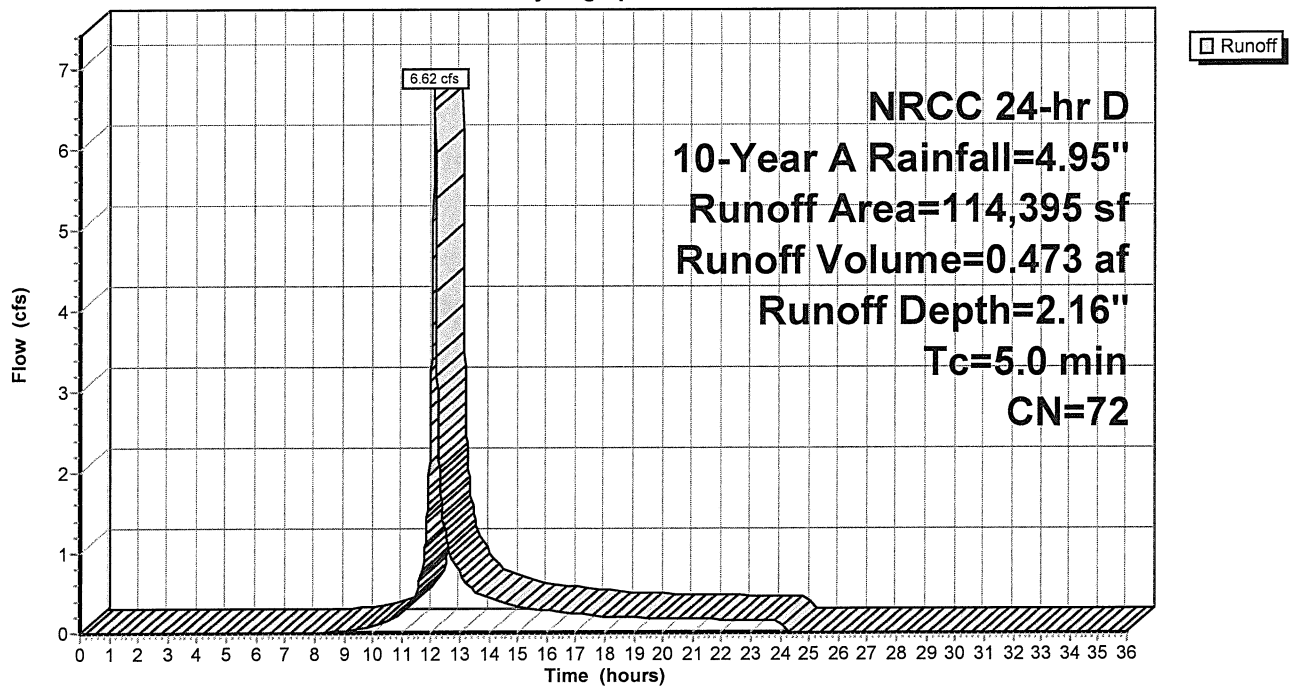
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NRCC 24-hr D 10-Year A Rainfall=4.95"

Area (sf)	CN	Description
105,390	72	Woods/grass comb., Good, HSG C
9,005	70	Woods, Good, HSG C
114,395	72	Weighted Average
114,395		100.00% Pervious Area

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

Subcatchment E-1: EX-1

Hydrograph



Summary for Subcatchment P-1:

Runoff = 2.57 cfs @ 12.13 hrs, Volume= 0.183 af, Depth= 2.24"
 Routed to Link AP-2 :

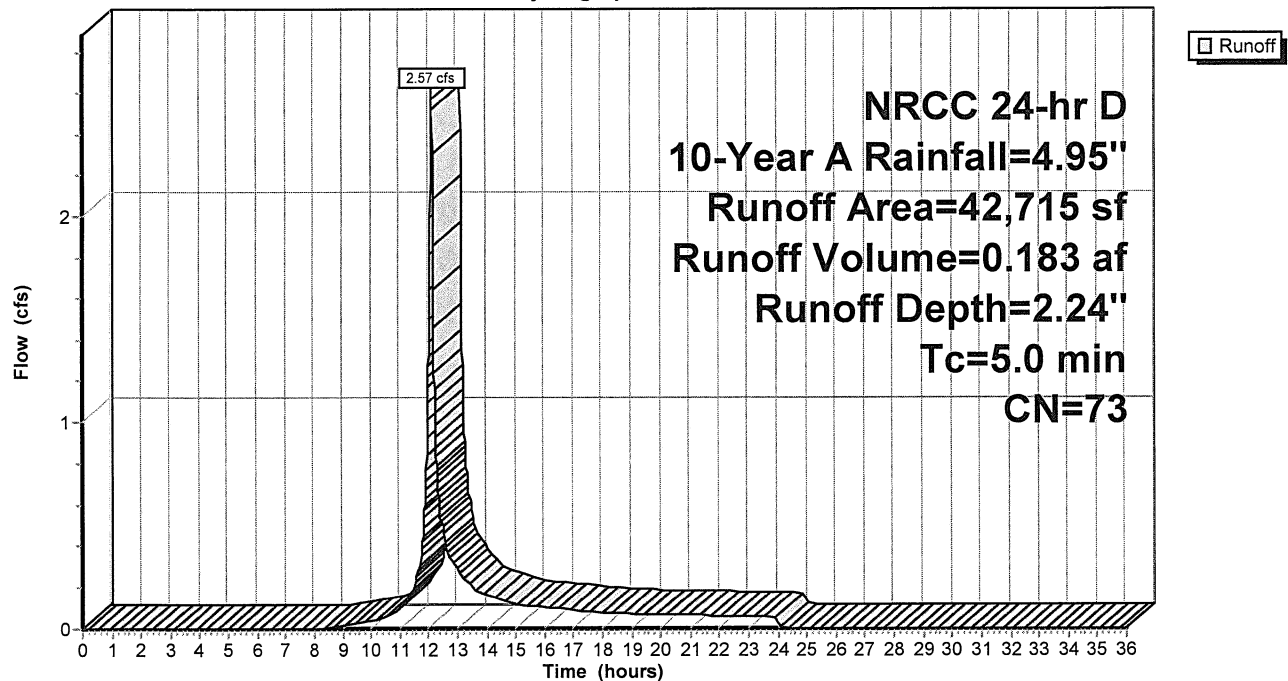
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NRCC 24-hr D 10-Year A Rainfall=4.95"

Area (sf)	CN	Description
35,024	74	>75% Grass cover, Good, HSG C
7,691	70	Woods, Good, HSG C
42,715	73	Weighted Average
42,715		100.00% Pervious Area

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

Subcatchment P-1:

Hydrograph



Pre-Post_Development_1-30-24

Prepared by McClure Engineering

HydroCAD® 10.20-4a s/n 03362 © 2023 HydroCAD Software Solutions LLC

NRCC 24-hr D 10-Year A Rainfall=4.95"

Printed 2/2/2024

Page 25

Summary for Subcatchment P-2:

Runoff = 2.32 cfs @ 12.12 hrs, Volume= 0.172 af, Depth= 3.52"
Routed to Reach 1R : Stone Swale

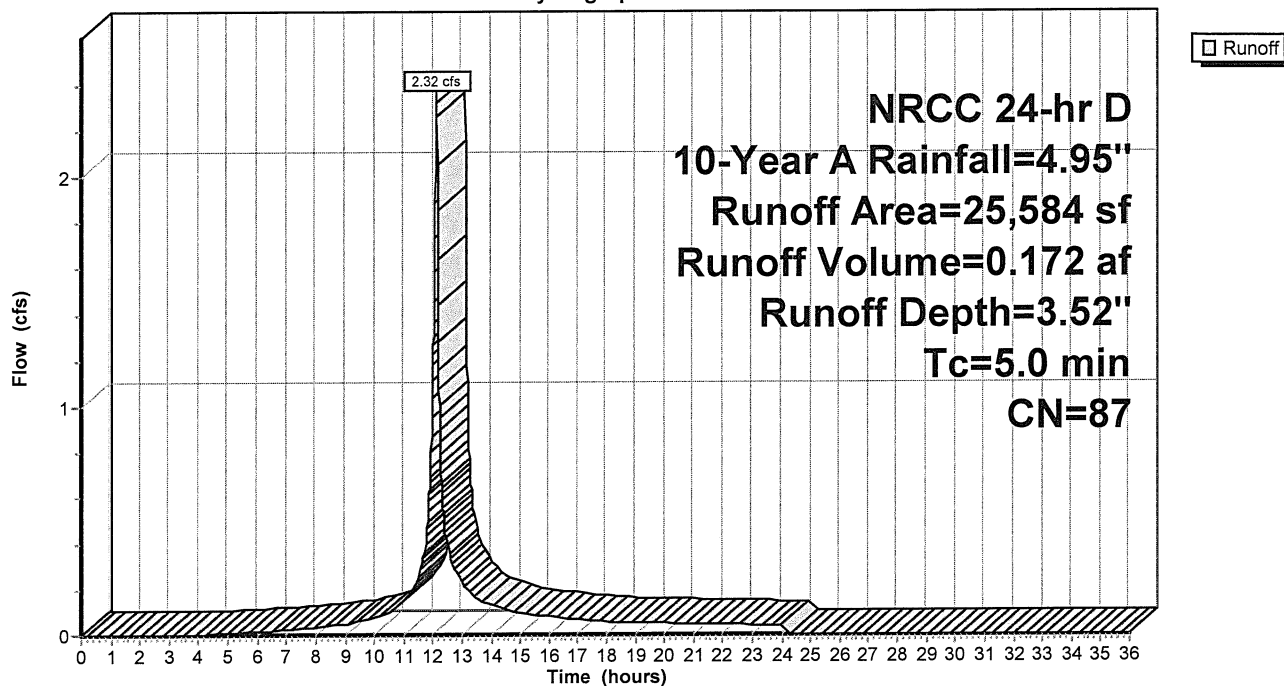
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year A Rainfall=4.95"

Area (sf)	CN	Description
14,364	89	Gravel roads, HSG C
300	98	Paved parking, HSG C
6,205	74	>75% Grass cover, Good, HSG C
4,715	98	Water Surface, HSG C
25,584	87	Weighted Average
20,569		80.40% Pervious Area
5,015		19.60% Impervious Area

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

Subcatchment P-2:

Hydrograph



Pre-Post_Development_1-30-24

Prepared by McClure Engineering

HydroCAD® 10.20-4a s/n 03362 © 2023 HydroCAD Software Solutions LLC

NRCC 24-hr D 10-Year A Rainfall=4.95"

Printed 2/2/2024

Page 26

Summary for Subcatchment P-3:

Runoff = 1.92 cfs @ 12.12 hrs, Volume= 0.137 af, Depth= 2.32"

Routed to Pond B-1 : basin 1

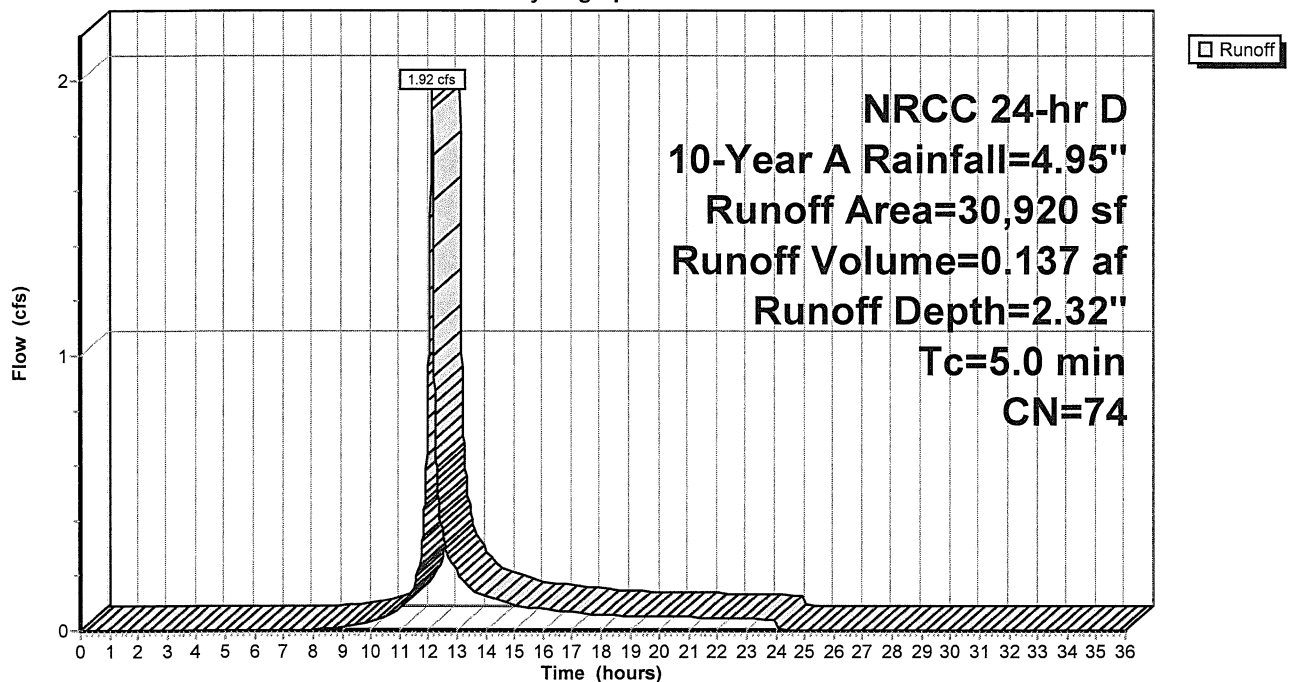
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year A Rainfall=4.95"

Area (sf)	CN	Description
1,000	89	Gravel roads, HSG C
300	98	Paved parking, HSG C
27,345	74	>75% Grass cover, Good, HSG C
2,275	70	Woods, Good, HSG C
30,920	74	Weighted Average
30,620		99.03% Pervious Area
300		0.97% Impervious Area

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

Subcatchment P-3:

Hydrograph



Summary for Subcatchment roof:

Runoff = 1.03 cfs @ 12.13 hrs, Volume= 0.090 af, Depth= 4.71"

Routed to Pond B-1 : basin 1

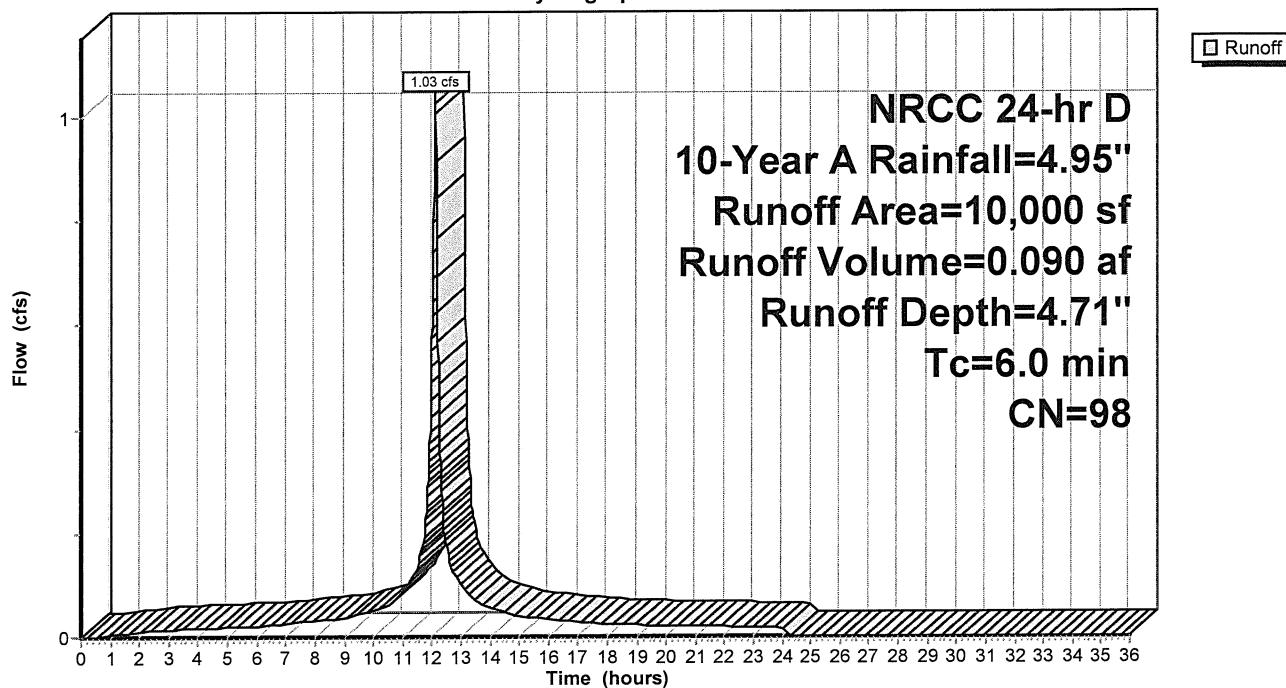
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year A Rainfall=4.95"

Area (sf)	CN	Description
10,000	98	Roofs, HSG D
10,000		100.00% Impervious Area

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

Subcatchment roof:

Hydrograph



Summary for Reach 1R: Stone Swale

[91] Warning: Storage range exceeded by 0.02'

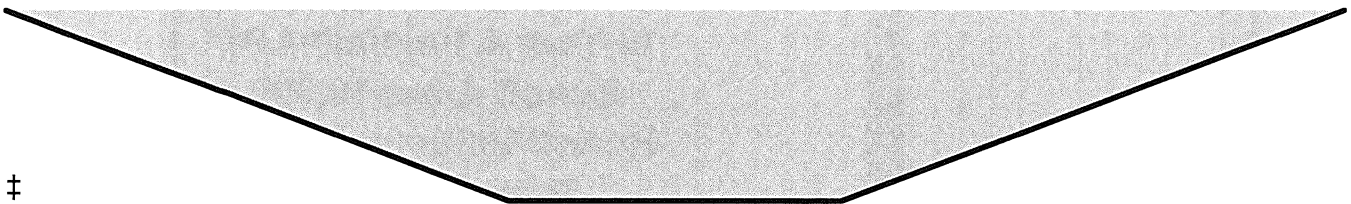
[55] Hint: Peak inflow is 116% of Manning's capacity

Inflow Area = 0.587 ac, 19.60% Impervious, Inflow Depth = 3.52" for 10-Year A event
Inflow = 2.32 cfs @ 12.12 hrs, Volume= 0.172 af
Outflow = 2.19 cfs @ 12.14 hrs, Volume= 0.172 af, Atten= 6%, Lag= 1.2 min
Routed to Pond T-1 : Infiltration Trench

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.63 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 0.53 fps, Avg. Travel Time= 6.9 min

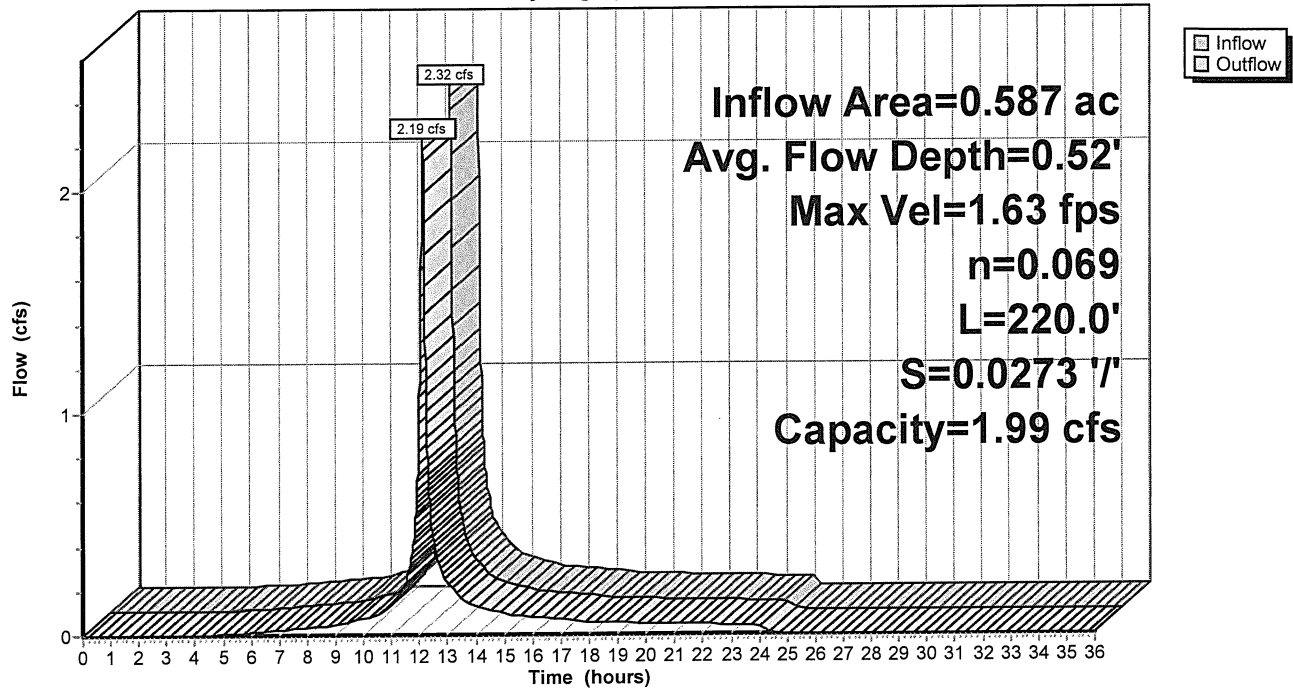
Peak Storage= 295 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.52', Surface Width= 4.14'
Bank-Full Depth= 0.50' Flow Area= 1.3 sf, Capacity= 1.99 cfs

1.00' x 0.50' deep channel, n= 0.069 Riprap, 6-inch
Side Slope Z-value= 3.0 '/' Top Width= 4.00'
Length= 220.0' Slope= 0.0273 '/'
Inlet Invert= 816.50', Outlet Invert= 810.50'



Reach 1R: Stone Swale

Hydrograph



Summary for Pond B-1: basin 1

Inflow Area = 1.527 ac, 23.03% Impervious, Inflow Depth = 3.13" for 10-Year A event
 Inflow = 4.96 cfs @ 12.13 hrs, Volume= 0.398 af
 Outflow = 2.71 cfs @ 12.23 hrs, Volume= 0.398 af, Atten= 45%, Lag= 5.8 min
 Discarded = 0.08 cfs @ 12.23 hrs, Volume= 0.121 af
 Primary = 2.63 cfs @ 12.23 hrs, Volume= 0.278 af

Routed to Link AP-2 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 808.38' @ 12.23 hrs Surf.Area= 3,180 sf Storage= 3,814 cf
 Flood Elev= 809.00' Surf.Area= 3,648 sf Storage= 5,940 cf

Plug-Flow detention time= 93.6 min calculated for 0.398 af (100% of inflow)
 Center-of-Mass det. time= 93.7 min (917.5 - 823.8)

Volume	Invert	Avail.Storage	Storage Description
#1	807.00'	155 cf	Custom Stage Data (Prismatic) Listed below (Recalc) -Impervious
#2	807.00'	95 cf	Custom Stage Data (Prismatic) Listed below (Recalc) -Impervious
#3	807.00'	9,728 cf	Custom Stage Data (Irregular) Listed below (Recalc)
		9,978 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
807.00	105	0	0
808.00	205	155	155

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
807.00	80	0	0
808.00	110	95	95

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
807.00	1,953	183.0	0	0	1,953
808.00	2,912	236.0	2,417	2,417	3,733
809.00	3,648	256.0	3,273	5,690	4,553
810.00	4,441	274.0	4,038	9,728	5,357

Device	Routing	Invert	Outlet Devices
#1	Primary	806.00'	12.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 806.00' / 804.00' S= 0.1000 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Discarded	807.00'	1.020 in/hr Exfiltration over Surface area Phase-In= 0.01'
#3	Device 1	807.50'	6.0" Vert. Orifice/Grate X 3.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	808.00'	4.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#5	Device 1	808.75'	2.0" x 2.0" Horiz. Orifice/Grate C= 0.600 in 24.0" x 24.0" Grate (1% open area) Limited to weir flow at low heads

Pre-Post_Development_1-30-24

Prepared by McClure Engineering

HydroCAD® 10.20-4a s/n 03362 © 2023 HydroCAD Software Solutions LLC

NRCC 24-hr D 10-Year A Rainfall=4.95"

Printed 2/2/2024

Page 31

#6 Primary 809.00' 10.0' long x 10.0' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.08 cfs @ 12.23 hrs HW=808.38' (Free Discharge)

2=Exfiltration (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=2.63 cfs @ 12.23 hrs HW=808.38' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 2.63 cfs of 5.18 cfs potential flow)

3=Orifice/Grate (Orifice Controls 2.25 cfs @ 3.81 fps)

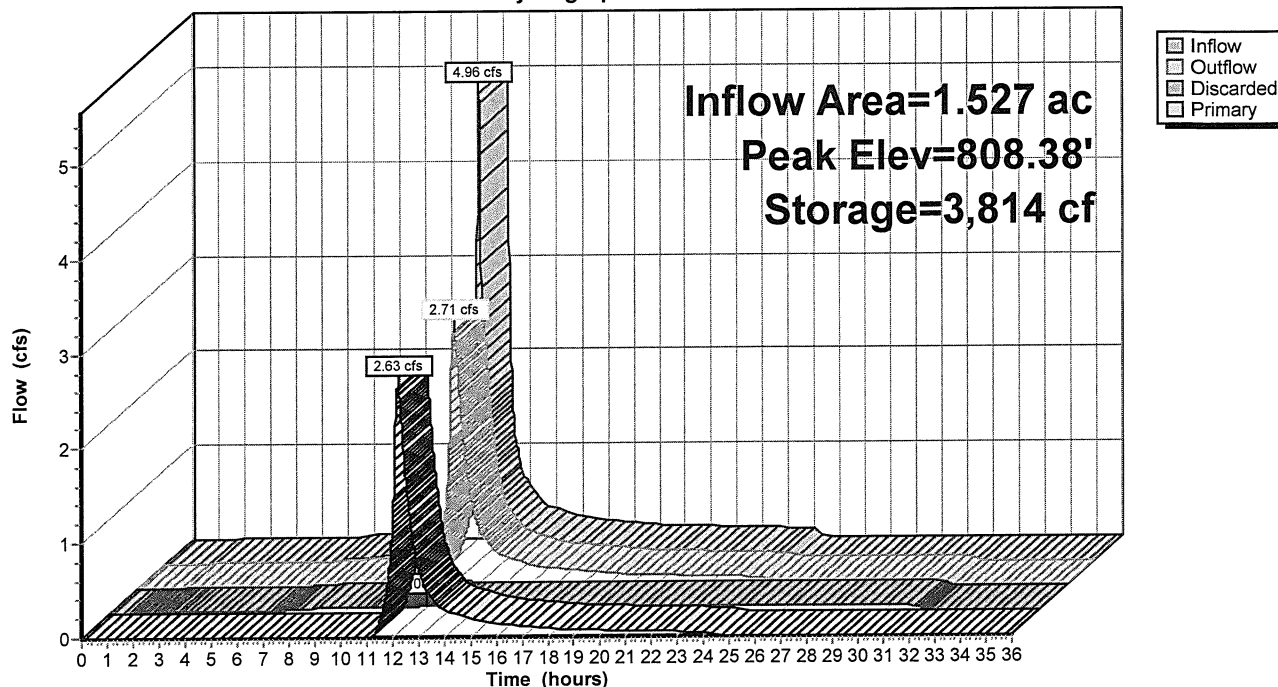
4=Orifice/Grate (Orifice Controls 0.39 cfs @ 2.21 fps)

5=Orifice/Grate (Controls 0.00 cfs)

6=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond B-1: basin 1

Hydrograph



Summary for Pond IT-1: Interceptor Trench

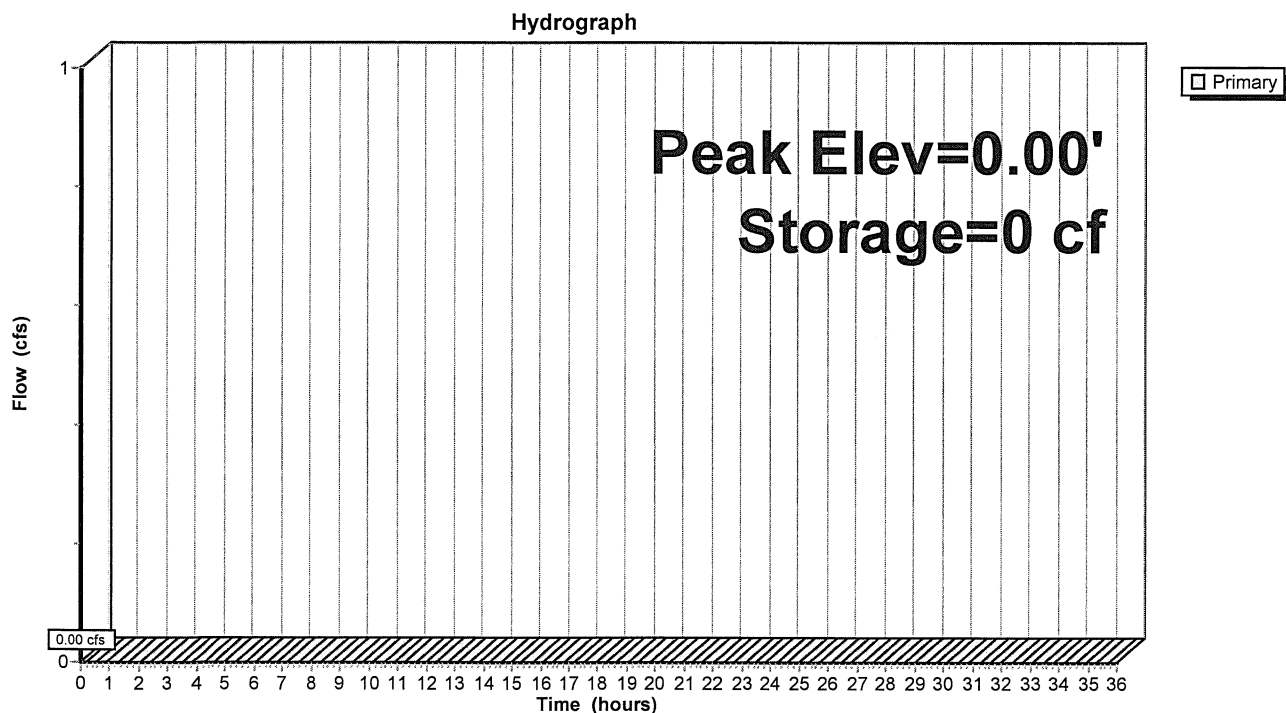
[43] Hint: Has no inflow (Outflow=Zero)

Volume	Invert	Avail.Storage	Storage Description
#1	669.00'	1,625 cf	3.00'W x 700.00'L x 2.00'H Prismatoid 4,200 cf Overall - 137 cf Embedded = 4,063 cf x 40.0% Voids
#2	669.00'	137 cf	6.0" Round Pipe Storage Inside #1 L= 700.0'
		1,762 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	669.00'	6.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads

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

↑1=Orifice/Grate (Controls 0.00 cfs)

Pond IT-1: Interceptor Trench

Summary for Pond T-1: Infiltration Trench

Inflow Area = 0.587 ac, 19.60% Impervious, Inflow Depth = 3.52" for 10-Year A event
 Inflow = 2.19 cfs @ 12.14 hrs, Volume= 0.172 af
 Outflow = 2.12 cfs @ 12.16 hrs, Volume= 0.170 af, Atten= 3%, Lag= 1.0 min
 Primary = 2.12 cfs @ 12.16 hrs, Volume= 0.170 af
 Routed to Pond B-1 : basin 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 810.00' @ 12.16 hrs Surf.Area= 400 sf Storage= 261 cf
 Flood Elev= 810.50' Surf.Area= 400 sf Storage= 341 cf

Plug-Flow detention time= 16.1 min calculated for 0.170 af (99% of inflow)
 Center-of-Mass det. time= 9.4 min (830.4 - 821.0)

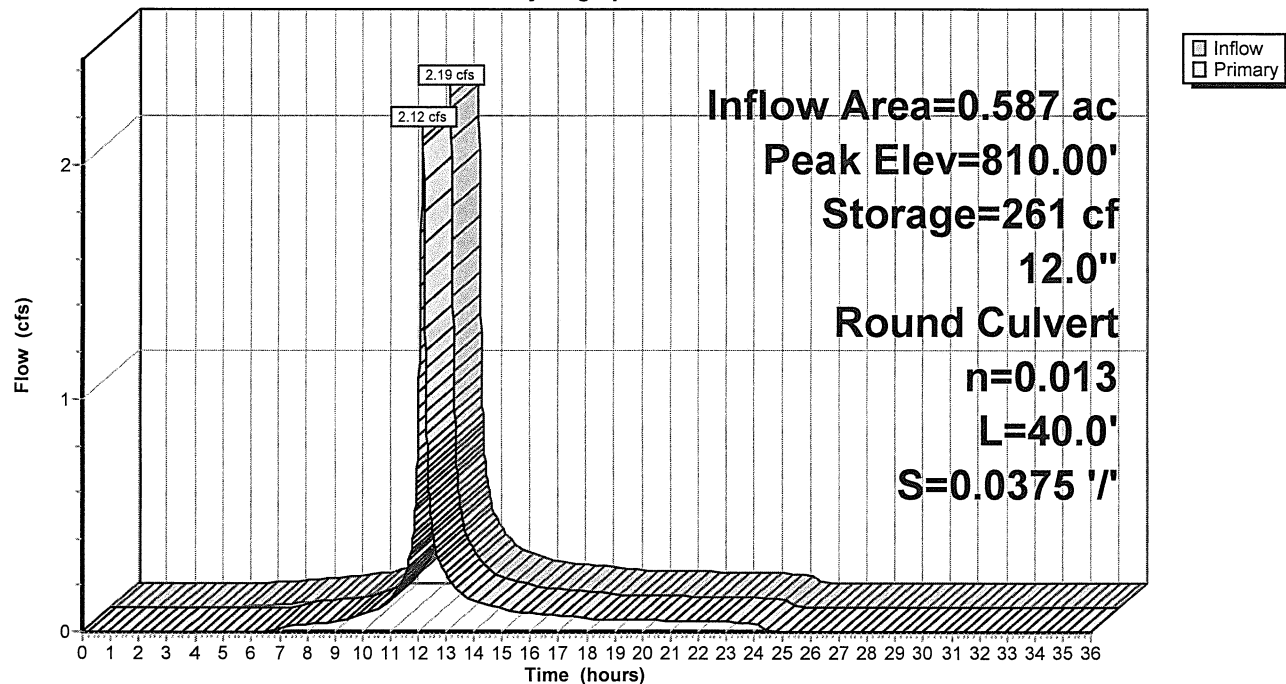
Volume	Invert	Avail.Storage	Storage Description
#1	808.50'	306 cf	4.00'W x 100.00'L x 2.00'H Prismatic 800 cf Overall - 35 cf Embedded = 765 cf x 40.0% Voids
#2	809.00'	35 cf	8.0" Round Pipe Storage Inside #1 L= 100.0'
		341 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	809.00'	12.0" Round Culvert L= 40.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 809.00' / 807.50' S= 0.0375 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.11 cfs @ 12.16 hrs HW=810.00' TW=808.30' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 2.11 cfs @ 2.69 fps)

Pond T-1: Infiltration Trench

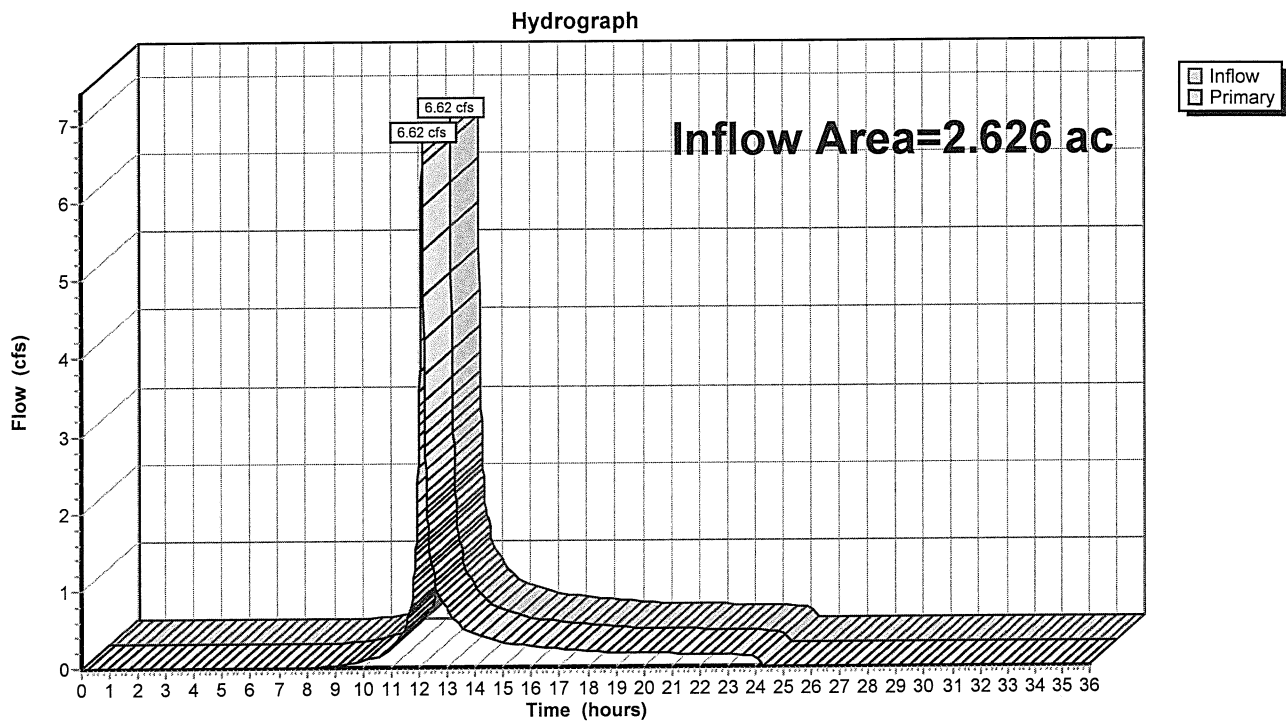
Hydrograph



Summary for Link AP-1: Analysis Point #1

Inflow Area = 2.626 ac, 0.00% Impervious, Inflow Depth = 2.16" for 10-Year A event
Inflow = 6.62 cfs @ 12.13 hrs, Volume= 0.473 af
Primary = 6.62 cfs @ 12.13 hrs, Volume= 0.473 af, Atten= 0%, Lag= 0.0 min

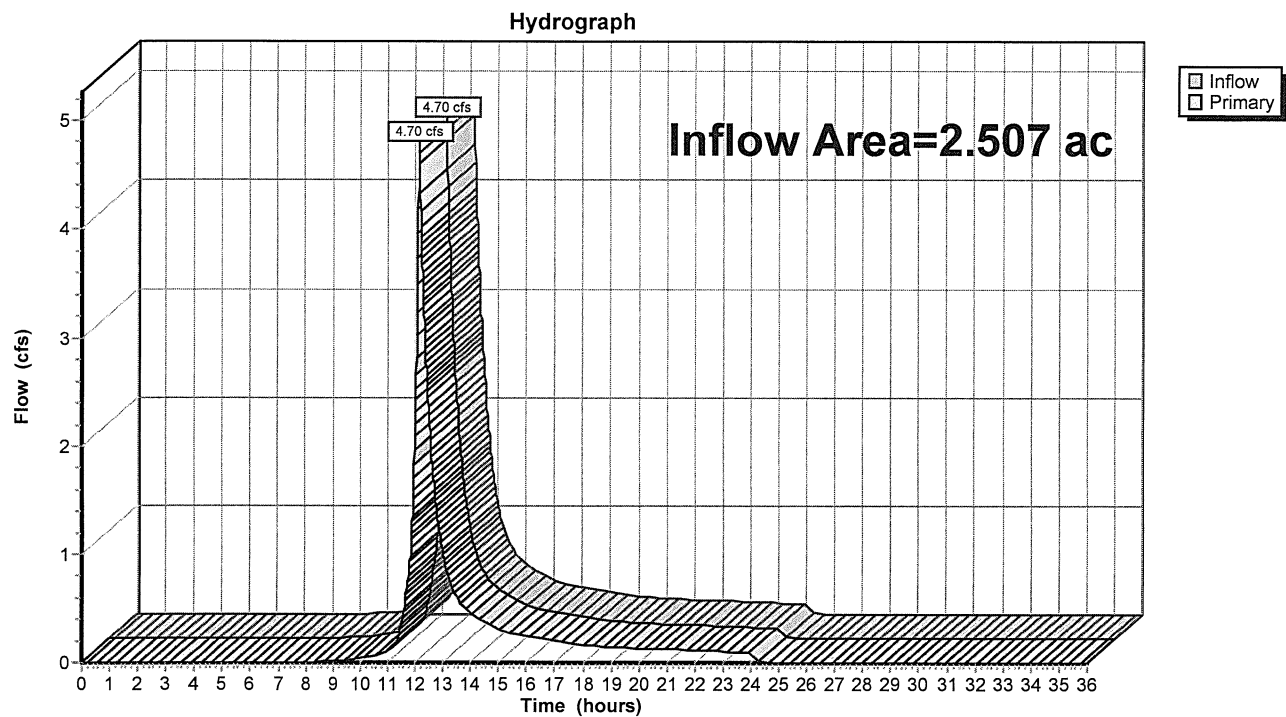
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link AP-1: Analysis Point #1

Summary for Link AP-2:

Inflow Area = 2.507 ac, 14.02% Impervious, Inflow Depth = 2.20" for 10-Year A event
Inflow = 4.70 cfs @ 12.14 hrs, Volume= 0.461 af
Primary = 4.70 cfs @ 12.14 hrs, Volume= 0.461 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 4L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link AP-2:

Pre-Post_Development_1-30-24

NRCC 24-hr D 25-Year A Rainfall=6.05"

Prepared by McClure Engineering

Printed 2/2/2024

HydroCAD® 10.20-4a s/n 03362 © 2023 HydroCAD Software Solutions LLC

Page 37

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E-1: EX-1Runoff Area=114,395 sf 0.00% Impervious Runoff Depth=3.03"
Tc=5.0 min CN=72 Runoff=9.29 cfs 0.664 af**Subcatchment P-1:**Runoff Area=42,715 sf 0.00% Impervious Runoff Depth=3.13"
Tc=5.0 min CN=73 Runoff=3.57 cfs 0.256 af**Subcatchment P-2:**Runoff Area=25,584 sf 19.60% Impervious Runoff Depth=4.57"
Tc=5.0 min CN=87 Runoff=2.97 cfs 0.223 af**Subcatchment P-3:**Runoff Area=30,920 sf 0.97% Impervious Runoff Depth=3.23"
Tc=5.0 min CN=74 Runoff=2.66 cfs 0.191 af**Subcatchment roof:**Runoff Area=10,000 sf 100.00% Impervious Runoff Depth=5.81"
Tc=6.0 min CN=98 Runoff=1.26 cfs 0.111 af**Reach 1R: Stone Swale**Avg. Flow Depth=0.59' Max Vel=1.72 fps Inflow=2.97 cfs 0.223 af
n=0.069 L=220.0' S=0.0273 '/' Capacity=1.99 cfs Outflow=2.80 cfs 0.223 af**Pond B-1: basin 1**Peak Elev=808.64' Storage=4,682 cf Inflow=6.44 cfs 0.524 af
Discarded=0.08 cfs 0.127 af Primary=3.26 cfs 0.397 af Outflow=3.34 cfs 0.524 af**Pond IT-1: Interceptor Trench**Peak Elev=0.00' Storage=0 cf
Primary=0.00 cfs 0.000 af**Pond T-1: Infiltration Trench**Peak Elev=810.31' Storage=310 cf Inflow=2.80 cfs 0.223 af
12.0" Round Culvert n=0.013 L=40.0' S=0.0375 '/' Outflow=2.68 cfs 0.222 af**Link AP-1: Analysis Point #1**Inflow=9.29 cfs 0.664 af
Primary=9.29 cfs 0.664 af**Link AP-2:**Inflow=6.31 cfs 0.652 af
Primary=6.31 cfs 0.652 af**Total Runoff Area = 5.133 ac Runoff Volume = 1.445 af Average Runoff Depth = 3.38"**
93.15% Pervious = 4.782 ac 6.85% Impervious = 0.352 ac

Summary for Subcatchment E-1: EX-1

Runoff = 9.29 cfs @ 12.12 hrs, Volume= 0.664 af, Depth= 3.03"
Routed to Link AP-1 : Analysis Point #1

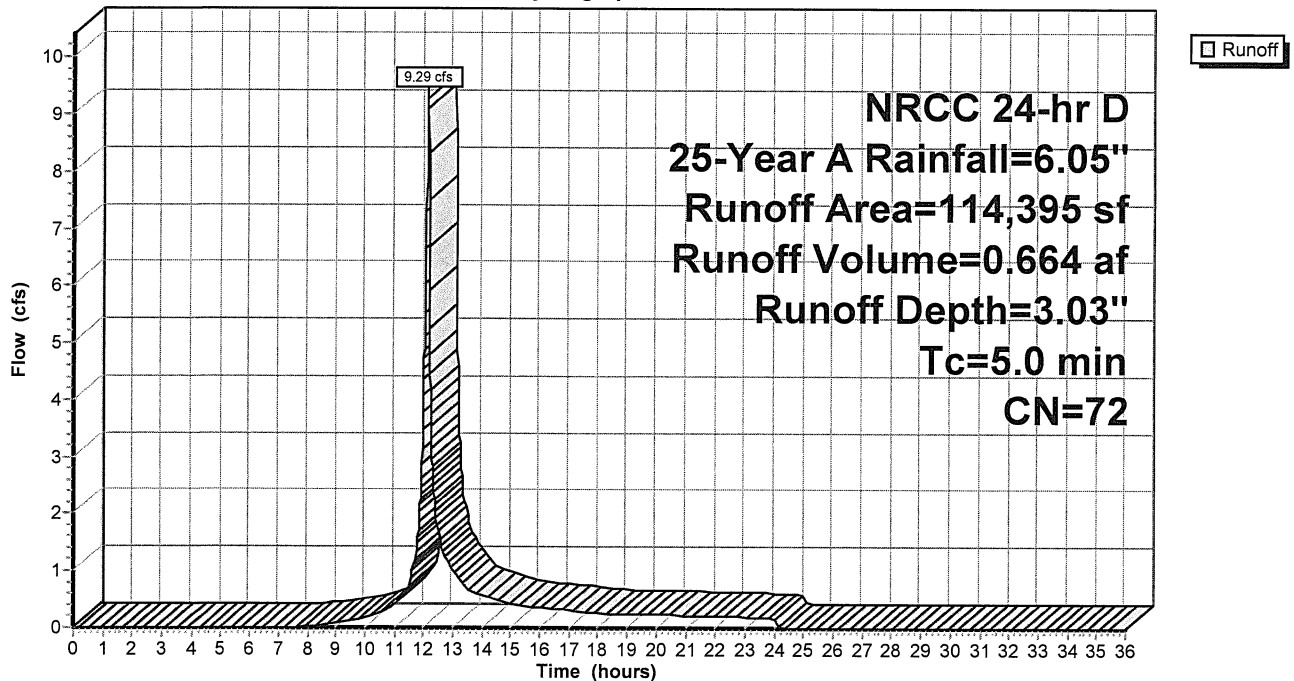
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 25-Year A Rainfall=6.05"

Area (sf)	CN	Description
105,390	72	Woods/grass comb., Good, HSG C
9,005	70	Woods, Good, HSG C
114,395	72	Weighted Average
114,395		100.00% Pervious Area

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

Subcatchment E-1: EX-1

Hydrograph



Summary for Subcatchment P-1:

