ALTUS ENGINEERING, INC.

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

February 11, 2022

Beverly Zendt, Planning Director
City of Portsmouth Municipal Complex
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: Planning Board Submission
"Monarch Village"
Assessor's Map 297, Lot 6
3548 Lafayette Road
Altus Project No. 5161

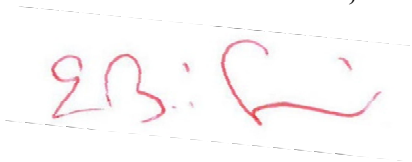
Dear Beverly,

On behalf of the Applicant, Monarch Village, LLC, Altus Engineering, Inc. respectfully submits a compete application package for the Planning Board hearing on February 17, 2022. This includes updated plans that incorporate all relevant TAC and third-party review comments.

Please call me if you have any questions or need any additional information.

Sincerely,

ALTUS ENGINEERING, INC.



Erik B. Saari
Vice President

ebs/5161-Ltr-PB-021122

City of Portsmouth, New Hampshire

Site Plan Application Checklist

This site plan application checklist is a tool designed to assist the applicant in the planning process and for preparing the application for Planning Board review. A pre-application conference with a member of the planning department is strongly encouraged as additional project information may be required depending on the size and scope. The applicant is cautioned that this checklist is only a guide and is not intended to be a complete list of all site plan review requirements. Please refer to the Site Plan review regulations for full details.

Applicant Responsibilities (Section 2.5.2): Applicable fees are due upon application submittal along with required attachments. The application shall be complete as submitted and provide adequate information for evaluation of the proposed site development. Waiver requests must be submitted in writing with appropriate justification.

Name of Owner/Applicant: Naveesha Holdings, LLC (Owner) Monarch Village, LLC (Applicant) Date Submitted: 08/23/21

Phone Number: (978) 685-0568 E-mail: nlee@ncsne.com

Site Address: 3548 Lafayette Road Map: 297 Lot: 6

Zoning District: Gateway 1 Lot area: 162,970 sq. ft.

Application Requirements			
☑	**Required Items for Submittal**	**Item Location (e.g. Page or Plan Sheet/Note #)**	**Waiver Requested**
☒	Fully executed and signed Application form. **(2.5.2.3)**	Viewpoint	N/A
☒	All application documents, plans, supporting documentation and other materials provided in digital Portable Document Format (PDF). **(2.5.2.8)**	Viewpoint	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Statement that lists and describes "green" building components and systems. **(2.5.3.1A)**	Green Statement	
☒	Gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. **(2.5.3.1B)**	Sheet C2	N/A
☒	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1C)**	Sheet EX-1, Note 2	N/A
☒	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. **(2.5.3.1D)**	Cover Sheet	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. **(2.5.3.1E)**	Sheets EX-1 and EX-2	N/A
☒	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1F)**	Cover Sheet	N/A
☒	List of reference plans. **(2.5.3.1G)**	Sheet EX-1	N/A
☒	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1H)**	Sheet C-4, Note 10	N/A

Site Plan Specifications			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Full size plans shall not be larger than 22 inches by 34 inches with match lines as required, unless approved by the Planning Director. Submittals shall be a minimum of 11 inches by 17 inches as specified by Planning Dept. staff. **(2.5.4.1A)**	Required on all plan sheets	N/A
☒	Scale: Not less than 1 inch = 60 feet and a graphic bar scale shall be included on all plans. **(2.5.4.1B)**	Required on all plan sheets	N/A
☒	GIS data should be referenced to the coordinate system New Hampshire State Plane, NAD83 (1996), with units in feet. **(2.5.4.1C)**	Sheets EX-1 and EX-2	N/A
☒	Plans shall be drawn to scale. **(2.5.4.1D)**	Required on all plan sheets	N/A
☒	Plans shall be prepared and stamped by a NH licensed civil engineer. **(2.5.4.1D)**	All required sheets	N/A
☒	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. **(2.5.4.1E)**	Sheets EX-1 and EX-2	N/A
☒	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**	All sheets	N/A
☒	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**	All sheets	N/A
☒	Individual plan sheet title that clearly describes the information that is displayed. **(2.5.4.2C)**	Required on all plan sheets	N/A
☒	Source and date of data displayed on the plan. **(2.5.4.2D)**	Sheets EX-1 and EX-2	N/A

Site Plan Specifications			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	A note shall be provided on the Site Plan stating: "All conditions on this Plan shall remain in effect in perpetuity pursuant to the requirements of the Site Plan Review Regulations." **(2.5.4.2E)**	Sheet C-2, Note 21	N/A
☒	Plan sheets submitted for recording shall include the following notes: a. "This Site Plan shall be recorded in the Rockingham County Registry of Deeds." b. "All improvements shown on this Site Plan shall be constructed and maintained in accordance with the Plan by the property owner and all future property owners. No changes shall be made to this Site Plan without the express approval of the Portsmouth Planning Director." **(2.13.3)**	Sheet C-2, Notes 22 & 23	N/A
☐	Plan sheets showing landscaping and screening shall also include the following additional notes: a. "The property owner and all future property owners shall be responsible for the maintenance, repair and replacement of all required screening and landscape materials." b. "All required plant materials shall be tended and maintained in a healthy growing condition, replaced when necessary, and kept free of refuse and debris. All required fences and walls shall be maintained in good repair." c. "The property owner shall be responsible to remove and replace dead or diseased plant materials immediately with the same type, size and quantity of plant materials as originally installed, unless alternative plantings are requested, justified and approved by the Planning Board or Planning Director." **(2.13.4)**	Pending	N/A

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
	1. Existing Conditions: (2.5.4.3A)		
☒	a. Surveyed plan of site showing existing natural and built features;	Sheets EX-1 and EX-2	
☐	b. Zoning boundaries;	N/A (no close boundary)	
☒	c. Dimensional Regulations;	Sheet C-2	
☒	d. Wetland delineation, wetland function and value assessment;	Sheet C-2	
☐	e. SFHA, 100-year flood elevation line and BFE data.	N/A	
	2. Buildings and Structures: (2.5.4.3B)		
☒	a. Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation;	Sheets C-2 and C-3	
☒	b. Elevations: Height, massing, placement, materials, lighting, façade treatments;	Elevations	
☒	c. Total Floor Area;	Sheet C-2	
☒	d. Number of Usable Floors;	Sheet C-2	
☒	e. Gross floor area by floor and use.	Sheet C-2	
	3. Access and Circulation: (2.5.4.3C)		
☒	a. Location/width of access ways within site;	Sheet C-2	
☒	b. Location of curbing, right of ways, edge of pavement and sidewalks;	Sheet C-2	
☒	c. Location, type, size and design of traffic signing (pavement markings);	Sheet C-2	
☒	d. Names/layout of existing abutting streets;	Sheet C-2	
☒	e. Driveway curb cuts for abutting prop. and public roads;	Sheet C-2	
☐	f. If subdivision; Names of all roads, right of way lines and easements noted;	N/A	
☒	g. AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	Fire Truck provided	
	4. Parking and Loading: (2.5.4.3D)		
☒	a. Location of off street parking/loading areas, landscaped areas/buffers;	Sheet C-2	
☒	b. Parking Calculations (# required and the # provided).	Sheet C-2, Note 8	
	5. Water Infrastructure: (2.5.4.3E)		
☒	a. Size, type and location of water mains, shut-offs, hydrants & Engineering data;	Sheet C-5	
☐	b. Location of wells and monitoring wells (include protective radii).	N/A	
	6. Sewer Infrastructure: (2.5.4.3F)		
☒	a. Size, type and location of sanitary sewage facilities & Engineering data.	Sheets C-5 and C-6	
	7. Utilities: (2.5.4.3G)		
☒	a. The size, type and location of all above & below ground utilities;	Sheet C-5	
☒	b. Size type and location of generator pads, transformers and other fixtures.	Sheet C-5	

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☐	**8. Solid Waste Facilities: (2.5.4.3H)**		
☒	a. The size, type and location of solid waste facilities.	Sheet C-2	
	9. Storm water Management: (2.5.4.3I)		
☒	a. The location, elevation and layout of all storm-water drainage.	Sheet C-3	
	10. Outdoor Lighting: (2.5.4.3J)		
☒	a. Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and; b. photometric plan.	Sheet C-6	
☒	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**	Sheet C-6	
	12. Landscaping: (2.5.4.3K)		
☒	a. Identify all undisturbed area, existing vegetation and that which is to be retained;	Sheet C-2	
☐	**b.** Location of any irrigation system and water source.	N/A	
	13. Contours and Elevation: (2.5.4.3L)		
☒	a. Existing/Proposed contours (2 foot minimum) and finished grade elevations.	Sheet C-3	
	14. Open Space: (2.5.4.3M)		
☒	a. Type, extent and location of all existing/proposed open space.	Sheet C-2	
☐	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	N/A	
☒	**16. Location of snow storage areas and/or off-site snow removal. (2.5.4.3O)**	Sheet C-2	
☐	**17. Character/Civic District (All following information shall be included): (2.5.4.3Q)**	N/A	
	a. Applicable Building Height (10.5A21.20 & 10.5A43.30);		
	b. Applicable Special Requirements (10.5A21.30);		
	c. Proposed building form/type (10.5A43);		
	d. Proposed community space (10.5A46).		

Other Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Traffic Impact Study or Trip Generation Report, as required. (*Four (4) hardcopies of the full study/report and Six (6) summaries to be submitted with the Site Plan Application*) **(3.2.1-2)**	Traffic Study attached	
☒	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**	Green Statement	
☐	Indicate whether the proposed development is located in a wellhead protection or aquifer protection area. Such determination shall be approved by the Director of the Dept. of Public Works. **(7.3.1)**	N/A	
☒	Indicate where measures to minimize impervious surfaces have been implemented. **(7.4.3)**	Site Plan	
☒	Calculation of the maximum effective impervious surface as a percentage of the site. **(7.4.3.2)**	Stormwater Management Plan	
☒	Stormwater Management and Erosion Control Plan. (*Four (4) hardcopies of the full plan/report and Six (6) summaries to be submitted with the Site Plan Application*) **(7.4.4.1)**	Stormwater Management Plan attached	

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	All local approvals, permits, easements and licenses required, including but not limited to: a. Waivers; b. Driveway permits; c. Special exceptions; d. Variances granted; e. Easements; f. Licenses. **(2.5.3.2A)**	Cover Sheet	
☒	Exhibits, data, reports or studies that may have been required as part of the approval process, including but not limited to: a. Calculations relating to stormwater runoff; b. Information on composition and quantity of water demand and wastewater generated; c. Information on air, water or land pollutants to be discharged, including standards, quantity, treatment and/or controls; d. Estimates of traffic generation and counts pre- and post-construction; e. Estimates of noise generation; f. A Stormwater Management and Erosion Control Plan; g. Endangered species and archaeological / historical studies; h. Wetland and water body (coastal and inland) delineations; i. Environmental impact studies. **(2.5.3.2B)**	Stormwater Plan Sheet C-4 N/A Traffic Analysis N/A Stormwater Mgmt. Plan N/A Sheets EX-1 and EX-2 N/A	

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☐	A document from each of the required private utility service providers indicating approval of the proposed site plan and indicating an ability to provide all required private utilities to the site. **(2.5.3.2D)**	Pending (Eversource and Unitil)	
☒	A list of any required state and federal permit applications required for the project and the status of same. **(2.5.3.2E)**	Cover Sheet	

Applicant's Signature: _____ **Date:** 08/23/21

"Green" Statement
Assessor's Map 297 Lot 6
Monarch Village
3548 Lafayette Road
Altus Project 5107

Pursuant to Section 2.5.3.1(a) of the Site Plan Review Regulations, Altus Engineering, Inc. respectfully submits the following list of the project's "green" components for the redevelopment of the Wren's Nest Motel proposed for 3548 Lafayette Road:

- All new and rehabilitated buildings will meet or exceed all applicable current energy codes.
- New site lighting will be energy efficient, dark-sky compliant LED fixtures.
- Stormwater will be directed to infiltration-based and closed drainage systems to provide appropriate treatment.
- Mini-split AC units will be used in all units to provide energy efficient cooling.
- The redevelopment proposes to reuse existing buildings to the greatest extent possible rather than demolish them.
- Mass transit in the form of the COAST bus network is located a short walk from the site.

ALTUS ENGINEERING, INC.

Civil
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133 Court Street
Portsmouth, NH
(603) 433-2335

"Monarch Village" 3548 Lafayette Road
Portsmouth, NH

Engineer's Opinion of Cost

(August 23, 2021 Plan Set)

PROJECT: 5161

Est. Qty	Unit	ITEM DESCRIPTION &	Cost/Unit	Total
1	LS	Site Demolition	$ 30,000.00	$ 30,000.00
1	LS	Clearing, Grubbing and Loam Stripping	$ 5,000.00	$ 5,000.00
106	TON	Hot Bituminous Pavement	$ 90.00	$ 9,540.00
945	SY	Concrete Sidewalk and Pads (incl. subgrade)	$ 70.00	$ 66,150.00
1,082	CY	Gravel (NHDOT 304.2)	$ 23.00	$ 24,886.00
541	CY	Crushed Gravel (NHDOT 304.3)	$ 29.00	$ 15,689.00
3	CY	Riprap	$ 25.00	$ 75.00
382	LF	6" PE Underdrain	$ 25.00	$ 9,550.00
16	LF	6" & 8" PE Pipe (smooth interior)	$ 30.00	$ 480.00
471	LF	12" PE Pipe (smooth interior)	$ 40.00	$ 18,840.00
328	LF	15" PE Pipe (smooth interior)	$ 50.00	$ 16,400.00
14	EA	4ft Dia. Catch Basin	$ 2,500.00	$ 35,000.00
3	EA	Special Catch Basins (Leaching Drain Manhole)	$ 3,000.00	$ 9,000.00
1	EA	Outlet Structure	$ 2,000.00	$ 2,000.00
2	EA	Sewer Manhole	$ 2,500.00	$ 5,000.00
5	EA	Manhole Cover and Frame	$ 700.00	$ 3,500.00
4	EA	Bollards	$ 200.00	$ 800.00
2	EA	Detectable Warning Devices, Cast Iron	$ 700.00	$ 1,400.00
1,151	LF	Vertical Granite Curb	$ 55.00	$ 63,305.00
430	LF	Sloped Granite Curb	$ 50.00	$ 21,500.00
404	LF	6" SDR 35 Sewer Pipe	$ 45.00	$ 18,180.00
544	LF	8" SDR 35 Sewer Pipe	$ 55.00	$ 29,920.00
230	LF	Domestic Water Service	$ 20.00	$ 4,600.00
538	LF	4" D.I. Water Pipe	$ 50.00	$ 26,900.00
96	LF	6" D.I. Water Pipe	$ 60.00	$ 5,760.00
574	LF	8" D.I. Water Pipe	$ 70.00	$ 40,180.00
1	EA	Hydrant Assembly	$ 4,000.00	$ 4,000.00
931	LF	SCH 40 Conduit (x4 per trench, incl. trenching and backfill)	$ 40.00	$ 37,240.00
6	EA	Traffic Sign Type C	$ 50.00	$ 300.00
33	LF	Wood Beam Guardrail	$ 30.00	$ 990.00
16	EA	Concrete Base and Light Pole	$ 3,000.00	$ 48,000.00
1	LS	Pavemnt Striping	$ 1,000.00	$ 1,000.00
1	LS	Misc. Temp. Erosion and Sediment Control	$ 3,000.00	$ 3,000.00
1	LS	Planted Landscape	$ 15,000.00	$ 15,000.00
			****SUBTOTAL:**	**$ 573,185.00**

**** Exclusions:**

Ledge Removal, Hazardous Waste Remediation, , Traffic Control, Offsite Work, Site Construction Monitoring and Reporting, Legal Issues

City of Portsmouth, NH

Property

Zoom To | Share

Search | Selection | Themes | Markup

297-10

297-9

297-8

297-6

297-5

Lafayette Rd

Coach Rd

Google AppGeo

43.020687,-70.800278

MONARCH VILLAGE
Residential Redevelopment

3548 Lafayette Road
Portsmouth, New Hampshire

Assessor's Parcel 297, Lot 6

ISSUED FOR PLANNING BOARD

Plan Issue Date:

DECEMBER 28, 2021

Owner:
NAVEESHA HOSPITALITY, LLC
440 Bedford St.
Lexington, MA 02420
(603) 396-6017

Applicant:
MONARCH VILLAGE, LLC
P.O. Box 365
East Hampstead, NH 03826
(603) 396-6017

Surveyor:
James Verra and Associates, Inc.
LAND SURVEYORS
101 Shattuck Way, Suite 8
Newington, New Hampshire 03801-7876
Voice 603.436.3557 Fax 603.436.8339

Soil Scientist:
MICHAEL CUOMO, CWS
6 York Pond Road
York, ME 03909
(207) 363-4532

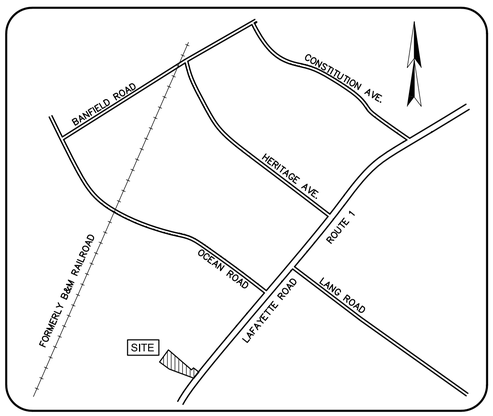
Lighting Consultant:
VISIBLELIGHT
24 STICKNEY TERRACE, SUITE 6
HAMPTON, NH 03842
(603) 926-6049

Civil Engineer:
ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

Landscape Architect:
woodburn & company
LANDSCAPE ARCHITECTURE
103 Kent Place Newmarket, New Hampshire Phone: 603.659.5949

Architect/Prefabricator:
Preferred Building Systems
A Division of Lavalley Building Supply
Preferred Building Systems
PO Box 1, 143 Twistback Road
Claremont, NH 03743
603-372-1050 603-372-5127 Fax
www.preferredbuildings.com

Architect:
CJ ARCHITECTS
4 MARKET STREET | PORTSMOUTH NH | 03801
P 603-431-2808 | F 603-431-2809

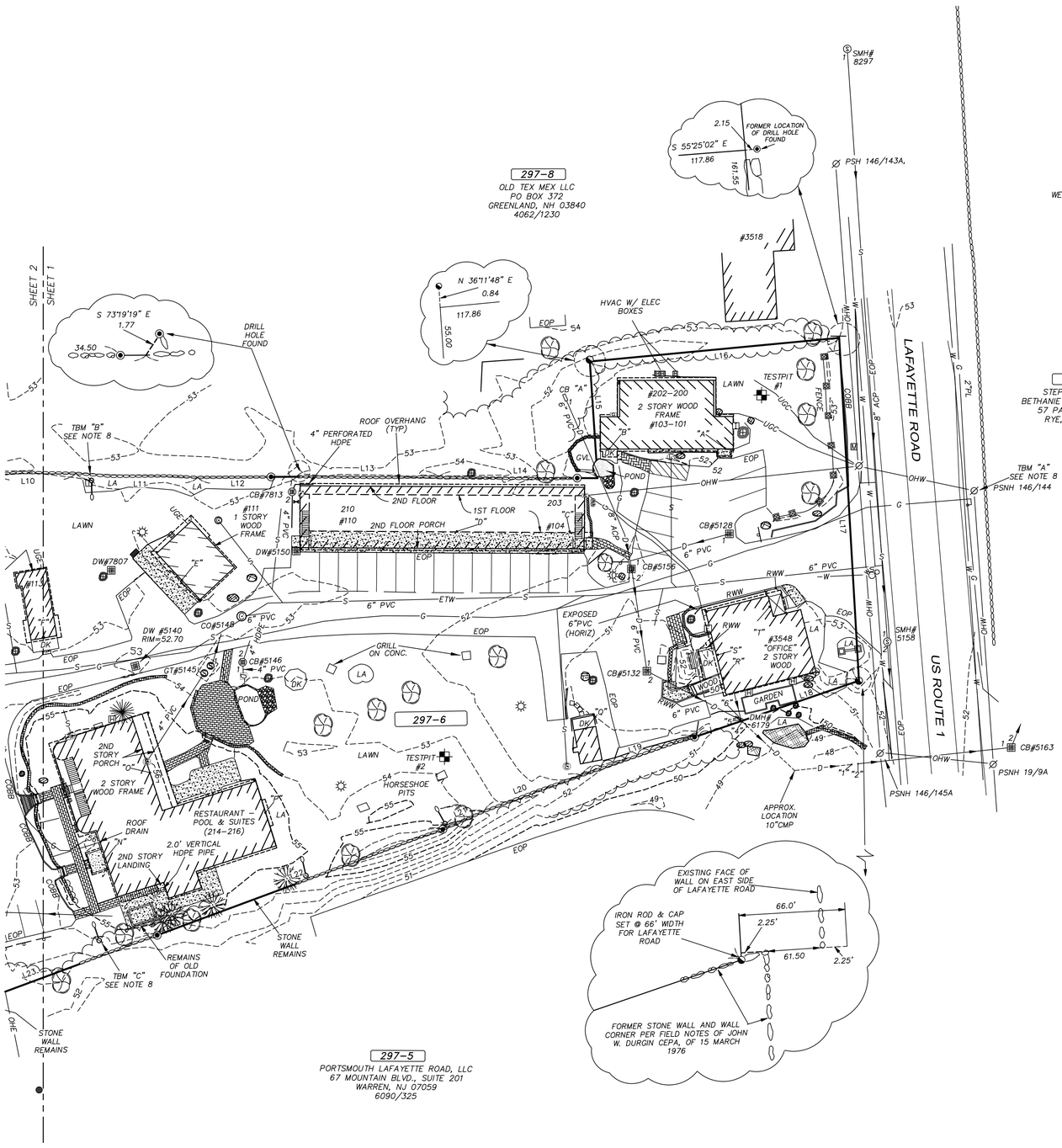


LOCUS NOT TO SCALE

Sheet Index Title	*Sheet No.:*	*Rev.*	*Date*
Existing Conditions Plan	EX-1	0	10/18/21
Existing Conditions Plan	EX-2	0	10/18/21
Demolition Plan	C-1	4	12/28/21
Site Plan	C-2	4	12/28/21
Stormwater Management Plan	C-3	5	12/28/21
Utility Plan	C-4	4	12/28/21
Sewer Plan and Profile	C-5	4	12/28/21
Lighting Plan	C-6	2	12/28/21
Landscape Plan	L-1	0	10/18/21
Detail Sheet	D-1	2	12/28/21
Detail Sheet	D-2	1	12/28/21
Detail Sheet	D-3	0	08/23/21
Detail Sheet	D-4	1	12/28/21
Detail Sheet	D-5	0	08/23/21
Detail Sheet	D-6	1	12/28/21
Detail Sheet	D-7	1	10/18/21
Elevations (Existing Buildings)	A1	0	09/30/21
Proposed Exterior Elevations (Building 1)	1.0	0	–
3D Isometric (Building 3)	A0.2	0	09/02/21
Front & Left Elevations (Building 3)	A1.1	0	09/02/21
Rear & Right Elevations (Building 3)	A1.2	0	09/02/21
3D Isometric (Building 6)	A0.2	0	–
Front & Left Elevations (Building 6)	A1.1	0	–
Rear & Right Elevations (Building 3)	A1.2	0	–
Storage Buildings – Proposed Elevations...	A1.0	0	09/29/21

Permit Summary:	*Submitted*	*Received*
Portsmouth Zoning Board	04/28/21	06/15/21
Portsmouth Site Plan Review	08/23/21	–
NHDOT Driveway Permit	08/23/21	–
NHDES Wastewater Discharge	–	–
EPA Notice of Intent	By Contractor 14 days prior to construction	

P5161

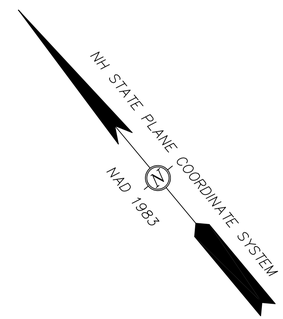


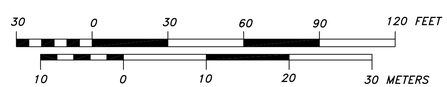
NOTES:

1. OWNER OF RECORD.....NAVEESHA HOSPITALITY, LLC.
   ADDRESS.....440 BEDFORD STREET, LEXINGTON, MA 02420
   DEED REFERENCE.....5230/888
   TAX SHEET / LOT.....297-06
   PARCEL AREA.....162,967 S.F, 3.741 ACRES
2. ZONED:.....*GATEWAY 1 (GW1)*
   MINIMUM LOT AREA..*10,000 S.F.*
   FRONTAGE.....*100'*
   FRONT YARD SETBACK....*80'**
   SIDE YARD SETBACK.....*20'*
   REAR YARD SETBACK.....*15'*
   * 70' MINIMUM / 90' MAXIMUM
3. THE RELATIVE ERROR OF CLOSURE WAS LESS THAN 1 FOOT IN 15,000 FEET.
4. *THE LOCATION OF ALL UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED UPON THE FIELD LOCATION OF ALL VISIBLE STRUCTURES (IE CATCH BASINS, MANHOLES, WATER GATES ETC.) AND INFORMATION COMPILED FROM PLANS PROVIDED BY UTILITY COMPANIES AND GOVERNMENTAL AGENCIES. ALL CONTRACTORS SHOULD NOTIFY, IN WRITING, SAID AGENCIES PRIOR TO ANY EXCAVATION WORK AND CALL DIG-SAFE @ 1-888-DIG-SAFE.*
5. *HORIZONTAL DATUM: NAD 1983 ESTABLISHED BY SURVEY GRADE GPS OBSERVATION AND NGS "OPUS" SOLUTION. REFERENCE FRAME: NAD83 (2011)(EPOCH: 2010.0000), US SURVEY FOOT.*
   VERTICAL DATUM: NAVD 1988. PRIMARY BENCHMARK: CITY OF PORTSMOUTH "ROBE"
6. *CONTRACTOR TO VERIFY SITE BENCHMARKS BY LEVELING BETWEEN 2 BENCHMARKS PRIOR TO THE ESTABLISHMENT OF ANY GRADES OR ELEVATIONS. DISCREPANCIES ARE TO BE REPORTED TO JAMES VERRA AND ASSOCIATES, INC..*
7. *THE PARCEL SHOWN HEREON LIES WITHIN ZONE X (AREA OF MINIMAL FLOOD HAZARD) AS IDENTIFIED ON FLOOD INSURANCE RATE MAP, ROCKINGHAM COUNTY, NEW HAMPSHIRE, MAP NUMBER 33015C0295F, EFFECTIVE DATE 1/29/2021 BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.*
8. *DESCRIPTIONS OF THE SITE BENCHMARKS:*
   TBM"A": LARGE SURVEY NAIL SET IN UTILITY POLE # 1.0' ABOVE GRADE ELEVATION=52.48
   TBM"B": LARGE SURVEY NAIL SET IN UTILITY POLE # 1.0' ABOVE GRADE ELEVATION=54.15
   TBM"C": LARGE SURVEY NAIL SET IN UTILITY POLE # 1.0' ABOVE GRADE ELEV.=54.71
9. *THE LOCATION OF WATER, SEWER AND DRAIN LINES OUTSIDE THE BUILDINGS COULD NOT BE DETERMINED.*
10. *LAFAYETTE ROAD LAID OUT AS 4 RODS (66') WIDE IN 1824 PER BOOK 1 PAGE 260 ROCKINGHAM COUNTY RECORDS.*
11. *THERE IS AN 8" FORCE MAIN RUNNING ALONG THE WESTERLY SIDE OF LAFAYETTE ROAD AS SHOWN ON THE CITY OF PORTSMOUTH GIS MAP (NOT FIELD LOCATED).*
12. *THE 6" PVC SEWER LINE SHOWN HEREON WAS PROTRACTED FROM A PLAN ENTITLED "WREN'S NEST MOTEL, PORTSMOUTH, NH" PREPARED BY MCKENZIE ENGINEERING CO., INC. DATED 9/11/1986, REVISED TO 10/8/99. THE SEWER LINE WAS NOT FIELD LOCATED BY JAMES VERRA AND ASSOCIATES, INC.*

REFERENCE PLANS:

1. *ALTA/ACSM LAND TITLE SURVEY, 3548 LAFAYETTE ROAD, PORTSMOUTH, N.H. ASSESSOR'S PARCEL: 297-6, OWNER: NAVEESHA HOSPITALITY, LLC. BY JAMES VERRA AND ASSOCIATES, INC. DATED 8/11/20211, NOT RECORDED.*





ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

JAMES VERRA & ASSOCIATES, INC.
LAND SURVEYORS
101 SHATTUCK WAY - SUITE 8
NEWINGTON, N.H. 03801- 7876
603-436-3557

JOB NO: 23401-A

ISSUED FOR:
ENGINEERING DESIGN

ISSUE DATE:
10-18-2021

REVISIONS
NO. DESCRIPTION BY DATE

DRAWN BY: GTD
APPROVED BY: JV
DRAWING FILE: 23401-A.DWG

SCALE:
22" x 34" - 1" = 30'
11" x 17" - 1" = 60'

APPLICANT:
MONARCH VILLAGE, LLC.
PO BOX 365
EAST HAMPSTEAD, NH 03826

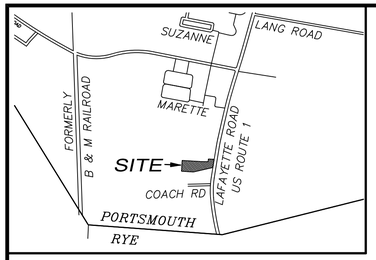
OWNER:
NAVEESHA HOSPITALITY, LLC.
440 BEDFORD STREET
LEXINGTON, MA 02420

PROJECT:
MONARCH VILLAGE
TAX MAP 297, LOT 06
3548 LAFAYETTE ROAD PORTSMOUTH, NH

TITLE:
EXISTING CONDITIONS PLAN
3548
LAFAYETTE ROAD
PORTSMOUTH, NH

SHEET NUMBER: 1 OF 2
EX-1

P5161



LOCUS
(N.T.S.)

RIM AND INVERT DATA

CB #5128 RIM = 51.34
(1) INV OUT(6"PVC)=49.84

CB #5156 RIM = 50.70
(1) INV IN(8"ACP)=48.52
(2) INV OUT(8"ACP)=48.44

CB #5132 RIM = 50.29
(1) INV IN(6"PVC)=47.14
(2) INV OUT(6"PVC)=47.24

CB #5146 RIM = 52.32
(1) INV IN(4"PVC)=50.82
(2) INV OUT(4"HDPE)=51.0

DW #5150 RIM = 52.32
SUMP=49.67

CB #7813 RIM = 52.47
(1) INV IN(4"PERFORATED PVC)=51.47
(2) INV OUT(4"PVC)=51.14

DW #7807(1.5' SQ.) RIM = 52.18
SUMP=49.68

CB #6618 RIM = 52.90
(1) INV OUT(4"PVC)=52.05

CB #6616 RIM = 52.57
(1) INV IN(4"PVC)=51.07
(2) INV OUT(6"PVC)=50.92

DW #7807(1.5' SQ.) RIM = 52.18
SUMP=49.68

CB #6637 RIM = 51.81
(1) INV IN(4"PVC)=50.48
(2) INV OUT(6"PVC)=50.46
INV (1) HAS 2.5" PIPE INSIDE 1T.

CB #5163 RIM = 51.31
(1) INV IN(15"HDPE)=46.16
(2) INV OUT(12"HDPE)=45.93

SMH #8297 RIM = 53.08
(1) INV OUT(8"ACP)=45.90

SMH #5158 RIM = 52.64
(1) INV IN(8"ACP)=44.82
(2) INV OUT(8"ACP)=44.85

SMH #5148 RIM = 53.04
(1) INV OUT(6"PVC) CO

GT #5145 RIM = 52.90
(1) INV OUT(4"PVC)=50.60

CB "A" RIM = 51.17
(1) INV OUT(6"PVC)=49.92

DMH #6179 RIM = 50.07
(4) INV OUT(8"ACP)=46.96
(5) INV IN(8"ACP)=46.78
(6) INV IN(4"PVC)=46.79

DMH #6628
TOP OF CONC. = 52.61
(1) INV IN(8"PVC)=48.36
(2) INV IN(6"PVC)=48.86
(3) INV IN(6"PVC)=48.81
(4) INV OUT(8"PVC)=49.40

BOUNDARY TABLE

LINE	BEARING	DISTANCE
L1	S 46°45'39" E	55.84
L2	S 50°25'38" E	28.19
L3	S 48°26'21" E	32.76
L4	S 53°29'06" E	26.05
L5	S 48°09'25" E	55.55
L6	S 50°01'00" E	48.70
L7	S 45°16'11" E	12.46
L8	S 53°53'04" E	27.20
L9	S 46°08'35" E	38.71
L10	S 50°38'24" E	36.90
L11	S 48°05'27" E	57.40
L12	S 50°22'53" E	46.54
L13	S 49°41'19" E	66.59
L14	S 49°45'44" E	75.00
L15	N 36°11'48" E	55.00
L16	S 55°25'02" E	117.86
L17	S 36°41'49" W	161.55
L18	N 68°55'23" W	81.78
L19	N 68°47'13" W	56.18
L20	N 70°13'10" W	48.84
L21	N 73°28'02" W	21.18
L22	N 70°20'01" W	143.30
L23	N 70°21'32" W	125.33
L24	N 71°58'56" W	29.07
L25	N 54°33'41" W	80.91
L26	N 55°08'12" W	63.44
L27	N 53°51'09" W	92.82
L28	N 36°11'05" E	58.36
L29	N 40°13'36" E	37.89
L30	N 30°39'55" E	23.36
L31	N 38°03'46" E	28.29
L32	N 33°35'32" E	40.79
L33	N 35°37'16" E	35.80
L34	N 35°04'41" E	38.78
L35	N 39°28'44" E	33.20

BUILDING ELEVATION TABLE

POINT	DESCRIPTION	ELEVATION
"A"	ALUM. THOLD	53.73
"B"	ALUM. THOLD	53.63
"C"	CARPET	52.87
"D"	ALUM. THOLD	53.65
"E"	ALUM. THOLD	54.20
"F"	ALUM. THOLD	53.69
"G"	ALUM. THOLD	53.87
"H"	ALUM. THOLD	54.07
"I"	CONCRETE	54.03
"J"	CARPET	53.94
"K"	ALUM. THOLD	54.10
"L"	CONCRETE	54.02
"M"	CARPET	56.20
"N"	ALUM. THOLD	56.27
"O"	ALUM. THOLD	56.18
"P"	ALUM. THOLD	56.22
"Q"	WOOD THOLD	52.40
"R"	ALUM. THOLD	48.65
"S"	WOOD FLOOR	56.32
"T"	TILE FLOOR	56.42
"U"	WOOD FLOOR	54.91
"V"	CONCRETE	53.97

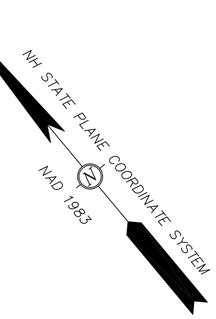
MISC. INVERT TABLE

INVERT	DESCRIPTION	ELEVATION
"1"	10" CMP	46.29±
"2"	15" HDPE	46.28

LEGEND:

- DRILL HOLE FOUND
- IRON ROD FOUND
- SURVEY NAIL (AS NOTED)
- CHAIN LINK FENCE
- *WOOD FENCE*
- CEMENT CONCRETE PAD
- BRICK PAVERS
- LARGE STONES
- STONE RETAINING WALL
- UTILITY POLE
- UTILITY POLE W/TRANSFORMER
- GUY
- —*OHW*— OVERHEAD WIRES
- —*OHE*— OVERHEAD ELECTRIC
- —*UGU*— UNDER GROUND UTILITIES
- *RCRD* ROCKINGHAM COUNTY REGISTRY OF DEEDS
- 297–06 TAX SHEET / LOT NO.
- *EOP* EDGE OF PAVEMENT
- *LA* LANDSCAPED AREA
- CATCH BASIN
- CATCH BASIN
- MISC. MANHOLE
- *SEWER CLEAN OUT*
- — W — WATER LINE
- — S — SEWER LINE
- —D— DRAIN LINE
- — G — GAS LINE
- WATER GATE VALVE
- WATER SHUT OFF VALVE
- HYDRANT
- RWW WOOD RETAINING WALL
- PSNH PUBLIC SERVICE CO. OF NH
- GAS METER
- COBB GRANITE COBBLESTONES
- DK WOOD DECK
- LARGE ROCK
- LIGHT POLE
- GVL GRAVEL
- TREE LINE/BRUSHLINE
- CONIFEROUS TREE
- DECIDUOUS TREE
- STUMP
- SIGN
- DW DRY WELL
- TEST PIT
- GT GREASE TRAP
- BRICK FENCE COLUMN ON CONC.

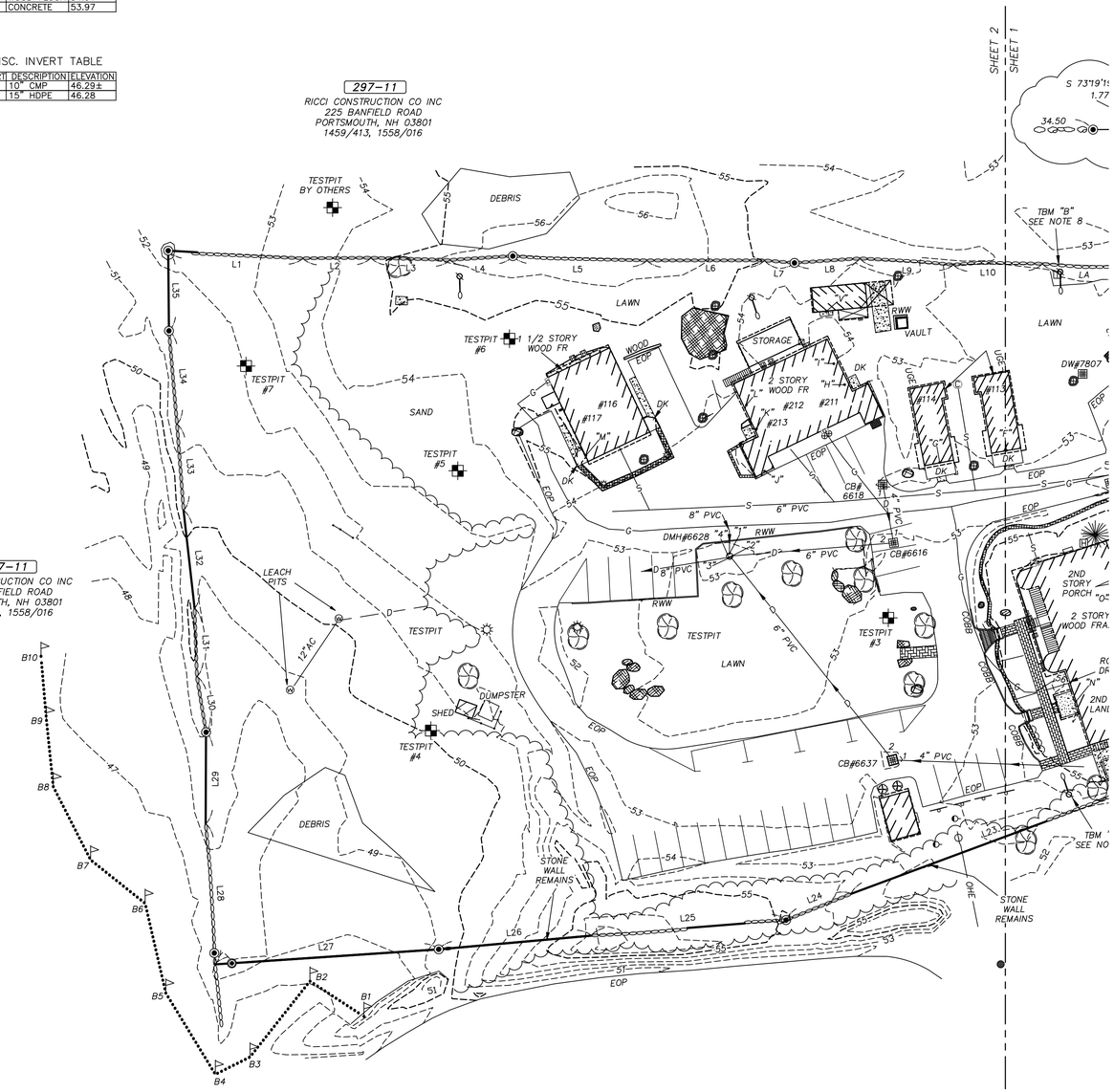
NH STATE PLANE COORDINATE SYSTEM
NAD 1983



30 0 30 60 90 120 FEET
10 0 10 20 30 METERS

297–11
RICCI CONSTRUCTION CO INC
225 BANFIELD ROAD
PORTSMOUTH, NH 03801
1459/413, 1558/016

297–11
RICCI CONSTRUCTION CO INC
225 BANFIELD ROAD
PORTSMOUTH, NH 03801
1459/413, 1558/016



P5161

ALTUS ENGINEERING, INC.
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JAMES VERRA & ASSOCIATES, INC.
LAND SURVEYORS
101 SHATTUCK WAY – SUITE 8
NEWINGTON, N.H. 03801- 7876
603-436-3557

JOB NO: 23401-A

ISSUED FOR:
ENGINEERING DESIGN

ISSUE DATE:
10-18-2021

REVISIONS

NO.	DESCRIPTION	BY	DATE

DRAWN BY: GTD
APPROVED BY: JV
DRAWING FILE: 23401-A.DWG

SCALE:
22" x 34" – 1" = 30'
11" x 17" – 1" = 60'

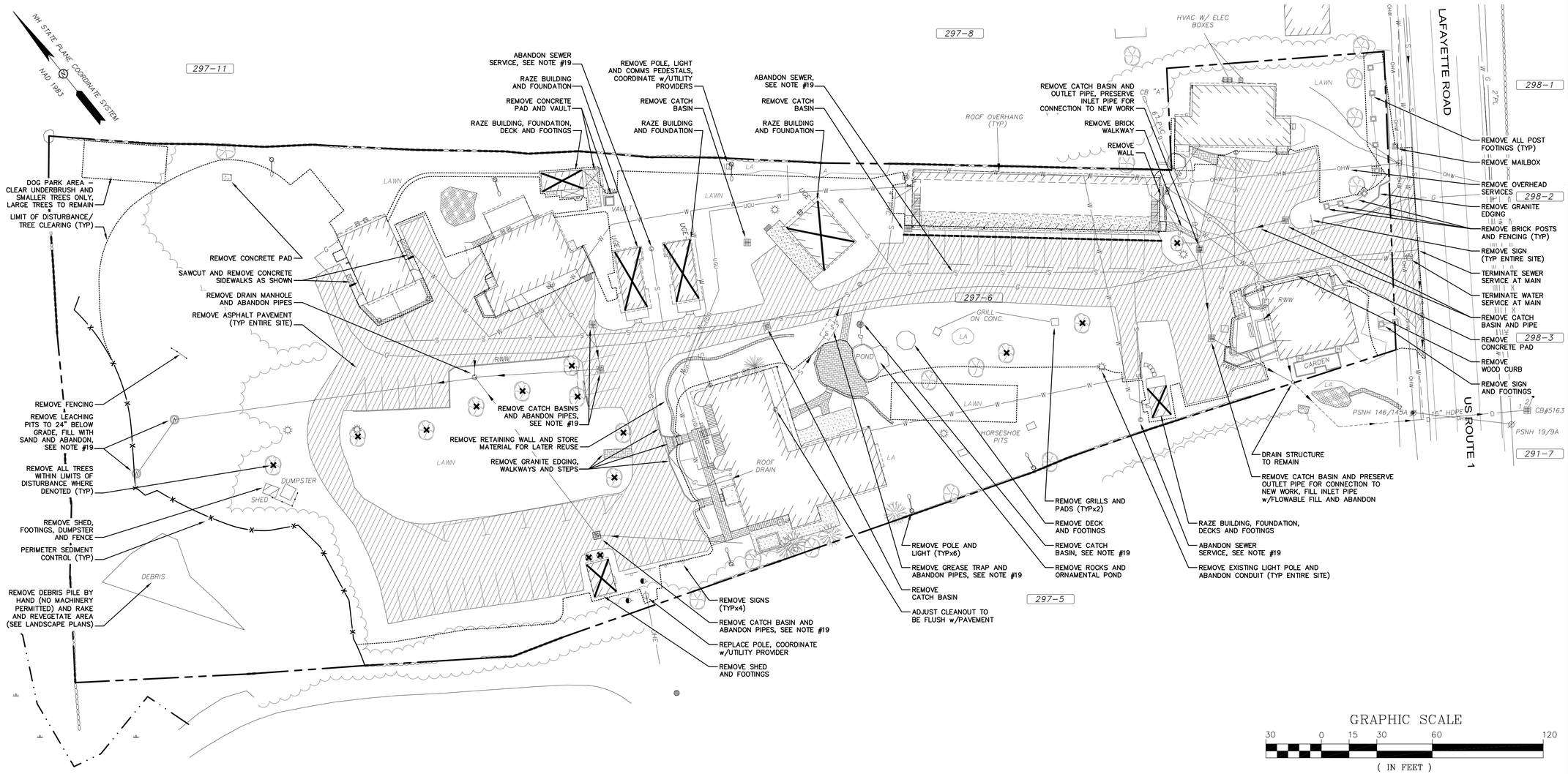
APPLICANT:
MONARCH VILLAGE, LLC.
PO BOX 365
EAST HAMPSTEAD, NH 03826

OWNER:
NAVEESHA HOSPITALITY, LLC.
440 BEDFORD STREET
LEXINGTON, MA 02420

PROJECT:
MONARCH VILLAGE
TAX MAP 297, LOT 06
3548 LAFAYETTE ROAD PORTSMOUTH, NH

TITLE:
EXISTING CONDITIONS PLAN
3548 LAFAYETTE ROAD
PORTSMOUTH, NH

SHEET NUMBER: 2 OF 2
EX-2



GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)

DEMOLITION NOTES

1. CITY DEMOLITION PERMIT REQUIRED PRIOR TO ANY BUILDING DEMOLITION ACTIVITIES. CONTRACTOR IS NOTIFIED THAT THIS PERMIT PROCESS MAY REQUIRE A 30-DAY LEAD TIME.
2. CONTRACTOR SHALL SAFELY SECURE THE SITE AND WORK LIMITS WITH SECURITY FENCING WHICH SHALL BE LOCKED DURING NON-WORK HOURS.
3. CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES SCHEDULED TO REMAIN.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE TIMELY NOTIFICATION OF ALL PARTIES, CORPORATIONS, COMPANIES, INDIVIDUALS AND STATE AND LOCAL AUTHORITIES OWNING AND/OR HAVING JURISDICTION OVER ANY UTILITIES RUNNING TO, THROUGH OR ACROSS AREAS TO BE DISTURBED BY DEMOLITION AND/OR CONSTRUCTION ACTIVITIES WHETHER OR NOT SAID UTILITIES ARE SUBJECT TO DEMOLITION, RELOCATION, MODIFICATION AND/OR CONSTRUCTION.
5. ALL UTILITY DISCONNECTIONS/DEMOLITIONS/RELOCATIONS SHALL BE COORDINATED BETWEEN THE CONTRACTOR, ALL APPROPRIATE UTILITY COMPANIES, PORTSMOUTH DPW AND ABUTTING PROPERTY OWNERS. UNLESS OTHERWISE SPECIFIED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELATED EXCAVATION, TRENCHING AND BACKFILLING.
6. WHERE SPECIFIED TO REMAIN, MANHOLE RIMS, CATCH BASIN GRATES, VALVE COVERS, HANDHOLES, ETC. SHALL BE ADJUSTED TO FINISH GRADE UNLESS OTHERWISE SPECIFIED.
7. SEE EROSION CONTROL PLANS FOR EROSION AND SEDIMENT CONTROL MEASURES THAT SHALL BE IN PLACE PRIOR TO DEMOLITION ACTIVITIES.
8. ALL MATERIALS SCHEDULED FOR DEMOLITION OR REMOVAL ON PRIVATE PROPERTY SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED.
9. ALL MATERIAL SCHEDULED TO BE REMOVED SHALL BE LEGALLY DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS/CODES.
10. WATER: PORTSMOUTH DPW, JIM TOW, (603) 427-1530.
11. TELECOMMUNICATIONS: FAIRPOINT, JOE CONSIDINE, (603) 427-5525.
12. CABLE: COMCAST, MIKE COLLINS, (603) 679-5695, EXT. 1037.
13. ELECTRICAL: EVERSOURCE, MICHAEL BUSBY, (603) 332-4227, EXT. 5555334.
14. GAS: UNITIL, DAVID BEAULIEU, (603) 294-5144.
15. CONTRACTOR TO CONTACT PORTSMOUTH DPW A MINIMUM OF TWO WEEKS PRIOR TO ANY DEMOLITION TO COORDINATE ALL WORK CONCERNING DISCONNECTION/DEMOLITION OF ANY PROPOSED WATER AND SEWER LINE IMPROVEMENTS.
16. ALL WATER MAIN AND SERVICE DISCONNECTIONS SHALL CONFORM TO PORTSMOUTH DPW STANDARDS.
17. NO BURNING SHALL BE PERMITTED PER LOCAL REGULATIONS.
18. HAZARDOUS MATERIALS ENCOUNTERED DURING DEMOLITION AND CONSTRUCTION ACTIVITIES SHALL BE ABATED IN STRICT ACCORDANCE WITH ALL APPLICABLE STATE AND LOCAL REGULATIONS.
19. EXISTING UTILITIES TO BE DISCONTINUED SHALL BE ABANDONED IN PLACE UNLESS OTHERWISE NOTED TO BE REMOVED OR ENCOUNTERED DURING THE INSTALLATION OF NEW WORK.
20. SHOULD GROUNDWATER BE ENCOUNTERED DURING EXCAVATION, APPROPRIATE BEST MANAGEMENT PRACTICES SHALL BE EMPLOYED TO ENSURE SEDIMENT LADEN WATER IS NOT DISCHARGED INTO THE CITY DRAINAGE SYSTEM. A DISCHARGE PERMIT SHALL BE OBTAINED PRIOR TO DISCHARGING GROUNDWATER.
21. THIS PLAN IS INTENDED TO PROVIDE MINIMUM GUIDELINES FOR THE DEMOLITION OF EXISTING SITE FEATURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL BUILDINGS, PAVEMENT, CONCRETE, CURBING, SIGNS, POLES, UTILITIES, FENCES, VEGETATION AND OTHER EXISTING FEATURES AS NECESSARY TO FULLY CONSTRUCT THE PROJECT.
22. SEE SHEET D-6 FOR LEGEND.

P5161

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE - ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
10/15/21

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: DECEMBER 28, 2021

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC WORK SEESION	EBS	08/03/21
1	TAC	EBS	08/23/21
2	TAC	EBS	10/18/21
3	REV. FRONT DRAIN DEMO	EBS	11/09/21
4	REV. PER TAC COA	EBS	12/28/21

DRAWN BY: EBS
APPROVED BY: EDW
DRAWING FILE: 5161-SITE.dwg

SCALE:
22" x 34" - 1" = 30'
11" x 17" - 1" = 60'

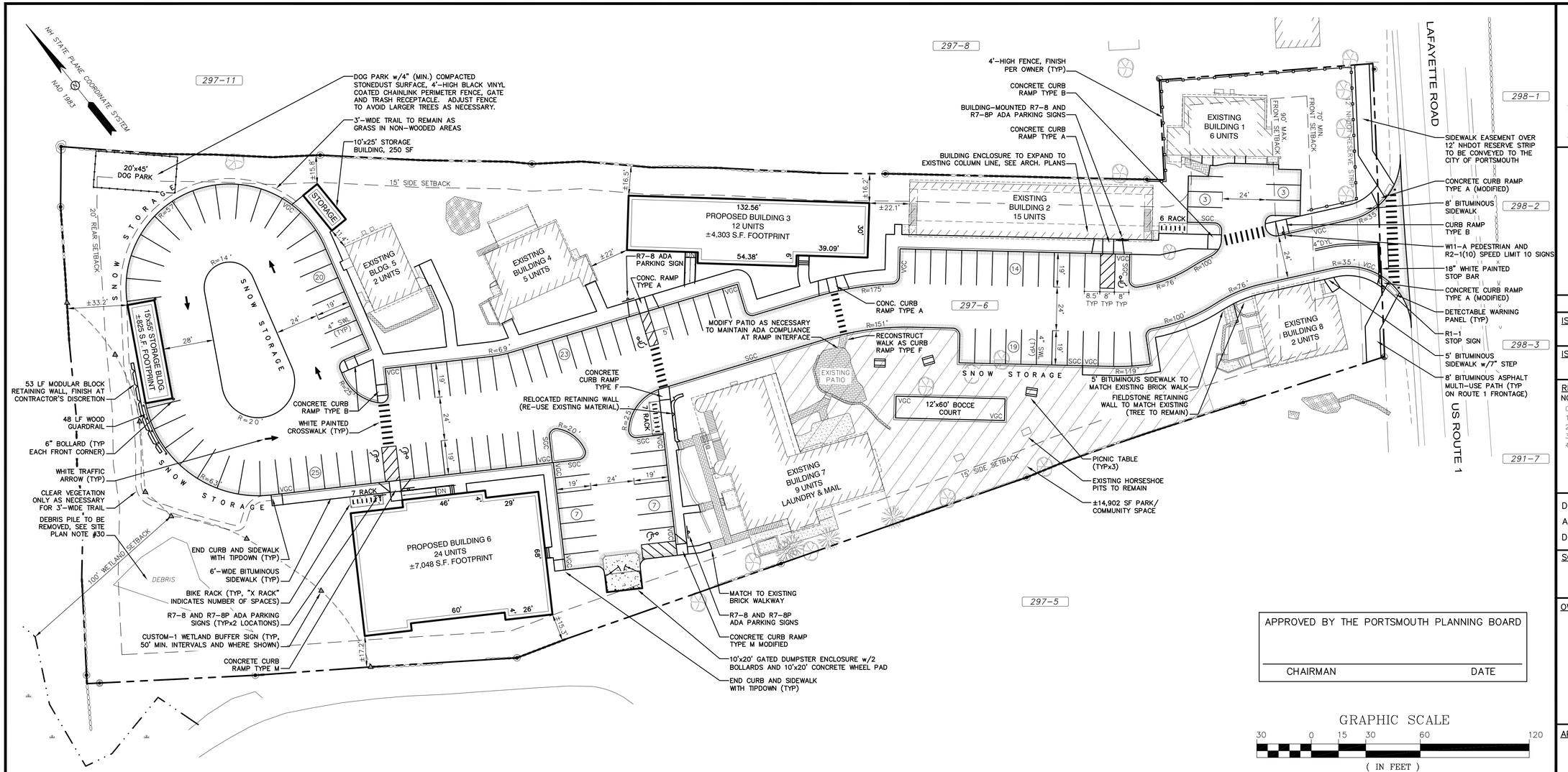
OWNER:
NAVEESHA HOSPITALITY, LLC
440 BEDFORD ST.
LEXINGTON, MA 02420

APPLICANT:
MONARCH VILLAGE, LLC
P.O. BOX 365
EAST HAMPSTEAD, NH 03826

PROJECT:
MONARCH VILLAGE
TAX MAP 297, LOT 6
3548 LAFAYETTE ROAD
PORTSMOUTH, NH 03801

TITLE:
DEMOLITION PLAN

SHEET NUMBER:
C-1



APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN DATE

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)

SITE NOTES

1. DESIGN INTENT – THIS PLAN IS INTENDED TO DEPICT A MULTI-FAMILY "GENERAL RESIDENTIAL DEVELOPMENT SITE" COMPRISED OF MULTIPLE EXISTING AND PROPOSED BUILDINGS TOGETHER WITH ASSOCIATED PARKING AND ACCESSWAYS.
2. THE BASE PLAN USED HERE WAS DEVELOPED FROM PRELIMINARY "EXISTING CONDITIONS PLAN, 3548 LAFAYETTE ROAD, PORTSMOUTH, NH" BY JAMES VERRA AND ASSOCIATES, INC., NOT YET DATED.
3. ZONE: G1 (GATEWAY 1)
4. DIMENSIONAL REQUIREMENTS:

MIN. LOT AREA:	10,000 S.F. (0.23 ACRE) ON DEVELOPMENT SITE ±162,970 S.F. (±3.74 AC.) PROVIDED
MIN. STREET FRONTAGE:	100' (ON LAFAYETTE ROAD) (161.55' EXISTING)
MIN. LOT DEPTH:	N/A
FRONT SETBACK:	70' MIN./90' MAX. (FROM LAFAYETTE ROAD CL)
SIDE SETBACK:	15'
REAR SETBACK:	20'
MAX. BUILDING HEIGHT:	50' (OR FOUR STORIES)
MAX. BUILDING LENGTH:	200'
MAX. BUILDING FOOTPRINT:	N/A
MAX. BUILDING COVERAGE:	50% (16.7%/±27,214 S.F. PROPOSED)
BUILDING STEPBACK:	N/A (ROW > 60')
BLDG FACADE ORIENTATION:	PARALLEL TO FRONT LOT LINE
FRONT LOT LINE BUILDOUT:	50% (34.3%/55.4' EXISTING)
DWELLING DENSITY:	20 UNITS/ACRE (GENERAL RESIDENTIAL)
DWELLING UNITS PER BLDG:	24 MAX. (APARTMENT BUILDING)
PERIMETER BUFFER:	75' FROM RES, MIXED RES, 4-L1 DIST. (N/A)
MIN. COMMUNITY SPACE:	10% (14.2%/±23,217 S.F. PROVIDED)
MIN. OPEN SPACE:	20% (44.2%/±71,987 S.F. PROPOSED)

5. ZONING SECTION 10.540 – CONDITIONAL USE PERMIT FROM PLANNING BOARD REQUIRED TO ALLOW A GENERAL RESIDENTIAL DEVELOPMENT SITE.
6. DENSITY CALCULATIONS:
   GENERAL RESIDENTIAL DEVELOPMENT: 20 DWELLING UNITS / ACRE
   3.74 ACRES X 20 = 75 UNITS PERMITTED (75 PROPOSED)
7. UNIT COMPOSITION: 18 STUDIO (RENOVATED)
   15 ONE BEDROOM (RENOVATED)
   3 TWO BEDROOM (RENOVATED)
   36 TWO BEDROOM (NEW)
   3 THREE BEDROOM (RENOVATED)
   75 TOTAL UNITS
8. PARKING REQUIREMENTS:
   DWELLING UNITS: 1.3 SPACES PER DWELLING UNIT OVER 750 S.F.
   75 UNITS x 1.3 = 98 SPACES REQUIRED
   VISITOR PARKING: 1 SPACE PER 5 DWELLING UNITS
   75 UNITS / 5 = 15 SPACES REQUIRED
   TOTAL PARKING REQUIRED: 113 SPACES
   TOTAL PARKING PROVIDED: 121 SPACES (8 SPACE/7.1% SURPLUS)
9. BIKE RACK REQUIREMENTS:
   1 RACK PER 5 UNITS
   75 UNITS / 5 = 15 RACKS REQUIRED
   TOTAL RACKS PROVIDED = 20
10. THE FOLLOWING VARIANCES FROM THE PORTSMOUTH ZONING ORDINANCE WERE GRANTED ON JUNE 15, 2021:

    SECTION 10.5B53.10 – TO ALLOW NEW BUILDINGS TO BE CONSTRUCTED OUTSIDE THE REQUIRED FRONT BUILDING SETBACK WHERE THE MINIMUM REQUIRED FRONT BUILDOUT IS NOT MET (50% REQUIRED, 34.3% PROVIDED).

    SECTION 10.5B22.40 – TO ALLOW NEW BUILDINGS TO BE CONSTRUCTED OUTSIDE THE MINIMUM AND MAXIMUM SETBACKS FROM THE CENTERLINE OF LAFAYETTE ROAD.
11. SNOW SHALL BE STORED AT THE EDGE OF PAVEMENT, IN AREAS SHOWN HEREON, AND/OR TRUCKED OFF SITE AS APPROPRIATE.
12. NO SAND SHALL BE USED FOR WINTER PARKING AREA MAINTENANCE. WINTER MAINTENANCE CONTRACTOR SHALL BE NHDES GREEN SNOWPRO CERTIFIED.
13. PAVEMENT MARKINGS SHALL BE CONSTRUCTED USING WHITE, YELLOW OR BLUE TRAFFIC PAINT (WHERE SPECIFIED) MEETING THE REQUIREMENTS OF AASHTO M248, TYPE F OR EQUAL. PAINTED ISLANDS AND LOADING ZONES SHALL BE 4"-WIDE DIAGONAL WHITE LINES 3'-0" O.C. BORDERED BY 4"-WIDE WHITE LINES. PARKING STALLS SHALL BE SEPARATED BY 4"-WIDE WHITE LINES. SEE DETAILS FOR HANDICAP SYMBOLS, SIGNS AND SIGN DETAILS.
14. PAVEMENT MARKINGS AND SIGNS SHALL CONFORM TO THE REQUIREMENTS OF THE "MANUAL ON UNIFORM TRAFFIC DEVICES," "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS" AND THE AMERICANS WITH DISABILITIES ACT (ADA), LATEST EDITIONS.
15. ALL CONSTRUCTION SHALL MEET THE MINIMUM STANDARDS OF THE CITY OF PORTSMOUTH & NHDOT'S STANDARD SPECIFICATION FOR ROAD & BRIDGE CONSTRUCTION, LATEST EDITIONS. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
16. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAWCUT LINES WITH RS-1 IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
17. ALL BONDS AND FEES SHALL BE PAID/POSTED PRIOR TO INITIATING CONSTRUCTION.
18. THE CONTRACTOR SHALL VERIFY ALL BENCHMARKS AND TOPOGRAPHY IN THE FIELD PRIOR TO CONSTRUCTION.
19. UNLESS OTHERWISE NOTED, ALL NEW CURBING SHALL BE VERTICAL GRANITE WITH A MINIMUM RADIUS OF 4'.
20. THE CONTRACTOR SHALL VERIFY ALL BUILDING DIMENSIONS WITH THE ARCHITECTURAL AND STRUCTURAL PLANS PRIOR TO CONSTRUCTION. ALL DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER FOR RESOLUTION.
21. BUILDING AREAS SHOWN ARE BASED ON FOOTPRINT MEASURED TO THE EDGE OF FOUNDATIONS AND/OR SLABS. ACTUAL INTERIOR SPACE WILL DIFFER.
22. ALTUS ENGINEERING, INC. MAKES NO WARRANTY REGARDING THE ADA COMPLIANCE OF ANY EXISTING BUILDINGS OR SITE ELEMENTS THAT ARE SCHEDULED TO REMAIN.
23. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
24. ALL IMPROVEMENTS SHOWN ON THIS SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES SHALL BE MADE TO THIS SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.
25. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
26. SITEWORK CONTRACTOR SHALL PREPARE A STAMPED AS-BUILT SITE PLAN STAMPED BY A LICENSED LAND SURVEYOR (LLS) & PROVIDE A DIGITAL (CAD FORMAT) COPY FOR THE CITY'S G.I.S. DATA BASE.
27. STREET/MAILING ADDRESSES FOR EACH APARTMENT SHALL BE DETERMINED BY PORTSMOUTH FIRE DEPARTMENT & DPW.
28. ALL BUILDINGS ARE TO BE USED FOR RENTAL APARTMENTS.
29. "COMMUNITY SPACE" SHOWN HEREON SHALL NOT LIMIT THE ABILITY OF ANY RESIDENT OF THE DEVELOPMENT FROM UTILIZING ANY OUTDOOR GREEN SPACE ON THE PROPERTY FOR ACTIVE OR PASSIVE RECREATION.
30. THE EXISTING DEBRIS PILE IN THE SOUTH WEST CORNER OF THE SITE IS TO BE REMOVED BY HAND, NO MACHINERY IS PERMITTED IN THE 100' CITY WETLAND BUFFER. FOLLOWING DEBRIS REMOVAL, THE AREA SHALL BE HAND RAKED AND REVEGETATED PER THE LANDSCAPE PLAN.
31. SEE SHEET D-6 FOR LEGEND.

P5161

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
10/18/21

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: DECEMBER 28, 2021

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC WORK SEESION	EBS	08/03/21
1	TAC	EBS	08/23/21
2	TAC	EBS	10/18/21
3	REV. BLDG. 3 SIDEWALK	EBS	11/09/21
4	REV. PER TAC COA	EBS	12/28/21

DRAWN BY: EBS
APPROVED BY: EDW
DRAWING FILE: 5161-SITE.dwg

SCALE:
22" x 34" – 1" = 30'
11" x 17" – 1" = 60'

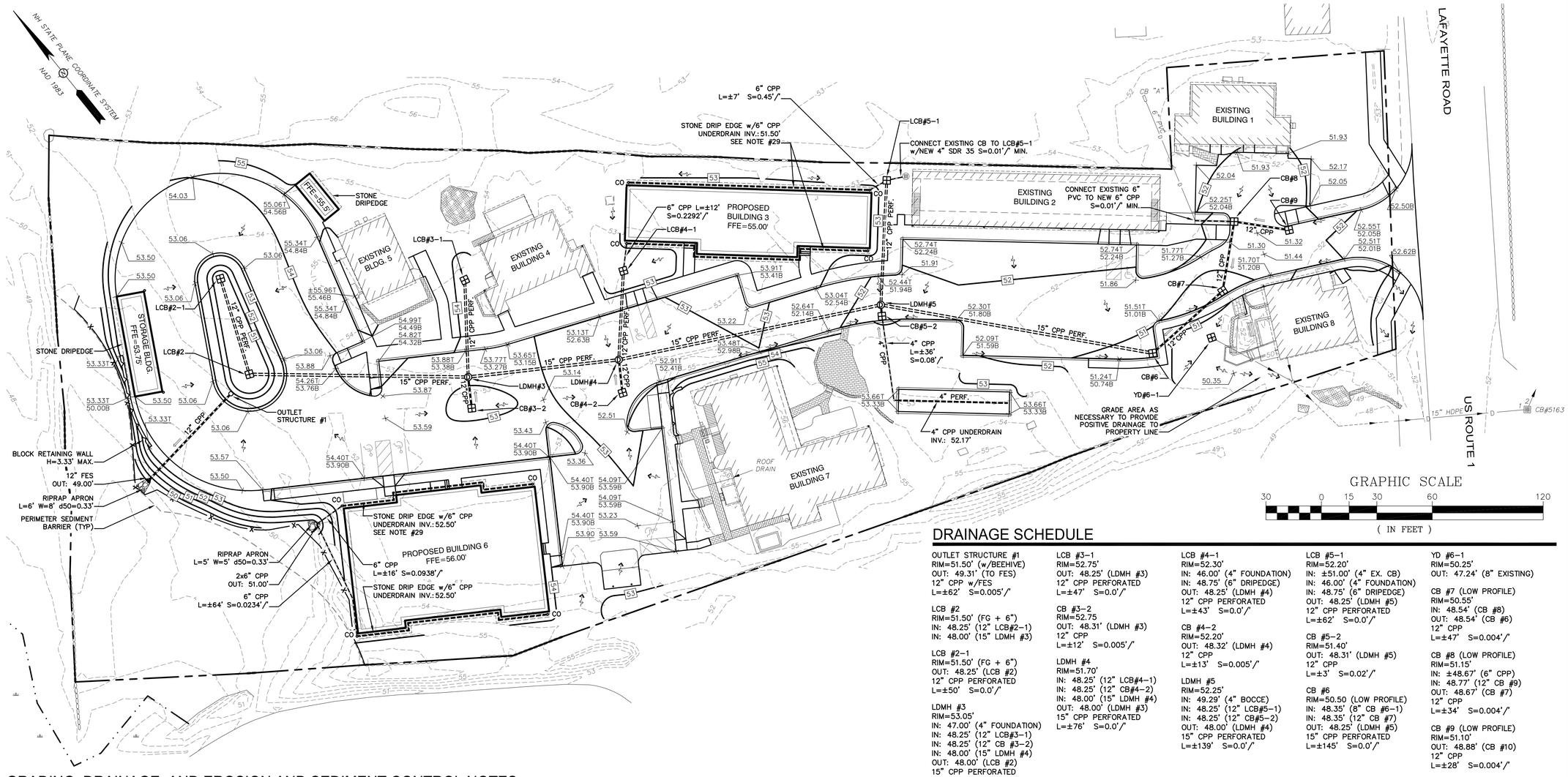
OWNER:
NAVEESHA HOSPITALITY, LLC
440 BEDFORD ST.
LEXINGTON, MA 02420

APPLICANT:
MONARCH VILLAGE, LLC
P.O. BOX 365
EAST HAMPSTEAD, NH 03826

PROJECT:
MONARCH VILLAGE
TAX MAP 297, LOT 6
3548 LAFAYETTE ROAD
PORTSMOUTH, NH 03801

TITLE:
SITE PLAN

SHEET NUMBER:
C-2



DRAINAGE SCHEDULE

OUTLET STRUCTURE #1
RIM=51.50' (w/BEEHIVE)
OUT: 49.31' (TO FES)
12" CPP w/FES
L=±62' S=0.005'/'

LCB #2
RIM=51.50' (FG + 6")
IN: 48.25' (12" LCB#2-1)
IN: 48.00' (15" LDMH #3)

LCB #2-1
RIM=51.50' (FG + 6")
OUT: 48.25' (LCB #2)
12" CPP PERFORATED
L=±50' S=0.0'/'

LDMH #3
RIM=53.05'
IN: 47.00' (4" FOUNDATION)
IN: 48.25' (12" LCB#3-1)
IN: 48.25' (12" CB #3-2)
IN: 48.00' (15" LDMH #4)
OUT: 48.00' (LCB #2)
15" CPP PERFORATED
L=±113' S=0.0'/'

LCB #3-1
RIM=52.75'
OUT: 48.25' (LDMH #3)
12" CPP PERFORATED
L=±47' S=0.0'/'

CB #3-2
RIM=52.75
OUT: 48.31' (LDMH #3)
12" CPP
L=±12' S=0.005'/'

LDMH #4
RIM=51.70'
IN: 48.25' (12" LCB#4-1)
IN: 48.25' (12" CB#4-2)
IN: 48.00' (15" LDMH #4)
OUT: 48.00' (LDMH #3)
15" CPP PERFORATED
L=±76' S=0.0'/'

LCB #4-1
RIM=52.30'
IN: 46.00' (4" FOUNDATION)
IN: 48.75' (6" DRIPEDGE)
OUT: 48.25' (LDMH #4)
12" CPP PERFORATED
L=±43' S=0.0'/'

CB #4-2
RIM=52.20'
OUT: 48.32' (LDMH #4)
12" CPP
L=±13' S=0.005'/'

LDMH #5
RIM=52.25'
IN: 49.29' (4" BOCCE)
IN: 48.25' (12" LCB#5-1)
IN: 48.25' (12" CB#5-2)
OUT: 48.00' (LDMH #4)
15" CPP PERFORATED
L=±139' S=0.0'/'

LCB #5-1
RIM=52.20'
IN: ±51.00' (4" EX. CB)
IN: 46.00' (4" FOUNDATION)
IN: 48.75' (6" DRIPEDGE)
12" CPP PERFORATED
L=±62' S=0.0'/'

CB #5-2
RIM=51.40'
OUT: 48.31' (LDMH #5)
12" CPP
L=±3' S=0.02'/'

CB #6
RIM=50.50 (LOW PROFILE)
IN: 48.35' (8" CB #6-1)
IN: 48.35' (12" CB #7)
OUT: 48.25' (LDMH #5)
15" CPP PERFORATED
L=±145' S=0.0'/'

YD #6-1
RIM=50.25'
OUT: 47.24' (8" EXISTING)

CB #7 (LOW PROFILE)
RIM=50.55'
IN: 48.54' (CB #8)
OUT: 48.54' (CB #6)
12" CPP
L=±47' S=0.004'/'

CB #8 (LOW PROFILE)
RIM=51.15'
IN: ±48.67' (6" CPP)
IN: 48.77' (12" CB #9)
OUT: 48.67' (CB #7)
12" CPP
L=±34' S=0.004'/'

CB #9 (LOW PROFILE)
RIM=51.10'
OUT: 48.88' (CB #10)
12" CPP
L=±28' S=0.004'/'

GRADING, DRAINAGE AND EROSION AND SEDIMENT CONTROL NOTES

1. DO NOT BEGIN CONSTRUCTION UNTIL ALL STATE AND LOCAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.
2. CONTRACTOR SHALL OBTAIN A "DIGSAFE" NUMBER AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION.
3. PROJECT SUBJECT TO EPA NPDES PHASE II. NOI, SWPPP AND MINIMUM WEEKLY INSPECTIONS REQUIRED. CONTRACTOR SHALL FILE NOI WITH EPA 2 WEEKS PRIOR TO CONSTRUCTION
4. ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH AND NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
5. ALL BENCHMARKS AND TOPOGRAPHY SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO INITIATING CONSTRUCTION.
6. UNLESS OTHERWISE AGREED IN WRITING, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING TEMPORARY BENCHMARKS (TBMS) AND PERFORMING ALL CONSTRUCTION SURVEY LAYOUT.
7. PRIOR TO CONSTRUCTION, FIELD VERIFY JUNCTIONS, LOCATIONS AND ELEVATIONS/INVERTS OF ALL EXISTING STORMWATER AND UTILITY LINES. PRESERVE AND PROTECT LINES TO BE RETAINED.
8. PERIMETER SEDIMENT CONTROLS AND CULVERT AND CATCH BASIN INLET PROTECTION MEASURES SHALL BE INSTALLED AFTER TREE CLEARING OPERATIONS HAVE CEASED AND BEFORE ANY STUMPING, GRUBBING OR OTHER EARTH DISTURBANCE.
9. GRIND STUMPS AND REUSE GRINDINGS FOR EROSION CONTROL WHERE POSSIBLE. NO STUMPS SHALL BE BURIED ON SITE.
10. TEMPORARY INLET PROTECTION MEASURES SHALL BE INSTALLED IN ALL CATCH BASINS WITHIN 100' OF THE PROJECT SITE WHEN SITE WORK WITHIN CONTRIBUTING AREAS IS ACTIVE OR SAID AREAS HAVE NOT BEEN STABILIZED.
11. NO EARTHWORK SHALL COMMENCE UNTIL ALL APPROPRIATE SEDIMENT AND EROSION CONTROL MEASURES HAVE BEEN INSTALLED. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE PROPERLY MAINTAINED IN GOOD WORKING ORDER FOR THE DURATION OF CONSTRUCTION AND THE SITE IS STABILIZED.
12. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE DESIGN STANDARDS AND SPECIFICATIONS SET FORTH BY THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES.
13. CONTRACTOR SHALL CONTROL DUST BY SPRAYING WATER, SWEEPING PAVED SURFACES, PROVIDING TEMPORARY VEGETATION, AND/OR MULCHING EXPOSED AREAS AND STOCKPILES.
14. CONTRACTOR SHALL TAKE WHATEVER MEANS NECESSARY TO PREVENT EROSION, PREVENT SEDIMENT FROM LEAVING THE SITE AND/OR ENTERING WETLANDS AND ENSURE PERMANENT SOIL STABILIZATION.
15. SEE DETAIL SHEETS FOR PERTINENT SEDIMENT AND EROSION CONTROL DETAILS AND ADDITIONAL NOTES.
16. DRAINAGE PIPE SHALL BE CORRUGATED POLYETHYLENE PIPE (CPP), TYPE ADS N-12 OR HANCOR H1-Q, OR PVC SDR 35 WHERE SPECIFIED. ALL FLARED END SECTIONS SHALL BE METAL.
17. ALL ROOF DRAIN RISERS SHALL BE LOCATED IN COORDINATION WITH THE ARCHITECTURAL PLANS TO MATCH GUTTER DOWNSPOUTS. RISERS SHALL BE SET TO FINISH GRADE PLUS 1' (MIN.).
18. IF SUITABLE, EXCAVATED MATERIALS SHALL BE PLACED AS FILL WITHIN UPLAND AREAS ONLY AND SHALL NOT BE PLACED WITHIN WETLANDS. PLACEMENT OF BORROW MATERIALS SHALL BE PERFORMED IN A MANNER THAT PREVENTS LONG TERM DIFFERENTIAL SETTLEMENT. EXCESSIVELY WET MATERIALS SHALL BE STOCKPILED AND ALLOWED TO DRAIN BEFORE PLACEMENT. FROZEN MATERIAL SHALL NOT BE USED FOR CONSTRUCTION.
19. PROTECTION OF SUBGRADE: THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN STABLE, DEWATERED SUBGRADES FOR FOUNDATIONS, PAVEMENT AREAS, UTILITY TRENCHES, AND OTHER AREAS DURING CONSTRUCTION. SUBGRADE DISTURBANCE MAY BE INFLUENCED BY EXCAVATION METHODS, MOISTURE, PRECIPITATION, GROUNDWATER CONTROL, AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT SUBGRADE DISTURBANCE. SUCH PRECAUTIONS MAY INCLUDE DIVERTING STORMWATER RUNOFF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAFFIC IN SENSITIVE AREAS, AND MAINTAINING AN EFFECTIVE DEWATERING PROGRAM. SOILS EXHIBITING HEAVING OR INSTABILITY SHALL BE OVER EXCAVATED TO MORE COMPETENT BEARING SOIL AND REPLACED WITH FREE DRAINING STRUCTURAL FILL. IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER, EXPOSED SUBGRADES ARE SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN GROUND. THIS WILL LIKELY REQUIRE REMOVAL OF A FROZEN SOIL CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATIONS. THE FINAL SUBGRADE ELEVATION WOULD ALSO REQUIRE AN APPROPRIATE DEGREE OF INSULATION AGAINST FREEZING.
20. ALL CATCH BASIN, MANHOLE AND OTHER DRAINAGE RIMS SHALL BE SET FLUSH WITH OR NO LESS THAN 0.1' BELOW FINISH GRADE. ANY RIM ABOVE SURROUNDING FINISH GRADE SHALL NOT BE ACCEPTED.
21. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE SIX (6") INCHES OF LOAM, LIMESTONE, FERTILIZER, SEED, AND MULCH USING APPROPRIATE SOIL STABILIZATION TECHNIQUES. SEE DETAILS FOR ADDITIONAL INFORMATION.
22. ALL SPOT GRADES ARE AT FINISH GRADE AND BOTTOM OF CURB WHERE APPLICABLE.
23. IN ORDER TO PROVIDE VISUAL CLARITY ON THE PLANS, DRAINAGE AND OTHER UTILITY STRUCTURES MAY NOT BE DRAWN TO SCALE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER SIZING AND LOCATION OF ALL STRUCTURES AND IS DIRECTED TO RESOLVE ANY POTENTIAL DISCREPANCY WITH THE ENGINEER PRIOR TO CONSTRUCTION.
24. ALL SWALES, STORMWATER PONDS AND THEIR CONTRIBUTING AREAS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
25. UPON COMPLETION OF CONSTRUCTION, ALL DRAINAGE INFRASTRUCTURE SHALL BE CLEANED OF ALL DEBRIS AND SEDIMENT.
26. UPON COMPLETION OF CONSTRUCTION, ALL TEMPORARY EROSION AND SEDIMENT CONTROLS SHALL BE REMOVED AND ANY AREAS DISTURBED BY THE REMOVAL SMOOTHED AND REVEGETATED.
27. TOTAL AREA OF DISTURBANCE = ±96,875 S.F., NHDES ALTERATION OF TERRAIN PERMIT NOT REQUIRED.
28. AREA OF DISTURBANCE EXCEEDS 43,560 S.F., COVERAGE UNDER EPA NPDES PHASE II CONSTRUCTION GENERAL PERMIT REQUIRED, NOI(S) TO BE FILED BY CONTRACTOR. SWPPP AND RELATED INSPECTIONS REQUIRED.
29. AREAS OF ROOF THAT WILL NOT DRAIN DIRECTLY TO THE STONE DRIP EDGE DUE TO THE PRESENCE OF SIDEWALK AT GROUND LEVEL SHALL BE EQUIPPED WITH GUTTERS WITH DOWNSPOUTS DIRECTED TO SAID DRIP EDGE.
30. RIGID INSULATION SHALL BE INSTALLED WHERE DRAIN PIPE COVER IS < 2'.
31. FOUNDATION DRAINS SHALL BE DIRECTED TO THE NEAREST DRAINAGE STRUCTURE OR SURFACE OUTLET OUTSIDE THE 100' WETLAND BUFFER. FINAL LOCATION TO BE DETERMINED BY THE ARCHITECT AND/OR CONTRACTOR.
32. BUILDING #'S 3 AND 6 SHALL BE EQUIPPED WITH SUMP PUMPS WITH DISCHARGE PIPES DIRECTED AWAY FROM SIDEWALKS AND PEDESTRIAN AREAS.
33. SEE SHEET D-6 FOR LEGEND.

