Town of Leicester
PLANNING BOARD

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

PLANNING BOARD AGENDA
Tuesday, October 17, 2023, 7PM
Meeting Room 3

- **Administrative**
  - Approval of minutes from October 3, 2023

- **Public Hearing**
  - **7:05pm: SP-2023-03 & SPR-2023-03 HY Ventures Leicester, LLC.**
    1621 Main Street, Leicester MA Map 18A, Parcel 13. Zone: HB-1
    The project includes the demolition of the existing abandoned single-family home and construction of an approximately 3,900 sq. ft. commercial building with 30 parking spaces and a drive-through for a proposed Starbucks and nail salon at 1621 Main Street

- **Old Business**
  - Discussion with Prospect Hill Estates, LLC regarding their request for release of performance bond for Oakridge Estates Senior Village

- **New Business**
  - Elect CMRPC Delegate and Alternate

- **Town Planner Report/General Discussion**

- **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

SPR-2023-01 & SP-2023-01

For Planning Office Use:
File #:_____

Leicester Planning Board
Site Plan Review & Special Permit Application Form

PERMIT TYPE: ☑ Special Permit ☐ Site Plan Review

CONTACT INFORMATION

Owner Information			
Name:		**Company Name:**	HY Ventures Leicester, LLC
Signature:	Duly Authorized		
Address:	313 Boston Post Road, Suite 120, Marlborough, MA 01752		
Phone:	(413) 256-6701	**Email:**	treidy@baconwilson.com

Applicant Information			
Name:	See Owner Information.	**Company Name:**	
Signature:	Duly Authorized		
Address:			
Phone:		**Email:**	

RECEIVED
SEP 14 2023
Town of Leicester
Development & Inspectional Services

Primary Contact Person (*The person that will be contacted by Planning Board staff during the application process.*)			
Name:	Thomas R. Reidy, Esq.	**Company Name:**	Bacon Wilson, P.C.
Address:	6 South East Street, Amherst, MA 01002		
Phone:	(413) 256-6701	**Email:**	treidy@baconwilson.com

PROJECT INFORMATION

Project Address:	1621 Main Street	**Zoning District:**	HB-1
Assessors Map & Parcel #	18A-13	**Deed Reference (Book & Page):**	Book 68752, Page 283
Applicable Zoning Bylaw Section(s):	3.2.03 Business (1 and 6-Restaurant and Service) Allowed by Right. 3.2.03 Business (11-Drive-Through) Allowed By Special Permit		
Proposed Land Use:	Nail Salon and Starbucks with a drive-through		
Existing Land Use:	Abandoned Single Family Home Lot		

For Planning Office Use:
File #:_____

PROJECT INFORMATION, Continued

Size of Proposed Structure(s):	3,900 Square Feet (2,400 Square feet- Starbucks, 1,500 Square Feet- Nail Salon)	
Total Lot Area:	.921 Acres (40,123 Square Feet)	
Water Source: *(Select One)*	◯ Private Well	◯ Cherry Valley & Rochdale Water District
	◯ Hillcrest Water District	◉ Leicester Water Supply District
Sewer Source: *(Select One)*	◯ Private Septic System	◯ Cherry Valley Sewer District
	◯ Hillcrest Water District	◉ Leicester Water Supply District
	◯ Oxford Rochdale Sewer District	

Brief Project Description:
Please include a brief description on this form (i.e. do not write "see attached"). *[Examples: New construction of a 20,000s.f. retail building and associated parking; Use of a 1,000s.f. portion of an existing structure for a proposed pet grooming clinic.]*

The Applicant seeks to demolish the existing abandoned single family home and construct a 3,900 square foot commercial building with 30 parking spaces and a drive-through (2,400 square feet- Starbucks, 1,500 square feet- Nail Salon)

Application Checklist

Use this checklist to ensure you have provided all required information. See Planning Board Site Plan Review & Special Permit Regulations for details. 13 copies are required except where noted.

☐ Plans (2-full-size & 11-11"x17")	☐ Detailed Project Narrative including any waiver requests [1]	☐ Drainage Analysis/ Stormwater Report, (3 copies) ☐ n/a
☐ Documentation of Availability of Water & Sewer ☐ n/a	☐ Certified Abutters List (1 copy)[2] ☐ n/a	☐ Traffic Study (3 copies) ☐ n/a
☐ Fees[3]	☐ .pdf copy of all required submittals (CD or USB Drive)	

1 See Planning Board Site Plan Regulations for details on what should be included in a Project Narrative. For special permits that don't require conformance with Site Plan Review submittal requirements, submit a narrative explaining conformance with special permit approval criteria (see Special Permit Regulations for details).

2 certified abutters lists are required for all Special Permits applications and for Major Site Plan Review Applications (new construction over 30,000 s.f. and ground-mounted solar over 250,000 s.f or 2 acres or more of tree clearing)

3 Please refer to the Planning Board's Fee Regulations. Checks must be made out to the Town of Leicester

For Planning Board Use:			
Date of Submittal:			
Public Hearing/Meeting Date(s):			
Date of Planning Board Vote:			
Date Decision Filed with Town Clerk:			

SPR-2023-01 & SP-2023-01

For Planning Office Use:
File #:_____

Leicester Planning Board
Site Plan Review & Special Permit Application Form

PERMIT TYPE: ☐ Special Permit ☑ Site Plan Review

CONTACT INFORMATION

Owner Information			
Name:		**Company Name:**	HY Ventures Leicester, LLC
Signature:			
Address:	313 Boston Post Road, Suite 120, Marlborough, MA 01752		
Phone:	(413) 256-6701	**Email:**	treidy@baconwilson.com
Applicant Information			
Name:	See Owner Information.	**Company Name:**	
Signature:			
Address:			
Phone:		**Email:**	
Primary Contact Person *(The person that will be contacted by Planning Board staff during the application process.)*			
Name:	Thomas R. Reidy, Esq.	**Company Name:**	Bacon Wilson, P.C.
Address:	6 South East Street, Amherst, MA 01002		
Phone:	(413) 256-6701	**Email:**	treidy@baconwilson.com

RECEIVED
SEP 14 2023
Town of Leicester
Development & Inspectional Services

PROJECT INFORMATION

Project Address:	1621 Main Street	**Zoning District:**	HB-1
Assessors Map & Parcel #	18A-13	**Deed Reference (Book & Page):**	Book 68752, Page 283
Applicable Zoning Bylaw Section(s):	3 2 03 Business (1 and 6-Restaurant and Service) Allowed by Right. 3 2 03 Business (11 Drive-Through) Allowed By Special Permit		
Proposed Land Use:	Nail Salon and Starbucks with a drive-through		
Existing Land Use:	Abandoned Single Family Home Lot		

Bacon Wilson
ATTORNEYS AT LAW

AMHERST
HADLEY
NORTHAMPTON
SPRINGFIELD
WESTFIELD

September 13, 2023

Hand Delivered

Leicester Planning Board
c/o David A. Genereux, Town Administrator
Town of Leicester
3 Washburn Square
Leicester, MA 01524

RE: Site Plan Approval & Special Permit Applications
1621 Main Street, Leicester, MA

Dear Mr. Genereux:

Please accept this submission packet on behalf of HY Ventures Leicester, LLC as formal Application for:

1. Site Plan Approval for the redevelopment of the parcel known as 1621 Main Street (the "Site"). The Applicant seeks to demolish the existing abandoned single-family home and construct an approximately 3,900 square foot commercial building with 30 parking spaces and a drive-through (2,400 square foot Starbucks with drive-through, and 1,500 square feet Nail Salon). The uses of a Starbucks and nail salon are allowed by right with Site Plan Approval by the Planning Board;

2. Special Permit to allow for the use of a drive-through for the Starbucks which is allowed under 3.2.03 Business(11) of the Leicester Zoning Bylaw; and,

3. Stormwater Permit under Chapter 15 of the Leicester General Laws and the Leicester Stormwater Regulations.

The following documents (as copies or original documents as appropriate) are included:

1. Site Plan Approval Application;
2. Special Permit Application;
3. Site Plan Approval and Special Permit Narrative;
4. List of Abutters;
5. Stormwater Management Report;
6. Stormwater Modification Letter for 1603 and 1605 Main Street;
7. Two (2) 24" x 36" site plan and elevations plan;
8. Two (2) 11" x 17" site plan and elevations plan; and,
9. Application Fee.

Thomas R. Reidy
Attorney
treidy@baconwilson.com

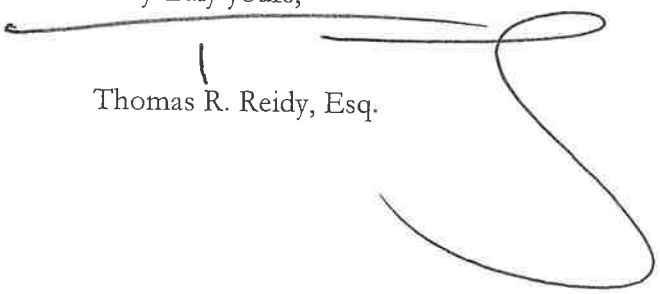
Bacon Wilson, P.C.\ Monsein & MacConnell
Attorneys at Law

6 South East Street
Amherst, MA 01002

Tel 413.256.6701
Fax 413.256.6469

Kindly place this matter on the Planning Board's agenda for the October 17th hearing, and please do not hesitate to contact me should you require any clarification.

Very truly yours,



Thomas R. Reidy, Esq.

For Planning Office Use:
File #:_____

Leicester Planning Board
Site Plan Review & Special Permit Application Form

PERMIT TYPE: ☐ Special Permit ☑ Site Plan Review

CONTACT INFORMATION

Owner Information			
Name:		**Company Name:**	HY Ventures Leicester, LLC
Signature:	Duly Authorized		
Address:	313 Boston Post Road, Suite 120, Marlborough, MA 01752		
Phone:	(413) 256-6701	**Email:**	treidy@baconwilson.com

Applicant Information			
Name:	See Owner Information.	**Company Name:**	
Signature:	Duly Authorized		
Address:			
Phone:		**Email:**	

Primary Contact Person (*The person that will be contacted by Planning Board staff during the application process.*)			
Name:	Thomas R. Reidy, Esq.	**Company Name:**	Bacon Wilson, P.C.
Address:	6 South East Street, Amherst, MA 01002		
Phone:	(413) 256-6701	**Email:**	treidy@baconwilson.com

PROJECT INFORMATION

Project Address:	1621 Main Street	**Zoning District:**	HB-1
Assessors Map & Parcel #	18A-13	**Deed Reference (Book & Page):**	Book 68752, Page 283
Applicable Zoning Bylaw Section(s):	3 2 03 Business (1 and 6-Restaurant and Service) Allowed by Right, 3 2 03 Business (11-Drive-Through) Allowed By Special Permit		
Proposed Land Use:	Nail Salon and Starbucks with a drive-through		
Existing Land Use:	Abandoned Single Family Home Lot		

For Planning Office Use:
File #:_____

PROJECT INFORMATION, Continued

Size of Proposed Structure(s):	3,900 Square Feet (2,400 Square feet- Starbucks, 1,500 Square Feet- Nail Salon)
Total Lot Area:	.921 Acres (40,123 Square Feet)

Water Source: *(Select One)*	◯ Private Well	◯ Cherry Valley & Rochdale Water District
	◯ Hillcrest Water District	◉ Leicester Water Supply District
Sewer Source: *(Select One)*	◯ Private Septic System	◯ Cherry Valley Sewer District
	◯ Hillcrest Water District	◉ Leicester Water Supply District
	◯ Oxford Rochdale Sewer District	

Brief Project Description:

Please include a brief description on this form (i.e. do not write "see attached"). *[Examples: New construction of a 20,000s.f. retail building and associated parking; Use of a 1,000s.f. portion of an existing structure for a proposed pet grooming clinic.]*

The Applicant seeks to demolish the existing abandoned single family home and construct a 3,900 square foot commercial building with 30 parking spaces and a drive-through (2,400 square feet- Starbucks, 1,500 square feet- Nail Salon)

Application Checklist

Use this checklist to ensure you have provided all required information. See Planning Board Site Plan Review & Special Permit Regulations for details. 13 copies are required except where noted.

☐ Plans (2-full-size & 11-11"x17")	☐ Detailed Project Narrative including any waiver requests [1]	☐ Drainage Analysis/ Stormwater Report, (3 copies) ☐ n/a
☐ Documentation of Availability of Water & Sewer ☐ n/a	☐ Certified Abutters List (1 copy)[2] ☐ n/a	☐ Traffic Study (3 copies) ☐ n/a
☐ Fees[3]	☐ .pdf copy of all required submittals (CD or USB Drive)	

1 See Planning Board Site Plan Regulations for details on what should be included in a Project Narrative. For special permits that don't require conformance with Site Plan Review submittal requirements, submit a narrative explaining conformance with special permit approval criteria (see Special Permit Regulations for details).

2 certified abutters lists are required for all Special Permits applications and for Major Site Plan Review Applications (new construction over 30,000 s.f. and ground-mounted solar over 250,000 s.f or 2 acres or more of tree clearing)

3 Please refer to the Planning Board's Fee Regulations. Checks must be made out to the Town of Leicester

For Planning Board Use:			
Date of Submittal:			
Public Hearing/Meeting Date(s):			
Date of Planning Board Vote:			
Date Decision Filed with Town Clerk:			

For Planning Office Use:
File #:_____

Leicester Planning Board
Site Plan Review & Special Permit Application Form

PERMIT TYPE: ☑ Special Permit ☐ Site Plan Review

CONTACT INFORMATION

Owner Information			
Name:		**Company Name:**	HY Ventures Leicester, LLC
Signature:	Duly Authorized		
Address:	313 Boston Post Road, Suite 120, Marlborough, MA 01752		
Phone:	(413) 256-6701	**Email:**	treidy@baconwilson.com

Applicant Information			
Name:	See Owner Information.	**Company Name:**	
Signature:	Duly Authorized		
Address:			
Phone:		**Email:**	

Primary Contact Person (*The person that will be contacted by Planning Board staff during the application process.*)			
Name:	Thomas R. Reidy, Esq.	**Company Name:**	Bacon Wilson, P.C.
Address:	6 South East Street, Amherst, MA 01002		
Phone:	(413) 256-6701	**Email:**	treidy@baconwilson.com

PROJECT INFORMATION

Project Address:	1621 Main Street	**Zoning District:**	HB-1
Assessors Map & Parcel #	18A-13	**Deed Reference (Book & Page):**	Book 68752, Page 283
Applicable Zoning Bylaw Section(s):	3 2 03 Business (1 and 6-Restaurant and Service) Allowed by Right, 3 2 03 Business (11-Drive-Through) Allowed By Special Permit		
Proposed Land Use:	Nail Salon and Starbucks with a drive-through		
Existing Land Use:	Abandoned Single Family Home Lot		

For Planning Office Use:
File #:_____

PROJECT INFORMATION, Continued

Size of Proposed Structure(s):	3,900 Square Feet (2,400 Square feet- Starbucks, 1,500 Square Feet- Nail Salon)	
Total Lot Area:	.921 Acres (40,123 Square Feet)	
Water Source: *(Select One)*	○ Private Well	○ Cherry Valley & Rochdale Water District
	○ Hillcrest Water District	◉ Leicester Water Supply District
Sewer Source: *(Select One)*	○ Private Septic System	○ Cherry Valley Sewer District
	○ Hillcrest Water District	◉ Leicester Water Supply District
	○ Oxford Rochdale Sewer District	

Brief Project Description:
Please include a brief description on this form (i.e. do not write "see attached"). *[Examples: New construction of a 20,000s.f. retail building and associated parking; Use of a 1,000s.f. portion of an existing structure for a proposed pet grooming clinic.]*

The Applicant seeks to demolish the existing abandoned single family home and construct a 3,900 square foot commercial building with 30 parking spaces and a drive-through (2,400 square feet- Starbucks, 1,500 square feet- Nail Salon)

Application Checklist

Use this checklist to ensure you have provided all required information. See Planning Board Site Plan Review & Special Permit Regulations for details. 13 copies are required except where noted.

☐ Plans (2-full-size & 11-11"x17")	☐ Detailed Project Narrative including any waiver requests [1]	☐ Drainage Analysis/ Stormwater Report, (3 copies) ☐ n/a
☐ Documentation of Availability of Water & Sewer ☐ n/a	☐ Certified Abutters List (1 copy) [2] ☐ n/a	☐ Traffic Study (3 copies) ☐ n/a
☐ Fees [3]	☐ .pdf copy of all required submittals (CD or USB Drive)	

1 See Planning Board Site Plan Regulations for details on what should be included in a Project Narrative. For special permits that don't require conformance with Site Plan Review submittal requirements, submit a narrative explaining conformance with special permit approval criteria (see Special Permit Regulations for details).

2 certified abutters lists are required for all Special Permits applications and for Major Site Plan Review Applications (new construction over 30,000 s.f. and ground-mounted solar over 250,000 s.f or 2 acres or more of tree clearing)

3 Please refer to the Planning Board's Fee Regulations. Checks must be made out to the Town of Leicester

For Planning Board Use:			
Date of Submittal:			
Public Hearing/Meeting Date(s):			
Date of Planning Board Vote:			
Date Decision Filed with Town Clerk:			

HY VENTURES LEICESTER, LLC

1621 MAIN STREET

LEICESTER, MASSACHUSETTS

SITE PLAN REVIEW/SPECIAL PERMIT NARRATIVE

OVERVIEW

HY Ventures Leicester, LLC (the "Applicant") is proposing the redevelopment of the parcel known as 1621 Main Street. The Site is currently comprised of an abandoned single-family home in disrepair. The Site is bounded to the west by woods, to the north by a residential property, to the east by Main Street (Route-9) and to the south by as gas station and convenience store. The Site will be an approximately .92-acre (40,123 square foot) parcel located within the HB-1 zoning district.

The proposal is for the removal of the existing structure and the redevelopment of the site to include a 3,900 square foot commercial/restaurant building, with 2,400 square of feet of the structure being a Starbucks with drive-though and 1,500 square feet Nail Salon, with a total building coverage of 10%. The Site will provide 30 parking spaces, and attendant signage, landscaping, lighting and site infrastructure. The sewer and water will be provided by the Leicester Water Supply District ("Project").

The Starbucks and nail salon use are allowed by right under the Leicester Zoning Bylaw with Site Plan Approval by the Planning Board. The use of a drive-through is allowed by Special Permit granted by the Planning Board.

The proposed Project is for the reconstruction and alteration of the Site, which currently is comprised of an abandoned single-family home, for use as a Starbucks with a drive-through and a nail salon. The Site will include landscaping as more completely and specifically detailed in the Site Landscape Plan (Plan 7), included in the submission packet.

The Starbucks will likely not operate outside of Monday-Sunday 5 A.M. to 11 P.M. It is anticipated that there will be a total of 35 employees hired to operate the store, with 6-8 employees at peak business hours and 2-4 employees at lower intensity business hours. Majestic Nails is a nail salon that specializes in manicures, pedicures and waxing. It is anticipated that the business will operate Monday-Friday 9:30 A.M. to 7 P.M., Saturday 9 A.M. to 6 P.M. and will be closed on Sundays, and will have 8-10 employees hired to operate the business.

The proposed Site will have one right-in-only only curb cut on the northeasterly portion of the lot, with additional site access through the Site's southerly side, leading to the southerly adjacent property (to be memorialized in an access easement), which provides access to a signalized intersection. The siting of the access site driveways allows for proper circulation of passengers and delivery vehicles.

Site illumination will be downcast LED lights which prevent light nuisance or light spillage onto adjacent properties. Adequate lighting is provided to increase public safety.

Civil Design Group has also provided a Stormwater Management Report, which evidences a system design that results in post-development peak runoff rates not exceeding pre-developments peak runoff rates. The collection system has been designed to convey runoff for the 25-year storm event and the stormwater management system incorporates both structural and non-structural BMP's to adequately treat runoff from the proposed redevelopment area in accordance with the DEP Stormwater Management Policy to the maximum extent practicable. Comprehensive computations and calculations with supporting figures and plans are attached.

The proposed signage, lighting and traffic flow ensures the safety, public health and welfare of pedestrians both on and off the site.

The proposed Project is in harmony with the uses in the HB-1 zoning district, as the intent of the district is to provide for the development and redevelopment of Leicester's highway business corridors by allowing a mix of commercial, office, research, and light industrial activities that create employment opportunities and expand the tax base.

The redevelopment of the Site will both eliminate the existing infrastructure at the Site and replace them with a state-of-the-art facility, and the Leicester tax base will be diversified and expanded (the value of the existing parcel is $344,600). It is likely the assessed value will be significantly higher due to the proposed Project, resulting in more tax revenue for the town of Leicester. Further, the Project would be a convenience to the Town and those individuals looking for the goods that it offers, while providing additional job opportunities. Appropriate downcast lighting, building siting, and site management will ensure that the neighborhood is not detrimentally affected.

HY Ventures Leicester, LLC believes the Project will be a benefit to the community and is an appropriate development of the site.

STORMWATER MANAGEMENT REPORT

FOR A

COMMERCIAL DEVELOPMENT

1621 MAIN STREET
LEICESTER, MA 01524

PREPARED FOR:

HY VENTURES LEICESTER, LLC
313 BOSTON POST ROAD WEST
MARLBOROUGH, MA 01752

PREPARED BY:

CIVIL DESIGN GROUP, LLC
21 HIGH STREET, SUITE 207
NORTH ANDOVER, MA 01845

DATE: AUGUST 2023

TABLE OF CONTENTS **PAGE**

I. STORMWATER MANAGEMENT NARRATIVE

1.0 SITE LOCATION AND DESCRIPTION…… 1
2.0 METHODOLOGY……. 1
3.0 SOILS…… 1
4.0 POINTS OF ANALYSIS…… 2
5.0 EXISTING DRAINAGE WATERSHEDS……..……. 2
6.0 PROPOSED DRAINAGE WATERSHEDS……. 2
7.0 PEAK FLOW RATE …… 3
8.0 WATER QUALITY…….. 3
9.0 GROUNDWATER RECHARGE …….……. 4
10.0 DRAINAGE CONVEYANCE SYSTEM……..……... 5
11.0 COMPLIANCE WITH THE MA DEP STORMWATER HANDBOOK…… 5
12.0 SUMMARY……. 7

II. LIST OF FIGURES

- FIGURE 1: USGS PLAN
- FIGURE 2: SOIL MAP
- FIGURE 3: PRE-DEVELOPMENT WATERSHEDS
- FIGURE 4: POST-DEVELOPMENT WATERSHEDS
- FIGURE 5: CATCH BASIN WATERSHEDS
- WATER QUALITY UNIT SIZING REPORT

III. HYDROLOGICAL & HYDRAULIC CALCULATIONS

- PRE-DEVELOPMENT HYDROCAD CALCULATIONS
- POST-DEVELOPMENT HYDROCAD CALCULATIONS
- PIPE DESIGN

IV. MASSACHUSETTS STORMWATER REPORT CHECKLIST

- DEP CHECKLIST FOR STORMWATER REPORT

V. APPENDIX A

- OPERATION AND MAINTENANCE PLAN (O&M)
  (WITH LONG-TERM POLLUTION PREVENTION PLAN)

p: 978-794-5400 f: 978.965.3971 www.cdgengineering.com

1.0 SITE LOCATION AND DESCRIPTION

Civil Design Group, LLC (CDG) has been retained by HY Ventures Leicester, LLC to prepare this Stormwater Management Report for the construction of commercial development located at 1621 Main Street in Leicester, Massachusetts (refer to Figure-1). The development program includes demolishing the existing single family home and includes constructing a new 3,900 square foot commercial/restaurant building with 30 parking spaces on a 0.92± acre site. The site is bounded to the south by woods, to the west by a residential property, to the north by Main Street and to the east by a gas station and convenience store.

According to FEMA flood insurance rate maps community panel number 25027C0780FE, effective date 06/21/2023, the site lies within Zone X, which is defined as areas determined to be outside the 0.2% (500-year) annual chance floodplain. Based on available MassGIS information, the does not include a wetland resource area and does not appear to lie within an Area of Critical Environmental Concern (ACEC), or an area mapped for rare and endangered species or certified vernal pools. The site does not lie within a groundwater protection area.

This study presents a comparative analysis of the pre-development and post-development hydrologic characteristics of the site, and outlines the proposed measures to mitigate flow, provide groundwater recharge, and improve water quality from the site in accordance with the municipal and the Massachusetts Department of Environmental Protection (DEP's) requirements. The proposed best management practices (BMPs) as outlined in this report include two subsurface infiltration systems to provide recharge and mitigation of the peak flow rates for the 2, 10, 25 and 100-year storm events and treatment devices to pretreat stormwater to the maximum extent practicable prior to discharging off site.

2.0 METHODOLOGY

Northeast Regional Climate Center (Cornell Rates) was utilized to source the precipitation values and Technical Release 55 (TR-55) methodology was utilized to determine weighted curve numbers (CNs) for each pre and post-development subcatchment area. Weighted CNs are based on ground cover type and hydrologic soil groups (HSGs). The times of concentration (Tc's) for each of the existing and proposed watersheds have been calculated. The areas that do not show a Tc travel path resulted in travel times of less than 6 minutes. CN and Tc values were then utilized to generate hydrographs using HydroCad 10.0, an industry standard software package that develops a hydrologic model based on the SCS method and computes peak discharges from rainfall runoff for urban and rural watersheds.

3.0 SOILS

According to the Natural Resources Conservation Service Web Soil Survey, underlying soils on the site are classified as Woodbridge fine sandy loam, which includes an associated hydrologic soil group [HSG] rating of C/D. Therefore, for the purposes of generating peak flow rates, this stormwater report utilizes an HSG rating of C for both the existing and proposed conditions, which is consistent with the recently approved project to the east. Furthermore, an infiltration rate of 0.27 in/hour is used for the expanded offsite infiltration basin which is the same rate used in the recently approved development.

p: 978-794-5400 f: 978.965.3971 www.cdgengineering.com

4.0 POINTS OF ANALYSIS

Points of Analysis (POAs) are discharge points or lines that convey runoff from the study area via overland flow or through drain pipes. The pre-development and post-development areas of disturbance drain to two (2) POAs listed and described below and shown on Figures 3 and 4.

TABLE-1: POINTS OF ANALYSIS

POINT OF ANALYSIS	DESCRIPTION
POA-1	A comparison line along the rear property line, which conveys runoff toward the wooded area to the south and eventually the downstream wetland.
1EV	The southwest corner of the abutting property, which conveys runoff toward the wooded area to the south and eventually the downstream wetland.

Both POA's merge to the same offsite location but they have been presented separately because they their respective watersheds are sourced on different properties.

5.0 EXISTING DRAINAGE WATERSHEDS

The existing watersheds are delineated based on topography, physical characteristics and drainage networks within the site limits and collect and direct stormwater towards the POAs. The total study area for this project is 0.94± acres as a portion of the upstream area between the Main Street curb line and front property line drain back towards the site. The pre-development watershed is described as follows:

Subcatchment EX-1: The 0.94-acre watershed is comprised of pavement, rooftop and grass areas. Runoff sheet flows via overland in a southerly direction towards POA-1.

6.0 PROPOSED DRAINAGE WATERSHEDS

Similar to the existing watersheds, the proposed watersheds are delineated based on topography, physical characteristics and drainage networks within the site limits and collect and direct stormwater towards the POAs. The two (2) post-development watersheds are described as follows:

Subcatchment PR-1: The 0.16-acre watershed is comprised of pavement and grass areas Runoff sheet flows via overland in a southerly direction towards POA-1.

Subcatchment PR-2: The 0.78-acre watershed is comprised of rooftop, pavement and grass areas. Runoff is collected in the new drainage system and is conveyed to the offsite expanded infiltration basin. The overflow runoff is discharged in a southerly direction towards 1EV.

7.0 PEAK FLOW RATE MITIGATION

The stormwater management system is designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates for the 2-year, 10-year, 25-year and 100-year, 24-hour storm events. Peak flow rates for the pre-development and post-development conditions are illustrated below:

p: 978-794-5400 f: 978.965.3971 www.cdgengineering.com

TABLE 2: PEAK FLOW RATE COMPARISON

POINT OF ANALYSIS	2-YEAR STORM EVENT (3.23"/24-HR)		10-YEAR STORM EVENT (4.58"/24-HR)		25-YEAR STORM EVENT (5.88"/24-HR)		100-YEAR STORM EVENT (8.68"/24-HR)	
	PRE (CFS)	POST (CFS)	PRE (CFS)	POST (CFS)	PRE (CFS)	POST (CFS)	PRE (CFS)	POST (CFS)
POA-1	*1.25*	**0.19**	*2.28*	**0.40**	*3.34*	**0.57**	*5.73*	**0.95**
1EV	*2.29**	**2.09**	*5.69**	**4.20**	*8.81**	**7.27**	*15.53**	**11.73**

*** Approved peak flow rates from previous project**

8.0 WATER QUALITY

The development program includes measures to treat runoff from impervious areas prior to discharging offsite. New stormwater controls have been incorporated into the design that result in a reduction in annual stormwater pollutant loads from the site. Through the use of structural and non-structural BMPs, the water quality volume from the watersheds contributing to the proposed drainage system will undergo treatment. Currently, the limit of work contains approximately 0.13 acres of impervious area or 13% of the site. The redevelopment program includes approximately 0.63 acres of impervious or 67% of the site, resulting in a net increase of 0.50 acres in impervious area. As depicted in Figure-5, subcatchments 1 and 4 corresponding to catch basins CB-1-CB-4 of the proposed drainage system, collect 0.53± acres of non-rooftop impervious area and will be treated to the standards (see below). The runoff from the remaining <0.01± acres of non-rooftop impervious area sheet flow onto Main Street. The following BMPs were selected to treat the average annual TSS load from stormwater runoff under the post-development condition. Refer to the TSS Removal Calculation Worksheet below.

- Deep Sump Hooded Catch Basins
  Stormwater runoff from proposed pavement areas will be directed via curbing and site grading to catch basins with deep sumps and hooded outlets. The catch basins will trap and remove sediment and larger particles from the stormwater and will improve the performance of subsequent BMP's. The sumps will be a minimum of 4' in depth and a regular inspection and cleaning schedule has been proposed to ensure optimal effectiveness. When properly designed and maintained, catch basin sumps are effective in reducing the sediment and pollutant load in runoff.

- Hydrodynamic Separator (HS4 Unit)
  Hydrodynamic Separators are designed to remove heavy particles, floating debris and hydrocarbons from stormwater. Stormwater enters the system where floatables and oils are separated prior to the clarified stormwater runoff discharging to an outlet pipe. See below for additional information about the TSS rates utilized for these proprietary BMPs.

- Infiltration Basin with Sediment Forebay
  A sediment forebay is an excavated pit or bermed area designed to slow incoming stormwater runoff and facilitate the gravity separation of suspended solids. Infiltration basins are stormwater runoff impoundments that are constructed over permeable soils. Pretreatment is critical for effective performance of infiltration basins. Runoff from the design storm is stored until it exfiltrates through the soil of the basin floor.

p: 978-794-5400 f: 978.965.3971 www.cdgengineering.com

TABLE 3: TSS REMOVAL CALCULATION WORKSHEET[1]

TREATMENT TRAIN-1 (TT#1): SC-1 - SC4 (0.53Ac)

BMP (A)	TSS Removal Rate (B)	Starting TSS Load (C)	Amount Removed (BxC) (D)	Remaining Load (C-D) (E)
Deep sump hooded catch basins	0.25	1.0	0.25	0.75
Infiltration w/ pre-treatment*	0.80[1]	0.75	0.60	0.15
Total TSS Removal = Summation of (D) =			**85%**	

*** Calculated using the Hydroworks software (minimum of 44% TSS Removal prior to infiltration)**

[1] 80% TSS removal credit when combined with adequate pretreatment

CUMULATIVE TSS REMOVAL: (0.53Acres x 0.85) + (0.01 Acres x 0.00) = 84%
0.54 Acres

Since the Hydroworks units are designed to treat the required flow without overflow, bypass, surcharge, or scouring, and since they include a built-in bypass mechanism to accommodate high flow storm events, they are considered "offline" units under the DEP policy as proposed.

9.0 GROUNDWATER RECHARGE

The DEP Stormwater Management Policy addresses the importance of recharging groundwater and reducing surface runoff. For a redevelopment project, the net increase in site impervious area must be infiltrated to approximate the annual recharge from pre-development conditions. The total impervious area contributing to the infiltration basin equals 2.78± acres. The required recharge equals a depth of runoff corresponding to the soil type multiplied by the net increase in impervious area for each soil type in the post development condition. Using a target factor of 0.25 inches for HSG-C, the total required recharge volume is as follows:

$$Rv = (F) \times (\text{newly created impervious area})$$

where,

Rv =Required recharge volume (cubic feet)
F = Target depth factor corresponding to the HSG.

$$Rv = 0.25 \text{ inch} \times 2.78 \text{ acres} \times (43{,}560 \text{ ft}^2/\text{acre}) \times (1 \text{ ft}/12 \text{ inch}) = 2{,}523 \text{ cubic feet}$$

The available storage within the infiltration basin below the lowest overflow outlet totals 5,124± cubic feet, thereby exceeding the required recharge volume.

10.0 DRAINAGE CONVEYANCE SYSTEM

The proposed stormwater conveyance system was designed to collect and convey runoff from developed areas to the associated stormwater management system BMP's described in this report. The drainage system consists

[1] TSS Removal Rate calculation includes non-rooftop impervious surfaces.

p: 978-794-5400 f: 978.965.3971 www.cdgengineering.com

four (4) deep sump hooded catch basins, one (1) water quality unit, one (1) infiltration basin and associated piping. Using the rational method to determine peak runoff flows, the proposed conveyance system is designed for the 25-year storm event.

11.0 COMPLIANCE WITH THE MASSACHUSETTS DEP STORMWATER HANDBOOK

This study presents a comparative analysis of the pre-development and post-development hydrologic characteristics of the site, and outlines the proposed measures to mitigate flow, provide groundwater recharge, and improve water quality from the site. The best management practices (BMPs) outlined in this report include measures to meet the municipal and the Massachusetts Department of Environmental Protection (DEP) requirements. Below is a summary of how the design complies with each applicable DEP standard.

Standard 1: No new stormwater conveyances may discharge untreated directly to or cause erosion in wetlands or waters of the Commonwealth.

The proposed stormwater conveyance system does not include any new *untreated* discharges. The overland and subsurface drainage connection points will remain consistent with the existing condition.

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

As indicated above and within the supporting HydroCad calculations, the stormwater management system is designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.

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

There is a net increase of impervious area and the corresponding required volume of runoff will be recharged to groundwater.

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

To aid in removal of total suspended solids, deep sump hooded catch basins and water quality units are proposed. Onsite non-rooftop impervious areas will be treated beyond 80%.

Standard 5: For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable.

p: 978-794-5400 f: 978.965.3971 www.cdgengineering.com

Source control such as rooftop capture and direct connection into the proposed drainage system have been implemented to reduce the discharge of stormwater from the site. In addition, installation of a water quality unit will increase TSS removal for the site from existing conditions.

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

Not applicable.

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

Not applicable.

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

The 'Demolition and Erosion Control Plan' outlines and depicts measures to control construction related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities.

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

An Operation and Maintenance Plan (O&M) has been developed that outlines maintenance requirements to ensure longevity of BMP's. See Appendix A.

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

The proposed stormwater management system does not include any illicit discharges.

12.0 SUMMARY

The stormwater management system for the proposed redevelopment includes measures for collecting, conveying, treating and controlling stormwater runoff from the site. The site results in a net zero change in impervious area and post-development peak runoff rates have been attenuated for the 2, 10, 25 and 100-year storm events. The collection system has been designed to convey runoff for the 25-year storm event and the stormwater management system incorporates both structural and non-structural BMP's to adequately treat runoff from the proposed redevelopment area in accordance with the DEP Stormwater Management Policy to

p: 978-794-5400 f: 978.965.3971 www.cdgengineering.com

the maximum extent practicable. Comprehensive computations and calculations with supporting figures and plans are attached.

p: 978-794-5400 f: 978.965.3971 www.cdgengineering.com

1,000 0 500 1,000 2,000

GRAPHIC SCALE IN FEET

SOURCE: USGS TOPOGRAPHIC MAP

PROPOSED
COMMERCIAL DEVELOPMENT

1621 MAIN STREET
LEICESTER, MA

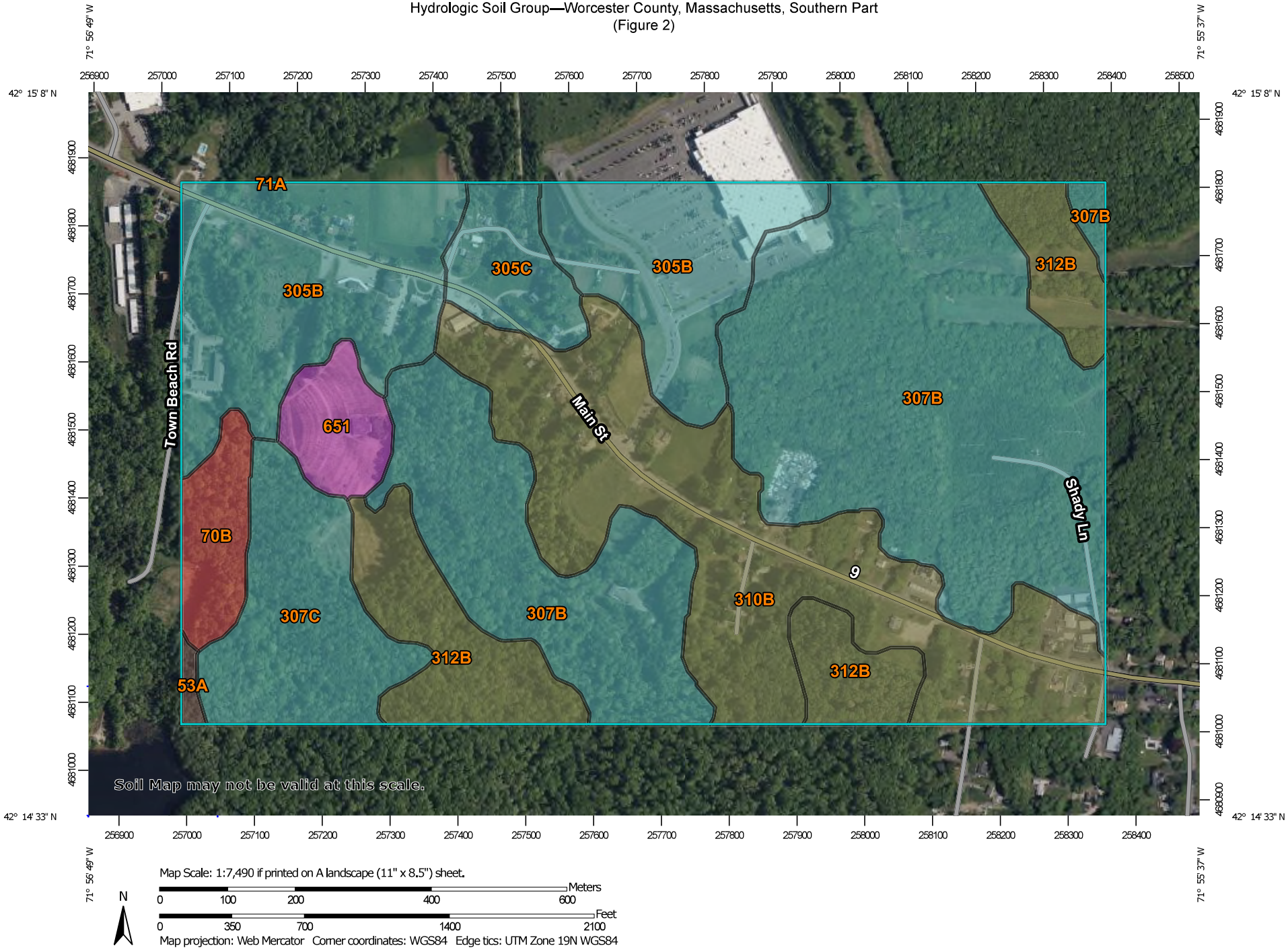
CIVIL DESIGN GROUP, LLC

21 HIGH STREET SUITE 207
NORTH ANDOVER, MA 01845
www.cdgengineering.com
p: 978-794-5400 f: 978-965-3971

FIGURE-1
USGS PLAN

08/2023

Hydrologic Soil Group—Worcester County, Massachusetts, Southern Part
(Figure 2)



Map Scale: 1:7,490 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 350 700 1400 2100

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

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Worcester County, Massachusetts, Southern Part
Survey Area Data: Version 15, Sep 9, 2022

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

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

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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
53A	Freetown muck, ponded, 0 to 1 percent slopes	B/D	0.8	0.3%
70B	Ridgebury fine sandy loam, 3 to 8 percent slopes	D	7.0	2.6%
71A	Ridgebury fine sandy loam, 0 to 3 percent slopes, extremely stony	D	0.0	0.0%
305B	Paxton fine sandy loam, 3 to 8 percent slopes	C	50.1	18.6%
305C	Paxton fine sandy loam, 8 to 15 percent slopes	C	8.5	3.2%
307B	Paxton fine sandy loam, 0 to 8 percent slopes, extremely stony	C	97.0	36.0%
307C	Paxton fine sandy loam, 8 to 15 percent slopes, extremely stony	C	19.5	7.2%
310B	Woodbridge fine sandy loam, 3 to 8 percent slopes	C/D	53.2	19.7%
312B	Woodbridge fine sandy loam, 0 to 8 percent slopes, extremely stony	C/D	26.5	9.8%
651	Udorthents, smoothed	A	6.7	2.5%
Totals for Area of Interest			**269.3**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

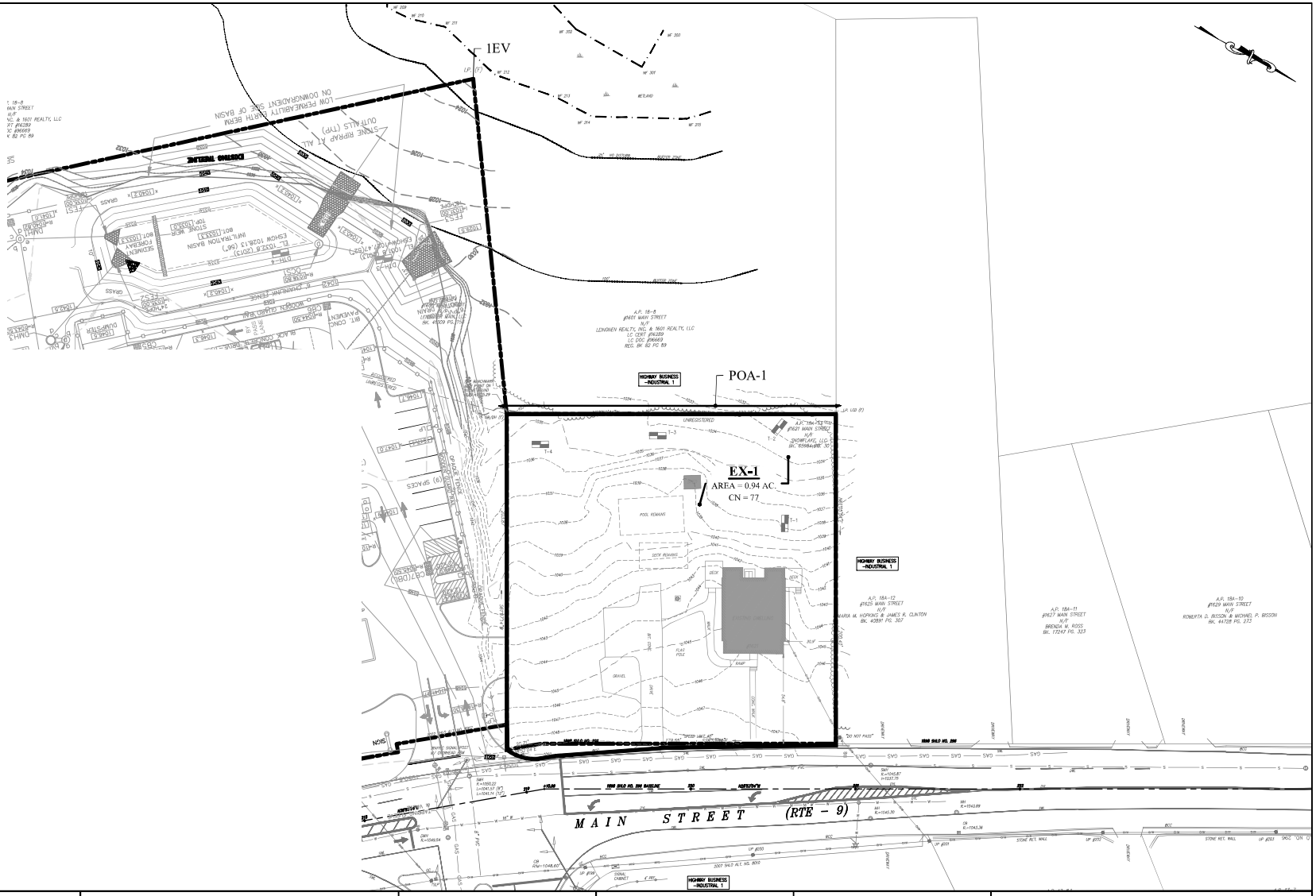
If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher



60 0 30 60 120

GRAPHIC SCALE IN FEET

CLIENT:
HY VENTURES LEICESTER, LLC
313 BOSTON POST ROAD WEST
MARLBOROUGH, MA 01752

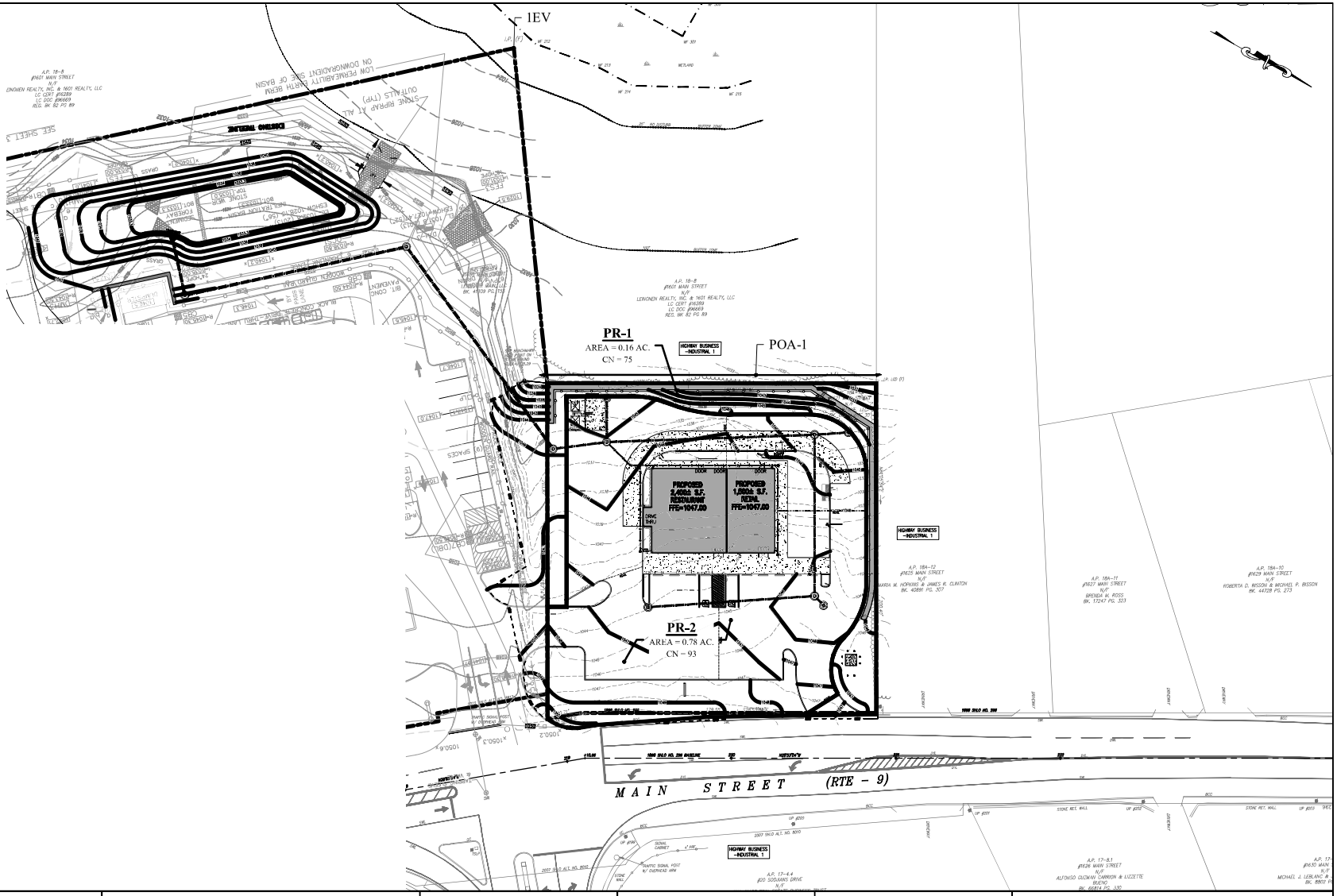
SITE:
1621 MAIN STREET, LEICESTER, MA 01524

CIVIL DESIGN GROUP, LLC
21 HIGH STREET, SUITE 207
NORTH ANDOVER, MA 01845
www.cdgengineering.com
p: 978-794-5400 f: 978-965-3971

NOT FOR CONSTRUCTION

FIGURE-3 EXISTING WATERSHED

DATE: 08/15/2023 | CDG# 23028



60 0 30 60 120

GRAPHIC SCALE IN FEET

CLIENT:
HY VENTURES LEICESTER, LLC
313 BOSTON POST ROAD WEST
MARLBOROUGH, MA 01752

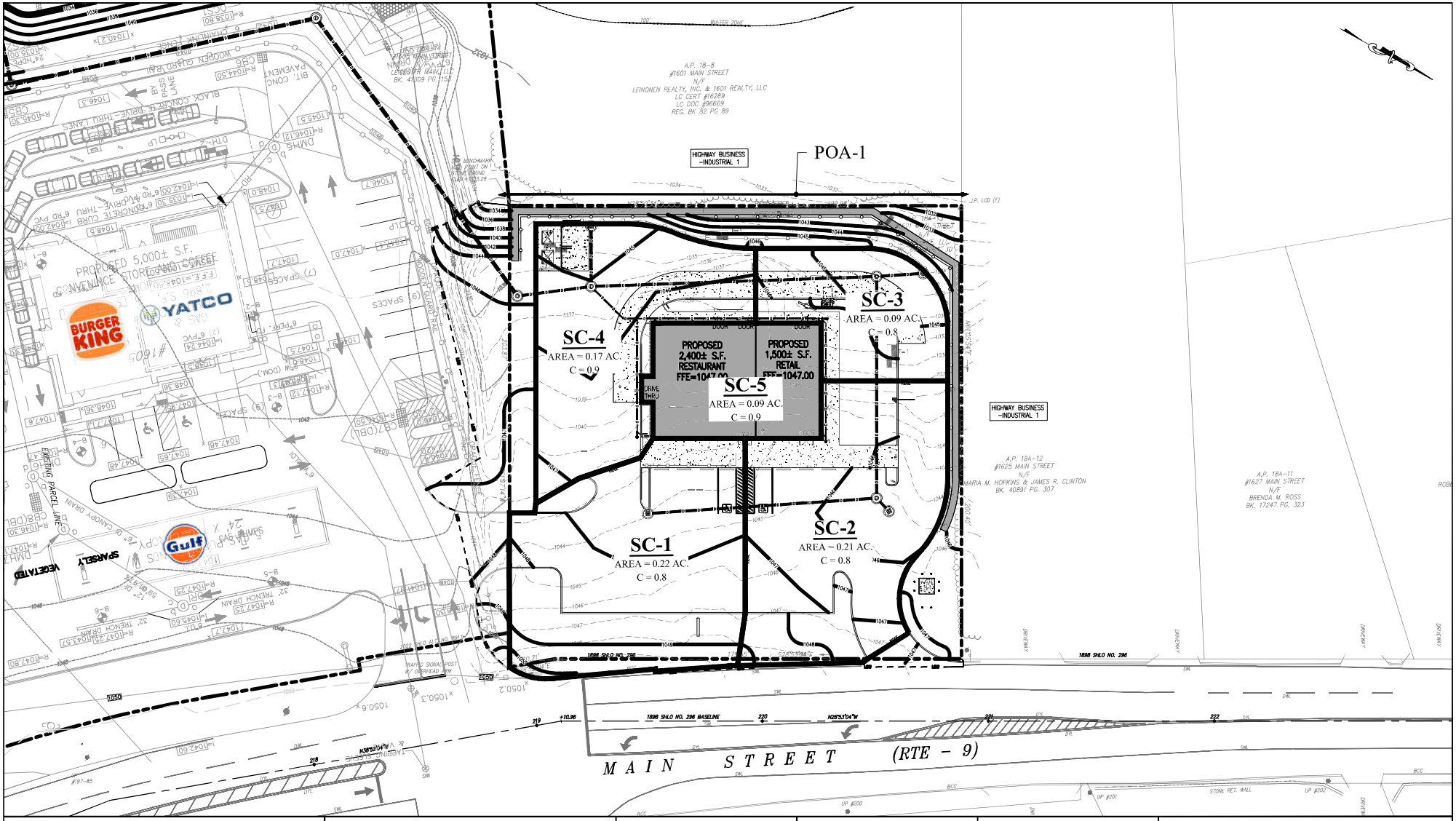
SITE:
1621 MAIN STREET, LEICESTER, MA 01524

CIVIL DESIGN GROUP, LLC
21 HIGH STREET, SUITE 207
NORTH ANDOVER, MA 01845
www.cdgengineering.com
p: 978-794-5400 f: 978-965-3971

NOT FOR CONSTRUCTION

FIGURE-4 PROPOSED WATERSHED

DATE: 08/15/2023 | CDG# 23028



CLIENT:
HY VENTURES LEICESTER, LLC
313 BOSTON POST ROAD WEST
MARLBOROUGH, MA 01752

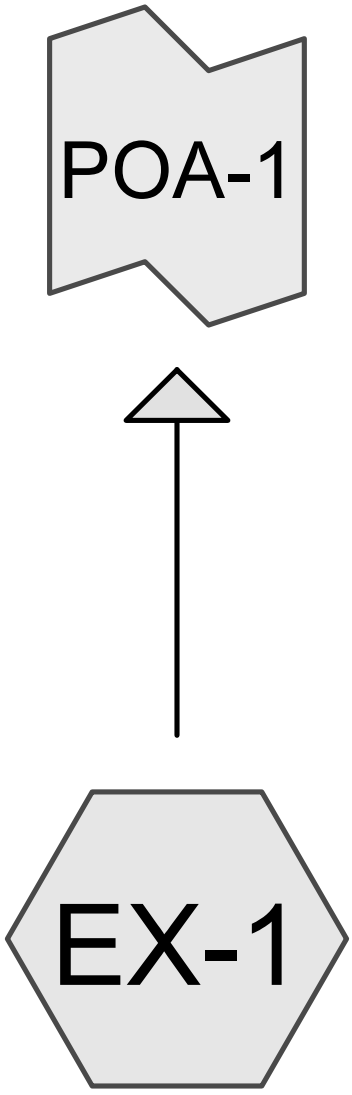
SITE:
1621 MAIN STREET, LEICESTER, MA 01524

CIVIL DESIGN GROUP, LLC
21 HIGH STREET, SUITE 207
NORTH ANDOVER, MA 01845
www.cdgengineering.com
p: 978-794-5400 f: 978-965-3971

NOT FOR CONSTRUCTION

FIGURE-5 PROPOSED CATCH BASIN WATERSHEDS

DATE: 08/15/2023 | CDG# 23028



Subcat Reach Pond Link

Routing Diagram for Pre Development
Prepared by {enter your company name here}, Printed 8/15/2023

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.811	74	>75% Grass cover, Good, HSG C (EX-1)
0.081	98	Paved parking, HSG C (EX-1)
0.045	98	Roofs, HSG C (EX-1)
0.937	**77**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.937	HSG C	EX-1
0.000	HSG D	
0.000	Other	
0.937		**TOTAL AREA**

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	0.811	0.000	0.000	0.811	>75% Grass cover, Good	EX-1
0.000	0.000	0.081	0.000	0.000	0.081	Paved parking	EX-1
0.000	0.000	0.045	0.000	0.000	0.045	Roofs	EX-1
0.000	**0.000**	**0.937**	**0.000**	**0.000**	**0.937**	**TOTAL AREA**	

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX-1: Runoff Area=40,818 sf 13.44% Impervious Runoff Depth=1.32"
Tc=6.0 min CN=74/98 Runoff=1.25 cfs 0.103 af

Link POA-1: Inflow=1.25 cfs 0.103 af
Primary=1.25 cfs 0.103 af

Total Runoff Area = 0.937 ac Runoff Volume = 0.103 af Average Runoff Depth = 1.32"
86.56% Pervious = 0.811 ac 13.44% Impervious = 0.126 ac

Summary for Subcatchment EX-1:

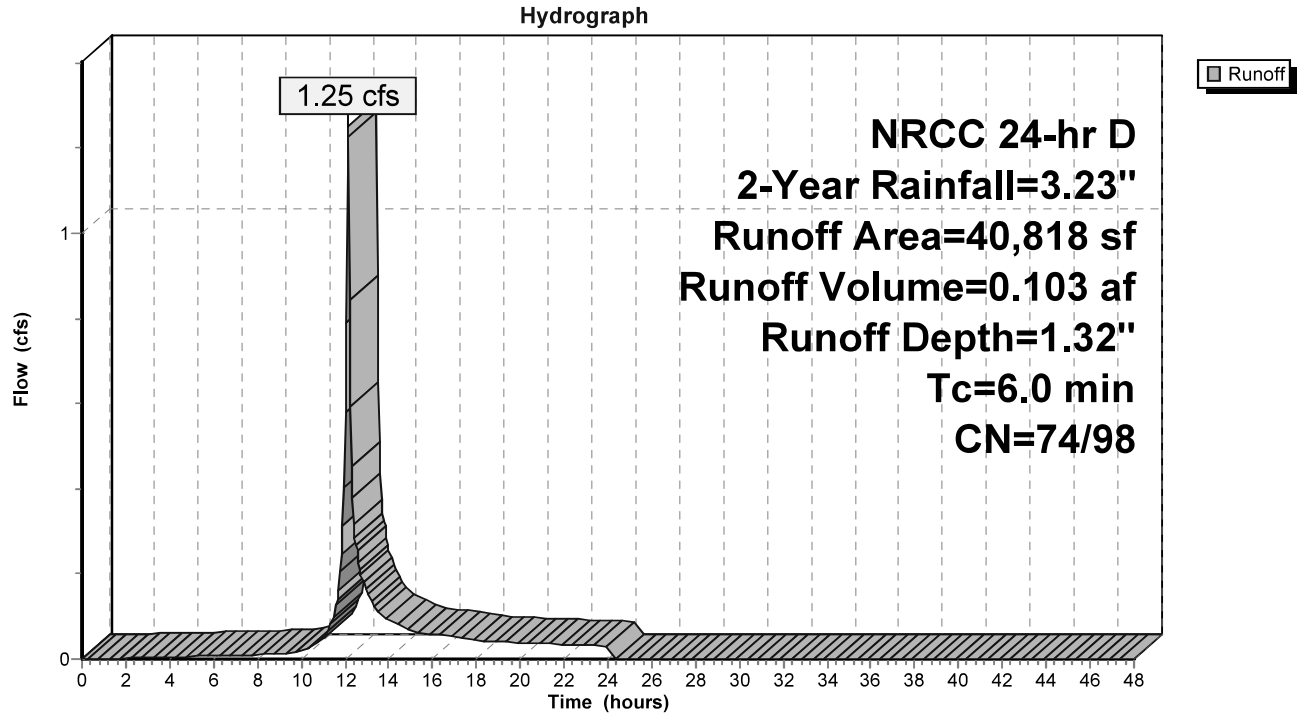
Runoff = 1.25 cfs @ 12.13 hrs, Volume= 0.103 af, Depth= 1.32"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05
NRCC 24-hr D 2-Year Rainfall=3.23"

Area (sf)	CN	Description
35,332	74	>75% Grass cover, Good, HSG C
1,975	98	Roofs, HSG C
3,511	98	Paved parking, HSG C
40,818	77	Weighted Average
35,332	74	86.56% Pervious Area
5,486	98	13.44% Impervious Area

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

Subcatchment EX-1:

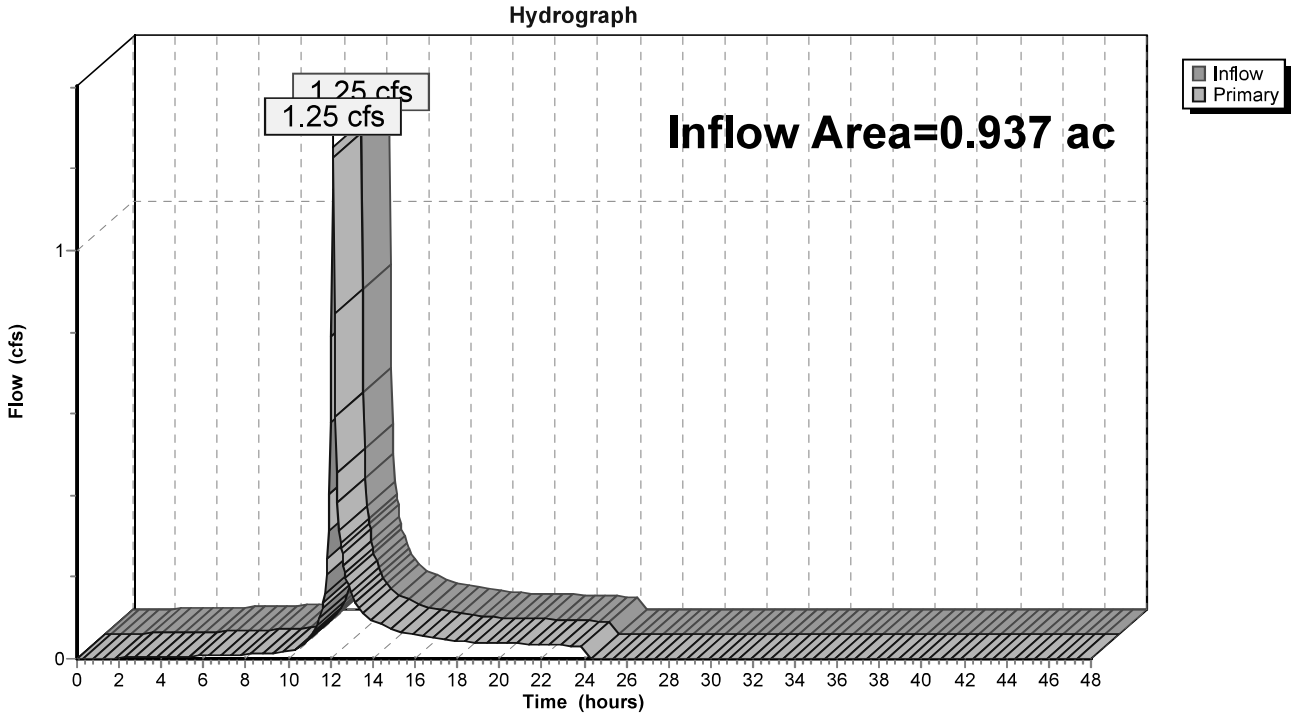


Summary for Link POA-1:

Inflow Area = 0.937 ac, 13.44% Impervious, Inflow Depth = 1.32" for 2-Year event
Inflow = 1.25 cfs @ 12.13 hrs, Volume= 0.103 af
Primary = 1.25 cfs @ 12.13 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link POA-1:



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX-1: Runoff Area=40,818 sf 13.44% Impervious Runoff Depth=2.34"
Tc=6.0 min CN=74/98 Runoff=2.28 cfs 0.183 af

Link POA-1: Inflow=2.28 cfs 0.183 af
Primary=2.28 cfs 0.183 af

Total Runoff Area = 0.937 ac Runoff Volume = 0.183 af Average Runoff Depth = 2.34"
86.56% Pervious = 0.811 ac 13.44% Impervious = 0.126 ac

Summary for Subcatchment EX-1:

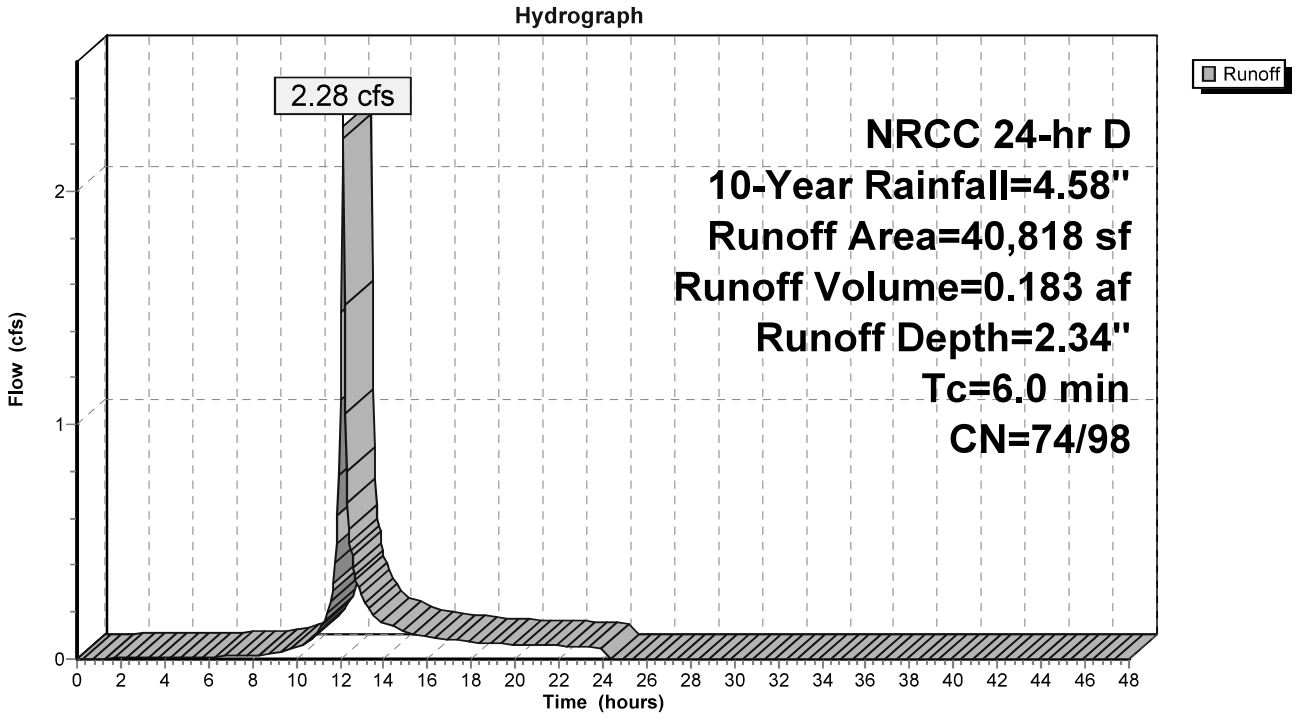
Runoff = 2.28 cfs @ 12.13 hrs, Volume= 0.183 af, Depth= 2.34"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05
NRCC 24-hr D 10-Year Rainfall=4.58"

Area (sf)	CN	Description
35,332	74	>75% Grass cover, Good, HSG C
1,975	98	Roofs, HSG C
3,511	98	Paved parking, HSG C
40,818	77	Weighted Average
35,332	74	86.56% Pervious Area
5,486	98	13.44% Impervious Area

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

Subcatchment EX-1:

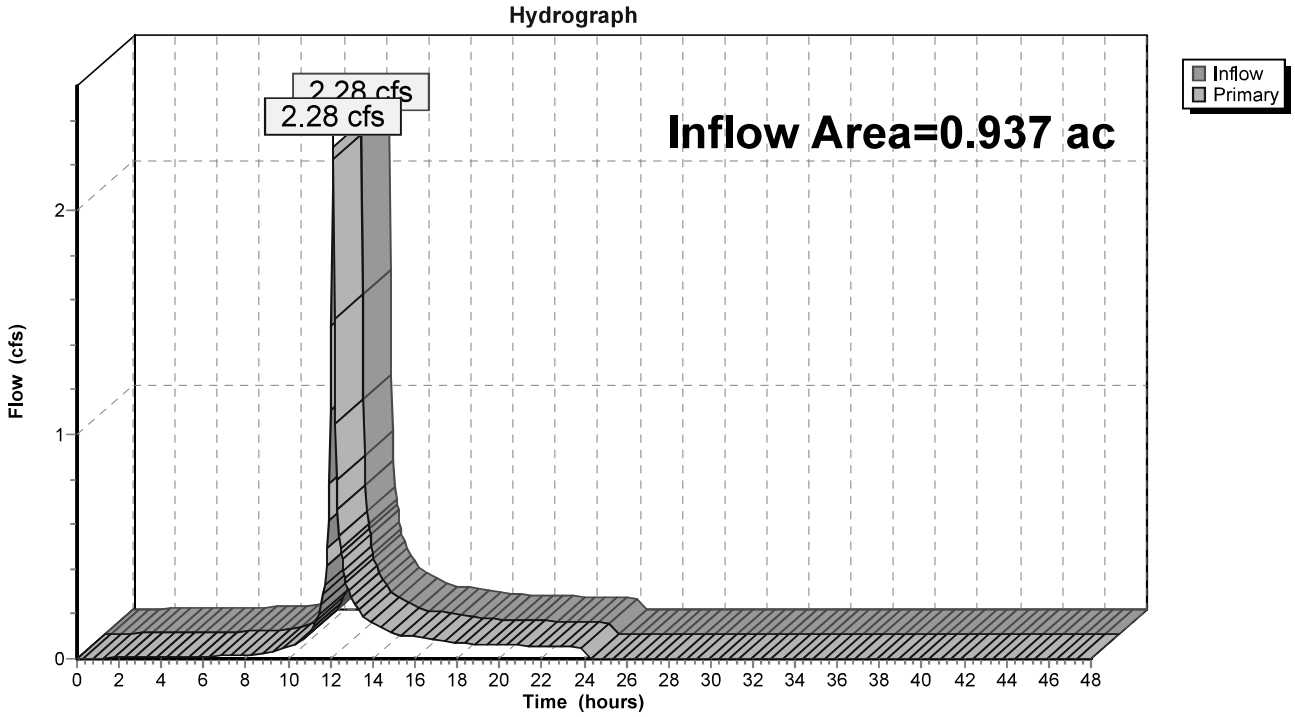


Summary for Link POA-1:

Inflow Area = 0.937 ac, 13.44% Impervious, Inflow Depth = 2.34" for 10-Year event
Inflow = 2.28 cfs @ 12.13 hrs, Volume= 0.183 af
Primary = 2.28 cfs @ 12.13 hrs, Volume= 0.183 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link POA-1:



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX-1: Runoff Area=40,818 sf 13.44% Impervious Runoff Depth=3.43"
Tc=6.0 min CN=74/98 Runoff=3.34 cfs 0.268 af

Link POA-1: Inflow=3.34 cfs 0.268 af
Primary=3.34 cfs 0.268 af

Total Runoff Area = 0.937 ac Runoff Volume = 0.268 af Average Runoff Depth = 3.43"
86.56% Pervious = 0.811 ac 13.44% Impervious = 0.126 ac

Summary for Subcatchment EX-1:

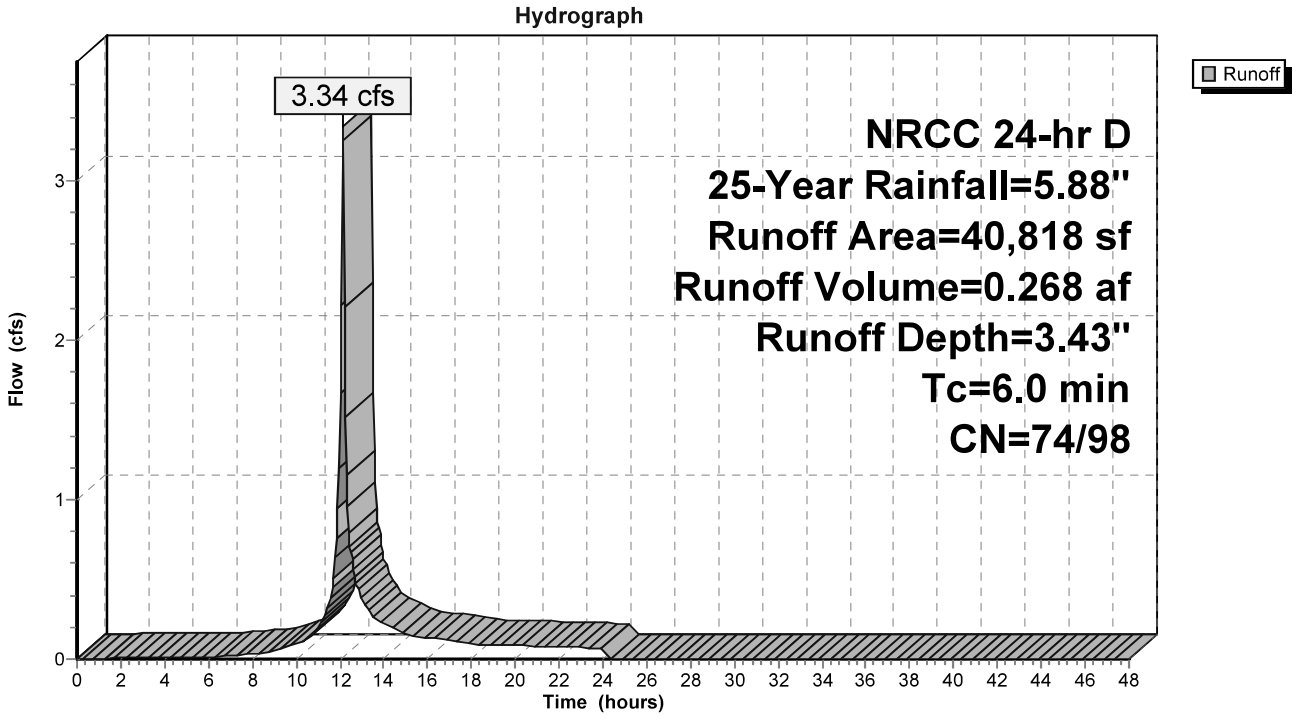
Runoff = 3.34 cfs @ 12.13 hrs, Volume= 0.268 af, Depth= 3.43"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05
NRCC 24-hr D 25-Year Rainfall=5.88"