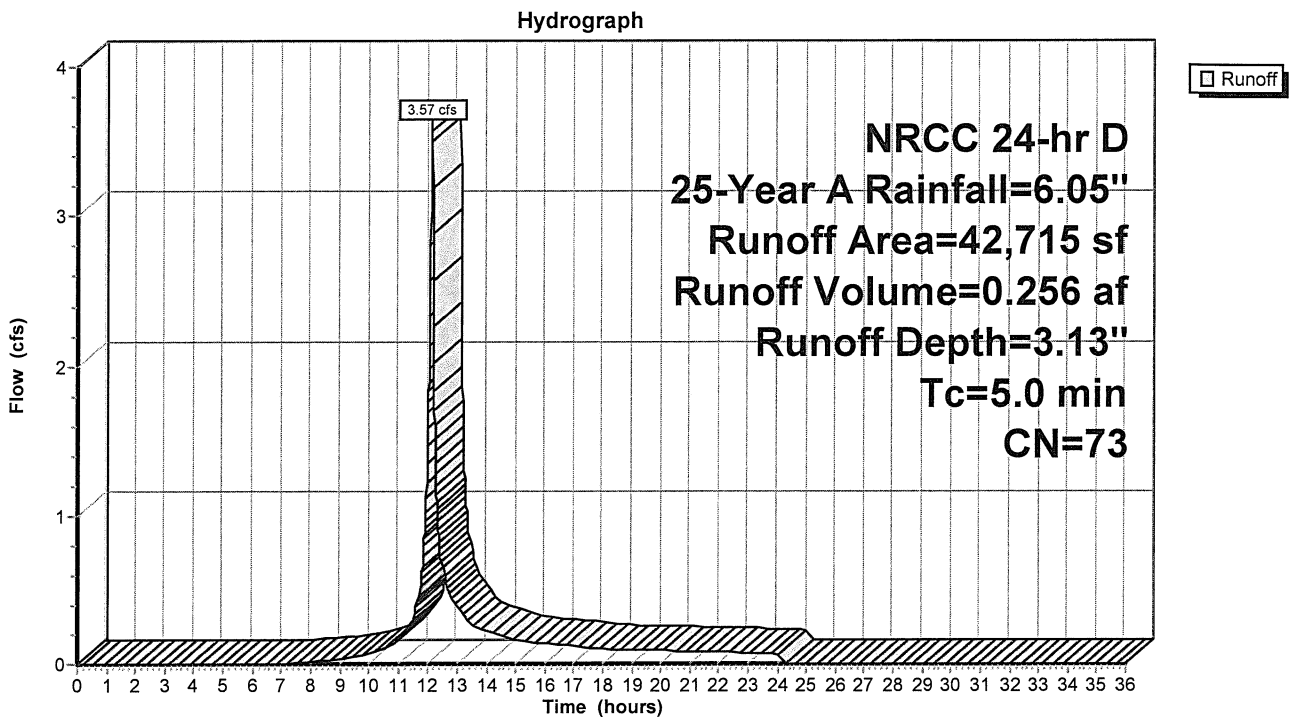
Runoff = 3.57 cfs @ 12.12 hrs, Volume= 0.256 af, Depth= 3.13"
Routed to Link AP-2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 25-Year A Rainfall=6.05"

Area (sf)	CN	Description
35,024	74	>75% Grass cover, Good, HSG C
7,691	70	Woods, Good, HSG C
42,715	73	Weighted Average
42,715		100.00% Pervious Area

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

Subcatchment P-1:



Pre-Post_Development_1-30-24

Prepared by McClure Engineering

HydroCAD® 10.20-4a s/n 03362 © 2023 HydroCAD Software Solutions LLC

NRCC 24-hr D 25-Year A Rainfall=6.05"

Printed 2/2/2024

Page 40

Summary for Subcatchment P-2:

Runoff = 2.97 cfs @ 12.12 hrs, Volume= 0.223 af, Depth= 4.57"

Routed to Reach 1R : Stone Swale

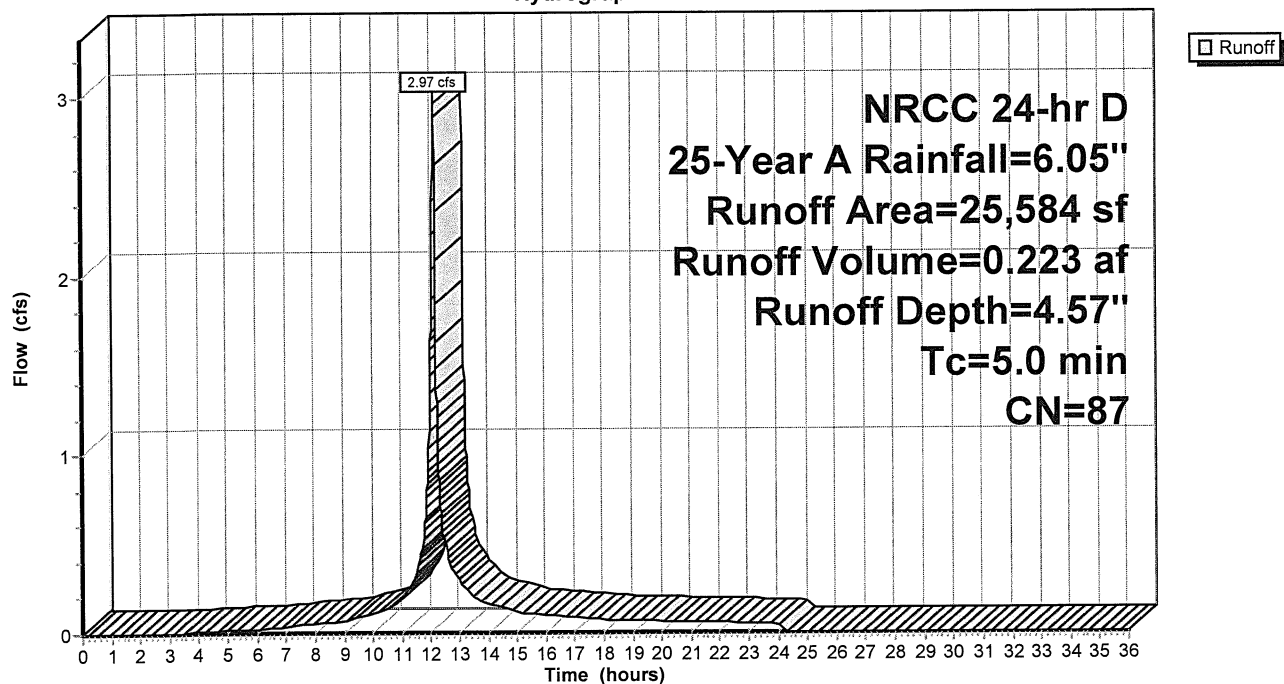
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 25-Year A Rainfall=6.05"

Area (sf)	CN	Description
14,364	89	Gravel roads, HSG C
300	98	Paved parking, HSG C
6,205	74	>75% Grass cover, Good, HSG C
4,715	98	Water Surface, HSG C
25,584	87	Weighted Average
20,569		80.40% Pervious Area
5,015		19.60% Impervious Area

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

Subcatchment P-2:

Hydrograph



Pre-Post_Development_1-30-24

Prepared by McClure Engineering

HydroCAD® 10.20-4a s/n 03362 © 2023 HydroCAD Software Solutions LLC

NRCC 24-hr D 25-Year A Rainfall=6.05"

Printed 2/2/2024

Page 41

Summary for Subcatchment P-3:

Runoff = 2.66 cfs @ 12.12 hrs, Volume= 0.191 af, Depth= 3.23"
Routed to Pond B-1 : basin 1

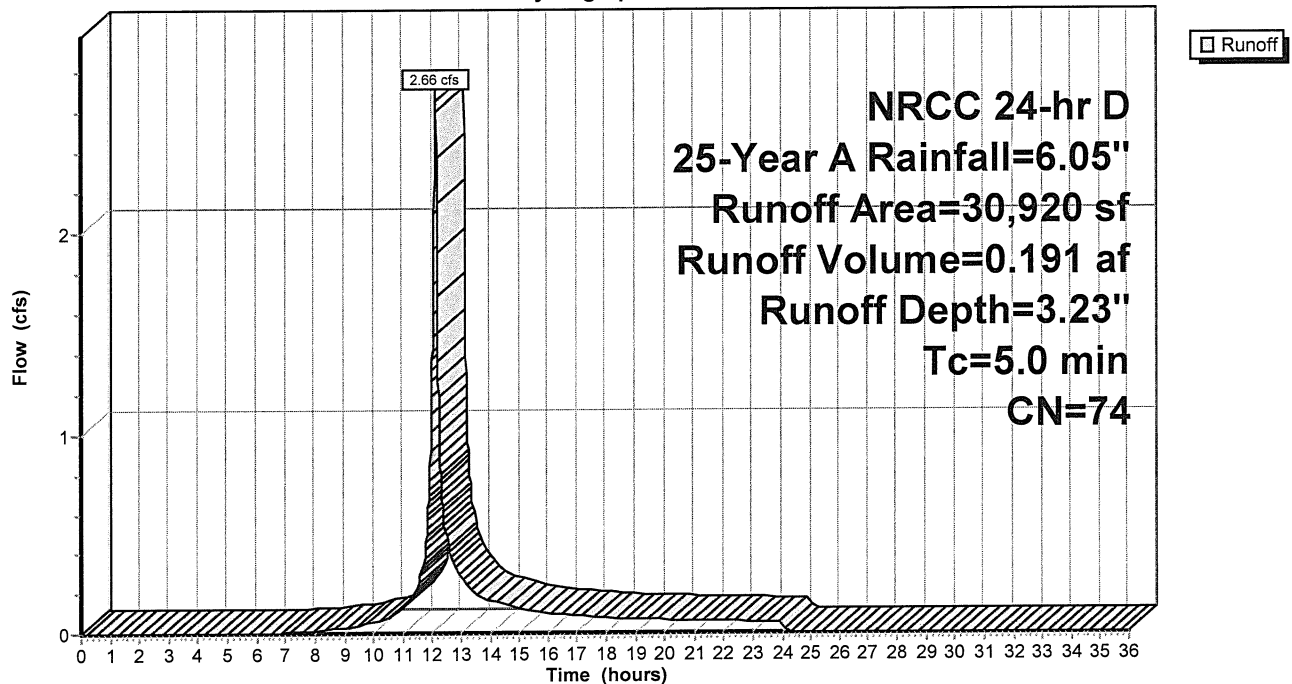
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 25-Year A Rainfall=6.05"

Area (sf)	CN	Description
1,000	89	Gravel roads, HSG C
300	98	Paved parking, HSG C
27,345	74	>75% Grass cover, Good, HSG C
2,275	70	Woods, Good, HSG C
30,920	74	Weighted Average
30,620		99.03% Pervious Area
300		0.97% Impervious Area

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

Subcatchment P-3:

Hydrograph



Summary for Subcatchment roof:

Runoff = 1.26 cfs @ 12.13 hrs, Volume= 0.111 af, Depth= 5.81"
 Routed to Pond B-1 : basin 1

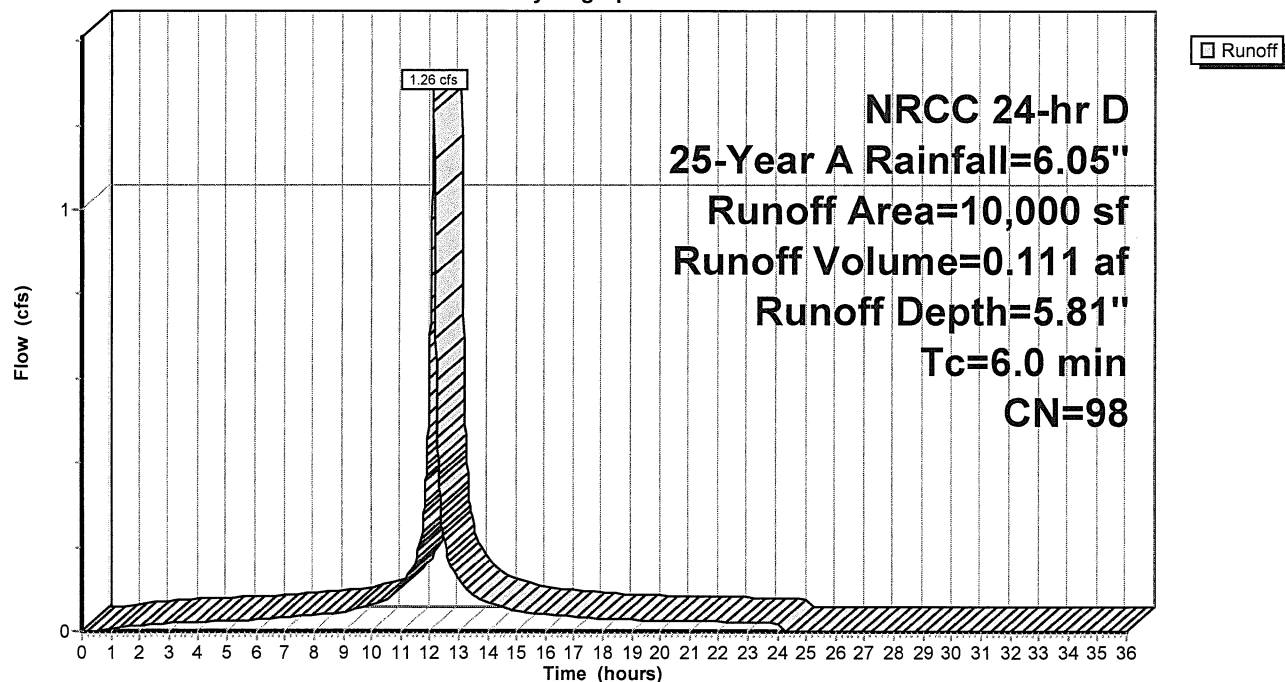
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NRCC 24-hr D 25-Year A Rainfall=6.05"

Area (sf)	CN	Description
10,000	98	Roofs, HSG D
10,000		100.00% Impervious Area

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

Subcatchment roof:

Hydrograph



Summary for Reach 1R: Stone Swale

[91] Warning: Storage range exceeded by 0.09'

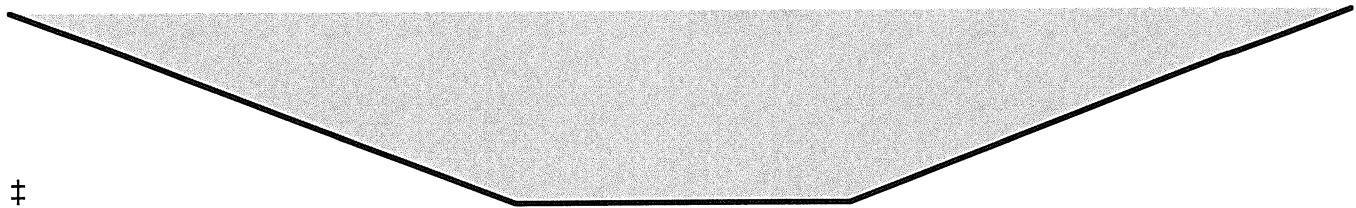
[55] Hint: Peak inflow is 149% of Manning's capacity

Inflow Area = 0.587 ac, 19.60% Impervious, Inflow Depth = 4.57" for 25-Year A event
Inflow = 2.97 cfs @ 12.12 hrs, Volume= 0.223 af
Outflow = 2.80 cfs @ 12.14 hrs, Volume= 0.223 af, Atten= 6%, Lag= 1.2 min
Routed to Pond T-1 : Infiltration Trench

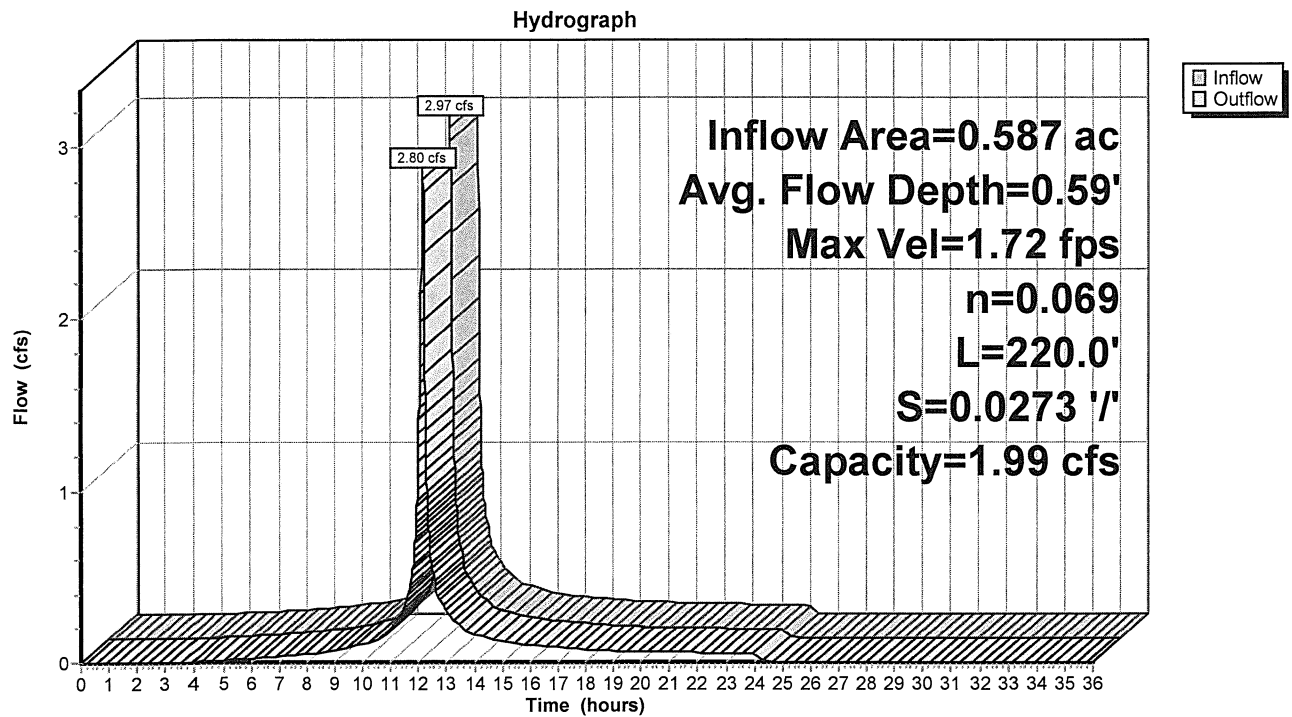
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.72 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 0.57 fps, Avg. Travel Time= 6.4 min

Peak Storage= 358 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.59' , Surface Width= 4.57'
Bank-Full Depth= 0.50' Flow Area= 1.3 sf, Capacity= 1.99 cfs

1.00' x 0.50' deep channel, n= 0.069 Riprap, 6-inch
Side Slope Z-value= 3.0 ' / ' Top Width= 4.00'
Length= 220.0' Slope= 0.0273 ' / '
Inlet Invert= 816.50', Outlet Invert= 810.50'



Reach 1R: Stone Swale



Pre-Post_Development_1-30-24

NRCC 24-hr D 25-Year A Rainfall=6.05"

Prepared by McClure Engineering

Printed 2/2/2024

HydroCAD® 10.20-4a s/n 03362 © 2023 HydroCAD Software Solutions LLC

Page 45

Summary for Pond B-1: basin 1

Inflow Area = 1.527 ac, 23.03% Impervious, Inflow Depth = 4.12" for 25-Year A event
 Inflow = 6.44 cfs @ 12.13 hrs, Volume= 0.524 af
 Outflow = 3.34 cfs @ 12.24 hrs, Volume= 0.524 af, Atten= 48%, Lag= 6.4 min
 Discarded = 0.08 cfs @ 12.24 hrs, Volume= 0.127 af
 Primary = 3.26 cfs @ 12.24 hrs, Volume= 0.397 af
 Routed to Link AP-2 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 808.64' @ 12.24 hrs Surf.Area= 3,375 sf Storage= 4,682 cf
 Flood Elev= 809.00' Surf.Area= 3,648 sf Storage= 5,940 cf

Plug-Flow detention time= 79.2 min calculated for 0.524 af (100% of inflow)
 Center-of-Mass det. time= 79.3 min (895.0 - 815.7)

Volume	Invert	Avail.Storage	Storage Description
#1	807.00'	155 cf	Custom Stage Data (Prismatic) Listed below (Recalc) -Impervious
#2	807.00'	95 cf	Custom Stage Data (Prismatic) Listed below (Recalc) -Impervious
#3	807.00'	9,728 cf	Custom Stage Data (Irregular) Listed below (Recalc)
		9,978 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
807.00	105	0	0
808.00	205	155	155

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
807.00	80	0	0
808.00	110	95	95

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
807.00	1,953	183.0	0	0	1,953
808.00	2,912	236.0	2,417	2,417	3,733
809.00	3,648	256.0	3,273	5,690	4,553
810.00	4,441	274.0	4,038	9,728	5,357

Device	Routing	Invert	Outlet Devices
#1	Primary	806.00'	12.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 806.00' / 804.00' S= 0.1000 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Discarded	807.00'	1.020 in/hr Exfiltration over Surface area Phase-In= 0.01'
#3	Device 1	807.50'	6.0" Vert. Orifice/Grate X 3.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	808.00'	4.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#5	Device 1	808.75'	2.0" x 2.0" Horiz. Orifice/Grate C= 0.600 in 24.0" x 24.0" Grate (1% open area) Limited to weir flow at low heads

Pre-Post_Development_1-30-24

Prepared by McClure Engineering

HydroCAD® 10.20-4a s/n 03362 © 2023 HydroCAD Software Solutions LLC

NRCC 24-hr D 25-Year A Rainfall=6.05"

Printed 2/2/2024

Page 46

#6 Primary 809.00' 10.0' long x 10.0' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.08 cfs @ 12.24 hrs HW=808.64' (Free Discharge)

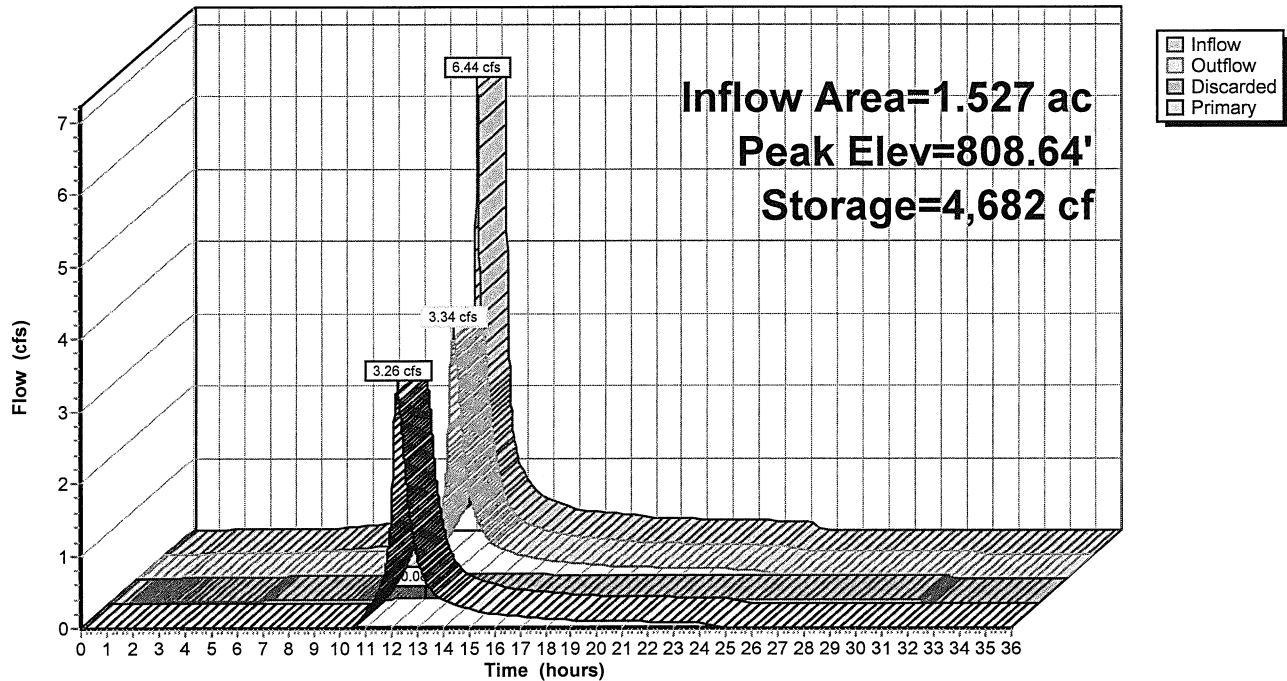
2=Exfiltration (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=3.26 cfs @ 12.24 hrs HW=808.64' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 3.26 cfs of 5.53 cfs potential flow)
3=Orifice/Grate (Orifice Controls 2.68 cfs @ 4.55 fps)
4=Orifice/Grate (Orifice Controls 0.58 cfs @ 3.32 fps)
5=Orifice/Grate (Controls 0.00 cfs)
6=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond B-1: basin 1

Hydrograph



Summary for Pond IT-1: Interceptor Trench

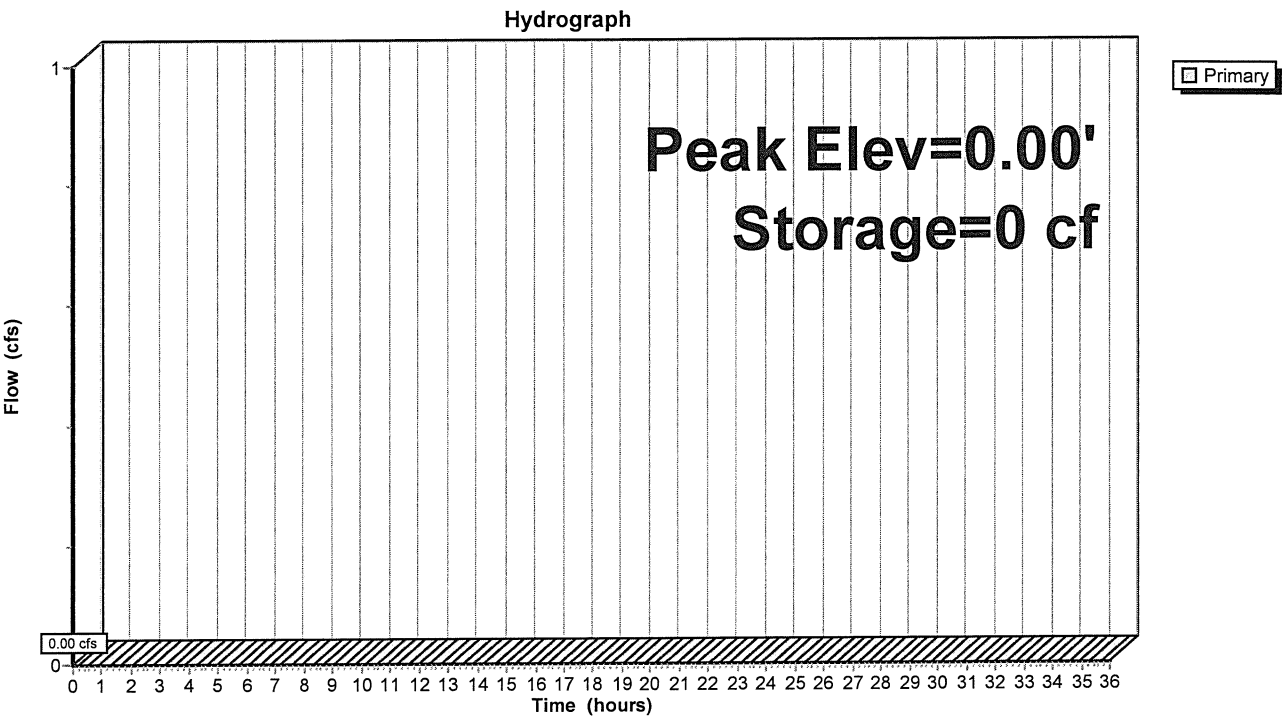
[43] Hint: Has no inflow (Outflow=Zero)

Volume	Invert	Avail.Storage	Storage Description
#1	669.00'	1,625 cf	3.00'W x 700.00'L x 2.00'H Prismatic 4,200 cf Overall - 137 cf Embedded = 4,063 cf x 40.0% Voids
#2	669.00'	137 cf	6.0" Round Pipe Storage Inside #1 L= 700.0'
		1,762 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	669.00'	6.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
1=Orifice/Grate (Controls 0.00 cfs)

Pond IT-1: Interceptor Trench



Summary for Pond T-1: Infiltration Trench

Inflow Area = 0.587 ac, 19.60% Impervious, Inflow Depth = 4.57" for 25-Year A event
 Inflow = 2.80 cfs @ 12.14 hrs, Volume= 0.223 af
 Outflow = 2.68 cfs @ 12.16 hrs, Volume= 0.222 af, Atten= 4%, Lag= 1.2 min
 Primary = 2.68 cfs @ 12.16 hrs, Volume= 0.222 af
 Routed to Pond B-1 : basin 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 810.31' @ 12.16 hrs Surf.Area= 400 sf Storage= 310 cf
 Flood Elev= 810.50' Surf.Area= 400 sf Storage= 341 cf

Plug-Flow detention time= 13.5 min calculated for 0.222 af (99% of inflow)
 Center-of-Mass det. time= 8.2 min (819.6 - 811.4)

Volume	Invert	Avail.Storage	Storage Description
#1	808.50'	306 cf	4.00'W x 100.00'L x 2.00'H Prismaoid 800 cf Overall - 35 cf Embedded = 765 cf x 40.0% Voids
#2	809.00'	35 cf	8.0" Round Pipe Storage Inside #1 L= 100.0'
		341 cf	Total Available Storage

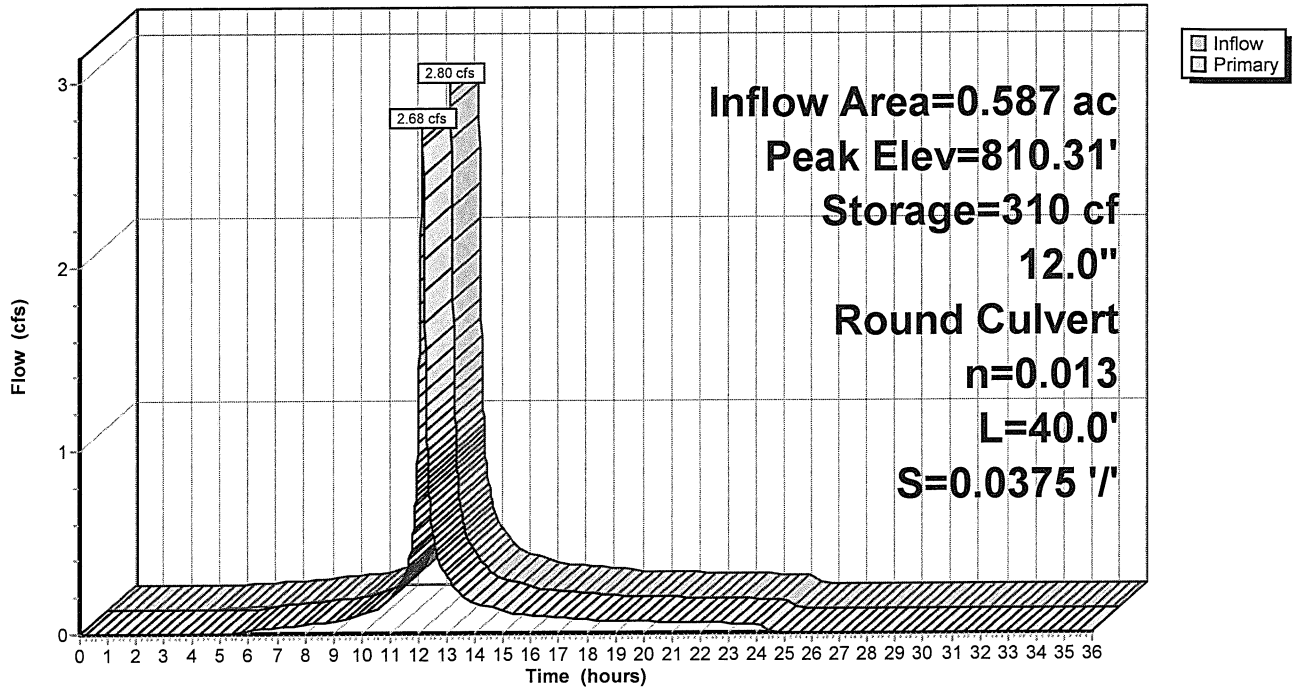
Device	Routing	Invert	Outlet Devices
#1	Primary	809.00'	12.0" Round Culvert L= 40.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 809.00' / 807.50' S= 0.0375 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.68 cfs @ 12.16 hrs HW=810.31' TW=808.53' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 2.68 cfs @ 3.42 fps)

Pond T-1: Infiltration Trench

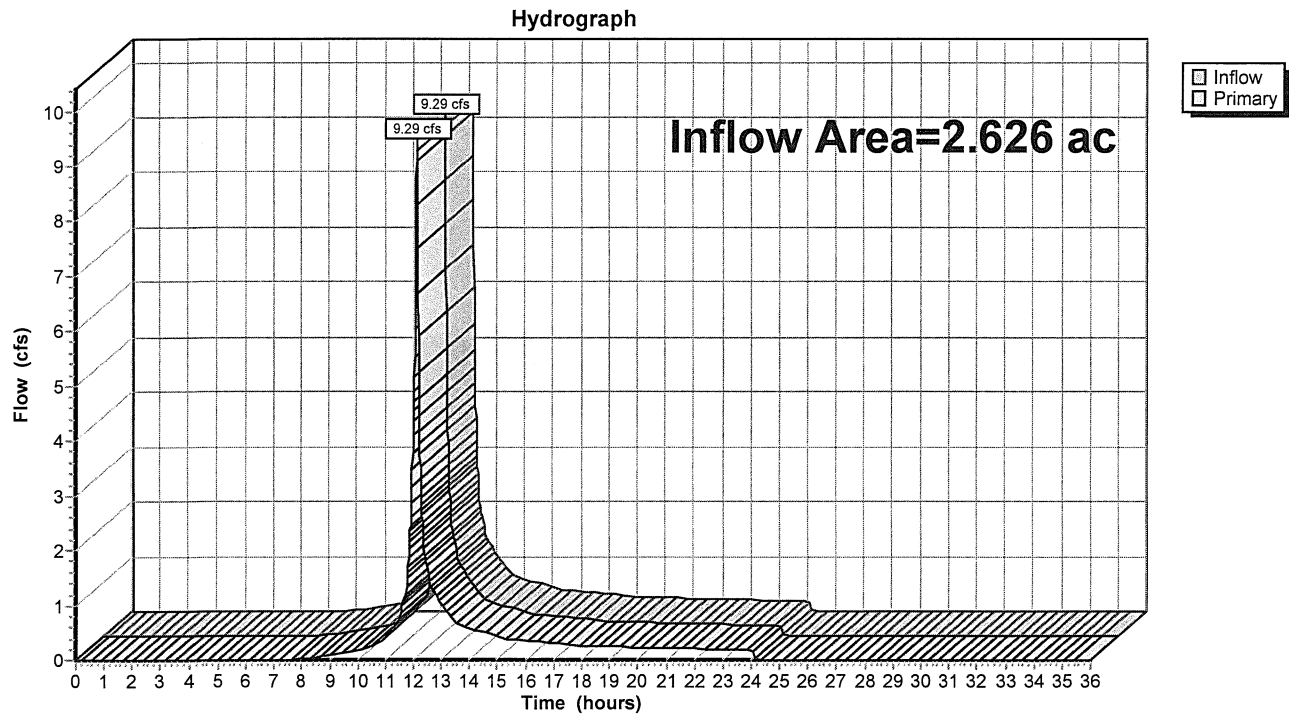
Hydrograph



Summary for Link AP-1: Analysis Point #1

Inflow Area = 2.626 ac, 0.00% Impervious, Inflow Depth = 3.03" for 25-Year A event
Inflow = 9.29 cfs @ 12.12 hrs, Volume= 0.664 af
Primary = 9.29 cfs @ 12.12 hrs, Volume= 0.664 af, Atten= 0%, Lag= 0.0 min

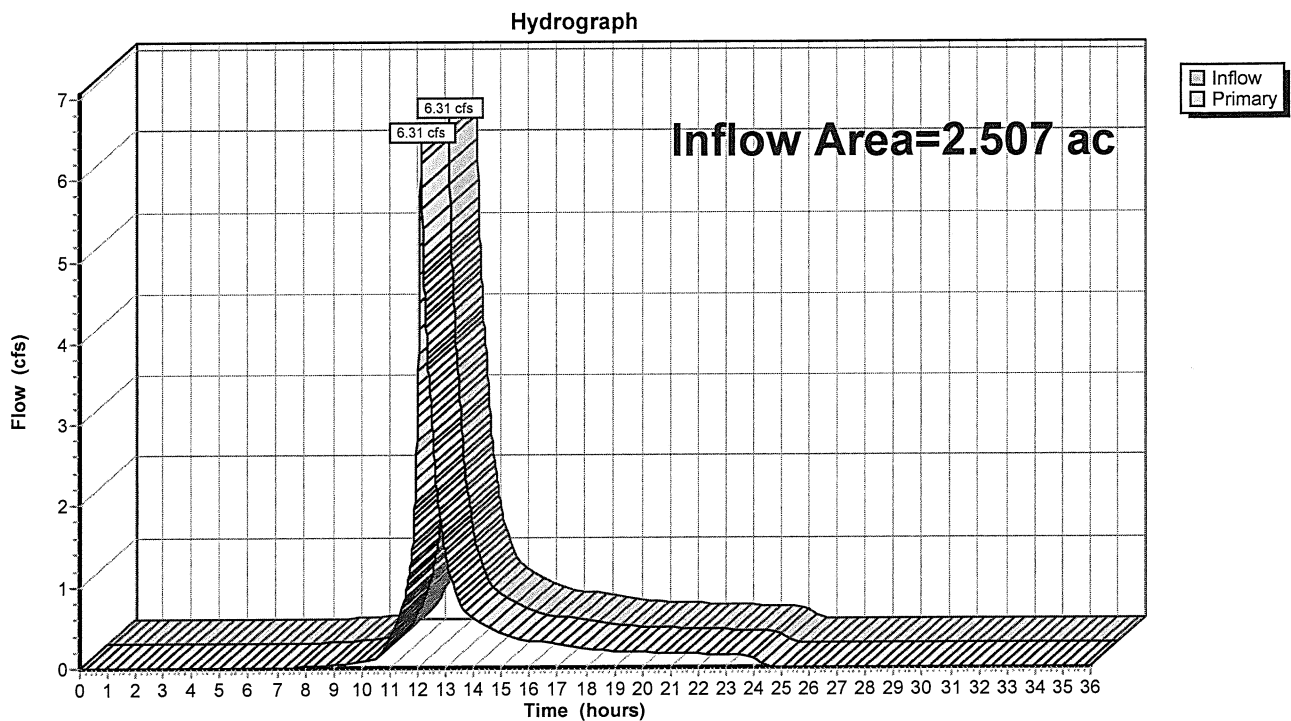
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link AP-1: Analysis Point #1

Summary for Link AP-2:

Inflow Area = 2.507 ac, 14.02% Impervious, Inflow Depth = 3.12" for 25-Year A event
Inflow = 6.31 cfs @ 12.13 hrs, Volume= 0.652 af
Primary = 6.31 cfs @ 12.13 hrs, Volume= 0.652 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 4L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link AP-2:

Pre-Post_Development_1-30-24

NRCC 24-hr D 100-Year A Rainfall=7.76"

Prepared by McClure Engineering

Printed 2/2/2024

HydroCAD® 10.20-4a s/n 03362 © 2023 HydroCAD Software Solutions LLC

Page 52

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E-1: EX-1 Runoff Area=114,395 sf 0.00% Impervious Runoff Depth=4.48"
Tc=5.0 min CN=72 Runoff=13.63 cfs 0.981 af

Subcatchment P-1: Runoff Area=42,715 sf 0.00% Impervious Runoff Depth=4.60"
Tc=5.0 min CN=73 Runoff=5.21 cfs 0.376 af

Subcatchment P-2: Runoff Area=25,584 sf 19.60% Impervious Runoff Depth=6.22"
Tc=5.0 min CN=87 Runoff=3.96 cfs 0.304 af

Subcatchment P-3: Runoff Area=30,920 sf 0.97% Impervious Runoff Depth=4.71"
Tc=5.0 min CN=74 Runoff=3.85 cfs 0.279 af

Subcatchment roof: Runoff Area=10,000 sf 100.00% Impervious Runoff Depth=7.52"
Tc=6.0 min CN=98 Runoff=1.62 cfs 0.144 af

Reach 1R: Stone Swale Avg. Flow Depth=0.70' Max Vel=1.81 fps Inflow=3.96 cfs 0.304 af
n=0.069 L=220.0' S=0.0273 ' /' Capacity=1.99 cfs Outflow=3.74 cfs 0.304 af

Pond B-1: basin 1 Peak Elev=809.05' Storage=6,120 cf Inflow=9.50 cfs 0.725 af
Discarded=0.09 cfs 0.135 af Primary=4.37 cfs 0.590 af Outflow=4.45 cfs 0.725 af

Pond IT-1: Interceptor Trench Peak Elev=0.00' Storage=0 cf
Primary=0.00 cfs 0.000 af

Pond T-1: Infiltration Trench Peak Elev=811.47' Storage=341 cf Inflow=3.74 cfs 0.304 af
12.0" Round Culvert n=0.013 L=40.0' S=0.0375 ' /' Outflow=4.19 cfs 0.302 af

Link AP-1: Analysis Point #1 Inflow=13.63 cfs 0.981 af
Primary=13.63 cfs 0.981 af

Link AP-2: Inflow=8.66 cfs 0.966 af
Primary=8.66 cfs 0.966 af

Total Runoff Area = 5.133 ac Runoff Volume = 2.084 af Average Runoff Depth = 4.87"
93.15% Pervious = 4.782 ac 6.85% Impervious = 0.352 ac

Summary for Subcatchment E-1: EX-1

Runoff = 13.63 cfs @ 12.12 hrs, Volume= 0.981 af, Depth= 4.48"
 Routed to Link AP-1 : Analysis Point #1

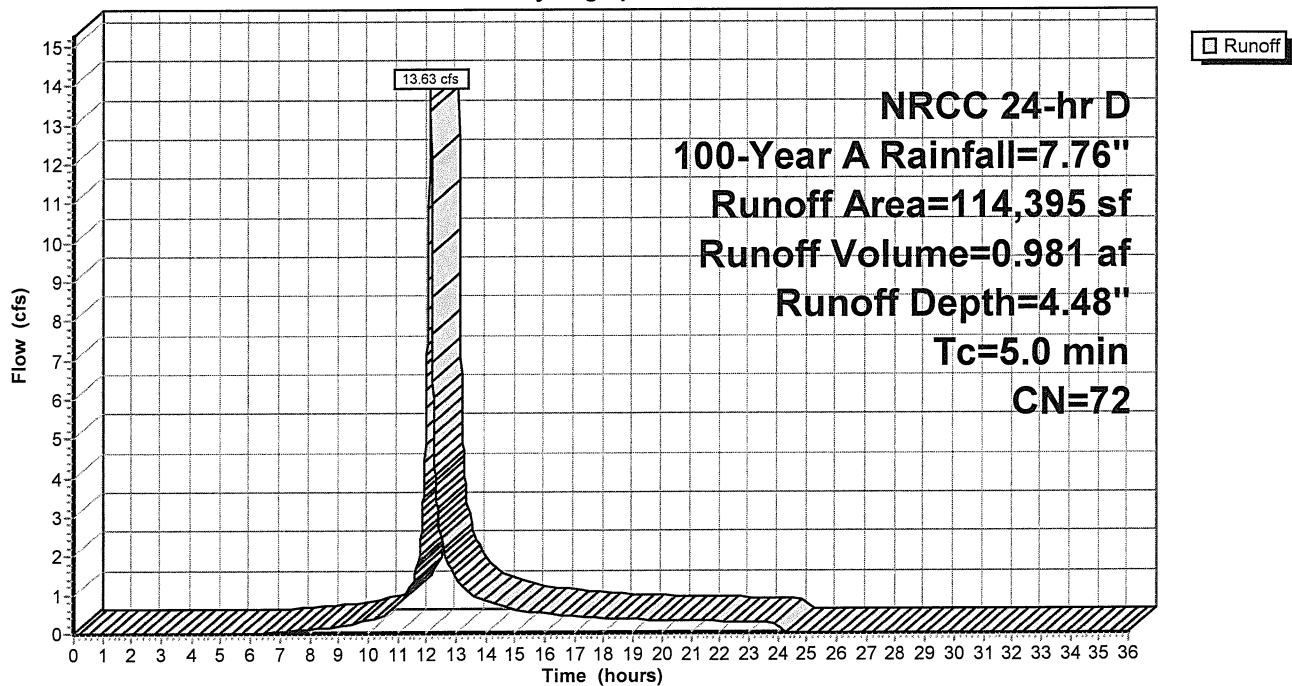
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NRCC 24-hr D 100-Year A Rainfall=7.76"

Area (sf)	CN	Description
105,390	72	Woods/grass comb., Good, HSG C
9,005	70	Woods, Good, HSG C
114,395	72	Weighted Average
114,395		100.00% Pervious Area

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

Subcatchment E-1: EX-1

Hydrograph



Summary for Subcatchment P-1:

Runoff = 5.21 cfs @ 12.12 hrs, Volume= 0.376 af, Depth= 4.60"
 Routed to Link AP-2 :

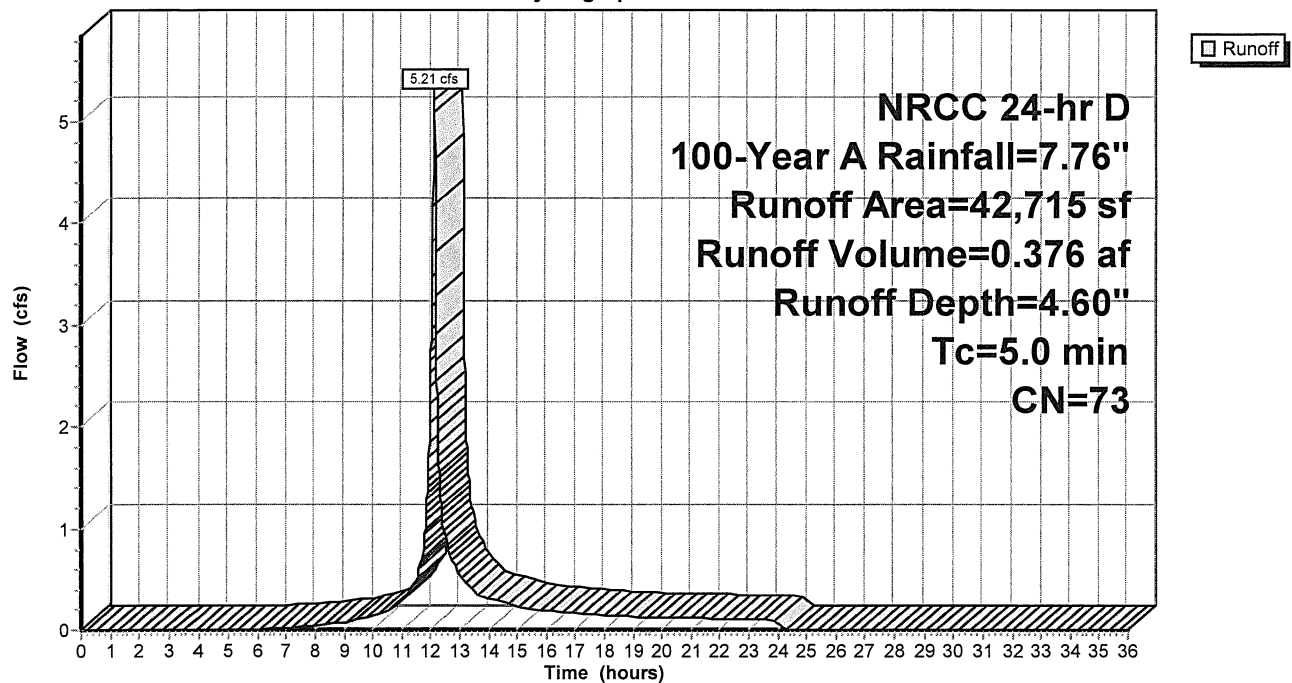
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NRCC 24-hr D 100-Year A Rainfall=7.76"

Area (sf)	CN	Description
35,024	74	>75% Grass cover, Good, HSG C
7,691	70	Woods, Good, HSG C
42,715	73	Weighted Average
42,715		100.00% Pervious Area

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

Subcatchment P-1:

Hydrograph



Summary for Subcatchment P-2:

Runoff = 3.96 cfs @ 12.12 hrs, Volume= 0.304 af, Depth= 6.22"
 Routed to Reach 1R : Stone Swale