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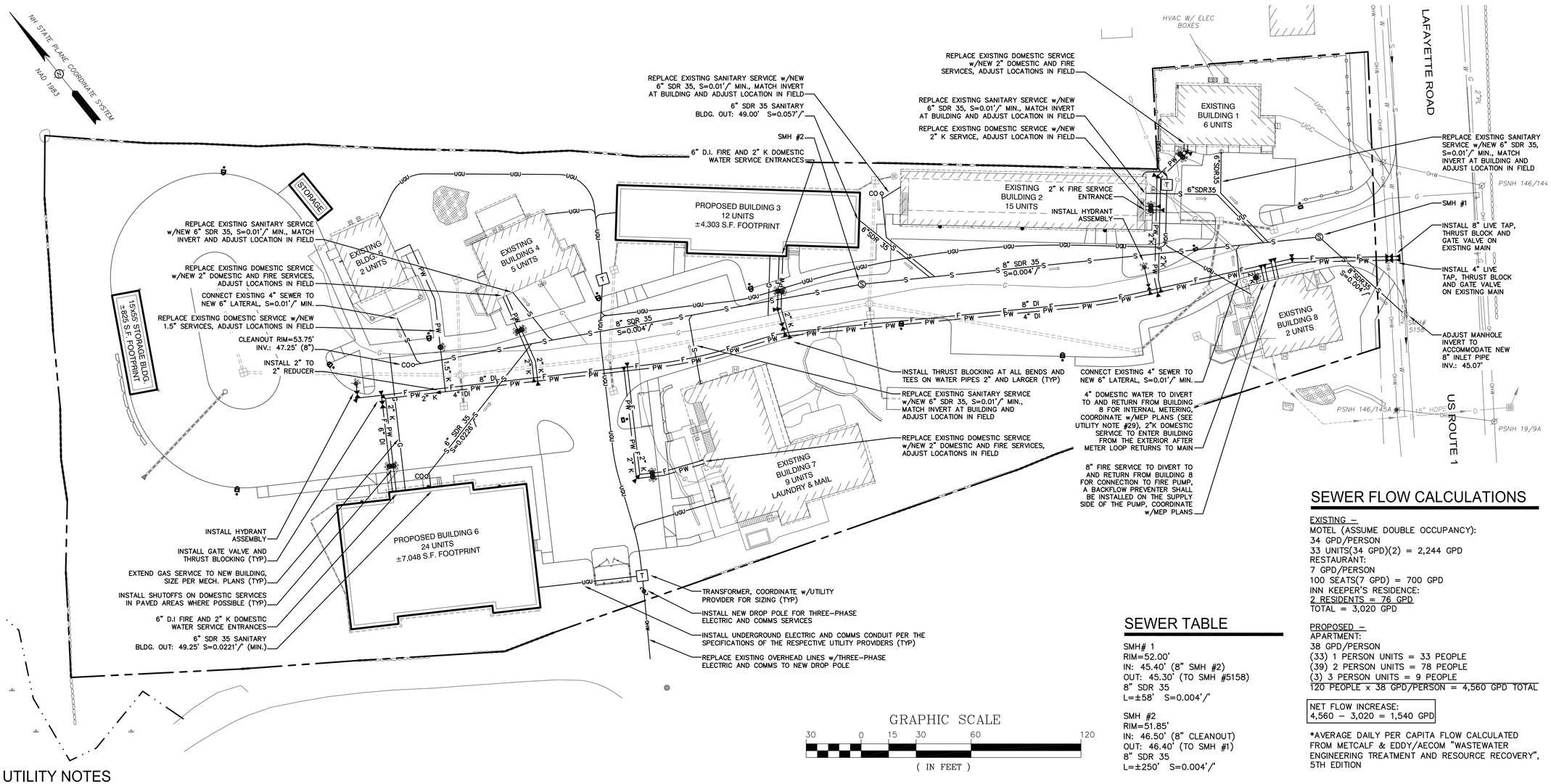
EAST HAMPSTEAD, NH 03826

PROJECT:
MONARCH VILLAGE
TAX MAP 297, LOT 6
3548 LAFAYETTE ROAD
PORTSMOUTH, NH 03801

TITLE:
STORMWATER MANAGEMENT PLAN

SHEET NUMBER:
C-3



SEWER FLOW CALCULATIONS

EXISTING –
MOTEL (ASSUME DOUBLE OCCUPANCY):
34 GPD/PERSON
33 UNITS(34 GPD)(2) = 2,244 GPD
RESTAURANT:
7 GPD/PERSON
100 SEATS(7 GPD) = 700 GPD
INN KEEPER'S RESIDENCE:
2 RESIDENTS = 76 GPD
TOTAL = 3,020 GPD

PROPOSED –
APARTMENT:
38 GPD/PERSON
(33) 1 PERSON UNITS = 33 PEOPLE
(39) 2 PERSON UNITS = 78 PEOPLE
(3) 3 PERSON UNITS = 9 PEOPLE
120 PEOPLE x 38 GPD/PERSON = 4,560 GPD TOTAL

NET FLOW INCREASE:
4,560 – 3,020 = 1,540 GPD

*AVERAGE DAILY PER CAPITA FLOW CALCULATED FROM METCALF & EDDY/AECOM "WASTEWATER ENGINEERING TREATMENT AND RESOURCE RECOVERY", 5TH EDITION

SEWER TABLE

SMH# 1
RIM=52.00'
IN: 45.40' (8" SMH #2)
OUT: 45.30' (TO SMH #5158)
8" SDR 35
L=±58' S=0.004'/'

SMH #2
RIM=51.85'
IN: 46.50' (8" CLEANOUT)
OUT: 46.40' (TO SMH #1)
8" SDR 35
L=±250' S=0.004'/'

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)

UTILITY NOTES

1. THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED UPON THE FIELD LOCATION OF ALL VISIBLE STRUCTURES (IE. CATCH BASINS, MANHOLES, WATER GATES, ETC.) AND INFORMATION COMPILED FROM PLANS PROVIDED BY UTILITY PROVIDERS AND GOVERNMENTAL AGENCIES. AS SUCH, THEY ARE NOT INCLUSIVE AS OTHER UTILITIES AND UNDERGROUND STRUCTURES THAT ARE NOT SHOWN ON THE PLANS MAY EXIST. THE ENGINEER, SURVEYOR AND OWNER ACCEPT NO RESPONSIBILITY FOR POTENTIAL INACCURACIES IN THE PLAN AND/OR UNFORESEEN CONDITIONS. THE CONTRACTOR SHALL NOTIFY, IN WRITING, SAID AGENCIES, UTILITY PROVIDERS, CITY OF PORTSMOUTH DPW AND OWNER'S AUTHORIZED REPRESENTATIVE AND CALL DIG SAFE AT 1 (800) DIG–SAFE AT LEAST SEVENTY–TWO (72) HOURS PRIOR TO ANY EXCAVATION WORK.
2. PRIOR TO CONSTRUCTION, IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND FIELD VERIFY JUNCTIONS, LOCATIONS AND ELEVATIONS/INVERTS OF ALL EXISTING AND PROPOSED STORMWATER AND UTILITY LINES. CONFLICTS SHALL BE ANTICIPATED AND ALL EXISTING LINES TO BE RETAINED SHALL BE PROTECTED. ANY DAMAGE DONE TO EXISTING UTILITIES SHALL BE REPAIRED AND, IF NECESSARY, EXISTING UTILITIES SHALL BE RELOCATED AT NO EXTRA COST TO THE OWNER. ALL CONFLICTS SHALL BE RESOLVED WITH THE INVOLVEMENT OF THE ENGINEER, DPW AND APPROPRIATE UTILITIES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE POSTING OF ALL BONDS AND PAYMENT OF ALL TAP, TIE–IN AND CONNECTION FEES.
4. ALL ROAD/LANE CLOSURES OR OTHER TRAFFIC INTERRUPTIONS SHALL BE COORDINATED WITH NHDOT, THE PORTSMOUTH POLICE DEPARTMENT AND DPW AT LEAST TWO WEEKS PRIOR TO COMMENCING RELATED CONSTRUCTION.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRENCHING, BEDDING, BACKFILL & COMPACTION FOR ALL UTILITY TRENCHING IN ADDITION TO ALL CONDUIT INSTALLATION AND COORDINATION OF ALL REQUIRED INSPECTIONS.
6. ALL TRENCHING, PIPE LAYING AND BACKFILLING SHALL CONFORM TO FEDERAL OSHA AND CITY REGULATIONS.
7. ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH AND NHDOT STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
8. SEE ARCHITECTURAL/MECHANICAL DRAWINGS FOR EXACT LOCATIONS & ELEVATIONS OF UTILITY CONNECTIONS AT BUILDING. COORDINATE ALL WORK WITHIN FIVE (5) FEET OF BUILDINGS WITH BUILDING CONTRACTOR AND ARCHITECTURAL/MECHANICAL DRAWINGS. ALL CONFLICTS AND DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY AND PRIOR TO COMMENCING RELATED WORK.
9. FINAL UTILITY LOCATIONS TO BE COORDINATED BETWEEN THE ARCHITECT, CONTRACTOR, APPROPRIATE UTILITY COMPANIES AND THE PORTSMOUTH DPW.
10. UTILITY PROVIDERS AND CONTACTS:
    - WATER & SEWER: PORTSMOUTH DPW, JIM TOW, (603) 427–1530.
    - GAS: UNITIL, DAVID BEAULIEU, (603) 294–5144.
    - TELECOMMUNICATIONS: CONSOLIDATED, JOE CONSIDINE, (603) 427–5525.
    - CABLE: COMCAST, MIKE COLLINS, (603) 679–5695, EXT. 1037.
    - ELECTRICAL: EVERSOURCE, MICHAEL BUSBY, (603) 332–4227, EXT. 5555334. ALL ELECTRIC CONDUIT INSTALLATION SHALL BE INSPECTED BY EVERSOURCE PRIOR TO BACKFILL, 48–HOUR MINIMUM NOTICE REQUIRED.
11. DETECTABLE WARNING TAPE SHALL BE PLACED OVER THE ENTIRE LENGTH OF ALL BURIED UTILITIES, COLORS PER THE RESPECTIVE UTILITY PROVIDERS.
12. CONTRACTOR TO PROVIDE BOLLARDS AT SERVICE ENTRANCES PER THE SPECIFICATIONS OF THE RESPECTIVE UTILITY PROVIDERS.
13. ALL WATER MAIN AND SERVICE INSTALLATIONS SHALL BE CONSTRUCTED AND TESTED PER PORTSMOUTH DPW STANDARDS AND SPECIFICATIONS. ALL OTHER UTILITIES SHALL BE TO THE STANDARDS AND SPECIFICATIONS OF THE RESPECTIVE UTILITY PROVIDERS.
14. WHERE WATER LINES CROSS, RUN ADJACENT TO OR ARE WITHIN 5' OF STORM DRAINAGE PIPES OR STRUCTURES, 2"–THICK CLOSED CELL RIGID BOARD INSULATION SHALL BE INSTALLED FOR FROST PROTECTION.
15. PER PORTSMOUTH DPW SPECIFICATIONS, ALL NEW WATERLINES SHALL BE WRAPPED WITH A WATER TIGHT POLYETHYLENE WRAPPING FOR THEIR FULL LENGTH, ALL DOMESTIC WATER SERVICES SHALL BE PROVIDED WITH BACKFLOW PREVENTERS AND ALL JOINTS SHALL HAVE THREE (3) WEDGES PER JOINT.
16. WATER AND SANITARY SEWER LINES SHALL BE LOCATED AT LEAST 10' HORIZONTALLY FROM EACH OTHER. WHERE CROSSING, 18" MINIMUM VERTICAL CLEARANCE SHALL BE PROVIDED WITH WATER INSTALLED OVER SEWER.
17. SEE ARCHITECTURAL/MECHANICAL DRAWINGS FOR EXACT LOCATIONS & ELEVATIONS OF UTILITY CONNECTIONS AT BUILDINGS. COORDINATE ALL WORK WITHIN FIVE (5) FEET OF BUILDINGS WITH BUILDING CONTRACTOR AND ARCHITECTURAL/MECHANICAL DRAWINGS. ALL CONFLICTS AND DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY PRIOR TO COMMENCING RELATED WORK.
18. FIRE ALARM PANELS SHALL BE MONITORED THROUGH A THIRD–PARTY SECURITY COMPANY. CONTRACTOR SHALL COORDINATE PANEL LOCATIONS AND INTERCONNECTIONS WITH CITY FIRE DEPT. AND ARCHITECT.
19. ALL MEANS, METHODS, MATERIALS AND INSTALLATION OF NEW SEWER LATERALS SHALL BE APPROVED AND WITNESSED BY PORTSMOUTH DPW PRIOR TO BACKFILLING.
20. APPLICANT SHALL HAVE A SITE SURVEY CONDUCTED BY A RADIO COMMUNICATIONS CARRIER APPROVED BY THE CITY'S COMMUNICATION DIVISION. THE RADIO COMMUNICATIONS CARRIER MUST BE FAMILIAR AND CONVERSANT WITH THE POLICE AND RADIO CONFIGURATION. IF THE SITE SURVEY INDICATES IT IS NECESSARY TO INSTALL A SIGNAL REPEATER EITHER ON OR NEAR THE PROPOSED PROJECT, THOSE COSTS SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER. THE APPLICANT SHALL BE REQUIRED TO PAY FOR THE SITE SURVEY WHETHER OR NOT THE SURVEY INDICATES A REPEATER IS NECESSARY. THE OWNER SHALL COORDINATE WITH THE SUPERVISOR OF RADIO COMMUNICATIONS FOR THE CITY. THE SURVEY SHALL BE COMPLETED AND THE REPEATER, IF DETERMINED IT IS REQUIRED, SHALL BE INSTALLED PRIOR TO THE ISSUANCE OF CERTIFICATE OF OCCUPANCY.
21. CONTRACTOR/OWNER SHALL PROVIDE DPW WITH DETAILS OF TEMPORARY & PERMANENT GROUNDWATER DEWATERING DESIGN IF NECESSARY.
22. THE APPLICANT OR ASSIGNS SHALL AGREE TO PAY FOR THE SERVICES OF A THIRD–PARTY OVERSIGHT ENGINEER, TO BE SELECTED BY THE CITY, TO MONITOR THE INSTALLATION OF UTILITIES INCLUDING SEWER, WATER AND DRAINAGE
23. THE APPLICANT SHALL ENTER INTO A MAINTENANCE AGREEMENT WITH THE PORTSMOUTH DPW FOR THE PROPOSED FIRE HYDRANT AND FLUSHING.
24. A HYDRANT FLOW TEST SHALL BE CONDUCTED EVERY FIVE YEARS IN COORDINATION WITH PORTSMOUTH DPW WATER DIVISION.
25. SITE SHALL BE SUBJECT TO A BLANKET EASEMENT FOR THE BENEFIT OF THE CITY OF PORTSMOUTH FOR THE PURPOSE OF WATER VALVE AND HYDRANT ACCESS AND WATER SYSTEM LEAK DETECTION.
26. THE CONTRACTOR SHALL CONFIRM ALL WATERLINE SIZES WITH THE MEP PLANS PRIOR TO INSTALLATION. ANY DISCREPANCY SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
27. ALL BUILDINGS WITH THREE OR MORE UNITS SHALL BE EQUIPPED WITH FIRE SPRINKLER SYSTEMS. COORDINATE EXTERIOR WATER SERVICE LINES WITH MEP PLANS.
28. ALL NEW WATER PIPING WITHIN THE LAFAYETTE ROAD RIGHT OF WAY SHALL BE DUCTILE IRON. THE CONTRACTOR HAS THE OPTION TO SUBSTITUTE PVC C900 WATER PIPE WITHIN THE PROJECT SITE.
29. INTERIOR TO BUILDING 8, SHUT OFF VALVES SHALL BE PROVIDED ON BOTH SIDES OF THE METER. A BACKFLOW PREVENTER AND BYPASS METERING SHALL ALSO BE PROVIDED. PORTSMOUTH WATER SHALL REVIEW AND APPROVE PLANS OF THIS AREA PRIOR TO CONSTRUCTION. COORDINATE WITH MEP PLANS AND PLUMBING CONTRACTOR.
30. ALL WATER VALVES AND SHUTOFFS SHALL BE PAINTED RED FOR FIRE OR BLUE DOMESTIC WITH PERMANENT RUST RESISTANT PAINT.
31. SEE SHEET D–6 FOR LEGEND.

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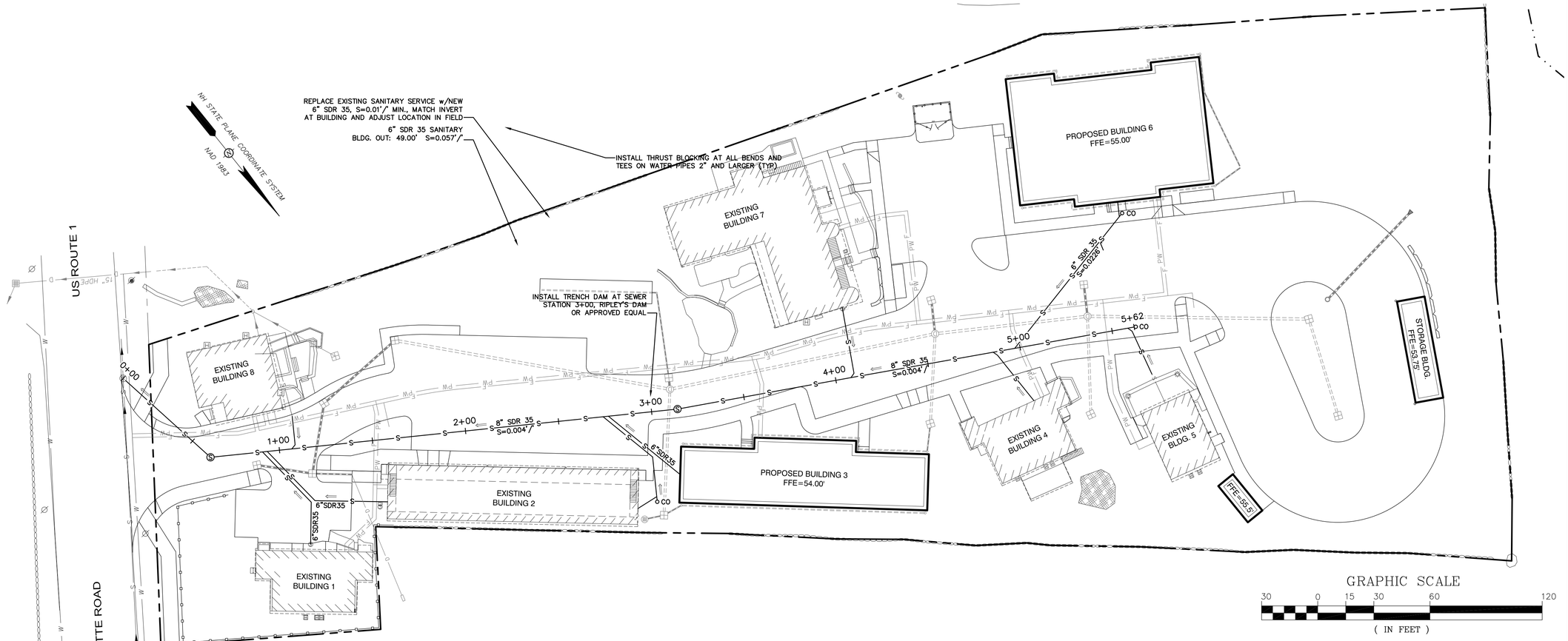
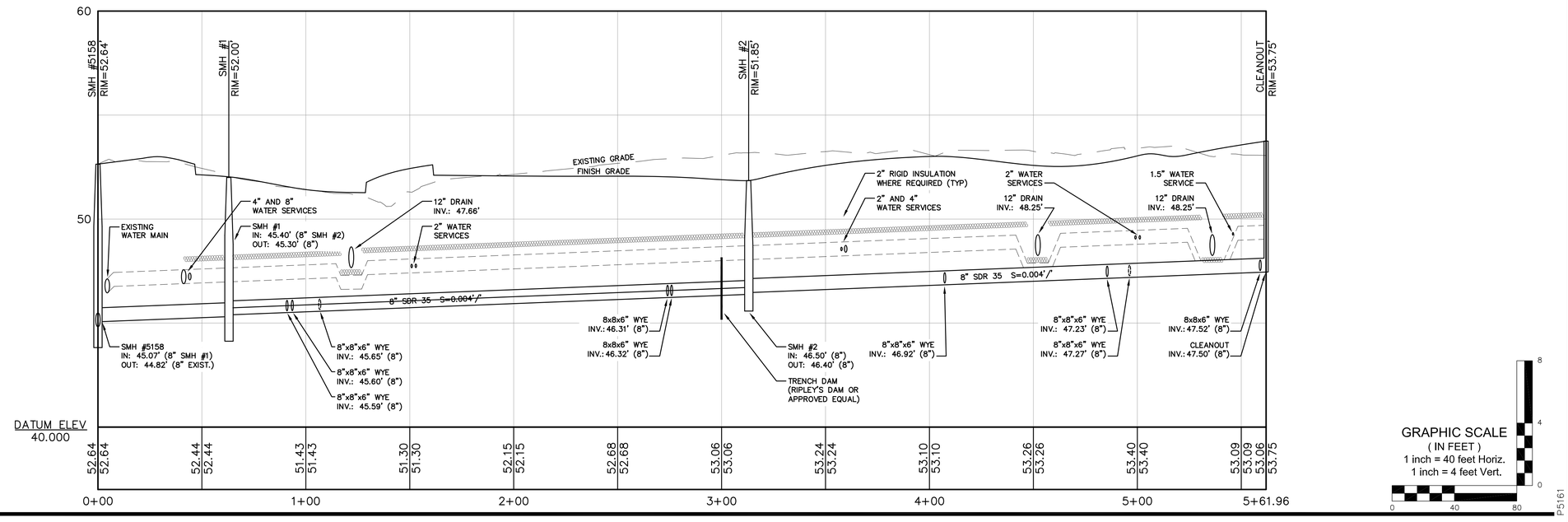
C-4





SEWER PROFILE

P5161

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER – 10/18/21

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: DECEMBER 28, 2021

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC WORK SEESION	EBS	08/03/21
1	TAC	EBS	08/23/21
2	TAC	EBS	10/18/21
3	REV. FRONT DRAINAGE	EBS	11/09/21
4	REV. PER TAC COA	EBS	12/28/21

DRAWN BY: EBS
APPROVED BY: EDW
DRAWING FILE: 5161-SITE.dwg

SCALE:
22" x 34" – 1" = 30'
11" x 17" – 1" = 60'

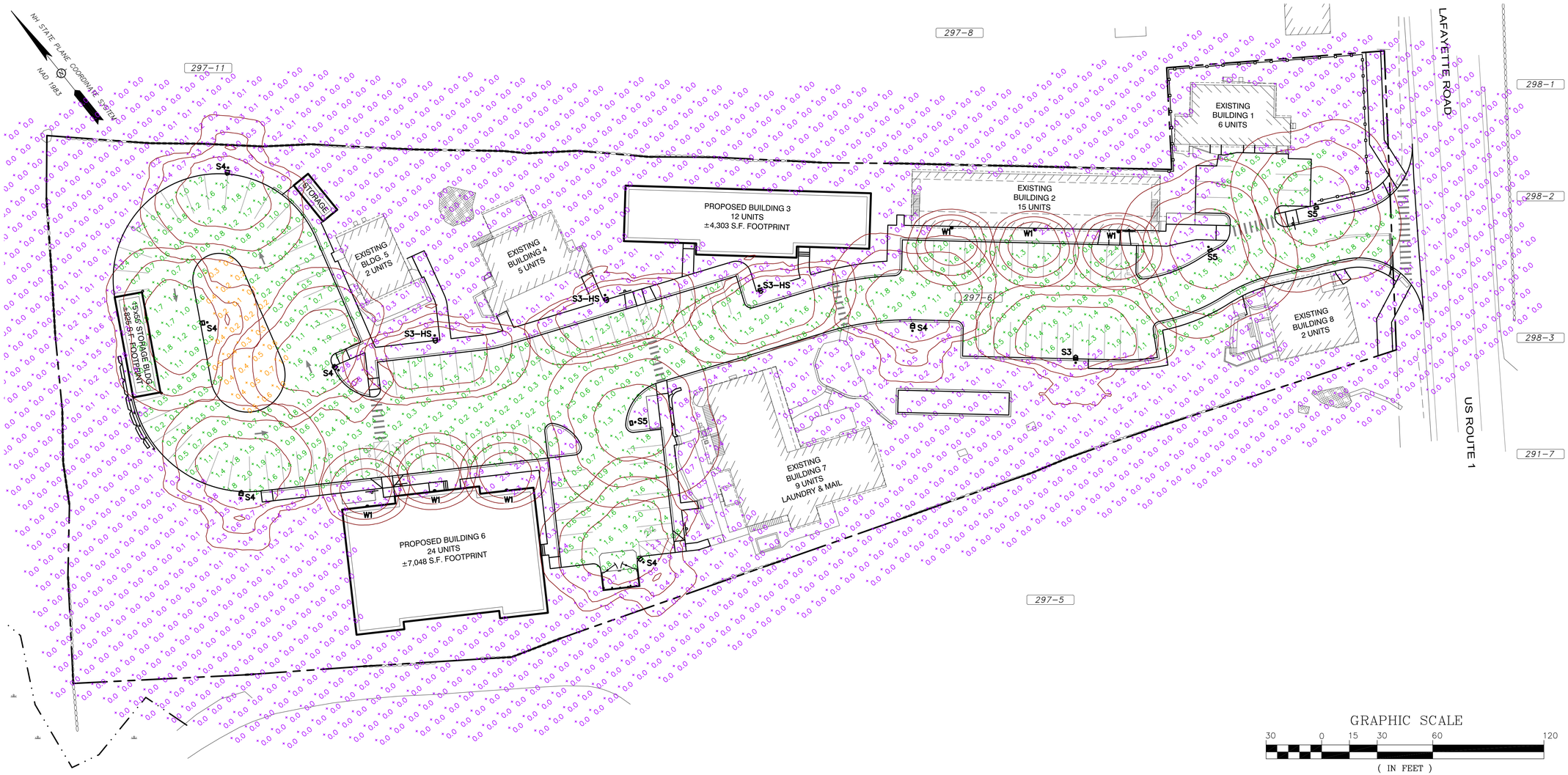
OWNER:
NAVEESHA HOSPITALITY, LLC
440 BEDFORD ST.
LEXINGTON, MA 02420

APPLICANT:
MONARCH VILLAGE, LLC
P.O. BOX 365
EAST HAMPSTEAD, NH 03826

PROJECT:
MONARCH VILLAGE
TAX MAP 297, LOT 6
3548 LAFAYETTE ROAD
PORTSMOUTH, NH 03801

TITLE:
SEWER PLAN AND PROFILE

SHEET NUMBER:
C-5



GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)

LIGHTING NOTES

1. SITE ELECTRICAL CONTRACTOR SHALL COORDINATE LOCATION OF UNDERGROUND UTILITIES, AND DRAINAGE BEFORE INSTALLING POLE BASES.
2. DETECTABLE WARNING TAPE SHALL BE PLACED OVER THE ENTIRE LENGTH OF ALL BURIED UTILITIES, COLORS PER THE RESPECTIVE UTILITY PROVIDERS.
3. LIGHTING CONDUIT SHALL BE PVC SCH 40.
4. ALL LIGHTING MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE AND LOCAL REGULATIONS.
5. ALL LIGHTING FIXTURES SHALL BE FULL CUT-OFF AND 3000K COLOR TEMPERATURE SO AS TO BE DARK-SKY COMPLIANT.
6. CONTRACTOR SHALL COORDINATE WITH ARCHITECT AND BUILDING ELECTRICAL CONTRACTOR FOR ALL SITE ELECTRICAL WORK INCLUDING BUT NOT LIMITED TO ALL SERVICE ENTRANCES/EXITS, RISERS, CIRCUITRY, METERS, SUB-METERS, ETC.
7. COORDINATE WITH ARCHITECTURAL PLANS FOR ALL BUILDING-MOUNTED FIXTURES, TYPES, LOCATIONS AND WIRING.
8. LUMINAIRE DATA IS TESTED TO INDUSTRY STANDARDS UNDER LABORATORY CONDITIONS. OPERATING VOLTAGE AND NORMAL MANUFACTURING TOLERANCES OF LAMP BALLAST AND LUMINAIRE MAY AFFECT FIELD RESULTS.
9. THIS LIGHTING DESIGN IS BASED ON LIMITED INFORMATION PROVIDED BY VISIBLE LIGHT, INC., 24 STICKNEY TERRACE, SUITE 6, HAMPTON, NH 03842. FIELD DEVIATIONS MAY SIGNIFICANTLY AFFECT PREDICTED PERFORMANCE. PRIOR TO INSTALLATION, CRITICAL SITE INFORMATION (POLE LOCATIONS, ORIENTATION, MOUNTING HEIGHT, CIRCUITRY, ETC.) SHALL BE COORDINATED BETWEEN THE CONTRACTOR, ARCHITECT AND SPECIFIER.
10. SEE DETAIL SHEETS FOR FIXTURE CUT SHEETS AND POLE BASE DETAIL.

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Island	+	0.4 fc	1.0 fc	0.1 fc	10.0:1	4.0:1
Outside of Parking Lot	+	0.1 fc	3.2 fc	0.0 fc	N/A	N/A
Parking Lot	+	1.0 fc	3.1 fc	0.2 fc	15.5:1	5.0:1

Schedule

Symbol	Label	QTY	Manufacturer	Catalog Number	Description	Lamp		Filename	Lumens per Lamp	LLF	Distribution
	S3	1	Lithonia Lighting	DSX0 LED P2 30K T3M MVOLT SPA DDBXD with SSS 14 4C DM19AS DDBXD	DSX0 LED Area Fixture; mounted at 16ft (14ft pole on 2ft base)	LED		DSX0_LED_P2_30K_T3M_MVOLT.ies	5416	5416.359	TYPE III, MEDIUM, BUG RATING: B1 – U0 – G2
	S3-HS	3	Lithonia Lighting	DSX0 LED P2 30K T3M MVOLT HS SPA DDBXD with SSS 14 4C DM19AS DDBXD	DSX0 LED Area Fixture with houseside shield; mounted at 16ft (14ft pole on 2ft base)	LED		DSX0_LED_P2_30K_T3M_MVOLT_HS.ies	4389	4388.992	TYPE III, SHORT, BUG RATING: B1 – U0 – G1
	S4	6	Lithonia Lighting	DSX0 LED P2 30K TFTM MVOLT SPA DDBXD with SSS 14 4C DM19AS DDBXD	DSX0 LED Area Fixture with houseside shield; mounted at 16ft (14ft pole on 2ft base)	LED		DSX0_LED_P2_30K_TFTM_MVOLT.ies	5576	5575.775	TYPE III, SHORT, BUG RATING: B1 – U0 – G2
	S5	3	Lithonia Lighting	DSX0 LED P2 30K T5M MVOLT SPA DDBXD with SSS 14 4C DM19AS DDBXD	DSX0 LED Area Fixture; mounted at 18ft (14ft pole on 2ft base)	LED		DSX0_LED_P2_30K_T5M_MVOLT.ies	5789	5789.027	TYPE VS, BUG RATING: B3 – U0 – G1
	W1	6	Lithonia Lighting	ARC1 LED P3 30K MVOLT DDBXD	ARC1 LED WITH P2 PERFORMANCE PACKAGE; mounted at 14ft	LED		ARC1_LED_P2_30K.ies	2035	2034.867	TYPE III, VERY SHORT, BUG RATING: B1 – U0 – G1

P5161

ALTUS ENGINEERING, INC.

133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

VISIBLELIGHT

NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: DECEMBER 28, 2021

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC	EBS	08/23/21
1	TAC	EBS	10/18/21
2	REV. PER TAC COA	EBS	12/28/21

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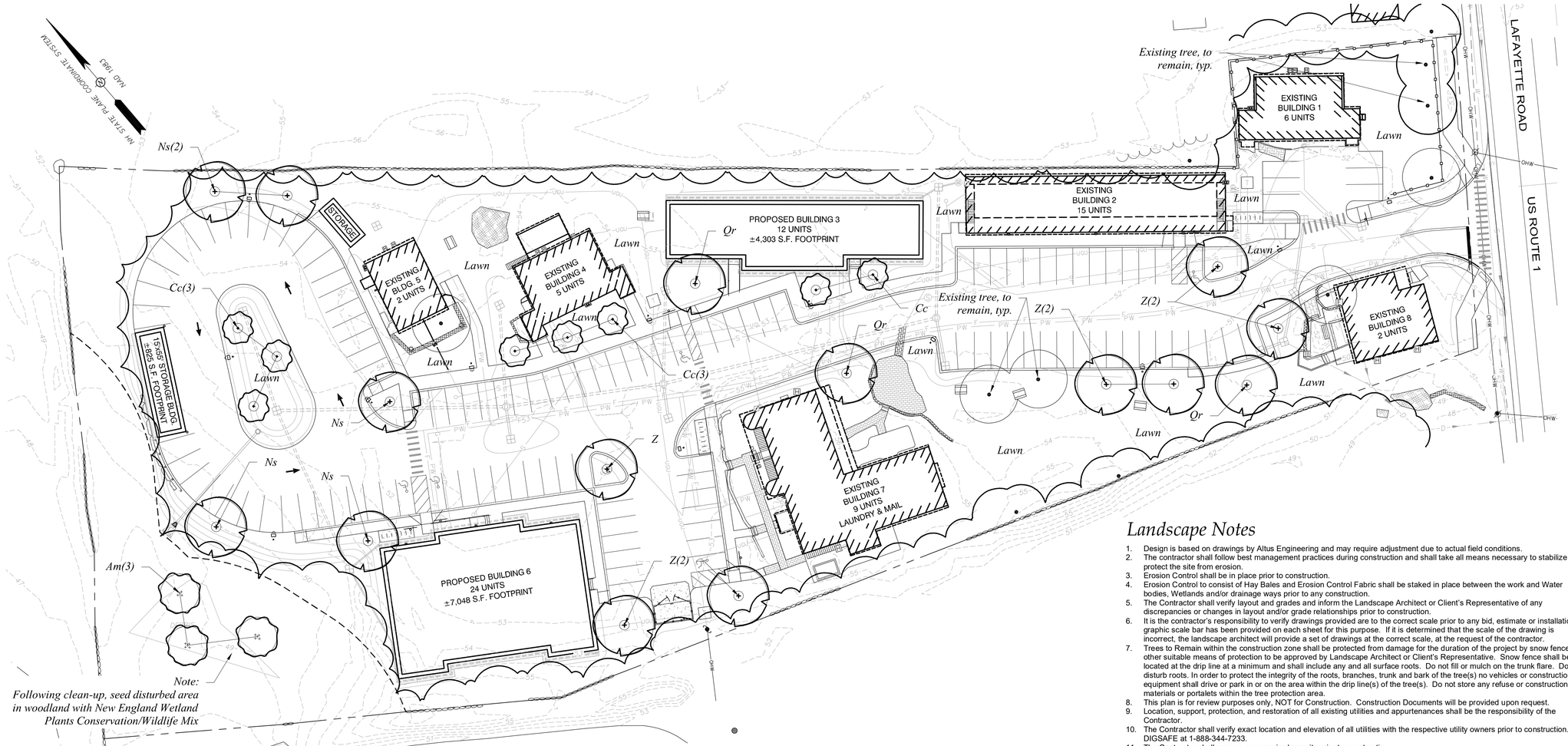
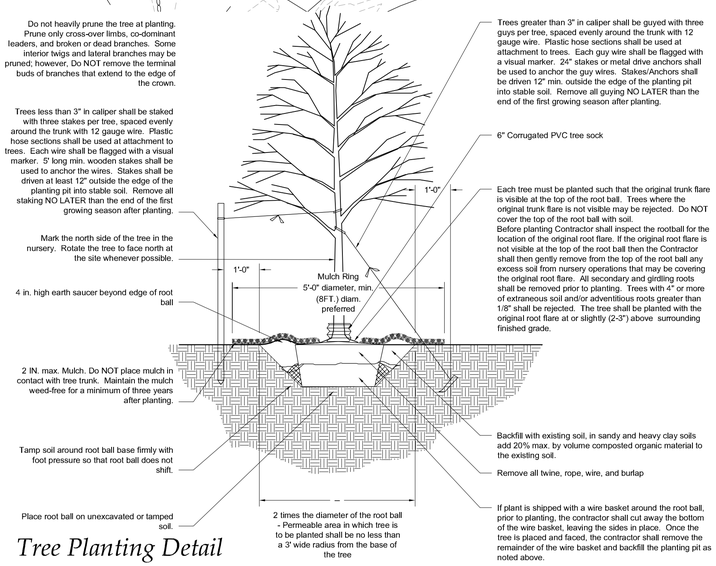
APPLICANT:
MONARCH VILLAGE, LLC
P.O. BOX 365
EAST HAMPSTEAD, NH 03826

PROJECT:
MONARCH VILLAGE
TAX MAP 297, LOT 6
3548 LAFAYETTE ROAD
PORTSMOUTH, NH 03801

TITLE:
LIGHTING PLAN

SHEET NUMBER:
C-6





Tree Planting Detail

Plant List

TREES

Symbol	Botanical Name	Common Name	Quantity	Size	Comments
Am	*Amelanchier canadensis*	Shadblow Serviceberry	3	8-10' Ht	B&B Multi-stem
Cc	*Crataegus crus-galli 'Inermis'*	Thornless Cockspur Hawthorn	8	2.5-3" Cal	B&B
Ns	*Nyssa Sylvatica 'Red Rage'*	Black Tupelo	5	2.5-3" Cal	B&B
Qr	*Quercus rubra*	Red Oak	3	2.5-3" Cal	B&B
Z	*Zelkova serrata 'Green Vase'*	Green Vase Zelkova	7	2.5-3" Cal	B&B

Landscape Notes

1. Design is based on drawings by Altus Engineering and may require adjustment due to actual field conditions.
2. The contractor shall follow best management practices during construction and shall take all means necessary to stabilize and protect the site from erosion.
3. Erosion Control shall be in place prior to construction.
4. Erosion Control to consist of Hay Bales and Erosion Control Fabric shall be staked in place between the work and Water bodies, Wetlands and/or drainage ways prior to any construction.
5. The Contractor shall verify layout and grades and inform the Landscape Architect or Client's Representative of any discrepancies or changes in layout and/or grade relationships prior to construction.
6. It is the contractor's responsibility to verify drawings provided are to the correct scale prior to any bid, estimate or installation. A graphic scale bar has been provided on each sheet for this purpose. If it is determined that the scale of the drawing is incorrect, the landscape architect will provide a set of drawings at the correct scale, at the request of the contractor.
7. Trees to Remain within the construction zone shall be protected from damage for the duration of the project by snow fence or other suitable means of protection to be approved by Landscape Architect or Client's Representative. Snow fence shall be located at the drip line at a minimum and shall include any and all surface roots. Do not fill or mulch on the trunk flare. Do not disturb roots. In order to protect the integrity of the roots, branches, trunk and bark of the tree(s) no vehicles or construction equipment shall drive or park in or on the area within the drip line(s) of the tree(s). Do not store any refuse or construction materials or portalets within the tree protection area.
8. This plan is for review purposes only, NOT for Construction. Construction Documents will be provided upon request.
9. Location, support, protection, and restoration of all existing utilities and appurtenances shall be the responsibility of the Contractor.
10. The Contractor shall verify exact location and elevation of all utilities with the respective utility owners prior to construction. Call DIGSAFE at 1-888-344-7233.
11. The Contractor shall procure any required permits prior to construction.
12. Prior to any landscape construction activities Contractor shall test all existing loam and loam from off-site intended to be used for lawns and plant beds using a thorough sampling throughout the supply. Soil testing shall indicate levels of pH, nitrates, macro and micro nutrients, texture, soluble salts, and organic matter. Contractor shall provide Landscape Architect with test results and recommendations from the testing facility along with soil amendment plans as necessary for the proposed plantings to thrive. All loam to be used on site shall be amended as approved by the Landscape Architect prior to placement.
13. Contractor shall notify landscape architect or owner's representative immediately if at any point during demolition or construction a site condition is discovered which may negatively impact the completed project. This includes, but is not limited to, unforeseen drainage problems, unknown subsurface conditions, and discrepancies between the plan and the site. If a contractor is aware of a potential issue, and does not bring it to the attention of the landscape architect or owner's representative immediately, they may be responsible for the labor and materials associated with correcting the problem.
14. The Contractor shall furnish and plant all plants shown on the drawings and listed thereon. All plants shall be nursery-grown under climatic conditions similar to those in the locality of the project. Plants shall conform to the botanical names and standards of size, culture, and quality for the highest grades and standards as adopted by the American Association of Nurserymen, Inc. in the American Standard of Nursery Stock, American Standards Institute, Inc. 230 Southern Building, Washington, D.C. 20005.
15. A complete list of plants, including a schedule of sizes, quantities, and other requirements is shown on the drawings. In the event that quantity discrepancies or material omissions occur in the plant materials list, the planting plans shall govern.
16. All plants shall be legibly tagged with proper botanical name.
17. The Contractor shall guarantee all plants for not less than one year from time of acceptance.
18. Owner or Owner's Representative will inspect plants upon delivery for conformity to Specification requirements. Such approval shall not affect the right of inspection and rejection during or after the progress of the work. The Owner reserves the right to inspect and/or select all trees at the place of growth and reserves the right to approve a representative sample of each type of shrub, herbaceous perennial, annual, and ground cover at the place of growth. Such sample will serve as a minimum standard for all plants of the same species used in this work.
19. No substitutions of plants may be made without prior approval of the Owner or the Owner's Representative for any reason.
20. All landscaping shall be provided with the following:
    a. Outside hose attachments spaced a maximum of 150 feet apart, and
    b. An underground irrigation system, or
    c. A temporary irrigation system designed for a two-year period of plant establishment.
21. If an automatic irrigation system is installed, all irrigation valve boxes shall be located within planting bed areas.
22. The contractor is responsible for all plant material from the time their work commences until final acceptance. This includes but is not limited to maintaining all plants in good condition, the security of the plant material once delivered to the site, and watering of plants. Plants shall be appropriately watered prior to, during and after planting. It is the contractor's responsibility to provide clean water suitable for plant health from off site, should it not be available on site.
23. All disturbed areas will be dressed with 6" of topsoil and planted as noted on the plans or seeded except plant beds. Plant beds shall be prepared to a depth of 12" with 75% loam and 25% compost.
24. Trees, ground cover, and shrub beds shall be mulched to a depth of 2" with one-year-old, well-composted, shredded native bark not longer than 4" in length and ½" in width, free of woodchips and sawdust. Mulch for ferns and herbaceous perennials shall be no longer than 1" in length. Trees in lawn areas shall be mulched in a 5' diameter min. saucer. Color of mulch shall be black.
25. In no case shall mulch touch the stem of a plant nor shall mulch ever be more than 3" thick total (including previously applied mulch) over the root ball of any plant.
26. Secondary lateral branches of deciduous trees overhanging vehicular and pedestrian travel ways shall be pruned up to a height of 6' to allow clear and safe passage of vehicles and pedestrians under tree canopy. Within the sight distance triangles at vehicle intersections the canopies shall be raised to 8' min.
27. Snow shall be stored a minimum of 5' from shrubs and trunks of trees.
28. Landscape Architect is not responsible for the means and methods of the contractor.

woodburn & company
LANDSCAPE ARCHITECTURE
103 Kent Place Newmarket, New Hampshire Phone: 603.659.5949

Monarch Village

LANDSCAPE PLAN

3548 Lafayette Road Portsmouth, New Hampshire

Drawn By:	VM
Checked By:	RW
Scale:	1" = 30' - 0"
Date:	October 18, 2021
Revisions:	

L-1

Sheet 1 of 1

SEDIMENT AND EROSION CONTROL NOTES

PROJECT NAME AND LOCATION

3548 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
TAX MAP 297 LOT 6

LATITUDE: 43°02'17" N
LONGITUDE: 70°48'00" W

OWNER/APPLICANT:
MONARCH VILLAGE, LLC
P.O. BOX 365
EAST HAMPSTEAD, NH 03826

DESCRIPTION

The project consists of the conversion of an existing motel to long-term rental units and the construction of two new apartment buildings together with associated site improvements.

DISTURBED AREA

The total area to be disturbed for the development is ±97,850 S.F. (±2.25 acres).

PROJECT PHASING

The proposed demolition, conversion and construction of buildings along with associated utilities will be completed in one phase.

NAME OF RECEIVING WATER

The site drains over land to unnamed wetlands tributary to Packer Bog & Berry's Brook.

SEQUENCE OF MAJOR ACTIVITIES

1. Install temporary erosion control measures including perimeter controls, stabilized construction entrance and inlet sediment filters as noted on the plan. All temporary erosion control measures shall be maintained in good working condition for the duration of the project.
2. Remove landscaping and trees, strip loam and stockpile.
3. Demolish existing site features, buildings, utilities, etc. as shown on Demolition Plan.
4. Construct building foundations.
5. Rough grade site including placement of borrow materials.
6. Construct new buildings and associated improvements.
7. Construct drainage structures, culverts, utilities & pavement base course materials.
8. Install base course paving & curbing.
9. Install top course paving and sidewalks.
10. Loam (6" min) and seed on all disturbed areas not paved or otherwise stabilized.
11. Install landscaping.
12. When all construction activity is complete and site is stabilized, remove all temporary erosion control measures and any sediment that has been trapped by these devices.

TEMPORARY EROSION & SEDIMENT CONTROL AND STABILIZATION PRACTICES

All work shall be in accordance with state and local permits. Work shall conform to the practices described in the "New Hampshire Stormwater Manual, Volumes 1 – 3", issued December 2008, as amended. As indicated in the sequence of Major Activities, perimeter controls shall be installed prior to commencing any clearing or grading of the site. Structural controls shall be installed concurrently with the applicable activity. Once construction activity ceases permanently in an area and permanent measures are established, perimeter controls shall be removed.

During construction, runoff will be diverted around the site with stabilized channels where possible. Sheet runoff from the site shall be filtered through appropriate perimeter controls. All storm drain inlets shall be provided with inlet protection measures.

Temporary and permanent vegetation and mulching is an integral component of the erosion and sedimentation control plan. All areas shall be inspected and maintained until vegetative cover is established. These control measures are essential to erosion prevention and also reduce costly rework of graded and shaped areas.

Temporary vegetation shall be maintained in these areas until permanent seeding is applied. Additionally, erosion and sediment control measures shall be maintained until permanent vegetation is established.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES

A. GENERAL

These are general inspection and maintenance practices that shall be used to implement the plan:

1. The smallest practical portion of the site shall be denuded at one time.
2. All control measures shall be inspected at least once each week and following any storm event of 0.5 inches or greater.
3. All measures shall be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours.
4. Built-up sediment shall be removed from perimeter barriers when it has reached one-third the height of the barrier or when "bulges" occur.
5. All diversion dikes shall be inspected and any breaches promptly repaired.
6. Temporary seeding and planting shall be inspected for bare spots, washouts, and unhealthy growth.
7. The owner's authorized engineer shall inspect the site on a periodic basis to review compliance with the Plans.
8. An area shall be considered stable if one of the following has occurred:
   a. Base course gravels have been installed in areas to be paved;
   b. A minimum of 85% vegetated growth as been established;
   c. A minimum of 3 inches of non-erosive material such as stone of riprap has been installed; – or –
   d. Erosion control blankets have been properly installed.
9. The length of time of exposure of area disturbed during construction shall not exceed 45 days.

B. MULCHING

Mulch shall be used on highly erodible soils, on critically eroding areas, on areas where conservation of moisture will facilitate plant establishment, and where shown on the plans.

1. Timing – In order for mulch to be effective, it must be in place prior to major storm events. There are two (2) types of standards which shall be used to assure this:
   a. Apply mulch prior to any storm event. This is applicable when working within 100 feet of wetlands. It will be necessary to closely monitor weather predictions, usually by contacting the National Weather Service in Concord, to have adequate warning of significant storms.
   b. Required Mulching within a specified time period. The time period can range from 21 to 28 days of inactivity on a area, the length of time varying with site conditions. Professional judgment shall be used to evaluate the interaction of site conditions (soil erodibility, season of year, extent of disturbance, proximity to sensitive resources, etc.) and the potential impact of erosion on adjacent areas to choose an appropriate time restriction.
2. Guidelines for Winter Mulch Application –

Type	Rate per 1,000 s.f.	Use and Comments
Hay or Straw	70 to 90 lbs.	Must be dry and free from mold. May be used with plantings.
Wood Chips or Bark Mulch	460 to 920 lbs.	Used mostly with trees and shrubs.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES (CONTINUED)

Jute and Fibrous Matting (Erosion Blanket	As per manufacturer Specifications	Used in slope areas, water courses and other Control areas.
Crushed Stone 1/4" to 1-1/2" dia.	Spread more than 1/2" thick	Effective in controlling wind and water erosion.
Erosion Control Mix	2" thick (min)	* The organic matter content is between 80 and 100% dry weight basis. * Particle size by weight is 100% passing a 6"screen and a minimum of 70 %, maximum of 85%, passing a 0.75" screen. *The organic portion needs to be fibrous and elongated. *Large portions of silts, clays or fine sands are not acceptable in the mix. * Soluble salts content is less than 4.0 mmhos/cm. *The pH should fall between 5.0 and 8.0.

3. Maintenance – All mulches must be inspected periodically, in particular after rainstorms, to check for rill erosion. If less than 90% of the soil surface is covered by mulch, additional mulch shall be immediately applied.

C. PERMANENT SEEDING –

1. Bedding – stones larger than 1½", trash, roots, and other debris that will interfere with seeding and future maintenance of the area should be removed. Where feasible, the soil should be tilled to a depth of 5" to prepare a seedbed and mix fertilizer into the soil.
2. Fertilizer – lime and fertilizer should be applied evenly over the area prior to or at the time of seeding and incorporated into the soil. Kinds and amounts of lime and organic fertilizer should be based on an evaluation of soil tests. When a soil test is not available, the following minimum amounts should be applied:

   Agricultural Limestone @ 100 lbs. per 1,000 s.f.
   10-20-20 organic fertilizer @ 12 lbs. per 1,000 s.f.

3. Seed Mixture (recommended):

Type	Lbs. / Acre	Lbs. / 1,000 sf
Tall Fescue	24	0.55
Creeping Red Fescue	24	0.55
Total	48	1.10

Seed Mixture (For slope embankments):
Grass Seed: Provide fresh, clean, new-crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America. Provide seed mixture composed of grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as specified:

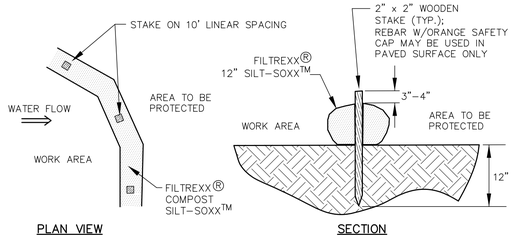
Type	Min. Purity (%)	Min. Germination (%)	Kg./Hectare (Lbs/Acre)
Creeping Red Fescue (c)	96	85	45 (40)
Perennial Rye Grass (a)	98	90	35 (30)
Redtop	95	80	5 (5)
Alsike Clover	97	90(e)	5 (5)
		Total	90 (80)

   a. Ryegrass shall be a certified fine-textured variety such as Pennfine, Fiesta, Yorktown, Diplomat, or equal.
   b. Fescue varieties shall include – Creeping Red and/or Hard Reliant, Scaldis, Koket, or Jamestown.

4. Sodding – sodding is done where it is desirable to rapidly establish cover on a disturbed area. Sodding an area may be substituted for permanent seeding procedures anywhere on site. Bed preparation, fertilizing, and placement of sod shall be performed according to the S.C.S. Handbook. Sodding is recommended for steep sloped areas, areas immediately adjacent to sensitive water courses, easily erodible soils (fine sand/silt), etc.

WINTER CONSTRUCTION NOTES

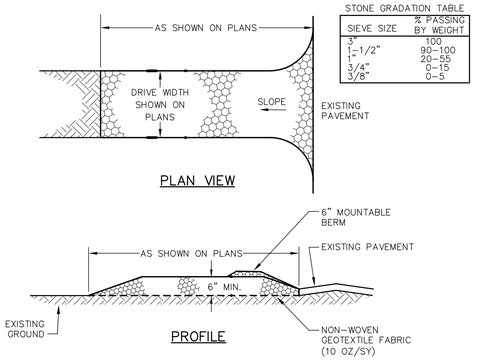
1. All proposed vegetated areas which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and elsewhere seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting. The installation of erosion control blankets or mulch and netting shall not occur over accumulated snow or on frozen ground and shall be completed in advance of thaw or spring melt events;
2. All ditches or swales which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized temporarily with stone or erosion control blankets appropriate for the design flow conditions; and
3. After November 15th, incomplete road or parking surfaces where work has stopped for the winter season shall be protected with a minimum of 3 inches of crushed gravel per NHDOT Item 304.3.



PLAN VIEW SECTION

NOTES:
1. SILTSOXX MAY BY USED IN PLACE OF SILT FENCE OR OTHER SEDIMENT BARRIERS.
2. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
3. SILTSOXX COMPOST/SOIL/ROCK/SEED FILL MATERIAL SHALL BE ADJUSTED AS NECESSARY TO MEET THE REQUIREMENTS OF THE SPECIFIC APPLICATION.
4. ALL SEDIMENT TRAPPED BY SILTSOXX SHALL BE DISPOSED OF PROPERLY.

TUBULAR SEDIMENT BARRIER — NOT TO SCALE



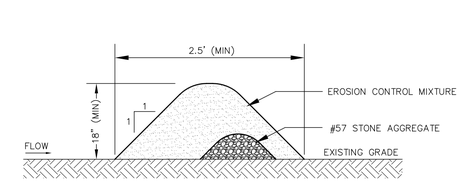
STONE GRADATION TABLE

SIEVE SIZE	% PASSING BY WEIGHT
3"	100
1-1/2"	90-100
1"	20-55
3/4"	0-15
3/8"	0-5

CONSTRUCTION SPECIFICATIONS

1. STONE SIZE – NHDOT STANDARD STONE SIZE #4 – SECTION 703 OF NHDOT STANDARD.
2. LENGTH – DETAILED ON PLANS (50 FOOT MINIMUM).
3. THICKNESS – SIX (6) INCHES (MINIMUM).
4. WIDTH – FULL DRIVE WIDTH UNLESS OTHERWISE SPECIFIED.
5. FILTER FABRIC – MIRAFI 600X OR EQUAL APPROVED BY ENGINEER.
6. SURFACE WATER CONTROL – ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS WILL REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEELS SHALL BE CLEANED TO REMOVE MUD PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. STABILIZED CONSTRUCTION EXITS SHALL BE INSTALLED AT ALL ENTRANCES TO PUBLIC RIGHTS-OF-WAY, AT LOCATIONS SHOWN ON THE PLANS, AND/OR WHERE AS DIRECTED BY THE ENGINEER.

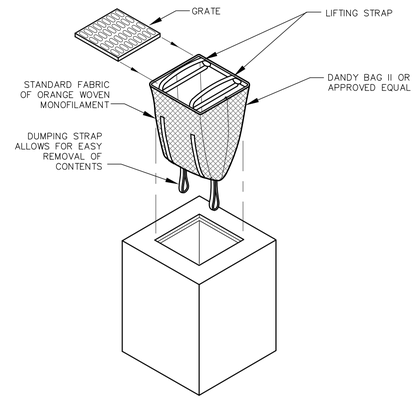
STABILIZED CONSTRUCTION EXIT — NOT TO SCALE



NOTES

1. ORGANIC FILTER BERMS MAY BE UTILIZED IN LIEU OF SILT FENCE OR OTHER SEDIMENT BARRIERS.
2. THE EROSION CONTROL MIXTURE USED IN FILTER BERMS SHALL BE A WELL-GRADED MIX OF PARTICLE SIZES THAT MAY CONTAIN ROCKS LESS THAN 4" IN DIAMETER, STUMP GRINDINGS, SHREDDED OR COMPOSTED BARK, AND/OR ACCEPTABLE MANUFACTURED PRODUCTS AND SHALL BE FREE OF REFUSE, PHYSICAL CONTAMINANTS AND MATERIAL TOXIC TO PLANT GROWTH. EROSION CONTROL MIXTURE SHALL MEET THE FOLLOWING STANDARDS:
   a) THE ORGANIC CONTENT SHALL BE 80-100% OF DRY WEIGHT.
   b) PARTICLE SIZE BY WEIGHT SHALL BE 100% PASSING A 6" SCREEN, AND 70-85% PASSING A 0.75" SCREEN.
   c) THE ORGANIC PORTION SHALL BE FIBROUS AND ELONGATED.
   d) LARGE PORTIONS OF SILTS, CLAYS, OR FINE SANDS SHALL NOT BE INCLUDED IN THE MIXTURE.
   e) SOLUBLE SALTS CONTENT SHALL BE >4.0mmhos/cm.
   f) THE pH SHALL BE BETWEEN 5.0 AND 8.0.
3. ORGANIC FILTER BERMS SHALL BE INSTALLED ALONG A RELATIVELY LEVEL CONTOUR. IT MAY BE NECESSARY TO CUT TALL GRASSES OR WOODY VEGETATION TO AVOID CREATING VOIDS AND BRIDGES THAT WOULD ENABLE FINES TO WASH UNDER THE BERM.
4. ON SLOPES LESS THAN 5%, OR AT THE BOTTOM OF SLOPES NO STEEPER THAN 3:1 AND UP TO 20' LONG, THE BERM SHALL BE A MINIMUM OF 12" HIGH (AS MEASURED ON THE UPHILL SIDE) AND A MINIMUM OF 36" WIDE. ON LONGER AND/OR STEEPER SLOPES, THE BERM SHALL BE TALLER AND WIDER TO ACCOMMODATE THE POTENTIAL FOR ADDITIONAL RUNOFF (MAXIMUM HEIGHT SHALL NOT EXCEED 2').
5. FROZEN GROUND, OUTCROPS OF BEDROCK, AND VERY ROOTED FORESTED AREAS PRESENT THE MOST PRACTICAL AND EFFECTIVE LOCATIONS FOR ORGANIC FILTER BERMS. OTHER BMP'S SHOULD BE USED AT LOW POINTS OF CONCENTRATED RUNOFF, BELOW CULVERT OUTLET APRONS, AROUND CATCH BASINS, AND AT THE BOTTOM OF STEEP PERIMETER SLOPES THAT HAVE A LARGE CONTRIBUTING AREA.
6. SEDIMENT SHALL BE REMOVED FROM BEHIND THE FILTER BERMS WHEN IT HAS ACCUMULATED TO ONE HALF THE ORIGINAL HEIGHT OF THE BERM.
7. ORGANIC FILTER BERMS MAY BE LEFT IN PLACE ONCE THE SITE IS STABILIZED PROVIDED ANY SEDIMENT DEPOSITS TRAPPED BY THEM ARE REMOVED AND DISPOSED OF PROPERLY.
8. FILTER BERMS ARE PROHIBITED AT THE BASE OF SLOPES STEEPER THAN 8% OR WHERE THERE IS FLOWING WATER WITHOUT THE SUPPORT OF ADDITIONAL MEASURES SUCH AS SILTFENCE.

ORGANIC FILTER BERM — NOT TO SCALE



INSTALLATION AND MAINTENANCE:

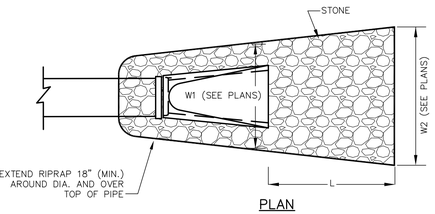
INSTALLATION: REMOVE THE GRATE FROM CATCH BASIN. IF USING OPTIONAL OIL ABSORBENTS; PLACE ABSORBENT PILLOW IN UNIT. STAND GRATE ON END. MOVE THE TOP LIFTING STRAPS OUT OF THE WAY AND PLACE THE GRATE INTO CATCH BASIN INSERT SO THE GRATE IS BELOW THE TOP STRAPS AND ABOVE THE LOWER STRAPS. HOLDING THE LIFTING DEVICES, INSERT THE GRATE INTO THE INLET.

MAINTENANCE: REMOVE ALL ACCUMULATED SEDIMENT AND DEBRIS FROM VICINITY OF THE UNIT AFTER EACH STORM EVENT. AFTER EACH STORM EVENT AND AT REGULAR INTERVALS, LOOK INTO THE CATCH BASIN INSERT. IF THE CONTAINMENT AREA IS MORE THAN 1/3 FULL OF SEDIMENT, THE UNIT MUST BE EMPTIED. TO EMPTY THE UNIT, LIFT THE UNIT OUT OF THE INLET USING THE LIFTING STRAPS AND REMOVE THE GRATE. IF USING OPTIONAL ABSORBENTS; REPLACE ABSORBENT WHEN NEAR SATURATION.

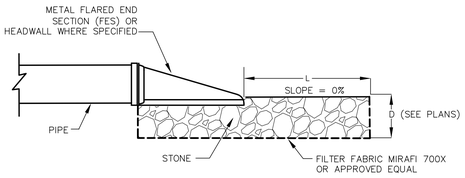
UNACCEPTABLE INLET PROTECTION METHOD:

A SIMPLE SHEET OF GEOTEXTILE UNDER THE GRATE IS NOT ACCEPTABLE.

STORM DRAIN INLET PROTECTION — NOT TO SCALE



PLAN



SECTION

MAINTENANCE

THE OUTLET PROTECTION SHOULD BE CHECKED AT LEAST ANNUALLY AND AFTER EVERY MAJOR STORM. IF THE RIPRAP HAS BEEN DISPLACED, UNDERMINED OR DAMAGED, IT SHOULD BE REPAIRED IMMEDIATELY. THE CHANNEL IMMEDIATELY BELOW THE OUTLET SHOULD BE CHECKED TO SEE THAT EROSION IS NOT OCCURRING. THE DOWNSTREAM CHANNEL SHOULD BE KEPT CLEAR OF OBSTRUCTIONS SUCH AS FALLEN TREES, DEBRIS, AND SEDIMENT THAT COULD CHANGE FLOW PATTERNS AND/OR TAILWATER DEPTHS ON THE PIPES. REPAIRS MUST BE CARRIED OUT IMMEDIATELY TO AVOID ADDITIONAL DAMAGE TO THE OUTLET PROTECTION APRON.

CONSTRUCTION SPECIFICATIONS

1. THE SUBGRADE FOR THE FILTER MATERIAL, GEOTEXTILE FABRIC, AND RIPRAP SHALL BE PREPARED TO THE LINES AND GRADES SHOWN ON THE PLANS.
2. THE ROCK OR GRAVEL USED FOR FILTER OR RIPRAP SHALL CONFORM TO THE SPECIFIED GRADATION.
3. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE ROCK RIPRAP. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 12 INCHES.
4. STONE FOR THE RIP RAP MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.

RIPRAP OUTLET PROTECTION — NOT TO SCALE

P5161

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
10/18/21

NOT FOR CONSTRUCTION

ISSUED FOR: REVIEW

ISSUE DATE: DECEMBER 28, 2021

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC	EBS	08/23/21
1	TAC	EBS	10/18/21
2	REV. PER TAC COA	EBS	12/28/21

DRAWN BY: EBS
APPROVED BY: EDW
DRAWING FILE: 5161-DS.dwg

SCALE: NOT TO SCALE

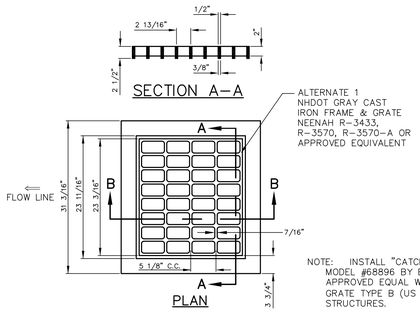
OWNER:
NAVEESHA HOSPITALITY, LLC
440 BEDFORD ST.
LEXINGTON, MA 02420

APPLICANT:
MONARCH VILLAGE, LLC
P.O. BOX 365
EAST HAMPSTEAD, NH 03826

PROJECT:
MONARCH VILLAGE
TAX MAP 297, LOT 6
3548 LAFAYETTE ROAD
PORTSMOUTH, NH 03801

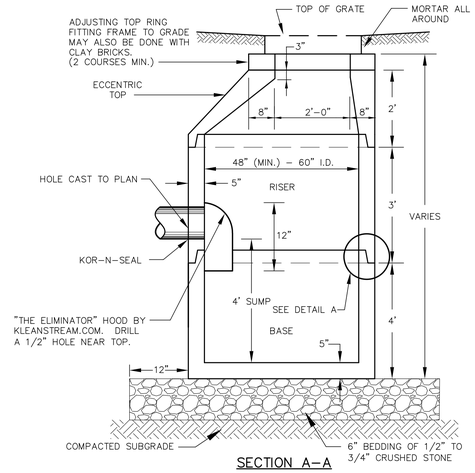
TITLE:
DETAIL SHEET

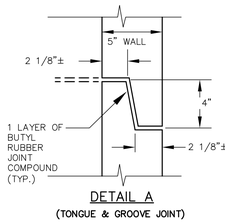
SHEET NUMBER:
D - 1

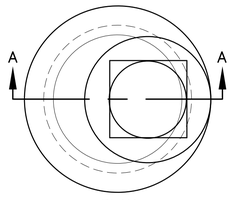


NOTES

1. ALL SECTIONS SHALL BE CONCRETE CLASS AA (4000 PSI).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FT. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE OR GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.
4. RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
5. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
6. USE H20 LOADING SLAB TOP SECTION IN LIEU OF ECCENTRIC TOP WHERE PIPE INVERT IS WITHIN 4' OF FINISH GRADE.
7. FRAME AND GRATE DIMENSIONS ARE TYPICAL BUT MAY VARY BASED ON PRODUCT SELECTED OR EQUIVALENT APPROVED BY THE ENGINEER.

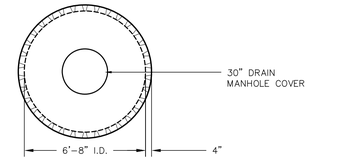


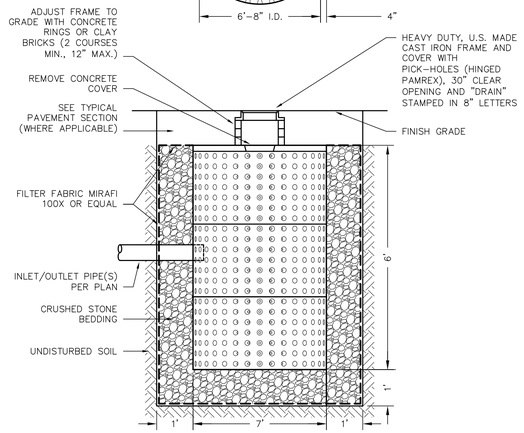




DEEP SUMP CATCH BASIN

NOT TO SCALE





NOTES:

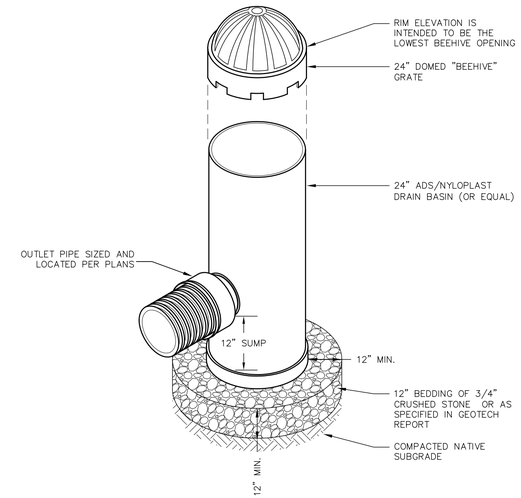
1. ALL MATERIALS TO BE DESIGNED FOR H–20 LOADING.
2. COVER TO BE SET FLUSH WITH FINISH GRADE.

CRUSHED STONE BEDDING

SIEVE SIZE	% FINER BY WEIGHT
1"	100
3/4"	90 – 100
3/8"	20 – 55
# 4	0 – 10
# 8	0 – 5

LEACHING DRAIN MANHOLE (LDMH)

NOT TO SCALE

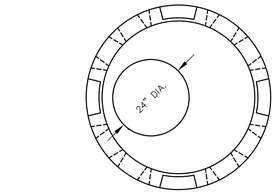


NOTES:

1. FRAMES AND GRATES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70–50–05.
2. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN AND DETAILS.
3. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE, N–12HP AND PVC SEWER.
4. INLINE DRAIN TO BE PVC DIAMETER AS SPECIFIED AND AS MANUFACTURED BY ADS OR APPROVED EQUAL.
5. THE CONTRACTOR SHALL INSTALL THE DRAIN BASIN PER THE MANUFACTURER'S RECOMMENDATIONS AND AS SHOWN ON THE DRAWINGS.

OUTLET STRUCTURE #1

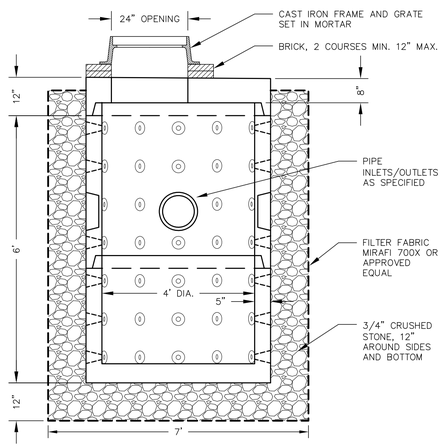
NOT TO SCALE



NOTES

1. TO ACCOMMODATE A 24" CAST IRON FRAME AND GRATE.
2. GRATE OPENING MAY BE OFFSET OR CENTERED IN STRUCTURE TOP.
3. CONCRETE: 4,000 PSI AFTER 28 DAYS.
4. MATERIALS SHALL WITHSTAND H–20 LOADING AT TRAFFIC AREAS
5. RIMS TO BE ELEVATED 6" ABOVE FINISH GRADE WHERE SPECIFIED, SEE DRAINAGE RIM AND INVERT SCHEDULE.

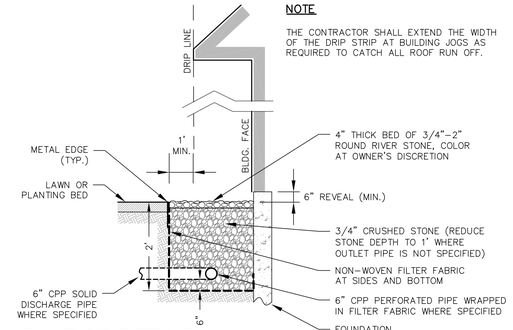
PLAN VIEW



SECTION VIEW

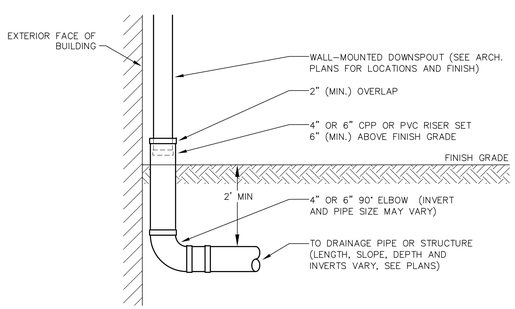
LEACHING CATCH BASIN (LCB)

NOT TO SCALE



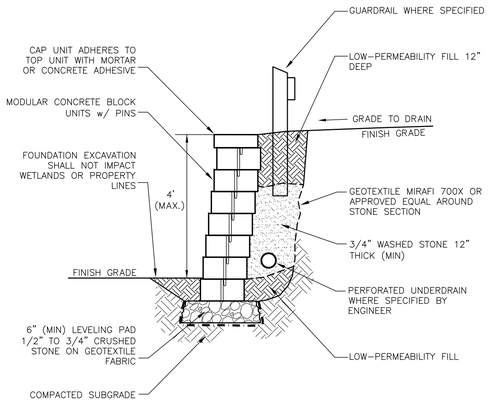
STONE DRIP EDGE

NOT TO SCALE



EXTERIOR ROOF DRAIN CONNECTION

NOT TO SCALE

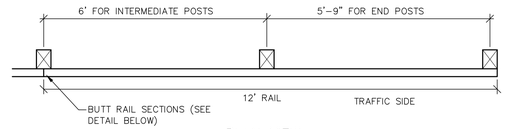


NOTES:

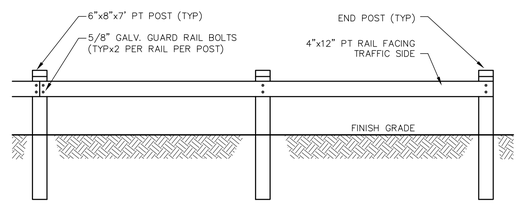
1. TYPICAL MODULAR BLOCK SHALL BE PRECAST CONCRETE MEASURING APPROXIMATELY 16"x12"x6". OTHER BLOCK SIZES MAY BE APPROVED BY THE ENGINEER UPON REQUEST. CAP UNITS SHALL BE PER THE STANDARDS OF THE SELECTED MANUFACTURER.
2. BLOCK MANUFACTURER SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
3. WALL SHALL BE INSTALLED PER THE REQUIREMENTS OF THE MANUFACTURER.
4. LOCKING PINS MAY OR MAY NOT BE REQUIRED BASED ON THE WALL MANUFACTURER APPROVED BY THE ENGINEER.
5. WALL SHALL BE EMBEDDED BELOW EXISTING GRADE THE DEPTH OF AT LEAST ONE BLOCK UNLESS OTHERWISE SPECIFIED BY THE WALL MANUFACTURER.
6. WALL BATTER SHALL BE PER THE MANUFACTURER'S SPECIFICATIONS.
7. BLOCK FINISH SHALL BE AT THE DISCRETION OF THE OWNER.
8. MODULAR BLOCK RETAINING WALL SHALL BE VERSA–LOK RETAINING WALL SYSTEMS (OR APPROVED EQUAL).
9. ANY WALL OVER 4' IN HEIGHT SHALL BE DESIGNED BY A NH REGISTERED PROFESSIONAL ENGINEER WHO SHALL PROVIDE STAMPED DRAWINGS TO THE CONTRACTOR PRIOR TO CONSTRUCTION.

MODULAR BLOCK RETAINING WALL

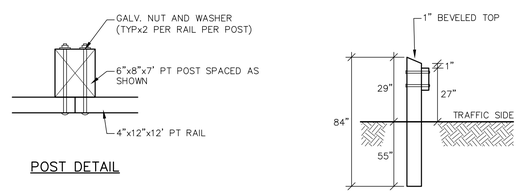
NOT TO SCALE



PLAN VIEW



FRONT VIEW



POST DETAIL

SIDE VIEW

NOTES

1. ALL POST AND RAIL MATERIAL SHALL BE PRESSURE TREATED (PT). PT POSTS SHALL BE RATED FOR GROUND CONTACT.
2. BOLT LENGTH IS DETERMINED BY 8" POST AND RAIL THICKNESS PLUS 1 INCH FOR NUT AND WASHER.
3. ALL MATERIAL TO MEET OR EXCEED NHDOT SECTION 606 – GUARDRAIL.

WOOD BEAM GUARDRAIL

NOT TO SCALE

P5161

ALTUS ENGINEERING, INC.
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STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
10/18/21

NOT FOR CONSTRUCTION

ISSUED FOR: REVIEW

ISSUE DATE: DECEMBER 28, 2021

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC	EBS	08/23/21
1	REV. PER TAC COA	EBS	12/28/21

DRAWN BY: EBS
APPROVED BY: EDW
DRAWING FILE: 5161–DS.dwg

SCALE: NOT TO SCALE

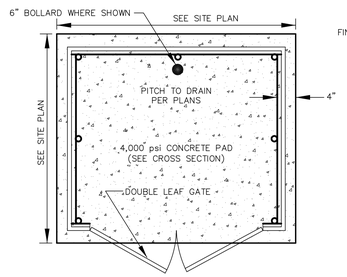
OWNER:
NAVEESHA HOSPITALITY, LLC
440 BEDFORD ST.
LEXINGTON, MA 02420

APPLICANT:
MONARCH VILLAGE, LLC
P.O. BOX 365
EAST HAMPSTEAD, NH 03826

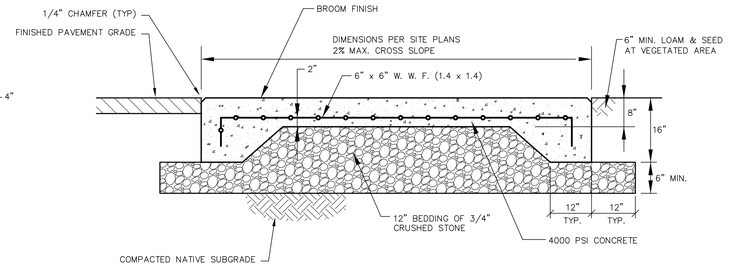
PROJECT:
MONARCH VILLAGE
TAX MAP 297, LOT 6
3548 LAFAYETTE ROAD
PORTSMOUTH, NH 03801

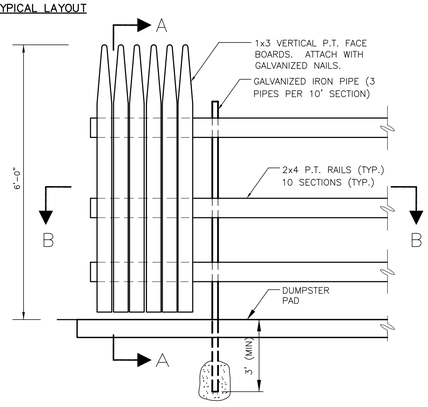
TITLE:
DETAIL SHEET

SHEET NUMBER:
D - 2

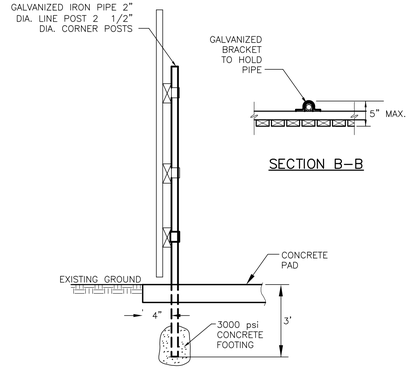


PLAN – TYPICAL LAYOUT





ELEVATION

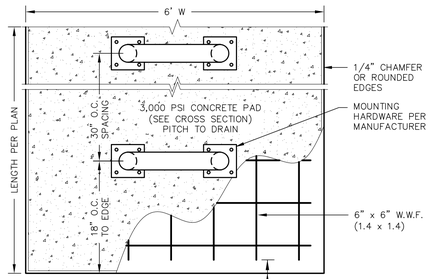


SECTION B–B

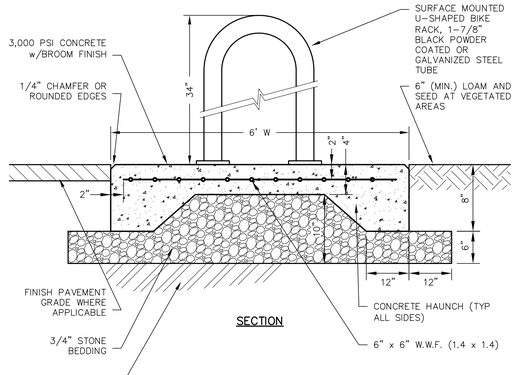
SECTION A–A

DUMPSTER ENCLOSURE AND PAD

NOT TO SCALE



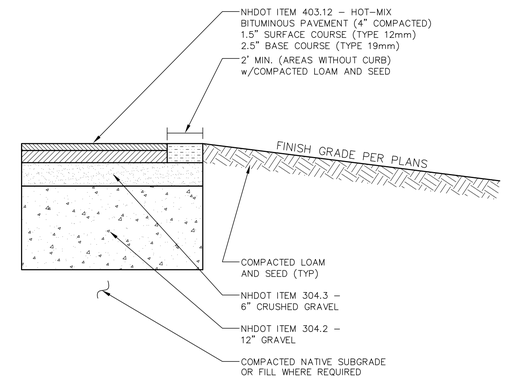
PLAN



SECTION

BICYCLE RACK PAD

NOT TO SCALE

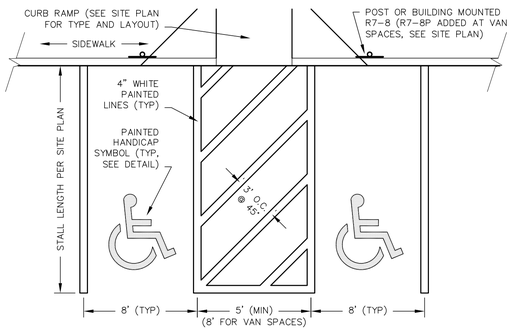


NOTES

1. PROJECT GEOTECHNICAL REPORT MAY REQUIRE A DIFFERENT PAVEMENT CROSS SECTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR READING AND FOLLOWING ALL RECOMMENDATIONS IN THE GEOTECHNICAL REPORT. IN THE EVENT THAT THE REPORT AND CIVIL PLANS DIFFER, THE MORE STRINGENT SPECIFICATION SHALL APPLY.
2. ALL EXISTING FILL, BURIED ORGANIC MATTER, CLAY, LOAM, MUCK, AND/OR OTHER QUESTIONABLE MATERIAL SHALL BE REMOVED FROM BELOW ALL PAVEMENT, SHOULDERS AND UNDERGROUND PIPING/UTILITIES TO DEPTHS RECOMMENDED IN GEOTECHNICAL REPORT.
3. SUBGRADE SHALL BE PROOFROLLED A MINIMUM OF 6 PASSES WITH A 10–TON VIBRATORY COMPACTOR OPERATING AT PEAK RATED FREQUENCY OR BY MEANS APPROVED BY THE ENGINEER.
4. FILL BELOW PAVEMENT GRADES SHALL BE GRANULAR BORROW COMPACTED PER MDOT REQUIREMENTS.
5. SITEWORK CONTRACTOR SHALL COORDINATE GEOTECHNICAL ENGINEERING INSPECTIONS WITH THE CONSTRUCTION MANAGER PRIOR TO PLACING GRAVELS.
6. TACK COAT SHALL BE APPLIED BETWEEN SUCCESSIVE LIFTS OF ASPHALT.
7. THE BITUMINOUS PAVEMENT SHALL BE COMPACTED TO 92 TO 97 PERCENT OF ITS THEORETICAL MAXIMUM DENSITY AS DETERMINED BY ASTM D–2041. THE BASE AND SUBBASE MATERIALS SHOULD BE COMPACTED TO AT LEAST 95 PERCENT OF THEIR MAXIMUM DRY DENSITIES AS DETERMINED BY ASTM D–1557.

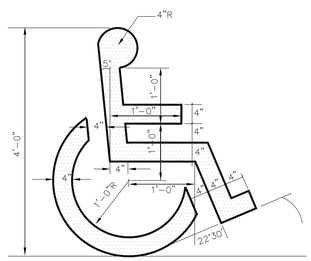
SITE PAVEMENT CROSS SECTION

NOT TO SCALE



HANDICAP PARKING STALL LAYOUT

NOT TO SCALE

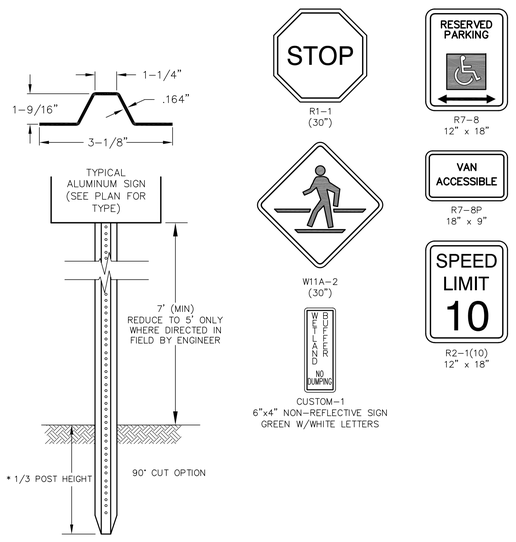


NOTES

1. SYMBOL TO BE PAINTED IN ALL HANDICAPPED ACCESSIBLE SPACES IN WHITE PAINT (BLUE–PAINTED SQUARE BACKGROUND OPTIONAL).

PAINTED HANDICAP SYMBOL

NOT TO SCALE



* IN LEDGE DRILL & GROUT TO A MIN OF 2'

CUSTOM–1
6"x4" NON–REFLECTIVE SIGN
GREEN W/WHITE LETTERS

LENGTH: AS REQUIRED

WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)

HOLES: 3/8" DIAMETER, 1" C–C FULL LENGTH

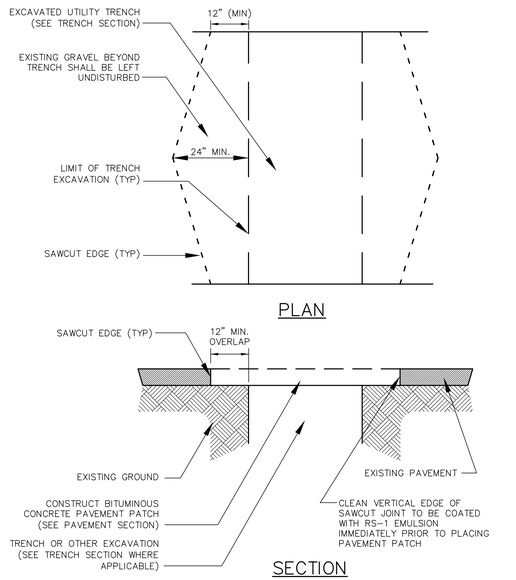
STEEL: SHALL CONFORM TO ASTM A–499 (GRADE 60) OR ASTM A–576 (GRADE 1070 – 1080)

NOTES

1. ALL SIGNS SHALL MEET THE REQUIREMENTS OF AND BE INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.

SIGN DETAILS

NOT TO SCALE



PLAN

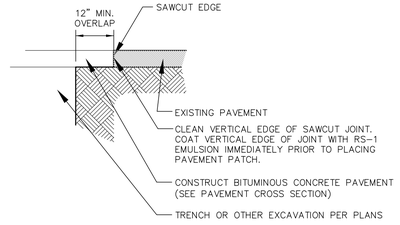
SECTION

NOTES

1. MACHINE CUT EXISTING PAVEMENT.
2. ALL TEMPORARY, DAMAGED OR DEFECTIVE PAVEMENT SHALL BE REMOVED PRIOR TO PLACEMENT OF PERMANENT TRENCH REPAIRS.
3. DIAMOND PATCHES, SHALL BE REQUIRED FOR ALL TRENCHES CROSSING ROADWAY. DIAMOND PATCHES SHALL MEET NHDOT REQUIREMENTS.

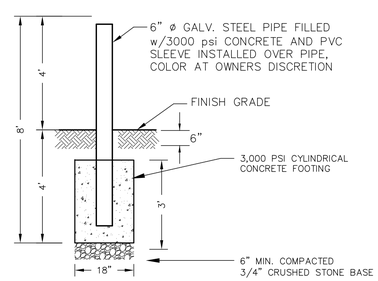
TYPICAL TRENCH PATCH

NOT TO SCALE



TYPICAL PAVEMENT SAWCUT

NOT TO SCALE



BOLLARD

NOT TO SCALE

P5161

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
8/23/21

NOT FOR CONSTRUCTION

ISSUED FOR: TAC

ISSUE DATE: AUGUST 23, 2021

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC	EBS	08/23/21

DRAWN BY: EBS
APPROVED BY: EDW
DRAWING FILE: 5161–DS.dwg

SCALE: NOT TO SCALE

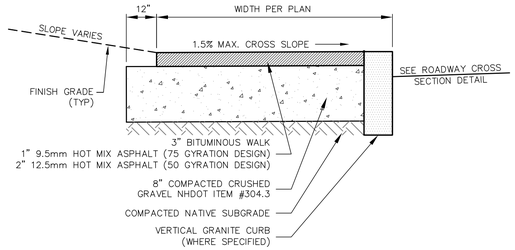
OWNER:
NAVEESHA HOSPITALITY, LLC
440 BEDFORD ST.
LEXINGTON, MA 02420

APPLICANT:
MONARCH VILLAGE, LLC
P.O. BOX 365
EAST HAMPSTEAD, NH 03826

PROJECT:
MONARCH VILLAGE
TAX MAP 297, LOT 6
3548 LAFAYETTE ROAD
PORTSMOUTH, NH 03801

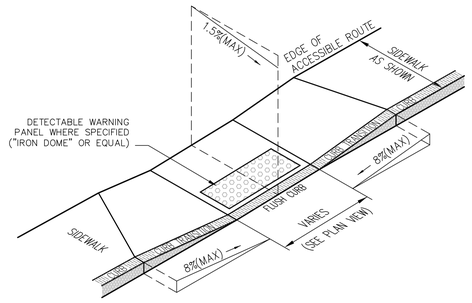
TITLE:
DETAIL SHEET

SHEET NUMBER:
D - 3



BITUMINOUS SIDEWALK

NOT TO SCALE



CURB RAMP (TYPE 'A')

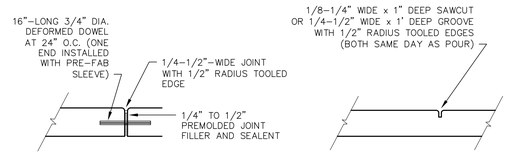
NOT TO SCALE

CURB RAMP (TYPE 'B')

NOT TO SCALE

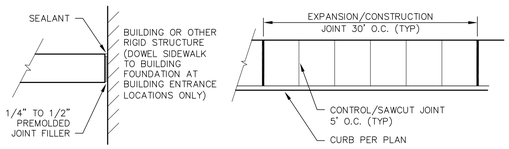
CURB RAMP (TYPE 'M')

NOT TO SCALE

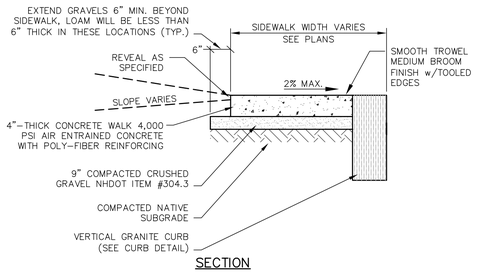


EXPANSION/CONSTRUCTION JOINT

CONTROL/SAWCUT JOINT



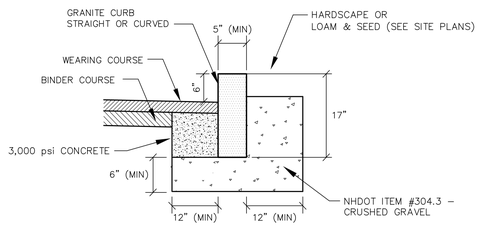
ISOLATION JOINT PLAN



SECTION

CONCRETE SIDEWALK DETAIL

NOT TO SCALE



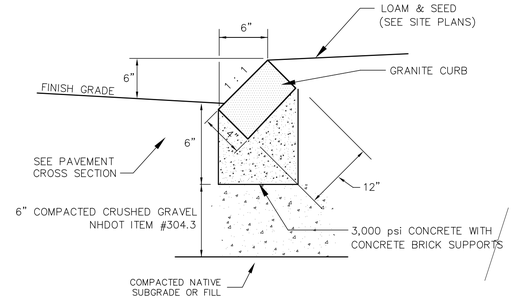
VERTICAL GRANITE CURB

NOT TO SCALE

NOTES:

1. SEE PLANS FOR CURB LOCATION.
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. MINIMUM LENGTH OF CURB STONES = 3'
4. MAXIMUM LENGTH OF CURB STONES = 10'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES - SEE CHART.
6. CURB ENDS TO ROUNDED AND BATTERED FACES TO BE CUT WHEN CALLED FOR ON THE PLANS.