Area (sf)	CN	Description
35,332	74	>75% Grass cover, Good, HSG C
1,975	98	Roofs, HSG C
3,511	98	Paved parking, HSG C
40,818	77	Weighted Average
35,332	74	86.56% Pervious Area
5,486	98	13.44% Impervious Area

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

Subcatchment EX-1:

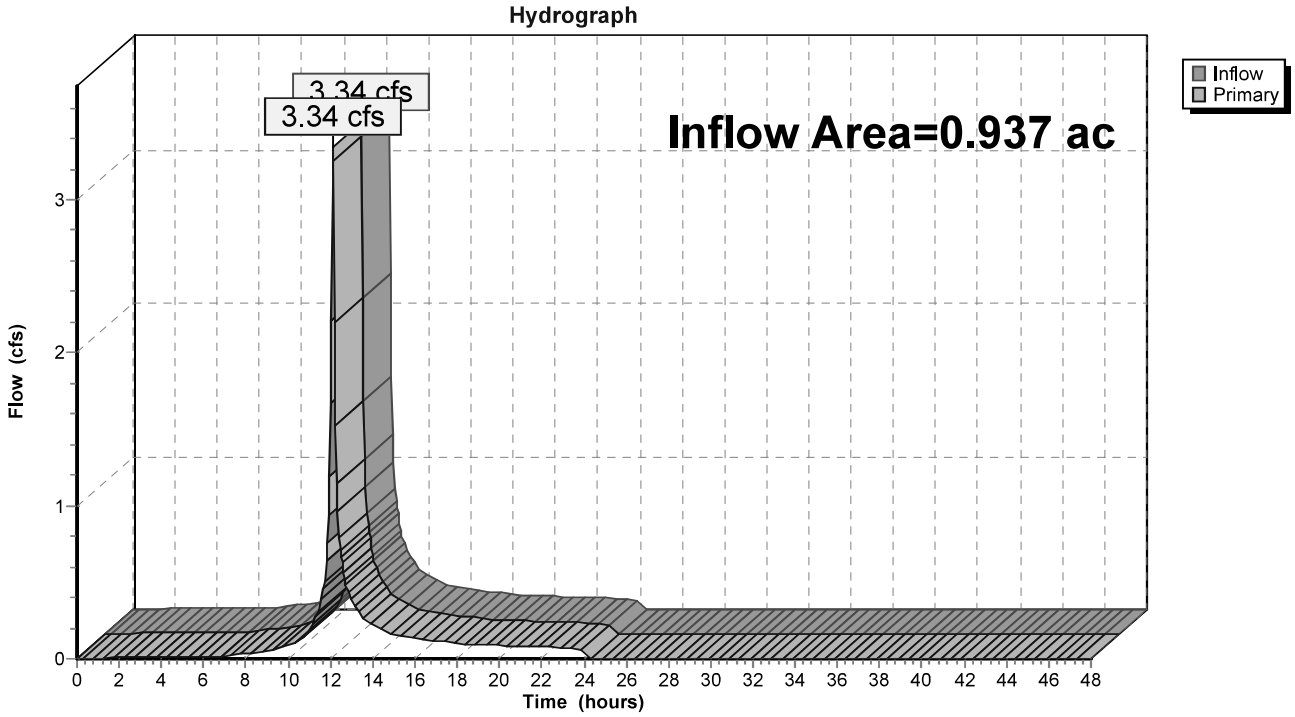


Summary for Link POA-1:

Inflow Area = 0.937 ac, 13.44% Impervious, Inflow Depth = 3.43" for 25-Year event
Inflow = 3.34 cfs @ 12.13 hrs, Volume= 0.268 af
Primary = 3.34 cfs @ 12.13 hrs, Volume= 0.268 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link POA-1:



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX-1: Runoff Area=40,818 sf 13.44% Impervious Runoff Depth=5.93"
Tc=6.0 min CN=74/98 Runoff=5.73 cfs 0.463 af

Link POA-1: Inflow=5.73 cfs 0.463 af
Primary=5.73 cfs 0.463 af

Total Runoff Area = 0.937 ac Runoff Volume = 0.463 af Average Runoff Depth = 5.93"
86.56% Pervious = 0.811 ac 13.44% Impervious = 0.126 ac

Summary for Subcatchment EX-1:

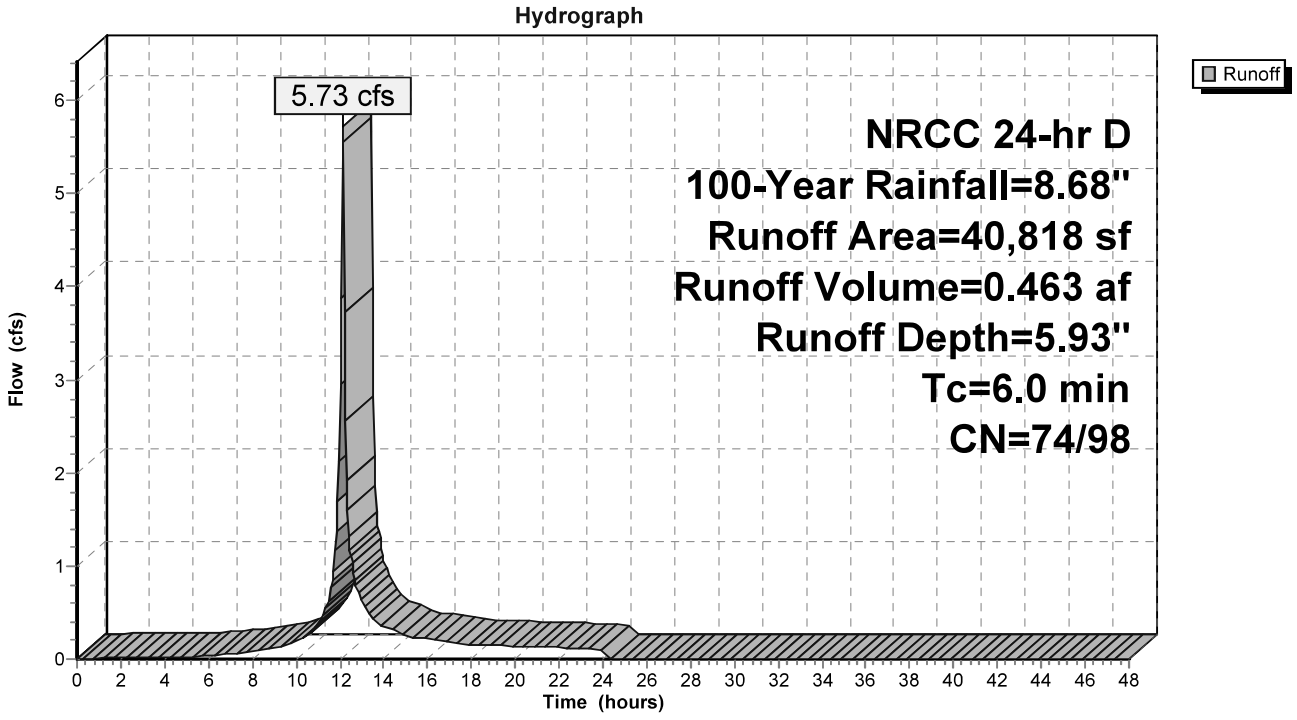
Runoff = 5.73 cfs @ 12.13 hrs, Volume= 0.463 af, Depth= 5.93"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05
NRCC 24-hr D 100-Year Rainfall=8.68"

Area (sf)	CN	Description
35,332	74	>75% Grass cover, Good, HSG C
1,975	98	Roofs, HSG C
3,511	98	Paved parking, HSG C
40,818	77	Weighted Average
35,332	74	86.56% Pervious Area
5,486	98	13.44% Impervious Area

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

Subcatchment EX-1:

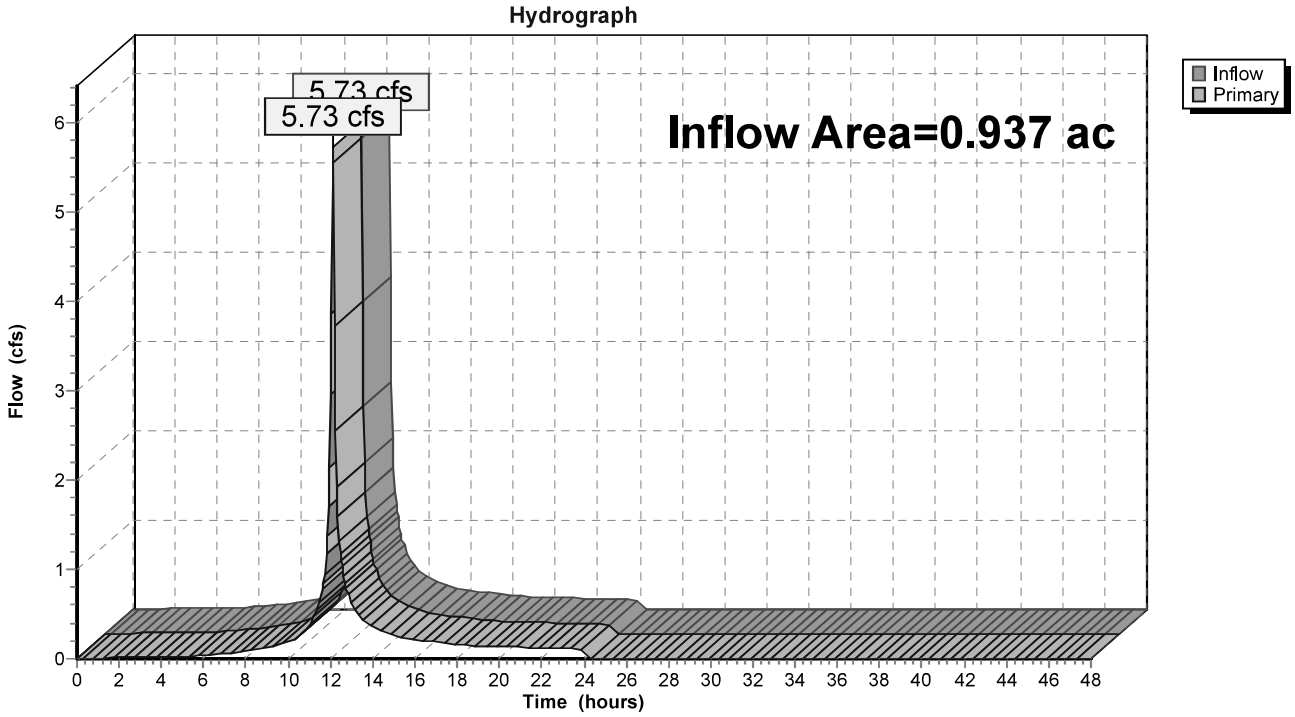


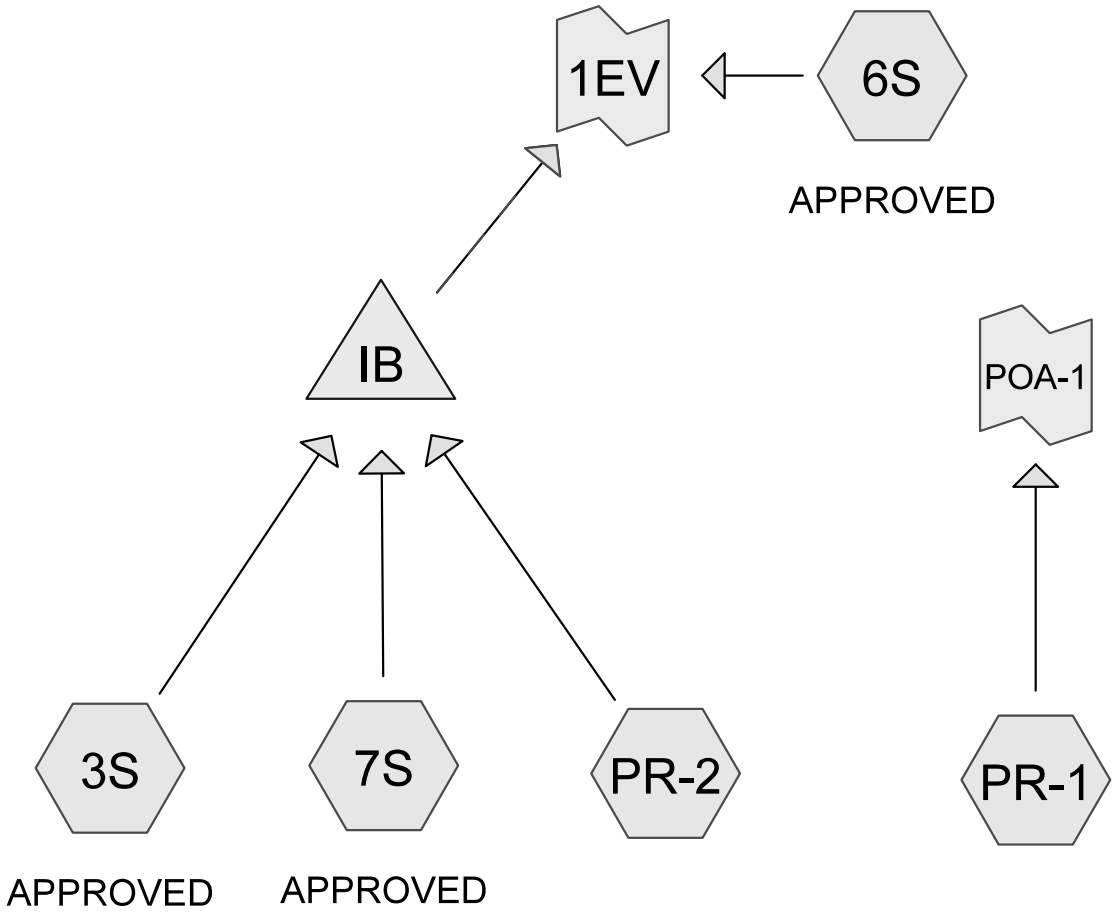
Summary for Link POA-1:

Inflow Area = 0.937 ac, 13.44% Impervious, Inflow Depth = 5.93" for 100-Year event
Inflow = 5.73 cfs @ 12.13 hrs, Volume= 0.463 af
Primary = 5.73 cfs @ 12.13 hrs, Volume= 0.463 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link POA-1:





Subcat Reach Pond Link

Routing Diagram for Post Development
Prepared by {enter your company name here}, Printed 8/15/2023

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.397	74	>75% Grass cover, Good, HSG C (3S, 6S, 7S, PR-1, PR-2)
0.013	89	Gravel roads, HSG C (7S)
2.183	98	Paved parking, HSG C (3S, PR-1, PR-2)
0.019	98	Riprap (6S, 7S)
0.511	98	Roofs, HSG C (3S, PR-2)
0.092	98	Unconnected pavement, HSG C (3S)
0.135	98	Water Surface, 0% imp, HSG C (7S)
0.248	70	Woods, Good, HSG C (6S)
4.598	**89**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
4.579	HSG C	3S, 6S, 7S, PR-1, PR-2
0.000	HSG D	
0.019	Other	6S, 7S
4.598		**TOTAL AREA**

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	1.397	0.000	0.000	1.397	>75% Grass cover, Good	3S, 6S, 7S, PR-1, PR-2
0.000	0.000	0.013	0.000	0.000	0.013	Gravel roads	7S
0.000	0.000	2.183	0.000	0.000	2.183	Paved parking	3S, PR-1, PR-2
0.000	0.000	0.000	0.000	0.019	0.019	Riprap	6S, 7S
0.000	0.000	0.511	0.000	0.000	0.511	Roofs	3S, PR-2
0.000	0.000	0.092	0.000	0.000	0.092	Unconnected pavement	3S
0.000	0.000	0.135	0.000	0.000	0.135	Water Surface, 0% imp	7S
0.000	0.000	0.248	0.000	0.000	0.248	Woods, Good	6S
0.000	**0.000**	**4.579**	**0.000**	**0.019**	**4.598**	**TOTAL AREA**	

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 3S: APPROVED Runoff Area=119,356 sf 75.36% Impervious Runoff Depth=2.56"
Tc=6.0 min CN=77/98 Runoff=6.68 cfs 0.585 af

Subcatchment 6S: APPROVED Runoff Area=26,955 sf 2.64% Impervious Runoff Depth=1.00"
Tc=6.0 min CN=72/98 Runoff=0.63 cfs 0.052 af

Subcatchment 7S: APPROVED Runoff Area=13,165 sf 1.02% Impervious Runoff Depth=1.80"
Tc=6.0 min CN=85/98 Runoff=0.58 cfs 0.045 af

Subcatchment PR-1: Runoff Area=6,949 sf 3.19% Impervious Runoff Depth=1.12"
Tc=6.0 min CN=74/98 Runoff=0.19 cfs 0.015 af

Subcatchment PR-2: Runoff Area=33,868 sf 80.16% Impervious Runoff Depth=2.61"
Tc=6.0 min CN=74/98 Runoff=1.92 cfs 0.169 af

Pond IB: Peak Elev=1,036.44' Storage=14,887 cf Inflow=9.18 cfs 0.800 af
Discarded=0.04 cfs 0.105 af Primary=1.68 cfs 0.623 af Secondary=0.00 cfs 0.000 af Outflow=1.72 cfs 0.728 af

Link 1EV: Inflow=2.09 cfs 0.674 af
Primary=2.09 cfs 0.674 af

Link POA-1: Inflow=0.19 cfs 0.015 af
Primary=0.19 cfs 0.015 af

Total Runoff Area = 4.598 ac Runoff Volume = 0.866 af Average Runoff Depth = 2.26"
41.01% Pervious = 1.886 ac 58.99% Impervious = 2.713 ac

Summary for Subcatchment 3S: APPROVED

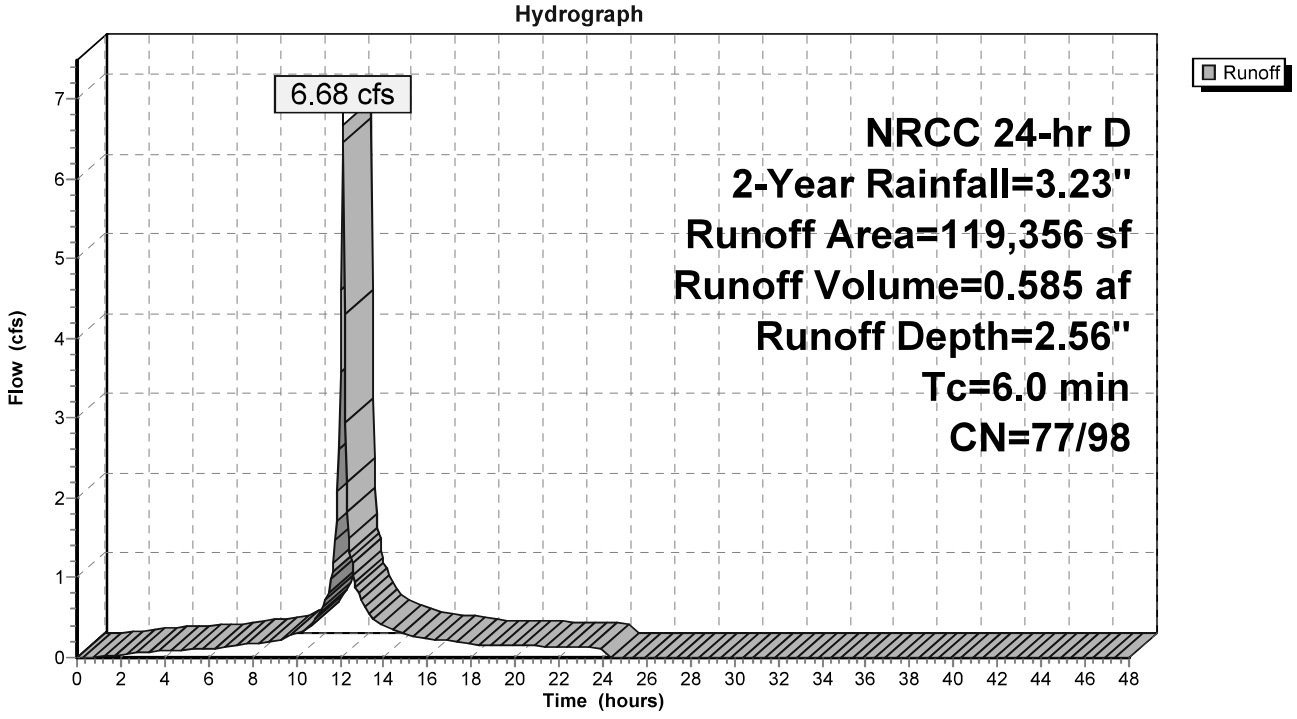
Runoff = 6.68 cfs @ 12.13 hrs, Volume= 0.585 af, Depth= 2.56"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05
NRCC 24-hr D 2-Year Rainfall=3.23"

Area (sf)	CN	Description
25,414	74	>75% Grass cover, Good, HSG C
71,602	98	Paved parking, HSG C
18,342	98	Roofs, HSG C
3,998	98	Unconnected pavement, HSG C
119,356	93	Weighted Average
29,412	77	24.64% Pervious Area
89,944	98	75.36% Impervious Area

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

Subcatchment 3S: APPROVED



Summary for Subcatchment 6S: APPROVED

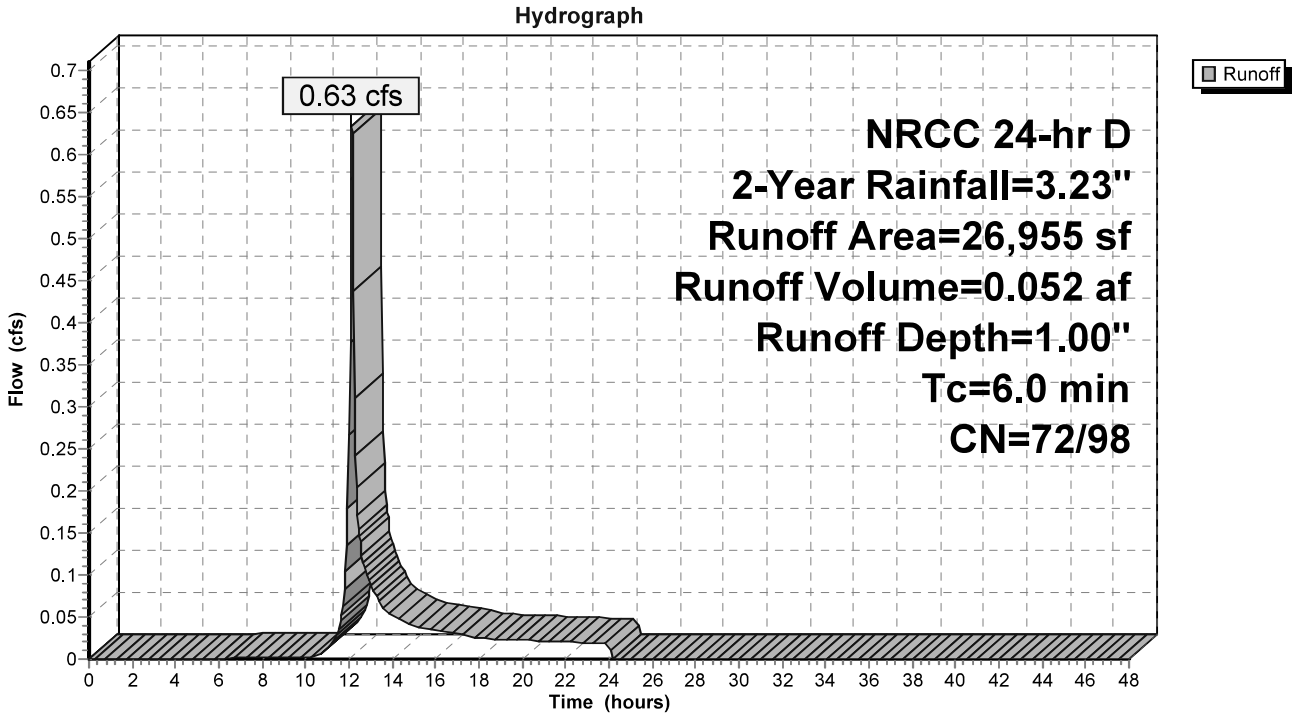
Runoff = 0.63 cfs @ 12.14 hrs, Volume= 0.052 af, Depth= 1.00"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05
NRCC 24-hr D 2-Year Rainfall=3.23"

	Area (sf)	CN	Description
	15,442	74	>75% Grass cover, Good, HSG C
*	711	98	Riprap
	10,802	70	Woods, Good, HSG C
	26,955	73	Weighted Average
	26,244	72	97.36% Pervious Area
	711	98	2.64% Impervious Area

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

Subcatchment 6S: APPROVED



Summary for Subcatchment 7S: APPROVED

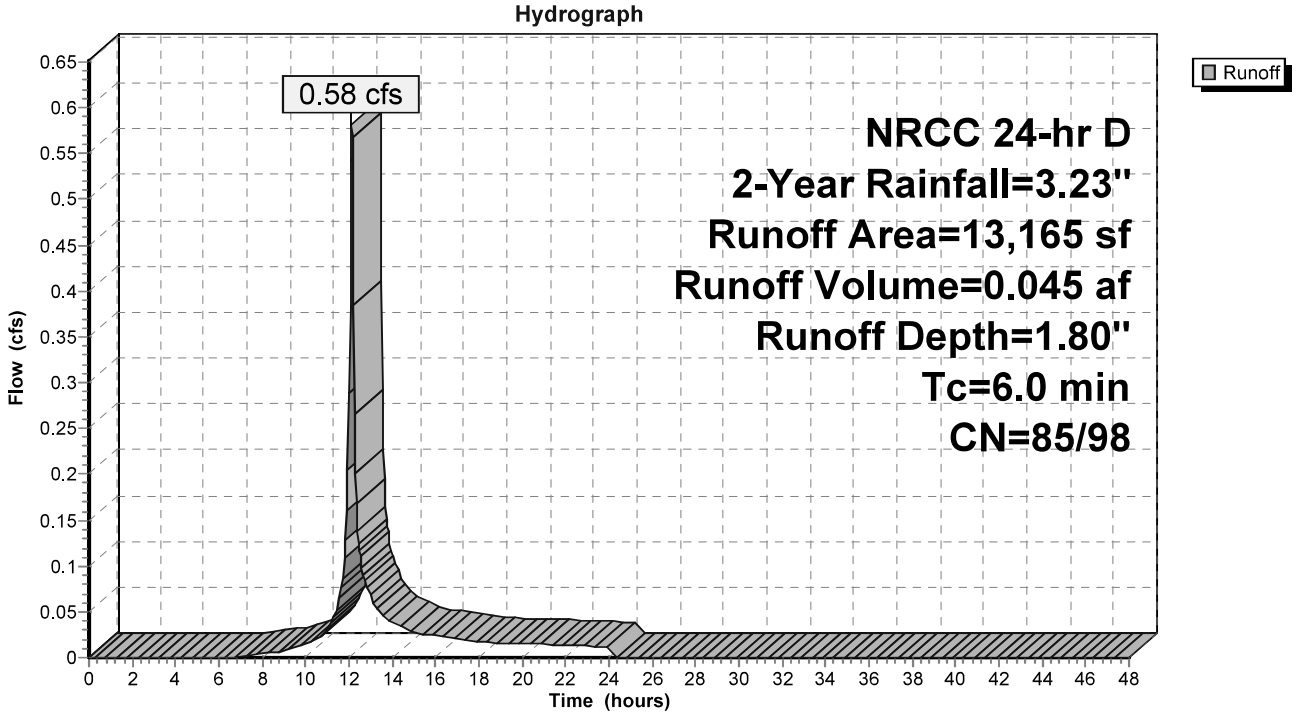
Runoff = 0.58 cfs @ 12.13 hrs, Volume= 0.045 af, Depth= 1.80"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05
NRCC 24-hr D 2-Year Rainfall=3.23"

	Area (sf)	CN	Description
	6,571	74	>75% Grass cover, Good, HSG C
	5,880	98	Water Surface, 0% imp, HSG C
*	134	98	Riprap
	580	89	Gravel roads, HSG C
	13,165	86	Weighted Average
	13,031	85	98.98% Pervious Area
	134	98	1.02% Impervious Area

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

Subcatchment 7S: APPROVED



Summary for Subcatchment PR-1:

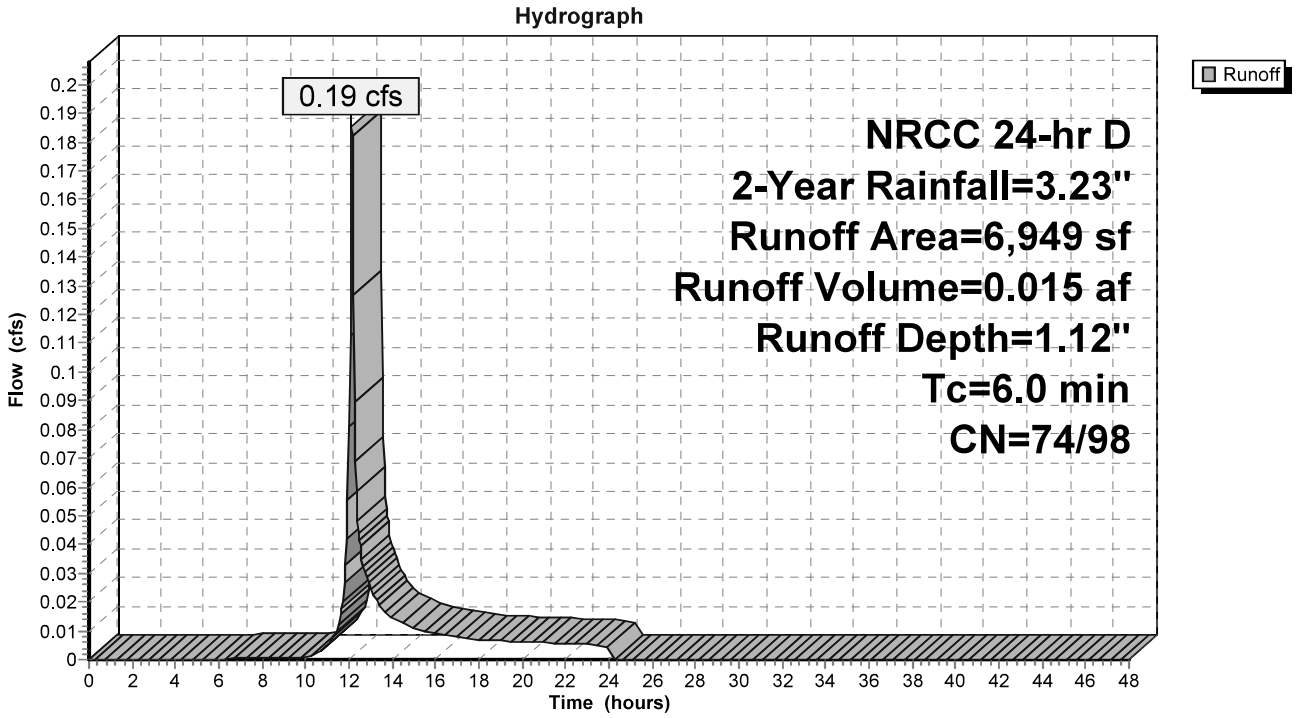
Runoff = 0.19 cfs @ 12.14 hrs, Volume= 0.015 af, Depth= 1.12"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05
NRCC 24-hr D 2-Year Rainfall=3.23"

Area (sf)	CN	Description
6,727	74	>75% Grass cover, Good, HSG C
222	98	Paved parking, HSG C
6,949	75	Weighted Average
6,727	74	96.81% Pervious Area
222	98	3.19% Impervious Area

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

Subcatchment PR-1:



Summary for Subcatchment PR-2:

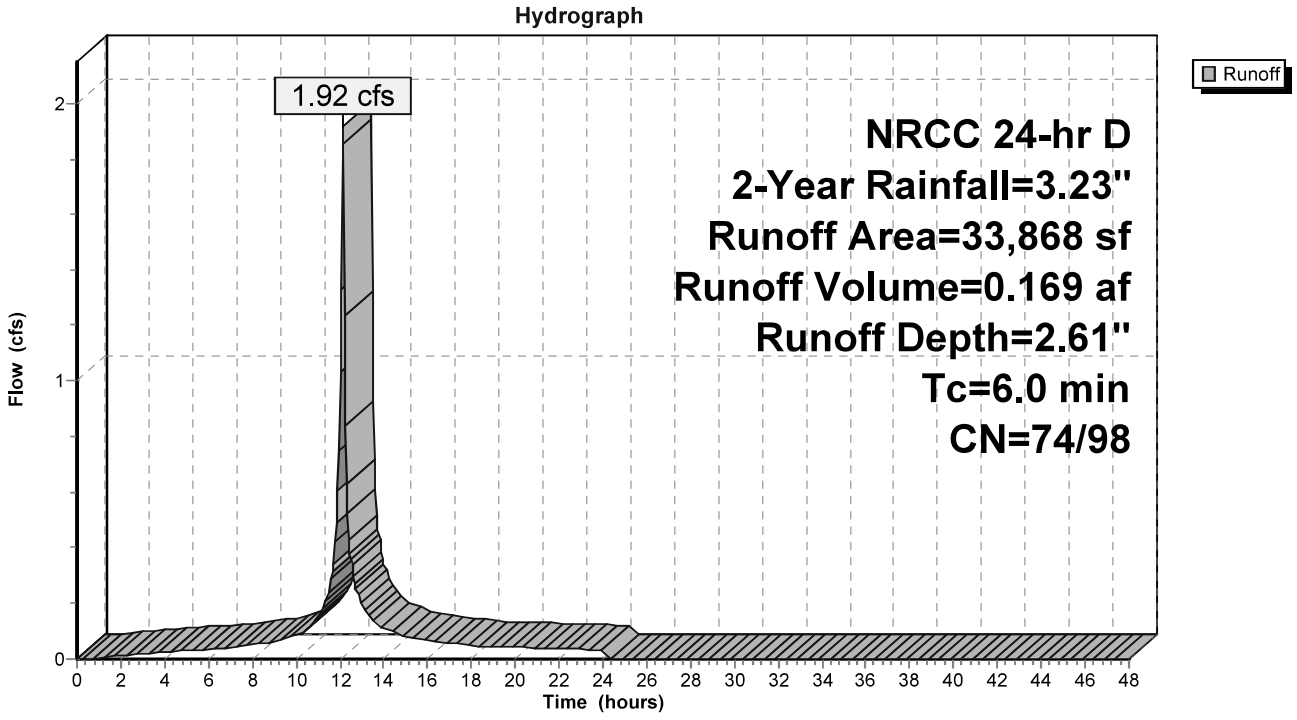
Runoff = 1.92 cfs @ 12.13 hrs, Volume= 0.169 af, Depth= 2.61"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05
NRCC 24-hr D 2-Year Rainfall=3.23"

Area (sf)	CN	Description
6,721	74	>75% Grass cover, Good, HSG C
3,900	98	Roofs, HSG C
23,247	98	Paved parking, HSG C
33,868	93	Weighted Average
6,721	74	19.84% Pervious Area
27,147	98	80.16% Impervious Area

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

Subcatchment PR-2:



Summary for Pond IB:

Inflow Area = 3.820 ac, 70.45% Impervious, Inflow Depth = 2.51" for 2-Year event
Inflow = 9.18 cfs @ 12.13 hrs, Volume= 0.800 af
Outflow = 1.72 cfs @ 12.51 hrs, Volume= 0.728 af, Atten= 81%, Lag= 22.7 min
Discarded = 0.04 cfs @ 12.51 hrs, Volume= 0.105 af
Primary = 1.68 cfs @ 12.51 hrs, Volume= 0.623 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 1,036.44' @ 12.51 hrs Surf.Area= 6,115 sf Storage= 14,887 cf

Plug-Flow detention time= 264.0 min calculated for 0.728 af (91% of inflow)
Center-of-Mass det. time= 212.5 min (990.5 - 778.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,033.30'	43,068 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,033.30	3,231	0	0
1,034.00	4,043	2,546	2,546
1,036.00	5,690	9,733	12,279
1,038.00	7,612	13,302	25,581
1,040.00	9,875	17,487	43,068

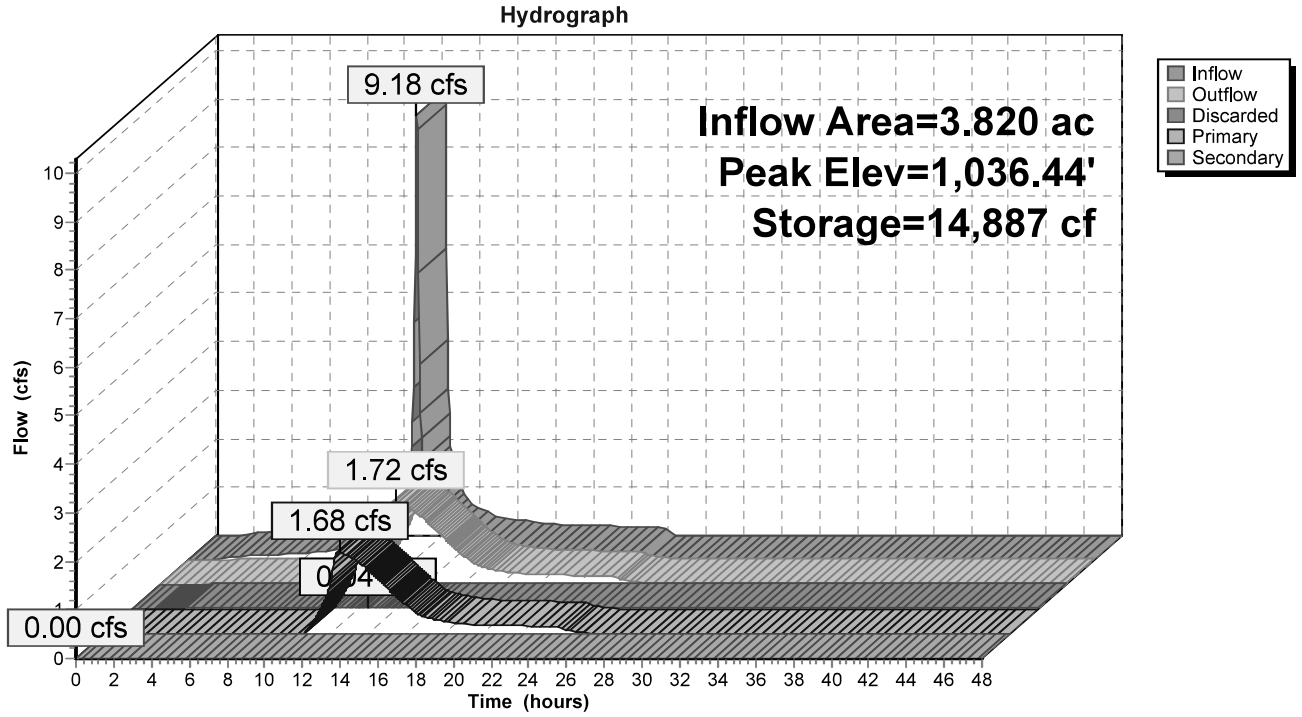
Device	Routing	Invert	Outlet Devices
#1	Primary	1,033.30'	**18.0" Round Culvert** L= 56.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,033.30' / 1,031.00' S= 0.0411 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,034.60'	**5.0" Vert. Orifice/Grate X 2.00** C= 0.600
#3	Device 1	1,036.94'	**8.0" Vert. Orifice/Grate X 3.00** C= 0.600
#4	Device 1	1,038.88'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	1,039.20'	**153.0 deg x 6.0' long x 2.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.47 (C= 3.09)
#6	Discarded	1,033.30'	**0.270 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.04 cfs @ 12.51 hrs HW=1,036.44' (Free Discharge)
└**6=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=1.68 cfs @ 12.51 hrs HW=1,036.44' (Free Discharge)
└**1=Culvert** (Passes 1.68 cfs of 11.61 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 1.68 cfs @ 6.15 fps)
  ├**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,033.30' (Free Discharge)
└**5=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond IB:

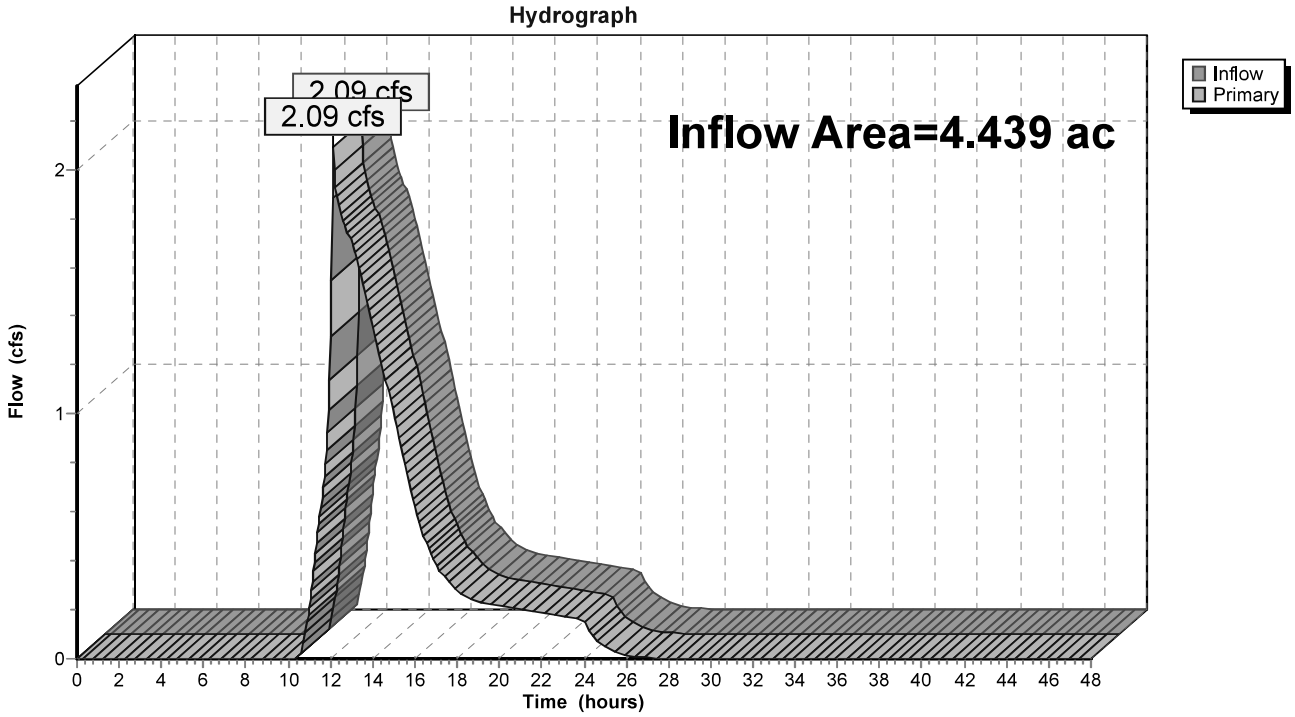

Hydrograph
9.18 cfs
1.72 cfs
1.68 cfs
0.00 cfs
Inflow Area=3.820 ac
Peak Elev=1,036.44'
Storage=14,887 cf
Inflow
Outflow
Discarded
Primary
Secondary
Flow (cfs)
Time (hours)
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
0 1 2 3 4 5 6 7 8 9 10

Summary for Link 1EV:

Inflow Area = 4.439 ac, 61.00% Impervious, Inflow Depth = 1.82" for 2-Year event
Inflow = 2.09 cfs @ 12.16 hrs, Volume= 0.674 af
Primary = 2.09 cfs @ 12.16 hrs, Volume= 0.674 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1EV:

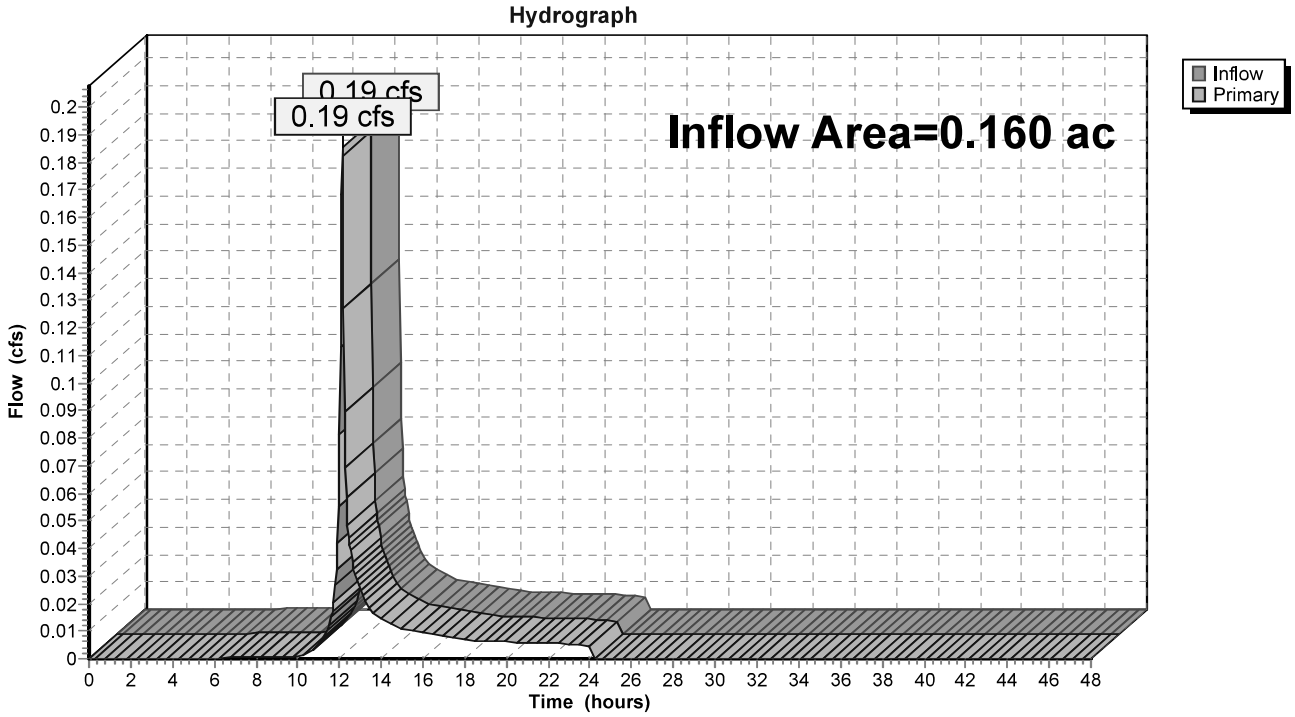


Summary for Link POA-1:

Inflow Area = 0.160 ac, 3.19% Impervious, Inflow Depth = 1.12" for 2-Year event
Inflow = 0.19 cfs @ 12.14 hrs, Volume= 0.015 af
Primary = 0.19 cfs @ 12.14 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link POA-1:



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 3S: APPROVED Runoff Area=119,356 sf 75.36% Impervious Runoff Depth=4.09"
Tc=6.0 min CN=77/98 Runoff=10.57 cfs 0.934 af

Subcatchment 6S: APPROVED Runoff Area=26,955 sf 2.64% Impervious Runoff Depth=2.15"
Tc=6.0 min CN=72/98 Runoff=1.42 cfs 0.111 af

Subcatchment 7S: APPROVED Runoff Area=13,165 sf 1.02% Impervious Runoff Depth=3.24"
Tc=6.0 min CN=85/98 Runoff=1.03 cfs 0.082 af

Subcatchment PR-1: Runoff Area=6,949 sf 3.19% Impervious Runoff Depth=2.32"
Tc=6.0 min CN=74/98 Runoff=0.40 cfs 0.031 af

Subcatchment PR-2: Runoff Area=33,868 sf 80.16% Impervious Runoff Depth=4.14"
Tc=6.0 min CN=74/98 Runoff=3.02 cfs 0.268 af

Pond IB: Peak Elev=1,037.38' Storage=21,052 cf Inflow=14.62 cfs 1.285 af
Discarded=0.04 cfs 0.110 af Primary=3.77 cfs 1.102 af Secondary=0.00 cfs 0.000 af Outflow=3.81 cfs 1.212 af

Link 1EV: Inflow=4.20 cfs 1.213 af
Primary=4.20 cfs 1.213 af

Link POA-1: Inflow=0.40 cfs 0.031 af
Primary=0.40 cfs 0.031 af

Total Runoff Area = 4.598 ac Runoff Volume = 1.426 af Average Runoff Depth = 3.72"
41.01% Pervious = 1.886 ac 58.99% Impervious = 2.713 ac

Summary for Subcatchment 3S: APPROVED

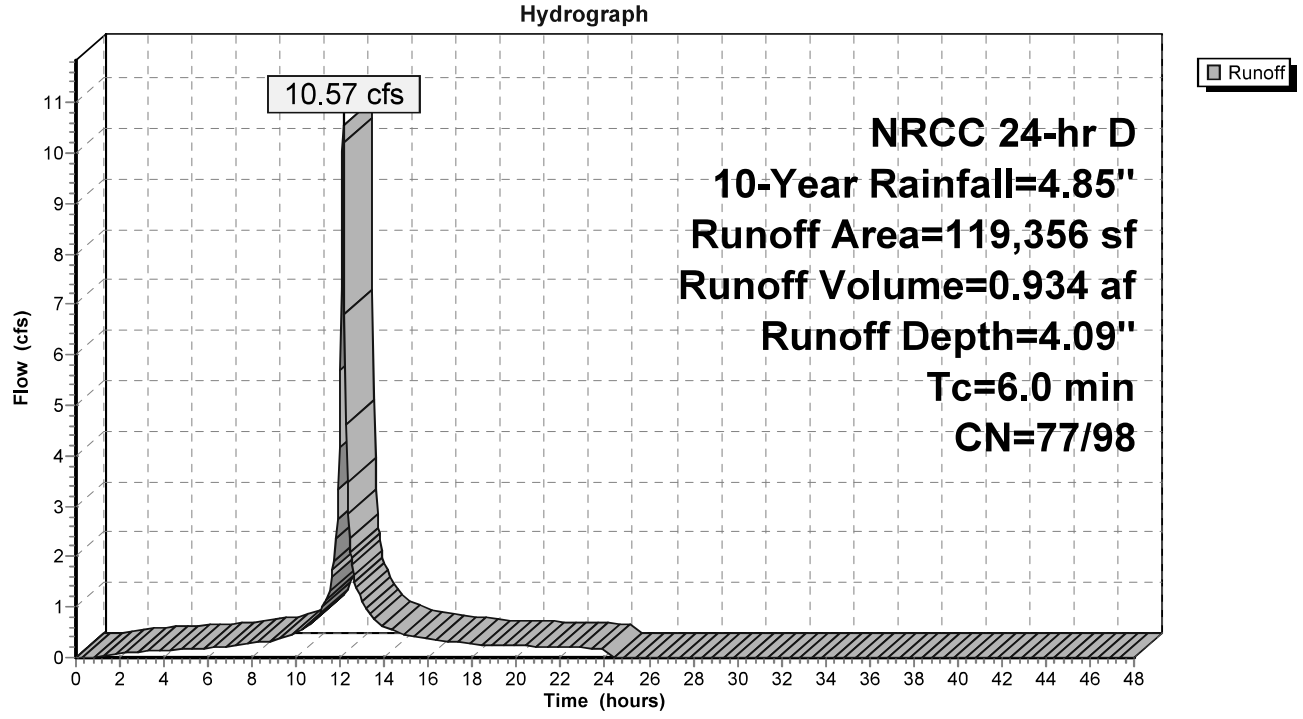
Runoff = 10.57 cfs @ 12.13 hrs, Volume= 0.934 af, Depth= 4.09"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05
NRCC 24-hr D 10-Year Rainfall=4.85"

Area (sf)	CN	Description
25,414	74	>75% Grass cover, Good, HSG C
71,602	98	Paved parking, HSG C
18,342	98	Roofs, HSG C
3,998	98	Unconnected pavement, HSG C
119,356	93	Weighted Average
29,412	77	24.64% Pervious Area
89,944	98	75.36% Impervious Area

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

Subcatchment 3S: APPROVED



Summary for Subcatchment 6S: APPROVED

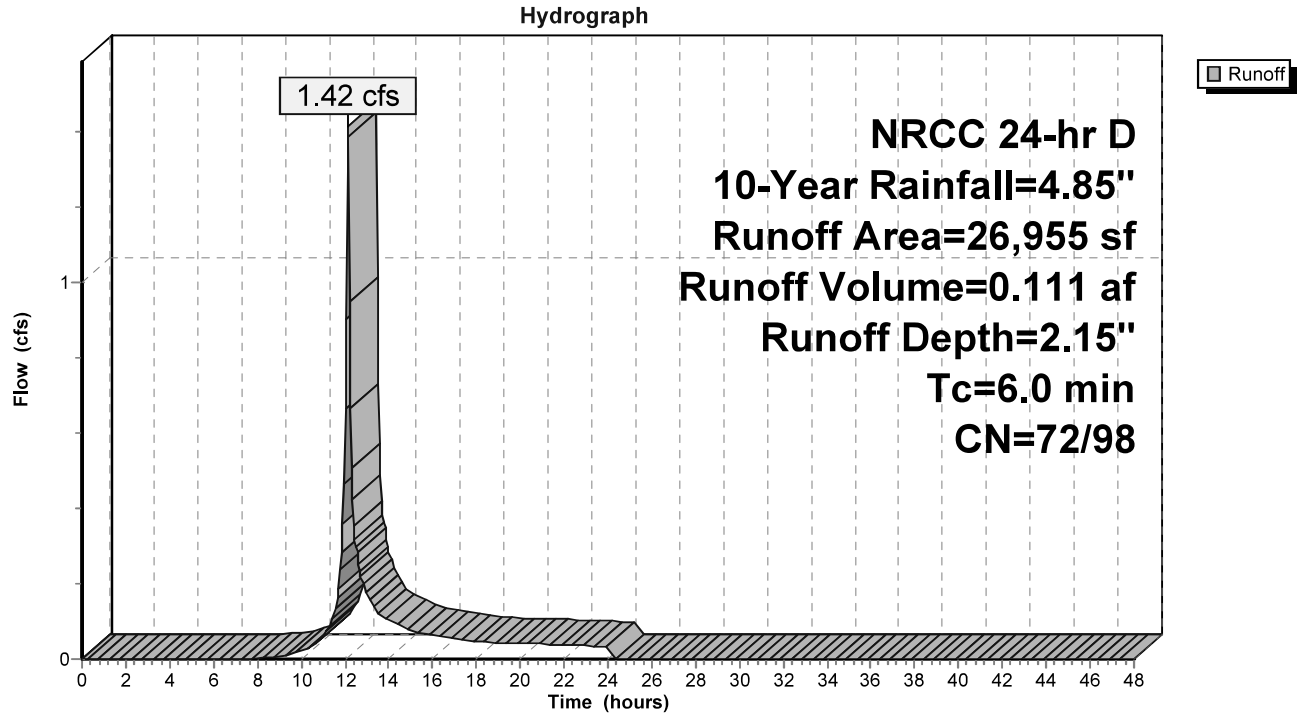
Runoff = 1.42 cfs @ 12.13 hrs, Volume= 0.111 af, Depth= 2.15"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05
NRCC 24-hr D 10-Year Rainfall=4.85"

	Area (sf)	CN	Description
	15,442	74	>75% Grass cover, Good, HSG C
*	711	98	Riprap
	10,802	70	Woods, Good, HSG C
	26,955	73	Weighted Average
	26,244	72	97.36% Pervious Area
	711	98	2.64% Impervious Area

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

Subcatchment 6S: APPROVED



Summary for Subcatchment 7S: APPROVED

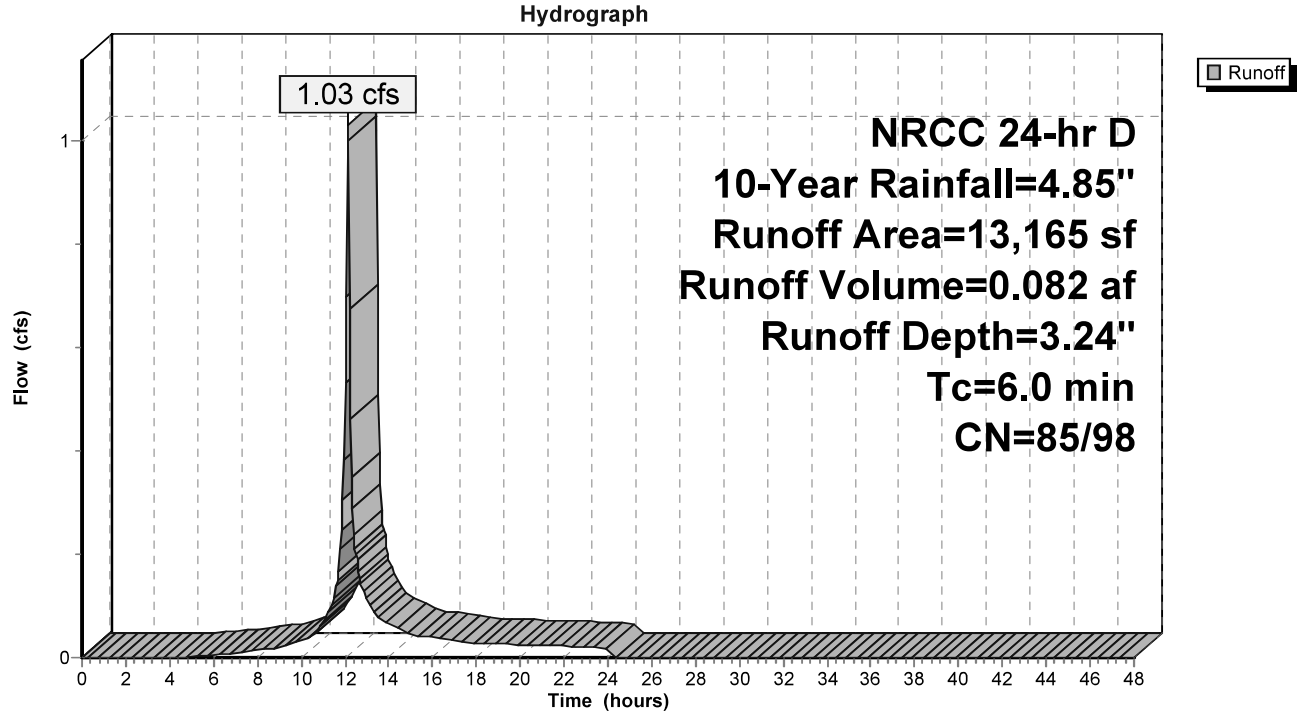
Runoff = 1.03 cfs @ 12.13 hrs, Volume= 0.082 af, Depth= 3.24"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05
NRCC 24-hr D 10-Year Rainfall=4.85"

	Area (sf)	CN	Description
	6,571	74	>75% Grass cover, Good, HSG C
	5,880	98	Water Surface, 0% imp, HSG C
*	134	98	Riprap
	580	89	Gravel roads, HSG C
	13,165	86	Weighted Average
	13,031	85	98.98% Pervious Area
	134	98	1.02% Impervious Area

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

Subcatchment 7S: APPROVED



Summary for Subcatchment PR-1:

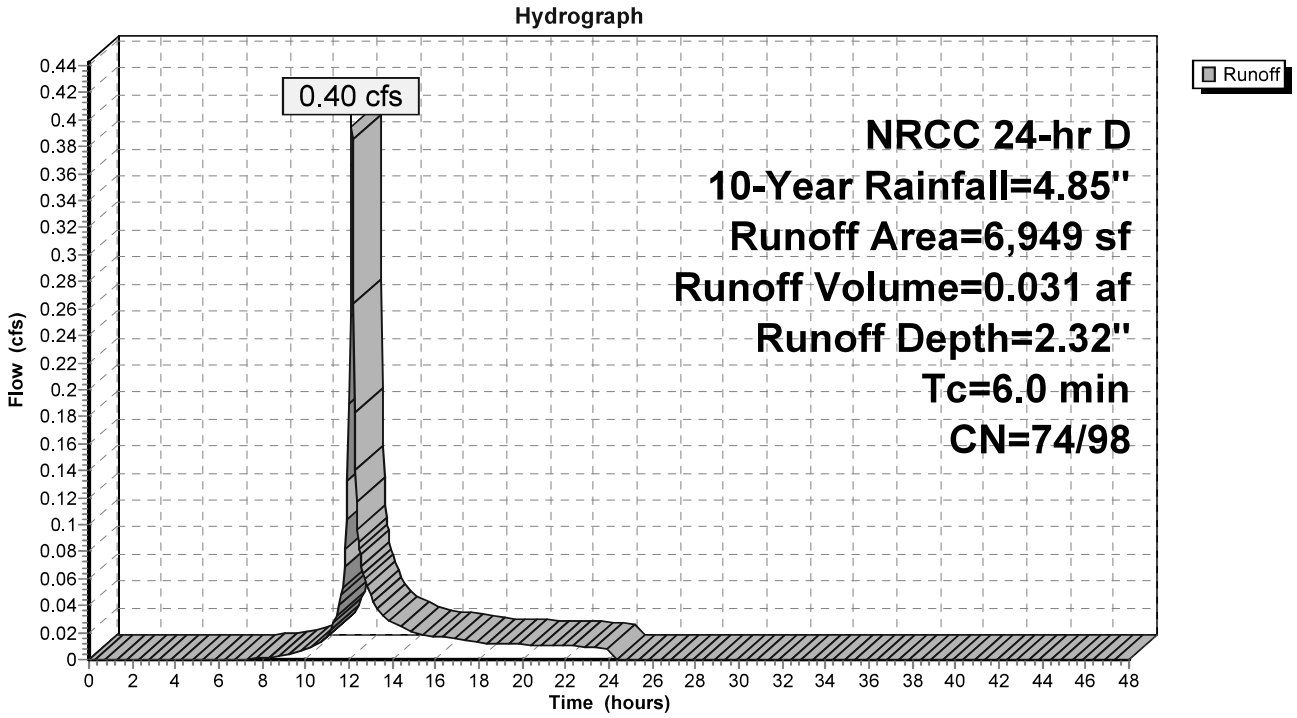
Runoff = 0.40 cfs @ 12.13 hrs, Volume= 0.031 af, Depth= 2.32"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05
NRCC 24-hr D 10-Year Rainfall=4.85"

Area (sf)	CN	Description
6,727	74	>75% Grass cover, Good, HSG C
222	98	Paved parking, HSG C
6,949	75	Weighted Average
6,727	74	96.81% Pervious Area
222	98	3.19% Impervious Area

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

Subcatchment PR-1:



Summary for Subcatchment PR-2:

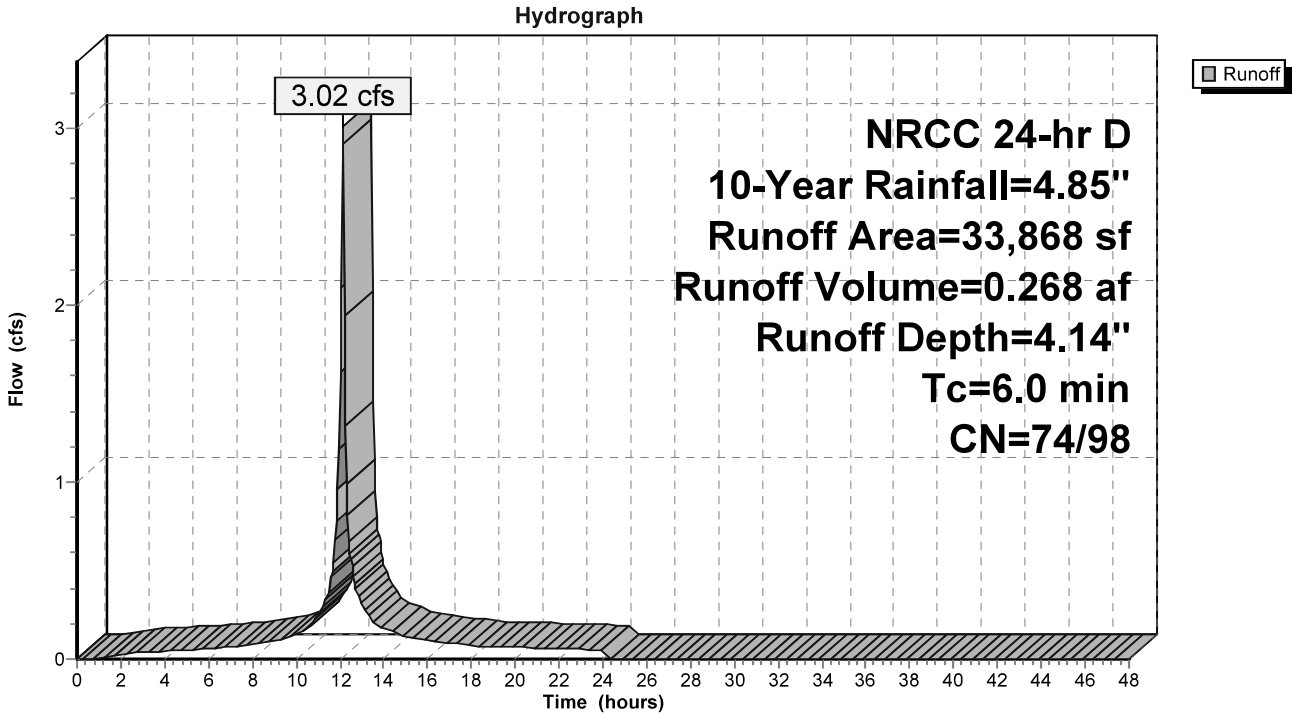
Runoff = 3.02 cfs @ 12.13 hrs, Volume= 0.268 af, Depth= 4.14"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05
NRCC 24-hr D 10-Year Rainfall=4.85"

Area (sf)	CN	Description
6,721	74	>75% Grass cover, Good, HSG C
3,900	98	Roofs, HSG C
23,247	98	Paved parking, HSG C
33,868	93	Weighted Average
6,721	74	19.84% Pervious Area
27,147	98	80.16% Impervious Area

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

Subcatchment PR-2:



Summary for Pond IB:

Inflow Area = 3.820 ac, 70.45% Impervious, Inflow Depth = 4.04" for 10-Year event
Inflow = 14.62 cfs @ 12.13 hrs, Volume= 1.285 af
Outflow = 3.81 cfs @ 12.36 hrs, Volume= 1.212 af, Atten= 74%, Lag= 14.2 min
Discarded = 0.04 cfs @ 12.36 hrs, Volume= 0.110 af
Primary = 3.77 cfs @ 12.36 hrs, Volume= 1.102 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 1,037.38' @ 12.36 hrs Surf.Area= 7,017 sf Storage= 21,052 cf

Plug-Flow detention time= 205.4 min calculated for 1.212 af (94% of inflow)
Center-of-Mass det. time= 170.9 min (940.7 - 769.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,033.30'	43,068 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,033.30	3,231	0	0
1,034.00	4,043	2,546	2,546
1,036.00	5,690	9,733	12,279
1,038.00	7,612	13,302	25,581
1,040.00	9,875	17,487	43,068

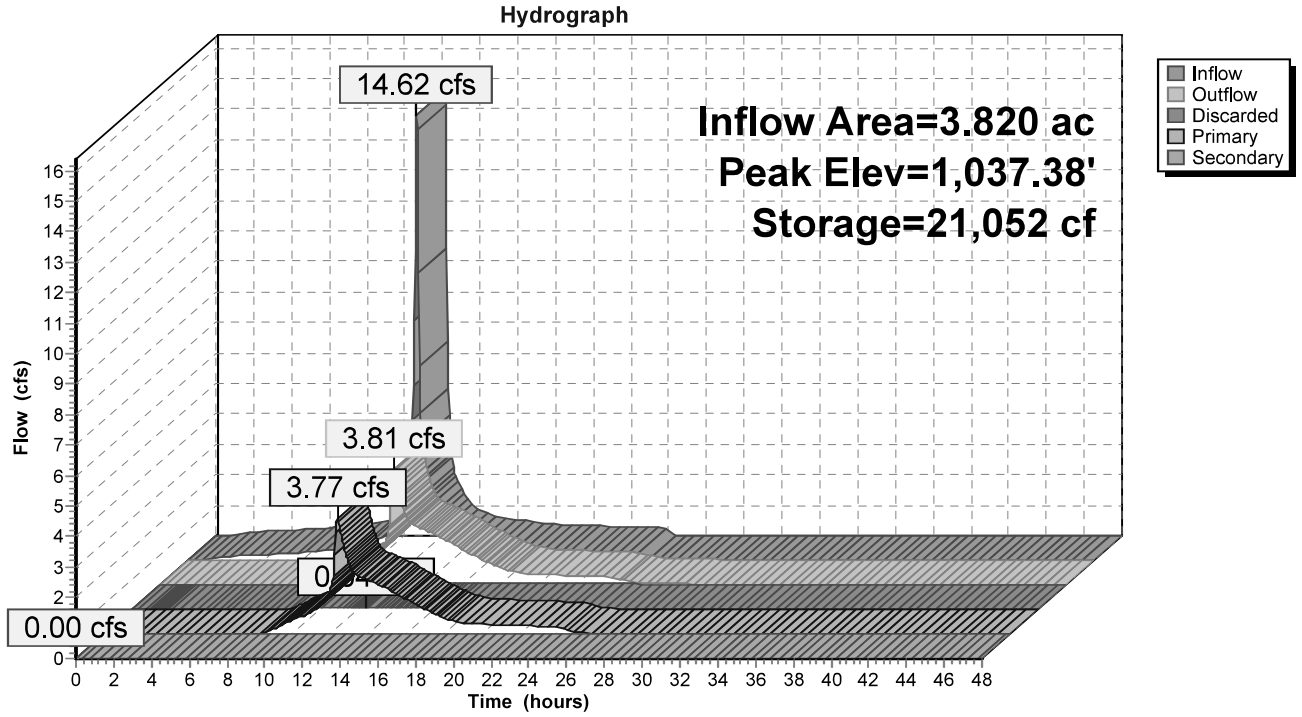
Device	Routing	Invert	Outlet Devices
#1	Primary	1,033.30'	**18.0" Round Culvert** L= 56.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,033.30' / 1,031.00' S= 0.0411 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,034.60'	**5.0" Vert. Orifice/Grate X 2.00** C= 0.600
#3	Device 1	1,036.94'	**8.0" Vert. Orifice/Grate X 3.00** C= 0.600
#4	Device 1	1,038.88'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	1,039.20'	**153.0 deg x 6.0' long x 2.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.47 (C= 3.09)
#6	Discarded	1,033.30'	**0.270 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.04 cfs @ 12.36 hrs HW=1,037.38' (Free Discharge)
└**6=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=3.75 cfs @ 12.36 hrs HW=1,037.38' (Free Discharge)
└**1=Culvert** (Passes 3.75 cfs of 13.70 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 2.11 cfs @ 7.72 fps)
  ├**3=Orifice/Grate** (Orifice Controls 1.65 cfs @ 2.26 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,033.30' (Free Discharge)
└**5=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond IB:

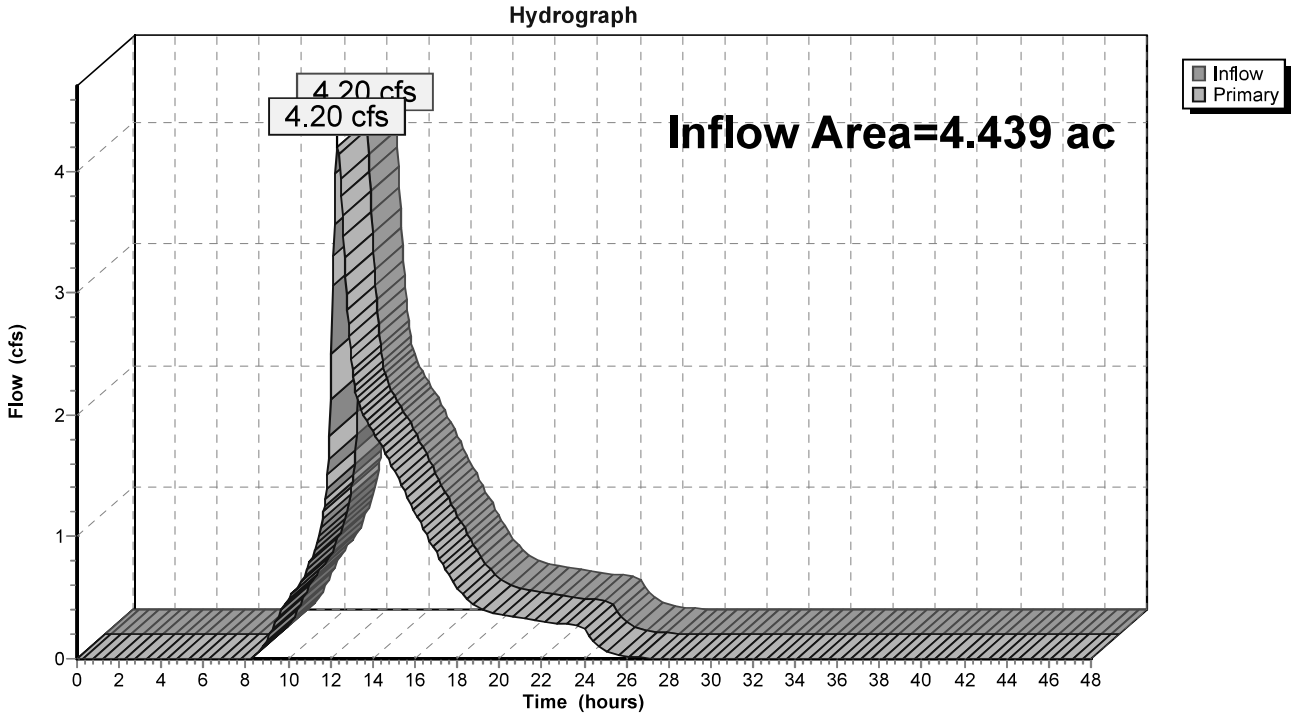

Hydrograph
14.62 cfs
3.81 cfs
3.77 cfs
0.00 cfs
Inflow Area=3.820 ac
Peak Elev=1,037.38'
Storage=21,052 cf
Inflow
Outflow
Discarded
Primary
Secondary
Flow (cfs)
Time (hours)