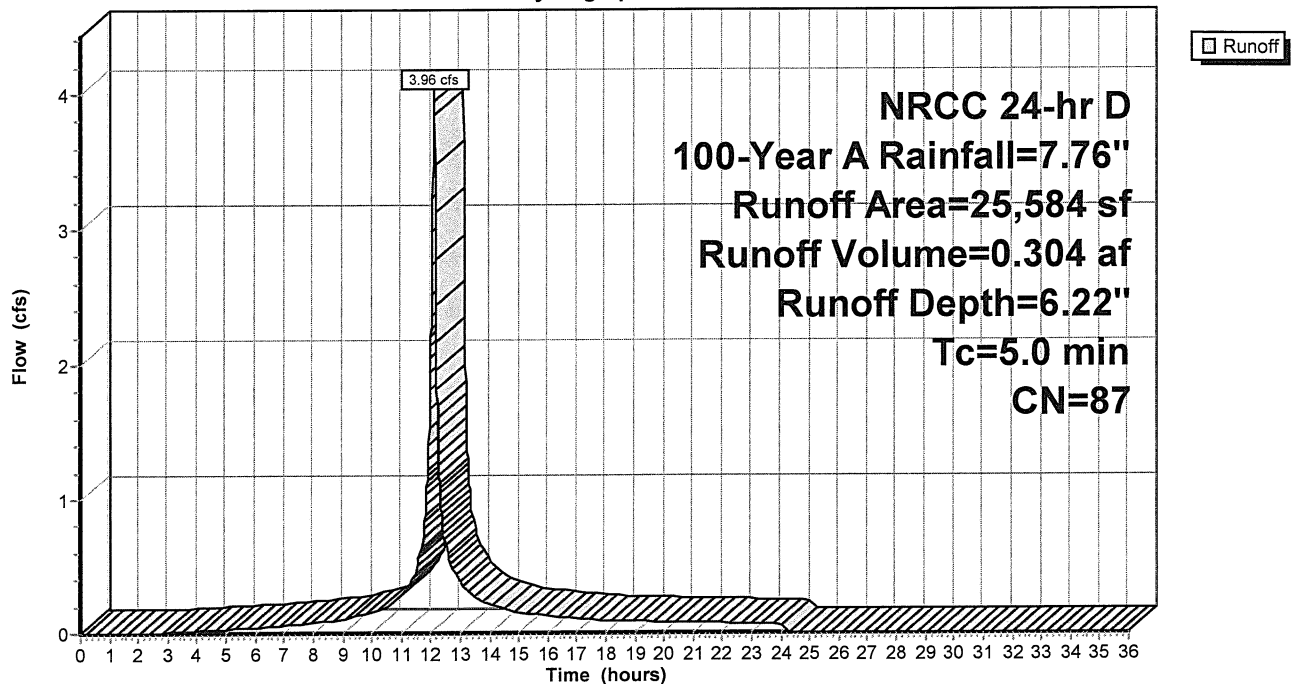
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NRCC 24-hr D 100-Year A Rainfall=7.76"

Area (sf)	CN	Description
14,364	89	Gravel roads, HSG C
300	98	Paved parking, HSG C
6,205	74	>75% Grass cover, Good, HSG C
4,715	98	Water Surface, HSG C
25,584	87	Weighted Average
20,569		80.40% Pervious Area
5,015		19.60% Impervious Area

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

Subcatchment P-2:

Hydrograph



Summary for Subcatchment P-3:

Runoff = 3.85 cfs @ 12.12 hrs, Volume= 0.279 af, Depth= 4.71"
 Routed to Pond B-1 : basin 1

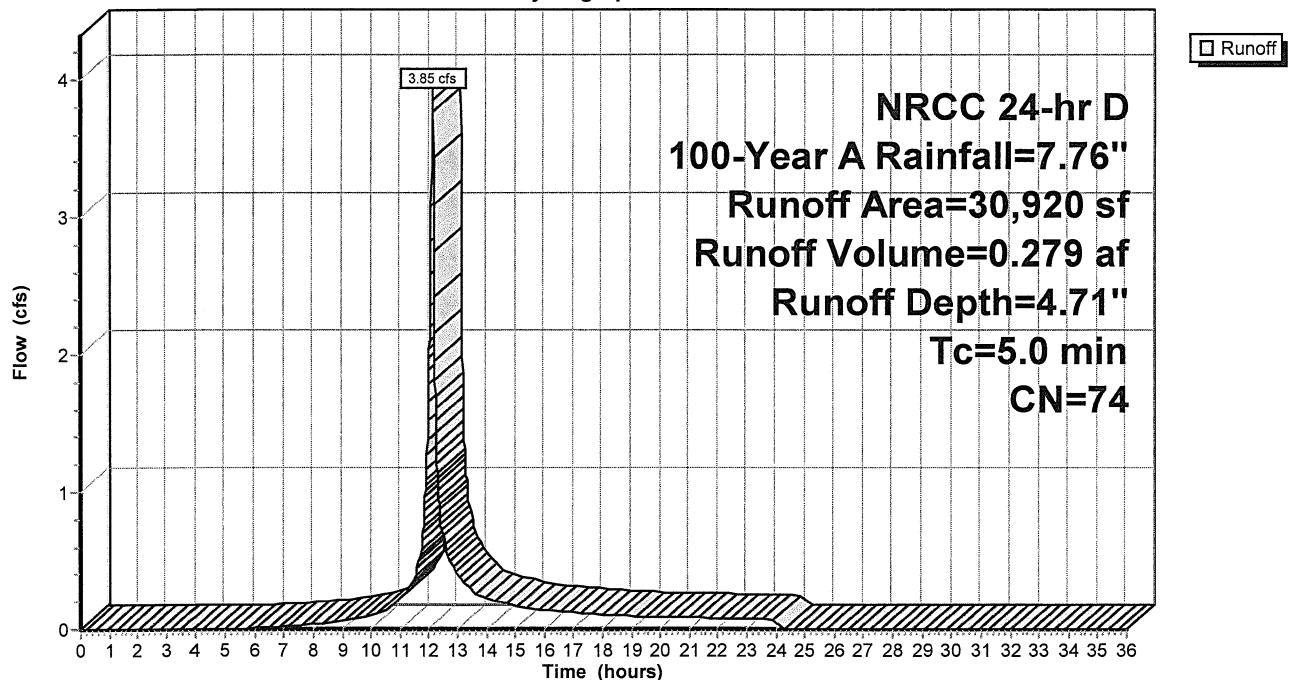
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NRCC 24-hr D 100-Year A Rainfall=7.76"

Area (sf)	CN	Description
1,000	89	Gravel roads, HSG C
300	98	Paved parking, HSG C
27,345	74	>75% Grass cover, Good, HSG C
2,275	70	Woods, Good, HSG C
30,920	74	Weighted Average
30,620		99.03% Pervious Area
300		0.97% Impervious Area

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

Subcatchment P-3:

Hydrograph



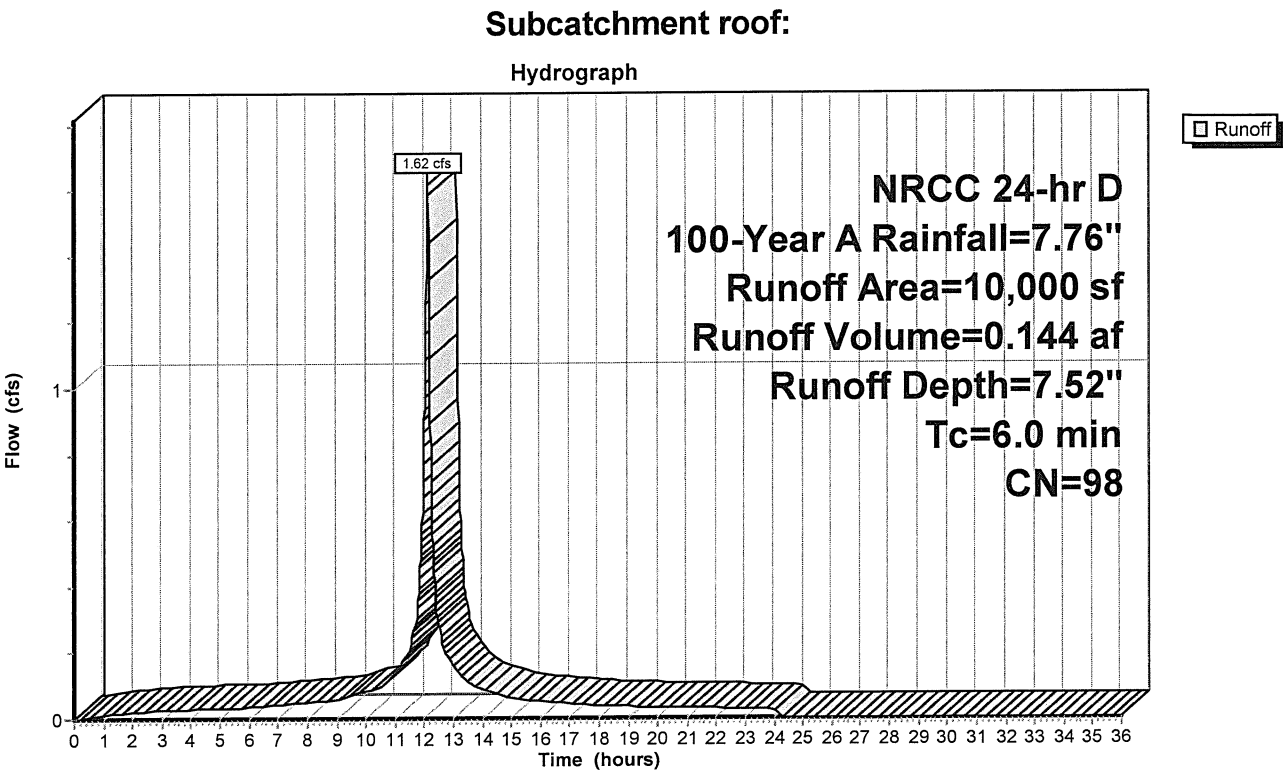
Summary for Subcatchment roof:

Runoff = 1.62 cfs @ 12.13 hrs, Volume= 0.144 af, Depth= 7.52"
Routed to Pond B-1 : basin 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 100-Year A Rainfall=7.76"

Area (sf)	CN	Description
10,000	98	Roofs, HSG D
10,000		100.00% Impervious Area

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



Summary for Reach 1R: Stone Swale

[91] Warning: Storage range exceeded by 0.20'

[55] Hint: Peak inflow is 199% of Manning's capacity

Inflow Area = 0.587 ac, 19.60% Impervious, Inflow Depth = 6.22" for 100-Year A event
Inflow = 3.96 cfs @ 12.12 hrs, Volume= 0.304 af
Outflow = 3.74 cfs @ 12.14 hrs, Volume= 0.304 af, Atten= 5%, Lag= 1.2 min
Routed to Pond T-1 : Infiltration Trench

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Max. Velocity= 1.81 fps, Min. Travel Time= 2.0 min

Avg. Velocity = 0.62 fps, Avg. Travel Time= 5.9 min

Peak Storage= 454 cf @ 12.14 hrs

Average Depth at Peak Storage= 0.70' , Surface Width= 5.23'

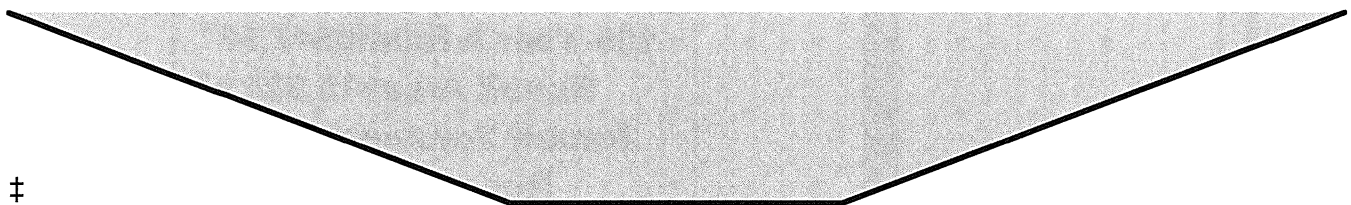
Bank-Full Depth= 0.50' Flow Area= 1.3 sf, Capacity= 1.99 cfs

1.00' x 0.50' deep channel, n= 0.069 Riprap, 6-inch

Side Slope Z-value= 3.0 '/' Top Width= 4.00'

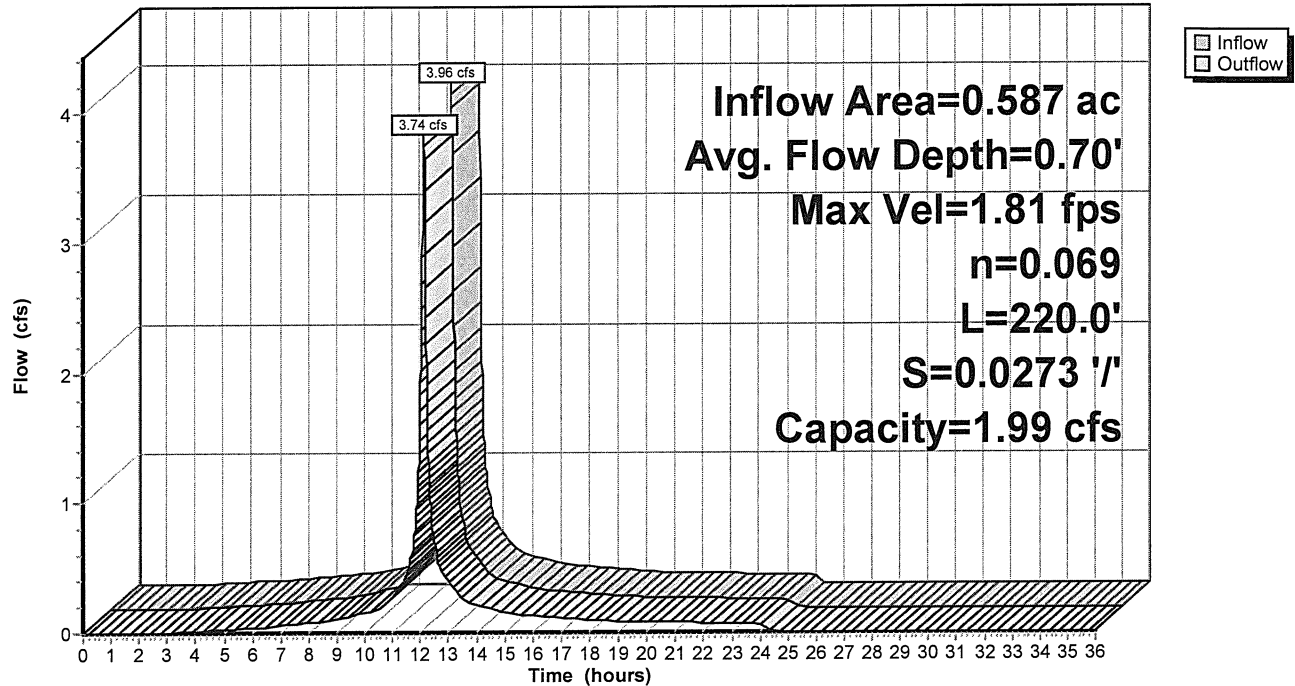
Length= 220.0' Slope= 0.0273 '/'

Inlet Invert= 816.50', Outlet Invert= 810.50'



Reach 1R: Stone Swale

Hydrograph



Summary for Pond B-1: basin 1

[58] Hint: Peaked 0.05' above defined flood level

Inflow Area = 1.527 ac, 23.03% Impervious, Inflow Depth = 5.70" for 100-Year A event
 Inflow = 9.50 cfs @ 12.12 hrs, Volume= 0.725 af
 Outflow = 4.45 cfs @ 12.24 hrs, Volume= 0.725 af, Atten= 53%, Lag= 7.4 min
 Discarded = 0.09 cfs @ 12.24 hrs, Volume= 0.135 af
 Primary = 4.37 cfs @ 12.24 hrs, Volume= 0.590 af
 Routed to Link AP-2 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 809.05' @ 12.24 hrs Surf.Area= 3,685 sf Storage= 6,120 cf
 Flood Elev= 809.00' Surf.Area= 3,648 sf Storage= 5,940 cf

Plug-Flow detention time= 66.0 min calculated for 0.725 af (100% of inflow)
 Center-of-Mass det. time= 66.0 min (872.0 - 806.0)

Volume	Invert	Avail.Storage	Storage Description
#1	807.00'	155 cf	Custom Stage Data (Prismatic) Listed below (Recalc) -Impervious
#2	807.00'	95 cf	Custom Stage Data (Prismatic) Listed below (Recalc) -Impervious
#3	807.00'	9,728 cf	Custom Stage Data (Irregular) Listed below (Recalc)
		9,978 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
807.00	105	0	0
808.00	205	155	155

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
807.00	80	0	0
808.00	110	95	95

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
807.00	1,953	183.0	0	0	1,953
808.00	2,912	236.0	2,417	2,417	3,733
809.00	3,648	256.0	3,273	5,690	4,553
810.00	4,441	274.0	4,038	9,728	5,357

Device	Routing	Invert	Outlet Devices
#1	Primary	806.00'	12.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 806.00' / 804.00' S= 0.1000 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Discarded	807.00'	1.020 in/hr Exfiltration over Surface area Phase-In= 0.01'
#3	Device 1	807.50'	6.0" Vert. Orifice/Grate X 3.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	808.00'	4.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#5	Device 1	808.75'	2.0" x 2.0" Horiz. Orifice/Grate

Pre-Post Development 1-30-24

Prepared by McClure Engineering

HydroCAD® 10.20-4a s/n 03362 © 2023 HydroCAD Software Solutions LLC

NRCC 24-hr D 100-Year A Rainfall=7.76"

Printed 2/2/2024

Page 61

C= 0.600 in 24.0" x 24.0" Grate (1% open area)
Limited to weir flow at low heads
#6 Primary 809.00' **10.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.09 cfs @ 12.24 hrs HW=809.05' (Free Discharge)

2=Exfiltration (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=4.36 cfs @ 12.24 hrs HW=809.05' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 4.09 cfs of 6.04 cfs potential flow)

3=Orifice/Grate (Orifice Controls 3.23 cfs @ 5.49 fps)

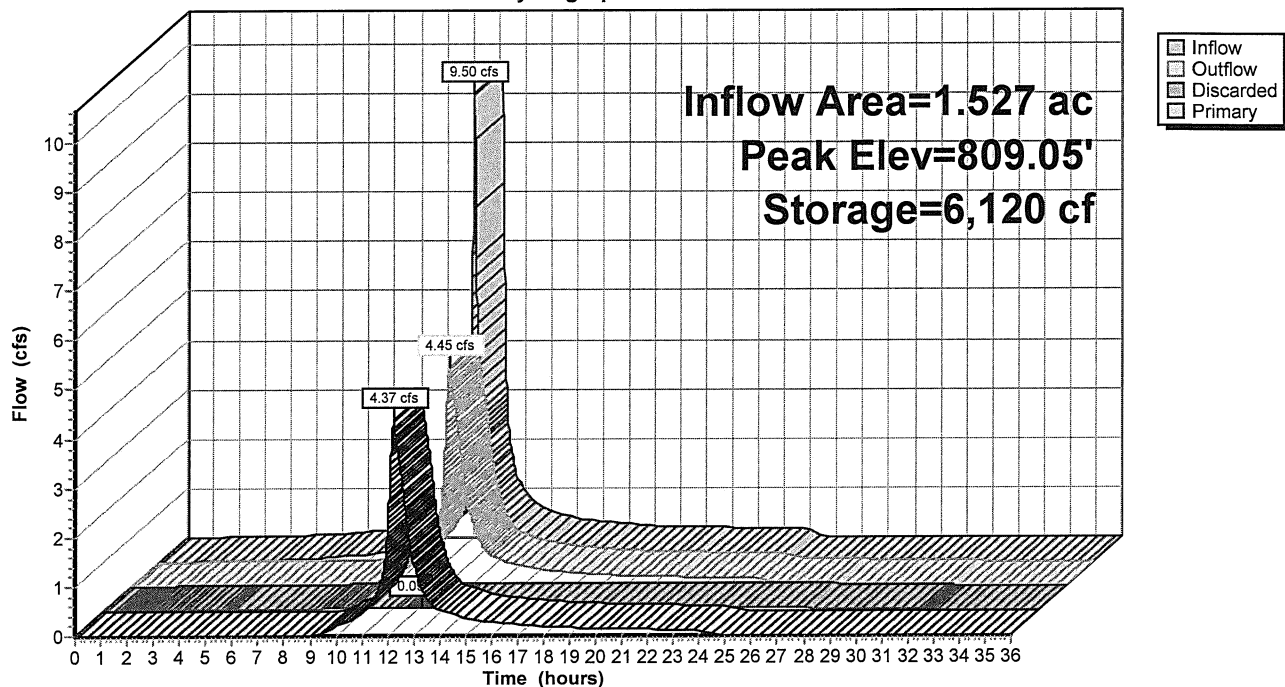
4=Orifice/Grate (Orifice Controls 0.79 cfs @ 4.52 fps)

5=Orifice/Grate (Orifice Controls 0.07 cfs @ 2.63 fps)

6=Broad-Crested Rectangular Weir (Weir Controls 0.27 cfs @ 0.55 fps)

Pond B-1: basin 1

Hydrograph



Summary for Pond IT-1: Interceptor Trench

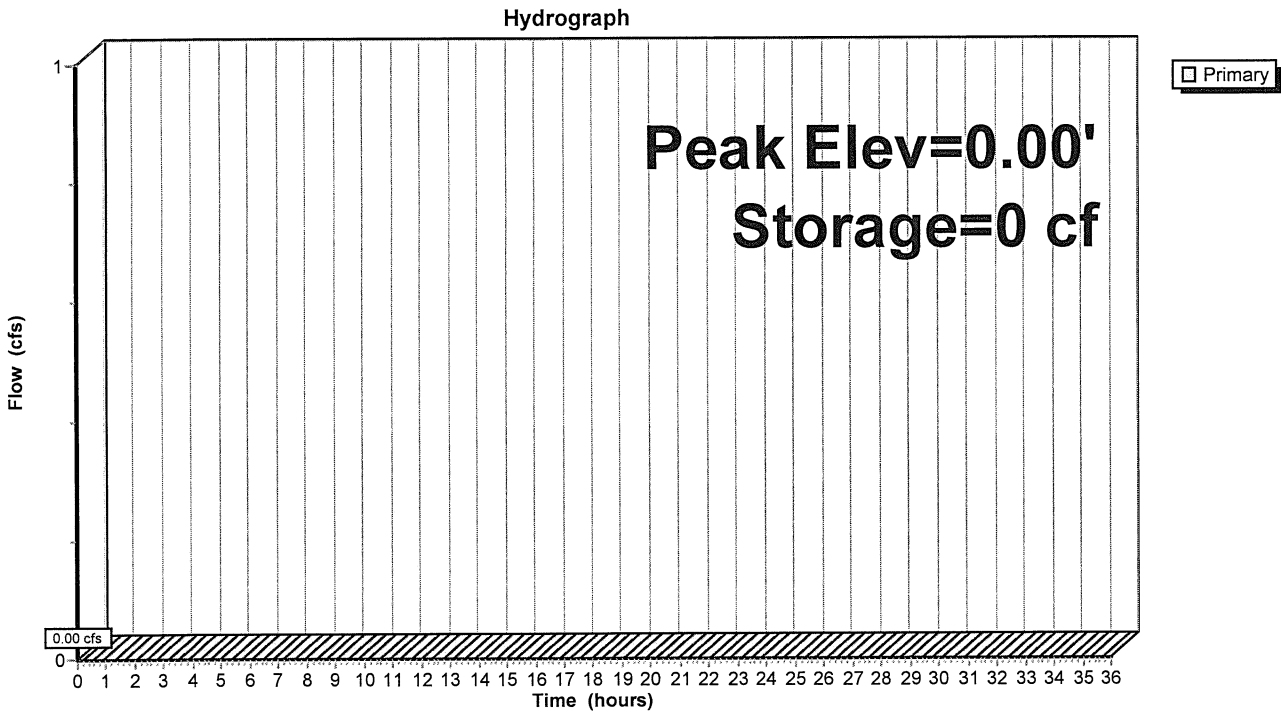
[43] Hint: Has no inflow (Outflow=Zero)

Volume	Invert	Avail.Storage	Storage Description
#1	669.00'	1,625 cf	3.00'W x 700.00'L x 2.00'H Prismatic 4,200 cf Overall - 137 cf Embedded = 4,063 cf x 40.0% Voids
#2	669.00'	137 cf	6.0" Round Pipe Storage Inside #1 L= 700.0'
		1,762 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	669.00'	6.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
1=Orifice/Grate (Controls 0.00 cfs)

Pond IT-1: Interceptor Trench



Summary for Pond T-1: Infiltration Trench

[93] Warning: Storage range exceeded by 0.97'

[58] Hint: Peaked 0.97' above defined flood level

[90] Warning: Qout>Qin may require smaller dt or Finer Routing

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

[62] Hint: Exceeded Reach 1R OUTLET depth by 0.27' @ 12.14 hrs

[64] Warning: Exceeded Reach 1R outlet bank by 0.47' @ 12.14 hrs

Inflow Area = 0.587 ac, 19.60% Impervious, Inflow Depth = 6.22" for 100-Year A event

Inflow = 3.74 cfs @ 12.14 hrs, Volume= 0.304 af

Outflow = 4.19 cfs @ 12.14 hrs, Volume= 0.302 af, Atten= 0%, Lag= 0.0 min

Primary = 4.19 cfs @ 12.14 hrs, Volume= 0.302 af

Routed to Pond B-1 : basin 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Peak Elev= 811.47' @ 12.14 hrs Surf.Area= 400 sf Storage= 341 cf

Flood Elev= 810.50' Surf.Area= 400 sf Storage= 341 cf

Plug-Flow detention time= 10.9 min calculated for 0.302 af (99% of inflow)

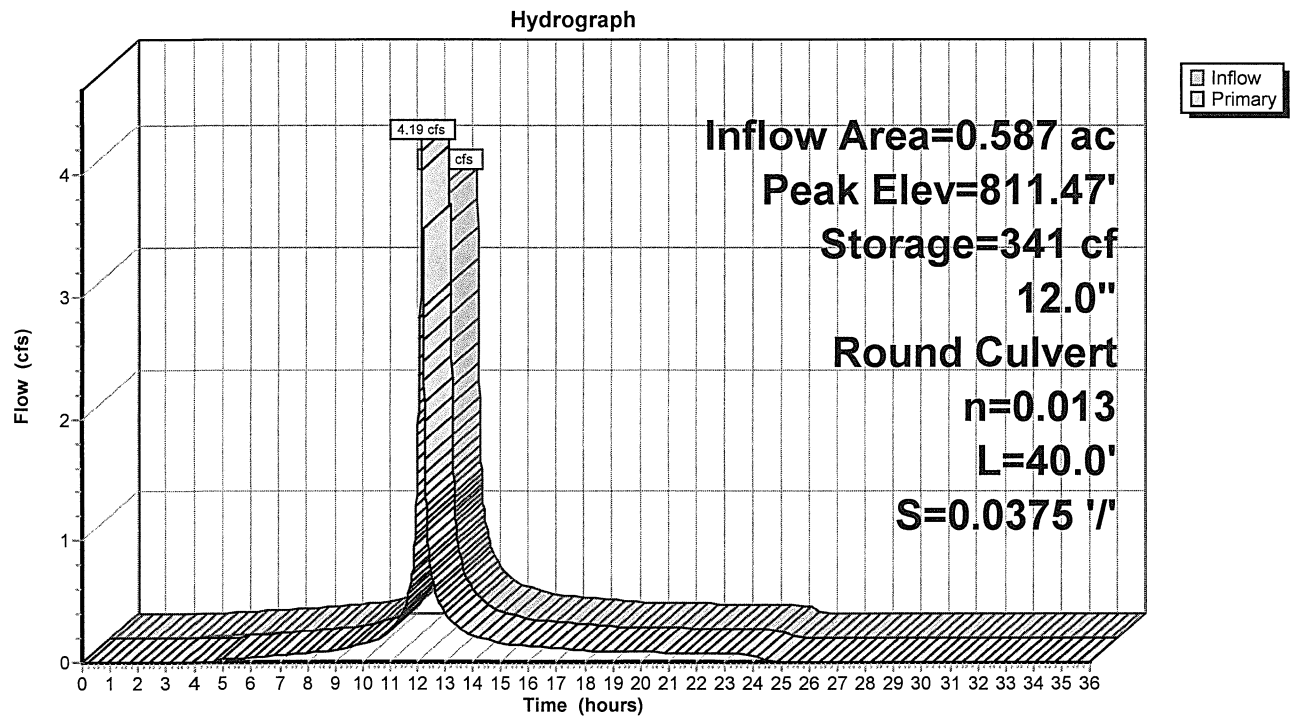
Center-of-Mass det. time= 6.9 min (807.2 - 800.2)

Volume	Invert	Avail.Storage	Storage Description
#1	808.50'	306 cf	4.00'W x 100.00'L x 2.00'H Prismatic 800 cf Overall - 35 cf Embedded = 765 cf x 40.0% Voids
#2	809.00'	35 cf	8.0" Round Pipe Storage Inside #1 L= 100.0'
		341 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	809.00'	12.0" Round Culvert L= 40.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 809.00' / 807.50' S= 0.0375 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=4.19 cfs @ 12.14 hrs HW=811.47' TW=808.81' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 4.19 cfs @ 5.33 fps)

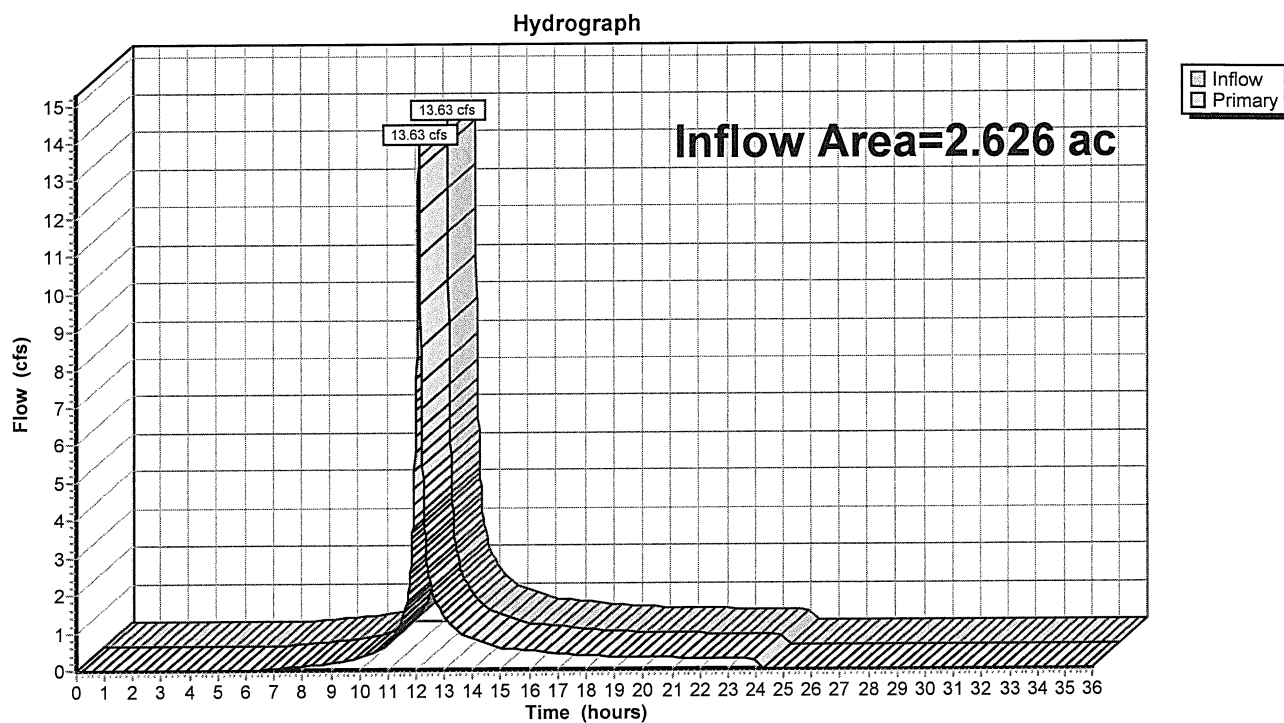
Pond T-1: Infiltration Trench



Summary for Link AP-1: Analysis Point #1

Inflow Area = 2.626 ac, 0.00% Impervious, Inflow Depth = 4.48" for 100-Year A event
Inflow = 13.63 cfs @ 12.12 hrs, Volume= 0.981 af
Primary = 13.63 cfs @ 12.12 hrs, Volume= 0.981 af, Atten= 0%, Lag= 0.0 min

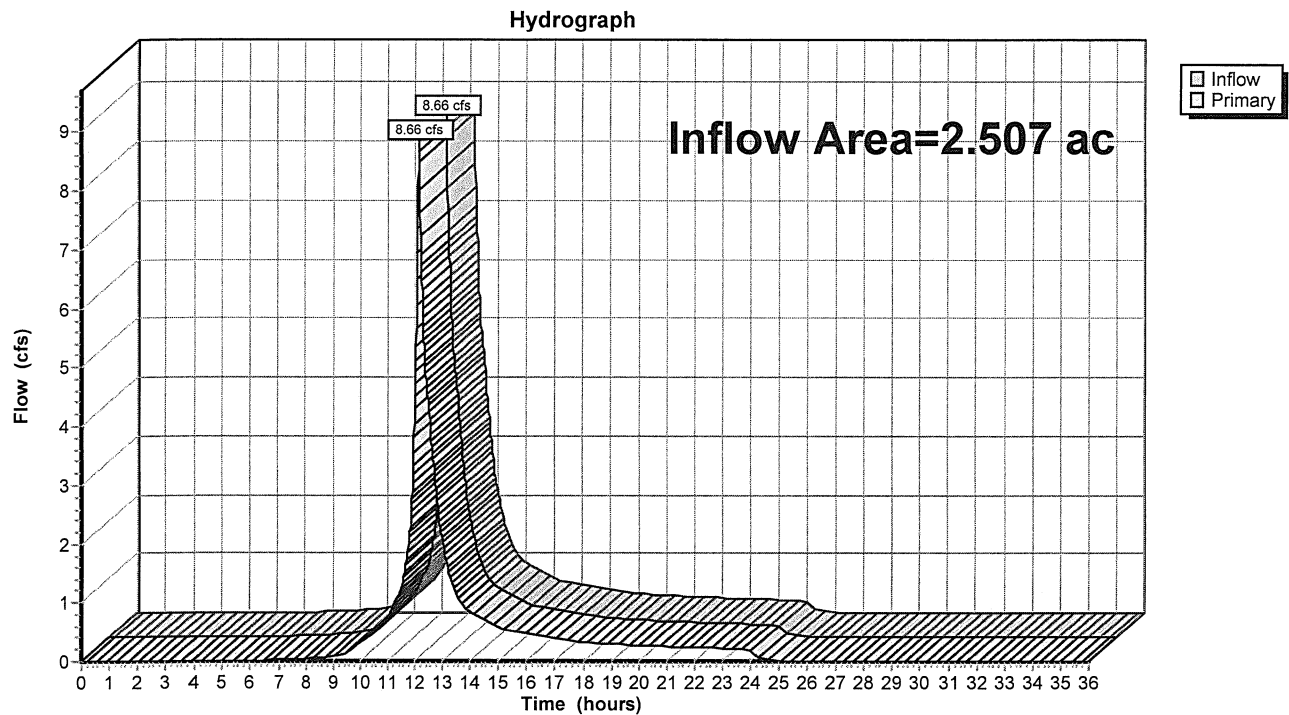
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

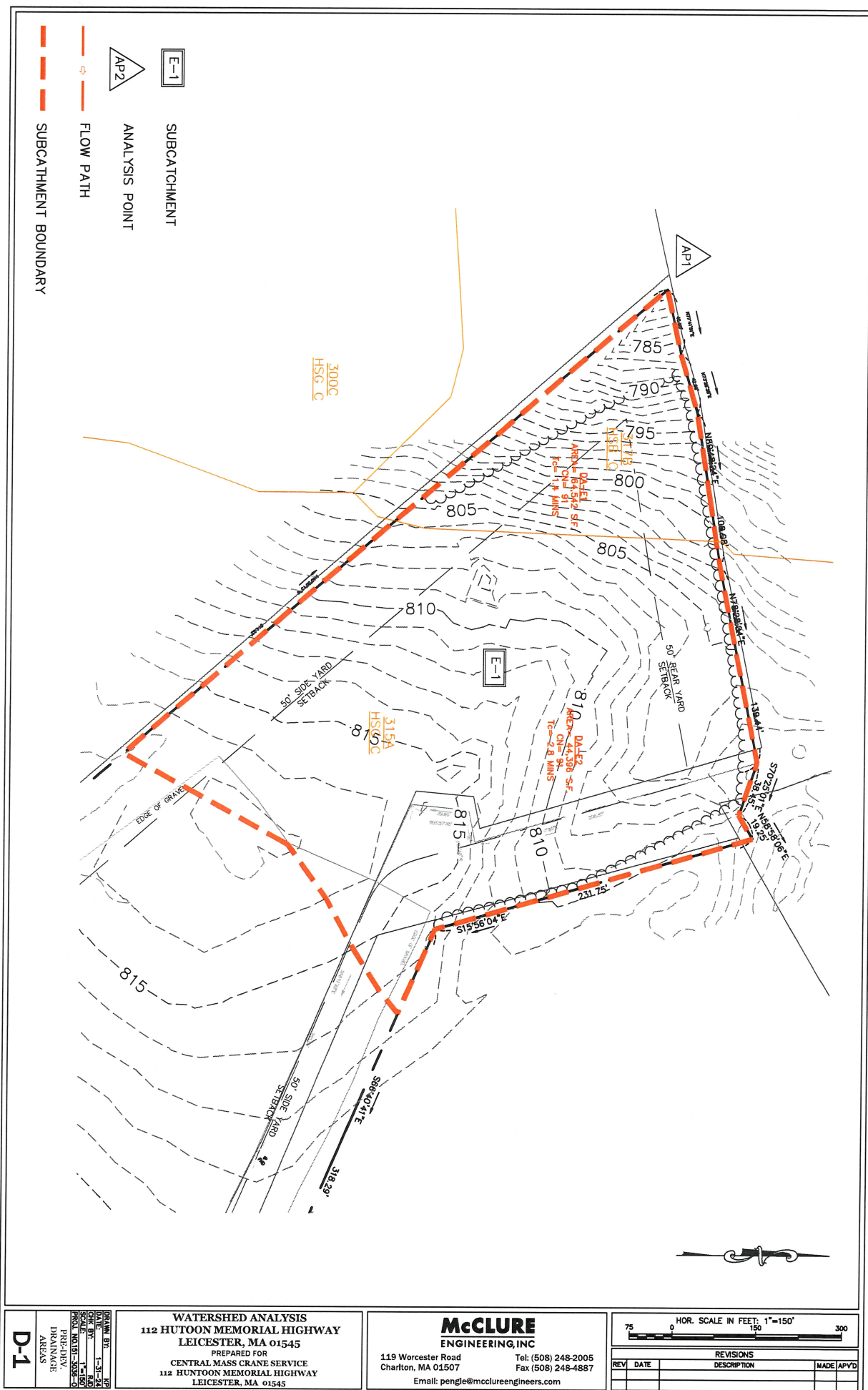
Link AP-1: Analysis Point #1

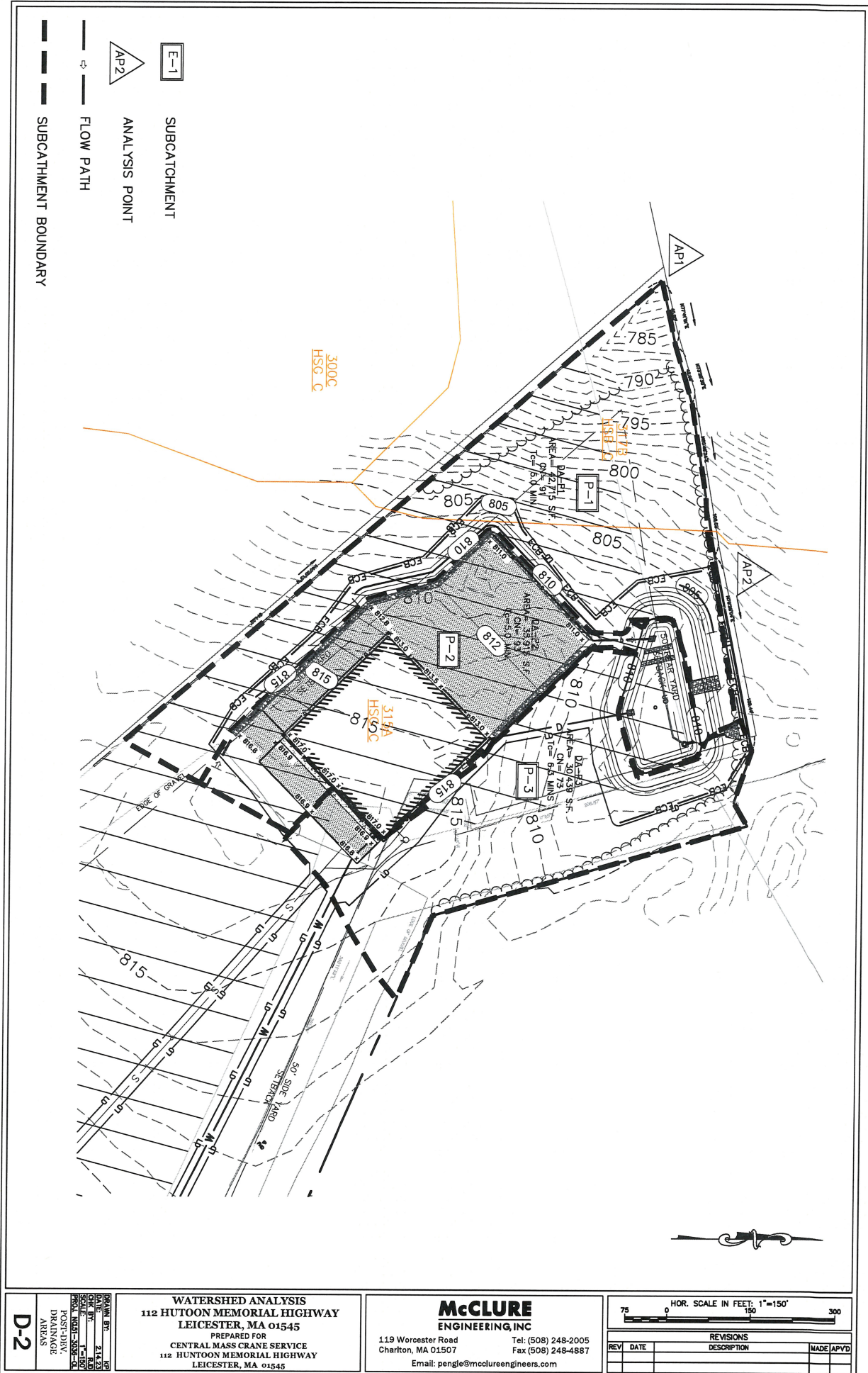
Summary for Link AP-2:

Inflow Area = 2.507 ac, 14.02% Impervious, Inflow Depth = 4.62" for 100-Year A event
Inflow = 8.66 cfs @ 12.13 hrs, Volume= 0.966 af
Primary = 8.66 cfs @ 12.13 hrs, Volume= 0.966 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 4L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link AP-2:





D-2

DRAWN BY: J.L.B.
 CHECKED BY: J.L.B.
 DATE: 1-14-03
 PROJECT: 151-3036-0
 POST-DRAWN: J.L.B.
 DRAINAGE AREAS

WATERSHED ANALYSIS
112 HUTOON MEMORIAL HIGHWAY
LEICESTER, MA 01545
 PREPARED FOR
 CENTRAL MASS CRANE SERVICE
 112 HUNTOON MEMORIAL HIGHWAY
 LEICESTER, MA 01545

McCLURE
ENGINEERING, INC.
 119 Worcester Road
 Charlton, MA 01507
 Tel: (508) 248-2005
 Fax: (508) 248-4887
 Email: pengle@mcclureengineers.com

REVISIONS			
REV	DATE	DESCRIPTION	MADE (APVD)

Pre-Post_Development_1-30-24

Prepared by McClure Engineering

HydroCAD® 10.20-4a s/n 03362 © 2023 HydroCAD Software Solutions LLC

NRCC 24-hr D 100-Year A Rainfall=7.76"

Printed 2/8/2024

Stage-Area-Storage for Pond B-1: basin 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
807.00	1,953	0	809.60	4,114	8,267
807.05	1,996	108	809.65	4,155	8,474
807.10	2,040	219	809.70	4,195	8,682
807.15	2,085	332	809.75	4,235	8,893
807.20	2,130	448	809.80	4,276	9,106
807.25	2,175	566	809.85	4,317	9,321
807.30	2,221	687	809.90	4,358	9,538
807.35	2,267	811	809.95	4,399	9,757
807.40	2,314	937	810.00	4,441	9,978
807.45	2,361	1,066			
807.50	2,409	1,197			
807.55	2,457	1,331			
807.60	2,505	1,469			
807.65	2,555	1,608			
807.70	2,604	1,751			
807.75	2,654	1,896			
807.80	2,705	2,045			
807.85	2,756	2,196			
807.90	2,808	2,350			
807.95	2,860	2,507			
808.00	2,912	2,667			
808.05	2,947	2,813			
808.10	2,982	2,961			
808.15	3,017	3,111			
808.20	3,053	3,263			
808.25	3,088	3,417			
808.30	3,124	3,572			
808.35	3,160	3,729			
808.40	3,196	3,888			
808.45	3,233	4,049			
808.50	3,270	4,211			
808.55	3,307	4,376			
808.60	3,344	4,542			
808.65	3,381	4,710			
808.70	3,419	4,880			
808.75	3,456	5,052			
808.80	3,494	5,226			
808.85	3,532	5,401			
808.90	3,571	5,579			
808.95	3,609	5,758			
809.00	3,648	5,940			
809.05	3,686	6,123			
809.10	3,724	6,308			
809.15	3,762	6,495			
809.20	3,800	6,684			
809.25	3,839	6,875			
809.30	3,878	7,068			
809.35	3,917	7,263			
809.40	3,956	7,460			
809.45	3,995	7,659			
809.50	4,035	7,860			
809.55	4,075	8,062			

APPENDIX E

TSS REMOVAL SPREADSHEET

INSTRUCTIONS:

1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: 112 Huntton Memorial Highway

B	C	D	E	F
BMP ¹	TSS Removal Rate ¹	Starting TSS Load*	Amount Removed (C*D)	Remaining Load (D-E)
Sediment Forebay	0.25	1.00	0.25	0.75
Sediment Forebay	0.25	0.75	0.19	0.56
Infiltration Basin	0.80	0.56	0.45	0.11
	0.00	0.11	0.00	0.11
	0.00	0.11	0.00	0.11

Separate Form Needs to be Completed for Each Outlet or BMP Train

Total TSS Removal =

CMCS
Project: RJD
Prepared By: RJD
Date: 2/2/2024

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

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed

1. From MassDEP Stormwater Handbook Vol. 1

APPENDIX F

STORMWATER CONSTRUCTION PERIOD SITE INSPECTION REPORT

Weekly Stormwater Construction Site Inspection Report

General Information				
Project Name				
MassDEP File Number:				
Date of Inspection		Start/End Time		
Inspector's Name(s) & Contact Information				
Type of Inspection: <input type="checkbox"/> Regular <input type="checkbox"/> Pre-storm event <input type="checkbox"/> During storm event <input type="checkbox"/> Post-storm event				
Weather Information				
Has there been a storm event since the last inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, provide: Storm Start Date & Time: Storm Duration (hrs): Approximate Amount of Precipitation (in):				
Weather at time of this inspection? <input type="checkbox"/> Clear <input type="checkbox"/> Cloudy <input type="checkbox"/> Rain <input type="checkbox"/> Sleet <input type="checkbox"/> Fog <input type="checkbox"/> Snowing <input type="checkbox"/> High Winds <input type="checkbox"/> Other: Temperature:				
Have any discharges occurred since the last inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe:				
Are there any discharges at the time of inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe:				
	Site – Specific BMPs	BMP Installed?	BMP Maintenance Required?	Corrective Action Needed and Notes
1	Erosion Control Barrier	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
2	Catch Basin Inlet Protection	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
3	Temporary Soil Stabilization	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
4	Stormwater System	<input type="checkbox"/> Yes <input type="checkbox"/> No	<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 and title: _____

Signature: _____ **Date:** _____

Overall Site Issues

Below are some general site issues that should be assessed during inspections. Customize this list as needed for conditions at your site.