RADIUS	MAX. LENGTH
21'	3'
22'-28'	4'
29'-35'	5'
36'-42'	6'
43'-49'	7'
50'-56'	8'
57'-60'	9'
OVER 60'	10'



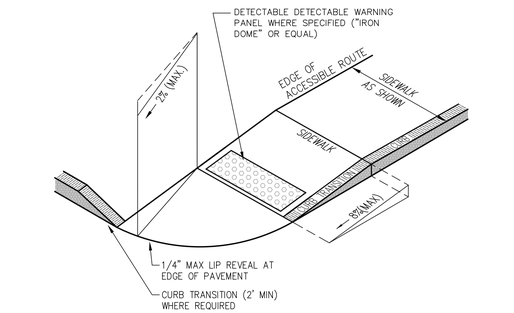
NOTES

1. SEE SITE PLAN FOR LIMITS OF CURBING
2. ADJOINING STONES OF STRAIGHT CURB LAID ON CURVES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH
3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 18"
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 8'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES - SEE CHART

RADIUS FOR STONES WITH SQUARE JOINTS	MAXIMUM LENGTH
16'-28'	1'-6"
29'-41'	2'
42'-55'	3'
56'-68'	4'
69'-82'	5'
83'-96'	6'
97'-110'	7'
OVER 110'	8'

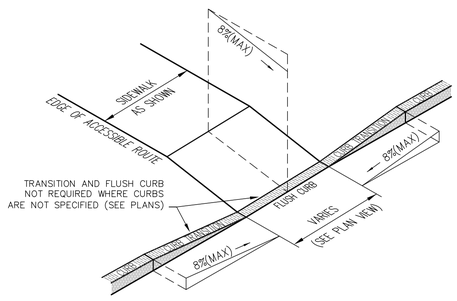
SLOPED GRANITE CURB

NOT TO SCALE



CURB RAMP (TYPE 'B')

NOT TO SCALE



CURB RAMP (TYPE 'F')

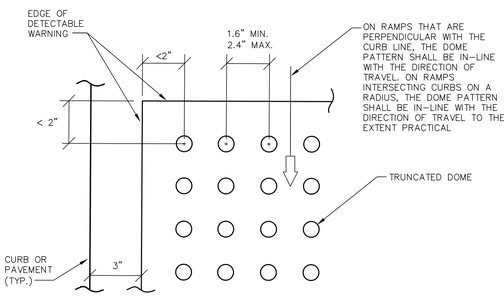
NOT TO SCALE

NOTES APPLICABLE TO ALL CURB RAMPS:

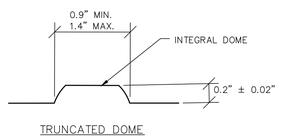
1. THE MAXIMUM ALLOWABLE CROSS SLOPE OF AN ACCESSIBLE ROUTE (SIDEWALK) AND CURB SHALL BE 1.5%
2. THE MAXIMUM ALLOWABLE RUNNING SLOPE OF AN ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE 5%
3. THE MAXIMUM ALLOWABLE RUNNING SLOPE OF AN ACCESSIBLE ROUTE (SIDEWALK) CURB RAMP SHALL BE 8.3% FOR A MAXIMUM ELEVATION CHANGE OF 6".
4. CURB TREATMENT VARIES, SEE PLANS FOR CURB TYPE.
5. BASE OF RAMP SHALL BE GRADED TO PREVENT THE PONDING OF WATER.
6. SEE CONCRETE SIDEWALK SECTION FOR RAMP CONSTRUCTION.
7. ALL CURB RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH AMERICANS WITH DISABILITIES ACT (ADA) AND ALL APPLICABLE CODES.
8. FLUSH CURB SECTIONS SHALL HAVE A MAXIMUM LIP REVEAL OF 1/4" WITH A BEVEL AT THE EDGE OF PAVEMENT.
9. EDGES OF SIDEWALK FOOTINGS ALONG FLUSH CURBS SHALL BE HAUNCHED SO AS TO EXTEND TO A MINIMUM DEPTH OF 1' BELOW FINISH GRADE.
10. NO RAMP SHALL BE LESS THAN 4' IN WIDTH.
11. CURB RAMPS SHALL HAVE A FLAT 2% MAX LANDING AT THE TOP AND BOTTOM OF THE RAMPS WHEN THERE IS A CHANGE IN DIRECTION.

CURB RAMP NOTES

NOT TO SCALE



PLAN VIEW



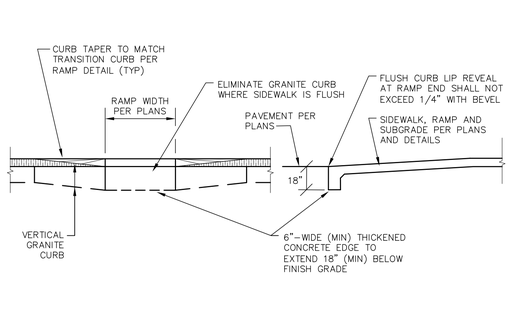
TRUNCATED DOME

NOTES:

1. BASE-TO-BASE SPACING SHALL BE 0.65" MINIMUM BETWEEN DOMES.
2. ALL SIDEWALK CURB RAMPS SHALL HAVE DETECTABLE WARNING SURFACES THAT EXTEND THE FULL WIDTH OF THE RAMP AND 2' DEPTH IN THE DIRECTION OF TRAVEL.
3. THE TOP WIDTH OF THE DOME SHALL BE A MINIMUM OF 50% AND A MAXIMUM OF 65% OF THE BASE DIAMETER.
4. WARNING PANELS TO BE CAST IRON ("IRON DOME" OR EQUAL).
5. PANEL SHALL BE INSTALLED SO THAT THE EDGE 3" FROM THE CURB LINE OR GUTTER.

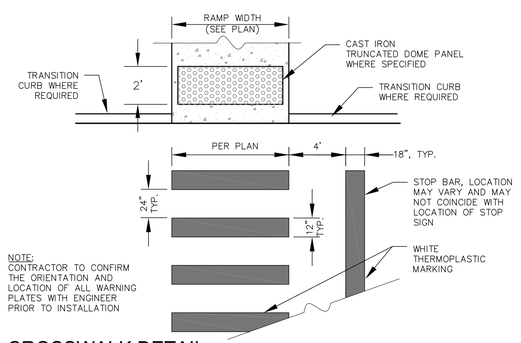
DETECTABLE WARNING PANEL

NOT TO SCALE



FLUSH CURB AT RAMP DETAIL

NOT TO SCALE



NOTE:
CONTRACTOR TO CONFIRM THE ORIENTATION AND LOCATION OF ALL WARNING PLATES WITH ENGINEER PRIOR TO INSTALLATION

CROSSWALK DETAIL

NOT TO SCALE

P5161

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE - ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
10/18/21

NOT FOR CONSTRUCTION

ISSUED FOR: REVIEW

ISSUE DATE: DECEMBER 28, 2021

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC	EBS	08/23/21
1	REV. PER TAC COA	EBS	12/28/21

DRAWN BY: EBS
APPROVED BY: EDW
DRAWING FILE: 5161-DS.dwg

SCALE: NOT TO SCALE

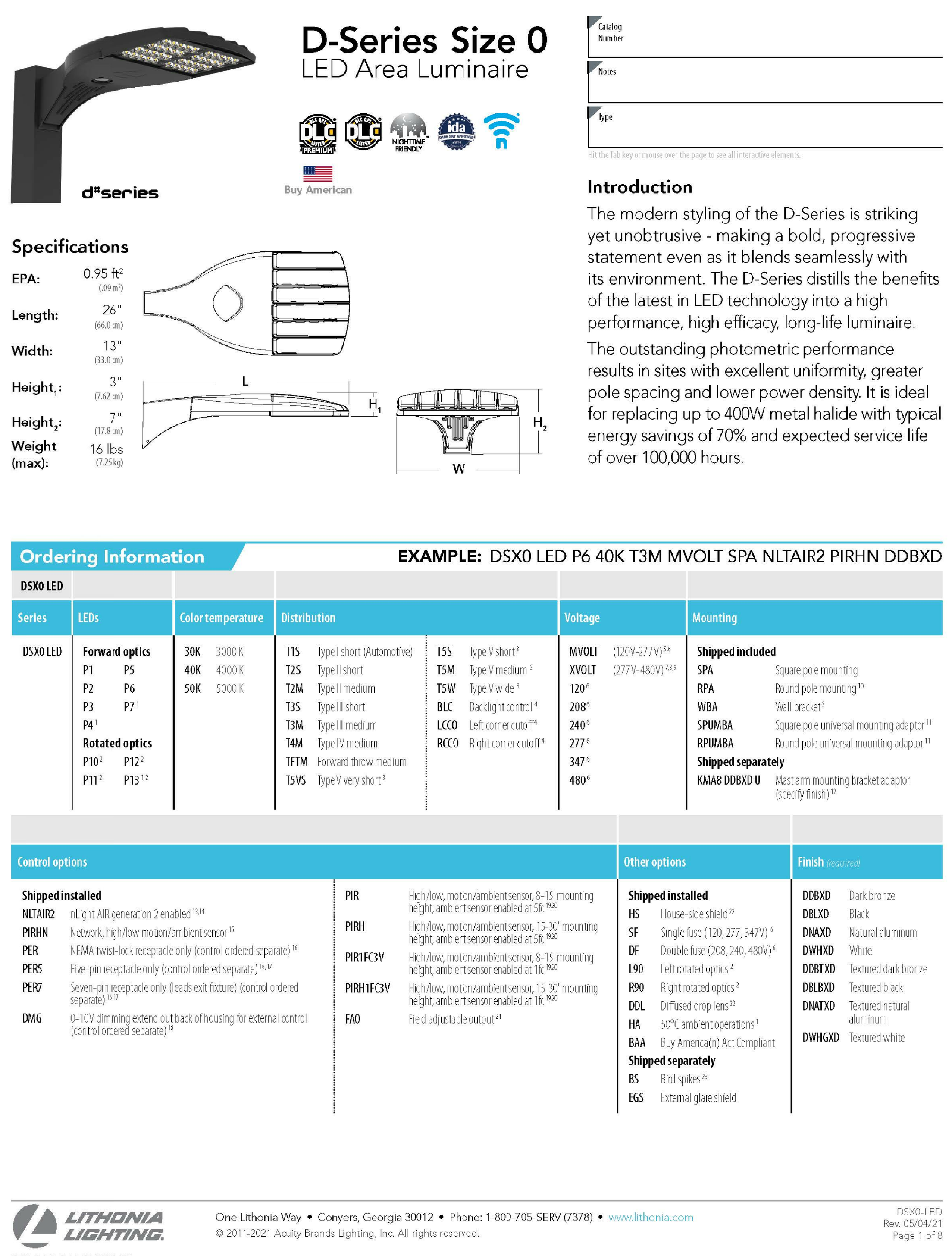
OWNER:
NAVEESHA HOSPITALITY, LLC
440 BEDFORD ST.
LEXINGTON, MA 02420

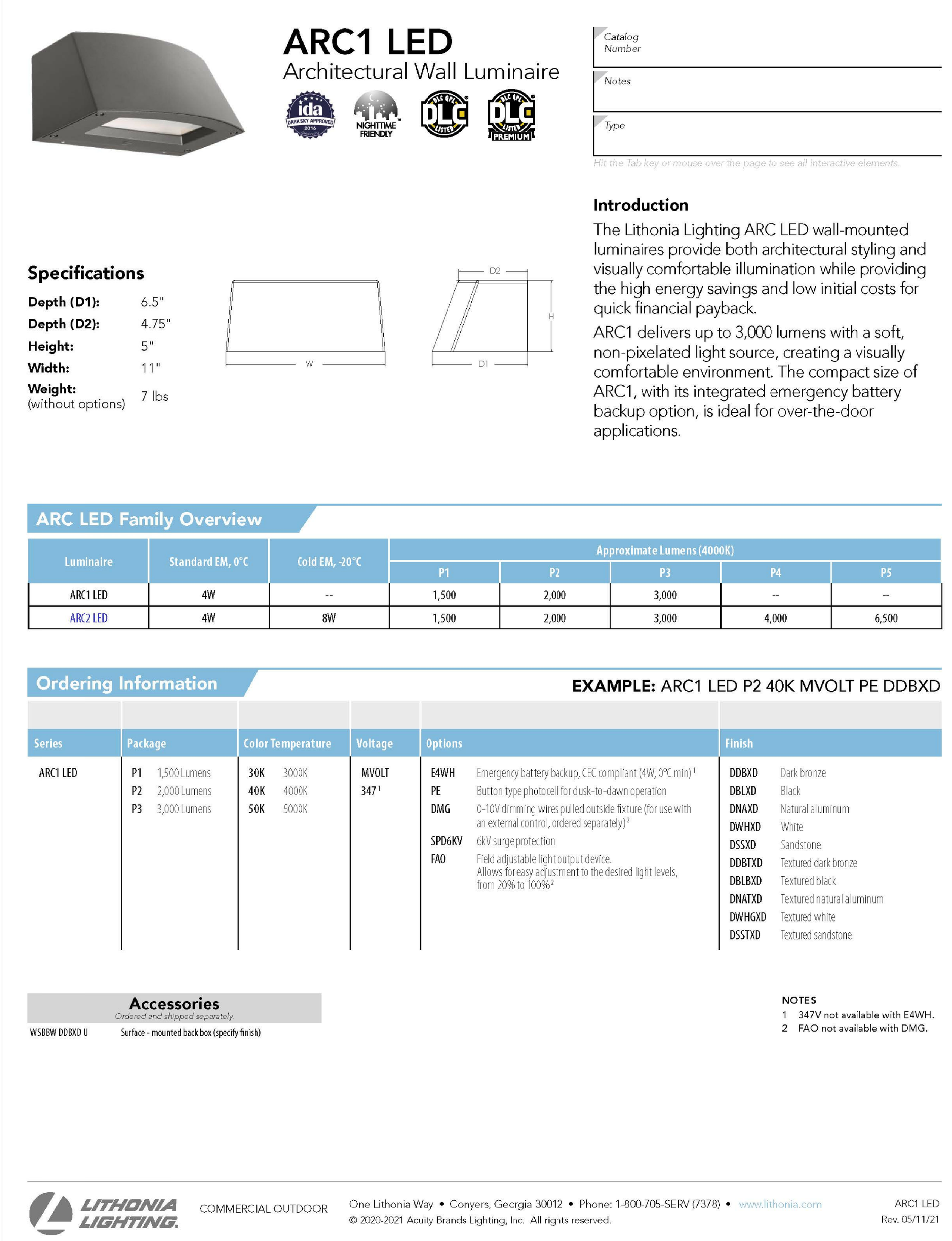
APPLICANT:
MONARCH VILLAGE, LLC
P.O. BOX 365
EAST HAMPSTEAD, NH 03826

PROJECT:
MONARCH VILLAGE
TAX MAP 297, LOT 6
3548 LAFAYETTE ROAD
PORTSMOUTH, NH 03801

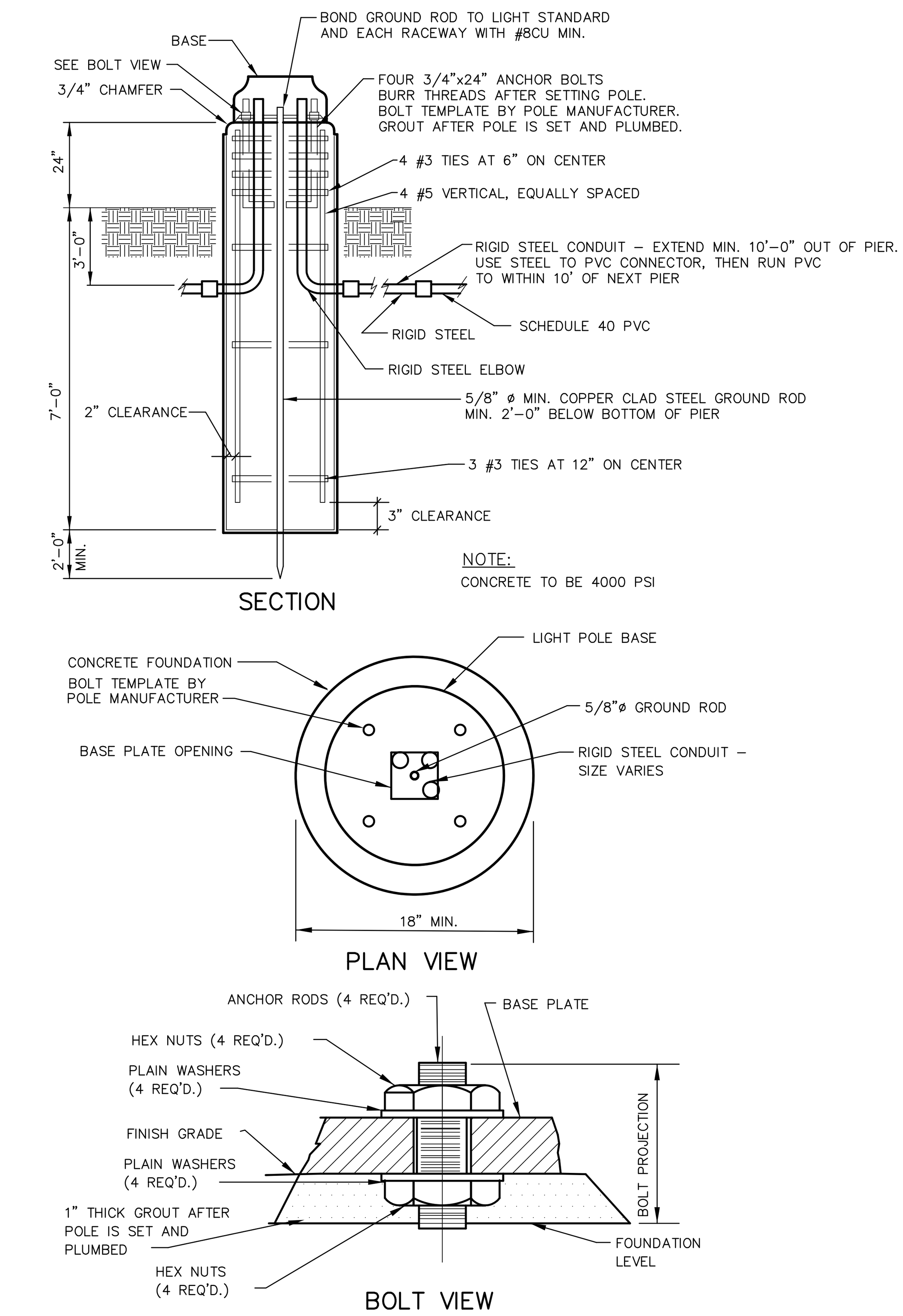
TITLE:
DETAIL SHEET

SHEET NUMBER:
D - 4

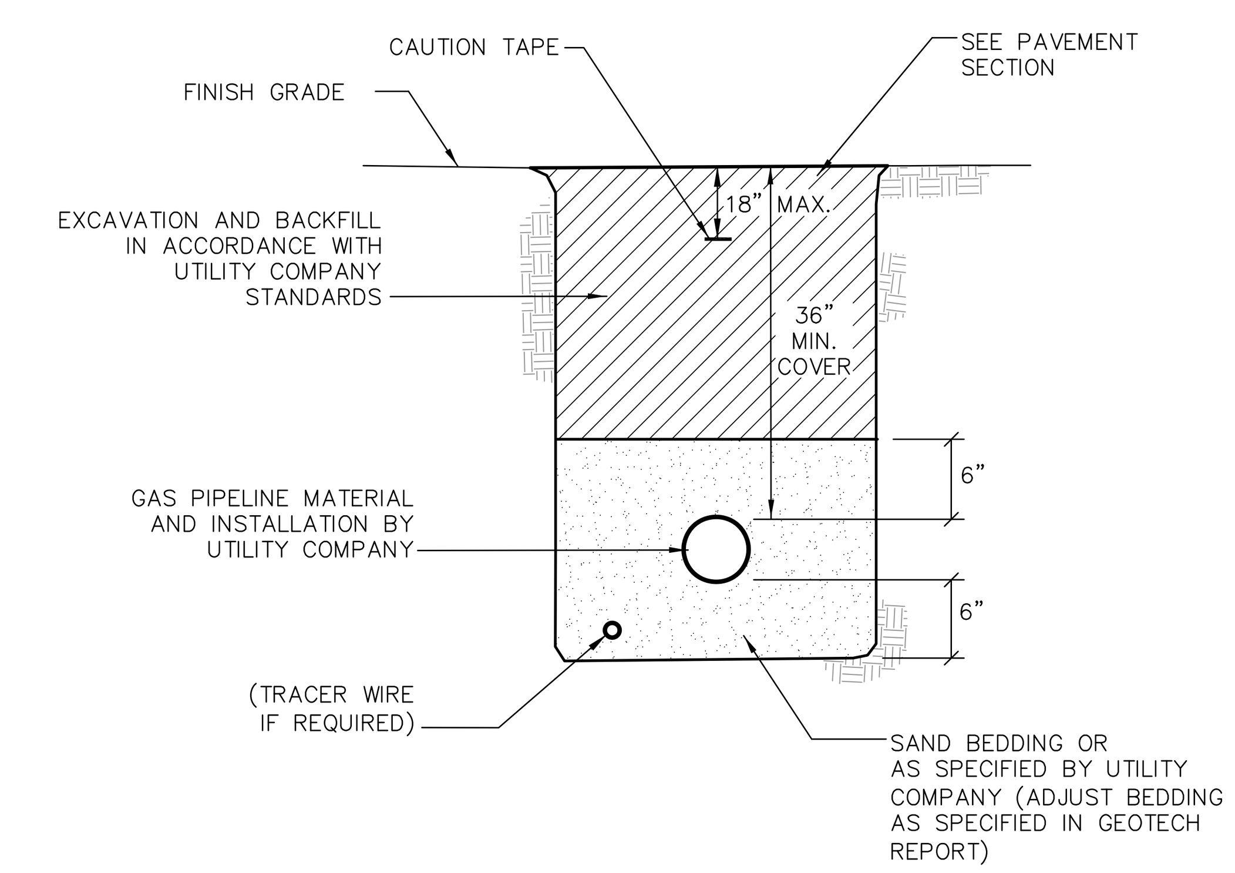




LIGHT FIXTURE CUT SHEETS NOT TO SCALE



LIGHT POLE BASE DETAIL NOT TO SCALE



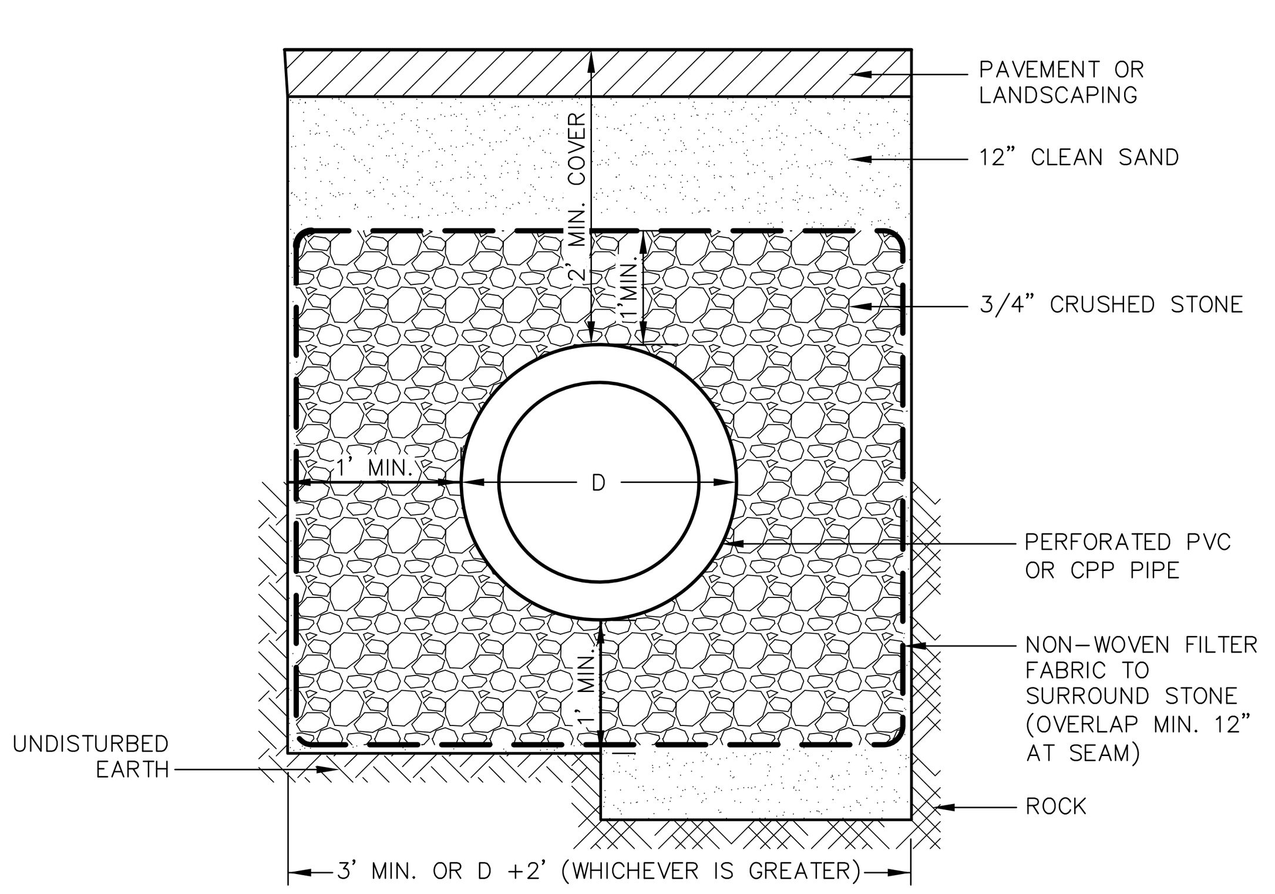
SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

NOTES

1. CONTRACTOR TO COORDINATE WITH UTILITY COMPANY AND PROVIDE ALL EXCAVATION, COMPACTION AND BACKFILL FOR PIPE INSTALLATION.
2. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.

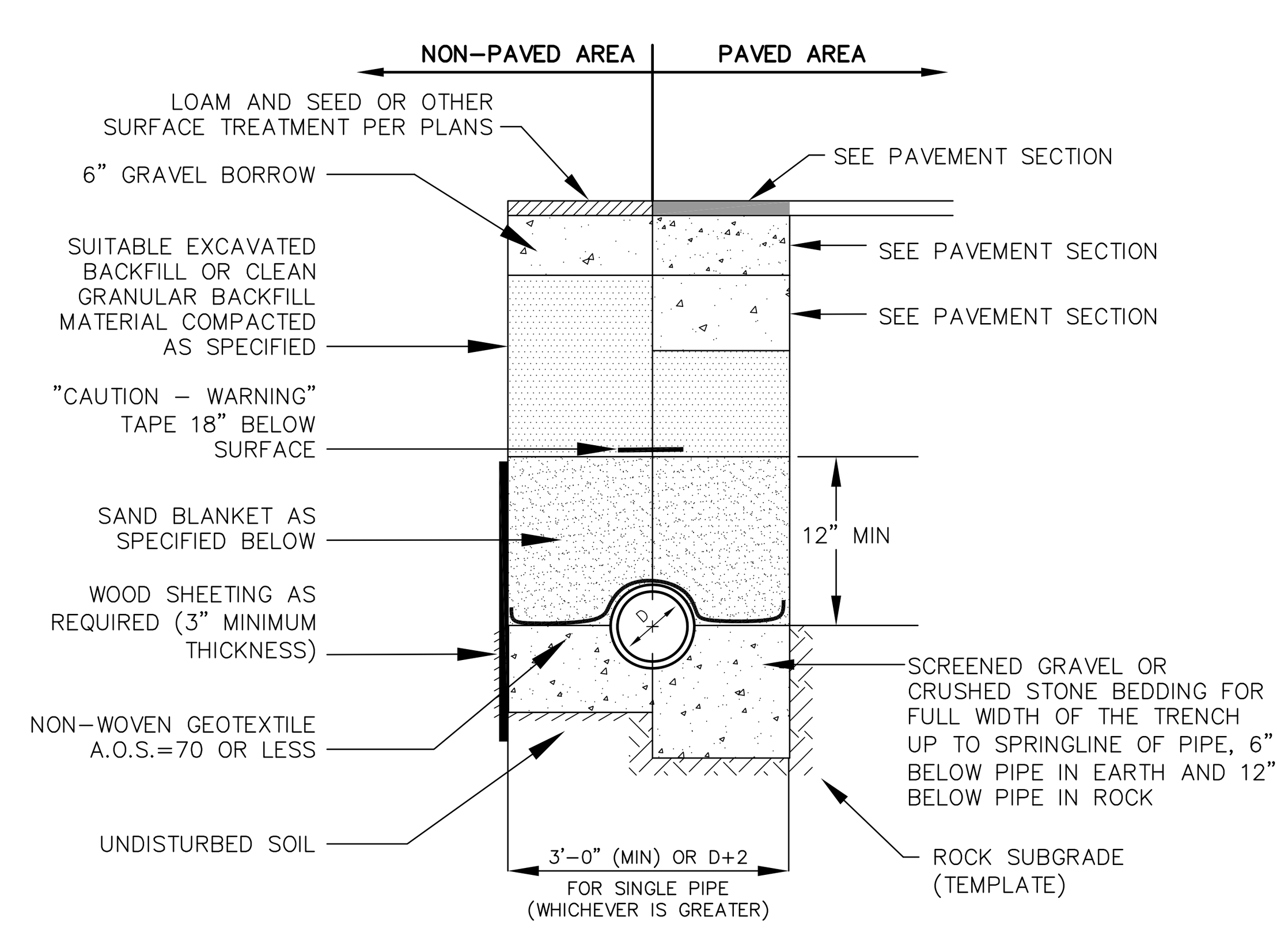
GAS TRENCH NOT TO SCALE



NOTES:

1. PAVEMENT REPAIR IN EXISTING ROADWAYS SHALL CONFORM TO STREET OPENING REGULATIONS.
2. NEW ROADWAY CONSTRUCTION SHALL CONFORM WITH PROJECT AND TOWN SPECIFICATIONS.
3. ALL MATERIALS ARE TO BE COMPACTED TO 95% OF ASTM D-1557.

PERFORATED PIPE DRAIN TRENCH NOT TO SCALE



NOTES

1. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.
2. INSULATE GRAVITY SEWER AND FORCEMAINS WHERE THERE IS LESS THAN 5'-0" OF COVER WITH 2" THICK CLOSED CELL RIGID BOARD INSULATION, 18" ON EACH SIDE OF PIPE.
3. MAINTAIN 12" MINIMUM HORIZONTAL SEPARATION AND WIDEN TRENCH ACCORDINGLY IF MULTIPLE PIPES ARE IN TRENCH.

SAND BLANKET/BARRIER

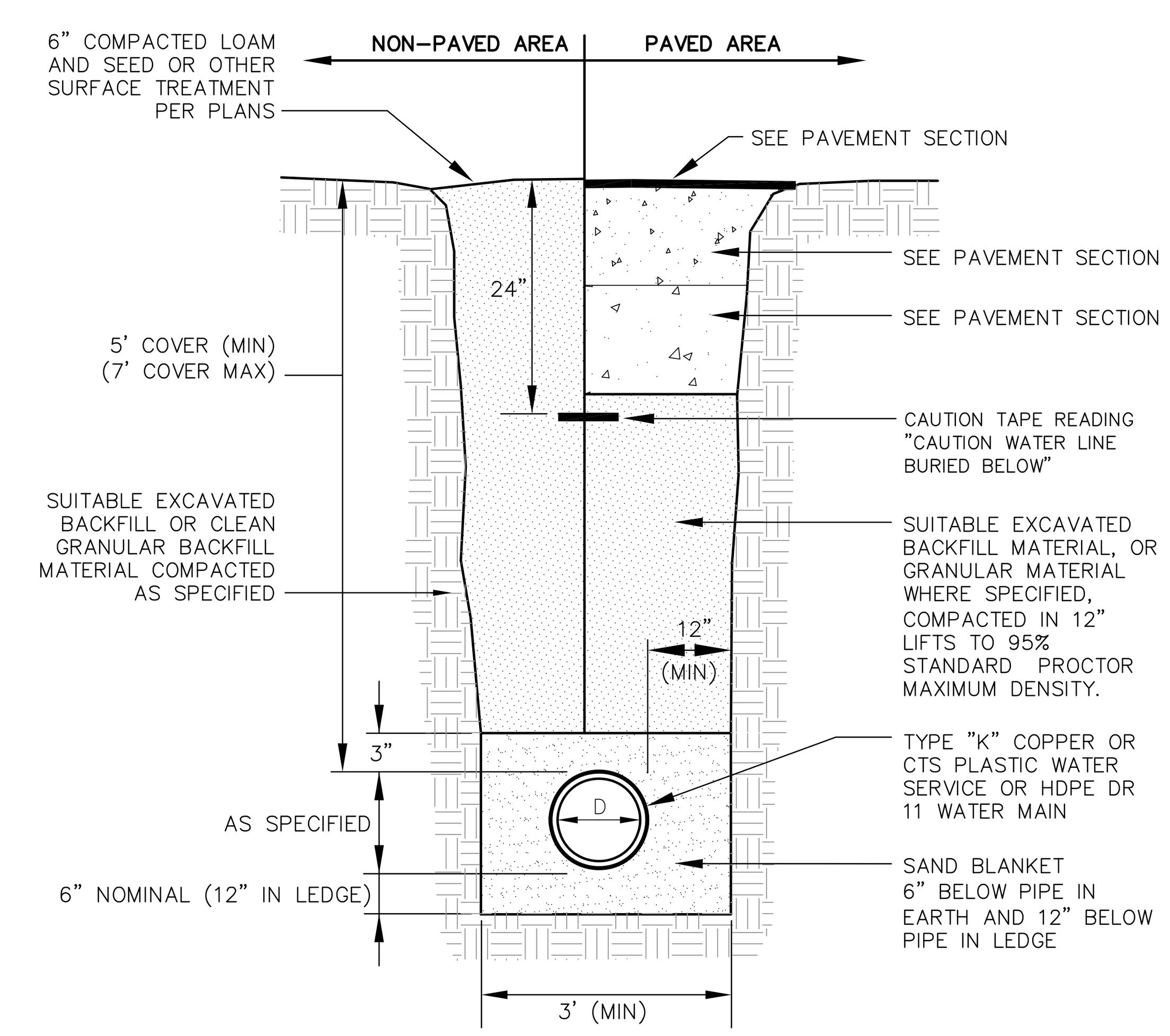
SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

SCREENED GRAVEL OR CRUSHED STONE BEDDING*

SIEVE SIZE	% PASSING BY WEIGHT
1"	100
3/4"	90 – 100
3/8"	20 – 55
# 4	0 – 10
# 8	0 – 5

* EQUIVALENT TO STANDARD STONE SIZE #67 – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS

DRAINAGE TRENCH NOT TO SCALE



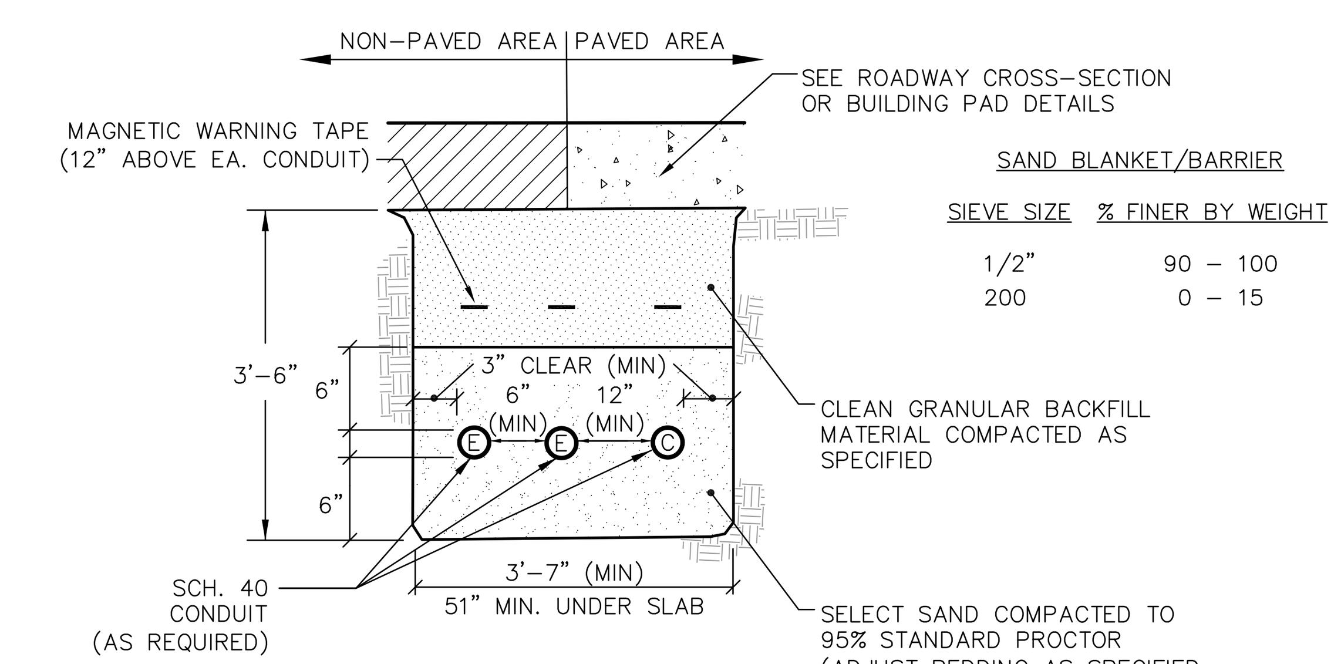
SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

NOTES

1. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.
2. ALL TRENCHING AND BACKFILL SHALL CONFORM WITH THE STANDARDS OF THE KITTERY WATER DISTRICT.

WATER MAIN TRENCH NOT TO SCALE



SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

NOTES

1. ALL CONDUIT IS TO BE SCHEDULE 40 PVC, ELECTRICAL GRADE, GRAY IN COLOR AND INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS. A 10-FOOT HORIZONTAL SECTION OF RIGID GALVANIZED STEEL CONDUIT WILL BE REQUIRED AT EACH SWEEP, UNLESS IN THE OPINION OF THE SERVICE PROVIDER DESIGNER, THE SWEEP-PVC JOINT IS NOT SUBJECT TO FAILURE DURING PULLING OF THE CABLE. ALL JOINTS ARE TO BE WATERTIGHT.
2. ALL 90 DEGREE SWEEPS WILL BE MADE WITH RIGID GALVANIZED STEEL WITH A MINIMUM RADIUS OF 36 INCHES FOR PRIMARY CABLES AND 24 INCHES FOR SECONDARY CABLES.
3. BACKFILL MAY BE MADE WITH EXCAVATED MATERIAL OR COMPARABLE, UNLESS MATERIAL IS DEEMED UNSUITABLE BY SERVICE PROVIDER. BACKFILL SHALL BE FREE OF FROZEN LUMPS, ROCKS, DEBRIS, AND RUBBISH. ORGANIC MATERIAL SHALL NOT BE USED AS BACKFILL. BACKFILL SHALL BE IN 6-INCH LAYERS AND THOROUGHLY COMPACTED.
4. A SUITABLE PULLING STRING, CAPABLE OF 300 POUNDS OF PULL, MUST BE INSTALLED IN THE CONDUIT BEFORE SERVICE PROVIDER IS NOTIFIED TO INSTALL CABLE. THE STRING SHOULD BE BLOWN INTO THE CONDUIT AFTER THE RUN IS ASSEMBLED TO AVOID BONDING THE STRING TO THE CONDUIT. A MINIMUM OF TWENTY-FOUR (24") INCHES OF ROPE SLACK SHALL REMAIN AT THE END OF EACH DUCT. PULL ROPE SHALL BE INSTALLED IN ALL CONDUIT FOR FUTURE PULLS. PULL ROPE SHALL BE NYLON ROPE HAVING A MINIMUM TENSILE STRENGTH OF THREE HUNDRED (300#) LBS.
5. SERVICE PROVIDER SHALL BE GIVEN THE OPPORTUNITY TO INSPECT ALL CONDUIT PRIOR TO BACKFILL. THE CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS SHOULD SERVICE PROVIDER BE UNABLE TO INSTALL ITS CABLE IN A SUITABLE MANNER.
6. TYPICAL CONDUIT SIZES ARE 3-INCH FOR SINGLE PHASE PRIMARY AND SECONDARY VOLTAGE CABLES, 4-INCH FOR THREE PHASE SECONDARY, AND 5-INCH FOR THREE PHASE PRIMARY. HOWEVER, SERVICE PROVIDERS MAY REQUIRE DIFFERENT NUMBERS, TYPES AND SIZES OF CONDUIT THAN THOSE SHOWN HERE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL CONDUIT SIZES, TYPES AND NUMBERS WITH EACH SERVICE PROVIDER PRIOR TO ORDERING THEM.
7. ROUTING OF CONDUIT, LOCATION OF MANHOLES, TRANSFORMERS, CABINETS, HANDHOLES, ETC., SHALL BE DETERMINED BY SERVICE PROVIDER DESIGN PERSONNEL. THE CONTRACTOR SHALL COORDINATE WITH ALL SERVICE PROVIDERS PRIOR TO THE INSTALLATION OF ANY CONDUIT.
8. ALL CONDUIT INSTALLATIONS MUST CONFORM TO THE CURRENT EDITION OF THE NATIONAL ELECTRIC SAFETY CODE, STATE AND LOCAL CODES AND ORDINANCES, AND WHERE APPLICABLE, THE NATIONAL ELECTRIC CODE. WHERE REQUIRED BY UTILITY PROVIDER, CONDUIT SHALL BE SUPPORTED IN PLACE USING PIPE STANCHIONS PLACED EVERY FIVE (5') FEET ALONG THE CONDUIT RUN.
9. UNDER A BUILDING SLAB THE CONDUIT SHALL BE ENCASED IN 8" OF CONCRETE ON ALL SIDES.
10. ALL CONDUIT TERMINATIONS SHALL BE CAPPED TO PREVENT DEBRIS FROM ENTERING CONDUIT.

ELECTRIC / COMMUNICATION TRENCH NOT TO SCALE

P5161

ALTUS ENGINEERING, INC.
133 Court Street
(603) 433-2335
Portsmouth, NH 03801
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STATE OF NEW HAMPSHIRE — ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER — 8/23/21

NOT FOR CONSTRUCTION

ISSUED FOR: TAC

ISSUE DATE: AUGUST 23, 2021

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC	EBS	08/23/21

DRAWN BY: EBS
APPROVED BY: EDW
DRAWING FILE: 5161-DS.dwg

SCALE: NOT TO SCALE

OWNER:
NAVEESHA HOSPITALITY, LLC
440 BEDFORD ST.
LEXINGTON, MA 02420

APPLICANT:
MONARCH VILLAGE, LLC
P.O. BOX 365
EAST HAMPSTEAD, NH 03826

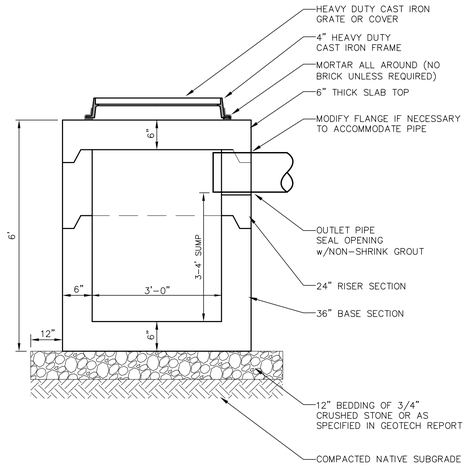
PROJECT:
MONARCH VILLAGE
TAX MAP 297, LOT 6
3548 LAFAYETTE ROAD
PORTSMOUTH, NH 03801

TITLE:
DETAIL SHEET

SHEET NUMBER:
D - 5

LEGEND

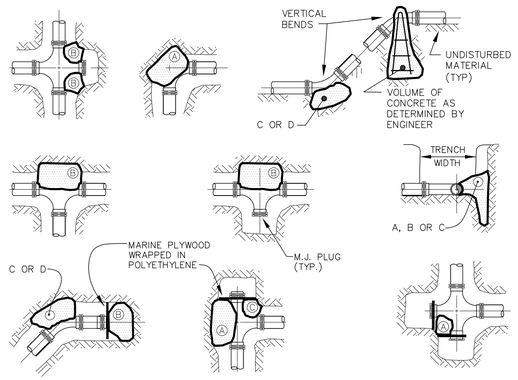
- PROPERTY LINE
- BUILDING SETBACK
- 100' WETLAND SETBACK
- STONEWALL
- WETLAND BOUNDARY
- TP #11 — TESTPIT OR BORING LOCATION
- EXISTING/PROPOSED GRAVEL
- VGC SGC — EXISTING PAVEMENT/CURB
- VGC SGC — PROPOSED PAVEMENT/VERTICAL OR SLOPED GRANITE CURB
- SWL SYL DYL — SINGLE WHITE LINE/SINGLE YELLOW LINE/DOUBLE YELLOW LINE
- EXISTING/PROPOSED GUARDRAIL
- EXISTING/PROPOSED STOCKADE FENCE
- 60 — EXISTING CONTOUR
- 60 — PROPOSED CONTOUR
- x 100.00 x 104.00T 100.00B — PROPOSED SPOT GRADE/TOP & BOTTOM OF WALL OR CURB
- PROPOSED RETAINING WALL
- W — EXISTING WATER/CURB STOP/VALVE/HYDRANT
- S — EXISTING SEWER/MANHOLE
- G — EXISTING GAS/VALVE
- OHW — UGU — EXIST. OVERHEAD/UNDERGROUND UTILITIES/POLE
- EXISTING DRAINAGE/CB/DMH
- W — PROPOSED THRUST BLOCK/CURB STOP/VALVE/HYDRANT
- PW — F — PROPOSED DOMESTIC/FIRE WATER SERVICE LINE
- S — PROPOSED SEWER/MANHOLE/CLEANOUT
- G — PROPOSED GAS OR PROPANE
- OHW — PROPOSED OVERHEAD UTILITIES/UTILITY POLE
- UGU — PROPOSED UNDERGROUND ELECTRIC/PHONE/TV
- PROPOSED DRAINAGE (HARD PIPE)/CB/DCB/DMH/FES
- PROPOSED DRAINAGE (PERFORATED PIPE)/CLEANOUT
- CPP FES HDWL — CORRUGATED PLASTIC PIPE/FLARED END SECTION/HEADWALL
- 4% — PROPOSED GROUND SLOPE/APPROX. GRADE/STONE CHECK DAM
- x x — SILTFENCE/SEDIMENT CONSTR. FENCE
- STABILIZED CONSTRUCTION EXIT
- PROPOSED LIMIT OF DISTURBANCE/TREE CLEARING
- EXISTING TREE/DRIP LINE
- PROPOSED TREELINE
- (44) [226] — PARKING COUNT PER ROW/FOR TOTAL SITE
- PROPOSED RIPRAP
- PROPOSED STONE DRIP EDGE



NOTES

1. FOR USE WHERE THE DISTANCE FROM THE RIM TO PIPE INVERT IS LESS THAN 2'-10".
2. STRUCTURE SHALL TO ACCOMMODATE HEAVY DUTY 24" SQ. C.I. FRAME AND GRATE.
3. "3' DIAMETER AREA DRAIN" AVAILABLE FROM PHOENIX PRECAST PRODUCTS (800-639-2199) OR APPROVED EQUAL.
4. CONCRETE: 4,000 PSI AFTER 28 DAYS
5. STRUCTURE SHALL BE STEEL REINFORCED AND MEET OR EXCEED H-20 LOADING.
6. SEAL ALL TONGUE AND GROOVE JOINTS w/BUTYL RUBBER JOINT COMPOUND.

3' I.D. LOW PROFILE CB / DMH — NOT TO SCALE

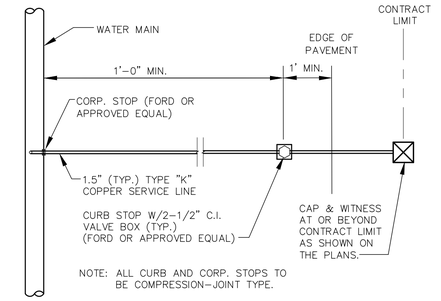


TEST PRESSURE = 150 psi	SQUARE FEET OF CONCRETE THRUST BLOCKING BEARING ON UNDISTURBED MATERIAL					
	REACTION TYPE		PIPE SIZE			
			4"	6"	8"	10"	12"
	A	90°	0.89	2.19	3.82	11.14	17.24
	B	180°	0.65	1.55	2.78	8.38	12.00
	C	45°	0.48	1.19	2.12	6.02	9.32
	D	22-1/2°	0.25	0.60	1.06	3.08	4.74
	E	11-1/4°	0.13	0.30	0.54	1.54	2.38

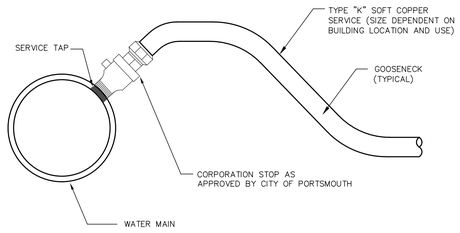
NOTES

1. POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL. WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL.
2. NO JOINTS SHALL BE COVERED WITH CONCRETE. POLYETHYLENE (6 MIL) SHALL BE PLACED AROUND FITTINGS PRIOR TO CONCRETE PLACEMENT.
3. ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
4. PLACE BOARD IN FRONT OF ALL PLUGS BEFORE POURING THRUST BLOCKS. WHERE M.J. PIPE IS USED, M.J. PLUG WITH RETAINER GLAND MAY BE SUBSTITUTED FOR END BLOCKINGS.

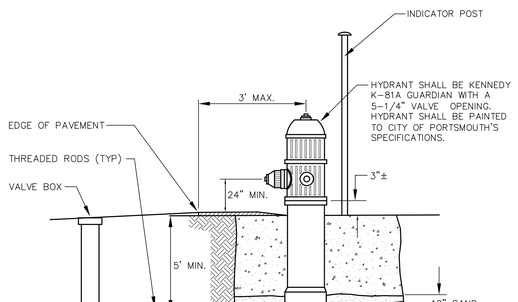
THRUST BLOCKING — NOT TO SCALE



NOTE: ALL MATERIALS AND SPECIFICATIONS SHALL CONFORM TO CITY OF PORTSMOUTH WATER DEPARTMENT STANDARDS AND REQUIREMENTS. VERIFY PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES.



WATER SERVICE CONNECTION — NOT TO SCALE

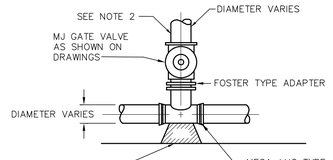


D (IN)	W (IN)
4	5
6	5
8	9

NOTES

1. HYDRANT INSTALLATION AND OPERATION TO CONFORM TO REGULATIONS OF THE CITY OF PORTSMOUTH WATER & FIRE DEPARTMENTS.
2. GATE VALVES & HYDRANTS TO OPEN RIGHT (CLOCKWISE).

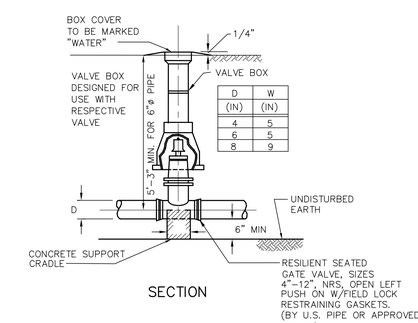
FIRE HYDRANT — NOT TO SCALE



NOTES:

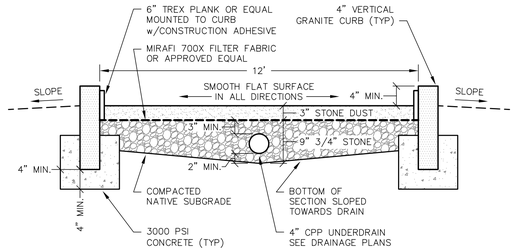
1. GATE VALVES SHALL OPEN RIGHT, PER CITY STANDARDS.
2. BRANCH PIPING SHALL BE MECHANICALLY RESTRAINED AS NOTED UNDER THRUST BLOCK DETAIL REQUIREMENTS.

TEE & GATE VALVE ASSEMBLY DETAIL — NOT TO SCALE

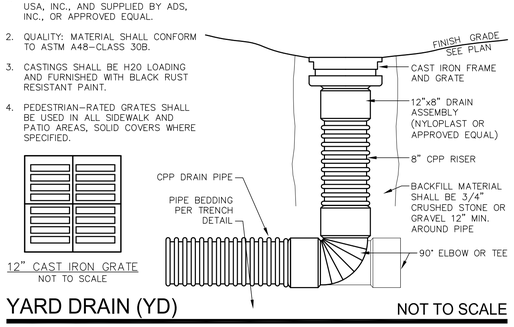


D (IN)	W (IN)
4	5
6	5
8	9

WATER VALVE DETAIL — NOT TO SCALE



BOCCE COURT CROSS SECTION — NOT TO SCALE

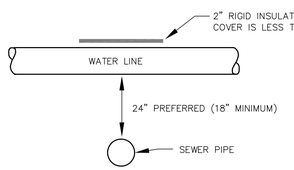


NOTES:

1. YARD DRAINS TO BE NYLOPLAST USA, INC., AND SUPPLIED BY ADS, INC., OR APPROVED EQUAL.
2. QUALITY: MATERIAL SHALL CONFORM TO ASTM A48-CLASS 30B.
3. CASTINGS SHALL BE H20 LOADING AND FURNISHED WITH BLACK RUST RESISTANT PAINT.
4. PEDESTRIAN-RATED GRATES SHALL BE USED IN ALL SIDEWALK AND PATIO AREAS, SOLID COVERS WHERE SPECIFIED.

12" CAST IRON GRATE
NOT TO SCALE

YARD DRAIN (YD) — NOT TO SCALE



NOTES

1. A MINIMUM HORIZONTAL DISTANCE OF 10 FEET SHALL BE MAINTAINED BETWEEN WATER AND SEWER MAINS. A MINIMUM VERTICAL DISTANCE WITH WATER ABOVE SEWER SHALL BE MAINTAINED.
2. SEWER PIPE JOINTS SHALL BE LOCATED A MINIMUM OF 6 FEET HORIZONTALLY FROM WATER MAIN.
3. IF THE REQUIRED CONFIGURATION CANNOT BE MET, THE SEWER MAIN SHALL BE CONSTRUCTED TO MEET THE NHDES REQUIREMENTS FOR FORCE MAIN CONSTRUCTION.

WATER MAIN / SEWER CROSSING — NOT TO SCALE

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE - ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
10/15/21

NOT FOR CONSTRUCTION

ISSUED FOR: REVIEW

ISSUE DATE: DECEMBER 28, 2021

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC	EBS	08/23/21
1	REV. PER TAC COA	EBS	12/28/21

DRAWN BY: EBS
APPROVED BY: EDW
DRAWING FILE: 5161-DS.dwg

SCALE: NOT TO SCALE

OWNER:
NAVEESHA HOSPITALITY, LLC
440 BEDFORD ST.
LEXINGTON, MA 02420

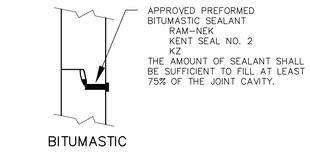
APPLICANT:
MONARCH VILLAGE, LLC
P.O. BOX 365
EAST HAMPSTEAD, NH 03826

PROJECT:
MONARCH VILLAGE
TAX MAP 297, LOT 6
3548 LAFAYETTE ROAD
PORTSMOUTH, NH 03801

TITLE:
DETAIL SHEET

SHEET NUMBER:
D - 6

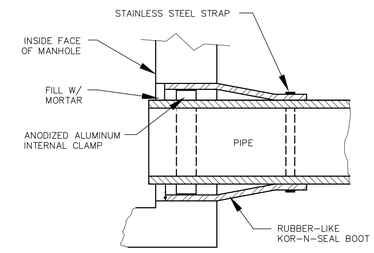
P5161



NOTE: ALL GASKETS, SEALANTS, MORTAR, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS.

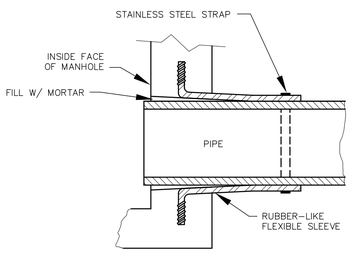
SEWER MANHOLE DETAIL B

NOT TO SCALE



KOR-N-SEAL JOINT SLEEVE
(OR EQUAL)

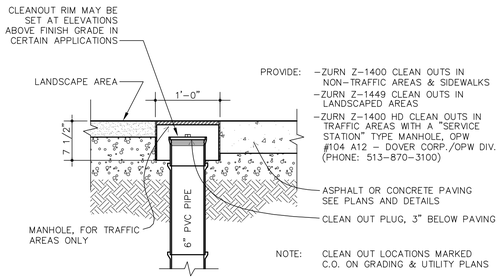
NOTE: ALL GASKETS, SEALANTS, MORTAR, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS.



LOCK-JOINT FLEXIBLE MANHOLE SLEEVE
(OR EQUAL)

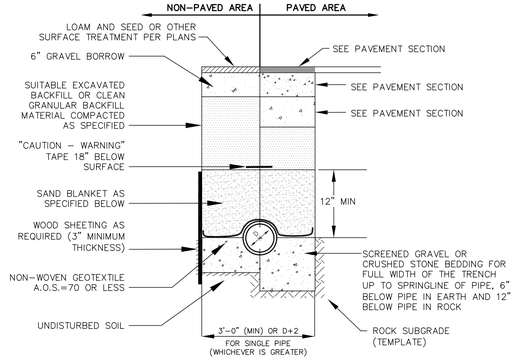
SEWER MANHOLE DETAIL A

NOT TO SCALE



CLEANOUT

NOT TO SCALE



NOTES

1. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.
2. INSULATE GRAVITY SEWER AND FORCEMAINS WHERE THERE IS LESS THAN 5'-0" OF COVER WITH 2" THICK CLOSED CELL RIGID BOARD INSULATION, 18" ON EACH SIDE OF PIPE.
3. MAINTAIN 12" MINIMUM HORIZONTAL SEPARATION AND WIDEN TRENCH ACCORDINGLY IF MULTIPLE PIPES ARE IN TRENCH.

SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 - 100
200	0 - 15

SCREENED GRAVEL OR CRUSHED STONE BEDDING*

SIEVE SIZE	% PASSING BY WEIGHT
1"	100
3/4"	90 - 100
3/8"	20 - 55
# 4	0 - 10
# 8	0 - 5

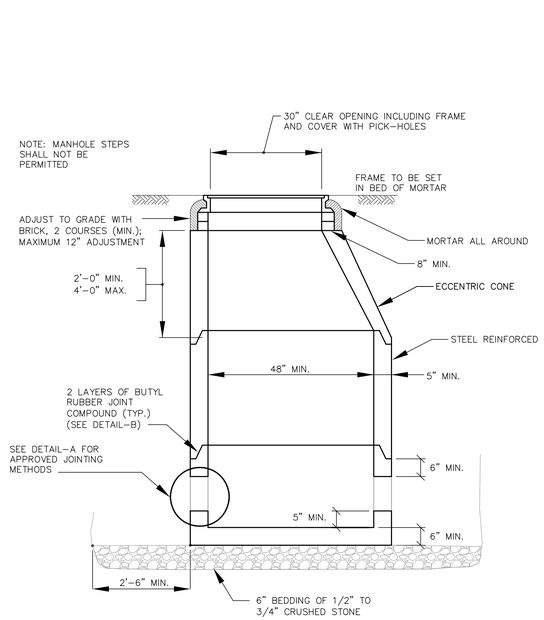
* EQUIVALENT TO STANDARD STONE SIZE #67 - SECTION 703 OF NHDOT STANDARD SPECIFICATIONS

STANDARD TRENCH NOTES

1. ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE: BACKFILL AS STATED IN THE TECHNICAL SPECIFICATIONS OR AS SHOWN ON THE DRAWING.
2. BEDDING: SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING THE GRADATION SHOWN IN THE TRENCH DETAIL. WHERE ORDERED BY THE ENGINEER TO STABILIZE THE BASE, SCREENED GRAVEL OR CRUSHED STONE 1-1/2 INCH TO 1/2 INCH SHALL BE USED.
3. SAND BLANKET: CLEAN SAND FREE FROM ORGANIC MATTER MEETING THE GRADATION SHOWN IN THE TRENCH DETAIL. BLANKET MAY BE REPLACED WITH BEDDING MATERIAL FOR CAST-IRON, DUCTILE IRON, AND REINFORCED CONCRETE PIPE PROVIDED THAT NO STONE LARGER THAN 2" IS IN CONTACT WITH THE PIPE AND THE GEOTEXTILE IS RELOCATED ACCORDINGLY.
4. SUITABLE MATERIAL: IN ROADS, ROAD SHOULDERS, WALKWAYS AND TRAVELED WAYS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS, PIECES OF PAVEMENT, ORGANIC MATTER, TOP SOIL, ALL WET OR SOFT MUCK, PEAT, OR CLAY, ALL EXCAVATED LEDGE MATERIAL, ALL ROCKS OVER 6 INCHES IN LARGEST DIMENSION, AND ANY MATERIAL WHICH, AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION. IN CROSS COUNTRY CONSTRUCTION, SUITABLE MATERIAL SHALL BE AS DESCRIBED ABOVE, EXCEPT THAT THE ENGINEER MAY PERMIT THE USE OF TOP SOIL, LOAM, MUCK, OR PEAT ONLY IF SATISFIED THAT THE COMPLETED CONSTRUCTION WILL BE ENTIRELY STABLE AND PROVIDED THAT EASY ACCESS TO THE SEWER FOR MAINTENANCE AND POSSIBLE RECONSTRUCTION WILL BE PRESERVED.
5. BASE COURSE AND PAVEMENT SHALL MEET THE REQUIREMENTS OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES - DIVISIONS 300 AND 400 RESPECTIVELY.
6. SHEETING, IF REQUIRED: WHERE SHEETING IS PLACED ALONGSIDE THE PIPE AND EXTENDS BELOW MID-DIAMETER, IT SHALL BE CUT OFF AND LEFT IN PLACE TO AN ELEVATION 1 FOOT ABOVE THE TOP OF PIPE. WHERE SHEETING IS ORDERED BY THE ENGINEER TO BE LEFT IN PLACE, IT SHALL BE CUT OFF AT LEAST 3 FEET BELOW FINISHED GRADE, BUT NOT LESS THAT 1 FOOT ABOVE THE TOP OF THE PIPE.
7. W = MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12 INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, W SHALL BE NO MORE THAN 36 INCHES. FOR PIPES GREATER THAN 15 INCHES IN NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS PIPE OUTSIDE DIAMETER (O.D.) ALSO, W SHALL BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE.
8. FOR CROSS COUNTRY CONSTRUCTION, BACKFILL, FILL AND/OR LOAM SHALL BE MOUNDED TO A HEIGHT OF 6 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
9. CONCRETE FOR ENCASEMENT SHALL CONFORM TO THE NEW HAMPSHIRE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS STANDARD SPECIFICATION REQUIREMENTS FOR CLASS A (3000#) CONCRETE AS FOLLOWS:
   CEMENT: 6.0 BAGS PER CUBIC YARD
   WATER: 5.75 GALLONS PER BAG
   CEMENT MAXIMUM SIZE OF AGGREGATE: 1 INCH
   CONCRETE ENCASEMENT IS NOT ALLOWED FOR PVC PIPE.
10. CONCRETE FULL ENCASEMENT: IF FULL ENCASEMENT IS UTILIZED, DEPTH OF CONCRETE BELOW PIPE SHALL BE 1/4 I.D. (4" MINIMUM). BLOCK SUPPORT SHALL BE SOLID CONCRETE BLOCKS.
11. NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES DESIGN STANDARDS REQUIRE TEN FEET (10') SEPARATION BETWEEN WATER AND SEWER. REFER TO TOWN'S STANDARD SPECIFICATIONS FOR METHODS OF PROTECTION IN AREAS THAT CANNOT MEET THESE REQUIREMENTS.
12. THE CONTRACTOR SHALL INSTALL TRENCH DAMS IN ACCORDANCE WITH NHDES REGULATIONS.

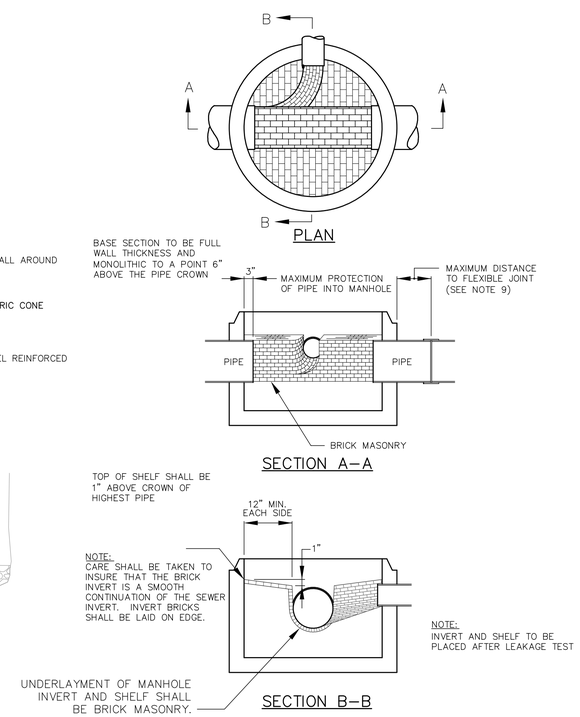
SEWER TRENCH

NOT TO SCALE



TYPICAL SECTION

SEWER MANHOLE



MANHOLE NOTES:

1. IT IS THE INTENTION OF THE NHDES THAT THE MANHOLE, INCLUDING ALL COMPONENT PARTS, HAVE ADEQUATE SPACE, STRENGTH AND LEAKPROOF QUALITIES CONSIDERED NECESSARY BY THE COMMISSION FOR THE INTENDED SERVICE. SPACE REQUIREMENTS AND CONFIGURATIONS, SHALL BE AS SHOWN ON THE DRAWING. MANHOLES MAY BE AN ASSEMBLY OF PRECAST SECTIONS, WITH OR WITHOUT STEEL REINFORCEMENT, WITH ADEQUATE JOINTING, OR CONCRETE CAST MONOLITHICALLY IN PLACE WITH OR WITHOUT REINFORCEMENT IN ANY APPROVED MANHOLE. THE COMPLETE STRUCTURE SHALL BE OF SUCH MATERIAL AND QUALITY AS TO WITHSTAND LOADS OF 8 TONS (H-20 LOADING) WITHOUT FAILURE AND PREVENT LEAKAGE IN EXCESS OF ONE GALLON PER DAY PER VERTICAL FOOT OF MAN-HOLE CONTINUOUSLY FOR THE LIFE OF THE STRUCTURE, A PERIOD GENERALLY IN EXCESS OF 25 YEARS IS TO BE UNDERSTOOD IN BOTH CASES.
2. BARRELS AND CONE SECTIONS SHALL BE PRECAST REINFORCED.
3. PRECAST CONCRETE BARREL SECTIONS, CONES AND BASES SHALL CONFORM TO ASTM C478.
4. LEAKAGE TEST SHALL BE PERFORMED IN ACCORDANCE WITH THE TOWN'S STANDARD SPECIFICATIONS AND WITH NHDES Env-Wq 704.17.
5. INVERTS AND SHELVES MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT CONSTRUCTED TO CONFORM TO THE SIZE OF PIPE AND FLOW AT CHANGES IN DIRECTION. THE INVERTS SHALL BE LAID OUT IN CURVES, OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPE TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY. BRICK MASONRY SHALL CONFORM WITH ASTM C32.
6. MORTAR MORTAR USED FOR MANHOLE CONSTRUCTION SHALL CONFORM WITH NHDES Env-Wq 704.13.
7. FRAMES AND COVERS MANHOLE FRAMES AND COVERS SHALL CONFORM WITH ASTM A48/48M, BE OF HEAVY DUTY DESIGN AND PROVIDE A 30-INCH CLEAR OPENING. A 3-INCH (MINIMUM HEIGHT) LETTER "S" FOR SEWERS OR "D" FOR DRAINS SHALL BE PLAINLY CAST INTO THE CENTER OF EACH COVER.
8. BEDDING SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C33.
   100% PASSING 1 INCH SCREEN 0-10% PASSING #4 SIEVE
   90-100% PASSING 3/4 INCH SCREEN 0-5% PASSING #8 SIEVE
   20- 55% PASSING 3/8 INCH SCREEN
   WHERE ORDERED BY THE ENGINEER TO STABILIZE THE BASE, SCREENED GRAVEL OR CRUSHED STONE 1-1/2" TO 1/2" SHALL BE USED.
9. CONCRETE FOR DROP SUPPORT SHALL CONFORM TO THE REQUIREMENT FOR CLASS A (3000 LBS.) CONCRETE OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS AS FOLLOWS:
   CEMENT 6.0 BAGS PER CUBIC YARD
   WATER 5.75 GALLONS PER BAG CEMENT
   MAXIMUM SIZE OF AGGREGATE 1 INCH 9.
10. FLEXIBLE JOINT A FLEXIBLE JOINT SHALL BE PROVIDED WITHIN THE FOLLOWING DISTANCES:
    PVC PIPE - 60"
    RCP & CI PIPE - ALL SIZES - 48"
    AC & VC PIPE - UP THROUGH 12" DIAMETER - 18"
    AC & VC PIPE - LARGER THAN 12" DIAMETER - 36"
11. SHALLOW MANHOLE IN LIEU OF A CONE SECTION, WHEN MANHOLE DEPTH IS LESS THAN 6 FEET, A REINFORCED CONCRETE SLAB COVER MAY BE USED HAVING AN ECCENTRIC ENTRANCE OPENING AND CAPABLE OF SUPPORTING H-20 LOADS.

NOT TO SCALE

P5161

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE - ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
10/18/21

NOT FOR CONSTRUCTION

ISSUED FOR: TAC

ISSUE DATE: OCTOBER 18, 2021

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC	EBS	08/23/21
1	TAC	EBS	10/18/21

DRAWN BY: EBS
APPROVED BY: EDW
DRAWING FILE: 5161-DS.dwg

SCALE: NOT TO SCALE

OWNER:
NAVEESHA HOSPITALITY, LLC
440 BEDFORD ST.
LEXINGTON, MA 02420

APPLICANT:
MONARCH VILLAGE, LLC
P.O. BOX 365
EAST HAMPSTEAD, NH 03826

PROJECT:
MONARCH VILLAGE
TAX MAP 297, LOT 6
3548 LAFAYETTE ROAD
PORTSMOUTH, NH 03801

TITLE:
DETAIL SHEET

SHEET NUMBER:
D - 7

BUILDING 1

FRONT VIEW

BACK VIEW

LEFT VIEW

RIGHT VIEW

BUILDING 2

FRONT VIEW

BACK VIEW

LEFT VIEW

RIGHT VIEW

BUILDING 4

FRONT VIEW

BACK VIEW

LEFT VIEW

RIGHT VIEW

NOT FOR CONSTRUCTION

REVISIONS:

MONARCH VILLAGE
3548 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE 03801

CJ ARCHITECTS
233 VAUGHAN STREET
SUITE 101
PORTSMOUTH, NH 03801
(603) 431-2808
www.cjarchitects.net

ELEVATIONS

DATE:	09/30/21
DRAWN BY:	KGM
APPROVED BY:	CJG
SCALE:	-
JOB NUMBER:	22107

A1

BUILDING 5

FRONT VIEW

BACK VIEW

LEFT VIEW

RIGHT VIEW

BUILDING 7

FRONT VIEW

BACK VIEW

LEFT VIEW

RIGHT VIEW

BUILDING 8

FRONT VIEW

BACK VIEW

LEFT VIEW

RIGHT VIEW

NOT FOR CONSTRUCTION

REVISIONS:

MONARCH VILLAGE
3548 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE 03801

CJ ARCHITECTS
233 VAUGHAN STREET
SUITE 101
PORTSMOUTH, NH 03801
(603) 431-2808
www.cjarchitects.net

ELEVATIONS

DATE:	09/30/21
DRAWN BY:	KGM
APPROVED BY:	CJG
SCALE:	-
JOB NUMBER:	22107

A2

EXTENTS OF EXTERIOR RENOVATIONS:
1. PAINT EXISTING SIDING
2. ADD NEW AZEK FLAT STOCK TRIM
3. REMOVE AWNING OVER ENTRIES
4. PAINT EXISTING DOORS
5. ADD (3) NEW ENTRY DOORS
6. ADD (3) NEW ENTRY STAIRS

BEFORE

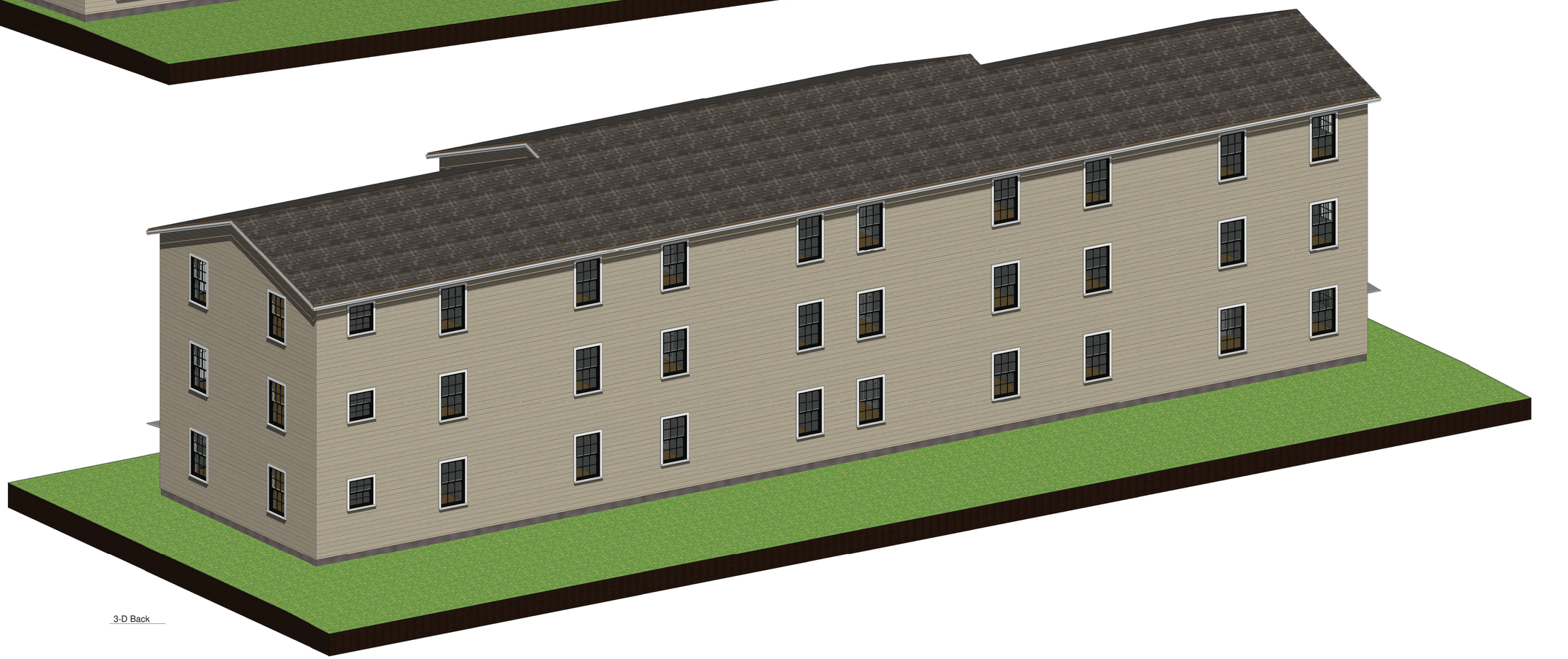
AFTER

3548 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

MONARCH VILLAGE
BUILDING 1 - PROPOSED EXTERIOR RENOVATIONS

CJ ARCHITECTS

3-D Front



3-D Back

Preferred Building Systems
PO Box 1, 143 Ivers Brook Road
Claremont, NH 03743
603-372-1050 603-372-5127 Fax
www.preferredbuildings.com

3D Isometric

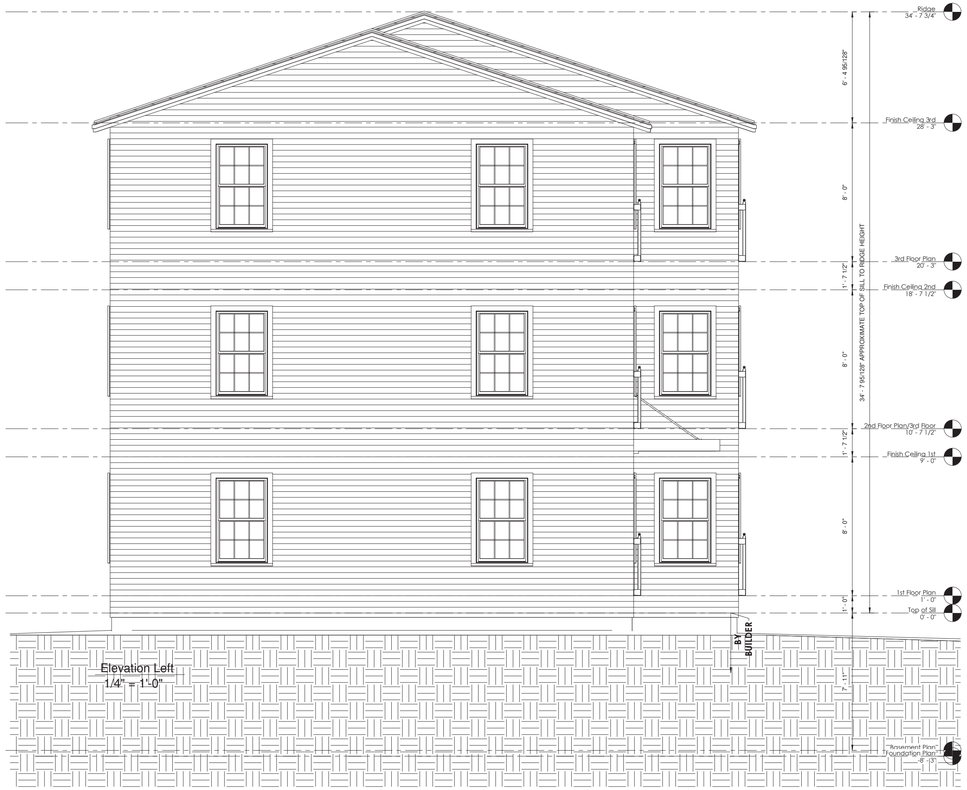
Monarch Village - Bldg 3
Portsmouth, NH

PB210543			
1	Prelim	9/2/21	MRC

Sheet:
A0.2

Notice: Do not scale drawing, use dimensions shown.

Elevation Front
1/4" = 1'-0"



Elevation Left
1/4" = 1'-0"

PRELIMINARY
NOT FOR CONSTRUCTION

ELEVATION NOTES

1. RIDGE VENT SHIP LOOSE BY FACTORY FOR INSTALLATION ONSITE BY SET CREW.
2. SHUTTERS SUPPLIED BY FACTORY FOR INSTALLATION ONSITE BY BUILDER.
3. ALL EXTERIOR RAILINGS, PORCHES AND PORCH ROOF ONSITE BY BUILDER.
4. RAMP BUILT TO COMPLY WITH 521 CMR 24 ONSITE BY BUILDER.
5. ALL EXTERIOR FINISH SIDING & EXTERIOR DOOR/WINDOW TRIM BY OTHERS.
6. IN PANELIZED GARAGE: ALL DOORS AND WINDOWS THAT ARE SHIPPED LOOSE BY FACTORY ARE INSTALLED ONSITE BY OTHERS. ALL LIGHTS, SWITCHES AND OUTLETS THAT ARE SHIPPED LOOSE BY FACTORY ARE INSTALLED ONSITE BY OTHERS. ASSOCIATED WIRING AND CONNECTION IN PANELIZED AREAS BY OTHERS. WIRE CONNECTION TO SERVICE PANEL COILED ABOVE CEILING ADJACENT TO PANELIZED AREA IN MODULAR COMPONENTS OF HOME.

Preferred Building Systems
PO Box 1, 143 Iverthorn Road
Claremont, NH 03743
603-372-1030 603-372-5127 Fax
www.preferredbuildings.com

Front & Left Elevations
Monarch Village - Bldg 3
Portsmouth, NH

PB210543	1	Prelim	9/2/21 MRC

Sheet:
A1.1

Notice: Do not scale drawing, use dimensions shown.

ROOF AREA MEETINGS SOLAR-READY ZONE, 300SQFT MIN. PATHWAYS FOR ROUTING COMPONENTS PROVIDED BY BUILDER ONSITE. FACTORY TO PREP ONLY FOR SOLAR. BUILDER TO PROVIDE ANY SOLAR COLLECTION SYSTEMS ONSITE. REFER TO ELECTRICAL SHEETS FOR CONDUIT LOCATIONS.

Elevation Rear
1/4" = 1'-0"

Elevation Right
1/4" = 1'-0"

PRELIMINARY
NOT FOR CONSTRUCTION

ELEVATION NOTES
1. RIDGE VENT SHIP LOOSE BY FACTORY FOR INSTALLATION ONSITE BY SET CREW. 2. SHUTTERS SUPPLIED BY FACTORY FOR INSTALLATION ONSITE BY BUILDER. 3. ALL EXTERIOR RAILINGS, PORCHES AND PORCH ROOF ONSITE BY BUILDER. 4. RAMP BUILT TO COMPLY WITH 521 CMR 24 ONSITE BY BUILDER. 5. ALL EXTERIOR FINISH SIDING & EXTERIOR DOOR/WINDOW TRIM BY OTHERS. 6. IN PANELIZED GARAGE: ALL DOORS AND WINDOWS THAT ARE SHIPPED LOOSE BY FACTORY ARE INSTALLED ONSITE BY OTHERS. ALL LIGHTS, SWITCHES AND OUTLETS THAT ARE SHIPPED LOOSE BY FACTORY ARE INSTALLED ONSITE BY OTHERS. ASSOCIATED WIRING AND CONNECTION IN PANELIZED AREAS BY OTHERS. WIRE CONNECTION TO SERVICE PANEL COILED ABOVE CEILING ADJACENT TO PANELIZED AREA IN MODULAR COMPONENTS OF HOME.

Preferred Building Systems
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Rear & Right Elevations
Monarch Village - Bldg 3
Portsmouth, NH

PB210543

1	Prelim	MRC
	9/2021	

Sheet:
A1.2

Note: Do not scale drawing, use dimension items

3-D Front

3-D Back

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8/31/2021 11:25:08 AM

3D Isometric

Monarch Village BLDG 6
Portsmouth, NH

PB210544

1	Prelim	Date	By
9			
8			
7			

Sheet:
A0.2

Notes: Do not scale drawing, use dimensions shown

Elevation Front
1/4" = 1'-0"

Elevation Left
1/4" = 1'-0"

PRELIMINARY
NOT FOR CONSTRUCTION

ELEVATION NOTES

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Front & Left Elevations

Monarch Village BLDG 6
Portsmouth, NH

PB210544

	Prelim	Date	By
1	Prelim		
9			
8			
7			

Sheet:
A1.1

Notes: Do not scale drawing, use dimensions shown

PRELIMINARY
NOT FOR CONSTRUCTION

ROOF AREA MEETINGS SOLAR-READY ZONE, 300SQFT MIN. PATHWAYS FOR ROUTING COMPONENTS PROVIDED BY BUILDER ONSITE. FACTORY TO PREP ONLY FOR SOLAR. BUILDER TO PROVIDE ANY SOLAR COLLECTION SYSTEMS ONSITE. REFER TO ELECTRICAL SHEETS FOR CONDUIT LOCATIONS.