Summary for Link 1EV:

Inflow Area = 4.439 ac, 61.00% Impervious, Inflow Depth = 3.28" for 10-Year event
Inflow = 4.20 cfs @ 12.33 hrs, Volume= 1.213 af
Primary = 4.20 cfs @ 12.33 hrs, Volume= 1.213 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1EV:

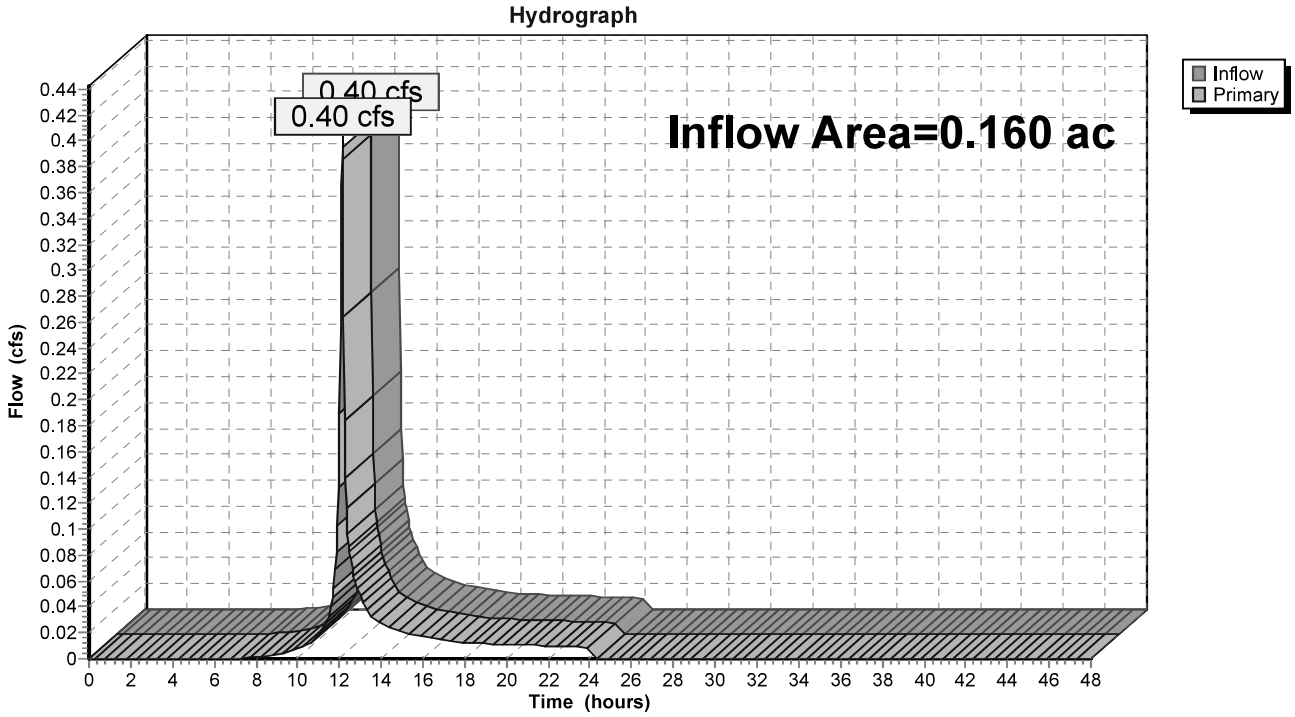


Summary for Link POA-1:

Inflow Area = 0.160 ac, 3.19% Impervious, Inflow Depth = 2.32" for 10-Year event
Inflow = 0.40 cfs @ 12.13 hrs, Volume= 0.031 af
Primary = 0.40 cfs @ 12.13 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link POA-1:



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 3S: APPROVED Runoff Area=119,356 sf 75.36% Impervious Runoff Depth=5.31"
Tc=6.0 min CN=77/98 Runoff=13.64 cfs 1.212 af

Subcatchment 6S: APPROVED Runoff Area=26,955 sf 2.64% Impervious Runoff Depth=3.16"
Tc=6.0 min CN=72/98 Runoff=2.09 cfs 0.163 af

Subcatchment 7S: APPROVED Runoff Area=13,165 sf 1.02% Impervious Runoff Depth=4.42"
Tc=6.0 min CN=85/98 Runoff=1.39 cfs 0.111 af

Subcatchment PR-1: Runoff Area=6,949 sf 3.19% Impervious Runoff Depth=3.36"
Tc=6.0 min CN=74/98 Runoff=0.57 cfs 0.045 af

Subcatchment PR-2: Runoff Area=33,868 sf 80.16% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=74/98 Runoff=3.88 cfs 0.347 af

Pond IB: Peak Elev=1,037.90' Storage=24,828 cf Inflow=18.91 cfs 1.670 af
Discarded=0.05 cfs 0.113 af Primary=6.30 cfs 1.485 af Secondary=0.00 cfs 0.000 af Outflow=6.35 cfs 1.597 af

Link 1EV: Inflow=7.27 cfs 1.647 af
Primary=7.27 cfs 1.647 af

Link POA-1: Inflow=0.57 cfs 0.045 af
Primary=0.57 cfs 0.045 af

Total Runoff Area = 4.598 ac Runoff Volume = 1.877 af Average Runoff Depth = 4.90"
41.01% Pervious = 1.886 ac 58.99% Impervious = 2.713 ac

Summary for Subcatchment 3S: APPROVED

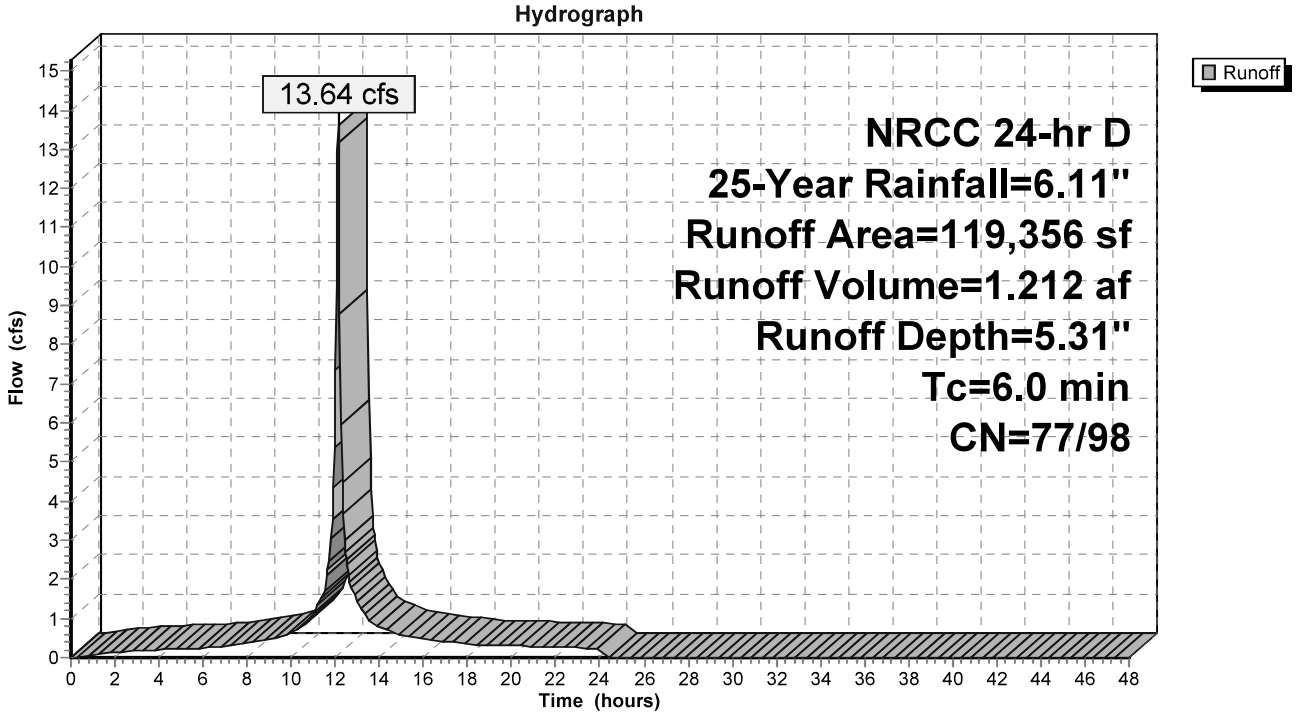
Runoff = 13.64 cfs @ 12.13 hrs, Volume= 1.212 af, Depth= 5.31"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05
NRCC 24-hr D 25-Year Rainfall=6.11"

Area (sf)	CN	Description
25,414	74	>75% Grass cover, Good, HSG C
71,602	98	Paved parking, HSG C
18,342	98	Roofs, HSG C
3,998	98	Unconnected pavement, HSG C
119,356	93	Weighted Average
29,412	77	24.64% Pervious Area
89,944	98	75.36% Impervious Area

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

Subcatchment 3S: APPROVED



Summary for Subcatchment 6S: APPROVED

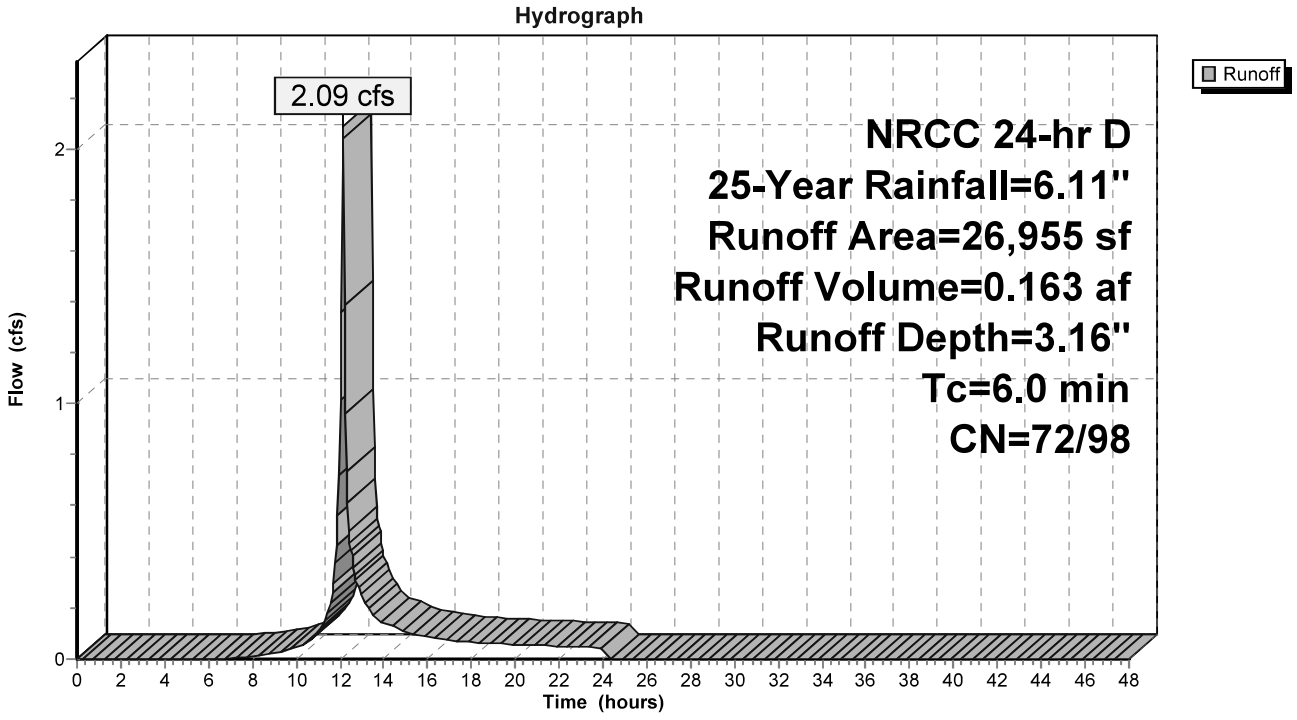
Runoff = 2.09 cfs @ 12.13 hrs, Volume= 0.163 af, Depth= 3.16"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05
NRCC 24-hr D 25-Year Rainfall=6.11"

	Area (sf)	CN	Description
	15,442	74	>75% Grass cover, Good, HSG C
*	711	98	Riprap
	10,802	70	Woods, Good, HSG C
	26,955	73	Weighted Average
	26,244	72	97.36% Pervious Area
	711	98	2.64% Impervious Area

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

Subcatchment 6S: APPROVED



Summary for Subcatchment 7S: APPROVED

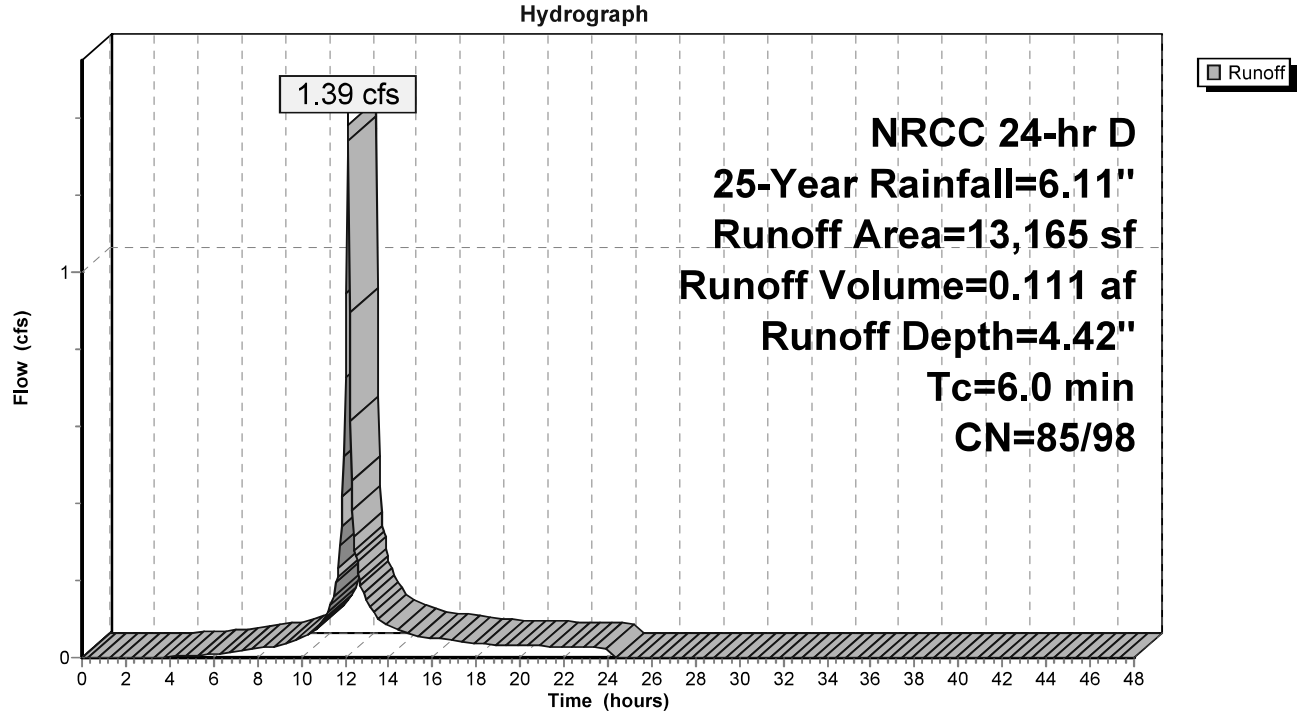
Runoff = 1.39 cfs @ 12.13 hrs, Volume= 0.111 af, Depth= 4.42"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05
NRCC 24-hr D 25-Year Rainfall=6.11"

	Area (sf)	CN	Description
	6,571	74	>75% Grass cover, Good, HSG C
	5,880	98	Water Surface, 0% imp, HSG C
*	134	98	Riprap
	580	89	Gravel roads, HSG C
	13,165	86	Weighted Average
	13,031	85	98.98% Pervious Area
	134	98	1.02% Impervious Area

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

Subcatchment 7S: APPROVED



Summary for Subcatchment PR-1:

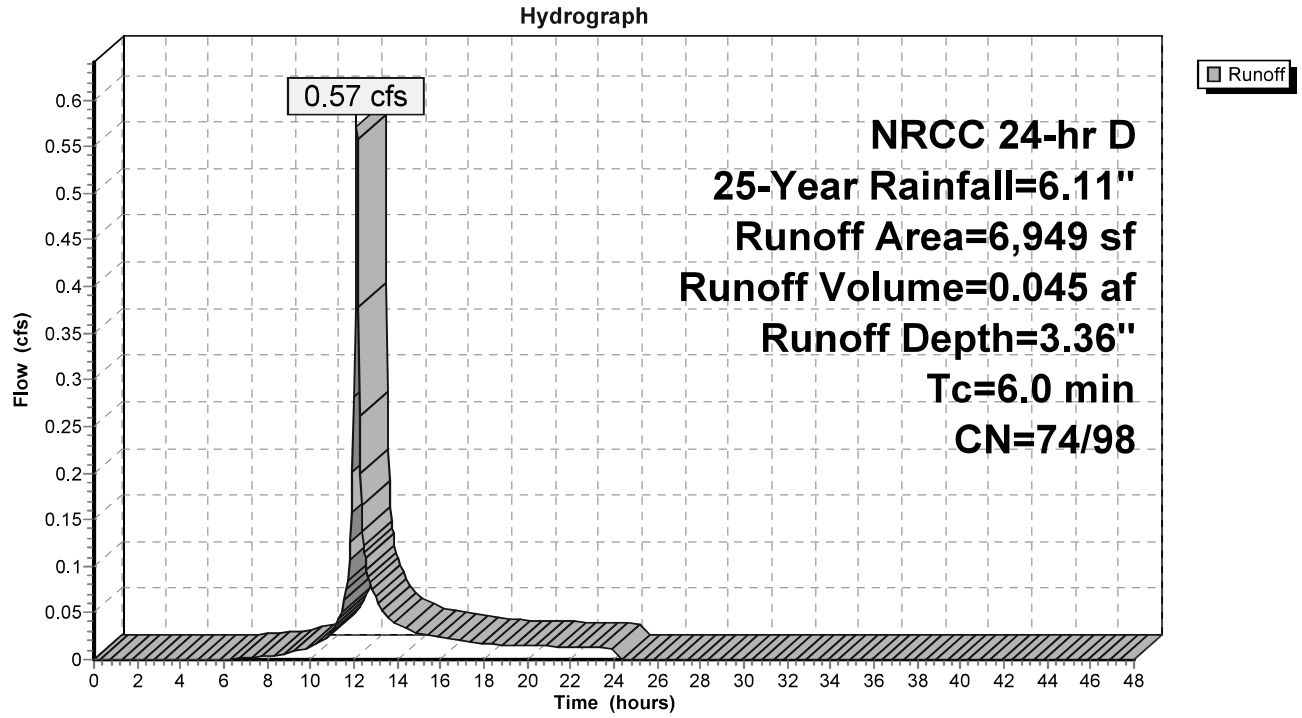
Runoff = 0.57 cfs @ 12.13 hrs, Volume= 0.045 af, Depth= 3.36"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05
NRCC 24-hr D 25-Year Rainfall=6.11"

Area (sf)	CN	Description
6,727	74	>75% Grass cover, Good, HSG C
222	98	Paved parking, HSG C
6,949	75	Weighted Average
6,727	74	96.81% Pervious Area
222	98	3.19% Impervious Area

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

Subcatchment PR-1:



Summary for Subcatchment PR-2:

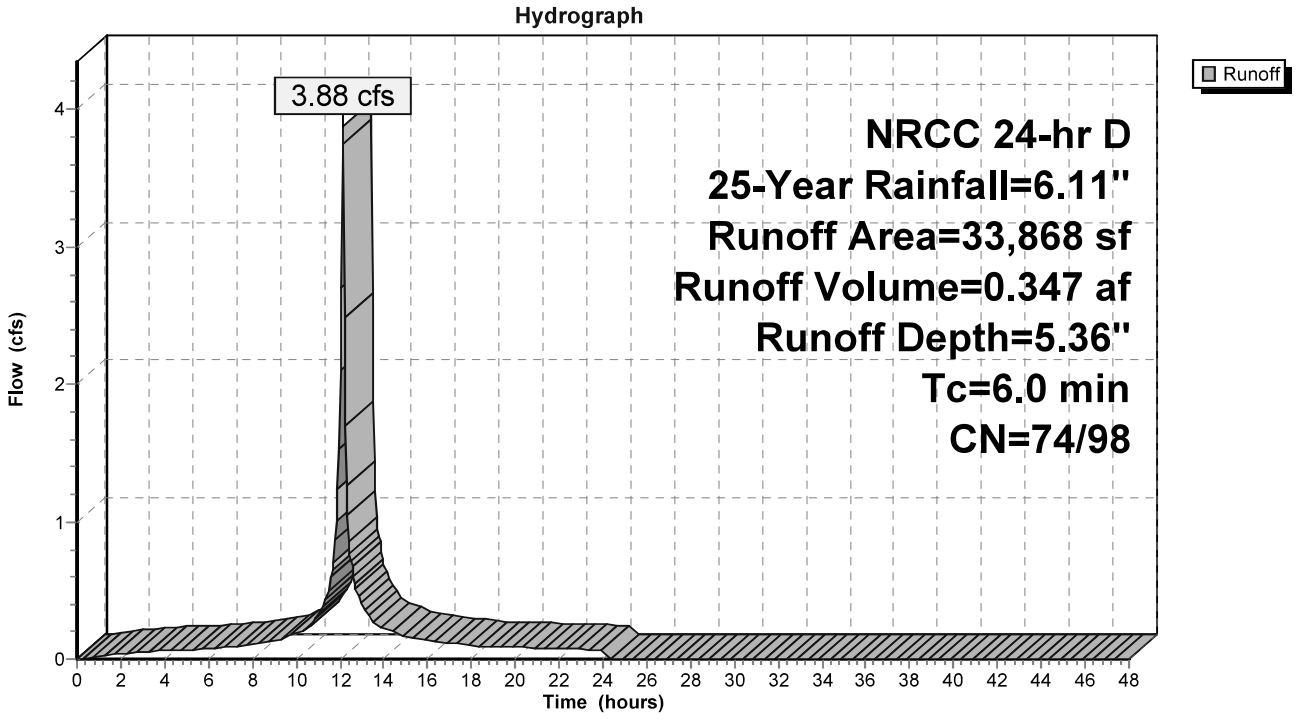
Runoff = 3.88 cfs @ 12.13 hrs, Volume= 0.347 af, Depth= 5.36"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05
NRCC 24-hr D 25-Year Rainfall=6.11"

Area (sf)	CN	Description
6,721	74	>75% Grass cover, Good, HSG C
3,900	98	Roofs, HSG C
23,247	98	Paved parking, HSG C
33,868	93	Weighted Average
6,721	74	19.84% Pervious Area
27,147	98	80.16% Impervious Area

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

Subcatchment PR-2:



Summary for Pond IB:

Inflow Area = 3.820 ac, 70.45% Impervious, Inflow Depth = 5.25" for 25-Year event
Inflow = 18.91 cfs @ 12.13 hrs, Volume= 1.670 af
Outflow = 6.35 cfs @ 12.30 hrs, Volume= 1.597 af, Atten= 66%, Lag= 10.6 min
Discarded = 0.05 cfs @ 12.30 hrs, Volume= 0.113 af
Primary = 6.30 cfs @ 12.30 hrs, Volume= 1.485 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 1,037.90' @ 12.30 hrs Surf.Area= 7,516 sf Storage= 24,828 cf

Plug-Flow detention time= 173.1 min calculated for 1.596 af (96% of inflow)
Center-of-Mass det. time= 147.1 min (912.6 - 765.5)

Volume	Invert	Avail.Storage	Storage Description
#1	1,033.30'	43,068 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,033.30	3,231	0	0
1,034.00	4,043	2,546	2,546
1,036.00	5,690	9,733	12,279
1,038.00	7,612	13,302	25,581
1,040.00	9,875	17,487	43,068

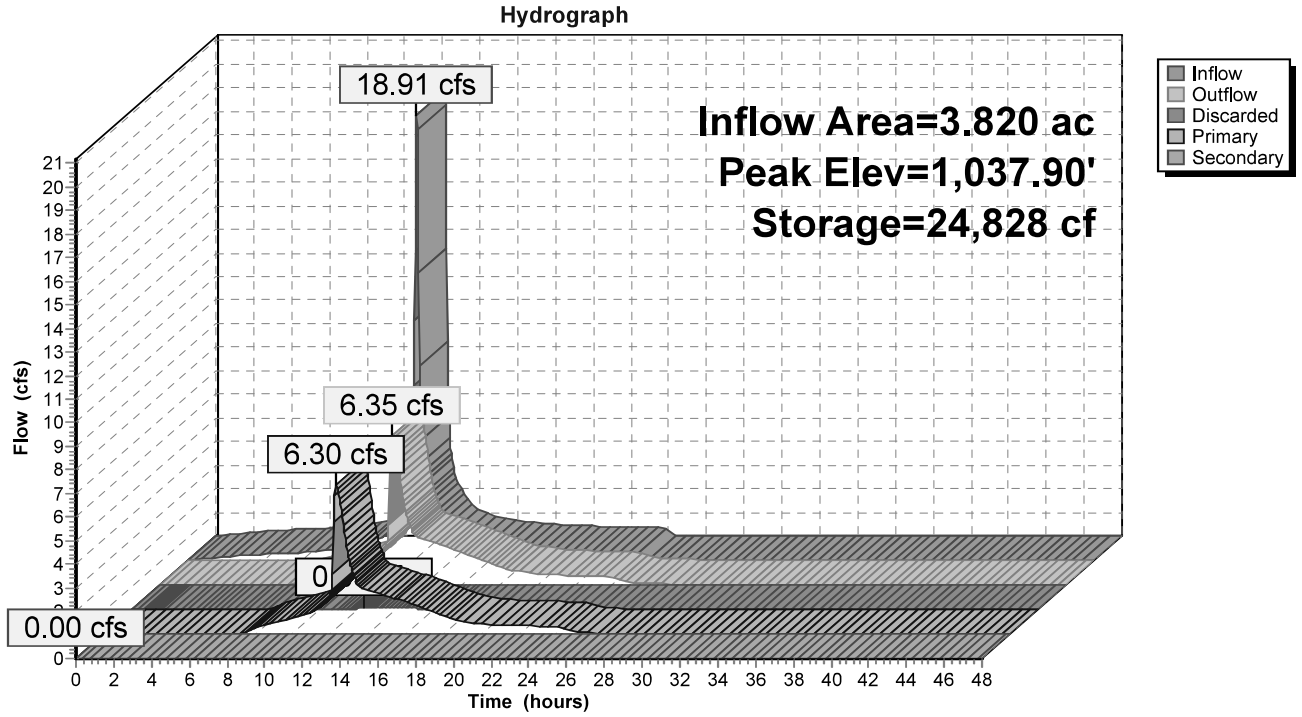
Device	Routing	Invert	Outlet Devices
#1	Primary	1,033.30'	**18.0" Round Culvert** L= 56.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,033.30' / 1,031.00' S= 0.0411 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,034.60'	**5.0" Vert. Orifice/Grate X 2.00** C= 0.600
#3	Device 1	1,036.94'	**8.0" Vert. Orifice/Grate X 3.00** C= 0.600
#4	Device 1	1,038.88'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	1,039.20'	**153.0 deg x 6.0' long x 2.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.47 (C= 3.09)
#6	Discarded	1,033.30'	**0.270 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.05 cfs @ 12.30 hrs HW=1,037.90' (Free Discharge)
└**6=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=6.30 cfs @ 12.30 hrs HW=1,037.90' (Free Discharge)
└**1=Culvert** (Passes 6.30 cfs of 14.73 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 2.31 cfs @ 8.46 fps)
  ├**3=Orifice/Grate** (Orifice Controls 3.99 cfs @ 3.81 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,033.30' (Free Discharge)
└**5=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond IB:

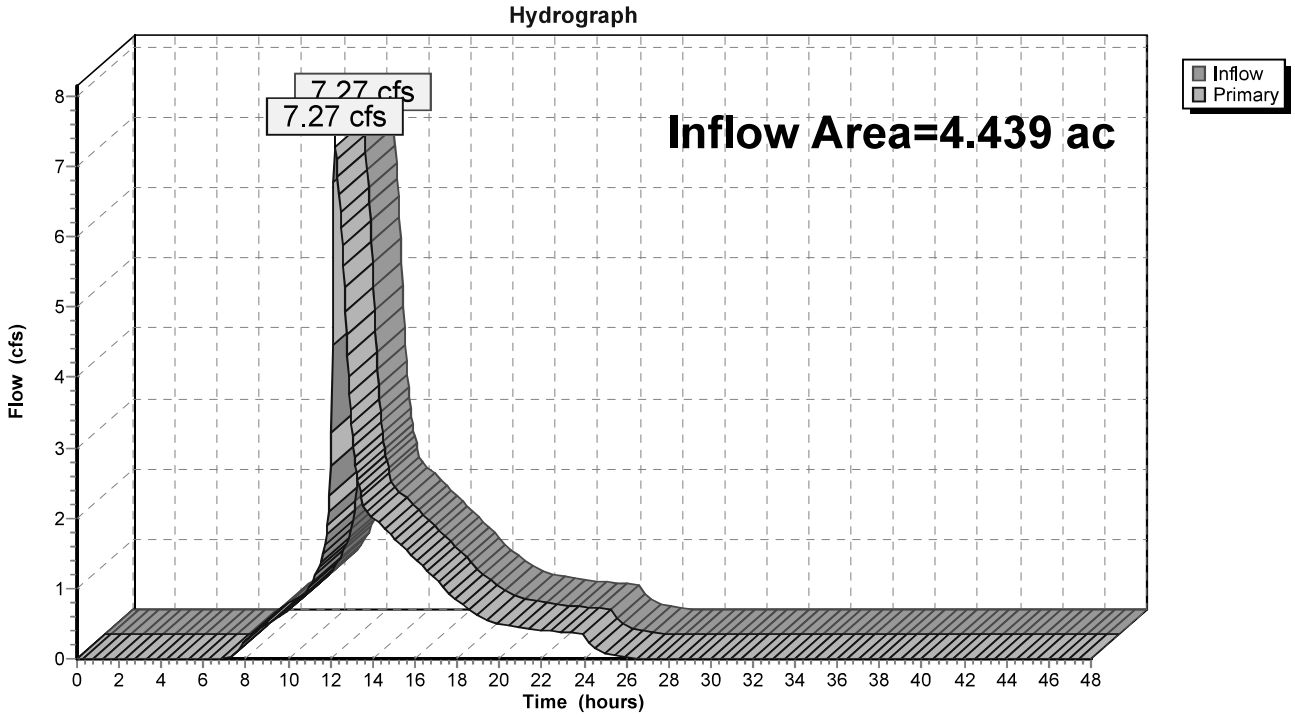

Hydrograph
18.91 cfs
6.35 cfs
6.30 cfs
0
0.00 cfs
Inflow Area=3.820 ac
Peak Elev=1,037.90'
Storage=24,828 cf
Inflow
Outflow
Discarded
Primary
Secondary
Flow (cfs)
Time (hours)

Summary for Link 1EV:

Inflow Area = 4.439 ac, 61.00% Impervious, Inflow Depth = 4.45" for 25-Year event
Inflow = 7.27 cfs @ 12.22 hrs, Volume= 1.647 af
Primary = 7.27 cfs @ 12.22 hrs, Volume= 1.647 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1EV:

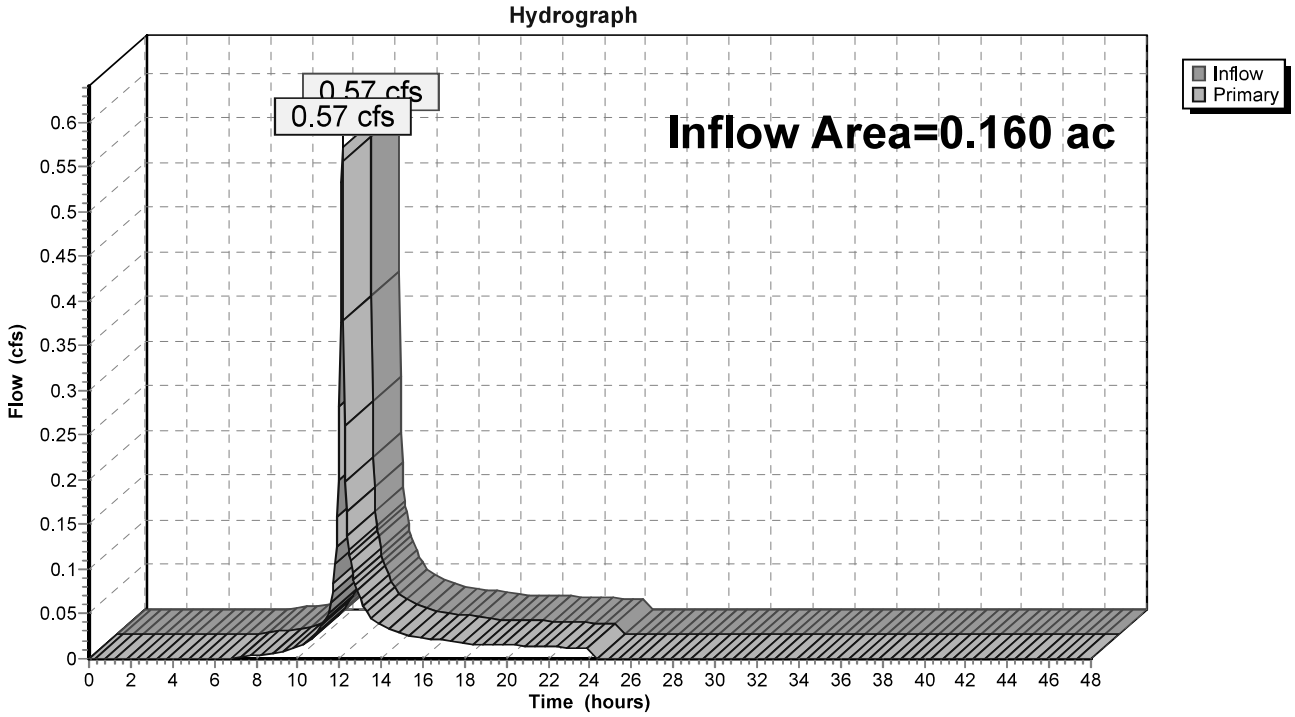


Summary for Link POA-1:

Inflow Area = 0.160 ac, 3.19% Impervious, Inflow Depth = 3.36" for 25-Year event
Inflow = 0.57 cfs @ 12.13 hrs, Volume= 0.045 af
Primary = 0.57 cfs @ 12.13 hrs, Volume= 0.045 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link POA-1:



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 3S: APPROVED Runoff Area=119,356 sf 75.36% Impervious Runoff Depth=7.81"
Tc=6.0 min CN=77/98 Runoff=19.93 cfs 1.784 af

Subcatchment 6S: APPROVED Runoff Area=26,955 sf 2.64% Impervious Runoff Depth=5.38"
Tc=6.0 min CN=72/98 Runoff=3.53 cfs 0.277 af

Subcatchment 7S: APPROVED Runoff Area=13,165 sf 1.02% Impervious Runoff Depth=6.89"
Tc=6.0 min CN=85/98 Runoff=2.10 cfs 0.173 af

Subcatchment PR-1: Runoff Area=6,949 sf 3.19% Impervious Runoff Depth=5.63"
Tc=6.0 min CN=74/98 Runoff=0.95 cfs 0.075 af

Subcatchment PR-2: Runoff Area=33,868 sf 80.16% Impervious Runoff Depth=7.86"
Tc=6.0 min CN=74/98 Runoff=5.66 cfs 0.510 af

Pond IB: Peak Elev=1,038.97' Storage=33,504 cf Inflow=27.69 cfs 2.467 af
Discarded=0.05 cfs 0.117 af Primary=10.00 cfs 2.277 af Secondary=0.00 cfs 0.000 af Outflow=10.06 cfs 2.394 af

Link 1EV: Inflow=11.73 cfs 2.555 af
Primary=11.73 cfs 2.555 af

Link POA-1: Inflow=0.95 cfs 0.075 af
Primary=0.95 cfs 0.075 af

Total Runoff Area = 4.598 ac Runoff Volume = 2.819 af Average Runoff Depth = 7.36"
41.01% Pervious = 1.886 ac 58.99% Impervious = 2.713 ac

Summary for Subcatchment 3S: APPROVED

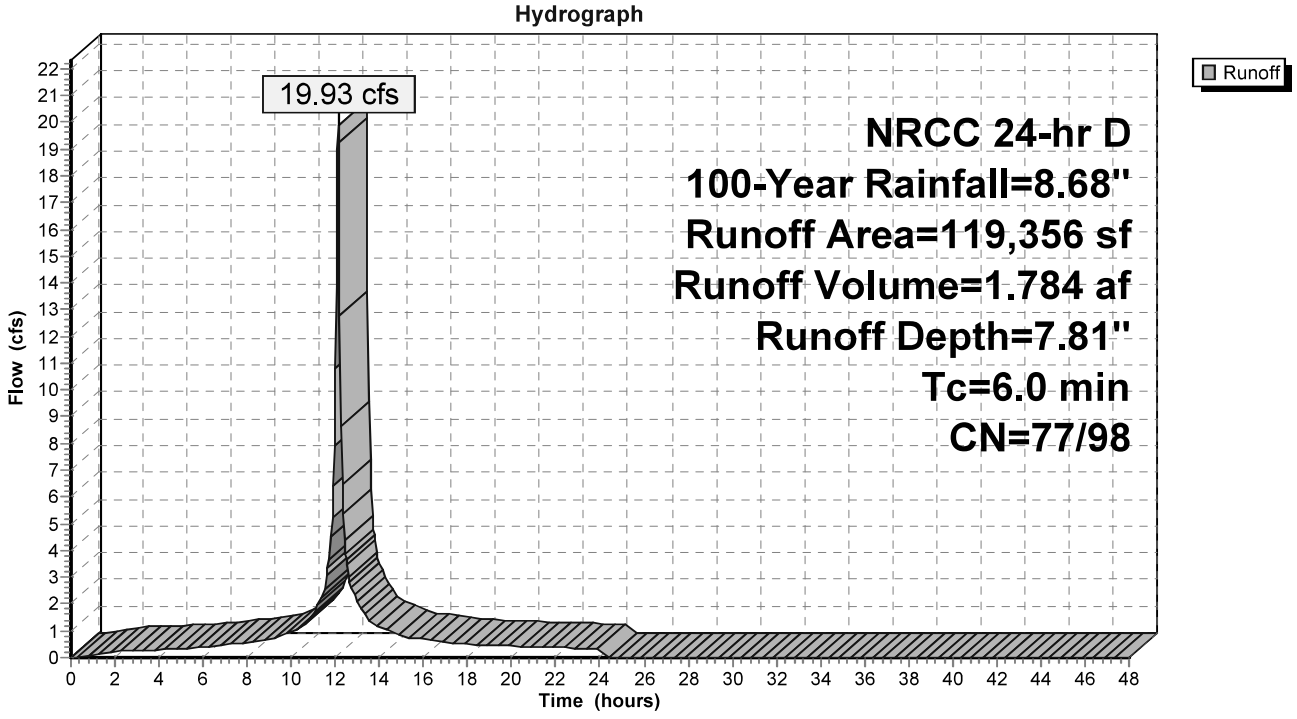
Runoff = 19.93 cfs @ 12.13 hrs, Volume= 1.784 af, Depth= 7.81"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05
NRCC 24-hr D 100-Year Rainfall=8.68"

Area (sf)	CN	Description
25,414	74	>75% Grass cover, Good, HSG C
71,602	98	Paved parking, HSG C
18,342	98	Roofs, HSG C
3,998	98	Unconnected pavement, HSG C
119,356	93	Weighted Average
29,412	77	24.64% Pervious Area
89,944	98	75.36% Impervious Area

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

Subcatchment 3S: APPROVED



Summary for Subcatchment 6S: APPROVED

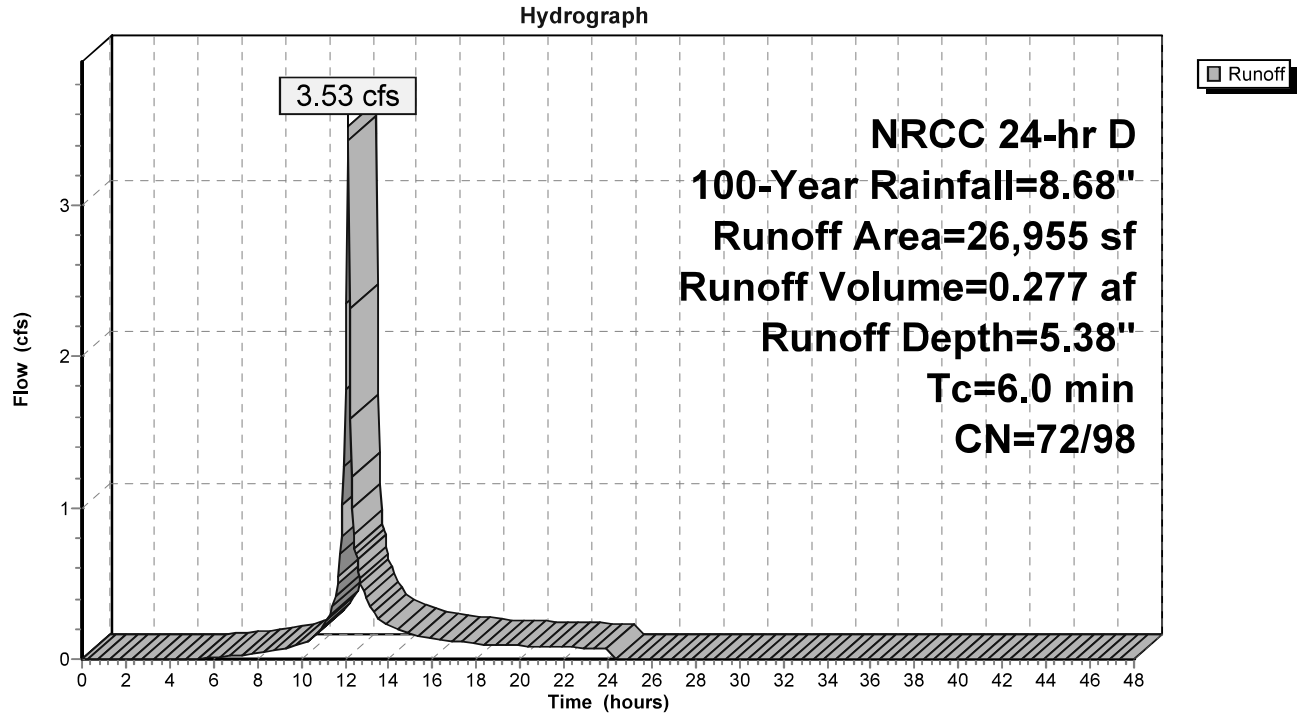
Runoff = 3.53 cfs @ 12.13 hrs, Volume= 0.277 af, Depth= 5.38"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05
NRCC 24-hr D 100-Year Rainfall=8.68"

	Area (sf)	CN	Description
	15,442	74	>75% Grass cover, Good, HSG C
*	711	98	Riprap
	10,802	70	Woods, Good, HSG C
	26,955	73	Weighted Average
	26,244	72	97.36% Pervious Area
	711	98	2.64% Impervious Area

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

Subcatchment 6S: APPROVED



Summary for Subcatchment 7S: APPROVED

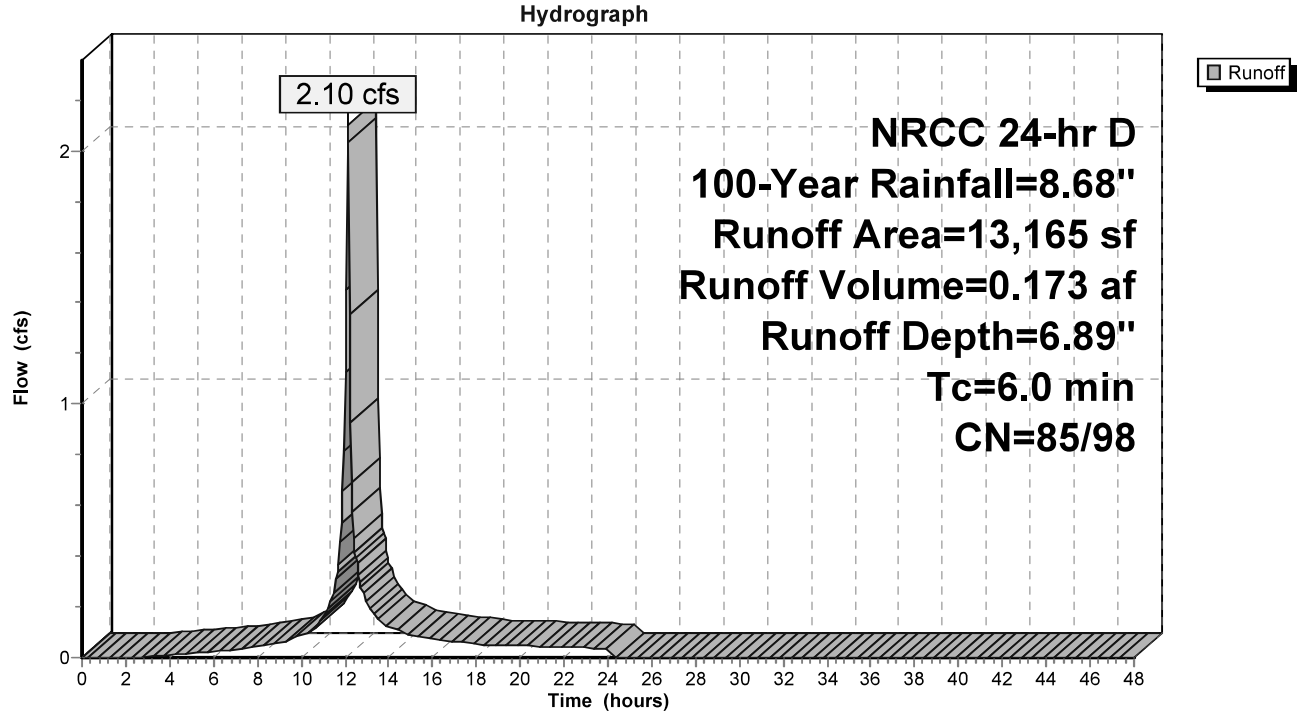
Runoff = 2.10 cfs @ 12.13 hrs, Volume= 0.173 af, Depth= 6.89"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05
NRCC 24-hr D 100-Year Rainfall=8.68"

	Area (sf)	CN	Description
	6,571	74	>75% Grass cover, Good, HSG C
	5,880	98	Water Surface, 0% imp, HSG C
*	134	98	Riprap
	580	89	Gravel roads, HSG C
	13,165	86	Weighted Average
	13,031	85	98.98% Pervious Area
	134	98	1.02% Impervious Area

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

Subcatchment 7S: APPROVED



Summary for Subcatchment PR-1:

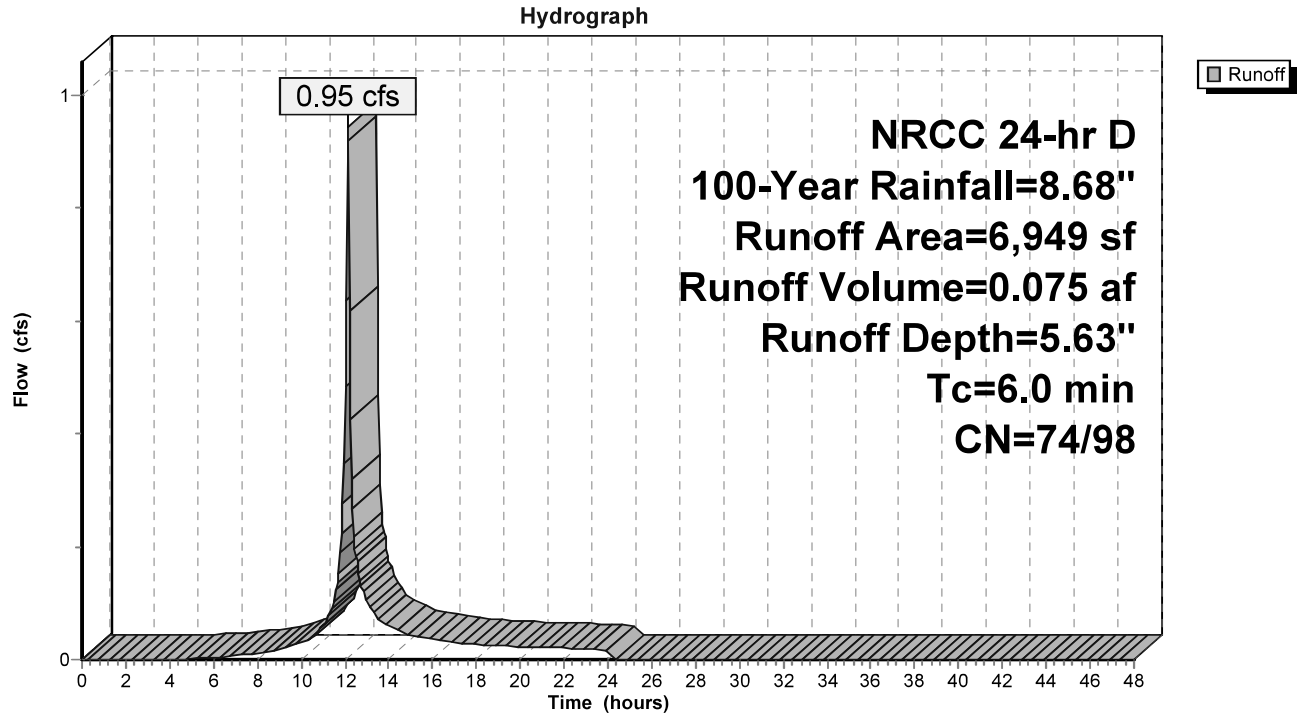
Runoff = 0.95 cfs @ 12.13 hrs, Volume= 0.075 af, Depth= 5.63"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05
NRCC 24-hr D 100-Year Rainfall=8.68"

Area (sf)	CN	Description
6,727	74	>75% Grass cover, Good, HSG C
222	98	Paved parking, HSG C
6,949	75	Weighted Average
6,727	74	96.81% Pervious Area
222	98	3.19% Impervious Area

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

Subcatchment PR-1:



Summary for Subcatchment PR-2:

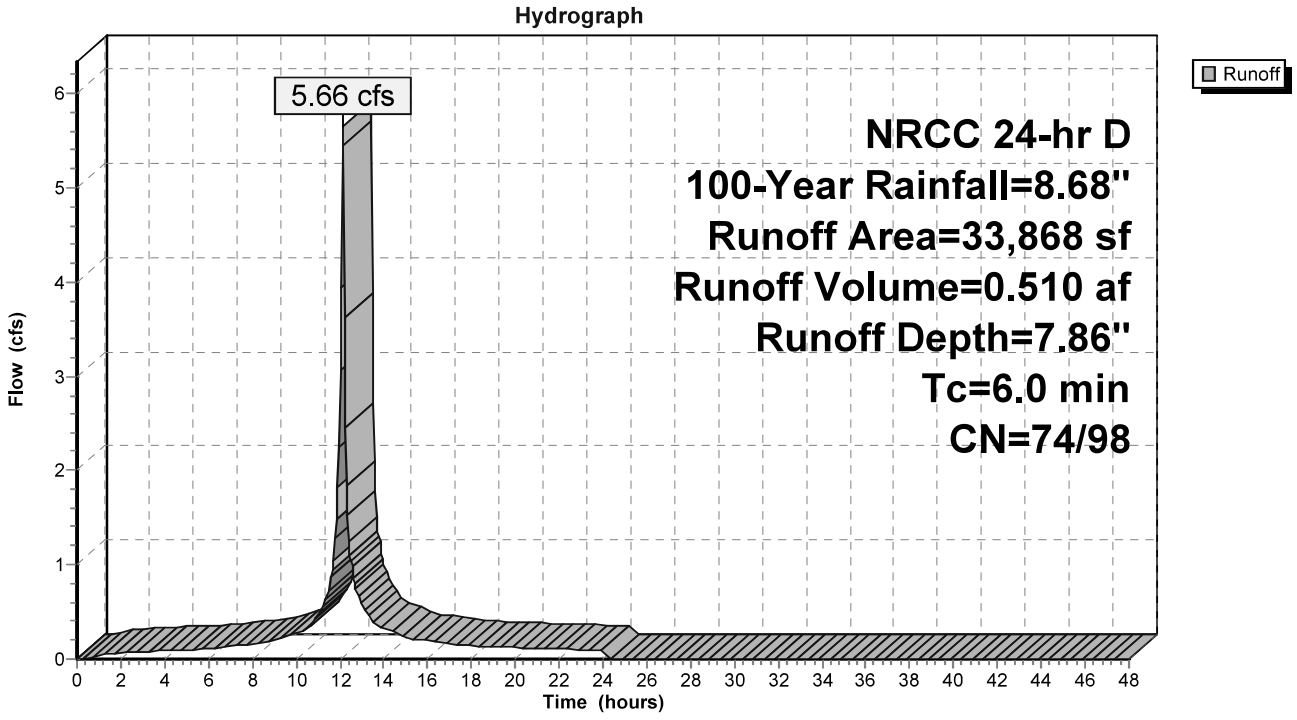
Runoff = 5.66 cfs @ 12.13 hrs, Volume= 0.510 af, Depth= 7.86"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-48.00 hrs, dt= 0.05
NRCC 24-hr D 100-Year Rainfall=8.68"

Area (sf)	CN	Description
6,721	74	>75% Grass cover, Good, HSG C
3,900	98	Roofs, HSG C
23,247	98	Paved parking, HSG C
33,868	93	Weighted Average
6,721	74	19.84% Pervious Area
27,147	98	80.16% Impervious Area

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

Subcatchment PR-2:



Summary for Pond IB:

Inflow Area = 3.820 ac, 70.45% Impervious, Inflow Depth = 7.75" for 100-Year event
Inflow = 27.69 cfs @ 12.13 hrs, Volume= 2.467 af
Outflow = 10.06 cfs @ 12.29 hrs, Volume= 2.394 af, Atten= 64%, Lag= 9.7 min
Discarded = 0.05 cfs @ 12.29 hrs, Volume= 0.117 af
Primary = 10.00 cfs @ 12.29 hrs, Volume= 2.277 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 1,038.97' @ 12.29 hrs Surf.Area= 8,711 sf Storage= 33,504 cf

Plug-Flow detention time= 139.2 min calculated for 2.391 af (97% of inflow)
Center-of-Mass det. time= 121.3 min (880.6 - 759.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1,033.30'	43,068 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,033.30	3,231	0	0
1,034.00	4,043	2,546	2,546
1,036.00	5,690	9,733	12,279
1,038.00	7,612	13,302	25,581
1,040.00	9,875	17,487	43,068

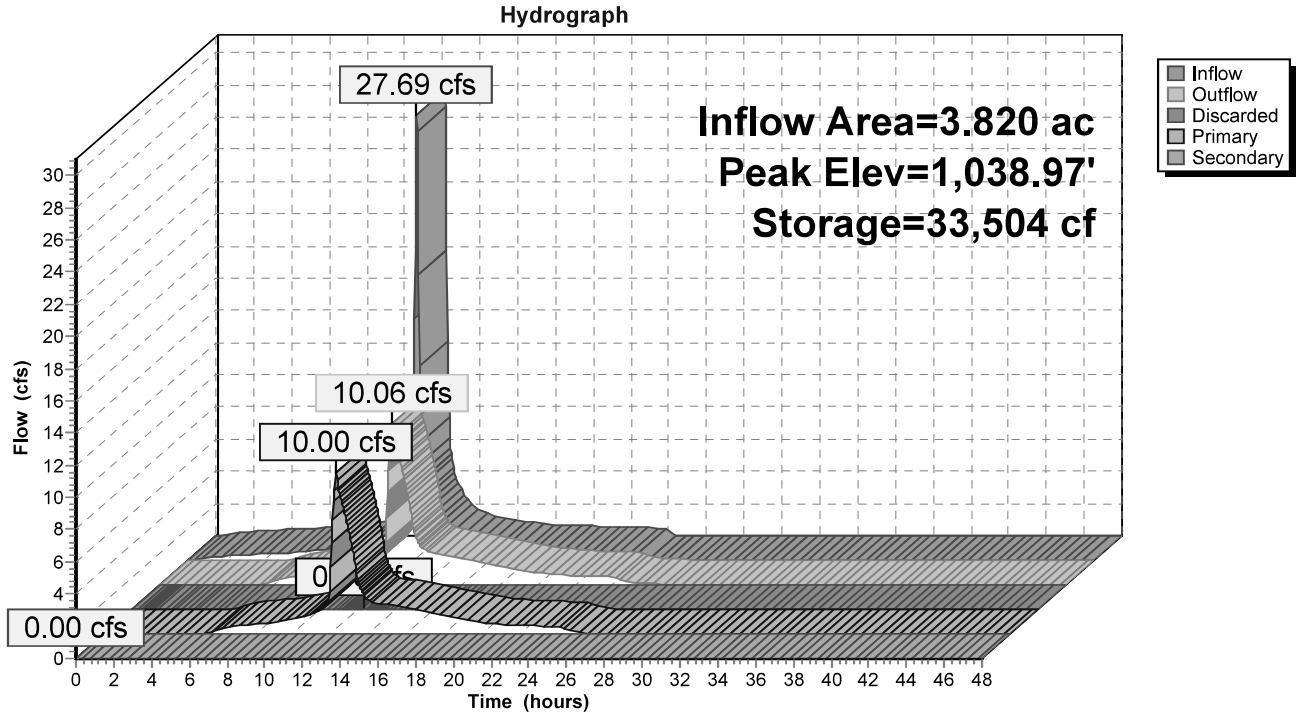
Device	Routing	Invert	Outlet Devices
#1	Primary	1,033.30'	**18.0" Round Culvert** L= 56.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,033.30' / 1,031.00' S= 0.0411 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,034.60'	**5.0" Vert. Orifice/Grate X 2.00** C= 0.600
#3	Device 1	1,036.94'	**8.0" Vert. Orifice/Grate X 3.00** C= 0.600
#4	Device 1	1,038.88'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	1,039.20'	**153.0 deg x 6.0' long x 2.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.47 (C= 3.09)
#6	Discarded	1,033.30'	**0.270 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.05 cfs @ 12.29 hrs HW=1,038.97' (Free Discharge)
└**6=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=9.91 cfs @ 12.29 hrs HW=1,038.97' (Free Discharge)
└**1=Culvert** (Passes 9.91 cfs of 16.65 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 2.68 cfs @ 9.82 fps)
  ├**3=Orifice/Grate** (Orifice Controls 6.56 cfs @ 6.27 fps)
  └**4=Orifice/Grate** (Weir Controls 0.67 cfs @ 0.96 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,033.30' (Free Discharge)
└**5=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond IB:

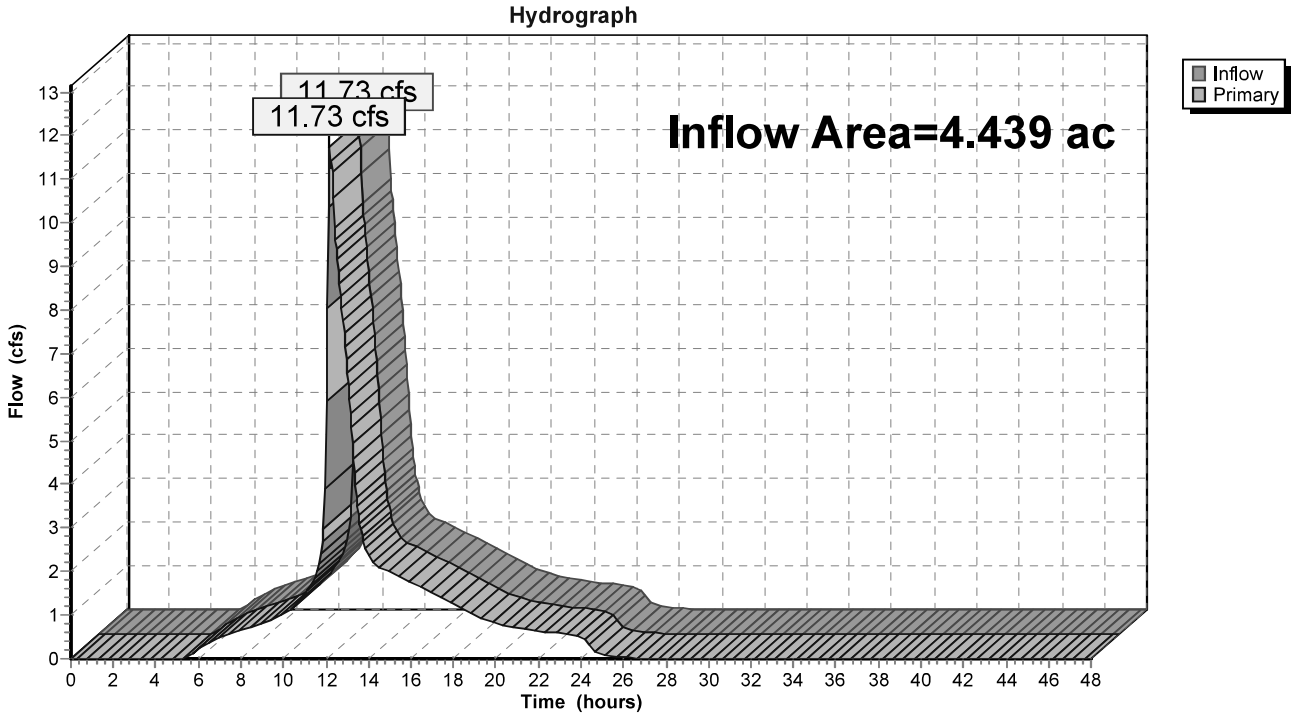

Hydrograph
27.69 cfs
10.06 cfs
10.00 cfs
0.00 cfs
Inflow Area=3.820 ac
Peak Elev=1,038.97'
Storage=33,504 cf
Inflow
Outflow
Discarded
Primary
Secondary
Flow (cfs)
Time (hours)

Summary for Link 1EV:

Inflow Area = 4.439 ac, 61.00% Impervious, Inflow Depth = 6.91" for 100-Year event
Inflow = 11.73 cfs @ 12.16 hrs, Volume= 2.555 af
Primary = 11.73 cfs @ 12.16 hrs, Volume= 2.555 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1EV:

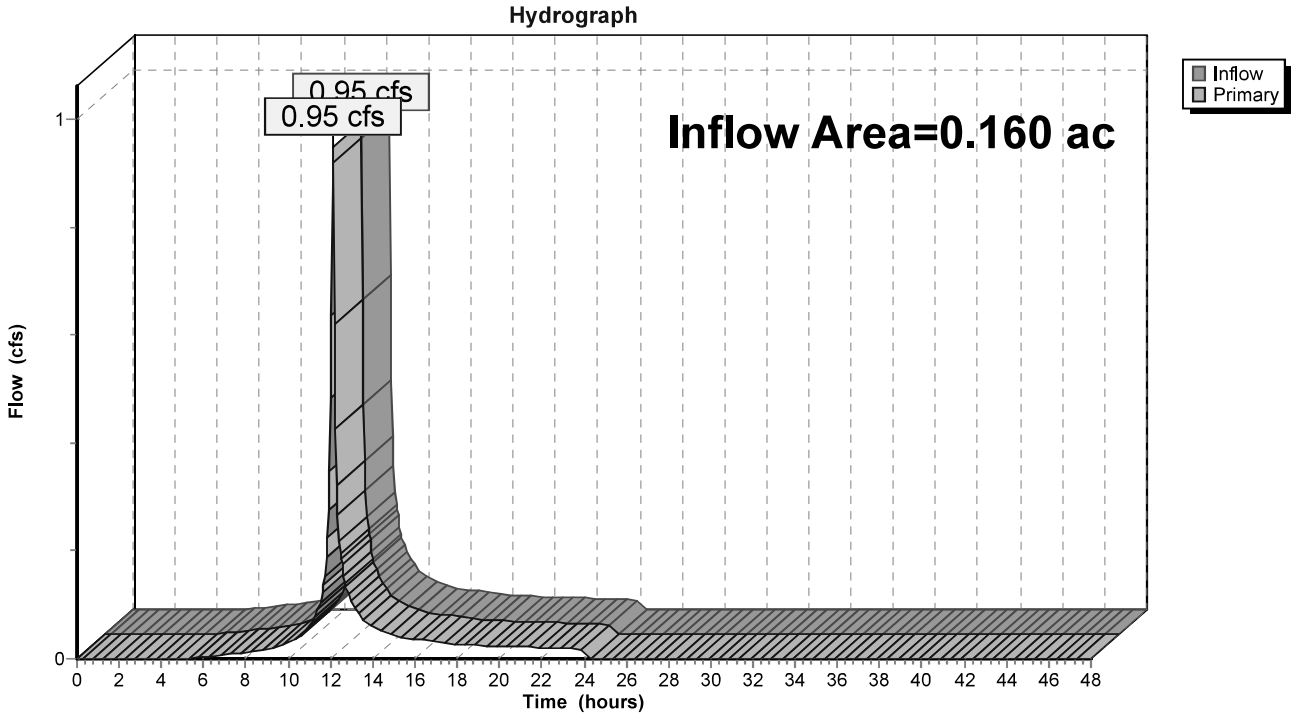


Summary for Link POA-1:

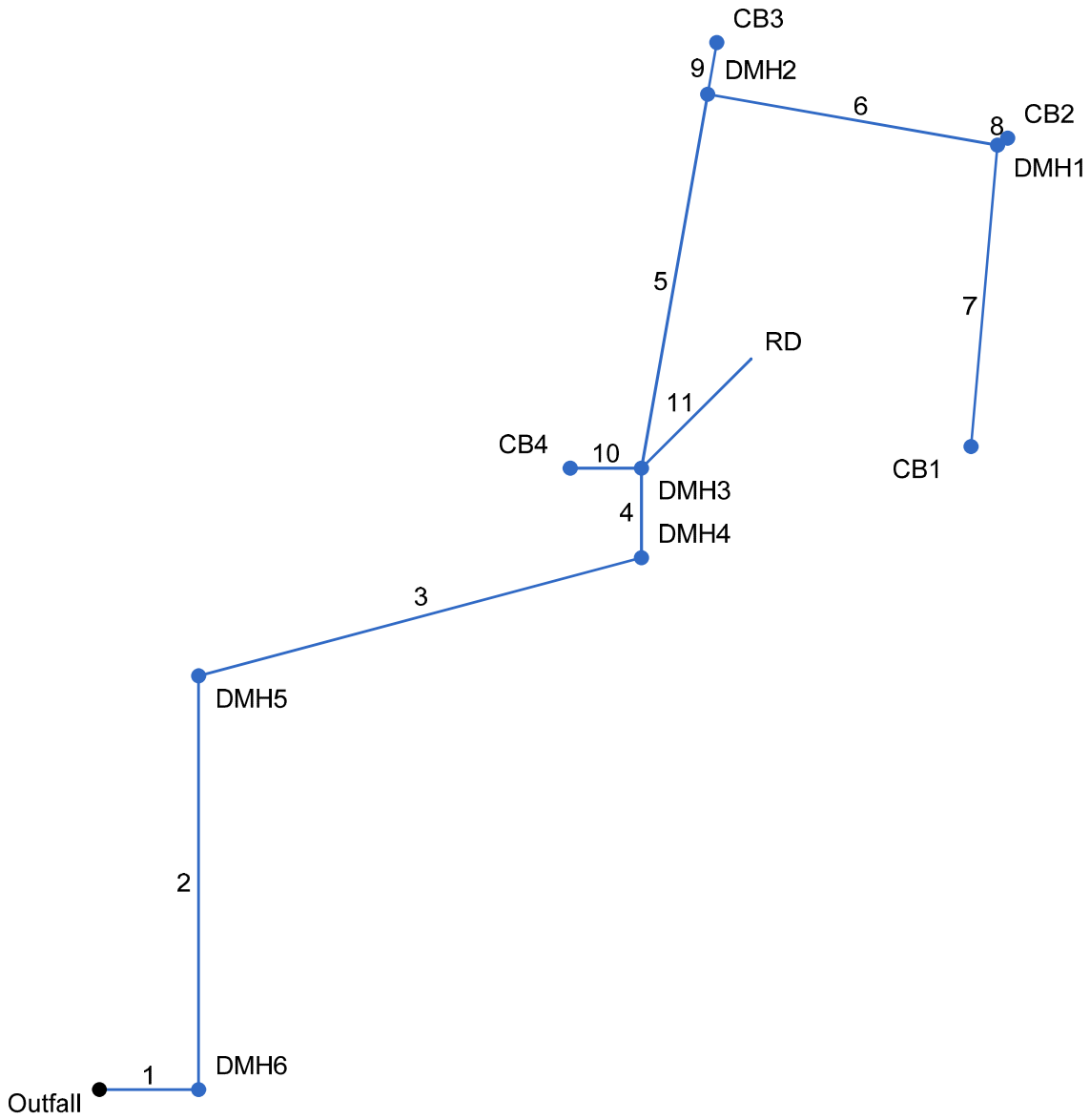
Inflow Area = 0.160 ac, 3.19% Impervious, Inflow Depth = 5.63" for 100-Year event
Inflow = 0.95 cfs @ 12.13 hrs, Volume= 0.075 af
Primary = 0.95 cfs @ 12.13 hrs, Volume= 0.075 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link POA-1:



Hydraflow Storm Sewers Extension for Autodesk® AutoCAD® Civil 3D® Plan



Project File: System-1.stm	Number of lines: 11	Date: 8/15/2023

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	32.000	0.000	MH	0.00	0.00	0.00	6.0	1035.00	0.62	1035.20	18	Cir	0.011	1.00	1045.00	DMH6-FES3
2	1	134.000	-90.000	MH	0.00	0.00	0.00	6.0	1035.30	0.52	1036.00	18	Cir	0.011	0.97	1042.00	DMH5-DMH6
3	2	148.000	75.000	MH	0.00	0.00	0.00	6.0	1036.10	0.51	1036.85	18	Cir	0.011	0.97	1045.00	DMH4-DMH5
4	3	29.000	-75.000	MH	0.00	0.00	0.00	6.0	1036.95	8.10	1039.30	12	Cir	0.011	1.00	1045.05	DMH3-DMH4
5	4	123.000	10.000	MH	0.00	0.00	0.00	6.0	1040.30	0.49	1040.90	12	Cir	0.011	1.00	1044.55	DMH2-DMH3
6	5	95.000	90.000	MH	0.00	0.00	0.00	6.0	1041.00	0.95	1041.90	12	Cir	0.011	1.00	1044.20	DMH1-DMH2
7	6	98.000	85.000	Grate	0.00	0.22	0.80	6.0	1042.00	1.02	1043.00	12	Cir	0.011	1.00	1046.00	CB1-DMH1
8	6	4.000	-45.000	Grate	0.00	0.21	0.80	6.0	1042.00	2.50	1042.10	12	Cir	0.011	1.00	1045.10	CB2-DMH1
9	5	17.000	0.000	Grate	0.00	0.09	0.80	6.0	1041.00	1.18	1041.20	12	Cir	0.011	1.00	1044.00	CB3-DMH2
10	4	23.000	-90.000	Grate	0.00	0.17	0.90	6.0	1041.30	1.30	1041.60	12	Cir	0.011	1.00	1044.60	CB4-DMH3
11	4	50.000	45.000	None	0.00	0.09	0.90	6.0	1041.30	5.40	1044.00	6	Cir	0.011	1.00	1047.00	RD-DMH3