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
1	Slopes and disturbed areas not actively being worked properly stabilized?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
2	Natural Resource areas (e.g., streams, wetlands, mature trees, etc.) protected with barriers or similar BMPs?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
3	Perimeter Controls and sediment barriers adequately installed (keyed into substrate) and maintained?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	*Surround Stockpiles w/ straw bales if > 1 week
4	Discharge Points and receiving waters free of any sediment deposits?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
5	Storm Drain Inlets properly protected?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
6	Construction exit preventing sediment from being tracked into the street?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7	Trash / Litter from work areas collected and placed in covered dumpsters?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8	Washout Facilities (e.g., paint, stucco, concrete) available, clearly marked, and maintained?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
9	Vehicle and Equipment Fueling , cleaning, and maintenance areas free of spills, leaks, or any other deleterious material?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10	Materials that are potential stormwater contaminants stored inside or under cover?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
11	Non-stormwater discharges (wash water, dewatering) properly controlled?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	

APPENDIX G

LONG-TERM OPERATION & MAINTENANCE (O & M) PLAN

ILLICIT DISCHARGE COMPLIANCE STATEMENT

Long Term Operations and Maintenance Plan

112 Huntoon Memorial Highway Leicester Ma 01566

Prepared For:
CENTRAL MASS CRANE SURVICE
112 HUNTOON MEMORIAL HIGHWAY
LEICESTER MA 01542

February 2, 2024

TABLE OF CONTENTS

Responsible Party.....	1
Site Description.....	2
Structural Storm Water BMP Maintenance.....	4
Sediment Forebay	
Infiltration Basin	
Pipe Outfall/Rip Rap Apron/Level Spreader	
Non-Structural Storm Water Controls.....	6
Silt Fence	
Mulching	
Temporary & Permanent Seeding	
Landscape & Parking Maintenance	
Fertilizer, Herbicide, and Pesticide Storage	
Waste Storage & Trash Removal	
Hazardous Waste or Oil Spill Reporting Procedure	
Snow Management Plan.....	8
Inspections / Recordkeeping / Training.....	9
Public Safety Features.....	9
Operation & Maintenance Budget Estimate.....	9

**Long-Term Operation & Maintenance Plan
Site Stormwater Management System
112 Huntoon Memorial Highway, Leicester, MA**

Property Owner/Responsible Party: CENTRAL MASS CRANE SERVICE
112 HUNTOON MEMORIAL HIGHWAY
LEICESTER MA
Phone 508-892-0400

Storm Water Management System Owner: (same as above)

Site subject to Wetlands Protection Act: NO

The Responsible Party Shall:

- Prepare an “**Operation and Maintenance (O & M) Compliance Statement**” (Attachment #1)
- Implement the routine and non-routine operation, maintenance, and inspection tasks in accordance with the procedures specified in this document to ensure that all storm water management systems function as designed.
- Maintain a log of all operation and maintenance (O & M) activities. Keep records for the last three (3) years, including inspections, repairs, replacement and disposal (for disposal, the log shall indicate the type of material and disposal location).
- Make this log available to **Town of Leicester** or DEP official representatives upon request;
- Allow **Town of Leicester** official representatives to inspect each storm water system “best management practice” (BMP) to determine whether the responsible party is implementing the operation and maintenance plan;
- Agree to notify in writing all future property owners of the presence of the storm water management system and the requirement for proper operation and maintenance.

Responsible Party shall maintain a contract with the following companies:

Site Maintenance: _____

Snow Removal and Plowing: _____

Storm Water System Maintenance: _____

**Long-Term Operation & Maintenance Plan
Site Stormwater Management System
112 Huntoon Memorial Highway, Leicester, MA**

Site Description:

The Subject Site is referenced as Leicester Assessor's Parcel I.D. 46 A 1.2-7 and consists of approximately 9.8 acres. The property lies on the northern side of Stafford Street at the intersection of Stafford Street and Huntoon Memorial Highway (Rte. 56). The parcel is more particularly described in Deed book 64563 Page 143 and Deed book 63722 Page 154 as recorded with the Worcester County Registry of Deeds.

The site is located within the Highway Business Industrial District 2. The existing site has a 14,440 sq ft office-storage-garage building and paved area. The site topography slopes generally from the high spot in the middle of the property towards Stafford Street in the front and to the southwest in the rear of the property.

The site is not located within an area of minimal flood hazard (Zone X) per Flood Insurance Rate Map (FIRM) Worcester County Massachusetts (All Jurisdictions), Map Number 25027C0933E, effective on 07/04/2021.

The proposed site layout is for the construction of a 10,000 sq Ft single story metal framed building. The construction will disturb approximately 1.46 acres of existing property. The building is proposed to connect to the municipal water and sewer systems, as well as have an underground electrical system. The stormwater management system consists of a swale/infiltration trench and a single stormwater basin. The basin is proposed as an infiltration basin. Loam and seed is proposed for all areas of disturbance.

Details are provided on the following Site Plan drawings:

“” Site Plan Modification, 112 Huntoon Memorial Highway, Leicester, MA” prepared by McClure Engineering, Inc., dated 1/30/24.

Operation and Maintenance (O&M) Plan

The purpose of this Storm Water Management System Operation and Maintenance Plan is to prevent erosion, sedimentation, pollution or other deterioration of the storm water management system and resource areas located on and adjacent to the property located at 112 Huntoon Memorial Highway, Leicester, MA. The storm water management system shall be maintained properly to assure its continued performance. Inspection and maintenance for the system should be in compliance with Table 1.

TABLE 1

STORMWATER SYSTEM INSPECTION AND MAINTENANCE SCHEDULE		
112 Huntoon Memorial Highway, Leicester, MA		
Best Management Practice (BMP)	Inspection Frequency	Maintenance Frequency
STRUCTURAL BMPs		
Infiltration Basin	After every major storm during first 3 months of operation and twice a year thereafter and when there are discharges through the high outlet orifice.	Bi-Annual Min (Early Spring & Late Fall) and/or As Needed
Sediment Forebay	Monthly	Quarterly and/or As Needed
Pipe Outfall/ Rip Rap Apron	After heavy rains and Bi-Annually Min (Early Spring & Late Fall)	Bi-Annual Min (Early Spring & Late Fall) and/or As Needed
NON-STRUCTURAL STORMWATER CONTROLS		
Landscaping	Bi-Annual (Early Spring & Late Fall)	Seasonally As Needed
Parking Area Sweeping	Bi-Annual (Early Spring & Late Fall)	Bi-Annual (2-Times / Year) (Apr/May and Oct/Nov.)
Snow Removal	Seasonally As Needed	In Accordance with M.G.L. Title XIV. Public Ways and Works; Chapter 85
Site Inspections	Bi-Annual (Early Spring & Late Fall)	Keep Records on File at Site for Three (3) Years

Responsible Party shall be responsible for the system and all Operation and Maintenance procedures, including those outlined in the following sections.

STRUCTURAL STORM WATER BMP MAINTENANCE:

Infiltration Basin:

Infiltration basins are prone to clogging and failure so it is imperative to develop and implement aggressive maintenance plans and schedules. Installing the required pretreatment BMPs will significantly reduce maintenance requirements for the basin. Perform inspections and preventive maintenance at least twice a year, and after every time drainage discharges through the high outlet orifice. Inspect the pretreatment BMPs in accordance with the minimal requirements specified for those practices and after every major storm event. A major storm event is defined as a storm that is equal to the 2-year, 24-hour storm (generally 2.9 to 3.6 inches in a 24-hour period, depending on the geographic location in Massachusetts). Once the basin is in

use, inspect it after every major storm for the first few months to ensure it is stabilized and functioning properly and if necessary take corrective action. Note how long water remains standing in the basin after a storm; standing water within the basin 48 to 72 hours after a storm indicates that the infiltration capacity may have been overestimated. If the ponding is due to clogging, immediately address the reasons for the clogging (such as upland sediment erosion, excessive compaction of soils, or low spots). Thereafter, inspect the infiltration basin at least twice per year. Important items to check during the inspection include signs of differential settlement, cracking, erosion, leakage in the embankments, tree growth on the embankments, condition of riprap, sediment accumulation, and the health of the turf. At least twice a year, mow the buffer area, side slopes, and basin bottom. Remove grass clippings and accumulated organic matter to prevent an impervious organic mat from forming. Remove trash and debris at the same time. Use deep tilling to break up clogged surfaces and revegetate immediately. Remove sediment from the basin as necessary but wait until the floor of the basin is thoroughly dry. Use light equipment to remove the top layer to not compact the underlying soil. Deep till the remaining soil and revegetate as soon as possible. Inspect and clean pretreatment devices associated with basins at least twice a year, and ideally every other month.

Sediment Forebay:

Sediment forebays should be readily accessible for maintenance and sediment removal. Inspect sediment forebays after each significant rainfall. Remove and properly dispose of sediment at least 2 times per year or when sediment deposits total approximately 12". The effectiveness of a sediment forebay is based less on its size than on regular sediment removal. Place waste material in designated disposal areas. Smooth site to blend with surrounding area and stabilize. Clean or replace gravel when sediment pool does not drain properly. Stabilize the floor and sidewalls of the sediment forebay before making it operational, otherwise the practice will discharge excess amounts of suspended sediments. After removing the sediment, replace any vegetation damaged during the clean-out by reseeding. When reseeding, incorporate practices such as hydroseeding with a tackifier, blanket, or similar practice to ensure that no scour occurs in the forebay, while the seeds germinate and develop roots. Check embankment, emergency spillway, and outlet for erosion damage. Check embankment for: settlement, seepage, or slumping along the toe or around pipe. Look for signs of seepage or erosion. Repair immediately. Remove trash and other debris from principal spillway, emergency spillway, and pool area.

Pipe Outfall/Rip Rap Apron/Level Spreader:

Inspect riprap outlet structures after heavy rains for erosion at sides and ends of apron and for stone displacement. Rock may need to be added if sediment builds up in the pore spaces of the outlet pad. Make repairs immediately using appropriate stone sizes. Do not place stones above finished grade. If erosion is occurring down gradient of the outfall, the down gradient vegetation is not stable and the area should be stabilized, the rip rap apron is not long or wide enough and needs to be increased, or the riprap stones are too small or not graded well. If movement of stone is occurring riprap stones may be too small or not graded well, or the appropriate filter fabric may not be installed under riprap. If erosion occurs around apron and scour holes appear at outlet, foundation may not be excavated wide or deep enough. If erosion of the foundation is occurring, the appropriate filter fabric may not be installed under riprap.

Level spreaders should be inspected periodically and after every major storm. Any detrimental

sediment accumulation should be removed. If rilling has taken place on the lip, the damage should be repaired and re-vegetated. Vegetation should be mowed occasionally to control weeds and encroachment of woody vegetation. Clippings should be removed and disposed of outside the spreader and away from the outlet area. Fertilization should be done as necessary to keep the vegetation healthy and dense. The spreader should be inspected after every runoff event to ensure that it is functioning correctly.

NON - STRUCTURAL STORM WATER MANAGEMENT CONTROLS / GOOD HOUSEKEEPING PRACTICES:

Silt Fence:

A sediment fence requires a great deal of maintenance. Silt fences should be inspected immediately after each rainfall and at least daily during prolonged rainfall. Remove accumulated sediment when it reaches one half the height of the sediment fence. Remove sediment deposits promptly to provide adequate storage volume for the next rain and to reduce pressure on fence. Take care to avoid undermining fence during cleanout. Sagging, frayed, torn, or otherwise damaged fabric should be repaired or replaced. Repair end runs and undercutting. Inspect reinforcement and staking materials for structural integrity and replace when necessary. Sediment deposits remaining after the fabric has been removed should be graded to conform to the existing topography and vegetated.

Mulching:

Mulching shall be used in areas which cannot be seeded because of the season or are otherwise unfavorable for plant growth (traffic and parking areas). When properly applied, mulch offers a fast, effective means of controlling erosion and dust. Soil surfaces should be roughened prior to mulching. Run track-mounted machinery up and down the slope to leave horizontal depressions in the soil running parallel to the slope. Roughened soil surfaces should be mulched and/or seeded as soon as possible. Ensure there is continuous, uniform, even coverage. Ensure mulch layer is not so thick that it suppresses desired seed germination and plant growth. Ensure rilling or gullying does not occur beneath "binded" mulch. Replace or repair mulch if washed or blown away. On steep slopes and critical areas such as waterways, use netting or anchoring with mulch to hold it in place. Inspect after rainstorms to check for movement of mulch or erosion. If washout, breakage, or erosion occurs, repair surface, reseed, remulch, and install new netting. Straw or grass mulches that blow or wash away should be repaired promptly. Blanket mulch that is displaced by flowing water should be repaired as soon as possible. Continue inspections until vegetation is well established.

Temporary & Permanent Seeding

Well-established vegetation is widely considered the most effective form of erosion control. The presence of temporary or permanent cover will provide stabilization and erosion protection to disturbed areas. Temporary seed mixes contain annual vegetation that grows quickly and helps stabilize an area until permanent vegetation can be established. Proper soil bed preparation, seeding method and soil moisture are critical for successful seed application. Before planting, scarify/roughen the soil surface and install appropriate surface drainage measures to prevent erosion and scouring. Seed with an approved conservation cover mix during the specified growing season, using native plant species. Seeding operations should be performed within one of the following periods: April 1 - May 31, August 1 - September 10, November 1 - December

15 as a dormant seeding (seeding rates shall be increased by 50% for dormant seeding). As needed, provide water, fertilizer, lime, and mulch to the seedbed. If it is unlikely that growth will occur due to cold weather, apply mulch for temporary stabilization. Inspect within 6 weeks of planting to see if stands are adequate. Check for damage after heavy rains. Stands should be uniform and dense. Fertilize, reseed, and mulch damaged and sparse areas immediately. Tack or tie down mulch as necessary. Seeds should be supplied with adequate moisture. Furnish water as needed, especially in abnormally hot or dry weather or on adverse sites. Water application rates should be controlled to prevent runoff. Inspect seeded areas for failure and make appropriate repairs and re-seed and re-plant as necessary. Inspect for bare spots, rilling, or gullyng and correct as necessary. If the stand has less than 40% cover, re-evaluate selection of seeding materials and quantities of fertilizer. Re-establish the stand following seedbed preparation and seeding recommendations. If the season prevents resowing, mulch or jute netting is an effective temporary cover. Lack of water may also be an issue. Conduct a follow up survey after one year and re-seed failed areas. Temporarily stabilized areas will require permanent stabilization when the area has been completed as designed or when the growing season begins.

Landscape & Parking Area Maintenance

Landscape areas shall be maintained in a neat and orderly fashion. Landscape maintenance debris shall not be deposited on adjacent properties and properly disposed of off-site as necessary to maintain a clean and orderly appearance. Parking Areas shall be inspected often and after significant rainfall events. Inspect for signs of erosion, rilling, gullyng. Regrade and repair parking areas as necessary. If areas need constant maintenance, apply mulch/wood chips to help prevent further erosion. Areas not used for parking or traffic should be seeded for stabilization. All parking areas should be stabilized prior to off season shutdown, preferably with a mulch application.

Fertilizer, Herbicide, and Pesticide Storage

Storage of all fertilizers, herbicides, and pesticides will be indoors. Use of all fertilizers, herbicides, and pesticides shall be in a manner consistent with the products intended use.

Waste Storage & Trash Removal

All waste products are to be stored indoors, under cover, or within a covered dumpster. Inspect on-site area for litter and trash on a weekly basis. Any accumulated trash, litter, and discarded materials in this area will be removed and will be disposed of at a suitable location on a weekly basis. The loading and dumpster areas throughout the site will be inspected on a daily basis for cardboard and/or paper products and will be inspected on a weekly basis for any accumulated trash, litter, and discarded material. Dumpster to be kept closed when not in use. Gates to the dumpster enclosure areas are proposed to be locked when not in use.

Hazardous Waste or Oil Spill Response Procedure

Initial Notification: In the event of a spill of hazardous waste or oil the facility manager or supervisor will be notified immediately by telephone.

Assessment – Initial Containment: The supervisor or manager will assess the incident and initiate control measures. The supervisor will first contact the Town of Leicester Fire

Department and then notify the Town of Leicester. The Fire Department is ultimately responsible for matters of public health and safety and should be notified immediately.

Fire Department Telephone: 911 (Emergency)
508-892-2525 (Non-Emergency/Dispatch)

Police Department Telephone: 911 (Emergency)
508-892-2525 (Non-Emergency/Dispatch)

Further Notification: Based on the assessment by the Fire Chief, additional services requiring a licensed site professional (LSP) may be needed. The Massachusetts Department of Environmental Protection and the EPA may be notified depending upon the nature and severity of the spill. The Fire Chief will be responsible for determining the level of clean up and notification required.

SNOW MANAGEMENT PLAN:

Snow plowing will be done to allow access to the site and provide safe passage from vehicle to front door. No salt shall be used to treat unpaved areas during snow and ice conditions. Snow from lighter storms will be plowed to the perimeter of the parking lots and allowed to melt onto the pavement surfaces. Snow will be temporarily stockpiled on the pavement surface during larger storm events to keep the parking area open for customers. This stockpiling will be temporary and will be located within designated areas throughout the Site, furthest away from the building entrances. If Site snow storage interferes with parking lot operations (i.e. blocking of travel aisles, sight distance, or parking) the snow pile will be either removed or reduced legally in a legal manner by the snowplow vendor within 24 hours.

Winter Road Salt & Sand Use Restrictions

Salt and sand for winter de-icing will only be stored indoors or under cover. Use of road salt and sand will only be used on a limited basis during the winter months to insure safe passage of pedestrian walkways and parking areas.

INSPECTIONS / RECORDKEEPING / TRAINING:

Routine Inspections

Routine inspections and maintenance to be conducted with the frequency described in this Operation and Maintenance Plan.

Records of all drainage system inspections and maintenance shall be kept on file for a period of at least three (3) years and provided to the Town of Leicester upon request.

PUBLIC SAFETY FEATURES:

The stormwater design consists of one subsurface pipe. Being private property, there are no public safety issues.

OPERATION AND MAINTENANCE BUDGET ESTIMATE:

The responsible party agrees to maintain an adequate annual budget to provide for the routine maintenance activities detailed in this document including but not limited to:

- Infiltration Basin Maintenance
- Sediment Forebay Maintenance
- Pipe Outfall/ Rip Rap Apron/ Trench Maintenance
- Landscape Maintenance
- Trash Removal
- Snow Plowing & Removal

Illicit Discharge Compliance Statement Site Stormwater Management System

Property Owner/Responsible Party: **Central Mass Crane Service, Inc.**
112 Huntoon Memorial Highway
Leicester, MA 01542
Phone: (781) 697-5861

Storm water Management System Owner: (same as above)

Site subject to Wetlands Protection Act: Yes

The above listed Responsible Party is responsible for implementation of the “Long-Term Operation and Maintenance Plan” and certifies that:

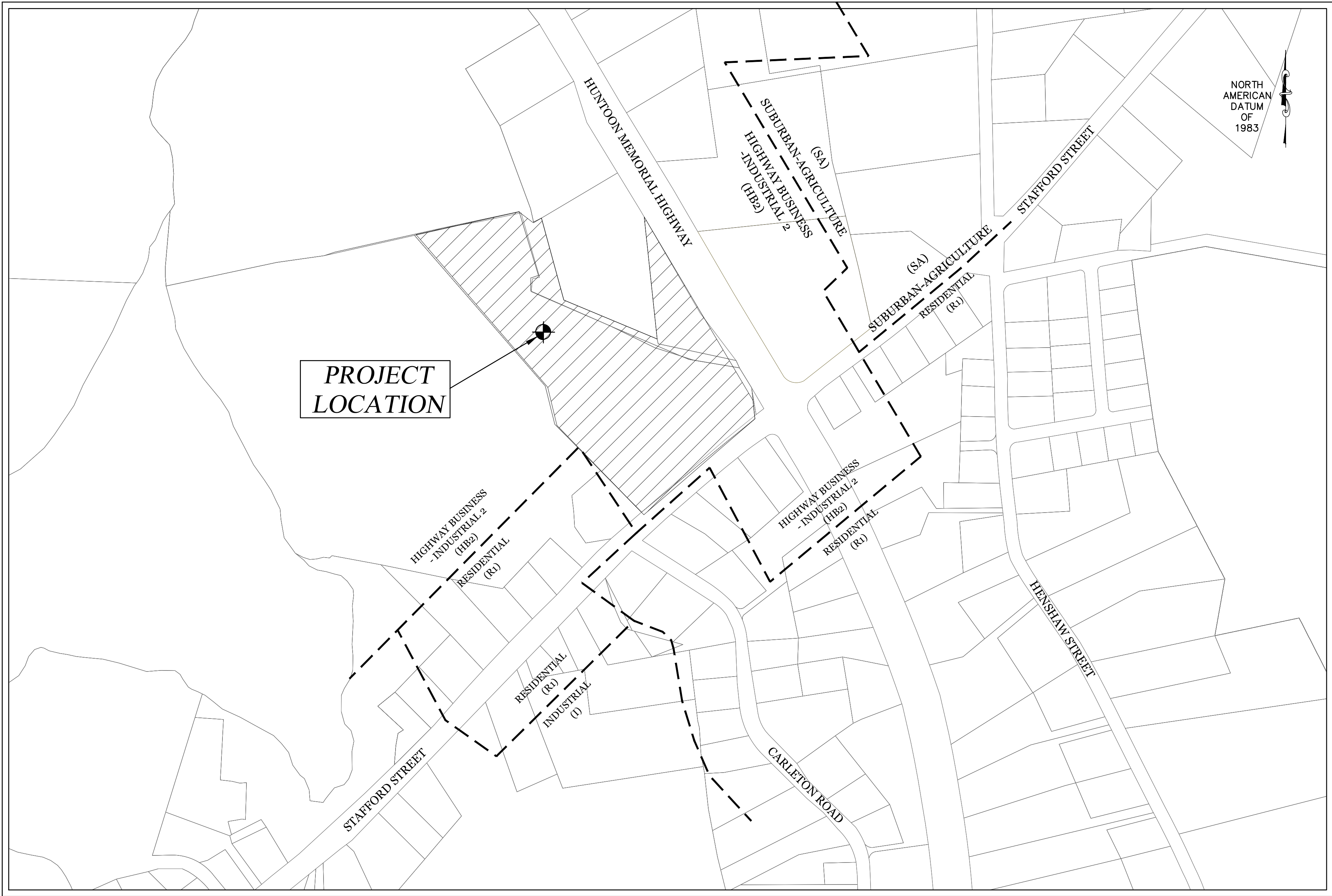
- The site has been inspected for erosion and appropriate steps have been taken to permanently stabilize any eroded areas.
- All aspects of storm water BMPs have been inspected for damage, wear and malfunction, and appropriate steps have been taken to repair or replace the system or portions of the system so that the storm water at the site may be managed in accordance with the Stormwater Management Standards, revise date January 2, 2008.
- There is no record or knowledge of existing illicit discharges to the on-site stormwater management system.
- All “future property owners” must be notified of their continuing legal responsibility to operate and maintain the existing stormwater management system structures.
- The “Long-Term Operation and Maintenance Plan” for the storm water BMPs is being implemented.

Signature of Responsible Party:

Owner

Date

SITE PLAN MODIFICATION
STORAGE-GARAGE BUILDING
112 HUNTOON MEMORIAL HIGHWAY
ROCHDALE, MA 01542-0338



SITE LOCUS

1" = 200'

DRAWING INDEX

C-1	TITLE SHEET
C-2	EXISTING CONDITIONS PLAN
C-3	LAYOUT, GRADING, AND UTILITY PLAN
C-4	EROSION AND SEDIMENTATION CONTROL PLAN
C-5 - C-6	CONSTRUCTION DETAILS

TAX MAP REFERENCES:

ASSESSORS ID: 46-A-1.2, 44-A-7 (FORMERLY), 44-A-10

RECORD OWNERS:

HUNTOON HIGHWAY, LLC.
112 HUNTOON MEMORIAL HIGHWAY
ROCHDALE, MA 01542-0338

DEED & PLAN REFERENCES:

(WORCESTER COUNTY REGISTRY OF DEEDS)

DEED BOOK: 52916 PAGE: 330
DEED BOOK 64563, PAGE 143
DEED BOOK 63722, PAGE 154
PLAN BOOK 897 PLAN 103
PLAN BOOK 953 PLAN 19
PLAN BOOK 954 PLAN 101

GENERAL NOTES:

1). THE PURPOSE OF THIS PLAN IS TO SHOW A PROPOSED GARAGE-STORAGE BUILDING AT 112 HUNTOON MEMORIAL HIGHWAY, ROCHDALE, MA.

2). THE SUBJECT PROPERTY IS LOCATED WITHIN THE ZONE (HB2) ZONING DISTRICT THAT HAVE THE FOLLOWING DIMENSIONAL REQUIREMENTS:

HB2 ZONE:	REQUIRED	PROVIDED
MINIMUM LOT AREA:	45,000 S.F.	426,888 S.F.±
MINIMUM LOT FRONTAGE:	200'	477'
FRONT SETBACK:	50'	722.8'
SIDE SETBACK:	50'	67.4'
REAR SETBACK:	50'	97.8'
MAXIMUM STORIES:	5 1/2 STORIES	2 STORY
MAX. BLDG. COVERAGE	40%	5%

3). THIS PLAN IS PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT AND IS SUBJECT TO ANY MATTERS THAT SUCH A REPORT MAY DISCLOSE.

4). THE WORK DEPICTED ON THIS PLAN IS SUBJECT TO THE TOWN OF LEICESTER SITE PLAN REQUIREMENTS AND THE MASSACHUSETTS STORMWATER MANAGEMENT BY-LAWS.

5). THE PROPERTY IS SUBJECT TO AND HAS THE BENEFIT OF SITE PLAN APPROVAL (SPR2014-1).

PROJECT ENGINEER:

ROBERT J. DUFF, P.E.
MCCLURE ENGINEERING, INC.
119 WORCESTER ROAD
CHARLTON, MA 01507
PHONE: (508) 248-2005

PROJECT SURVEYOR:

MARK LAPRAD, P.L.S.
MCCLURE ENGINEERING, INC.
119 WORCESTER ROAD
CHARLTON, MA 01507
PHONE: (508) 248-2005

SURVEY NOTES:

1. SITE EXISTING CONDITIONS, PROPERTY BOUNDARIES, AND TOPOGRAPHY BASED ON AN ON THE GROUND SURVEY CONDUCTED BY MCCLURE ENGINEERING, INC. TOPOGRAPHY SUPPLEMENTED WITH U.S.G.S. 2015 LIDAR.

2. SITE DOES NOT APPEAR TO LIE WITHIN THE 100-YEAR FLOOD ZONE ACCORDING TO FEMA FIRM MAP NO. 25027C0784E, EFFECTIVE JULY 21, 2023.

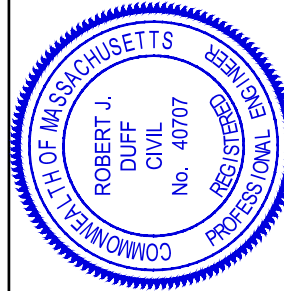
LEICESTER PLANNING BOARD
SITE PLAN APPROVAL

SITE PLAN MODIFICATION
112 HUNTOON MEMORIAL HIGHWAY
ROCHDALE, MA
PREPARED FOR
HUNTOON HIGHWAY, LLC.
112 HUNTOON MEMORIAL HIGHWAY
ROCHDALE, MA 01542-0338

DRAWN BY: KKP
DATE: 1/31/2024
CHK BY: RID
SCALE: 1"=200'
PROJ. NO. 151-3036-0

TITLE SHEET

C-1



ROBERT J. DUFF, PE
PROFESSIONAL ENGINEER

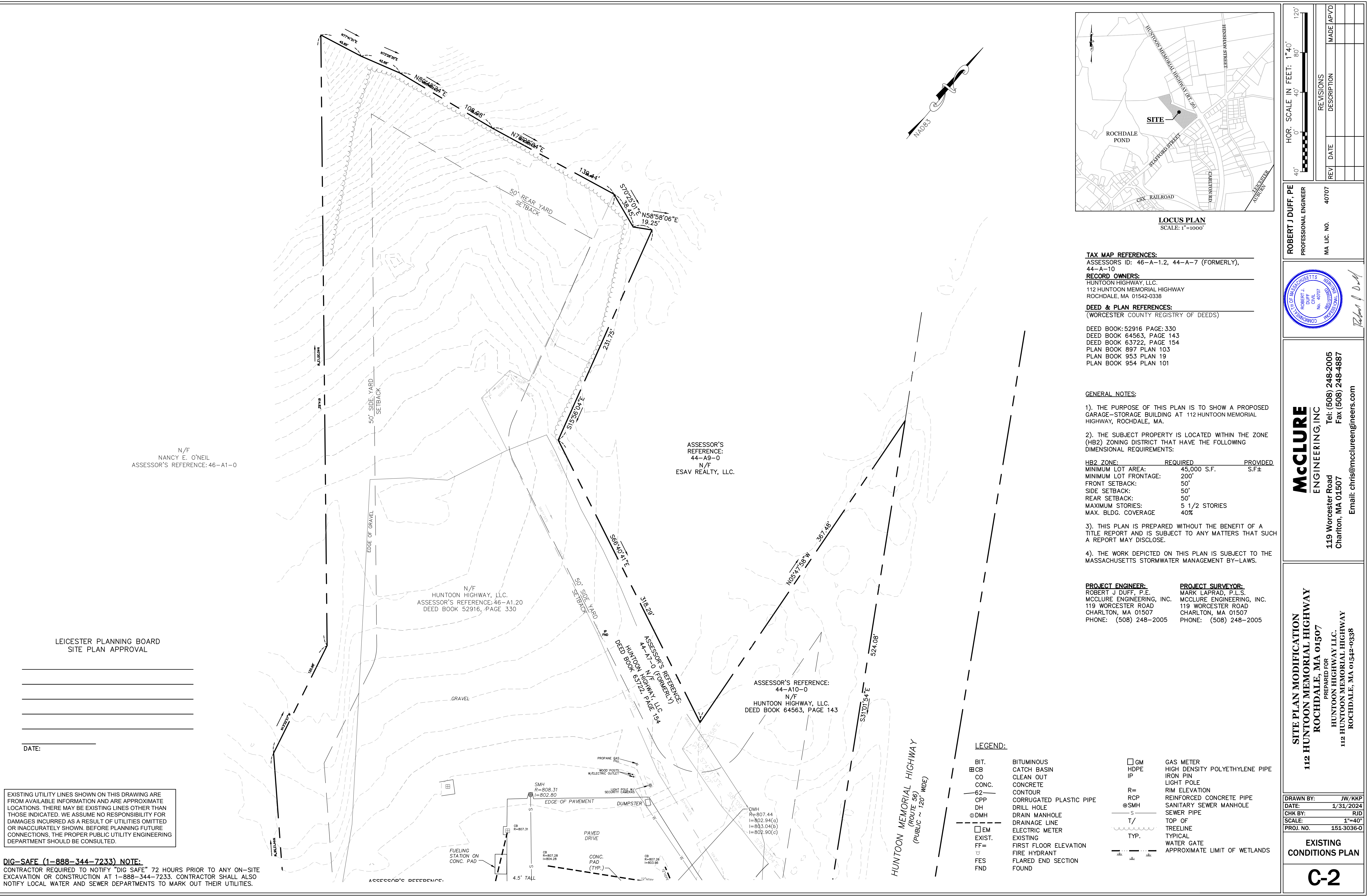
MA LIC. NO. 40707

REV	DATE	REVISIONS	MADE APVD
		DESCRIPTION	

HOR. SCALE IN FEET: 1"=200'
0 200 400 600

DIG-SAFE (1-888-344-7233) NOTE:
CONTRACTOR REQUIRED TO NOTIFY "DIG SAFE" 72 HOURS PRIOR TO ANY ON-SITE EXCAVATION OR CONSTRUCTION AT 1-888-344-7233. CONTRACTOR SHALL ALSO NOTIFY LOCAL WATER AND SEWER DEPARTMENTS TO MARK OUT THEIR UTILITIES.

T:_ACTIVE CLIENTS-PROJECTS FOLDER\CENTRAL MA CRANE\151-3036-O-EC_KP.dwg, 2/8/2024 10:36:10 AM, AutoCAD PDF (General Documentation).pc3



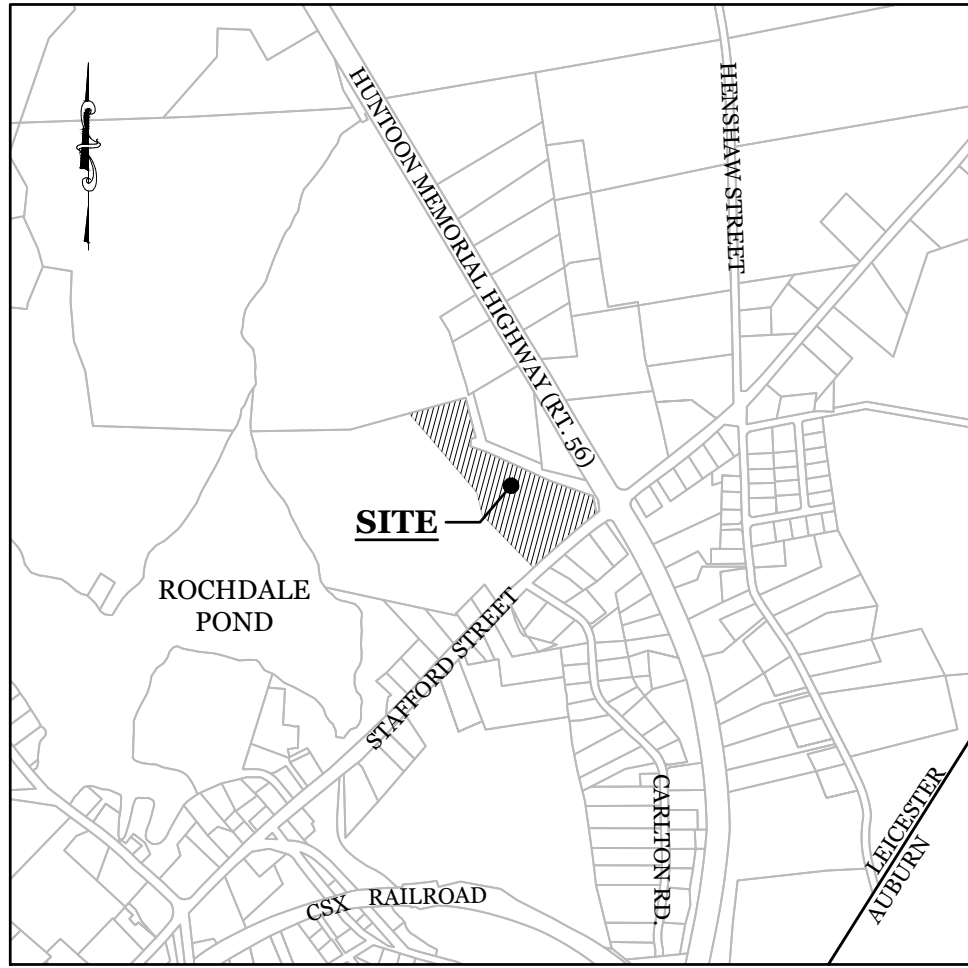
N/F
NANCY E. O'NEIL
ASSESSOR'S REFERENCE: 46-A1-0

ASSESSOR'S
REFERENCE:
44-A9-0
N/F
ESAV REALTY, LLC.

N/F
HUNTOON HIGHWAY, LLC.
ASSESSOR'S REFERENCE: 46-A1.20
DEED BOOK 52916, PAGE 330

ASSESSOR'S REFERENCE:
44-A10-0
N/F
HUNTOON HIGHWAY, LLC
DEED BOOK 63722, PAGE 154

ASSESSOR'S REFERENCE:
44-A10-0
N/F
HUNTOON HIGHWAY, LLC.
DEED BOOK 64563, PAGE 143



TAX MAP REFERENCES:
ASSESSORS ID: 46-A-1.2, 44-A-7 (FORMERLY), 44-A-10
RECORD OWNERS:
HUNTOON HIGHWAY, LLC.
112 HUNTOON MEMORIAL HIGHWAY
ROCHDALE, MA 01542-0338
DEED & PLAN REFERENCES:
(WORCESTER COUNTY REGISTRY OF DEEDS)

DEED BOOK: 52916 PAGE: 330
DEED BOOK 64563, PAGE 143
DEED BOOK 63722, PAGE 154
PLAN BOOK 897 PLAN 103
PLAN BOOK 953 PLAN 19
PLAN BOOK 954 PLAN 101

GENERAL NOTES:

- 1). THE PURPOSE OF THIS PLAN IS TO SHOW A PROPOSED GARAGE-STORAGE BUILDING AT 112 HUNTOON MEMORIAL HIGHWAY, ROCSDALE, MA.
- 2). THE SUBJECT PROPERTY IS LOCATED WITHIN THE ZONE (HB2) ZONING DISTRICT THAT HAVE THE FOLLOWING DIMENSIONAL REQUIREMENTS:

HB2 ZONE:	REQUIRED	PROVIDED
MINIMUM LOT AREA:	45,000 S.F.	S.F.±
MINIMUM LOT FRONTAGE:	200'	
FRONT SETBACK:	50'	
SIDE SETBACK:	50'	
REAR SETBACK:	50'	
MAXIMUM STORIES:	5 1/2 STORIES	
MAX. BLDG. COVERAGE	40%	
- 3). THIS PLAN IS PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT AND IS SUBJECT TO ANY MATTERS THAT SUCH A REPORT MAY DISCLOSE.
- 4). THE WORK DEPICTED ON THIS PLAN IS SUBJECT TO THE MASSACHUSETTS STORMWATER MANAGEMENT BY-LAWS.

PROJECT ENGINEER:
ROBERT J. DUFF, P.E.
MCCLURE ENGINEERING, INC.
119 WORCESTER ROAD
CHARLTON, MA 01507
PHONE: (508) 248-2005

PROJECT SURVEYOR:
MARK LAPRAD, P.L.S.
MCCLURE ENGINEERING, INC.
119 WORCESTER ROAD
CHARLTON, MA 01507
PHONE: (508) 248-2005

LEGEND:

- | | | | |
|-------|-------------------------|------|--------------------------------|
| BIT. | BITUMINOUS | GM | GAS METER |
| CB | CATCH BASIN | HDPE | HIGH DENSITY POLYETHYLENE PIPE |
| CO | CLEAN OUT | IP | IRON PIN |
| CONC. | CONCRETE | | LIGHT POLE |
| 62 | CONTOUR | R= | RIM ELEVATION |
| CPP | CORRUGATED PLASTIC PIPE | RCP | REINFORCED CONCRETE PIPE |
| DH | DRILL HOLE | SMH | SANITARY SEWER MANHOLE |
| DMH | DRAIN MANHOLE | S | SEWER PIPE |
| | DRAINAGE LINE | T/ | TOP OF |
| | ELECTRIC METER | TYP. | TREELINE |
| EM | EXISTING | | TYPICAL |
| FF= | FIRST FLOOR ELEVATION | | WATER GATE |
| FES | FIRE HYDRANT | | APPROXIMATE LIMIT OF WETLANDS |
| FND | FLARED END SECTION | | |
| | FOUND | | |

EXISTING UTILITY LINES SHOWN ON THIS DRAWING ARE FROM AVAILABLE INFORMATION AND ARE APPROXIMATE LOCATIONS. THERE MAY BE EXISTING LINES OTHER THAN THOSE INDICATED. WE ASSUME NO RESPONSIBILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES OMITTED OR INACCURATELY SHOWN. BEFORE PLANNING FUTURE CONNECTIONS, THE PROPER PUBLIC UTILITY ENGINEERING DEPARTMENT SHOULD BE CONSULTED.

DIG-SAFE (1-888-344-7233) NOTE:
CONTRACTOR REQUIRED TO NOTIFY "DIG SAFE" 72 HOURS PRIOR TO ANY ON-SITE EXCAVATION OR CONSTRUCTION AT 1-888-344-7233. CONTRACTOR SHALL ALSO NOTIFY LOCAL WATER AND SEWER DEPARTMENTS TO MARK OUT THEIR UTILITIES.

ROBERT J. DUFF, PE
PROFESSIONAL ENGINEER
MA LIC. NO. 40707

Robert J. Duff

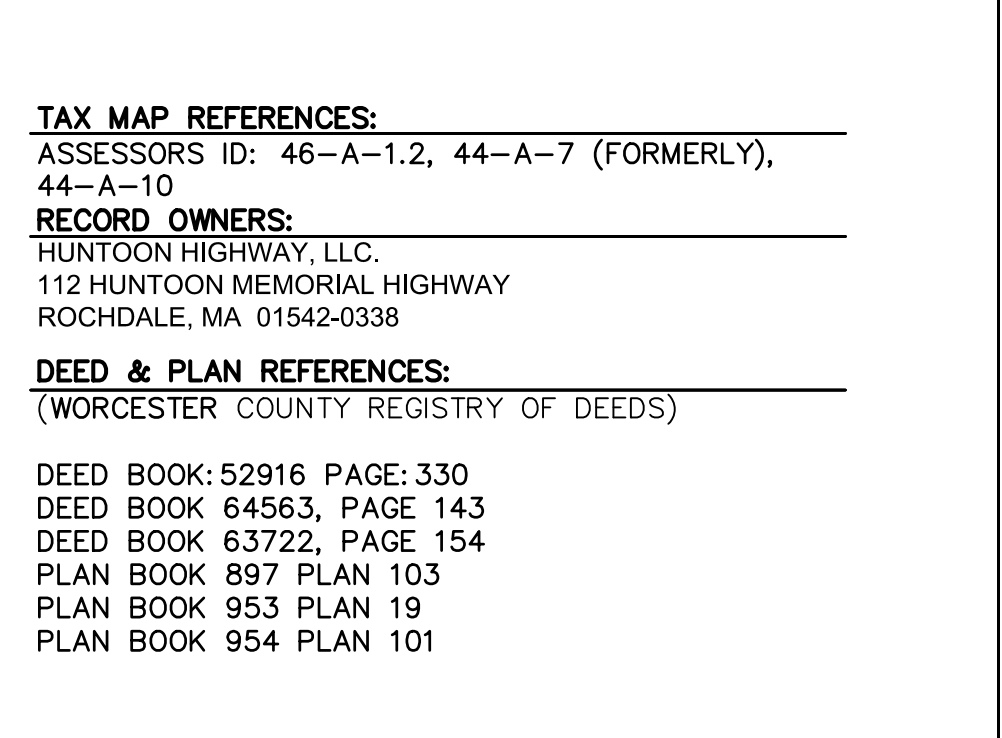
REVISIONS	
REV	DESCRIPTION

McCLURE
ENGINEERING, INC.
119 Worcester Road
Charlton, MA 01507
Tel: (508) 248-2005
Fax: (508) 248-4887
Email: chris@mcclureengineers.com


SITE PLAN MODIFICATION
112 HUNTOON MEMORIAL HIGHWAY
ROCHDALE, MA 01507
PREPARED FOR
HUNTOON HIGHWAY LLC.
112 HUNTOON MEMORIAL HIGHWAY
ROCHDALE, MA 01542-0338

DRAWN BY: JW/KKP
DATE: 1/31/2024
CHK BY: RJD
SCALE: 1"=40'
PROJ. NO.: 151-3036-O

EXISTING
CONDITIONS PLAN
C-2



ROBERT J. DUFF, P.E.	
PROFESSIONAL ENGINEER	
MA LIC. NO.	40707



Seal of the Commonwealth of Massachusetts, Professional Engineer, Robert J. Duff, License No. 40707.

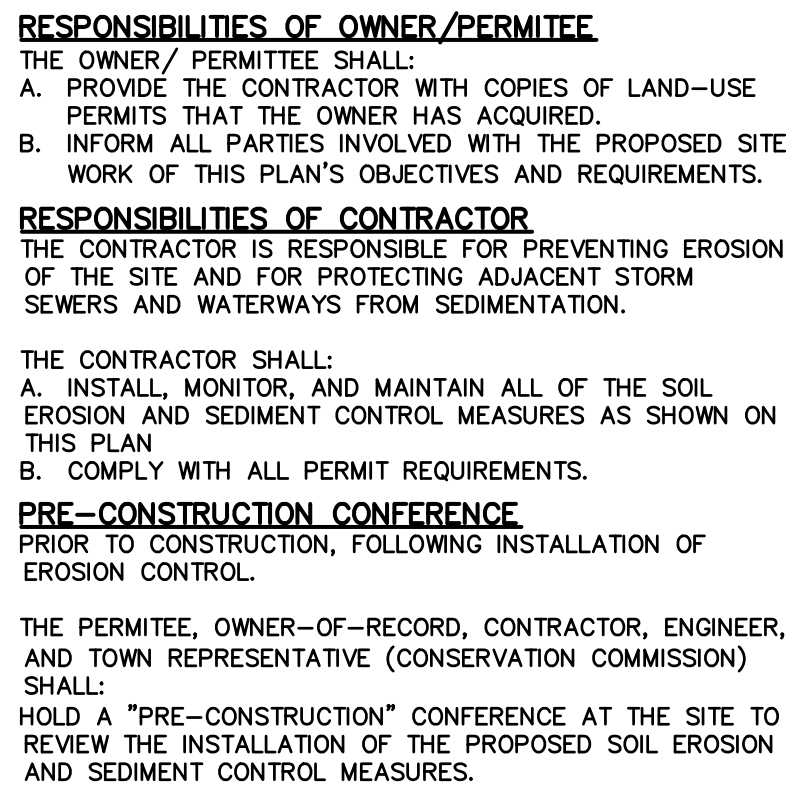
Robert J. Duff

<u>PROJECT ENGINEER:</u>	<u>PROJECT SURVEYOR:</u>
ROBERT J DUFF, P.E.	MARK LAPRAD, P.L.S.
MCCLURE ENGINEERING, INC.	MCCLURE ENGINEERING, INC.
119 WORCESTER ROAD	119 WORCESTER ROAD
CHARLTON, MA 01507	CHARLTON, MA 01507
PHONE: (508) 248-2005	PHONE: (508) 248-2005

SURVEY NOTES:

1. SITE EXISTING CONDITIONS, PROPERTY BOUNDARIES, AND TOPOGRAPHY BASED ON AN ON THE GROUND SURVEY CONDUCTED BY MCCLURE ENGINEERING, INC. TOPOGRAPHY SUPPLEMENTED WITH U.S.G.S. 2015 LIDAR.
2. SITE DOES NOT APPEAR TO LIE WITHIN THE 100-YEAR FLOOD ZONE ACCORDING TO FEMA FIRM MAP NO. 25027C00784E, EFFECTIVE JUNE 21, 2023.

<p>SITE PLAN MODIFICATION</p> <p>112 HUNTOON MEMORIAL HIGHWAY</p> <p>ROCHDALE, MA 01507</p> <p>PREPARED FOR</p> <p>HUNTOON HIGHWAY LLC.</p> <p>112 HUNTOON MEMORIAL HIGHWAY</p> <p>ROCHDALE, MA 01542-0338</p>
<p>DRAWN BY: JW/KKP</p> <p>DATE: 1/31/2024</p> <p>CHK BY: RJD</p> <p>SCALE: 1"=40'</p> <p>PROJ. NO. 151-3036-0</p>
<p>LAYOUT, GRADING</p> <p>AND UTILITY PLAN</p>
<p>C-3</p>



GENERAL CONTROLS

1. CLEANING OF STORMWATER STRUCTURES:
CLEAN ALL STORMWATER STRUCTURES INCLUDING, BUT NOT LIMITED TO, TOWNS, SWALES, SUBSURFACE RETENTION BASINS, SAND TRAP AND RIPRAP APRONS OF SEDIMENT UPON COMPLETION OF THE PROJECT.

2. PAVEMENT MAINTENANCE:
THE CONTRACTOR SHALL SWEEP PAVED ROADWAYS ADJACENT TO THE SITE ON A ROUTINE BASIS TO PREVENT TRACKING OF MUD INTO PUBLIC ROADWAYS AND WASHING OF MUD INTO WATERWAYS. IF THE CONTRACTOR'S SCHEDULE FOR CLEANING THE PAVEMENT IS FOUND TO BE INADEQUATE BY THE OWNER, THE OWNER'S REPRESENTATIVE, OR TOWN, THE CONTRACTOR SHALL INCREASE THE FREQUENCY AT NO ADDITIONAL COST TO THE OWNER.

3. WASTE DISPOSAL:
THE CONTRACTOR SHALL PROVIDE AN ADEQUATE NUMBER OF COVERED WASTE CONTAINERS TO ENSURE THAT NO LITTER, DEBRIS, BUILDING MATERIALS, OR SIMILAR MATERIALS ARE DISPOSED IN THE TOWNS OR WATERWAYS. THE CONTRACTOR SHALL INSTRUCT SUBCONTRACTORS TO USE THE CONTAINERS FOR WASTE MATERIAL. THE CONTAINERS SHALL BE PROMPTLY EMPTIED WHEN FULL.

GENERAL CONDITIONS

1. IF EROSION CONTROL MEASURES ARE DAMAGED BY CONSTRUCTION VEHICLES, ACTS OF VANDALISM, OR SEVERE WEATHER CONDITIONS, THE CONTRACTOR SHALL IMMEDIATELY REMOVE SECTIONS OF THE MONITOR OF THE EROSION CONTROL MEASURES AND REPAIR THESE MEASURES TO A FUNCTIONAL CONDITION.

2. IF, DURING OR AFTER CONSTRUCTION, IT BECOMES APPARENT THAT EXISTING EROSION CONTROL MEASURES ARE INCAPABLE OF CONTROLLING EROSION, THE ENGINEER OR THE TOWN MAY REQUIRE ADDITIONAL CONTROL MEASURES, INCLUDING BUT NOT LIMITED TO: ADDITION OF STRAW MATS, HAYBALES, SILT FENCE, SEDIMENT BASINS, MECHANICALLY ANCHORED MULCH, OR ENHANCED DEWATERING FILTRATION.

3. NO CONSTRUCTION SHALL PROCEED UNTIL A WRITTEN PROPOSAL OF METHODS TO PREVENT CONSTRUCTION DEBRIS, PAINT, OR OTHER SUCH CONTAMINATED MATERIALS FROM ENTERING TOWNS OR WATERWAYS. THE TOWN'S WATER COURSE HAS BEEN SUBMITTED BY THE CONTRACTOR TO THE OWNER, APPROVED BY THE OWNER AND SUCH METHODS HAVE BEEN IMPLEMENTED AS THE OWNER DIRECTS. THESE MATERIALS SHALL BE PROMPTLY REMOVED AND DISPOSED OF IN AN ENVIRONMENTALLY SAFE MANNER IN ACCORDANCE WITH ALL APPLICABLE FEDERAL AND STATE LAWS AND REGULATIONS. THE OWNER MAY ORDER THE CONTRACTOR TO CEASE SUCH CONSTRUCTION IF THE CONTRACTOR'S METHODS OF THE OWNER, WIND OR STORM CONDITIONS, THREATEN TO CAUSE THE DEPOSIT OF SUCH MATERIAL IN A WATERWAY.