Elevation Rear
1/4" = 1'-0"

Elevation Right
1/4" = 1'-0"

ELEVATION NOTES

1. RIDGE VENT SHIP LOOSE BY FACTORY FOR INSTALLATION ONSITE BY SET CREW.
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Rear & Right Elevations

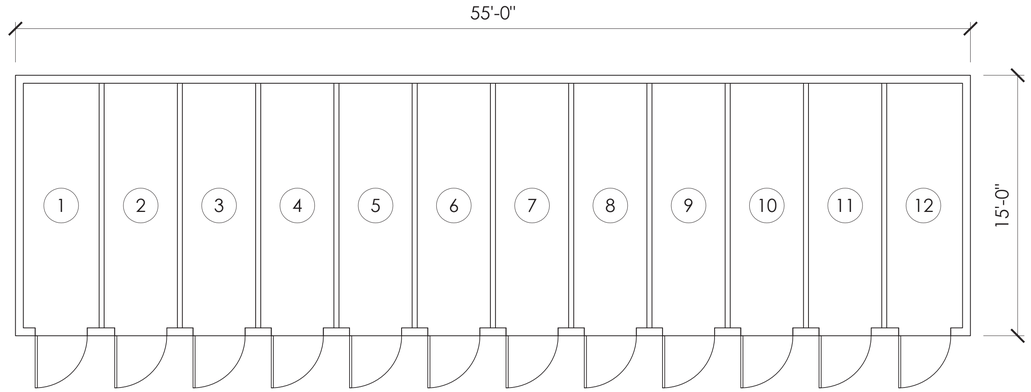
Monarch Village BLDG 6
Portsmouth, NH

PB210544

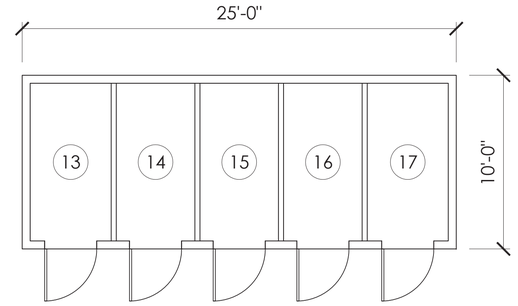
	Prelim	Date	By
1			
9			
8			
7			

Sheet:
A1.2

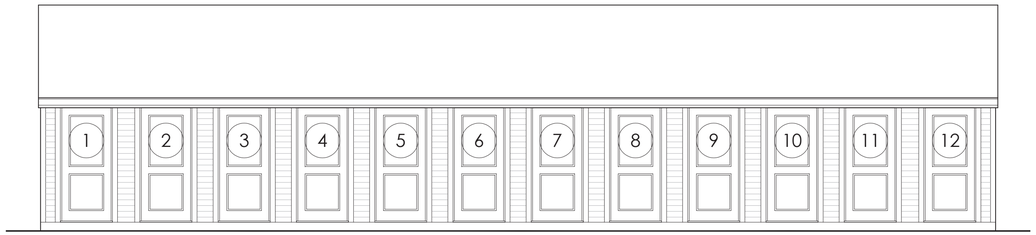
Notes: Do not scale drawing, use dimensions shown



1 STORAGE 1 - FIRST FLOOR PLAN
1/4" = 1'-0"

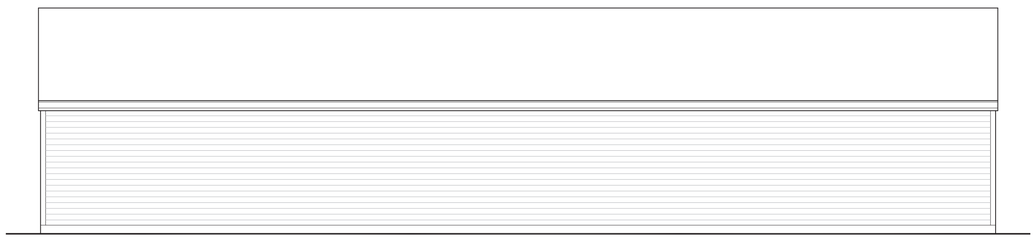


6 STORAGE 2 - FIRST FLOOR PLAN
1/4" = 1'-0"

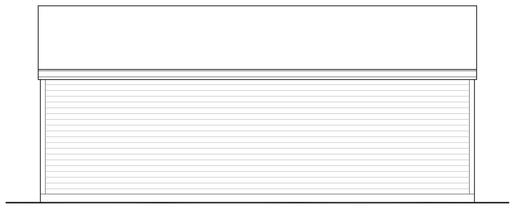


2 STORAGE 1 -FRONT
1/4" = 1'-0"

7 STORAGE 2 -FRONT
1/4" = 1'-0"



3 STORAGE 1 - BACK
1/4" = 1'-0"



8 STORAGE 2 -BACK
1/4" = 1'-0"

4 STORAGE 1 - LEFT
1/4" = 1'-0"

5 STORAGE 1 - RIGHT
1/4" = 1'-0"

9 STORAGE 2 - LEFT
1/4" = 1'-0"

10 STORAGE 2 - RIGHT
1/4" = 1'-0"

DRAFT
09/29/21

NOT FOR CONSTRUCTION

REVISIONS:

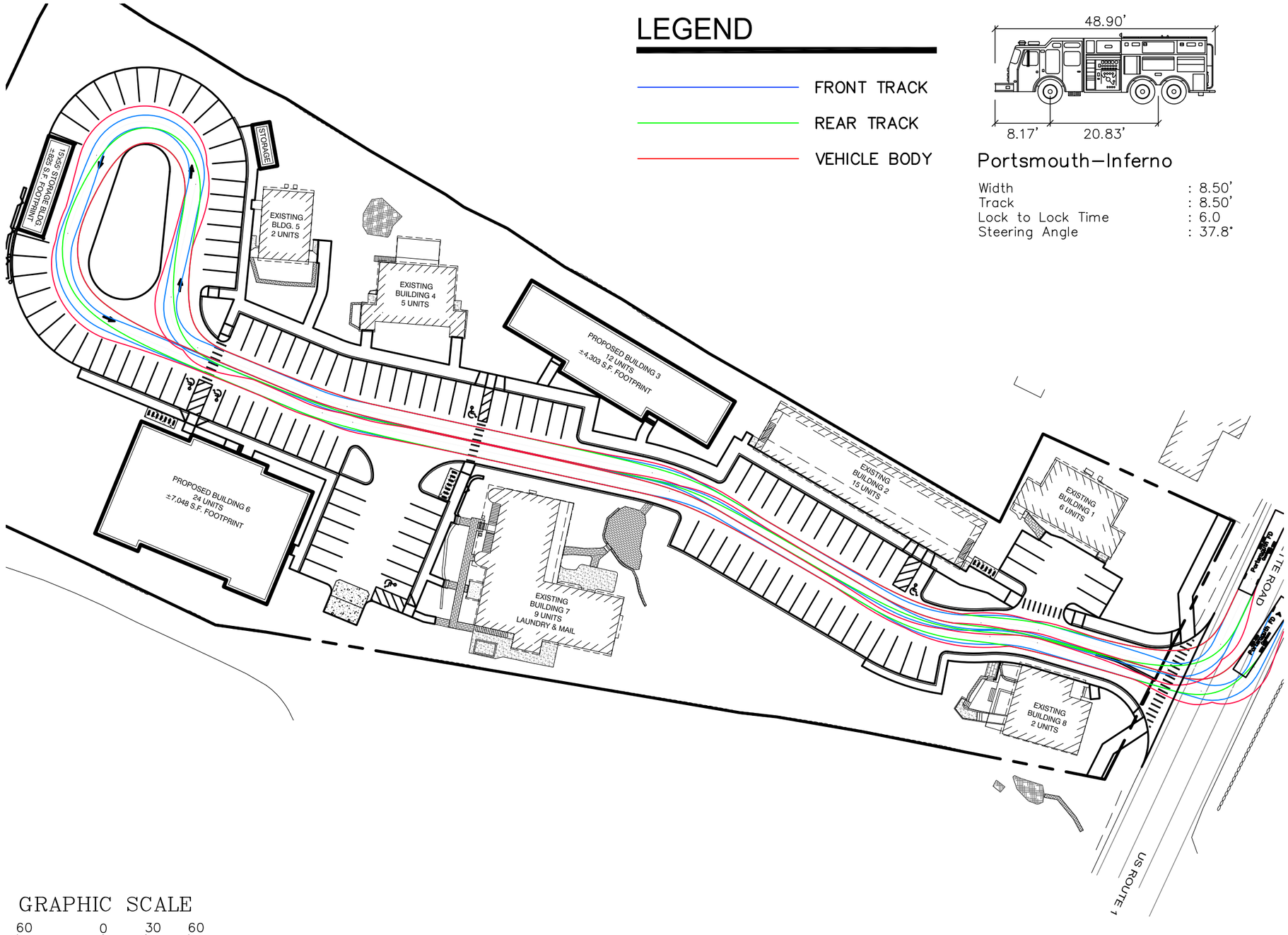
MONARCH VILLAGE
3548 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE 03801

CJ ARCHITECTS
233 VAUGHAN ST., SUITE 101 (603) 431-2808
PORTSMOUTH, NH 03801 www.cjarchitects.net

STORAGE BUILDINGS - PROPOSED FLOOR PLANS & ELEVATIONS

DATE:	--
DRAWN BY:	JAW
APPROVED BY:	CJG
SCALE:	1/4" = 1'-0"
JOB NUMBER:	22107

A1.0



LEGEND

- FRONT TRACK
- REAR TRACK
- VEHICLE BODY

Portsmouth–Inferno

Width	: 8.50'
Track	: 8.50'
Lock to Lock Time	: 6.0
Steering Angle	: 37.8°

GRAPHIC SCALE

60 0 30 60

(IN FEET)

P5161

ALTUS ENGINEERING, INC.

133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

SCALE: 11"x17" 1" = 60'

ISSUED FOR: TAC

ISSUE DATE: OCTOBER 18, 2021

REVISIONS:

NO.	DESCRIPTION	BY	
0	TAC	EBS	08/23/21
1	TAC	EBS	10/18/21

OWNER:
NAVEESHA HOSPITALITY, LLC
440 BEDFORD ST.
LEXINGTON, MA 02420

APPLICANT:
MONARCH VILLAGE, LLC
P.O. BOX 365
EAST HAMPSTEAD, NH 03826

PROJECT:
MONARCH VILLAGE
TAX MAP 297, LOT 6
3548 LAFAYETTE ROAD
PORTSMOUTH, NH 03801

TITLE:
FIRE APPARATUS TURNING EXHIBIT

SHEET NUMBER:
EXH-1

Stephen G. Pernaw & Company, Inc.
P.O. Box 1721 • Concord, NH 03302
tel: (603) 731-8500 • fax: (866) 929-6094 • sgp@pernaw.com
Transportation: Engineering • Planning • Design

M E M O R A N D U M

Ref: 2109A

To: Erik Saari, Vice President
Altus Engineering, Inc.

From: Stephen G. Pernaw, P.E., PTOE

Subject: Proposed Residential Development – Traffic Evaluation
Portsmouth, New Hampshire

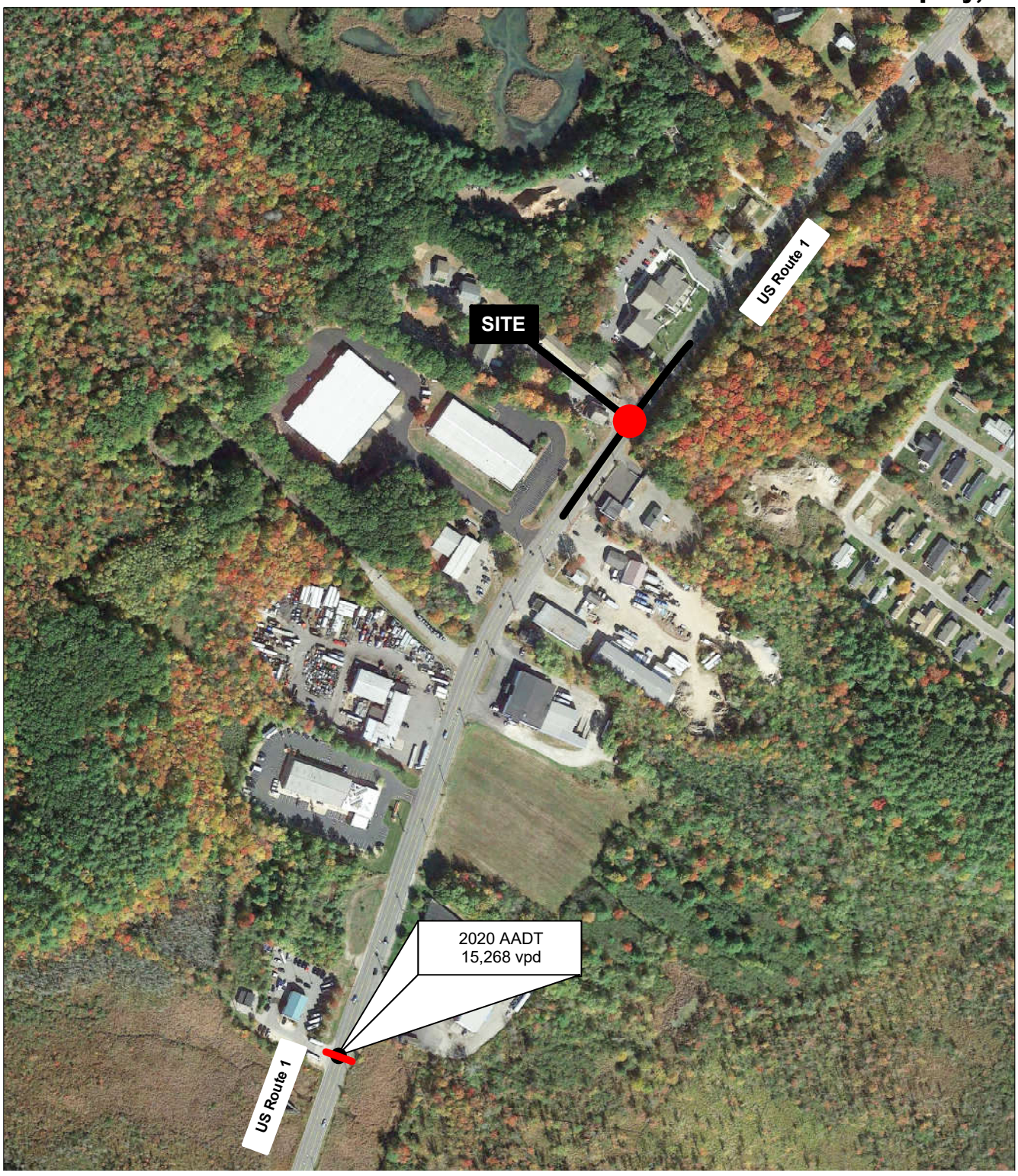
Date: August 3, 2021

As requested, Pernaw & Company, Inc. has conducted this *"Traffic Evaluation"* regarding the residential development project that is proposed by Monarch Village, LLC at what is now the Wren's Nest Village Inn site on the west side of US Route 1 (US1) in Portsmouth, New Hampshire. This study evaluates the US1/Existing Site Driveway intersection in terms of traffic operations, capacity, and safety based on an analysis of 2032 Build traffic volumes. The purpose of this memorandum is to summarize our research of available traffic count data, our recent traffic counts at the subject site, the trip generation analysis for the proposed development, the post-development traffic projections, and the results of the various technical analyses. To summarize:

Proposed Development – The plan entitled *"Board of Adjustment Site Plan,"* prepared by Altus Engineering, Inc., Sheet 1 of 1, dated April 28, 2021 shows that the proposed development will replace the 33-room inn with 75 new residential apartment units in eight buildings (proposed and existing). These buildings will be reached via a private site driveway (see Attachment 1). The existing driveway intersects the west side of US1 approximately 700-feet north of Coach Road. The location of the subject site with respect to the area roadway system and the automatic traffic recorder are shown on Figure 1.

Existing Conditions – US1 extends in a general north-south direction and provides access between Maine (northerly) and North Hampton (southerly). This road provides one travel lane in each direction for through traffic in the vicinity of the subject site. The pavement width is delineated with a continuous two-way left-turn lane and four-inch single white edge lines. A combination of paved, grass, and gravel shoulders of variable width are present along both sides of the roadway. The speed limit is posted at 45 mph in each direction in this area.

Existing Traffic Volumes – According to a short-term NHDOT traffic count conducted on US1 in August 2020, this roadway section carried an estimated Annual Average Daily Traffic (AADT) volume of approximately 15,268 vehicles per day (vpd), down from 18,297 vpd in 2019. The hourly data indicates that weekday volumes typically reached peak levels from 8:00 to 9:00 AM and from 3:00 to 4:00 or 4:00 to 5:00 PM. The diagrams on Page 3 summarize the daily and hourly variations in traffic demand on US1 in 2020 (with Covid-19) and in 2017 (pre-pandemic) (see Attachments 2-4).



= AUTOMATIC TRAFFIC RECORDER LOCATION (NHDOT)

= INTERSECTION TURNING MOVEMENT COUNT LOCATION

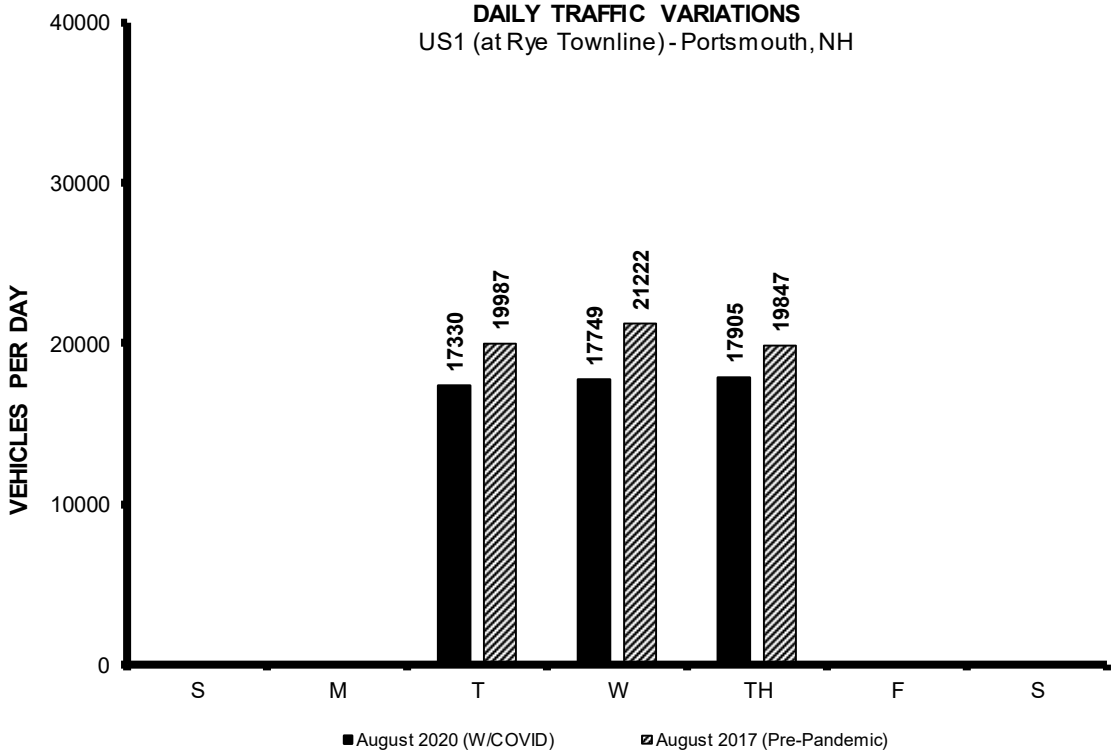
NORTH

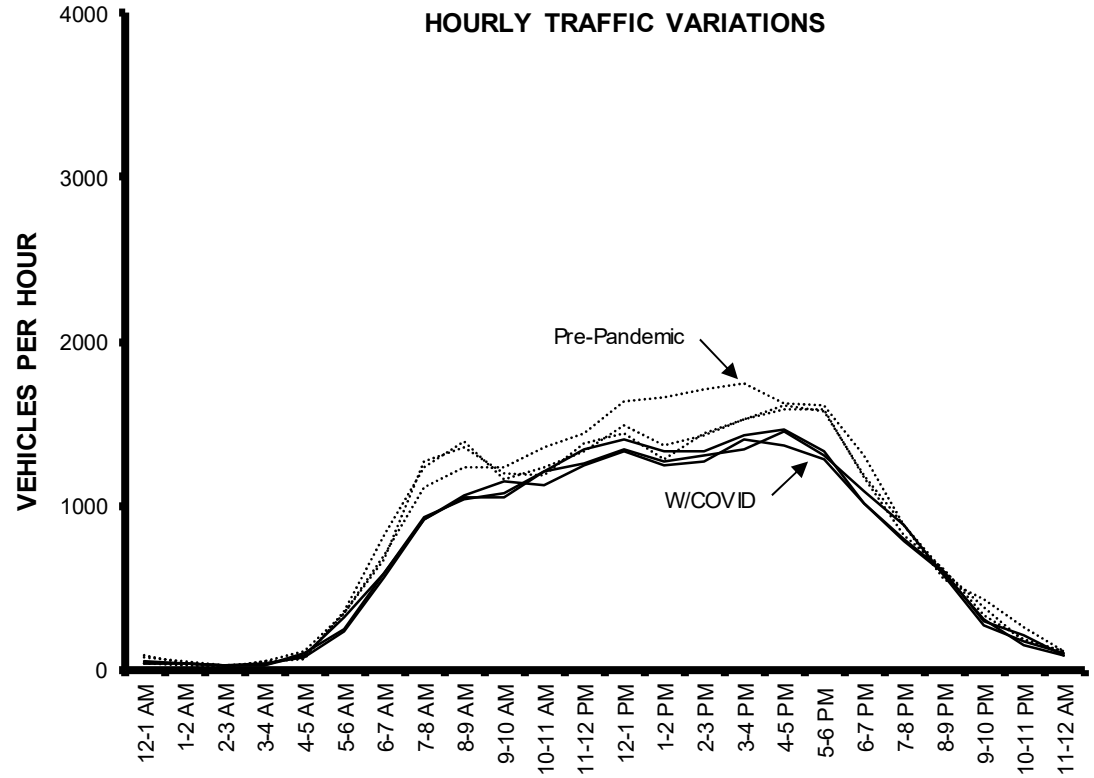
2109A

Figure 1

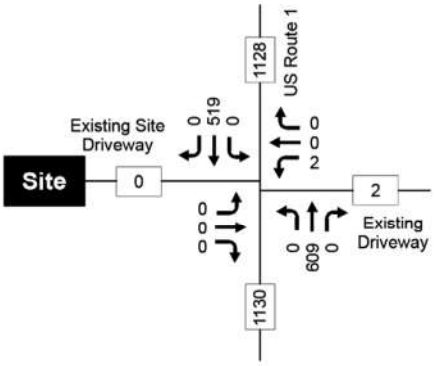
Site Location

Traffic Evaluation, Proposed Residential Development, Portsmouth, New Hampshire

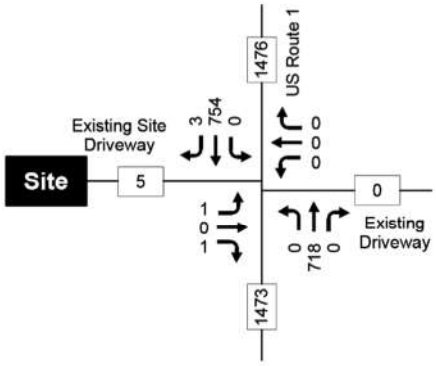

DAILY TRAFFIC VARIATIONS
US1 (at Rye Townline) - Portsmouth, NH
VEHICLES PER DAY
40000
30000
20000
10000
0
17330
19987
17749
21222
17905
19847
S
M
T
W
TH
F
S
August 2020 (W/COVID)
August 2017 (Pre-Pandemic)


HOURLY TRAFFIC VARIATIONS
VEHICLES PER HOUR
4000
3000
2000
1000
0
Pre-Pandemic
W/COVID
12-1 AM
1-2 AM
2-3 AM
3-4 AM
4-5 AM
5-6 AM
6-7 AM
7-8 AM
8-9 AM
9-10 AM
10-11 AM
11-12 PM
12-1 PM
1-2 PM
2-3 PM
3-4 PM
4-5 PM
5-6 PM
6-7 PM
7-8 PM
8-9 PM
9-10 PM
10-11 PM
11-12 AM

The raw 2021 directional traffic volume data on US1 are summarized in the diagrams below. This data shows that travel in the northbound direction is predominant during the morning peak hour, and this reverses to southbound during the evening peak hour. This pattern is indicative of the employment opportunities in the city, and the proximity of Interstate Route 95.



AM PEAK HOUR
Thursday, July 1, 2021
7:45 to 8:45 AM



PM PEAK HOUR
Thursday, July 1, 2021
3:15 to 4:15 PM

When compared with the 2017 NHDOT count data, it is obvious that the current traffic levels on US1 have been affected by the COVID-19 pandemic. For this reason, the subsequent post-development traffic volumes contained herein reflect the use of a separate COVID adjustment factor. The raw traffic count data is attached (see Attachments 5-13).

Trip Generation – To estimate the quantity of vehicle-trips that will be produced by the proposed residential apartment units, the standard trip generation rates and equations published by the Institute of Transportation Engineers[1] (ITE) were considered. More specifically, Land Use Code LUC 220 - Multifamily Housing (Low-Rise) was utilized for the proposed apartments, and LUC 320 – Motel was utilized for the former inn. The new apartments are expected to generate approximately 36 vehicle-trips (8 arrivals, 28 departures) during the AM peak hour, and 46 vehicle-trips (29 arrivals, 17 departures) during the PM peak hour, on an average weekday basis (see Attachment 14). Attachment 15 contains diagrams that show the distribution of site traffic at the US1/Existing Site Driveway intersection.

[1] Institute of Transportation Engineers, *Trip Generation*, 10th Edition (Washington, D.C., 2017)

Table 1 — **Trip Generation Comparison**
(3548 Lafayette Road - Portsmouth, New Hampshire)

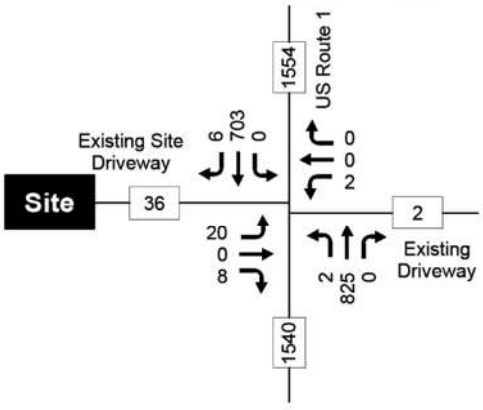
		Former Wren's Nest Village Inn [1]	Proposed Apartments [2]	Net Change
Weekday (24 Hour)				
	Entering	56 veh	275 veh	219 trips
	Exiting	56 veh	275 veh	219 trips
	Total	112 trips	550 trips	438 trips
AM Peak Hour				
	Entering	5 veh	8 veh	3 trips
	Exiting	8 veh	28 veh	20 trips
	Total	13 trips	36 trips	+23 trips
PM Peak Hour				
	Entering	7 veh	29 veh	22 trips
	Exiting	6 veh	17 veh	11 trips
	Total	13 trips	46 trips	+33 trips

[1] ITE Land Use Code 320 - Motel w/ 33 rooms

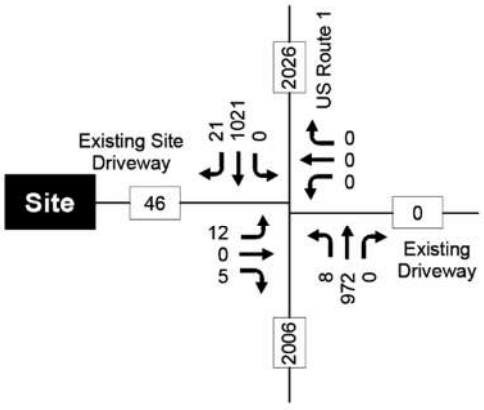
[2] ITE Land Use Code 220 - Multifamily Housing (Low-Rise) w/ 75 apartments

Future Build Traffic Projections – The diagrams below summarize the Build traffic projections for the 2032 horizon year. These projections are based on the July 2021 traffic count data, a peak-month seasonal adjustment factor of 1.02 (see Attachment 16), a 1.0% background traffic growth rate, compounded annually (see Attachment 17), and a COVID-19 adjustment factor of 1.19 (see Attachment 18). The trip distribution analysis (

see Attachment 19) indicates that the majority of site traffic (73%) are expected to travel to/from points north on US1.



2032 AM BUILD



2032 PM BUILD

Auxiliary Turn Lane Warrants Analysis

Left-Turn Treatment - The type of treatment needed to accommodate left-turning vehicles from any street or highway to an intersecting side street (or driveway) can range from no treatment, where turning volumes are low; to the provision of a bypass lane for through traffic to travel around left-turning vehicles; to the addition of a formal center turn lane used exclusively by left-turning vehicles for deceleration and storage while waiting to complete their maneuvers. Fortunately, this section of US1 is currently delineated with a continuous two-way left-turn lane.

Right-Turn Treatment - The type of treatment needed to accommodate right-turning vehicles from any street or highway to any intersecting side street (or driveway) can range from a radius only, where turning volumes are low; to the provision of a short 10:1 right-turn taper; to the addition of an exclusive right-turn lane, where turning volumes and through traffic volumes are significant. Analysis of the 2022 traffic volumes contained herein using NCHRP 457 guidelines confirmed that right-turn treatment is warranted during the PM peak hour period at the subject intersection. The results of these analyses are summarized on Table 2 and the computations are attached (Attachments 20 & 21). It should be noted that only 13 right-turn arrivals satisfied this criterion. At busier intersections on US1 (Washington Road, Ocean Road, Longmeadow Road, etc.) right-turns occur from the through lane.

Minor Road Approach Treatment - The type of treatment needed to accommodate exiting vehicles from the minor-road approach at a stop-controlled intersection can range from a single lane (shared left-right lane) in low-volume conditions, to two exit lanes (exclusive left-turn lane and exclusive right-turn lane) where turning volumes and through traffic volumes are significant, to multiple exit lanes in extreme cases. The analysis is also summarized on Table 2 and shows that a single departure lane on the existing site driveway approach to US1 is sufficient for the size and type of development that is proposed (see Attachments 22 & 23).

Table 2 — **Auxiliary Turn Lane Warrants Analysis**
US Route 1 / Existing Site Driveway

	2022 Opening Year Case		2032 Horizon Year Case	
	AM Peak	PM Peak	AM Peak	PM Peak
II. RIGHT-TURN LANE WARRANTS ANALYSIS				
Peak Hour Inputs:				
Right-Turn Volume (SB)	6	21	-	-
Approach Volume (SB)	642	945	-	-
Speed (mph)	45	45	-	-
Limiting Right-Turn Volume (veh/h)	27	13	-	-
Add Right-Turn Bay?	**NO**	**YES**	-	-
III. MINOR-ROAD APPROACH GEOMETRY ANALYSIS				
Peak Hour Inputs:				
Major-Road Volume (NB-SB)	-	-	1536	2022
% Right-Turns on Minor (EB)	-	-	29	29
Minor-Road Approach Volume	-	-	28	17
Limiting Minor-Road Volume (veh/h)	-	-	84	43
Consider TWO Approach Lanes?	-	-	**NO**	**NO**

Findings & Conclusions

1. The July 2021 traffic count conducted on US1 at the subject site revealed that approximately 1,130 vehicles were observed passing the site during the AM peak hour (7:45 to 8:45 AM) and 1,473 vehicles observed during the PM peak hour (3:15 to 4:15 PM). The predominant travel direction was northbound during the AM, and southbound during the PM.

2. The Wren's Nest Village Inn did not appear to be in full operation as it generated only 0 (AM) and 5 (PM) vehicle-trip during the peak hour periods.

3. The proposed residential apartment units are expected to generate approximately 36 (AM) and 46 (PM) vehicle-trips during the peak hour periods. The majority (73%) are expected to travel to/from points north on US1.

4. The 2022 PM Build traffic volumes satisfy the NCHRP guidelines for right-turn treatment with only 21 southbound right-turn arrivals. Based on the lane configuration utilized at many other busier intersections on US1 (with shared through-right lanes), it is reasonable to expect that the subject intersection will continue to function safely and efficiently with one shared travel lane on each approach to the US1/Existing Site Driveway intersection.

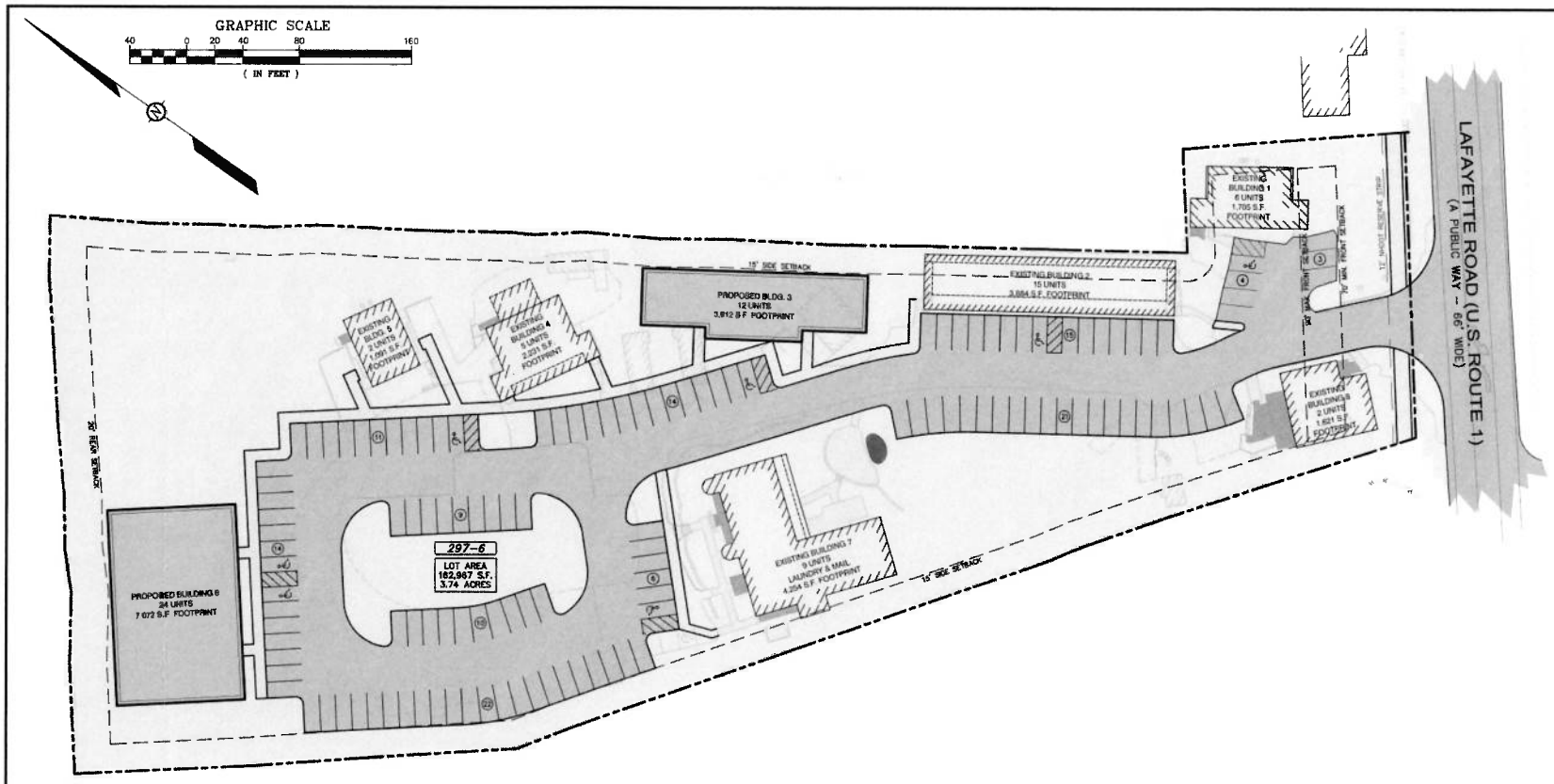
5. The available sight distances looking left and right from the site driveway approach to US1 exceed the NHDOT 400-foot guideline by a considerable margin as a result of the straight horizontal alignment of the highway in the flat terrain.

For a development project of this size and type, providing ample sight distances looking left and right from the site driveway to US1 is the most important safety consideration. The existing site driveway should operate under stop sign control (MUTCD R1-1), and be delineated with a 12-24 inch white stop line and a short section of four-inch double-yellow centerline to separate inbound and outbound vehicles.

Attachments

STAMP

ATTACHMENTS



NOTES

1. DESIGN INTENT – THIS PLAN IS INTENDED TO DEPICT A MULTI-FAMILY "GENERAL RESIDENTIAL DEVELOPMENT SITE" COMPRISED OF MULTIPLE EXISTING AND PROPOSED BUILDINGS TOGETHER WITH ASSOCIATED PARKING AND ACCESSWAYS.
2. THE BASE PLAN USED HERE WAS DEVELOPED FROM "ALTA/ACSM LAND TITLE SURVEY, 3548 LAFAYETTE ROAD, PORTSMOUTH, NH" BY JAMES VERRA AND ASSOCIATES, INC., DATED AUGUST 11, 2011.
3. ZONE: G1 (GATEWAY 1)
4. DIMENSIONAL REQUIREMENTS:

MIN. LOT AREA:	10,000 S.F. (0.23 ACRE) ON DEVELOPMENT SITE ±162,967 S.F. (3.74 AC.) PROVIDED
MIN. STREET FRONTAGE:	100' (ON LAFAYETTE ROAD) (181.55' EXISTING)
MIN. LOT DEPTH:	N/A
FRONT SETBACK:	70' MIN./90' MAX. (FROM LAFAYETTE ROAD CL)
SIDE SETBACK:	15'
REAR SETBACK:	20'
MAX. BUILDING HEIGHT:	50' (OR FOUR STORIES)
MAX. BUILDING LENGTH:	200'
MAX. BUILDING FOOTPRINT:	N/A
MAX. BUILDING COVERAGE:	50% (15.8%/±25,770 S.F. PROPOSED)
BUILDING STEPBACK:	N/A (ROW > 60')
BLDG FACADE ORIENTATION:	PARALLEL TO FRONT LOT LINE
FRONT LOT LINE BUILDOUT:	50% (34.3%/55.4' EXISTING)
DWELLING DENSITY:	20 UNITS/ACRE (GENERAL RESIDENTIAL)
DWELLING UNITS PER BLDG:	4 MIN./24 MAX.
PERIMETER BUFFER:	75' FROM RES, MIXED RES, OR 4-11 DISTRICTS
MIN. COMMUNITY SPACE:	10% (FOR DEVELOPMENT SITE)
MIN. OPEN SPACE:	20% (50.3%/±81,963 S.F. PROPOSED)

5. ZONING SECTION 10.540 – CONDITIONAL USE PERMIT FROM PLANNING BOARD REQUIRED TO ALLOW A GENERAL RESIDENTIAL DEVELOPMENT SITE.
6. NHDES ALTERATION OF TERRAIN PERMIT REQUIRED IF AREA OF DISTURBANCE OVER 100,000 S.F.
7. COVERAGE UNDER EPA NPDES PHASE II CONSTRUCTION GENERAL PERMIT REQUIRED IF AREA OF DISTURBANCE OVER 43,560 SF.
8. NHDOT DRIVEWAY PERMIT REQUIRED.
9. DENSITY CALCULATIONS:
   GENERAL RESIDENTIAL DEVELOPMENT: 20 DWELLING UNITS / ACRE
   3.74 ACRES X 20 = 75 UNITS PERMITTED (75 PROPOSED)
10. UNIT COMPOSITION: 18 STUDIO (RENOVATED)
    15 ONE BEDROOM (RENOVATED)
    3 TWO BEDROOM (RENOVATED)
    36 TWO BEDROOM (NEW)
    3 THREE BEDROOM (RENOVATED)
    75 TOTAL UNITS
11. PARKING REQUIREMENTS:
    DWELLING UNITS: 1.3 SPACES PER DWELLING UNIT OVER 750 S.F.
    75 UNITS x 1.3 = 98 SPACES REQUIRED
    VISITOR PARKING: 1 SPACE PER 5 DWELLING UNITS
    75 UNITS / 5 = 15 SPACES REQUIRED
    TOTAL PARKING REQUIRED: 113 SPACES
    TOTAL PARKING PROVIDED: 129 SPACES (16 SPACE/14.2% SURPLUS)
12. THE FOLLOWING VARIANCE FROM THE PORTSMOUTH ZONING ORDINANCE IS REQUIRED FOR THIS PROJECT:

    SECTION 10.5B53.10 – TO ALLOW NEW BUILDINGS TO BE CONSTRUCTED OUTSIDE THE REQUIRED 70'-90' FRONT BUILDING SETBACK WHERE THE MINIMUM REQUIRED FRONT BUILDOUT IS NOT MET (50% REQUIRED, 34.3% PROVIDED).

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

NOT FOR CONSTRUCTION

ISSUED FOR: BOARD OF ADJUSTMENT

ISSUE DATE: APRIL 28, 2021

REVISIONS

NO.	DESCRIPTION	BY	DATE
1	ZBA	EBS	04.28.21

DRAWN BY: EBS
APPROVED BY: EBS
DRAWING FILE: 5161-ZBA.dwg

SCALE: 22"x34" 1" = 30'
11"x17" 1" = 60'

OWNER/APPLICANT:
MONARCH VILLAGE, LLC
P.O. BOX 365
EAST HAMPSTEAD, NH 03826

PROJECT:
MONARCH VILLAGE
TAX MAP 297 LOT 6
3548 LAFAYETTE ROAD
PORTSMOUTH, NH 03801

TITLE:
BOARD OF ADJUSTMENT SITE PLAN

SHEET NUMBER:
1 of 1

P5161

Attachment 1

New Hampshire DOT
Department of Transportation

MS2
Transportation Data Management System

List View | All DIRs

Record 1 of 1 Goto Record go

Location ID	82379021	MPO ID	
Type	SPOT	HPMS ID	
On NHS	Yes	On HPMS	Yes
LRS ID	U0000001__	LRS Loc Pt.	
SF Group	04	Route Type	
AF Group	04	Route	US 1
GF Group	E	Active	Yes
Class Dist Grp	Default	Category	3
Seas Clss Grp	Default		
WIM Group	Default		
QC Group	Default		
Fnct'l Class	Other Principal Arterial	Milepost	
Located On	Lafayette Rd		
Loc On Alias	US 1 (LAFAYETTE RD) AT RYE TL		

More Detail

STATION DATA

Directions: 2-WAY | NB | SB

AADT

	Year	AADT	DHV-30	K %	D %	PA	BC	Src
	2020	15,268	1,462	10	51	14,192 (93%)	1,076 (7%)	
	2019	18,297[3]		10	51	16,759 (92%)	1,538 (8%)	Grown from 2018
	2018	18,080[3]		10	51	16,671 (92%)	1,409 (8%)	Grown from 2017
	2017	17,725	1,741	10	51	16,448 (93%)	1,277 (7%)	
	2016	22,063[3]				20,122 (91%)	1,941 (9%)	Grown from 2015

|<< < > >>| 1-5 of 15

Travel Demand Model

	Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV

VOLUME COUNT

	Date	Int	Total
	Thu 8/13/2020	60	17,905
	Wed 8/12/2020	60	17,749
	Tue 8/11/2020	60	17,330
	Thu 8/31/2017	60	19,847
	Wed 8/30/2017	60	21,222
	Tue 8/29/2017	60	19,987
	Fri 8/1/2014	60	25,642
	Thu 7/31/2014	60	25,355
	Wed 7/30/2014	60	25,063

VOLUME TREND

Year	Annual Growth
2020	-17%
2019	1%
2018	2%
2017	-20%
2016	2%
2015	3%
2014	7%
2011	6%

New Hampshire DOT
Department of Transportation

MS2
Transportation Data Management System

Excel Version

Weekly Volume Report			
Location ID:	82379021	**Type:**	SPOT
Located On:	Lafayette Rd	**:**	
Direction:	2-WAY		
Community:	PORTSMOUTH	**Period:**	Mon 8/10/2020 - Sun 8/16/2020
AADT:	15268		

Start Time	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Avg	Graph
12:00 AM		39	44	56				46	0.3%
1:00 AM		44	33	34				37	0.2%
2:00 AM		21	26	23				23	0.1%
3:00 AM		33	29	30				31	0.2%
4:00 AM		72	83	95				83	0.5%
5:00 AM		238	317	249				268	1.5%
6:00 AM		568	586	584				579	3.3%
7:00 AM		911	928	917				919	5.2%
8:00 AM		1060	1039	1045				1,048	5.9%
9:00 AM		1147	1070	1052				1,090	6.2%
10:00 AM		1128	1210	1211				1,183	6.7%
11:00 AM		1247	1261	1342				1,283	7.3%
12:00 PM		1326	1342	1406				1,358	7.7%
1:00 PM		1244	1272	1334				1,283	7.3%
2:00 PM		1274	1312	1325				1,304	7.4%
3:00 PM		1399	1345	1424				1,389	7.9%
4:00 PM		1373	1458	1462				1,431	8.1%
5:00 PM		1280	1308	1325				1,304	7.4%
6:00 PM		1008	1092	1019				1,040	5.9%
7:00 PM		782	875	798				818	4.6%
8:00 PM		586	580	594				587	3.3%
9:00 PM		313	266	293				291	1.6%
10:00 PM		145	174	204				174	1.0%
11:00 PM		92	99	83				91	0.5%
Total	**0**	**17,330**	**17,749**	**17,905**	**0**	**0**	**0**		
24hr Total		17330	17749	17905				17,661	
AM Pk Hr		11:00	11:00	11:00					
AM Peak		1247	1261	1342				1,283	
PM Pk Hr		3:00	4:00	4:00					
PM Peak		1399	1458	1462				1,440	
% Pk Hr		8.07%	8.21%	8.17%				8.15%	

New Hampshire DOT
Department of Transportation

MS2
Transportation Data Management System

Excel Version

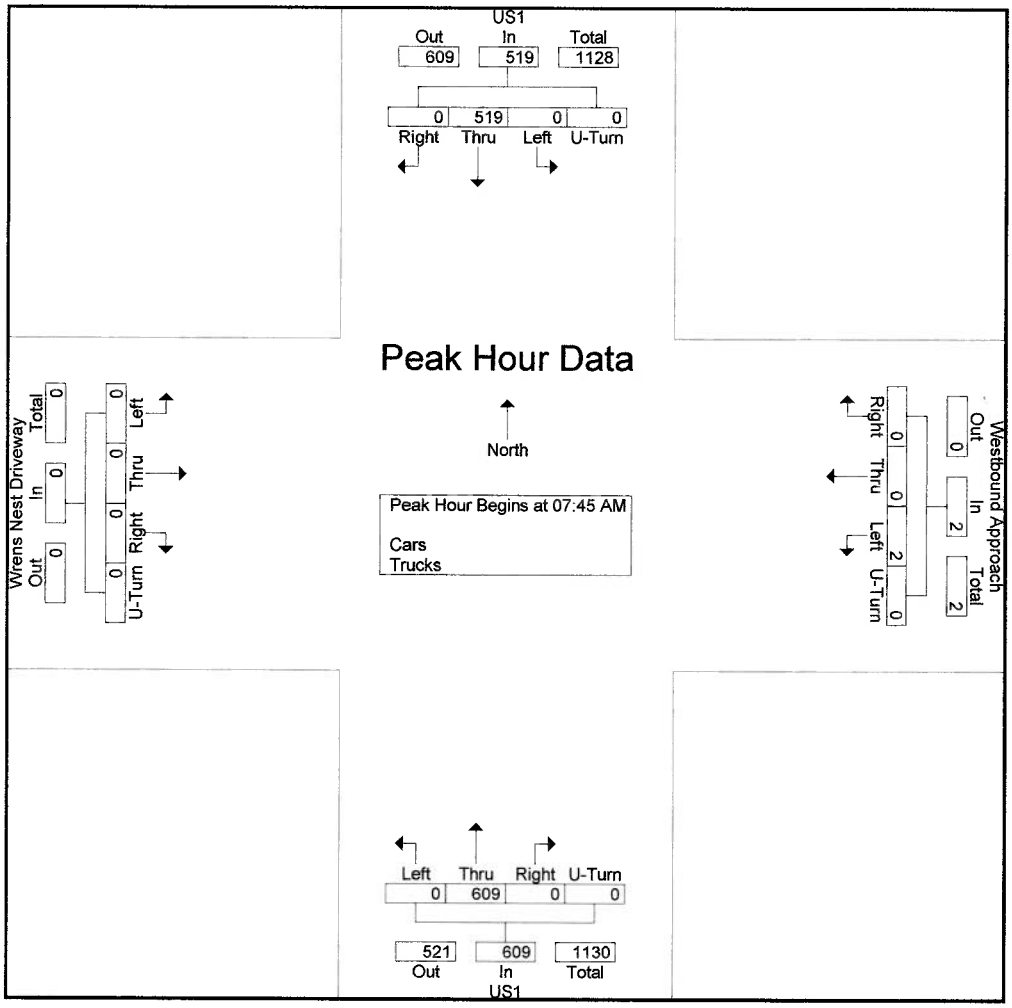
Weekly Volume Report			
Location ID:	82379021	**Type:**	SPOT
Located On:	Lafayette Rd	**:**	
Direction:	2-WAY		
Community:	PORTSMOUTH	**Period:**	Mon 8/28/2017 - Sun 9/3/2017
AADT:	17725		

Start Time	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Avg	Graph
12:00 AM		82	75	38				65	0.3%
1:00 AM		43	47	29				40	0.2%
2:00 AM		18	31	17				22	0.1%
3:00 AM		47	40	54				47	0.2%
4:00 AM		69	74	114				86	0.4%
5:00 AM		360	348	343				350	1.7%
6:00 AM		820	693	672				728	3.6%
7:00 AM		1232	1115	1268				1,205	5.9%
8:00 AM		1396	1238	1357				1,330	6.5%
9:00 AM		1156	1236	1195				1,196	5.9%
10:00 AM		1233	1357	1183				1,258	6.2%
11:00 AM		1325	1443	1376				1,381	6.8%
12:00 PM		1490	1630	1446				1,522	7.5%
1:00 PM		1365	1663	1276				1,435	7.0%
2:00 PM		1424	1712	1436				1,524	7.5%
3:00 PM		1530	1741	1521				1,597	7.8%
4:00 PM		1581	1618	1614				1,604	7.9%
5:00 PM		1592	1609	1572				1,591	7.8%
6:00 PM		1166	1310	1186				1,221	6.0%
7:00 PM		818	882	885				862	4.2%
8:00 PM		614	552	595				587	2.9%
9:00 PM		331	432	379				381	1.9%
10:00 PM		179	260	175				205	1.0%
11:00 PM		116	116	116				116	0.6%
Total	**0**	**19,987**	**21,222**	**19,847**	**0**	**0**	**0**		
24hr Total		19987	21222	19847				20,352	
AM Pk Hr		8:00	11:00	11:00					
AM Peak		1396	1443	1376				1,405	
PM Pk Hr		5:00	3:00	4:00					
PM Peak		1592	1741	1614				1,649	
% Pk Hr		7.97%	8.20%	8.13%				8.10%	

Stephen G. Pernaw & Company, Inc.
P.O. Box 1721
Concord, New Hampshire 03302

File Name : 2109A_852343_07-01-2021
Site Code :
Start Date : 7/1/2021
Page No : 2

	US1 From North					Westbound Approach From East					US1 From South					Wrens Nest Driveway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	137	0	0	137	0	0	**2**	0	**2**	0	163	0	0	163	0	0	0	0	0	**302**
08:00 AM	0	128	0	0	128	0	0	0	0	0	0	139	0	0	139	0	0	0	0	0	267
08:15 AM	0	115	0	0	115	0	0	0	0	0	0	**170**	0	0	**170**	0	0	0	0	0	285
08:30 AM	0	**139**	0	0	**139**	0	0	0	0	0	0	137	0	0	137	0	0	0	0	0	276
Total Volume	0	519	0	0	519	0	0	2	0	2	0	609	0	0	609	0	0	0	0	0	1130
% App. Total	0	100	0	0		0	0	100	0		0	100	0	0		0	0	0	0		
PHF	.000	.933	.000	.000	.933	.000	.000	.250	.000	.250	.000	.896	.000	.000	.896	.000	.000	.000	.000	.000	.935



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File Name : 2109A_852343_07-01-2021
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Start Date : 7/1/2021
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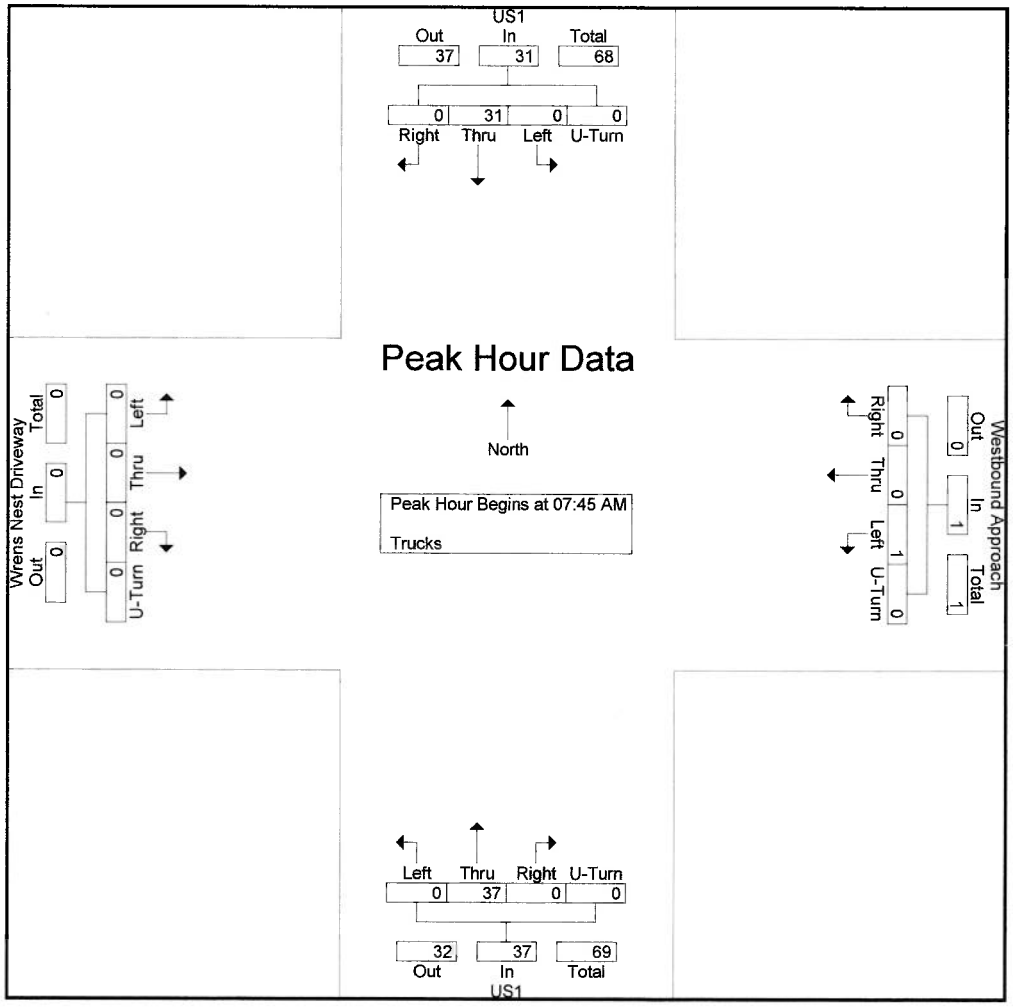
	US1 From North					Westbound Approach From East					US1 From South					Wrens Nest Driveway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	8	0	0	8	0	0	**1**	0	**1**	0	6	0	0	6	0	0	0	0	0	15
08:00 AM	0	**10**	0	0	**10**	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	17
08:15 AM	0	7	0	0	7	0	0	0	0	0	0	**14**	0	0	**14**	0	0	0	0	0	**21**
08:30 AM	0	6	0	0	6	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	16
Total Volume	0	31	0	0	31	0	0	1	0	1	0	37	0	0	37	0	0	0	0	0	69
% App. Total	0	100	0	0		0	0	100	0		0	100	0	0		0	0	0	0		
PHF	.000	.775	.000	.000	.775	.000	.000	.250	.000	.250	.000	.661	.000	.000	.661	.000	.000	.000	.000	.000	.821



Stephen G. Pernaw & Company, Inc.

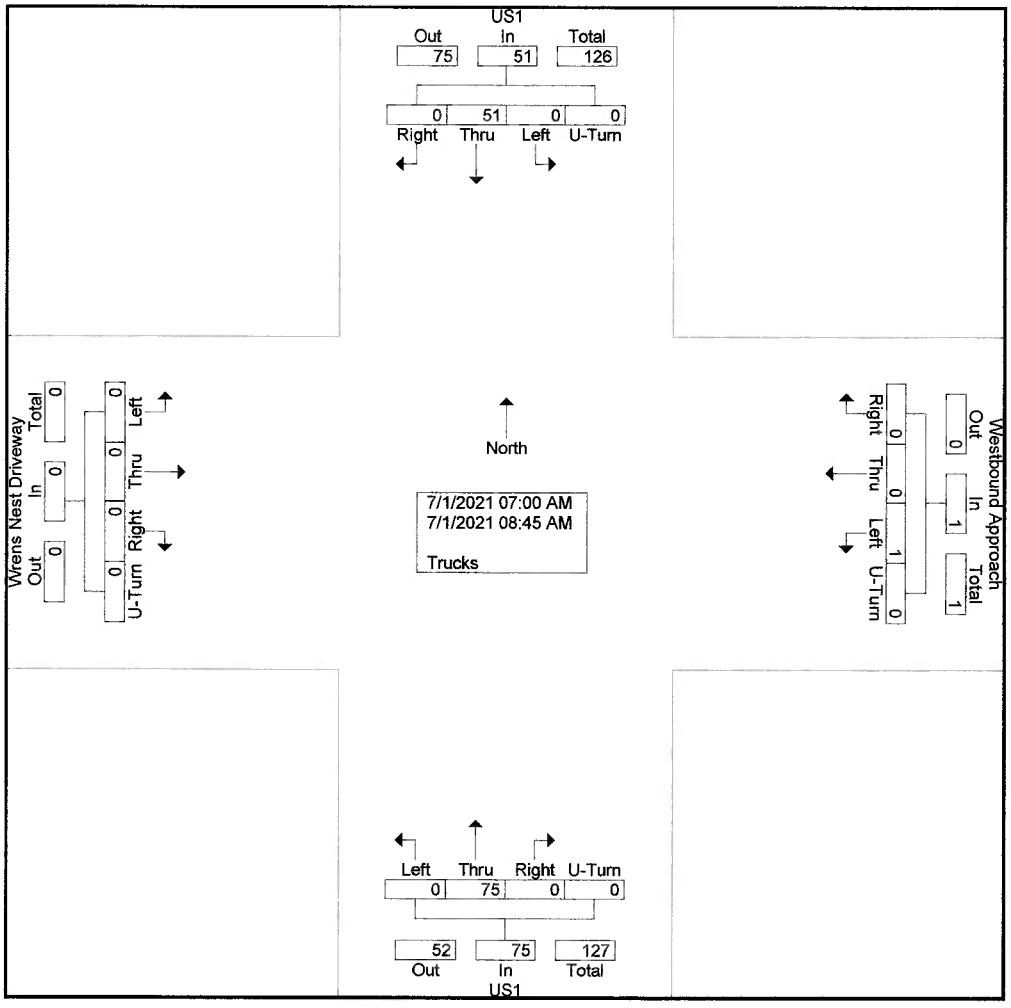
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Number: 2109A
Town/State: Portsmouth, New Hampshire

File Name : 2109A_852343_07-01-2021
Site Code :
Start Date : 7/1/2021
Page No : 1

Groups Printed- Trucks

	US1 From North					Westbound Approach From East					US1 From South					Wrens Nest Driveway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
07:00 AM	0	3	0	0	3	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	13
07:15 AM	0	8	0	0	8	0	0	0	0	0	0	15	0	0	15	0	0	0	0	0	23
07:30 AM	0	4	0	0	4	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	11
07:45 AM	0	8	0	0	8	0	0	1	0	1	0	6	0	0	6	0	0	0	0	0	15
Total	0	23	0	0	23	0	0	1	0	1	0	38	0	0	38	0	0	0	0	0	62
08:00 AM	0	10	0	0	10	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	17
08:15 AM	0	7	0	0	7	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	21
08:30 AM	0	6	0	0	6	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	16
08:45 AM	0	5	0	0	5	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	11
Total	0	28	0	0	28	0	0	0	0	0	0	37	0	0	37	0	0	0	0	0	65
Grand Total	0	51	0	0	51	0	0	1	0	1	0	75	0	0	75	0	0	0	0	0	127
Apprch %	0	100	0	0		0	0	100	0		0	100	0	0		0	0	0	0		
Total %	0	40.2	0	0	40.2	0	0	0.8	0	0.8	0	59.1	0	0	59.1	0	0	0	0	0	



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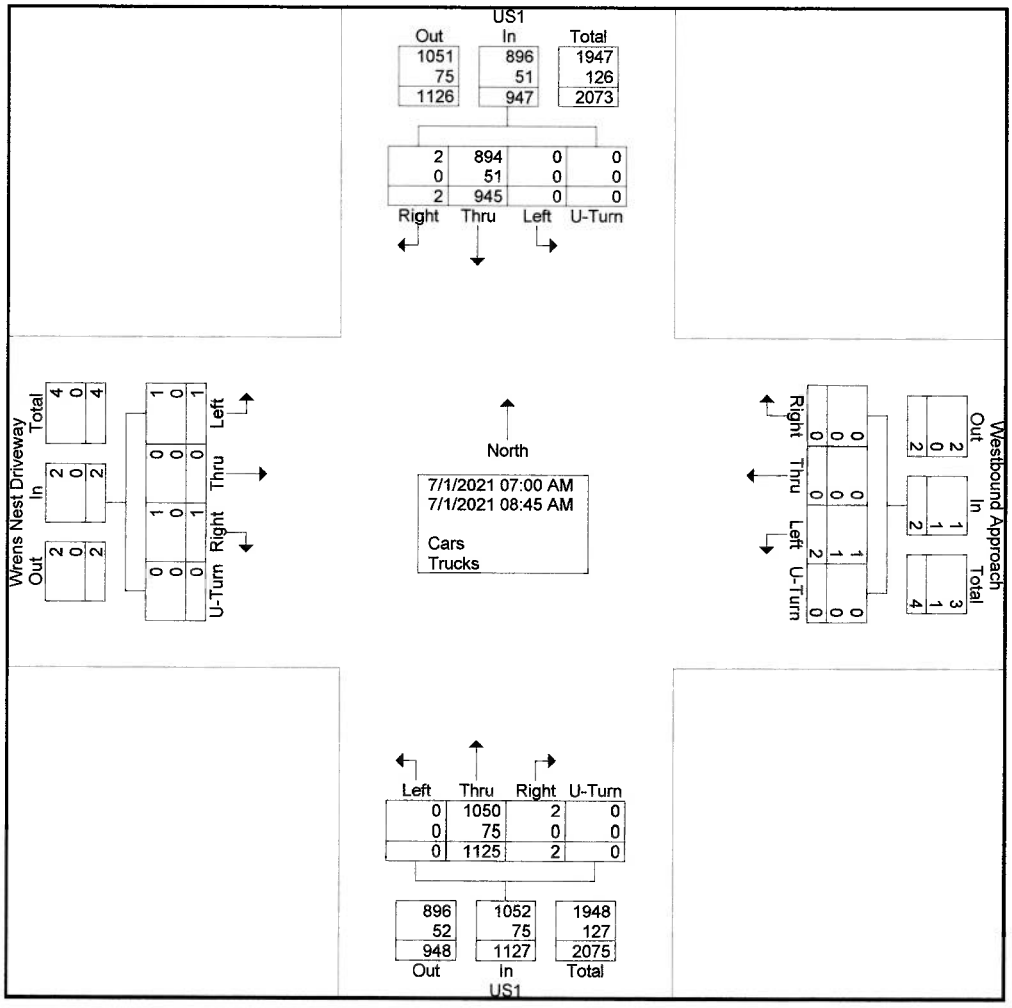
P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Number: 2109A
Town/State: Portsmouth, New Hampshire

File Name : 2109A_852343_07-01-2021
Site Code :
Start Date : 7/1/2021
Page No : 1

Groups Printed- Cars - Trucks

	US1 From North					Westbound Approach From East					US1 From South					Wrens Nest Driveway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
07:00 AM	2	76	0	0	78	0	0	0	0	0	0	109	0	0	109	0	0	1	0	1	188
07:15 AM	0	92	0	0	92	0	0	0	0	0	2	125	0	0	127	0	0	0	0	0	219
07:30 AM	0	103	0	0	103	0	0	0	0	0	0	140	0	0	140	1	0	0	0	1	244
07:45 AM	0	137	0	0	137	0	0	2	0	2	0	163	0	0	163	0	0	0	0	0	302
Total	2	408	0	0	410	0	0	2	0	2	2	537	0	0	539	1	0	1	0	2	953
08:00 AM	0	128	0	0	128	0	0	0	0	0	0	139	0	0	139	0	0	0	0	0	267
08:15 AM	0	115	0	0	115	0	0	0	0	0	0	170	0	0	170	0	0	0	0	0	285
08:30 AM	0	139	0	0	139	0	0	0	0	0	0	137	0	0	137	0	0	0	0	0	276
08:45 AM	0	155	0	0	155	0	0	0	0	0	0	142	0	0	142	0	0	0	0	0	297
Total	0	537	0	0	537	0	0	0	0	0	0	588	0	0	588	0	0	0	0	0	1125
Grand Total	2	945	0	0	947	0	0	2	0	2	2	1125	0	0	1127	1	0	1	0	2	2078
Apprch %	0.2	99.8	0	0		0	0	100	0		0.2	99.8	0	0		50	0	50	0		
Total %	0.1	45.5	0	0	45.6	0	0	0.1	0	0.1	0.1	54.1	0	0	54.2	0	0	0	0	0.1	
Cars	2	894	0	0	896	0	0	1	0	1	2	1050	0	0	1052	1	0	1	0	2	1951
% Cars	100	94.6	0	0	94.6	0	0	50	0	50	100	93.3	0	0	93.3	100	0	100	0	100	93.9
Trucks	0	51	0	0	51	0	0	1	0	1	0	75	0	0	75	0	0	0	0	0	127
% Trucks	0	5.4	0	0	5.4	0	0	50	0	50	0	6.7	0	0	6.7	0	0	0	0	0	6.1



Stephen G. Pernaw & Company, Inc.
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File Name : 2109A_852343_07-01-2021
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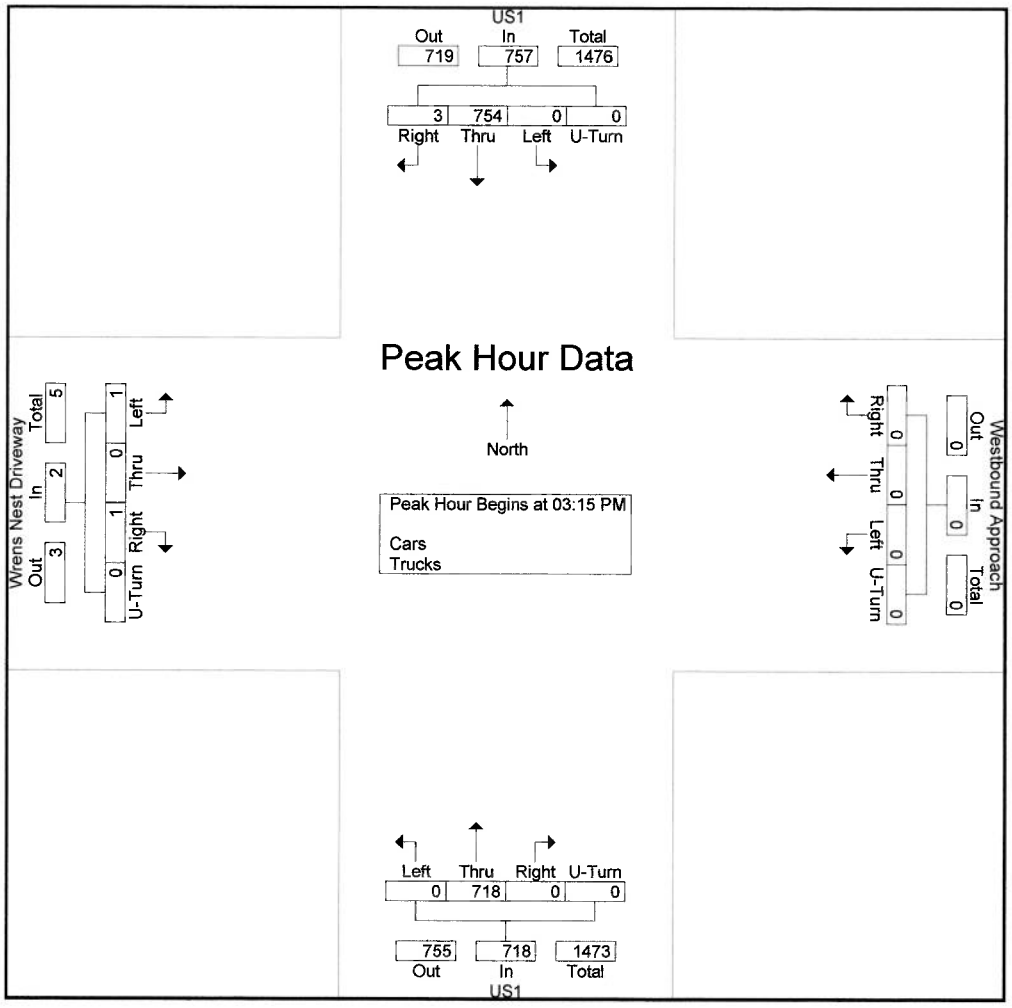
Start Date : 7/1/2021
Page No : 3

	US1 From North					Westbound Approach From East					US1 From South					Wrens Nest Driveway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:15 PM																					
03:15 PM	0	185	0	0	185	0	0	0	0	0	0	**196**	0	0	**196**	0	0	0	0	0	381
03:30 PM	1	**199**	0	0	**200**	0	0	0	0	0	0	181	0	0	181	**1**	0	**1**	0	**2**	**383**
03:45 PM	0	183	0	0	183	0	0	0	0	0	0	160	0	0	160	0	0	0	0	0	343
04:00 PM	**2**	187	0	0	189	0	0	0	0	0	0	181	0	0	181	0	0	0	0	0	370
Total Volume	3	754	0	0	757	0	0	0	0	0	0	718	0	0	718	1	0	1	0	2	1477
% App. Total	0.4	99.6	0	0		0	0	0	0		0	100	0	0		50	0	50	0		
PHF	.375	.947	.000	.000	.946	.000	.000	.000	.000	.000	.000	.916	.000	.000	.916	.250	.000	.250	.000	.250	.964



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Weather: Fair
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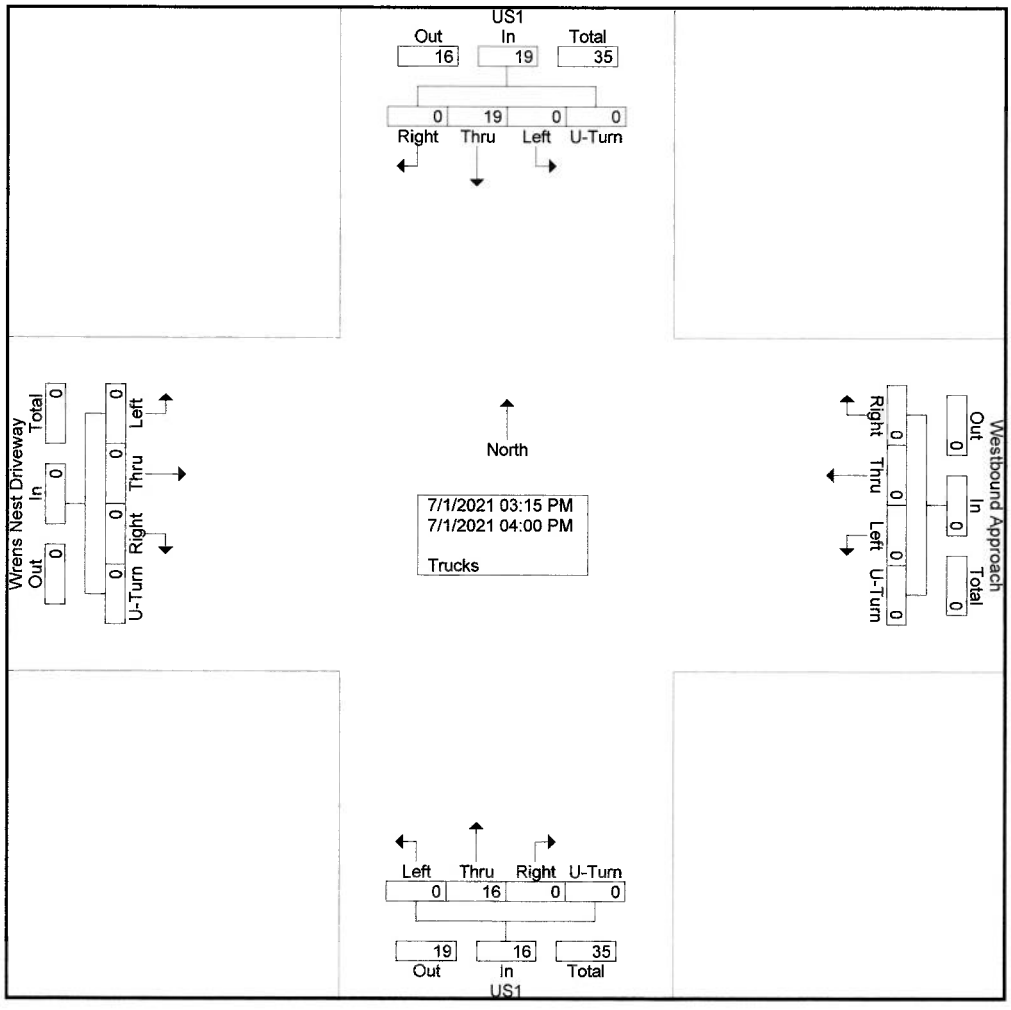
Job Number: 2109A
Town/State: Portsmouth, New Hampshire

File Name : 2109A_852343_07-01-2021
Site Code :
Start Date : 7/1/2021
Page No : 1

Groups Printed- Trucks

	US1 From North					Westbound Approach From East					US1 From South					Wrens Nest Driveway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
03:15 PM	0	6	0	0	6	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	8
03:30 PM	0	6	0	0	6	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	15
03:45 PM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
Total	0	14	0	0	14	0	0	0	0	0	0	12	0	0	12	0	0	0	0	0	26
04:00 PM	0	5	0	0	5	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	9
Grand Total	0	19	0	0	19	0	0	0	0	0	0	16	0	0	16	0	0	0	0	0	35
Apprch %	0	100	0	0		0	0	0	0		0	100	0	0		0	0	0	0		
Total %	0	54.3	0	0	54.3	0	0	0	0	0	0	45.7	0	0	45.7	0	0	0	0	0	



Stephen G. Pernaw & Company, Inc.

P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Number: 2109A
Town/State: Portsmouth, New Hampshire

File Name : 2109A_852343_07-01-2021
Site Code :
Start Date : 7/1/2021
Page No : 1

Groups Printed- Cars - Trucks

	US1 From North					Westbound Approach From East					US1 From South					Wrens Nest Driveway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
03:00 PM	0	161	0	0	161	0	0	0	0	0	0	152	0	0	152	0	0	1	0	1	314
03:15 PM	0	185	0	0	185	0	0	0	0	0	0	196	0	0	196	0	0	0	0	0	381
03:30 PM	1	199	0	0	200	0	0	0	0	0	0	181	0	0	181	1	0	1	0	2	383
03:45 PM	0	183	0	0	183	0	0	0	0	0	0	160	0	0	160	0	0	0	0	0	343
Total	1	728	0	0	729	0	0	0	0	0	0	689	0	0	689	1	0	2	0	3	1421
04:00 PM	2	187	0	0	189	0	0	0	0	0	0	181	0	0	181	0	0	0	0	0	370
04:15 PM	0	200	0	0	200	0	0	0	0	0	2	171	0	0	173	1	0	1	0	2	375
04:30 PM	0	190	0	0	190	0	0	0	0	0	0	174	0	0	174	0	0	0	0	0	364
04:45 PM	1	174	0	0	175	0	0	2	0	2	0	165	0	0	165	1	0	0	0	1	343
Total	3	751	0	0	754	0	0	2	0	2	2	691	0	0	693	2	0	1	0	3	1452
05:00 PM	0	180	0	0	180	0	0	0	0	0	0	212	0	0	212	0	0	1	0	1	393
05:15 PM	3	188	0	0	191	0	0	0	0	0	0	184	0	0	184	0	0	1	0	1	376
05:30 PM	0	169	0	0	169	0	0	0	0	0	0	182	0	0	182	0	0	1	0	1	352
05:45 PM	2	142	0	0	144	0	0	0	0	0	0	158	0	0	158	0	0	1	0	1	303
Total	5	679	0	0	684	0	0	0	0	0	0	736	0	0	736	0	0	4	0	4	1424
Grand Total	9	2158	0	0	2167	0	0	2	0	2	2	2116	0	0	2118	3	0	7	0	10	4297
Apprch %	0.4	99.6	0	0		0	0	100	0		0.1	99.9	0	0		30	0	70	0		
Total %	0.2	50.2	0	0	50.4	0	0	0	0	0	0	49.2	0	0	49.3	0.1	0	0.2	0	0.2	
Cars	9	2120	0	0	2129	0	0	2	0	2	1	2086	0	0	2087	3	0	7	0	10	4228
% Cars	100	98.2	0	0	98.2	0	0	100	0	100	50	98.6	0	0	98.5	100	0	100	0	100	98.4
Trucks	0	38	0	0	38	0	0	0	0	0	1	30	0	0	31	0	0	0	0	0	69
% Trucks	0	1.8	0	0	1.8	0	0	0	0	0	50	1.4	0	0	1.5	0	0	0	0	0	1.6

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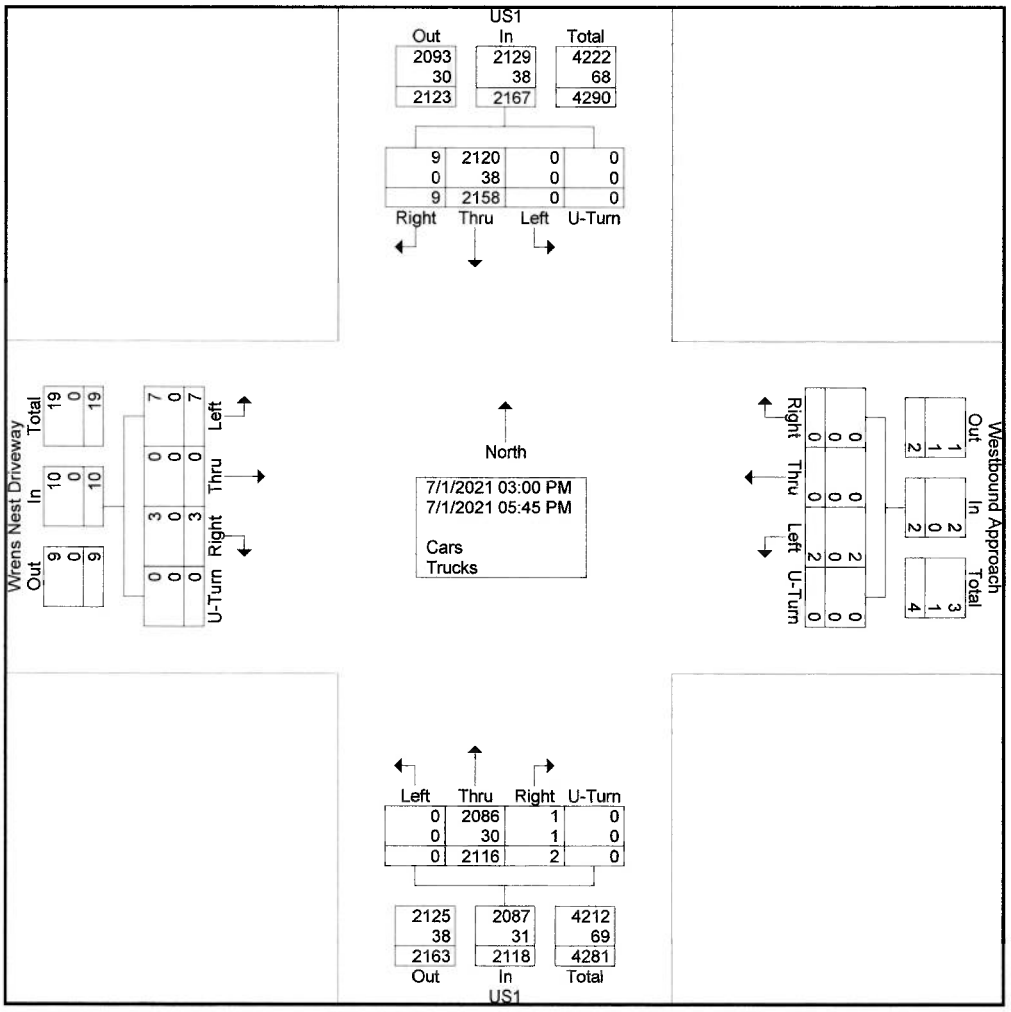
Concord, New Hampshire 03302

File Name : 2109A_852343_07-01-2021
Site Code :
Start Date : 7/1/2021
Page No : 2



Stephen G. Pernaw & Company, Inc.

P.O. Box 1721
Concord, New Hampshire 03302

Weather: Fair
Collected By: MV
Job Number: 2109A
Town/State: Portsmouth, New Hampshire

File Name : 2109A_852343_07-01-2021
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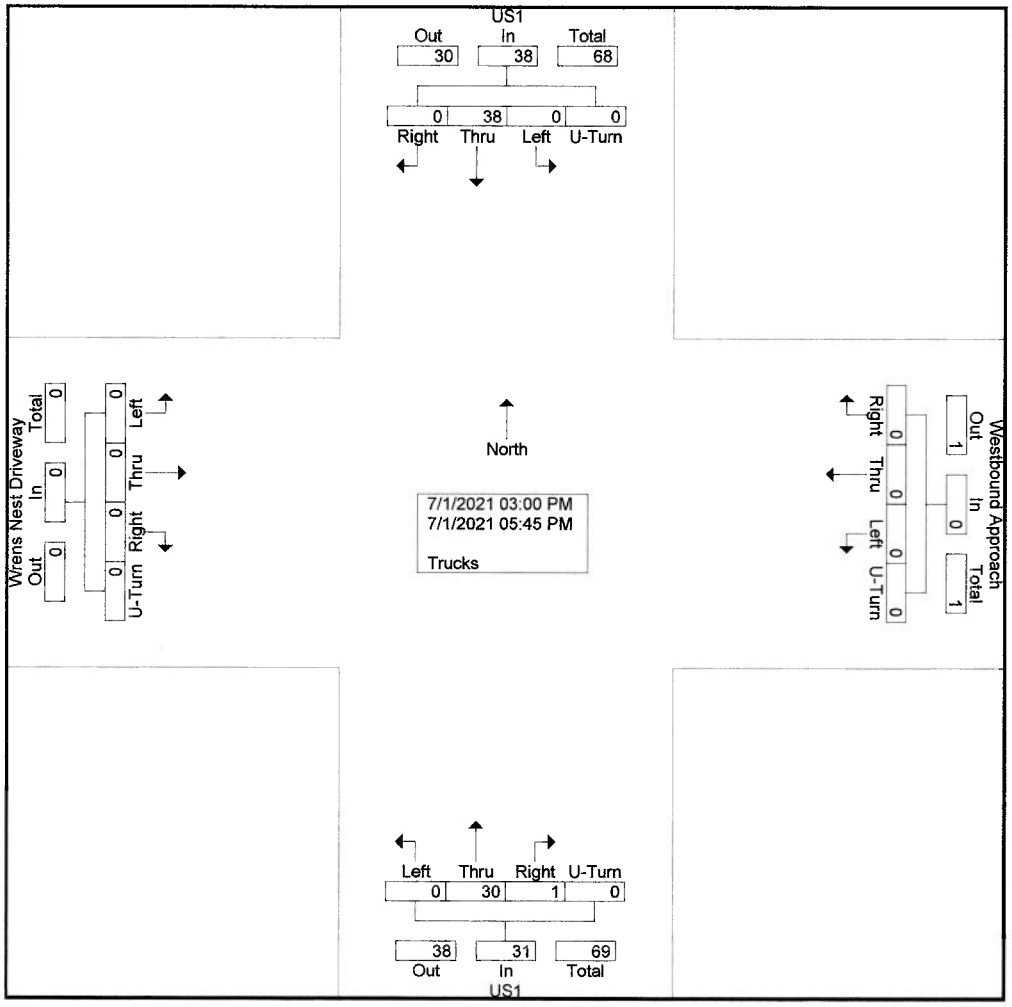
Groups Printed- Trucks

	US1 From North					Westbound Approach From East					US1 From South					Wrens Nest Driveway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
03:00 PM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
03:15 PM	0	6	0	0	6	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	8
03:30 PM	0	6	0	0	6	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	15
03:45 PM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
Total	0	16	0	0	16	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	29
04:00 PM	0	5	0	0	5	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	9
04:15 PM	0	5	0	0	5	0	0	0	0	0	1	4	0	0	5	0	0	0	0	0	10
04:30 PM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
04:45 PM	0	7	0	0	7	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	8
Total	0	18	0	0	18	0	0	0	0	0	1	11	0	0	12	0	0	0	0	0	30
05:00 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
05:15 PM	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	4
05:30 PM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Total	0	4	0	0	4	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	10
Grand Total	0	38	0	0	38	0	0	0	0	0	1	30	0	0	31	0	0	0	0	0	69
Apprch %	0	100	0	0		0	0	0	0		3.2	96.8	0	0		0	0	0	0		
Total %	0	55.1	0	0	55.1	0	0	0	0	0	1.4	43.5	0	0	44.9	0	0	0	0	0	



Trip Generation Summary

Alternative: 3548 Lafayette Road, Portsmouth, NH
Phase:
Project: 2109A

Open Date: 6/22/2021
Analysis Date: 6/22/2021

ITE	Land Use		Weekday Average Daily Trips *	Enter	Exit	Total	Weekday AM Peak Hour of Adjacent Street Traffic *	Enter	Exit	Total	Weekday PM Peak Hour of Adjacent Street Traffic *	Enter	Exit	Total
320	MOTEL 1			56	55	111		5	8	13		7	6	13
	33	Rooms												
220	LOW-RISE 1			275	274	549		8	28	36		29	17	46
	75	Dwelling Units												
Unadjusted Volume				331	329	660		13	36	49		36	23	59
Internal Capture Trips				0	0	0		0	0	0		1	1	2
Pass-By Trips				0	0	0		0	0	0		0	0	0
Volume Added to Adjacent Streets				331	329	660		13	36	49		35	22	57

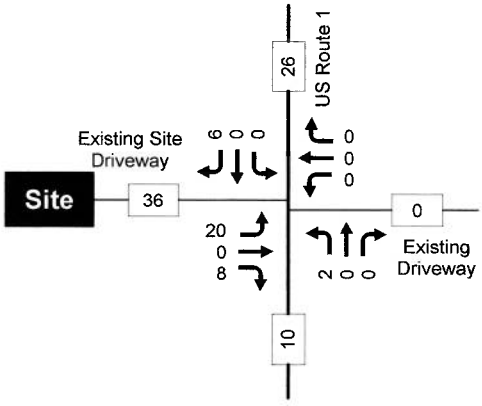
Total Weekday Average Daily Trips Internal Capture = 0 Percent
Total Weekday AM Peak Hour of Adjacent Street Traffic Internal Capture = 0 Percent
Total Weekday PM Peak Hour of Adjacent Street Traffic Internal Capture = 3 Percent

* - Custom rate used for selected time period.

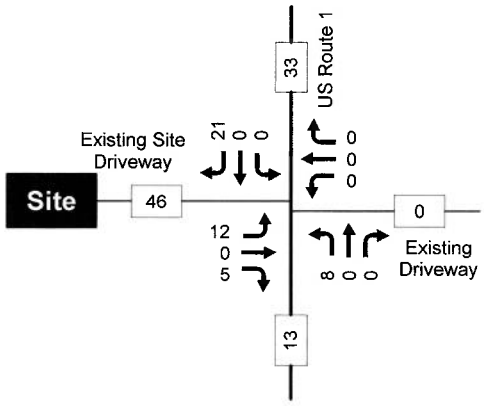
Source: Institute of Transportation Engineers, Trip Generation Manual 10th Edition
TRIP GENERATION 10, TRAFFICWARE, LLC

Attachment 14

Pernaw & Company, Inc



AM Peak Hour



PM Peak Hour

2109A

NORTH

Attachment

Site Generated Traffic Volumes

Traffic Evaluation, Proposed Residential Development, Portsmouth, New Hampshire

Seasonal Adjustment Factors
NHDOT Group 4 (Urban Highways)

Stephen G. Pernaw & Company, Inc.