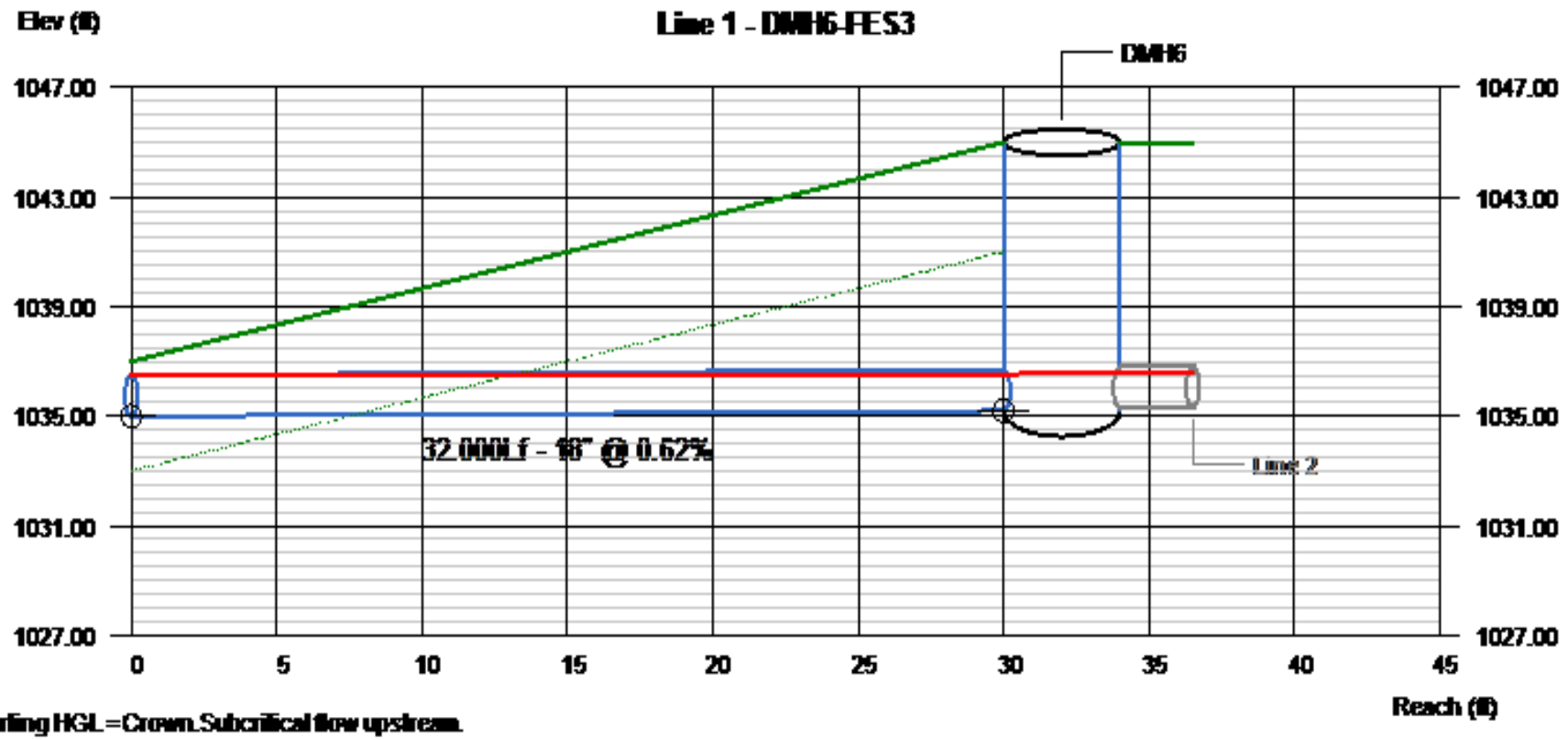
Project File: System-1.stm | Number of lines: 11 | Date: 8/15/2023

Storm Sewer Summary Report

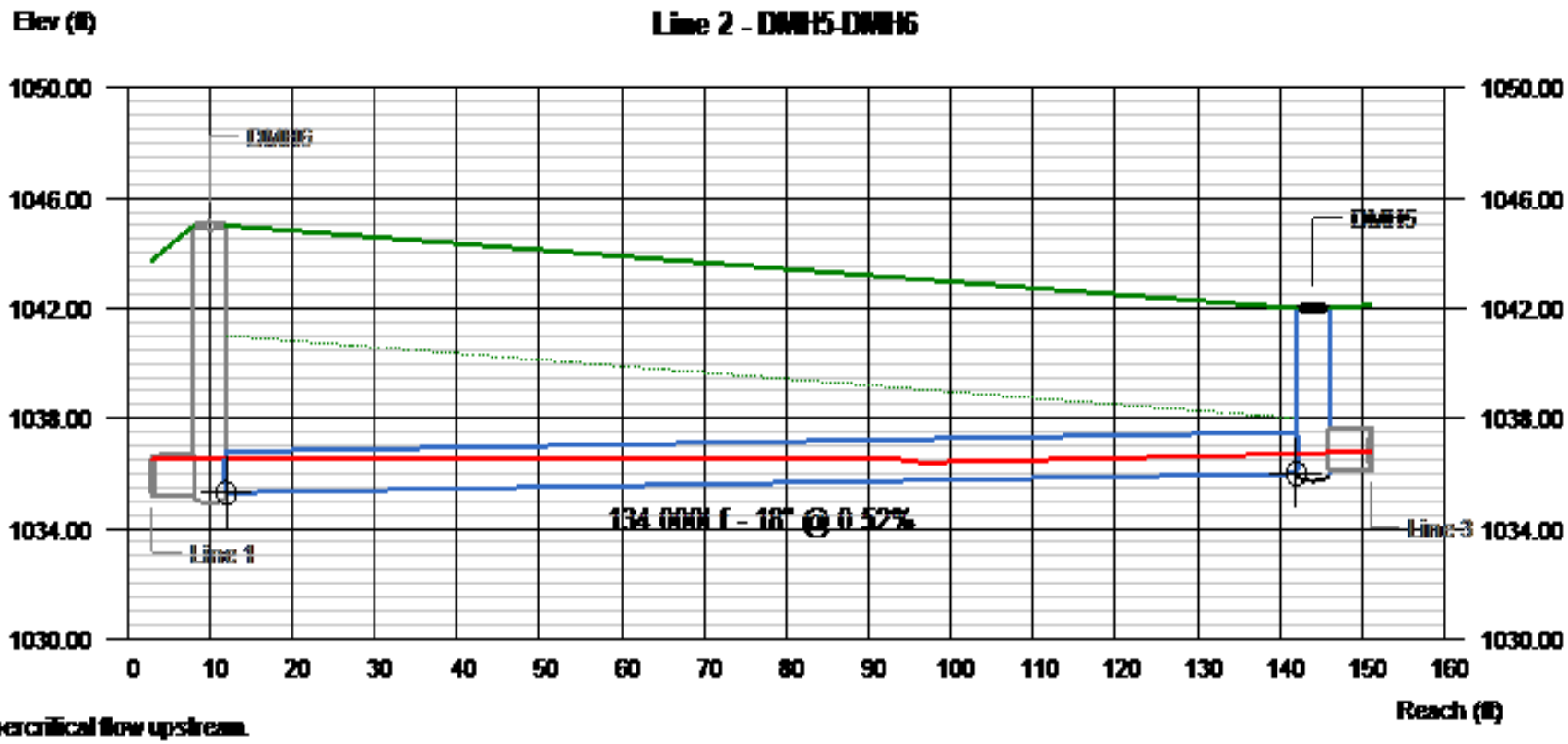
Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	DMH6-FES3	3.39	18	Cir	32.000	1035.00	1035.20	0.625	1036.50	1036.51	0.07	1036.58	End	Manhole
2	DMH5-DMH6	3.52	18	Cir	134.000	1035.30	1036.00	0.522	1036.58	1036.72	n/a	1036.72 j	1	Manhole
3	DMH4-DMH5	3.68	18	Cir	148.000	1036.10	1036.85	0.507	1036.78	1037.58	0.28	1037.58	2	Manhole
4	DMH3-DMH4	3.70	12	Cir	29.000	1036.95	1039.30	8.104	1037.58	1040.12	n/a	1040.12	3	Manhole
5	DMH2-DMH3	2.43	12	Cir	123.000	1040.30	1040.90	0.488	1040.99	1041.59	0.27	1041.87	4	Manhole
6	DMH1-DMH2	2.06	12	Cir	95.000	1041.00	1041.90	0.947	1041.87	1042.51	n/a	1042.51 j	5	Manhole
7	CB1-DMH1	1.11	12	Cir	98.000	1042.00	1043.00	1.020	1042.51	1043.44	n/a	1043.44 j	6	Grate
8	CB2-DMH1	1.06	12	Cir	4.000	1042.00	1042.10	2.499	1042.51	1042.53	n/a	1042.53 j	6	Grate
9	CB3-DMH2	0.45	12	Cir	17.000	1041.00	1041.20	1.176	1041.87	1041.48	n/a	1041.48	5	Grate
10	CB4-DMH3	0.96	12	Cir	23.000	1041.30	1041.60	1.304	1041.60	1042.01	0.16	1042.01	4	Grate
11	RD-DMH3	0.51	6	Cir	50.000	1041.30	1044.00	5.400	1041.50	1044.36	n/a	1044.36	4	None

Project File: System-1.stm | Number of lines: 11 | Run Date: 8/15/2023

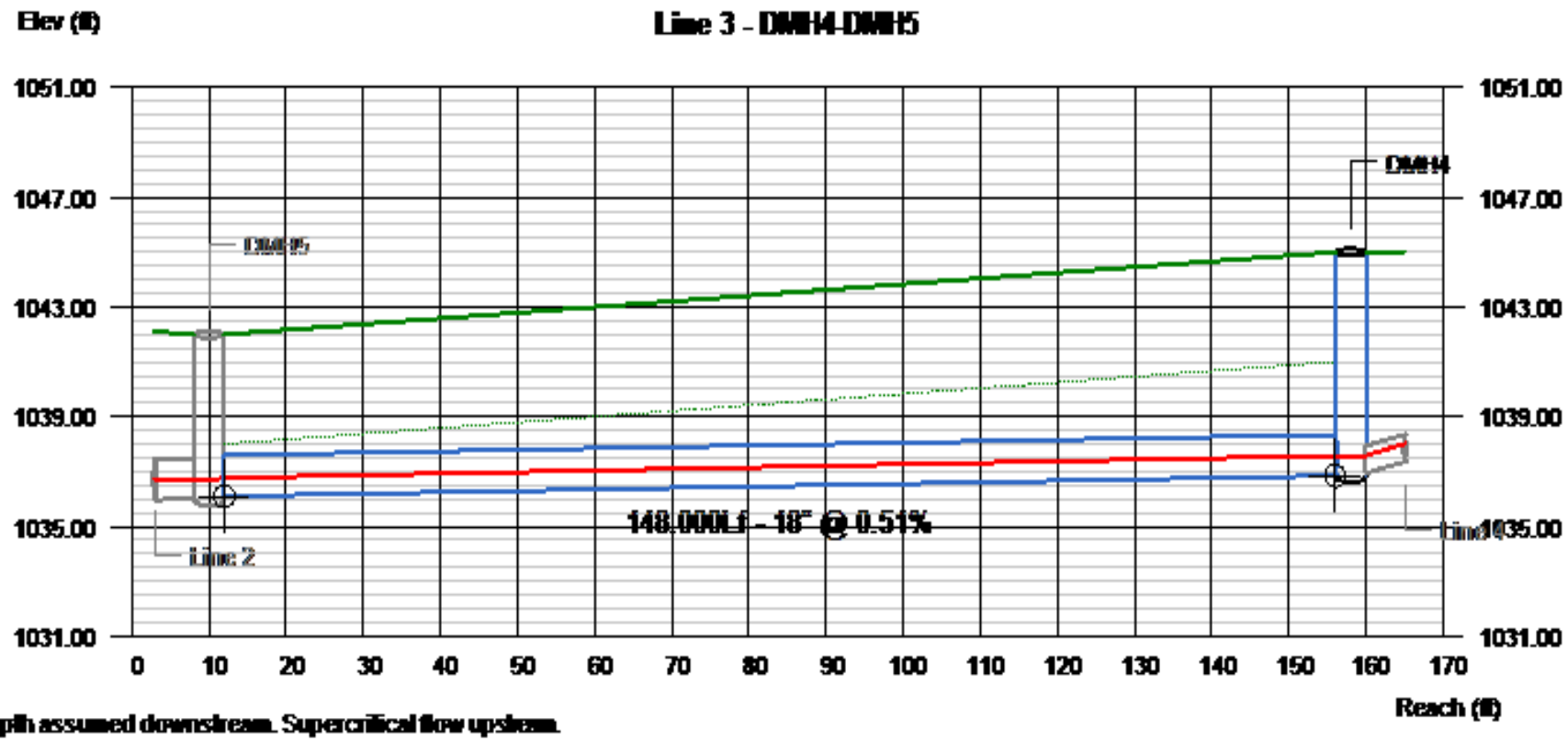
NOTES: Return period = 25 Yrs. ; j - Line contains hyd. jump.



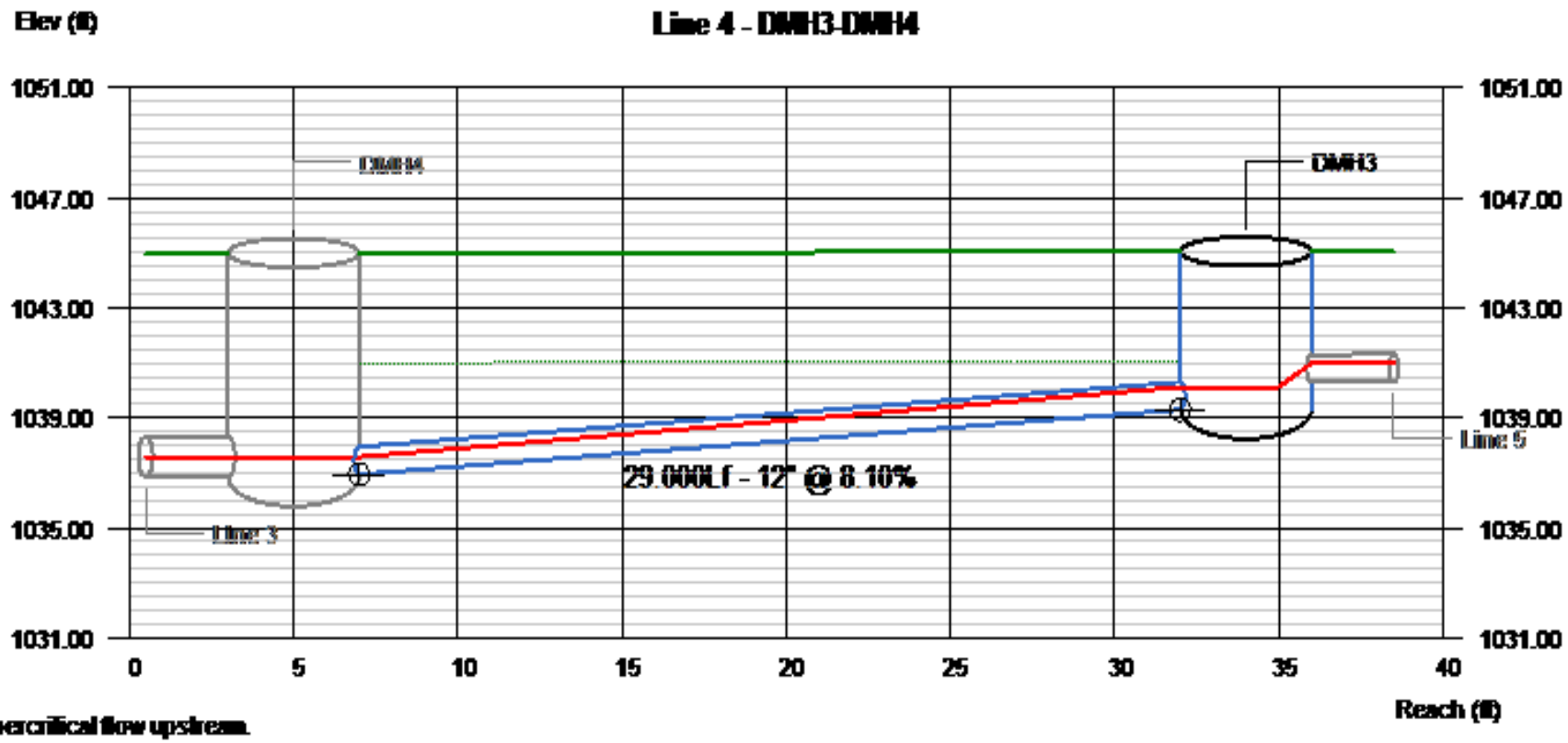
Starting HGL = Crown. Subcritical flow upstream.



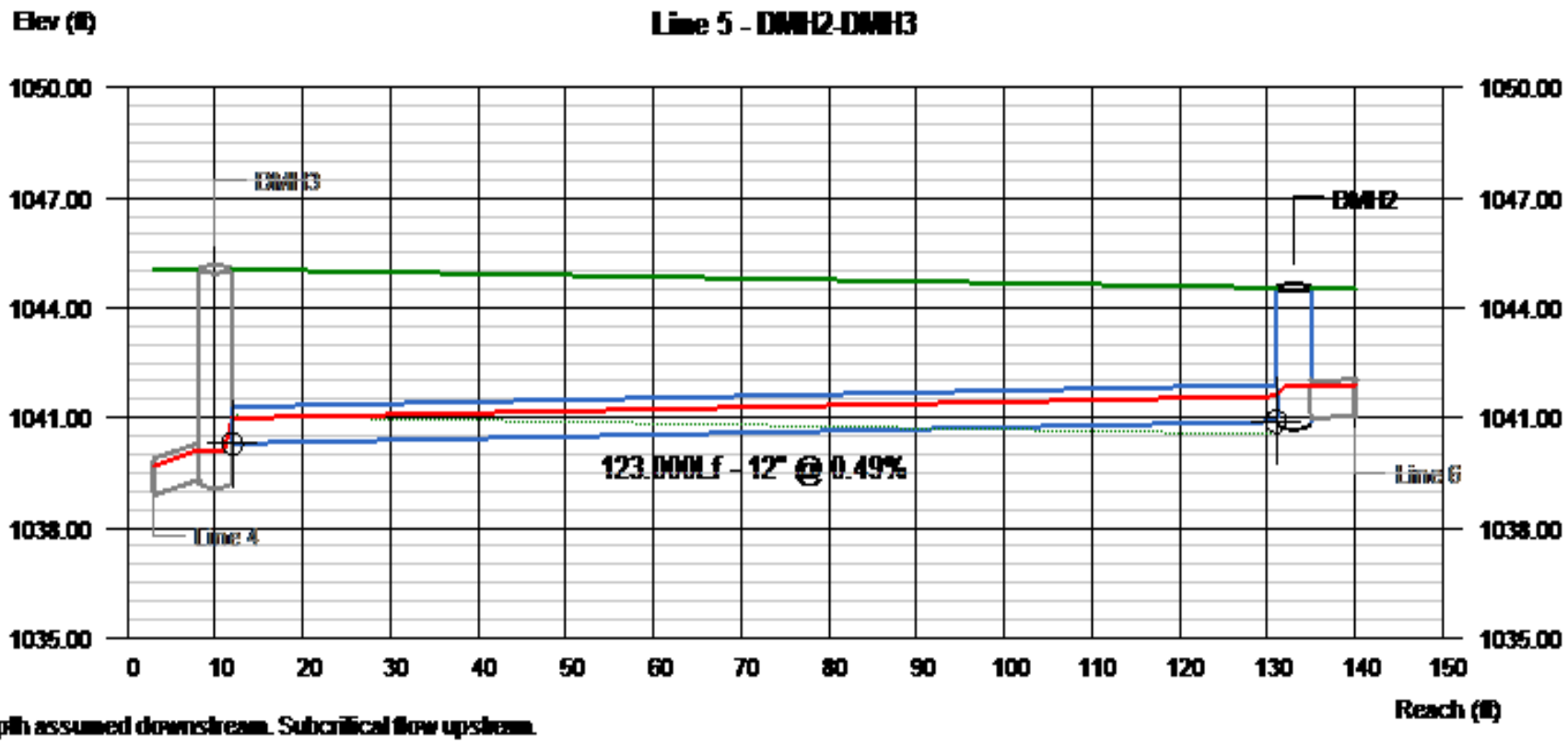
Supercritical flow upstream.



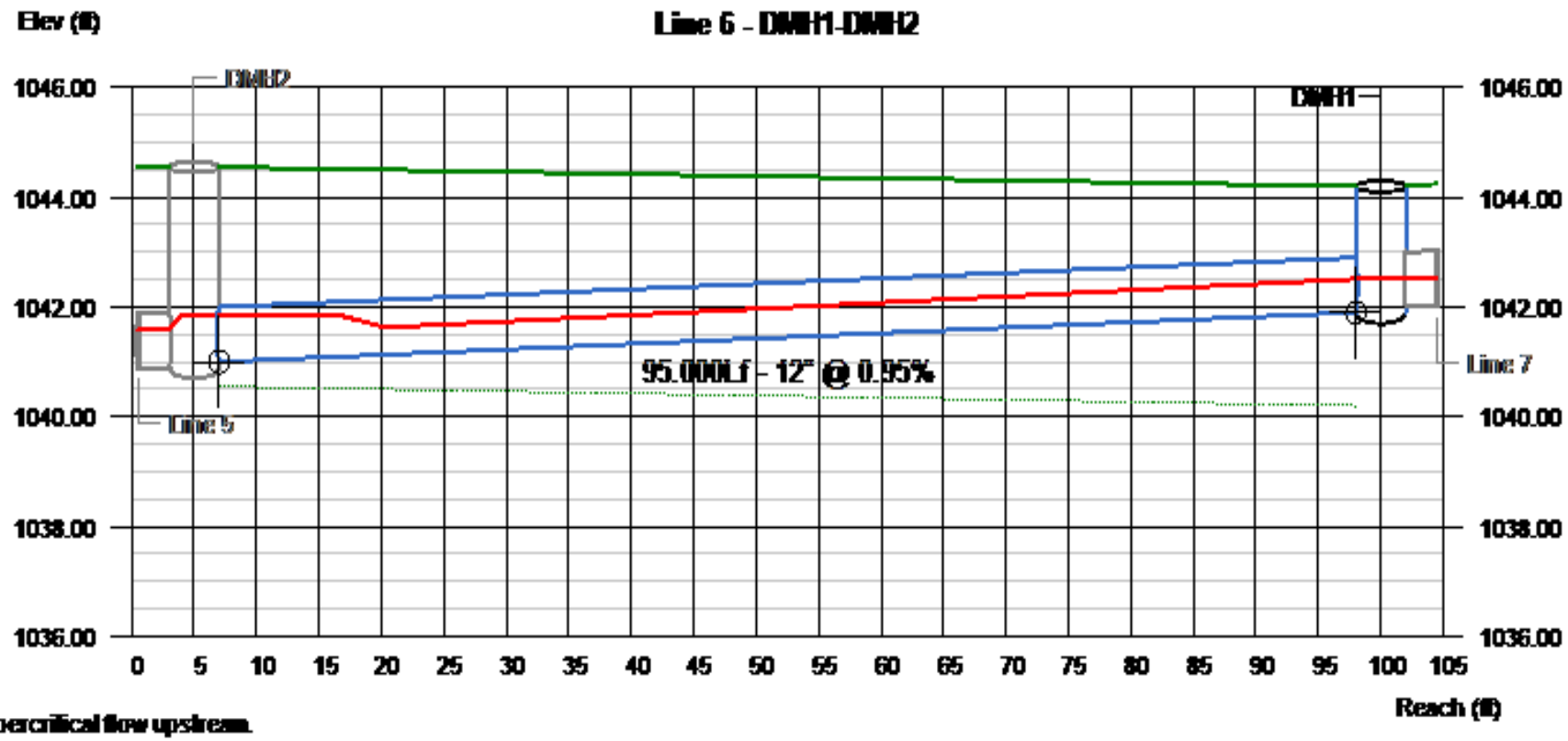
depth assumed downstream. Supercritical flow upstream.



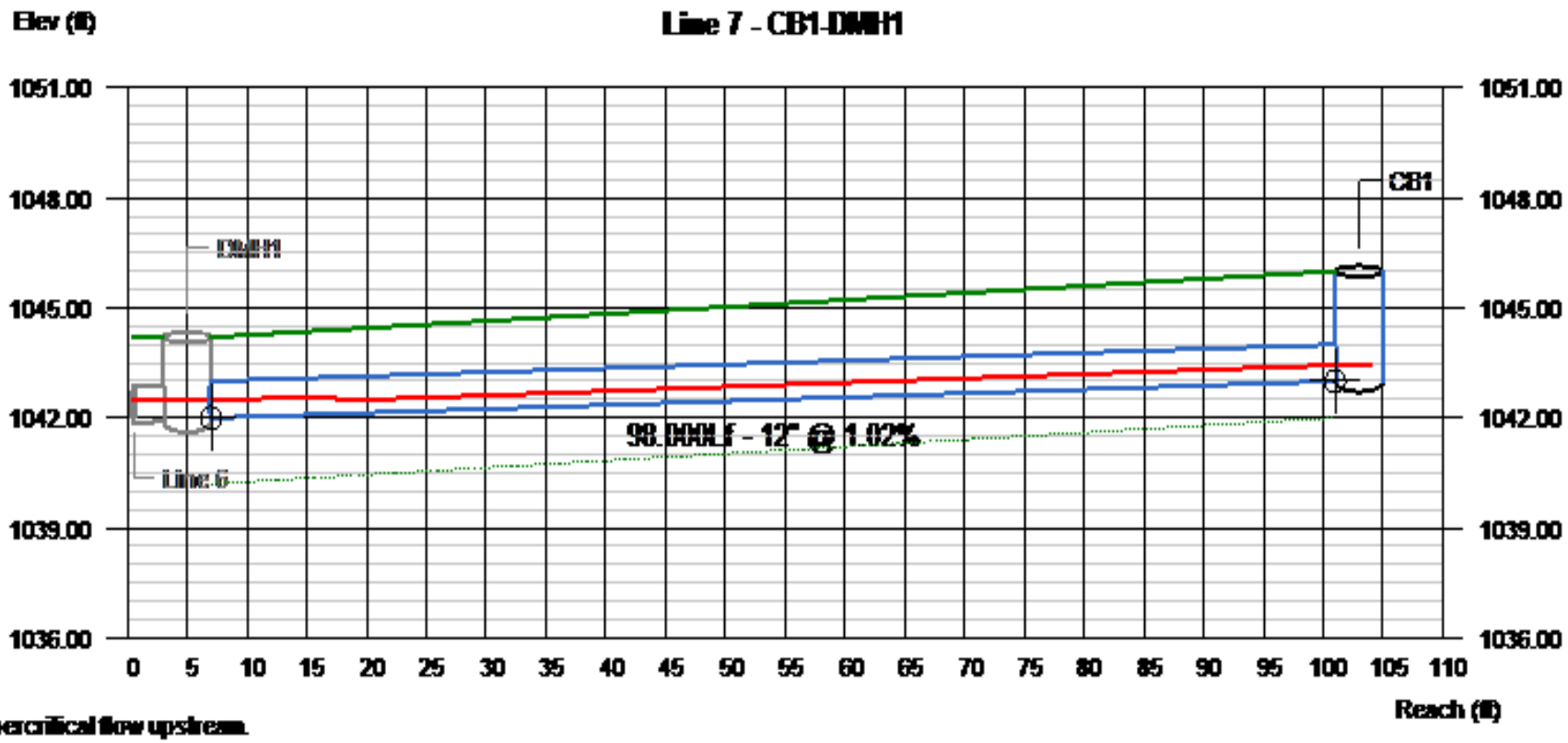
Supercritical flow upstream.



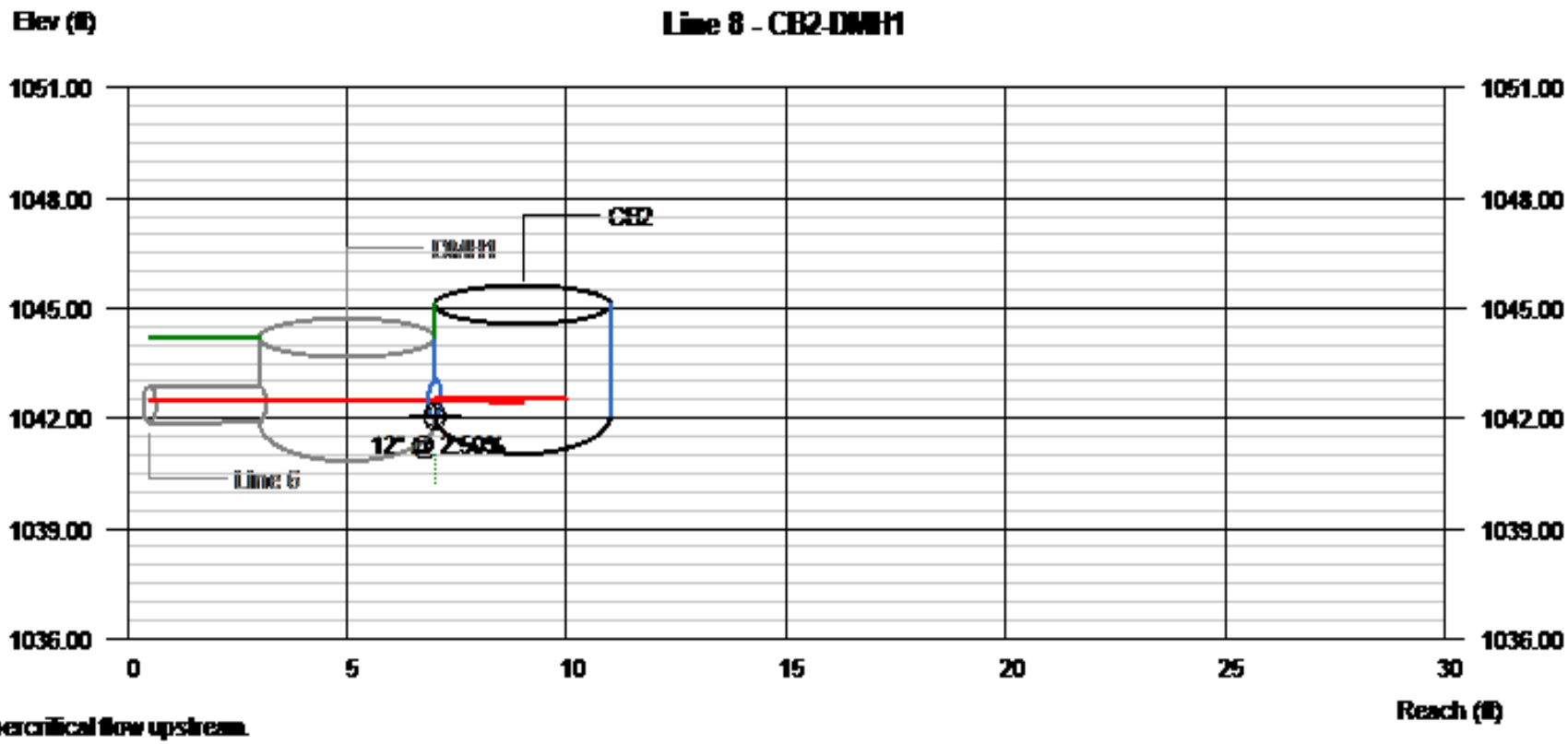
depth assumed downstream. Subcritical flow upstream.

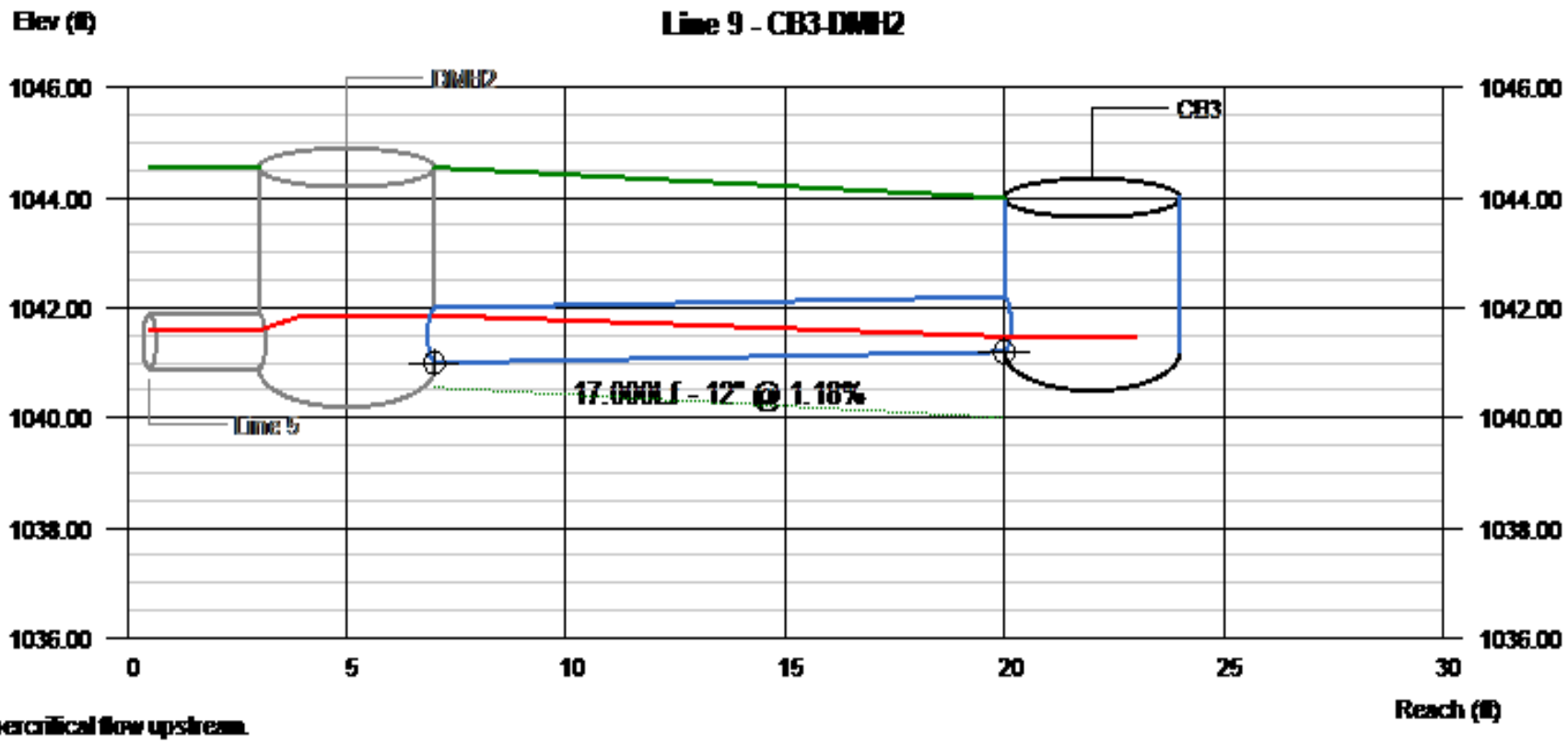


Supercritical flow upstream.

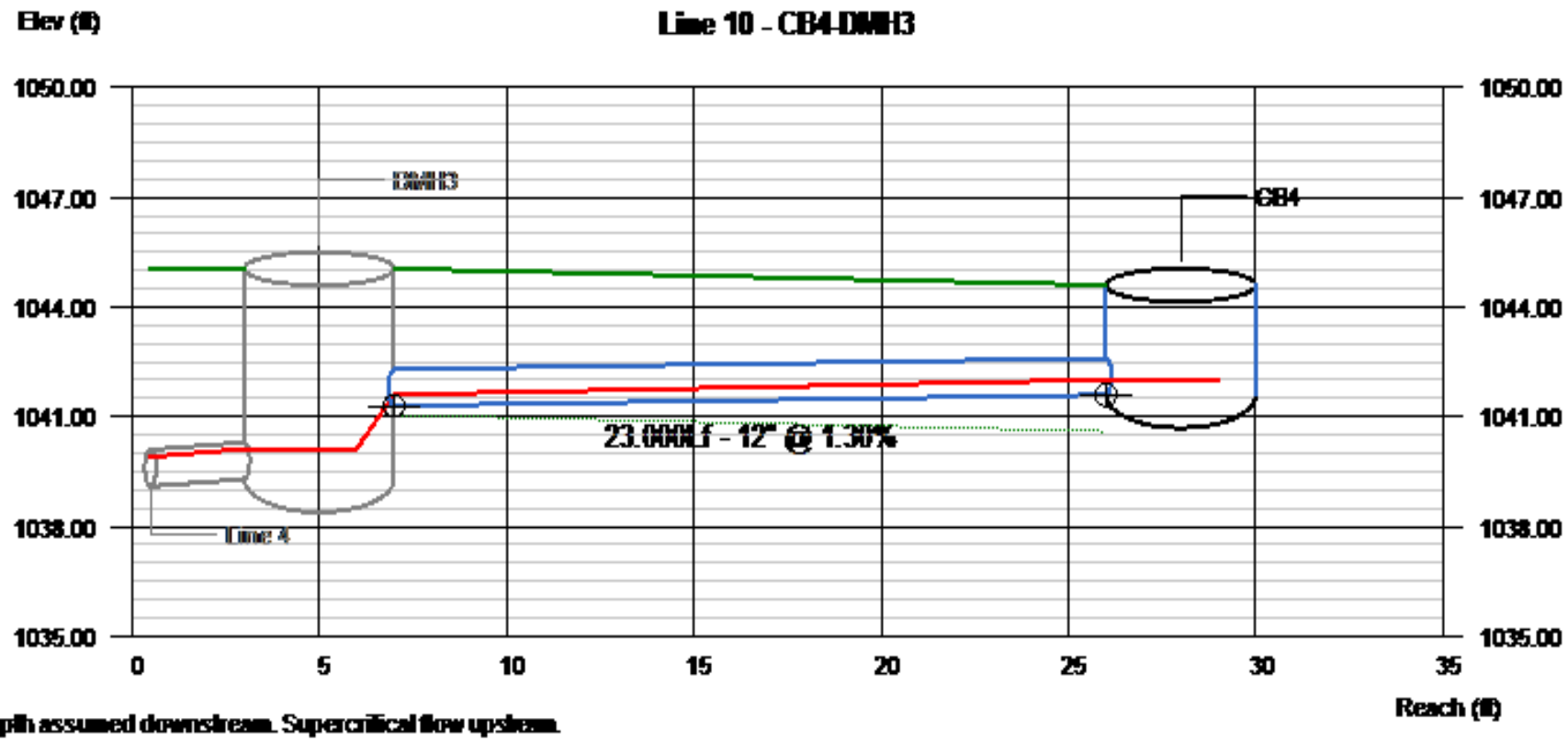


Supercritical flow upstream.

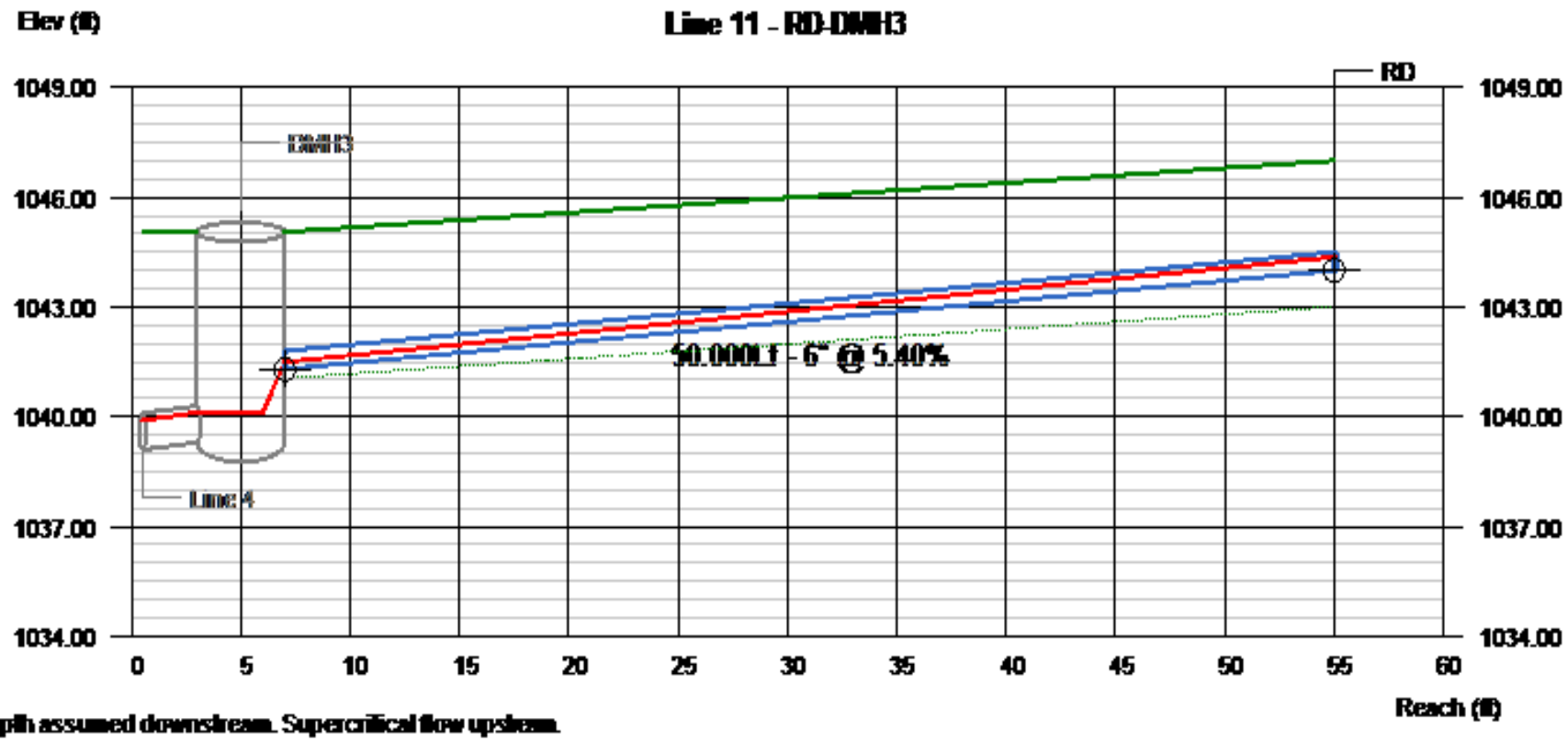

Elev (ft)
Line 8 - CB2-DMH1
1051.00
1048.00
1045.00
1042.00
1039.00
1036.00
0
5
10
15
20
25
30
Reach (ft)
CB2
DMH1
12" @ 2.50%
Line: 6
Supercritical flow upstream.



Supercritical flow upstream.



depth assumed downstream. Supercritical flow upstream.



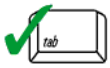
depth assumed downstream. Supercritical flow upstream.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

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 8[2]
- 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.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

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.

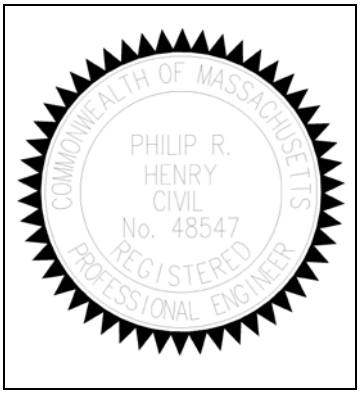
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the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



08/2023

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 Field[1]

☐ 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.

OPERATION AND MAINTENANCE PLAN

FOR A

COMMERCIAL DEVELOPMENT

1621 MAIN STREET
LEICESTER, MA 01524

PREPARED FOR:

HY VENTURES LEICESTER, LLC
313 BOSTON POST ROAD WEST
MARLBOROUGH, MA 01752

PREPARED BY:

CIVIL DESIGN GROUP, LLC
21 HIGH STREET, SUITE 207
NORTH ANDOVER, MA 01845

DATE: AUGUST 2023

TABLE OF CONTENTS

1.0 INTRODUCTION…….....2
2.0 LONG TERM POLLUTION PREVENTION PLAN (LTPPP)……..……...2
3.0 STORMWATER MANAGEMENT SYSTEM…….....3
4.0 SNOW MANAGEMENT AND DEICING CONTROL……...……...4
5.0 ILLICIT DISCHARGE STATEMENT……...…….....4

APPENDIX A – OPERATION AND MAINTENANCE REPORT FORM

APPENDIX B – HYDROWORKS OPERATION AND MAINTENANCE PLAN

FIGURE 1 – BMP LOCATION PLAN

p: 978-794-5400 f: 978.965.3971 www.cdgengineering.com

OPERATION AND MAINTENANCE PLAN

1.0 INTRODUCTION

In accordance with the standards set forth by the Massachusetts Department of Environmental Protection (MADEP) Stormwater Management Policy, Civil Design Group, LLC has prepared the following Operations and Maintenance (O&M) Plan for a proposed convenience store and gas station located at the site below.

PROPERTY INFORMATION

PROPERTY ADDRESS	LANDOWNER & STORMWATER MANAGEMENT SYSTEM OWNER
1621 MAIN STREET LEICESTER, MA 01524	Owner: HY VENTURES LEICESTER, LLC
	Contact: TBD
	Phone: TBD
	Email: TBD

The landowner shall be responsible for the long-term operation and maintenance of the site and the stormwater management system and shall be responsible for record keeping of inspections, maintenance and repairs. If the site owner changes, the new site owner shall assume all responsibilities outlined in this O&M plan. The site owner shall hire a qualified professional to conduct scheduled inspections and maintain records in accordance with the inspection schedule outline enclosed within this document.

Site Engineer: Civil Design Group, LLC
Address: 21 High Street, Suite 207, North Andover, MA 01845
Office Phone: 978-794-5400
Contact: Philip R. Henry, P.E.

2.0 LONG TERM POLLUTION PREVENTION PLAN (LTPPP)

In accordance with Standard #4 from the MADEP Stormwater Management Policy, the following LTPPP has been prepared as part of this O&M Plan. The purpose of the LTPPP is to identify potential pollutant sources in stormwater discharges and implement prevention measures prior to affecting downstream resource areas.

Housekeeping:
The site shall be kept in a clean and working order. Substances and materials to be used on site that consistent with the nature of business shall be protected from the elements by storing indoors or in containers with appropriate lids. Proper disposal and care shall be followed when disposing of empty containers.

Solid Waste:
Solid waste materials shall be stored in the dumpsters provided on site. The dumpster enclosure shall be kept closed when not in use and the trash shall not be left outside of the enclosure. The owner shall contract with a waste management company to properly dispose of waste material. The dumpsters shall be emptied on a regular basis.

Pet Waste Management:
Pet waste is not anticipated based on the proposed use of the site.

p: 978-794-5400 f: 978.965.3971 www.cdgengineering.com

Petroleum Products:
Petroleum products shall be stored in sealed containers and clearly labeled. Petroleum storage tanks shall be located a minimum of 100 linear feet from wetland resource areas, drainage ways, inlets and surface waters unless stored within a building. Petroleum storage tanks shall be equipped with a secondary means of containment designed to provide a containment volume that is equal to 110% of the volume of the largest tank unless otherwise required. Drip pans or other form of containment shall be provided for all dispensers. Any asphalt substances used onsite will be applied according to the manufacturer's recommendations.

Fertilizers, Herbicides and Pesticides:
Fertilizers, herbicides and pesticides shall be used in the minimum amounts recommended by the manufacturer and applied to limit contact with stormwater. These products shall be stored in containers indoors.

Paints and Cleaning Solvents:
Paints and containers shall be properly stored in their original containers. Disposal of these products and their containers shall be in accordance with the manufacturer's recommendations.

Spill Prevention and Response:
In the event of a spill of a hazardous substance the following response action items shall be followed in order to prevent or minimize discharge to the stormwater management system.

1. Spills shall be immediately addressed.
2. Spills of hazardous substances shall be remediated using the manufacturers' protocol for cleanup.
3. Vehicular and fuel spills shall be remediated in accordance to local and state regulations.
4. The following equipment and materials shall be present on site and shall be clearly identifiable:
    a. Absorbent materials, brooms, dust pans, mops, rags, gloves, goggles, trash containers, etc.
5. Spills that are toxic or hazardous in nature shall be reported to the MA DEP and professional emergency contractor.
6. The owner shall designate individuals who will receive spill prevention and response training. These individuals will each become responsible for a particular phase of prevention and response. The names of these personnel shall be posted in the material storage area and in the management office.

3.0 STORMWATER MANAGEMENT SYSTEM

The components of the stormwater management system shall be inspected, monitored and maintained in accordance with the following to ensure that the on-site stormwater management/BMP facilities for the project function as intended. Routine inspection and proper maintenance of these individual components is essential to providing the long-term enhancement of both the quality and quantity of the runoff from the site.

The proposed stormwater management Best Management Practices (BMP's) have been designed to collect and convey runoff from developed areas in accordance with the Massachusetts DEP's Stormwater Management Policy. Using the rational method to determine peak runoff flows, the onsite drainage system is designed for the 25-year storm event. The drainage system consists of one (1) hydrodynamic separator, four (4) catch basins and associated piping and manholes. The drainage system discharges into a previously approved offsite infiltration basin that will be expanded to accommodate the additional flow. A drainage easement will need to be memorialized to allow for the conveyance, discharge and maintenance of the piping, hydrodynamic separator and basin.

p: 978-794-5400 f: 978.965.3971 www.cdgengineering.com

Street Sweeping
Sweeping shall be performed twice a year, once in the spring and once in the fall, within the parking lot and driveway areas to reduce the amount of sediment and trash entering the catch basins.

Deep Sump Hooded Catch Basins
Stormwater runoff from proposed pavement areas is directed via curbing and site grading to catch basins with deep sumps and hooded outlets and trench drains. These structures are designed to trap and remove sediment and larger particles from the stormwater and improve the performance of subsequent BMP's. The catch basin sumps are a minimum of 4' in depth and a routine inspection and cleaning schedule shall be followed to ensure optimal effectiveness.

Inspection Frequency:	Quarterly
Inspection Tools:	Manhole hook; survey rod; sludge judge
Items to Inspect:	Measure sediment in sump using survey rod; visually check for floating debris or trash; visually check for oil and if more than a sheen is present, use sludge judge to measure thickness of layer; visually ensure that hood is in place; visually ensure that grate is in good condition; visually ensure that outlet pipe is unobstructed
Maintenance Threshold(s):	Annually or ≥24" sediment in sump (whichever comes first); discernible layer of oil/hydrocarbons on surface; floating trash
Maintenance Equipment:	Vactor or clamshell for sediment removal; vactor and/or oil sorbent pads for oil/hydrocarbon removal; net for floating debris or trash removal

Hydrodynamic Separator
Hydrodynamic Separators are designed to remove heavy particles, floating debris and hydrocarbons from stormwater. Stormwater enters the system where floatables and oils are separated prior to the clarified stormwater runoff discharging to an outlet pipe. See the attached product description sheets for additional information, including maintenance recommendations.

- Inspection Frequency: Quarterly
- Cleaning Threshold(s): Per manufacturer's recommendations
- Equipment: Vactor

4.0 SNOW MANAGEMENT AND DEICING CONTROL

The Owner shall contract with a company to properly clear and remove snow. The contractor shall be responsible for maintaining all roads, driveways, parking lots, sidewalks and pedestrian access onsite as well as along the right-of-way frontage. Snow shall be piled in the designated areas snow storage areas to the extent practicable. Snow shall be removed from the site if the capacity of the designated areas is reached, and disposed of in accordance with applicable regulations and requirements.

Deicing chemicals shall be kept indoors in a safe location and shall be clearly labeled. Deicing solutions such as calcium chloride, rock salt and/or sand may be used unless otherwise restricted by the municipality. Deicing methods shall be used in conjunction with snow removal to maintain safe pedestrian and vehicular access.

p: 978-794-5400 f: 978.965.3971 www.cdgengineering.com

5.0 ILLICIT DISCHARGE STATEMENT

The stormwater management system is *not* intended to convey any illicit discharges and or pollutants and as such, control measures that are identified within this report shall be strictly adhered to in order to minimize the risk of contamination. Any unknown existing illicit discharges that are discovered as part of the redevelopment of the subject site shall be eliminated in accordance with local, state and federal regulations.

p: 978-794-5400 f: 978.965.3971 www.cdgengineering.com

ILLICIT DISCHARGE STATEMENT

FOR A

COMMERCIAL DEVELOPMENT

1621 MAIN STREET
LEICESTER, MASSACHUSETTS

DATE: AUGUST 2023

Illicit discharges to the stormwater management system are discharges not entirely comprised of stormwater. There are no known illicit discharges currently at the site nor are any illicit discharges proposed as part of the project. The stormwater management system is *not* intended to convey any illicit discharges and or pollutants. Any unknown existing illicit discharges that are discovered as part of the development of the subject site shall be eliminated in accordance with local, state and federal regulations.

Signature

Hussein Yatim/Principal

Name/Title

8/16/2023

Date

APPENDIX-A

OPERATION AND MAINTENANCE REPORT FORM

STORMWATER DIVISION
OF CIVIL DESIGN GROUP, LLC

21 High Street, Suite 207
North Andover, MA 01845
Tel 978.794.5400
www.cdgengineering.com

QUARTERLY STORMWATER INSPECTION REPORT

Site:	Commercial Development	**Date:**	
Address:	1621 Main Street, Leicester, MA	**Time:**	
Inspector:		**Weather:**	

CATCH BASIN, YARD DRAIN, TRENCH DRAINS (QUARTERLY)

Unit #	Sediment (inches)	Oil (inches)	Hood/ Pipes	Grate	Last Cleaned	Attention Recommended
CB-1						
CB-2						
CB-3						
CB-4						

PROPRIETARY SEPARATORS (QUARTERLY)

Unit #	Sediment (inches)	Oil (inches)	Trash	Cover	Last Cleaned	Attention Recommended
DMH-6 (HS4)						

Unit #	Sediment (inches)	Oil (inches)	Trash	Cover	Last Cleaned	Attention Recommended

Hydroworks® HydroStorm

Operations & Maintenance Manual

Version 1.0

Please call Hydroworks at 888-290-7900 or email us at support@hydroworks.com if you have any questions regarding the Inspection Checklist. Please fax a copy of the completed checklist to Hydroworks at 888-783-7271 for our records.

Introduction

The HydroStorm is a state of the art hydrodynamic separator. Hydrodynamic separators remove solids, debris and lighter than water (oil, trash, floating debris) pollutants from stormwater. Hydrodynamic separators and other water quality measures are mandated by regulatory agencies (Town/City, State, Federal Government) to protect storm water quality from pollution generated by urban development (traffic, people) as part of new development permitting requirements.

As storm water treatment structures fill up with pollutants they become less and less effective in removing new pollution. Therefore, it is important that storm water treatment structures be maintained on a regular basis to ensure that they are operating at optimum performance. The HydroStorm is no different in this regard and this manual has been assembled to provide the owner/operator with the necessary information to inspect and coordinate maintenance of their HydroStorm.

Hydroworks® HydroStorm Operation

The Hydroworks HydroStorm (HS) separator is a unique hydrodynamic by-pass separator. It incorporates a protected submerged pretreatment zone to collect larger solids, a treatment tank to remove finer solids, and a dual set of weirs to create a high flow bypass. High flows are conveyed directly to the outlet and do not enter the treatment area, however, the submerged pretreatment area still allows removal of coarse solids during high flows.

Under normal or low flows, water enters an inlet area with a horizontal grate. The area underneath the grate is submerged with openings to the main treatment area of the separator. Coarse solids fall through the grate and are either trapped in the pretreatment area or conveyed into the main treatment area depending on the flow rate. Fines are transported into the main treatment area. Openings and weirs in the pretreatment area allow entry of water and solids into the main treatment area and cause water to rotate in the main treatment area creating a vortex motion. Water in the main treatment area is forced to rise along the walls of the separator to discharge from the treatment area to the downstream pipe.

The vortex motion forces solids and floatables to the middle of the inner chamber. Floatables are trapped since the inlet to the treatment area is submerged. The design maximizes the retention of settled solids since solids are forced to the center of the inner chamber by the vortex motion of water while water must flow up the walls of the separator to discharge into the downstream pipe.

A set of high flow weirs near the outlet pipe create a high flow bypass over both the pretreatment area and main treatment chamber. The rate of flow into the treatment area is regulated by the number and size of openings into the treatment chamber and the height of by-pass weirs. High flows flow over the weirs directly to the outlet pipe preventing the scour and resuspension of any fines collected in the treatment chamber.

A central access tube is located in the structure to provide access for cleaning. The arrangement of the inlet area and bypass weirs near the outlet pipe facilitate the use of multiple inlet pipes.

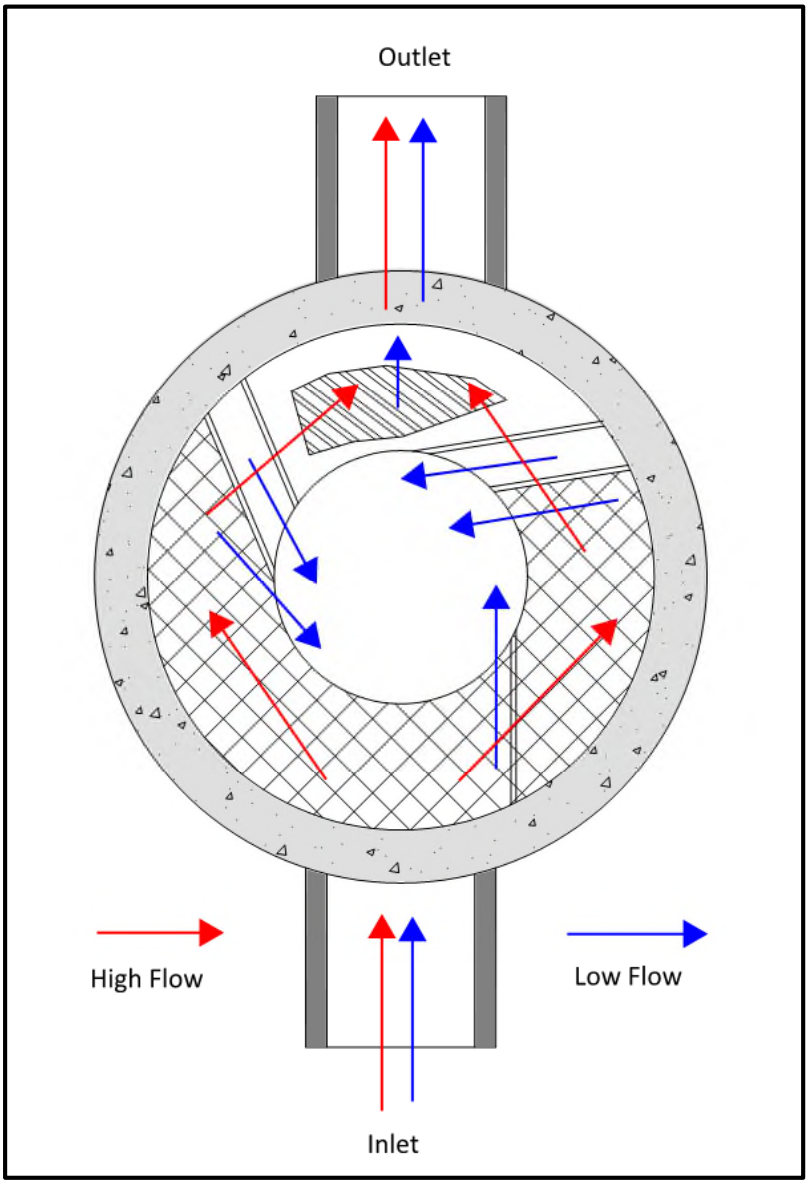


Figure 1. Hydroworks HydroStorm Operation – Plan View

Figure 2 is a profile view of the HydroStorm separator showing the flow patterns for low and high flows.

Hydroworks

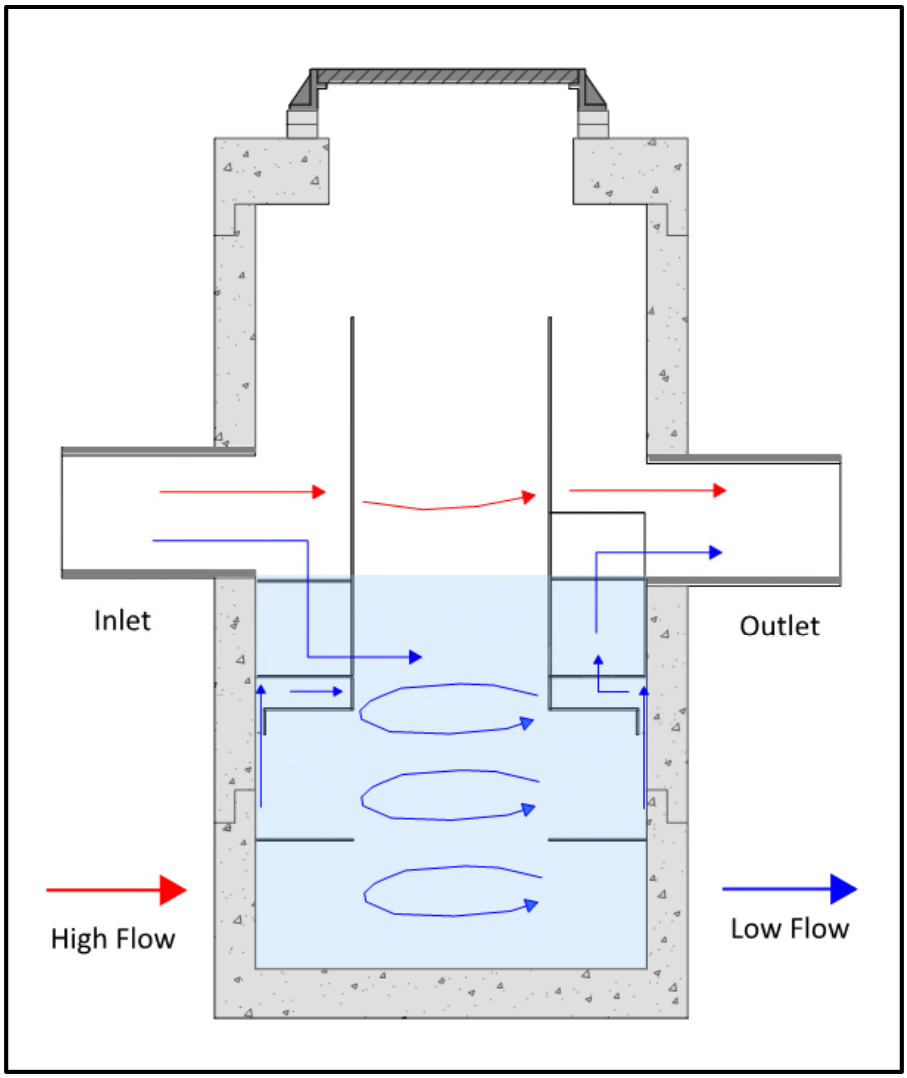


Figure 2. Hydroworks HydroStorm Operation – Profile View

The HS 4i is an inlet version of the HS 4 separator. There is a catch-basin grate on top of the HS 4i. A funnel sits sits underneath the grate on the frame and directs the water to the inlet side of the separator to ensure all lows flows are properly treated. The whole funnel is removed for inspection and cleaning.

Hydroworks

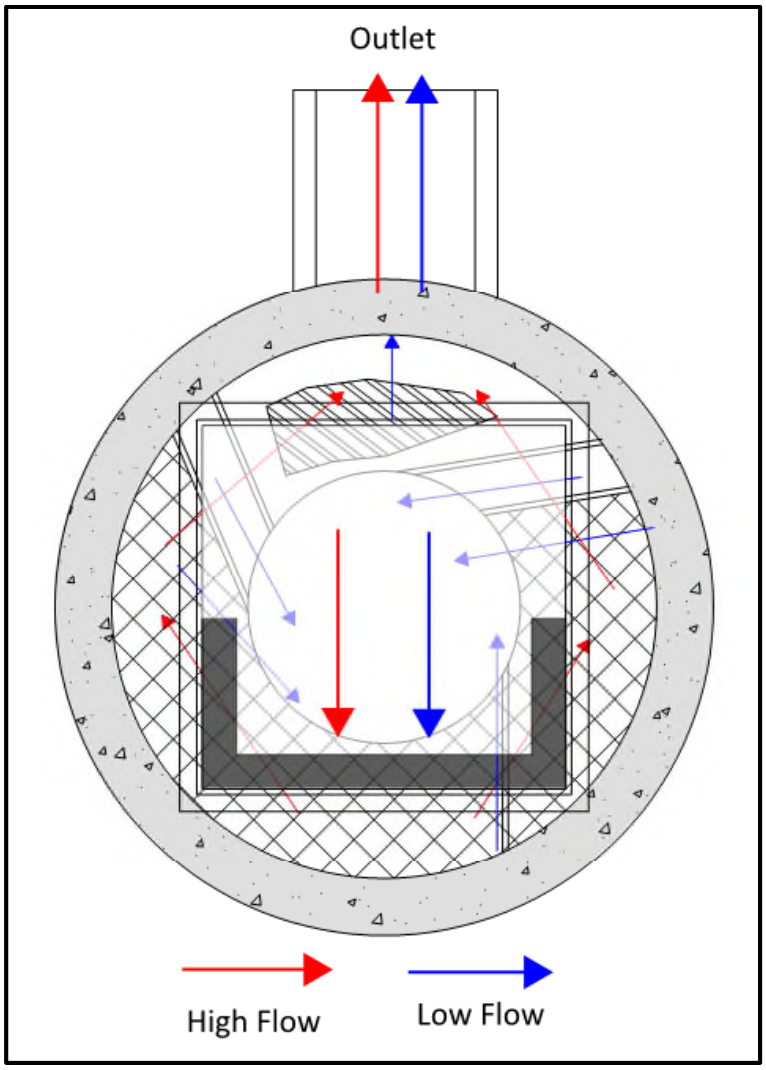


Figure 3. Hydroworks HS 4i Funnel

Inspection

Procedure

Floatables

A visual inspection can be conducted for floatables by removing the covers and looking down into the center access tube of the separator. Separators with an inlet grate (HS 4i or custom separator) will have a plastic funnel located under the grate that must be removed from the frame prior to inspection or maintenance. If you are missing a funnel please contact Hydroworks at the numbers provided at the end of this document.

Hydroworks

TSS/Sediment

Inspection for TSS build-up can be conducted using a Sludge Judge®, Core Pro®, AccuSludge® or equivalent sampling device that allows the measurement of the depth of TSS/sediment in the unit. These devices typically have a ball valve at the bottom of the tube that allows water and TSS to flow into the tube when lowering the tube into the unit. Once the unit touches the bottom of the device, it is quickly pulled upward such that the water and TSS in the tube forces the ball valve closed allowing the user to see a full core of water/TSS in the unit. The unit should be inspected for TSS through each of the access covers. Several readings (2 or 3) should be made at each access cover to ensure that an accurate TSS depth measurement is recorded.

Frequency

Construction Period

The HydroStorm separator should be inspected every four weeks and after every large storm (over 0.5" (12.5 mm) of rain) during the construction period.

Post-Construction Period

The Hydroworks HydroStorm separator should be inspected during the first year of operation for normal stabilized sites (grassed or paved areas). If the unit is subject to oil spills or runoff from unstabilized (storage piles, exposed soils) areas the HydroStorm separator should be inspected more frequently (4 times per year). The initial annual inspection will indicate the required future frequency of inspection and maintenance if the unit was maintained after the construction period.

Reporting

Reports should be prepared as part of each inspection and include the following information:

1. Date of inspection
2. GPS coordinates of Hydroworks unit
3. Time since last rainfall
4. Date of last inspection
5. Installation deficiencies (missing parts, incorrect installation of parts)
6. Structural deficiencies (concrete cracks, broken parts)
7. Operational deficiencies (leaks, blockages)
8. Presence of oil sheen or depth of oil layer
9. Estimate of depth/volume of floatables (trash, leaves) captured
10. Sediment depth measured
11. Recommendations for any repairs and/or maintenance for the unit
12. Estimation of time before maintenance is required if not required at time of inspection

A sample inspection checklist is provided at the end of this manual.

Maintenance

Procedure

The Hydroworks HydroStorm unit is typically maintained using a vacuum truck. There are numerous companies that can maintain the HydroStorm separator. Maintenance with a vacuum truck involves removing all of the water and sediment together. The water is then separated from the sediment on the truck or at the disposal facility.

A central access opening (24" or greater) is provided to the gain access to the lower treatment tank of the unit. This is the primary location to maintain by vacuum truck. The pretreatment area can also be vacuumed and/or flushed into the lower treatment tank of the separator for cleaning via the central access once the water level is lowered below the pretreatment floor.

In instances where a vacuum truck is not available other maintenance methods (i.e. clamshell bucket) can be used, but they will be less effective. If a clamshell bucket is used the water must be decanted prior to cleaning since the sediment is under water and typically fine in nature. Disposal of the water will depend on local requirements. Disposal options for the decanted water may include:

1. Discharge into a nearby sanitary sewer manhole
2. Discharge into a nearby LID practice (grassed swale, bioretention)
3. Discharge through a filter bag into a downstream storm drain connection

The local municipality should be consulted for the allowable disposal options for both water and sediments prior to any maintenance operation. Once the water is decanted the sediment can be removed with the clamshell bucket.

Disposal of the contents of the separator depend on local requirements. Maintenance of a Hydroworks HydroStorm unit will typically take 1 to 2 hours based on a vacuum truck and longer for other cleaning methods (i.e. clamshell bucket).

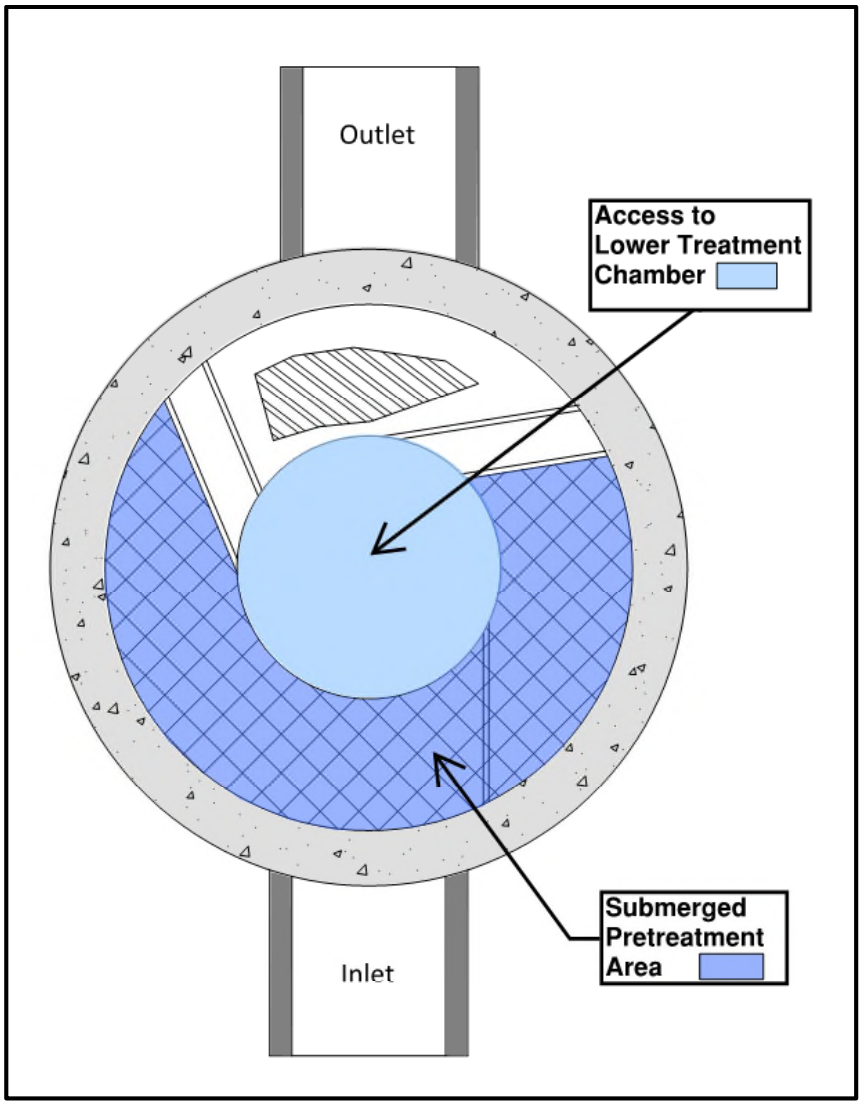


Figure 3. Maintenance Access

Frequency

Construction Period

A HydroStorm separator can fill with construction sediment quickly during the construction period. The HydroStorm must be maintained during the construction period when the depth of TSS/sediment reaches 24" (600 mm). It must also be maintained during the construction period if there is an appreciable depth of oil in the unit (more than a sheen) or if floatables other than oil cover over 50% of the area of the separator

The HydroStorm separator should be maintained at the end of the construction period, prior to operation for the post-construction period.

Hydroworks

Post-Construction Period

The HydroStorm was independently tested by Alden Research Laboratory in 2017. A HydroStorm HS 4 was tested for scour with a 50% sediment depth of 0.5 ft. Therefore, maintenance for sediment accumulation is required if the depth of sediment is 1 ft or greater in separators with standard water (sump) depths (Table 1).

There will be designs with increased sediment storage based on specifications or site-specific criteria. A measurement of the total water depth in the separator through the central access tube should be taken and compared to water depth given in Table 1. The standard water depth from Table 1 should be subtracted from the measured water depth and the resulting extra depth should be added to the 1 ft to determine the site-specific sediment maintenance depth for that separator.

For example, if the measured water depth in the HS-7 is 7 feet, then the sediment maintenance depth for that HS-7 is 2 ft (= 1 + 7 – 6) and the separator does not need to be cleaned for sediment accumulation until the measure sediment depth is 2 ft.

The HydroStorm separator must also be maintained if there is an appreciable depth of oil in the unit (more than a sheen) or if floatables other than oil cover over 50% of the water surface of the separator.