DESCRIPTION AND MAINTENANCE OF EROSION CONTROL MEASURES

TEMPORARY STABILIZATION MEASURES

EROSION CONTROL BARRIERS:
INSTALL EROSION CONTROL BARRIERS AT VARIOUS LOCATIONS AS SHOWN ON THE PLANS AND DETAILS. EMBED THE EROSION CONTROL BARRIER INTO THE GROUND AND FIRMLY ANCHOR IT AS SHOWN IN THE DETAILS. REMOVE SEDIMENT ONCE LEVELS HAVE REACHED 1/4 OF THE EFFECTIVE HEIGHT. REPAIR AND/OR REPLACE THE SILT FENCE/ HAYBALES IMMEDIATELY IF DAMAGED OR DEGENERATED.

STOCKPILING OR STORAGE OF EXCAVATED MATERIALS: COMPLETELY SURROUND TEMPORARY MATERIAL STOCKPILES WITH STRAW WATTLES TO PREVENT TRANSPORTATION OF SEDIMENT. NO STOCKPILES SHALL BE KEPT WITHIN 100' WETLAND BUFFER ZONES.

DUST CONTROL:

TAKE PRECAUTIONS TO PREVENT DUST FROM BECOMING A NUISANCE TO ADJACENT PROPERTY OWNERS. BROOD OFF PAVEMENT AREAS ADJOINING THE EXCAVATION ON A DAILY BASIS. COVER AND/OR KEEP MOIST ALL EARTH STOCKPILES AT ALL TIMES. USE CALCIUM CHLORIDE TO CONTROL DUST OVER CERTAIN AREAS OF THE SITE AS NEEDED AND/OR AS DIRECTED BY THE SUPERVISOR. CALCIUM CHLORIDE SHALL CONFORM TO ASTM D-88, TYPE I. THE CONTRACTOR SHALL MAINTAIN AND INSPECT, ON A DAILY BASIS, THE ADEQUACY OF DUST CONTROL MEASURES AND CORRECT ANY DEFICIENCIES IMMEDIATELY.

DEWATERING:

IF DEWATERING IS REQUIRED, WATER SHOULD BE DISCHARGED TO DEWATERING BAGS OR OTHER SEDIMENT REMOVAL DEVICES PRIOR TO DISCHARGE TO RESOURCE AREAS. WATER MAY ALSO BE USED FOR DUST CONTROL AND/OR VEGETATION WATERING.

CONSTRUCTION SCHEDULE AND EROSION & SEDIMENTATION CONTROL CHECKLIST


112 HUNTOON MEMORIAL HIGHWAY

NO.	WORK DESCRIPTION
SEQUENCE OF CONSTRUCTION	
THE FOLLOWING NARRATIVE DESCRIBES THE PLANNED CONSTRUCTION SEQUENCE WITH AN EMPHASIS ON THE TIMING AND SEQUENCE OF EROSION/SEDIMENTATION CONTROL MEASURES:	
THE FOLLOWING CONSTRUCTION SEQUENCE WILL BE REQUIRED TO INSURE THE EFFECTIVENESS OF THE EROSION/SEDIMENT CONTROL MEASURES IS OPTIMIZED.	
1.	INSTALL STABILIZED CONSTRUCTION EXIT(S), SWPPP ENTRANCE SIGN, AND DEP SIGN.
2.	INSTALL EROSION CONTROL BARRIERS ON THE ENTIRE SITE (CLEAR ONLY THOSE AREAS NECESSARY TO INSTALL SILT FENCE AND HAYBALES.)
3.	EROSION CONTROL INSPECTION WILL BE CONDUCTED AFTER INSTALLATION OF EROSION CONTROL BARRIERS.
4.	PREPARE TEMPORARY PARKING AND STORAGE AREA UPON IMPLEMENTATION AND INSTALLATION OF THE FOLLOWING AREAS: PARKING, LAY DOWN, PORTA POTTY, MATERIAL STORAGE CONTAINERS, ETC., DENOTE THEM ON THE SITE MAPS IMMEDIATELY AND NOTE ANY CHANGES IN THE LOCATIONS AS THEY OCCUR THROUGHOUT THE CONSTRUCTION PROCESS.
5.	CLEAR AND GRUB AREA FOR SEDIMENT TRAPS. CONSTRUCT AND STABILIZE SEDIMENT TRAPS. HALT ALL ACTIVITIES AND CONTACT THE CIVIL ENGINEERING CONSULTANT TO PERFORM INSPECTION AND CERTIFICATION OF BMP'S. GENERAL CONTRACTOR SHALL SCHEDULE AND CONDUCT STORM WATER PRE-CONSTRUCTION MEETING WITH ENGINEER AND ALL GROUND-DISTURBING CONTRACTORS BEFORE PROCEEDING WITH CONSTRUCTION.
6.	BEGIN CLEARING AND GRUBBING THE SITE.
7.	INSTALL TEMPORARY DIVERSION DITCHES AND CHECK DAMS.
8.	BEGIN GRADING THE SITE AS NEEDED.
9.	START INSTALLATION OF DRAINAGE, UTILITIES AND SITE WORK.
10.	TEMPORARILY SEED, THROUGHOUT CONSTRUCTION, DENuded AREAS THAT WILL BE INACTIVE FOR 15 DAYS OR MORE. PERMANENTLY STABILIZE AREA TO BE VEGETATED AS THEY ARE COMPLETED.
FINAL PHASE	
1.	PERMANENTLY STABILIZE ANY REMAINING EXPOSED AREAS.
2.	TEMPORARY DRAINAGE DITCHES TO BE REMOVED AND STABILIZED.
3.	SEDIMENT FROM TRAPS TO BE REMOVED AND SEDIMENT DISPOSED OF OFFSITE. BASINS ARE TO BE REMOVED AND AREAS STABILIZED AS BASINS AS SHOWN ON LAYOUT, GRADING AND UTILITY PLAN.
4.	ONCE ENTIRE SITE IS STABILIZED, CALL FOR FINAL INSPECTION FROM SITE MONITOR.
NOTES:	
ONCE CONSTRUCTION IS COMPLETED, ALL DISTURBED AREAS ARE TO BE STABILIZED WITH LOAM AND SEED UNLESS OTHERWISE SPECIFIED.	
INSPECTIONS WILL BE CONDUCTED WEEKLY AND AFTER 0.25 INCH RAIN EVENTS. COPIES OF WEEKLY EROSION CONTROL REPORTS SHALL BE KEPT ON RECORD AND PROVIDED TO THE TOWN AND ENGINEER AT THEIR REQUEST.	
EXTRA EROSION CONTROL MATERIALS (STRAW WATILES, SILT FENCE) EQUAL TO 100 LF SHALL BE KEPT ON SITE FOR EMERGENCY REPAIRS. THESE MATERIALS SHALL BE KEPT COVERED.	
NOTE: APPLICANT AND/OR LANDOWNER SHALL NOTIFY THE TOWN OF LEICESTER IN WRITING AT LEAST FIVE (5) BUSINESS DAYS PRIOR TO COMMENCING ANY WORK.	

HOR. SCALE IN FEET: 1"=40'

REVISIONS			
REV	DATE	DESCRIPTION	MADE BY/VD

Robert J Duff, PE
PROFESSIONAL ENGINEER
MA LIC. NO. 40707


Robert J Duff

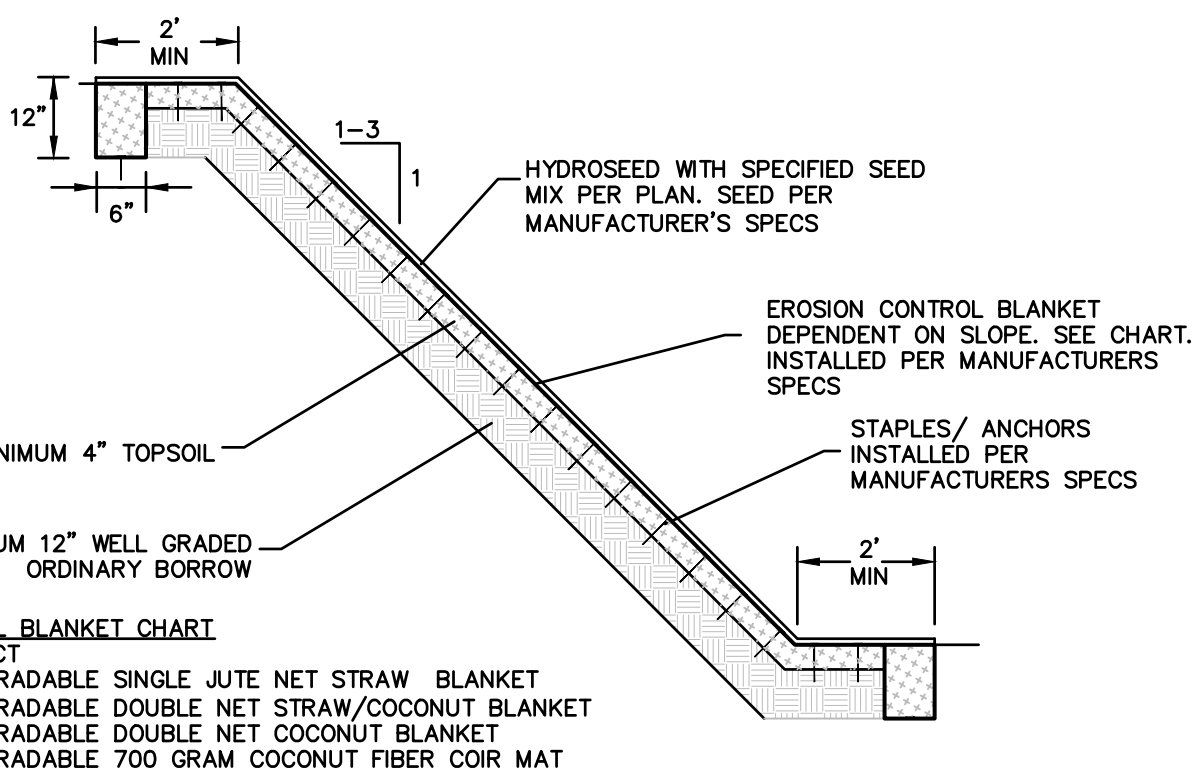
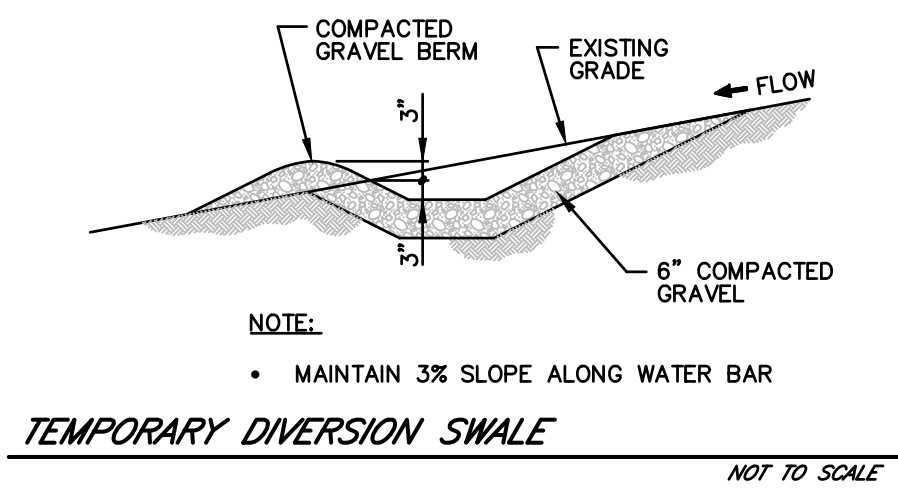
McCLURE
ENGINEERING, INC.
119 Worcester Road
Charlton, MA 01507
Tel: (508) 248-2005
Fax: (508) 248-4887
Email: chris@mcclureengineers.com

SITE PLAN MODIFICATION
1112 HUNTOON MEMORIAL HIGHWAY
ROCHDALE, MA 01507

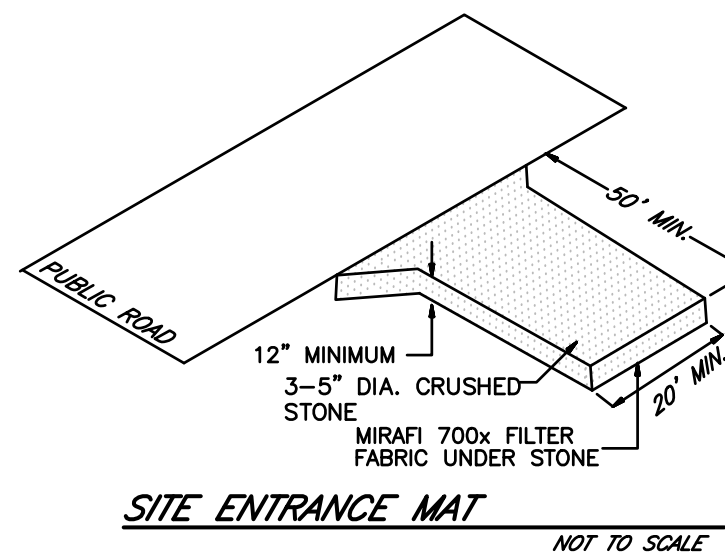
PREPARED FOR
HUNTOON HIGHWAY LLC.
112 HUNTOON MEMORIAL HIGHWAY
ROCHDALE, MA 01542-0338

DRAWN BY:	JW
DATE:	1/31/2024
CHK BY:	RJD
SCALE:	1" = 40'
PROJ. NO.	151-3036-0

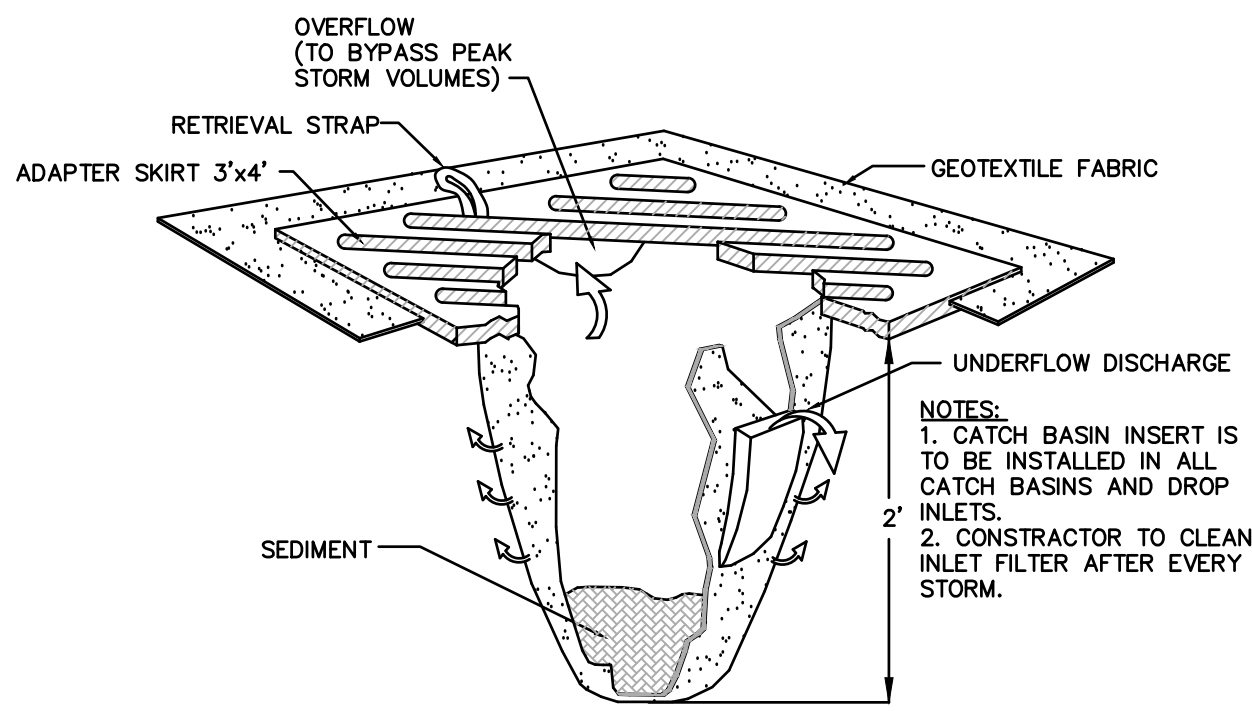
SOIL EROSION & SEDIMENT CONTROL PLAN
C-4



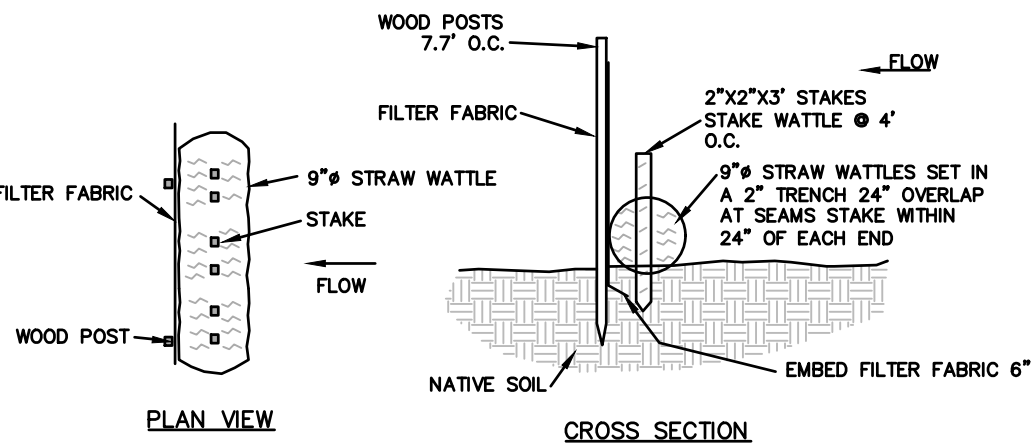
SLOPE STABILIZATION DETAILS



STONE CHECK DAM DETAIL

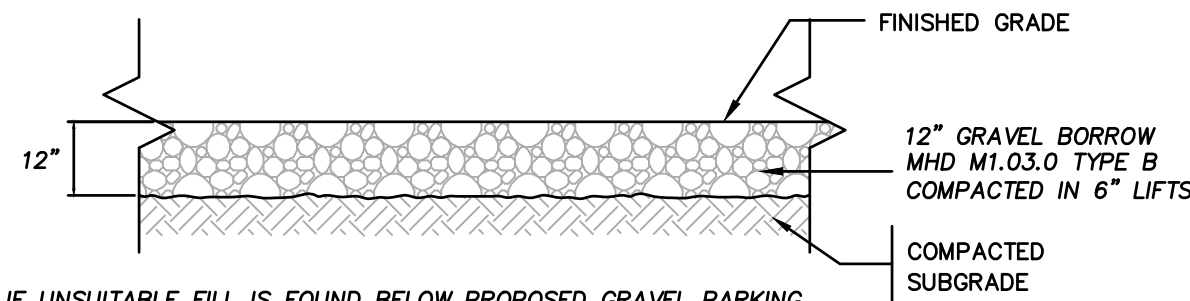


CATCH BASIN INLET FILTER "SILT SACK"
NOT TO SCALE



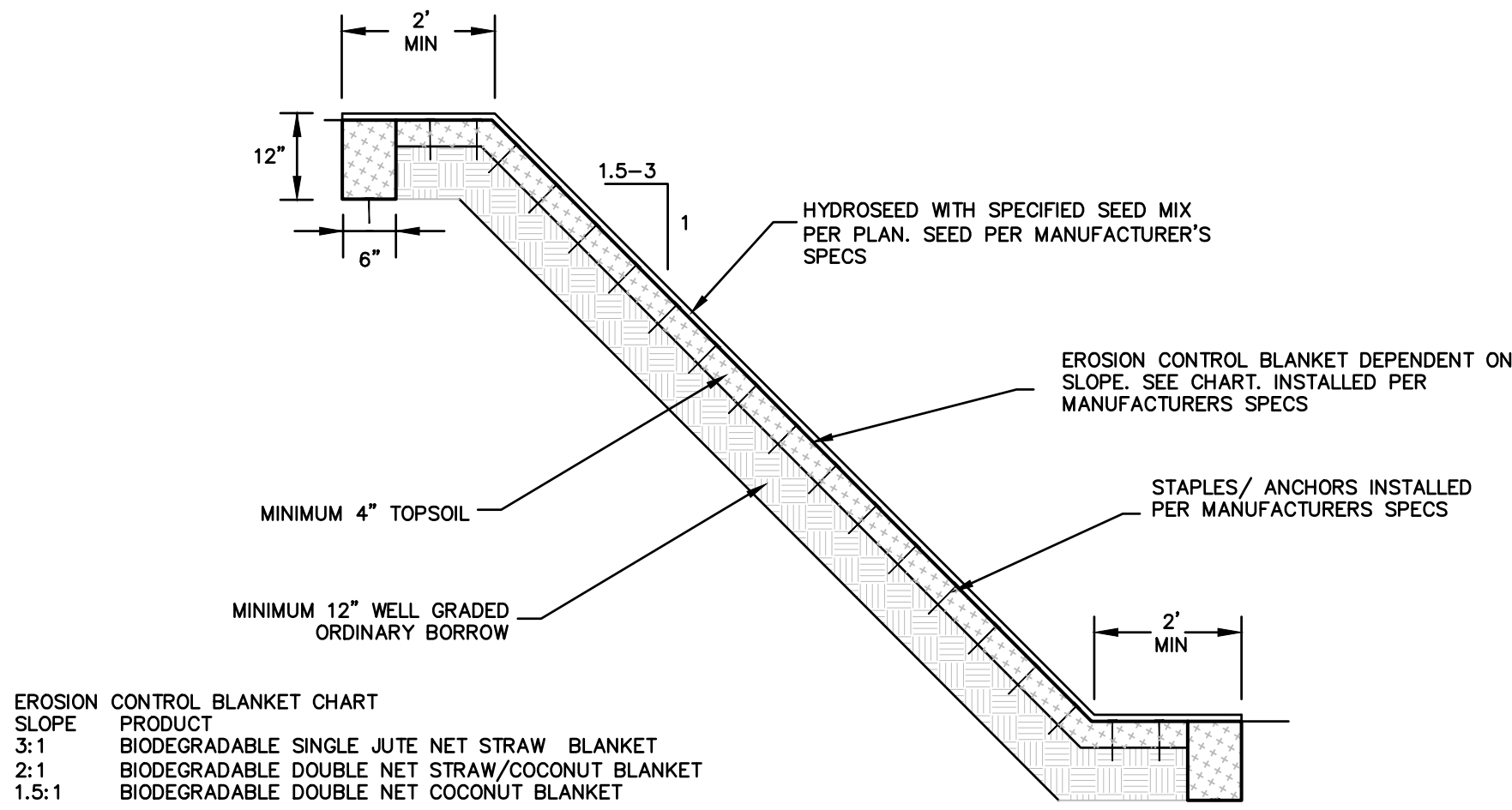
STRAW WATTLE AND SILT FENCE DETAIL

T:_ACTIVE CLIENTS-PROJECTS FOLDER\CENTRAL MA CRANE\151-3036-0-Central MA Crane_112 Huntton Mem Hwy_Site Plan.dwg(151-3036-0_Details_KP.dwg 2/8/2024 9:54:51 AM, AutoCAD PDF (General Documentation).pc3



GRAVEL PARKING LOT DETAIL

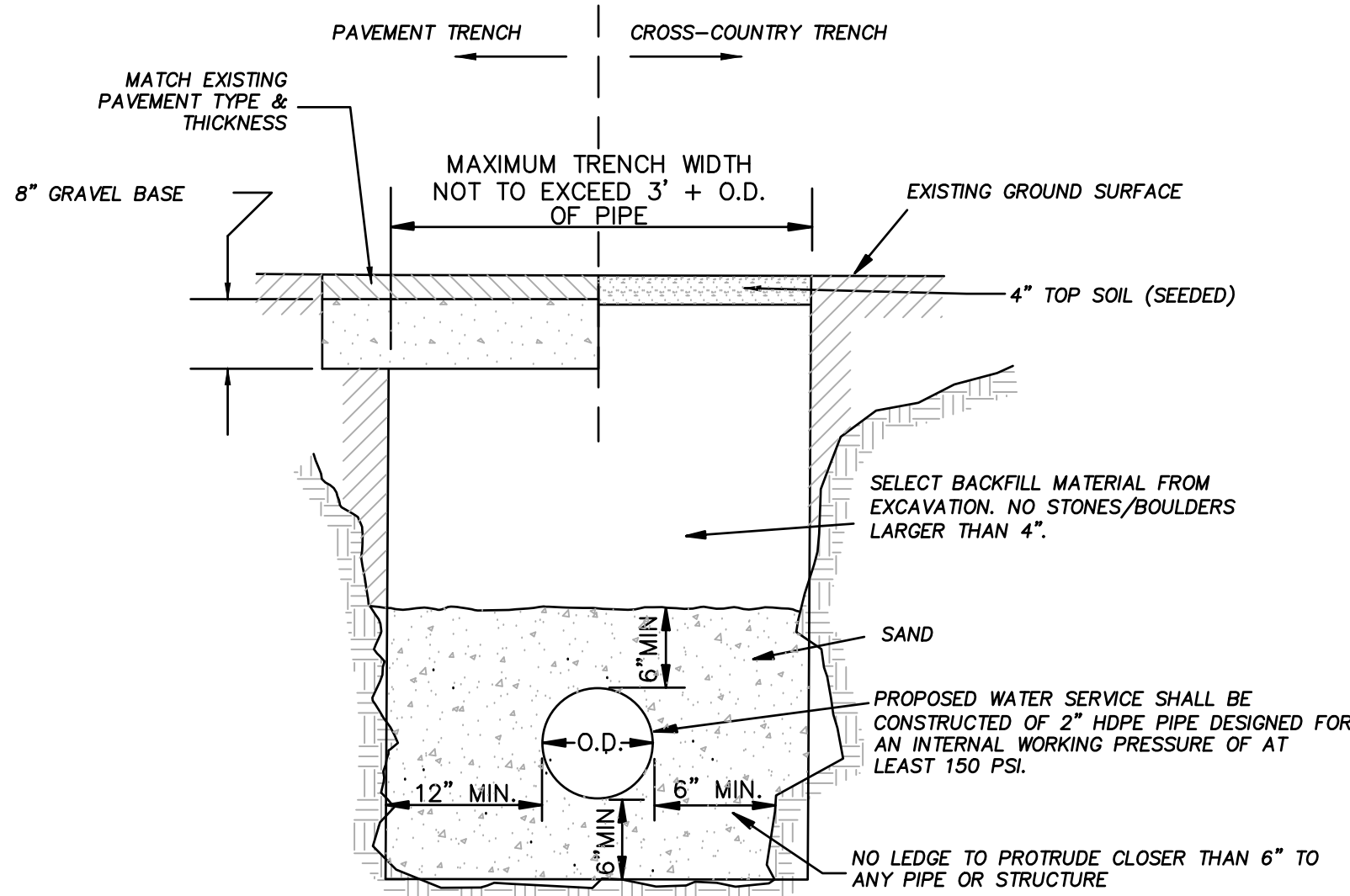
NOT TO SCALE



EROSION CONTROL BLANKET CHART	
SLOPE	PRODUCT
3:1	BIODEGRADABLE SINGLE JUTE NET STRAW BLANKET
2:1	BIODEGRADABLE DOUBLE NET STRAW/COCONUT BLANKET
1.5:1	BIODEGRADABLE DOUBLE NET COCONUT BLANKET

SLOPE STABILIZATION DETAILS

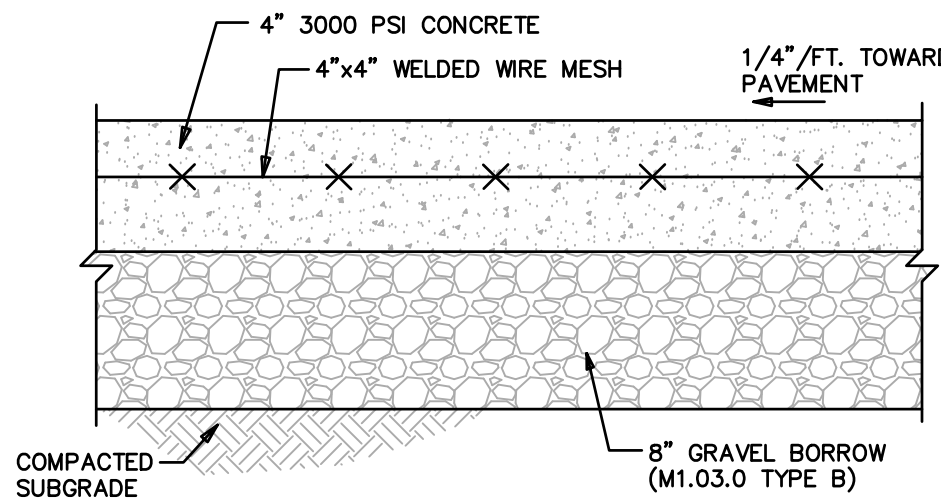
NOT TO SCALE



NOTE:
IF SIGNIFICANT LEDGE IS ENCOUNTERED IN THE COURSE OF ROADWAY OR UTILITY CONSTRUCTION, THE TOWN WILL BE INFORMED AND A PLAN FOR SOIL TEST OR BORINGS AS WELL AS EXPECTED METHODS AND SCHEDULE OF REMOVAL SHALL BE SUBMITTED TO THE TOWN.

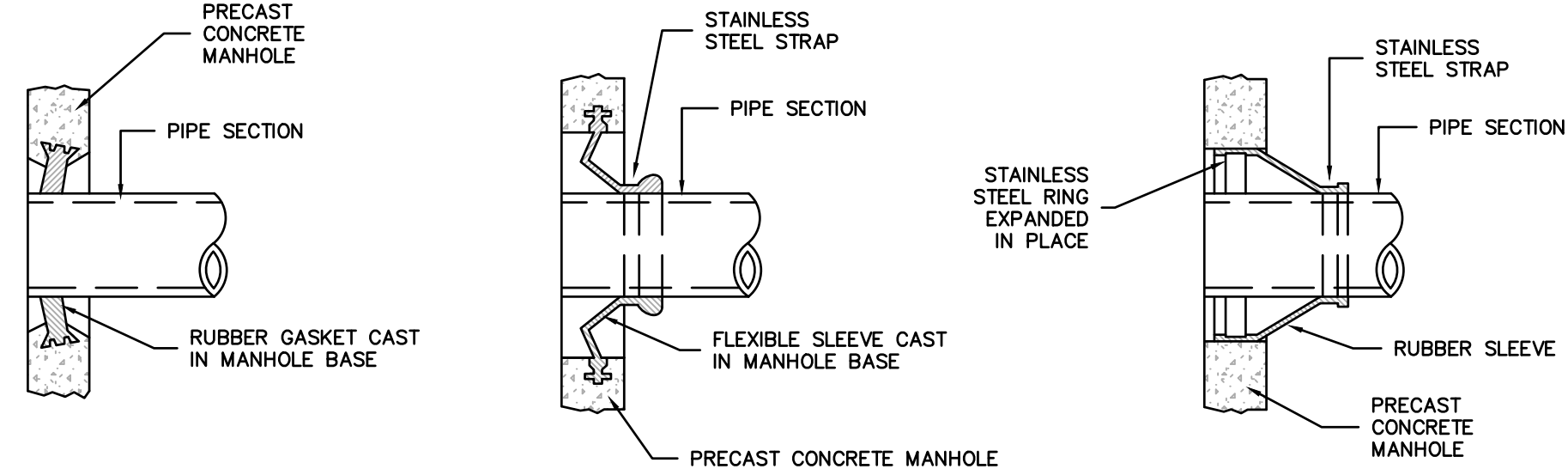
TYPICAL WATER SERVICE TRENCH SECTION

NOT TO SCALE



CONCRETE APRON DETAIL

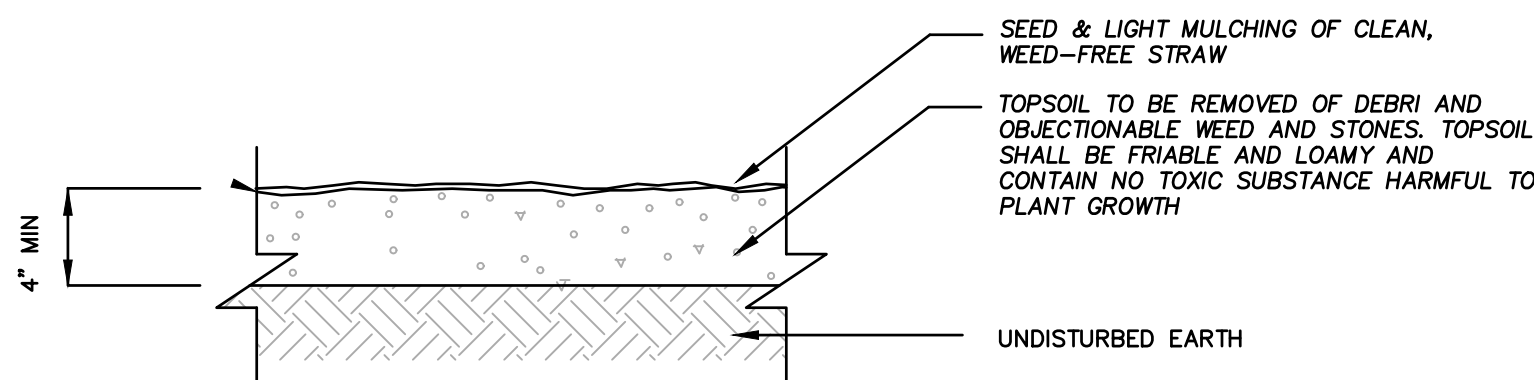
NOT TO SCALE



NOTE:
1) CONTRACTOR SHALL BE REQUIRED TO MAKE ALL PIPE PENETRATIONS WATER TIGHT.
2) THE PIPE TO MANHOLE CONNECTION SHALL BE A FLEXIBLE RUBBER PIPE SLEEVE EITHER CAST IN PRECAST MANHOLE SECTION OR HELD IN PLACE BY STAINLESS STEEL RINGS EXPANDED IN PLACE TO MEET SPECIFICATIONS OF ASTM C923.

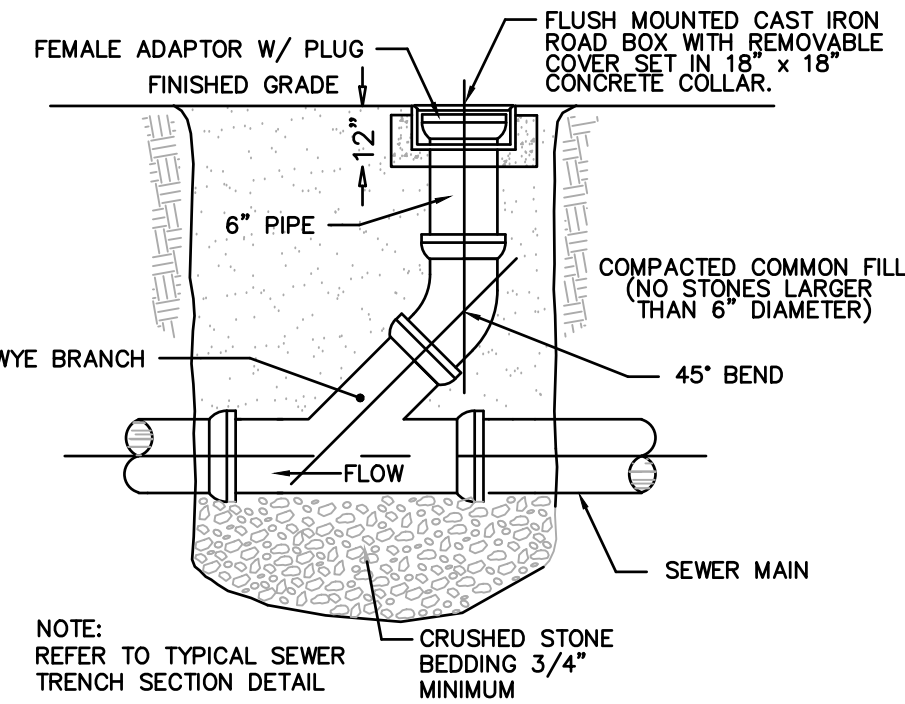
MANHOLE SEAL DETAILS

NOT TO SCALE



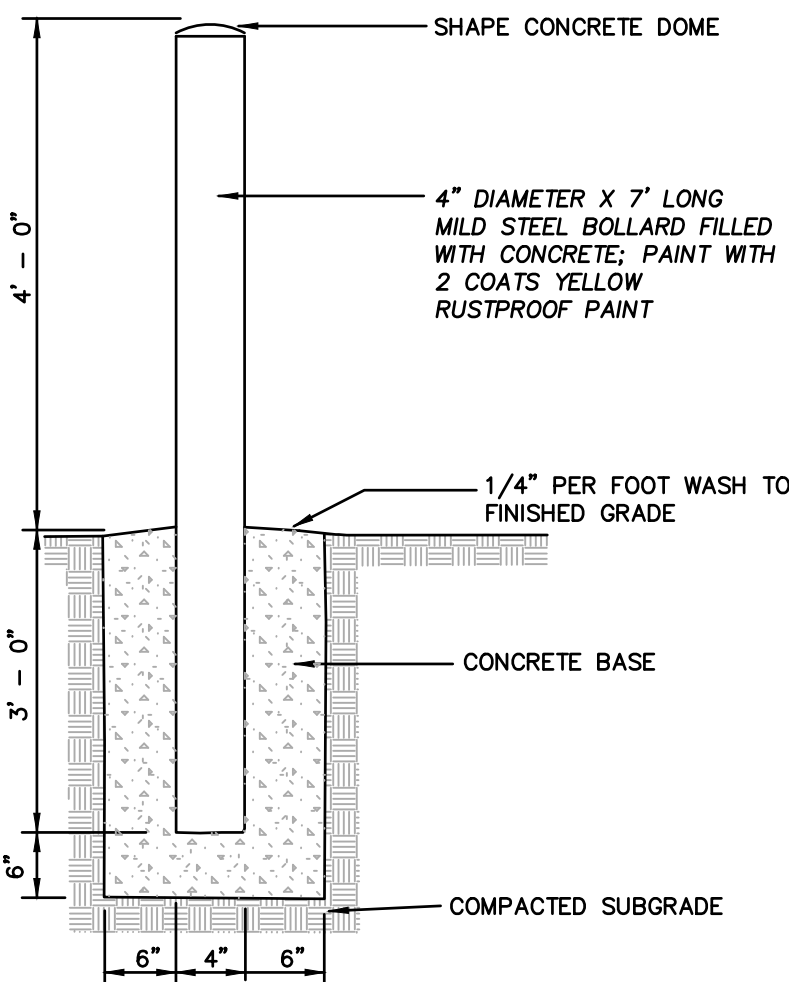
TOP SOIL & SEEDING DETAIL

NOT TO SCALE



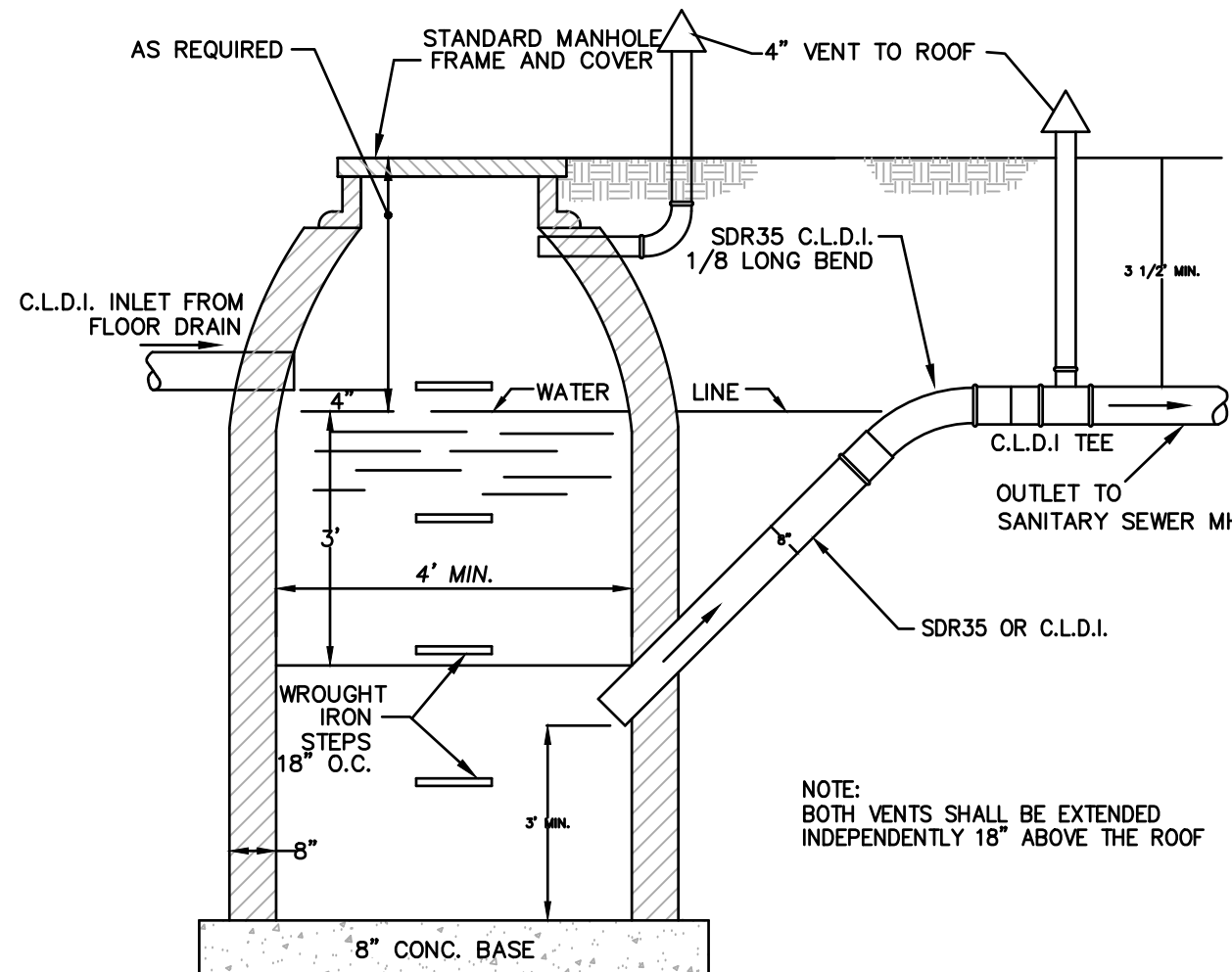
TYPICAL GRAVITY SEWER CLEANOUT DETAIL

NOT TO SCALE



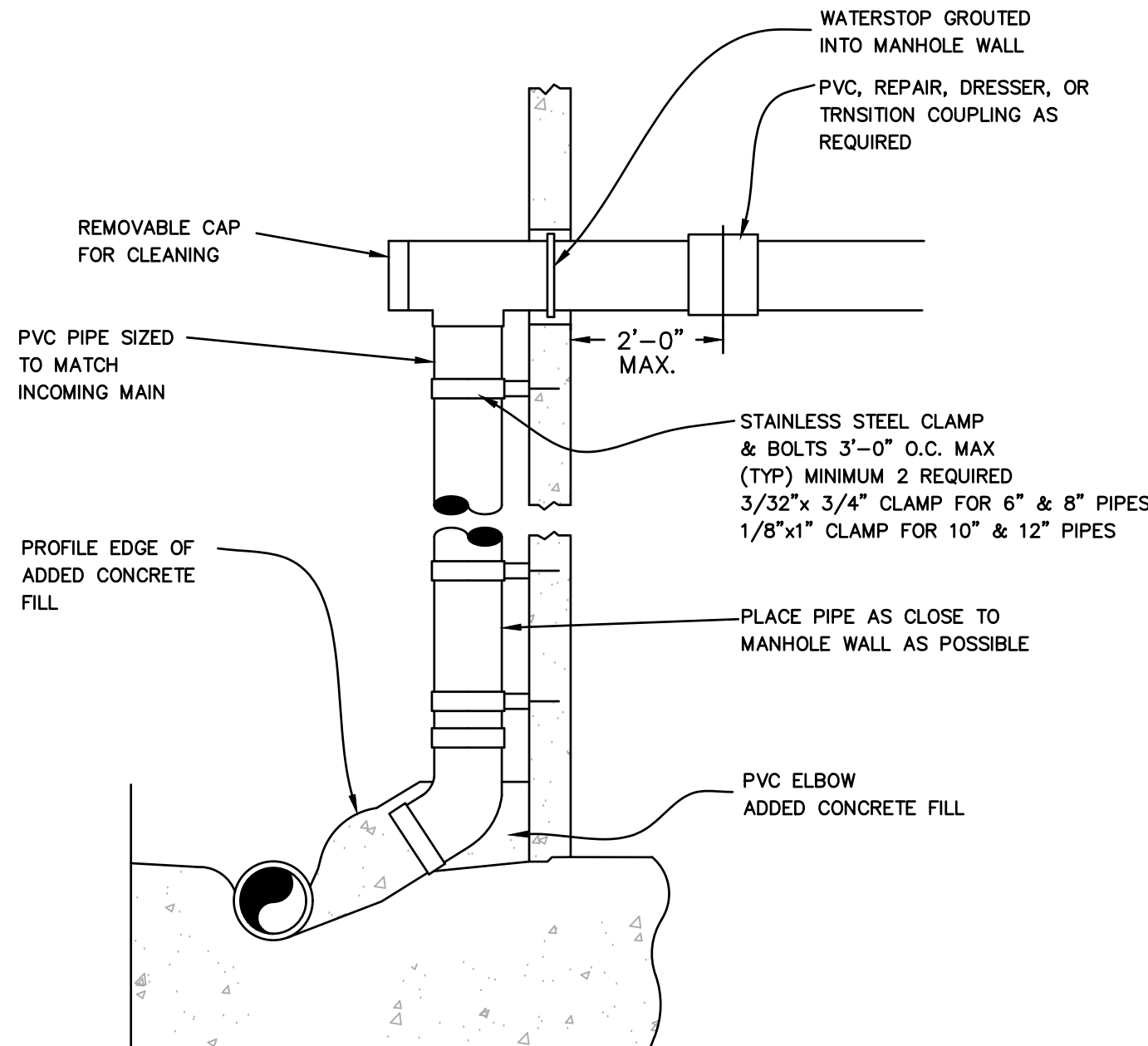
STEEL PIPE BOLLARD

NOT TO SCALE



OIL/GREASE SEPARATOR DETAIL

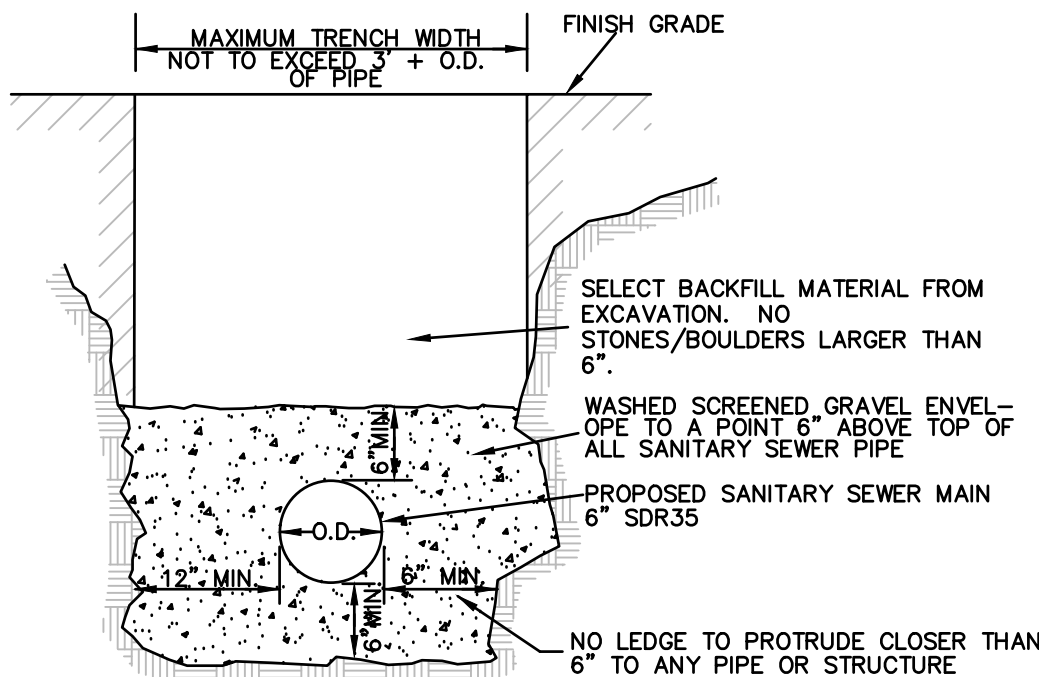
NOT TO SCALE



NOTES:
ENCLOSE ELBOW IN CONCRETE, FORM SMOOTH CHANNEL TO MANHOLE FLOWLINE.
INSTALL WATERSTOP IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AS SHOWN.
PVC PIPE AND FITTINGS TO BE SDR-35 SCHEDULE 40.