Year 2019 Monthly Data - Urban

		Adjustment to	
Month	ADT	Average	Peak
Jan	11,431	1.12	1.23
Feb	11,848	1.08	1.18
Mar	12,141	1.06	1.15
Apr	12,860	1.00	1.09
May	13,551	0.95	1.03
Jun	13,785	0.93	1.02
Jul	13,942	0.92	1.01
Aug	14,016	0.92	1.00
Sep	13,379	0.96	1.05
Oct	13,339	0.96	1.05
Nov	12,265	1.05	1.14
Dec	11,496	1.12	1.22

Year 2018 Monthly Data - Urban

		Adjustment to	
Month	ADT	Average	Peak
Jan	11,282	1.13	1.24
Feb	11,848	1.08	1.18
Mar	11,828	1.08	1.18
Apr	12,491	1.02	1.12
May	13,587	0.94	1.03
Jun	13,911	0.92	1.00
Jul	13,765	0.93	1.01
Aug	13,945	0.92	1.00
Sep	13,168	0.97	1.06
Oct	13,367	0.96	1.04
Nov	12,215	1.05	1.14
Dec	11,963	1.07	1.17

Year 2017 Monthly Data - Urban

		Adjustment to	
Month	ADT	Average	Peak
Jan	12254	1.21	1.33
Feb	13494	1.10	1.21
Mar	14,335	1.03	1.14
Apr	15004	0.99	1.09
May	15547	0.95	1.05
Jun	16310	0.91	1.00
Jul	15523	0.95	1.05
Aug	15974	0.93	1.02
Sep	15546	0.95	1.05
Oct	15104	0.98	1.08
Nov	14,544	1.02	1.12
Dec	14151	1.05	1.15

July To Peak-Month Factor	**1.02**

August To Peak-Month Factor	**1.01**

Stephen G. Pernaw & Company, Inc.

STEPHEN G. PERNAW & COMPANY, INC.
PROJECT: Proposed Residential Development, Portsmouth, New Hampshire
NUMBER: 2109A
COUNT STATION: 82379021

HISTORICAL GROWTH CALCULATIONS

LOCATION : US1 (at Rye Townline) - Portsmouth, NH
CASE : AADT

ARITHMETIC PROJECTIONS

YEAR	AADT
2016	22063
2017	17725
2018	18080
2019	18297

Regression Output:

Constant	2226791.5
Std Err of Y Est	1782.4049
R Squared	0.4851527
No. of Observations	4
Degrees of Freedom	2
X Coefficient	-1094.3
Std Err of Coef.	797.11569

PROJECTIONS

2021	15211
2022	14117
2023	13023
2024	11928
2025	10834
2026	9740
2027	8645
2028	7551
2029	6457
2030	5363
2031	4268

RATE = -1094 VPD/YEAR

GEOMETRIC PROJECTIONS

YEAR	AADT	Ln AADT
2016	22063	10.00166
2017	17725	9.78273
2018	18080	9.80256
2019	18297	9.81449

Regression Output:

Constant	119.13115
Std Err of Y Est	0.090459
R Squared	0.4726824
No. of Observations	4
Degrees of Freedom	2
X Coefficient	-0.0541664
Std Err of Coef.	0.0404545

PROJECTIONS

2021	15690
2022	14863
2023	14079
2024	13337
2025	12634
2026	11967
2027	11336
2028	10739
2029	10173
2030	9636
2031	9128

CONCLUSION: USE 1%/YEAR

RATE = -5.3 % / YEAR

Stephen G. Pernaw & Company, Inc.

CALCULATION SHEET

Attachment 18

Project:	Residential Development	Job Number:	2109A
Calculated By:	SGP	Date:	7/14/2021
Checked By:	CA	Date:	7/14/2021
Sheet No:	1	Of:	1
Subject:	COVID-19 Adjustment Factor		

I. Given:

1. NHDOT short term traffic count (Station 82379021) on US Route 1 (at Rye Townline) - Portsmouth, NH
   - A. August 2017 average weekday volume = 20,352 vpd
   - B. August 2020 average weekday volume = 17,661 vpd
   - C. Annual growth rate = 1.0% per year
   - D. Peak Month Factor = 1.01

2. Calculate 2021 August volume (w/o Covid) from August 2017

   $20352 \times 1.01^4 \times 1.01 = 21{,}390$

3. Calculate 2021 August volume (w/Covid) from August 2020

   $17661 \times 1.01 \times 1.01 = 18{,}016$

3. Calculate Covid Factor

$$\text{August 2021 estimate w/o Covid} = \frac{21{,}390}{\text{August 2021 actual volume w/Covid} = 18{,}016} = 1.19$$

Stephen G. Pernaw & Company, Inc.

TRIP DISTRIBUTION ANALYSIS - Portsmouth, New Hampshire

A. Work Destination Report - Where Workers are Employed Who Live in Portsmouth, New Hampshire

		Gateway %		Gateway Allocation		
		Rt 1 N	Rt 1 S	Rt 1 N	Rt 1 S	
	Count					
Portsmouth city (Rockingham, NH)	4,293	0.90	0.10	3864	429	4293
Dover city (Strafford, NH)	563	1.00		563	0	563
Manchester city (Hillsborough, NH)	433		1.00	0	433	433
Exeter town (Rockingham, NH)	385		1.00	0	385	385
Boston city (Suffolk, MA)	381	0.50	0.50	191	191	382
Newington town (Rockingham, NH)	380	0.90	0.10	342	38	380
Durham town (Strafford, NH)	301	1.00		301	0	301
Hampton town (Rockingham, NH)	275		1.00	0	275	275
Nashua city (Hillsborough, NH)	236		1.00	0	236	236
Rochester city (Strafford, NH)	212	1.00		212	0	212
	7459			5473	1987	7460
				73.4%	26.6%	100%
				73	27	100

Attachment 19

Stephen G. Pernaw & Company, Inc.

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

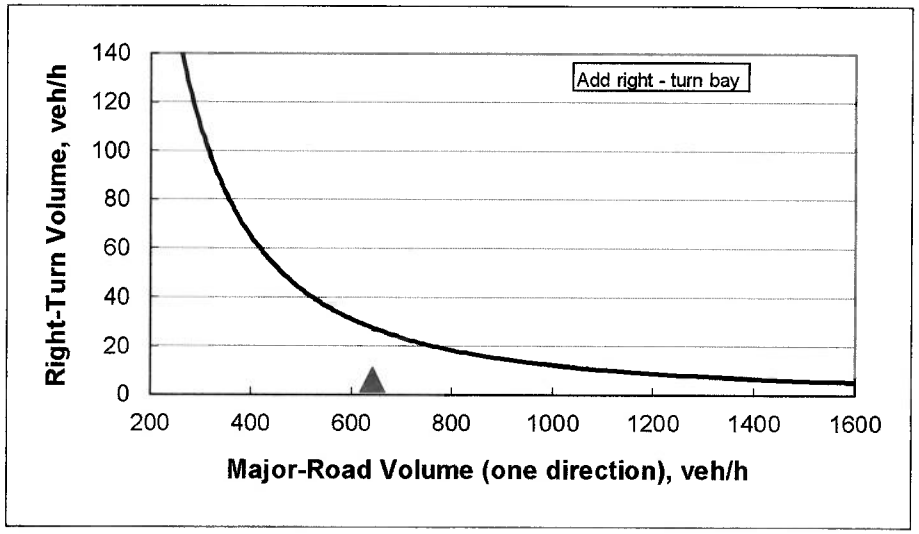
INPUT

2-lane roadw ay

Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	642
Right-turn volume, veh/h:	6

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	27
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	



Attachment 20

Stephen G. Pernaw & Company, Inc.

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

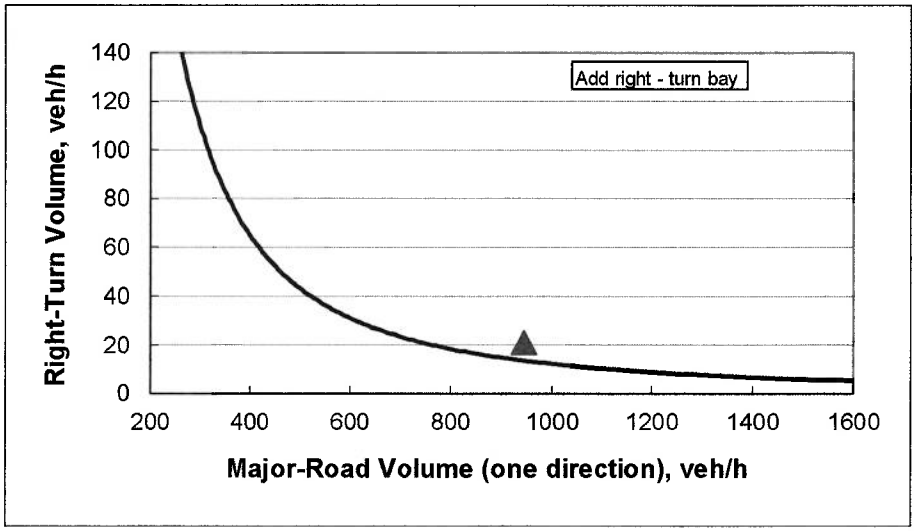
INPUT

2-lane roadway

Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	945
Right-turn volume, veh/h:	21

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	13
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Add right-turn bay.	



Attachment 21

Stephen G. Pernaw & Company, Inc.

Figure 2 - 4. Guideline for determining minor-road approach geometry at two-way stop-controlled intersections.

INPUT

Variable	Value
Major-road volume (total of both directions), veh/h:	1536
Percentage of right-turns on minor road, %:	29%
Minor-road volume (one direction), veh/h:	28

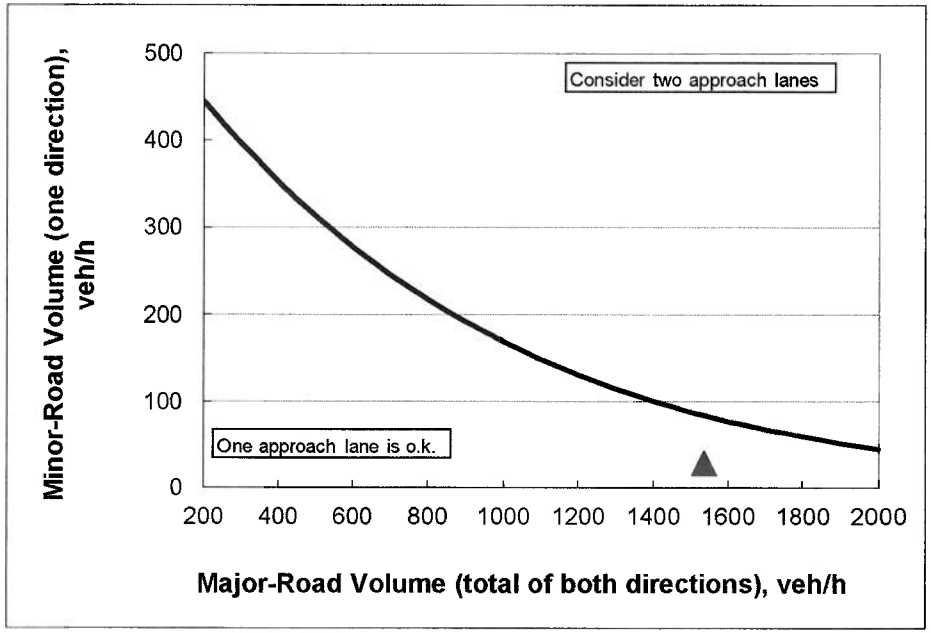
OUTPUT

Variable	Value
Limiting minor-road volume (one direction), veh/h:	84
Guidance for determining minor-road approach geometry:	
ONE approach lane is o.k.	

CALIBRATION CONSTANTS

Minor Road	Critical gap, s:	Follow-up gap, s:
Right-turn capacity, veh/h:	6.2	3.3
Left-turn and through capacity, veh/h:	6.5	4.0

* according to Table 17 - 5 of the HCM



Stephen G. Pernaw & Company, Inc.

Figure 2 - 4. Guideline for determining minor-road approach geometry at two-way stop-controlled intersections.

INPUT

Variable	Value
Major-road volume (total of both directions), veh/h:	2022
Percentage of right-turns on minor road, %:	29%
Minor-road volume (one direction), veh/h:	17

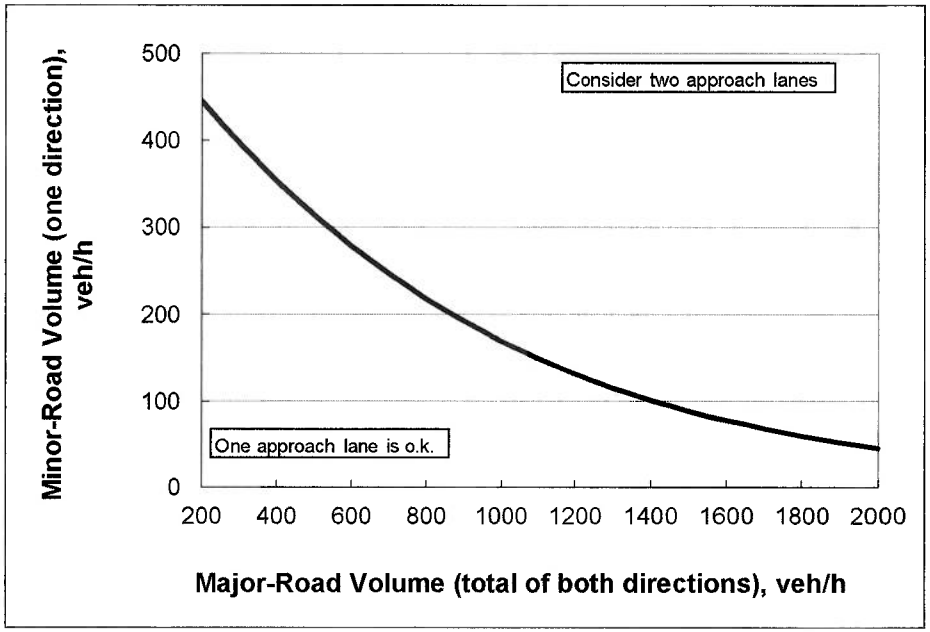
OUTPUT

Variable	Value
Limiting minor-road volume (one direction), veh/h:	43
Guidance for determining minor-road approach geometry:	
ONE approach lane is o.k.	

CALIBRATION CONSTANTS

Minor Road	Critical gap, s:	Follow-up gap, s:
Right-turn capacity, veh/h:	6.2	3.3
Left-turn and through capacity, veh/h:	6.5	4.0

* according to Table 17 - 5 of the HCM



Attachment 23

169 Ocean Boulevard/PO Box 249
Hampton, NH 03842
603.601.8154
TheEngineeringCorp.com
Create | Design | Innovate

Peter Stith
Senior Planner
City of Portsmouth Planning Department
City Hall, 3rd Floor
1 Junkins Avenue
Portsmouth, NH 03801

October 18, 2021

Ref. T1166

Re: Lafayette Road Development – Residential Development
Transportation Peer Review

Dear Mr. Stith:

On behalf of the City of Portsmouth, TEC, Inc. (TEC) has reviewed documents as part of the transportation engineering peer review of a residential development located on the west side of US Route 1 (Lafayette Road) in Portsmouth. The project consists of replacing a 33-room inn with 75 new residential apartment units in eight buildings. The project includes a total of 123 parking spaces on-site.

Altus Engineering, Inc. submitted the following documents on behalf of Monarch Village, LLC (the "Applicant"), which TEC reviewed for conformance with the City of Portsmouth Zoning Bylaws and generally accepted industry standards:

- *Proposed Residential Development – Traffic Evaluation*, prepared for Altus Engineering by Pernaw & Company – August 3, 2021
- *Site Plans* - prepared by Altus Engineering – August 23, 2021

TEC completed a review of these documents for the City of Portsmouth, and the following provides a summary of the comments that were compiled during our review:

Transportation Impact Evaluation

1. The Traffic Evaluation presents a study area intersection at the site driveway and Lafayette Road (US 1). TEC concurs with the scope of the study area and does not find that additional intersections are warranted based upon the documented trip generation levels.
2. Traffic volume counts were conducted at the existing site driveway with Lafayette Road (US 1) in July 2021, with traffic volumes expected to be lower based on the continued presence of the Covid-19 pandemic. The adjustment factor for the Covid-19 impact was calculated by comparing historic NHDOT traffic counts at a count location along Lafayette Road (US 1) to the south of the subject site. As a result, the 2021 counted traffic volumes were adjusted upward by 1.19 percent. A seasonal adjustment factor and an annual

growth factor of 1.02 and 1.01, respectively, were applied to the counted volumes to reflect the average month condition. TEC finds this methodology to be conservative based upon a review of permanent count station data recorded by NHDOT along Lafayette Road (US 1) to the north of the site.

3. The weekday morning and weekday evening peak commuter hours were studied to determine the project's overall effect on the roadway. TEC concurs that these selected time periods are generally appropriate for a residential land use.
4. NHDOT guidance requires the study of "Opening Year" and "Horizon" (Opening Year plus 10 years) conditions. The Horizon Year for this project was noted to be 2032, indicating the Opening Year to be 2022. The adjusted 2021 traffic volumes were grown with the background growth rate to the 2032 Build Year. TEC concurs with this methodology.
5. The Traffic Evaluation uses data published in the Institute of Transportation Engineers (ITE) publication *Trip Generation, 10th Edition* to estimate the traffic generated by the proposed development. The Traffic Evaluation uses data found under Land Use Code (LUC) 220 – Multi-Family Housing (Low-Rise) for the proposed apartment units and LUC 320 – Motel for the former inn. TEC concurs that the trip generation methodology is in conformance with industry standards.
6. The vehicular traffic generated by the proposed project was distributed onto the adjacent roadway system based upon a work destination report. TEC concurs with this methodology. TEC notes that the site generated traffic volumes used in the 2032 Build Year condition include the total trips projected to be generated by the proposed apartment units. No credit was taken for the existing development volumes. TEC concurs with this calculation.
7. A traffic operations and queue analysis was not conducted in the Traffic Evaluation. The Applicant's engineer should confirm that the anticipated queue length for vehicles exiting the site driveway onto Lafayette Road (US 1) will not impact on-site circulation during peak hours.
8. An existing Two-Way-Left-Turn Lane is provided on Lafayette Road (US 1) along the site frontage, allowing left turning vehicles to exit the through traffic stream to perform their desired movement. An auxiliary Turn Lane Warrant Analysis was conducted at the site driveway intersection for a potential southbound right turn lane along Lafayette Road (US 1), concluding that a right turn lane is warranted at the location. Given the volume of site generated traffic projected to perform this movement, TEC concurs that the construction of a right turn lane is not necessary to safely accommodate entering right turning vehicles. A single lane is proposed along the site driveway approach intersecting Lafayette Road (US 1). TEC concurs that this geometry is appropriate for the subject site.
9. The Traffic Evaluation indicates that sufficient sight distances are provided for vehicles exiting the site driveway. TEC recorded similar intersection sight distances in the field. The Site Plans should indicate the areas within the required sight triangles where vegetation and signage are to be removed or kept low.

10. The Applicant should provide turning templates showing the ability of a refuse vehicle access the proposed dumpster area and egress the site through the circulation pattern without conflicting with parked vehicles.

11. A Fire Apparatus Turning Exhibit was provided for the site, indicating that a standard fire apparatus can access all areas of the site and circulate adequately. TEC defers to the City of Portsmouth Fire Department to determine whether this circulation pattern and design vehicle are acceptable.

12. Sidewalk is provided throughout a majority of the site to facilitate pedestrian access to on-site amenities and Lafayette Road (US 1). A gap in the sidewalk network exists along the community space between Buildings 7 and 8. The Applicant should consider closing this gap to allow residents from all buildings to safely access this recreational area. Painted crosswalks are provided at all internal pedestrian crossings. An 8-foot asphalt shared-use path is provided along the Lafayette Road (US 1) site frontage.

13. The City of Portsmouth Zoning Ordinance requires a total of 98 parking spaces for the 75 apartments, based upon the most conservative unit size and parking requirement of 1.3 spaces per unit over 750 square feet, plus one visitor space per 5 dwelling units, for a total of 113 spaces. A total of 123 parking spaces are proposed to be provided on the site. TEC confirmed a total of 123 spaces provided on-site. The 123 parking spaces provided exceeds the City of Portsmouth Zoning Ordinance requirement by ten spaces.

Please do not hesitate to contact me directly if you have any questions concerning this peer review at 732-500-7834. Thank you for your consideration.

Sincerely,
TEC, Inc.
"The Engineering Corporation"

Elizabeth Oltman

Elizabeth Oltman, PE
Director of Transportation Planning

ALTUS ENGINEERING, INC.

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

October 25, 2021

Peter Britz, Interim Planning Director
City of Portsmouth Municipal Complex
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: Application for Site Plan Review
"Monarch Village"
Assessor's Map 297, Lot 6
3548 Lafayette Road
Altus Project No. 5161

Dear Peter,

Altus Engineering, Inc. is in receipt of TEC's transportation peer review dated October 18, 2021. We offer the following in response to their comments:

1. TEC finds that an expanded study area is unwarranted. No comment required.

2. TEC concurs with the methodology of the traffic study. No comment required.

3. TEC concurs that the selected time periods are appropriate. No comment required.

4. TEC concurs with the methodology of the traffic study. No comment required.

5. TEC concurs that the trip generation methodology is acceptable. No comment required.

6. TEC concurs with the trip generation and distribution calculations. No comment required.

7. A queueing analysis has been prepared and included with this correspondence. The analysis shows no conflicts with internal traffic circulation.

8. TEC concurs that the entrance geometry is appropriate. No comment required.

9. The referenced sight triangles are within areas of the State right of way. Therefore, no woody vegetation, signs or other obstacles will be present. An exhibit of said triangles is included with this correspondence.

10. A trash truck turning template has been prepared and included with this correspondence.

11. TEC agrees that the design vehicle, in this case an Inferno ladder truck, can safely navigate the site but defers to the Fire Department for approval. No comment required.

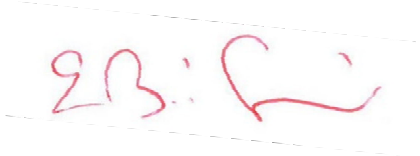
12. A pedestrian can be expected to safely cross the site driveway from the north to the patio area included in the subject open space. The additional impervious surface, construction cost and long-term maintenance requirements of additional sidewalk is not warranted in this situation.

13. TEC agrees that the provide parking meets the Ordinance. No comment required.

If you have any questions or need additional information, please contact us. Thank you for your time and consideration.

Sincerely,

ALTUS ENGINEERING, INC.



Erik B. Saari
Vice President

ebs/5161-ResponseLetter-TEC-102521

Enclosures

Stephen G. Pernaw & Company, Inc.
P.O. Box 1721 • Concord, NH 03302
tel: (603) 731-8500 • fax: (866) 929-6094 • sgp@ pernaw.com
Transportation: Engineering • Planning • Design

M E M O R A N D U M

Ref: 2109A

To: Erik Saari, Vice President
Altus Engineering, Inc.

From: Stephen G. Pernaw, P.E., PTOE

Subject: Proposed Residential Development – Response to TEC Comments
Portsmouth, New Hampshire

Date: October 19, 2021

On August 3, 2021 our office prepared the "*Traffic Evaluation"* for the residential development project that is proposed by Monarch Village, LLC at what is now the Wren's Nest Village Inn. We are now in receipt of peer review comments from TEC dated October 18, 2021. The purpose of this memorandum is to address Comment 7. TEC concurs with the traffic evaluation with respect to Comments 1-6 and 8. Comments 9-13 will be addressed by Altus Engineering, Inc. under separate cover.

TEC Comment 7: *"A traffic operations and queue analysis was not conducted in the Traffic Evaluation. The Applicant's engineer should confirm that the anticipated queue lengths for vehicles exiting the site driveway on to Lafayette Road (US 1) will not impact on-site circulation during peak hours."*

SGP Response: The subject intersection was analyzed as requested, and the attached computations demonstrate that the 95th percentile queue in the year 2032 is projected to be 1.2 vehicles (AM) and 1.4 vehicles (PM) during the peak hour periods. This analysis demonstrates that vehicle queuing on the site driveway approach to US1 will not impact on-site circulation during the peak hour periods.

Attachments

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↱		↰	↱	
Traffic Vol, veh/h	20	0	8	2	0	0	2	825	0	0	703	6
Future Vol, veh/h	20	0	8	2	0	0	2	825	0	0	703	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	375	-	-	625	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0	0	6	0	0	6	0
Mvmt Flow	22	0	9	2	0	0	2	917	0	0	756	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1680	1680	759	1685	1683	917	762	0	0	917	0	0
Stage 1	759	759	-	921	921	-	-	-	-	-	-	-
Stage 2	921	921	-	764	762	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	76	96	410	75	95	332	859	-	-	752	-	-
Stage 1	402	418	-	327	352	-	-	-	-	-	-	-
Stage 2	327	352	-	399	416	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	76	96	410	73	95	332	859	-	-	752	-	-
Mov Cap-2 Maneuver	76	96	-	73	95	-	-	-	-	-	-	-
Stage 1	401	418	-	326	351	-	-	-	-	-	-	-
Stage 2	326	351	-	390	416	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	57.2	55.9	0	0
HCM LOS	F	F		

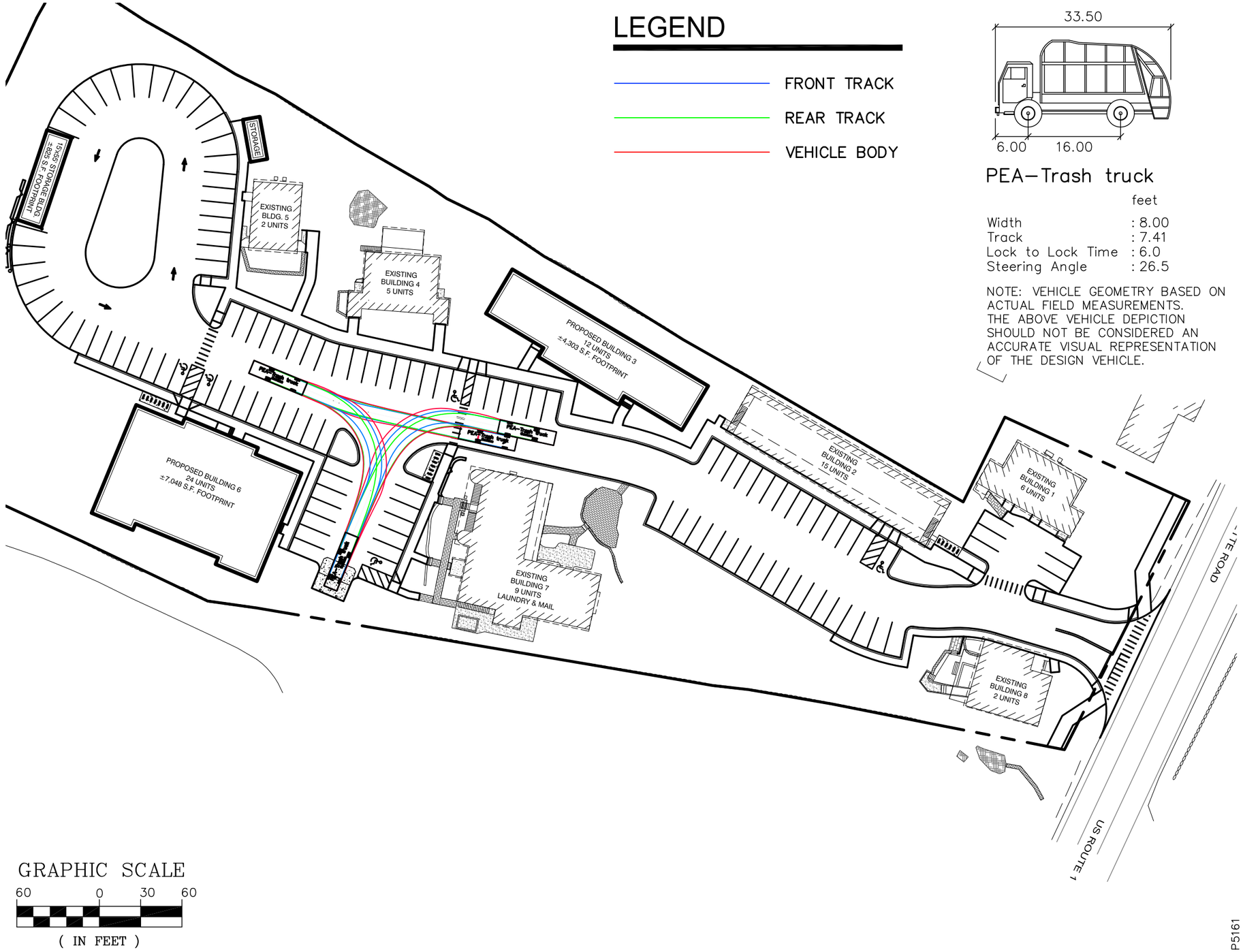
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	859	-	-	99	73	752	-	-
HCM Lane V/C Ratio	0.003	-	-	0.314	0.03	-	-	-
HCM Control Delay (s)	9.2	-	-	57.2	55.9	0	-	-
HCM Lane LOS	A	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.2	0.1	0	-	-

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↱		↰	↱	
Traffic Vol, veh/h	12	0	5	0	0	0	8	972	0	0	1021	21
Future Vol, veh/h	12	0	5	0	0	0	8	972	0	0	1021	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	375	-	-	625	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	92	92	92	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	3	0
Mvmt Flow	13	0	6	0	0	0	9	1057	0	0	1075	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2161	2161	1086	2164	2172	1057	1097	0	0	1057	0	0
Stage 1	1086	1086	-	1075	1075	-	-	-	-	-	-	-
Stage 2	1075	1075	-	1089	1097	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	35	48	265	35	47	276	644	-	-	667	-	-
Stage 1	264	295	-	268	298	-	-	-	-	-	-	-
Stage 2	268	298	-	263	291	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	35	47	265	34	46	276	644	-	-	667	-	-
Mov Cap-2 Maneuver	35	47	-	34	46	-	-	-	-	-	-	-
Stage 1	260	295	-	264	294	-	-	-	-	-	-	-
Stage 2	264	294	-	257	291	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	125.8	0	0.1	0
HCM LOS	F	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	644	-	-	47	-	667	-	-
HCM Lane V/C Ratio	0.014	-	-	0.402	-	-	-	-
HCM Control Delay (s)	10.7	-	-	125.8	0	0	-	-
HCM Lane LOS	B	-	-	F	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.4	-	0	-	-



PEA–Trash truck

	feet
Width	: 8.00
Track	: 7.41
Lock to Lock Time	: 6.0
Steering Angle	: 26.5

NOTE: VEHICLE GEOMETRY BASED ON ACTUAL FIELD MEASUREMENTS. THE ABOVE VEHICLE DEPICTION SHOULD NOT BE CONSIDERED AN ACCURATE VISUAL REPRESENTATION OF THE DESIGN VEHICLE.

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

SCALE: 11"x17" 1" = 60'

ISSUED FOR: TAC

ISSUE DATE: OCTOBER 27, 2021

REVISIONS:

NO.	DESCRIPTION	BY
0	TAC	EBS 10/27/21

OWNER:
NAVEESHA HOSPITALITY, LLC
440 BEDFORD ST.
LEXINGTON, MA 02420

APPLICANT:
MONARCH VILLAGE, LLC
P.O. BOX 365
EAST HAMPSTEAD, NH 03826

PROJECT:
MONARCH VILLAGE
TAX MAP 297, LOT 6
3548 LAFAYETTE ROAD
PORTSMOUTH, NH 03801

TITLE:
TRASH TRUCK TURNING EXHIBIT

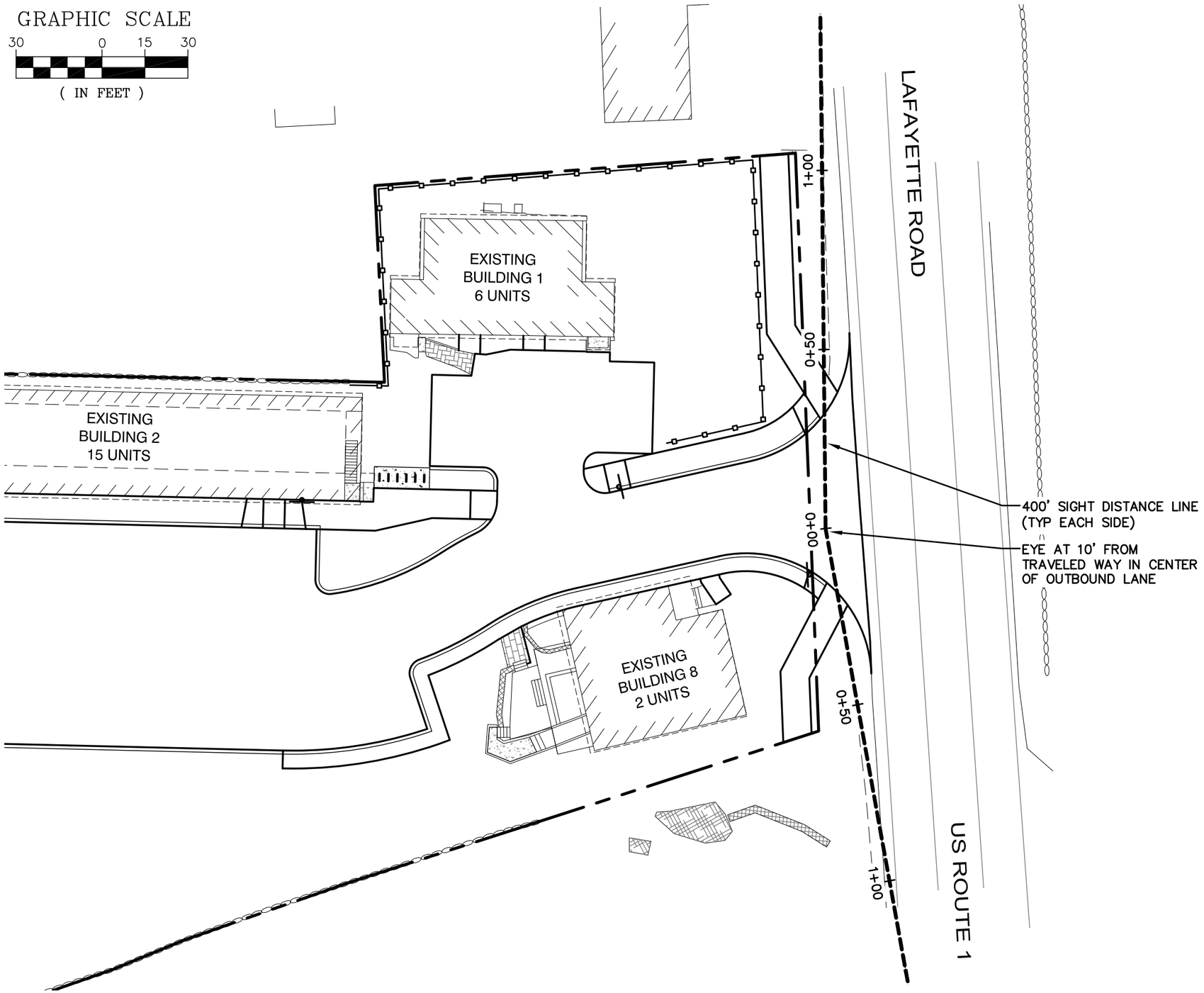
SHEET NUMBER:
EXH-2

P5161

GRAPHIC SCALE

30 0 15 30

(IN FEET)



P5161

ALTUS ENGINEERING, INC.

133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

SCALE: 11"x17" 1" = 30'

ISSUED FOR: TAC

ISSUE DATE: OCTOBER 25, 2021

REVISIONS:

NO.	DESCRIPTION	BY
0	TAC	EBS 10/25/21

OWNER:

NAVEESHA HOSPITALITY, LLC

440 BEDFORD ST.
LEXINGTON, MA 02420

APPLICANT:

MONARCH VILLAGE, LLC

P.O. BOX 365
EAST HAMPSTEAD, NH 03826

PROJECT:

MONARCH VILLAGE

TAX MAP 297, LOT 6
3548 LAFAYETTE ROAD
PORTSMOUTH, NH 03801

TITLE:

SIGHT TRIANGLES EXHIBIT

SHEET NUMBER:

EXH-3

Stephen G. Pernaw & Company, Inc.
P.O. Box 1721 • Concord, NH 03302
tel: (603) 731-8500 • fax: (866) 929-6094 • sgp@ pernaw.com
Transportation: Engineering • Planning • Design

M E M O R A N D U M

Ref: 2109A

To: Erik Saari, Vice President
Altus Engineering, Inc.

From: Stephen G. Pernaw, P.E., PTOE

Subject: Proposed Residential Development – Response to TEC Comments
Portsmouth, New Hampshire

Date: October 19, 2021

On August 3, 2021 our office prepared the "*Traffic Evaluation"* for the residential development project that is proposed by Monarch Village, LLC at what is now the Wren's Nest Village Inn. We are now in receipt of peer review comments from TEC dated October 18, 2021. The purpose of this memorandum is to address Comment 7. TEC concurs with the traffic evaluation with respect to Comments 1-6 and 8. Comments 9-13 will be addressed by Altus Engineering, Inc. under separate cover.

TEC Comment 7: *"A traffic operations and queue analysis was not conducted in the Traffic Evaluation. The Applicant's engineer should confirm that the anticipated queue lengths for vehicles exiting the site driveway on to Lafayette Road (US 1) will not impact on-site circulation during peak hours."*

SGP Response: The subject intersection was analyzed as requested, and the attached computations demonstrate that the 95th percentile queue in the year 2032 is projected to be 1.2 vehicles (AM) and 1.4 vehicles (PM) during the peak hour periods. This analysis demonstrates that vehicle queuing on the site driveway approach to US1 will not impact on-site circulation during the peak hour periods.

Attachments

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↱		↰	↱	
Traffic Vol, veh/h	20	0	8	2	0	0	2	825	0	0	703	6
Future Vol, veh/h	20	0	8	2	0	0	2	825	0	0	703	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	375	-	-	625	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0	0	6	0	0	6	0
Mvmt Flow	22	0	9	2	0	0	2	917	0	0	756	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1680	1680	759	1685	1683	917	762	0	0	917	0	0
Stage 1	759	759	-	921	921	-	-	-	-	-	-	-
Stage 2	921	921	-	764	762	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	76	96	410	75	95	332	859	-	-	752	-	-
Stage 1	402	418	-	327	352	-	-	-	-	-	-	-
Stage 2	327	352	-	399	416	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	76	96	410	73	95	332	859	-	-	752	-	-
Mov Cap-2 Maneuver	76	96	-	73	95	-	-	-	-	-	-	-
Stage 1	401	418	-	326	351	-	-	-	-	-	-	-
Stage 2	326	351	-	390	416	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	57.2	55.9	0	0
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	859	-	-	99	73	752	-	-
HCM Lane V/C Ratio	0.003	-	-	0.314	0.03	-	-	-
HCM Control Delay (s)	9.2	-	-	57.2	55.9	0	-	-
HCM Lane LOS	A	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.2	0.1	0	-	-

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↱		↰	↱	
Traffic Vol, veh/h	12	0	5	0	0	0	8	972	0	0	1021	21
Future Vol, veh/h	12	0	5	0	0	0	8	972	0	0	1021	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	375	-	-	625	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	92	92	92	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	3	0
Mvmt Flow	13	0	6	0	0	0	9	1057	0	0	1075	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2161	2161	1086	2164	2172	1057	1097	0	0	1057	0	0
Stage 1	1086	1086	-	1075	1075	-	-	-	-	-	-	-
Stage 2	1075	1075	-	1089	1097	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	35	48	265	35	47	276	644	-	-	667	-	-
Stage 1	264	295	-	268	298	-	-	-	-	-	-	-
Stage 2	268	298	-	263	291	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	35	47	265	34	46	276	644	-	-	667	-	-
Mov Cap-2 Maneuver	35	47	-	34	46	-	-	-	-	-	-	-
Stage 1	260	295	-	264	294	-	-	-	-	-	-	-
Stage 2	264	294	-	257	291	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	125.8	0	0.1	0
HCM LOS	F	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	644	-	-	47	-	667	-	-
HCM Lane V/C Ratio	0.014	-	-	0.402	-	-	-	-
HCM Control Delay (s)	10.7	-	-	125.8	0	0	-	-
HCM Lane LOS	B	-	-	F	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.4	-	0	-	-

UNDERWOOD engineers

25 Vaughan Mall
Portsmouth, NH, 03801-4012
Tel: 603-436-6192 Fax: 603-431-4733

Drainage Review Memorandum

To: Peter Stith, Principal Planner, City of Portsmouth
cc: Erik Saari, Altus Engineering

From: Allison Rees, P.E., Robert Saunders, P.E.
Date: November 8, 2021
Re: Monarch Village Residential Development/3458 Lafayette Road
Portsmouth, NH

Background/Purpose:

The City of Portsmouth is requesting a peer review of the Drainage Study/Drainage Design for the referenced project. Underwood Engineers (UE) visited the site on November 2, 2021 to review existing conditions and drainage. Initially, UE received plans and drainage reports dated October 18, 2021. UE identified a couple of drainage concerns, reducing the efficacy of continuing the review, and following some discussion with the Developers consultant, Altus Engineering, UE was provided with updated plans and drainage runs for the "front half" of the site, dated October 28. This review is a compilation of comments developed from the October 18th original submission for the drainage improvements servicing the rear of the site, and the October 28 revised submission for improvements to the front of the site. The following comments are provided for consideration.

Findings and Recommendations:

General

1. The Applicant proposes to manage stormwater runoff through infiltration practices and through replacement of existing closed drainage that discharges offsite.

2. Existing groundwater elevations ranges from 32" to 60" below existing grade based on test pits performed by the soil scientist on July 16, 2021. The shallowest ledge was encountered at 72" below grade. Percolation rates ranged from 2 min/inch to 6 min/inch.

3. Soils are classified as excessively drained at the rear half of the site based on Natural Resource Conservation Services mapping and drainage analysis.

4. It is unclear what rights, if any, may exist that permit the existing drainage system to continue onto and discharge to the abutting parcel to the south. Per Altus Engineering, the Developer is working on obtaining an easement. If the easement is not granted, the drainage in this area may require revision to be handled onsite.

5. The back half of the site is relying on a proposed drainage system that must surcharge into the infiltration/detention pond at its terminus. The pipes are all flat and will be prone to deposition of sedimentation which will expedite clogging of the system. It appears that the low spot in the system is not at the infiltration basin but rather LDMHs 3 & 4. This type of system will require an inordinate level of maintenance to ensure it functions as designed.

Drainage Analysis

6. The drainage model runs do not include the error messages. *(Re)submissions should include the HydroCAD error messages.*

7. Per comment 5 above, the back half of the site is relying on a proposed drainage system that must surcharge into the infiltration/detention pond at its terminus. While this practice is possible in reality, it may be outside of the HydroCAD model's capacity to properly interpret. *The applicant may need to modify the way the connections are being applied to the model to ensure that the results are valid.* It appears that the model is not allowing for the dynamic (backward) flow required to accurately depict the systems response to storm events. Consultation of the routing settings may be required to allow flow in all direction within the pipes and structures.

8. The drainage system in the front of the site is surcharging above the rims of several structures. UE notes that the model is capturing the ponding that might occur, however the system is being modelled based on free discharge from the outlet (on the abutting property). It appears likely that tailwater may occur in the system between the end of the existing/proposed system and the downstream 15" pipe under Route 1 – Lafayette Road.

9. The infiltration does not contain any pre-treatment to remove sediment before the infiltration practice.

10. The proposed infiltration drainage practice appears to be within the Estimated Seasonal High Water Table (ESHWT). UE notes that several of the test pits were advanced well beyond the ESHWT without noting of the observed groundwater table. *An opinion regarding the frequency for which the water table approaches the ESHWT could be valuable in the evaluation of the viability of the proposed infiltration practice.*

Site Development Plans

DWG EX2:

11. *The test pits should be numbered to match the test pit logs*

DWG C1:

12. *The demolition plan should be updated to reflect the drainage revisions received on 10/28/2021.*

DWG C3:

13. The Cross Slope across the drive aisle between the infiltration practice and the 54' contour is in excess of 4% and the profile slopes of the parking spaces between the 54' contour and proposed sidewalk in front of existing building 5 is approx. 4.5%. Modifications to the grading will likely result in changes to the storage volume of the infiltration basin.

14. Yard drain #6 discharges to daylight before the existing 15" HDPE that crosses underneath Lafayette Road. The ROW line is not shown in this area. *The ROW line should be added to ensure any proposed work is outside of the NHDOT ROW.*

15. The slope of all of the pipes on the eastern side of the site are very flat at 0.005. *We recommend an increase in slope where possible. Insulation should be added if cover is less than 2'.*

16. *Foundation drain discharge locations should be indicated on the plan.*

Follow-up:

Questions and comments concerning this review can be directed to either Allison Rees or Robert Saunders. UE anticipates that the system revisions provided on October 28 will be incorporated into the design set for subsequent review and approval.

UNDERWOOD ENGINEERS, INC.

ALTUS ENGINEERING, INC.

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

November 9, 2021

Peter Britz, Interim Planning Director
City of Portsmouth Municipal Complex
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: Application for Site Plan Review
"Monarch Village"
Assessor's Map 297, Lot 6
3548 Lafayette Road
Altus Project No. 5161

Dear Peter,

Altus Engineering, Inc. is in receipt of Underwood Engineer's drainage peer review dated November 8, 2021. We offer the following in response to their comments:

1. Altus agrees that this is the design approach. No comment required.

2. Altus agrees with UEI's assessment of the subsurface conditions. No comment required.

3. Altus agrees with UEI's assessment of the site's soils. No comment required.

4. The front drainage infrastructure directed to the southerly abutting property has apparently been in operation for decades which has created a prescriptive easement in favor of the applicant. However, at the request of TAC, the applicant is in the process of securing appropriate easements to formalize the facts on the ground. We expect them to be executed in the near future.

5. All catch basins will be equipped with deeps sumps which should minimize the discharge of sediment into the system. That said, the applicant is aware of the maintenance requirements as outlined in the maintenance manual.

6. The attached drainage analysis includes the requested error messages.

7. We agree that HydroCAD may not adequately capture the true conditions of the rear drainage system seeing that the tailwater and headwater elevations are not consistent across the model as would be expected. We have modified the model by combining the majority of the infiltration system into a single node (Pond 44P). We have also increased routing to six which smoothed the calculations as much as possible. Higher settings showed no additional benefit.

8. Altus agrees that tailwater at the outlet may affect the front drainage system. In anticipation of this, we have increased the pipe size from CB #9-1 to the FES outlet to 15" which has eliminated rim surcharge from all but the 50-year storm event.

9. The rear infiltration pond is designed with two leaching catch basins in its sump. In order to minimize sediment and debris from entering, the rims have been designed to be 6" above the floor of the pond. This allows the pond to act as its own forebay which will trap any incoming sediment or debris.

10. We have attached correspondence from the project soil scientist, Mike Cuomo, regarding the water table. As discussed, the water table may rise to the level of the rear drainage system for only a few weeks out of the year. We expect that this will not have an outsized impact to the functionality of the system given its capacity and emergency discharge capability.

11. The test pits shown on the Existing Conditions Plan have been numbered appropriately.

12. The Demolition Plan has been amended to reflect changes to the front drainage system.

13. The design slope to the west of Building 5 is 4.14% which is perfectly acceptable where non-ADA parking stalls are proposed.

14. We have included the ROW line to the south of the southeast lot corner. No work is proposed in the ROW.

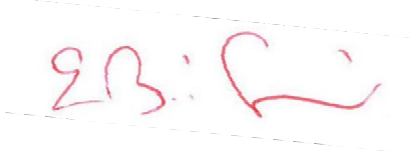
15. In order to maintain as much cover over the pipes as possible, we have kept the pipe slopes in the front system at 0.5%. We have added Note #29 to Sheet C-3 mandating insulation where pipe cover is less than two feet.

16. Note #31 has been added to Sheet C-3 addressing foundations drains.

If you have any questions or need additional information, please contact us. Thank you for your time and consideration.

Sincerely,

ALTUS ENGINEERING, INC.



Erik B. Saari
Vice President

ebs/5161-ResponseLetter-UEI-110921

Enclosures

Michael Cuomo, Soil Scientist
6 York Pond Road, York, Maine 03909
207 363 4532
mcuomosoil@gmail.com

Memo to: Erik Saari, P.E.
From: Michael Cuomo
Date: 9 November 2021
Regarding: Seasonal High Water Table

You requested a brief explanation of what the seasonal high water table (SHWT) determination in test pits means, particularly in regard to duration of wetness. Your request was specific to the site at 3548 Lafayette Road in Portsmouth, but my answer applies broadly.

The upper limit of redoximorphic features (now redox, formerly called mottles) is the seasonal high water table as identified in test pits. This is identified by dis-colorations in the soil which corresponds with saturation to that elevation for a minimum of 3 consecutive weeks during the growing season. The groundwater saturation only forms redox if it is repeated in most years, defined as 6 out of ten, over a long period of time, maybe 10 to 100 years. This is a biological, chemical, and physical process which changes naturally occurring iron and manganese in soil through the reduction and translocation when the soil is anaerobic, followed by oxidation when the soil is aerobic.

The upper limit of redox is generally accepted to be the briefest duration of soil saturation, 3 weeks during the growing season. As one progresses downward in the soil profile, the duration of saturation is known to increase, until a zone of permanent saturation or bedrock is reached. There are no good generalizations about the distance from the SHWT to the zone of permanent saturation, because it is highly variable with topography and geologic parent material. There is no zone of permanent saturation in some soils, in which case it would be found within the bedrock.

SHWT determinations do not distinguish between a perched water table and ground water saturation to depth. A perched water table is from precipitation that is prevented from traveling directly downward due to a restrictive layer in the soil. Groundwater saturation to depth can be thought of as groundwater moving up in the soil, compared to atmospheric water moving

New Comment

17. UE notes that proposed foundation drain inverts into several drainage structures are well below the outlet pipe invert elevations. Confirm the intent and address as required.

Follow-up:

Questions and comments concerning this review can be directed to either Allison Rees or Robert Saunders.

UNDERWOOD ENGINEERS, INC.

UNDERWOOD engineers
25 Vaughan Mall
Portsmouth, NH, 03801-4012
Tel: 603-436-6192 Fax: 603-431-4733

Drainage Review Memorandum

To: Peter Stith, Principal Planner, City of Portsmouth
cc: Erik Saari, Altus Engineering
AMR
From: Allison Rees, P.E., Robert Saunders, P.E.
Date: December 3, 2021
Re: Monarch Village Residential Development/3458 Lafayette Road
Portsmouth, NH

Review No. 2

Background/Purpose:

Altus Engineering provided a response letter along with revised plans and a revised drainage study based on our previous comments dated November 8, 2021. All comments have been resolved satisfactorily with the exception of the following.

General

5. Response acknowledged; UE defers further comment to the City of Portsmouth.

Drainage Analysis

6. Response Acknowledged; Error messages have been reviewed and are consistent with the expectations given the drainage model revisions.

7. Response Acknowledged; UE concurs that the model has been revised to better represent the proposed conditions.

Site Development Plans

DWG C3:

13. The 4+% cross slope on the drive aisle around the infiltration practice should be mitigated or a barrier (e.g. timber guardrail, curb, boulders) be placed around the top of the infiltration basin. UE defers resolution to the City of Portsmouth.

down. The two are not mutually exclusive and there are some complex and difficult to distinguish overlaps.

Let me know if you need further explanation.

ALTUS ENGINEERING, INC.

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

November 9, 2021

Peter Britz, Interim Planning Director
City of Portsmouth Municipal Complex
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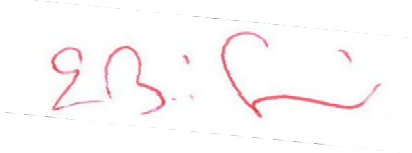


Erik B. Saari
Vice President

ebs/5161-ResponseLetter-UEI-110921

Enclosures

DRAINAGE ANALYSIS

FOR

Site Redevelopment
of
"Monarch Village"

3548 Lafayette Road
Portsmouth, NH

Tax Map 297, Lot 6

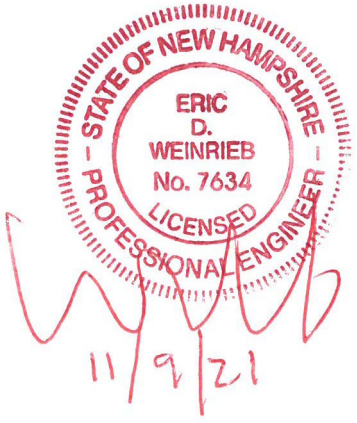
October 18, 2021
Revised October 28, 2021
Revised November 9, 2021

Prepared For:

Monarch Village, LLC
P.O. Box 365
East Hampstead, NH 03826

Prepared By:

ALTUS ENGINEERING, INC.
133 Court Street
Portsmouth, NH 03801
Phone: (603) 433-2335



ALTUS ENGINEERING, INC.

Table of Contents

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Section 1

Narrative

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PROJECT DESCRIPTION

Monarch Village, LLC is proposing to redevelop the existing Wren's Nest Motel located at 3548 Lafayette Road in Portsmouth, NH. The property is identified as Assessor's Map 297, Lot 6, is approximately 3.74 acres in size and is located in the City's Gateway 1 (G1) district. The site currently hosts number of buildings used for motel rooms, a restaurant, indoor pool, private loop roadway and parking areas surrounded by a lawn areas with a section of woodland located at the rear of the site.

The proposed project will raze a few of the smaller buildings, construct an two new buildings and repurpose the remaining structures for a total of seventy five residential apartments together with associated accessways and parking.

Runoff from the development will be directed to two separate closed drainage systems to provide stormwater mitigation. The stormwater management system proposed for the site will reduce peak flows and treat site runoff prior to discharging offsite.

Site Soils

The NRCS indicates that the subject property consists of several primary soil classifications:

26B – Windsor loamy sand, HSG A
699 – Urban-Land-Canton complex, HSG B

Pre-Development (Existing Conditions)

The pre-development site conditions reflect the existing conditions of the site, which include the existing buildings and private roadway. The current site is equipped with what appears to be a homemade drainage system that discharges to the east and southeast to a culvert the crosses US Route 1 identified as Point of Analysis #1 (POA #1) and to woodland to the west (POA #2). The Pre-Development analysis models the existing site conditions for the point of analysis.

The grades and elevations shown on the plans are based on the site survey completed by James Verra and Associates, Inc. and included in the plan set. The study pre-development area was analyzed as several subcatchments directed to the existing drainage structures, many of which are designed for infiltration.

Post-Development (Proposed Site Design)

Several of the existing buildings will be razed and new buildings with associated site improvements will be constructed. These include a new stormwater system as depicted on the attached Post-Development Watershed Plan. The same points of analysis used in the Pre-Development model (POA #'s 1 and 2) were used for comparison of the Pre and Post development conditions.

The Post-Development Watershed Plan illustrates the proposed stormwater management system. Site topography, existing features, proposed site improvements, proposed grading, drainage and erosion control measures are shown on the accompanying plans. Recommended erosion control measures are based upon the December 2008 edition of the "*New Hampshire Stormwater Manual Volumes 1 through 3*" prepared by NHDES and Comprehensive Environmental, Inc. as amended.

CALCULATION METHODS

The drainage study was completed using the USDA SCS TR-20 Method within the HydroCAD Stormwater Modeling System. Reservoir routing was performed with the Dynamic Storage Indication method with automated calculation of tailwater conditions. A Type III 24-hour rainfall distribution was utilized in analyzing the data for the 2, 10, 25 and 50 year - 24-hour storm events using rainfall data provided by the Northeast Regional Climate Center (NRCC). As the project site lies within a Coastal and Great Bay Community identified by NHDES Alteration of Terrain, all rainfall amounts were increased by 15% to account for potential future increases in rainfall due to climate change.

Disclaimer

Altus Engineering, Inc. notes that stormwater modeling is limited in its capacity to precisely predict peak rates of runoff and flood elevations. Results should not be considered to represent actual storm events due to the number of variables and assumptions involved in the modeling effort. Surface roughness coefficients (n), entrance loss coefficients (ke), velocity factors (kv) and times of concentration (Tc) are based on subjective field observations and engineering judgment using available data. For design purposes, curve numbers (Cn) describe the average conditions. However, curve numbers will vary from storm to storm depending on the antecedent runoff conditions (ARC) including saturation and frozen ground. Also, higher water elevations than predicted by modeling could occur if drainage channels, closed drain systems or culverts are not maintained and/or become blocked by debris before and/or during a storm event as this will impact flow capacity of the structures. Structures should be re-evaluated if future changes occur within relevant drainage areas in order to assess any required design modifications.

Drainage Analysis

A complete summary of the drainage model is included in the appendix of this report. The following table compares pre- and post-development peak rates at the Point of Analysis identified on the plans for the 2, 10, 25, and 50-year storm events:

Stormwater Modeling Summary
Peak Q (cfs) for Type III 24-Hour Storm Events

*Rainfall Intensities Reflect 15% Increase per AoT	**2-Yr Storm (3.69 inch)**	**10-Yr Storm (5.60 inch)**	**25-Yr Storm (7.10 inch)**	**50-Yr Storm (8.50 inch)**
POA #1				
Pre	3.00	5.79	8.08	10.25
Post	2.57	1.09	5.85	6.91
Change	**-0.43**	**-1.25**	**-2.23**	**-3.34**
POA #2				
Pre	1.42	2.96	4.55	6.17
Post	0.01	0.21	0.70	3.69
Change	**-1.41**	**-2.75**	**-3.85**	**-2.48**

As the above table demonstrates, the proposed peak rates of runoff will be decreased from the existing conditions for all analyzed storm events.

CONCLUSION

This proposed site redevelopment of the Wren's Nest Motel off of Lafayette Road in Portsmouth, NH will have minimal adverse effect on abutting properties and infrastructure as a result of stormwater runoff or siltation. Post-construction peak rates of runoff from the site will be lower than the existing conditions for all analyzed storm events. The new stormwater management system will also provide appropriate treatment of runoff from the entirety of the proposed impervious area. Appropriate steps will be taken to properly mitigate erosion and sedimentation through the use of temporary and permanent Best Management Practices for sediment and erosion control, including deep sump catch basins with grease hoods and infiltration-based practices.

Section 2

Aerial Photo and USGS Map

ALTUS
ENGINEERING, INC.


Weatherstone
Gateway Luxury Apartments
SITE
Wren's Nest Village Inn
3.8 (103)
3-star hotel
Lafayette Rd
QHT Inc
Coach Rd
AAMCO Transmissions & Total Car Care
Coach Rd
Wood Brothers Moving & Storage
Coach Rd
1
1


SITE
DOVER
Wentworth Terrace
Dover Point
General Sullivan Bridge
Bloody Point
Piscataqua River
Adlington Hill
Tobeys Corner
Mast Cove
Frankfort Island
Green Acre
Bolt Hill
Bartlett Hill
Oyster River
Durham Point
Fox Point
Hen Island
Mathes Cem
Broad Cove
Carters Rock
Clamshell Pond
Trickys Cove
Newington Station
Mill Pond
Knight Hill
Little Bay
ROCKINGHAM CO
STRAFFORD CO
Newington
MAINE
NEW HAMPSHIRE
Piscataqua
YORK CO
ROCKINGHAM CO
Spinney Creek
Welsh Cove
Furber Strait
Ferry Way Trl
Adams Point
Atlantic Heights
Christian Shore
Oak Terrace
Footman Islands
Wentworth Acres
Bersum Gardens
Freemans Point
Maine-New Hampshire Bridge
Nobles Island
Badgers Island
Memorial Bridge
Peverly Brook Upper Pond
Thomas Point
Hoyt Hill
Portsmouth International Airport at Pease
Brown Hill
Creek Area
Woodman Point
Herods Cove
Great Bay Community College
Nannie Island
Fabyan Point
Great Bay
Pannaway Manor
Meadowbrook
Swan Island
Bracketts Point
Weeks Point
PORTSMOUTH
Portsmouth Plains
Calvary Cem
Saint Marys Cem
Sagamore Hill
Sagamore Creek
Bayside
Pierce Point
Temple Israel Cem
Greenland Station
Great Bog
Pickering Brook
Peverly Hill
Greenland
Elwyn Park
Greenland Cem
Camp Gundalow
Packer Bog
Langs Corner
Coombs Pond
Salter Family Cem
Wedgewood Cem
Rye
Central Cem
Breakfast Hill
Berry Family Cem
Winnicut Mills
Winnicut Mills Pond
Barton Hill
Dow Family Cem
West Rye

Section 3

Drainage Calculations

Pre-Development
2-Year, 24-Hour Summary
10-Year, 24-Hour Complete
25-Year, 24-Hour Summary
50-Year, 24-Hour Summary

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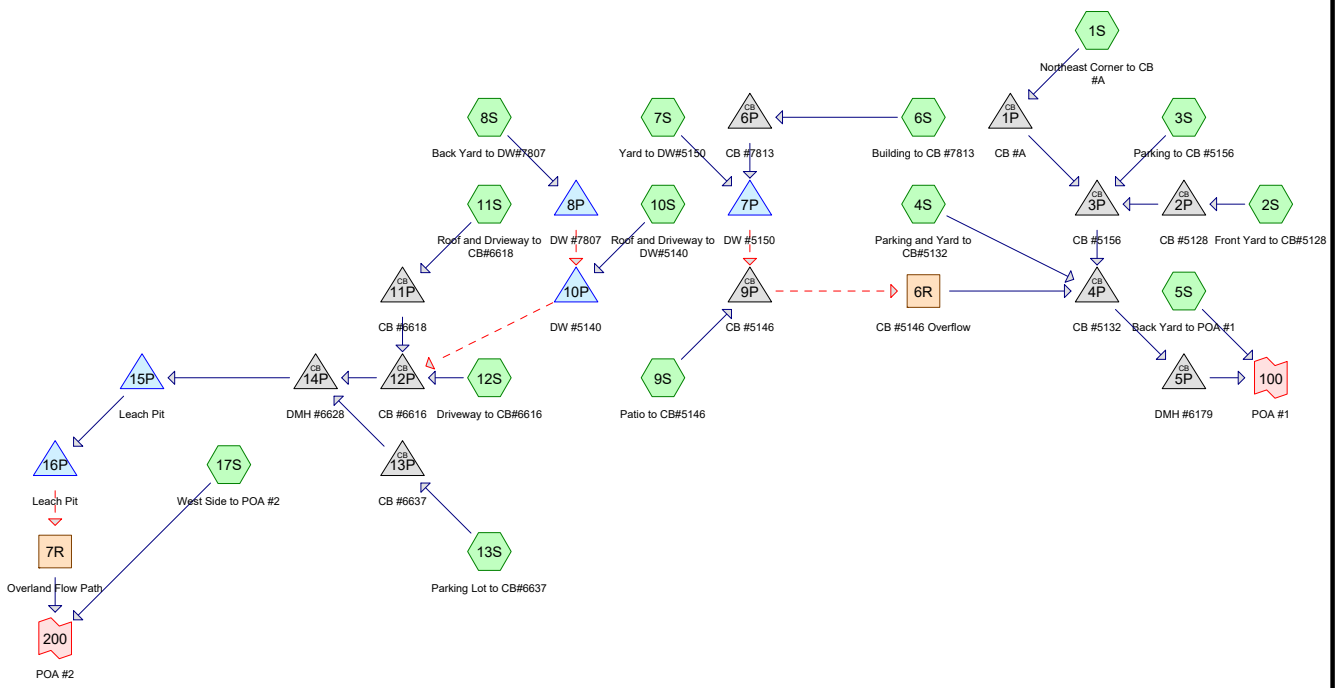
ENGINEERING, INC.



Subcat Reach Pond Link

Routing Diagram for 5161-Pre
Prepared by Altus Engineering, Inc., Printed 9/29/2021

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Northeast Corner to CB Runoff Area=12,217 sf 28.05% Impervious Runoff Depth=1.13"
Flow Length=180' Tc=6.0 min CN=70 Runoff=0.34 cfs 0.026 af

Subcatchment 2S: Front Yard to CB#5128 Runoff Area=8,717 sf 62.34% Impervious Runoff Depth=2.10"
Flow Length=152' Tc=6.0 min CN=84 Runoff=0.48 cfs 0.035 af

Subcatchment 3S: Parking to CB #5156 Runoff Area=4,667 sf 88.88% Impervious Runoff Depth=3.02"
Flow Length=71' Slope=0.0183 '/' Tc=6.0 min CN=94 Runoff=0.35 cfs 0.027 af

Subcatchment 4S: Parking and Yard to Runoff Area=28,462 sf 48.73% Impervious Runoff Depth=1.71"
Flow Length=199' Tc=6.0 min CN=79 Runoff=1.28 cfs 0.093 af

Subcatchment 5S: Back Yard to POA #1 Runoff Area=3,901 sf 71.11% Impervious Runoff Depth=2.35"
Flow Length=80' Tc=6.0 min CN=87 Runoff=0.24 cfs 0.018 af

Subcatchment 6S: Building to CB #7813 Runoff Area=3,002 sf 59.56% Impervious Runoff Depth=1.44"
Flow Length=44' Tc=6.0 min CN=75 Runoff=0.11 cfs 0.008 af

Subcatchment 7S: Yard to DW#5150 Runoff Area=2,885 sf 38.51% Impervious Runoff Depth=0.80"
Flow Length=58' Tc=6.0 min CN=64 Runoff=0.05 cfs 0.004 af

Subcatchment 8S: Back Yard to DW#7807 Runoff Area=13,543 sf 26.09% Impervious Runoff Depth=0.49"
Flow Length=71' Tc=6.0 min CN=57 Runoff=0.10 cfs 0.013 af

Subcatchment 9S: Patio to CB#5146 Runoff Area=3,939 sf 48.26% Impervious Runoff Depth=1.71"
Flow Length=73' Slope=0.0150 '/' Tc=6.0 min CN=79 Runoff=0.18 cfs 0.013 af

Subcatchment 10S: Roof and Driveway to Runoff Area=3,331 sf 82.92% Impervious Runoff Depth=2.82"
Flow Length=48' Tc=6.0 min CN=92 Runoff=0.24 cfs 0.018 af

Subcatchment 11S: Roof and Drvieway to Runoff Area=3,598 sf 85.52% Impervious Runoff Depth=2.82"
Flow Length=68' Slope=0.0100 '/' Tc=6.0 min CN=92 Runoff=0.26 cfs 0.019 af

Subcatchment 12S: Driveway to CB#6616 Runoff Area=3,965 sf 51.63% Impervious Runoff Depth=1.79"
Flow Length=90' Tc=6.0 min CN=80 Runoff=0.19 cfs 0.014 af

Subcatchment 13S: Parking Lot to Runoff Area=23,260 sf 52.04% Impervious Runoff Depth=1.44"
Tc=0.0 min CN=75 Runoff=1.01 cfs 0.064 af

Subcatchment 17S: West Side to POA #2 Runoff Area=61,787 sf 21.51% Impervious Runoff Depth=0.16"
Flow Length=383' Tc=10.3 min CN=47 Runoff=0.05 cfs 0.019 af

Reach 6R: CB #5146 Overflow Avg. Flow Depth=0.04' Max Vel=1.21 fps Inflow=0.34 cfs 0.025 af
n=0.013 L=198.0' S=0.0102 '/' Capacity=58.25 cfs Outflow=0.31 cfs 0.025 af

Reach 7R: Overland Flow Path Avg. Flow Depth=0.13' Max Vel=0.87 fps Inflow=1.47 cfs 0.090 af
n=0.035 L=107.0' S=0.0091 '/' Capacity=104.18 cfs Outflow=1.42 cfs 0.090 af

Pond 1P: CB #A Peak Elev=51.23' Inflow=0.34 cfs 0.026 af
6.0" Round Culvert n=0.012 L=84.0' S=0.0107 '/' Outflow=0.34 cfs 0.026 af

Pond 2P: CB #5128 Peak Elev=51.22' Inflow=0.48 cfs 0.035 af
Outflow=0.48 cfs 0.035 af

Pond 3P: CB #5156 Peak Elev=51.05' Inflow=1.17 cfs 0.088 af
Outflow=1.17 cfs 0.088 af

Pond 4P: CB #5132 Peak Elev=50.37' Inflow=2.76 cfs 0.207 af
Outflow=2.76 cfs 0.207 af

Pond 5P: DMH #6179 Peak Elev=50.12' Inflow=2.76 cfs 0.207 af
Outflow=2.76 cfs 0.207 af

Pond 6P: CB #7813 Peak Elev=52.48' Inflow=0.11 cfs 0.008 af
Outflow=0.11 cfs 0.008 af

Pond 7P: DW #5150 Peak Elev=52.39' Storage=11 cf Inflow=0.16 cfs 0.013 af
Discarded=0.00 cfs 0.000 af Secondary=0.16 cfs 0.012 af Outflow=0.16 cfs 0.012 af

Pond 8P: DW #7807 Peak Elev=52.22' Storage=11 cf Inflow=0.10 cfs 0.013 af
Discarded=0.12 cfs 0.013 af Secondary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.013 af

Pond 9P: CB #5146 Peak Elev=52.39' Inflow=0.34 cfs 0.025 af
Outflow=0.34 cfs 0.025 af

Pond 10P: DW #5140 Peak Elev=53.38' Storage=155 cf Inflow=0.24 cfs 0.018 af
Discarded=0.00 cfs 0.000 af Secondary=0.24 cfs 0.015 af Outflow=0.24 cfs 0.015 af

Pond 11P: CB #6618 Peak Elev=52.91' Inflow=0.26 cfs 0.019 af
4.0" Round Culvert n=0.012 L=23.0' S=0.0426 '/' Outflow=0.26 cfs 0.019 af

Pond 12P: CB #6616 Peak Elev=52.57' Inflow=0.68 cfs 0.048 af
6.0" Round Culvert n=0.012 L=66.0' S=0.0312 '/' Outflow=0.68 cfs 0.048 af

Pond 13P: CB #6637 Peak Elev=53.92' Inflow=1.01 cfs 0.064 af
6.0" Round Culvert n=0.012 L=107.0' S=0.0154 '/' Outflow=1.01 cfs 0.064 af

Pond 14P: DMH #6628 Peak Elev=51.46' Inflow=1.45 cfs 0.112 af
8.0" Round Culvert n=0.012 L=161.0' S=0.0100 '/' Outflow=1.45 cfs 0.112 af

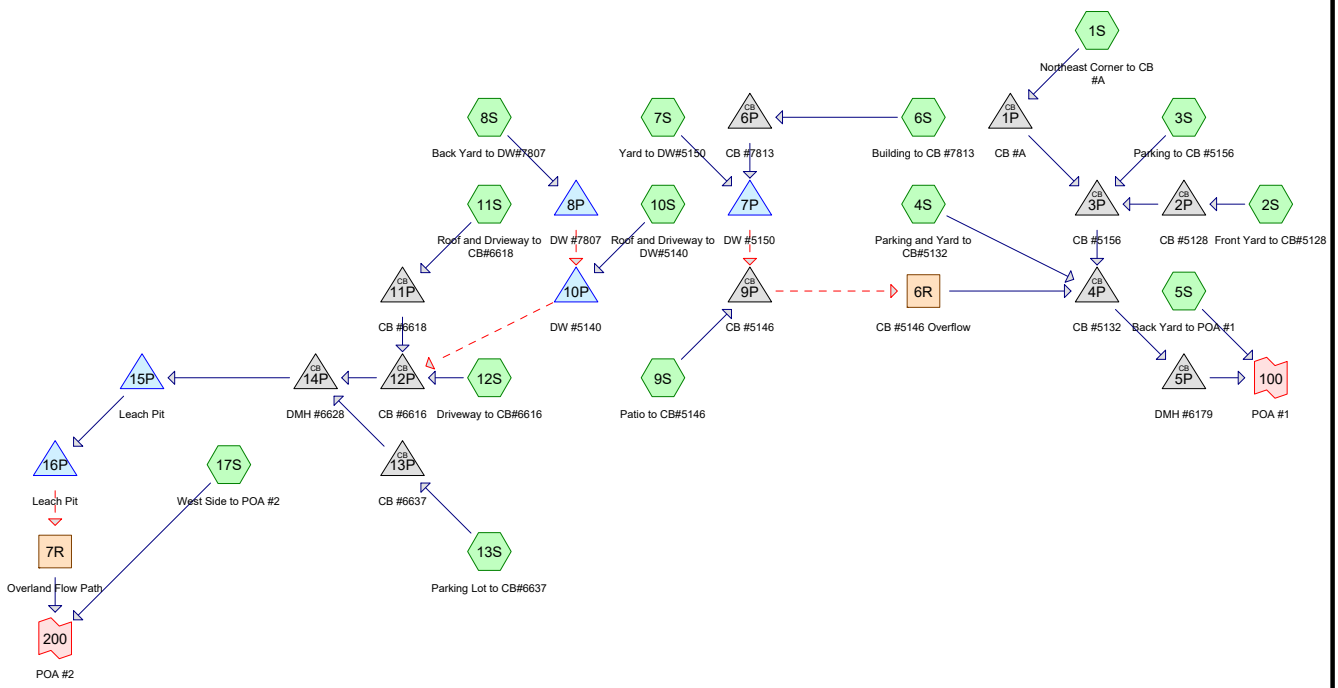
Pond 15P: Leach Pit Peak Elev=49.15' Storage=93 cf Inflow=1.45 cfs 0.112 af
Discarded=0.01 cfs 0.019 af Primary=1.53 cfs 0.093 af Outflow=1.54 cfs 0.112 af

Pond 16P: Leach Pit Peak Elev=49.03' Storage=119 cf Inflow=1.53 cfs 0.093 af
Discarded=0.00 cfs 0.000 af Secondary=1.47 cfs 0.090 af Outflow=1.47 cfs 0.090 af

Link 100: POA #1 Inflow=3.00 cfs 0.225 af
Primary=3.00 cfs 0.225 af

Link 200: POA #2 Inflow=1.42 cfs 0.109 af
Primary=1.42 cfs 0.109 af

Total Runoff Area = 4.070 ac Runoff Volume = 0.372 af Average Runoff Depth = 1.10"
59.80% Pervious = 2.434 ac 40.20% Impervious = 1.636 ac



Subcat Reach Pond Link

Routing Diagram for 5161-Pre
Prepared by Altus Engineering, Inc., Printed 9/29/2021

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.709	39	>75% Grass cover, Good, HSG A (6S, 7S, 8S, 11S, 13S, 17S)
0.864	61	>75% Grass cover, Good, HSG B (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 17S)
0.022	98	Gravel (1S, 3S, 6S, 17S)
1.171	98	Impervious (1S, 2S, 3S, 4S, 5S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 17S)
0.007	98	Ledge (8S, 17S)
0.435	98	Roof (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 10S, 11S, 13S, 17S)
0.749	30	Woods, Good, HSG A (13S, 17S)
0.112	55	Woods, Good, HSG B (1S, 13S)
4.070	**66**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.458	HSG A	6S, 7S, 8S, 11S, 13S, 17S
0.975	HSG B	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 17S
0.000	HSG C	
0.000	HSG D	
1.636	Other	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 17S
4.070		**TOTAL AREA**

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Northeast Corner to CB Runoff Area=12,217 sf 28.05% Impervious Runoff Depth=2.49"
Flow Length=180' Tc=6.0 min CN=70 Runoff=0.80 cfs 0.058 af

Subcatchment 2S: Front Yard to CB#5128 Runoff Area=8,717 sf 62.34% Impervious Runoff Depth=3.82"
Flow Length=152' Tc=6.0 min CN=84 Runoff=0.87 cfs 0.064 af

Subcatchment 3S: Parking to CB #5156 Runoff Area=4,667 sf 88.88% Impervious Runoff Depth=4.90"
Flow Length=71' Slope=0.0183 '/' Tc=6.0 min CN=94 Runoff=0.55 cfs 0.044 af

Subcatchment 4S: Parking and Yard to Runoff Area=28,462 sf 48.73% Impervious Runoff Depth=3.32"
Flow Length=199' Tc=6.0 min CN=79 Runoff=2.49 cfs 0.181 af

Subcatchment 5S: Back Yard to POA #1 Runoff Area=3,901 sf 71.11% Impervious Runoff Depth=4.14"
Flow Length=80' Tc=6.0 min CN=87 Runoff=0.41 cfs 0.031 af

Subcatchment 6S: Building to CB #7813 Runoff Area=3,002 sf 59.56% Impervious Runoff Depth=2.94"
Flow Length=44' Tc=6.0 min CN=75 Runoff=0.23 cfs 0.017 af

Subcatchment 7S: Yard to DW#5150 Runoff Area=2,885 sf 38.51% Impervious Runoff Depth=1.98"
Flow Length=58' Tc=6.0 min CN=64 Runoff=0.15 cfs 0.011 af

Subcatchment 8S: Back Yard to DW#7807 Runoff Area=13,543 sf 26.09% Impervious Runoff Depth=1.44"
Flow Length=71' Tc=6.0 min CN=57 Runoff=0.46 cfs 0.037 af

Subcatchment 9S: Patio to CB#5146 Runoff Area=3,939 sf 48.26% Impervious Runoff Depth=3.32"
Flow Length=73' Slope=0.0150 '/' Tc=6.0 min CN=79 Runoff=0.34 cfs 0.025 af

Subcatchment 10S: Roof and Driveway to Runoff Area=3,331 sf 82.92% Impervious Runoff Depth=4.68"
Flow Length=48' Tc=6.0 min CN=92 Runoff=0.39 cfs 0.030 af

Subcatchment 11S: Roof and Drvieway to Runoff Area=3,598 sf 85.52% Impervious Runoff Depth=4.68"
Flow Length=68' Slope=0.0100 '/' Tc=6.0 min CN=92 Runoff=0.42 cfs 0.032 af

Subcatchment 12S: Driveway to CB#6616 Runoff Area=3,965 sf 51.63% Impervious Runoff Depth=3.42"
Flow Length=90' Tc=6.0 min CN=80 Runoff=0.36 cfs 0.026 af

Subcatchment 13S: Parking Lot to Runoff Area=23,260 sf 52.04% Impervious Runoff Depth=2.94"
Tc=0.0 min CN=75 Runoff=2.12 cfs 0.131 af

Subcatchment 17S: West Side to POA #2 Runoff Area=61,787 sf 21.51% Impervious Runoff Depth=0.77"
Flow Length=383' Tc=10.3 min CN=47 Runoff=0.67 cfs 0.090 af

Reach 6R: CB #5146 Overflow Avg. Flow Depth=0.07' Max Vel=1.52 fps Inflow=0.72 cfs 0.053 af
n=0.013 L=198.0' S=0.0102 '/' Capacity=58.25 cfs Outflow=0.69 cfs 0.053 af

Reach 7R: Overland Flow Path Avg. Flow Depth=0.19' Max Vel=1.04 fps Inflow=3.15 cfs 0.193 af
n=0.035 L=107.0' S=0.0091 '/' Capacity=104.18 cfs Outflow=2.63 cfs 0.193 af

Pond 1P: CB #A Peak Elev=53.27' Inflow=0.80 cfs 0.058 af
6.0" Round Culvert n=0.012 L=84.0' S=0.0107 '/' Outflow=0.80 cfs 0.058 af

Pond 2P: CB #5128 Peak Elev=51.47' Inflow=0.87 cfs 0.064 af
Outflow=0.87 cfs 0.064 af

Pond 3P: CB #5156 Peak Elev=51.46' Inflow=2.22 cfs 0.166 af
Outflow=2.22 cfs 0.166 af

Pond 4P: CB #5132 Peak Elev=50.51' Inflow=5.38 cfs 0.399 af
Outflow=5.38 cfs 0.399 af

Pond 5P: DMH #6179 Peak Elev=50.21' Inflow=5.38 cfs 0.399 af
Outflow=5.38 cfs 0.399 af

Pond 6P: CB #7813 Peak Elev=52.62' Inflow=0.23 cfs 0.017 af
Outflow=0.23 cfs 0.017 af

Pond 7P: DW #5150 Peak Elev=52.44' Storage=11 cf Inflow=0.38 cfs 0.028 af
Discarded=0.00 cfs 0.000 af Secondary=0.38 cfs 0.028 af Outflow=0.38 cfs 0.028 af

Pond 8P: DW #7807 Peak Elev=52.34' Storage=54 cf Inflow=0.46 cfs 0.037 af
Discarded=0.41 cfs 0.037 af Secondary=0.00 cfs 0.000 af Outflow=0.41 cfs 0.037 af

Pond 9P: CB #5146 Peak Elev=52.44' Inflow=0.72 cfs 0.053 af
Outflow=0.72 cfs 0.053 af

Pond 10P: DW #5140 Peak Elev=53.79' Storage=371 cf Inflow=0.39 cfs 0.030 af
Discarded=0.00 cfs 0.000 af Secondary=2.19 cfs 0.027 af Outflow=2.19 cfs 0.027 af

Pond 11P: CB #6618 Peak Elev=67.70' Inflow=0.42 cfs 0.032 af
4.0" Round Culvert n=0.012 L=23.0' S=0.0426 '/' Outflow=0.42 cfs 0.032 af

Pond 12P: CB #6616 Peak Elev=67.47' Inflow=2.57 cfs 0.085 af
6.0" Round Culvert n=0.012 L=66.0' S=0.0312 '/' Outflow=2.57 cfs 0.085 af

Pond 13P: CB #6637 Peak Elev=70.28' Inflow=2.12 cfs 0.131 af
6.0" Round Culvert n=0.012 L=107.0' S=0.0154 '/' Outflow=2.12 cfs 0.131 af

Pond 14P: DMH #6628 Peak Elev=61.54' Inflow=3.31 cfs 0.216 af
8.0" Round Culvert n=0.012 L=161.0' S=0.0100 '/' Outflow=3.31 cfs 0.216 af

Pond 15P: Leach Pit Peak Elev=49.73' Storage=104 cf Inflow=3.31 cfs 0.216 af
Discarded=0.01 cfs 0.021 af Primary=3.18 cfs 0.195 af Outflow=3.20 cfs 0.216 af

Pond 16P: Leach Pit Peak Elev=49.21' Storage=123 cf Inflow=3.18 cfs 0.195 af
Discarded=0.00 cfs 0.000 af Secondary=3.15 cfs 0.193 af Outflow=3.15 cfs 0.193 af

Link 100: POA #1 Inflow=5.79 cfs 0.430 af
Primary=5.79 cfs 0.430 af

Link 200: POA #2 Inflow=2.96 cfs 0.283 af
Primary=2.96 cfs 0.283 af

Total Runoff Area = 4.070 ac Runoff Volume = 0.777 af Average Runoff Depth = 2.29"
59.80% Pervious = 2.434 ac 40.20% Impervious = 1.636 ac

Summary for Subcatchment 1S: Northeast Corner to CB #A

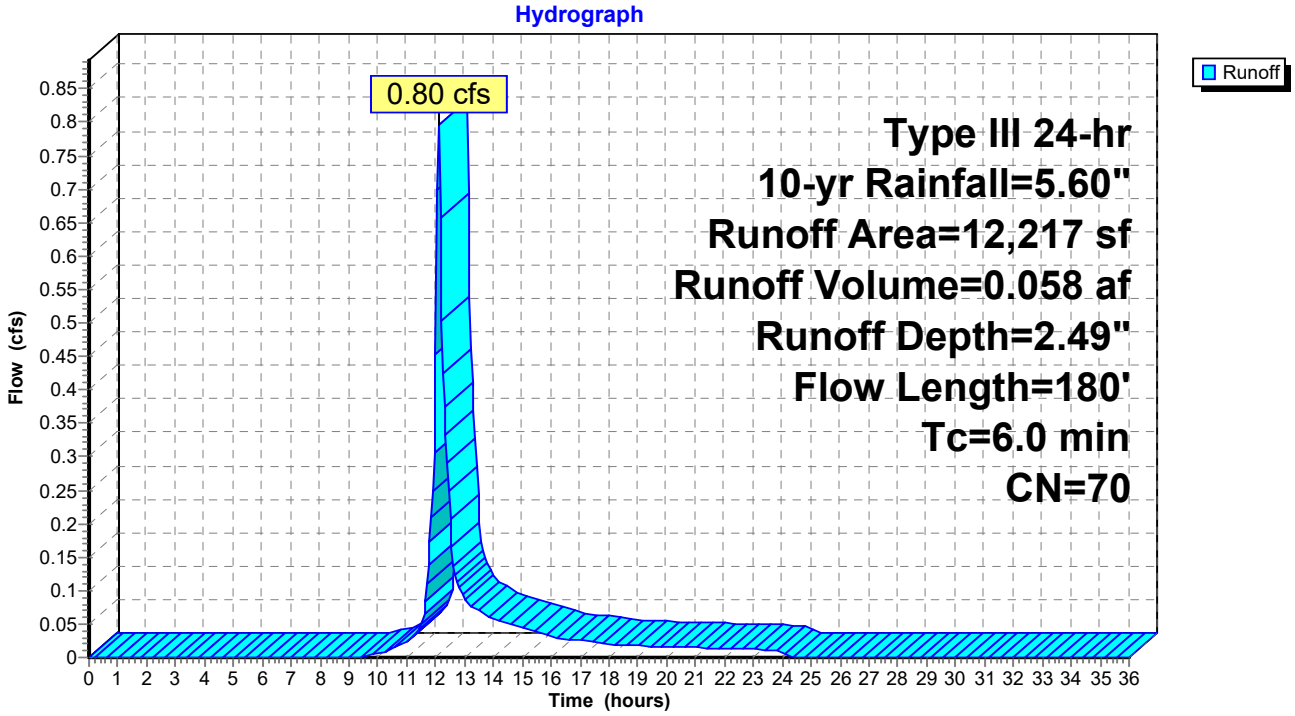
Runoff = 0.80 cfs @ 12.10 hrs, Volume= 0.058 af, Depth= 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	2,260	98	Roof
*	977	98	Impervious
*	190	98	Gravel
	5,242	61	>75% Grass cover, Good, HSG B
	3,548	55	Woods, Good, HSG B
	12,217	70	Weighted Average
	8,790		71.95% Pervious Area
	3,427		28.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	28	0.0200	1.15		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.69"
3.8	152	0.0175	0.66		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.2	180	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1S: Northeast Corner to CB #A