Table 1 Standard Dimensions for Hydroworks HydroStorm Models

Model	Diameter (ft)	Total Water Depth (ft)	Sediment Maintenance Depth for Table 1 Total Water Depth(ft)
HS-3	3	3	1
HS-4	4	4	1
HS-5	5	4	1
HS-6	6	4	1
HS-7	7	6	1
HS-8	8	7	1
HS-9	9	7.5	1
HS-10	10	8	1
HS-11	11	9	1
HS-12	12	9.5	1

HYDROSTORM INSPECTION SHEET

Date _____
Date of Last Inspection _____

Site _____
City _____
State _____
Owner _____

GPS Coordinates _____

Date of last rainfall _____

Site Characteristics	**Yes**	**No**
Soil erosion evident	☐	☐
Exposed material storage on site	☐	☐
Large exposure to leaf litter (lots of trees)	☐	☐
High traffic (vehicle) area	☐	☐

HydroStorm	**Yes**	**No**
Obstructions in the inlet or outlet	☐ *	☐
Missing internal components	☐ **	☐
Improperly installed inlet or outlet pipes	☐ ***	☐
Internal component damage (cracked, broken, loose pieces)	☐ **	☐
Floating debris in the separator (oil, leaves, trash)	☐	☐
Large debris visible in the separator	☐ *	☐
Concrete cracks/deficiencies	☐ ***	☐
Exposed rebar	☐ **	☐
Water seepage (water level not at outlet pipe invert)	☐ ***	☐

Water level depth below outlet pipe invert _____“

Routine Measurements

Floating debris depth	**< 0.5” (13mm)**	☐	**>0.5” 13mm)**	☐ *
Floating debris coverage	**< 50% of surface area**	☐	**> 50% surface area**	☐ *
Sludge depth	**< 12” (300mm)**	☐	**> 12” (300mm)**	☐ ****

* Maintenance required
** Repairs required
*** Further investigation is required

Hydroworks

Other Comments:

Hydroworks

Hydroworks® HydroStorm

One Year Limited Warranty

Hydroworks, LLC warrants, to the purchaser and subsequent owner(s) during the warranty period subject to the terms and conditions hereof, the Hydroworks HydroStorm to be free from defects in material and workmanship under normal use and service, when properly installed, used, inspected and maintained in accordance with Hydroworks written instructions, for the period of the warranty. The standard warranty period is 1 year.

The warranty period begins once the separator has been manufactured and is available for delivery. Any components determined to be defective, either by failure or by inspection, in material and workmanship will be repaired, replaced or remanufactured at Hydroworks' option provided, however, that by doing so Hydroworks, LLC will not be obligated to replace an entire insert or concrete section, or the complete unit. This warranty does not cover shipping charges, damages, labor, any costs incurred to obtain access to the unit, any costs to repair/replace any surface treatment/cover after repair/replacement, or other charges that may occur due to product failure, repair or replacement.

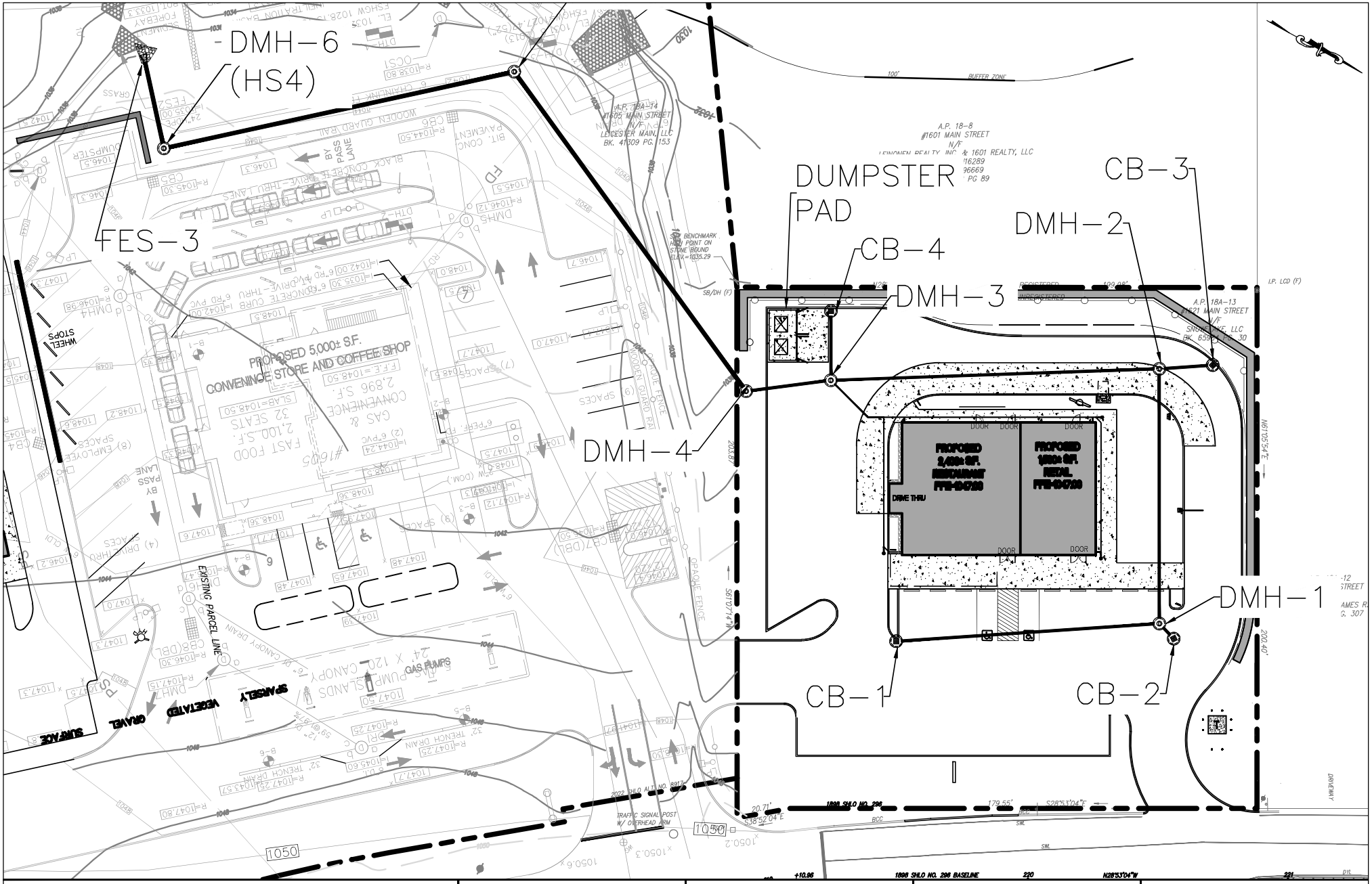
This warranty does not apply to any material that has been disassembled or modified without prior approval of Hydroworks, LLC, that has been subjected to misuse, misapplication, neglect, alteration, accident or act of God, or that has not been installed, inspected, operated or maintained in accordance with Hydroworks, LLC instructions and is in lieu of all other warranties expressed or implied. Hydroworks, LLC does not authorize any representative or other person to expand or otherwise modify this limited warranty.

The owner shall provide Hydroworks, LLC with written notice of any alleged defect in material or workmanship including a detailed description of the alleged defect upon discovery of the defect. Hydroworks, LLC should be contacted at 136 Central Ave., Clark, NJ 07066 or any other address as supplied by Hydroworks, LLC. (888-290-7900).

This limited warranty is exclusive. There are no other warranties, express or implied, or merchantability or fitness for a particular purpose and none shall be created whether under the uniform commercial code, custom or usage in the industry or the course of dealings between the parties. Hydroworks, LLC will replace any goods that are defective under this warranty as the sole and exclusive remedy for breach of this warranty.

Subject to the foregoing, all conditions, warranties, terms, undertakings or liabilities (including liability as to negligence), expressed or implied, and howsoever arising, as to the condition, suitability, fitness, safety, or title to the Hydroworks HydroStorm are hereby negated and excluded and Hydroworks, LLC gives and makes no such representation, warranty or undertaking except as expressly set forth herein. Under no circumstances shall Hydroworks, LLC be liable to the Purchaser or to any third party for product liability claims; claims arising from the design, shipment, or installation of the HydroStorm, or the cost of other goods or services related to the purchase and installation of the HydroStorm. For this Limited Warranty to apply, the HydroStorm must be installed in accordance with all site conditions required by state and local codes; all other applicable laws; and Hydroworks' written installation instructions.

Hydroworks, LLC expressly disclaims liability for special, consequential or incidental damages (even if it has been advised of the possibility of the same) or breach of expressed or implied warranty. Hydroworks, LLC shall not be liable for penalties or liquidated damages, including loss of production and profits; labor and materials; overhead costs; or other loss or expense incurred by the purchaser or any third party. Specifically excluded from limited warranty coverage are damages to the HydroStorm arising from ordinary wear and tear; alteration, accident, misuse, abuse or neglect; improper maintenance, failure of the product due to improper installation of the concrete sections or improper sizing; or any other event not caused by Hydroworks, LLC. This limited warranty represents Hydroworks' sole liability to the purchaser for claims related to the HydroStorm, whether the claim is based upon contract, tort, or other legal basis.



50 0 25 50 100

GRAPHIC SCALE IN FEET

CLIENT:

HY VENTURES LEICESTER, LLC

313 BOSTON POST ROAD WEST
MARLBOROUGH, MA 01752

SITE:

PROPOSED COMMERCIAL DEVELOPMENT

1621 MAIN STREET
LECIESTER, MA

CIVIL DESIGN GROUP, LLC

21 HIGH STREET SUITE 207
NORTH ANDOVER, MA 01845
www.cdgengineering.com
p: 978-794-5400 f: 978-965-3971

FIGURE 1: BMP LOCATION PLAN

08/2023

Bacon Wilson
ATTORNEYS AT LAW

AMHERST
HADLEY
NORTHAMPTON
SPRINGFIELD
WESTFIELD

September 14, 2023

Hand Delivered

Planning Department
c/o Joshua Campbell, Planning Board Chair
Town of Leicester
3 Washburn Square
Leicester, MA 01524

RE: Stormwater Modification
1603-1605 & 1621 Main Street, Leicester, MA

Dear Mr. Campbell:

Please accept this letter on behalf of the owner of the property, TK8 Leicester, LLC as a request for modification to the approved stormwater infiltration basin at 1603-1605 Main Street pursuant to Condition 5 of the "Pre-Construction/Use" Section of the Special Permit/Site Plan Review and Stormwater Permit Decision issued by the Town of Leicester Planning Board and Recorded in the Worcester County Registry of Deeds at Book 67852, Page 295.

The condition requires that requests for substantial modifications to the approved proposal, plans or supporting documents be made to the Planning Board. The landowner seeks to allow an adjacent property (1621 Main Street) to utilize the stormwater basin on 1603-1605 Main Street for redevelopment of the 1621 Main Street site.

The 1621 Main Street redevelopment is subject to its own Special Permit/Site Plan Review and Stormwater Permit process. Any review of the shared stormwater infiltration system—and therefore the change to the 1603-1605 approval—can be accomplished through the 1621 Main Street process and a separate Modification or hearing on such a change to the 1603-1605 site would be unnecessary.

The requested modifications are more fully explained in the attached memorandum from Phillip E. Henry, P.E. of Civil Design Group, LLC.

Very truly yours,

TK8 Leicester, LLC

Thomas R. Reidy, Esq.
Duly Authorized

Thomas R. Reidy
Attorney
treidy@baconwilson.com

Bacon Wilson, P.C.\ Monsein & MacConnell
Attorneys at Law

6 South East Street
Amherst, MA 01002

Tel 413.256.6701
Fax 413.256.6469

CIVIL DESIGN GROUP, LLC
ENGINEERING. LAND USE. PLANNING. PERMITTING.

21 High Street, Suite 207
North Andover, MA 01845
Tel 978.794.5400
www.cdgengineering.com

Memorandum

To: Leicester Planning Board

From: Philip Henry, P.E.

Date: August 22, 2023

Re: Stormwater Modifications
1603, 1605 & 1621 Main Street
Leicester, MA 01524

The above ground infiltration basin that was part of the Site Development Plan for 1603 & 1605 Main Street, Leicester, MA and approved as part of the November, 30, 2021 Special Permit/Site Plan Review & Stormwater Permit Decision is proposed to be modified. The proposed development located at 1621 Main Street abuts the 1603/1605 project to west and plans to convey stormwater to the previously approved infiltration basin via catch basins, drain manholes and associated piping. The basin's volumetric capacity is proposed to be expanded to account for the increase in stormwater runoff, however, the peak flow rate out of the basin as well as the high water level has been either maintained or slightly decreased as compared to the approved stormwater characteristics. The outlet control structure, infiltration rate and the overflow spillway also remained unchanged from the approved development, therefore, the expanded basin footprint and capacity is intended to function in similar fashion to the approved design.

For Planning Office Use:
File #:_____

PROJECT INFORMATION, Continued

Size of Proposed Structure(s):	3,900 Square Feet (2,400 Square feet- Starbucks, 1,500 Square Feet- Nail Salon)	
Total Lot Area:	.921 Acres (40,123 Square Feet)	
Water Source: *(Select One)*	◯ Private Well	◯ Cherry Valley & Rochdale Water District
	◯ Hillcrest Water District	◉ Leicester Water Supply District
Sewer Source: *(Select One)*	◯ Private Septic System	◯ Cherry Valley Sewer District
	◯ Hillcrest Water District	◉ Leicester Water Supply District
	◯ Oxford Rochdale Sewer District	

Brief Project Description:

Please include a brief description on this form (i.e. do not write "see attached"). *[Examples: New construction of a 20,000s.f. retail building and associated parking; Use of a 1,000s.f. portion of an existing structure for a proposed pet grooming clinic.]*

The Applicant seeks to demolish the existing abandoned single family home and construct a 3,900 square foot commercial building with 30 parking spaces and a drive-through (2,400 square feet- Starbucks, 1,500 square feet- Nail Salon)

Application Checklist

Use this checklist to ensure you have provided all required information. See Planning Board Site Plan Review & Special Permit Regulations for details. 13 copies are required except where noted.

☐ Plans (2-full-size & 11-11"x17")	☐ Detailed Project Narrative including any waiver requests [1]	☐ Drainage Analysis/ Stormwater Report, (3 copies) ☐ n/a
☐ Documentation of Availability of Water & Sewer ☐ n/a	☐ Certified Abutters List (1 copy)[2] ☐ n/a	☐ Traffic Study (3 copies) ☐ n/a
☐ Fees[3]	☐ .pdf copy of all required submittals (CD or USB Drive)	

1 See Planning Board Site Plan Regulations for details on what should be included in a Project Narrative. For special permits that don't require conformance with Site Plan Review submittal requirements, submit a narrative explaining conformance with special permit approval criteria (see Special Permit Regulations for details).

2 certified abutters lists are required for all Special Permits applications and for Major Site Plan Review Applications (new construction over 30,000 s.f. and ground-mounted solar over 250,000 s.f or 2 acres or more of tree clearing)

3 Please refer to the Planning Board's Fee Regulations. Checks must be made out to the Town of Leicester

For Planning Board Use:			
Date of Submittal:			
Public Hearing/Meeting Date(s):			
Date of Planning Board Vote:			
Date Decision Filed with Town Clerk:			

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

PRINCIPALS
Robert J. Michaud, P.E.
Daniel J. Mills, P.E., PTOE

M E M O R A N D U M

DATE: September 14, 2023

TO: Mr. Hussein Yatim
HY Ventures Leicester, LLC
313 Boston Post Road West, Suite 120
Marlborough, MA 01752

FROM: Robert J. Michaud, P.E. – Managing Principal
Daniel A. Dumais, P.E. – Senior Project Manager

RE: **Proposed Starbucks w/Drive Through & Retail Facility**
1621 Main Street, Leicester, Massachusetts

MDM Transportation Consultants, Inc. (MDM) has conducted this initial traffic memorandum (TM) for a proposed restaurant with drive-through (Starbucks) and retail facility to be located at 1621 Main Street (Route 9) in Leicester, Massachusetts. The location of the Site relative to the adjacent roadway network is shown in **Figure 1.** This TA evaluates projected trip generation and provides a preliminary capacity analysis for the primary shared signalized site driveway along Route 9 at the existing Walmart Superstore. As part of the project a formal TIAS (Traffic Impact and Access Study) is underway with updated traffic counts will be provided according to MassDOT and Town standards and will be submitted pending completion.

Key findings of the assessment are as follows:

- *Trip Generation*. Based on a review of ITE and empirical trip generation methodology for the primary generator (Starbucks), the more conservative analysis of operations for the proposed Starbucks was based on ITE methodology. Based on ITE methodology the project is estimated to generate approximately 210 vehicle-trips (107 entering and 103 exiting) during the weekday morning peak hour, 104 vehicle trips (52 entering and 52 exiting) during the weekday evening peak hour, and 221 vehicle trips (110 entering and 111 exiting) during the Saturday midday peak hour. As a conservative measure, no credit or trip reduction is taken for pedestrian trips to/from the surrounding neighborhood or adjoining land uses (mixed-use fuel facility with Burger King w/ drive-through). Given the nature of the use, pass-by and diverted traffic, which represents the portion of site-generated trips that is drawn from the existing traffic stream (Route 9) and that is not "new" traffic to area roadways is on average 90% for the Coffee Shop with drive-through.

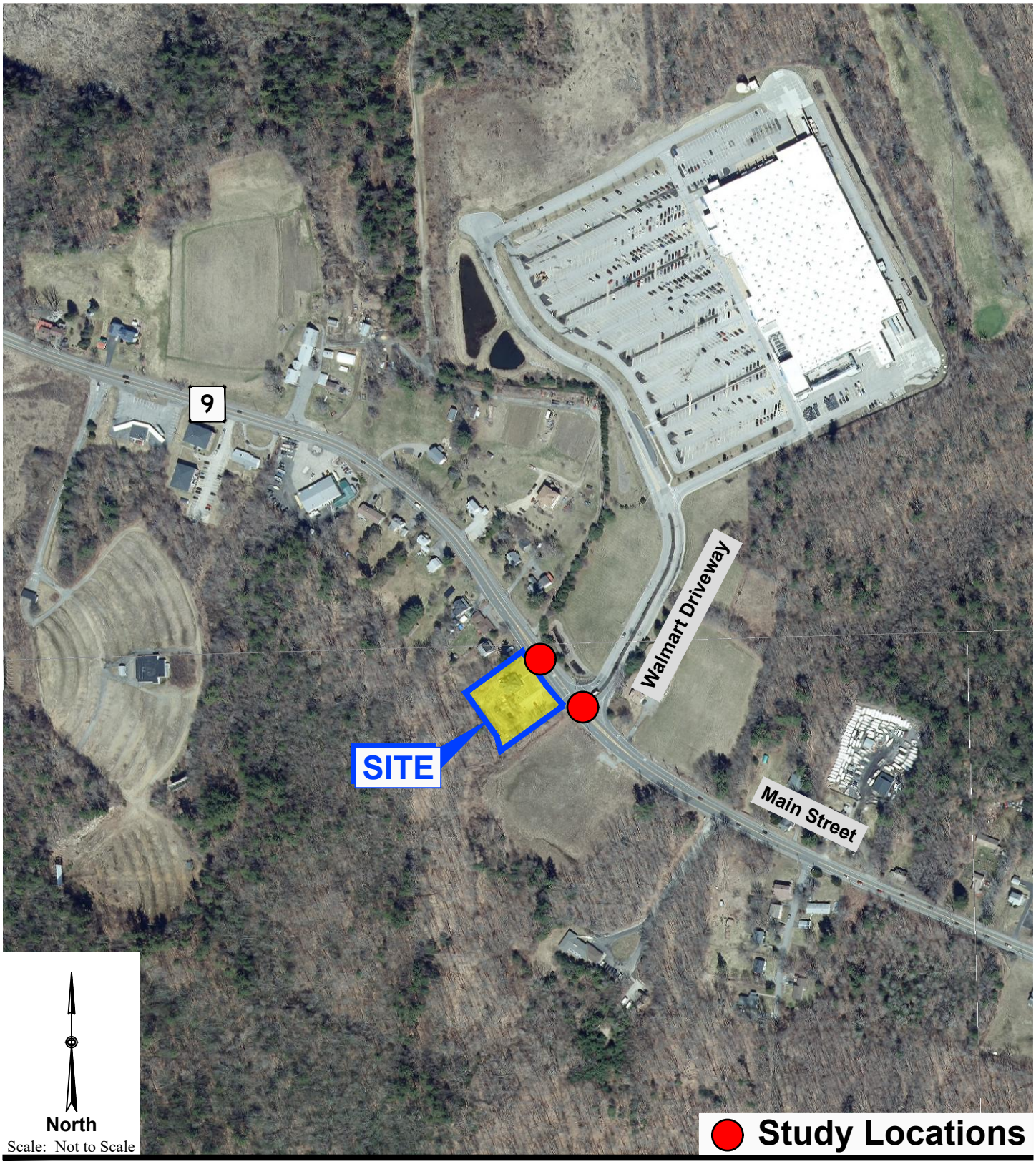


Figure 1

Site Location

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

Date: September 2023
Dwg No. 1314 MR01.dwg

When adjusted for pass-by/diverted trips, the project will result in a nominal 22 new vehicle trips (13 entering and 9 exiting) during the weekday morning peak hour, 10 new vehicle trips (5 entering and 5 exiting) during the weekday evening peak hour and 21 new vehicle trips (10 entering and 21 exiting) during the Saturday midday peak hour.

- *Adequate Capacity.* The results of the preliminary capacity analysis indicates that the proposed development is expected to have minimal impact on the primary shared signalized driveway along Route 9 at the existing Walmart Superstore will continue to operate below capacity at LOS C or better during the weekday morning, weekday evening and Saturday midday peak hours.

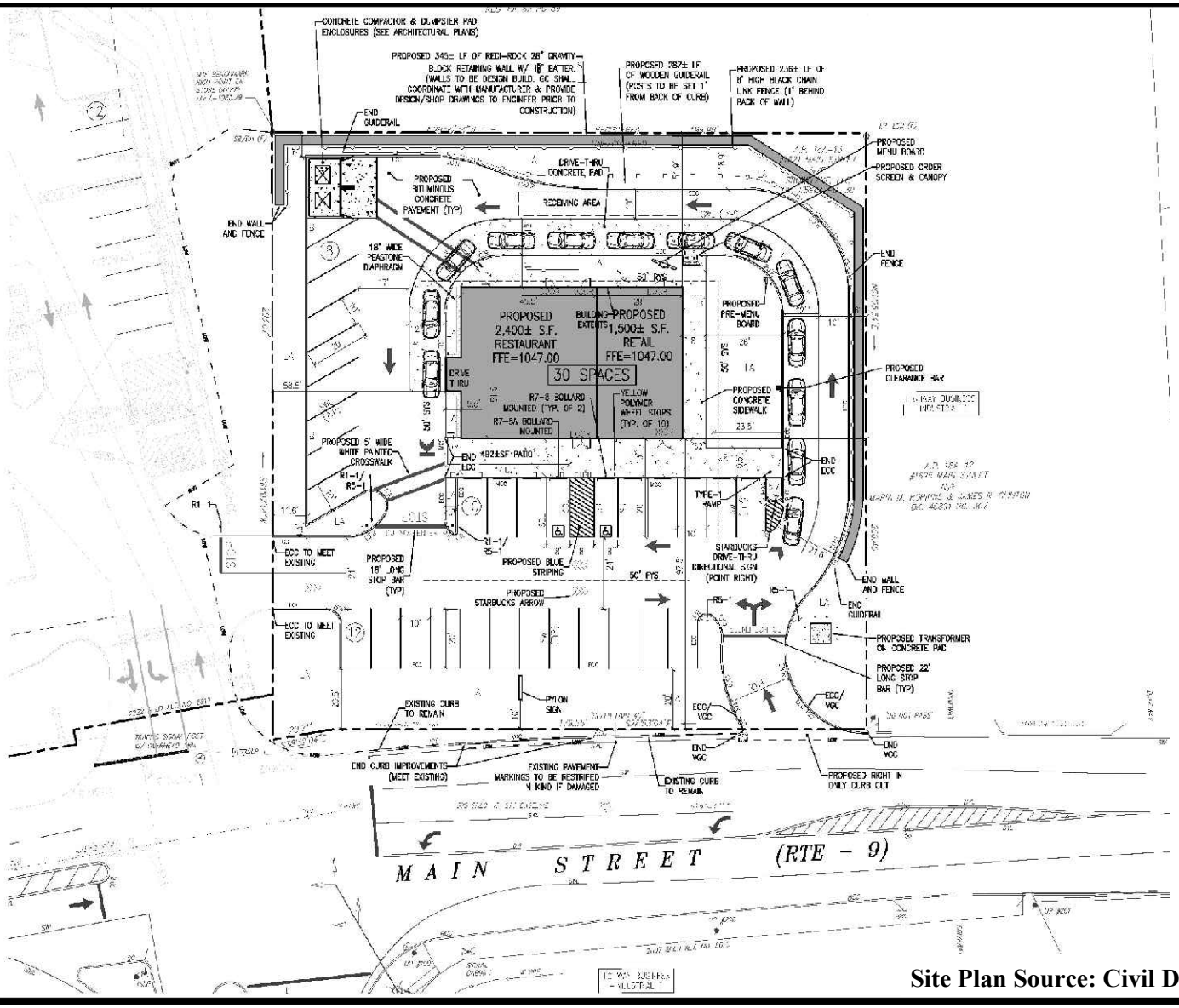
In summary, MDM finds that relative traffic increases for the proposed project represents an inconsequential change in new area roadway volumes - a level of change that falls well within normal day-to-day fluctuations in traffic entering and exiting the study intersection and is immaterial to traffic operations in the area. Accordingly, no roadway improvements are anticipated to accommodate the project. The project and its impacts will be described in more detail in the pending formal TIAS including a review of on-site circulation and drive-thru queue analysis.

PROJECT DESCRIPTION

The site consists of approximately 1.0± acres of land located along the southern side of Main Street (Route 9). The existing Site includes a residential with access/egress via a driveway on Main Street. Under the proposed Site programming, the proposed facility will provide approximately 2,400 sf of restaurant use (Starbucks) with drive-through window and 1,500 sf of retail space. Access/egress to the Site is proposed to be via a right-turn entering driveway on Main Street eastbound and a cross-connection to the adjacent mixed use fuel facility property to provide access to the signalized intersection at the Walmart Superstore (Soojian Drive) The preliminary site layout prepared by Civil Design Group (CDG), Inc. is presented in **Figure 2**.

TRIP GENERATION

The trip generation estimates for the Site are provided for the weekday morning, weekday evening and Saturday midday periods, which correspond to the critical analysis periods for the proposed uses and adjacent street traffic flow.



North
Scale: Not to Scale

Site Plan Source: Civil Design Group, LLC

Figure 2

Preliminary Site Plan

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

Date: September 2023
Dwg No. 1314 MR01.dwg

New traffic generated by the Starbucks with drive-through portion of the project was first estimated using trip rates published in ITE's *Trip Generation*[1] for the Land Use Code (LUC) 937 – Coffee/Donut Shop with Drive-Through Window and then compared to empirical Starbucks with drive through data. **Table 1** presents the trip-generation comparison for the trips to be generated by the Starbucks Coffee Shop with Drive Through or similar based on ITE trip rate methodology with a comparison to empirical observations based on existing Starbucks facilities.

TABLE 1
TRIP-GENERATION COMPARISON – STARBUCKS

Period	ITE Basis[1]	Empirical Basis[2]	Used For Report
Weekday Morning Peak-Hour:			
Enter	**105**	98	**105**
Exit	**101**	97	**101**
Total	**206**	195	**206**
Weekday Evening Peak-Hour:			
Enter	**47**	36	**47**
Exit	**47**	32	**47**
Total	**94**	68	**94**
Saturday Midday Peak-Hour:			
Enter	**105**	54	**105**
Exit	**106**	56	**106**
Total	**211**	110	**211**

[1] Based on ITE LUC 937 (Coffee/Donut Shop with Drive-Through Window) trip rates applied to 2,400 sf.
[2] Based on empirical trip rates for Starbucks.

As summarized in **Table 1**, relative to ITE-based trip estimates, the empirically estimated trip activity is consistent but slightly lower, therefore, the use of the ITE-based trip estimates for planning purposes presents a conservative basis. The coffee shop use of the site is estimated to generate approximately 206 vehicle-trips during the weekday morning peak hour, 94 vehicle trips during the weekday evening peak hour, and 211 vehicle trips during the Saturday midday peak hour.

New traffic generated by the project was estimated using trip rates published in ITE's *Trip Generation* for the Land Use Code (LUC) 937 – Coffee/Donut Shop with Drive-Through Window and LUC 822 – Strip Retail Plaza (<45k). **Table 2** presents the trip-generation summary for the trips to be generated by the proposed development based on the more conservative ITE trip rate methodology.

[1] *Trip Generation,* 11th Edition; Institute of Transportation Engineers; Washington, DC; 2021.

TABLE 2
TRIP-GENERATION SUMMARY

Period	Coffee Shop Trips[1]	Retail Trips[2]	Total Site Trips
Weekday Morning Peak-Hour:			
Enter	105	2	**107**
Exit	101	2	**103**
Total	206	4	**210**
Weekday Evening Peak-Hour:			
Enter	47	5	**52**
Exit	47	5	**52**
Total	94	10	**104**
Saturday Midday Peak-Hour:			
Enter	105	5	**110**
Exit	106	5	**111**
Total	211	10	**221**

[1] Based on Table 1.
[2] Based on ITE LUC 822 Strip Retail Plaza (<40k) trip rates applied to 1,500 sf.

As summarized in **Table 2,** the development is estimated to generate approximately 210 vehicle-trips (107 entering and 103 exiting) during the weekday morning peak hour, 104 vehicle trips (52 entering and 52 exiting) during the weekday evening peak hour, and 221 vehicle trips (110 entering and 111 exiting) during the Saturday midday peak hour. The trip estimates were then adjusted to reflect pass-by and diverted traffic, which represents the portion of site-generated trips that is drawn from the existing traffic stream and that is not "new" traffic to area roadways. Pass-by data as published by ITE in the *Trip Generation Handbook*[2] indicates average pass-by rates are approximately 90% for the Coffee Shop use planned for the site. As a conservative measure, no credit or trip reduction is taken for pedestrian trips to/from the surrounding neighborhood or adjoining land uses. **Table 3** summarizes the trip generation for the project with respect to total trips pass-by trips, and net new trips developed to the area by the project.

[2] *Trip Generation Manual, 10th Edition, Volume 1: User's Guide and Handbook, Institute* of Transportation Engineers; 2017.

TABLE 3
TRIP-GENERATION
(Net Trips)

Period/Direction	Site Trips		
	Total[1]	Pass-By[2]	Net New Trips[3]
Weekday Morning Peak Hour			
Entering	107	-92	13
Exiting	103	-92	9
Total	210	-184	22
Weekday Evening Peak Hour			
Entering	52	-42	5
Exiting	52	-42	5
Total	104	-84	10
Saturday Midday Peak Hour			
Entering	110	-95	10
Exiting	111	-95	11
Total	221	-190	21

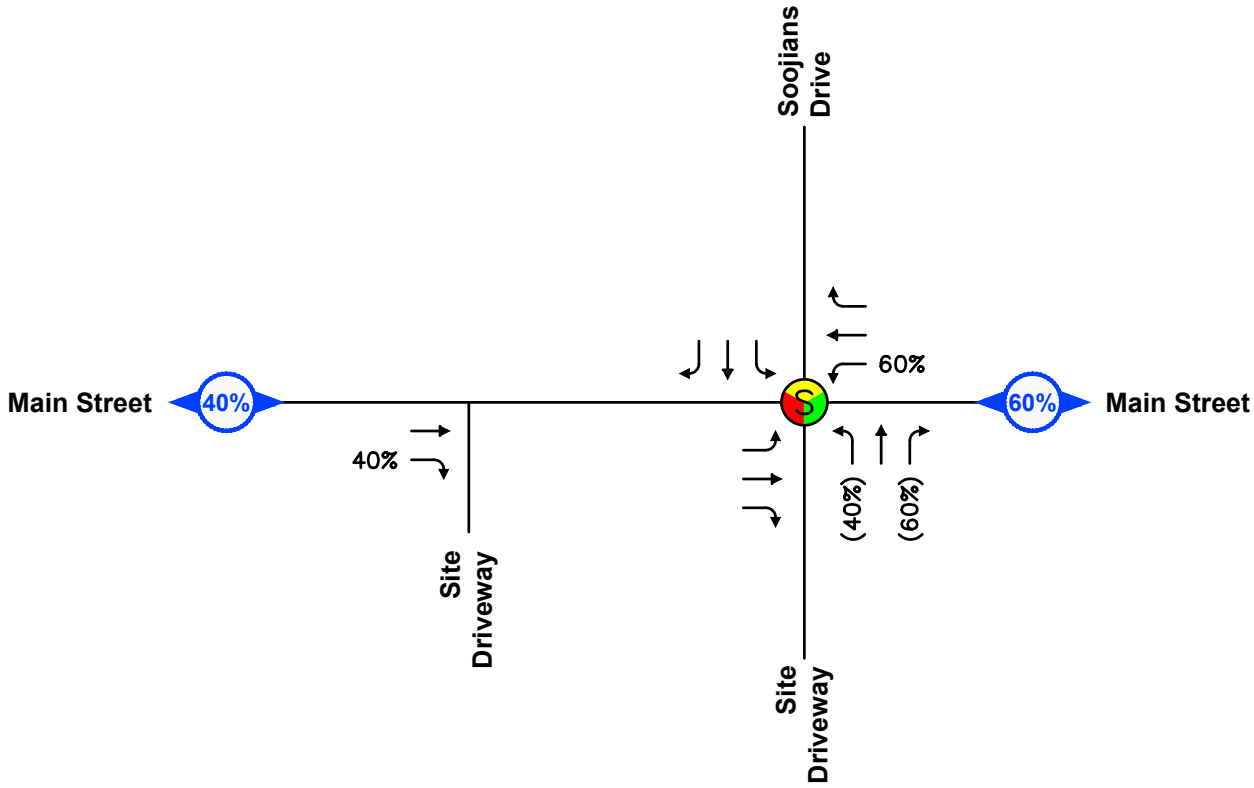
[1]Total Site Trips as shown in **Table 2**.
[2]Pass-by = 90% Coffee Shop pass-by per ITE Trip Generation Handbook.
[3]Net New Trips to the project area.

As summarized in **Table 3,** the proposed development is estimated to generate a nominal 22 new vehicle trips (13 entering and 9 exiting) during the weekday morning peak hour, 10 new vehicle trips (5 entering and 5 exiting) during the weekday evening peak hour and 21 new vehicle trips (10 entering and 21 exiting) during the Saturday midday peak hour.

Trip Distribution

The directional distribution of development-generated trips on the roadway network is a function of a number of variables including local area populations and the efficiency of the roadways leading to the Site. Existing travel patterns served as the primary basis for determining the trip distribution pattern for the proposed development. The data suggests 60% of new trips will occur via Route 9 to/from east and 40% of new trips via Route 9 to/from west. Pass-by/ diverted trips were assigned to the roadway network based on exiting travel patterns along Route 9 and the Walmart driveway. The distribution of the site generated trips is displayed in **Figure 3**. Trip distribution calculations are provided in the **Attachments**.

Development-related trips for the proposed development are assigned to the roadway network using the trip-generation estimates shown in **Table 3** and the distribution patterns presented in **Figure 3**. Development-related trips at each intersection approach for the weekday morning, weekday evening and Saturday midday peak hours are quantified in **Figure 4**.



North
Scale: Not to Scale

NOTES:
%(%) = Entering (Exiting)
= Signalized Intersection

Figure 3

Trip Distribution

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

Date: September 2023
Dwg No. 1314 MR01.dwg

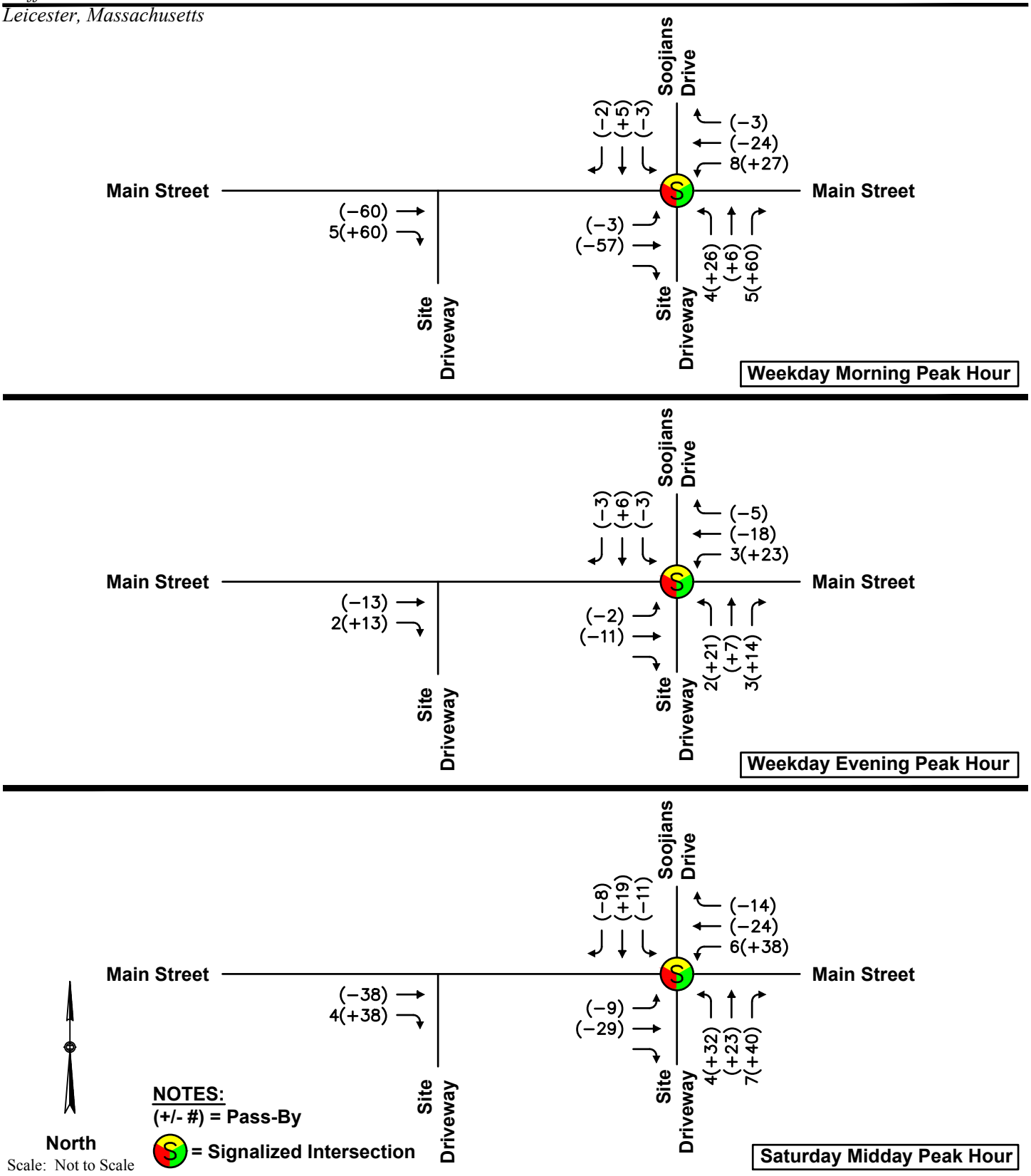


Figure 4

Trip Generation

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

Date: September 2023
Dwg No. 1314 MR01.dwg

Design Year Traffic Conditions

Design Year condition traffic volumes are derived by adding incremental traffic increases for the proposed development as shown in **Figure 4** to the 2028 Build condition (see **Attachments**) intersection as outlined in the TIAS[3] prepared for the adjacent mixed-use fuel facility.

OPERATIONS ANALYSIS

This section provides an overview of operational analysis methodology, and an assessment of intersection operations under Design Year traffic conditions.

Analysis Methodology

Intersection capacity analyses are presented in this section for the Design Year traffic-volume conditions. Capacity analyses, conducted in accordance with EEA/MassDOT guidelines, provide an index of how well the roadway facilities serve the traffic demands placed upon them. The operational results provide the basis for recommended access and roadway improvements in the following section.

Capacity analysis of intersections is developed using the Synchro® computer software, which implements the methods of the Highway Capacity Manual (HCM) 6th Edition. The resulting analysis presents a level-of-service (LOS) designation for individual intersection movements. The LOS is a letter designation that provides a qualitative measure of operating conditions based on several factors including roadway geometry, speeds, ambient traffic volumes, traffic controls, and driver characteristics. Since the LOS of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of LOS, depending on the time of day, day of week, or period of year. A range of six levels of service are defined on the basis of average delay, ranging from LOS A (the least delay) to LOS F (delays greater than 80 seconds for signalized movements). The specific control delays and associated LOS designations are presented in the **Attachments**.

Intersection Capacity Analysis Results

Level-of-Service (LOS) analyses were conducted for Design Year conditions for the study intersection. The results of the intersection capacity are summarized below in **Table 4** and for the weekday morning, weekday evening and Saturday midday peak hours. Detailed analysis is presented in the **Attachments**.

[3] *TIAS, Gas Station Development at 1603 – 1605 Main Street in Leicester, MA,* prepared by Ron Muller & Associates dated March 29, 2021.

TABLE 4
INTERSECTION CAPACITY ANALYSIS RESULTS
MAIN STREET (ROUTE 9) AT WALMART SUPERSTORE (SOOJIANS DRIVE)

	Weekday Morning Peak Hour			Weekday Evening Peak Hour			Saturday Midday Peak Hour		
Approach	v/c[1]	Delay[2]	LOS[3]	v/c	Delay	LOS	v/c	Delay	LOS
Eastbound	0.74	15	B	0.51	13	B	0.75	21	C
Westbound	0.37	7	A	0.88	23	C	0.72	14	B
Northbound	0.41	20	B	0.60	36	D	0.49	27	C
Southbound	0.30	24	C	0.60	20	C	0.56	15	B
Total	**0.74**	**14**	**B**	**0.88**	**21**	**C**	**0.75**	**18**	**B**

[1]Volume-to-capacity ratio
[2]Average control delay per vehicle (in seconds)
[3]Level of service
[4]n/a = not applicable

As summarized in **Table 4**, the proposed development is not expected to materially impact the study area intersection and will continue to operate below capacity at LOS C or better during the weekday morning, weekday evening and Saturday midday peak hours. Relative traffic increases for the proposed project represents an inconsequential change in area roadway volumes - a level of change that falls well within normal day-to-day fluctuations in traffic entering and exiting the study intersection and is immaterial to traffic operations in the area. Accordingly, no roadway improvements are anticipated to accommodate the project. As part of the project a formal TIAS (Traffic Impact and Access Study) is underway with updated traffic counts will be provided according to MassDOT and Town standards. The TIAS will be submitted pending completion which will describe the impacts in more detail including a review of on-site circulation and drive-thru queue analysis.

ATTACHMENTS

- Trip Generation
- Trip Distribution
- 2028 Build Traffic Volumes
- Capacity Analysis

- Trip Generation

Institute of Transportation Engineers (ITE) 11th Edition
Land Use Code (LUC) 822 - Strip Retail Plaza <40ksf

Average Vehicle Trips Ends vs: 1,000 Sq. Feet Gross Leasable Area
Independent Variable (X): 1.500

AVERAGE WEEKDAY DAILY

T = 54.45*(X)
T = 54.45* 1.50
T = 81.68
T = 82 vehicle trips
with 50% (41 vpd) entering and 50% (41 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 2.36 * (X)
T = 2.36 * 1.50
T = 3.54
T = 4 vehicle trips
with 60% (2 vph) entering and 40% (2 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 6.59 *(X)
T = 6.59* 1.50
T = 9.89
T = 10 vehicle trips
with 50% (5 vph) entering and 50% (5 vph) exiting.

SATURDAY DAILY

Proportional Estimate Method:

LUC 820 Weekday Daily 37.01 x LUC 822 Saturday Midday 6.57 =
LUC 820 Saturday Midday 4.40

T = 55.26*(X)
T = 55.26* 1.50
T = 82.89
T = 82 vehicle trips
with 50% (41 vpd) entering and 50% (41 vpd) exiting.

SATURDAY PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 6.57 *(X)
T = 6.57* 1.50
T = 9.89
T = 10 vehicle trips
with 51% (5 vph) entering and 49% (5 vph) exiting.

Institute of Transportation Engineers (ITE) 11th Edition
Land Use Code (LUC) 937 - Coffee/Donut Shop with Drive-Through Window

Average Vehicle Trips Ends vs 1,000 Sq. Feet Gross Floor Area
Independent Variable (X) 2.40

Pass-By: 0.9

AVERAGE WEEKDAY DAILY

T = 533.57 * (X)
T = 533.57 * 2.40
T = 1280.57
T = 1,280 vehicle trips
with 50% (640 vph) entering and 50% (640 vph) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 85.88* (X)
T = 85.88 * 2.40
T = 206.11
T = 206 vehicle trips
with 51% (105 vph) entering and 49% (101 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 38.99 * (X)
T = 38.99 * 2.40
T = 93.58
T = 94 vehicle trips
with 50% (47 vph) entering and 50% (47 vph) exiting.

SATURDAY DAILY

(Daily LUC 937/ Daily LUC 934)*SaturdayDaily LUC 934

533.57 * y y= 703.22
467.48 616.12

T= y * (X)
T= 1688
with 50% (844 vph) entering and 50% (844 vph) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

T = 87.91 * (X)
T = 87.91 * 2.40
T = 210.98
T = 210 vehicle trips
with 50% (105 vph) entering and 50% (105 vph) exiting.

	Total	Pass-By	Net New
AM			
In	105	92	**13**
Out	101	92	**9**
Total	206	184	**22**
PM			
In	47	42	**5**
Out	47	42	**5**
Total	94	84	**10**
Sat			
In	105	95	**10**
Out	105	95	**10**
Total	210	190	**20**
Weekday Daily	1,280	1,152	**128**
Saturday Daily	1,688	1,520	**168**

Source: ITE Trip Generation, 11th Edition

Worcester				Marlborough 1	Marlborough 2			Northborough			
AM Peak Hour	Total	Walk-In	Drive-Thru	Total	Total	Drive-Thru	Walk-In	Total	Drive-Thru	Walk-In	
In	88	33	55	88	132	72	60	85	42	43	
Out	85	30	55	100	125	72	53	78	42	36	
Total	173	63	110	188	257	144	113	163	84	79	

PM Peak Hour	Total	Walk-In	Drive-Thru	Total				Total	Drive-Thru	Walk-In
In	40	21	19	27				30	14	16
Out	37	18	19	31				25	14	11
Total	77	39	38	58				55	28	27

Saturday Midda	Total	Walk-In	Drive-Thru		Total	Drive-Thru	Walk-In
In	49	24	25		59	32	27
Out	44	19	25		67	32	35
Total	93	43	50		126	64	62

	Total	Walk In	Drive Thru	89% Pass-By	Net New
In	98	45	56	87	11
Out	97	40	56	87	10
Total	195	85	113	174	21
		Drive Thru % =	57%		

	Total	Walk In	Drive Thru		
In	32	19	17	25	7
Out	31	15	17	25	6
Total	63	33	33	56	7
		Drive Thru % =	53%		

	Total	Walk In	Drive Thru		
In	54	26	29	37	17
Out	56	27	29	37	19
Total	110	53	57	98	12
		Drive Thru % =	54%		

- Trip Distribution

Trip Distribution
1314 Leicester

Weekday Morning Peak Hour

	Entering Volume	Exiting Volume
Route 9 East	45	51
Route 9 West	51	28

Weekday Evening Peak Hour

	Entering Volume	Exiting Volume
Route 9 East	211	166
Route 9 West	75	133

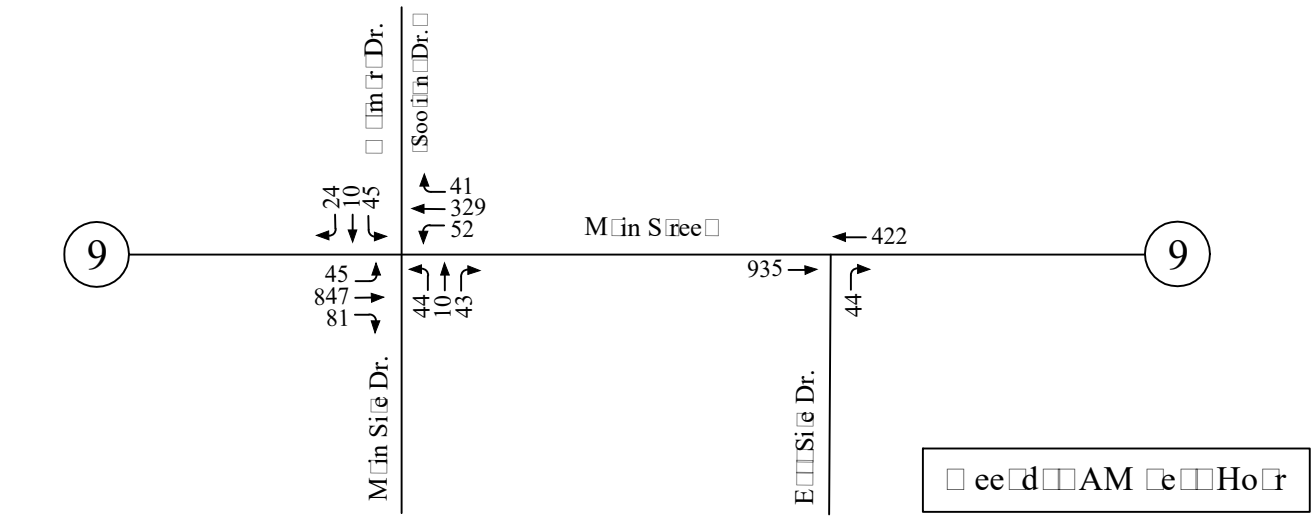
Saturday Midday Peak Hour

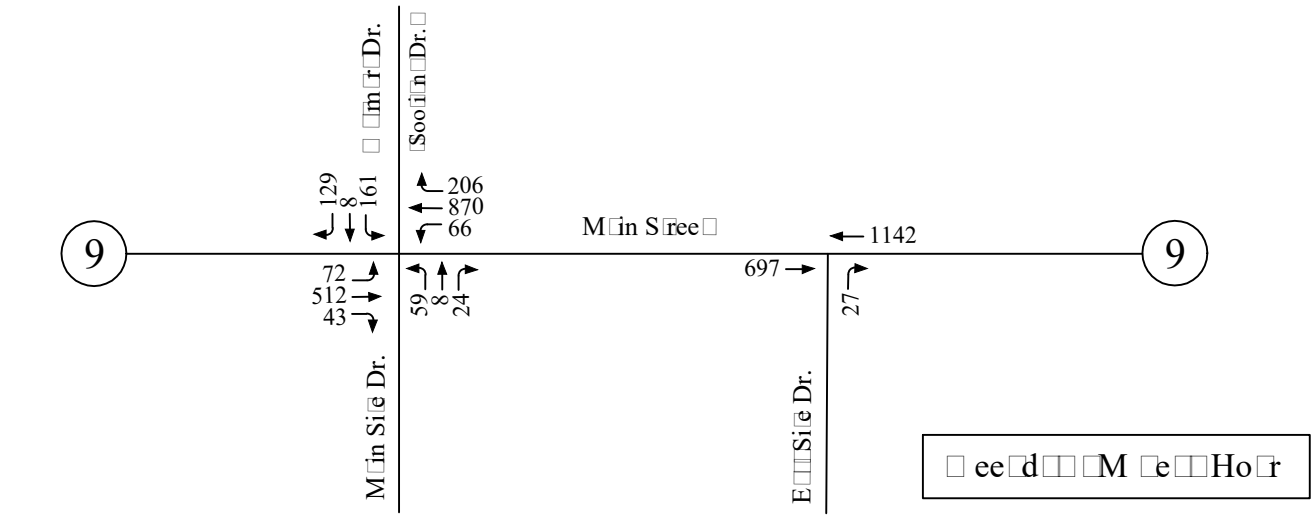
	Entering Volume	Exiting Volume
Route 9 East	292	243
Route 9 West	183	192

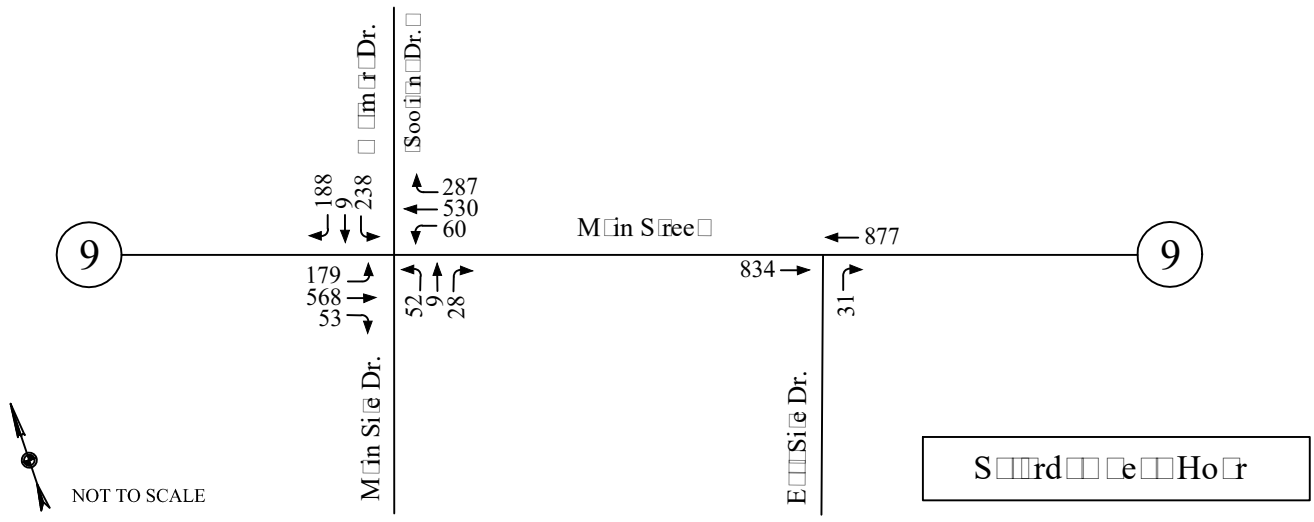
	Total West	Total East
	28	51
	51	45
	133	166
	75	211
	192	292
	183	243
	662	1008
	39.6%	60.4%
SAY	**40%**	**60%**

□ 2028 Build Traffic Volumes

Figure 5
2028 Mid
Peak Hour Traffic Volumes







- [ ] Capacity Analysis

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	787	81	87	305	38	74	16	108	42	15	22
Future Volume (vph)	42	787	81	87	305	38	74	16	108	42	15	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	16	16	10	12	16	12	12	12	12	12	12
Storage Length (ft)	125		0	115		300	0		0	0		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	40			75			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.986				0.850		0.870			0.911	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1652	2082	0	1589	1792	1727	1805	1653	0	1736	1664	0
Flt Permitted	0.542			0.100			0.728			0.581		
Satd. Flow (perm)	942	2082	0	167	1792	1727	1383	1653	0	1061	1664	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13				140		127			26	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1000			1000			1000			1000	
Travel Time (s)		22.7			22.7			22.7			22.7	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	2%	2%	2%	6%	6%	6%	0%	0%	0%	4%	4%	4%
Adj. Flow (vph)	49	926	95	102	359	45	87	19	127	49	18	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	1021	0	102	359	45	87	146	0	49	44	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		10			10			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.09	0.85	0.85	1.09	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA	Free	Perm	NA		Perm	NA	

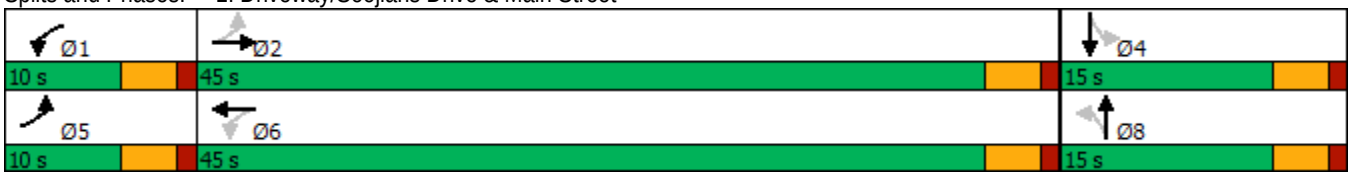
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6		Free	8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.0	10.0		9.0	10.0		9.0	9.0		9.0	9.0	
Total Split (s)	10.0	45.0		10.0	45.0		15.0	15.0		15.0	15.0	
Total Split (%)	14.3%	64.3%		14.3%	64.3%		21.4%	21.4%		21.4%	21.4%	
Maximum Green (s)	6.0	41.0		6.0	41.0		11.0	11.0		11.0	11.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effct Green (s)	42.3	39.5		43.2	41.6	59.5	9.1	9.1		9.1	9.1	
Actuated g/C Ratio	0.71	0.66		0.73	0.70	1.00	0.15	0.15		0.15	0.15	
v/c Ratio	0.07	0.74		0.37	0.29	0.03	0.41	0.41		0.30	0.16	
Control Delay	2.9	15.0		9.7	7.0	0.0	33.1	11.6		31.6	16.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	2.9	15.0		9.7	7.0	0.0	33.1	11.6		31.6	16.6	
LOS	A	B		A	A	A	C	B		C	B	
Approach Delay		14.5			6.9			19.6			24.5	
Approach LOS		B			A			B			C	
90th %ile Green (s)	6.0	41.0		6.0	41.0		11.0	11.0		11.0	11.0	
90th %ile Term Code	Max	Max		Max	Hold		Max	Max		Max	Max	
70th %ile Green (s)	6.0	41.0		6.0	41.0		11.0	11.0		11.0	11.0	
70th %ile Term Code	Max	Max		Max	Hold		Max	Max		Hold	Hold	
50th %ile Green (s)	6.0	40.5		6.0	40.5		9.6	9.6		9.6	9.6	
50th %ile Term Code	Max	Gap		Max	Hold		Gap	Gap		Hold	Hold	
30th %ile Green (s)	0.0	32.2		6.0	42.2		7.6	7.6		7.6	7.6	
30th %ile Term Code	Skip	Gap		Max	Hold		Gap	Gap		Hold	Hold	
10th %ile Green (s)	0.0	27.6		0.0	27.6		0.0	0.0		0.0	0.0	
10th %ile Term Code	Skip	Dwell		Skip	Dwell		Skip	Skip		Skip	Skip	
Queue Length 50th (ft)	4	296		9	67	0	34	7		19	7	
Queue Length 95th (ft)	11	437		32	110	0	70	47		46	30	
Internal Link Dist (ft)		920			920			920			920	
Turn Bay Length (ft)	125			115		300						
Base Capacity (vph)	749	1454		278	1255	1727	280	436		215	358	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.07	0.70		0.37	0.29	0.03	0.31	0.33		0.23	0.12	

Intersection Summary

Area Type: Other
Cycle Length: 70

Actuated Cycle Length: 59.5
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 13.6
Intersection LOS: B
Intersection Capacity Utilization 76.2%
ICU Level of Service D
Analysis Period (min) 15
90th %ile Actuated Cycle: 70
70th %ile Actuated Cycle: 70
50th %ile Actuated Cycle: 68.1
30th %ile Actuated Cycle: 57.8
10th %ile Actuated Cycle: 31.6

Splits and Phases: 1: Driveway/Soojians Drive & Main Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	501	43	92	852	201	82	15	41	158	14	126
Future Volume (vph)	70	501	43	92	852	201	82	15	41	158	14	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	16	16	10	12	16	12	12	12	12	12	12
Storage Length (ft)	125		0	115		300	0		0	0		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	40			75			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988				0.850		0.891			0.865	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1652	2086	0	1668	1881	1812	1805	1693	0	1787	1627	0
Flt Permitted	0.112			0.311			0.664			0.434		
Satd. Flow (perm)	195	2086	0	546	1881	1812	1262	1693	0	816	1627	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9				203		43			131	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1000			1000			1000			1000	
Travel Time (s)		22.7			22.7			22.7			22.7	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Adj. Flow (vph)	73	522	45	96	888	209	85	16	43	165	15	131
Shared Lane Traffic (%)												
Lane Group Flow (vph)	73	567	0	96	888	209	85	59	0	165	146	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		10			10			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.09	0.85	0.85	1.09	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA	Free	Perm	NA		pm+pt	NA	

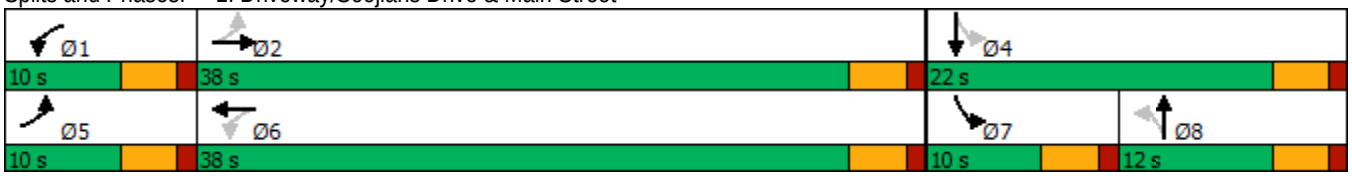
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2		1	6			8		7	4	
Permitted Phases	2			6		Free	8			4		
Detector Phase	5	2		1	6		8	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.0	10.0		9.0	10.0		9.0	9.0		9.5	9.0	
Total Split (s)	10.0	38.0		10.0	38.0		12.0	12.0		10.0	22.0	
Total Split (%)	14.3%	54.3%		14.3%	54.3%		17.1%	17.1%		14.3%	31.4%	
Maximum Green (s)	6.0	34.0		6.0	34.0		8.0	8.0		6.0	18.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effct Green (s)	40.3	35.7		40.3	35.7	66.6	7.5	7.5		15.2	15.2	
Actuated g/C Ratio	0.61	0.54		0.61	0.54	1.00	0.11	0.11		0.23	0.23	
v/c Ratio	0.29	0.51		0.22	0.88	0.12	0.60	0.26		0.60	0.31	
Control Delay	8.5	13.6		6.6	29.7	0.1	49.3	16.5		31.7	7.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	8.5	13.6		6.6	29.7	0.1	49.3	16.5		31.7	7.5	
LOS	A	B		A	C	A	D	B		C	A	
Approach Delay		13.0			22.7			35.9			20.3	
Approach LOS		B			C			D			C	
90th %ile Green (s)	6.0	34.0		6.0	34.0		8.0	8.0		6.0	18.0	
90th %ile Term Code	Max	Hold		Max	Max		Max	Max		Max	Hold	
70th %ile Green (s)	6.0	34.0		6.0	34.0		8.0	8.0		6.0	18.0	
70th %ile Term Code	Max	Hold		Max	Max		Max	Max		Max	Hold	
50th %ile Green (s)	6.0	34.0		6.0	34.0		8.0	8.0		6.0	18.0	
50th %ile Term Code	Max	Hold		Max	Max		Max	Max		Max	Hold	
30th %ile Green (s)	6.0	34.0		6.0	34.0		8.0	8.0		6.0	18.0	
30th %ile Term Code	Max	Hold		Max	Max		Max	Max		Max	Hold	
10th %ile Green (s)	0.0	39.1		0.0	39.1		0.0	0.0		6.0	6.0	
10th %ile Term Code	Skip	Dwell		Skip	Dwell		Skip	Skip		Max	Hold	
Queue Length 50th (ft)	11	159		14	351	0	36	6		58	5	
Queue Length 95th (ft)	24	248		30	#605	0	#94	38		108	45	
Internal Link Dist (ft)		920			920			920			920	
Turn Bay Length (ft)	125			115		300						
Base Capacity (vph)	250	1121		432	1007	1812	153	243		275	540	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.29	0.51		0.22	0.88	0.12	0.56	0.24		0.60	0.27	

Intersection Summary

Area Type: Other
Cycle Length: 70

Actuated Cycle Length: 66.6
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 20.5
Intersection LOS: C
Intersection Capacity Utilization 75.4%
ICU Level of Service D
Analysis Period (min) 15
90th %ile Actuated Cycle: 70
70th %ile Actuated Cycle: 70
50th %ile Actuated Cycle: 70
30th %ile Actuated Cycle: 70
10th %ile Actuated Cycle: 53.1
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Driveway/Soojians Drive & Main Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	539	53	104	506	273	88	32	75	227	28	180
Future Volume (vph)	170	539	53	104	506	273	88	32	75	227	28	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	16	16	10	12	16	12	12	12	12	12	12
Storage Length (ft)	125		0	115		300	0		0	0		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	40			75			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987				0.850		0.895			0.870	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1652	2084	0	1652	1863	1794	1805	1700	0	1805	1653	0
Flt Permitted	0.237			0.171			0.702			0.412		
Satd. Flow (perm)	412	2084	0	297	1863	1794	1334	1700	0	783	1653	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9				290		80			191	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1000			1000			1000			1000	
Travel Time (s)		22.7			22.7			22.7			22.7	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	181	573	56	111	538	290	94	34	80	241	30	191
Shared Lane Traffic (%)												
Lane Group Flow (vph)	181	629	0	111	538	290	94	114	0	241	221	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		10			10			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.09	0.85	0.85	1.09	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA	Free	Perm	NA		pm+pt	NA	

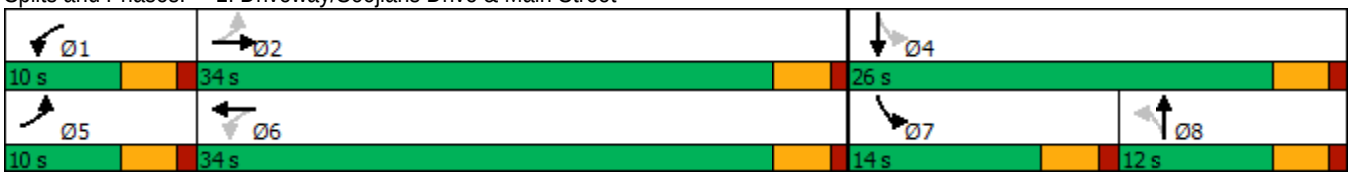
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2		1	6			8		7	4	
Permitted Phases	2			6		Free	8			4		
Detector Phase	5	2		1	6		8	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.0	10.0		9.0	10.0		9.0	9.0		9.5	9.0	
Total Split (s)	10.0	34.0		10.0	34.0		12.0	12.0		14.0	26.0	
Total Split (%)	14.3%	48.6%		14.3%	48.6%		17.1%	17.1%		20.0%	37.1%	
Maximum Green (s)	6.0	30.0		6.0	30.0		8.0	8.0		10.0	22.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effct Green (s)	27.7	23.4		27.7	23.4	58.4	8.5	8.5		18.8	18.8	
Actuated g/C Ratio	0.47	0.40		0.47	0.40	1.00	0.15	0.15		0.32	0.32	
v/c Ratio	0.53	0.75		0.38	0.72	0.16	0.49	0.36		0.56	0.33	
Control Delay	14.2	22.6		11.2	22.6	0.2	39.5	15.8		23.2	6.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	14.2	22.6		11.2	22.6	0.2	39.5	15.8		23.2	6.1	
LOS	B	C		B	C	A	D	B		C	A	
Approach Delay		20.7			14.3			26.5			15.0	
Approach LOS		C			B			C			B	
90th %ile Green (s)	6.0	30.0		6.0	30.0		8.0	8.0		10.0	22.0	
90th %ile Term Code	Max	Max		Max	Max		Max	Max		Max	Hold	
70th %ile Green (s)	6.0	29.7		6.0	29.7		8.0	8.0		10.0	22.0	
70th %ile Term Code	Max	Gap		Max	Hold		Max	Max		Max	Hold	
50th %ile Green (s)	6.0	24.6		6.0	24.6		8.0	8.0		10.0	22.0	
50th %ile Term Code	Max	Gap		Max	Hold		Max	Max		Max	Hold	
30th %ile Green (s)	6.0	20.8		6.0	20.8		8.0	8.0		10.0	22.0	
30th %ile Term Code	Max	Gap		Max	Hold		Max	Max		Max	Hold	
10th %ile Green (s)	0.0	11.5		0.0	11.5		0.0	0.0		7.4	7.4	
10th %ile Term Code	Skip	Dwell		Skip	Dwell		Skip	Skip		Gap	Hold	
Queue Length 50th (ft)	34	209		20	179	0	36	12		71	8	
Queue Length 95th (ft)	63	324		41	284	0	#102	58		142	54	
Internal Link Dist (ft)		920			920			920			920	
Turn Bay Length (ft)	125			115		300						
Base Capacity (vph)	340	1178		299	1049	1794	208	333		466	819	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.53	0.53		0.37	0.51	0.16	0.45	0.34		0.52	0.27	

Intersection Summary

Area Type: Other
Cycle Length: 70

Actuated Cycle Length: 58.4
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 17.6 Intersection LOS: B
Intersection Capacity Utilization 69.5% ICU Level of Service C
Analysis Period (min) 15
90th %ile Actuated Cycle: 70
70th %ile Actuated Cycle: 69.7
50th %ile Actuated Cycle: 64.6
30th %ile Actuated Cycle: 60.8
10th %ile Actuated Cycle: 26.9
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Driveway/Soojians Drive & Main Street



LOCUS PLAN
SCALE: 1"=1,000'±

SITE PLAN SET

FOR

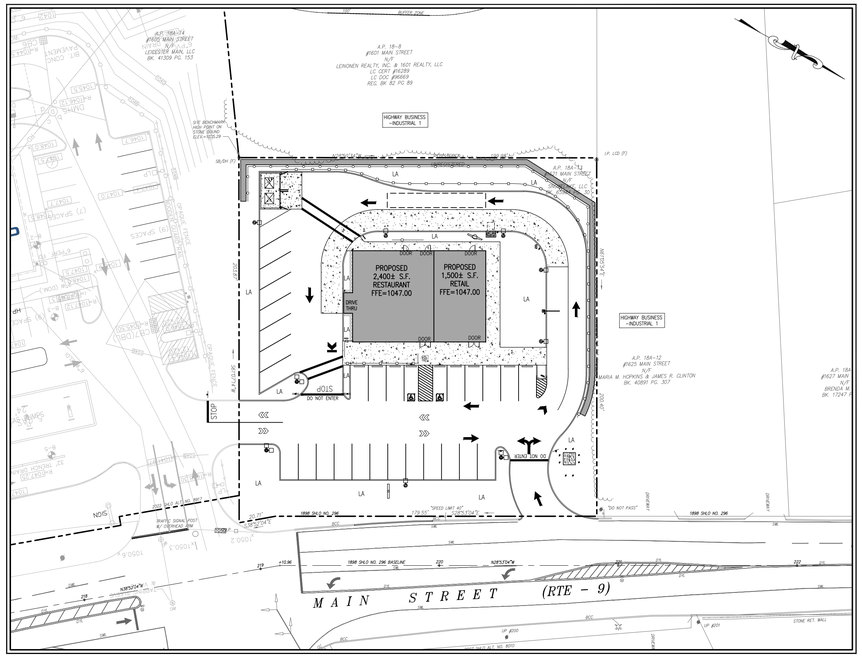
PROPOSED RESTAURANT & RETAIL DEVELOPMENT

1621 MAIN STREET (RTE-9)
LEICESTER, MA 01524

APPROVED BY THE
TOWN OF LEICESTER
PLANNING BOARD

DATE SITE PLAN ENDORSED: _____

DATE	DATE REVISED	SHEET NUMBER	SHEET DESCRIPTION
09/08/2023	-	1	□OVER SHEET
06/01/2023	-	2	E□ISTING □ONDITIONS □□AN
09/08/2023	-	3	DEMO□ITION □ EROSION □ONTRO□ □□AN
09/08/2023	-	4	SITE □□AN
09/08/2023	-	5	GRADING □ DRAINAGE □□AN
09/08/2023	-	6	UTI□IT□ □□AN
09/08/2023	-	7	□ANDS□A□E □□AN
09/08/2023	-	8	□IRE A□□ARATUS □IR□U□ATION □□AN
09/08/2023	-	9	□ONSTRU□TION DETAI□S
09/08/2023	-	10	□ONSTRU□TION DETAI□S
09/08/2023	-	11	□ONSTRU□TION DETAI□S
09/08/2023	-	12	□ONSTRU□TION DETAI□S
09/08/2023	-	13	□ONSTRU□TION DETAI□S
08/18/2023	-	R□-9076-SI	□HOTOMETRI□ □□AN
08/18/2023	-	R□-9076-S1	□IGHT DETAI□S
09/11/2023	-	1R2-4R2	SIGNAGE □□ANS
9/11/2023	-	1	□□OOR □□AN
9/11/2023	-	2	E□TERIOR E□EVATIONS
9/11/2023	-	3	E□TERIOR E□EVATIONS



OVERALL LAYOUT PLAN
S□A□E: 1"□40□

PREPARED BY:

CIVIL DESIGN GROUP, LLC

21 HIGH STREET SUITE 207
NORTH ANDOVER, MA 01845
www.cdgengineering.com
p: 978-794-5400
f: 978-965-3971
□ONTA□T: □HI□I□HENR□, □E.