SEWER MANHOLE INTERIOR DROP INLET

NOT TO SCALE



NOTE: ALL SANITARY SEWERS MORE THAN 20 FEET DEEP SHALL BE CONSTRUCTED USING SCHEDULE 80 PVC OR SCHEDULE 40 DUCTILE IRON PIPE.

TYP. GRAVITY SEWER MAIN TRENCH SECTION

NOT TO SCALE

REVISIONS		MADE BY	DATE
REV	DATE	DESCRIPTION	

ROBERT J. DUFF, P.E.
PROFESSIONAL ENGINEER
MA LIC. NO. 40707



McCLURE
ENGINEERING, INC.
119 Worcester Road
Charlton, MA 01507
Tel: (508) 248-2005
Fax: (508) 248-4887
Email: rduff@mcclureengineers.com

SITE PLAN MODIFICATION
112 HUNTON MEMORIAL HIGHWAY
ROCHDALE, MA
PREPARED FOR
CENTRAL MASS CRANE
112 HUNTON MEMORIAL HIGHWAY
ROCHDALE, MA 01542-0338

DRAWN BY: KKP
DATE: 1/31/2024
CHK BY: RJD
SCALE:
PROJ. NO. 151-3036-0

CONSTRUCTION
DETAILS

C-5



C-6

Department Comments 112 Huntoon Mem Hwy

Building:

Harold Leaming

Police Department:

Ken Antanavica

2/20/24: I have no objection to these plans.

Health Department

Francis Dagle

Fire Department

Mike Wilson

2/15/24: Only concerns are access around the building. Fire access is not clear in the drawings

DPW

Kris Lauzon

2/14/24: Looks good

CVRWD

Ben Morris – see attached letter

Cherry Valley and Rochdale Water District

Established 1910

P.O. BOX 138

ROCHDALE, MASSACHUSETTS 01542

OFFICE (508) 892-9616 • FAX: (508) 892-4371

COMMISSIONERS

Robert H. Lemieux, Cherry Valley
Arthur E.J. Levesque, Greenville
Joseph McGinn, Rochdale

JENNIFER M. WOOD
Treasurer

BENJAMIN MORRIS
Superintendent

February 16, 2024

RE: 112 Huntoon Hwy Building

To whom it may concern,

The intent of this letter is to verify that the above-listed property is within the Cherry Valley & Rochdale Water District and is available to connect to the public water supply. The District will require that the Districts Engineers review the utility plan (at owners' expense) as it pertains to the water connections prior to any water utility construction commencing. To properly review the proposed connection and to determine fees associated with this connection the District will need the following information.

- Plan review application submitted with payment.
- Estimated fire flow demand.
- Flow test data (flow test can be scheduled with District office)
- Proposed backflow installation plan
- Estimated Daily domestic usage.
- Estimated meter size.

Upon completion of construction, the Districts cross connection surveyor will survey the facility and determine if more backflow devices may be required.

Please have the project engineer contact the District to arrange the above-mentioned information.

Should you have any further questions, please feel free to contact me at 508-892-9616.

Respectfully,



Benjamin Morris

Superintendent

Cherry Valley & Rochdale Water District

"This is an equal opportunity provider and employer"

February 22, 2024

Leicester Planning Board
Town of Leicester
3 Washburn Square
Leicester, Massachusetts 01524

Re: Central Mass Crane
Site Plan Modification 2024

To the Board:

We are in receipt of the following information in association with the above referenced project:

- Plan entitled “SITE PLAN MODIFICATION, 112 HUNTOON MEMORIAL HIGHWAY, ROCHDALE, MA”, comprised of 7 sheets, dated 1/31/2024 by McClure Engineering, Inc. of Charlton.
- Bound package entitled “Stormwater Management Report, Site Plan Modification, Central MA Crane Service, Inc, 112 Huntoon Memorial Highway by McClure Engineering, Inc. of Charlton, dated January 26, 2024.
- Letter addressed to Kristen Jacobsen, providing narrative of project, dated January 29, 2024, by McClure Engineering, Inc. of Charlton, with attachments including:
 - Request for Modification of Approval, dated 1/31/24
 - Land Owner Authorization Form, date 1/31/24
 - Billing Authorization Form, dated 1-31-24
 - 300 Feet Abutters List Report, certified by Leicester Assessor’s Office

We have performed a review of the submitted plans for conformance with Leicester Zoning By-Laws including §5.2: *Site Plan Review and Site Plan Review Regulations*; §3.31 *Highway Business-Industrial District 2*; Chapter 15, *Stormwater Bylaw and Stormwater Regulations*; *Landscaping Regulations*.

Our comments are found below:

1. Under Chapter 15, *Stormwater Bylaw*, Section 4.0, A & D, a stormwater permit is required.
2. Site plans are found to be complete, with the following exceptions:
 - a.) Proposed landscaping not found (REF: Site Plan Review Regulations, Section II, F, 6)
 - b.) Location where earth removal or filling is proposed, and volume of material to be moved not found. (REF: Site Plan Review Regulations, Section II, F, 9)
 - c.) Elevations for exterior facades of the proposed structure (REF: Site Plan Review Regulations, Section II, F, 10)
3. A photometric plan has been submitted, which indicates that light intensity on adjoining properties will be .1 Fc or less, a minimal impact. The information received does not document the specific type of light fixture proposed. The original building constructed on this property is equipped with “wall-pack” fixtures, which emit light directly from the side of the building. Following construction, comments were received from neighbors, some located hundreds of feet away, complaining of glare from the lights.

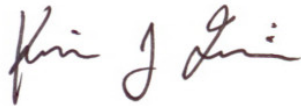
Leicester Planning Board may wish to request the Engineer explore the use of lights which direct light downward, or the use of shields, which re-direct light in a downward direction.

4. Plans do not propose landscaping. Section 5.5.02.2 *Landscaping*, provides requirements for landscape plantings and landscape buffer.

5. A note should be added to the plan which requires that the building roof have gutters, and that downspouts be connected into the underground roof drain system.
6. Leicester Planning Board may wish to request the Engineer address the need for (or lack of need for) parking; plans propose no parking.
7. Pertaining to hydrology and stormwater:
 - a.) Per Massachusetts Stormwater Management Policy and Leicester Stormwater Regulations, Section 4.0, A, 19, soil testing is required within the Infiltration Basin.
 - b.) Leicester Planning Board may wish to consider if restricting access to the Infiltration Basin is necessary. Plans do not require a fence on the perimeter of the basin. The basin will retain approximately 2 feet of water for limited periods following severe storm events.
 - c.) In the hydrologic analysis, the Routing Diagram is too small to be legible.

Please contact this office should you have questions.

Sincerely,
QUINN ENGINEERING, INC.

A handwritten signature in dark ink, appearing to read "Kevin J. Quinn".

Kevin J. Quinn, P.E.
President

PUBLIC HEARING
CENTRAL MA CRANE-JACK DAIGE
SPR-2014-01 – MODIFICATION
Revised Submittals

LETTER OF TRANSMITTAL

TO: Kristen Jacobsen
Planning Board
Town of Leicester
3 Washburn Square
Leicester, MA 01524
508-892-7007

PROJ. NO: 151-3016-O **DATE:** 3/7/24

PROJECT: Site Plan Modification

LOCATION: 112 Huntoon Memorial Highway
Parcel IDs: 46-A-1.2, 44-A-10

SENT BY WAY OF THE FOLLOWING: Hand Delivery

COPIES	DATE	ITEM DESCRIPTION
		SITE PLAN MODIFICATION
1	3/7/24	McClure Response to Quinn Engineering Peer Review comments date 9/23/21
1	3/7/24	Planning Board waiver request letter dated 3/7/24
3	3/7/24	"Site Plan Modification" 112 Huntoon Memorial Highway, Rochdale, MA revise date 3/7/24 (Size 24x36)
6	3/7/24	"Site Plan Modification" 112 Huntoon Memorial Highway, Rochdale, MA revise date 3/7/24 (Size 11x17)

REMARKS:

Dear Planning Board Members,

Enclosed are the above listed documents pertaining to the Site Plan Modification for 112 Huntoon Memorial Highway, Rochdale, MA. Please call me with any questions or comments at (508) 248-2005.

Sincerely,



Robert J Duff, P.E.
Senior Engineer

cc: Jack Daige, Central MA Crane Service, Inc., 112 Huntoon Memorial Highway, Rochdale, MA 01542

March 6, 2024

Leicester Planning Board
Town of Leicester
3 Washburn Square
Leicester, Massachusetts 01524

**Re: McClure Response to Quinn Engineering Peer Review comments date 2/22/24
Central Mass Crane - 2024 Site Plan Modification: Proposed Building
112 Huntoon Memorial Highway; Parcel IDs: 44-A-10 and 46-A-1.2**

Dear Planning Board Members:

McClure Engineering, Inc. (McClure) is in receipt of the following peer review comments from Quinn Engineering (Quinn) date February 22, 2024 relating to the "Site Plan Modification" 112 Huntoon Memorial Highway, Rochdale, MA, dated 1/31/24 by McClure Engineering, Inc. McClure provides the following technical responses to each comment:

Quinn Comments:

1. Under Chapter 15, *Stormwater Bylaw*, Section 4.0, A & D, a stormwater permit is required.
McClure Response: The applicant will apply for the stormwater permit.
2. Site plans are found to be complete, with the following exceptions:
 - a.) Proposed landscaping not found (REF: Site Plan Review Regulations, Section II, F, 6)
McClure Response: Applicant has requested a waiver from this requirement.
 - b.) Location where earth removal or filling is proposed, and volume of material to be moved not found. (REF: Site Plan Review Regulations, Section II, F, 9)
McClure Response: Area of fill has been added to Sheet C3. The preliminary estimate is approximately 5,000 to 6,000 CYD of material will be imported,
 - c.) Elevations for exterior facades of the proposed structure (REF: Site Plan Review Regulations, Section II, F, 10)
McClure Response: Per the owner, the proposed building will be 20 feet high with the roof peak of 21.5 feet at the center of the building.
3. A photometric plan has been submitted, which indicates that light intensity on adjoining properties will be .1 Fc or less, a minimal impact. The information received does not document the specific type of light fixture proposed. The original building constructed on this property is equipped with "wall-pack" fixtures, which emit light directly from the side of the building. Following construction, comments were received from neighbors, some located hundreds of feet away,

complaining of glare from the lights.

Leicester Planning Board may wish to request the Engineer explore the use of lights which direct light downward, or the use of shields, which re-direct light in a downward direction.

McClure Response: The submitted lighting plan shows no spillage into abutting properties. The proposed wall packs are on the front and rear of the building which means the lighting is not directed towards the abutters. The applicant is aware of the previous concerns and will provide shields to further prevent protection if deemed necessary by the Board at a further date. We request that this be included as a condition of approval.

4. Plans do not propose landscaping. Section 5.5.02.2 *Landscaping*, provides requirements for landscape plantings and landscape buffer.

McClure Response: Applicant has requested a waiver from this requirement.

5. A note should be added to plan which requires that the building roof have gutters, and that downspouts be connected into the underground roof drain system.

McClure Response: Note added to Sheet C3. Downspout Detail added to Sheet C6

6. Leicester Planning Board may wish to request the Engineer address the need for (or lack of need for) parking; plans propose no parking.

McClure Response: Currently the site has 20 parking spaces in front of the office building. This parking spaces count meets the required for both current and proposed development of the site. The applicant has requested a waiver from this requirement.

7. Pertaining to hydrology and stormwater:

- a.) Per Massachusetts Stormwater Management Policy and Leicester Stormwater Regulations, Section 4.0, A, 19, soil testing is required within the Infiltration Basin.

McClure Response: Witnessed soil testing was done in 2006 with the original site design. The testing produced consistent results in terms of soil type and estimated seasonal groundwater depth. This test data was used in the current design methodology. We believe that additional testing will not provide any different soil results.

- b.) The Leicester Planning Board may wish to consider if restricting access to the Infiltration Basin is necessary. Plans do not require a fence on the perimeter of the basin. The basin will retain approximately 2 feet of water for limited periods following severe storm events.

McClure Response: Fencing is not required and, in this design, not needed. This is a commercial site instead of a residential subdivision which greatly reduces the chance of unauthorized playing in the area. The basin will crest at 2.05 'during the 100 yr. storm event then quickly empty out. Besides the actual cost to install fencing, there is the on-going maintenance cost. The applicant requests not to install fencing with this site plan application.

- c.) In the hydrologic analysis, the Routing Diagram is too small to be legible.

McClure Response: revised Routing Diagram resubmitted.

Leicester Fire Department February 15, 2024 e-mail regarding access around the building

McClure Response: 25-foot gravel driveway is to be placed around the right side of the proposed building. This should provide sufficient access for fire vehicles around the entire building.

Cherry Valley and Rochdale Water District February 16, 2024 letter

McClure Response: We have contacted the water district Superintendent Benjamin Morris and he requested that we delay the Water Districts plan review application until the site plan has been approved by the Planning Board. We request that the Planning Board make this a condition of approval.

McClure is providing "Site Plan Modification" 112 Huntoon Memorial Highway, Rochdale, MA 01542," plan set revise date 3-7-24.

Please call me with any questions or comments at (508) 248-2005.

Sincerely,



Robert J Duff, P.E.
Senior Engineer

Enclosures

cc: Jack Daigne, Central MA Crane Service, Inc., 112 Huntoon Memorial Highway, Rochdale, MA 01542

March 6, 2024

Leicester Planning Board
Town of Leicester
3 Washburn Square
Leicester, Massachusetts 01524

**Re: Planning Board waiver request
Central Mass Crane - 2024 Site Plan Modification: Proposed Building
112 Huntoon Memorial Highway; Parcel IDs: 44-A-10 and 46-A-1.2**

Dear Planning Board Members

McClure Engineering on behalf of the applicant Mr. Jack Daigle Central Mass Crane Service requests waiver from the following Leicester Site Plan Regulations

Section II & Section 5.5.02.2 Landscaping. The original approved site plan has landscaping (trees) only on the southern property line. The proposed building will be in the rear of the property. There are no abutting structures in line with the proposed building. On the north and east side there are woods. Providing additional landscaping will not provide any benefit to the project.

Parking The project currently has 20 parking stalls located in the front of the office building. This number of parking spaces is sufficient for both the existing and proposed development of the site. Additional spaces for the proposed non-public building will not provide any benefit to the proposed project.

We thank the Planning Board for their consideration on this waiver requests. If there are any questions, please contact the undersigned at 508-248-2005

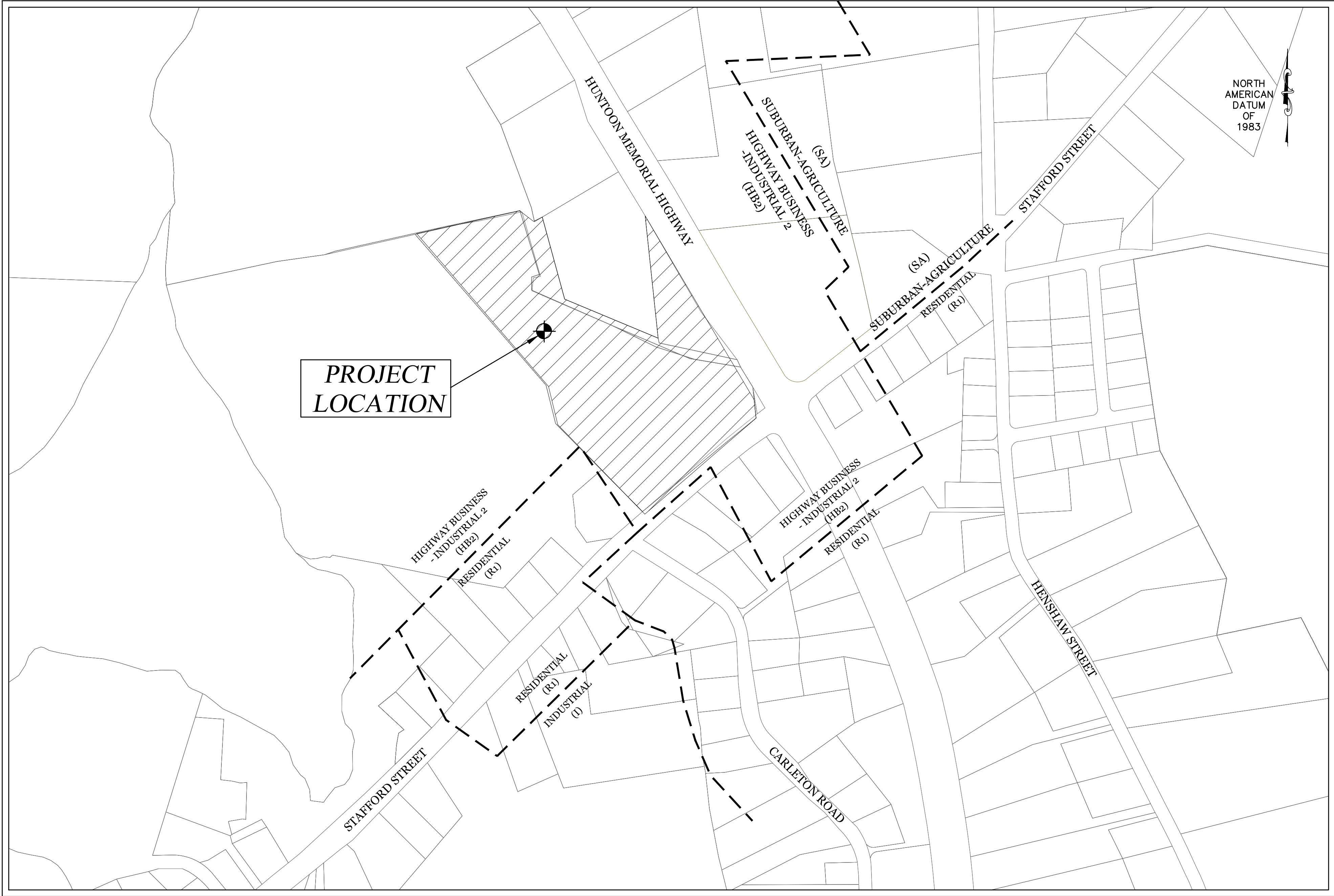
Respectfully



Robert J Duff P.E.

Senior cc: Jack Daigle, Central MA Crane Service, Inc., 112 Huntoon Memorial Highway, Rochdale, MA 01542

**SITE PLAN MODIFICATION
STORAGE-GARAGE BUILDING
112 HUNTOON MEMORIAL HIGHWAY
ROCHDALE, MA 01542-0338**



SITE LOCUS

$$\mathbf{1'' = 200}$$

DRAWING INDEX

C-1	TITLE SHEET
C-2	EXISTING CONDITIONS PLAN
C-3	LAYOUT, GRADING, AND UTILITY PLAN
C-4	EROSION AND SEDIMENTATION CONTROL PLAN
C-5 - C-6	CONSTRUCTION DETAILS

DIG-SAFE (1-888-344-7233) NOTE:
CONTRACTOR REQUIRED TO NOTIFY "DIG SAFE" 72 HOURS PRIOR TO ANY ON-SITE
EXCAVATION OR CONSTRUCTION AT 1-888-344-7233. CONTRACTOR SHALL ALSO
NOTIFY LOCAL WATER AND SEWER DEPARTMENTS TO MARK OUT THEIR UTILITIES.

TAX MAP REFERENCES

ASSESSORS ID: 46-A-1.2, 44-A-7 (FORMERLY),
44-A-10

RECORD OWNERS:

HUNTOON HIGHWAY, LLC.
112 HUNTOON MEMORIAL HIGHWAY
ROCHDALE, MA 01542-0338

DEED & PLAN REFERENCES:

(WORCESTER COUNTY REGISTRY OF DEEDS)

DEED BOOK: 52916 PAGE: 330
DEED BOOK 64563, PAGE 143
DEED BOOK 63722, PAGE 154
PLAN BOOK 897 PLAN 103
PLAN BOOK 953 PLAN 19
PLAN BOOK 954 PLAN 101

GENERAL NOTES

- 1). THE PURPOSE OF THIS PLAN IS TO SHOW A PROPOSED GARAGE-STORAGE BUILDING AT 112 HUNTOON MEMORIAL HIGHWAY, ROCHDALE, MA.

- 2). THE SUBJECT PROPERTY IS LOCATED WITHIN THE ZONE (HB2) ZONING DISTRICT THAT HAVE THE FOLLOWING DIMENSIONAL REQUIREMENTS:

HB2 ZONE:	REQUIRED	PROVIDED
MINIMUM LOT AREA:	45,000 S.F.	426,888 S.F.±
MINIMUM LOT FRONTAGE:	200'	477'
FRONT SETBACK:	50'	722.8'
SIDE SETBACK:	50'	67.4'
REAR SETBACK:	50'	97.8'
MAXIMUM STORIES:	5 1/2 STORIES	2 STORY
MAX. BLDG. COVERAGE	40%	5%

- 3). THIS PLAN IS PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT AND IS SUBJECT TO ANY MATTERS THAT SUCH A REPORT MAY DISCLOSE.

- 4). THE WORK DEPICTED ON THIS PLAN IS SUBJECT TO THE TOWN OF LEICESTER SITE PLAN REQUIREMENTS AND THE MASSACHUSETTS STORMWATER MANAGEMENT BY-LAWS.

- 5). THE PROPERTY IS SUBJECT TO AND HAS THE BENEFIT OF SITE PLAN APPROVAL (SPR2014-1).

PROJECT ENGINEER:

ROBERT J DUFF, P.E.
MCCLURE ENGINEERING, INC.
119 WORCESTER ROAD
CHARLTON, MA 01507
PHONE: (508) 248-2005

PROJECT SURVEYOR:

MARK LAPRAD, P.L.S.
MCCLURE ENGINEERING, INC.
119 WORCESTER ROAD
CHARLTON, MA 01507
PHONE: (508) 248-2005

SURVEY NOTES:

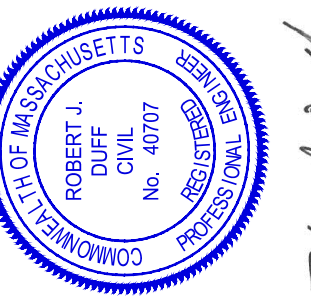
1. SITE EXISTING CONDITIONS, PROPERTY BOUNDARIES, AND TOPOGRAPHY BASED ON AN ON THE GROUND SURVEY CONDUCTED BY MCCLURE ENGINEERING, INC. TOPOGRAPHY SUPPLEMENTED WITH U.S.G.S. 2015 LIDAR.

2. SITE DOES NOT APPEAR TO LIE WITHIN THE 100-YEAR FLOOD ZONE ACCORDING TO FEMA FIRM MAP NO. 25027C0784E, EFFECTIVE JULY 21, 2023.

LEICESTER PLANNING BOARD
SITE PLAN APPROVAL

ROBERT J DUFF, PE
PROFESSIONAL ENGINEER

MA LIC. NO. 40707



McCLURE
ENGINEERING, INC.
Road Tel: (508) 253-1111

Charlton, MA 01507
Fax (508) 248-4887
Email: rduff@mcclureengineers.com

SITE PLAN MODIFICATION
1112 HUNTOON MEMORIAL HIGHWAY
ROCHDALE, MA
PREPARED FOR
HUNTOON HIGHWAY, LLC

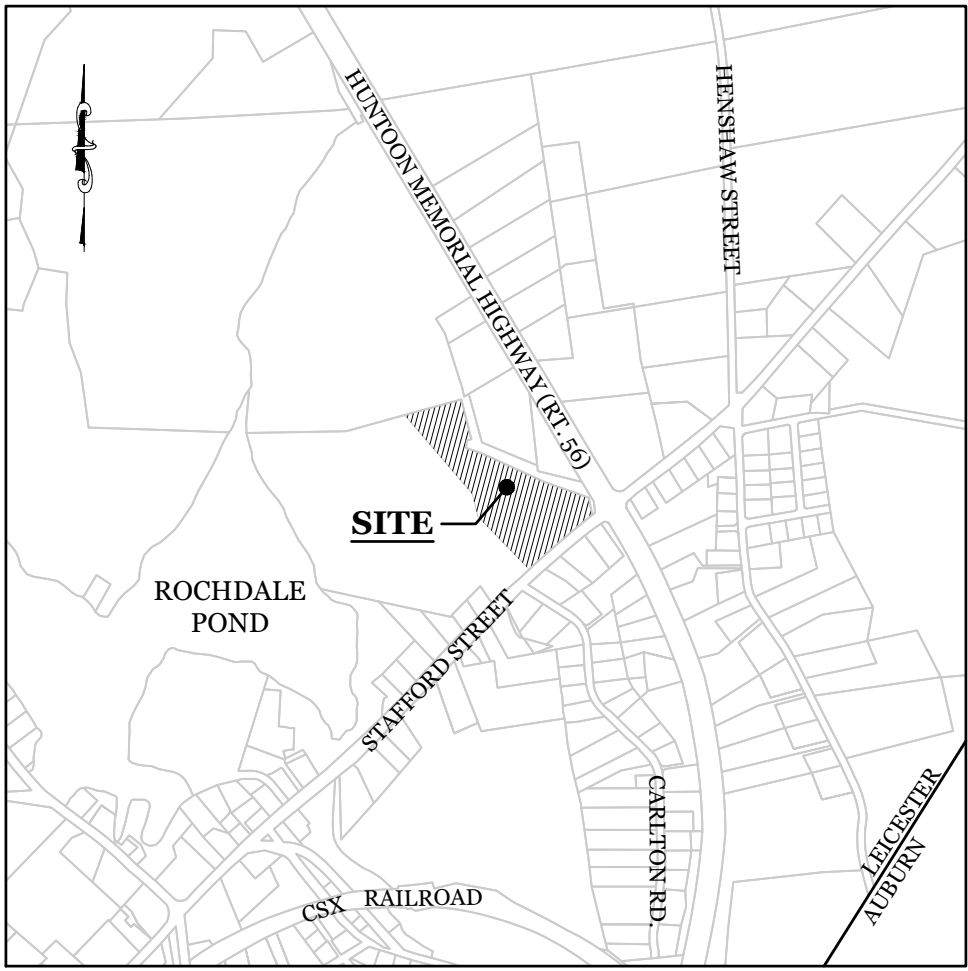
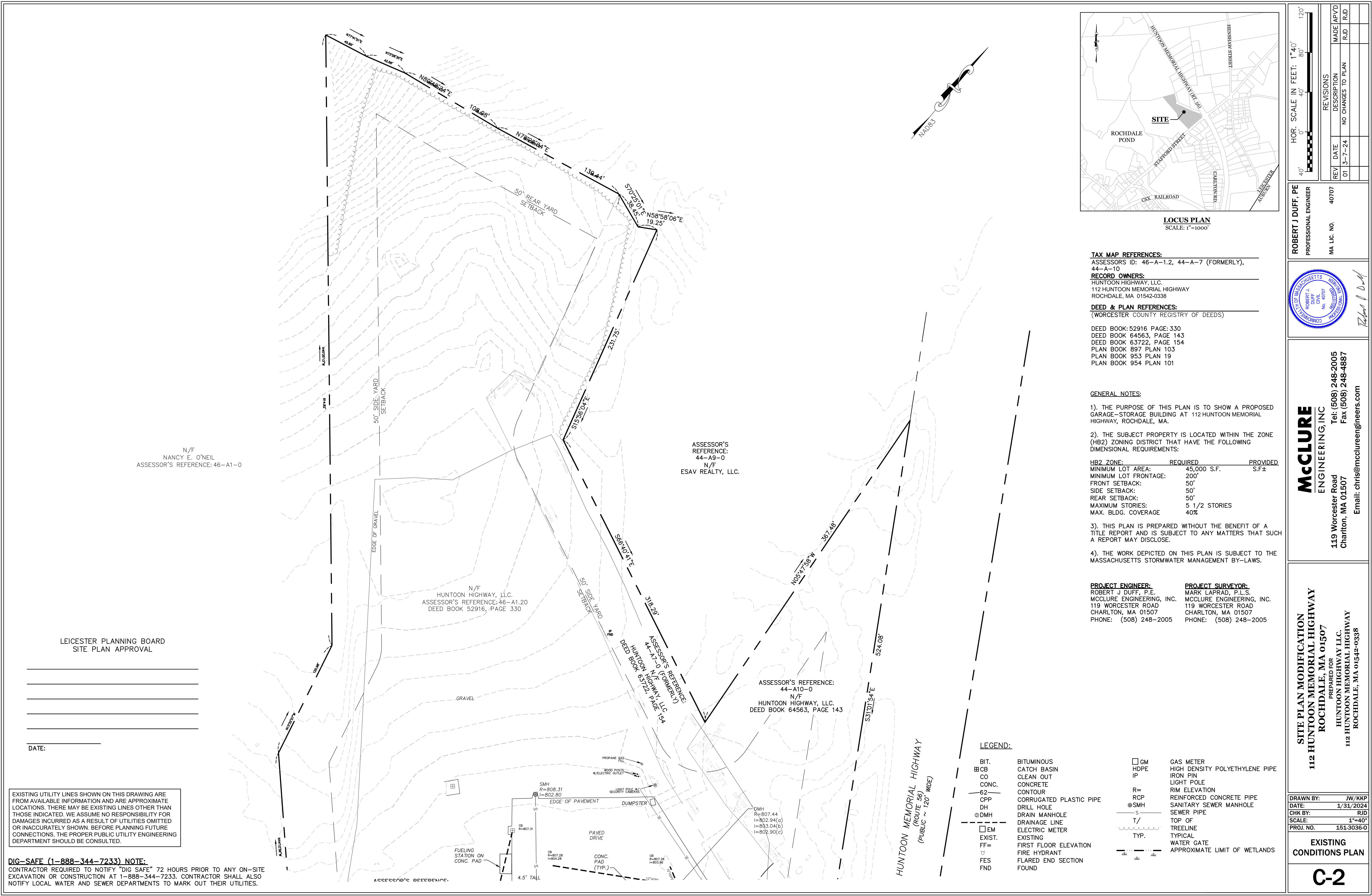
**112 HUNTOON MEMORIAL HIGHWAY
HUNTOON HIGHWAY, LLC.
ROCHDALE, MA 01542-0338**

DRAWN BY:	KKP
DATE:	1/31/2024
CHECK BY:	RJD
SCALE:	1"=200'
PROJ. NO.	151-3036-0

TITLE SHEET

C-1

T:_ACTIVE CLIENTS-PROJECTS FOLDER\CENTRAL MA Crane\112 Huntoon Mem Hwy_Site Plan\dwg\151-3036-O_EC.dwg, 3/7/2024 11:28:21 AM, AutoCAD PDF (General Documentation).p3



TAX MAP REFERENCES:
ASSESSORS ID: 46-A-1.2, 44-A-7 (FORMERLY), 44-A-10
RECORD OWNERS:
HUNTOON HIGHWAY, LLC.
112 HUNTOON MEMORIAL HIGHWAY
ROCHDALE, MA 01542-0338
DEED & PLAN REFERENCES:
(WORCESTER COUNTY REGISTRY OF DEEDS)

DEED BOOK: 52916, PAGE: 330
DEED BOOK 64563, PAGE 143
DEED BOOK 63722, PAGE 154
PLAN BOOK 897 PLAN 103
PLAN BOOK 953 PLAN 19
PLAN BOOK 954 PLAN 101

GENERAL NOTES:

1). THE PURPOSE OF THIS PLAN IS TO SHOW A PROPOSED GARAGE-STORAGE BUILDING AT 112 HUNTOON MEMORIAL HIGHWAY, ROCHESTER, MA.

2). THE SUBJECT PROPERTY IS LOCATED WITHIN THE ZONE (HB2) ZONING DISTRICT THAT HAVE THE FOLLOWING DIMENSIONAL REQUIREMENTS:

HB2 ZONE: REQUIRED PROVIDED
MINIMUM LOT AREA: 45,000 S.F. S.F.±
MINIMUM LOT FRONTAGE: 200'
FRONT SETBACK: 50'
SIDE SETBACK: 50'
REAR SETBACK: 50'
MAXIMUM STORIES: 5 1/2 STORIES
MAX. BLDG. COVERAGE 40%

3). THIS PLAN IS PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT AND IS SUBJECT TO ANY MATTERS THAT SUCH A REPORT MAY DISCLOSE.

4). THE WORK DEPICTED ON THIS PLAN IS SUBJECT TO THE MASSACHUSETTS STORMWATER MANAGEMENT BY-LAWS.

PROJECT ENGINEER:
ROBERT J DUFF, P.E.
MCCLURE ENGINEERING, INC.
119 WORCESTER ROAD
CHARLTON, MA 01507
PHONE: (508) 248-2005
PROJECT SURVEYOR:
MARK LAPRAD, P.L.S.
MCCLURE ENGINEERING, INC.
119 WORCESTER ROAD
CHARLTON, MA 01507
PHONE: (508) 248-2005

LEGEND:

BIT. BITUMINOUS
CB CATCH BASIN
CO CLEAN OUT
CONC. CONCRETE
62 CONTOUR
CPP CORRUGATED PLASTIC PIPE
DH DRILL HOLE
DMH DRAIN MANHOLE
EM DRAINAGE LINE
EXIST. EXISTING
FF= FIRST FLOOR ELEVATION
FES FIRE HYDRANT
FND FLARED END SECTION
FOUND

GM GAS METER
HDPE HIGH DENSITY POLYETHYLENE PIPE
IP IRON PIN
R= RIM ELEVATION
RCP REINFORCED CONCRETE PIPE
SMH SANITARY SEWER MANHOLE
S SEWER PIPE
T/ TOP OF
TYP. TYPICAL
WATER GATE
APPROXIMATE LIMIT OF WETLANDS

ROBERT J DUFF, PE
PROFESSIONAL ENGINEER
MA LIC. NO. 40707

Robert J. Duff

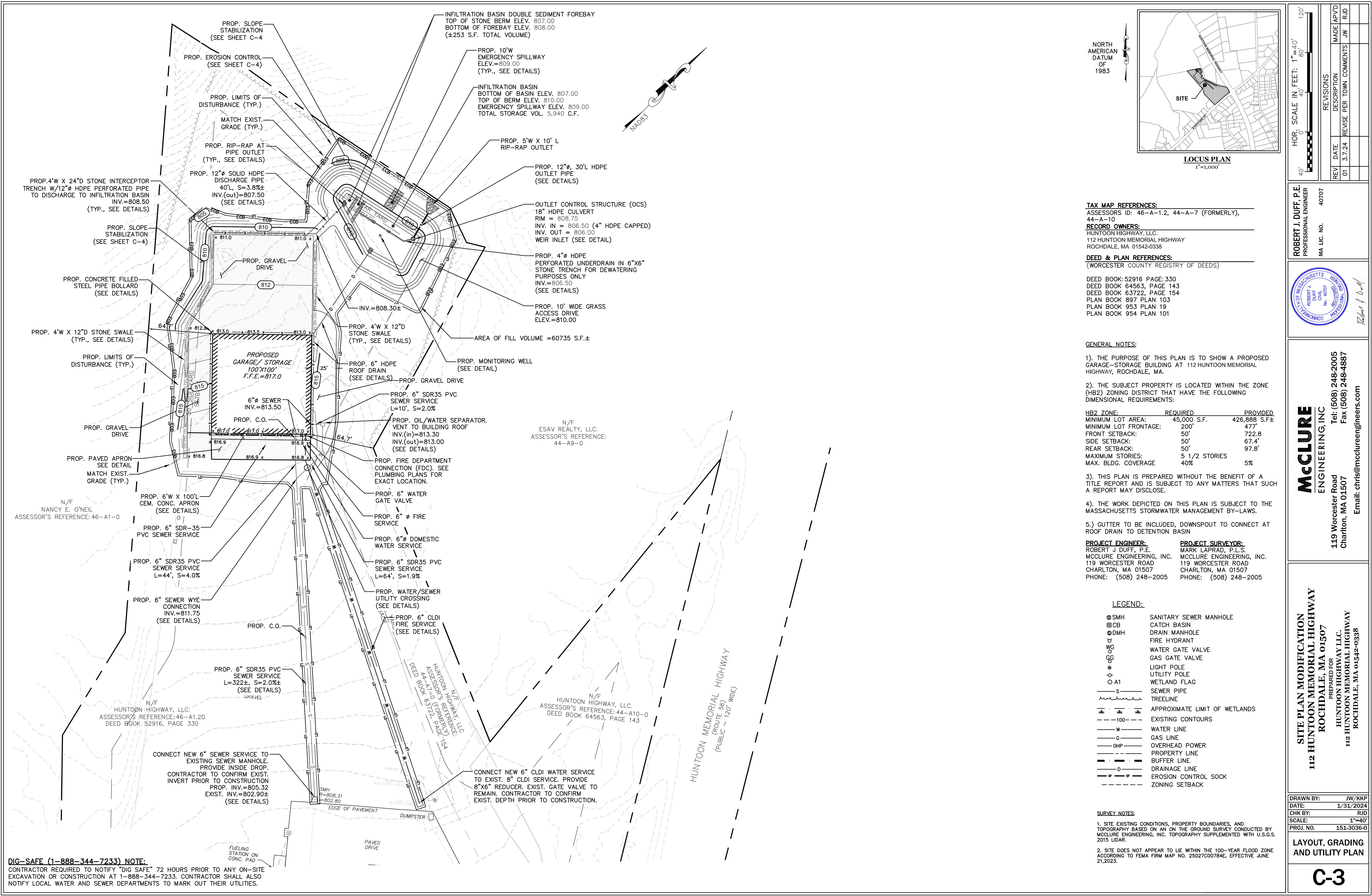
McCLURE
ENGINEERING, INC.
119 Worcester Road
Charlton, MA 01507
Tel: (508) 248-2005
Fax (508) 248-4887
Email: chris@mcclureengineers.com

SITE PLAN MODIFICATION
112 HUNTOON MEMORIAL HIGHWAY
ROCHESTER, MA 01507
PREPARED FOR
HUNTOON HIGHWAY LLC.
112 HUNTOON MEMORIAL HIGHWAY
ROCHESTER, MA 01542-0338

DRAWN BY: JW/KKP
DATE: 1/31/2024
CHK BY: RJD
SCALE: 1"=40'
PROJ. NO. 151-3036-0

EXISTING
CONDITIONS PLAN
C-2

T:_ACTIVE CLIENTS-PROJECTS FOLDER\CENTRAL MA CRANE\151-3036-0_Central MA Crane_112 Huntoon Mem Hwy_Site Plan.dwg, 3/7/2024 11:10:12 AM, Adobe PDF



ROBERT J. DUFF, P.E.
PROFESSIONAL ENGINEER
MA LIC. NO. 40707

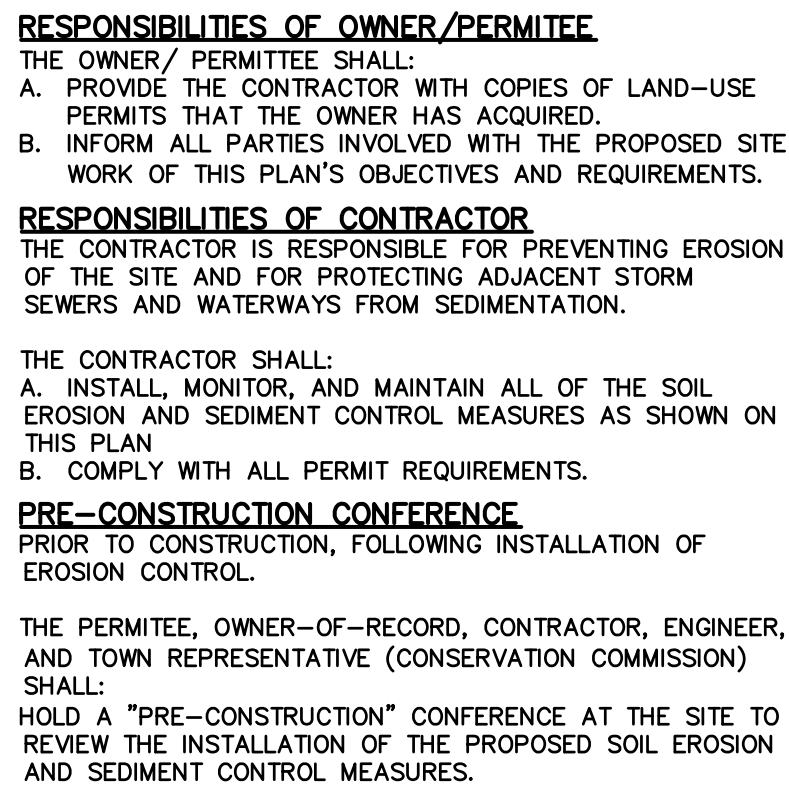
McCLURE ENGINEERING, INC.
119 Worcester Road
Charlton, MA 01507
Tel: (508) 248-2005
Fax: (508) 248-4887
Email: chris@mcclureengineers.com

SITE PLAN MODIFICATION
112 HUNTOON MEMORIAL HIGHWAY
ROCHDALE, MA 01507
PREPARED FOR
HUNTOON HIGHWAY LLC.
112 HUNTOON MEMORIAL HIGHWAY
ROCHDALE, MA 01542-0338

LAYOUT, GRADING AND UTILITY PLAN

C-3

DRAWN BY: JW/KKP
DATE: 1/31/2024
CHK BY: RJD
SCALE: 1"=40'
PROJ. NO. 151-3036-0



GENERAL CONTROLS

1. CLEANSING OF STORMWATER STRUCTURES:
CLEAN ALL STORMWATER STRUCTURES INCLUDING, BUT NOT LIMITED TO, TOWNS, SWALES, SUBSURFACE RETENTION BASINS, SEDIMENT TRAPS, AND RIPRAP APRONS OF SEDIMENT UPON COMPLETION OF THE PROJECT.

2. PAVEMENT MAINTENANCE:
THE CONTRACTOR SHALL SWEEP PAVED ROADWAYS ADDITIONALLY TO THE SCHEDULED BASIS TO PREVENT TRACKING OF MUD INTO PUBLIC ROADWAYS AND WASHING OF MUD INTO WATERWAYS. IF THE CONTRACTOR'S SCHEDULE FOR CLEANING THE PAVEMENT IS FOUND TO BE INADEQUATE BY THE OWNER, OWNER'S REPRESENTATIVE, OR TOWN, THE CONTRACTOR SHALL INCREASE THE FREQUENCY AT NO ADDITIONAL COST TO THE OWNER.

3. WASTE DISPOSAL:
THE CONTRACTOR SHALL PROVIDE AN ADEQUATE NUMBER OF COVERED WASTE CONTAINERS TO ENSURE THAT NO LITTER OR NON-HAZARDOUS MATERIALS OR SIMILAR MATERIALS ARE DISCHARGED TO WETLANDS OR WATERCOURSES. THE CONTRACTOR SHALL INSTRUCT SUBCONTRACTORS TO USE THE CONTAINERS FOR WASTE MATERIAL. THE CONTAINERS SHALL BE PROMPTLY EMPTIED WHEN FULL.

GENERAL CONDITIONS

1. IF EROSION CONTROL MEASURES ARE DAMAGED BY CONSTRUCTION VEHICLES, ACTS OF VANDALISM, OR SEVERE WEATHER, THE CONTRACTOR SHALL IMMEDIATELY REMOVE SEDIMENT IN THE VICINITY OF THE EROSION CONTROL MEASURES AND REPAIR THESE MEASURES TO A FUNCTIONAL CONDITION.

2. IF, DURING OR AFTER CONSTRUCTION, IT BECOMES APPARENT THAT EXISTING EROSION CONTROL MEASURES ARE INCAPABLE OF CONTROLLING EROSION, THE ENGINEER OR THE TOWN MAY REQUIRE ADDITIONAL CONTROL MEASURES, INCLUDING BUT NOT LIMITED TO: ADDITIONAL STRAW WATTLE FENCE, SEDIMENT BASINS, MECHANICALLY ANCHORED MULCH, OR ENHANCED DEWATERING FILTRATION.

DESCRIPTION AND MAINTENANCE OF EROSION CONTROL MEASURES

TEMPORARY STABILIZATION MEASURES

EROSION CONTROL BARRIERS:

INSTALL EROSION CONTROL BARRIERS AT VARIOUS LOCATIONS AS SHOWN ON THE PLANS AND DETAILS. EMBED THE EROSION CONTROL BARRIER INTO THE GROUND AND FIRMLY ANCHOR IT AS SHOWN IN THE DETAILS. REMOVE SEDIMENT ONCE LEVELS HAVE REACHED 1/4 OF THE EFFECTIVE HEIGHT. REPAIR AND/OR REPLACE THE SILT FENCE/ HAYBALES IMMEDIATELY IF DAMAGED OR DETERIORATED.

STOCKPILING OR STORAGE OF EXCAVATED MATERIALS: COMPLETELY SURROUND TEMPORARY MATERIAL STOCKPILES WITH STRAW WATTLES TO PREVENT TRANSPORTATION OF SEDIMENT. NO STOCKPILES SHALL BE KEPT WITHIN 100' WETLAND BUFFER ZONES.

DUST CONTROL:

TAKE PRECAUTIONS TO PREVENT DUST FROM BECOMING A PROBLEM FOR ADJACENT PROPERTY OWNERS. BROOM OFF PAVEMENT AREAS ADJOINING THE EXCAVATION ON A DAILY BASIS. COVER AND/OR KEEP MOST ALL EARTH STOCKPILES AT ALL TIMES. USE CALCIUM CHLORIDE TO CONTROL DUST OVER CERTAIN AREAS OF THE SITE AS NEEDED AND/OR AS DIRECTED. CALCIUM CHLORIDE SHALL CONFORM TO ASTM D-88, TYPE 1. THE CONTRACTOR SHALL MAINTAIN AND INSPECT, ON A DAILY BASIS, THE ADEQUACY OF DUST CONTROL MEASURES AND CORRECT ANY DEFICIENCIES IMMEDIATELY.

DEWATERING:

IF DEWATERING IS REQUIRED, WATER SHOULD BE DISCHARGED TO DEWATERING BASINS OR OTHER SEDIMENT REMOVAL DEVICES PRIOR TO DISCHARGE TO ADJACENT AREAS. WATER MAY ALSO BE USED FOR DUST CONTROL AND/OR VEGETATION WATERING.

CONSTRUCTION SCHEDULE AND EROSION & SEDIMENTATION CONTROL CHECKLIST

112 HUNTOON MEMORIAL HIGHWAY

NO.	WORK DESCRIPTION
SEQUENCE OF CONSTRUCTION	
THE FOLLOWING NARRATIVE DESCRIBES THE PLANNED CONSTRUCTION SEQUENCE WITH AN EMPHASIS ON THE TIMING AND SEQUENCE OF EROSION/SEDIMENTATION CONTROL MEASURES:	
THE FOLLOWING CONSTRUCTION SEQUENCE WILL BE REQUIRED TO INSURE THE EFFECTIVENESS OF THE EROSION/SEDIMENT CONTROL MEASURES IS OPTIMIZED.	
1.	INSTALL STABILIZED CONSTRUCTION EXIT(S), SWPPP ENTRANCE SIGN, AND DEP SIGN.
2.	INSTALL EROSION CONTROL BARRIERS ON THE ENTIRE SITE (CLEAR ONLY THOSE AREAS NECESSARY TO INSTALL SILT FENCE AND HAYBALES).
3.	EROSION CONTROL INSPECTION WILL BE CONDUCTED AFTER INSTALLATION OF EROSION CONTROL BARRIERS.
4.	PREPARE TEMPORARY PARKING AND STORAGE AREA UPON IMPLEMENTATION AND INSTALLATION OF THE FOLLOWING AREAS: PARKING, LAY DOWN, PORTA POTTY, MATERIAL STORAGE CONTAINERS, ETC., DENOTE THEM ON THE SITE MAPS IMMEDIATELY AND NOTE ANY CHANGES IN THE LOCATIONS AS THEY OCCUR THROUGHOUT THE CONSTRUCTION PERIOD.
5.	CLEAR AND GRUB AREA FOR SEDIMENT TRAPS. CONSTRUCT AND STABILIZE SEDIMENT TRAPS. HALT ALL ACTIVITIES AND CONTACT THE CIVIL ENGINEERING CONSULTANT TO PERFORM INSPECTION AND CERTIFICATION OF BMP'S. GENERAL CONTRACTOR SHALL SCHEDULE AND CONDUCT STORM WATER PRE-CONSTRUCTION MEETING WITH ENGINEER AND ALL GROUND-DISTURBING CONTRACTORS BEFORE PROCEEDING WITH CONSTRUCTION.
6.	BEGIN CLEARING AND GRUBBING THE SITE.
7.	INSTALL TEMPORARY DIVERSION DITCHES AND CHECK DAMS.
8.	BEGIN GRADING THE SITE AS NEEDED.
9.	START INSTALLATION OF DRAINAGE, UTILITIES AND SITE WORK.
10.	TEMPORARILY SEED, THROUGHOUT CONSTRUCTION, DENUDED AREAS THAT WILL BE INACTIVE FOR 15 DAYS OR MORE. PERMANENTLY STABILIZE AREA TO BE VEGETATED AS THEY ARE COMPLETED.
FINAL PHASE	
1.	PERMANENTLY STABILIZE ANY REMAINING EXPOSED AREAS.
2.	TEMPORARY DRAINAGE DITCHES TO BE REMOVED AND STABILIZED.
3.	SEDIMENT FROM TRAPS TO BE REMOVED AND SEDIMENT DISPOSED OF OFFSITE. BASINS ARE TO BE REMOVED TO THE EXTENT OF THE BASINS AS SHOWN ON LAYOUT, GRADING AND UTILITY PLAN.
4.	ONCE ENTIRE SITE IS STABILIZED, CALL FOR FINAL INSPECTION FROM SITE MONITOR.
NOTES:	
ONCE CONSTRUCTION IS COMPLETED, ALL DISTURBED AREAS ARE TO BE STABILIZED WITH LOAM AND SEED UNLESS OTHERWISE SPECIFIED.	
INSPECTIONS WILL BE CONDUCTED WEEKLY AND AFTER 0.25 INCH RAIN EVENTS. COPIES OF WEEKLY INSPECTION REPORTS SHALL BE KEPT ON RECORD AND PROVIDED TO THE TOWN AND ENGINEER AT THEIR REQUEST.	
EXTRA EROSION CONTROL MATERIALS (STRAW WATLES, SILT FENCE) EQUAL TO 100 LF SHALL BE KEPT ON SITE FOR EMERGENCY REPAIRS. THESE MATERIALS SHALL BE KEPT COVERED.	
NOTE: APPLICANT AND/OR LANDOWNER SHALL NOTIFY THE TOWN OF LEICESTER IN WRITING AT LEAST FIVE (5) BUSINESS DAYS PRIOR TO COMMENCING ANY WORK.	