Summary for Subcatchment 2S: Front Yard to CB#5128

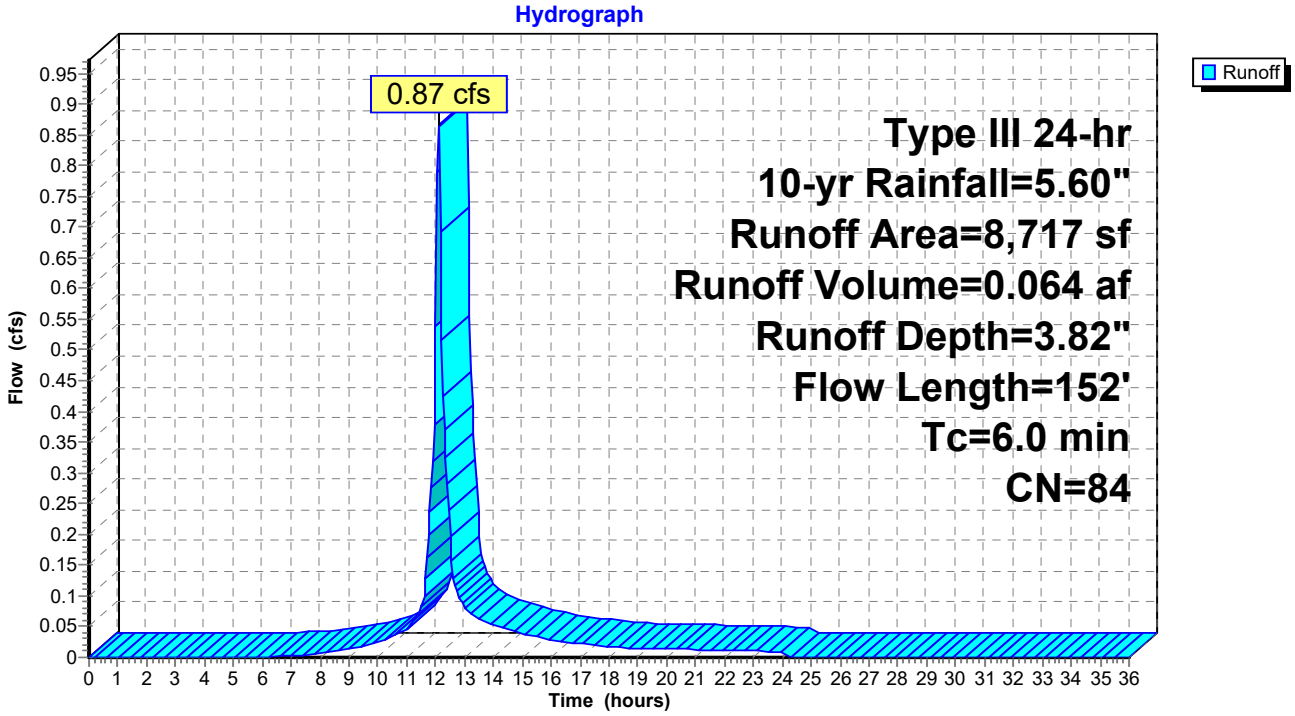
Runoff = 0.87 cfs @ 12.09 hrs, Volume= 0.064 af, Depth= 3.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	244	98	Roof
*	5,190	98	Impervious
	3,283	61	>75% Grass cover, Good, HSG B
	8,717	84	Weighted Average
	3,283		37.66% Pervious Area
	5,434		62.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	30	0.0200	1.16		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.69"
0.7	122	0.0192	2.81		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	152	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2S: Front Yard to CB#5128



Summary for Subcatchment 3S: Parking to CB #5156

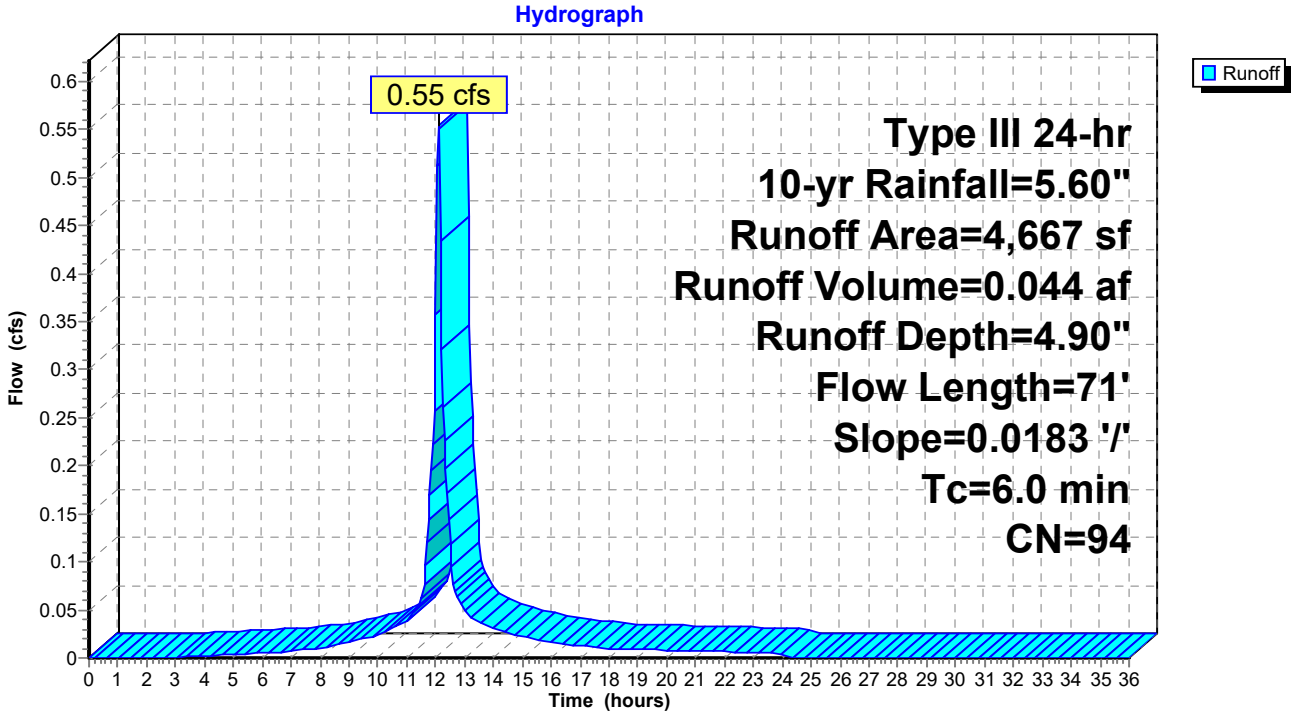
Runoff = 0.55 cfs @ 12.09 hrs, Volume= 0.044 af, Depth= 4.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	807	98	Roof
*	2,697	98	Impervious
*	644	98	Gravel
	519	61	>75% Grass cover, Good, HSG B
	4,667	94	Weighted Average
	519		11.12% Pervious Area
	4,148		88.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	23	0.0183	1.06		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.69"
0.3	48	0.0183	2.75		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	71	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 3S: Parking to CB #5156



Summary for Subcatchment 4S: Parking and Yard to CB#5132

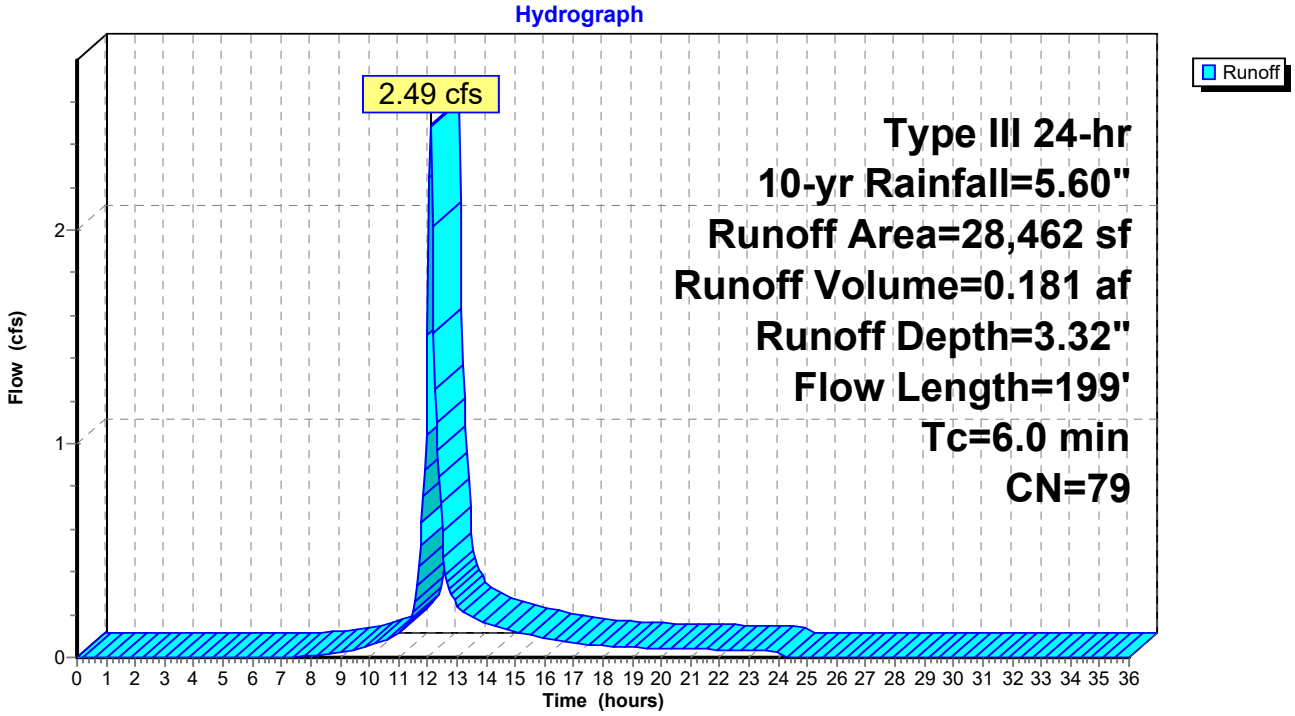
Runoff = 2.49 cfs @ 12.09 hrs, Volume= 0.181 af, Depth= 3.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	3,915	98	Roof
*	9,954	98	Impervious
	14,593	61	>75% Grass cover, Good, HSG B
	28,462	79	Weighted Average
	14,593		51.27% Pervious Area
	13,869		48.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	24	0.0100	0.84		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.69"
1.4	175	0.0112	2.15		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.9	199	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 4S: Parking and Yard to CB#5132



Summary for Subcatchment 5S: Back Yard to POA #1

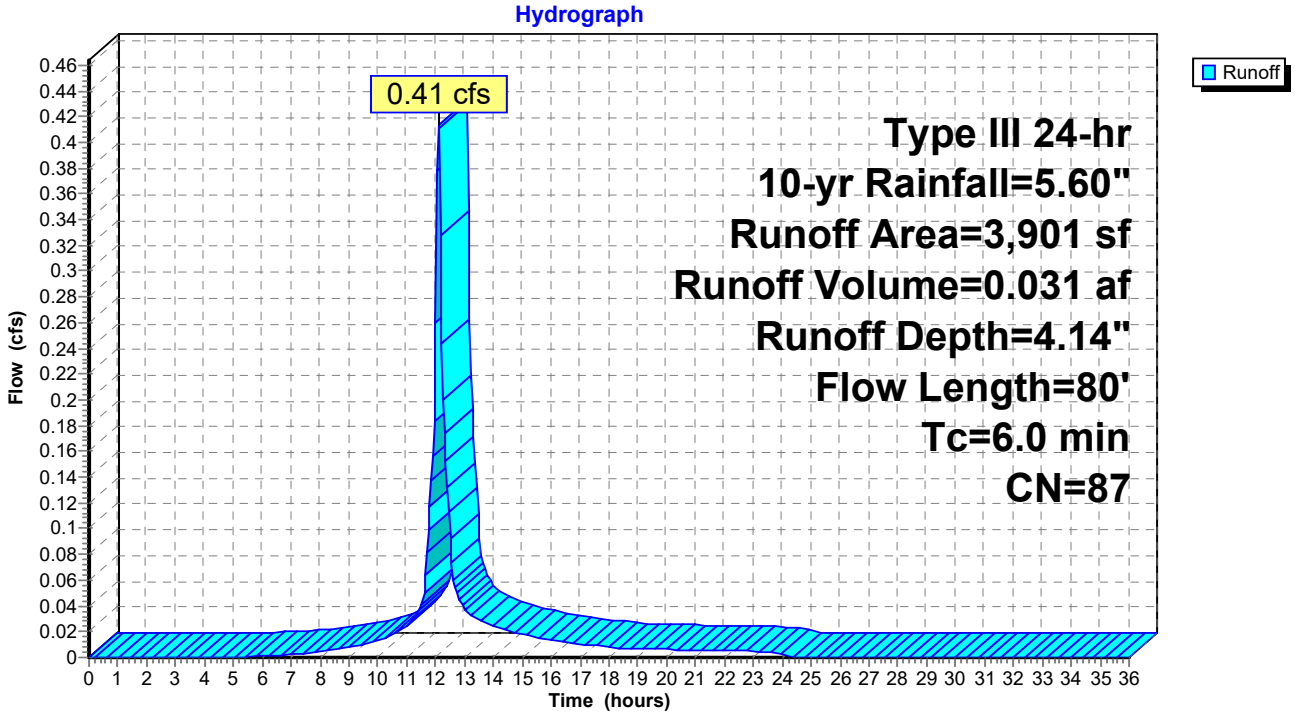
Runoff = 0.41 cfs @ 12.09 hrs, Volume= 0.031 af, Depth= 4.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	925	98	Roof
*	1,849	98	Impervious
	1,127	61	>75% Grass cover, Good, HSG B
	3,901	87	Weighted Average
	1,127		28.89% Pervious Area
	2,774		71.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	34	0.0200	1.19		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.69"
0.5	35	0.0040	1.28		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	11	0.1250	2.47		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.1	80	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 5S: Back Yard to POA #1



Summary for Subcatchment 6S: Building to CB #7813

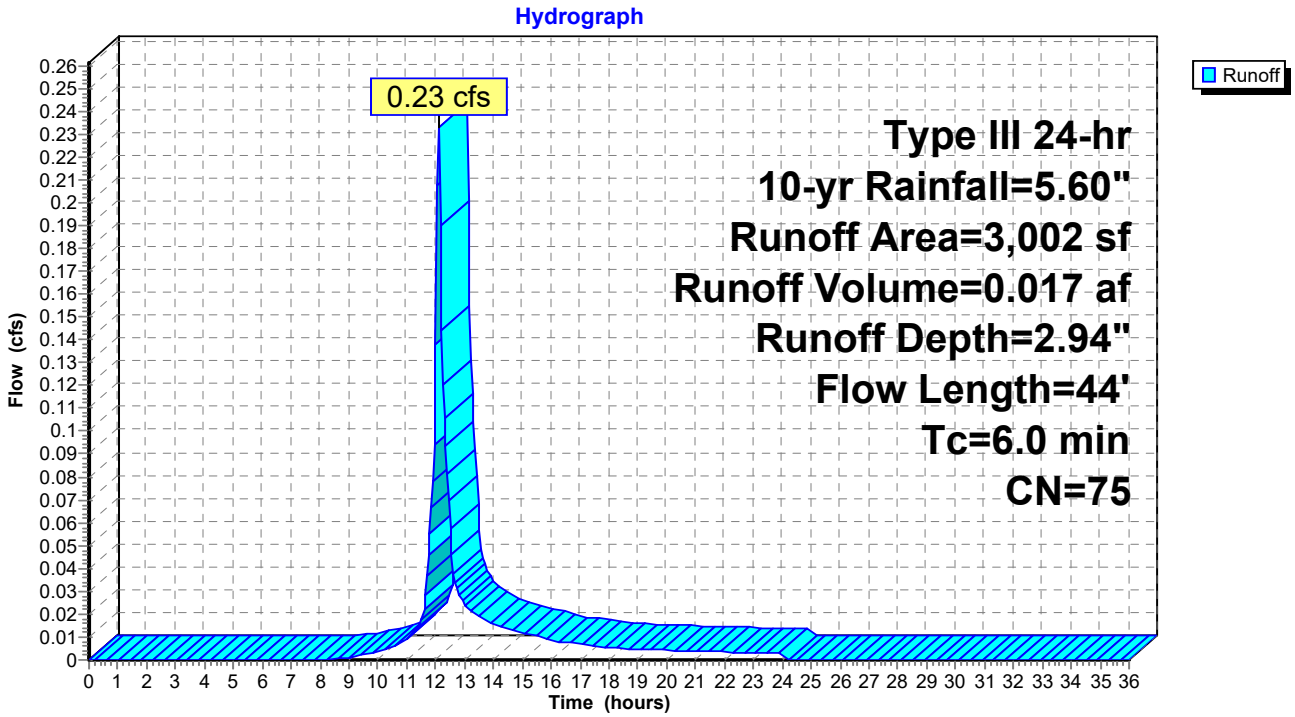
Runoff = 0.23 cfs @ 12.09 hrs, Volume= 0.017 af, Depth= 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	1,709	98	Roof
*	79	98	Gravel
	161	61	>75% Grass cover, Good, HSG B
	1,053	39	>75% Grass cover, Good, HSG A
	3,002	75	Weighted Average
	1,214		40.44% Pervious Area
	1,788		59.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	21	0.0281	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
0.4	23	0.0232	1.07		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.7	44	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 6S: Building to CB #7813



Summary for Subcatchment 7S: Yard to DW#5150

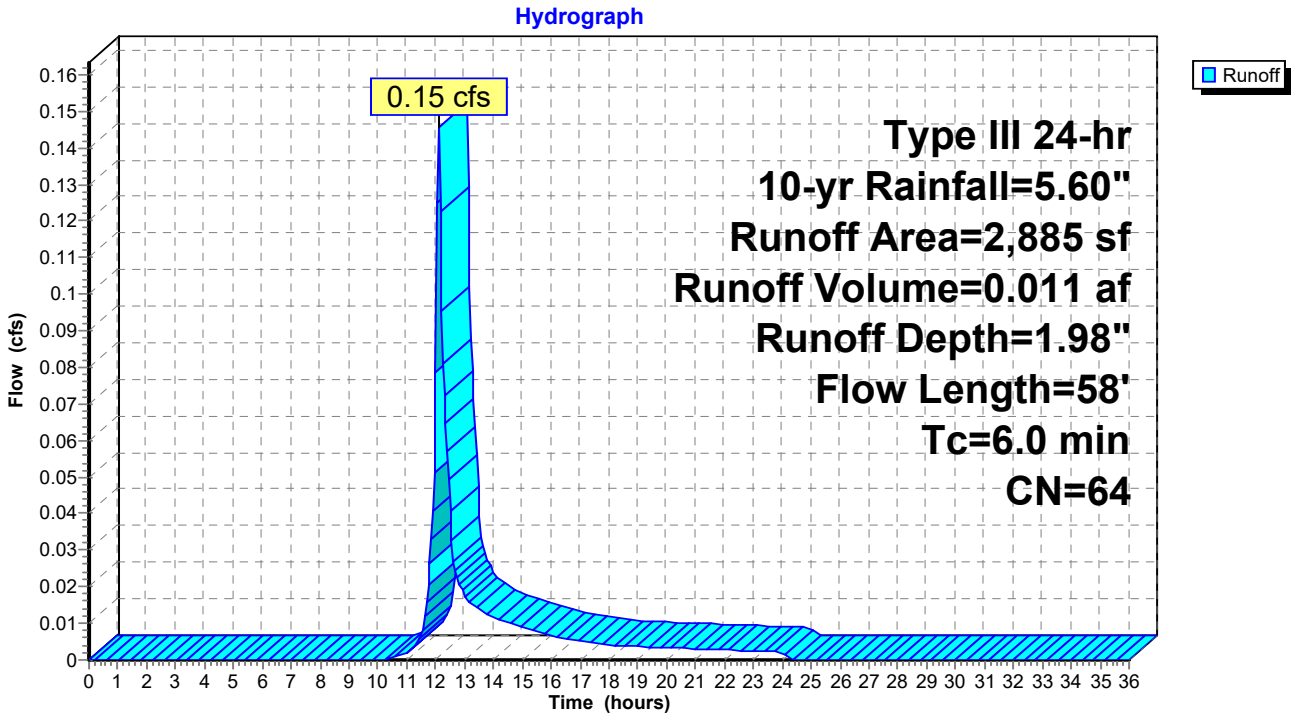
Runoff = 0.15 cfs @ 12.10 hrs, Volume= 0.011 af, Depth= 1.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	398	98	Roof
*	713	98	Impervious
	272	61	>75% Grass cover, Good, HSG B
	1,502	39	>75% Grass cover, Good, HSG A
	2,885	64	Weighted Average
	1,774		61.49% Pervious Area
	1,111		38.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	18	0.0328	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
0.7	40	0.0173	0.92		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.6	58	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 7S: Yard to DW#5150



Summary for Subcatchment 8S: Back Yard to DW#7807

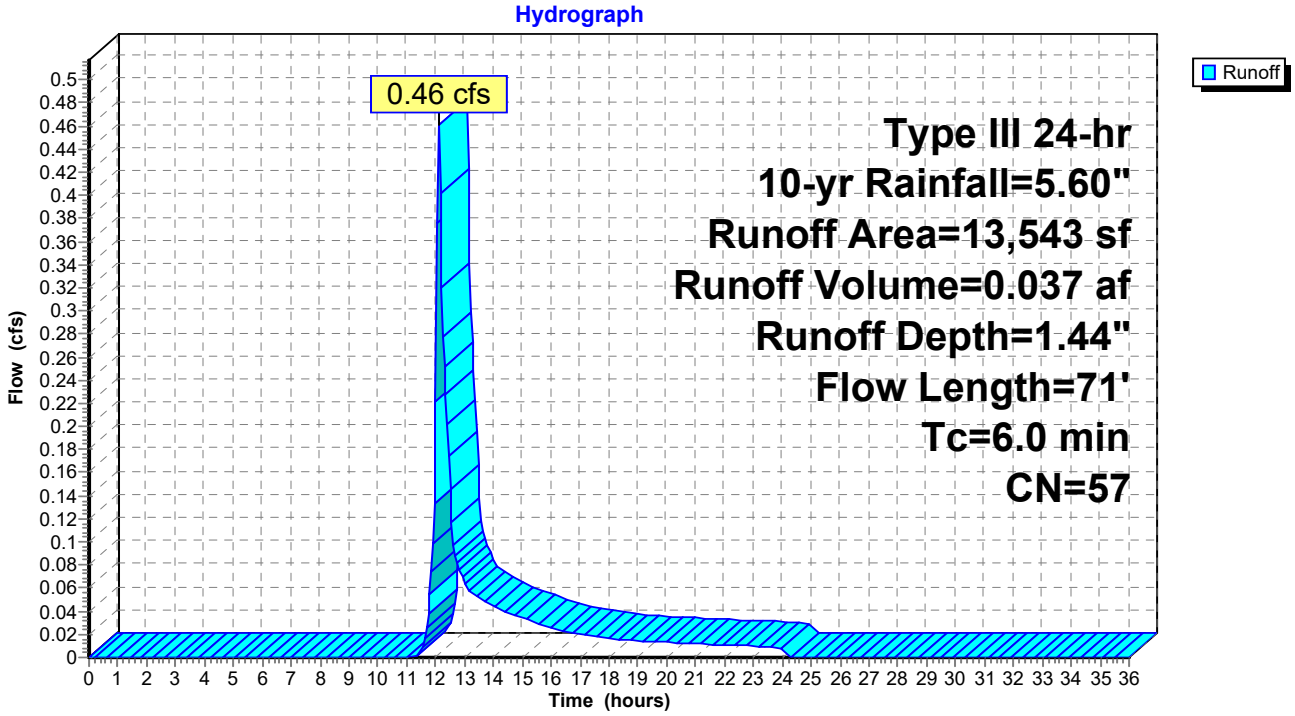
Runoff = 0.46 cfs @ 12.10 hrs, Volume= 0.037 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	2,870	98	Roof
*	563	98	Impervious
*	100	98	Ledge
	1,702	61	>75% Grass cover, Good, HSG B
	8,308	39	>75% Grass cover, Good, HSG A
	13,543	57	Weighted Average
	10,010		73.91% Pervious Area
	3,533		26.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	16	0.0369	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
1.1	55	0.0150	0.86		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.7	71	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 8S: Back Yard to DW#7807



Summary for Subcatchment 9S: Patio to CB#5146

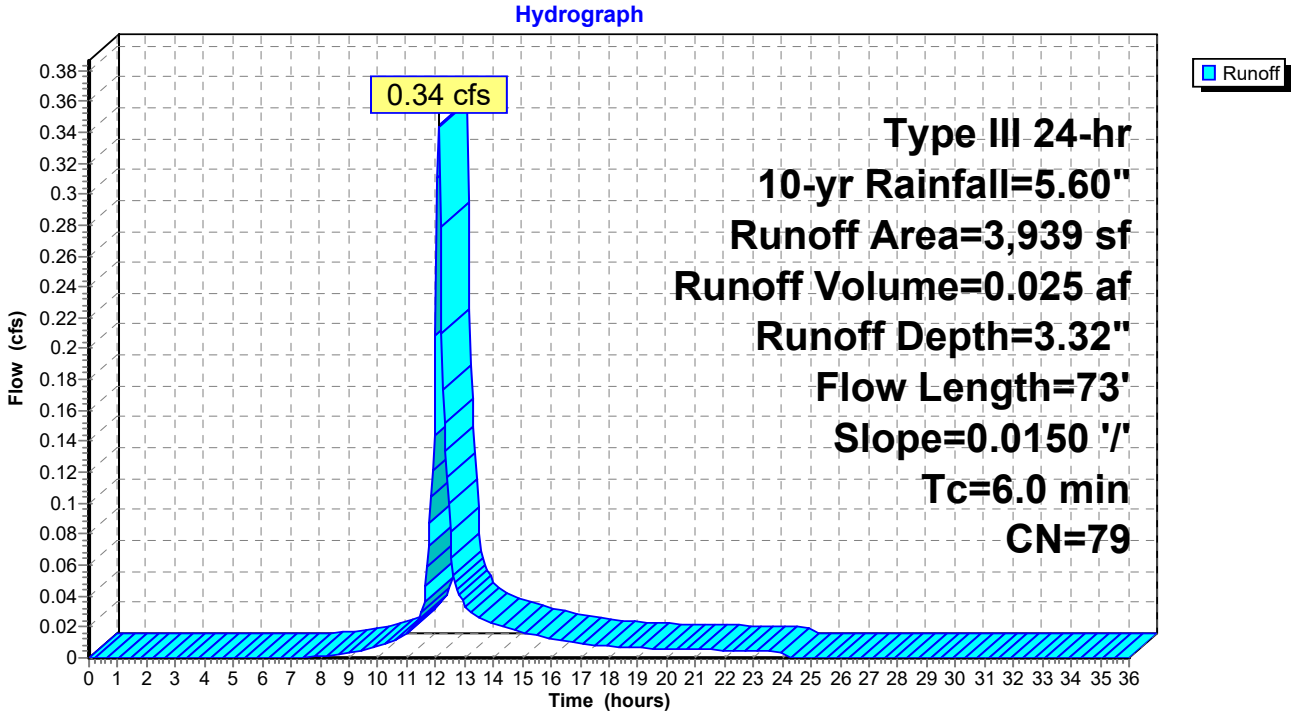
Runoff = 0.34 cfs @ 12.09 hrs, Volume= 0.025 af, Depth= 3.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	1,901	98	Impervious
	2,038	61	>75% Grass cover, Good, HSG B
	3,939	79	Weighted Average
	2,038		51.74% Pervious Area
	1,901		48.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	18	0.0150	0.93		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.69"
0.4	55	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	73	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 9S: Patio to CB#5146



Summary for Subcatchment 10S: Roof and Driveway to DW#5140

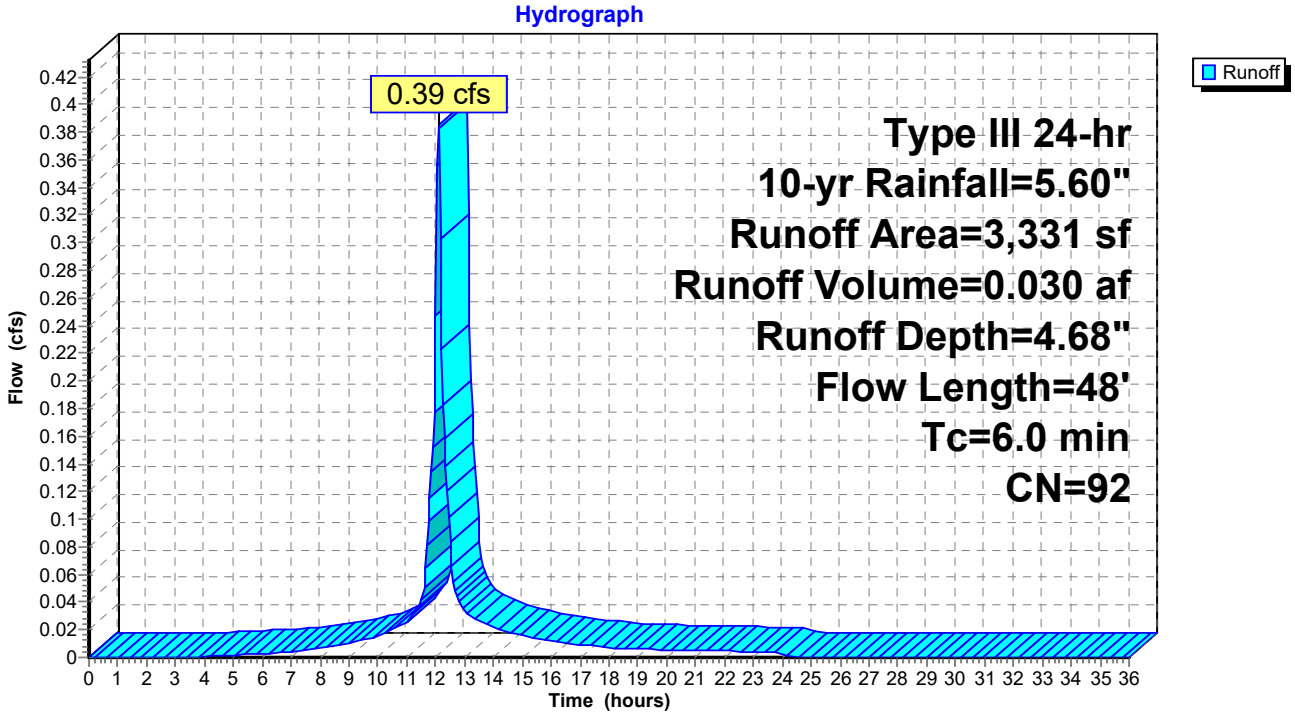
Runoff = 0.39 cfs @ 12.09 hrs, Volume= 0.030 af, Depth= 4.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	1,585	98	Roof
*	1,177	98	Impervious
	569	61	>75% Grass cover, Good, HSG B
	3,331	92	Weighted Average
	569		17.08% Pervious Area
	2,762		82.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0150	0.85		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.69"
0.3	37	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	48	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 10S: Roof and Driveway to DW#5140



Summary for Subcatchment 11S: Roof and Drvieway to CB#6618

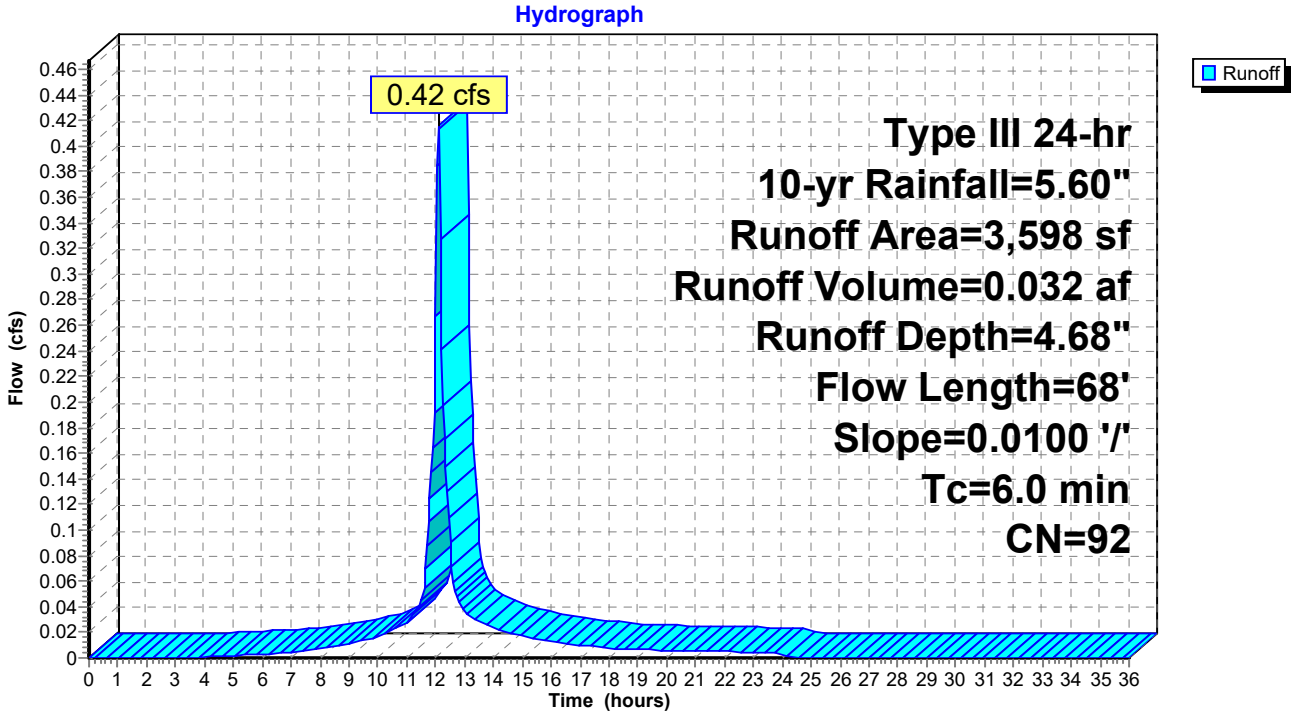
Runoff = 0.42 cfs @ 12.09 hrs, Volume= 0.032 af, Depth= 4.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	903	98	Roof
*	2,174	98	Impervious
	427	61	>75% Grass cover, Good, HSG B
	94	39	>75% Grass cover, Good, HSG A
	3,598	92	Weighted Average
	521		14.48% Pervious Area
	3,077		85.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	22	0.0100	0.83		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.69"
0.4	46	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	68	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 11S: Roof and Drvieway to CB#6618



Summary for Subcatchment 12S: Driveway to CB#6616

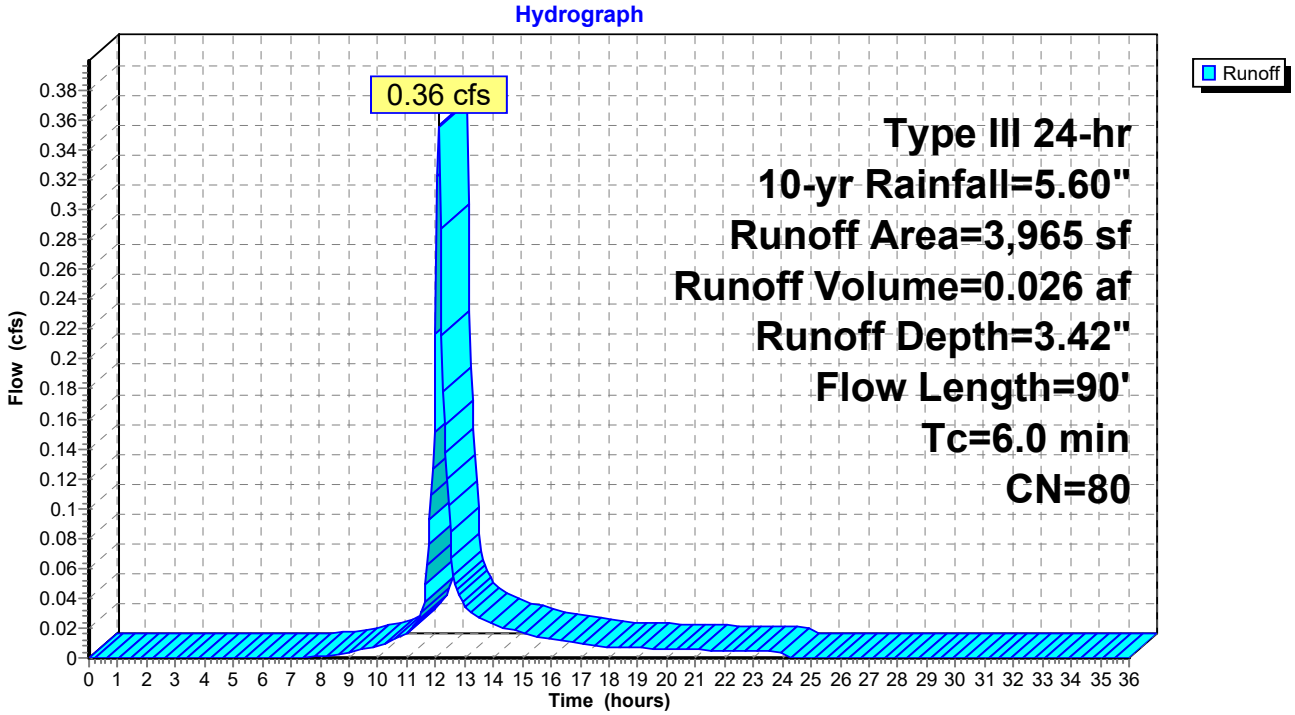
Runoff = 0.36 cfs @ 12.09 hrs, Volume= 0.026 af, Depth= 3.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	2,047	98	Impervious
	1,918	61	>75% Grass cover, Good, HSG B
	3,965	80	Weighted Average
	1,918		48.37% Pervious Area
	2,047		51.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	24	0.0100	0.84		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.69"
1.1	26	0.0034	0.41		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	40	0.0070	1.70		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.0	90	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 12S: Driveway to CB#6616



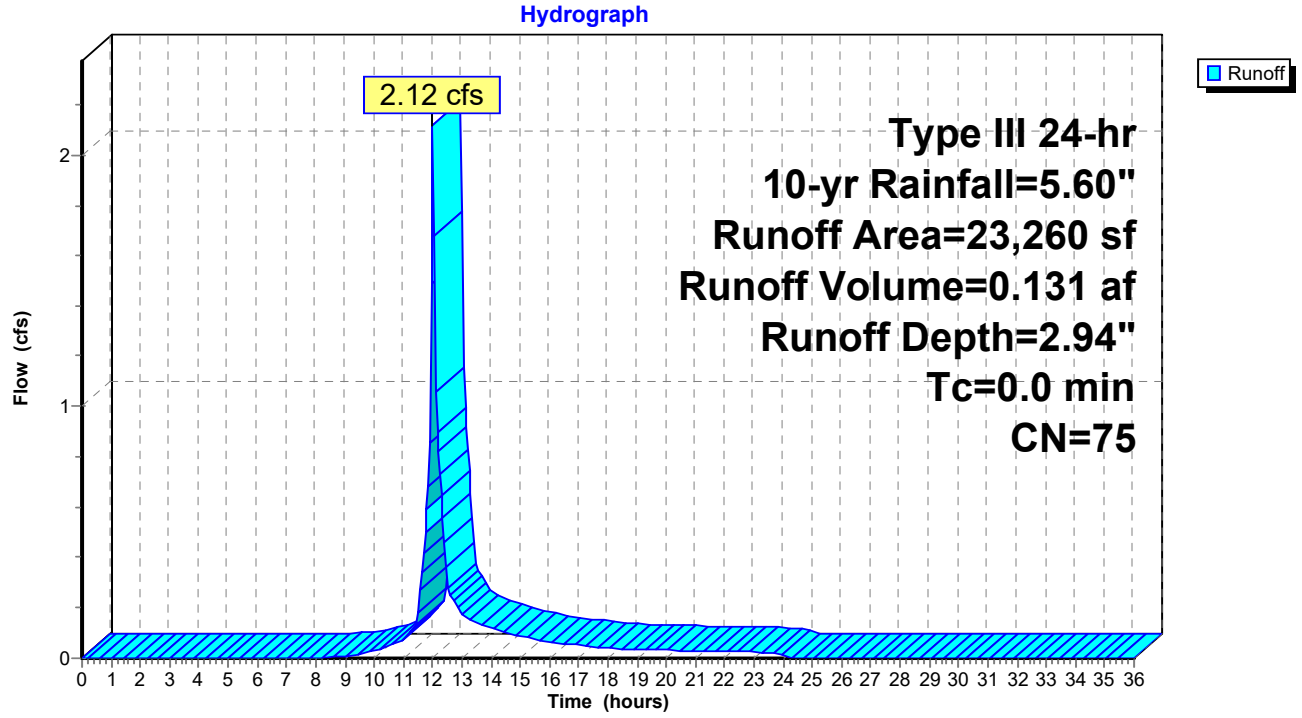
Summary for Subcatchment 13S: Parking Lot to CB#6637

Runoff = 2.12 cfs @ 12.00 hrs, Volume= 0.131 af, Depth= 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	2,090	98	Roof
*	10,015	98	Impervious
	5,669	61	>75% Grass cover, Good, HSG B
	1,325	55	Woods, Good, HSG B
	2,787	39	>75% Grass cover, Good, HSG A
	1,374	30	Woods, Good, HSG A
	23,260	75	Weighted Average
	11,155		47.96% Pervious Area
	12,105		52.04% Impervious Area

Subcatchment 13S: Parking Lot to CB#6637



Summary for Subcatchment 17S: West Side to POA #2

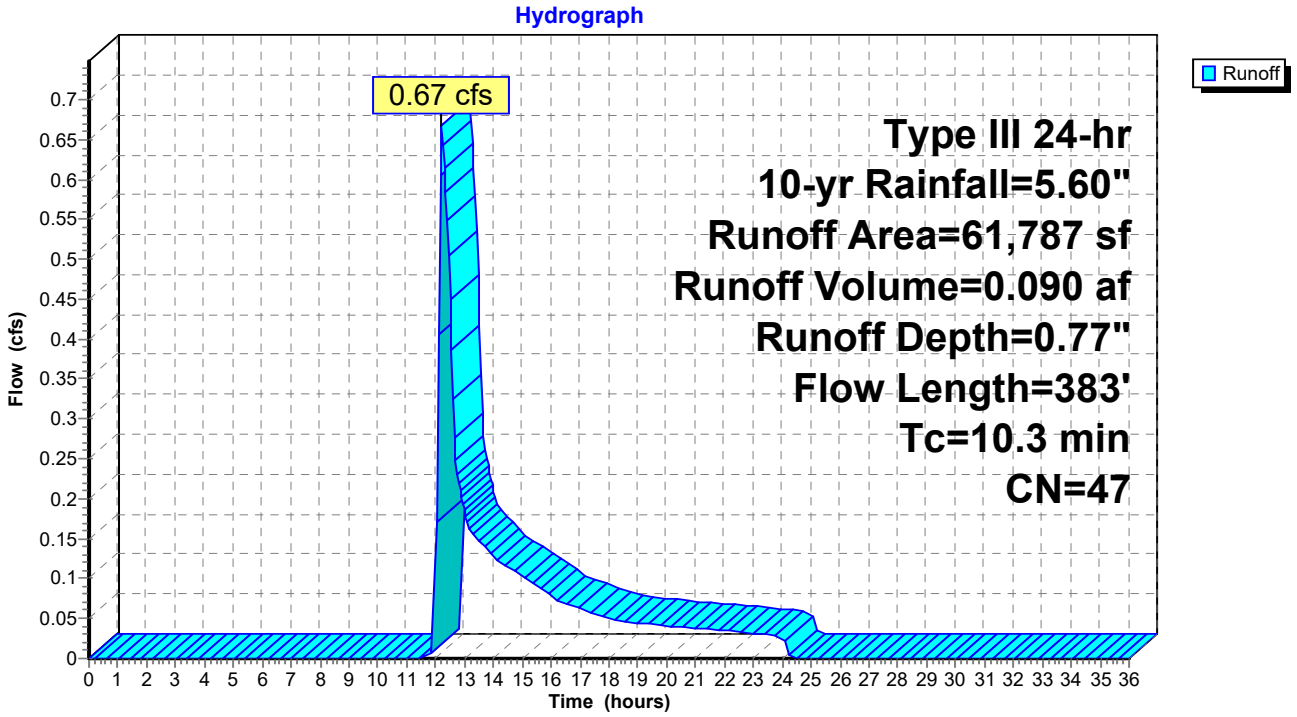
Runoff = 0.67 cfs @ 12.21 hrs, Volume= 0.090 af, Depth= 0.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	1,247	98	Roof
*	11,762	98	Impervious
*	62	98	Gravel
*	220	98	Ledge
	97	61	>75% Grass cover, Good, HSG B
	17,145	39	>75% Grass cover, Good, HSG A
	31,254	30	Woods, Good, HSG A
	61,787	47	Weighted Average
	48,496		78.49% Pervious Area
	13,291		21.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	32	0.0380	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
2.4	144	0.0208	1.01		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.7	110	0.0455	1.07		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.4	97	0.0091	0.48		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.3	383	Total			

Subcatchment 17S: West Side to POA #2



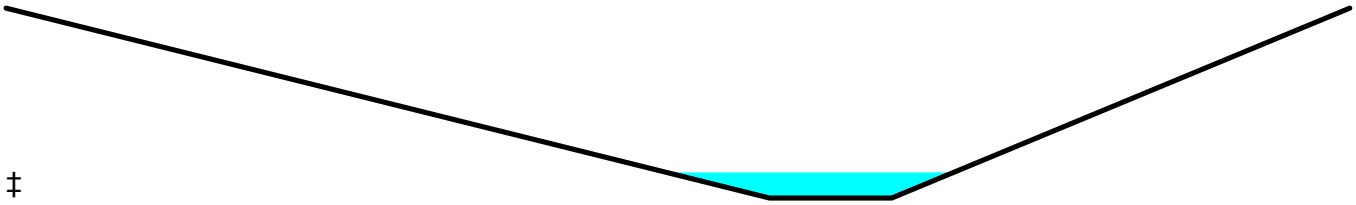
Summary for Reach 6R: CB #5146 Overflow

Inflow = 0.72 cfs @ 12.09 hrs, Volume= 0.053 af
Outflow = 0.69 cfs @ 12.12 hrs, Volume= 0.053 af, Atten= 4%, Lag= 1.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.52 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 0.51 fps, Avg. Travel Time= 6.5 min

Peak Storage= 89 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 0.50' Flow Area= 12.0 sf, Capacity= 58.25 cfs

4.00' x 0.50' deep channel, n= 0.013 Asphalt, smooth
Side Slope Z-value= 50.0 30.0 '/' Top Width= 44.00'
Length= 198.0' Slope= 0.0102 '/'
Inlet Invert= 52.31', Outlet Invert= 50.29'



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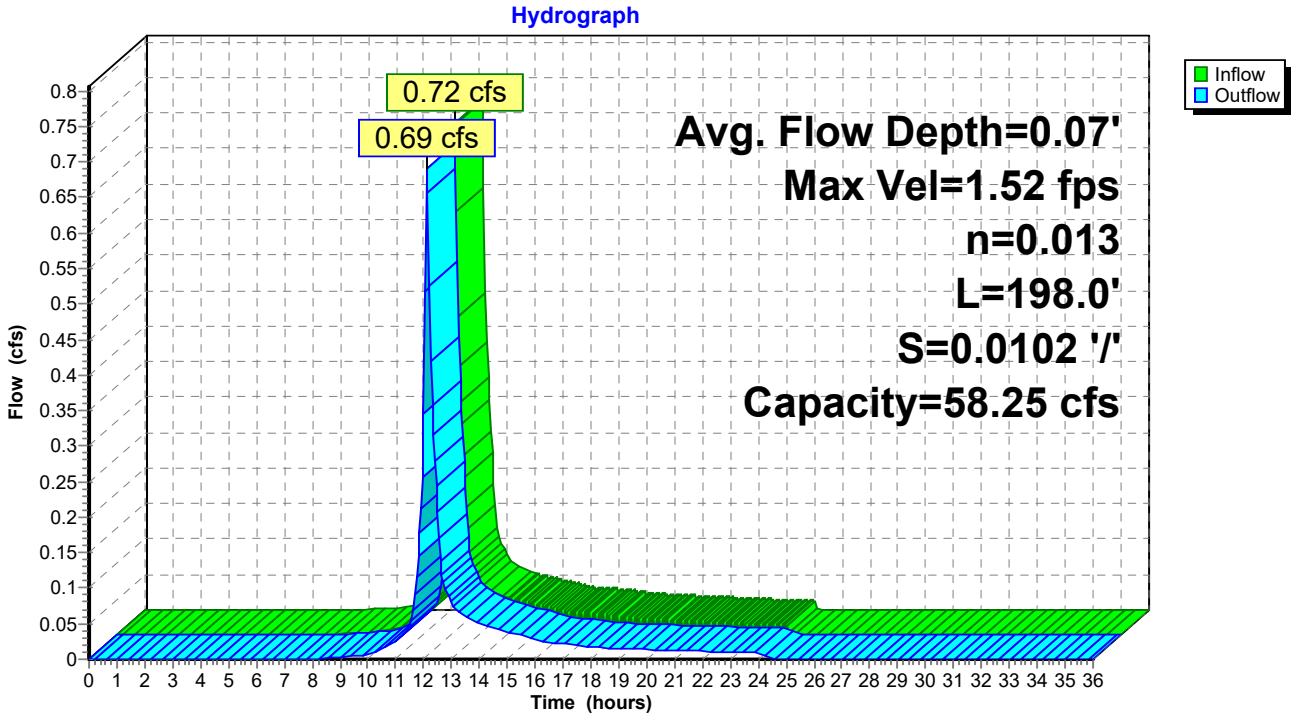
Reach 6R: CB #5146 Overflow



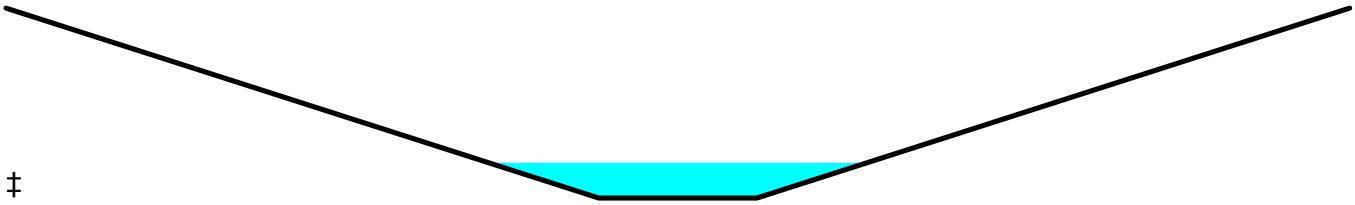
Summary for Reach 7R: Overland Flow Path

Inflow = 3.15 cfs @ 12.25 hrs, Volume= 0.193 af
Outflow = 2.63 cfs @ 12.04 hrs, Volume= 0.193 af, Atten= 16%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.04 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 0.35 fps, Avg. Travel Time= 5.1 min

Peak Storage= 270 cf @ 12.04 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.00' Flow Area= 38.0 sf, Capacity= 104.18 cfs

8.00' x 1.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 30.0 '/' Top Width= 68.00'
Length= 107.0' Slope= 0.0091 '/'
Inlet Invert= 48.75', Outlet Invert= 47.78'



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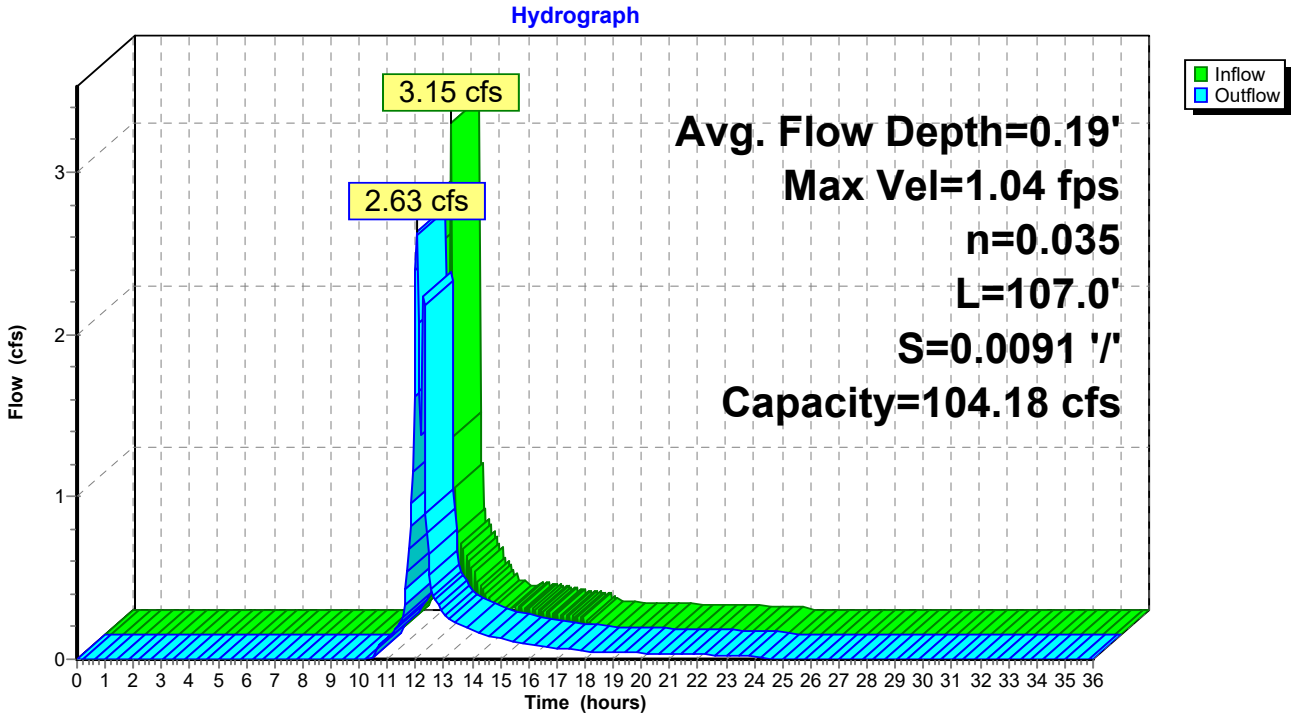
Reach 7R: Overland Flow Path



Summary for Pond 1P: CB #A

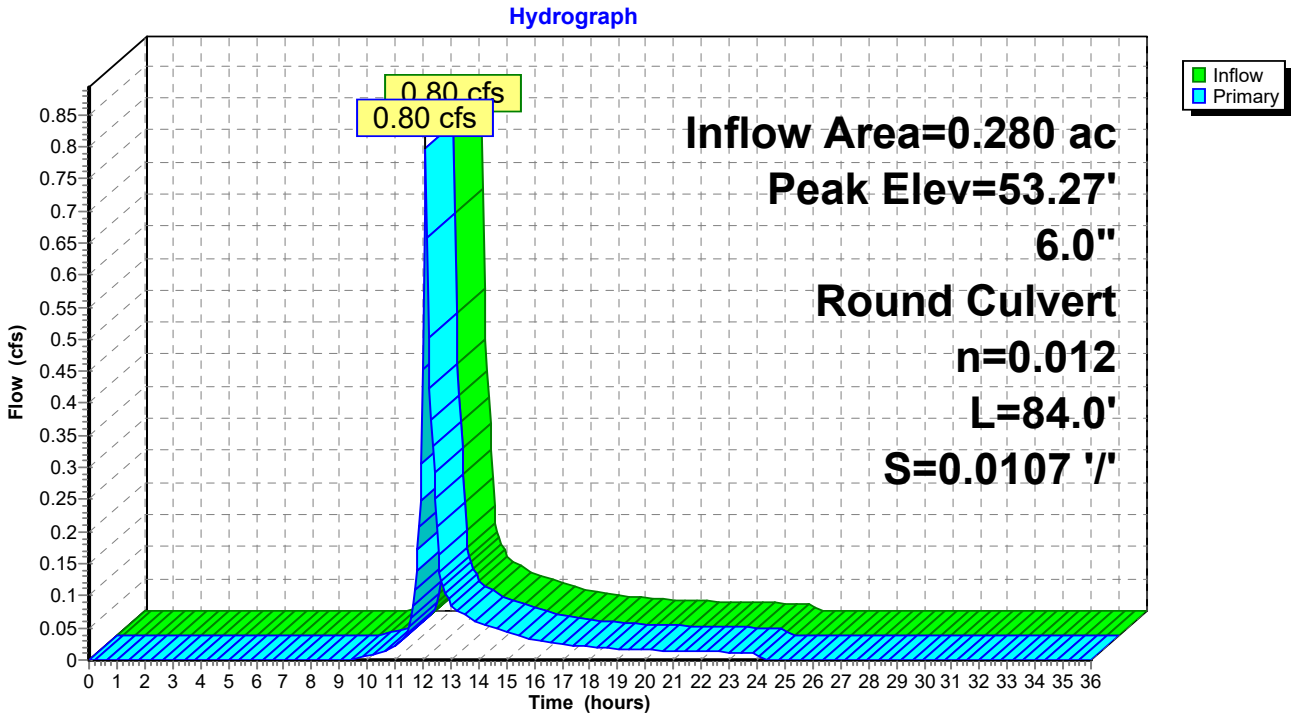
Inflow Area = 0.280 ac, 28.05% Impervious, Inflow Depth = 2.49" for 10-yr event
Inflow = 0.80 cfs @ 12.10 hrs, Volume= 0.058 af
Outflow = 0.80 cfs @ 12.10 hrs, Volume= 0.058 af, Atten= 0%, Lag= 0.0 min
Primary = 0.80 cfs @ 12.10 hrs, Volume= 0.058 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 53.27' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	49.42'	**6.0" Round Culvert** L= 84.0' Ke= 0.500 Inlet / Outlet Invert= 49.42' / 48.52' S= 0.0107 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.78 cfs @ 12.10 hrs HW=53.21' TW=51.46' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.78 cfs @ 3.97 fps)

Pond 1P: CB #A



Summary for Pond 2P: CB #5128

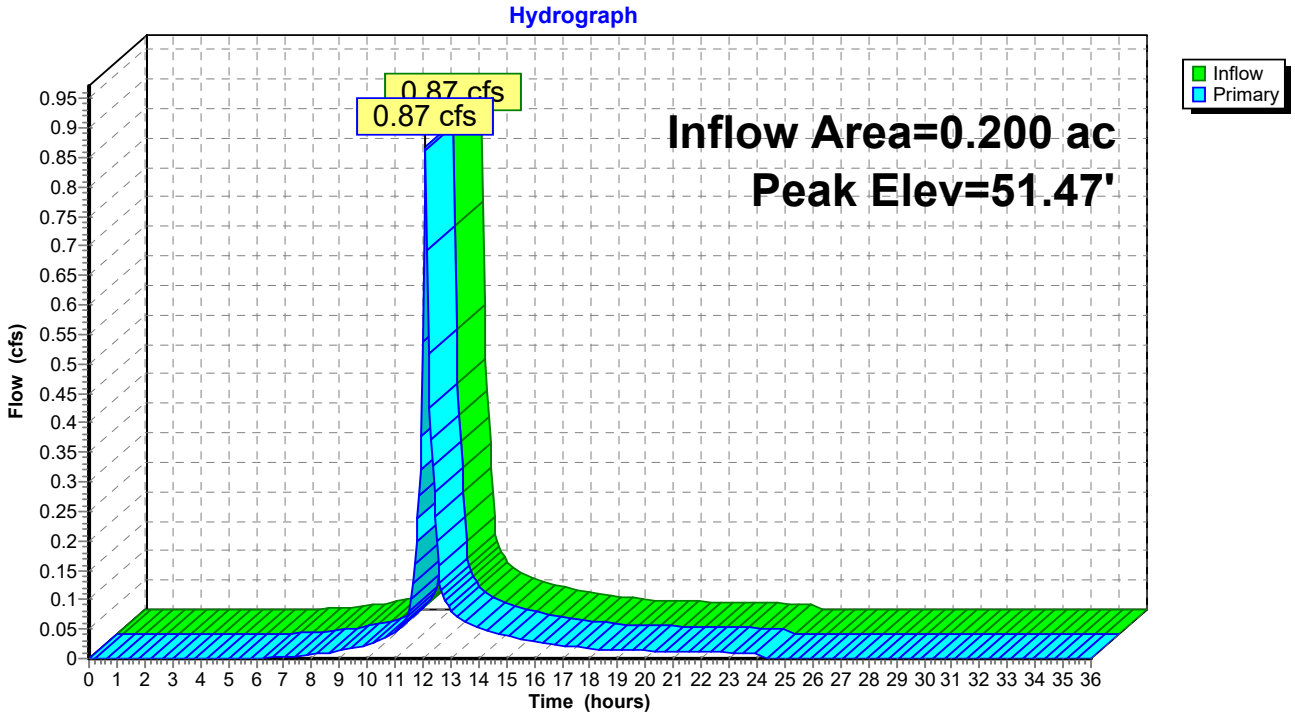
Inflow Area = 0.200 ac, 62.34% Impervious, Inflow Depth = 3.82" for 10-yr event
Inflow = 0.87 cfs @ 12.09 hrs, Volume= 0.064 af
Outflow = 0.87 cfs @ 12.09 hrs, Volume= 0.064 af, Atten= 0%, Lag= 0.0 min
Primary = 0.87 cfs @ 12.09 hrs, Volume= 0.064 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 51.47' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	49.84'	**6.0" Round Culvert** L= 47.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 49.84' / 48.52' S= 0.0281 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#2	Primary	51.40'	**20.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.49 cfs @ 12.09 hrs HW=51.46' TW=51.46' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.06 cfs @ 0.32 fps)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 0.42 cfs @ 0.34 fps)

Pond 2P: CB #5128



Summary for Pond 3P: CB #5156

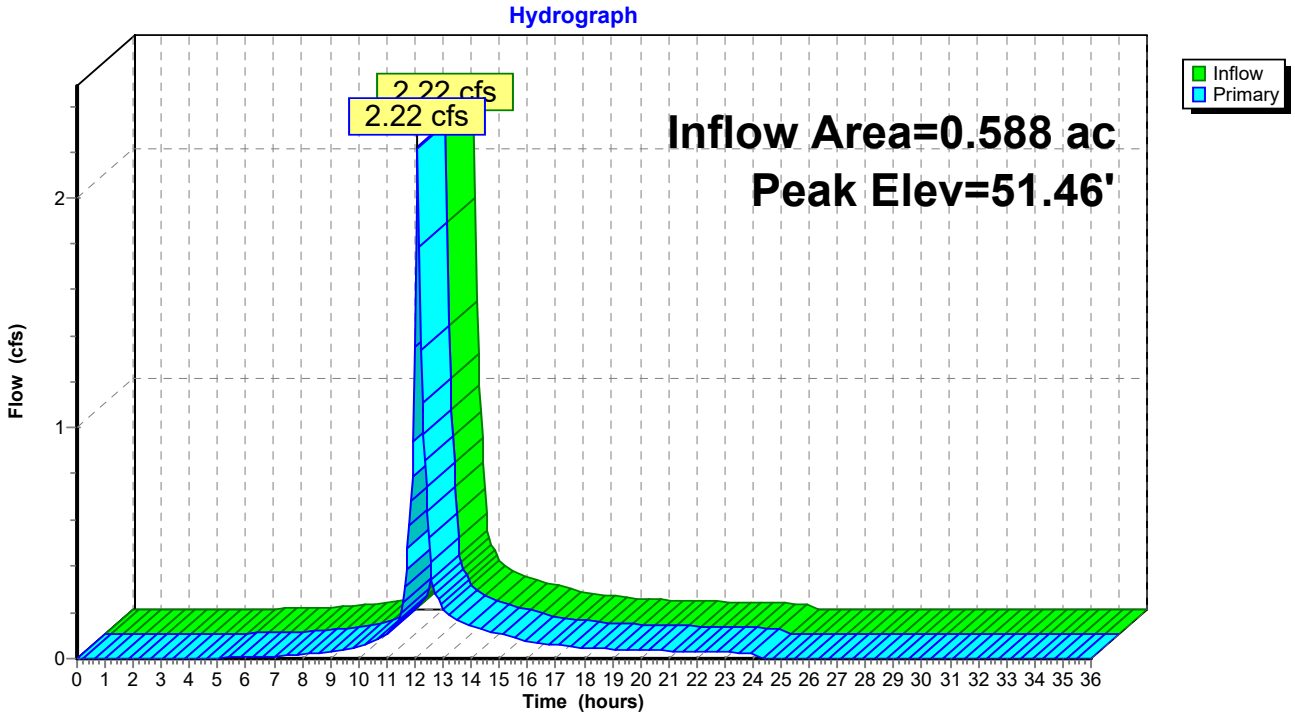
Inflow Area = 0.588 ac, 50.81% Impervious, Inflow Depth = 3.38" for 10-yr event
Inflow = 2.22 cfs @ 12.09 hrs, Volume= 0.166 af
Outflow = 2.22 cfs @ 12.09 hrs, Volume= 0.166 af, Atten= 0%, Lag= 0.0 min
Primary = 2.22 cfs @ 12.09 hrs, Volume= 0.166 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 51.46' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	48.44'	**8.0" Round Culvert** L= 46.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.44' / 47.14' S= 0.0283 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Primary	51.40'	**20.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=2.14 cfs @ 12.09 hrs HW=51.46' TW=50.50' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.44 cfs @ 4.12 fps)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 0.70 cfs @ 0.63 fps)

Pond 3P: CB #5156



Summary for Pond 4P: CB #5132

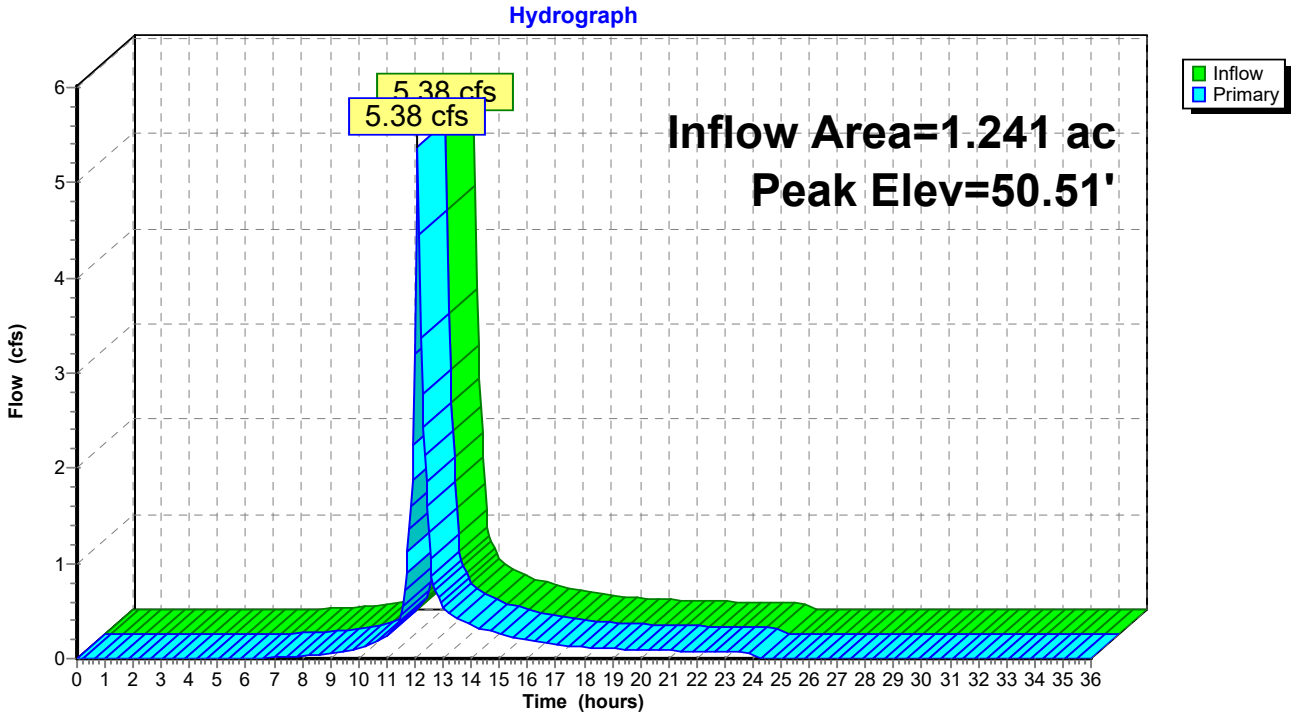
Inflow Area = 1.241 ac, 49.72% Impervious, Inflow Depth = 3.86" for 10-yr event
Inflow = 5.38 cfs @ 12.09 hrs, Volume= 0.399 af
Outflow = 5.38 cfs @ 12.09 hrs, Volume= 0.399 af, Atten= 0%, Lag= 0.0 min
Primary = 5.38 cfs @ 12.09 hrs, Volume= 0.399 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 50.51' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	47.24'	**8.0" Round Culvert** L= 48.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 47.24' / 46.78' S= 0.0096 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Primary	50.20'	**10.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=5.26 cfs @ 12.09 hrs HW=50.50' TW=50.21' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.79 cfs @ 2.25 fps)
2=Broad-Crested Rectangular Weir (Weir Controls 4.47 cfs @ 1.48 fps)

Pond 4P: CB #5132



Summary for Pond 5P: DMH #6179

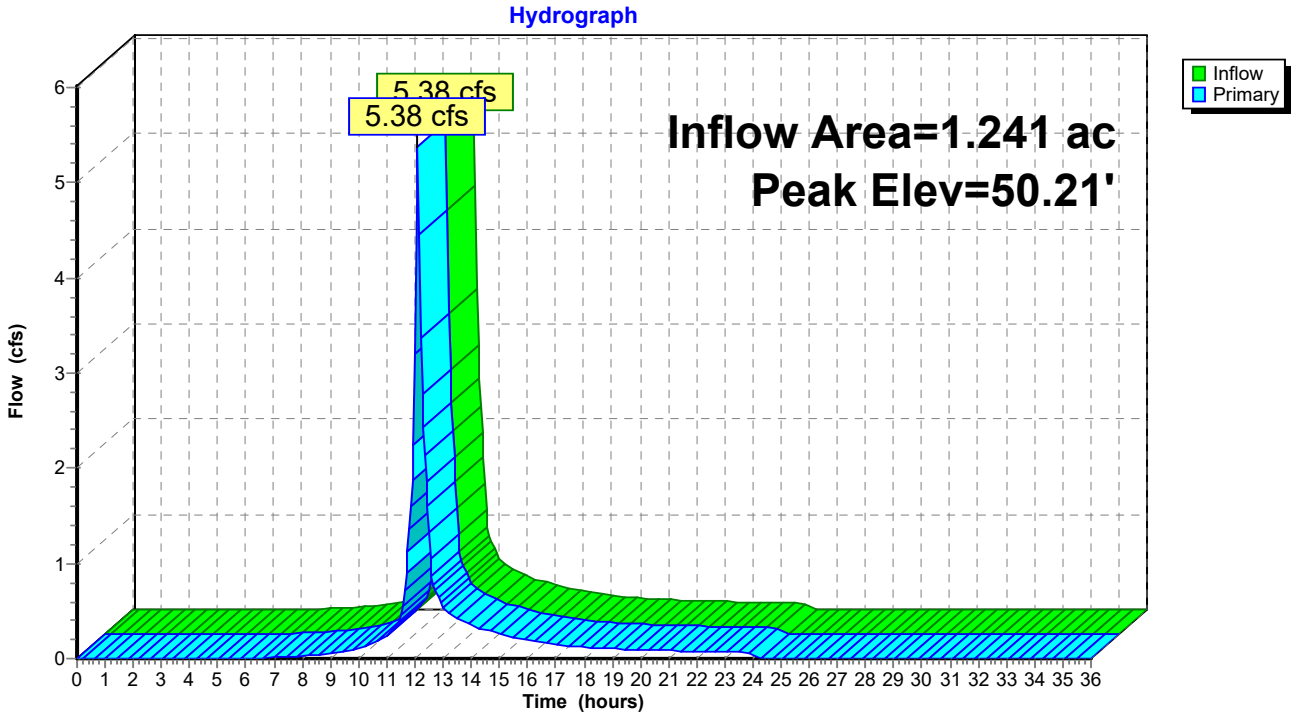
Inflow Area = 1.241 ac, 49.72% Impervious, Inflow Depth = 3.86" for 10-yr event
Inflow = 5.38 cfs @ 12.09 hrs, Volume= 0.399 af
Outflow = 5.38 cfs @ 12.09 hrs, Volume= 0.399 af, Atten= 0%, Lag= 0.0 min
Primary = 5.38 cfs @ 12.09 hrs, Volume= 0.399 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 50.21' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	46.96'	**8.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.96' / 46.29' S= 0.0112 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Primary	50.07'	**20.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=5.30 cfs @ 12.09 hrs HW=50.21' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 2.45 cfs @ 7.02 fps)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 2.85 cfs @ 1.01 fps)

Pond 5P: DMH #6179



Summary for Pond 6P: CB #7813

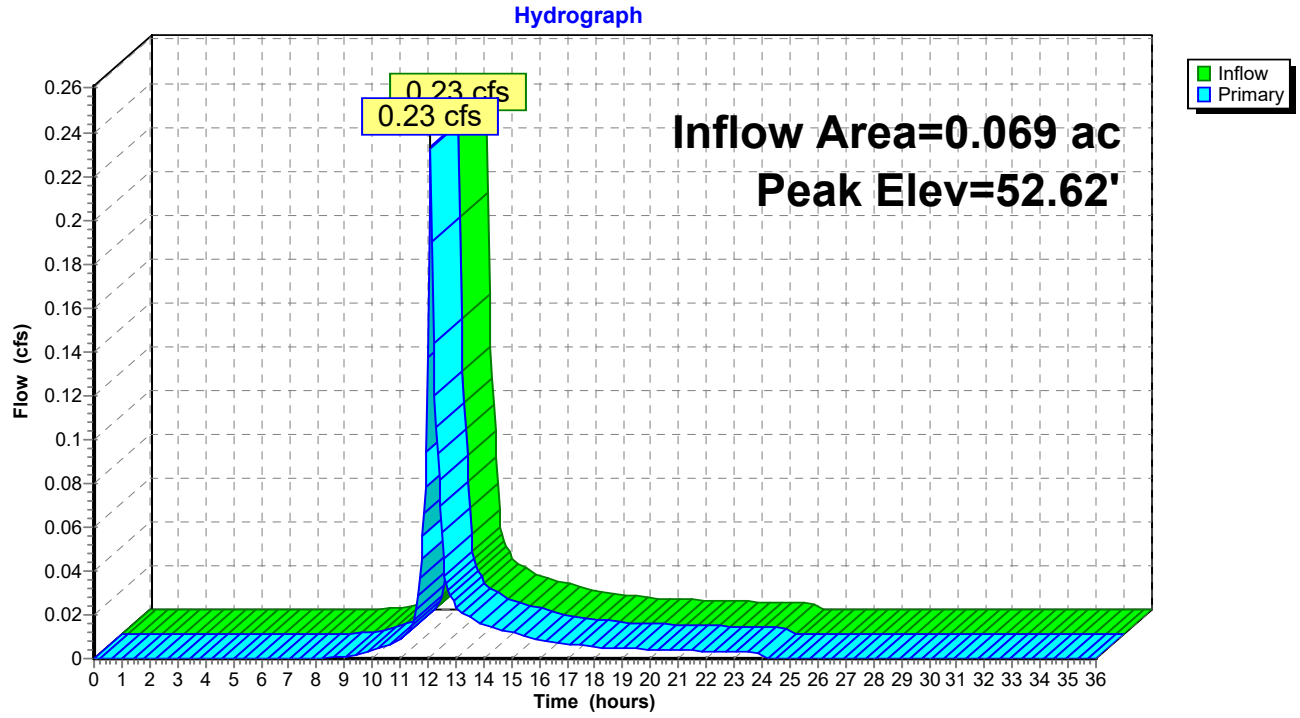
Inflow Area = 0.069 ac, 59.56% Impervious, Inflow Depth = 2.94" for 10-yr event
Inflow = 0.23 cfs @ 12.09 hrs, Volume= 0.017 af
Outflow = 0.23 cfs @ 12.09 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min
Primary = 0.23 cfs @ 12.09 hrs, Volume= 0.017 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 52.62' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	51.14'	**4.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 51.14' / 50.89' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#2	Primary	52.60'	**10.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.22 cfs @ 12.09 hrs HW=52.62' TW=52.43' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.15 cfs @ 1.67 fps)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 0.07 cfs @ 0.38 fps)

Pond 6P: CB #7813



Summary for Pond 7P: DW #5150

Inflow Area = 0.135 ac, 49.24% Impervious, Inflow Depth = 2.47" for 10-yr event
Inflow = 0.38 cfs @ 12.10 hrs, Volume= 0.028 af
Outflow = 0.38 cfs @ 12.10 hrs, Volume= 0.028 af, Atten= 1%, Lag= 0.0 min
Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.38 cfs @ 12.10 hrs, Volume= 0.028 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 52.44' @ 12.15 hrs Surf.Area= 6 sf Storage= 11 cf

Plug-Flow detention time= 7.5 min calculated for 0.028 af (99% of inflow)
Center-of-Mass det. time= 2.4 min (842.6 - 840.2)

Volume	Invert	Avail.Storage	Storage Description
#1	49.67'	17 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

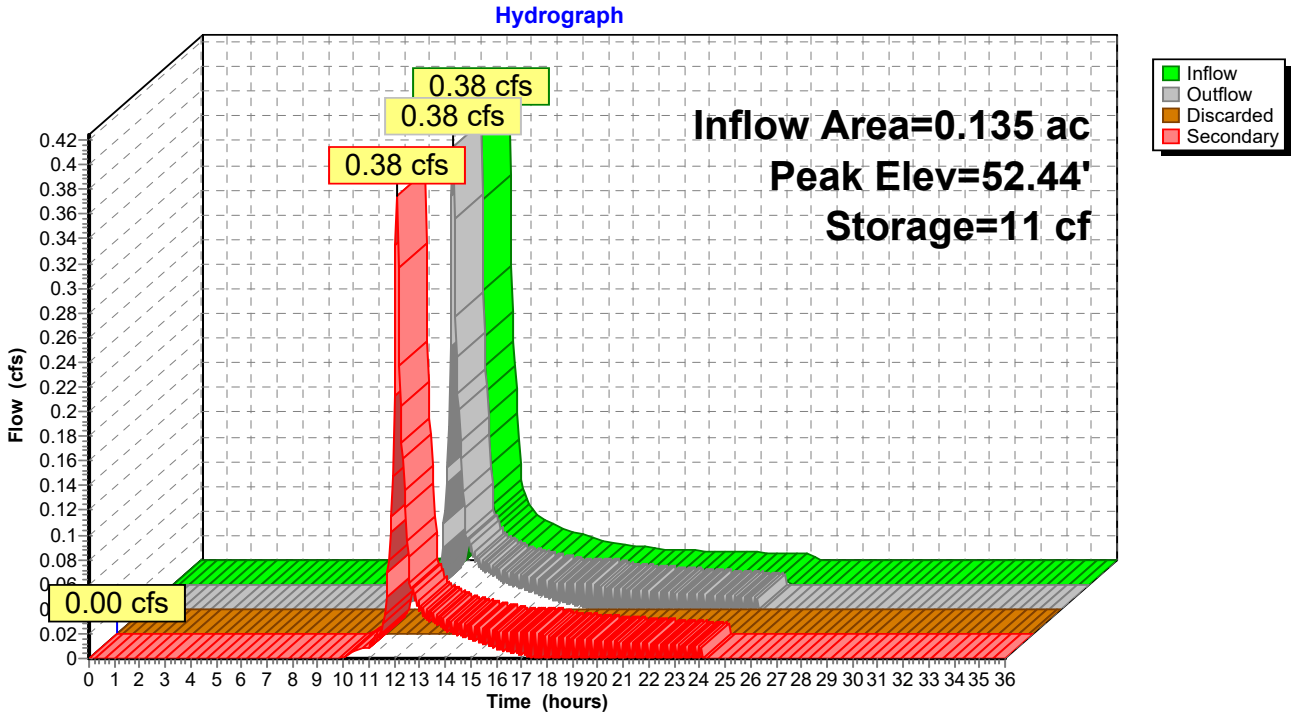
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
49.67	4	0	0
52.32	4	11	11
53.00	16	7	17

Device	Routing	Invert	Outlet Devices
#1	Discarded	49.67'	**30.000 in/hr Exfiltration over Surface area from 49.67' - 52.32'** Excluded Surface area = 4 sf Phase-In= 0.01'
#2	Secondary	52.32'	**10.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.67' (Free Discharge)
1=Exfiltration (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 12.10 hrs HW=52.43' TW=52.43' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 7P: DW #5150



Summary for Pond 8P: DW #7807

Inflow Area = 0.311 ac, 26.09% Impervious, Inflow Depth = 1.44" for 10-yr event
Inflow = 0.46 cfs @ 12.10 hrs, Volume= 0.037 af
Outflow = 0.41 cfs @ 12.15 hrs, Volume= 0.037 af, Atten= 12%, Lag= 3.0 min
Discarded = 0.41 cfs @ 12.15 hrs, Volume= 0.037 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 52.34' @ 12.15 hrs Surf.Area= 584 sf Storage= 54 cf

Plug-Flow detention time= 4.2 min calculated for 0.037 af (100% of inflow)
Center-of-Mass det. time= 4.3 min (880.5 - 876.2)

Volume	Invert	Avail.Storage	Storage Description
#1	49.68'	4,239 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

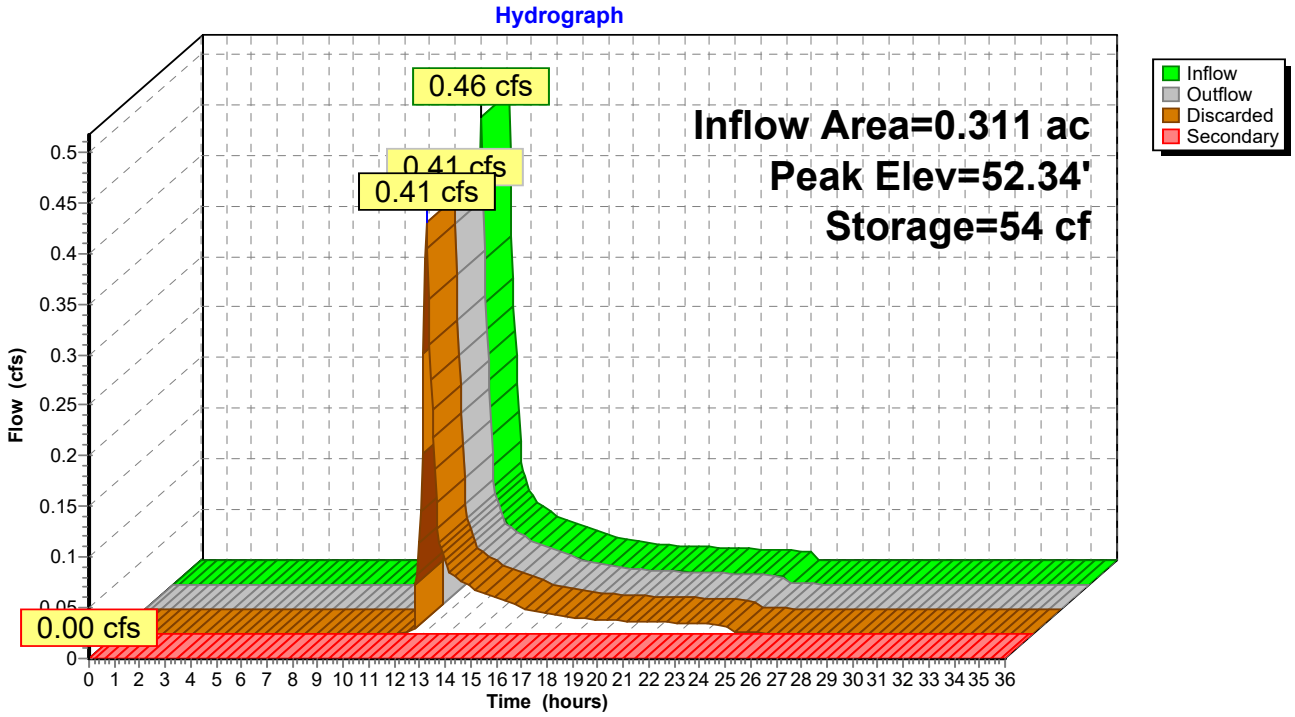
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
49.68	3	0	0
52.18	3	8	8
53.00	3,000	1,231	1,239
54.00	3,000	3,000	4,239

Device	Routing	Invert	Outlet Devices
#1	Discarded	49.68'	**30.000 in/hr Exfiltration over Surface area from 49.67' - 52.47'** Excluded Surface area = 0 sf Phase-In= 0.01'
#2	Secondary	53.18'	**20.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.40 cfs @ 12.15 hrs HW=52.34' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.40 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.68' TW=49.15' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 8P: DW #7807



Summary for Pond 9P: CB #5146

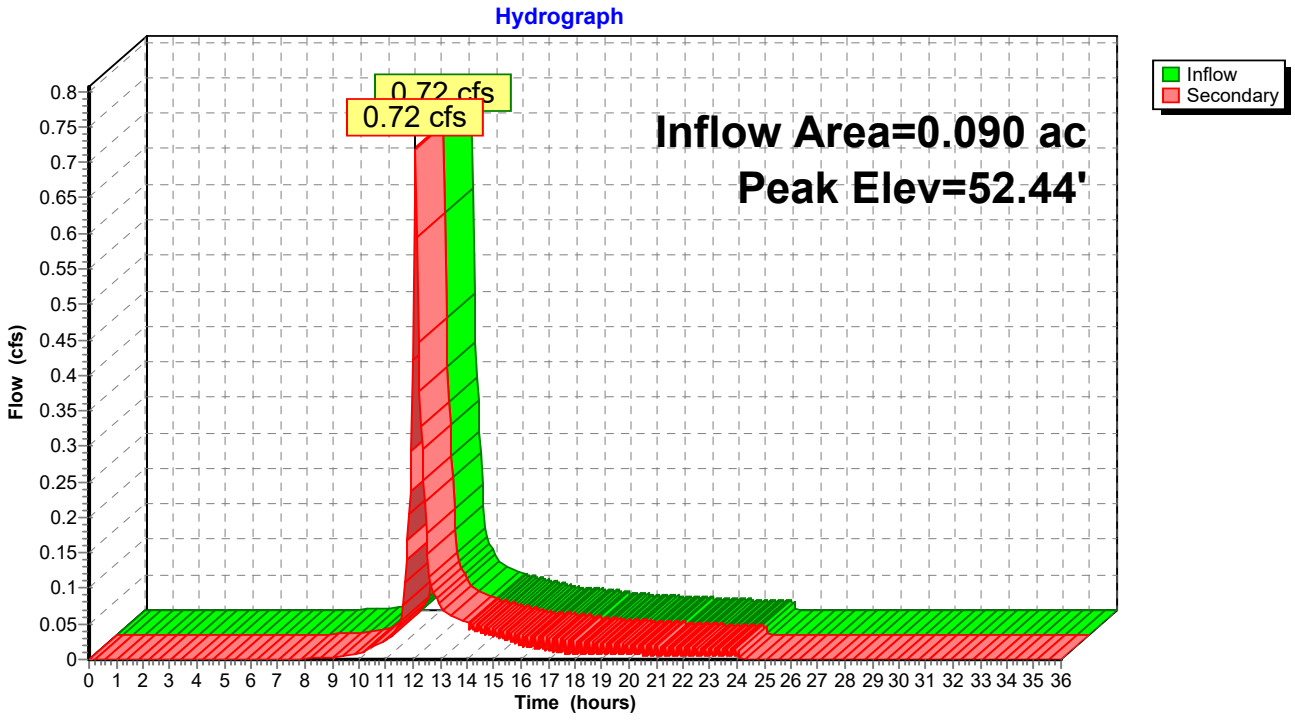
Inflow Area = 0.090 ac, 48.26% Impervious, Inflow Depth = 6.99" for 10-yr event
Inflow = 0.72 cfs @ 12.09 hrs, Volume= 0.053 af
Outflow = 0.72 cfs @ 12.09 hrs, Volume= 0.053 af, Atten= 0%, Lag= 0.0 min
Secondary = 0.72 cfs @ 12.09 hrs, Volume= 0.053 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 52.44' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Secondary	52.32'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Secondary OutFlow Max=0.68 cfs @ 12.09 hrs HW=52.43' TW=52.38' (Dynamic Tailwater)
└**1=Orifice/Grate** (Weir Controls 0.68 cfs @ 0.94 fps)