PREPARED FOR:

HY VENTURES LEICESTER, LLC
313 BOSTON POST ROAD WEST
MARLBOROUGH, MA 01752

PROPERTY:
1621 MAIN STREET □RTE-9□
□EI□ESTER, MA 01524

ASSESSORS MA□ 18A, □OT 13

OWNER OF RECORD:
H□ VENTURES □EI□ESTER, □□□
313 □OSTON □OST ROAD □ EST
MAR□□OROUGH, MA 01752

MUNICIPALITY CONTACTS:

DEPARTMENT	CONTACT	PHONE NUMBER	ADDRESS
TOWN ADMINISTRATOR	DAVID GENEREUX	508-892-7077	3 WASHBURN SQUARE, LEICESTER, MA 01524
CODE ENFORCCEMENT	MICHAEL SILVA	508-892-7003	3 WASHBURN SQUARE, LEICESTER, MA 01524
ASSESSOR	LINDA BERISHA	508-892-7001	3 WASHBURN SQUARE, LEICESTER, MA 01524
FIRE CHIEF	MICHAEL WILSON	508-892-7022	3 PAXTON STREET, LEICESTER, MA 01524
PUBLIC WORKS	ROBERT PROVOST	508-892-7021	3 WASHBURN SQUARE, LEICESTER, MA 01524
PLANNING	JOHN CHARBONNEAU	508-892-7007	3 WASHBURN SQUARE, LEICESTER, MA 01524
POLICE	KENNETH ANTANAVICA	508-892-7009	90 SOUTH MAIN STREET, LEICESTER, MA 01524
CITY CLERK	LISA JOHNSON	508-892-7011	3 WASHBURN SQUARE, LEICESTER, MA 01524
BOARD OF HEALTH	FRANCIS DAGLE	508-892-7008	3 WASHBURN SQUARE, LEICESTER, MA 01524

NOT FOR CONSTRUCTION

ISSUED TO:
TOWN OF LEICESTER

SEAL:
COMMONWEALTH OF MASSACHUSETTS
PHILIP R. HENRY
CIVIL
No. 48547
REGISTERED PROFESSIONAL ENGINEER

PHILIP R. HENRY, P.E.

SHEET:
COVER SHEET

1

CDG PROJECT #: 23028

PROPERTY INFORMATION:

CURRENT OWNER OF RECORD: HY VENTURES LEICESTER, LLC
SITE ADDRESS: 1621 MAIN STREET, LEICESTER, MA (WORCESTER COUNTY)
ASSESSORS PARCEL: MAP 18A LOT 13
DEED REFERENCE: BOOK 68752 PAGE 283

ZONING DISTRICT: HIGHWAY BUSINESS-INDUSTRIAL DISTRICT 1 (HB-1)

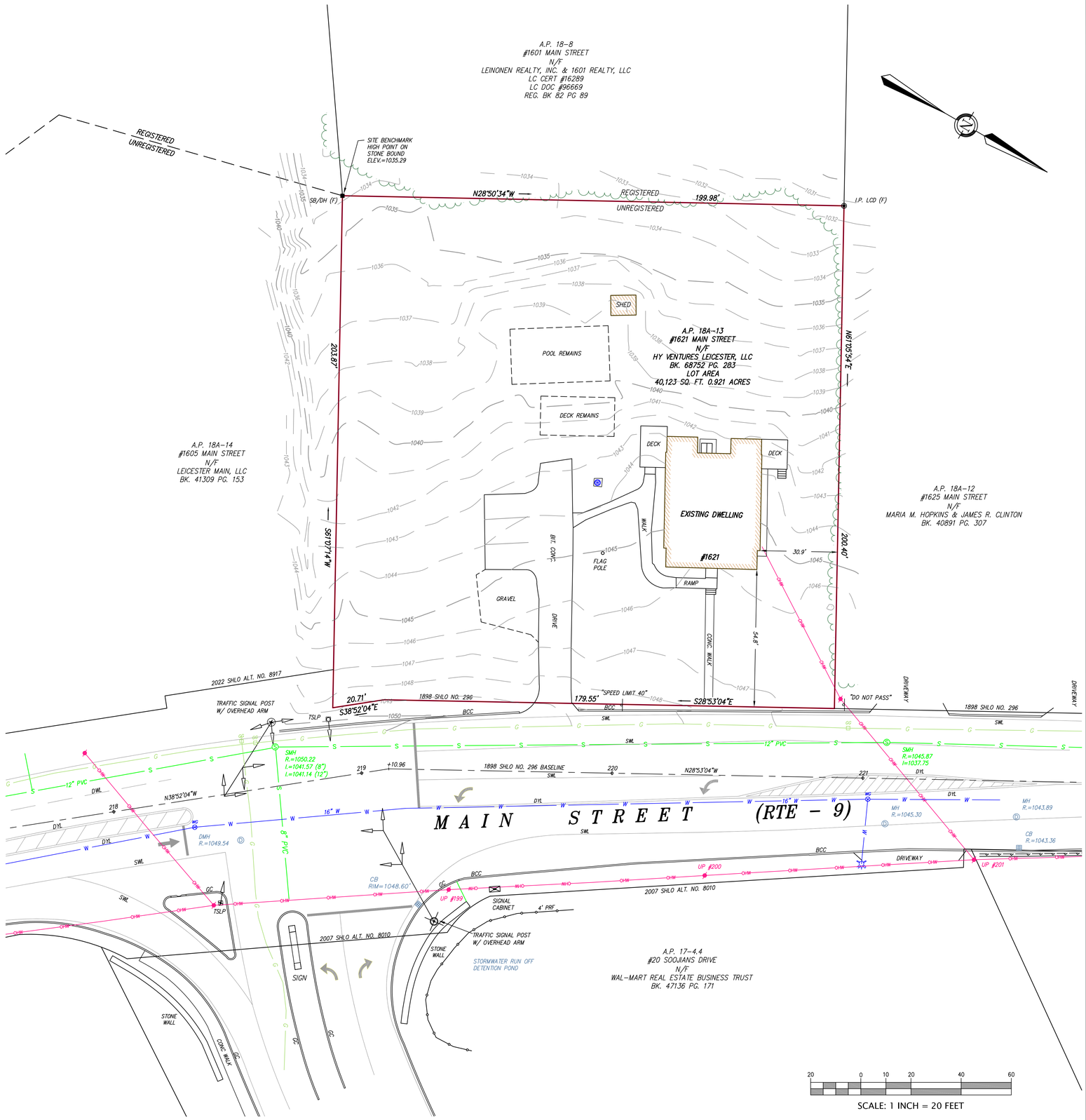
TOTAL LAND AREA = 40,123 SQ. FT. 0.921 ACRES

GENERAL NOTES:

1. THIS PLAN IS THE RESULT OF AN ON-THE-GROUND SURVEY PERFORMED BY ODONE SURVEY & MAPPING ON MAY 10, 2023. SURVEY BY TRIMBLE S6 TOTAL STATION.
2. BASIS OF BEARINGS: 1898 SHLO NO. 296
3. THE VERTICAL POSITIONS SHOWN ON THIS PLAN ARE BASED ON KEYNET RTK GPS NETWORK AND IS SUBJECT TO FURTHER ADJUSTMENT TO ANY LOCAL NGS BENCHMARKS. THE VERTICAL DATUM IS RELATIVE TO NAVD 1988.
4. PROPERTY HAS DIRECT ACCESS TO MAIN STREET, A DESIGNATED PUBLIC WAY. THERE ARE NO PROPERTY LINES LOCATED WITHIN THE BOUNDS OF SAID STREETS.
5. UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN COMPILED FROM AVAILABLE RECORDS AND THEREFORE, THE RELATIONSHIP BETWEEN ACTUAL FIELD LOCATION AND LOCATION SHOWN HEREON MUST BE CONSIDERED APPROXIMATE. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES AND FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION AS INDICATED ON THIS PLAN. BEFORE CONSTRUCTION CALL "DIG SAFE" 1-888-344-7233
6. FLOOD NOTE: BASED ON MAPS PREPARED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) AVAILABLE ONLINE AT WWW.MSC.FEMA.GOV, AND BY GRAPHIC PLOTTING ONLY, THIS PROPERTY IS LOCATED IN ZONE X ON FLOOD INSURANCE RATE MAP NUMBER 25027C0780E, WHICH BEARS AN EFFECTIVE DATE OF 07/04/2011 AND IS NOT IN A SPECIAL FLOOD HAZARD AREA.

LEGEND

	EXISTING BUILDING
GG / G	GAS LINE/GAS VALVE
OHW	OVERHEAD WIRES
DMH / D	DRAIN LINE/DRAIN MANHOLE
WG / W	WATER LINE/WATER GATE
SMH / S	SEWER LINE/SEWER MANHOLE
	TREE LINE
1040	MAJOR CONTOUR
1042	MINOR CONTOUR
CB	CATCH BASIN
	FIRE HYDRANT
LP	LIGHT POLE
UP	UTILITY POLE
GW	GUY WIRE
	SIGN
A.P.	ASSESSORS PARCEL
BK. PG.	DEED BOOK/PAGE
BIT. CONC.	BITUMINOUS CONCRETE
BCC	BITUM. CONCRETE CURB
CONC.	CONCRETE SURFACE
CC	CONCRETE CURB
DYL	DOUBLE YELLOW LINE
GC	GRANITE CURB
C.L.F.	CHAIN LINK FENCE
EOP	EDGE OF PAVEMENT
(F)	FOUND
(M.)	MEASURED
N/F	NOW OR FORMERLY
(REC.)	RECORD
SWL	SOLID WHITE LINE
TSLP	TRAFFIC SIGNAL LIGHT POLE



REVISIONS:

REV.	DATE	COMMENT
1	6/1/2023	DRAFT ISSUE
2		
3		
4		
5		

SURVEYOR'S CERTIFICATION

THIS PLAN AND THE SURVEY ON WHICH IT WAS BASED WAS PREPARED IN ACCORDANCE WITH PROCEDURAL AND TECHNICAL STANDARDS FOR THE PRACTICE OF LAND SURVEYING IN THE COMMONWEALTH OF MASSACHUSETTS (250 CMR SEC. 6.00).

GLENN D. ODONE JR.
REGISTERED LAND SURVEYOR NO. 45068
COMMONWEALTH OF MASSACHUSETTS

COMMONWEALTH OF MASSACHUSETTS
GLENN D. ODONE JR. No. 45068 REGISTERED LAND SURVEYOR

SURVEYED BY:

ODONE SURVEY & MAPPING

SURVEYING ~ MAPPING ~ PLANNING & CONSULTING

291 Main Street, Suite 5
Northborough, MA 01532
Tel.: 508-351-6022 Fax: 508-351-6633

CONTACT: Glenn D. Odone, P.L.S.
email: glenn.odone@osm-pc com
web: www.osm-pc.com

CIVIL ENGINEER:

CIVIL DESIGN GROUP, LLC
21 HIGH STREET, SUITE 207
NORTH ANDOVER, MA 01845
www.cdgengineering.com
p: 978-794-5400 f: 978-914-6161

PREPARED FOR:

HY VENTURES LEICESTER, LLC

313 BOSTON POST ROAD WEST
MARLBOROUGH, MA 01752

PROJECT:

PROPOSED RETAIL DEVELOPMENT

1621 MAIN STREET (RT 9)
LEICESTER, MA 01524

SHEET:

EXISTING CONDITIONS PLAN OF LAND

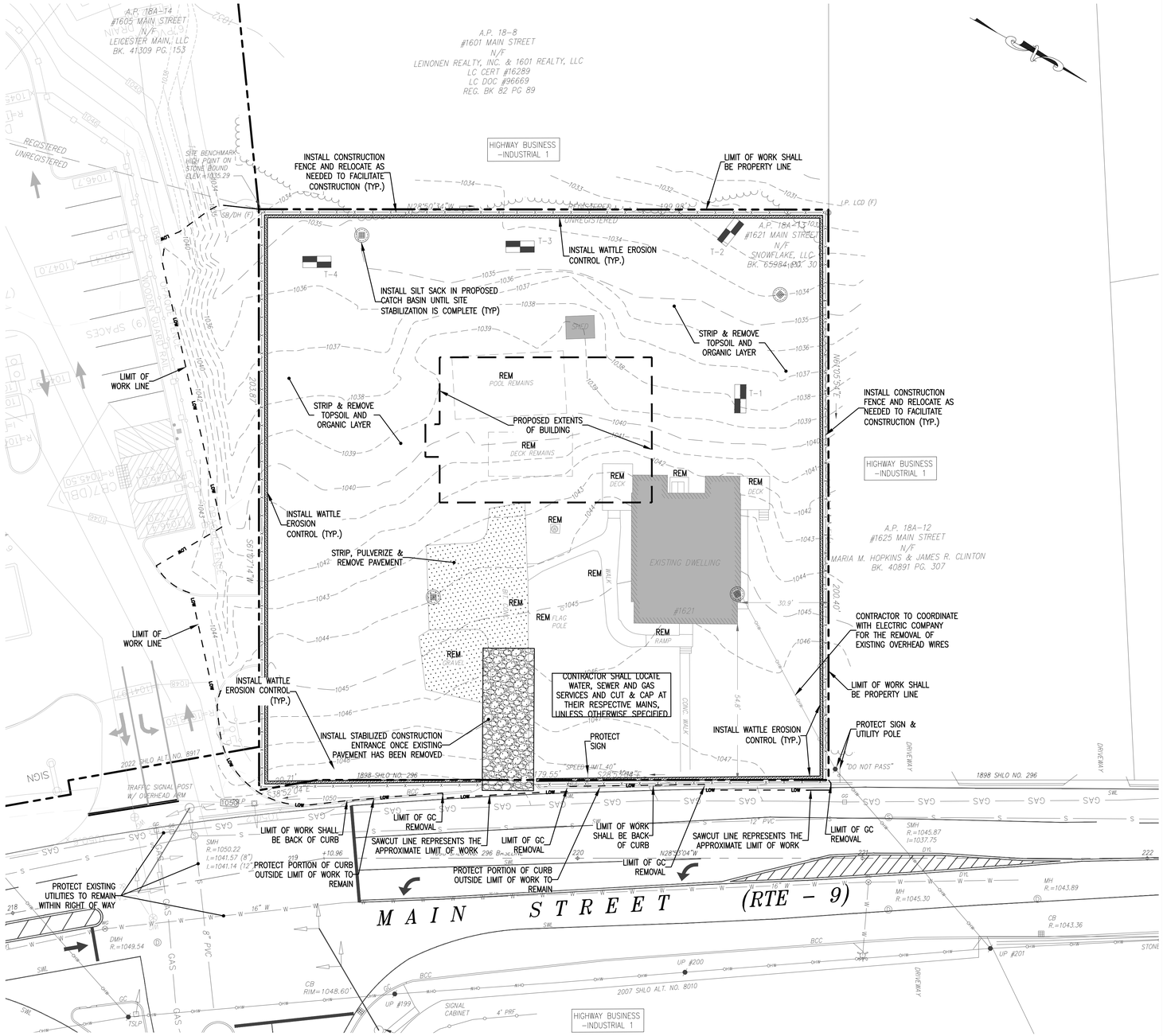
2

DATE: JUNE 1, 2023
REV.:

DWG FILE: 1660-01A
PROJECT NO. 20231660

SITE DEMOLITION & EROSION CONTROL NOTES

1. THE LOCATION AND ELEVATION OF EXISTING UTILITIES AND STRUCTURES SHOWN ON THESE PLANS ARE BASED ON MEASUREMENTS TAKEN IN THE FIELD AND DISCOVERED RECORDS FROM VARIOUS UTILITY COMPANIES AND/OR FROM THE MUNICIPALITY. THIS INFORMATION SHALL NOT BE CONSIDERED EXACT AND THE CONTRACTOR SHALL VERIFY ALL UNDERGROUND UTILITY LOCATIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES. CONTRACTOR SHALL NOTIFY 'DIG SAFE' (811) AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION TO REQUEST EXISTING UTILITY MARK OUT LOCATIONS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY IF EXISTING UTILITY LOCATIONS CONFLICT WITH THE PROPOSED DEVELOPMENT PROGRAM SO THAT A REMEDIAL ACTION CAN TAKE PLACE PRIOR TO ANY WORK. THE CONTRACTOR IS RESPONSIBLE FOR RELOCATING ALL EXISTING UTILITIES AS A RESULT OF THE PROPOSED DEVELOPMENT.
2. THIS PROJECT SITE IS CURRENTLY AN ABANDONED SINGLE FAMILY HOME LOT.
3. EXISTING BASE INFORMATION INCLUDING STRUCTURES, UTILITIES AND TOPOGRAPHY ARE TAKEN FROM PLAN ENTITLED "EXISTING CONDITIONS PLAN OF LAND" PREPARED BY ODONE SURVEY & MAPPING, DATED 06/01/2023.
4. WATER, SEWER AND GAS SERVICES TO BE CUT & CAPPED AT MAIN AND SERVICE LINES SHALL BE ABANDONED IN PLACE, UNLESS OTHERWISE SPECIFIED.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING ALL CONSTRUCTION RELATED CONDITIONS OUTLINED IN THE APPROVALS IN ADDITION TO THE ITEMS OUTLINED IN THESE CONSTRUCTION DOCUMENTS.
6. CONTRACTOR SHALL PERFORM CONSTRUCTION SEQUENCING SUCH THAT EARTH MATERIALS ARE EXPOSED FOR A MINIMUM OF TIME BEFORE THEY ARE COVERED, SEEDED, OR OTHERWISE STABILIZED TO PREVENT EROSION.
7. REFUELING AND ANY WORK ASSOCIATED WITH THE MAINTENANCE OF CONSTRUCTION EQUIPMENT TO BE PERFORMED IN COMPLIANCE WITH APPLICABLE REGULATIONS.
8. THE AREAS OF CONSTRUCTION SHALL REMAIN IN A STABLE CONDITION AT THE CLOSE OF EACH CONSTRUCTION DAY. EROSION CONTROLS SHALL BE CHECKED AT THIS TIME AND MAINTAINED OR REINFORCED IF NECESSARY.
9. THE LIMIT OF WORK FOR THIS PROJECT SHALL BE SHOWN ON THE PLANS AS SAWCUT LINES, WATTLE LINES, AND/OR CONSTRUCTION FENCE LINES. EXISTING FEATURES OUTSIDE LIMIT OF WORK LINE ARE TO REMAIN UNLESS OTHERWISE SPECIFIED AND THE EXISTING FEATURES WITHIN LIMIT OF WORK LINE SHALL BE REMOVED UNLESS OTHERWISE SPECIFIED.
10. THE CONTRACTOR SHALL NOTIFY ALL APPLICABLE MUNICIPAL DEPARTMENTS INCLUDING THE BUILDING DEPARTMENT AT LEAST 48 HOURS PRIOR TO START OF WORK.
11. THE CONTRACTOR SHALL ARRANGE A PRE-CONSTRUCTION MEETING WITH THE ENGINEER PRIOR TO THE START OF CONSTRUCTION. ALL WORK MUST BE INSPECTED BY THE MUNICIPALITY/STATE.
12. ALL DISTURBED OFF-SITE AREAS SHALL BE RESTORED TO PRE CONSTRUCTION CONDITION.
13. A STABILIZED CONSTRUCTION ENTRANCE SHALL BE INSTALLED PER THE DETAIL WHEREVER CONSTRUCTION ACCESS EXISTS. PAVED AREAS SHALL BE KEPT CLEAN AT ALL TIMES. TRACKED MUD OR SEDIMENT SHALL BE REMOVED (VACUUM SWEEPING) PRIOR TO THE NEXT STORM EVENT.
14. PEDESTRIAN AND VEHICULAR ACCESS WITHIN ANDOVER STREET AND THE MALL DRIVEWAY SHALL BE KEPT IN GOOD CONDITION AND SHALL BE PASSABLE THROUGHOUT CONSTRUCTION.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND PAYING FOR ALL PERMITS AND UTILITY CONNECTION/DISCONNECTION FEES RELATED TO THE PROJECT. CONTRACTOR SHALL NOTIFY AND COORDINATE ALL UTILITY WORK WITH THE APPLICABLE UTILITY COMPANIES AND/OR LOCAL DEPARTMENTS. ALL PERMITS SHALL BE KEPT WITHIN THE TRAILER AND CLEARLY VISIBLE.
16. THE OFFSITE DISPOSAL OF ALL DEMOLISHED MATERIALS SHALL COMPLY WITH THE APPLICABLE LOCAL, STATE AND FEDERAL GUIDELINES.
17. EXISTING ONSITE BITUMINOUS PAVEMENT SHALL BE STRIPPED, PULVERIZED AND STOCKPILED ONSITE TO BE USED AS RECLAIMED ASPHALT PAVEMENT BORROW/COMMON FILL MATERIAL IF DEEMED SUITABLE BY THE GEOTECHNICAL RECOMMENDATIONS. IF EXISTING PAVEMENT IS NOT SUITABLE FOR REUSE, IT SHALL BE REMOVED OFFSITE IN CONFORMANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.
18. CONSTRUCTION DUMPSTERS SHALL BE LOCATED ON A STABLE SURFACE AND SHALL BE PROPERLY MAINTAINED AND EMPTIED ON A REGULAR BASIS.
19. CONTRACTOR SHALL NOT STOCKPILE OR LOCATE DUMPSTERS WITHIN WETLAND RESOURCE AREA BUFFER ZONES IF PRESENT ON SITE.
20. THE CONTRACTOR IS RESPONSIBLE FOR THE GENERAL UPKEEP OF THE SITE DURING THE CONSTRUCTION PROCESS.
21. MEANS OF PROTECTING EXISTING MONITORING WELLS, IF APPLICABLE, SHALL BE COORDINATED WITH THE OWNER'S ENVIRONMENTAL CONSULTANT PRIOR TO CONSTRUCTION.
22. THIS PROJECT IS INTENDED TO BE A SINGLE PHASE PROJECT WITH AN ESTIMATED OPEN AREA OF LESS THAN 1 ACRE.
23. PERMANENT BEST MANAGEMENT PRACTICES ARE NOT INTENDED TO USED AS TEMPORARY SEDIMENT BASINS AND UPSTREAM AREAS SHALL NOT CONNECT TO THE PERMANENT BMP'S UNTIL THE SITE IS STABILIZED. HOWEVER, IF A PERMANENT BMP IS UTILIZED DURING CONSTRUCTION FOR UNFORESEEN SITE CONDITIONS, THE BMP(S) SHALL BE CLEANED AND/OR RESTORED PRIOR TO END OF CONSTRUCITON.
24. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PER THE PLANS AND IN ACCORDANCE WITH LOCAL AND STATE REGULATIONS. THESE MEASURES SHALL BE FUNCTIONING AT THE START OF THE CONSTRUCTION PRIOR TO ANY EARTH DISTURBANCE INCLUDING DEMOLITION AND SHALL REMAIN IN PLACE UNTIL UPSTREAM SITE WORK IS COMPLETE AND THE GROUND COVER IS STABILIZED. PERMANENT STABILIZATION IS DEFINED AS 90% SEEDED COVERAGE.
25. CONSTRUCTION DURING THE WINTER SHALL INCLUDE INSPECTIONS AFTER EACH 1" RAINFALL/SNOWFALL EVENT AND NO LESS THAN ONCE PER WEEK. ALL AREAS WITHIN 75 FEET OF A PROTECTED NATURAL RESOURCE MUSTE BE PROTECTED WITH A DOUBLE ROW OF SEDIMENT BARRIERS.
26. THE CONTRACTOR SHALL PERFORM ALL WORK, AND INSTALL ALL MEASURES REQUIRED TO REASONABLY CONTROL SOIL EROSION RESULTING FROM CONSTRUCTION OPERATIONS AND PREVENT EXCESSIVE FLOW OF SEDIMENT FROM THE CONSTRUCTION SITE.
27. CONTRACTOR SHALL IMPLEMENT TEMPORARY AND PERMANENT STABILIZATION METHODS IN ACCORDANCE WITH THESE PLANS AND IN ACCORDANCE WITH STABILIZATION REQUIREMENTS IN THE LATEST GENERAL NPDES PERMIT FOR DISCHARGES FROM CONSTRUCTION ACTIVITIES.
28. ALL DEWATERING OPERATIONS MUST DISCHARGE DIRECTLY INTO A SEDIMENT BASIN TO ALLOW FOR SUFFICIENT SETTLING PRIOR TO DISCHARGE.
29. PROVIDE AND STORE AUXILIARY DEWATERING EQUIPMENT ON THE SITE IN THE EVENT OF BREAKDOWN. PROVIDE NON-WOVEN FILTER FABRIC SHALL BE SPECIFICALLY DESIGNED FOR SUBSURFACE DRAINAGE APPLICATIONS.
30. WATER FROM THE TRENCHES AND EXCAVATIONS SHALL BE DISPOSED OF IN SUCH A MANNER AS TO AVOID PUBLIC NUISANCE, INJURY TO PUBLIC HEALTH OR THE ENVIRONMENT, OR DAMAGE TO PUBLIC OR PRIVATE PROPERTY, OR DAMAGE TO THE WORK COMPLETED OR IN PROGRESS. DO NOT DISCHARGE WATER INTO ANY SANITARY SEWER SYSTEM. SILTATION BARRIERS SHALL BE UTILIZED IF NECESSARY.
31. WATER FROM TRENCHES AND EXCAVATIONS SHALL NOT BE DISCHARGED DIRECTLY TO STORM DRAIN SYSTEMS. PROPER TREATMENT TO A SEDIMENTATION AREA IS TO TAKE PLACE PRIOR TO DISCHARGE TO ANY DRAINAGE SYSTEMS.
32. THE CONTRACTOR SHALL REPAIR ANY DAMAGE RESULTING FROM THE FAILURE OF THE DEWATERING OPERATIONS OR FROM FAILURE TO MAINTAIN ALL AREAS OF WORK IN SUITABLE DRY CONDITION.
33. DO NOT EXCAVATE UNTIL THE DEWATERING SYSTEM IS OPERATIONAL AND THE EXCAVATION MAY PROCEED WITHOUT DISTURBANCE TO THE FINAL SUBGRADE.
34. UNLESS OTHERWISE SPECIFIED, CONTINUE DEWATERING UNINTERRUPTED UNTIL THE STRUCTURES, PIPES, AND APPURTENANCES TO BE BUILT HAVE BEEN PROPERLY INSTALLED. WHERE SUBGRADE MATERIALS ARE UNABLE TO MEET SUBGRADE DENSITY REQUIREMENTS DUE TO IMPROPER DEWATERING TECHNIQUES, REMOVE AND REPLACE THE MATERIALS AS DIRECTED BY THE ENGINEER.
35. THE PROPOSED ONSITE DRAINAGE SYSTEM SHALL BE INSTALLED AS SOON AS PRACTICABLE. ALL EXISTING AND PROPOSED CATCH BASIN INLETS SHALL BE PROTECTED WITH A SILT SACK (SEE DETAIL).
36. DUST IS TO BE CONTROLLED BY AN APPROVED METHOD ACCORDING TO LOCAL, STATE AND FEDERAL STANDARDS AND MAY INCLUDE WATERING WITH A SOLUTION OF CALCIUM CHLORIDE AND WATER.
37. ABUTTING PROPERTIES SHALL BE PROTECTED FROM EXCAVATION AND FILLING OPERATIONS FROM THIS PROJECT AT ALL TIMES. WORK ON ABUTTING PROPERTY SHALL REQUIRE WRITTEN AUTHORIZATION FROM THE OWNER PRIOR TO ANY LAND DISTURBANCE.
38. THE EROSION CONTROL MEASURES ILLUSTRATED IN THIS PLAN SET SHALL BE THE MINIMUM REQUIRED CONTROLS IMPLEMENTED. THE CONTRACTOR SHALL KEEP ADDITIONAL EROSION CONTROL MEASURES SUCH AS WATTLES ONSITE AT ALL TIMES TO RELOCATE OR ADD SUCH MEASURES AS THE PROJECT EVOLVES OR AN UNFORESEEN CONDITION OCCURS.
39. EROSION CONTROL MIX SHOULD CONTAIN A WELL-GRADED MIXTURE OF PARTICLE SIZES AND MAY CONTAIN ROCKS LESS THAN 4" IN DIAMETER. EROSION CONTROL MIX SHOULD BE FREE OF REFUSE, PHYSICAL CONTAMINANTS, AND MATERIAL TOXIC TO PLANT GROWTH SUCH AS FLY ASH OR YARD SCRAPING. LARGE PORTIONS OF SILTS, CLAYS OR FINE SANDS ARE NOT ACCEPTABLE IN THE MIX. THE MIX COMPOSITION SHOULD MEET THE FOLLOWING STANDARDS:
    - 39.1. THE ORGANIC MATTER CONTENT SHOULD BE BETWEEN 80% AND 100%, DRY WEIGHT BASIS.
    - 39.2. PARTICLE SIZE BY WEIGHT SHOULD BE 100% PASSING A 6" SCREEN AND 70% TO 85% PASSING A 0.75" SCREEN.
    - 39.3. THE ORGANIC PORTION NEEDS TO BE FIBROUS AND ELONGATED.
    - 39.4. SOLUBLE SALTS CONTENT SHALL BE < 4.0 MMHOS/CM.
    - 39.5. THE PH SHOULD BE BETWEEN 5.0 AND 8.0.
    - 39.6. PROHIBITED AT THE BASE OF AN SLOPE STEEPER THAN 8% OR WHERE RUNOFF IS FLOWING WITHOUT THE SUPPORT OF ADDITIONAL MEASURES, SUCH AS SILT FENCE.
40. STOCKPILES SHALL BE LOCATED ONSITE OUTSIDE OF ALL WETLAND RESOURCE AREA BUFFER ZONES IF PRESENT ON SITE. EROSION CONTROL MEASURES SHALL BE INSTALLED AT THE FOOT OF THE STOCKPILE AND AND SHALL BE COVERED TO PREVENT WASHOUT.
41. ALL PROPOSED SLOPES 3:1 AND STEEPER SHALL BE STABILIZED WITH AN EROSION CONTROL MATTING AND SHALL BE HYDROSEEDED.
42. ALL PIPELINES OR STRUCTURES NOT STABLE AGAINST UPLIFT DURING CONSTRUCTION OR PRIOR TO COMPLETION SHALL BE THOROUGHLY BRACED OR OTHERWISE PROTECTED.
43. ALL SITE DRAINAGE, WATER, AND SEWER WORK OUTSIDE THE BUILDING FOOTPRINT SHALL BE PERFORMED BY A LICENSED DRAIN LAYER.
44. ANY PROPOSED SURFACE OPENINGS AND EXCAVATION WORK WITHIN THE CITY RIGHT-OF-WAY LIMITS WILL REQUIRE A STREET OPENING PERMIT (SOP).
45. A TRENCH OPENING PERMIT (TOP) SHALL BE OBTAINED PRIOR TO THE EXCAVATION OF ANY TRENCH.



LEGEND

EXISTING	PROPOSED	DESCRIPTION
		PROPERTY LINE
Ⓓ		DRAIN MANHOLE
□		CATCH BASIN
Ⓢ		SEWER MANHOLE
D		DRAIN PIPE
G		GAS LINE
OHW		OVERHEAD WIRES
W		WATER LINE
S		SEWER LINE
		HYDRANT
		SIGN
		SITE LIGHT
		UTILITY POLE
170		INDEX CONTOUR
169		MINOR CONTOUR
		TREE LINE
		CONCRETE SIDEWALK
I.P.		IRON PIPE/IRON PIN
		EXISTING BUILDINGS & APPURTENANCES TO BE DEMOLISHED
		CONSTRUCTION FENCE
		WATTLES
		PROPOSED BUILDING PAD
		PAVEMENT TO BE RECLAIMED (IF SUITABLE)
		STABILIZED CONSTRUCTION ENTRANCE
B#@		BORING LOCATION

GENERAL ABBREVIATIONS

ASSESSOR'S PARCEL	A.P.
BOTTOM OF CURB	BC
BITUMINOUS CONCRETE CURB	BCC
BITUMINOUS CONCRETE	BIT. CONC
BOTTOM OF WALL	BW
CATCH BASIN	CB
CHAIN LINK FENCE	C.L.F.
CLEANOUT	CO
CONCRETE SURFACE	CONC
DRILL HOLE FOUND	DH (F)
DRAIN MANHOLE	DMH
DOUBLE WALL FIBER GLASS	DWFG
DASHED WHITE LINE	DWL
DOUBLE YELLOW CENTERLINE	DYCL
EDGE OF PAVEMENT	EOP
EXTRUDED CONCRETE CURB	ECC
ELECTRIC HANDHOLE	EHH
FINISHED FLOOR ELEVATION	FF=
FRONT YARD	FY
VERTICAL GRANITE CURB	GC
GAS METER	GM
HIGH DENSITY POLYETHYLENE PIPE	HDPE
INVERT ELEVATION	I=
LINEAL FEET	LF
LANDSCAPED AREA	LA
MONOLITHIC CONCRETE CURB	MCC
MATCH EXISTING	ME
INVERT NOT AVAILABLE	N/A
NOW OR FORMERLY	N/F
ON CENTER	OC
RIM ELEVATION	R=
ROOF DRAIN	RD
REMOVE	REM
REAR YARD	RY
SEWER FORCE MAIN	SFM
SOLID WHITE EDGE LINE	SWEL
SOLID WHITE LINE	SWL
SIDE YARD	SY
TOP OF CURB	TC
TOP OF WALL	TW
UTILITY POLE	UP
VITRIFIED CLAY	VC
WATER GATE	WG
WATER SHUT-OFF	WSO

811 DigSafe MA ME NH RI VT

NOT FOR CONSTRUCTION

CDG PROJECT #: 23028

REVISIONS:

REV	DATE	COMMENT
1		
2		
3		
4		
5		
6		
7		
8		
9		

SEAL:

COMMONWEALTH OF MASSACHUSETTS
PHILIP R. HENRY
CIVIL
No. 48547
REGISTERED PROFESSIONAL ENGINEER

PHILIP R. HENRY, P.E.

PLANNING BOARD:

CIVIL ENGINEER:

CIVIL DESIGN GROUP, LLC
21 HIGH STREET, SUITE 207
NORTH ANDOVER, MA 01845
www.cdgengineering.com
p: 978-794-5400 f: 978-965-3971

PREPARED FOR:

HY VENTURES LEICESTER, LLC

313 BOSTON POST ROAD WEST
MARLOROUGH, MA 01752

PROJECT:

PROPOSED RETAIL DEVELOPMENT

1621 MAIN STREET (RT-9)
LEICESTER, MA 01524

SCALE: 20 0 10 20 40
GRAPHIC SCALE IN FEET

SHEET: **DEMOLITION & EROSION CONTROL PLAN**

3

DATE: 08/21/2023

GENERAL NOTES

1. ZONING INFORMATION OBTAINED FROM THE TOWN OF LEICESTER ZONING ORDINANCE AS AMENDED THROUGH JUNE 2020.
2. THE PROJECT SITE IS LOCATED ON ASSESSOR LOT 13 ON MAP 18A AND TOTALS APPROXIMATELY 0.92 ACRES.
3. THE PROJECT LIES WITHIN THE HIGHWAY BUSINESS 1 (HB–1) DISTRICT AND DOES NOT LIE WITHIN AN OVERLAY DISTRICT.
4. MODIFICATIONS TO THIS PLAN MAY OCCUR AS UNFORESEEN CONDITIONS ARISE. ALL CHANGES SHALL BE APPROVED BY THE ENGINEER & MUNICIPALITY.
5. ALTERNATIVE METHODS AND PRODUCTS OTHER THAN THOSE SPECIFIED MAY BE USED IF REVIEWED AND APPROVED BY THE OWNER, SITE ENGINEER, AND APPROPRIATE REGULATORY AGENCY PRIOR TO INSTALLATION.
6. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF ALL PRODUCTS, MATERIALS, AND PLANT SPECIFICATIONS TO THE OWNER AND SITE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION OR DELIVERY TO THE SITE. ALLOW A MINIMUM OF 14 WORKING DAYS FOR REVIEW.
7. THE CONTRACTOR SHALL PROVIDE AS–BUILT RECORDS OF ALL CONSTRUCTION (INCLUDING UNDERGROUND UTILITIES) TO THE OWNER AT THE END OF THE CONSTRUCTION.
8. THE PROPERTY IS LOCATED WITHIN THE ZONE X FLOOD ZONE, AS SHOWN ON THE FLOOD INSURANCE RATE MAP, COMMUNITY PANEL NO. 25027c0780e WHICH BEARS AN EFFECTIVE DATE OF JULY 4, 2011.

SITE LAYOUT NOTES

1. THE BUILDING OUTLINE SHOWN ON THIS PLAN DEPICTS THE FINISH TO FINISH EXTENTS OF THE BUILDING. CONTRACTOR SHALL REFER TO THE ARCHITECTURAL DRAWINGS FOR FOUNDATION PLANS FOR THE PURPOSE OF STAKING OUT THE BUILDING. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT BUILDING DIMENSIONS AND EXTERIOR FEATURES INCLUDING UTILITY METERS, BOLLARDS, DOORS, PILASTERS, RAMPS, ETC.
2. BUILDING SIDEWALK DIMENSIONS ARE MEASURED FROM EXTERIOR FINISH MATERIAL OF STRUCTURE.
3. ALL LIMITS OF PAVEMENT SHALL BE CURBED, UNLESS OTHERWISE NOTED.
4. ALL ONSITE CURB SHALL BE EXTRUDED CONCRETE AND MONOLITHIC CONCRETE, UNLESS OTHERWISE SPECIFIED. OFFSITE CURB SHALL BE VERTICAL GRANITE.
5. NON–ACCESSIBLE PARKING SPACE DIMENSIONS AS SHOWN ON THE PLAN ARE 10' WIDE x 20' LONG, UNLESS OTHERWISE SPECIFIED.
6. ALL PAVEMENT MARKINGS SHALL BE ACCOMPLISHED WITH USE OF PAINTING MACHINES AND/OR STENCILS. ALL PAINT FOR PAVEMENT MARKING SHALL MEET THE REQUIREMENTS OF SOLVENTBORNE APPLICATION RECOMMENDATIONS (LATEX TRAFFIC PAINT BY BENJAMIN MOORE #TD58 LOW VOC). PARKING STALL AND ISLAND STRIPING SHALL BE 4" WIDE AND SHALL BE STRAIGHT WITH A CLEAN EDGE. ALL DIRECTIONAL ARROWS, STOP BARS, ETC. SHALL CONFORM WITH MUTCD. ALL PAVEMENT MARKINGS SHALL HAVE TWO COATS OF PAINT WITH AT LEAST 14 DAYS IN BETWEEN APPLICATIONS.
7. PAVEMENT LETTERS SHALL BE 2' WIDE X 2' LONG.
8. STOP BARS SHALL BE 12" WIDE AND SOLID LINES SHALL BE 4" IN WIDTH (SEE SITE PLAN FOR LENGTH & COLOR).
9. ACCESSIBLE PARKING SPACES SHALL CONFORM TO THE LATEST EDITION OF THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT (ADA) AND THE ARCHITECTURAL ACCESS BOARD (AAB) AS SHOWN ON THE SITE LAYOUT PLAN.
10. ACCESSIBLE PARKING AISLE STRIPING SHALL CONSIST OF 4" SOLID LINES OF LATEX TRAFFIC PAINT BY BENJAMIN MOORE #TD58 LOW VOC ADA BLUE COLOR ORIENTED AT A 45 DEGREE ANGLE AND SPACED 3' ON CENTER.
11. DIRECTIONAL AND ACCESSIBLE SIGNS SHALL CONFORM TO THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR COLOR AND SIZE.
12. ALL FLAT WORK WITHIN THE RIGHT OF WAY SHALL CONFORM TO MUNICIPAL/STATE STANDARDS.
13. REPLACEMENT PAVEMENT AS A RESULT OF UTILITY AND DRAINAGE TRENCHING WITHIN THE RIGHT–OF–WAY SHALL MATCH EXISTING PAVEMENT THICKNESS.
14. SNOW SHALL NOT BE STORED IN ANY LANDSCAPED AREAS, EXCEPT FOR DESIGNATED SNOW STORAGE AREAS, AND SHALL NOT BE STORED IN ANY MANNER WHICH AFFECTS VISIBILITY FOR PEDESTRIANS AND VEHICLES. THE CLEARING OF SNOW MUST COMMENCE WHEN STOCKPILED SNOW EITHER IMPEDES THE SIDEWALK OR PARKING SPACE ACCESS, AT WHICH TIME, THE APPLICANT WOULD BE EXPECTED TO REMOVE THE SNOW WITHIN 24 HOURS.
15. SITE LIGHTS TO BE INSTALLED PER DETAIL. CONTRACTOR SHALL NOTIFY THE ENGINEER IF THIS DISTANCE CANNOT BE ACHIEVED DUE TO DRAINAGE OR UTILITY CONFLICTS. REFER TO DETAILS FOR SITE LIGHT POLE BASE DETAILS AND SPECIFICATIONS.

ZONING INFORMATION

ZONING DISTRICT : HIGHWAY BUSINESS -1 (HB-1)

REGULATION	REQUIRED	EXISTING	PROPOSED LOW
MIN. LOT AREA	60,000 SF	40,123 SF±	NO CHANGE
MIN. LOT FRONTAGE	200 FT	200.2 FT±	NO CHANGE
MIN. FY SETBACK	50 FT	54.8 FT±	97.5 FT±
MIN. SY SETBACK	50 FT	30.9 FT±	58.5 FT±
MIN. RY SETBACK	50 FT	93.7 FT±	51.9 FT±
MAX. BUILDING HEIGHT	55 FT/5.5 STORIES	23 FT±	<55 FT
MAX. BUILDING COVERAGE	40%	5%±	10%±

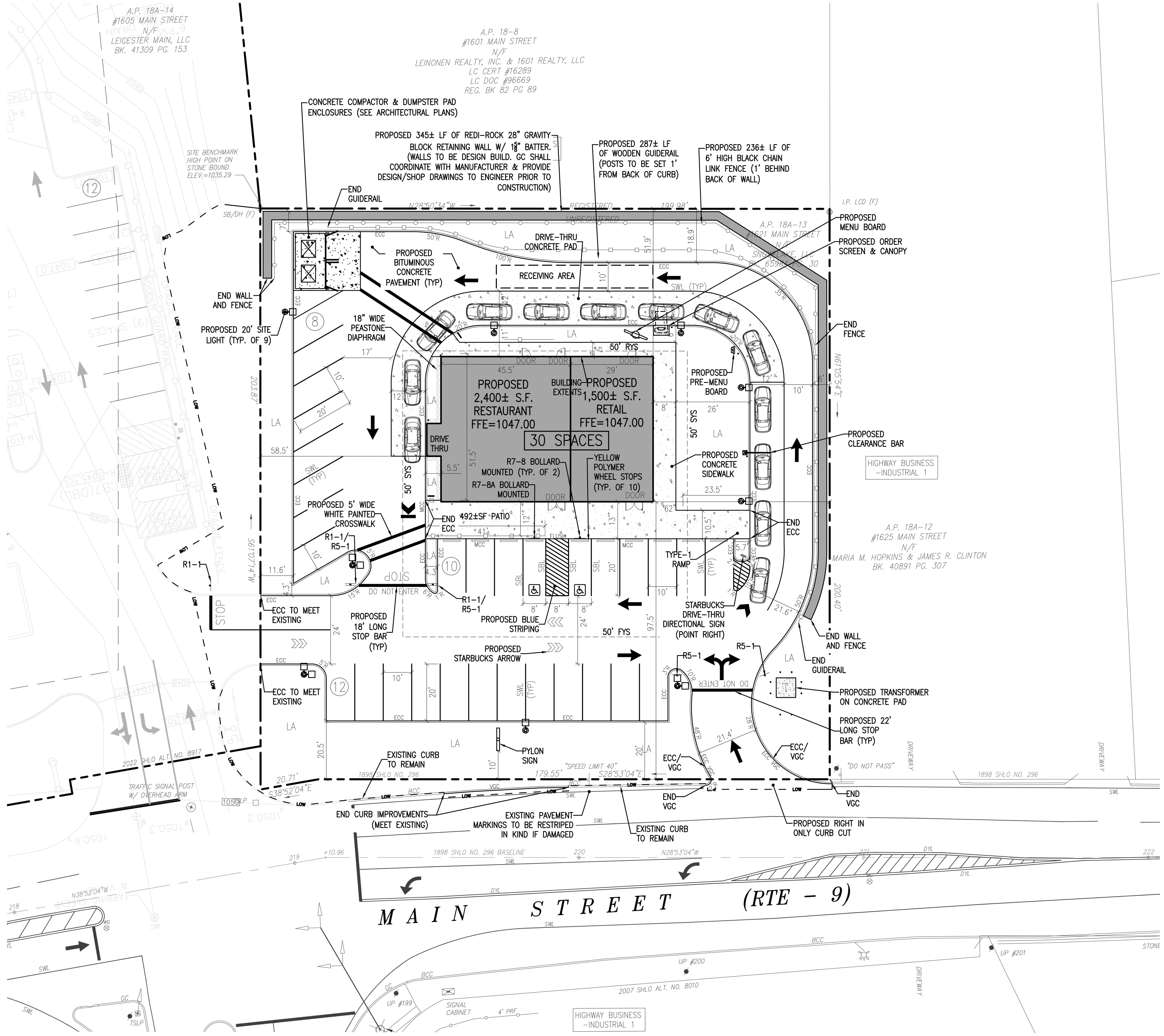
PARKING & LOADING INFORMATION

USE	REQUIRED	PROVIDED
PARKING: RETAIL: 1 SPACE/200 GROSS FLOOR AREA 1,500 SF/200 = 7.5 SPACES RESTAURANTS: 1 SPACE/EMPLOYEE + 1 SPACE/3 SEATS ASSUME 50 SEATS/6 EMPLOYEES = 22.6 SPACES	30 SPACES	30 SPACES
LOADING: ADEQUATE OFF–STREET LOADING FACILITIES AND SPACE MUST BE PROVIDED TO SERVICE ALL NEEDS CREATED BY NEW CONSTRUCTION. FACILITIES SHALL BE SO SIZED AND ARRANGED THAT NO TRUCKS NEED TO BACK ONTO OR OFF A PUBLIC WAY, OR BE PARKED ON A PUBLIC WAY WHILE LOADING OR UNLOADING.		PROVIDED

LAND COVERAGE CALCULATIONS

TOTAL DISTURBED AREA: 0.92± ACRES

COVER	EXISTING	PROPOSED
BUILDING	0.04± AC	0.09± AC
PAVEMENT/CONCRETE	0.08± AC	0.59± AC
OPEN SPACE	0.80± AC	0.24± AC
TOTAL	0.92± AC	0.92± AC



MUTCD REFERENCE	SIGN (METAL)
R1–1 30"x30"	STOP
R7–8 12"X18"	RESERVED PARKING
R7–8a 12"X18"	VAN ACCESSIBLE
R3–5 30"X30"	DO NOT ENTER

LEGEND

EXISTING	PROPOSED	DESCRIPTION
		PROPERTY LINE
		BUILDING SETBACK/ BUFFER
	6	PARKING SPACES
	2'R	CURB RADIUS
		ACCESSIBLE PAVEMENT MARKINGS
		RAMP UPSLOPE DIRECTION
		SIGN
		LIGHT
		UTILITY POLE
		WOODEN GUIDE RAIL
		PAINTED ARROW
		DIRECTIONAL ARROW
		CONCRETE PAD/SIDEWALK
		ACCESSIBLE RAMP
I.P.		IRON PIPE/IRON PIN

GENERAL ABBREVIATIONS

ASSESSORS PARCEL	A.P.
BOTTOM OF CURB	BC
BITUMINOUS CONCRETE CURB	BCC
BITUMUNOUS CONCRETE	BIT. CONC
BOTTOM OF WALL	BW
CATCH BASIN	CB
CAPE COD BERM	CCB
CHAIN LINK FENCE	C.L.F.
CLEANOUT	CO
CONCRETE SURFACE	CONC
DRAIN MANHOLE	DMH
DOUBLE WALL FIBER GLASS	DWFG
DASHED WHITE LINE	DWL
DOUBLE YELLOW CENTERLINE	DYCL
EDGE OF CONCRETE	EOC
EDGE OF PAVEMENT	EOP
EXTRUDED CONCRETE CURB	ECC
FINISHED FLOOR ELEVATION	FF=
FRONT YARD	FY
VERTICAL GRANITE CURB	GC
SLOPED GRANITE CURB	SGC
GAS METER	GM
HIGH DENSITY POLYETHYLENE PIPE	HDPE
INVERT ELEVATION	I=
LINEAL FEET	LF
LANDSCAPED AREA	LA
MONOLITHIC CONCRETE CURB	MCC
MATCH EXISTING	ME
INVERT NOT AVAILABLE	N/A
NOW OR FORMERLY	N/F
ON CENTER	OC
PRECAST CONCRETE CURB	PCC
RIM ELEVATION	R=
ROOF DRAIN	RD
REMOVE	REM
REAR YARD	RY
SOLID WHITE EDGE LINE	SWEL
SOLID WHITE LINE	SWL
SIDE YARD	SY
SOLID YELLOW LINE	SYL
TOP OF CURB	TC
TOP OF WALL	TW
UTILITY POLE	UP

NOT FOR CONSTRUCTION

CDG PROJECT #: 23028

REVISIONS:

REV	DATE	COMMENT
1		
2		
3		
4		
5		
6		
7		
8		
9		

SEAL:

COMMONWEALTH OF MASSACHUSETTS
PHILIP R. HENRY
CIVIL
No. 48547
REGISTERED PROFESSIONAL ENGINEER

PHILIP R. HENRY, P.E.

PLANNING BOARD:

CIVIL ENGINEER:

CIVIL DESIGN GROUP, LLC

21 HIGH STREET, SUITE 207
NORTH ANDOVER, MA 01845
www.cdgengineering.com
p: 978-794-5400 f: 978-965-3971

PREPARED FOR:

HY VENTURES LEICESTER, LLC

313 BOSTON POST ROAD WEST
MARLOROUGH, MA 01752

PROJECT:

PROPOSED RETAIL DEVELOPMENT

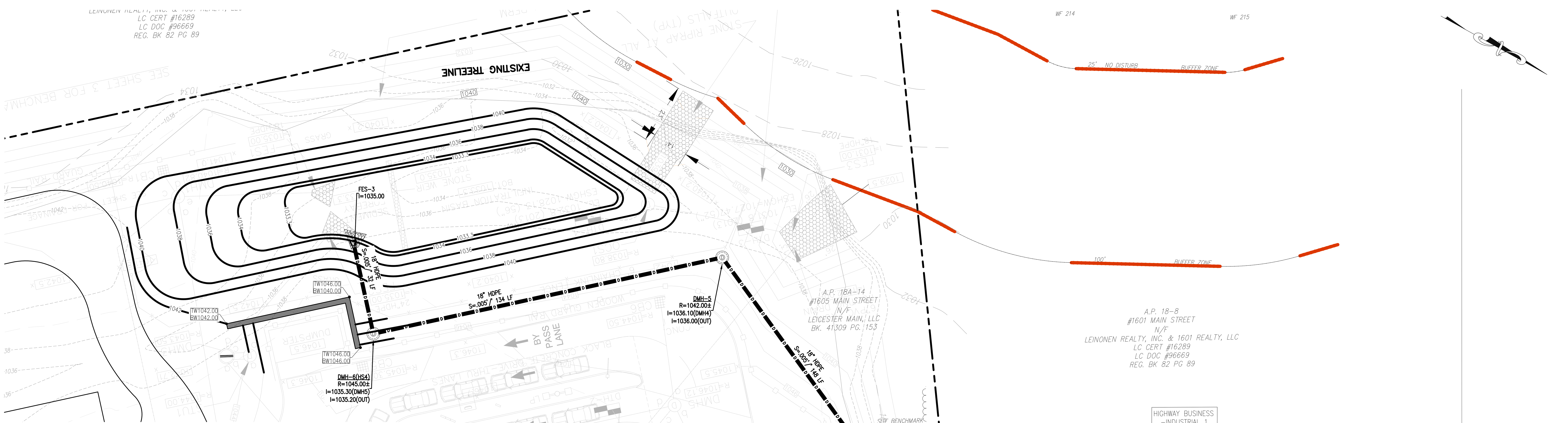
1621 MAIN STREET (RT-9)
LEICESTER, MA 01524

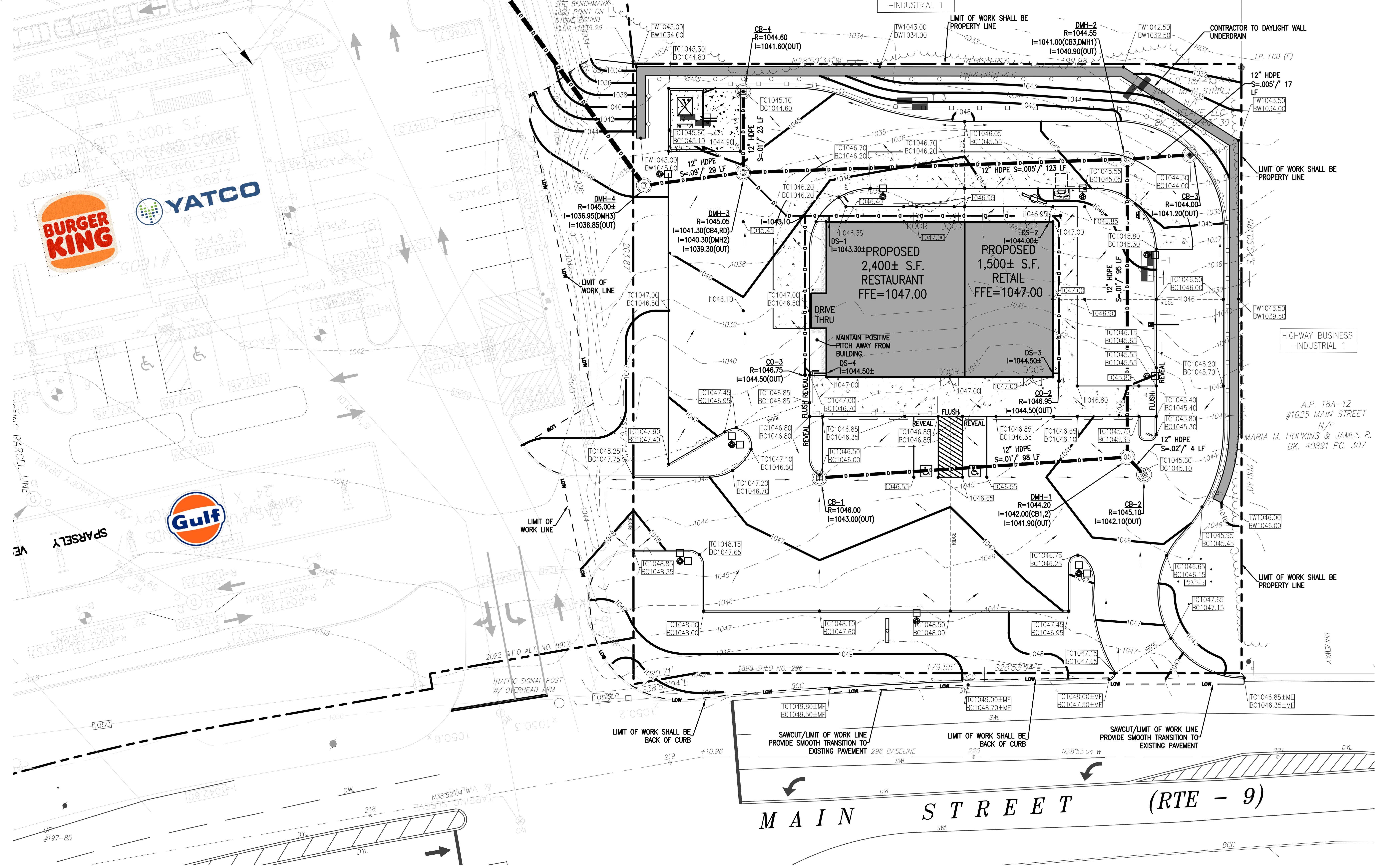
SCALE: 20 0 10 20 40
GRAPHIC SCALE IN FEET

SHEET: **SITE PLAN**

4

DATE: 08/21/2023





GRADING & DRAINAGE NOTES

1. THE ELEVATIONS SHOWN ON THIS PLAN ARE BASED ON THE DATUM REFERENCE ON THE EXISTING CONDITIONS PLAN.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING ALL CONTROL POINTS AND ELEVATION BENCHMARKS THROUGHOUT CONSTRUCTION.
3. EXTERIOR ELEVATIONS ALONG EACH BUILDING SIDE MAY VARY IN ORDER TO ACHIEVE GRADE IN CERTAIN AREAS. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE AWAY FROM THE PROPOSED BUILDING.
4. NEW SIDEWALKS SHALL HAVE A MAXIMUM CROSS SLOPE OF 2.0% AND A MAXIMUM RUNNING SLOPE OF 5.0% UNLESS AN ADA COMPLIANT RAMP IS PROVIDED. RAMPS SHALL NOT EXCEED AN 8.0% RUNNING SLOPE AND SHALL NOT EXCEED A 6" RISE UNLESS A HANDRAIL IS PROVIDED. FURTHERMORE, ACCESSIBLE PARKING SPACES AND PROXIMATE ACCESS AISLES SHALL BE SLOPED AT A MAXIMUM OF 2.0% IN ALL DIRECTIONS. SHOULD ANY DISCREPANCIES WITH THESE REQUIREMENTS ARISE DURING CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY SO THAT AN ACCEPTABLE SOLUTION CAN BE DETERMINED.
5. CONTRACTOR SHALL NOTIFY ENGINEER IF THE ILLUSTRATED GRADES CANNOT BE ACHIEVED WITHIN ACCESSIBLE AREAS, INCLUDING PARKING SPACES, ROUTES AND RAMPS.
6. UNLESS OTHERWISE SPECIFIED, THE CONTRACTOR SHALL PROVIDE AS–BUILT RECORDS OF ALL CONSTRUCTION (INCLUDING UNDERGROUND UTILITIES) TO THE OWNER AT THE END OF THE CONSTRUCTION.
7. CURB SHALL TRANSITION FROM FLUSH TO FULL DEPTH REVEAL WITHIN 6 FEET.
8. PROPOSED BOTTOM OF CURB ELEVATIONS ALONG EXISTING STREETS ARE BASED ON EXISTING CONDITIONS INFORMATION AND SHALL BE CONSIDERED APPROXIMATE. CONTRACTOR SHALL MATCH EXISTING EDGE OF PAVEMENT GRADE.
9. EXISTING DRAINAGE AND UTILITY RIM ELEVATIONS LOCATED WITHIN THE LIMIT OF WORK TO REMAIN SHALL BE ADJUSTED BY THE CONTRACTOR TO MATCH NEW FINISHED GRADE.
10. ALL FLAT WORK WITHIN THE RIGHT OF WAY SHALL CONFORM TO MUNICIPAL/STATE STANDARDS.
11. EXISTING TREES OUTSIDE OF THE LIMIT OF WORK SHALL BE PROTECTED DURING CONSTRUCTION.
12. ALL DISTURBED AREAS OUTSIDE THE LIMIT OF WORK SHALL BE RESTORED IN KIND.
13. NEW DRAINAGE PIPE SHALL BE DUAL WALL CORRUGATED HDPE (ADS N–12 OR APPROVED EQUAL), UNLESS OTHERWISE SPECIFIED.
14. ROOF DRAIN LEADERS SHALL BE 6" HDPE PIPE, UNLESS OTHERWISE SPECIFIED.
15. ELEVATION OF LANDSCAPED AREAS ARE GIVEN AT PLANTED/SOD GRADE.
16. ANY DISTURBED AREAS THAT WILL NOT BE STABILIZED BY PAVEMENT OR BUILDING BASE COURSES SHALL BE SODDED OR SEEDED & MULCHED. MULCHING SHALL BE USED TO STABILIZE DISTURBED AREAS.
17. ALL BACK FILL SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER. BACK FILL SHALL BE NON–PLASTIC IN NATURE, FREE FROM ROOTS, VEGETATIVE MATTER, WASTE, CONSTRUCTION MATERIALS, OR OTHER OBJECTIONABLE MATERIAL. BACK FILL MATERIALS SHALL BE CAPABLE OF BEING COMPACTED BY MECHANICAL MEANS AND THE MATERIAL SHALL HAVE NO TENDENCY TO FLOW OR BEHAVE IN A PLASTIC MANNER UNDER TAMPING BLOWS OR PROOF ROLLING. ALL BACK FILL MATERIAL SHALL BE PLACED IN LOOSE 6–IN. LIFTS AND COMPACTED BY MECHANICAL MEANS, AS SPECIFIED BY THE GEOTECHNICAL ENGINEER.
18. ALL BUILDINGS, SIDEWALK, AND PAVEMENT SUB–GRADES SHALL BE COMPACTED TO 98% OF ASTM D698 TO A DEPTH OF 12–IN. AND TO 95% OF ASTM D698 BELOW 12–IN DEPTHS. ALL OTHER NON–STRUCTURAL AREAS SHALL BE COMPACTED TO 90% OF ASTM D698.

NOT FOR CONSTRUCTION

CDG PROJECT #: 23028

REVISIONS:

REV	DATE	COMMENT
1		
2		
3		
4		
5		
6		
7		
8		
9		

SEAL:

COMMONWEALTH OF MASSACHUSETTS — PHILIP R. HENRY — CIVIL — No. 48547 — REGISTERED PROFESSIONAL ENGINEER

PHILIP R. HENRY, P.E.

PLANNING BOARD:

CIVIL ENGINEER:

CIVIL DESIGN GROUP, LLC
21 HIGH STREET, SUITE 207
NORTH ANDOVER, MA 01845
www.cdgengineering.com
p: 978-794-5400 f: 978-965-3971

PREPARED FOR:

HY VENTURES LEICESTER, LLC
313 BOSTON POST ROAD WEST
MARLOROUGH, MA 01752

PROJECT:

PROPOSED RETAIL DEVELOPMENT
1621 MAIN STREET (RT-9)
LEICESTER, MA 01524

SCALE: 20 0 10 20 40
GRAPHIC SCALE IN FEET

SHEET: GRADING & DRAINAGE PLAN
5

DATE: 08/21/2023

UTILITY NOTES

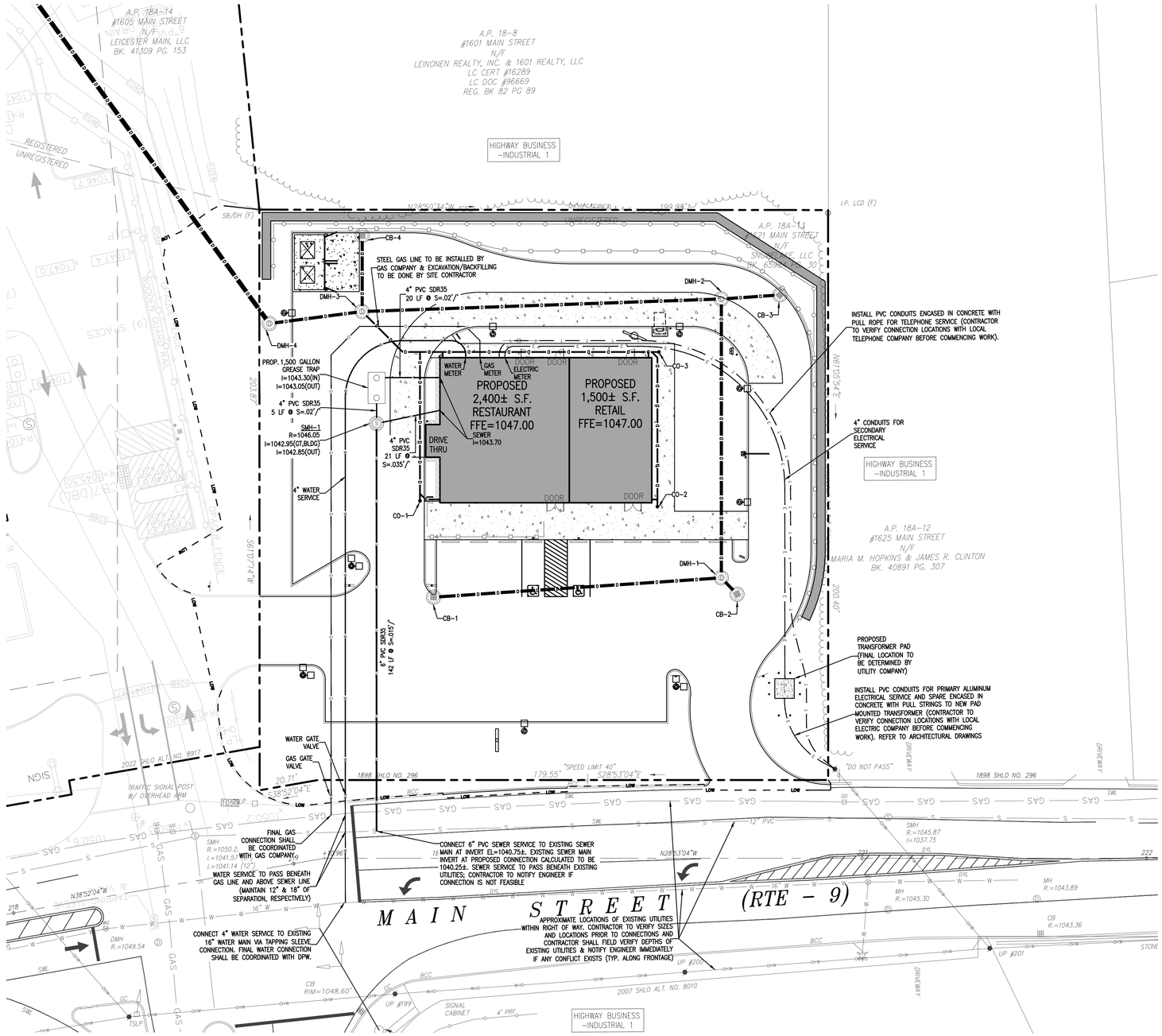
1. ALL WATER SERVICES SHALL BE INSTALLED WITH A MINIMUM 5'-6" AND A MAXIMUM OF 6' OF COVER EXCEPT AS NOTED OR DETAILED OTHERWISE. GREATER DEPTHS ARE PERMITTED WHERE REQUIRED TO AVOID CONFLICTS WITH OTHER UTILITIES.
2. ALL WATER SERVICE INSTALLATION METHODS AND TESTING REQUIREMENTS SHALL MEET OR EXCEED ALL LOCAL MUNICIPAL REQUIREMENTS.
3. EXISTING WATER, SEWER, ELECTRICAL, TELEPHONE AND GAS LINES DEPICTED ON THIS PLAN ARE BASED ON RECORD DRAWINGS. CONTRACTOR SHALL VERIFY SIZE AND LOCATION OF ALL UTILITIES PRIOR TO CONNECTION.
4. PROPOSED GAS SERVICE LOCATION IS APPROXIMATE ONLY. THE CONTRACTOR SHALL CONFIRM WITH THE GAS COMPANY THAT GAS LINE INSTALLATION SHALL BE BY THE LOCAL GAS COMPANY. THE CONTRACTOR SHALL GIVE THE GAS COMPANY ADVANCE NOTICE OF WHEN THE GAS LINE CAN BE INSTALLED. THE CONTRACTOR IS RESPONSIBLE FOR ALL EXCAVATION, BACKFILL AND COMPACTION FOR THE GAS LINE.
5. DUE TO THE SCALE OF THE SITEWORK DRAWINGS, THE EXACT LOCATION OF UTILITY SERVICES TO THE BUILDING SHALL BE VERIFIED WITH THE BUILDING DRAWINGS.
6. ALL UTILITIES, PIPE MATERIALS, STRUCTURES, AND INSTALLATION METHODS SHALL CONFORM TO MUNICIPALITY STANDARDS AND REQUIREMENTS.
7. SUITABLE, TEMPORARY PLUGS SHALL BE INSTALLED IN THE OPEN ENDS OF UTILITY SERVICES TO THE BUILDING PRIOR TO BACKFILLING. STUB LOCATIONS SHALL BE MARKED IN THE FIELD SO THAT THEY MAY BE EASILY LOCATED.
8. WATER & SEWER SERVICE CONNECTIONS SHALL BE INSPECTED BY THE MUNICIPAL WATER & SEWER DEPARTMENT.
9. ALL SITE DRAINAGE, WATER, AND SEWER WORK OUTSIDE THE BUILDING FOOTPRINT SHALL BE PERFORMED BY A LICENSED DRAIN LAYER.
10. EXISTING DRAINAGE AND UTILITY RIM ELEVATIONS LOCATED WITHIN THE LIMIT OF WORK TO REMAIN SHALL BE ADJUSTED BY THE CONTRACTOR TO MATCH NEW FINISHED GRADE.
11. CONTRACTOR TO FIELD VERIFY DEPTH OF EXISTING UTILITIES ALONG THE PATH OF THE PROPOSED UTILITY CONNECTIONS AND NOTIFY ENGINEER IMMEDIATELY IF A CONFLICT EXISTS.
12. EXCAVATION, CONDUIT INSTALLATION AND BACKFILLING FOR ELECTRICAL AND TELEPHONE SERVICES TO BE PERFORMED BY SITE CONTRACTOR.
13. EXISTING WATER, SEWER AND GAS SERVICES SHOULD BE EVALUATED TO DETERMINE IF SUITABLE FOR REUSE BY THE CONTRACTOR AND SHALL NOTIFY THE ENGINEER OF THE SAME. IF EXISTING UTILITIES ARE DEEMED TO NOT BE SUITBALE, THEY ARE TO BE CUT & CAPPED AT THE MAIN AND SERVICE LINES SHALL BE REMOVED, UNLESS OTHERWISE SPECIFIED BY THE MUNICIPALITY AND/OR UTILITY COMPANY. AS SUCH, THE SAWCUT LINES SHOWN ON THESE PLANS DO NOT ACCOUNT FOR THE REMOVAL OF THE EXISIING UTILITIES BUT THE CONTRACTOR SHALL ASSUME REMOVAL FOR THE PURPOSES OF BIDDING THE PROJECT.

LEGEND

EXISTING	PROPOSED	DESCRIPTION
		PROPERTY LINE
Ⓓ	Ⓓ	DRAIN MANHOLE
□	▩	CATCH BASIN
Ⓢ	Ⓢ	SEWER MANHOLE
Ⓣ EMH		TELEPHONE MANHOLE
D	D	DRAIN PIPE
G		GAS LINE
OHW		OVERHEAD WIRES
UE		UNDERGROUND WIRES
T		TELEPHONE LINE
W	W	WATER LINE
S		SEWER LINE
		ACCESSIBLE PAVEMENT MARKINGS
		SIGN
☼	□	LIGHT
●		UTILITY POLE
		CONCRETE SIDEWALK/PAD
		BIT. CONC. SIDEWALK
◉ I.P.		IRON PIPE/IRON PIN

GENERAL ABBREVIATIONS

ASSESSOR'S PARCEL	A.P.
BOTTOM OF CURB	BC
BITUMINOUS CONCRETE CURB	BCC
BITUMINOUS CONCRETE	BIT. CONC
BOTTOM OF WALL	BW
CATCH BASIN	CB
CHAIN LINK FENCE	C.L.F.
DRAIN CLEANOUT	DCO
SEWER CLEANOUT	SCO
CONCRETE SURFACE	CONC
DRILL HOLE FOUND	DH (F)
DRAIN MANHOLE	DMH
DOUBLE WALL FIBER GLASS	DWFG
DASHED WHITE LINE	DWL
DOUBLE YELLOW CENTERLINE	DYCL
EDGE OF PAVEMENT	EOP
EXTRUDED CONCRETE CURB	ECC
ELECTRIC HANDHOLE	EHH
FINISHED FLOOR ELEVATION	FF=
FRONT YARD	FY
VERTICAL GRANITE CURB	GC
GAS METER	GM
HIGH DENSITY POLYETHYLENE PIPE	HDPE
INVERT ELEVATION	I=
LINEAL FEET	LF
LANDSCAPED AREA	LA
MONOLITHIC CONCRETE CURB	MCC
MATCH EXISTING	ME
INVERT NOT AVAILABLE	N/A
NOW OR FORMERLY	N/F
ON CENTER	OC
RIM ELEVATION	R=
ROOF DRAIN	RD
REMOVE	REM
REAR YARD	RY
SEWER FORCE MAIN	SFM
SOLID WHITE EDGE LINE	SWEL
SOLID WHITE LINE	SWL
SIDE YARD	SY
SLOPED GRANITE CURB	SGC
TOP OF CURB	TC
TOP OF WALL	TW
UTILITY POLE	UP
VITRIFIED CLAY	VC
WATER GATE	WG
WATER SHUT-OFF	WSO



NOT FOR CONSTRUCTION

CDG PROJECT #: 23028

REVISIONS:

REV	DATE	COMMENT
1		
2		
3		
4		
5		
6		
7		
8		
9		

SEAL:

COMMONWEALTH OF MASSACHUSETTS
PHILIP R. HENRY
CIVIL
No. 48547
REGISTERED PROFESSIONAL ENGINEER

PHILIP R. HENRY, P.E.