Robert J Duff, PE

PROFESSIONAL ENGINEER

MA LIC. NO. 40707

40' 0" 40' 80' 120'

HOR. SCALE IN FEET: 1"=40'

REV

DATE

REVISIONS

DESCRIPTION

MADE BY

APV

Robert J. Duff

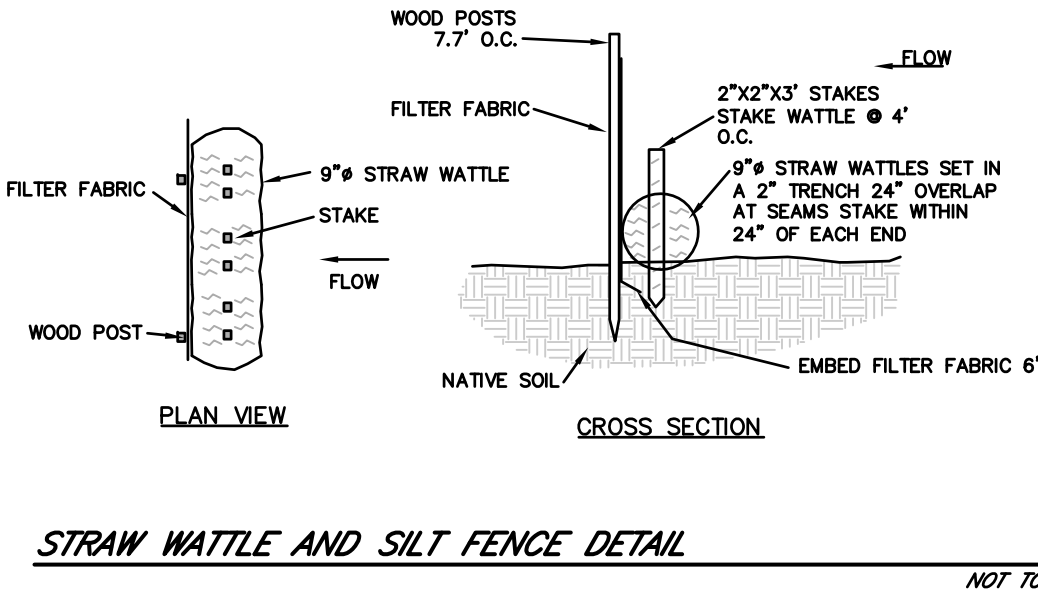
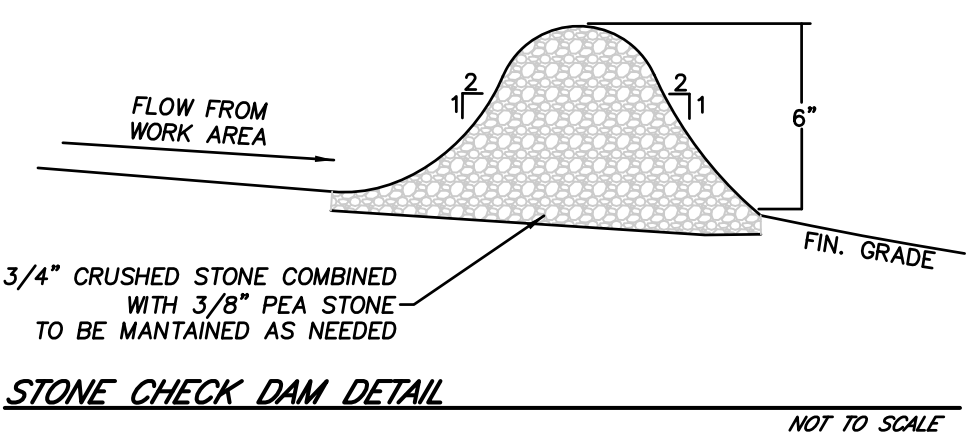
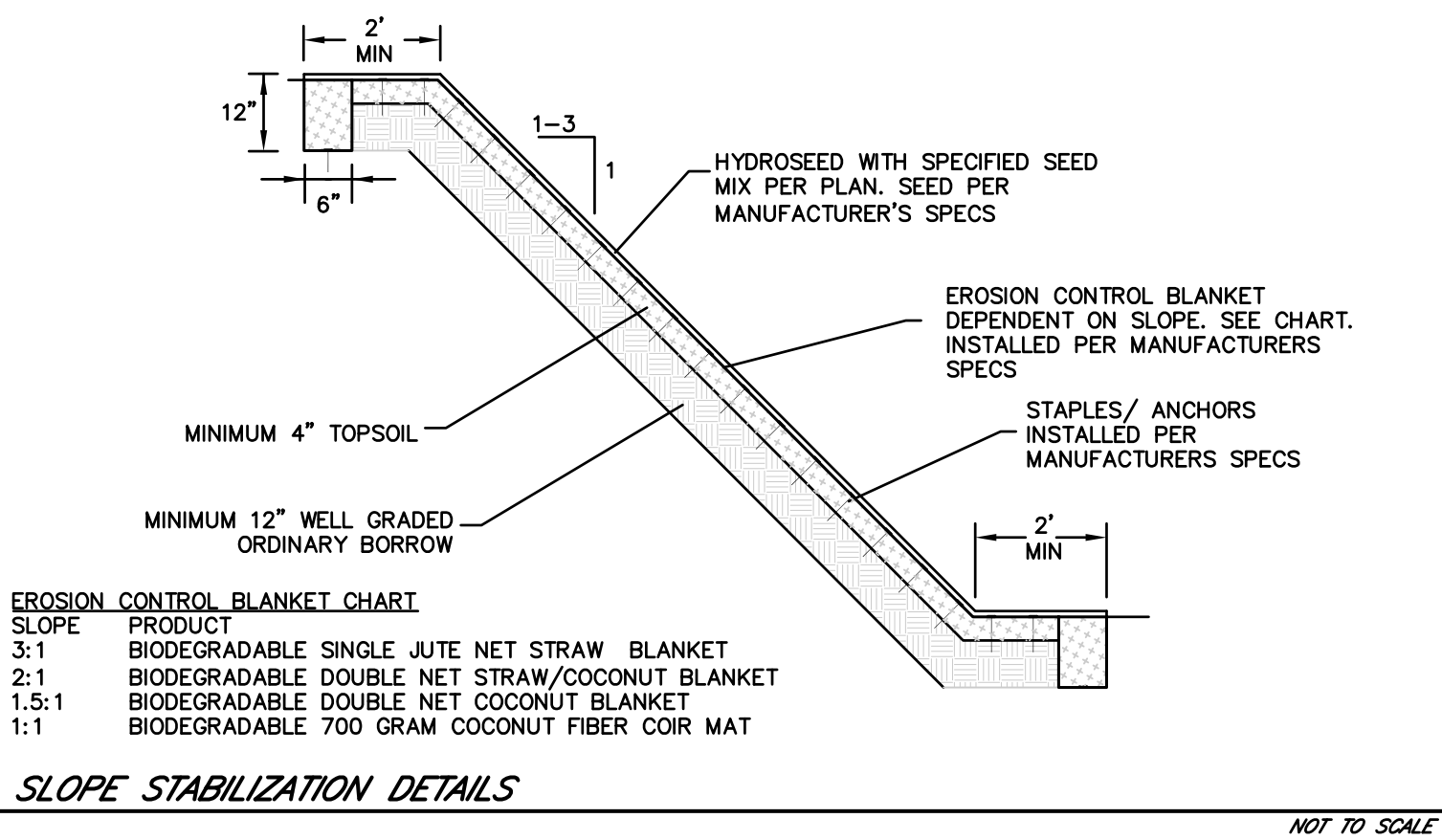
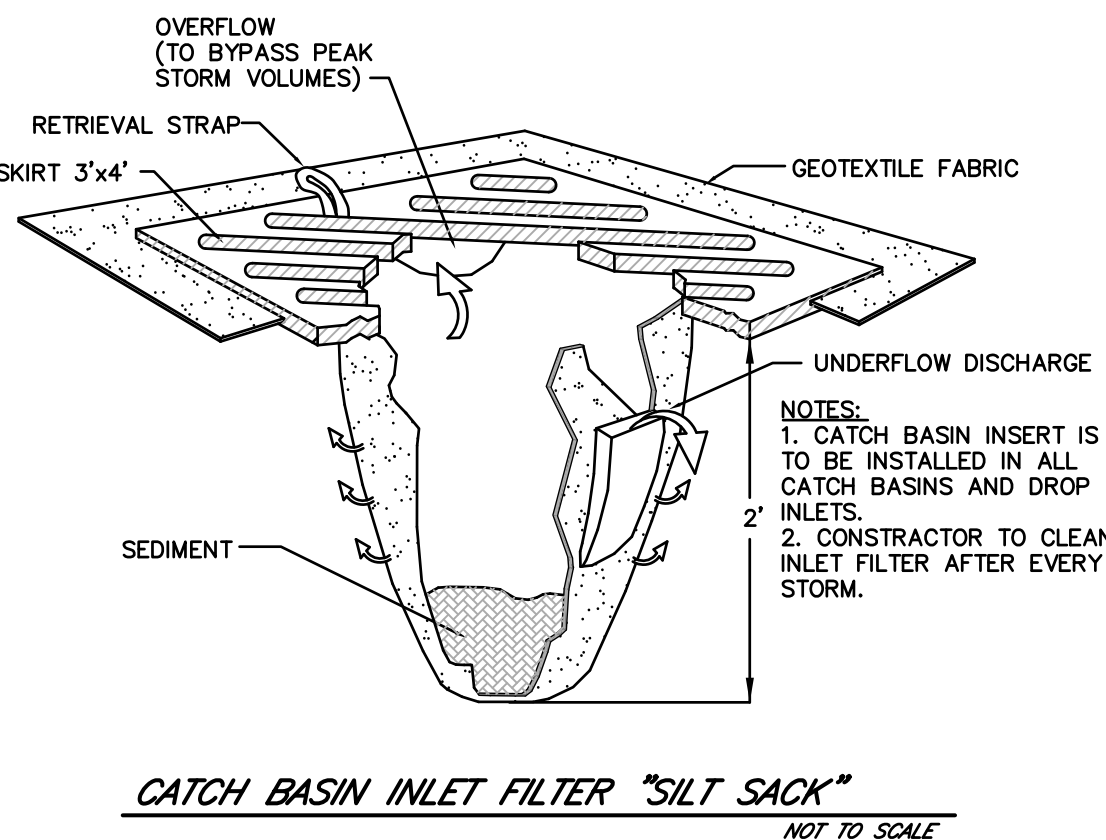
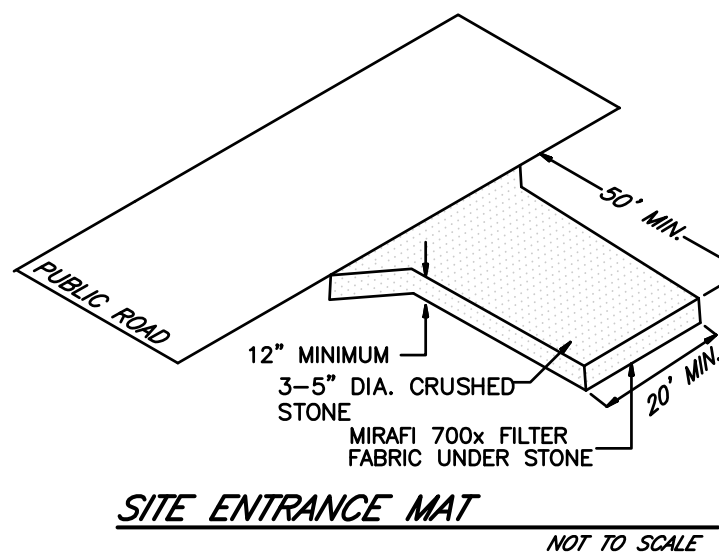
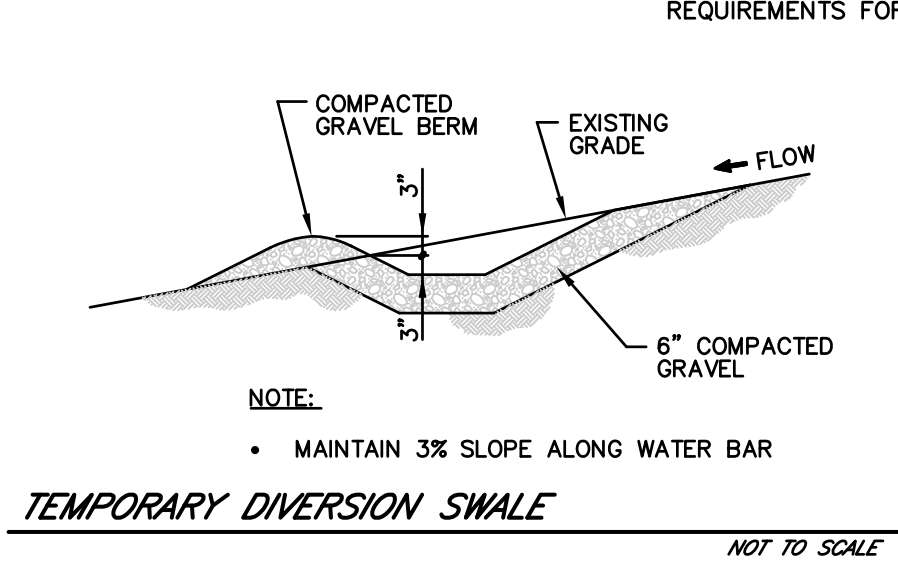
McCLURE
ENGINEERING, INC.
119 Worcester Road
Charlton, MA 01507
Tel: (508) 248-2005
Fax (508) 248-4887
Email: chris@mcclureengineers.com

SITE PLAN MODIFICATION
1112 HUNTON MEMORIAL HIGHWAY
ROCHDALE, MA 01507

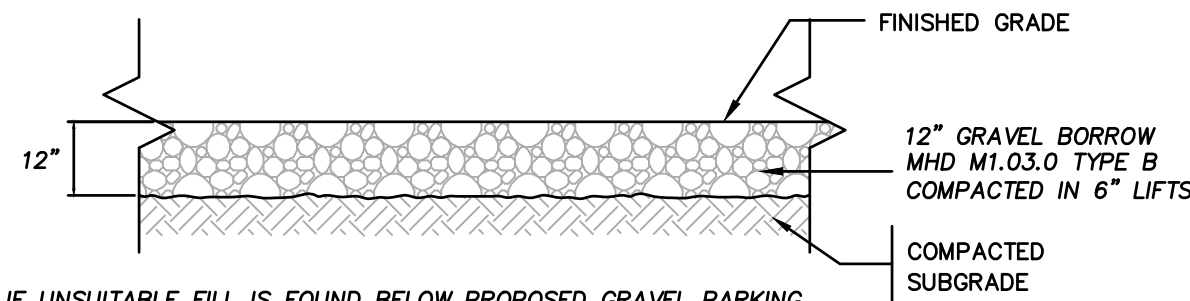
PREPARED FOR
HUNTON HIGHWAY LLC.
112 HUNTON MEMORIAL HIGHWAY
ROCHDALE, MA 01542-0338

DRAWN BY:	JW
DATE:	1/31/2024
CHK BY:	RJD
SCALE:	1" = 40'
PROJ. NO.	151-3036-0

SOIL EROSION & SEDIMENT CONTROL PLAN
C-4

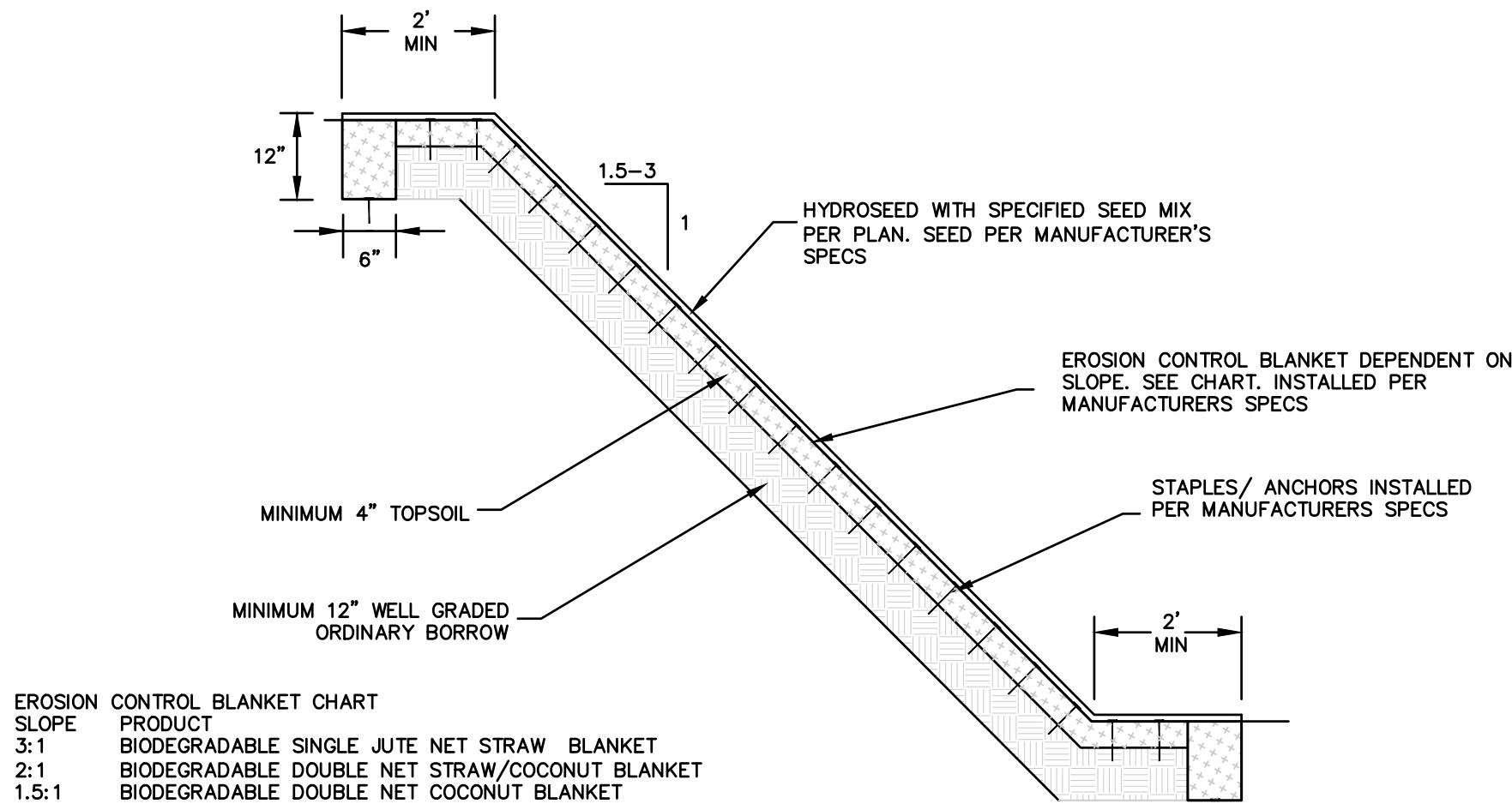


T:_ACTIVE CLIENTS-PROJECTS FOLDER\CENTRAL MA CRANE\151-3036-0_Central MA Crane_112 Huntton Mem Hwy_Site Plan.dwg 151-3036-0_Details.dwg 3/7/2024 11:22:47 AM, AutoCAD PDF (General Documentation).pc3



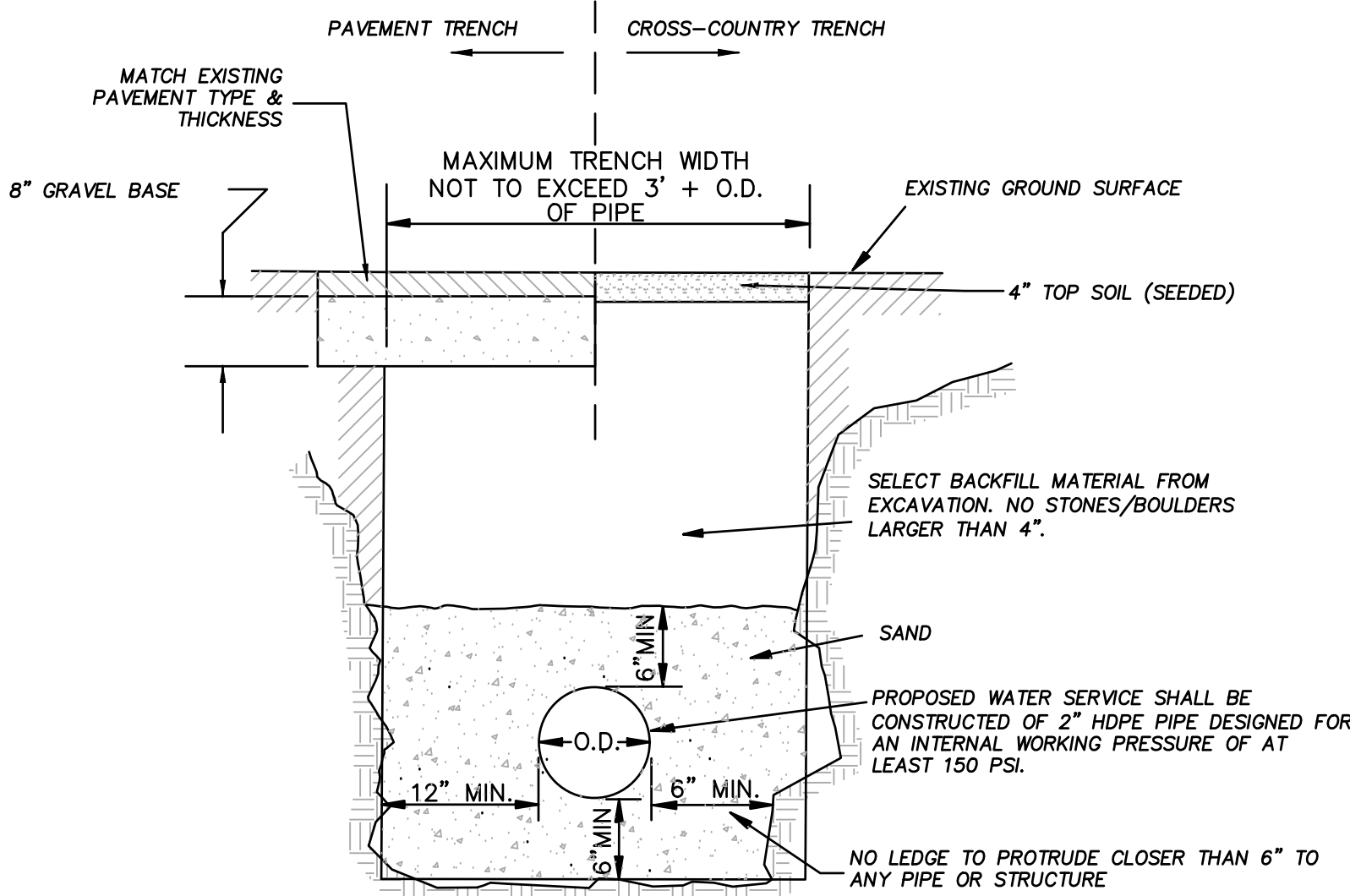
GRAVEL PARKING LOT DETAIL

NOT TO SCALE



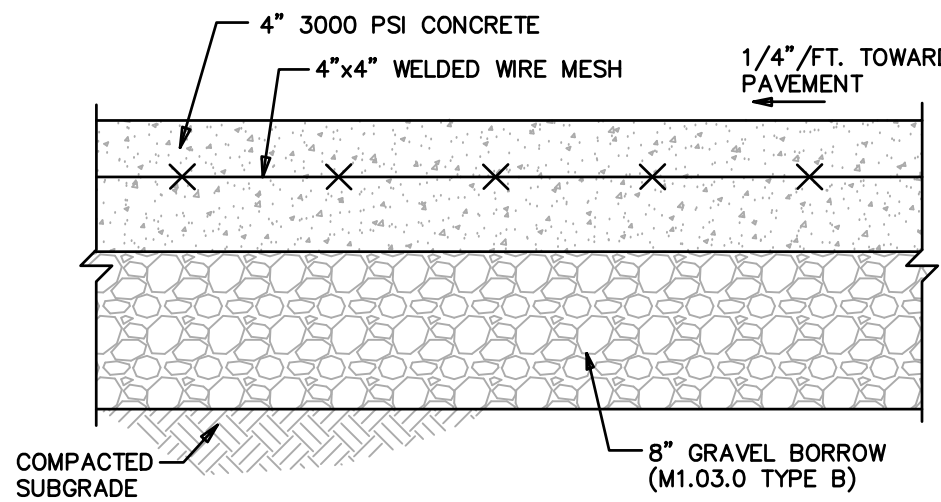
SLOPE STABILIZATION DETAILS

NOT TO SCALE



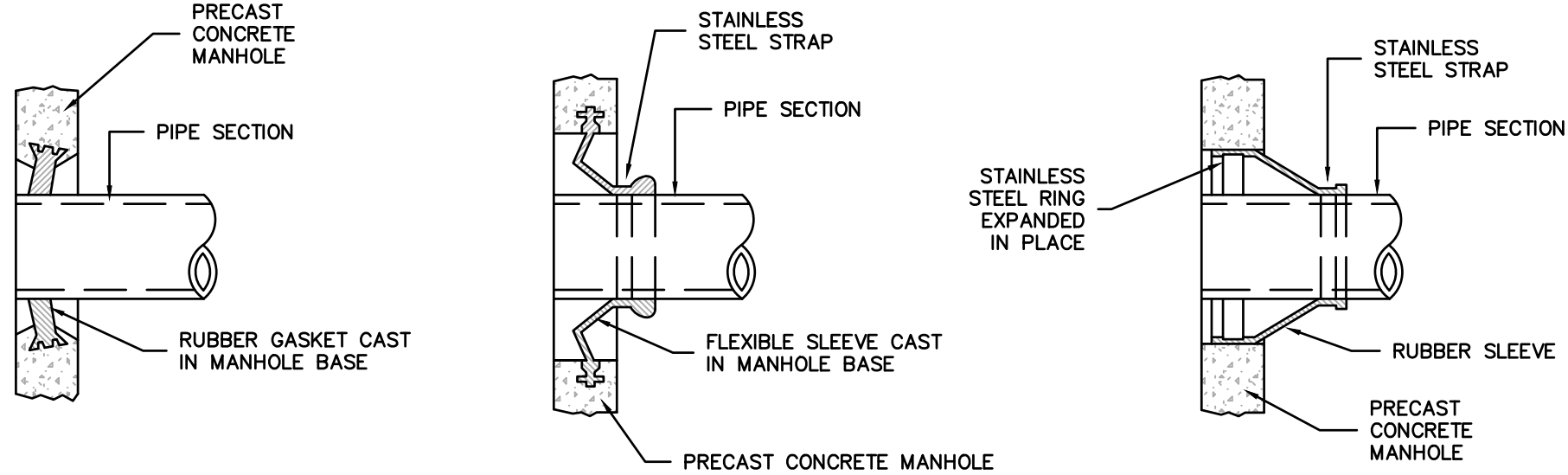
TYPICAL WATER SERVICE TRENCH SECTION

NOT TO SCALE



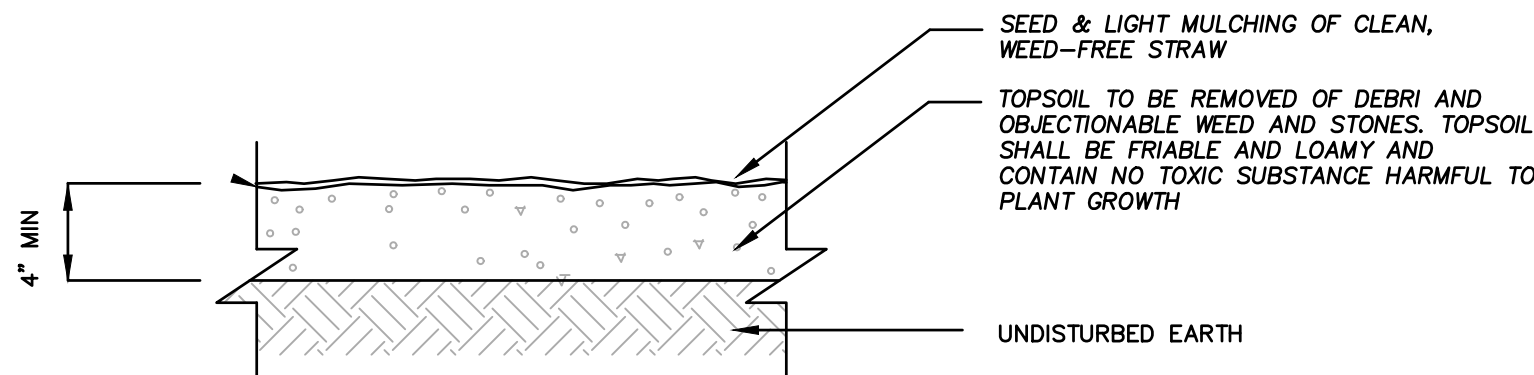
CONCRETE APRON DETAIL

NOT TO SCALE



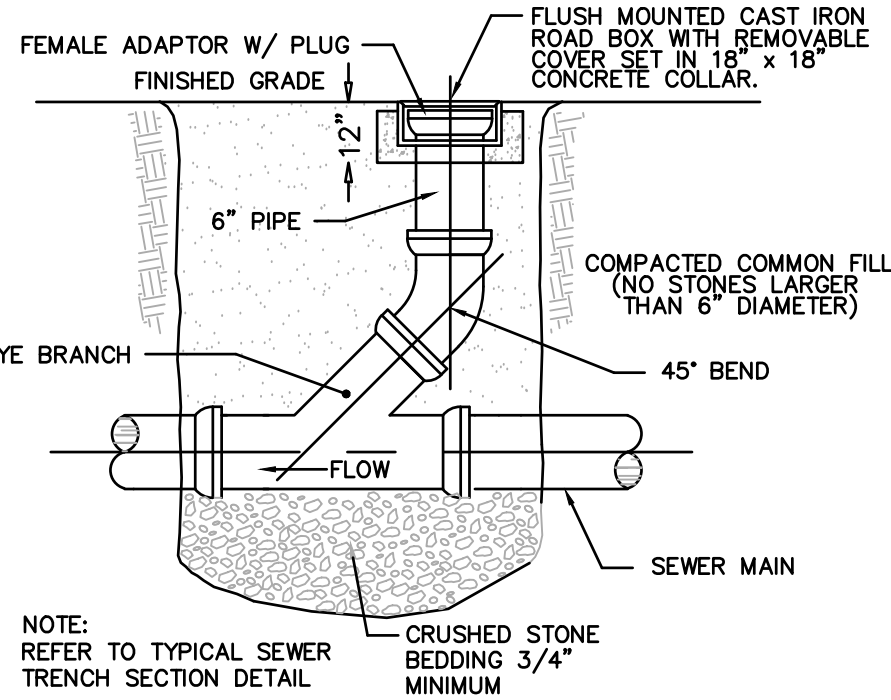
MANHOLE SEAL DETAILS

NOT TO SCALE



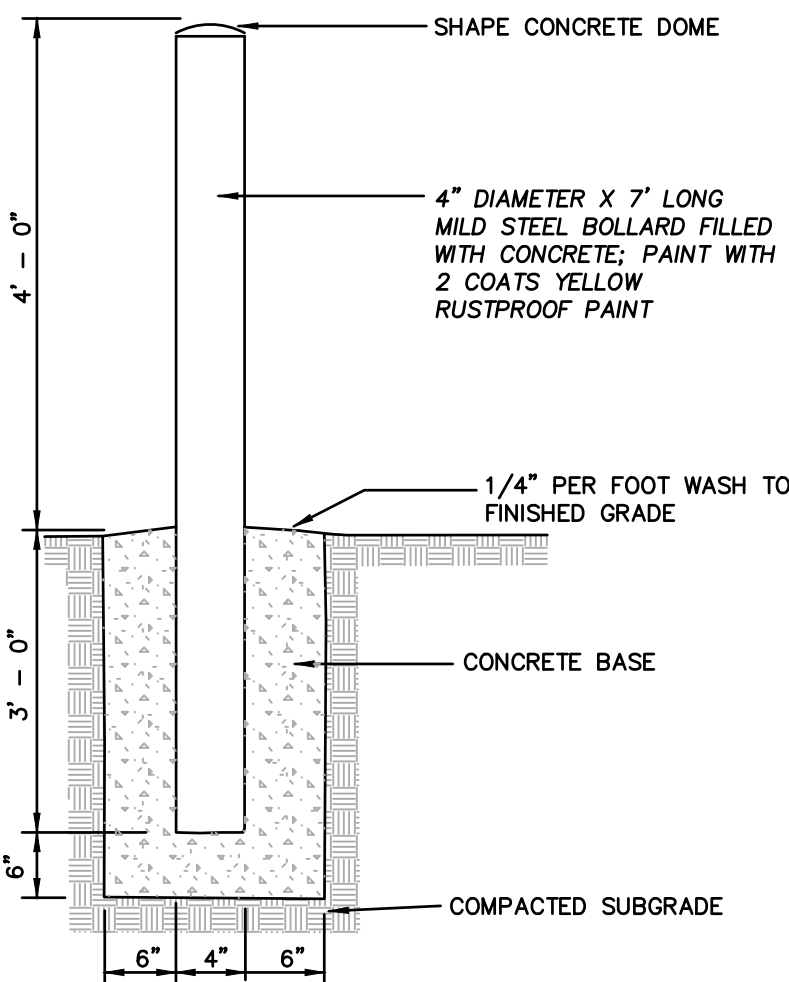
TOP SOIL & SEEDING DETAIL

NOT TO SCALE



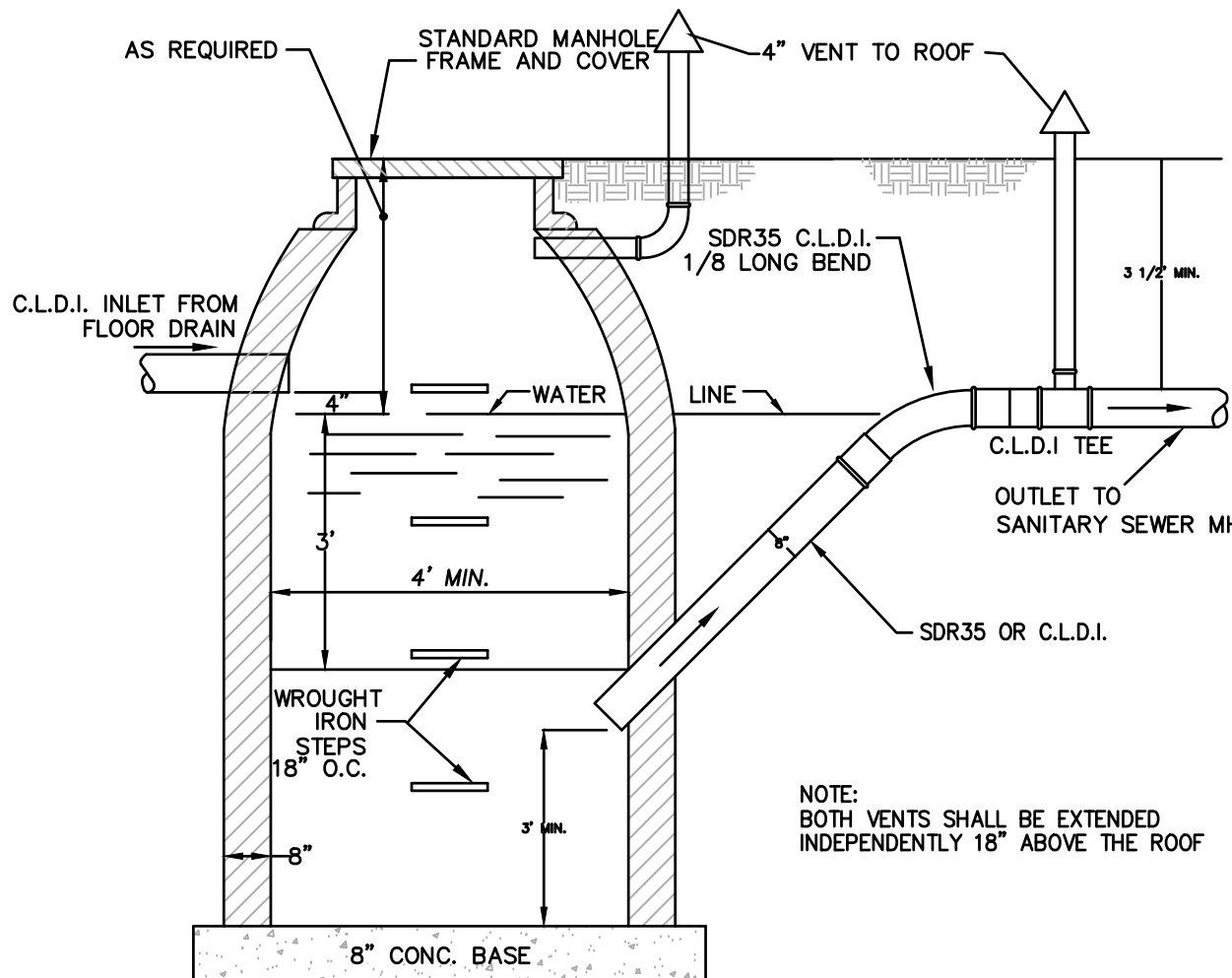
TYPICAL GRAVITY SEWER CLEANOUT DETAIL

NOT TO SCALE



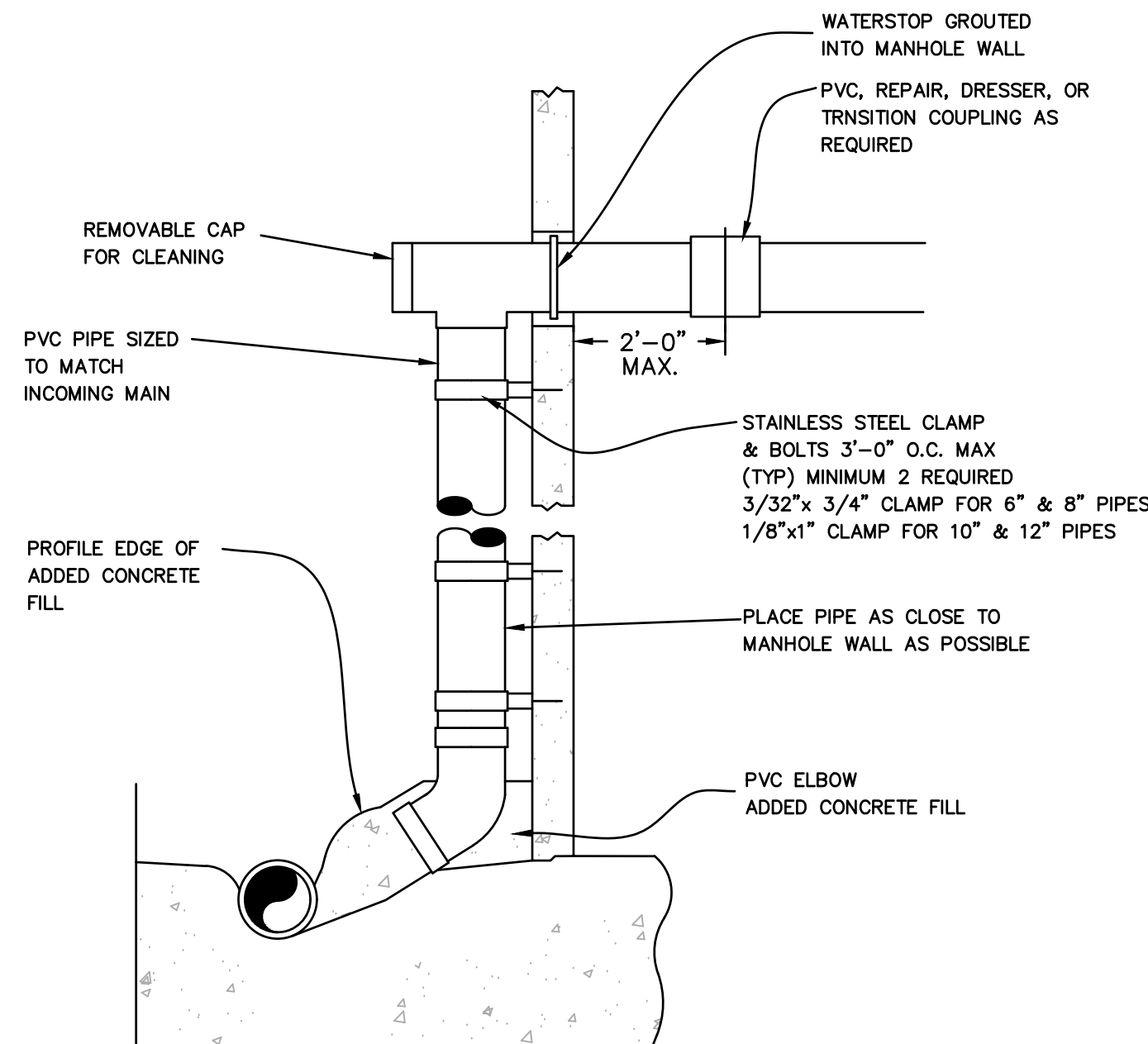
STEEL PIPE BOLLARD

NOT TO SCALE



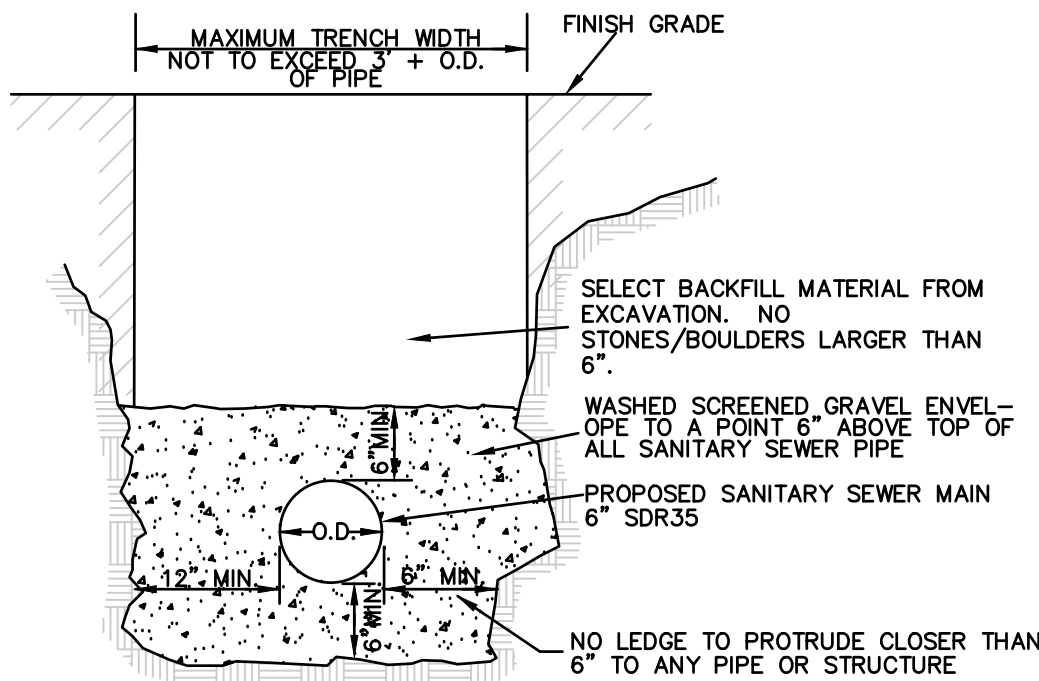
OIL/GREASE SEPARATOR DETAIL

NOT TO SCALE



SEWER MANHOLE INTERIOR DROP INLET

NOT TO SCALE



TYP. GRAVITY SEWER MAIN TRENCH SECTION

NOT TO SCALE

REVISIONS			
REV	DATE	DESCRIPTION	MADE BY
01	3-7-24	NO CHANGES TO PLAN	RJD

ROBERT J. DUFF, P.E.	40707
PROFESSIONAL ENGINEER	
MA LIC. NO.	



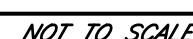
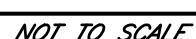
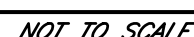
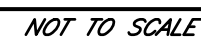
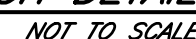
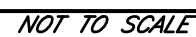
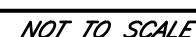
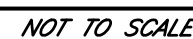
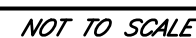
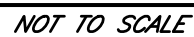
McCLURE
ENGINEERING, INC.
119 Worcester Road
Charlton, MA 01507
Tel: (508) 248-2005
Fax: (508) 248-4887
Email: rduff@mcclureengineers.com

SITE PLAN MODIFICATION
112 HUNTON MEMORIAL HIGHWAY
ROCHDALE, MA
PREPARED FOR
CENTRAL MASS CRANE
112 HUNTON MEMORIAL HIGHWAY
ROCHDALE, MA 01542-0338

DRAWN BY:	KKP
DATE:	1/31/2024
CHK BY:	RJD
SCALE:	
PROJ. NO.	151-3036-0

CONSTRUCTION
DETAILS

C-5



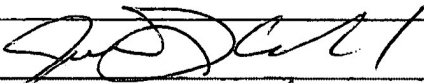

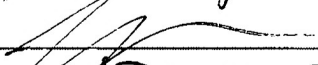


C-6

700 & 704 MAIN STREET

694 & 696 MAIN STREET





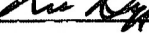
BOARD SIGNATURES FOR REGISTRY OF DEEDS

TOWN OF LEICESTER, MANUMBER OF PLANNING BOARD MEMBERS -5-

MEMBER NAME (Print/Type)	MEMBER SIGNATURE	ELECTION/APPOINTMENT (MM/DD/YYYY)	TERM EXPIRES (MM/DD/YYYY)
Joshua Campbell		7/1/2022	7/1/2024
SHARON J. NIST		7/1/2023	7/1/2026
JAMES REINKE		7/1/2021	7/1/2024
ANTHONY FERRO		7/22	7/28
Leon Dykas		7/23	7/26

Number of Signatures Required _____

AUTHORIZED AGENTS SIGNING FOR APPROVAL NOT REQUIRED

MEMBER NAME (Print/Type)	MEMBER SIGNATURE	ELECTION/APPOINTMENT (MM/DD/YYYY)	TERM EXPIRES (MM/DD/YYYY)
JAMES REINKE		7/2021	7/2024
SHARON J. NIST		7/2023	7/2026
Joshua Campbell		7/2021	7/2024
ANTHONY FERRO		7/22	7/28
Leon Dykas		7/22	7/26

DATE OF NEXT ELECTION _____ (MM/DD/YYYY)

AFTER COMPLETION, PLEASE MAIL ORIGINAL TO: WORCESTER DISTRICT REGISTRY OF DEEDS
ATTENTION: PLAN DEPARTMENT
90 FRONT STREET - #C201
WORCESTER, MA 01608

Mass. General Laws Ch.41

REC: 8/21/23

MINUTES

Leicester Planning Board Meeting Minutes February 20, 2024

Location: Leicester Town Hall, Meeting Room 3

Member Present: Joshua Campbell, James Reinke, Sharon Nist, Chris Clark (Alternate)

Members Absent: Anthony Escobar, Lee Dykas

Staff Members Present: Kristen Jacobsen, Town Planner, Lisa Westwell, Administrative Assistant to the Planning Department

Members of the Public in Attendance: None

Call to Order: Chairman Campbell called the meeting to order at 7:00 PM

Approval of minutes from February 6, 2024

Motion by Ms. Nist to approve the February 6, 2024, minutes with correction of minor typos.