Pond 9P: CB #5146



Summary for Pond 10P: DW #5140

Inflow Area = 0.076 ac, 82.92% Impervious, Inflow Depth = 4.68" for 10-yr event
Inflow = 0.39 cfs @ 12.09 hrs, Volume= 0.030 af
Outflow = 2.19 cfs @ 12.25 hrs, Volume= 0.027 af, Atten= 0%, Lag= 9.7 min
Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 2.19 cfs @ 12.25 hrs, Volume= 0.027 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 53.79' @ 12.19 hrs Surf.Area= 525 sf Storage= 371 cf

Plug-Flow detention time= 86.4 min calculated for 0.027 af (89% of inflow)
Center-of-Mass det. time= 34.9 min (814.1 - 779.2)

Volume	Invert	Avail.Storage	Storage Description
#1	49.15'	1,007 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

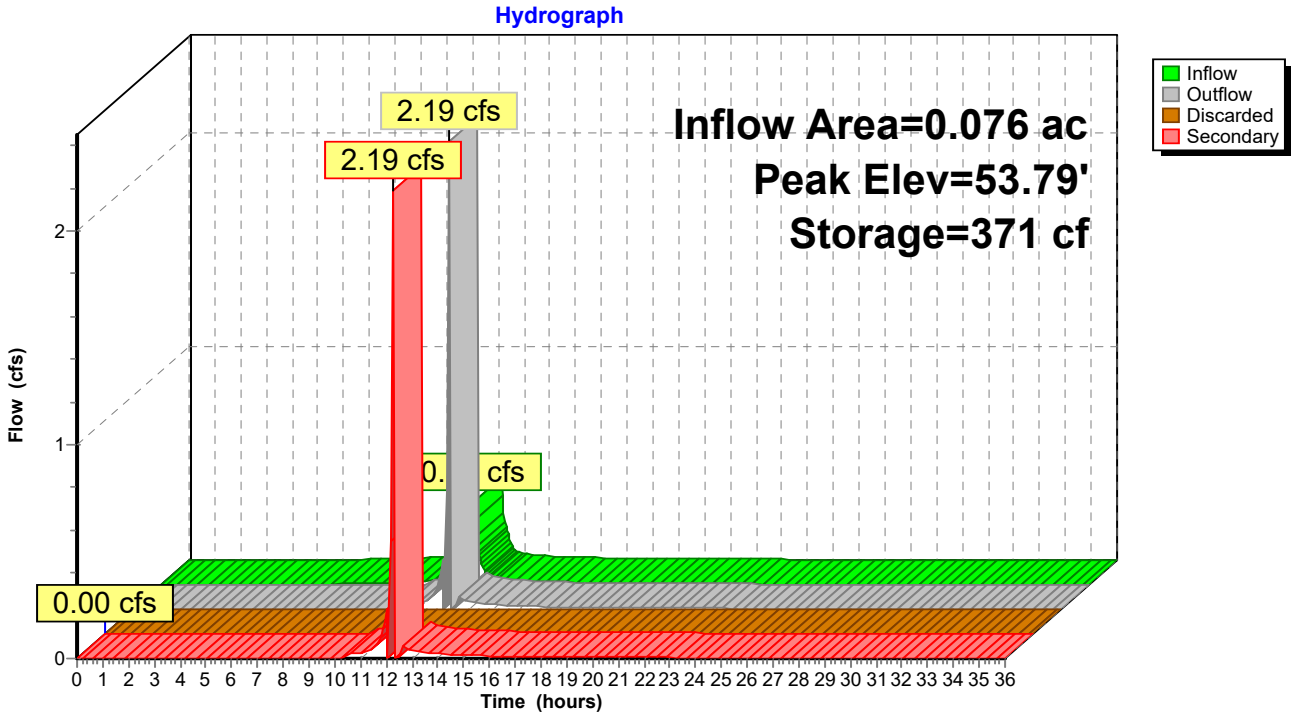
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
49.15	3	0	0
52.70	3	11	11
53.00	116	18	28
53.35	525	112	141
55.00	525	866	1,007

Device	Routing	Invert	Outlet Devices
#1	Discarded	49.15'	**30.000 in/hr Exfiltration over Surface area from 49.15' - 52.70'** Excluded Surface area = 3 sf Phase-In= 0.01'
#2	Secondary	53.35'	**20.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.15' (Free Discharge)
1=Exfiltration (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 12.25 hrs HW=53.47' TW=66.91' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 10P: DW #5140



Summary for Pond 11P: CB #6618

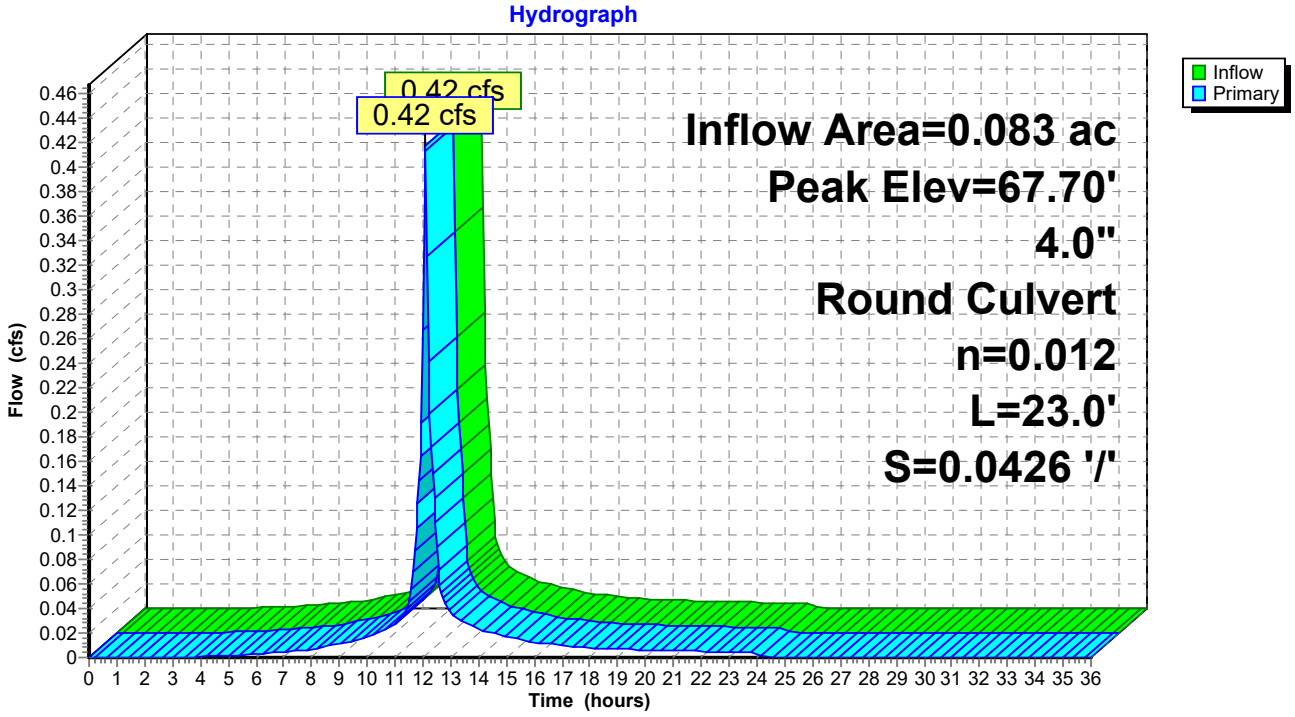
Inflow Area = 0.083 ac, 85.52% Impervious, Inflow Depth = 4.68" for 10-yr event
Inflow = 0.42 cfs @ 12.09 hrs, Volume= 0.032 af
Outflow = 0.42 cfs @ 12.09 hrs, Volume= 0.032 af, Atten= 0%, Lag= 0.0 min
Primary = 0.42 cfs @ 12.09 hrs, Volume= 0.032 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 67.70' @ 12.31 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	52.05'	**4.0" Round Culvert** L= 23.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 52.05' / 51.07' S= 0.0426 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.46 cfs @ 12.09 hrs HW=59.76' TW=57.99' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.46 cfs @ 5.23 fps)

Pond 11P: CB #6618



Summary for Pond 12P: CB #6616

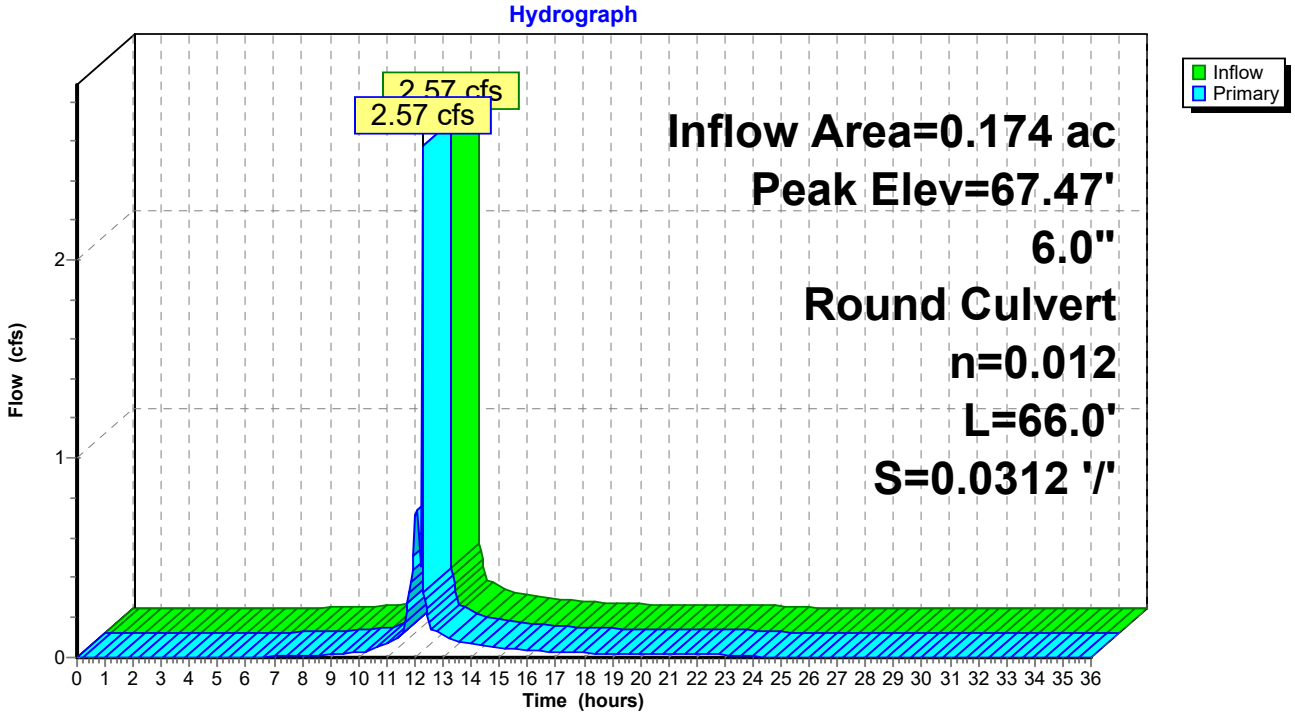
Inflow Area = 0.174 ac, 67.75% Impervious, Inflow Depth = 5.86" for 10-yr event
Inflow = 2.57 cfs @ 12.25 hrs, Volume= 0.085 af
Outflow = 2.57 cfs @ 12.25 hrs, Volume= 0.085 af, Atten= 0%, Lag= 0.0 min
Primary = 2.57 cfs @ 12.25 hrs, Volume= 0.085 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 67.47' @ 12.26 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	50.92'	**6.0" Round Culvert** L= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 50.92' / 48.86' S= 0.0312 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=1.49 cfs @ 12.25 hrs HW=66.70' TW=61.38' (Dynamic Tailwater)
↳**1=Culvert** (Outlet Controls 1.49 cfs @ 7.59 fps)

Pond 12P: CB #6616



Summary for Pond 13P: CB #6637

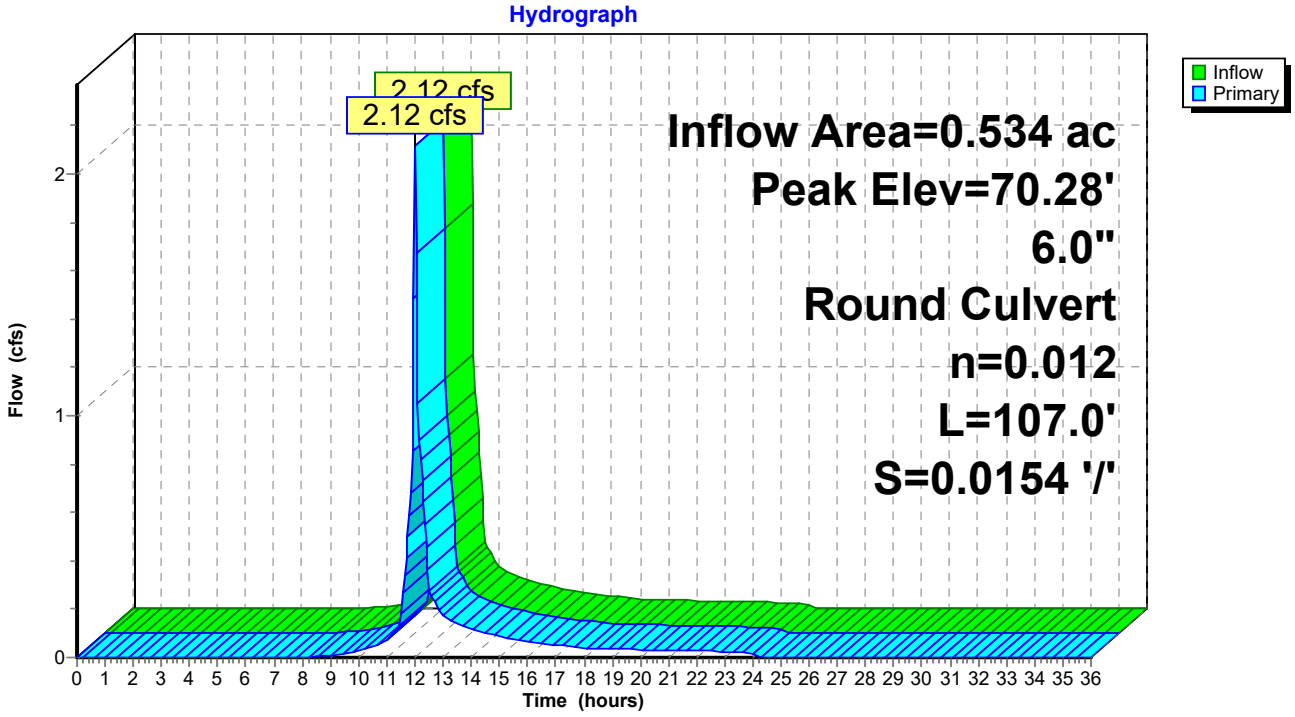
Inflow Area = 0.534 ac, 52.04% Impervious, Inflow Depth = 2.94" for 10-yr event
Inflow = 2.12 cfs @ 12.00 hrs, Volume= 0.131 af
Outflow = 2.12 cfs @ 12.00 hrs, Volume= 0.131 af, Atten= 0%, Lag= 0.0 min
Primary = 2.12 cfs @ 12.00 hrs, Volume= 0.131 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 70.28' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	50.46'	**6.0" Round Culvert** L= 107.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 50.46' / 48.81' S= 0.0154 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=1.78 cfs @ 12.00 hrs HW=69.22' TW=58.12' (Dynamic Tailwater)
↳**1=Culvert** (Outlet Controls 1.78 cfs @ 9.06 fps)

Pond 13P: CB #6637



Summary for Pond 14P: DMH #6628

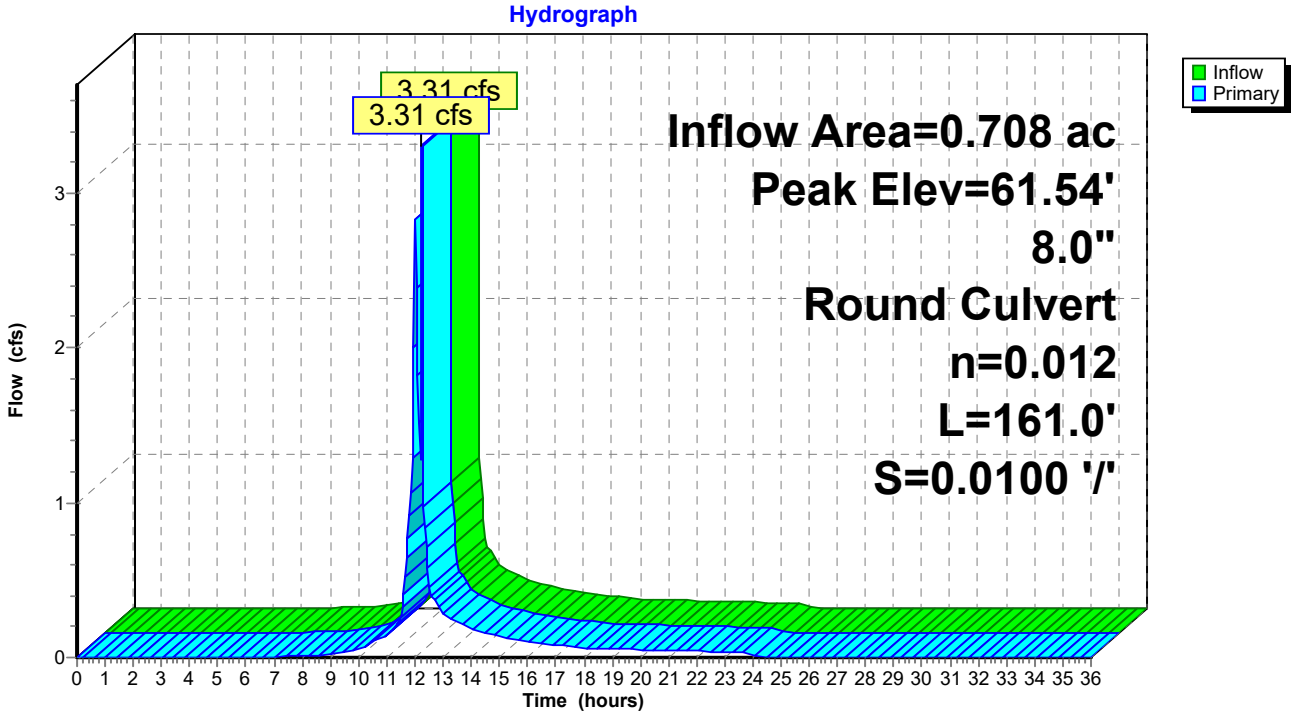
Inflow Area = 0.708 ac, 55.90% Impervious, Inflow Depth = 3.66" for 10-yr event
Inflow = 3.31 cfs @ 12.25 hrs, Volume= 0.216 af
Outflow = 3.31 cfs @ 12.25 hrs, Volume= 0.216 af, Atten= 0%, Lag= 0.0 min
Primary = 3.31 cfs @ 12.25 hrs, Volume= 0.216 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 61.54' @ 12.25 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	49.40'	**8.0" Round Culvert** L= 161.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 49.40' / 47.79' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=3.18 cfs @ 12.25 hrs HW=61.17' TW=49.71' (Dynamic Tailwater)
1=Culvert (Outlet Controls 3.18 cfs @ 9.11 fps)

Pond 14P: DMH #6628



Summary for Pond 15P: Leach Pit

Inflow Area = 0.708 ac, 55.90% Impervious, Inflow Depth = 3.66" for 10-yr event
Inflow = 3.31 cfs @ 12.25 hrs, Volume= 0.216 af
Outflow = 3.20 cfs @ 12.25 hrs, Volume= 0.216 af, Atten= 3%, Lag= 0.1 min
Discarded = 0.01 cfs @ 8.65 hrs, Volume= 0.021 af
Primary = 3.18 cfs @ 12.25 hrs, Volume= 0.195 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 49.73' @ 12.25 hrs Surf.Area= 19 sf Storage= 104 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 8.4 min (823.7 - 815.2)

Volume	Invert	Avail.Storage	Storage Description
#1	44.24'	114 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

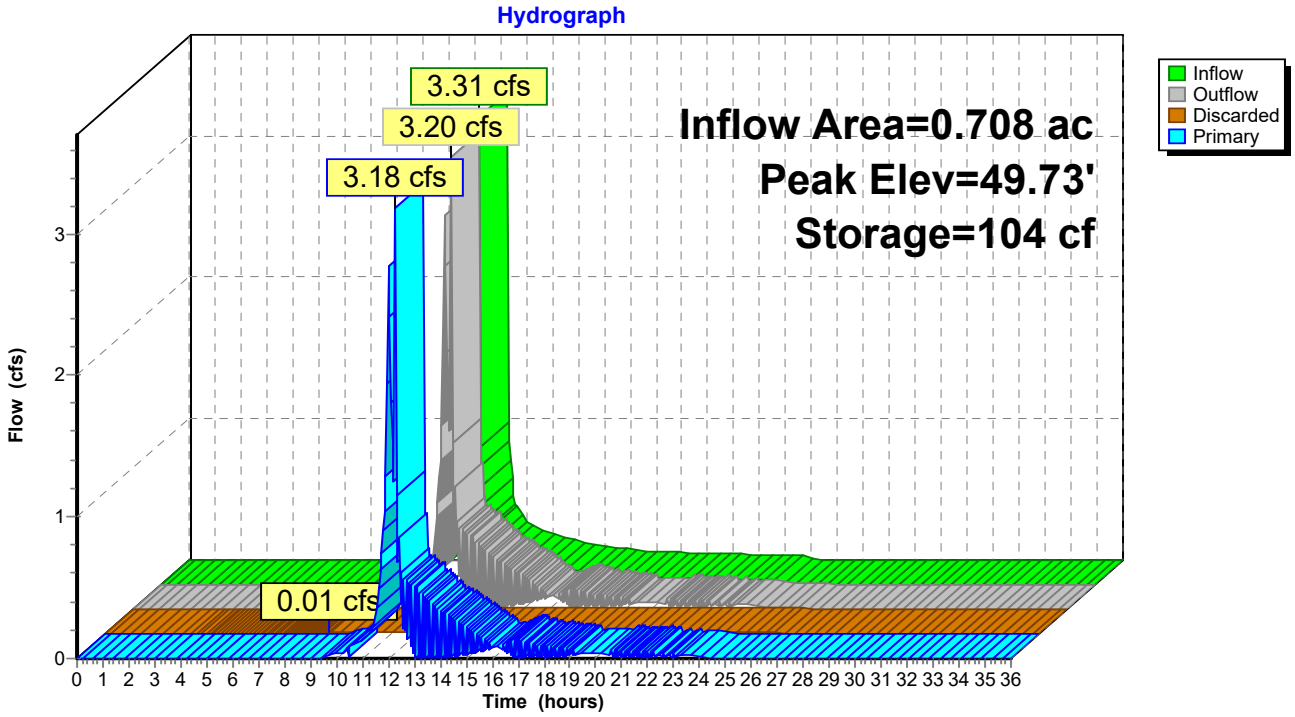
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.24	19	0	0
50.24	19	114	114

Device	Routing	Invert	Outlet Devices
#1	Primary	47.24'	**12.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 47.24' / 46.94' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Discarded	44.24'	**30.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 8.65 hrs HW=44.31' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=2.72 cfs @ 12.25 hrs HW=49.72' TW=49.20' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 2.72 cfs @ 3.46 fps)

Pond 15P: Leach Pit



Summary for Pond 16P: Leach Pit

Inflow Area = 0.708 ac, 55.90% Impervious, Inflow Depth = 3.31" for 10-yr event
Inflow = 3.18 cfs @ 12.25 hrs, Volume= 0.195 af
Outflow = 3.15 cfs @ 12.25 hrs, Volume= 0.193 af, Atten= 1%, Lag= 0.0 min
Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 3.15 cfs @ 12.25 hrs, Volume= 0.193 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 49.21' @ 12.25 hrs Surf.Area= 19 sf Storage= 123 cf

Plug-Flow detention time= 10.9 min calculated for 0.193 af (99% of inflow)
Center-of-Mass det. time= 2.8 min (809.3 - 806.4)

Volume	Invert	Avail.Storage	Storage Description
#1	42.75'	138 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

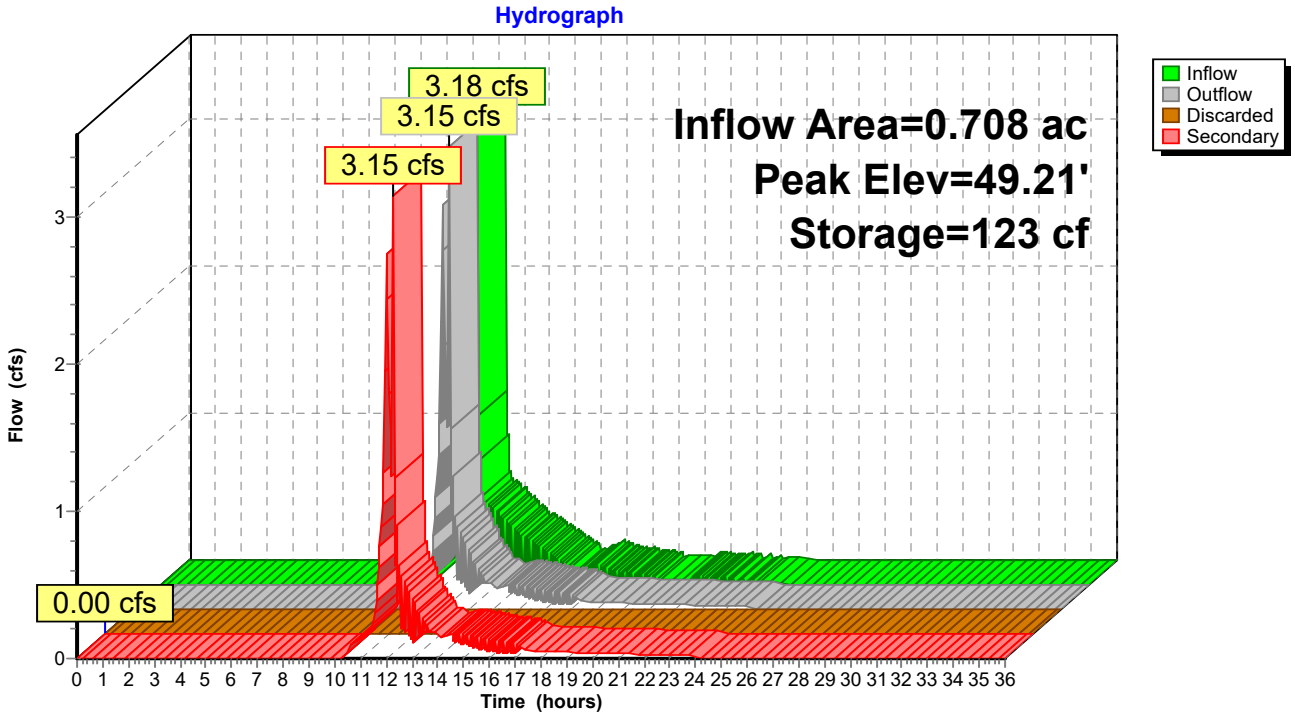
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.75	19	0	0
48.75	19	114	114
50.00	19	24	138

Device	Routing	Invert	Outlet Devices
#1	Discarded	42.75'	**30.000 in/hr Exfiltration over Surface area from 42.75' - 48.75'** Excluded Surface area = 19 sf Phase-In= 0.01'
#2	Secondary	48.75'	**4.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=42.75' (Free Discharge)
↑**1=Exfiltration** (Controls 0.00 cfs)

Secondary OutFlow Max=3.04 cfs @ 12.25 hrs HW=49.21' TW=48.92' (Dynamic Tailwater)
↑**2=Broad-Crested Rectangular Weir** (Weir Controls 3.04 cfs @ 1.67 fps)

Pond 16P: Leach Pit

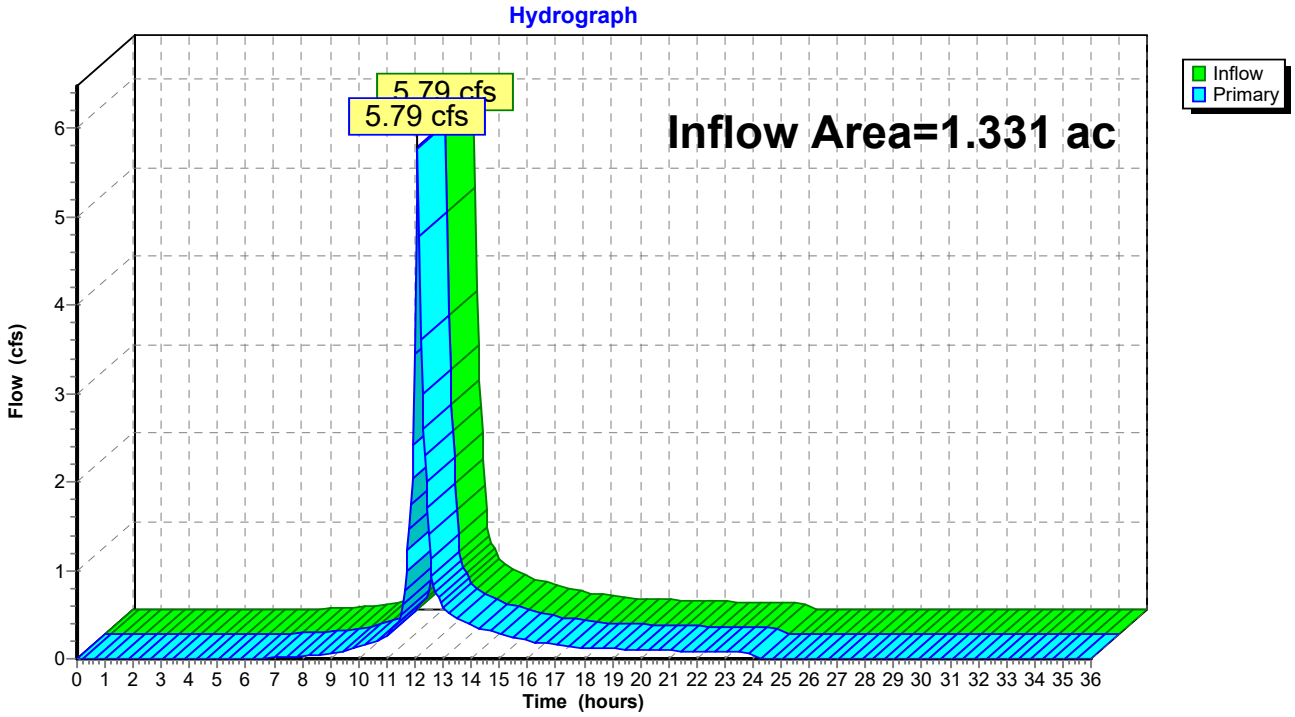


Summary for Link 100: POA #1

Inflow Area = 1.331 ac, 51.16% Impervious, Inflow Depth = 3.88" for 10-yr event
Inflow = 5.79 cfs @ 12.09 hrs, Volume= 0.430 af
Primary = 5.79 cfs @ 12.09 hrs, Volume= 0.430 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link 100: POA #1

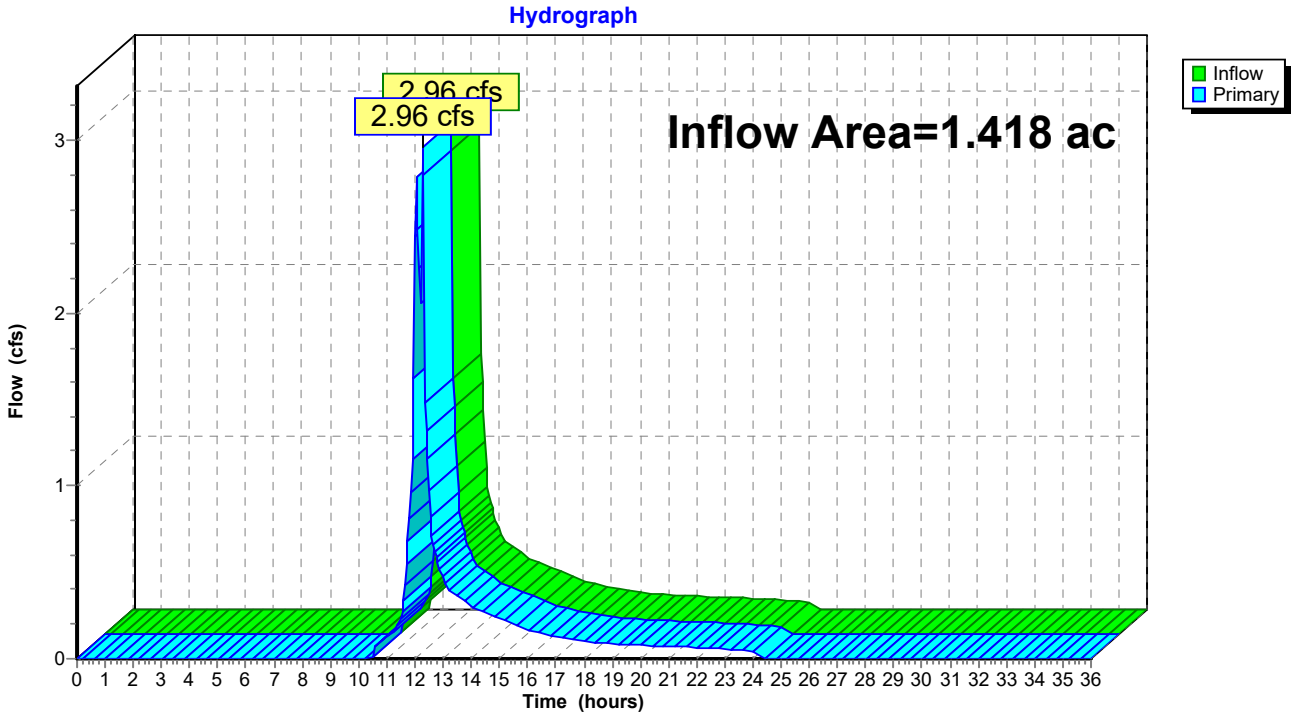


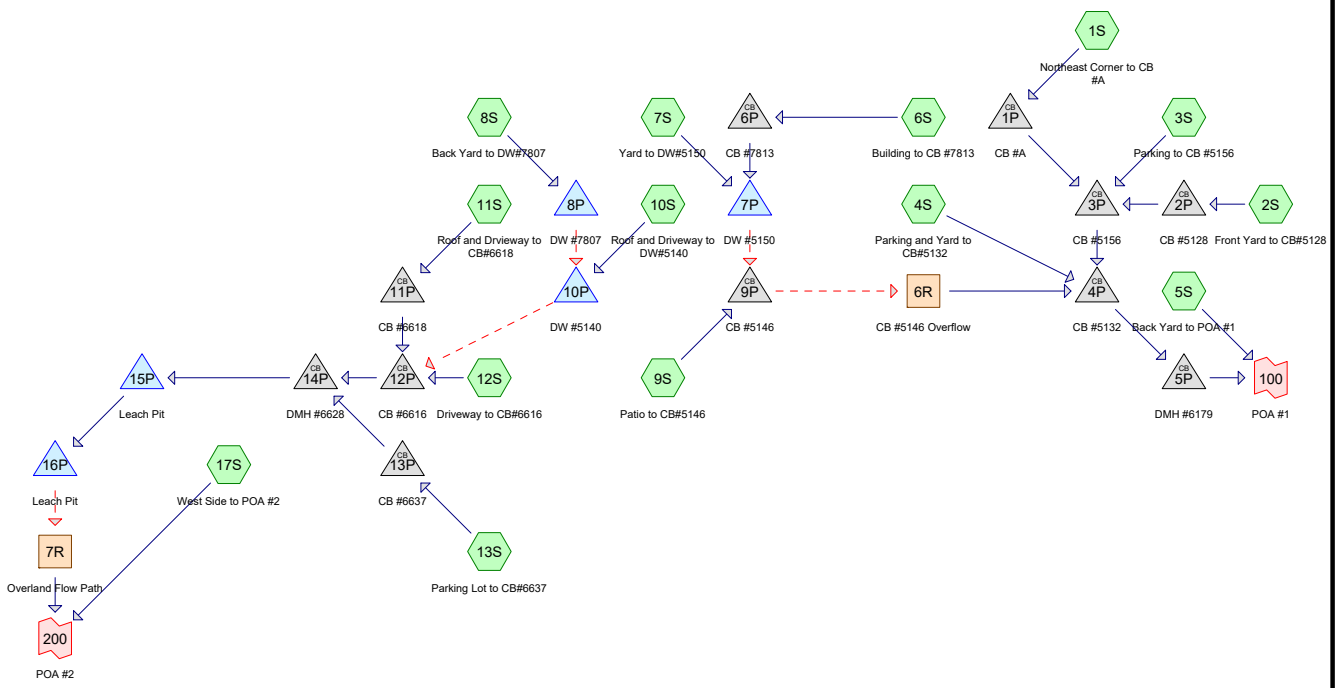
Summary for Link 200: POA #2

Inflow Area = 1.418 ac, 21.51% Impervious, Inflow Depth = 2.39" for 10-yr event
Inflow = 2.96 cfs @ 12.27 hrs, Volume= 0.283 af
Primary = 2.96 cfs @ 12.27 hrs, Volume= 0.283 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link 200: POA #2





Subcat Reach Pond Link

Routing Diagram for 5161-Pre
Prepared by Altus Engineering, Inc., Printed 9/29/2021

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Northeast Corner to CB Runoff Area=12,217 sf 28.05% Impervious Runoff Depth=3.70"
Flow Length=180' Tc=6.0 min CN=70 Runoff=1.19 cfs 0.087 af

Subcatchment 2S: Front Yard to CB#5128 Runoff Area=8,717 sf 62.34% Impervious Runoff Depth=5.23"
Flow Length=152' Tc=6.0 min CN=84 Runoff=1.17 cfs 0.087 af

Subcatchment 3S: Parking to CB #5156 Runoff Area=4,667 sf 88.88% Impervious Runoff Depth=6.39"
Flow Length=71' Slope=0.0183 '/' Tc=6.0 min CN=94 Runoff=0.71 cfs 0.057 af

Subcatchment 4S: Parking and Yard to Runoff Area=28,462 sf 48.73% Impervious Runoff Depth=4.68"
Flow Length=199' Tc=6.0 min CN=79 Runoff=3.48 cfs 0.255 af

Subcatchment 5S: Back Yard to POA #1 Runoff Area=3,901 sf 71.11% Impervious Runoff Depth=5.58"
Flow Length=80' Tc=6.0 min CN=87 Runoff=0.55 cfs 0.042 af

Subcatchment 6S: Building to CB #7813 Runoff Area=3,002 sf 59.56% Impervious Runoff Depth=4.24"
Flow Length=44' Tc=6.0 min CN=75 Runoff=0.34 cfs 0.024 af

Subcatchment 7S: Yard to DW#5150 Runoff Area=2,885 sf 38.51% Impervious Runoff Depth=3.08"
Flow Length=58' Tc=6.0 min CN=64 Runoff=0.23 cfs 0.017 af

Subcatchment 8S: Back Yard to DW#7807 Runoff Area=13,543 sf 26.09% Impervious Runoff Depth=2.38"
Flow Length=71' Tc=6.0 min CN=57 Runoff=0.81 cfs 0.062 af

Subcatchment 9S: Patio to CB#5146 Runoff Area=3,939 sf 48.26% Impervious Runoff Depth=4.68"
Flow Length=73' Slope=0.0150 '/' Tc=6.0 min CN=79 Runoff=0.48 cfs 0.035 af

Subcatchment 10S: Roof and Driveway to Runoff Area=3,331 sf 82.92% Impervious Runoff Depth=6.15"
Flow Length=48' Tc=6.0 min CN=92 Runoff=0.50 cfs 0.039 af

Subcatchment 11S: Roof and Drvieway to Runoff Area=3,598 sf 85.52% Impervious Runoff Depth=6.15"
Flow Length=68' Slope=0.0100 '/' Tc=6.0 min CN=92 Runoff=0.54 cfs 0.042 af

Subcatchment 12S: Driveway to CB#6616 Runoff Area=3,965 sf 51.63% Impervious Runoff Depth=4.79"
Flow Length=90' Tc=6.0 min CN=80 Runoff=0.49 cfs 0.036 af

Subcatchment 13S: Parking Lot to Runoff Area=23,260 sf 52.04% Impervious Runoff Depth=4.24"
Tc=0.0 min CN=75 Runoff=3.04 cfs 0.189 af

Subcatchment 17S: West Side to POA #2 Runoff Area=61,787 sf 21.51% Impervious Runoff Depth=1.46"
Flow Length=383' Tc=10.3 min CN=47 Runoff=1.68 cfs 0.172 af

Reach 6R: CB #5146 Overflow Avg. Flow Depth=0.08' Max Vel=1.69 fps Inflow=1.04 cfs 0.076 af
n=0.013 L=198.0' S=0.0102 '/' Capacity=58.25 cfs Outflow=1.01 cfs 0.076 af

Reach 7R: Overland Flow Path Avg. Flow Depth=0.22' Max Vel=1.14 fps Inflow=4.43 cfs 0.279 af
n=0.035 L=107.0' S=0.0091 '/' Capacity=104.18 cfs Outflow=3.56 cfs 0.279 af

Pond 1P: CB #A Peak Elev=55.58' Inflow=1.19 cfs 0.087 af
6.0" Round Culvert n=0.012 L=84.0' S=0.0107 '/' Outflow=1.19 cfs 0.087 af

Pond 2P: CB #5128 Peak Elev=51.51' Inflow=1.17 cfs 0.087 af
Outflow=1.17 cfs 0.087 af

Pond 3P: CB #5156 Peak Elev=51.50' Inflow=3.08 cfs 0.231 af
Outflow=3.08 cfs 0.231 af

Pond 4P: CB #5132 Peak Elev=50.60' Inflow=7.53 cfs 0.562 af
Outflow=7.53 cfs 0.562 af

Pond 5P: DMH #6179 Peak Elev=50.28' Inflow=7.53 cfs 0.562 af
Outflow=7.53 cfs 0.562 af

Pond 6P: CB #7813 Peak Elev=52.64' Inflow=0.34 cfs 0.024 af
Outflow=0.34 cfs 0.024 af

Pond 7P: DW #5150 Peak Elev=52.47' Storage=11 cf Inflow=0.57 cfs 0.041 af
Discarded=0.00 cfs 0.000 af Secondary=0.56 cfs 0.041 af Outflow=0.56 cfs 0.041 af

Pond 8P: DW #7807 Peak Elev=52.44' Storage=132 cf Inflow=0.81 cfs 0.062 af
Discarded=0.66 cfs 0.062 af Secondary=0.00 cfs 0.000 af Outflow=0.66 cfs 0.062 af

Pond 9P: CB #5146 Peak Elev=52.47' Inflow=1.04 cfs 0.076 af
Outflow=1.04 cfs 0.076 af

Pond 10P: DW #5140 Peak Elev=54.09' Storage=529 cf Inflow=0.50 cfs 0.039 af
Discarded=0.00 cfs 0.000 af Secondary=3.46 cfs 0.036 af Outflow=3.46 cfs 0.036 af

Pond 11P: CB #6618 Peak Elev=89.78' Inflow=0.54 cfs 0.042 af
4.0" Round Culvert n=0.012 L=23.0' S=0.0426 '/' Outflow=0.54 cfs 0.042 af

Pond 12P: CB #6616 Peak Elev=89.49' Inflow=3.89 cfs 0.115 af
6.0" Round Culvert n=0.012 L=66.0' S=0.0312 '/' Outflow=3.89 cfs 0.115 af

Pond 13P: CB #6637 Peak Elev=92.09' Inflow=3.04 cfs 0.189 af
6.0" Round Culvert n=0.012 L=107.0' S=0.0154 '/' Outflow=3.04 cfs 0.189 af

Pond 14P: DMH #6628 Peak Elev=75.19' Inflow=4.79 cfs 0.304 af
8.0" Round Culvert n=0.012 L=161.0' S=0.0100 '/' Outflow=4.79 cfs 0.304 af

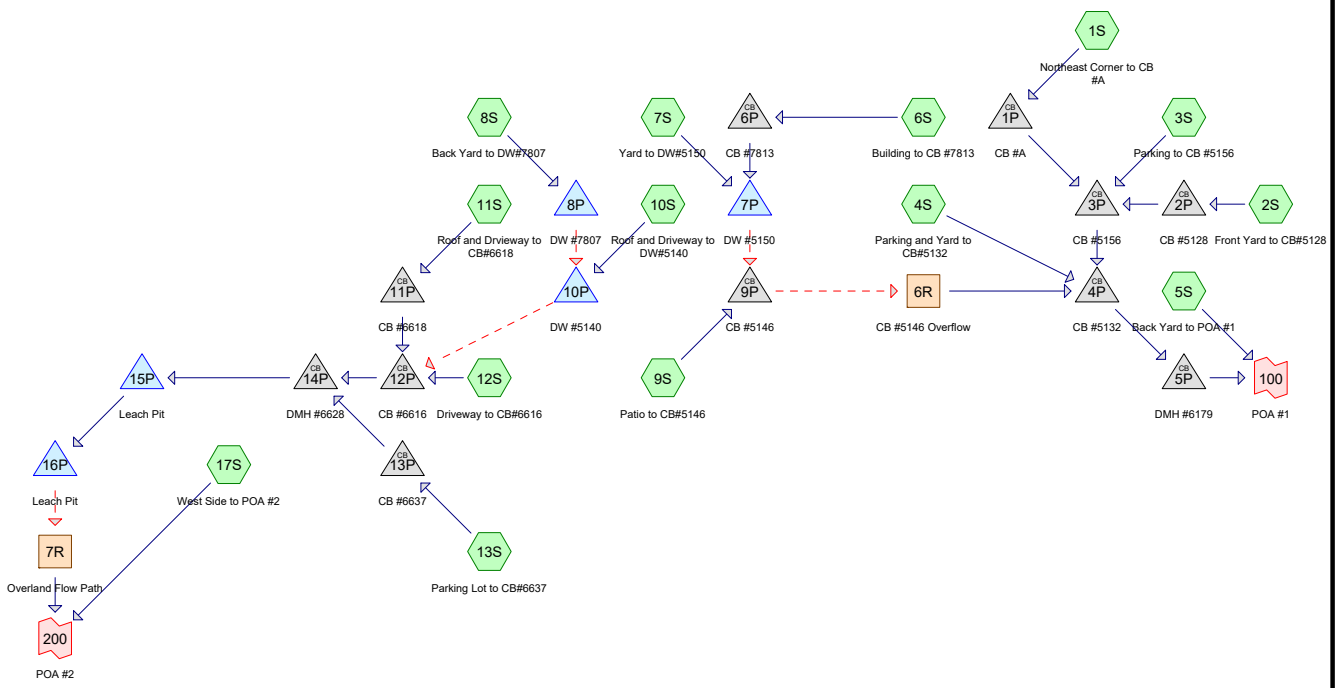
Pond 15P: Leach Pit Peak Elev=50.52' Storage=114 cf Inflow=4.79 cfs 0.304 af
Discarded=0.01 cfs 0.022 af Primary=4.57 cfs 0.282 af Outflow=4.58 cfs 0.304 af

Pond 16P: Leach Pit Peak Elev=49.32' Storage=125 cf Inflow=4.57 cfs 0.282 af
Discarded=0.00 cfs 0.000 af Secondary=4.43 cfs 0.279 af Outflow=4.43 cfs 0.279 af

Link 100: POA #1 Inflow=8.08 cfs 0.603 af
Primary=8.08 cfs 0.603 af

Link 200: POA #2 Inflow=4.55 cfs 0.451 af
Primary=4.55 cfs 0.451 af

Total Runoff Area = 4.070 ac Runoff Volume = 1.144 af Average Runoff Depth = 3.37"
59.80% Pervious = 2.434 ac 40.20% Impervious = 1.636 ac



Subcat Reach Pond Link

Routing Diagram for 5161-Pre
Prepared by Altus Engineering, Inc., Printed 9/29/2021

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Northeast Corner to CB Runoff Area=12,217 sf 28.05% Impervious Runoff Depth=4.90"
Flow Length=180' Tc=6.0 min CN=70 Runoff=1.58 cfs 0.114 af

Subcatchment 2S: Front Yard to CB#5128 Runoff Area=8,717 sf 62.34% Impervious Runoff Depth=6.58"
Flow Length=152' Tc=6.0 min CN=84 Runoff=1.46 cfs 0.110 af

Subcatchment 3S: Parking to CB #5156 Runoff Area=4,667 sf 88.88% Impervious Runoff Depth=7.78"
Flow Length=71' Slope=0.0183 '/' Tc=6.0 min CN=94 Runoff=0.86 cfs 0.069 af

Subcatchment 4S: Parking and Yard to Runoff Area=28,462 sf 48.73% Impervious Runoff Depth=5.98"
Flow Length=199' Tc=6.0 min CN=79 Runoff=4.41 cfs 0.325 af

Subcatchment 5S: Back Yard to POA #1 Runoff Area=3,901 sf 71.11% Impervious Runoff Depth=6.94"
Flow Length=80' Tc=6.0 min CN=87 Runoff=0.68 cfs 0.052 af

Subcatchment 6S: Building to CB #7813 Runoff Area=3,002 sf 59.56% Impervious Runoff Depth=5.50"
Flow Length=44' Tc=6.0 min CN=75 Runoff=0.43 cfs 0.032 af

Subcatchment 7S: Yard to DW#5150 Runoff Area=2,885 sf 38.51% Impervious Runoff Depth=4.18"
Flow Length=58' Tc=6.0 min CN=64 Runoff=0.32 cfs 0.023 af

Subcatchment 8S: Back Yard to DW#7807 Runoff Area=13,543 sf 26.09% Impervious Runoff Depth=3.36"
Flow Length=71' Tc=6.0 min CN=57 Runoff=1.18 cfs 0.087 af

Subcatchment 9S: Patio to CB#5146 Runoff Area=3,939 sf 48.26% Impervious Runoff Depth=5.98"
Flow Length=73' Slope=0.0150 '/' Tc=6.0 min CN=79 Runoff=0.61 cfs 0.045 af

Subcatchment 10S: Roof and Driveway to Runoff Area=3,331 sf 82.92% Impervious Runoff Depth=7.54"
Flow Length=48' Tc=6.0 min CN=92 Runoff=0.61 cfs 0.048 af

Subcatchment 11S: Roof and Drvieway to Runoff Area=3,598 sf 85.52% Impervious Runoff Depth=7.54"
Flow Length=68' Slope=0.0100 '/' Tc=6.0 min CN=92 Runoff=0.65 cfs 0.052 af

Subcatchment 12S: Driveway to CB#6616 Runoff Area=3,965 sf 51.63% Impervious Runoff Depth=6.10"
Flow Length=90' Tc=6.0 min CN=80 Runoff=0.62 cfs 0.046 af

Subcatchment 13S: Parking Lot to Runoff Area=23,260 sf 52.04% Impervious Runoff Depth=5.50"
Tc=0.0 min CN=75 Runoff=3.93 cfs 0.245 af

Subcatchment 17S: West Side to POA #2 Runoff Area=61,787 sf 21.51% Impervious Runoff Depth=2.23"
Flow Length=383' Tc=10.3 min CN=47 Runoff=2.84 cfs 0.263 af

Reach 6R: CB #5146 Overflow Avg. Flow Depth=0.09' Max Vel=1.82 fps Inflow=1.35 cfs 0.099 af
n=0.013 L=198.0' S=0.0102 '/' Capacity=58.25 cfs Outflow=1.31 cfs 0.099 af

Reach 7R: Overland Flow Path Avg. Flow Depth=0.24' Max Vel=1.21 fps Inflow=4.75 cfs 0.365 af
n=0.035 L=107.0' S=0.0091 '/' Capacity=104.18 cfs Outflow=4.55 cfs 0.365 af

Pond 1P: CB #A Peak Elev=58.68' Inflow=1.58 cfs 0.114 af
6.0" Round Culvert n=0.012 L=84.0' S=0.0107 '/' Outflow=1.58 cfs 0.114 af

Pond 2P: CB #5128 Peak Elev=51.54' Inflow=1.46 cfs 0.110 af
Outflow=1.46 cfs 0.110 af

Pond 3P: CB #5156 Peak Elev=51.53' Inflow=3.89 cfs 0.294 af
Outflow=3.89 cfs 0.294 af

Pond 4P: CB #5132 Peak Elev=50.68' Inflow=9.58 cfs 0.718 af
Outflow=9.58 cfs 0.718 af

Pond 5P: DMH #6179 Peak Elev=50.33' Inflow=9.58 cfs 0.718 af
Outflow=9.58 cfs 0.718 af

Pond 6P: CB #7813 Peak Elev=52.65' Inflow=0.43 cfs 0.032 af
Outflow=0.43 cfs 0.032 af

Pond 7P: DW #5150 Peak Elev=52.50' Storage=12 cf Inflow=0.75 cfs 0.055 af
Discarded=0.00 cfs 0.000 af Secondary=0.74 cfs 0.054 af Outflow=0.74 cfs 0.054 af

Pond 8P: DW #7807 Peak Elev=52.57' Storage=282 cf Inflow=1.18 cfs 0.087 af
Discarded=0.74 cfs 0.087 af Secondary=0.00 cfs 0.000 af Outflow=0.74 cfs 0.087 af

Pond 9P: CB #5146 Peak Elev=52.50' Inflow=1.35 cfs 0.099 af
Outflow=1.35 cfs 0.099 af

Pond 10P: DW #5140 Peak Elev=54.51' Storage=751 cf Inflow=0.61 cfs 0.048 af
Discarded=0.00 cfs 0.000 af Secondary=3.96 cfs 0.047 af Outflow=3.96 cfs 0.047 af

Pond 11P: CB #6618 Peak Elev=94.61' Inflow=0.65 cfs 0.052 af
4.0" Round Culvert n=0.012 L=23.0' S=0.0426 '/' Outflow=0.65 cfs 0.052 af

Pond 12P: CB #6616 Peak Elev=94.56' Inflow=4.24 cfs 0.145 af
6.0" Round Culvert n=0.012 L=66.0' S=0.0312 '/' Outflow=4.24 cfs 0.145 af

Pond 13P: CB #6637 Peak Elev=118.47' Inflow=3.93 cfs 0.245 af
6.0" Round Culvert n=0.012 L=107.0' S=0.0154 '/' Outflow=3.93 cfs 0.245 af

Pond 14P: DMH #6628 Peak Elev=75.80' Inflow=4.78 cfs 0.390 af
8.0" Round Culvert n=0.012 L=161.0' S=0.0100 '/' Outflow=4.78 cfs 0.390 af

Pond 15P: Leach Pit Peak Elev=50.86' Storage=114 cf Inflow=4.78 cfs 0.390 af
Discarded=0.01 cfs 0.022 af Primary=4.81 cfs 0.367 af Outflow=4.82 cfs 0.390 af

Pond 16P: Leach Pit Peak Elev=49.35' Storage=125 cf Inflow=4.81 cfs 0.367 af
Discarded=0.00 cfs 0.000 af Secondary=4.75 cfs 0.365 af Outflow=4.75 cfs 0.365 af

Link 100: POA #1 Inflow=10.25 cfs 0.770 af
Primary=10.25 cfs 0.770 af

Link 200: POA #2 Inflow=6.17 cfs 0.628 af
Primary=6.17 cfs 0.628 af

Total Runoff Area = 4.070 ac Runoff Volume = 1.511 af Average Runoff Depth = 4.46"
59.80% Pervious = 2.434 ac 40.20% Impervious = 1.636 ac

Section 4

Drainage Calculations

Post-Development
2-Year, 24-Hour Summary
10-Year, 24-Hour Complete
25-Year, 24-Hour Summary
50-Year, 24-Hour Summary

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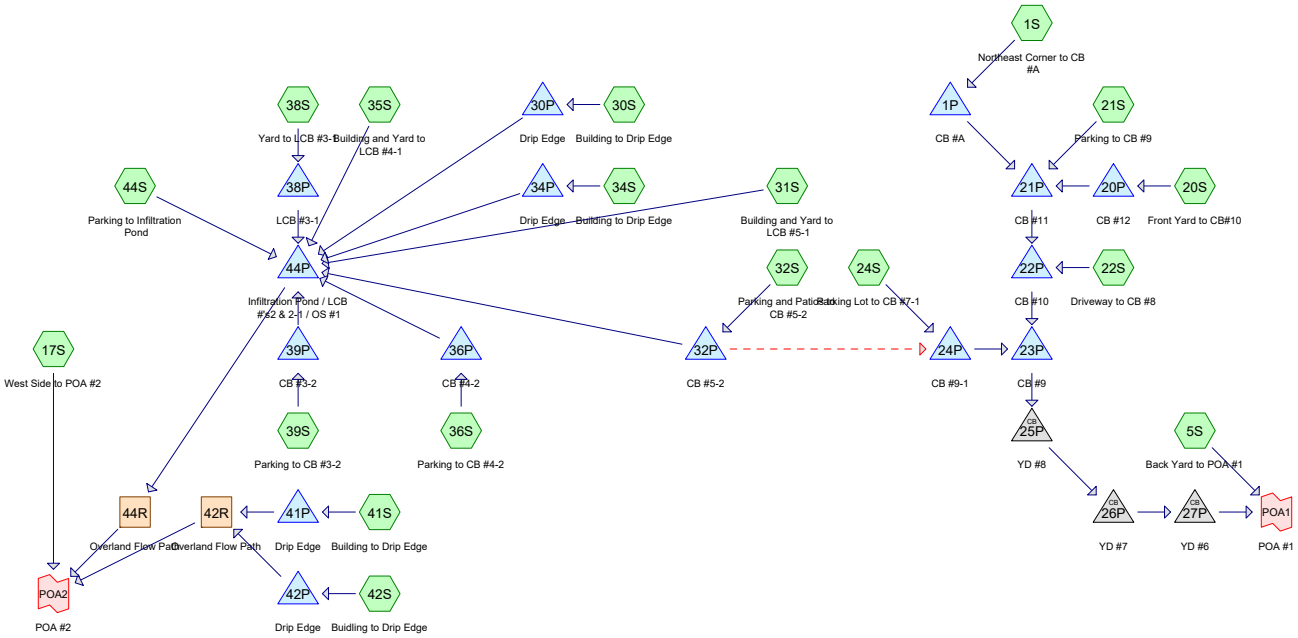


Subcat Reach Pond Link

Routing Diagram for 5161-Post-110921

Prepared by Altus Engineering, Inc., Printed 11/9/2021

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points x 6
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Northeast Corner to CB Runoff Area=12,050 sf 27.65% Impervious Runoff Depth=1.07"
Flow Length=180' Tc=6.0 min CN=69 Runoff=0.32 cfs 0.025 af

Subcatchment 5S: Back Yard to POA #1 Runoff Area=10,478 sf 33.46% Impervious Runoff Depth=1.31"
Flow Length=198' Tc=6.0 min CN=73 Runoff=0.36 cfs 0.026 af

Subcatchment 17S: West Side to POA #2 Runoff Area=25,189 sf 1.64% Impervious Runoff Depth=0.00"
Flow Length=357' Tc=11.1 min CN=33 Runoff=0.00 cfs 0.000 af

Subcatchment 20S: Front Yard to CB#10 Runoff Area=6,933 sf 69.88% Impervious Runoff Depth=2.35"
Flow Length=147' Tc=6.0 min CN=87 Runoff=0.44 cfs 0.031 af

Subcatchment 21S: Parking to CB #9 Runoff Area=3,178 sf 77.66% Impervious Runoff Depth=2.63"
Flow Length=46' Slope=0.0181 '/' Tc=6.0 min CN=90 Runoff=0.22 cfs 0.016 af

Subcatchment 22S: Driveway to CB #8 Runoff Area=4,683 sf 86.46% Impervious Runoff Depth=2.92"
Flow Length=152' Tc=6.0 min CN=93 Runoff=0.35 cfs 0.026 af

Subcatchment 24S: Parking Lot to CB #7-1 Runoff Area=17,662 sf 63.74% Impervious Runoff Depth=2.18"
Flow Length=262' Tc=9.0 min CN=85 Runoff=0.94 cfs 0.074 af

Subcatchment 30S: Building to Drip Edge Runoff Area=4,788 sf 41.52% Impervious Runoff Depth=0.75"
Tc=6.0 min CN=63 Runoff=0.08 cfs 0.007 af

Subcatchment 31S: Building and Yard to Runoff Area=2,900 sf 58.93% Impervious Runoff Depth=1.44"
Tc=6.0 min CN=75 Runoff=0.11 cfs 0.008 af

Subcatchment 32S: Parking and Patios to Runoff Area=11,430 sf 69.54% Impervious Runoff Depth=2.27"
Flow Length=105' Tc=6.0 min CN=86 Runoff=0.70 cfs 0.050 af

Subcatchment 34S: Building to Drip Edge Runoff Area=2,681 sf 86.35% Impervious Runoff Depth=2.82"
Tc=6.0 min CN=92 Runoff=0.20 cfs 0.014 af

Subcatchment 35S: Building and Yard to Runoff Area=6,052 sf 23.60% Impervious Runoff Depth=0.45"
Flow Length=134' Tc=6.0 min CN=56 Runoff=0.04 cfs 0.005 af

Subcatchment 36S: Parking to CB #4-2 Runoff Area=22,757 sf 73.29% Impervious Runoff Depth=2.35"
Flow Length=108' Tc=7.1 min CN=87 Runoff=1.38 cfs 0.102 af

Subcatchment 38S: Yard to LCB #3-1 Runoff Area=7,404 sf 21.57% Impervious Runoff Depth=0.31"
Flow Length=103' Tc=6.0 min CN=52 Runoff=0.02 cfs 0.004 af

Subcatchment 39S: Parking to CB #3-2 Runoff Area=7,969 sf 87.51% Impervious Runoff Depth=2.72"
Flow Length=59' Slope=0.0178 '/' Tc=6.0 min CN=91 Runoff=0.57 cfs 0.041 af

Subcatchment 41S: Building to Drip Edge Runoff Area=4,150 sf 89.64% Impervious Runoff Depth=2.82"
Tc=6.0 min CN=92 Runoff=0.30 cfs 0.022 af

Subcatchment 42S: Buidling to Drip Edge Runoff Area=5,811 sf 56.29% Impervious Runoff Depth=1.19"
Tc=6.0 min CN=71 Runoff=0.18 cfs 0.013 af

Subcatchment 44S: Parking to Infiltration Runoff Area=21,163 sf 80.97% Impervious Runoff Depth=2.35"
Flow Length=96' Tc=6.0 min CN=87 Runoff=1.33 cfs 0.095 af

Reach 42R: Overland Flow Path Avg. Flow Depth=0.01' Max Vel=0.28 fps Inflow=0.04 cfs 0.000 af
n=0.035 L=156.0' S=0.0204 '/' Capacity=156.47 cfs Outflow=0.01 cfs 0.000 af

Reach 44R: Overland Flow Path Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=114.0' S=0.0091 '/' Capacity=104.51 cfs Outflow=0.00 cfs 0.000 af

Pond 1P: CB #A Peak Elev=49.79' Storage=1 cf Inflow=0.32 cfs 0.025 af
6.0" Round Culvert n=0.012 L=70.0' S=0.0107 '/' Outflow=0.32 cfs 0.025 af

Pond 20P: CB #12 Peak Elev=48.48' Storage=8 cf Inflow=0.44 cfs 0.031 af
12.0" Round Culvert n=0.012 L=28.0' S=0.0050 '/' Outflow=0.43 cfs 0.031 af

Pond 21P: CB #11 Peak Elev=48.42' Storage=10 cf Inflow=0.97 cfs 0.072 af
12.0" Round Culvert n=0.012 L=34.0' S=0.0050 '/' Outflow=0.97 cfs 0.072 af

Pond 22P: CB #10 Peak Elev=48.27' Storage=12 cf Inflow=1.32 cfs 0.098 af
15.0" Round Culvert n=0.012 L=22.0' S=0.0050 '/' Outflow=1.32 cfs 0.098 af

Pond 23P: CB #9 Peak Elev=48.16' Storage=13 cf Inflow=2.22 cfs 0.172 af
15.0" Round Culvert n=0.012 L=20.0' S=0.0050 '/' Outflow=2.22 cfs 0.172 af

Pond 24P: CB #9-1 Peak Elev=48.21' Storage=12 cf Inflow=0.94 cfs 0.074 af
Outflow=0.94 cfs 0.074 af

Pond 25P: YD #8 Peak Elev=47.92' Inflow=2.22 cfs 0.172 af
15.0" Round Culvert n=0.012 L=38.0' S=0.0050 '/' Outflow=2.22 cfs 0.172 af

Pond 26P: YD #7 Peak Elev=47.61' Inflow=2.22 cfs 0.172 af
15.0" Round Culvert n=0.012 L=32.0' S=0.0050 '/' Outflow=2.22 cfs 0.172 af

Pond 27P: YD #6 Peak Elev=47.29' Inflow=2.22 cfs 0.172 af
15.0" Round Culvert n=0.012 L=24.0' S=0.0050 '/' Outflow=2.22 cfs 0.172 af

Pond 30P: Drip Edge Peak Elev=51.00' Storage=0 cf Inflow=0.08 cfs 0.007 af
Discarded=0.08 cfs 0.007 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.007 af

Pond 32P: CB #5-2 Peak Elev=48.85' Storage=7 cf Inflow=0.70 cfs 0.050 af
Primary=0.70 cfs 0.050 af Secondary=0.00 cfs 0.000 af Outflow=0.70 cfs 0.050 af

Pond 34P: Drip Edge Peak Elev=51.01' Storage=1 cf Inflow=0.20 cfs 0.014 af
Discarded=0.20 cfs 0.014 af Primary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.014 af

Pond 36P: CB #4-2 Peak Elev=49.07' Storage=10 cf Inflow=1.38 cfs 0.102 af
12.0" Round Culvert n=0.012 L=13.0' S=0.0054 '/' Outflow=1.38 cfs 0.102 af

Pond 38P: LCB #3-1 Peak Elev=44.76' Storage=0 cf Inflow=0.02 cfs 0.004 af
Discarded=0.02 cfs 0.004 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.004 af

Pond 39P: CB #3-2 Peak Elev=48.77' Storage=6 cf Inflow=0.57 cfs 0.041 af
12.0" Round Culvert n=0.012 L=12.0' S=0.0050 '/' Outflow=0.57 cfs 0.041 af

Pond 41P: Drip Edge Peak Elev=52.61' Storage=56 cf Inflow=0.30 cfs 0.022 af
Discarded=0.17 cfs 0.022 af Primary=0.04 cfs 0.000 af Outflow=0.21 cfs 0.022 af

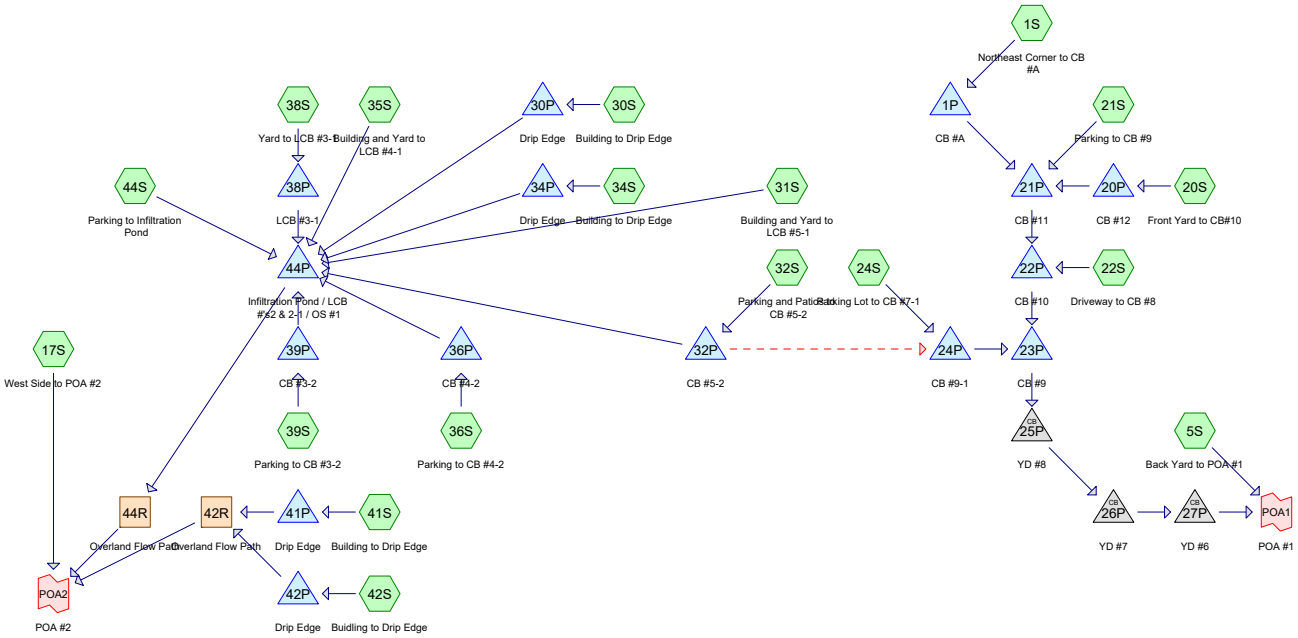
Pond 42P: Drip Edge Peak Elev=52.01' Storage=1 cf Inflow=0.18 cfs 0.013 af
Discarded=0.18 cfs 0.013 af Primary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.013 af

Pond 44P: Infiltration Pond / LCB #'s2 & 2-1 / Peak Elev=48.35' Storage=1,749 cf Inflow=4.11 cfs 0.302 af
Discarded=2.28 cfs 0.302 af Primary=0.00 cfs 0.000 af Outflow=2.28 cfs 0.302 af

Link POA1: POA #1 Inflow=2.57 cfs 0.198 af
Primary=2.57 cfs 0.198 af

Link POA2: POA #2 Inflow=0.01 cfs 0.000 af
Primary=0.01 cfs 0.000 af

Total Runoff Area = 4.070 ac Runoff Volume = 0.561 af Average Runoff Depth = 1.66"
46.62% Pervious = 1.897 ac 53.38% Impervious = 2.172 ac



Subcat Reach Pond Link

Routing Diagram for 5161-Post-110921

Prepared by Altus Engineering, Inc., Printed 11/9/2021

Current Messages

[13] Note: Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points x 6
[16] Note: Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
[19] Note: Type III 24-hr 10-yr Rainfall=5.60"
[22] Note: Reach routing by Dyn-Stor-Ind method
[25] Note: Pond routing by Dyn-Stor-Ind method
[28] Note: Updating Subcat 17S: West Side to POA #2
[28] Note: Updating Subcat 41S: Building to Drip Edge
[28] Note: Updating Pond 41P: Drip Edge
[28] Note: Updating Subcat 42S: Buidling to Drip Edge
[28] Note: Updating Pond 42P: Drip Edge
[28] Note: Updating Reach 42R: Overland Flow Path
[28] Note: Updating Subcat 31S: Building and Yard to LCB #5-1
[28] Note: Updating Subcat 35S: Building and Yard to LCB #4-1
[28] Note: Updating Subcat 44S: Parking to Infiltration Pond
[28] Note: Updating Subcat 30S: Building to Drip Edge
[28] Note: Updating Pond 30P: Drip Edge
[28] Note: Updating Subcat 32S: Parking and Patios to CB #5-2
[28] Note: Updating Pond 32P: CB #5-2
[28] Note: Updating Subcat 24S: Parking Lot to CB #7-1
[28] Note: Updating Pond 24P: CB #9-1
[28] Note: Updating Subcat 22S: Driveway to CB #8
[28] Note: Updating Subcat 21S: Parking to CB #9
[28] Note: Updating Subcat 1S: Northeast Corner to CB #A
[28] Note: Updating Pond 1P: CB #A
[28] Note: Updating Subcat 20S: Front Yard to CB#10
[28] Note: Updating Pond 20P: CB #12
[28] Note: Updating Pond 21P: CB #11
[28] Note: Updating Pond 22P: CB #10
[28] Note: Updating Pond 23P: CB #9
[28] Note: Updating Pond 25P: YD #8
[28] Note: Updating Pond 26P: YD #7
[28] Note: Updating Pond 27P: YD #6
[28] Note: Updating Subcat 5S: Back Yard to POA #1
[28] Note: Updating Link POA1: POA #1
[28] Note: Updating Subcat 34S: Building to Drip Edge
[28] Note: Updating Pond 34P: Drip Edge
[28] Note: Updating Subcat 36S: Parking to CB #4-2
[28] Note: Updating Pond 36P: CB #4-2
[28] Note: Updating Subcat 38S: Yard to LCB #3-1
[28] Note: Updating Pond 38P: LCB #3-1
[28] Note: Updating Subcat 39S: Parking to CB #3-2
[28] Note: Updating Pond 39P: CB #3-2
[28] Note: Updating Pond 44P: Infiltration Pond / LCB #'s2 & 2-1 / OS #1
[28] Note: Updating Reach 44R: Overland Flow Path
[28] Note: Updating Link POA2: POA #2
[87] Warning: Pond 32P Oscillations may require smaller dt or Finer Routing (severity=12)

[90] Warning: Pond 24P Qout>Qin may require smaller dt or Finer Routing
[87] Warning: Pond 38P Oscillations may require smaller dt or Finer Routing (severity=14)
[87] Warning: Pond 39P Oscillations may require smaller dt or Finer Routing (severity=16)
[87] Warning: Pond 44P Oscillations may require smaller dt or Finer Routing (severity=23)
[80] Warning: Pond 44P Exceeded Pond 38P by 3.75' @ 12.27 hrs (5.67 cfs 0.203 af)

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points x 6
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Northeast Corner to CB Runoff Area=12,050 sf 27.65% Impervious Runoff Depth=2.40"
Flow Length=180' Tc=6.0 min CN=69 Runoff=0.77 cfs 0.055 af

Subcatchment 5S: Back Yard to POA #1 Runoff Area=10,478 sf 33.46% Impervious Runoff Depth=2.76"
Flow Length=198' Tc=6.0 min CN=73 Runoff=0.78 cfs 0.055 af

Subcatchment 17S: West Side to POA #2 Runoff Area=25,189 sf 1.64% Impervious Runoff Depth=0.11"
Flow Length=357' Tc=11.1 min CN=33 Runoff=0.01 cfs 0.005 af

Subcatchment 20S: Front Yard to CB#10 Runoff Area=6,933 sf 69.88% Impervious Runoff Depth=4.14"
Flow Length=147' Tc=6.0 min CN=87 Runoff=0.75 cfs 0.055 af

Subcatchment 21S: Parking to CB #9 Runoff Area=3,178 sf 77.66% Impervious Runoff Depth=4.46"
Flow Length=46' Slope=0.0181 '/' Tc=6.0 min CN=90 Runoff=0.37 cfs 0.027 af

Subcatchment 22S: Driveway to CB #8 Runoff Area=4,683 sf 86.46% Impervious Runoff Depth=4.79"
Flow Length=152' Tc=6.0 min CN=93 Runoff=0.56 cfs 0.043 af

Subcatchment 24S: Parking Lot to CB #7-1 Runoff Area=17,662 sf 63.74% Impervious Runoff Depth=3.93"
Flow Length=262' Tc=9.0 min CN=85 Runoff=1.66 cfs 0.133 af

Subcatchment 30S: Building to Drip Edge Runoff Area=4,788 sf 41.52% Impervious Runoff Depth=1.90"
Tc=6.0 min CN=63 Runoff=0.23 cfs 0.017 af

Subcatchment 31S: Building and Yard to Runoff Area=2,900 sf 58.93% Impervious Runoff Depth=2.94"
Tc=6.0 min CN=75 Runoff=0.23 cfs 0.016 af

Subcatchment 32S: Parking and Patios to Runoff Area=11,430 sf 69.54% Impervious Runoff Depth=4.03"
Flow Length=105' Tc=6.0 min CN=86 Runoff=1.22 cfs 0.088 af

Subcatchment 34S: Building to Drip Edge Runoff Area=2,681 sf 86.35% Impervious Runoff Depth=4.68"
Tc=6.0 min CN=92 Runoff=0.32 cfs 0.024 af

Subcatchment 35S: Building and Yard to Runoff Area=6,052 sf 23.60% Impervious Runoff Depth=1.37"
Flow Length=134' Tc=6.0 min CN=56 Runoff=0.20 cfs 0.016 af

Subcatchment 36S: Parking to CB #4-2 Runoff Area=22,757 sf 73.29% Impervious Runoff Depth=4.14"
Flow Length=108' Tc=7.1 min CN=87 Runoff=2.38 cfs 0.180 af

Subcatchment 38S: Yard to LCB #3-1 Runoff Area=7,404 sf 21.57% Impervious Runoff Depth=1.09"
Flow Length=103' Tc=6.0 min CN=52 Runoff=0.17 cfs 0.015 af

Subcatchment 39S: Parking to CB #3-2 Runoff Area=7,969 sf 87.51% Impervious Runoff Depth=4.57"
Flow Length=59' Slope=0.0178 '/' Tc=6.0 min CN=91 Runoff=0.93 cfs 0.070 af

Subcatchment 41S: Building to Drip Edge Runoff Area=4,150 sf 89.64% Impervious Runoff Depth=4.68"
Tc=6.0 min CN=92 Runoff=0.49 cfs 0.037 af

Subcatchment 42S: Buidling to Drip Edge Runoff Area=5,811 sf 56.29% Impervious Runoff Depth=2.58"
Tc=6.0 min CN=71 Runoff=0.40 cfs 0.029 af

Subcatchment 44S: Parking to Infiltration Runoff Area=21,163 sf 80.97% Impervious Runoff Depth=4.14"
Flow Length=96' Tc=6.0 min CN=87 Runoff=2.30 cfs 0.167 af

Reach 42R: Overland Flow Path Avg. Flow Depth=0.04' Max Vel=0.63 fps Inflow=0.28 cfs 0.004 af
n=0.035 L=156.0' S=0.0204 '/' Capacity=156.47 cfs Outflow=0.21 cfs 0.004 af

Reach 44R: Overland Flow Path Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=114.0' S=0.0091 '/' Capacity=104.51 cfs Outflow=0.00 cfs 0.000 af

Pond 1P: CB #A Peak Elev=50.81' Storage=7 cf Inflow=0.77 cfs 0.055 af
6.0" Round Culvert n=0.012 L=70.0' S=0.0107 '/' Outflow=0.75 cfs 0.055 af

Pond 20P: CB #12 Peak Elev=49.47' Storage=20 cf Inflow=0.75 cfs 0.055 af
12.0" Round Culvert n=0.012 L=28.0' S=0.0050 '/' Outflow=0.73 cfs 0.055 af

Pond 21P: CB #11 Peak Elev=49.41' Storage=23 cf Inflow=1.84 cfs 0.137 af
12.0" Round Culvert n=0.012 L=34.0' S=0.0050 '/' Outflow=1.83 cfs 0.137 af

Pond 22P: CB #10 Peak Elev=49.15' Storage=23 cf Inflow=2.38 cfs 0.180 af
15.0" Round Culvert n=0.012 L=22.0' S=0.0050 '/' Outflow=2.35 cfs 0.180 af

Pond 23P: CB #9 Peak Elev=48.99' Storage=24 cf Inflow=3.97 cfs 0.313 af
15.0" Round Culvert n=0.012 L=20.0' S=0.0050 '/' Outflow=3.95 cfs 0.313 af

Pond 24P: CB #9-1 Peak Elev=49.08' Storage=23 cf Inflow=1.66 cfs 0.133 af
Outflow=1.66 cfs 0.133 af

Pond 25P: YD #8 Peak Elev=48.56' Inflow=3.95 cfs 0.313 af
15.0" Round Culvert n=0.012 L=38.0' S=0.0050 '/' Outflow=3.95 cfs 0.313 af

Pond 26P: YD #7 Peak Elev=48.12' Inflow=3.95 cfs 0.313 af
15.0" Round Culvert n=0.012 L=32.0' S=0.0050 '/' Outflow=3.95 cfs 0.313 af

Pond 27P: YD #6 Peak Elev=47.69' Inflow=3.95 cfs 0.313 af
15.0" Round Culvert n=0.012 L=24.0' S=0.0050 '/' Outflow=3.95 cfs 0.313 af

Pond 30P: Drip Edge Peak Elev=51.01' Storage=1 cf Inflow=0.23 cfs 0.017 af
Discarded=0.23 cfs 0.017 af Primary=0.00 cfs 0.000 af Outflow=0.23 cfs 0.017 af

Pond 32P: CB #5-2 Peak Elev=51.02' Storage=32 cf Inflow=1.22 cfs 0.088 af
Primary=1.19 cfs 0.088 af Secondary=0.00 cfs 0.000 af Outflow=1.19 cfs 0.088 af

Pond 34P: Drip Edge Peak Elev=51.09' Storage=15 cf Inflow=0.32 cfs 0.024 af
Discarded=0.26 cfs 0.024 af Primary=0.00 cfs 0.000 af Outflow=0.26 cfs 0.024 af

Pond 36P: CB #4-2 Peak Elev=51.10' Storage=36 cf Inflow=2.38 cfs 0.180 af
12.0" Round Culvert n=0.012 L=13.0' S=0.0054 '/' Outflow=2.36 cfs 0.180 af

Pond 38P: LCB #3-1 Peak Elev=47.27' Storage=51 cf Inflow=0.17 cfs 0.015 af
Discarded=0.16 cfs 0.015 af Primary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.015 af

Pond 39P: CB #3-2 Peak Elev=51.01' Storage=35 cf Inflow=0.93 cfs 0.070 af
12.0" Round Culvert n=0.012 L=12.0' S=0.0050 '/' Outflow=0.90 cfs 0.070 af

Pond 41P: Drip Edge Peak Elev=52.84' Storage=83 cf Inflow=0.49 cfs 0.037 af
Discarded=0.18 cfs 0.033 af Primary=0.28 cfs 0.004 af Outflow=0.46 cfs 0.037 af

Pond 42P: Drip Edge Peak Elev=52.47' Storage=63 cf Inflow=0.40 cfs 0.029 af
Discarded=0.25 cfs 0.029 af Primary=0.00 cfs 0.000 af Outflow=0.25 cfs 0.029 af

Pond 44P: Infiltration Pond / LCB #'s2 & 2-1 / Peak Elev=51.00' Storage=3,903 cf Inflow=7.17 cfs 0.537 af
Discarded=3.45 cfs 0.537 af Primary=0.00 cfs 0.000 af Outflow=3.45 cfs 0.537 af

Link POA1: POA #1 Inflow=4.70 cfs 0.368 af
Primary=4.70 cfs 0.368 af

Link POA2: POA #2 Inflow=0.21 cfs 0.009 af
Primary=0.21 cfs 0.009 af

Total Runoff Area = 4.070 ac Runoff Volume = 1.033 af Average Runoff Depth = 3.05"
46.62% Pervious = 1.897 ac 53.38% Impervious = 2.172 ac

Summary for Subcatchment 1S: Northeast Corner to CB #A

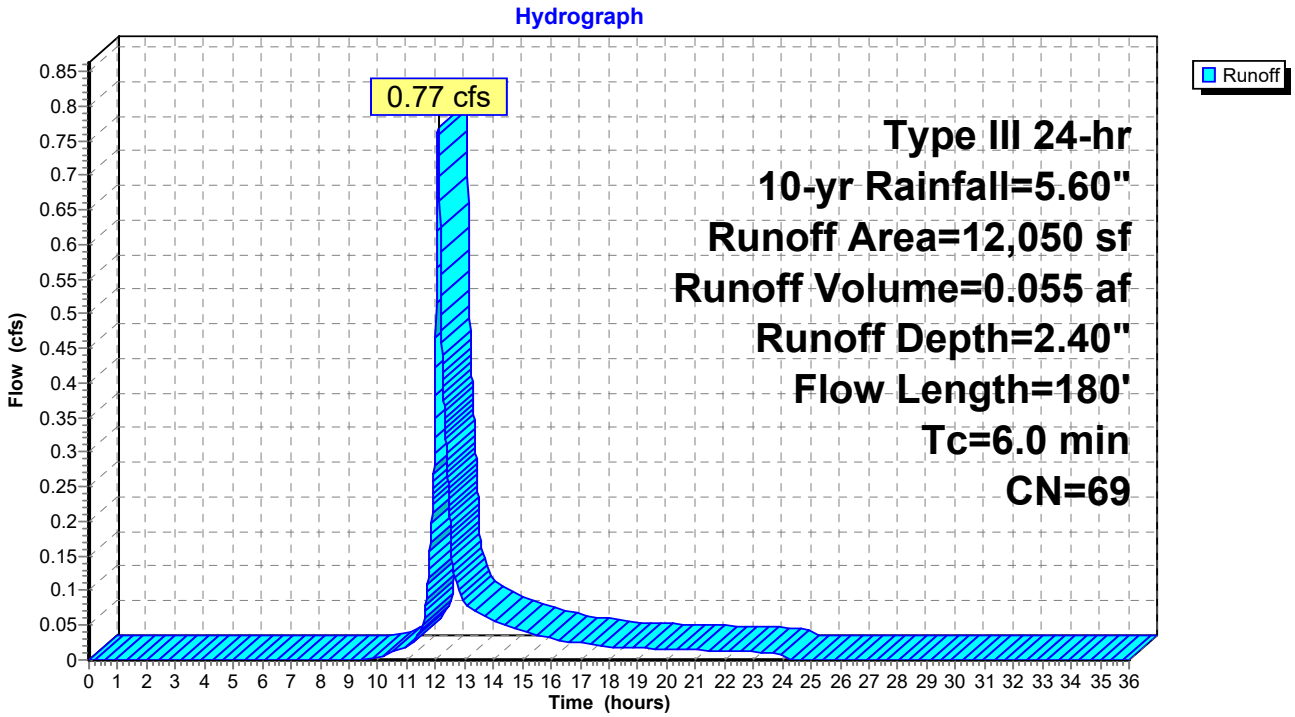
Runoff = 0.77 cfs @ 12.09 hrs, Volume= 0.055 af, Depth= 2.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	2,260	98	Roof
*	1,072	98	Impervious
	5,170	61	>75% Grass cover, Good, HSG B
	3,548	55	Woods, Good, HSG B
	12,050	69	Weighted Average
	8,718		72.35% Pervious Area
	3,332		27.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	28	0.0200	1.15		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.69"
3.8	152	0.0175	0.66		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.2	180	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1S: Northeast Corner to CB #A