PLANNING BOARD:

CIVIL ENGINEER:

CIVIL DESIGN GROUP, LLC
21 HIGH STREET, SUITE 207
NORTH ANDOVER, MA 01845
www.cdgengineering.com
p: 978-794-5400 f: 978-965-3971

PREPARED FOR:

HY VENTURES LEICESTER, LLC

313 BOSTON POST ROAD WEST
MARLOROUGH, MA 01752

PROJECT:

PROPOSED RETAIL DEVELOPMENT

1621 MAIN STREET (RT-9)
LEICESTER, MA 01524

SCALE:

20 0 10 20 40
GRAPHIC SCALE IN FEET

SHEET:

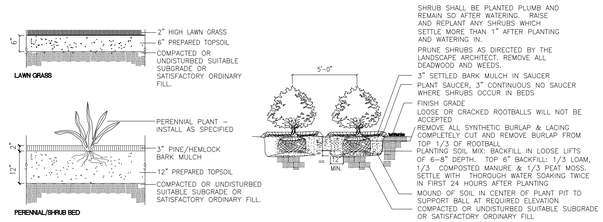
UTILITY PLAN

6

DATE: 09/08/2023

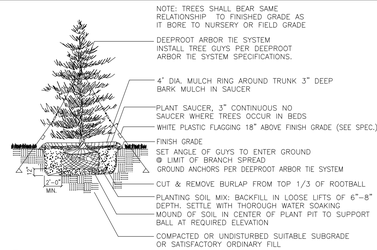
PLANT MATERIAL LIST

SYM.	QTY.	BOTANICAL NAME	COMMON NAME	SIZE
DECIDUOUS AND ORNAMENTAL TREES				
LS	5	LIQUIDAMBAR STYRACIFLUA	AMERICAN SWEETGUM	2–2 1/2"
TC	3	TSUGA CANADENSIS	CANADIAN HEMLOCK	2–2 1/2"
TCG	3	TILIA CORDATA GREENSPIRE	GREENSPIRE LITTLE LEAF LINDEN	2–2 1/2"
SHRUBS				
AZ	4	AZALEA DELAWARE VALLEY WHITE	AZALEA DELAWARE VALLEY WHITE	#5
IL	3	ILIX OPACA	AMERICAN HOLLY	#5
VIB	2	VIBURNUM CARLESI	MAYFLOWER VIBURNUM	#5
PERENNIALS AND GRASSES				
CA	46	CALAMAGROSTIS X ACUTIFLORA	FEATHER REED GRASS	1 GAL
FE	44	FESTUCA c. 'ELIJAH BLUE'	ELIJAH BLUE FESCUE	1 GAL
HH	46	HEMEROCALLIS 'HAPPY RETURNS'	HAPPY RETURNS DAYLILLIES	1 GAL
IS	46	IRIS SIBERICA 'CAESAR'S BROTHER'	CAESAR'S BROTHER'S IRIS	1 GAL

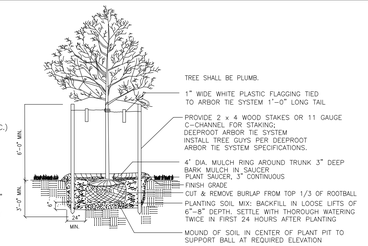


1 **PERENNIAL, LAWN + NATURALIZED GRASS**
SCALE: N.T.S.

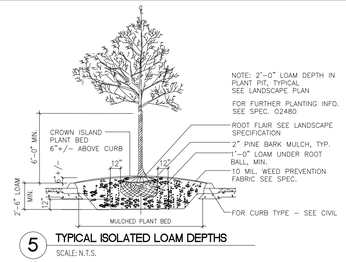
2 **TYPICAL SHRUB PLANTING**
SCALE: N.T.S.



3 **EVERGREEN TREE PLANTING**
SCALE: N.T.S.



4 **DECIDUOUS TREE PLANTING AND STAKING**
SCALE: N.T.S.



5 **TYPICAL ISOLATED LOAM DEPTHS**
SCALE: N.T.S.

GENERAL NOTES

1. CONTRACTOR SHALL MAKE A SITE VISIT PRIOR TO BIDDING TO EXAMINE EXISTING CONDITIONS FOR THEMSELVES. CONTRACTOR TO FAMILIARIZE THEMSELVES WITH DESIGN DOCUMENTS, NOTES & DETAILS AND THE MASSDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, CURRENT EDITION.
2. CONTRACTOR SHALL NOTIFY/COORDINATE WITH THE MUNICIPALITY PRIOR TO PLANT MATERIAL INSTALLATION.
3. PRIOR TO THE PRE–CONSTRUCTION MEETING, THE CONTRACTOR SHALL CONTACT DIG SAFE @ 1–888–344–7233 TO HAVE THE EXISTING UTILITIES MARKED.
4. THE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIAL IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTING SHOWN ON THE DRAWINGS. SEE SPECIFICATION.
5. ALL PLANT MATERIAL SHALL CONFORM TO THE GUIDELINES ESTABLISHED BY "THE AMERICAN STANDARD FOR NURSERY STOCK," PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC. ANSI Z60.1–CURRENT EDITION.
6. ALL PLANTS TO BE BALLED IN BURLAP OR CONTAINER GROWN. NO PLASTIC BURLAP.
7. THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL PLANT MATERIALS FOR ONE (1) FULL YEAR FROM DATE OF ACCEPTANCE.
8. HEAL ALL CONSTRUCTION SCARS WITH NATURALIZED GRASS, LAWN OR MULCH AS INDICATED ON PLAN.
9. "DRY ROOTS" SHALL BE ADDED TO ALL NEW TREE PLANTING PITS. ALL NEW LOAM SHALL BE TESTED AND AMENDED AS STATED IN THE LOAM REPORT PROVIDED BY LOAM SUPPLIER.
10. LANDSCAPE CONTRACTOR SHALL SUBMIT A WATERING SCHEDULE PROGRAM FOR THE 60 DAY MAINTENANCE PERIOD TO OWNER FOR ALL PROPOSED PLANT MATERIAL.
11. PROTECT EXISTING PLANT MATERIAL WITHIN CONSTRUCTION LIMITS. PROVIDE WATERING PROGRAM FOR ALL PROPOSED PLANT MATERIAL DURING CONSTRUCTION.

LANDSCAPE NOTES

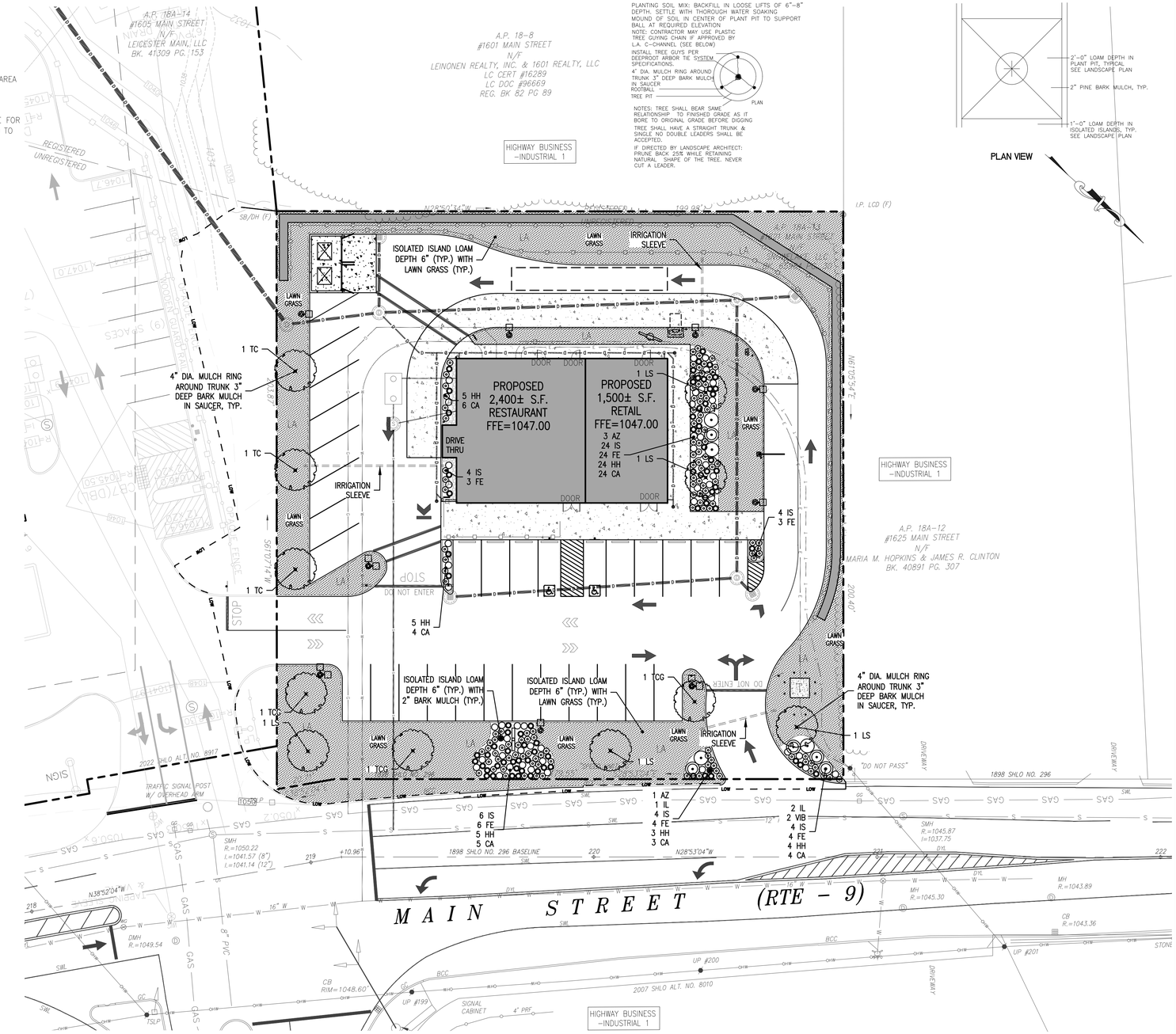
1. LOAM DEPTHS SHALL BE AS FOLLOWS:
   - LAWN AREAS: 6" ROLLED THICKNESS
   - PLANT BEDS: 1'–0" LOAM DEPTH IN THE PLANTED AREA WITH 2" MULCH
   - ISOLATED PLANTED ISLANDS: 1'–0" LOAM DEPTH
2. LAWN GRASS SHALL BE LANDSCAPE/UTILITY MIXTURE FOR SUN/SHADE AND MAY INCLUDE BUT IS NOT LIMITED TO THE FOLLOWING SPECIES:
   - ENCHANTED PERENNIAL RYEGRASS
   - CREEPING RED FESCUE
   - GOLDRUSH KENTUCKY BLUEGRASS

IRRIGATION NOTES

1. THE DESIGN/BUILD IRRIGATION SUB–CONTRACTOR SHALL PROVIDE A COMPLETE SYSTEM FOR THE IRRIGATION AREAS SHOWN ON THE PLAN, WHICH INCLUDES NEW AND EXISTING TRANSPLANTED PLANT MATERIALS. SHOP DRAWINGS SHALL BE PROVIDED AT A SUITABLE SCALE TO ILLUSTRATE THAT THE DESIGNATED PLANT MATERIALS WILL BE IRRIGATED BY EITHER SPRAY HEADS, MIST HEADS OR DRIP IRRIGATION TUBING.
2. IRRIGATION TO BE COORDINATED WITH GENERAL CONTRACTOR TO LOCATE THE NECESSARY PVC SLEEVING TO COMPLETE IRRIGATION PROGRAM.
3. ALL LAWN AREAS SHALL BE SPRAY HEAD IRRIGATED. THE HEADS SHALL BE LOCATED FOR HEAD TO HEAD COVERAGE WITH ABSOLUTELY NO OVER–SPRAY ONTO THE PAVEMENT.
4. ALL TREES, SHRUBS AND GROUND COVER SHALL BE DRIP IRRIGATED/IRRIGATED WITH SHRUB MIST HEADS. CONTRACTOR SHALL BE AWARE THAT THE IRRIGATION SYSTEM SHALL BE ROUTED TO THE PYLON SIGN PLANTINGS AND PLANTERS AROUND THE BUILDING.
5. THE IRRIGATION LAYOUT AND ALL OF THE COMPONENTS SHALL CONFORM TO THE SPECIFICATIONS. THE SPECIFICATIONS CALL FOR SHOP DRAWINGS TO BE SUBMITTED FOR APPROVAL, AS WELL AS CONFORMANCE TO THE MATERIALS SPECIFIED.
6. THE CONTRACTOR SHALL BE EXTREMELY CAREFUL DURING THE INSTALLATION PROCESS NOT TO DISTURB NEW OR EXISTING PLANT MATERIALS. THE CONTRACTOR IS TO COORDINATE HIS WORK WITH OTHER SUB–CONTRACTORS.
7. SLEEVING UNDER PAVEMENTS MUST BE AVAILABLE AND IN THE PROPER LOCATION PRIOR TO PAVING.
8. THE IRRIGATION CONTRACTOR SHALL CONFORM TO ANY LOCAL CODES OR ORDINANCES THAT MAY BE REQUIRED TO COMPLETE THE WORK.
9. THE IRRIGATION ALTERNATE SHALL INCLUDE THE COST OF CONNECTING TO THE BUILDING WATER SERVICE DOWN STREAM OF THE BACK FLOW PREVENTER OF THE IRRIGATION WELL.
10. THE IRRIGATION CONTRACTOR SHALL TEST WATER SOURCE FOR WATER QUALITY INCLUDING MINERALS THAT MAY CAUSE STAINING OF CONCRETE, GRANITE, PAVEMENT & CURBS.

LEGEND

- PROTECT EXISTING TREES TO REMAIN, TYP.
- ORNAMENTAL & FLOWERING TREES (DRIP OR MIST HEAD IRRIGATION)
- PERENNIALS (DRIP OR MIST HEAD IRRIGATION)
- SEEDED LAWN (SPRAY–HEAD IRRIGATION)
- IRRIGATION SLEEVES



NOT FOR CONSTRUCTION

CDG PROJECT #: 23028

REVISIONS:

REV	DATE	COMMENT
1		
2		
3		
4		
5		
6		
7		
8		
9		

SEAL:

COMMONWEALTH OF MASSACHUSETTS
PHILIP R. HENRY
CIVIL
No. 48547
REGISTERED PROFESSIONAL ENGINEER

PHILIP R. HENRY, P.E.

PLANNING BOARD:

CIVIL ENGINEER:

CIVIL DESIGN GROUP, LLC
21 HIGH STREET, SUITE 207
NORTH ANDOVER, MA 01845
www.cdgengineering.com
p: 978-794-5400 f: 978-965-3971

PREPARED FOR:

HY VENTURES LEICESTER, LLC

313 BOSTON POST ROAD WEST MARLOROUGH, MA 01752

PROJECT:

PROPOSED RETAIL DEVELOPMENT

1621 MAIN STREET (RT-9) LEICESTER, MA 01524

SCALE: 20 0 10 20 40
GRAPHIC SCALE IN FEET

SHEET: **LANDSCAPE PLAN**

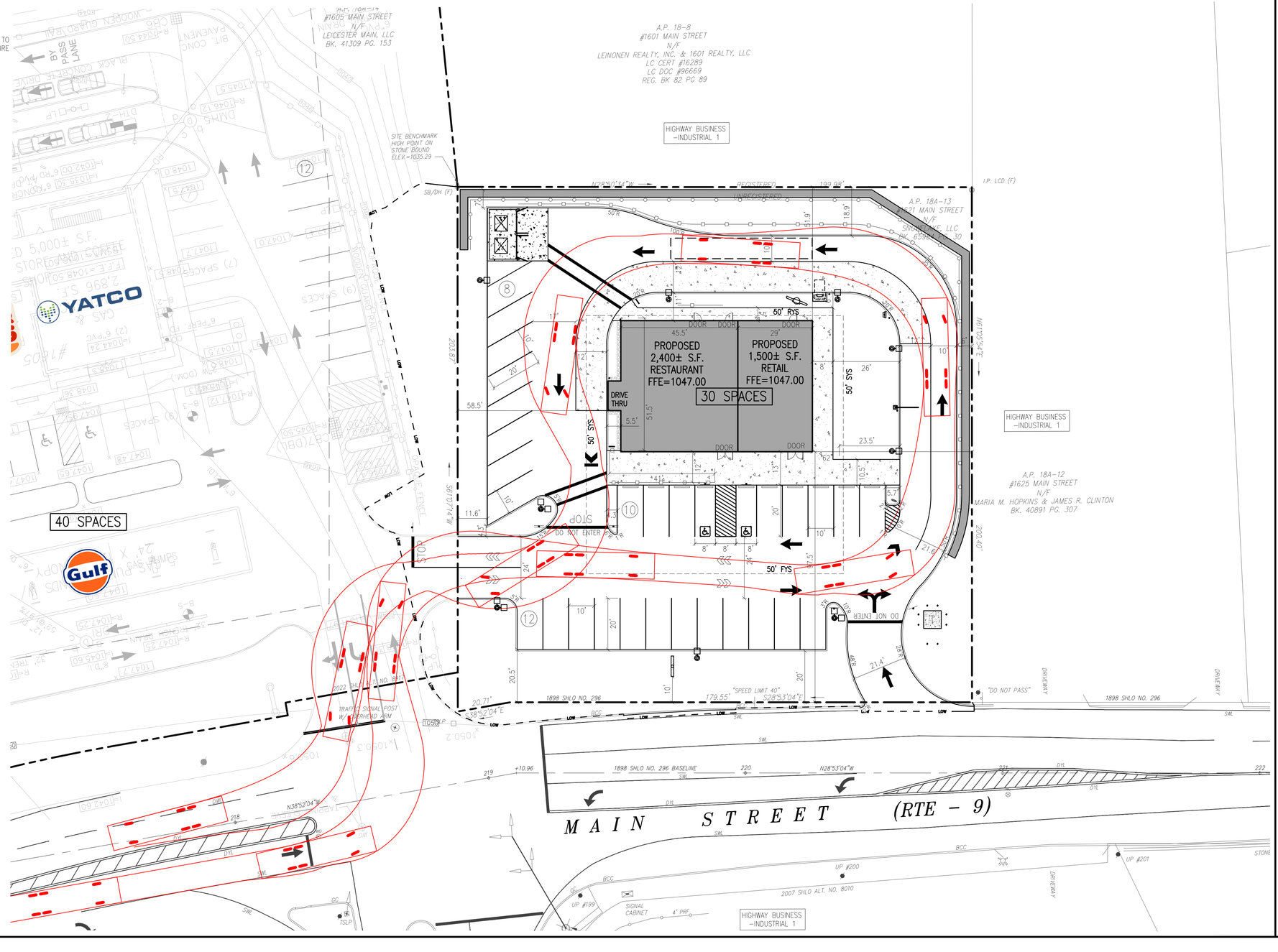
7

DATE: 08/21/2023

BOARD OF FIRE PREVENTION REGULATION COMPLIANCE

1. IN ACCORDANCE WITH 527 CMR 1 SECTION 18.1.1.4, FIRE APPARATUS MANEUVERS / VEHICLE SWEPT PATHS HAVE BEEN PROVIDED.
2. IN ACCORDANCE WITH 527 CMR 1 SECTION 18.1.1.5, THIS PLAN BEARS THE SEAL OF A REGISTERED PROFESSIONAL ENGINEER.
3. IN ACCORDANCE WITH 527 CMR 1 SECTION 18.2.3.2.1.1, ACCESS ROADS EXTEND TO WITHIN 150' OF AT LEAST ONE EXTERIOR DOOR THAT CAN BE OPENED FROM THE OUTSIDE.
4. IN ACCORDANCE WITH 527 CMR 1 SECTION 18.2.3.2.2.1, ANY PORTION OF THE EXTERIOR WALL OF THE FIRST STORY OF EACH BUILDING IS WITHIN 250' OF AN ACCESS ROAD.
5. IN ACCORDANCE WITH 527 CMR 1 SECTION 18.2.3.4.1.1, ACCESS ROADS HAVE BEEN PROVIDED WITH UNOBSTRUCTED WIDTHS OF NOT LESS THAN 20'.
6. IN ACCORDANCE WITH 527 CMR 1 SECTION 18.2.3.4.1.2, ACCESS ROADS HAVE BEEN PROVIDED WITH UNOBSTRUCTED VERTICAL CLEARANCE OF NOT LESS THAN 13'-6".
7. IN ACCORDANCE WITH 527 CMR 1 SECTION 18.2.3.4.3.1, INSIDE TURNING RADII HAVE BEEN PROVIDED EQUAL TO OR GREATER THAN THE EQUIVALENT OF 25' RADII FOR A 20' WIDE ACCESS ROAD.
8. IN ACCORDANCE WITH 527 CMR 1 SECTION 18.2.3.4.2, ACCESS ROADS HAVE BEEN DESIGNED TO SUPPORT FIRE APPARATUS AND ARE PROVIDED WITH AN ALL-WEATHER DRIVING SURFACE.
9. IN ACCORDANCE WITH 527 CMR 1 SECTION 18.2.3.4.4, TURNAROUND PROVISIONS HAVE BEEN MADE FOR DEAD-END ACCESS ROADS.
10. IN ACCORDANCE WITH 527 CMR 1 SECTION 18.2.3.4.6.1, ACCESS ROAD GRADES DO NOT EXCEED 10%.
11. CIVIL DESIGN GROUP RECOMMENDS THAT THE FIRE TRUCK MANUEVERING BE FIELD VERIFIED AS SOON AS PRACTICABLE WITH THE AMHERST FIRE DEPARTMENT PRESENT TO WITNESS THE SAME. CDG SHALL NOT BE HELD LIABILE FOR THE INABILITY OF THE FIRE TRUCK TO ACCESS AND EXIT THE SITE.

LEICESTER TOWN LADDER 53
TRUCK DIMENSIONS



NOT FOR CONSTRUCTION

CDG PROJECT #: 23028

REVISIONS:

REV	DATE	COMMENT
1		
2		
3		
4		
5		
6		
7		
8		
9		

SEAL:

COMMONWEALTH OF MASSACHUSETTS
PHILIP R. HENRY
CIVIL
No. 48547
REGISTERED PROFESSIONAL ENGINEER

PHILIP R. HENRY, P.E.

PLANNING BOARD:

CIVIL ENGINEER:

CIVIL DESIGN GROUP, LLC
21 HIGH STREET, SUITE 207
NORTH ANDOVER, MA 01845
www.cdgengineering.com
p: 978-794-5400 f: 978-965-3971

PREPARED FOR:

HY VENTURES LEICESTER, LLC

313 BOSTON POST ROAD WEST
MARLOROUGH, MA 01752

PROJECT:

PROPOSED RETAIL DEVELOPMENT

1621 MAIN STREET (RT-9)
LEICESTER, MA 01524

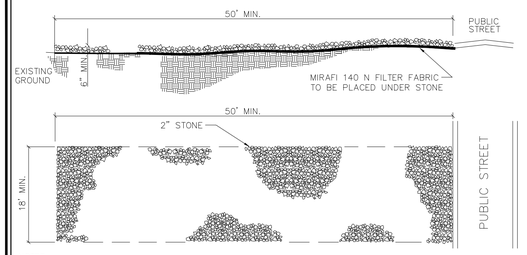
SCALE:
20 0 10 20 40
GRAPHIC SCALE IN FEET

SHEET:

FIRE APPARATUS CIRCULATION PLAN

8

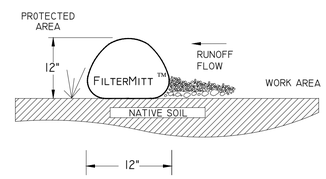
DATE: 08/21/2023



NOTES:
1. A STABILIZED CONSTRUCTION ENTRANCE COMPRISED OF 2" CRUSHED STONE SHALL BE LOCATED WHERE CONSTRUCTION RELATED VEHICLES WILL ACCESS THE CONSTRUCTION SITE ONTO A PUBLIC STREET.
2. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC STREETS OR ADJACENT LAND. ADDITIONAL STONE SHALL BE ADDED AS CONDITIONS WARRANT.
3. ANY SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC STREETS SHALL BE REMOVED IMMEDIATELY.
4. WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTERING A PUBLIC STREET, IF APPLICABLE. WHEEL WASHING SHALL BE DONE IN AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS TO A DESIGNATED SEDIMENT TRAP.

TYPICAL STABILIZED CONSTRUCTION ENTRANCE DETAIL

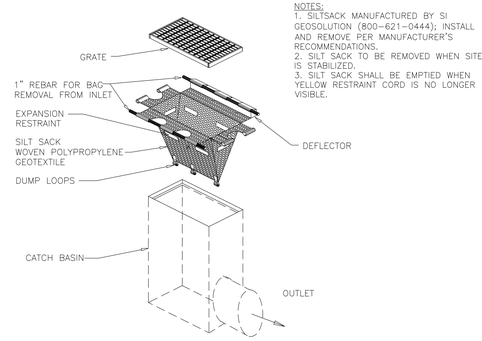
NOT TO SCALE



NOTES:
1. WATTLES SHALL BE FILTERMITT, SILTSOXX, OR APPROVED EQUAL.
2. WATTLES SHALL BE A MINIMUM OF 12" AND SHALL BE BIODEGRADABLE.
3. WATTLES SHALL NOT CONSIST OF STRAW.
4. WATTLES SHALL BE INSPECTED REGULARLY.

TYPICAL WATTLE DETAIL

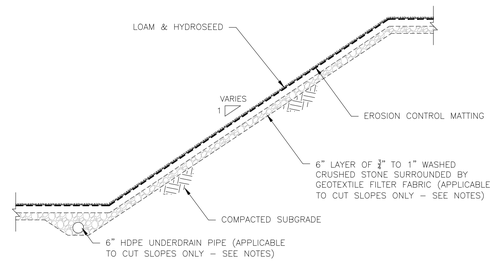
NOT TO SCALE



NOTES:
1. SILTSACK MANUFACTURED BY SI GEOSOLUTION (800-621-0444); INSTALL AND REMOVE PER MANUFACTURER'S RECOMMENDATIONS.
2. SILT SACK TO BE REMOVED WHEN SITE IS STABILIZED.
3. SILT SACK SHALL BE EMPTIED WHEN YELLOW RESTRAINT CORD IS NO LONGER VISIBLE.

TYPICAL SILT SACK DETAIL

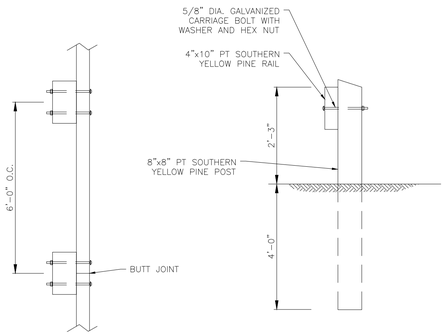
NOT TO SCALE



NOTES:
1. THIS DETAIL APPLIES TO ALL SLOPES 3H:1V AND STEEPER.
2. STONE LAYER AND ASSOCIATED UNDERDRAIN ONLY APPLY WHERE SLOPE IS IN A CUT (NOT APPLICABLE TO FILL SLOPES).

TYPICAL SLOPE STABILIZATION DETAIL

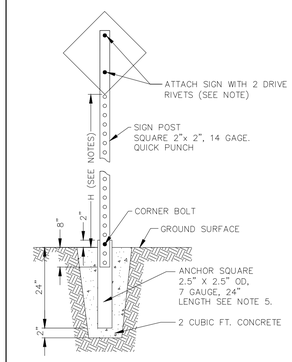
NOT TO SCALE



NOTE:
1. INSTALL RAIL FACE 1.5' FROM FACE OF CURB.

WOODEN GUIDE RAIL DETAIL

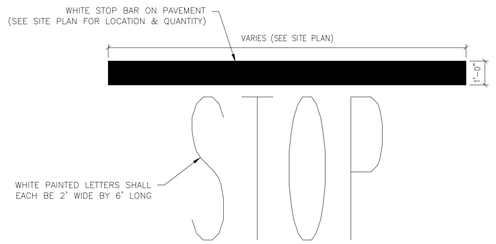
NOT TO SCALE



NOTES:
1. TYPICAL HEIGHT (H) SHALL BE 7'-0", EXCEPT FOR ACCESSIBLE PARKING SIGNAGE, WHICH SHALL HAVE A HEIGHT AS SPECIFIED IN THE APPLICABLE DETAIL.
2. METAL POSTS SHALL BE QUICK PUNCH POST.
3. FOR IN-SIDEWALK INSTALLATIONS, CORE 4" DIA. HOLE. ANCHOR LENGTH MAY BE DECREASED TO 12".
4. POST SHALL BE GALVANIZED ROLLED CARBON SHEET STEEL, ASTM A570 GRADE 50 AND SHALL HAVE 7/16" DIE-PUNCHED KNOCKOUTS ON 1" CENTERS FULL LENGTH, FOUR SIDES.
5. ANCHOR SHALL HAVE 4 7/16" HOLES ONE EACH SIDE 2" FROM TOP END. FINISH SHALL BE ZINC HOT DIPPED GALVANIZED MATERIAL TO MEET ASTM A500 GRADE B.
6. DRIVE RIVETS TO BE TL3806 3/8" DIA.
7. CORNER BOLTS TO BE TLCB516M.
8. SIGNS SHALL BE MOUNTED 7' FROM BOTTOM OF SIGN TO GROUND SURFACE AND 6' FROM THE BOTTOM OF THE LOWER SIGN FOR MULTIPLE SIGNS ON A SINGLE POST, UNLESS OTHERWISE SPECIFIED.
9. GC SHALL BE RESPONSIBLE TO FURNISH AND INSTALL SIGNS AND POSTS.

BREAKAWAY SIGN POST DETAIL

NOT TO SCALE

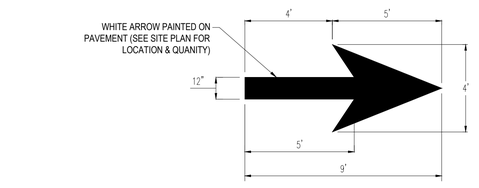


NOTE:

ALL PAVEMENT STRIPING AND MARKINGS SHALL CONSIST OF CHLORINATED RUBBER PAINT APPLIED TO A DRY SURFACE WHEN THE TEMPERATURE IS GREATER THAN 40°F. PAINT SHALL BE APPLIED AT A MINIMUM OF 0.015" (15 MIL) FILM THICKNESS.

TYPICAL PAINTED STOP BAR

NOT TO SCALE

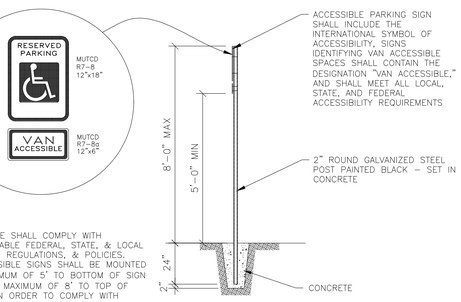


NOTE:

ALL PAVEMENT STRIPING AND MARKINGS SHALL CONSIST OF CHLORINATED RUBBER PAINT APPLIED TO A DRY SURFACE WHEN THE TEMPERATURE IS GREATER THAN 40°F. PAINT SHALL BE APPLIED AT A MINIMUM OF 0.015" (15 MIL) FILM THICKNESS

TYPICAL PAINTED ARROW DETAIL

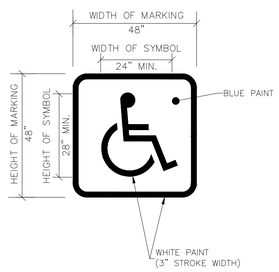
NOT TO SCALE



NOTES:
1. SIGNAGE SHALL COMPLY WITH APPLICABLE FEDERAL, STATE, & LOCAL CODES, REGULATIONS, & POLICIES.
2. ACCESSIBLE SIGNS SHALL BE MOUNTED A MINIMUM OF 5' TO BOTTOM OF SIGN AND A MAXIMUM OF 8' TO TOP OF SIGN IN ORDER TO COMPLY WITH APPLICABLE ADA AND AAB REQUIREMENTS.
3. VAN ACCESSIBLE SIGN SHALL BE USED ON ONE PARKING SPACE PER BUILDING, SUCH THAT THE STRIPED ACCESSIBLE AISLE IS ON THE PASSENGER SIDE OF THE VAN SPACE.

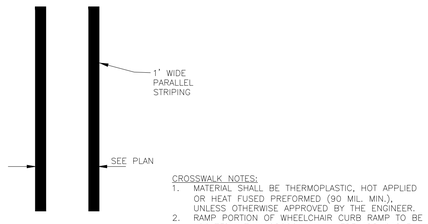
ACCESSIBLE PARKING SIGNAGE DETAIL

NOT TO SCALE



TYPICAL ACCESSIBLE PARKING SPACE MARKING DETAIL

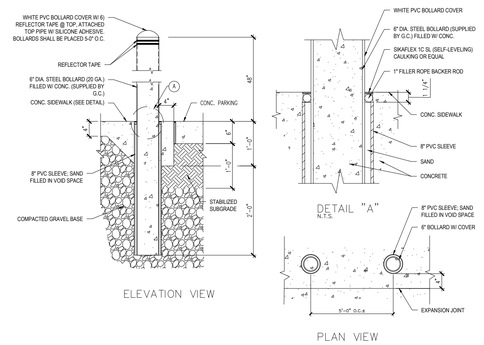
NOT TO SCALE



CROSSWALK NOTES:
1. MATERIAL SHALL BE THERMOPLASTIC, HOT APPLIED OR HEAT FUSED PREFORMED (90 MIL MIN.), UNLESS OTHERWISE APPROVED BY THE ENGINEER.
2. RAMP PORTION OF WHEELCHAIR CURB RAMP TO BE LOCATED WITHIN CROSSWALK, WHERE APPLICABLE.
3. CROSSWALK LENGTH WILL VARY.

TYPICAL CROSSWALK DETAIL

NOT TO SCALE



TYPICAL BOLLARD SET IN FLUSH CONCRETE WALK DETAIL

NOT TO SCALE

NOT FOR CONSTRUCTION

CDG PROJECT #: 23028

REVISIONS:

REV	DATE	COMMENT
1		
2		
3		
4		
5		
6		
7		
8		
9		

SEAL:

COMMONWEALTH OF MASSACHUSETTS
PHILIP R. HENRY
CIVIL
No. 48547
REGISTERED PROFESSIONAL ENGINEER

PHILIP R. HENRY, P.E.

PLANNING BOARD:

CIVIL ENGINEER:

CIVIL DESIGN GROUP, LLC
21 HIGH STREET, SUITE 207
NORTH ANDOVER, MA 01845
www.cdgengineering.com
p: 978-794-5400 f: 978-965-3971

PREPARED FOR:

HY VENTURES LEICESTER, LLC

313 BOSTON POST ROAD WEST
MARLOROUGH, MA 01752

PROJECT:

PROPOSED RETAIL DEVELOPMENT

1621 MAIN STREET (RT-9)
LEICESTER, MA 01524

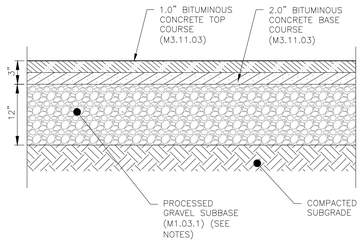
SCALE: AS NOTED

SHEET:

CONSTRUCTION DETAILS

9

DATE: 09/08/2023

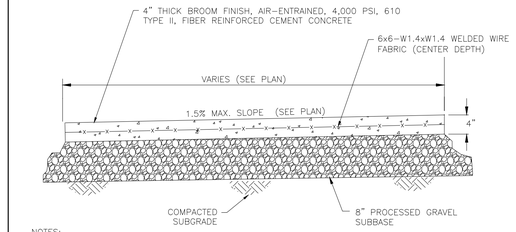


NOTES:

1. THIS DETAIL PROVIDES A MINIMUM STANDARD FOR PAVEMENT CONSTRUCTION BASED ON THE AASHTO GUIDE FOR DESIGN OF PAVEMENT STRUCTURES. THE FINAL PAVEMENT SECTION SHALL BE DESIGNED BY A GEOTECHNICAL ENGINEER AND SHALL BE UTILIZED IF MORE STRINGENT THAN THIS DETAIL.
2. MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE MassDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
3. THE SOIL MUST HAVE A MOISTURE CONTENT DRY OF OPTIMUM AS DETERMINED BY THE MOISTURE–DENSITY RELATIONSHIP TEST METHOD ASTM D1557.
4. THE SOIL CAN BE COMPACTED TO 98% OF THE MAXIMUM STANDARD PROCTOR DENSITY AS DETERMINED BY THE MOISTURE–DENSITY RELATIONSHIP TEST METHOD ASTM D698.
5. THE SOIL SHALL NOT BE USED IF THE MATERIAL CONTAINS ORGANIC MATTER, RUBBLE, DEBRIS OR ANY OTHER DELETERIOUS MATERIAL.

TYPICAL BITUMINOUS PAVEMENT DETAIL

NOT TO SCALE

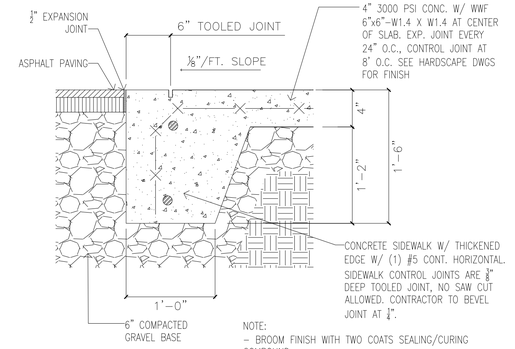


NOTES:

1. THIS DETAIL PROVIDES A MINIMUM STANDARD FOR SIDEWALK CONSTRUCTION. THE FINAL SIDEWALK SECTION SHALL BE DESIGNED BY A GEOTECHNICAL ENGINEER AND SHALL BE UTILIZED IF MORE STRINGENT THAN THIS DETAIL.
2. GROOVE JOINTS 1" DEEP WITH 1/3" RADII SHALL BE REQUIRED IN THE CONCRETE SIDEWALK AT 5' INTERVALS, ALL GROOVE JOINTS SHALL LEAVE A HORIZONTAL GAP OF LESS THAN $\frac{3}{4}$" TO COMPLY WITH ADA REQUIREMENTS.
3. ONE 1/2" EXPANSION JOINT WILL BE REQUIRED AT 40' INTERVALS. A 1/2" EXPANSION JOINT WILL BE REQUIRED WHERE THE SIDEWALK JOINS ANY RIGID STRUCTURE. EXPANSION JOINT FILLER STRIP SHALL BE INSTALLED FLUSH WITH THE SIDEWALK SURFACE TO PROVIDE A SMOOTH TRANSITION ACROSS JOINTS, IN ACCORDANCE WITH ADA REQUIREMENTS.
4. FLAT WORK WITHIN THE MUNICIPAL RIGHT OF WAY SHALL BE CONSTRUCTED IN CONFORMANCE WITH MUNICIPAL STANDARD SPECIFICATIONS.

TYPICAL ONSITE CONCRETE SIDEWALK DETAIL

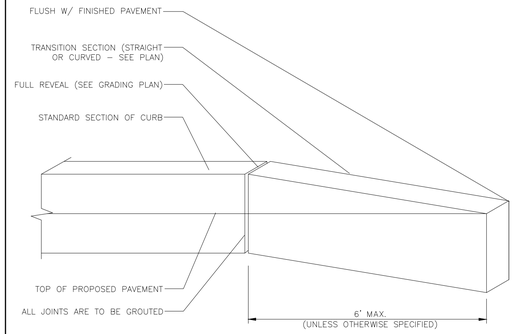
NOT TO SCALE



NOTE:
– BROOM FINISH WITH TWO COATS SEALING/CURING COMPOUND.

FLUSH CONCRETE SIDEWALK/PARKING DETAIL

NOT TO SCALE

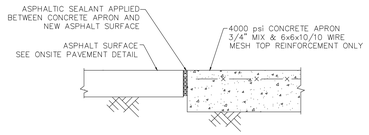


NOTES:

1. SEE TYPICAL CURB DETAIL FOR ADDITIONAL INFORMATION

ONSITE TRANSITION CURB DETAIL

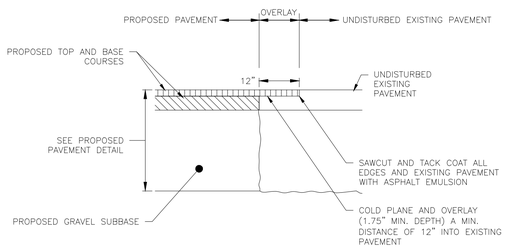
NOT TO SCALE



NOTE:
– 6" CONC. APRON @ CANOPY
– 8" CONC. APRON @ TANK

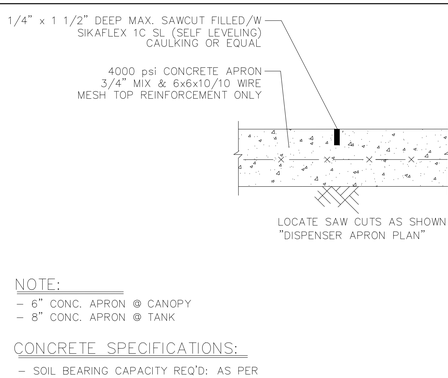
TYPICAL ASPHALT /CONCRETE TRANSITION DETAIL

NOT TO SCALE



PAVEMENT TIE-IN DETAIL

NOT TO SCALE



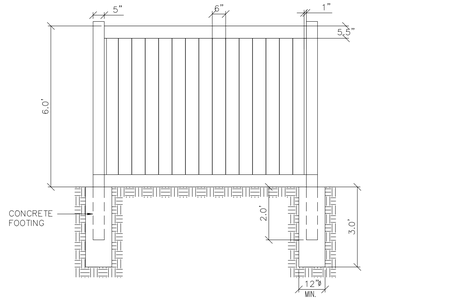
NOTE:
– 6" CONC. APRON @ CANOPY
– 8" CONC. APRON @ TANK

CONCRETE SPECIFICATIONS:

– SOIL BEARING CAPACITY REQ'D: AS PER GEOTECHNICAL REPORT
– CONC. STRENGTH: 4000psi @ 28 DAYS 3% TO 7% AIR,
TROWELLED SMOOTH FINISH WITH TWO COATS SEALING/CURING COMPOUND.

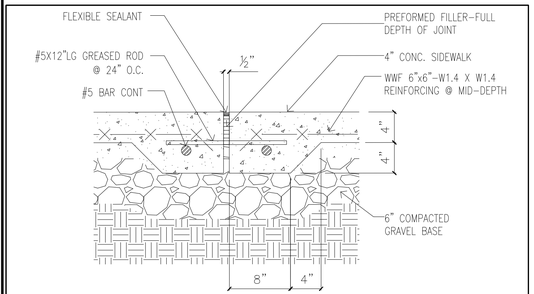
TYPICAL SAWCUT DETAIL

NOT TO SCALE



WHITE VINYL FENCE DETAIL

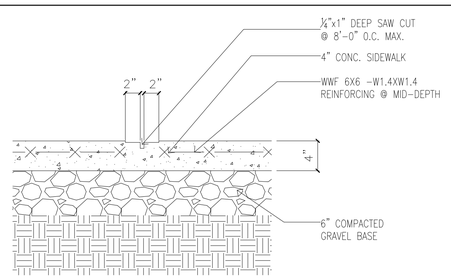
NOT TO SCALE



NOTE:
– CONTROL JOINTS @ 20'–0" O.C. MAX. REFER TO PLAN
– BROOM FINISH WITH TWO COATS SEALING/CURING COMPOUND.

TYPICAL SIDEWALK EXPANSION JOINT DETAIL

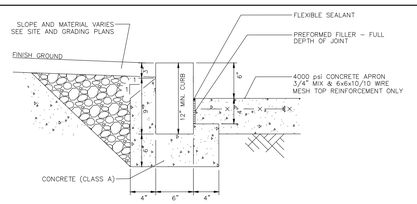
NOT TO SCALE



NOTE:
– TOOL JOINT SPACING REFER TO PLAN
– BROOM FINISH WITH TWO COATS SEALING/CURING COMPOUND.

TYPICAL SIDEWALK CONTROL JOINT DETAIL

NOT TO SCALE

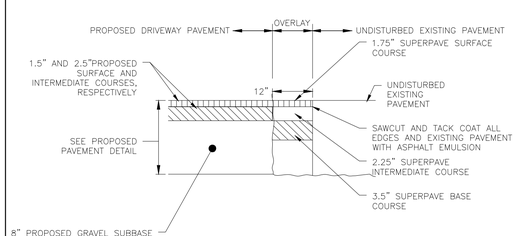


1. MAXIMUM LENGTH OF STRAIGHT CURB STONES – 18"
2. MINIMUM LENGTH OF STRAIGHT CURB STONES – 8'
3. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES SEE CHART
4. ADJOINING STONES OF STRAIGHT CURB LAID ON CURVES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
5. SEE PAVEMENT DETAIL FOR SPECIFICATIONS ON PAVEMENT AND GRAVEL.
6. ALL JOINTS ARE TO BE GROUTED

NOTE: VERTICAL GRANITE CURBING TO BE INSTALLED ONLY WHEN IT ABUTS CONCRETE (I.E. TANK MAT, CANOPY MAT, AIR TOWER, REMOTE FILL PAD) SLOPED GRANITE CURBING TO BE INSTALLED IN ALL OTHER LOCATIONS UNLESS SPECIFICALLY IDENTIFIED ON THE SITE PLAN.

TYPICAL VERTICAL GRANITE CURB DETAIL

NOT TO SCALE



NOTE: IF THE EXISTING ROADWAY IS THICKER THAN THE PAVEMENT SPECIFIED ABOVE, CONTRACTOR SHOULD MATCH EXISTING PAVEMENT SECTION THICKNESSES.

MASSDOT PAVEMENT TIE-IN DETAIL

NOT TO SCALE

NOT FOR CONSTRUCTION

CDG PROJECT #: 23028

REVISIONS:

REV	DATE	COMMENT
1		
2		
3		
4		
5		
6		
7		
8		
9		

SEAL:

COMMONWEALTH OF MASSACHUSETTS
PHILIP R. HENRY
CIVIL
No. 48547
REGISTERED PROFESSIONAL ENGINEER

PHILIP R. HENRY, P.E.

PLANNING BOARD:

CIVIL ENGINEER:

CIVIL DESIGN GROUP, LLC
21 HIGH STREET, SUITE 207
NORTH ANDOVER, MA 01845
www.cdgengineering.com
p: 978-794-5400 f: 978-965-3971

PREPARED FOR:

HY VENTURES LEICESTER, LLC

313 BOSTON POST ROAD WEST MARLOROUGH, MA 01752

PROJECT:

PROPOSED RETAIL DEVELOPMENT

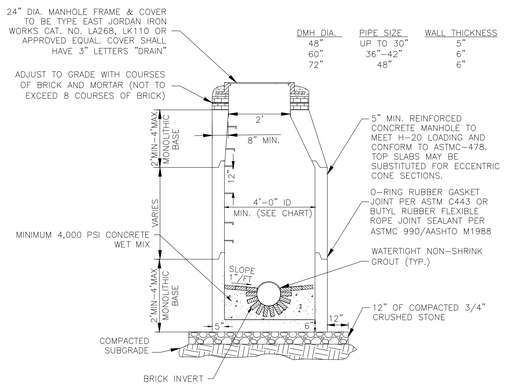
1621 MAIN STREET (RT-9) LEICESTER, MA 01524

SCALE: AS NOTED

SHEET: **CONSTRUCTION DETAILS**

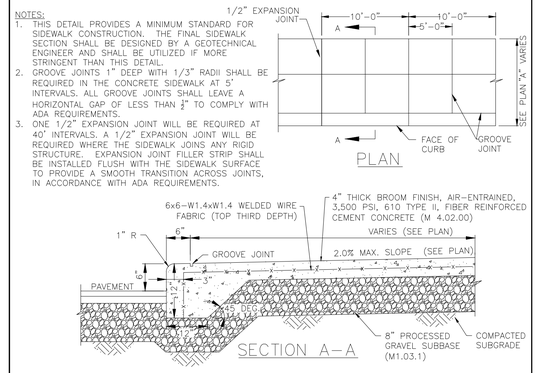
10

DATE: 09/08/2023



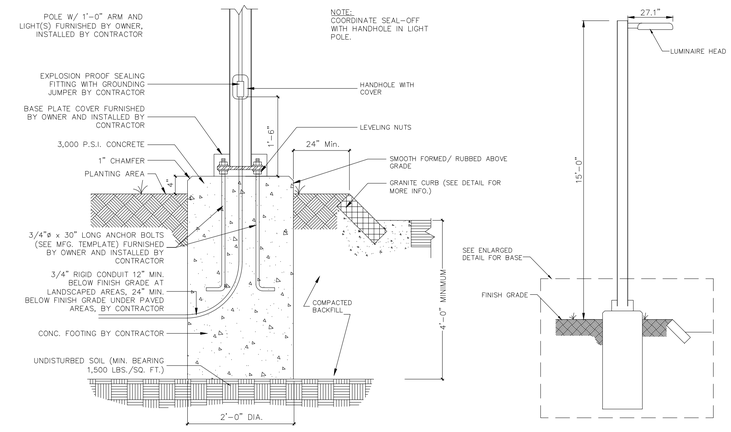
TYPICAL DRAIN MANHOLE DETAIL

NOT TO SCALE



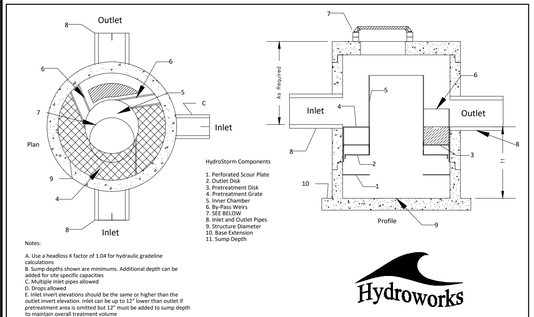
TYPICAL MONOLITHIC CURB AND SIDEWALK DETAIL

NOT TO SCALE



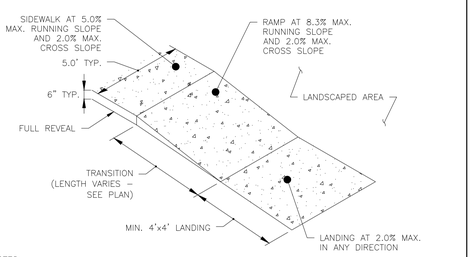
LIGHT POLE IN LANDSCAPE AREA DETAIL

NOT TO SCALE



TYPICAL HYDROWORKS HS4 DETAIL

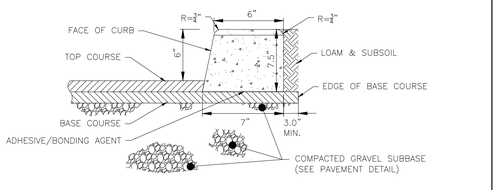
NOT TO SCALE



NOTES:
1. CURBS AND WALKS ALONG ACCESSIBLE ROUTES SHALL MEET OR EXCEED THE APPLICABLE REQUIREMENTS SET FORTH IN THE FEDERAL AMERICANS WITH DISABILITIES ACT (ADA) ACCESSIBILITY GUIDELINES AND APPLICABLE STATE REGULATIONS.
2. THE MAXIMUM ALLOWABLE SIDEWALK AND CURB RAMP CROSS SLOPES SHALL BE 2.0% (0.5% MIN.).
3. THE MAXIMUM ALLOWABLE RUNNING SLOPE OF ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE 5.0%.
4. THE MAXIMUM ALLOWABLE SLOPE OF RAMP AND WING SLOPES SHALL BE 8.3%.
5. MAINTAIN A MINIMUM OF 3 FEET CLEAR AT ANY PERMANENT OBSTACLE IN ACCESSIBLE ROUTE (I.E., HYDRANTS, UTILITY POLES, TREE WELLS, SIGNS ETC.)
6. THE SURFACE OF THE RAMP SHALL BE FLUSH WITH THE FLOW LINE OF THE CURB AND GUTTER.
7. RAMP CONSTRUCTION SHALL CONFORM TO THE TYPICAL SIDEWALK SECTION.
8. ALL RAMPS SHALL BE CEMENT CONCRETE WITH BROOM FINISHED NON-SLIP SURFACE.

TYPICAL ACCESSIBLE CURB RAMP (TYPE-1) DETAIL

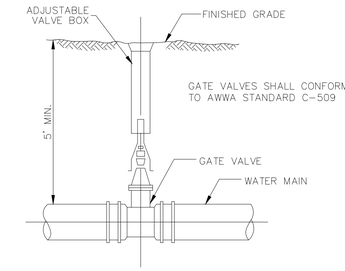
NOT TO SCALE



NOTE:
1. THE CONCRETE SHALL BE A MIXTURE OF APPROXIMATELY 65% STATE APPROVED CONCRETE SAND, 20% 3/8" STONE, AND 15% CEMENT. CONCRETE SHALL CONTAIN ONE (1) LB. OF FIBER MESH PER CUBIC YARD AND HAVE COMPRESSIVE STRENGTH OF 4,000 PSI AFTER 28 DAYS. THE CONCRETE SHALL MEET OR EXCEED ASTM C94 STANDARD SPECIFICATION FOR READY MIX CONCRETE.
2. THE ASPHALT PAVEMENT SHALL BE CLEANED BY SCARIFYING OR WASHING TO REMOVE ALL DUST, OIL AND LOOSE MATERIAL PRIOR TO APPLYING A TWO COMPONENT EPOXY OR SUITABLE CONCRETE ADHESIVE DESIGNED TO BOND FRESH CONCRETE TO EXISTING PAVEMENT SHALL BE USED.
3. CONTROL JOINTS SHALL BE INSTALLED AT NINE FOOT INTERVALS (OR AS RECOMMENDED BY THE MANUFACTURER/INSTALLER) AND AT ALL RADIUS POINTS TO MINIMIZE CRACKING.
4. THE FINISHED CURBING SHALL BE COATED WITH A CURING COMPOUND DESIGNED TO SEAL THE SURFACE AND FORM A WATERPROOF MEMBRANE TO RETARD THE LOSS OF WATER FROM THE FRESH CONCRETE. THE MANUFACTURER'S INSTRUCTIONS SHALL BE FOLLOWED.

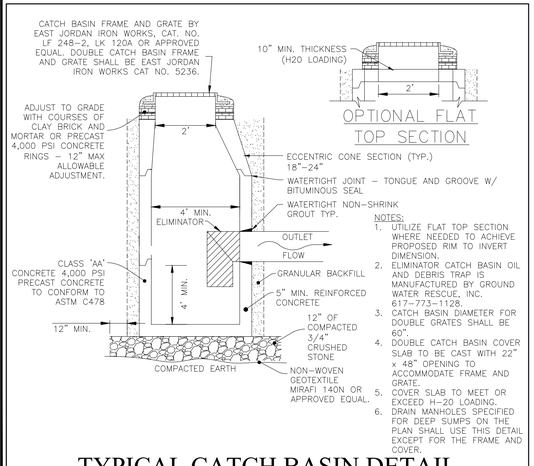
TYPICAL EXTRUDED CURB DETAIL

NOT TO SCALE



TYPICAL GATE VALVE DETAIL

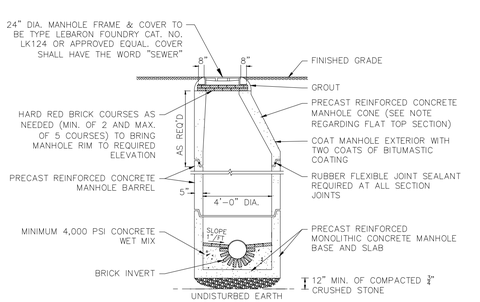
NOT TO SCALE



NOTES:
1. UTILIZE FLAT TOP SECTION WHERE NEEDED TO ACHIEVE PROPOSED RIM TO INVERT DIMENSION.
2. ELIMINATOR CATCH BASIN OIL AND DEBRIS TRAP IS MANUFACTURED BY GROUND WATER RESCUE, INC. 617-773-1128.
3. CATCH BASIN DIAMETER FOR DOUBLE GRATES SHALL BE 60".
4. DOUBLE CATCH BASIN COVER SLAB TO BE CAST WITH 22" x 48" OPENING TO ACCOMMODATE FRAME AND GRATE.
5. COVER SLAB TO MEET OR EXCEED H-20 LOADING.
6. DRAIN MANHOLES SPECIFIED FOR DEEP SUMPS ON THE PLAN SHALL USE THIS DETAIL EXCEPT FOR THE FRAME AND COVER.

TYPICAL CATCH BASIN DETAIL

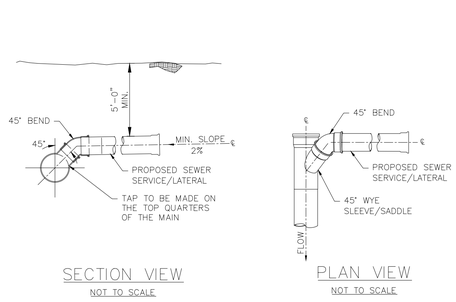
NOT TO SCALE



NOTES:
1. TYPICAL SANITARY MANHOLE TO BE 4 FEET IN DIAMETER.
2. 5'-0" DIAMETER FOR ALL MANHOLE DEPTHS GREATER THAN 12 FEET (6" MIN. WALL THICKNESS AND 7" MIN. BASE THICKNESS FOR 5'-0" DIAMETER MANHOLES).
3. UTILIZE FLAT TOP SECTION IF NEEDED FOR SHALLOW INSTALLATION.
4. INNER EDGE OF BRICK TABLE TO BE AT ELEVATION OF CROWN OF TOP OF PIPE.
5. DESIGN LOAD - HS20.
6. ALL INVERTS SHALL BE 4,000 PSI CEMENT CONCRETE IN VOID AREAS AND RED SEWER BRICK CONSTRUCTION.
7. ALL INVERTS SHALL BE BUILT IN PLACE AFTER ALL PIPES HAVE BEEN INSTALLED.
8. FILL ALL LIFTING HOLES WITH NON-SHRINK GROUT AFTER INSTALLATION.

TYPICAL SEWER MANHOLE DETAIL

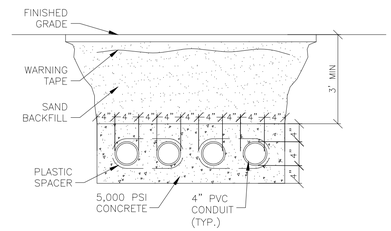
NOT TO SCALE



NOTES:
1. SEWER SERVICES SHALL BE 6" SDR-35 PVC UNLESS OTHERWISE NOTED ON THE PLAN. THE CONTRACTOR SHALL CONFIRM THE PIPE SIZE AND MATERIAL WITH THE MUNICIPALITY PRIOR TO INSTALLATION.
2. SEWER TAP AND LATERAL SHALL BE CONSTRUCTED IN ACCORDANCE WITH APPLICABLE MUNICIPAL REQUIREMENTS AND/OR STANDARDS.
3. SEWER LATERAL SHALL BE PITCHED AT 2.0% MINIMUM SLOPE UNLESS OTHERWISE INDICATED OR UNLESS OTHERWISE REQUIRED BY THE MUNICIPALITY.

TYPICAL SEWER SERVICE CONNECTION DETAIL

NOT TO SCALE



NOTES:
1. DUCT BANK TO BE CONSTRUCTED PER UTILITY COMPANY STANDARDS IF DIFFERENT THAN THIS DETAIL.

TYPICAL ELECTRICAL/TELEPHONE/CABLE DUCTBANK DETAIL

NOT TO SCALE

NOT FOR CONSTRUCTION

CDG PROJECT #: 23028

REVISIONS:

REV	DATE	COMMENT
1		
2		
3		
4		
5		
6		
7		
8		
9		

SEAL:

COMMONWEALTH OF MASSACHUSETTS
PHILIP R. HENRY
CIVIL
No. 48547
REGISTERED PROFESSIONAL ENGINEER

PHILIP R. HENRY, P.E.

PLANNING BOARD:

CIVIL ENGINEER:

CIVIL DESIGN GROUP, LLC
21 HIGH STREET, SUITE 207
NORTH ANDOVER, MA 01845
www.cdgengineering.com
p: 978-794-5400 f: 978-965-3971

PREPARED FOR:

HY VENTURES LEICESTER, LLC

313 BOSTON POST ROAD WEST
MARLOROUGH, MA 01752

PROJECT:

PROPOSED RETAIL DEVELOPMENT

1621 MAIN STREET (RT-9)
LEICESTER, MA 01524

SCALE:

AS NOTED

SHEET:

CONSTRUCTION DETAILS

11

DATE: 09/08/2023

SPECIFICATIONS

NOTES

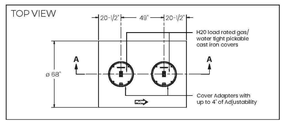
1. 6" plain end SCH. 40 inlet/outlet.
2. Unit weight - w/composite covers: 1,400 lbs.; w/cast iron covers: 1,918 lbs.
3. Maximum operating temperature: 150° F continuous.
4. Capacities - Liquid: 1,010 gal.; Grease: 8,547 lbs. (954.4 gal.); Solids: 213 gal.
5. Built-in Flow control. For series installations, only install flow control on the first unit in the series if necessary.
6. For gravity drainage applications only.
7. Do not use for pressure applications.
8. Cover placement allows full access to tank for proper maintenance.
9. Vent not required unless per local code.
10. Engineered inlet and outlet diffusers with inspection ports are removable to inspect / clean piping. For series installations, the top of the inlet diffuser on the first unit in the series must be sealed.
11. Integral air relief / Anti-siphon / Sampling access.

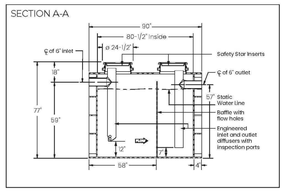
ENGINEER SPECIFICATION GUIDE

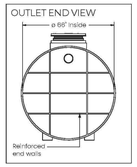
Schier Great Basin™ grease interceptor model # GB-1000 shall be ReRoto guaranteed and made in USA of seamless, molded polyethylene with minimum 3/4" uniform wall thickness. Interceptor shall be furnished for below grade installation with field adjustable riser system. Interceptor flow rate shall be 100 GPM. Interceptor grease capacity shall be 8,547 lbs. Cover shall provide water/gas-tight seal and have minimum 15,000 lbs. load capacity.

CERTIFIED PERFORMANCE

Great Basin™ hydromechanical grease interceptors are third party performance tested and listed by IAPMO to ASME #A112.14.3 and CSA B481.1 grease interceptor standards and greatly exceed requirements for grease separation and storage. They are compliant to the Uniform Plumbing Code and the International Plumbing Code.







Rated Grease Capacities for Units Piped in Series

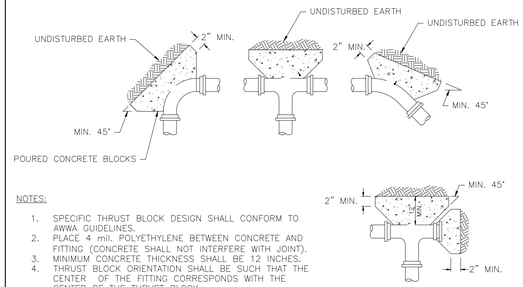
No. of Units in Series	Removal Efficiency 100 GPM 98.8%	99%
2	13,094 lbs.	12,474 lbs.
3	19,641 lbs.	18,711 lbs.
4	26,188 lbs.	24,948 lbs.

SCHIER LIFETIME GUARANTEED GREASE INTERCEPTORS	MODEL NUMBER: GB-1000	DESCRIPTION: 100 GPM Polyethylene Grease Interceptor – 1,010 gallon capacity	
9500 Woodend Road | Edwardsville, KS 66111 | Tel: 913-599-2300 | www.schierproducts.com	PART #: 4030-002-01	DWG BY: B. Karrer	DATE: 1/10/2020
© Copyright 2020 Schier, All Rights Reserved	REV: 1 4/11/2019	ECO:	

page 4 of 4

GREASE TRAP DETAIL

NOT TO SCALE

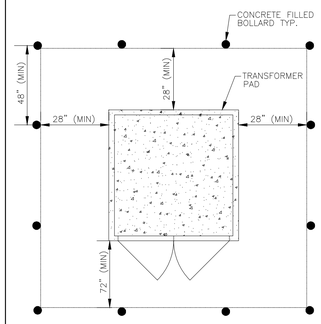


NOTES:

1. SPECIFIC THRUST BLOCK DESIGN SHALL CONFORM TO AWWA GUIDELINES.
2. PLACE 4 mil. POLYETHYLENE BETWEEN CONCRETE AND FITTING (CONCRETE SHALL NOT INTERFERE WITH JOINT).
3. MINIMUM CONCRETE THICKNESS SHALL BE 12 INCHES.
4. THRUST BLOCK ORIENTATION SHALL BE SUCH THAT THE CENTER OF THE FITTING CORRESPONDS WITH THE CENTER OF THE THRUST BLOCK.
5. THE MINIMUM ALLOWABLE ANGLE (EITHER VERTICAL OR HORIZONTAL) SHALL BE 45 DEGREES.

TYPICAL THRUST BLOCK DETAIL

NOT TO SCALE

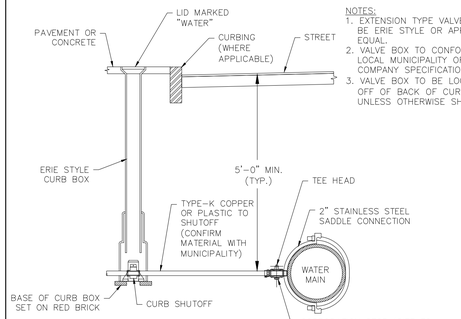


NOTES:

1. FINAL TRANSFORMER PAD SIZE TO BE AS DETERMINED BY THE UTILITY COMPANY.
2. TRANSFORMER PAD SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE UTILITY COMPANY.
3. BOLLARDS SHALL BE 6" SCHEDULE 40 GALVANIZED STEEL 5' EXPOSED HEIGHT, UNLESS OTHERWISE REQUIRED BY THE UTILITY COMPANY (REFER TO "PAD BOLLARD" DETAIL FOR ADDITIONAL INFORMATION ON BOLLARD CONSTRUCTION).

TYPICAL TRANSFORMER PAD DETAIL

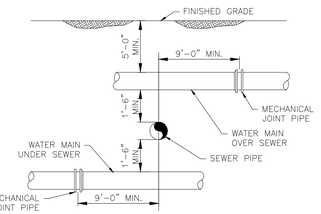
NOT TO SCALE



NOTES:
1. EXTENSION TYPE VALVE BOX TO BE ERIE STYLE OR APPROVED EQUAL.
2. VALVE BOX TO CONFORM TO THE LOCAL MUNICIPALITY OR UTILITY COMPANY SPECIFICATIONS.
3. VALVE BOX TO BE LOCATED 18" OFF OF BACK OF CURB (TYP.) UNLESS OTHERWISE SHOWN.

TYPICAL WATER SERVICE CONNECTION DETAIL

NOT TO SCALE

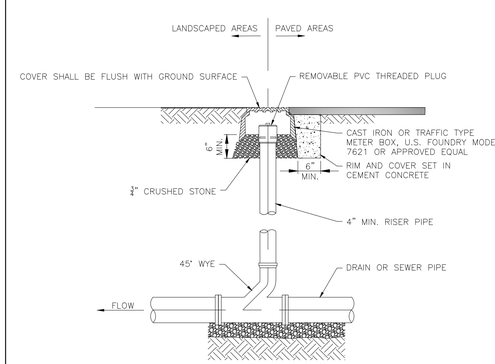


NOTES:

1. SEWERS SHALL BE KEPT REMOTE FROM WATER SUPPLY PIPING AND STRUCTURES. WHEREVER FEASIBLE, SEWERS SHOULD BE LAID AT A MINIMUM HORIZONTAL DISTANCE OF 10 FEET FROM WATER MAINS. IF LOCAL CONDITIONS PREVENT THIS, THE WATER MAIN SHOULD BE LAID IN A SEPARATE TRENCH, AND THE ELEVATIONS OF THE CROWN OF THE SEWER PLACED AT LEAST 18 INCHES BELOW THE INVERT OF THE WATER MAIN.
2. WHENEVER SEWERS MUST CROSS UNDER WATER MAINS, THE CROWN OF THE SEWER SHOULD BE PLACED A MINIMUM OF 18 INCHES BELOW THE INVERT OF THE WATER MAIN. IN ADDITION, THE WATER MAIN MUST BE CONSTRUCTED WITH ONE FULL LENGTH OF PIPE CENTERED ABOVE THE CROSSING. THE WATER PIPE SHALL HAVE MECHANICAL JOINTS FOR A MINIMUM DISTANCE OF 10 FEET ON EACH SIDE OF THE CROSSING.
3. WHEN IT IS IMPOSSIBLE TO OBTAIN HORIZONTAL OR VERTICAL SEPARATION AS STIPULATED ABOVE, BOTH THE WATER AND THE SEWER PIPING SHALL BE CONSTRUCTED SUCH THAT THE PIPE JOINTS ARE PLACED AS FAR AWAY FROM THE CROSSING AS POSSIBLE AND THE PIPE CROSSING SHALL BE SLEEVED A DISTANCE OF 10 FEET ON ALL SIDES OF THE CROSSING.

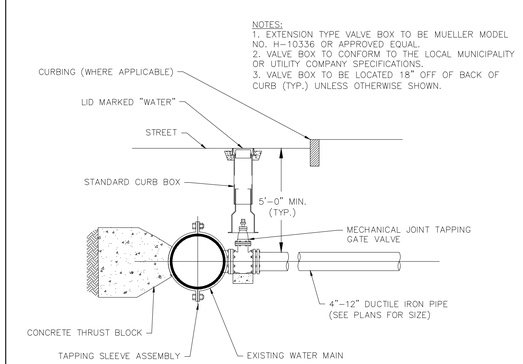
WATER/SEWER CROSSING DETAIL

NOT TO SCALE



TYPICAL CLEANOUT DETAIL

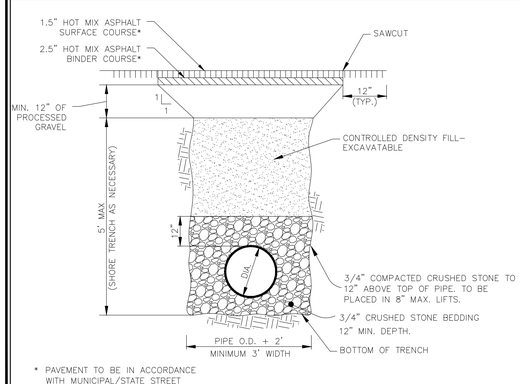
NOT TO SCALE



NOTES:
1. EXTENSION TYPE VALVE BOX TO BE MUELLER MODEL NO. H-10336 OR APPROVED EQUAL.
2. VALVE BOX TO CONFORM TO THE LOCAL MUNICIPALITY OR UTILITY COMPANY SPECIFICATIONS.
3. VALVE BOX TO BE LOCATED 18" OFF OF BACK OF CURB (TYP.) UNLESS OTHERWISE SHOWN.

TAPPING SLEEVE CONNECTION DETAIL

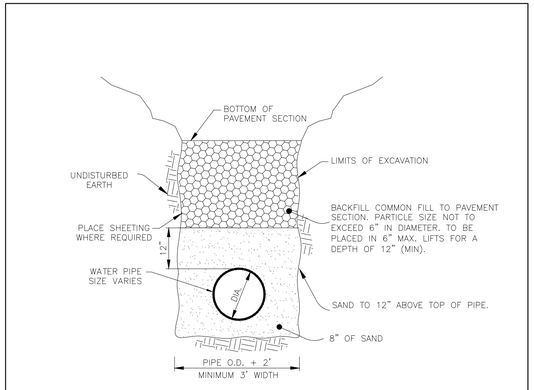
NOT TO SCALE



* PAVEMENT TO BE IN ACCORDANCE WITH MUNICIPAL/STATE STREET STANDARDS

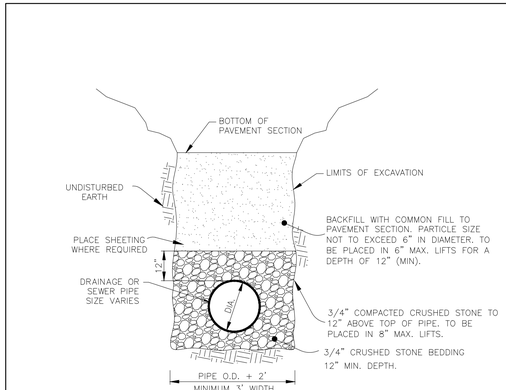
UTILITY TRENCH DETAIL IN EXISTING PAVEMENT TO REMAIN

NOT TO SCALE



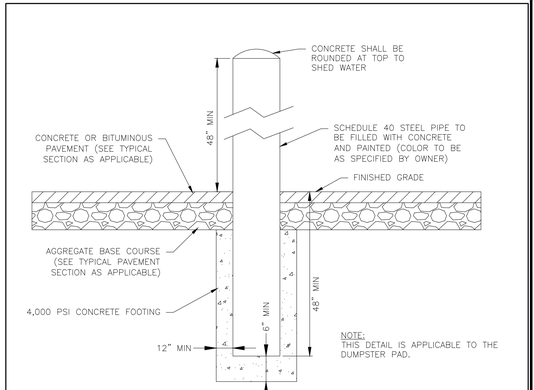
TYPICAL WATER TRENCH DETAIL

NOT TO SCALE



TYPICAL DRAIN & SEWER TRENCH DETAIL

NOT TO SCALE



NOTE:
THIS DETAIL IS APPLICABLE TO THE DUMPSTER PAD.

TYPICAL PAD BOLLARD DETAIL

NOT TO SCALE

NOT FOR CONSTRUCTION

CDG PROJECT #: 23028

REVISIONS:

REV	DATE	COMMENT
1		
2		
3		
4		
5		
6		
7		
8		
9		

SEAL:

COMMONWEALTH OF MASSACHUSETTS
PHILIP R. HENRY
CIVIL
No. 48547
REGISTERED PROFESSIONAL ENGINEER

PHILIP R. HENRY, P.E.

PLANNING BOARD:

CIVIL ENGINEER:

CIVIL DESIGN GROUP, LLC
21 HIGH STREET, SUITE 207
NORTH ANDOVER, MA 01845
www.cdgengineering.com
p: 978-794-5400 f: 978-965-3971

PREPARED FOR:

HY VENTURES LEICESTER, LLC

313 BOSTON POST ROAD WEST MARLOROUGH, MA 01752

PROJECT:

PROPOSED RETAIL DEVELOPMENT

1621 MAIN STREET (RT-9) LEICESTER, MA 01524

SCALE:

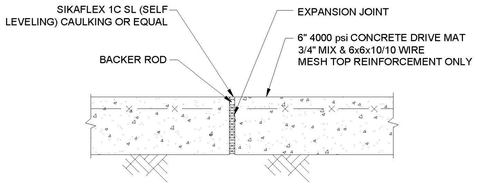
AS NOTED

SHEET:

CONSTRUCTION DETAILS

12

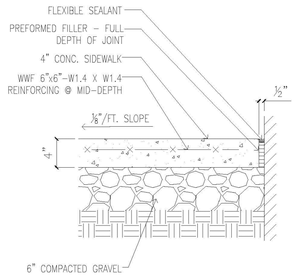
DATE: 09/08/2023



CONCRETE SPECIFICATIONS:
-SOIL BEARING CAPACITY REQ'D: AS PER GEOTECHNICAL REPORT
-CONC. STRENGTH: 4000psi @ 28 DAYS 3% TO 7% AIR, TROWELLED SMOOTH FINISH WITH TWO COATS SEALING/CURING COMPOUND.