Second: Mr. Reinke

Discussion: None

Record of Vote:

Joshua Campbell	Aye
James Reinke	Aye
Sharon Nist	Aye
Anthony Escobar	Absent
Lee Dykas	Absent
Three (3) in Favor. None (0) Opposed. Two (2) Absent Approved 3 to 0	

700 and 704 Main St. – Cultec System Install Status

Ms. Jacobsen said the Planning Department received an email from Mark Farnham regarding the Cultec system but Mr. Farnham wasn't able to attend this meeting. Ms. Jacobsen read Mr. Farnham's email in which he said the gutters are connected, provided photos, attached Cultec invoices, asked about the 696 and 698 duplexes Cultec systems. Mr. Campbell asked if we requested invoices or photos from the 696 and 698 system. Ms. Jacobsen said no but she would do a site visit with Harold Leaming, Building Inspector, to confirm install. Mr. Reinke said he wants to make sure everyone is playing by the same standards. Ms. Jacobsen suggested including a standard condition on approvals that as-builts are required to be submitted upon project completion. Mr. Reinke concurred. Mr. Reinke said the gutter connection fix was temporary and asked when they would be putting in the permanent connection. Ms. Jacobsen said they didn't clarify that, but she would reach out to Mr. Farnham. Mr. Reinke suggested Ms. Jacobsen and Mr. Leaming view the system before it is backfilled. Ms. Nist said they should have a deadline.

Ms. Jacobsen said the Board could appoint Alternate Member, Chris Clark, as a voting member out of necessity since there were two boards members absent tonight.

Motion by Mr. Reinke to appoint Chris Clark as a voting member out of necessity tonight.

Second: Ms. Nist

Discussion: None

Record of Vote:

Joshua Campbell	Aye
James Reinke	Aye
Sharon Nist	Aye
Anthony Escobar	Absent
Lee Dykas	Absent
Chris Clark, Alternate Member	
Three (3) in Favor. None (0) Opposed. Two (2) Absent Approved 3 to 0	

Motion by Mr. Reinke to set a deadline for the property at 700 and 704 Main St. to have a permanent solution to their stormwater management roof leaders being tied into the Cultec system by May 15, 2024.

Second: Ms. Nist

Discussion: None

Record of Vote:

Joshua Campbell	Aye
James Reinke	Aye
Sharon Nist	Aye
Anthony Escobar	Absent
Lee Dykas	Absent
Chris Clark, Alternate Member	Aye
Four (4) in Favor. None (0) Opposed. Two (2) Absent Approved 4 to 0	

3 Blueberry Lane - Status

Ms. Jacobsen said Jay Dubois sent a site inspection memo from 1/4/24 and read the memo. Mr. Dubois said occupancy permits were obtained, that landscaping and plantings still needed to be installed along the northern boundary line, and additional grading be completed along southern-western boundary line in order to enhance the site's drainage infrastructure. Mr. Dubois indicated this work will be done in the spring when the weather allows. Ms. Jacobsen said the applicant had submitted a modification which he later withdrew and asked for the return of his surety. She said the Board asked for an as-built or inspection by his engineer and his engineer, Mr. Dubois, provided the inspection report. Ms. Jacobsen also said the site has an occupancy permit, the site is being used, and the permit was issued in 2021 yet there are still outstanding items. She suggested setting a date for plantings to be done and completion of that would warrant returning his surety.

Mr. Reinke said he will make a motion to set a date, and he wants people to comply with what has been approved and hold people accountable.

Motion by Mr. Reinke to set a deadline for the corrective actions set for 3 Blueberry Lane as described by the applicant's engineer by May 15, 2024.

Second: Ms. Nist

Discussion: Ms. Nist asked if that would be enough time weather wise. Mr. Reinke and Ms. Jacobsen said the date can be changed if the weather is not good.

Record of Vote:

Joshua Campbell	Aye
James Reinke	Aye
Sharon Nist	Aye
Anthony Escobar	Absent
Lee Dykas	Absent
Chris Clark, Alternate Member	Aye
Four (4) in Favor. None (0) Opposed. Two (2) Absent Approved 4 to 0	

Authorization for Town Planner to sign ANR plans

Ms. Jacobsen explained the MA law that allows the Town Planner to sign ANR plans on behalf of the Planning Board. Ms. Westwell said that historically Michelle Buck had this authority and this is what Ms. Nist was referring to the Board signing each year a few meetings back. Ms. Nist asked if this was required and Ms. Jacobsen said it's not required, and that the Board typically signs ANRs at the meeting. Mr. Reinke said this allows the Town Planner to sign in the Board's stead, but Ms. Nist is talking about the Board signatures being recorded at the registry each year. Ms. Jacobsen will check with the registry.

Motion by Mr. Reinke to table the ANR authorization to the Board's next meeting on 3/12/24.

Second: Ms. Nist

Discussion: General discussion about March meeting dates.

Record of Vote:

Joshua Campbell	Aye
James Reinke	Aye
Sharon Nist	Aye
Anthony Escobar	Absent
Lee Dykas	Absent
Chris Clark, Alternate Member	Aye
Four (4) in Favor. None (0) Opposed. Two (2) Absent Approved 4 to 0	

Town Planner Report/General Discussion

Zoning Bylaws

Ms. Jacobsen asked for discussion on the use table. Three zones have been incorporated that were left off the use table. She wants to see what uses the Board would like to see in each zone now that the uses from each individual zone section have been incorporated into the use table so that the zoning bylaw is consistent and easy to use for staff and the public.

Retail

Ms. Jacobsen said there were some options for retail:

- Different scales of retail - large, small, with or without outdoor storage and which ones will be in allowed by right or by special permit in a zone.
- Square footage for small vs large retail.

Mr. Reinke suggested aligning the sizes with the building code as smaller entities have less requirements so it's less expense. Mr. Reinke said he thought the number was 7,500 sq. ft. but to check with the building inspector. Ms. Jacobsen suggested small scale be 7,500 sq. ft. or under and large scale be over 7,500 sq. ft.

Ms. Jacobsen asked what zones would work for those retail scales. Mr. Reinke suggested HB-1, BR-1 and asked if large scale was allowed now in BR-1. Ms. Jacobsen said currently retail in BR-1 is not allowed. Site Plan review would be triggered based on size or it could be by Special Permit. Mr. Reinke suggested small scale in the BR-1 zone, but not large scale based on what business already exist in that zone so the smaller scale zones grown in the abutting larger scale zones. Board discussed existing businesses in the BR-1 zone, costs to applicants for permitting through site plan review vs special permit, small scale vs large scale, and traffic concerns. Mr. Reinke surmised that small business owners would most likely look for an existing place to rent where a big company would buy vacant land or an existing building and then build out. Ms. Jacobsen said they also want to make sure they don't make an existing building in a current zone non-conforming by changing the zone requirements. Mr. Reinke suggested allowing small scale retail in the BR-1 by site plan review and special permit. Ms. Jacobsen said it can always be changed if it's not working. Mr. Campbell concurred.

RIB Zone

Ms. Jacobsen said this zone allows for retail, banks, gift shops, childcare facilities, drive-thru with special permit (see zoning bylaw for complete list) but it's not broken out by size. Mr. Reinke said it's a small district and large would not be good there. Ms. Jacobsen said half of this zone is in the Water Resource Protection Overlay District (WRPOD) which is restrictive. Ms. Jacobsen asked if the Board wanted to leave retail by right or make some by Special Permit. Ms. Nist mentioned the applicant that was interested in doing an athletic facility. Mr. Reinke said that type of facility would be allowed there by Special Permit and suggested RIB have small scale retail by right and large scale by Special Permit.

NB Zone

Ms. Jacobsen said these are small lots so they may not want large scale there at all or make it less strict. Site plan review if required for anything in this zone. Mr. Reinke and Ms. Nist said to leave it alone for now.

SA Zone

Ms. Jacobsen said retail is not allowed in this zone, but gifts shops or antiques are allowed by right and have to be in something that looks like a house. There were no suggestions made by the Board to change this zone.

R-1 and R-2 Zones

Ms. Jacobsen said retail is not allowed in this zone, but gifts shops are allowed by right. There were no suggestions made by the Board to change this zone.

B Zone

Ms. Jacobsen said retail is allowed by right and asked if they want to consider small and large scale. Mr. Reinke said most are small parcels. Ms. Jacobsen said there were a few large parcels. She pointed out an old undeveloped subdivision with paper roads that a gentleman called about as he bought two of the parcels and wanted to build on them. Ms. Jacobsen said if someone were to buy all the parcels, it would create a large parcel to build on. Mr. Reinke suggested small scale retail by right and large scale by Special Permit. Mr. Campbell and Mr. Clark concurred.

CB Zone

Mr. Reinke said large scale retail would be difficult and suggested small scale by right and large scale by Special Permit. Ms. Jacobsen and Mr. Campbell concurred.

Industrial and Business Industrial-A Zones

Ms. Jacobsen suggested keeping that as industrial unless nothing gets developed there or the mill buildings start to decline and then they can change it. Mr. Reinke asked if that was the only pocket of industrial and Ms. Jacobsen said there is a small Industrial-A zone. The Board would like to see retail allowed in the Industrial Zone to open up options.

Ms. Jacobsen said retail is allowed by right in the Business Industrial-A Zone and it is primarily full of solar farms. Mr. Reinke wants to research this zone and see if it can be BR-1.

HB-1 Zone

Ms. Jacobsen said retail is allowed by right and it would be good to add small and large scale mixed use. Mr. Reinke agreed and suggested delineating large and small scale retail.

HB-2 Zone

Ms. Jacobsen said 90 Huntoon Memorial warehouse, Vangarden, and Joe's Auto are already in this zone and that retail is allowed. Mr. Reinke suggested leaving this zone as it is.

Uses Appearing in Only One Zone

Ms. Jacobsen said there are some uses that are inconsistent in sections of the current bylaw:

- Cemeteries – only existing allowed
- Liquor stores – not mentioned
- Medical offices – not mentioned – consider separating, for example, medical office from professional office from research facility in the use table and then define them.
- Some uses are overly specific and some uses can be simplified
- Some zones are missing personal services such as barber or beauty shop and spa
- If a use is not included in a zone, it's not allowed at all

Ms. Nist asked if chiropractic and physical therapy would be considered medical and Ms. Jacobsen said yes, it would be considered medical. Mr. Reinke asked Ms. Jacobsen to take a first pass at updating the use table and show the changes for the Board to review.

Meeting Dates

Due to a Board member conflict, the March 19th meeting will be moved to March 26th, 2024.

HB-1 Zoning Discussion Handout (2/20/24)

See: https://www.leicesterma.org/sites/g/files/vyhlf781/f/uploads/hb1_and_br1.pdf

Ms. Jacobsen reviewed the handout with the Board. In the BR-1 zone, there are 27 parcels affected by this change. All the single family homes affected will be increasing conformity as they are not allowed in HB-1. Ones that are currently non-conforming will likely remain non-conforming, but this is no more detrimental than current zoning.

Ms. Jacobsen said one of the big pushes for the HB-1 area is to allow mixed use. She suggested adding HB-1 mixed use development with horizontal mixed use. She said vertical mixed use is more for urban environments whereas horizontal mixes look more like town houses or condos even though they are apartments. She said they could specify commercial mixed use vs residential mixed use.

Ms. Jacobsen said she researched ratio/density and what that looks like in a mixed use setting. The Board can decide what they want the Town's max density to be and what the design should look like for mixed use.

Ms. Nist asked if any of the mixed use developments shown in the handout have open space. Ms. Jacobsen said that there can be an open space component, but the Town's open space bylaw is for a residential subdivision bylaw and not mixed use/commercial endeavor. Ms. Jacobsen offered

some options for commercial acreage and residential acreage requirements used by other Town for the Board to consider.

Ms. Jacobsen said there are options for reduced acreage to accommodate mixed use or to have outdoor areas. The handout also includes options for design guidelines for the Board to consider. Ms. Jacobsen said the goal is to come up with something that works for the Town. Mr. Reinke agreed that he wants it to be Leicester-centric, so it fits with our Town. He said the commercial component adds to the Town tax base as it draws people from other towns too.

Ms. Jacobsen said that research shows mixed use does not typically increase traffic as apartment dwellers tend to make one trip while single family homeowners make multiple trips per day.

Mr. Reinke asked if MBTA can be wrapped into this. Ms. Jacobsen said that the MBTA deadline might have gotten pushed another year and that she was attending a meeting about it. She said that mixed use is a win-win because we are compliant with the law and it benefits the Town. She said the MBTA mixed use must be by right but it's still subject to site plan review. Mr. Reinke said compliance with MBTA does come with some benefits as far as grants. Ms. Jacobsen said they can also add an affordability component but to keep in mind that "affordable" rent for a one bedroom apartment could be \$1,400 or more a month.

Ms. Jacobsen said that in order to make the Annual Town Meeting, the Board has to send the changes to the Selectboard, and they have to send it back to the Planning Board. She said like to get this to the Selectboard after the next Planning Board meeting.

Ms. Nist asked about native species for landscaping. Ms. Jacobsen said we can update the list. Mr. Reinke suggested contacting Jan Parke with CGLT.

There was general discussion about the next meeting agenda and the most recent EDC meeting.

Motion by Ms. Nist to adjourn.

Second: Mr. Reinke

Discussion: None

Record of Vote:

Joshua Campbell	Aye
James Reinke	Aye
Sharon Nist	Aye
Anthony Escobar	Absent
Lee Dykas	Absent
Chris Clark, Alternate Member	Aye
Four (4) in Favor. None (0) Opposed. Two (2) Absent Approved 4 to 0	

Meeting adjourned at 8:56 p.m.

Respectfully Submitted by:
Lisa Westwell, Administrative Assistant
to the Planning Department

Date Approved: _____

Planning Board Signatures

Joshua Campbell, Chair

Anthony Escobar

James Reinke, Vice Chair

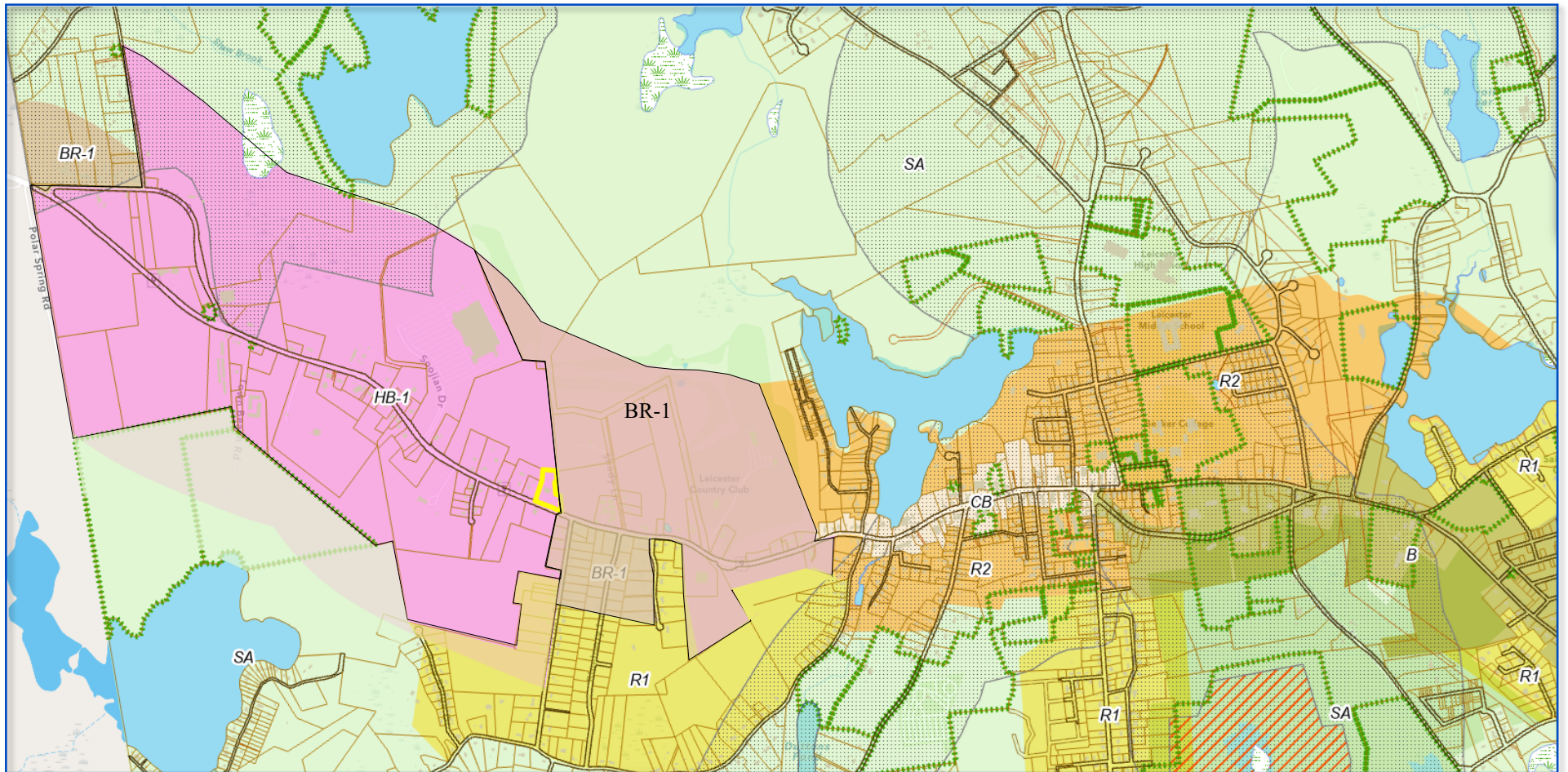
Lee Dykas

Sharon Nist, Clerk

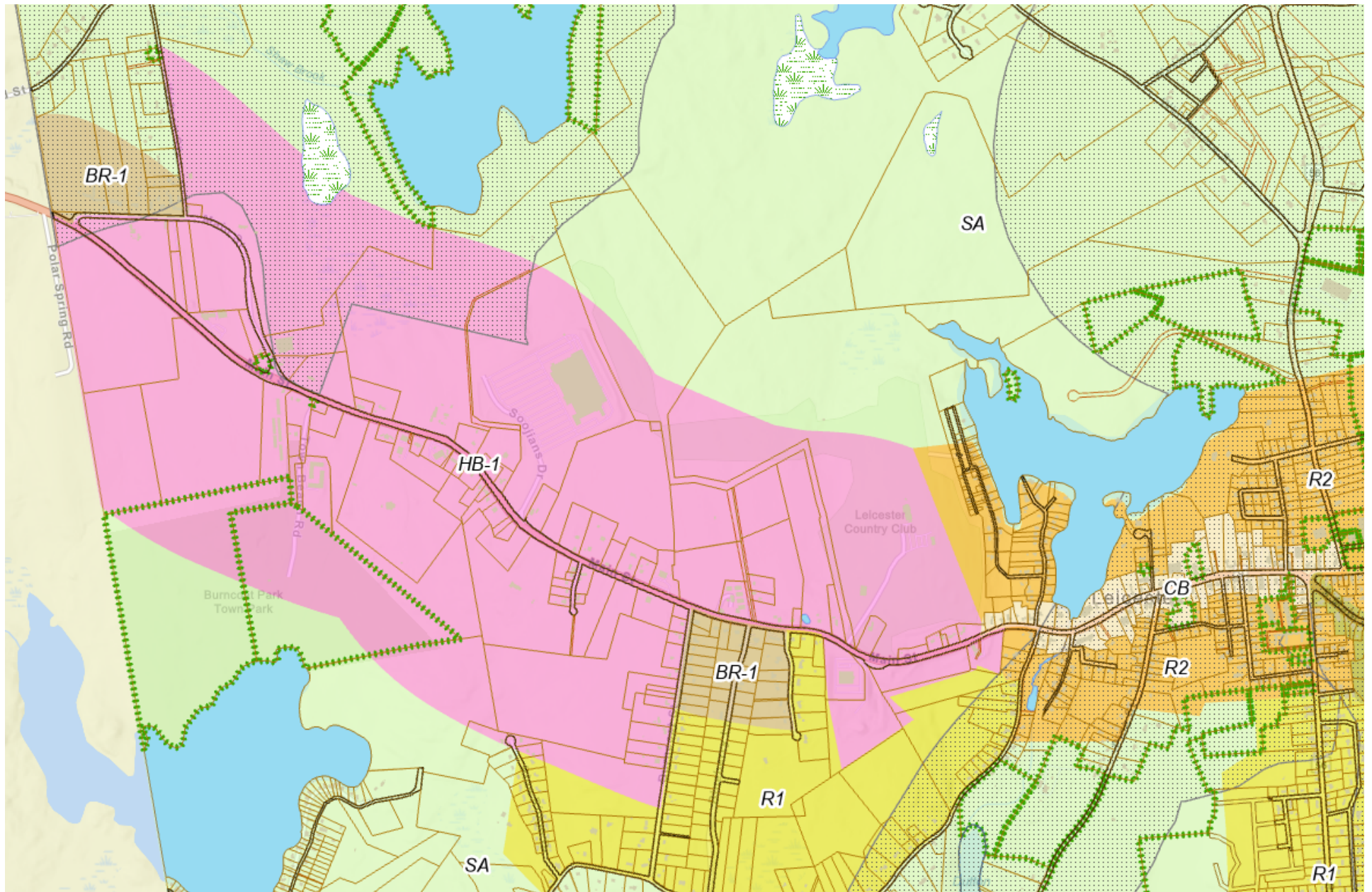
Chris Clark, Alternate Member

ZONING BYLAW

HB-1



Rezoning HB-, BR-1, & R1



Current HB-1 & BR1 Zones

Current Dimensional Regulations

HB-1	Minimum Area	Frontage	Front	Side	Rear	Max Height	# of stories	Max Coverage
	60,000	200	50	50	50	55'	5.5	40%

BR-1	Minimum Area	Frontage	Front	Side	Rear	Max Height	# of stories	Max Coverage
Single Family	50,000	200	40	40	40	55'	5.5	30%
Structure	20,000	150	50	40	40	55'	5.5	30%

R1	Minimum Area	Frontage	Front	Side	Rear	Max Height	# of stories	Max Coverage
	50,000	150	25	15	25	35'	2.5	30%

Parcels Affected by Change- 27

	Parcel ID	Current Zone	New Zone			Parcel ID	Current Zone	New Zone
1	18-B12-0	HB-1	BR-1		16	19A-A5-0	HB-1	BR-1
2	18-B12.1-0	HB-1	BR-1		17	19A-A6-0	HB-1	BR-1
3	17-B9-0	HB-1/SA	BR-1/SA		18	26A-B28.1-0	HB-1	BR-1
4	19-A1.1-0	HB-1	BR-1		19	26A-B28-0	HB-1	BR-1
5	19-A1-0	HB-1	BR-1		20	26B-A2-0	HB-1	BR-1
6	18-B13-0	HB-1	BR-1		21	18B-B12-0	HB-1	R1
7	19-A2-0	HB-1	BR-1		22	18B-B13-0	HB-1	R1
8	19-A3-0	HB-1	BR-1		23	18B-B14-0	HB-1	R1
9	19-A4-0	HB-1	BR-1		24	18B-B16-0	HB-1	R1
10	19-A5-0	HB-1	BR-1		25	18B-B17-0	HB-1	R1
11	19-A6-0	HB-1	BR-1		26	18B-B18-0	HB-1	R1
12	19-A7-0	HB-1	BR-1		27	27B-A22-0	HB-1/R1	R1
13	19A-A1-0	HB-1	BR-1					
14	19A-A2-0	HB-1	BR-1					
15	19A-A4.0	HB-1	BR-1					

Conformity Differences

Parcel ID	Current Zone	New Zone	Meets Dimensional Req for current zone	Meets Dimensional Req for New Zone	Use Current Zone	Use New Zone
18-B12-0	HB-1	BR-1	yes	Yes	Unknown	Unknown
18-B12.1-0	HB-1	BR-1	dirt road access to rt9	Yes	broadcasting	
17-B9-0	HB-1/SA	BR-1/SA	yes		Leicester Country Club	Yes-SP
17-B9-0	HB-1	BR-1			Broadcasting	
19-A1-0	HB-1	BR-1	yes	Yes	SFH-no (PENC)	SFH Yes
18-B13-0	HB-1	BR-1	yes	Yes	Self storage SP	Yes-SP
19-A2-0	HB-1	BR-1	yes	Yes	SFH– No-PENC	Y
19-A3-0	HB-1	BR-1	No	Yes	SFH-No-PENC	Y
19-A3-0	HB-1	BR-1	No	no	SFH-No-PENC	Y
19-A5-0	HB-1	BR-1	Yes	Yes	SFH-No-PENC	Y
19-A6-0	HB-1	BR-1	No	No	SFH-No-PENC	Y
19-A7-0	HB-1	BR-1	Yes	Yes	Leicester CC N- PENC	Yes-SP
19A-A1-0	HB-1	BR-1	No	Yes	N –Multi-PENC	No mention
19A-A2-0	HB-1	BR-1	No	Yes	L. Water Supply	-
19A-A4.0	HB-1	BR-1	No	No	SFH-No-PENC	Yes

Parcel ID	Current Zone	New Zone	Meets Dimensional Req for current zone	Meets Dimensional Req for New Zone	Use Current Zone	Use New Zone
19A-A5-0	HB-1	BR-1	No	No	SFH-No-PENC	Yes
19A-A6-0	HB-1	BR-1	No	No	SFH-No-PENC	Yes
19A-A7-0	HB-1	BR-1	No	No	SFH-No-PENC	Yes
26A-B28.1-0	HB-1	BR-1	Yes	Yes	Tractor Supply Retail	Yes
26A-B28-0	HB-1	BR-1	Yes	Yes	Unknown	Unknown
26B-A2-0	HB-1	BR-1	Yes	Yes	Tractor Supply- Retail-Yes	Yes-SP
18B-B12-0	HB-1	R1	Yes	Yes	Unknown	Unknown
18B-B13-0	HB-1	R1	No	No	SFH-No-PENC	Yes
18B-B14-0	HB-1	R1	No	No	SFH-No-PENC	Yes
18B-B16-0	HB-1	R1	Yes	Yes	SFH-No-PENC	Yes
18B-B17-0	HB-1	R1	Yes	Yes	SFH-No-PENC	Yes
18B-B17.1-0	HB-1	R1	No	No	SFH-No-PENC	Yes
18B-B18-0	HB-1	R1	No	No	SFH-No-PENC	Yes
27B-A22-0	HB-1/R1	R1	Yes	Yes	Unknown	Unknown

Proposed Additional Uses HB-1

Large Scale Retail with Outside Storage
Large Scale Retail without Outside Storage

Large Scale Retail Example: 'big box' stores, full service grocery Stores

Small Scale Retail with Outside Storage
Small Scale Retail without Outside Storage

Small Scale Retail Example: gift shops, clothing stores, small specialty stores, convenience stores (without fuel sales)

HB-1 Mixed Use Development Standards (to be added to Definitions & Section 2.11)

HB-1 Mixed Use development in HB-1 is subject to Site Plan Review.

Fire suppression?

**Site Development Standards shall follow 2.11.2, 2.11.3,
2.11.4, 2.44.5, 2.11.6, 2.11.7**

Definition

HB-1 Mixed Use– (Horizontal Mix) - Mixed use developments shall have both a residential and a commercial component, Regardless of the composition of uses, all mixed use projects shall be scaled to ensure consistency with the surrounding neighborhoods. Mixed use projects can utilize “horizontal” mixed use where commercial, office, and residential uses are designed as a single project, yet constructed in separate and distinct building footprints.

HB-1 Mixed Use Density Requirements

Residential Density	
Units/Acre (max)	20
Units/Acre (minimum)	5
Residential Density Bonus	

Density bonus for 10% affordable housing units?

Minimum Commercial Requirements ^{1, 2}	
Overall Project Size	Minimum Commercial Building Area Required
Up to 3 Acres	1,500 square feet
3-5 Acres	2,500 square feet
5-7.5 Acres	3,500 square feet
7.5-10 Acres	4,500 square feet
10-15 Acres	5,500 square feet
15-20 Acres	6,500 square feet
20+ Acres	7,500 square feet

¹ The Planning Board may authorize a reduction in the amount of minimum commercial building area if the Board can make findings supported by substantial evidence, including market analysis submitted by the applicant, demonstrating that the goals and intent of the HB-1 zone are being achieved with the project as designed.

² The Planning Board may authorize a reduction in the minimum amount of commercial building area if the amount of mandatory land set aside 20% Open Space and 10% useable outdoor space.

Design Guidelines

1. Newly constructed buildings should not overwhelm or disregard the adjacent context with regard to building location, scale, bulk, massing, material, color, texture and fenestration.
2. Contemporary designs should respect the traditional character of their context and maintain the front setback established by neighboring buildings.
3. Distinguishing features, historic elements and examples of craftsmanship should not be removed or covered during the alteration of existing older structures. Where damaged, they should be restored or recreated.
4. Signage, awnings, light fixtures and other applied elements should not cover architectural details, and should be in scale with the building facade and its immediate context. Generally, materials that have been applied to cover older traditional facade elements should be removed and not replaced.
5. Materials used should be of high quality and durability, and should complement existing contextual materials.
6. Consider the effect of small-scale details on visual appeal for pedestrians.
7. Consider the effect of overall forms, materials and colors on visual appeal for drivers.
8. All service entrances, dumpsters and loading facilities should be located at the rear of buildings. They should be screened from view with solid wood fencing, a masonry wall and/ or landscaping from public streets and parking areas.
9. Equipment (such as air conditioner units or exhaust fans) should be screened from view, and located either in the rear of the building or on the roof. No equipment should be mounted on street facade(s), or be visible from the street or customer parking areas.
10. Break up long expanses of blank wall with pilasters to suggest structural bays, or vary massing and/ or roof line to provide visual interest.
11. Break up vertical massing with materials or trim that define a distinct base, middle and top
12. Colors should be complementary and harmonic, and not clash on any given facade. Developer should not use the entire building as a brand identity package in such a way that it becomes an “attractive nuisance.”
13. Applied elements - Such as railings, awnings, signage and light fixtures - Should coordinate with, rather than overwhelm the proportions of the building.
14. If equipment is mounted behind louvered panels or other visual screen, screening should be oriented to conceal the equipment from view from any public way or private residence and finished to obscure.
15. Visible roof vents, and other roof elements and penetrations, should be finished to match adjacent roof color
16. Windows and Doors should reflect the style of the building itself in scale, proportion and construction. Storefront windows and doors can utilize modern framing systems, but it is preferred that glazing not extend to the ground.
17. Appropriately scaled lighting fixtures are recommended
18. Free-standing fixtures should be coordinated in appearance with building-mounted light fixtures
19. Landscape lighting is encouraged
20. Expanses of blank wall should be softened through the use of landscape treatments such as foundation plantings or trellises.
21. Chain link fencing is discouraged.
22. Landscaping should be designed with consideration of nearby building, walkways and parking areas.
23. Parking lots should be designed with landscaped islands, and islands between buildings, roads and walkways should be abundantly planned to create a strong horticulture character throughout the year
24. All landscaping shall be scaled appropriately for pedestrian traffic and properly maintained in a healthy condition

BATTERY ENERGY STORAGE BYLAW INTRODUCTION

Battery Energy Storage Systems (BESS)

Energy & Utility	SA	R1	R2	B	CB	I	BI-A	HB-1	HB-2	BR-1	RIB	NB
Tier 3 and Tier 4 Battery Energy Storage Systems (stand alone)	N	N	N	SP	N	SP	SP	SP	SP	N	N	N
Tier 1 Residential Battery Energy Storage System	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Tier 2 Battery Energy Storage System	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP

Definitions to be added to Section 1.3

Battery(ies): A single cell or a group of cells connected together electrically in series, in parallel, or a combination of both, which can charge, discharge, and store energy electrochemically. For the purposes of this bylaw, batteries utilized in consumer products are excluded from these requirements.

Battery Energy Storage Management System: An electronic system that protects energy storage systems from operating outside their safe operating parameters and disconnects electrical power to the energy storage system or places it in a safe condition if potentially hazardous temperatures or other conditions are detected.

Battery Energy Storage System (BESS): One or more devices, assembled together, capable of storing energy in order to supply electrical energy at a future time, not to include a stand-alone 12-volt car battery or an electric motor vehicle. A Battery Energy Storage System is classified a Tier 1, Tier 2, Tier 3, or Tier 4 BESS as follows:

1. Tier 1 Battery Energy Storage Systems have an aggregate energy capacity equal to 250KWh or less and, whose purpose is to store energy from residential solar energy systems if in a room or enclosed structure, consisting of only a single energy storage system technology.
2. Tier 2 Battery Energy Storage Systems have an aggregate energy capacity equal to 250KWh or less and, whose purpose is to store energy from commercial solar energy systems if in a room or enclosed structure, consisting of only a single energy storage system technology.
3. Tier 3 Battery Energy Storage Systems are defined as those that are interconnected to high voltage transmission lines and have an aggregate energy capacity greater 250 KWh but less than or equal to 10 MWh.
4. Tier 4 Battery Energy Storage Systems are defined as those that are interconnected to high voltage transmission lines and have an aggregate energy capacity greater than 10 MWh. The facility must comply with the State's most current electrical code (527 CMR. 12.00) and the State's most current Fire Code (527 CMR 1.00)

Cell: The basic electrochemical unit, characterized by an anode and a cathode, used to receive, store, and deliver electrical energy.

Commissioning: A systematic process that provides documented confirmation that a battery energy storage system functions according to the intended design criteria and complies with applicable code requirements.

Dedicated-Use Building: A building that is built for the primary intention of housing battery energy storage system equipment, is classified as Group F-1 occupancy as defined in the International Building Code, and complies with the following:

1. The building's only use is battery energy storage, energy generation, and other electrical grid-related operations.

2. No other occupancy types are permitted in the building.
3. Occupants in the rooms and areas containing battery energy storage systems are limited to personnel that operate, maintain, service, test, and repair the battery energy storage system and other energy systems.
4. Administrative and support personnel are permitted in areas within the buildings that do not contain battery energy storage system, provided the following:
 - a. The areas do not occupy more than 10 percent of the building area of the story in which they are located.
 - b. A means of egress is provided from the administrative and support use areas to the public way that does not require occupants to traverse through areas containing battery energy storage systems or other energy system equipment.

Section 5.20

Battery Energy Storage Systems (BESS)

A. Purpose.

The purpose of this bylaw is to provide for the construction and operation of Battery Energy Storage Systems (BESS) and to provide standards for the placement, design, construction, monitoring, modification and removal of energy storage systems that address public safety, protection of the Town and private drinking water supply, minimize impacts on scenic, natural and historic resources of the Town of Ware, and provide adequate financial assurance for decommissioning. The provisions set forth in this section shall take precedence over all other sections when considering applications related to the construction, operation, and/or repair of Battery Energy Storage Systems.

B. Definitions – Refer to definitions in Section 1.3

C. Applicability

1. Building-integrated Battery Energy Storage Systems

- a. Battery Energy Storage Systems that are building-integrated, whether a residential or commercial building, energy storage systems shall not be erected, constructed, installed, or modified as provided in this section without first obtaining a building permit from the Building Inspector.
- b. Building-integrated energy storage systems may be coupled with rooftop solar or behind the meter applications for peak shaving.
- c. Building-integrated battery energy storage systems may be located in any zoning district of the Town of Leicester.

2. Co-located Battery Energy Storage Systems

- a. Battery Energy Storage Facilities are encouraged to co-locate with solar photovoltaic installations, energy, power generation stations, and electrical substations. Ware Zoning
- b. Battery Energy Storage Systems associated with on-site solar power generation shall be permitted in the same districts as Large-Scale Solar Arrays by Special Permit and Site Plan Review.
- c. If co-located with a solar photovoltaic installation, the BESS shall not exceed the necessary capacity and size generated by the output of the co-located solar photovoltaic installation.

3. Battery Energy Storage systems not associated with on-site solar generation shall only be permitted in the Business (B), Industrial (I), Business-Industrial A (BI-A), Highway Business-Industrial District 1, and Highway-Business-Industrial District 2, districts, and shall require a Special Permit and Site Plan Review from the Planning Board. Battery Energy Storage Systems not associated with on-site solar generation are prohibited in the Water Resource Protection Overlay District

- a. The nameplate capacity of an Energy Storage system shall not exceed the total kw of renewable energy being produced on the 3-phase distribution line that the energy storage system will be interconnected to.
- b. Modifications to, retrofits or replacements of an existing battery energy storage system that increase the total battery energy storage system designed discharge duration or power rating shall be subject to this bylaw.

D. General Requirements

- 1. In accordance with Section C above, all Tier 2, Tier 3 and Tier 4 battery energy storage systems shall require a special permit and site plan approval by the Planning Board prior to construction, installation, or modification as provided in this bylaw.
- 2. The construction, operation, and decommissioning of all battery storage energy storage systems shall be consistent with all applicable local, state, and federal requirements, including but not limited to all applicable environmental, safety, construction, fire, and electrical requirements.
- 3. A building permit and an electrical permit shall be required for installation of all battery energy storage systems.

E. Application Materials

1) In addition to requirements of Section 6.12 Site Plan Review the application for a Special Permit under this Section 5.20 shall include the following:

- a. A site plan prepared, stamped and signed by a Professional Engineer licensed to practice in Massachusetts, that shows the following:

- b. An existing condition plan with property lines and physical features, including topography and roads, characteristics of vegetation (trees mature, old growth, shrubs, open field, etc.), wetlands, streams, ledge, for the project site;

- 1) Proposed changes to the landscape of the site, including grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures, driveways, snow storage, and storm water management systems; including total acreage of disturbed area, total vegetation cleared, not including mowed fields;
- 2) Trees with a DBH of 20" or greater within project parcel(s) shall be identified to determine tree loss, along with inventorying of diseased or hazard trees slated to be removed due to proposed development;
- 3) Property lines and physical dimensions of the subject property with contour intervals of no more than 10 feet;
- 4) Property lines of adjacent parcels within 300 feet.
- 5) Location, dimensions, and types of existing major structures on the property;
- 6) Location of the proposed battery energy storage structures, foundations, and associated equipment;
- 7) The right-of-way of any public road that is contiguous with the property;
- 8) Any overhead or underground utilities;
- 9) At least one color photograph of the existing site, measuring eight (8) inches by ten (10) inches;
- 10) Locations of active farmland and prime farmland soils, wetlands, permanently protected open space, Priority Habitat Areas and BioMap 2 Critical Natural Landscape Core Habitat mapped by the Natural Heritage & Endangered Species Program (NHESP) and "Important Wildlife Habitat" mapped by the DEP;
- 11) Locations of floodplains or inundation areas for moderate or high hazard dams;
- 12) Locations of local or National Historic Districts; and
- 13) Stormwater management and erosion and sediment control.
 - a. A preliminary equipment specification sheet that documents the proposed battery energy storage system components, inverters and associated electrical equipment that

are to be installed, including manufacturer and model. A final equipment specification sheet shall be submitted prior to the issuance of building permit;

- b. One- or three-line electrical diagram showing associated components, and electrical interconnection methods, with all NEC compliant disconnects and overcurrent devices;
- c. Contact information and signature of the project proponent, as well as all co-proponents, if any, and all property owners;
- d. Contact information and signature of agents representing the project proponent, if any;
- e. Contact information for the person(s) responsible for public inquiries throughout the life of the system;
- f. An operations and maintenance plan for Battery Energy Storage System. Such plan shall describe continuing battery energy storage system maintenance and property upkeep, as well as design, construction, installation, testing and commissioning information;
 - i) Energy Storage System technical specifications, including manufacturer and model;
- g. Electrical schematic;
- h. Documentation that shows the owner of the Energy Storage System has site control, which shall include easements and access roads;
- i. Documentation that shows the owner of the Energy Storage System has notified the electric utility of this installation.
- j. Emergency Operations Plan. A copy of the approved Emergency Operations Plan shall be given to the system owner, the local fire department, and local fire code official. A permanent copy shall also be placed in an approved location to be accessible to facility personnel, fire code officials, and emergency responders. The emergency operations plan shall include the following information:
 - 1. Procedures for safe shutdown, de-energizing, or isolation of equipment and systems under emergency conditions to reduce the risk of fire, electric shock, and personal injuries, and for safe startup following cessation of emergency conditions.
 - 2. Procedures for inspection and testing of associated alarms, interlocks, and controls.
 - i. This includes hazmat appliances for conducting atmospheric monitoring with a scientific officer to support.
 - 3. Procedures to be followed in response to notifications from the Battery Energy Storage Management System, when provided, that could signify potentially dangerous conditions, including shutting down equipment, summoning service and repair personnel, and providing agreed upon notification to fire department personnel for potentially hazardous conditions in the event of a system failure.
 - 4. Emergency procedures to be followed in case of fire, explosion, release of liquids or vapors, damage to critical moving parts, or other potentially dangerous conditions. Procedures can include sounding the alarm, notifying the fire department, evacuating personnel, de-energizing equipment, and controlling and extinguishing the fire.

5. Response considerations similar to a safety data sheet (SDS) that will address response safety concerns and extinguishment when an SDS is not required.
6. Procedures for dealing with battery energy storage system equipment damaged in a fire or other emergency event, including maintaining contact information for personnel qualified to safely remove damaged battery energy storage system equipment from the facility.
7. Other procedures as determined necessary by the Town to provide for the safety of occupants, neighboring properties, and emergency responders.
8. Procedures and schedules for conducting drills of these procedures and for training local first responders on the contents of the plan and appropriate response procedures.
 - i. Trainings must be provided and organized by the applicant.
- k. Proof of liability insurance: The applicant shall be required to provide evidence of liability insurance in an amount and for a duration sufficient to cover loss or damage to persons and property caused by the failure of the system.
- l. A noise study, prepared by a qualified individual with experience in environmental acoustics, to assess the impact of all noise sources generated from the project to abutting properties, and determine the appropriate layout, design, and control measures. The report should include details of assessment methods, summarize the results, and recommend the required outdoor as well as any indoor control measures.

F. Design and Site Standards

1. In addition to the standards for Special Permit and Site Plan Review in the Zoning Bylaw, the applicant shall adhere to the following standards and provide such information on the site plan:
 - a. Utility Lines. All on-site utility lines shall be placed underground to the extent feasible and as permitted by the serving utility.
 - b. Signage. The signage shall include the type of technology associated with the systems, any special hazards associated, the type of suppression system installed, and 24-hour emergency contact information. All information shall be clearly displayed on a light reflective surface. Clearly visible warning signs concerning voltage shall be placed at the base of all pad-mounted transformers and substations.
 - c. Lighting. Lighting of the systems shall be limited to that minimally required for safety and operational purposes and shall be reasonably shielded and downcast from abutting properties.

- d. Setbacks. Battery Energy Storage Systems not co-located with solar photovoltaic installations shall adhere to a fifty (50) foot setback from the front, side, and rear property lines and shall adhere to a one hundred fifty (150) foot setback from any residential buildings. . BESS's shall also adhere to a one hundred (100) foot setback from water wells (both private and public) located either on-site or on abutting properties.
- e. Fire protection. Battery Energy Storage Systems not co-located with solar photovoltaic installations shall be located on properties serviced by the public water system or by a water supply acceptable to the Planning Board and Ware Fire Department.
- f. Vegetation and Tree-Cutting. Areas within ten (10) feet on each side of a system shall be cleared of combustible vegetation and other combustible growth. Single specimens of trees or shrubbery and cultivated ground covers such as green grass, ivy, succulents, or similar plants shall be exempt provided that they do not form a means of readily transmitting fire. Clearing of natural vegetation shall be limited to that which is necessary for the construction, operation and maintenance of the system and that which is otherwise prescribed by applicable bylaws and regulations.
- g. Noise. The 1-hour average noise generated from the systems, components, and associated ancillary equipment shall not exceed a noise level of 60 dBA as measured at the property line.

G. Safety System Certification.

Battery energy storage systems and equipment shall be listed by a Nationally Recognized Testing Laboratory to UL 9540 (Standard for battery energy storage systems and Equipment) or approved equivalent, with subcomponents meeting each of the following standards as applicable:

- a. UL 1973 (Standard for Batteries for Use in Stationary, Vehicle Auxiliary Power and Light Electric Rail Applications),
- b. UL 1642 (Standard for Lithium Batteries),
- c. UL 1741 or UL 62109 (Inverters and Power Converters),
- d. Certified under the applicable electrical, building, and fire prevention codes as required.
- e. Alternatively, field evaluation by an approved testing laboratory for compliance with UL 9540 (or approved equivalent) and applicable codes, regulations and safety standards may be used to meet system certification requirements.

H. Special Permit Criteria

1. The Planning Board may approve an application if the Board finds that the system complies with the Site Plan Review and Approval criteria and with the conditions for granting Special Permits. Battery energy storage systems shall also satisfy the following additional criteria:

- a. Environmental features of the site are protected, and surface runoff will not cause damage to surrounding properties or increase soil erosion and sedimentation of nearby streams and ponds.
- b. The Planning Board may also impose conditions as it finds reasonably appropriate to safeguard the town or neighborhood including, but not limited to, screening, lighting, noise, fences, modification of the exterior appearance of electrical cabinets, battery storage systems, or other structures, limitation upon system size, and means of vehicular access or traffic features.
- c. No occupancy permit shall be granted by the Building Commissioner, nor shall the site be energized or interconnected to the utility until the Planning Board has received, reviewed, and approved an as-built plan that demonstrates that the work proposed on the approved site plan, including all stormwater management components and associated offsite improvements, have been completed in accordance with the approved plan and certified same to the Building Commissioner.
- d. The Planning Board may, in its discretion, approve an as-built plan upon provision of a type of surety as determined by the SPGA, to secure incomplete work where such work is not immediately necessary for lawful operation of the system without negative effect on public health and safety and surrounding properties.
- e. The applicant shall make every effort to coordinate necessary surveying and finalization of the as-built plans and submission of required construction control documents prior to the conclusion of construction. Notwithstanding the above, a temporary occupancy permit may be granted with the approval of the Planning Board subject to conditions for completion of work imposed by the Board.

I. Decommissioning

1. As part of the applicant's submission to the Board, the applicant shall submit a decommissioning plan, to be implemented upon abandonment or in conjunction with removal from property. The plan shall include:

- a. A narrative description of the activities to be accomplished, including who will perform that activity and at what point in time, for complete physical removal of all battery energy storage system components, structures, equipment, security barriers, and transmission lines from the property.
- b. Disposal of all solid and hazardous waste in accordance with local, state, and federal regulations.
- c) The anticipated life of the battery energy storage systems.
- c. The estimated decommissioning costs and how said estimate was determined.
- d. The method of ensuring that funds will be available for decommissioning and restoration.
- f) The method by which the decommissioning cost will be kept current.
- e. The manner in which the site will be restored, including a description of how any changes to the surrounding areas and other systems adjacent to the battery energy storage system, such as, but not limited to, structural elements, building penetrations, means of egress, and required fire detection suppression systems, will be protected during decommissioning and confirmed as being acceptable after the system is removed.
- f. A listing of any contingencies for removing an intact operational battery energy storage system from service, and for removing an energy storage system from service that has been damaged by a fire or other event.

1. Decommissioning Fund.

- a. The owner and/or operator of the energy storage system, shall continuously maintain a fund or bond payable to the Town, in an approved form for the removal of the battery energy storage system, in an amount to be determined by the SPGA for the period of the life of the facility.
- b. All costs of the financial security shall be borne by the applicant. The amount shall include a mechanism for calculating increased removal costs due to inflation.
- c. An inspection of the completed decommissioned area shall be reviewed by a consultant hired by the Planning Board before approving the decommissioning work in accordance with the Decommissioning Plan.
- d. The owner and/or operator shall pay for the cost of this review with such payment being provided by the owner and/or operator prior to the consultant undertaking said review, in accordance with MGL Chapter 44, Section 53G.

J. Abandonment.

The battery energy storage system shall be considered abandoned when it ceases to operate consistently for more than twelve (12) months. The system shall be presumed abandoned if the owner and/or operator fails to respond affirmatively within thirty (30) days to a written inquiry from the Building Inspector as to the continued validity and operation of the system.

If the owner or operator fails to comply with decommissioning upon any abandonment, the Town, may, at its discretion, and utilize the 88 for the removal of a system and restore the site in accordance with the decommissioning plan.

K. Severability.

If any provision of this By-Law is found to be invalid by a court of competent jurisdiction, the remainder of this By-Law shall not be affected but remain in full force. The invalidity of any provision of this By-Law shall not affect the validity of the remainder of the Leicester Zoning By-Law.