TYPICAL EXPANSION JOINT DETAIL

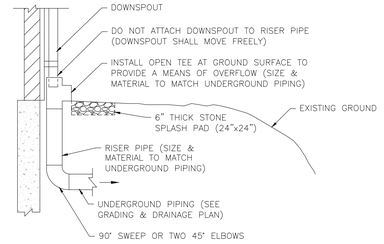
NOT TO SCALE



NOTE:
– BROOM FINISH WITH TWO COATS SEALING/CURING COMPOUND.

TYPICAL SIDEWALK AT BUILDING WALL DETAIL

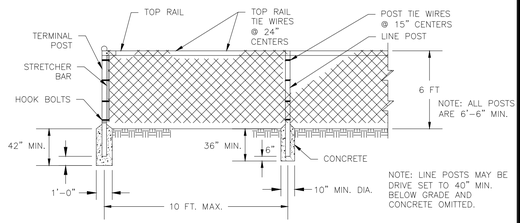
NOT TO SCALE



NOTES:
1. EACH BUILDING OR UNIT SHALL HAVE A MINIMUM OF ONE GUTTER DOWNSPOUT OVERFLOW ON EACH INDEPENDENT PIPE NETWORK. THE OVERFLOW SHALL BE INSTALLED ON THE DOWNSPOUT LOCATED AT THE LOWEST GROUND ELEVATION ALONG THE BUILDING WITHIN EACH PIPE NETWORK.
2. FOR GUTTER SYSTEMS THAT TIE INTO DRYWELLS, EACH DOWNSPOUT SHALL INCLUDE AN OVERFLOW.

GUTTER DOWNSPOUT DETAIL

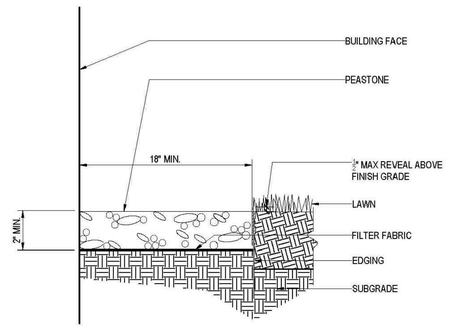
NOT TO SCALE



NOTES:
1. MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE MANUFACTURER'S SPECIFICATIONS.
2. FENCE SHALL BE VINYL COATED BLACK.
3. ALL POSTS SHALL BE INSTALLED VERTICALLY. WHERE POSTS ARE INSTALLED ON AN INCLINED SURFACE, THE ANGLE OF THE POST SHALL BE ADJUSTED SO THAT THE POST WILL BE VERTICAL.
4. THE FENCING SHALL BE #9 GAGE FENCE FABRIC, STANDARD 2–INCH CHAIN LINK DIAMOND MESH.

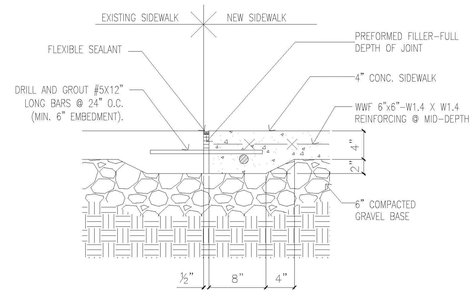
BLACK CHAIN LINK FENCE DETAIL

NOT TO SCALE



PEASTONE FOUNDATION STRIP DETAIL

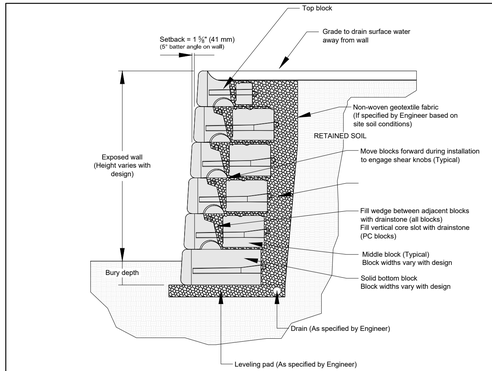
NOT TO SCALE



NOTE:
– BROOM FINISH WITH TWO COATS SEALING/CURING COMPOUND.

TYPICAL SIDEWALK EXPANSION JOINT (NEW TO EXISTING) DETAIL

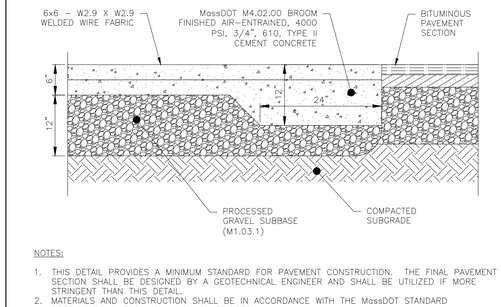
NOT TO SCALE



NOTES:
1. TOP AND BOTTOM OF WALL ELEVATIONS SHOWN ON GRADING & DRAINAGE PLANS REPRESENT THE EXPOSED PORTION OF THE WALL.
2. ALL WALLS WITH GREATER THAN 4 FEET EXPOSED HEIGHT SHALL BE DESIGNED BY A STRUCTURAL ENGINEER.

TYPICAL GRAVITY WALL DETAIL

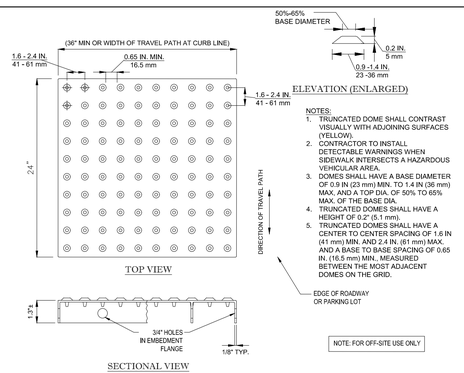
NOT TO SCALE



NOTES:
1. THIS DETAIL PROVIDES A MINIMUM STANDARD FOR PAVEMENT CONSTRUCTION. THE FINAL PAVEMENT SECTION SHALL BE DESIGNED BY A GEOTECHNICAL ENGINEER AND SHALL BE UTILIZED IF MORE STRINGENT THAN THIS DETAIL.
2. MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE MassDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
3. RIGID PAVEMENT THAT ABUTS FLEXIBLE PAVEMENT SHALL MAINTAIN A 12" THICKNESS FOR THE OUTERMOST TWO FEET AS SHOWN.

TYPICAL CONCRETE PAD DETAIL

NOT TO SCALE

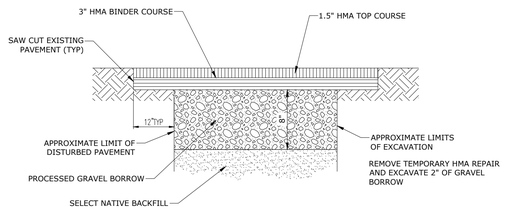


NOTES:
1. TRUNCATED DOME SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES (YELLOW).
2. CONTRACTOR TO INSTALL DETECTABLE WARNINGS WHEN SIDEWALK INTERSECTS A HAZARDOUS VEHICULAR AREA.
3. DOMES SHALL HAVE A BASE DIAMETER OF 0.9 IN (23 mm) MIN. TO 1.4 IN (36 mm) MAX. AND A TOP DIA. OF 50% TO 65% MAX. OF THE BASE DIA.
4. TRUNCATED DOMES SHALL HAVE A HEIGHT OF 0.2" (5.1 mm).
5. TRUNCATED DOMES SHALL HAVE A CENTER TO CENTER SPACING OF 1.6 IN (41 mm) MIN. AND 2.4 IN. (61 mm) MAX. AND A BASE TO BASE SPACING OF 0.65 IN. (16.5 mm) MIN., MEASURED BETWEEN THE MOST ADJACENT DOMES ON THE GRID.

NOTE TO DESIGNER:
IF A WALK CROSSES OR ADJOINS A VEHICULAR WAY WHERE THE WALKING SURFACE AND PAVEMENT ARE NOT SEPARATED BY CURBS, RAILING OR OTHER ELEMENTS, THE BOUNDARY BETWEEN THE AREA SHALL BE DEFINED BY A CONTINUOUS DETECTABLE WARNING WHICH IS MIN. 36" WIDE (ADA ACCESSIBLE GUIDELINES) AND MIN. 24" DEPTH.

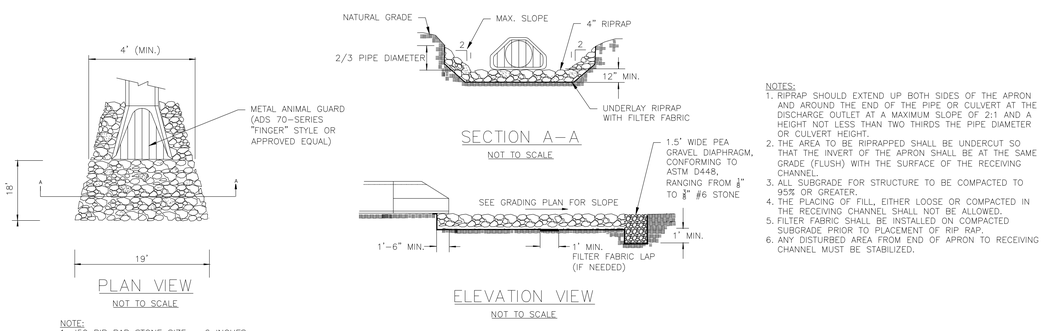
TYPICAL DETECTABLE WARNING AREA DETAIL

NOT TO SCALE



TYPICAL PERMANENT ROADWAY TRENCH REPAIR DETAIL

NOT TO SCALE



NOTES:
1. RIPRAP SHOULD EXTEND UP BOTH SIDES OF THE APRON AND AROUND THE END OF THE PIPE OR CULVERT AT THE DISCHARGE OUTLET AT A MAXIMUM SLOPE OF 2:1 AND A HEIGHT NOT LESS THAN TWO THIRDS THE PIPE DIAMETER OR CULVERT HEIGHT.
2. THE AREA TO BE RIPRAPPED SHALL BE UNDERCUT SO THAT THE INVERT OF THE APRON SHALL BE AT THE SAME GRADE (FLUSH) WITH THE SURFACE OF THE RECEIVING CHANNEL.
3. ALL SUBGRADE FOR STRUCTURE TO BE COMPACTED TO 95% OR GREATER.
4. THE PLACING OF FILL, EITHER LOOSE OR COMPACTED IN THE RECEIVING CHANNEL SHALL NOT BE ALLOWED.
5. FILTER FABRIC SHALL BE INSTALLED ON COMPACTED SUBGRADE PRIOR TO PLACEMENT OF RIP RAP.
6. ANY DISTURBED AREA FROM END OF APRON TO RECEIVING CHANNEL MUST BE STABILIZED.

NOTE:
1. d50 RIP RAP STONE SIZE = 6 INCHES.

RIP RAP APRON DETAIL

NOT TO SCALE

NOT FOR CONSTRUCTION

CDG PROJECT #: 23028

REVISIONS:

REV	DATE	COMMENT
1		
2		
3		
4		
5		
6		
7		
8		
9		

SEAL:

COMMONWEALTH OF MASSACHUSETTS
PHILIP R. HENRY
CIVIL
No. 48547
REGISTERED PROFESSIONAL ENGINEER

PHILIP R. HENRY, P.E.

PLANNING BOARD:

CIVIL ENGINEER:

CIVIL DESIGN GROUP, LLC
21 HIGH STREET, SUITE 207
NORTH ANDOVER, MA 01845
www.cdgengineering.com
p: 978-794-5400 f: 978-965-3971

PREPARED FOR:

HY VENTURES LEICESTER, LLC

313 BOSTON POST ROAD WEST MARLOROUGH, MA 01752

PROJECT:

PROPOSED RETAIL DEVELOPMENT

1621 MAIN STREET (RT-9) LEICESTER, MA 01524

SCALE:

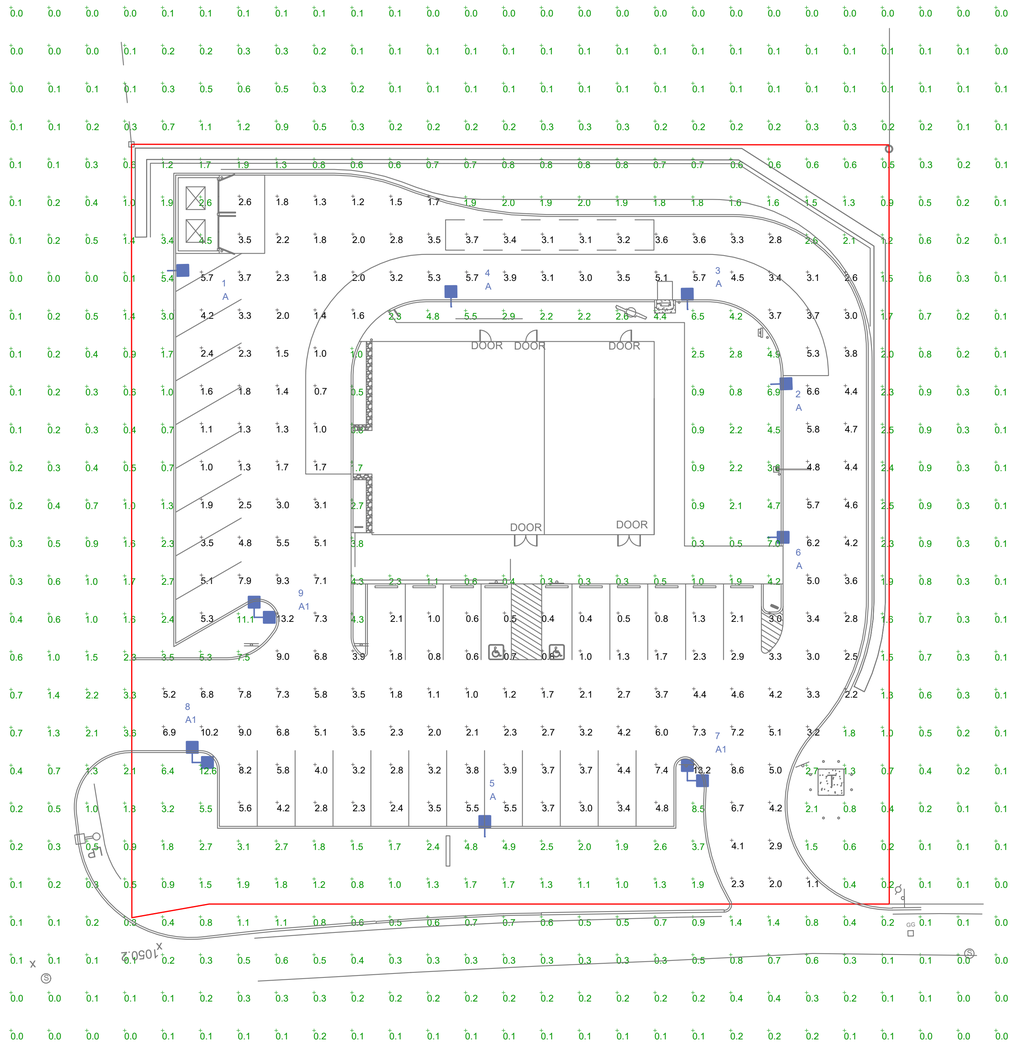
AS NOTED

SHEET:

CONSTRUCTION DETAILS

13

DATE: 09/08/2023



- POLE MOUNTED FIXTURES ARE MOUNTED ON A 17FT POLE ATOP A 36 INCH HIGH CONCRETE BASE.

LUMINAIRE LOCATION SUMMARY		
LUM NO.	LABEL	MTG. HT.
1	A	20
2	A	20
3	A	20
4	A	20
5	A	20
6	A	20
7	A1	20
8	A1	20
9	A1	20

FOOTCANDLE LEVELS CALCULATED AT GRADE USING INITIAL LUMEN VALUES					
LABEL	AVG	MAX	MIN	AVG/MIN	MAX/MIN
PAVEDAREA	3.61	13.2	0.5	7.22	26.40
UNDEFIND AREA	0.93	12.6	0.0	N.A.	N.A.

LUMINAIRE SCHEDULE									
SYMBOL	QTY	LABEL	ARRANGEMENT	LUMENS	LLF	BUG RATING	WATTS/LUMINAIRE	TOTAL WATTS	MANUFACTURE	DESCRIPTION
	6	A	Single	10450	1.000	B2-U0-G2	68	408	Cree Lighting	OSQ-ML-C-DA-XX + OSQM-C-11L-57K7-3M-UL-NM-XX-Q9
	3	A1	2 @ 90 DEG	10450	1.000	B2-U0-G2	68	408	Cree Lighting	OSQ-ML-C-DA-XX + OSQM-C-11L-57K7-3M-UL-NM-XX-Q9

REDLEONARD ASSOCIATES
1340 Kemper Meadow Dr, Forest Park, OH 45240
513-574-9500 | redleonard.com

REV.	BY	DATE	DESCRIPTION
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

SCALE: 1" = 20'
LAYOUT BY: TAS
DWG SIZE: D
DATE: 8/18/23

PROJECT NAME:
STARBUCKS
LEICESTER, MA
DRAWING NUMBER:
RL-9076-S1

TM

		QTY	LABEL	DESCRIPTION
AREA		6	A	OSQ-ML-C-DA-XX + OSQM-C-11L-57K7-3M-UL-NM-XX-Q9
		3	A1	OSQ-ML-C-DA-XX + OSQM-C-11L-57K7-3M-UL-NM-XX-Q9

ADDITIONAL FIXTURE INFO

OSQ Series

OSQ™ LED Area/Flood Luminaire featuring Patented NanoComfort™ Technology – Version C

Rev. Date: V3 04/17/2023

Product Description

The OSQ™ Area/Flood luminaire blends extreme optical control, advanced thermal management and modern, clean aesthetics. Built to last, the housing is rugged cast aluminum with an integral, weathertight LED driver compartment. Versatile mounting configurations offer simple installation. Its slim, low-profile design minimizes wind load requirements and blends seamlessly into the site providing even, quality illumination. Medium is suitable upgrade for HID applications up to 400 Watts. Large is suitable upgrade for HID applications up to 1000 Watts. Extra Large is suitable upgrade for HID applications up to multiple 1000 Watts.

Applications: Parking lots, walkways, campuses, car dealerships, office complexes, high-mast and internal roadways

Performance Summary

Utilizes Patented NanoComfort™ Technology

Utilizes Cree TrueWhite® Technology on 5000K Luminaires

Assembled in the USA by Cree Lighting from US and imported parts

Initial Delivered Lumens: 4,000 - 75,000

Efficacy: Up to 171 LPW

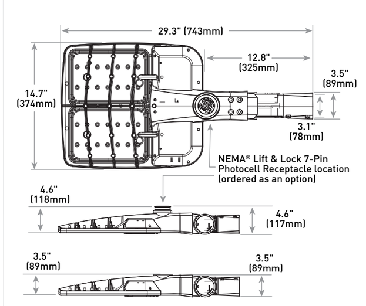
CRI: Minimum 70 CRI (3000K, 4000K & 5700K); 90 CRI (5000K)

CCT: 3000K, 4000K, 5000K, 5700K

Limited Warranty†: 10 years for luminaire; 10 years for Colorfast DeltaGuard® finish; 5 years for BML sensor; up to 5 years for Synapse® accessories; 1 year for luminaire accessories

† See http://creelighting.com/warranty for warranty terms. For Synapse accessories, consult Synapse spec sheets for details on warranty terms.

OSQM - AA Mount



Luminaire	Weight
OSQM	19.3 lbs. (8.8kg)

Note: For OSQL, OSQX and additional mounts, refer to drawings beginning on page 26.

Ordering Information

Fully assembled luminaire is composed of two components that must be ordered separately:
Example: **Mount:** OSQ-ML-C-AA-BK + **Luminaire:** OSQM-C-4L-30K7-2M-UL-NM-BK

Mount (Luminaire must be ordered separately)*	
OSQ-	
Medium/Large Mounts **OSQ-ML-C-AA** Adjustable Arm **OSQ-ML-C-DA** Direct Arm **OSQ-ML-C-TM** Trunnion Mount **Extra Large Mounts** **OSQ-X-C-AA** Adjustable Arm **OSQ-X-C-DA** Direct Arm	**Color Options:** **SV** Silver, **BZ** Bronze, **BK** Black, **WH** White

* Reference fixture mounting drill pattern, EPA, and pole configuration suitability data beginning on page 14.

Luminaire (Mount must be ordered separately)

Family	Size	Series	Lumen Package†	CCT/CRI	Optic	Voltage	Mount	Color Options	Controls*	Options
OSQ		C								
OSQ	**M** Medium **L** Large **X** Extra Large	C	**Medium** **4L** 4,000 Lumens **6L** 6,000 Lumens **9L** 9,000 Lumens **11L** 11,000 Lumens **16L** 16,000 Lumens **Large** **22L** 22,000 Lumens **30L** 30,000 Lumens **40L** 40,000 Lumens **Extra Large** **50L** 50,000 Lumens **65L** 65,000 Lumens **75L** 75,000 Lumens	**30K7** 3000K, 70 CRI **40K7** 4000K, 70 CRI **50K9** 5000K, 90 CRI **57K7** 5700K, 70 CRI	**Asymmetric** **2M** Type II Mid **2B** Type II Mid w/ Factory-Installed Backlight Shield **3M** Type III Mid **3B** Type III Mid w/ Factory-Installed Backlight Shield **4M** Type IV Mid **4B** Type IV Mid w/ Factory-Installed Backlight Shield **AF** Automotive FrontlineOptic™ **AB** Automotive-FrontlineOptic™ w/Factory-Installed Backlight Shield **Symmetric** **5M** Type V Mid **5N** Type V Narrow **33** NEMA® 3x3 **44** NEMA® 4x4 **55** NEMA® 5x5 **66** NEMA® 6x6 **75** NEMA® 7x5	**UL** Universal 120-277V **UH** Universal 347-480V - Not available with 4L, 40L or 75L lumen packages **UE** Universal 277-480V - Available only with 40L and 75L lumen packages	**NM** No Mount - Must specify mount from table above - Mount ships separately	**BK** Black **BZ** Bronze **SV** Silver **WH** White	**BML** **Bluetooth® Technology Enabled Multi-Level Sensor** - Utilizes a multifunction sensor - Refer to BML spec sheet for details - 20-40' sensor lens installed on luminaire; 8-20' sensor lens and aisle shroud included - Intended for downlight applications at 0° tilt - Not available with Q or X options or Synapse TL7-B2 or TL7-HVG accessories **Q9/Q8/Q7/Q6/Q5/Q4/Q3/Q2/Q1** **Field Adjustable Output** - Must select Q9, Q8, Q7, Q6, Q5, Q4, Q3, Q2, or Q1 - Offers full range adjustability - Refer to pages 15-25 for power and lumen values - Not available with BML or X options or Synapse TL7-B2 or TL7-HVG accessories **X8/X7/X6/X5/X4/X3/X2/X1** **Locked Lumen Output** - Must select X8, X7, X6, X5, X4, X3, X2, or X1 - Not available with BML or Q options - X1 option not available with the following lumen package/voltage offerings: 9L/UL, 16L/UL, 16L/UH, 30L/UL, 30L/UH, 65L/UL, 65L/UH - X2 option not available 9L/UL lumen package/voltage - Lumen output is permanently locked to the setting selected - Refer to pages 15-25 for power and lumen values	**20KV** **20kV/10kA Surge Suppression** - Replaces standard 10kV/5kA surge protection **F** **Fuse** - Compatible with 120V, 277V or 347V (phase to neutral) - Consult factory if fusing is required for 208V, 240V or 480V (phase to phase) - When code dictates fusing, use time delay fuse **N** **Utility Label and NEMA® Lift & Lock 7-Pin Photocell Receptacle** - External utility label per ANSI C136.15-2020 - 7-pin receptacle per ANSI C136.41 - Available only with OSQM & OSQL luminaires - Intended for downlight applications with maximum 45° tilt - Factory connected 0-10V dim leads - Requires photocell or shorting cap by others **R** **NEMA® Lift & Lock 7-Pin Photocell Receptacle** - 7-pin receptacle per ANSI C136.41 - Intended for downlight applications with maximum 45° tilt - Factory connected 0-10V dim leads - Requires photocell or shorting cap by others - Refer to page 2 for compatible Synapse control offerings **RL** **Rotate Left** - LED and optic are rotated to the left - Refer to RR/RL configuration diagram on page 26 for optic directionality - Not for use with symmetric optics **RR** **Rotate Right** - LED and optic are rotated to the right - Refer to RR/RL configuration diagram on page 26 for optic directionality - Not for use with symmetric optics

† Lumen Package codes identify approximate light output only. Actual lumen output levels vary by CCT and optic selection. Refer to Initial Delivered Lumen tables for specific lumen values
* Luminaire comes standard with 0-10V dimming

UL CERTIFIED · RoHS COMPLIANT · ida DARK SKY APPROVED · CREE TRUE WHITE TECHNOLOGY

US: creelighting.com (800) 236-6800
Canada: creelighting-canada.com (800) 473-1234

CREE LIGHTING®

Product Specifications

CREE LIGHTING NANOCOMFORT™ TECHNOLOGY

Cree Lighting's NanoComfort™ Technology ends the trade-offs in outdoor lighting by providing superior glare reduction and visual comfort in high-efficiency illumination delivered precisely where it is needed. The basic building block of NanoComfort™Technology is a compact 4x4 array of LEDs. Each of the 16 LEDs in a module is in contact with its own acrylic polymer lens to capture and precisely direct light. With NanoComfort™ Technology, the acrylic optics are cut and sculpted into facets that relieve the glare and harshness while improving visual comfort – all while retaining superb efficacy and control.

CREE TRUEWHITE® TECHNOLOGY

A revolutionary way to generate high-quality white light, Cree TrueWhite® Technology is a patented approach that delivers an exclusive combination of 90+ CRI, beautiful light characteristics and lifelong color consistency, all while maintaining high luminous efficacy – a true no compromise solution.

CONSTRUCTION & MATERIALS

- Slim, low profile design minimizes wind load requirements
- Luminaire housing is rugged die cast aluminum with an integral, weathertight LED driver compartment and high-performance heat sink
- Acrylic optic w/clear tempered glass lens
- Convenient interlocking mounting method on direct arm. Mounting adaptor is rugged die cast aluminum and mounts to 3" (76mm) or larger square or round pole, secured by two 5/16-18 UNC bolts spaced on 2" (51mm) centers. Refer to page 14 for fixture mounting drill pattern
- Adjustable arm mount adapters are rugged die cast aluminum
- OSQ-ML-C-AA mounts to a horizontal or vertical 2" (51mm) IP, 2.375" (60mm) O.D. tenon and can be adjusted 180° in 2.5° increments
- OSQ-X-C-AA mounts to a horizontal or vertical 2" (51mm) IP, 2.375-2.50" (60-64mm) O.D. steel tenon and can be adjusted 180° in 5.0° increments. **NOTE: Tenon length must be a minimum of 3.75" (95mm), and tenon must be steel**
- Trunnion mount is constructed of A500 and A1011 steel and is adjustable from 0-180° in 15° degree increments. Trunnion mount secures to surface with (1) 3/4" bolt or (2) 1/2" or 3/8" bolts
- Luminaires include 15" (381mm) 18/5 cord exiting the luminaire
- Designed for uplight and downlight applications. Uplight orientation not suitable for use with N or R options
- Exclusive Colorfast DeltaGuard® finish features an E-Coat epoxy primer with an ultra-durable powder topcoat, providing excellent resistance to corrosion, ultraviolet degradation and abrasion. Silver, bronze, black, and white are available

Weight

Mount	Housing Size		
	Medium	Large	Extra Large
Direct Arm	19.7 lbs. (8.9kg)	28.8 lbs. (13.1kg)	45.8 lbs. (20.8kg)
Adjustable Arm	19.3 lbs. (8.8kg)	28.4 lbs. (12.9kg)	48.6 lbs. (22.0kg)
Trunnion	23.2 lbs. (10.5kg)	32.3 lbs. (14.7kg)	N/A

For BML sensor add 0.1 lbs. (45g), and for NEMA receptacle, add 0.3 lbs. (136g).

ELECTRICAL SYSTEM

- **Input Voltage:** 120-277V, 277-480V or 347-480V, 50/60Hz, Class 1 drivers
- **Power Factor:** > 0.9 at full load
- **Total Harmonic Distortion:** < 20% at full load
- Integral 10kV/5kA surge suppression protection standard; 20kV/10kA surge suppression protection optional
- When code dictates fusing, a slow blow fuse or type C/D breaker should be used to address inrush current
- Designed with 0-10V dimming capabilities. Controls by others
- Refer to Dimming spec sheet for details
- **Maximum 10V Source Current:** 1.8mA
- **Operating Temperature Range:** -40°C - +40°C (-40°F - +104°F)

REGULATORY & VOLUNTARY QUALIFICATIONS

- cULus Listed (UL1598)
- Suitable for wet locations
- Meets NEMA C82.77 standards
- Drivers and LEDs are UL certified in accordance with UL8750
- Meets requirements of IP66 per IEC 60529 when ordered without N or R options
- Certified to ANSI C136.31-2018, 3G bridge and overpass vibration standards
- ANSI C136.2 10kV/5kA (standard) and 20kV/10kA (optional) surge suppression protection tested in accordance with IEEE/ANSI C62.41.2
- Meets FCC Part 15, Subpart B, Class A limits for conducted and radiated emissions
- Luminaire and finish endurance tested to withstand 5,000 hours of elevated ambient salt fog conditions as defined in ASTM Standard B 117
- Lens meets IK07 requirements per IEC 60068-2
- Assembled in the USA by Cree Lighting from US and imported parts
- Meets Buy American requirements within ARRA
- RoHS compliant. Consult factory for additional details
- Dark Sky Friendly, IDA Approved when ordered with 30K CCT and direct arm mount only. Please refer to https://www.darksky.org/our-work/lighting/lighting-for-industry/fsa/fsa-products/ for most current information (Pending)
- ⚠ **CA RESIDENTS WARNING:** Cancer and Reproductive Harm – www.p65warnings.ca.gov

Product Specifications

SYNAPSE® SIMPLYSNAP INTELLIGENT CONTROL

The Synapse SimplySNAP platform is a highly intuitive connected lighting solution featuring zone dimming, motion sensing, and daylight harvesting with utility-grade power monitoring and support of up to 1000 nodes per gateway. The system features a reliable and robust self-healing mesh network with a browser-based interface that runs on smartphones, tablets, and PCs. The Twist-Lock Lighting Controller (TL7-B2 or TL7-HVG) and Site Controller (SS450-002) take the OSQ Series to a new performance plateau, providing extreme energy productivity, code compliance and a better light experience.

Synapse Wireless Control Accessories	
Twist-Lock Lighting Controller TL7-B2 - Suitable for 120-277V (UL) voltage only - Requires NEMA/ANSI C136.41 7-Pin Dimming Receptacle - Not for use with BML or Q options - Provides On/Off switching, dimming, power metering, digital sensor input, and status monitoring of luminaire - Refer to TL7-B2 spec sheet for details **Twist-Lock Lighting Controller** TL7-HVG - Suitable for 120-480V (UL, UE and UH) voltages - Requires NEMA/ANSI C136.41 7-Pin Dimming Receptacle - Not for use with BML or Q options - Provides On/Off switching, dimming, power metering, digital sensor input, and status monitoring of luminaire - Refer to TL7-HVG spec sheet for details **SimplySNAP Central Base Station** CBSSW-450-002 - Includes On-Site Controller (SS450-002) and 5-button switch - Indoor and Outdoor rated - Refer to CBSSW-450-002 spec sheet for details	**Synapse Wireless Sensor** WSN-DPM - Motion and light sensor - Control multiple zones - Refer to WSN-DPM spec sheet for details **SimplySNAP On-Site Controller** SS450-002 - Verizon® LTE-enabled - Designed for indoor applications - Refer to SS450-002 spec sheet for details **Building Management System (BMS) Gateway** BMS-GW-002 - Required for BACnet integration - Refer to BMS-GW-002 spec sheet for details **Outdoor Antennas** **(Optional, for increased range, 8dB gain)** KIT-ANT420SM - Kit includes antenna, 20' cable and bracket KIT-ANT360 - Kit includes antenna, 30' cable and bracket KIT-ANT600 - Kit includes antenna, 50' cable and bracket - Refer to Outdoor antenna spec sheet for details

Electrical Data*

Lumen Package	System Watts 120-480V	Utility Label Wattage	Total Current (A)					
			120V	208V	240V	277V	347V	480V
4L**	26	30	0.21	0.12	0.11	0.09	N/A	N/A
6L	37	40	0.31	0.18	0.15	0.13	0.11	0.08
9L	55	60	0.46	0.27	0.23	0.20	0.16	0.12
11L	68	70	0.57	0.33	0.28	0.25	0.20	0.14
16L	97	100	0.81	0.47	0.40	0.35	0.28	0.20
22L	131	130	1.09	0.63	0.55	0.47	0.38	0.27
30L	175	180	1.46	0.84	0.73	0.63	0.50	0.36
40L	236	240	1.96	1.13	0.98	0.85	0.68	0.49
50L	297	N/A	2.48	1.43	1.24	1.07	0.86	0.62
65L	384	N/A	3.20	1.85	1.60	1.39	1.11	0.80
75L	447	N/A	3.73	2.15	1.86	1.61	1.29	0.93

* Electrical data at 25°C (77°F). Actual wattage may differ by +/- 10% when operating between 120-277V, 277-480V or 347-480V+/-10%.
** Available with UL voltage only.

OSQ-C Series Ambient Adjusted Lumen Maintenance[1]

Ambient	Initial LMF	25K hr Reported[2] LMF	50K hr Reported[2] LMF	75K hr Reported[2] LMF	100K hr Reported[2] LMF
5°C (41°F)	1.02	0.99	0.93	0.88	0.83
10°C (50°F)	1.02	0.98	0.93	0.87	0.82
15°C (59°F)	1.01	0.98	0.92	0.87	0.82
20°C (68°F)	1.01	0.97	0.92	0.86	0.81
25°C (77°F)	1.00	0.97	0.91	0.86	0.81

[1] Lumen maintenance values at 25°C (77°F) are calculated per IES TM-21 based on IES LM-80 report data for the LED package and in-situ luminaire testing. Luminaire ambient temperature factors (LATF) have been applied to all lumen maintenance factors. Please refer to the Temperature Zone Reference Document for outdoor average nighttime ambient conditions.
[2] In accordance with IES TM-21, Reported values represent interpolated values based on time durations that are up to 6x the tested duration in the IES LM-80 report for the LED.

Accessories

Field-Installed	
Backlight Shield OSQ-M-C-BLSF (Medium) OSQ-L-C-BLSF (Large) OSQ-X-C-BLSF (Extra Large) - Not for use with rotated optics **Bird Spikes** OSQ-M-C-BRDSPK OSQ-L-C-BRDSPK OSQ-X-C-BRDSPK	**Shorting Cap** XA-XSLSHRT

US: creelighting.com (800) 236-6800
Canada: creelighting-canada.com (800) 473-1234

CREE LIGHTING®

REDLEONARD ASSOCIATES
1340 Kemper Meadow Dr, Forest Park, OH 45240
513-574-9500 | redleonard.com

PROJECT NAME:
STARBUCKS
LEICESTER, MA
DRAWING NUMBER:
RL-9076-S1

DOUBLE SIDED MID:

SCALE 1/2”=1’-0”: 29.3 SQ. FT.

(1) D/F LED CABINET _WHITE LEXAN FACES AND TRANSLUCENT VINYL GRAPHICS. TWO TENANTS (SPECS TBD)

BUILDING SIGNAGE:

(3) STARBUCK LOGO CHANNEL CANS (SPECS. TBD)

(3) SETS “DRIVE THRU” CHANNEL LETTERS (SPECS. TBD)

(3) SETS “MAJESTIC NAILS” CHANNEL LETTERS (SPECS. TBD)

APPROX SCALE” 3/8”=1’-0”

SEE PAGE 2 FOR BLDG LOCATION

NHSigns
66 Gold Ledge Avenue, Auburn, NH 03032
603.437.1200
FAX 603.437.1222
www.nhsigns.com

- DESIGN
- MANUFACTURE
- INSTALL
- SERVICE

CLIENT: YATCO STARBUCKS LEICESTER, MA MID

LOCATION: 1621 MAIN ST LEICESTER, MA

DATE: 09/7/23

ACCT. REP: FP

DESIGNER: KAREN DAVIS

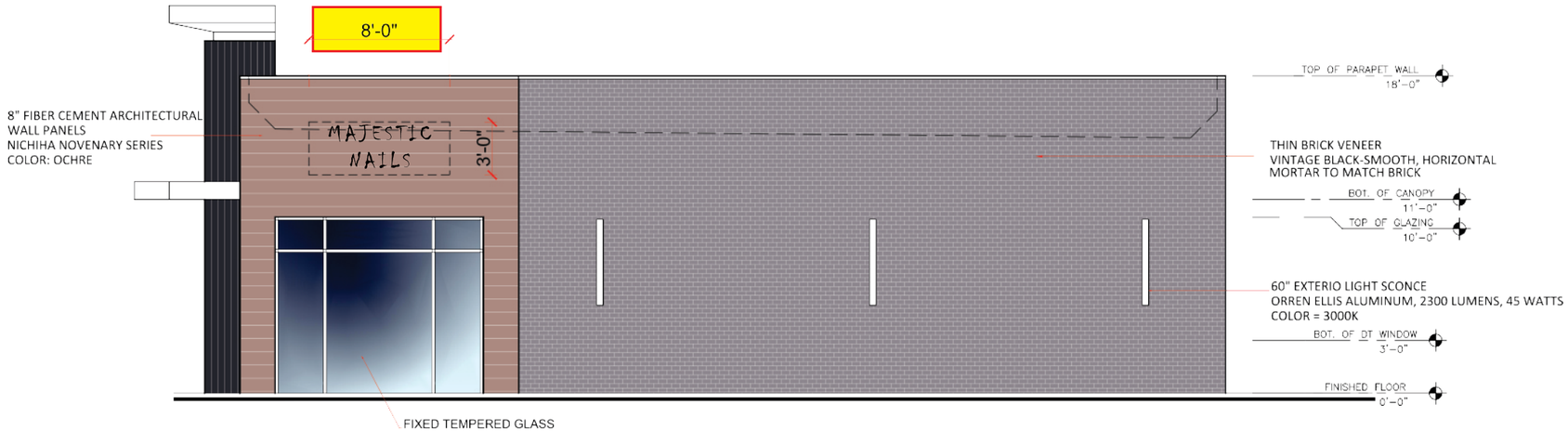
Rev#	Date:
1. new fasica	9/7/23
2. new archit. dwg	9/11/23
3.spelling + more	9/13/23

FILE NAME LOC: YATCO STARBUCKS (1621) LEICESTER, MA MID & CL

Please Note: it is the customers responsibility to provide primary electrical service (including ground wiring) directly from panel box, to within six ft. of sign(s). Installation to comply with N.E.C.600

NORTH-EAST FACADE

74.5' FRONTAGE



NORTH-WEST FACADE

SCALE: NTS

NH Signs
SERVING NEW ENGLAND
SINCE 1992
66 Gold Ledge Avenue,
Auburn, NH 03032
603.437.1200
FAX 603.437.1222
www.nhsigns.com

- DESIGN
- MANUFACTURE
- INSTALL
- SERVICE (UL Underwriters Laboratories, Inc. ELECTRIC SIGN)

CLIENT:
YATCO STARBUCKS
LEICESTER, MA MID

LOCATION:
1621 MAIN ST
LEICESTER, MA

DATE:
09/7/23

ACCT. REP:
FP

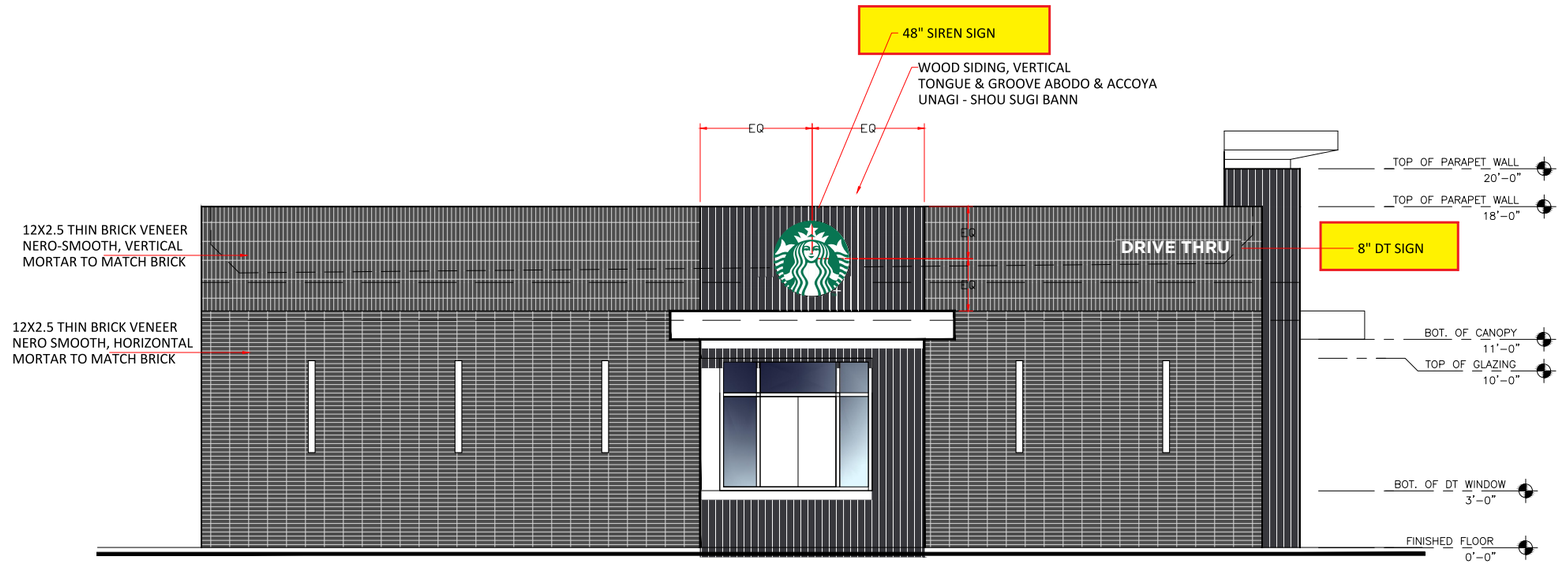
DESIGNER:
KAREN DAVIS

Rev#	Date:
1. new fasica	9/7/23
2. new archit. dwg	9/11/23
3.spelling + more	9/13/23

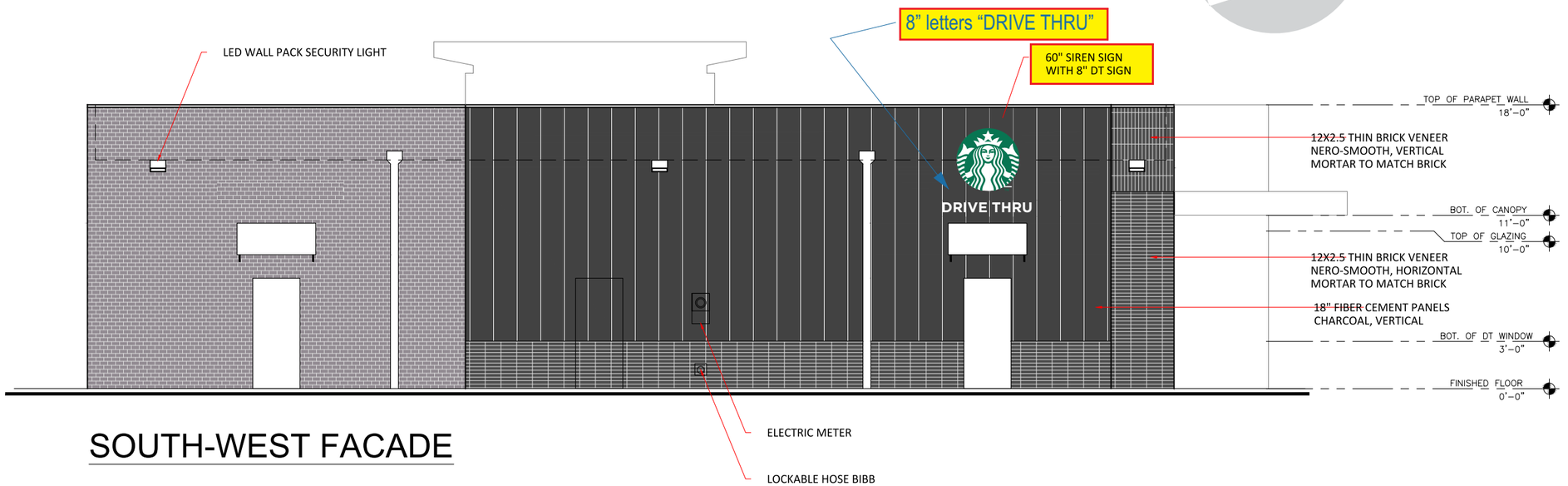
FILE NAME LOC:
YATCO STARBUCKS (1621)
LEICESTER, MA MID & CL

Please Note: it is the customers responsibility to provide primary electrical service (including ground wiring) directly from panel box, to within six ft. of sign(s). Installation to comply with N.E.C.600

PAGE: 2-r3



SOUTH EAST FACADE



SOUTH-WEST FACADE

SCALE: NTS

NH Signs
SERVING NEW ENGLAND SINCE 1992
66 Gold Ledge Avenue,
Auburn, NH 03032
603.437.1200
FAX 603.437.1222
www.nhsigns.com

- DESIGN
- MANUFACTURE
- INSTALL
- SERVICE

Underwriters Laboratories, Inc. ELECTRIC SIGN

CLIENT:
YATCO STARBUCKS
LEICESTER, MA MID

LOCATION:
1621 MAIN ST
LEICESTER, MA

DATE:
09/7/23

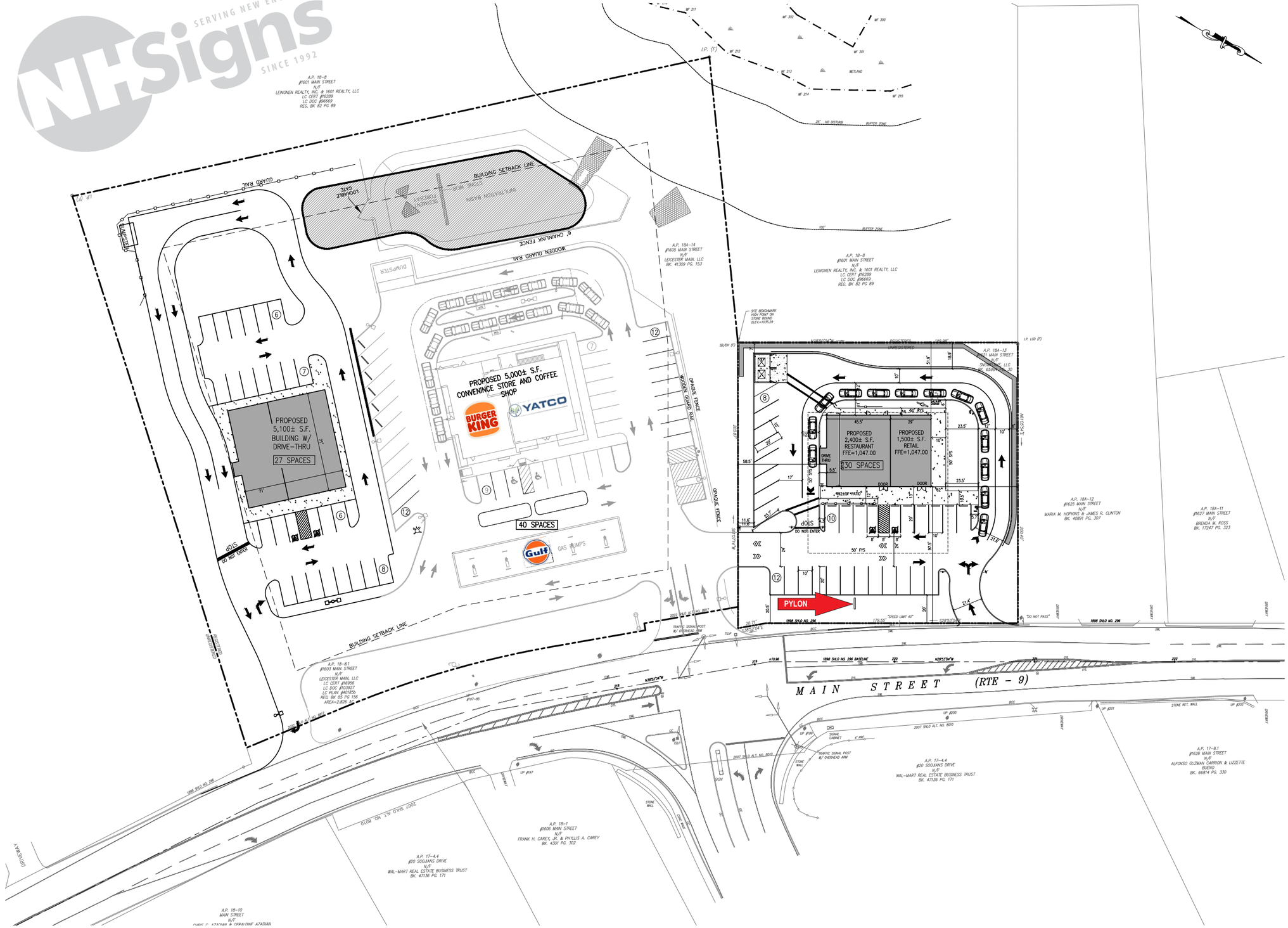
ACCT. REP:
FP

DESIGNER:
KAREN DAVIS

Rev#	Date:
1. new fasica	9/7/23
2. new archit. dwg	9/11/23
3.spelling + more	9/13/23

FILE NAME LOC:
YATCO STARBUCKS (1621
LEICESTER, MA MID & CL

Please Note: it is the customers responsibility to provide primary electrical service (including ground wiring) directly from panel box, to within six ft. of sign(s). Installation to comply with N.E.C.600



NHSigns SERVING NEW ENGLAND SINCE 1992

66 Gold Ledge Avenue,
Auburn, NH 03032

603.437.1200
FAX 603.437.1222
www.nhsigns.com

- DESIGN
- MANUFACTURE
- INSTALL
- SERVICE

Underwriters Laboratories Inc. ELECTRIC SIGN

CLIENT:
YATCO STARBUCKS LEICESTER, MA MID

LOCATION:
1621 MAIN ST
LEICESTER, MA

DATE:
09/7/23

ACCT. REP:
FP

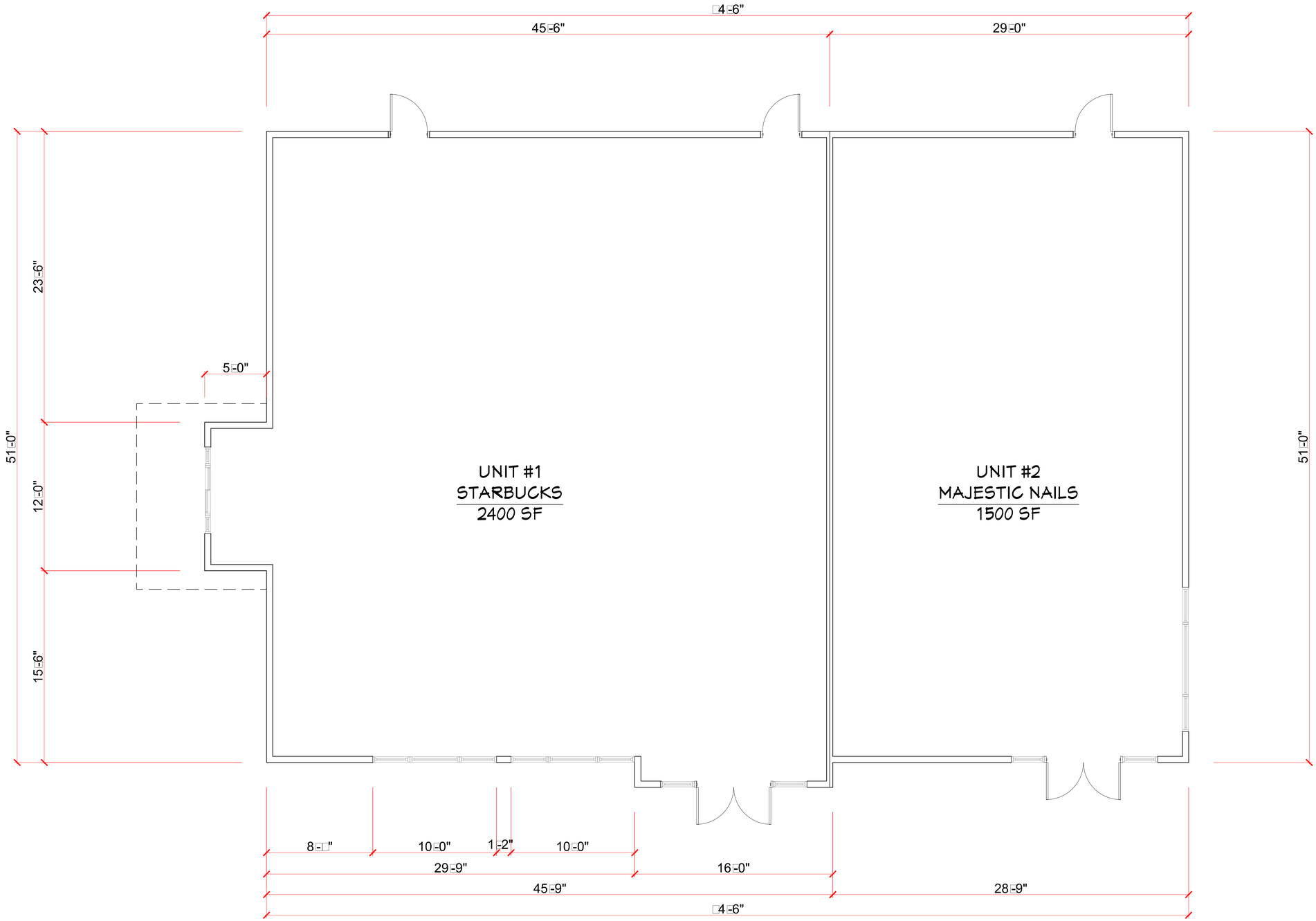
DESIGNER:
KAREN DAVIS

Rev#	Date:
1. new fasica	9/7/23
2. new archit. dwg	9/11/23
3.spelling + more	9/13/23

FILE NAME LOC:
YATCO STARBUCKS (1621 LEICESTER, MA MID & CL

Please Note: it is the customers responsibility to provide primary electrical service (including ground wiring) directly from panel box, to within six ft. of sign(s). Installation to comply with N.E.C.600

PAGE: 4-r3



FLOOR PLAN

ARCHITECTURE . PLANNING . DESIGN

aaDESIGN SERVICES L.L.C.
43 MONROE AVE, WORCESTER, MA 01602
TEL: 508-769-0579 . FAX: 508-754-5415

OWNER:

PROJECT NAME:

MIXED USE BUILDING

PROJECT NO: C2348

PROJECT ADDRESS:

1621
MAIN STREET
LEICESTER, MA

SHEET TITLE:

FLOOR PLAN

STAMP:

SCALE: AS SHOWN

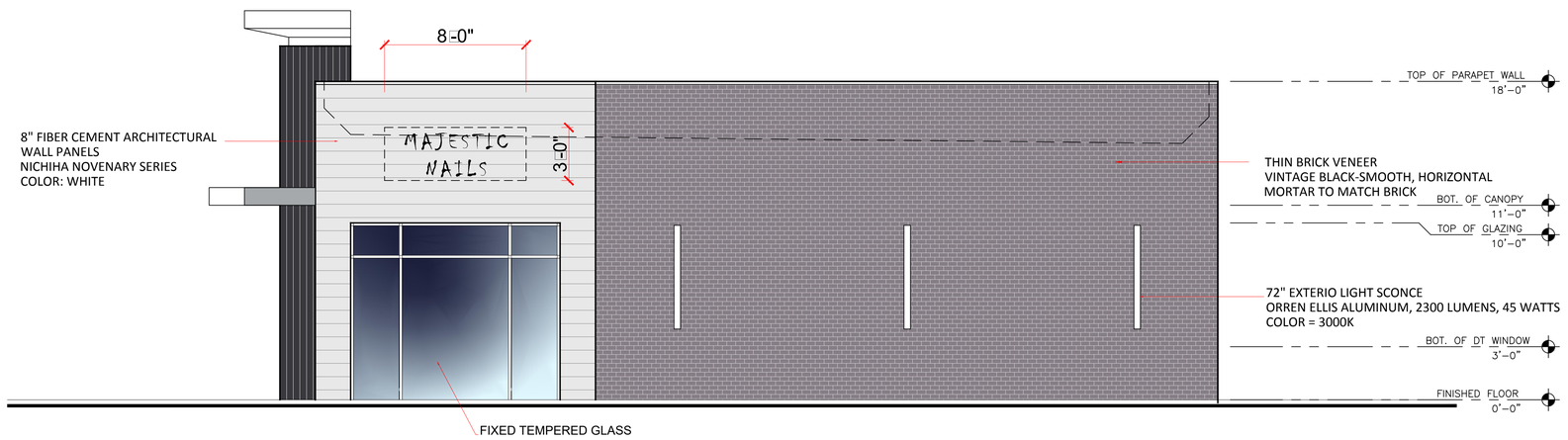
DATE: 9-12-2023

REVISIONS:

SHEET NO:

1

NORTH-EAST FACADE



NORTH-WEST FACADE

ARCHITECTURE . PLANNING . DESIGN

aaDESIGN SERVICES L.L.C.
43 MONROE AVE, WORCESTER, MA 01602
TEL: 508-769-0579 . FAX: 508-754-5415

OWNER:

PROJECT NAME:

MIXED USE BUILDING

PROJECT NO: C2348

PROJECT ADDRESS:

1621
MAIN STREET
LEICESTER, MA

SHEET TITLE:

EXTERIOR ELEVATIONS

STAMP:

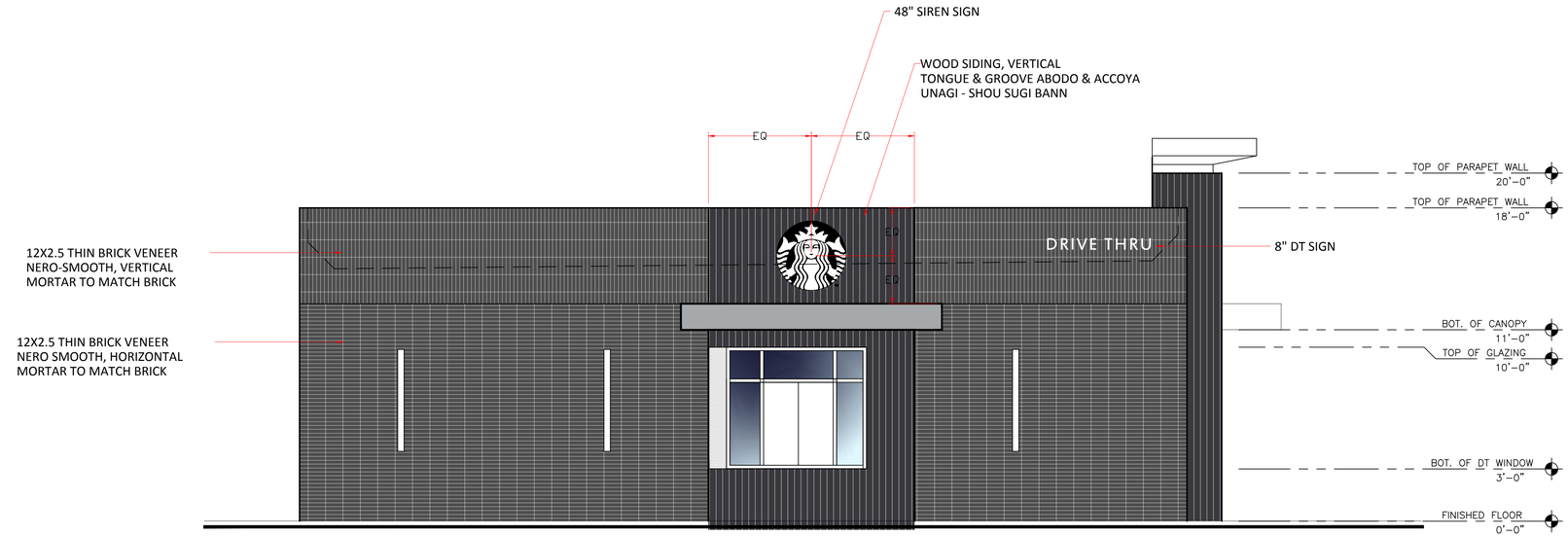
SCALE: AS SHOWN

DATE: 9-12-2023

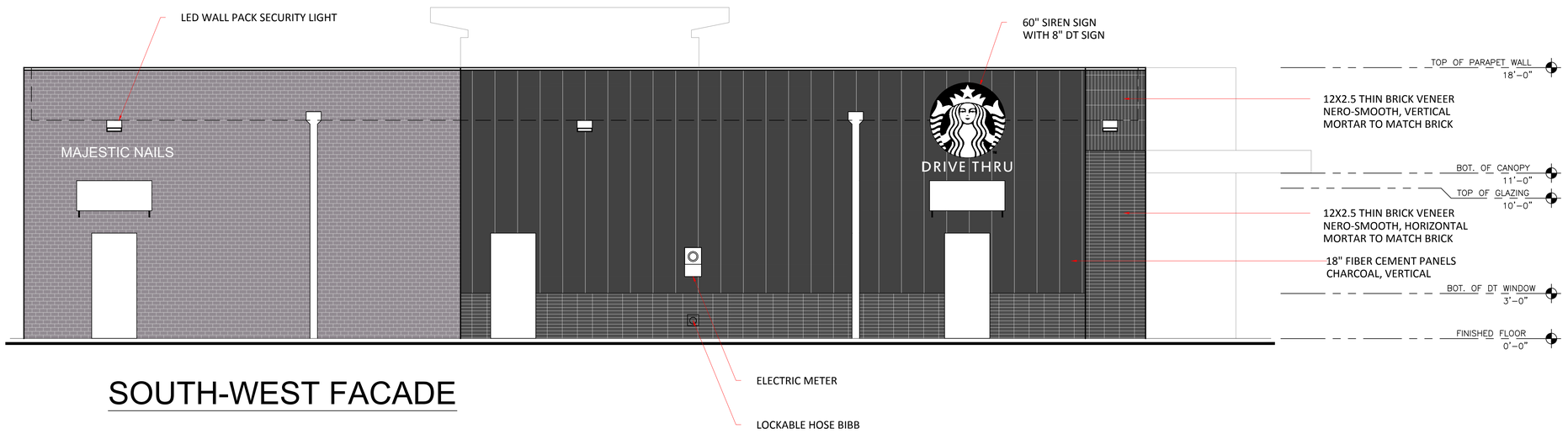
REVISIONS:

SHEET NO:

2



SOUTH EAST FACADE



SOUTH-WEST FACADE

ARCHITECTURE . PLANNING . DESIGN

AADESIGN SERVICES L.L.C.
43 MONROE AVE, WORCESTER, MA 01602
TEL: 508-769-0579 . FAX: 508-754-5415

OWNER:

PROJECT NAME:

MIXED USE BUILDING

PROJECT NO: C2348

PROJECT ADDRESS:

1621
MAIN STREET
LEICESTER, MA

SHEET TITLE:

EXTERIOR ELEVATIONS

STAMP:

SCALE: AS SHOWN

DATE: 9-11-2023

REVISIONS:

SHEET NO:

3

QUINN
ENGINEERING, INC.

P.O. Box 107
Paxton, Massachusetts 01612
Phone: (508) 753-7999
Fax: (508) 795-0939

October 10, 2023

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

Re: 1621 Main Street
Site Plan Review, Special Permit

To the Planning Board:

We are in receipt of the following information package submitted in reference to a proposed commercial development located at 1621 Main Street:

- Plans entitled "Site Plan Set for Proposed Restaurant & Retail Development, 1621 Main Street (RTE-9), Leicester Ma 01524", consisting of 19 sheets, prepared by Civil Design Group, LLC of North Andover, MA.

- A package of information, including

    - a submission letter addressed to Leicester Planning Board dated September 13, 2023, from Thomas R. Reidy, Esq; Bacon/Wilson
    - Applications for Site Plan Review and Special Permit
    - Site Plan Review/Special Permit Narrative, undated
    - Stormwater Management Report, dated August 2023 prepared by Civil Design Group, LLC of North Andover, MA.

- Memorandum addressed to Mr. Hussein Yatim, HY Ventures Leicester, LLC, dated September 14, 2023, regarding "Proposed Starbucks w/ Drive Through & Retail Facility". Memorandum addresses traffic impacts.

At the request of the Board, we have reviewed plans of for conformance with §5.2.03, *Site Plan Review* and other appropriate sections of the Leicester Zoning Bylaw, *Site Plan Review Regulations, Special Permit Regulations, Parking Regulations and Stormwater Regulations.*

Our comments on the submitted information follows:

1. The submitted information should include the anticipated schedule for development. (REF: Site Plan Review Regulations, II, E, 4)

2. Leicester Planning Board may wish to request the Engineer address pedestrian access. (REF: §5.5.02.2, A, 8)

3. Accessible parking spaces are called out to be 8 feet wide; minimum parking space width is 10 feet, (REF: §5.5.02.2,B, 1, and *Leicester Parking Regulations* IV, A)

4. The abutting property at 1625 Main Street appears to be in residential use. §5.5.02.2, B requires a 50 foot landscape buffer on sites where a non-residential use abuts a residential use. Per §5.5.02.2, E, access drives may be allowed in the buffer areas, except that Leicester Planning Board may require an opaque fence and/or other plantings. In the area where the site abuts this property, no landscape buffer is found, however, an access drive is proposed. Leicester Planning Board may wish to request the Engineer address compliance with these bylaws.

5. Parking spaces are proposed within 50 feet of the of the property line with 1625 Main Street. Parking is not allowed within buffer areas. (REF: 5.5.02.2, H)

6. The entrance drive from 1603/1605 Main Street is 24 feet in width. Drives which serve access/egress must be a minimum of 25 feet in width. (REF: §5.5.02.2, C, 2; also Leicester Parking Regulations IV, C).

7. Plans should document areas of site which are to be cut or filled. It is believed that the entire site will be filled. (REF: Leicester Stormwater Regulations 4.0, A)

8. Engineer should document that landscaping area complies with 5% area requirement identified in §5.5.02.2, I.

9. Site lighting plan indicates that minimal light spill (less than 1 fc) will occur on the neighboring parcels to the north and west. In the area of the driveway to the proposed commercial development at 1603/1605 Main Street, peak lighting intensity of 2.2 fc is found. At the entrance ramp from Main Street, the peak lighting intensity is 1.4 fc. Site lighting is not regulated in Leicester; it is the opinion of this office that the lighting in these areas is appropriate.

10. The Narrative on the site plan indicates that during times of peak demand, the restaurant may be staffed with 6 – 8 employees. The parking calculation is based on a maximum of 6 employees. Leicester Planning Board may wish to request an opinion from the Leicester Zoning Enforcement Officer as to parking adequacy.

11. The Fire Apparatus Circulation plan indicates that maneuvering apparatus may conflict with parked vehicles and with a light post. Leicester Planning Board may wish to request the input of Leicester Fire Department.

12. Stormwater collected from this site will be discharged to a stormwater basin which will be shared in common with the development at 1603/1605 Main Street. This shared use should be governed by an agreement or easement which will:

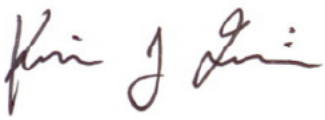
    - Define how maintenance or repair responsibilities and costs will be shared by parties which use the basin.
    - Provide deeded rights which ensure the ongoing use of common stormwater facilities by both parties.

13. Plans for the stormwater basin should depict and identify the (separate) stormwater basin improvements proposed for 1603/1605 Main Street.

14. The drive-through has a queue line which accommodates thirteen vehicles. While this queue line is considered to be optimal for the site, it remains possible that at times of peak demand, customer vehicles may extend beyond this queue line.

Please don't hesitate to contact this office with questions you may have.

Sincerely,
QUINN ENGINEERING, INC.



Kevin J. Quinn, P.E.
President

Department Comments 1621 Main St.

Building:

Harold Leaming

After careful review of the sight plan, I have no issues on ADA the site provides ample accessible parking places (formula 25 spaces and under 1 van accessible space 26 and over and below 50 2 accessible spaces are required including van accessibility. The site has provided ample accessible parking. I also have reviewed the building fire separation and found the site to be within the distances provided in 780 CMR Chapter 7 sec 702 and sec 705. I have no other concerns with the site plan review.

Police Department:

Ken Antanavica

Hello Kristen:

I do not see any glairing problems with the traffic flow. It appears that it will work well.

Health Department

Francis Dagle

The Health Dept has no comments on the special permit. We would only note that they will be required to test and remediate any lead or asbestos before the demolition process.

QUINN
ENGINEERING, INC.

P.O. Box 107
Paxton, Massachusetts 01612
Phone: (508) 753-7999
Fax: (508) 795-0939

October 11, 2023

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

Re: 112 Huntoon Highway
Conceptual Plan

To the Planning Board:

We are in receipt of a site plan entitled "Site Plan Modification, 112 Huntoon Memorial Highway, Rochdale, MA", prepared by McClure Engineering, Inc, identified as Concept Plan with a date of 8/31/23.

The site plan depicts a 100' x 100' building footprint, described as "Proposed Garage/Storage", with an apparent expansion of the existing yard, where cranes and other heavy construction equipment is stored, assemble and repaired. The yard expansion is identified as 450' long x 62' wide.

The site is located in the Highway Business- Industrial District 2 (HB-2). In HB-2, uses described as "storage warehouse" and "contractor yard" are allowed as of right. "gasoline station" use is allowed by Special Permit from Leicester Zoning Board of Appeals. Leicester Planning Board may wish to request the Zoning Enforcement Officer comment on the proposed uses, and their relation to the Zoning Bylaw.

The proposed development would be subject to the following:

- **Site Plan Review**. Under §5.2.02, 1, a, the proposed site work will be subject to Site Plan Review, however, because the existing site development is already

subject to a Site Plan Approval, any significant alteration would require amending the existing Site Plan approval.

- **Leicester Stormwater Bylaw**. Site plans must be prepared in compliance with the stormwater regulations, and secure a Stormwater Permit.

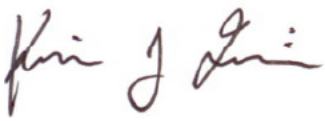
- **Wetlands Protection Act**. Site development work extends into wetland Buffer Zone, jurisdictional under the Wetlands Protection Act. A Notice of Intent must be submitted to Leicester Conservation Commission, and approved.

Under §5.5.02.2 of the Leicester Zoning Bylaw, specific requirements exist for landscape buffers, particularly where non-residential uses abut residential uses. The Engineer must evaluate the status of adjoining properties and prepare site plans with appropriate landscape buffers.

It is also noted that site lighting has been a subject of neighbor comments in the past in relation to this site; site plans should address control of lighting to prevent objectionable glare onto adjoining properties. Leicester Planning Board may wish to require a light intensity (photometric) plan.

I am not aware of any reason why the site development work proposed in the Concept Plan cannot be designed in compliance with the above regulations.

Please don't hesitate to contact this office with questions you may have.
Sincerely,
QUINN ENGINEERING, INC.



Kevin J. Quinn, P.E.
President

To the Planning Board

October 12, 2023

Upon the request of Justin Stelmok of Oakridge Estates, I researched the surety reserved for the subdivision “Oakridge Estates. The Town of Leicester paid the amount of $292,816.10 by a check issued to Hometown Bank on March 29, 2012. There are no remaining funds for this subdivision.

Regards,

Kristen Jacobsen

Town Planner

Town Planner Update- Planning Board Meeting 10-17-2023

- **112 Huntoon- Jack Daige:** After researching the Planning Department reached out to Jack to obtain the following information:
  - Site Plan Review Application with project narrative describing the scope of the project, including addressing stormwater, wetlands, and landscape buffers, etc., per Quinn Engineering's 10/11/23 comment letter.
  - Plan set stamped by a professional engineer.
  - Site Plan Review application fee of $3,150 for "new commercial structures over 3,000 square feet". There is currently a balance in the 53G account that can be used for peer review fee(s) and you will be notified if it needs to be replenished.
  - Request a 300 ft Abutters List and mail notification to abutters CM/RR. Provide PB with copy of abutters list and proof of mailing.
  - The Town will publish a public hearing notice (legal ad) and will be billed directly through the newspaper.
  - This project will be placed on agenda once all requested documents are received and the public hearing has been scheduled.

  Please note the plans submitted to Quinn Engineering were marked as unstamped concept plans. The Planning Department only accepts stamped plans.

- **190 Main Street**: Needs inspection. Awaiting word from Conservation Commissioner. They have also approached the Planning Department because they would like to alter the interior of the structure to include a number of offices/maker spaces with a large portion of square footage reserved for storage. No new application has been submitted to date.

  Contacted Building Inspector for the following inspections
  700 & 704 Main Street
  747 Main Street
  25a/b Pleasant Street