Summary for Subcatchment 5S: Back Yard to POA #1

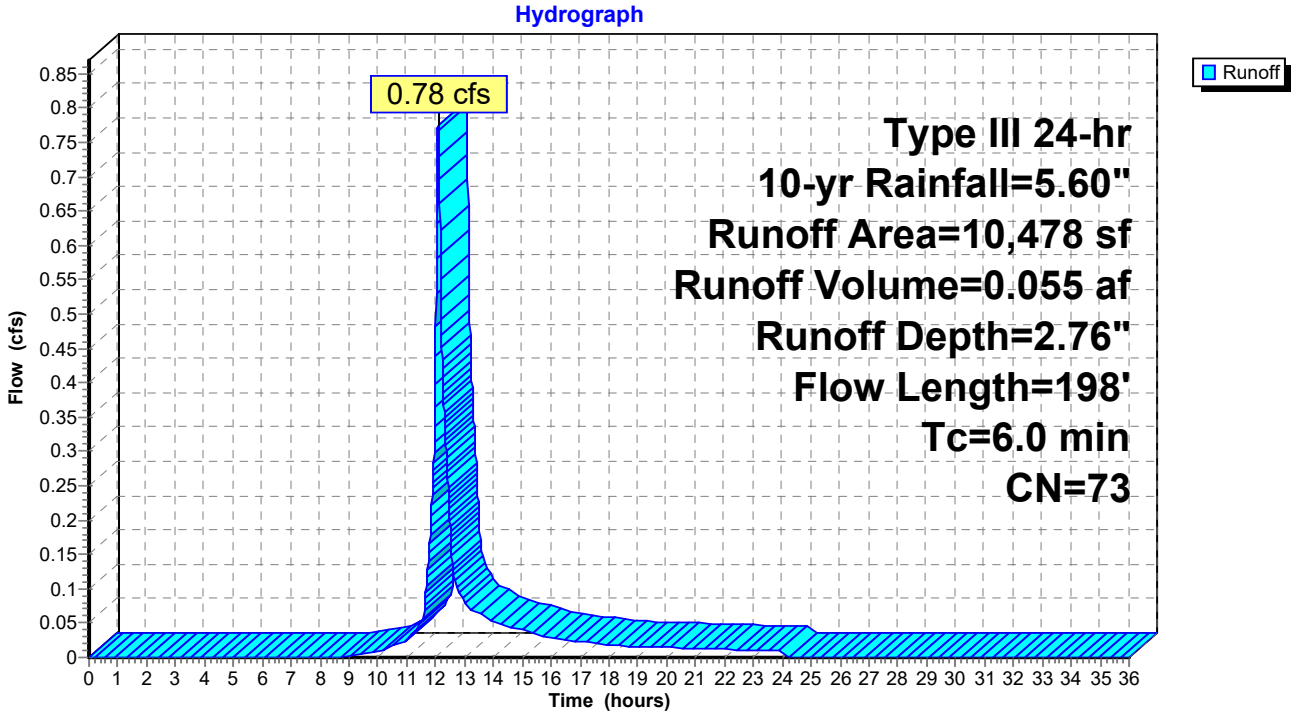
Runoff = 0.78 cfs @ 12.09 hrs, Volume= 0.055 af, Depth= 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	925	98	Roof
*	2,581	98	Impervious
	6,972	61	>75% Grass cover, Good, HSG B
	10,478	73	Weighted Average
	6,972		66.54% Pervious Area
	3,506		33.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	13	0.2000	0.31		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
0.7	72	0.0588	1.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.0	113	0.0175	0.93		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.4	198	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 5S: Back Yard to POA #1



Summary for Subcatchment 17S: West Side to POA #2

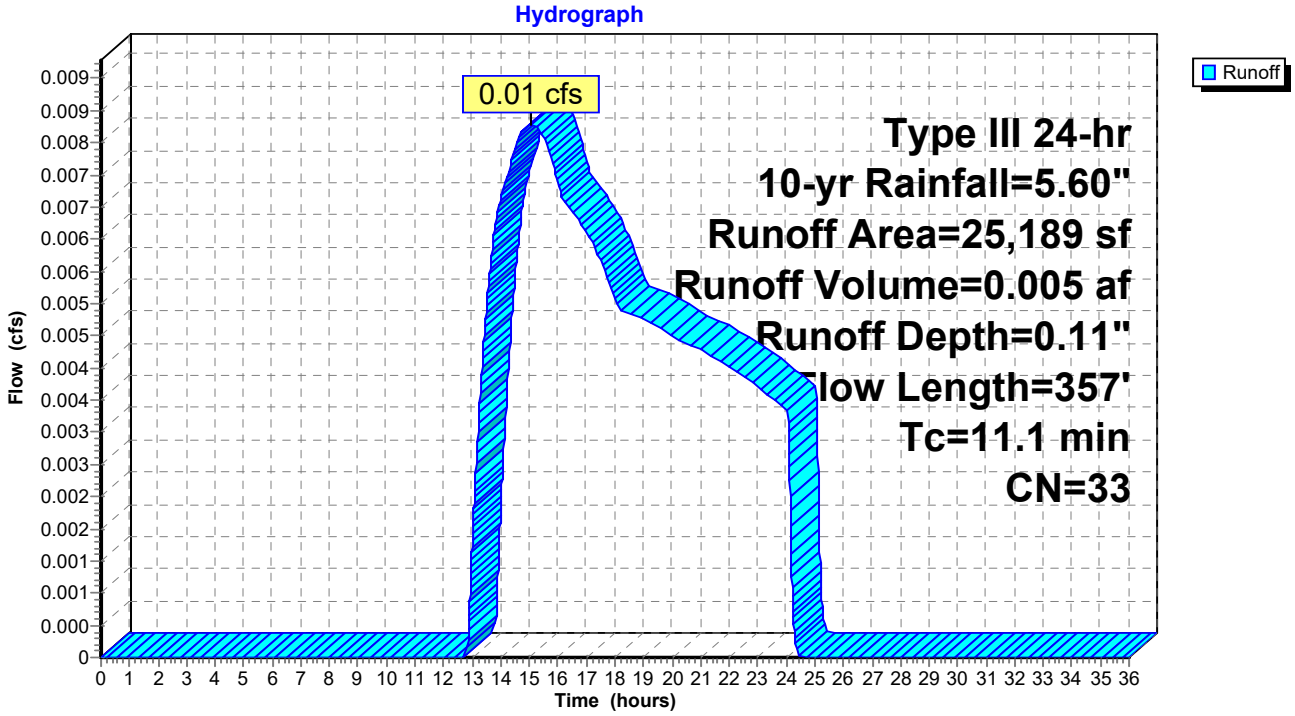
Runoff = 0.01 cfs @ 15.06 hrs, Volume= 0.005 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	413	98	Roof
	4,461	39	>75% Grass cover, Good, HSG A
	20,315	30	Woods, Good, HSG A
	25,189	33	Weighted Average
	24,776		98.36% Pervious Area
	413		1.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	44	0.0500	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
4.4	216	0.0273	0.83		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.4	97	0.0091	0.48		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.1	357	Total			

Subcatchment 17S: West Side to POA #2



Summary for Subcatchment 20S: Front Yard to CB#10

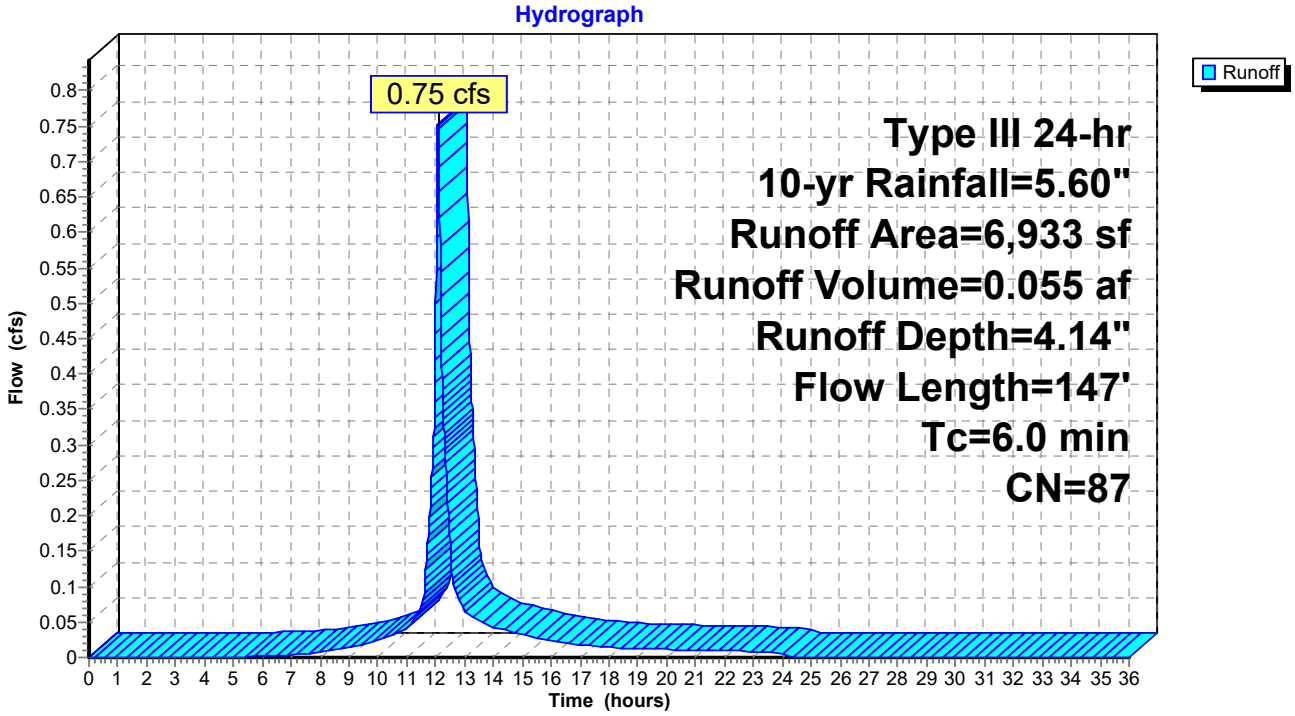
Runoff = 0.75 cfs @ 12.09 hrs, Volume= 0.055 af, Depth= 4.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	262	98	Roof
*	4,583	98	Impervious
	2,088	61	>75% Grass cover, Good, HSG B
	6,933	87	Weighted Average
	2,088		30.12% Pervious Area
	4,845		69.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	31	0.0200	1.17		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.69"
0.5	41	0.0040	1.28		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.4	75	0.0232	3.09		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.3	147	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 20S: Front Yard to CB#10



Summary for Subcatchment 21S: Parking to CB #9

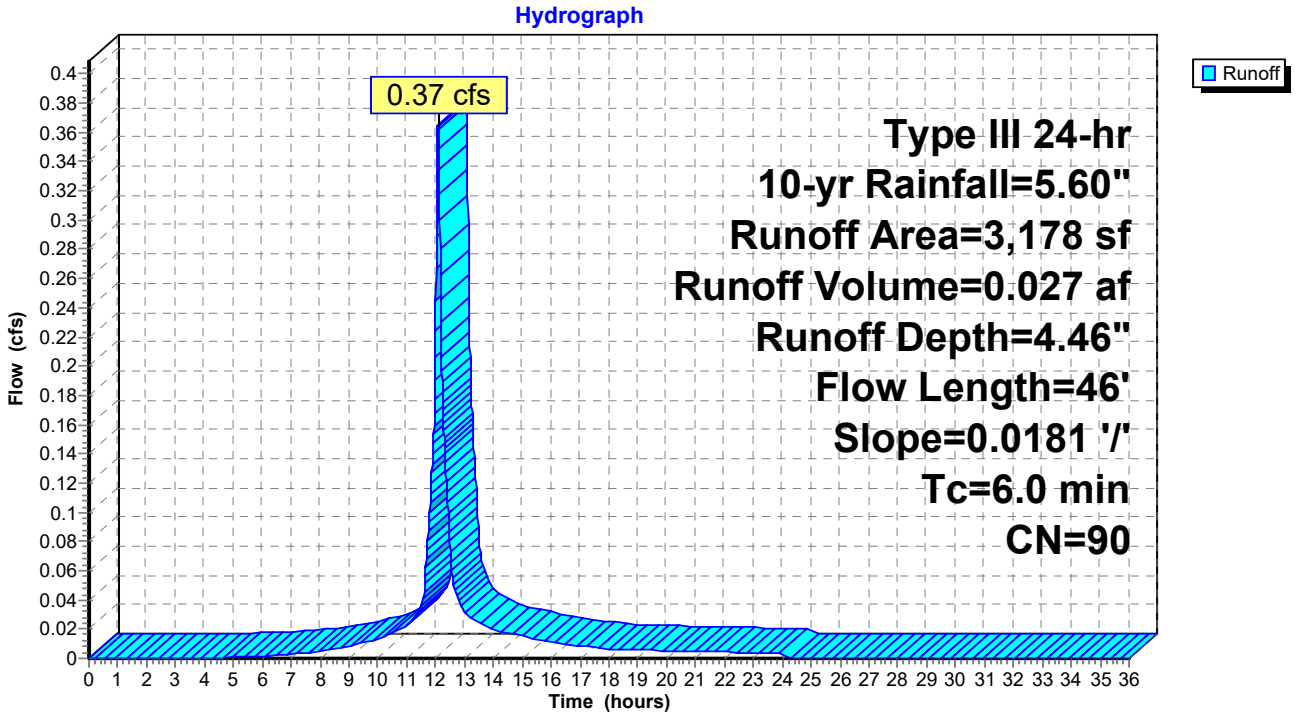
Runoff = 0.37 cfs @ 12.08 hrs, Volume= 0.027 af, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	667	98	Roof
*	1,801	98	Impervious
	710	61	>75% Grass cover, Good, HSG B
	3,178	90	Weighted Average
	710		22.34% Pervious Area
	2,468		77.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	46	0.0181	1.22		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.69"
0.6	46	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 21S: Parking to CB #9



Summary for Subcatchment 22S: Driveway to CB #8

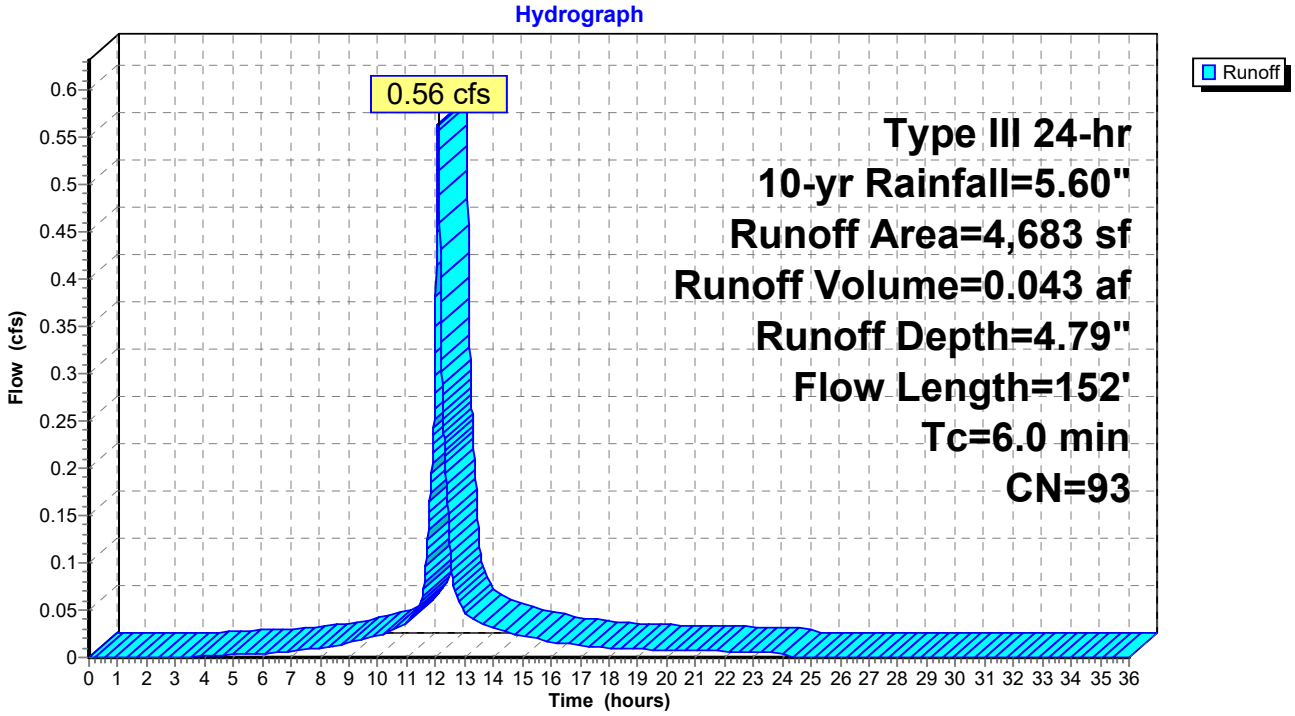
Runoff = 0.56 cfs @ 12.08 hrs, Volume= 0.043 af, Depth= 4.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	879	98	Roof
*	3,170	98	Impervious
	634	61	>75% Grass cover, Good, HSG B
	4,683	93	Weighted Average
	634		13.54% Pervious Area
	4,049		86.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	39	0.0200	1.22		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.69"
0.7	113	0.0197	2.85		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.2	152	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 22S: Driveway to CB #8



Summary for Subcatchment 24S: Parking Lot to CB #7-1

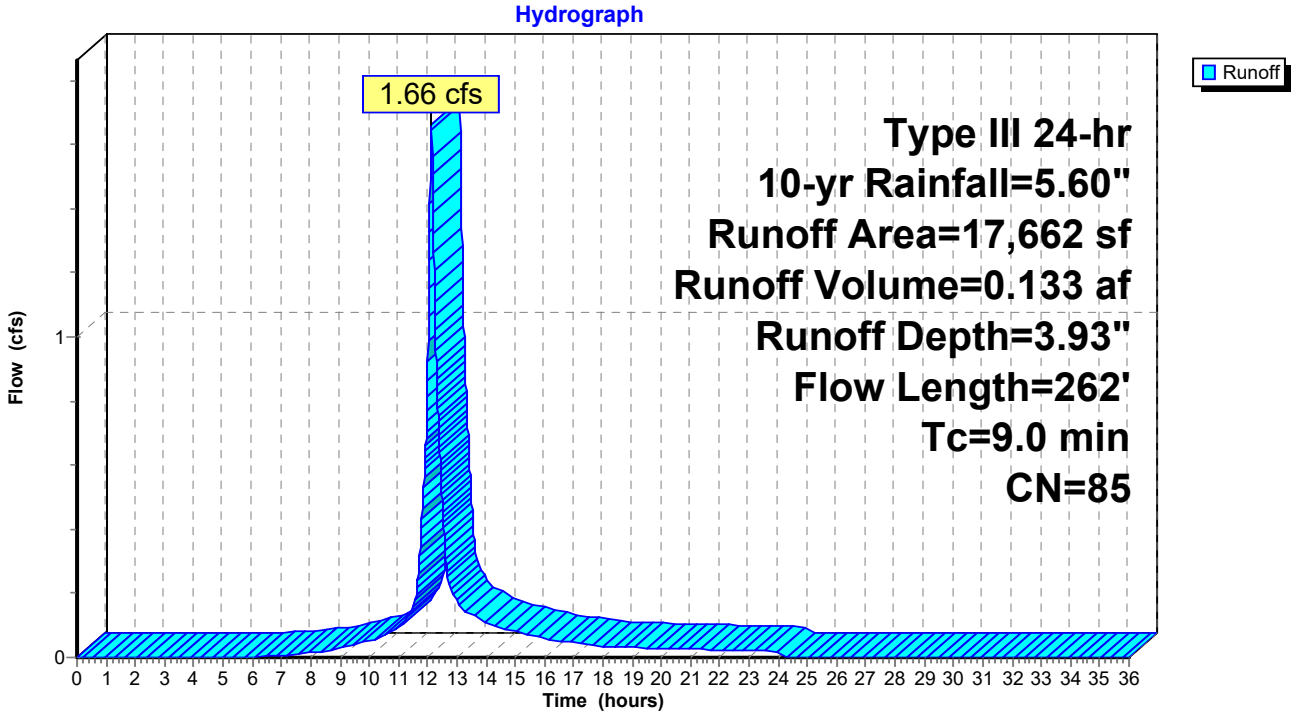
Runoff = 1.66 cfs @ 12.13 hrs, Volume= 0.133 af, Depth= 3.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	2,881	98	Roof
*	8,377	98	Impervious
	6,404	61	>75% Grass cover, Good, HSG B
	17,662	85	Weighted Average
	6,404		36.26% Pervious Area
	11,258		63.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.0118	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
1.6	105	0.0238	1.08		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.9	107	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
9.0	262	Total			

Subcatchment 24S: Parking Lot to CB #7-1



Summary for Subcatchment 30S: Building to Drip Edge

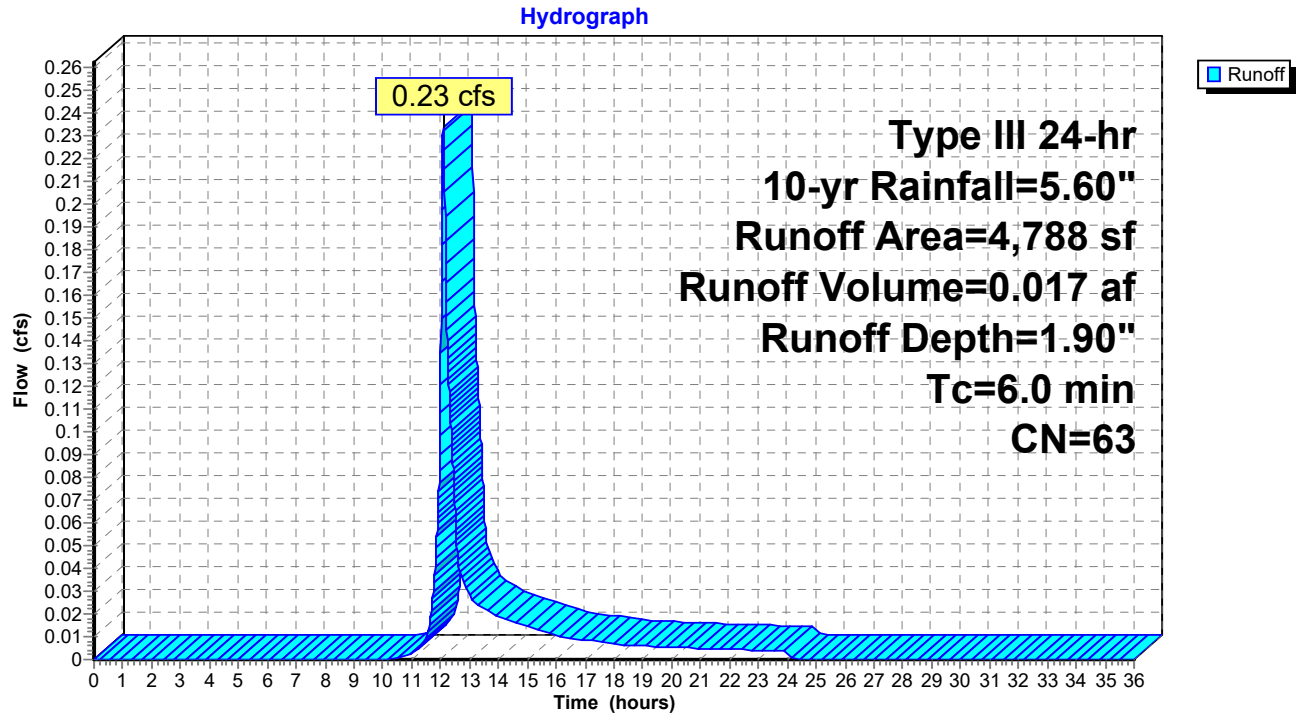
Runoff = 0.23 cfs @ 12.10 hrs, Volume= 0.017 af, Depth= 1.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	1,988	98	Roof
	2,800	39	>75% Grass cover, Good, HSG A
	4,788	63	Weighted Average
	2,800		58.48% Pervious Area
	1,988		41.52% Impervious Area

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

Subcatchment 30S: Building to Drip Edge



Summary for Subcatchment 31S: Building and Yard to LCB #5-1

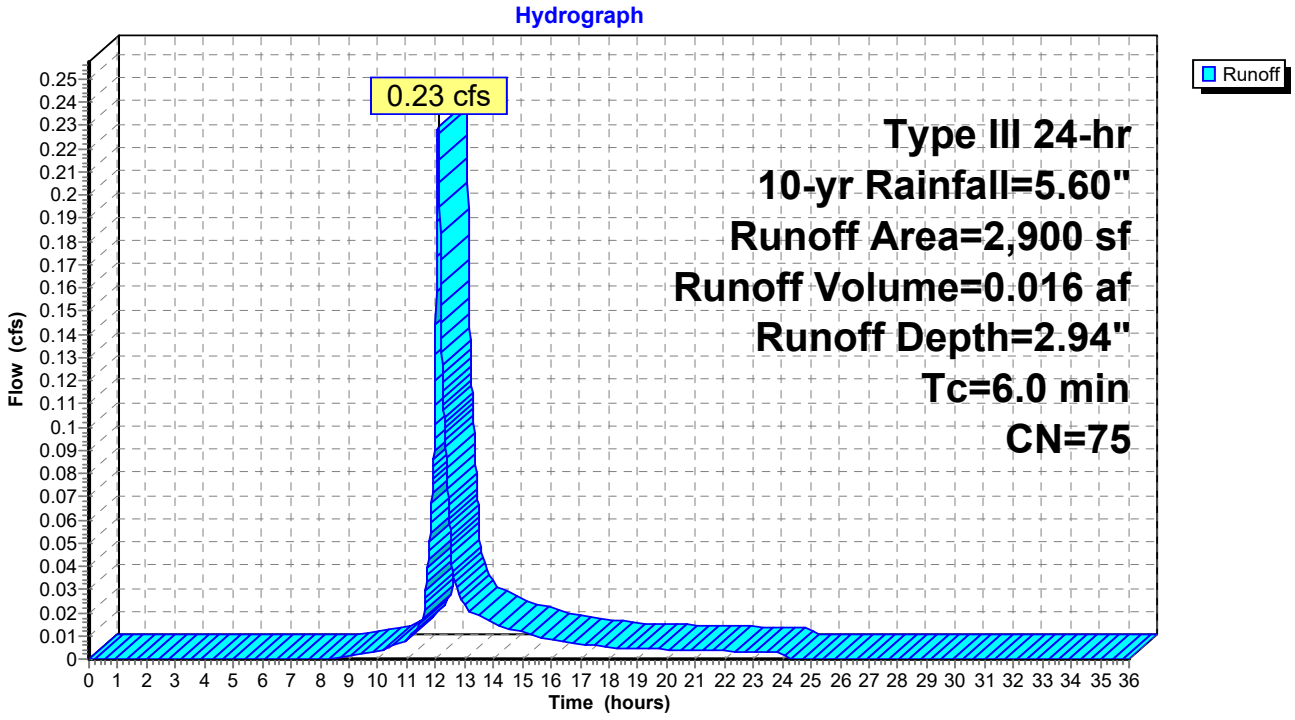
Runoff = 0.23 cfs @ 12.09 hrs, Volume= 0.016 af, Depth= 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	1,709	98	Roof
	161	61	>75% Grass cover, Good, HSG B
	1,030	39	>75% Grass cover, Good, HSG A
	2,900	75	Weighted Average
	1,191		41.07% Pervious Area
	1,709		58.93% Impervious Area

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

Subcatchment 31S: Building and Yard to LCB #5-1



Summary for Subcatchment 32S: Parking and Patios to CB #5-2

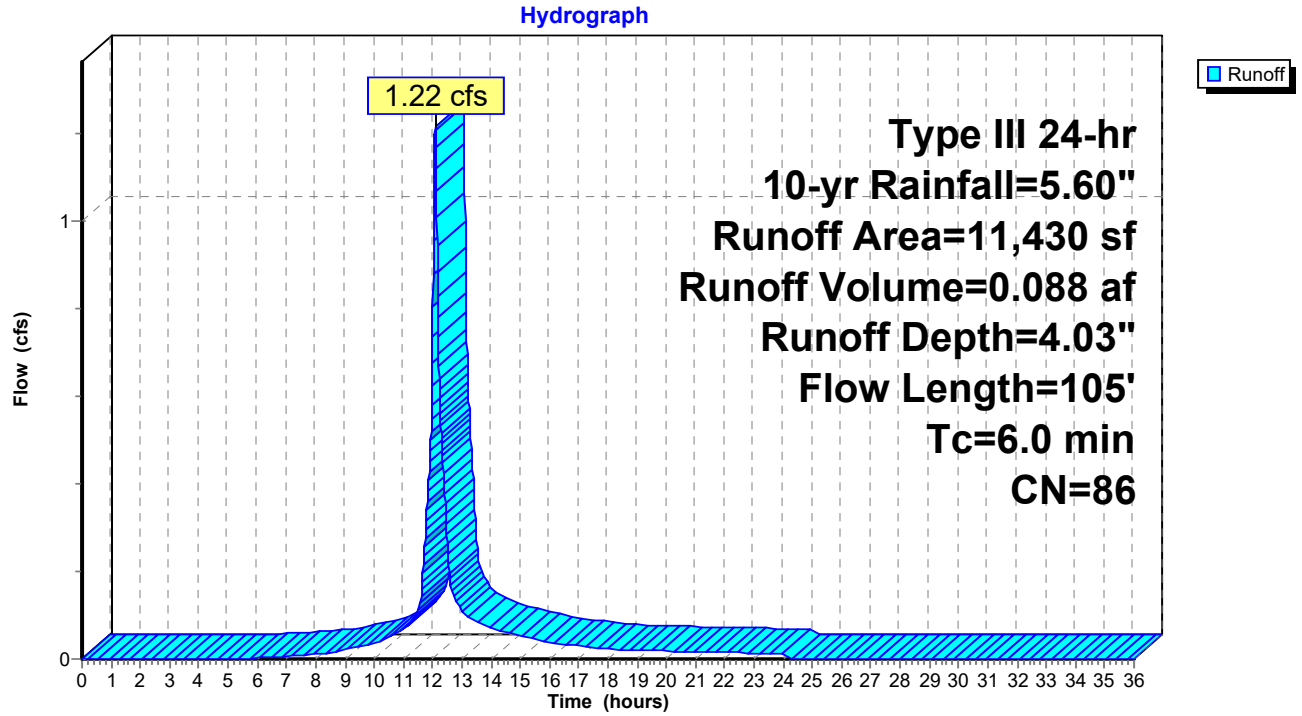
Runoff = 1.22 cfs @ 12.09 hrs, Volume= 0.088 af, Depth= 4.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	1,353	98	Roof
*	6,595	98	Impervious
	2,990	61	>75% Grass cover, Good, HSG B
	492	39	>75% Grass cover, Good, HSG A
	11,430	86	Weighted Average
	3,482		30.46% Pervious Area
	7,948		69.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	18	0.0100	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
0.2	45	0.0250	3.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	42	0.0217	2.99		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.5	105	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 32S: Parking and Patios to CB #5-2



Summary for Subcatchment 34S: Building to Drip Edge

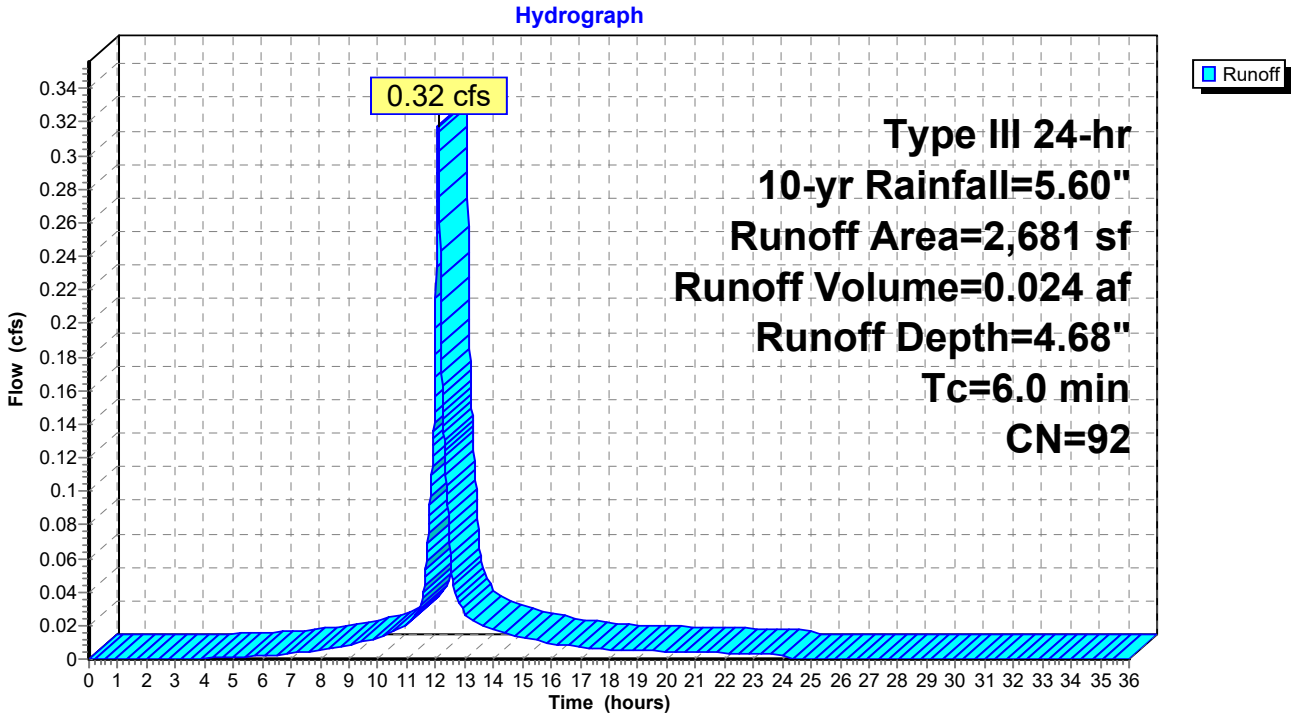
Runoff = 0.32 cfs @ 12.08 hrs, Volume= 0.024 af, Depth= 4.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	2,315	98	Roof
	270	61	>75% Grass cover, Good, HSG B
	96	39	>75% Grass cover, Good, HSG A
	2,681	92	Weighted Average
	366		13.65% Pervious Area
	2,315		86.35% Impervious Area

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

Subcatchment 34S: Building to Drip Edge



Summary for Subcatchment 35S: Building and Yard to LCB #4-1

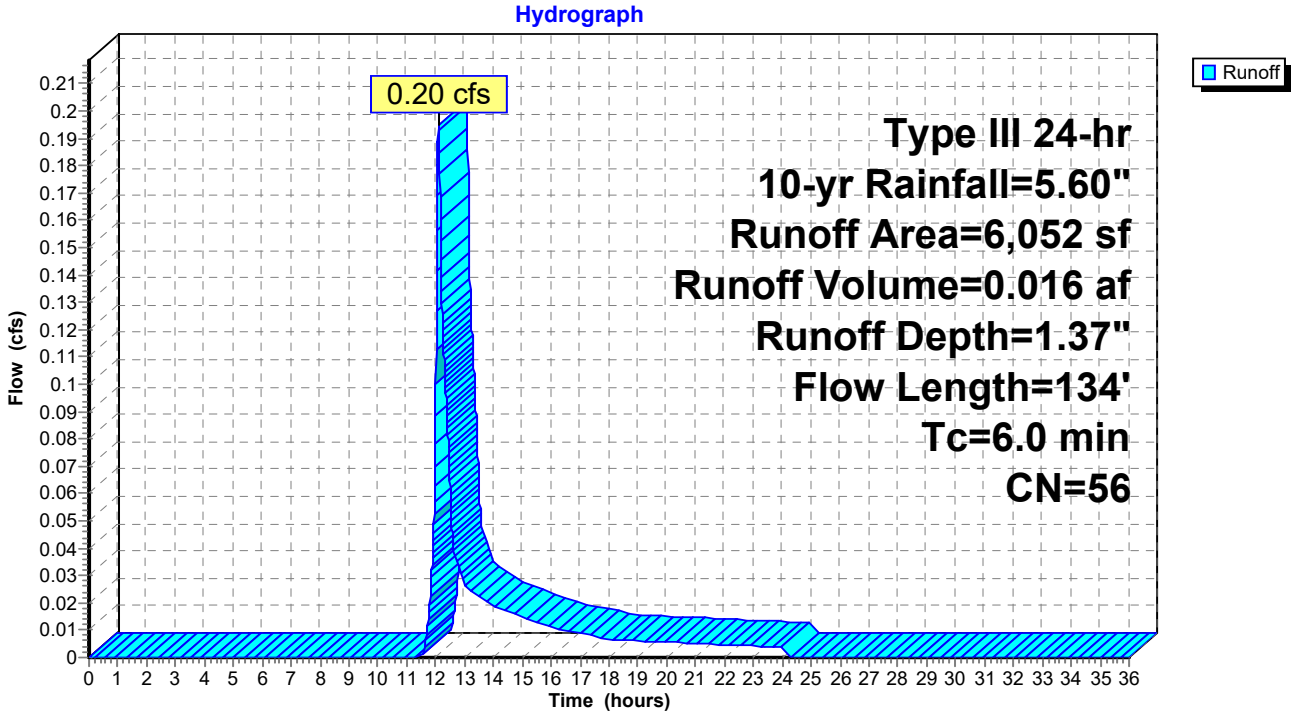
Runoff = 0.20 cfs @ 12.10 hrs, Volume= 0.016 af, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	1,275	98	Roof
*	53	98	Impervious
*	100	98	Ledge
	918	61	>75% Grass cover, Good, HSG B
	3,706	39	>75% Grass cover, Good, HSG A
	6,052	56	Weighted Average
	4,624		76.40% Pervious Area
	1,428		23.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	34	0.0645	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
1.0	57	0.0175	0.93		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.4	43	0.0050	0.49		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.8	134	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 35S: Building and Yard to LCB #4-1



Summary for Subcatchment 36S: Parking to CB #4-2

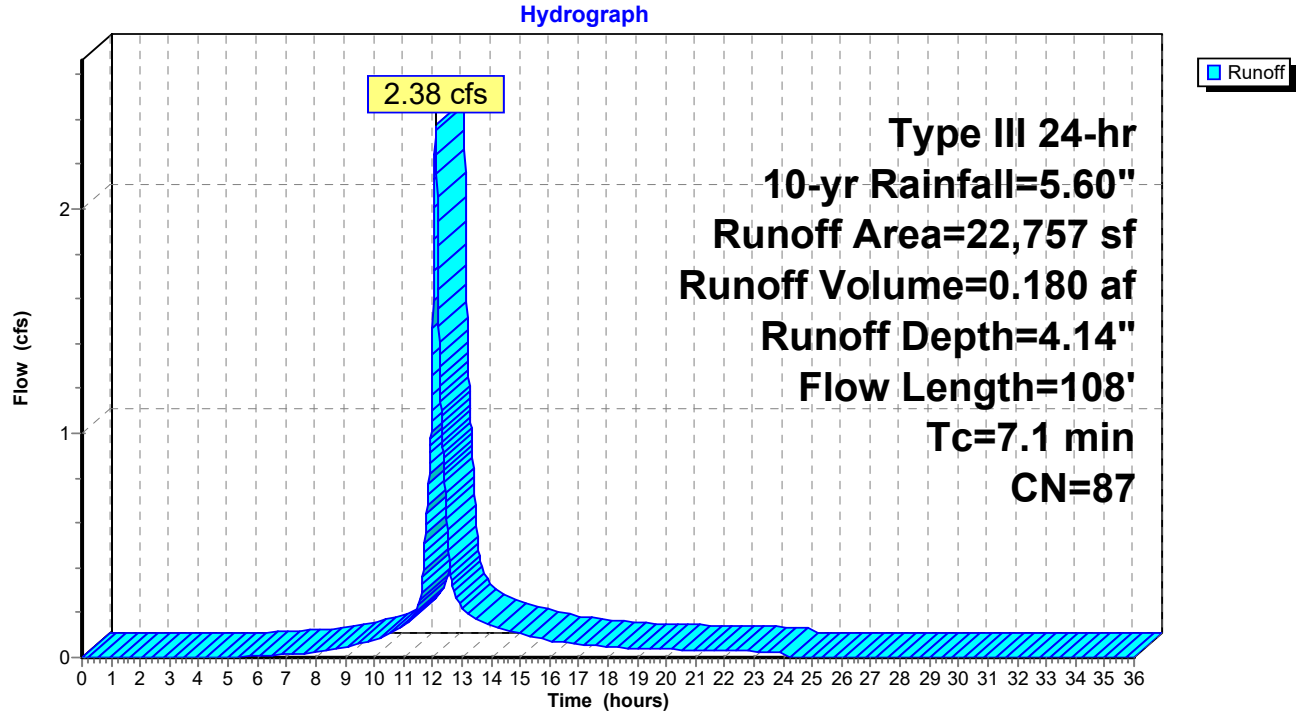
Runoff = 2.38 cfs @ 12.10 hrs, Volume= 0.180 af, Depth= 4.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	2,496	98	Roof
*	14,182	98	Impervious
	4,496	61	>75% Grass cover, Good, HSG B
	1,165	55	Woods, Good, HSG B
	418	39	>75% Grass cover, Good, HSG A
	22,757	87	Weighted Average
	6,079		26.71% Pervious Area
	16,678		73.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	34	0.0470	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.7	29	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	45	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.1	108	Total			

Subcatchment 36S: Parking to CB #4-2



Summary for Subcatchment 38S: Yard to LCB #3-1

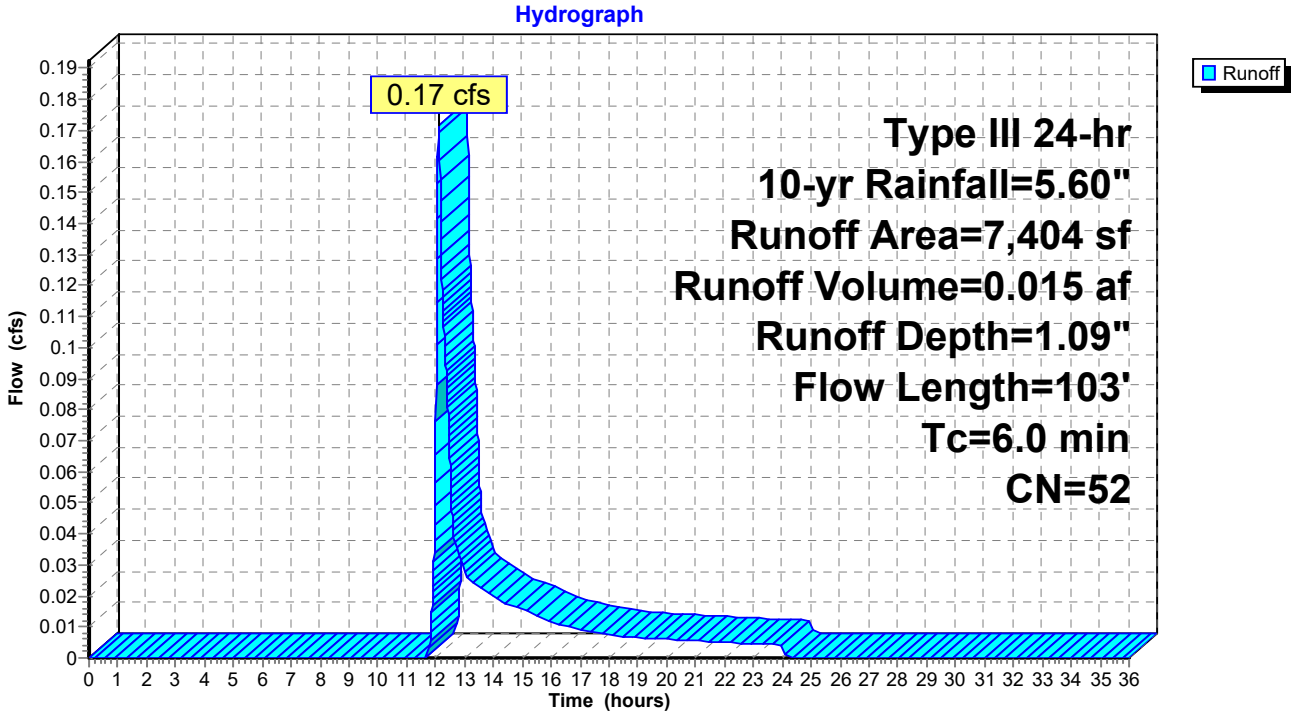
Runoff = 0.17 cfs @ 12.11 hrs, Volume= 0.015 af, Depth= 1.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	952	98	Roof
*	425	98	Impervious
*	220	98	Ledge
	5,807	39	>75% Grass cover, Good, HSG A
	7,404	52	Weighted Average
	5,807		78.43% Pervious Area
	1,597		21.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	32	0.0378	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
0.9	71	0.0351	1.31		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.7	103	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 38S: Yard to LCB #3-1



Summary for Subcatchment 39S: Parking to CB #3-2

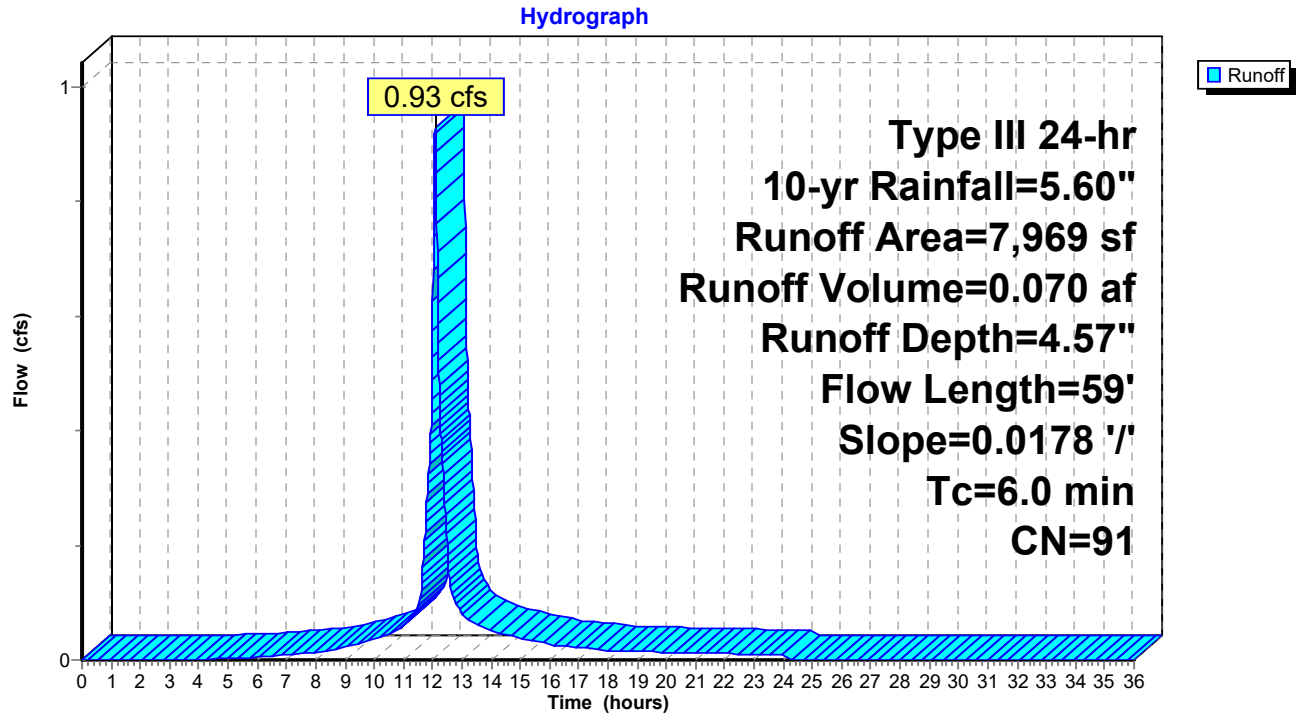
Runoff = 0.93 cfs @ 12.08 hrs, Volume= 0.070 af, Depth= 4.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	429	98	Roof
*	6,545	98	Impervious
	52	61	>75% Grass cover, Good, HSG B
	943	39	>75% Grass cover, Good, HSG A
	7,969	91	Weighted Average
	995		12.49% Pervious Area
	6,974		87.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	30	0.0178	1.11		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.69"
0.2	29	0.0178	2.71		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	59	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 39S: Parking to CB #3-2



Summary for Subcatchment 41S: Building to Drip Edge

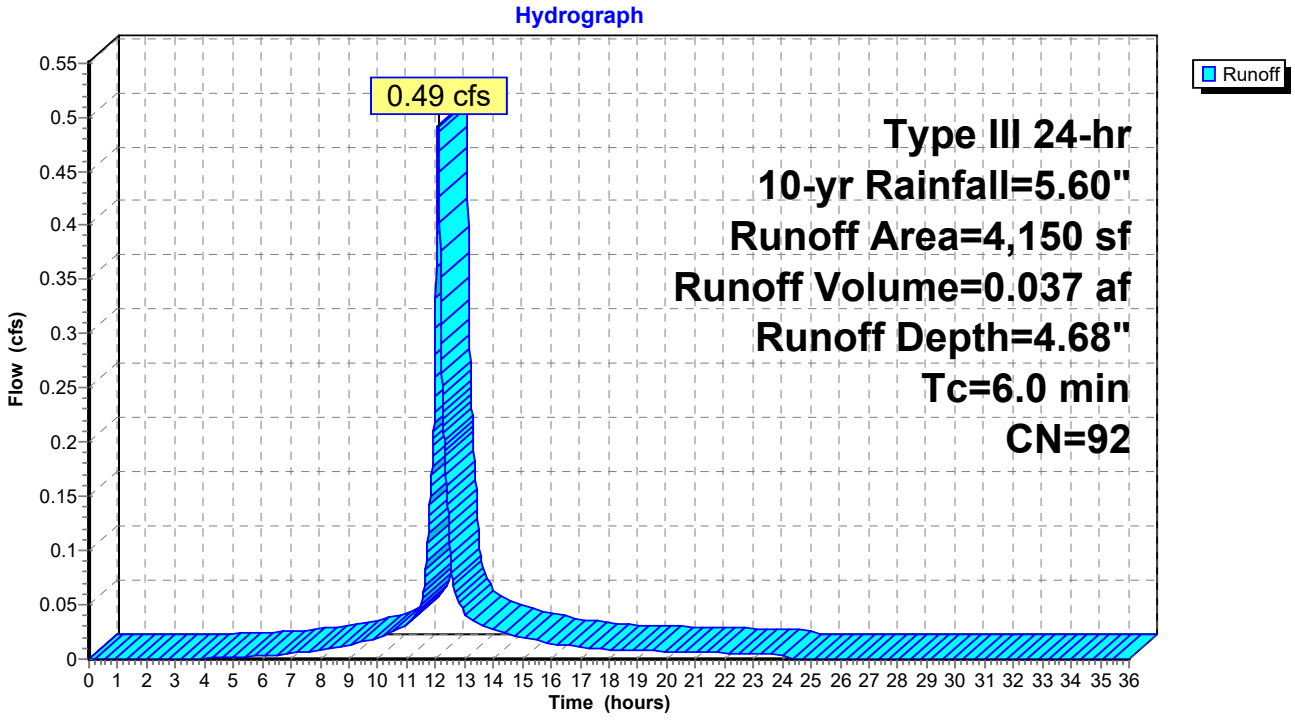
Runoff = 0.49 cfs @ 12.08 hrs, Volume= 0.037 af, Depth= 4.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	3,720	98	Roof
	65	61	>75% Grass cover, Good, HSG B
	365	39	>75% Grass cover, Good, HSG A
	4,150	92	Weighted Average
	430		10.36% Pervious Area
	3,720		89.64% Impervious Area

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

Subcatchment 41S: Building to Drip Edge



Summary for Subcatchment 42S: Buidling to Drip Edge

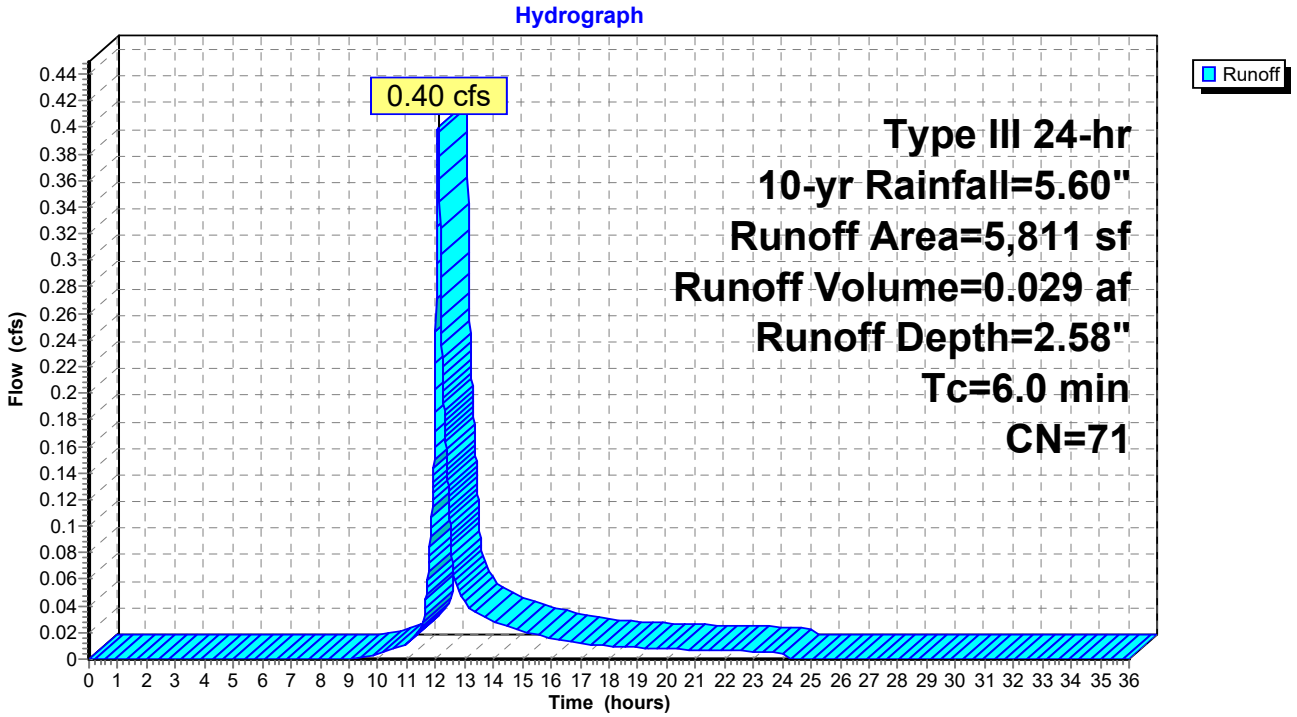
Runoff = 0.40 cfs @ 12.09 hrs, Volume= 0.029 af, Depth= 2.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	3,271	98	Roof
	80	61	>75% Grass cover, Good, HSG B
	147	55	Woods, Good, HSG B
	755	39	>75% Grass cover, Good, HSG A
	1,558	30	Woods, Good, HSG A
	5,811	71	Weighted Average
	2,540		43.71% Pervious Area
	3,271		56.29% Impervious Area

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

Subcatchment 42S: Buidling to Drip Edge



Summary for Subcatchment 44S: Parking to Infiltration Pond

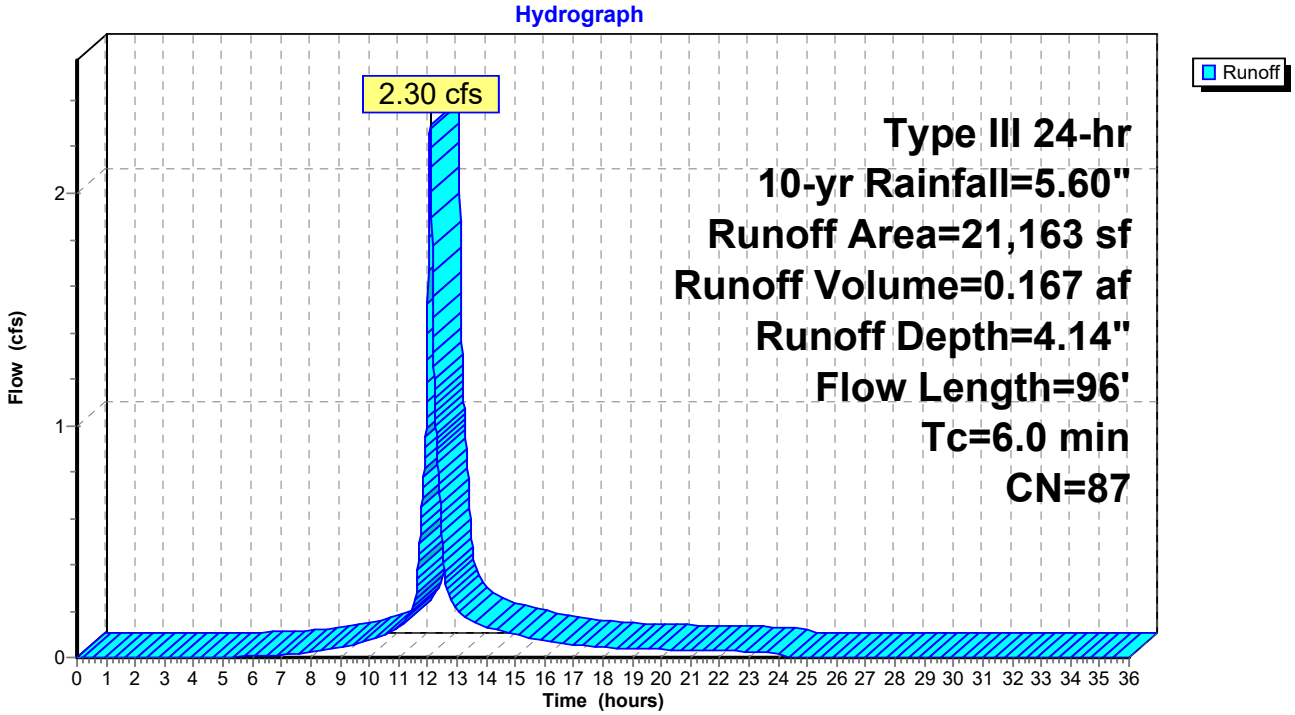
Runoff = 2.30 cfs @ 12.09 hrs, Volume= 0.167 af, Depth= 4.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=5.60"

	Area (sf)	CN	Description
*	538	98	Roof
*	16,597	98	Impervious
	4,028	39	>75% Grass cover, Good, HSG A
	21,163	87	Weighted Average
	4,028		19.03% Pervious Area
	17,135		80.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	30	0.0113	0.92		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.69"
0.4	46	0.0113	2.16		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	20	0.3333	4.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	96	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 44S: Parking to Infiltration Pond



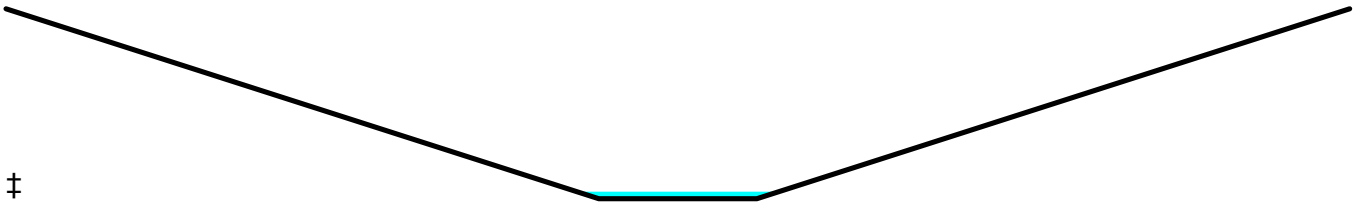
Summary for Reach 42R: Overland Flow Path

Inflow Area = 0.229 ac, 70.18% Impervious, Inflow Depth = 0.20" for 10-yr event
Inflow = 0.28 cfs @ 12.11 hrs, Volume= 0.004 af
Outflow = 0.21 cfs @ 12.17 hrs, Volume= 0.004 af, Atten= 24%, Lag= 3.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 6
Max. Velocity= 0.63 fps, Min. Travel Time= 4.1 min
Avg. Velocity = 0.33 fps, Avg. Travel Time= 7.9 min

Peak Storage= 52 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.04'
Bank-Full Depth= 1.00' Flow Area= 38.0 sf, Capacity= 156.47 cfs

8.00' x 1.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 30.0 '/' Top Width= 68.00'
Length= 156.0' Slope= 0.0204 '/'
Inlet Invert= 51.00', Outlet Invert= 47.81'



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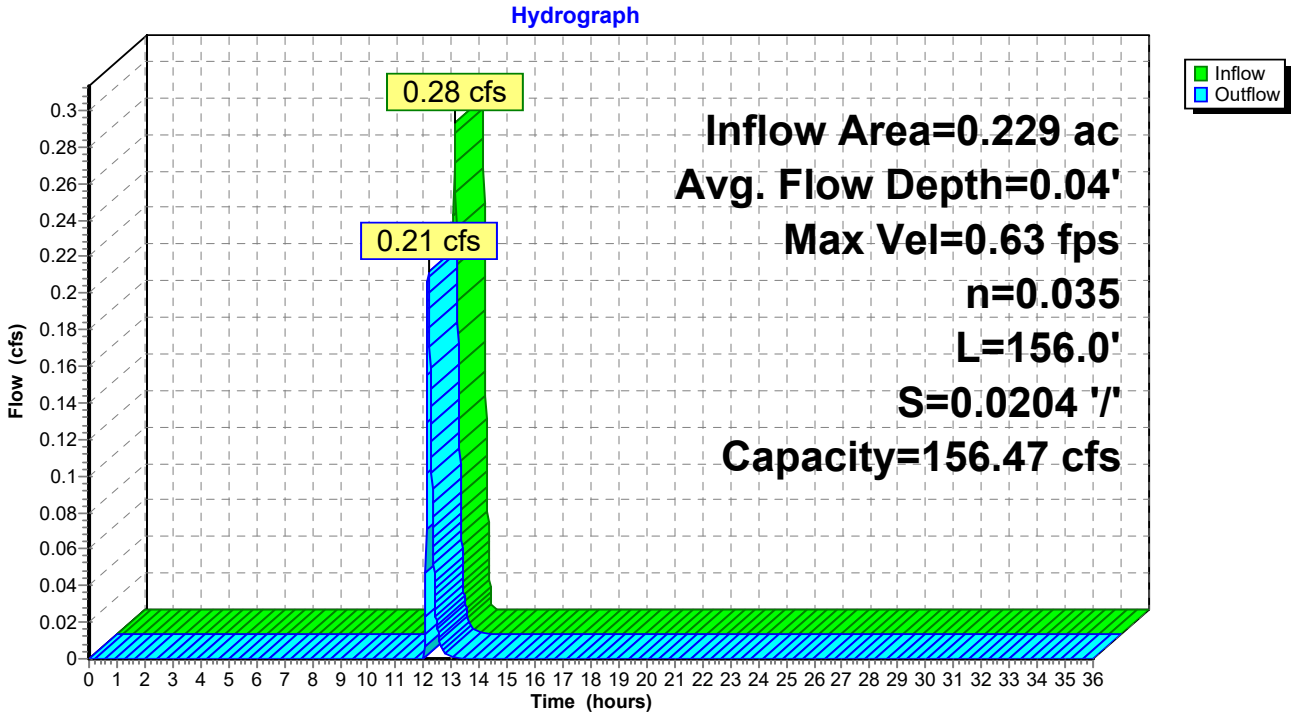
Reach 42R: Overland Flow Path



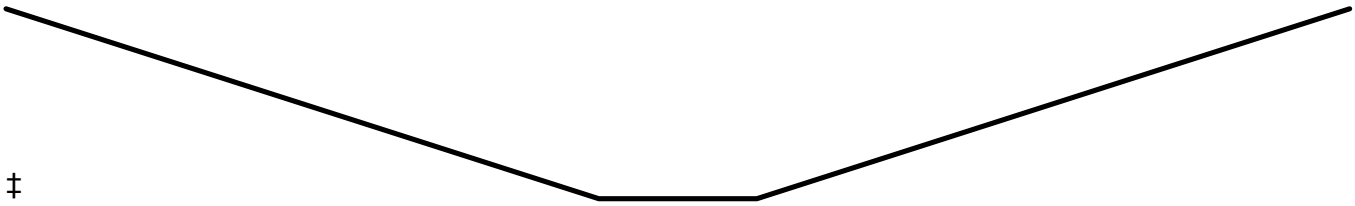
Summary for Reach 44R: Overland Flow Path

Inflow Area = 2.001 ac, 66.29% Impervious, Inflow Depth = 0.00" for 10-yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 6
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 38.0 sf, Capacity= 104.51 cfs

8.00' x 1.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 30.0 '/' Top Width= 68.00'
Length= 114.0' Slope= 0.0091 '/'
Inlet Invert= 48.85', Outlet Invert= 47.81'



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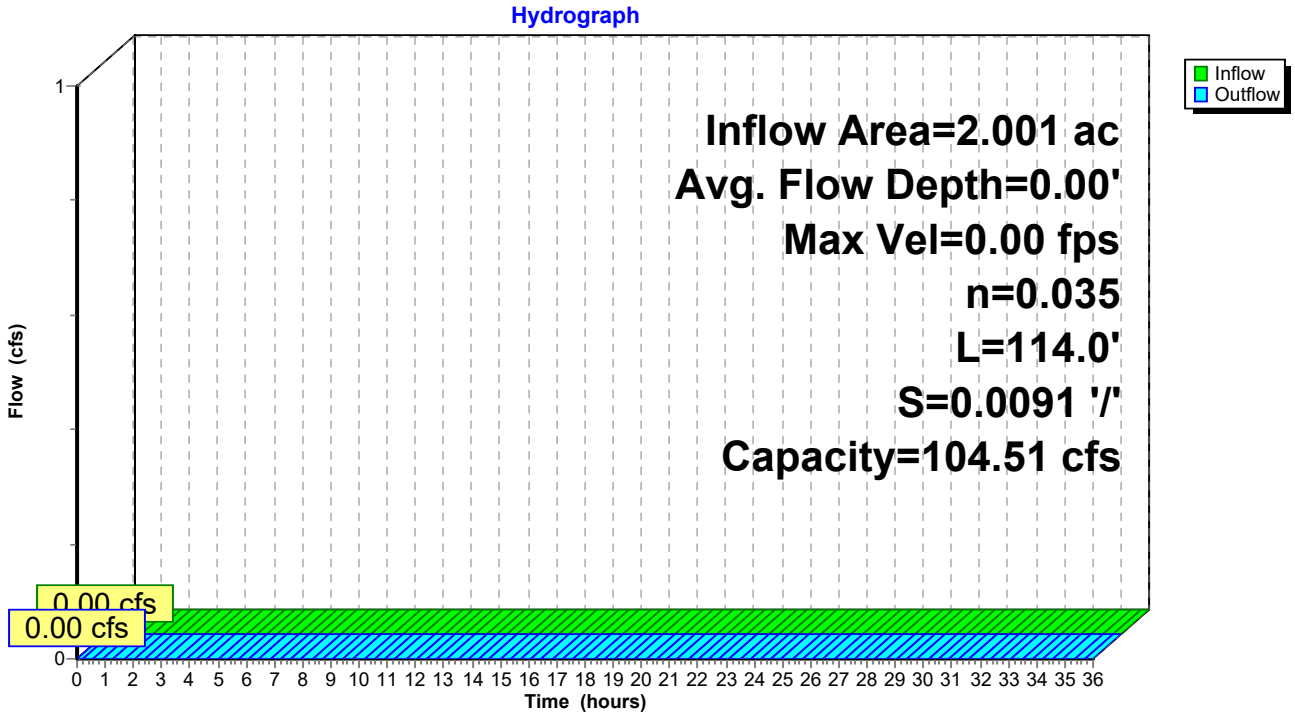
Reach 44R: Overland Flow Path



Summary for Pond 1P: CB #A

Inflow Area = 0.277 ac, 27.65% Impervious, Inflow Depth = 2.40" for 10-yr event
Inflow = 0.77 cfs @ 12.09 hrs, Volume= 0.055 af
Outflow = 0.75 cfs @ 12.09 hrs, Volume= 0.055 af, Atten= 2%, Lag= 0.0 min
Primary = 0.75 cfs @ 12.09 hrs, Volume= 0.055 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 6
Peak Elev= 50.81' @ 12.11 hrs Surf.Area= 54 sf Storage= 7 cf

Plug-Flow detention time= 0.2 min calculated for 0.055 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (844.3 - 844.1)

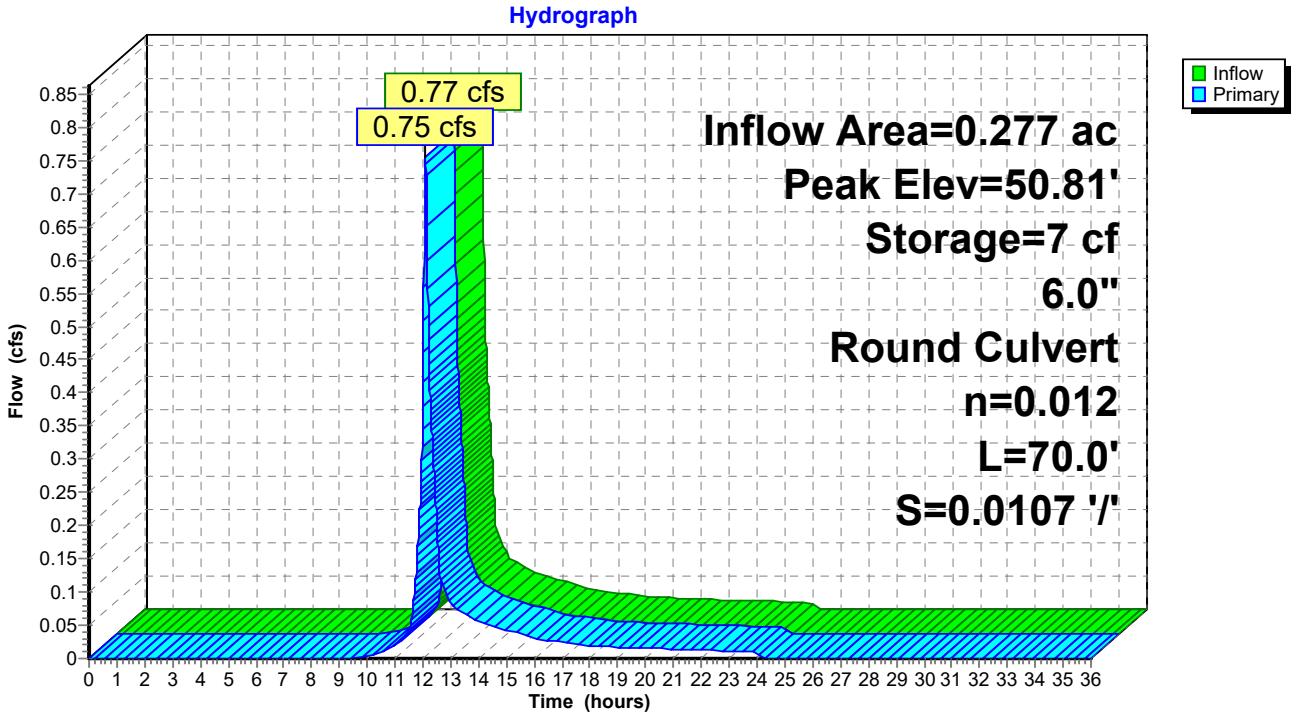
Volume	Invert	Avail.Storage	Storage Description
#1	49.42'	876 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
49.42	4	0	0
50.77	4	5	5
52.00	1,412	871	876

Device	Routing	Invert	Outlet Devices
#1	Primary	49.42'	**6.0" Round Culvert** L= 70.0' Ke= 0.500 Inlet / Outlet Invert= 49.42' / 48.67' S= 0.0107 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.76 cfs @ 12.09 hrs HW=50.77' TW=49.32' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.76 cfs @ 3.87 fps)

Pond 1P: CB #A


Hydrograph
0.77 cfs
0.75 cfs
Inflow Area=0.277 ac
Peak Elev=50.81'
Storage=7 cf
6.0"
Round Culvert
n=0.012
L=70.0'
S=0.0107 '/'
Inflow
Primary
Flow (cfs)
Time (hours)

Summary for Pond 20P: CB #12

Inflow Area = 0.159 ac, 69.88% Impervious, Inflow Depth = 4.14" for 10-yr event
Inflow = 0.75 cfs @ 12.09 hrs, Volume= 0.055 af
Outflow = 0.73 cfs @ 12.10 hrs, Volume= 0.055 af, Atten= 4%, Lag= 1.1 min
Primary = 0.73 cfs @ 12.10 hrs, Volume= 0.055 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 6
Peak Elev= 49.47' @ 12.11 hrs Surf.Area= 11 sf Storage= 20 cf

Plug-Flow detention time= 0.6 min calculated for 0.055 af (100% of inflow)
Center-of-Mass det. time= 0.6 min (797.7 - 797.1)

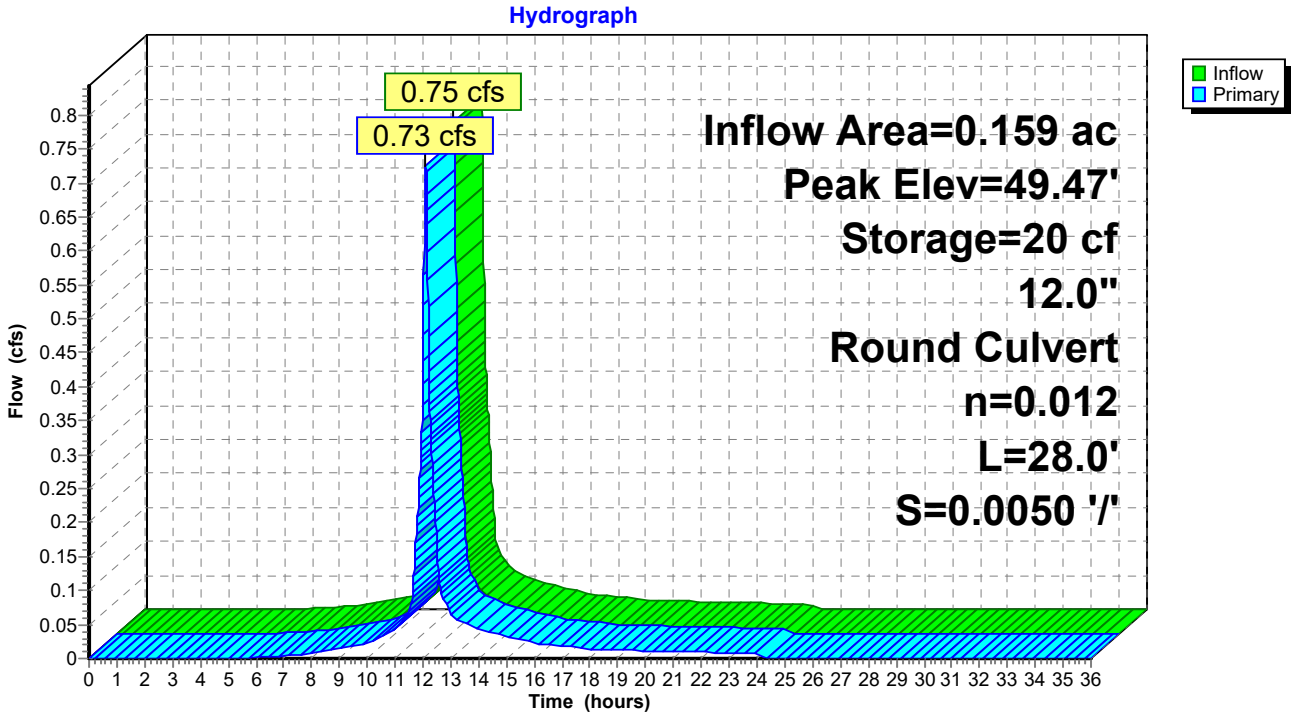
Volume	Invert	Avail.Storage	Storage Description
#1	47.88'	61 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.88	13	0	0
49.10	13	16	16
51.10	4	17	33
51.30	277	28	61

Device	Routing	Invert	Outlet Devices
#1	Primary	47.88'	**12.0" Round Culvert** L= 28.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 47.88' / 47.74' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.94 cfs @ 12.10 hrs HW=49.46' TW=49.39' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.94 cfs @ 1.19 fps)

Pond 20P: CB #12



Summary for Pond 21P: CB #11

Inflow Area = 0.509 ac, 48.03% Impervious, Inflow Depth = 3.24" for 10-yr event
Inflow = 1.84 cfs @ 12.09 hrs, Volume= 0.137 af
Outflow = 1.83 cfs @ 12.10 hrs, Volume= 0.137 af, Atten= 1%, Lag= 0.5 min
Primary = 1.83 cfs @ 12.10 hrs, Volume= 0.137 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 6
Peak Elev= 49.41' @ 12.11 hrs Surf.Area= 13 sf Storage= 23 cf

Plug-Flow detention time= 0.4 min calculated for 0.137 af (100% of inflow)
Center-of-Mass det. time= 0.4 min (814.7 - 814.4)

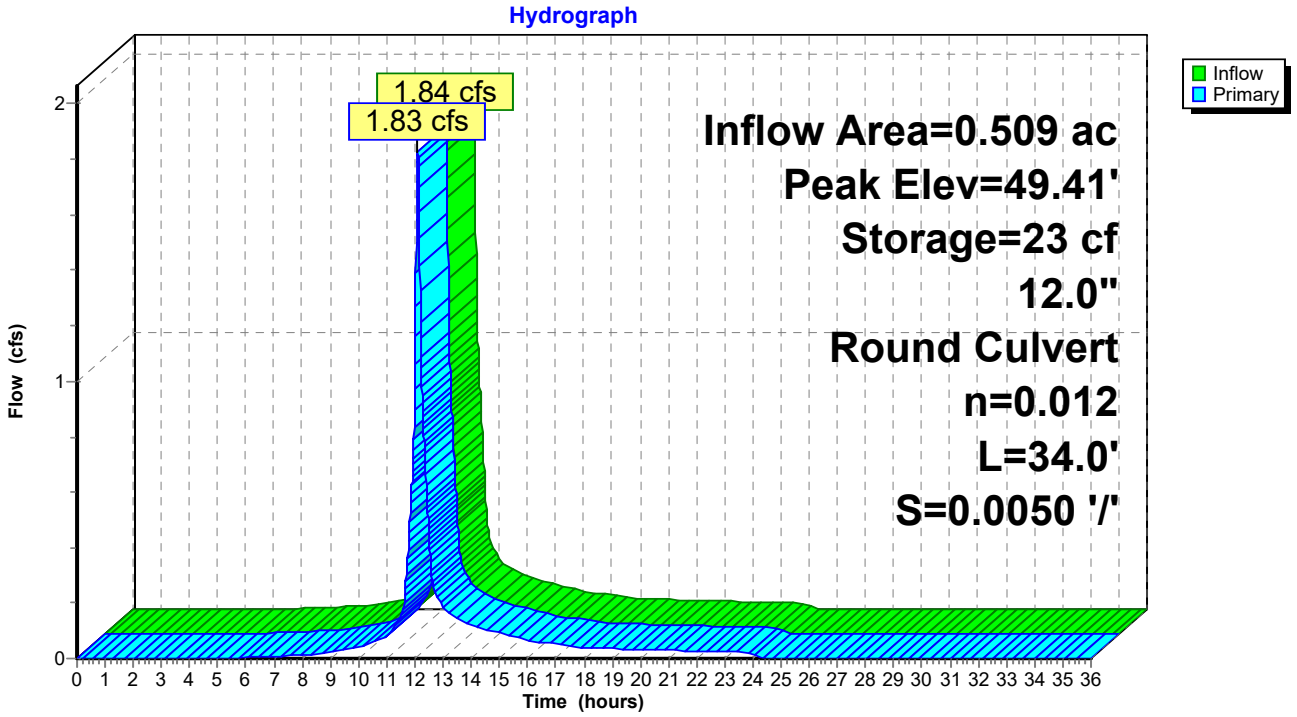
Volume	Invert	Avail.Storage	Storage Description
#1	47.64'	56 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.64	13	0	0
50.15	13	33	33
51.15	4	9	41
51.30	190	15	56

Device	Routing	Invert	Outlet Devices
#1	Primary	47.64'	**12.0" Round Culvert** L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 47.64' / 47.47' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.10 cfs @ 12.10 hrs HW=49.39' TW=49.08' (Dynamic Tailwater)
1=Culvert (Inlet Controls 2.10 cfs @ 2.67 fps)

Pond 21P: CB #11



Summary for Pond 22P: CB #10

Inflow Area = 0.616 ac, 54.74% Impervious, Inflow Depth = 3.51" for 10-yr event
Inflow = 2.38 cfs @ 12.10 hrs, Volume= 0.180 af
Outflow = 2.35 cfs @ 12.10 hrs, Volume= 0.180 af, Atten= 1%, Lag= 0.0 min
Primary = 2.35 cfs @ 12.10 hrs, Volume= 0.180 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 6
Peak Elev= 49.15' @ 12.12 hrs Surf.Area= 13 sf Storage= 23 cf

Plug-Flow detention time= 0.4 min calculated for 0.180 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (805.6 - 805.3)

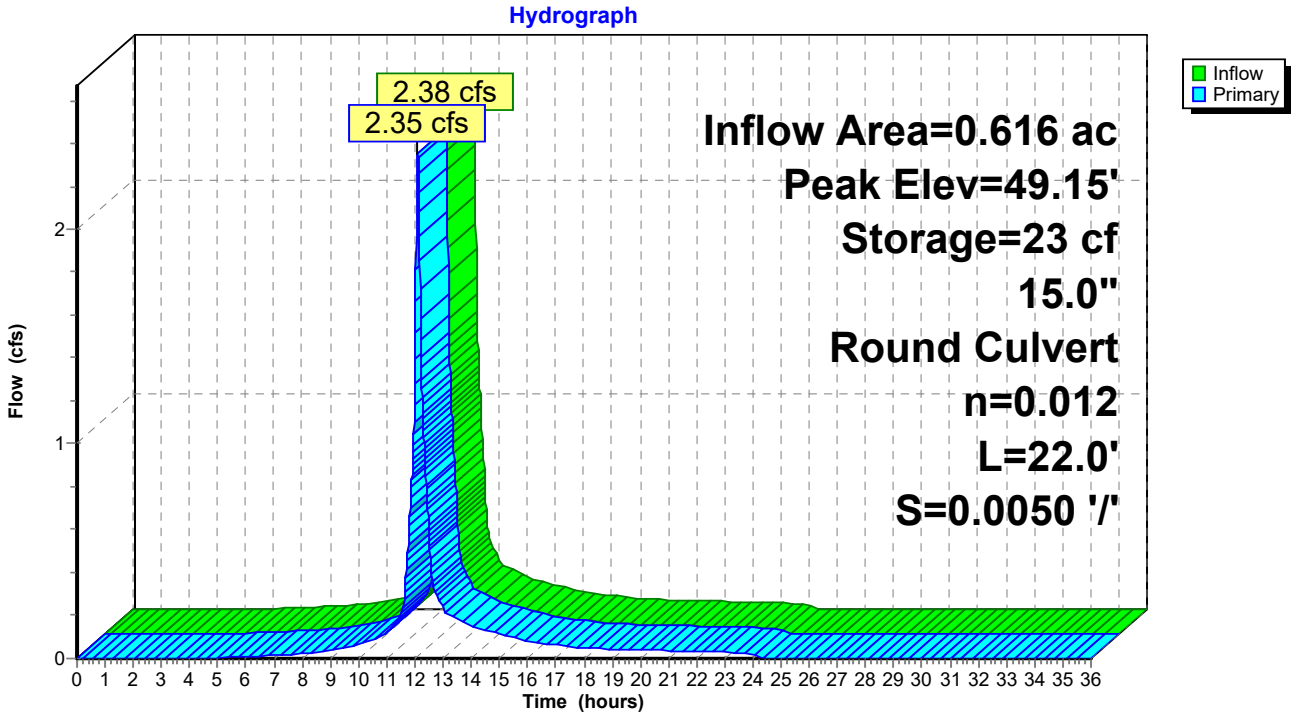
Volume	Invert	Avail.Storage	Storage Description
#1	47.37'	176 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.37	13	0	0
49.30	13	25	25
50.30	4	9	34
51.00	402	142	176

Device	Routing	Invert	Outlet Devices
#1	Primary	47.37'	**15.0" Round Culvert** L= 22.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 47.37' / 47.26' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=2.49 cfs @ 12.10 hrs HW=49.06' TW=48.89' (Dynamic Tailwater)
1=Culvert (Inlet Controls 2.49 cfs @ 2.03 fps)

Pond 22P: CB #10



Summary for Pond 23P: CB #9

Inflow Area = 1.022 ac, 58.31% Impervious, Inflow Depth = 3.68" for 10-yr event
Inflow = 3.97 cfs @ 12.11 hrs, Volume= 0.313 af
Outflow = 3.95 cfs @ 12.11 hrs, Volume= 0.313 af, Atten= 0%, Lag= 0.2 min
Primary = 3.95 cfs @ 12.11 hrs, Volume= 0.313 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 6
Peak Elev= 48.99' @ 12.13 hrs Surf.Area= 13 sf Storage= 24 cf

Plug-Flow detention time= 0.2 min calculated for 0.313 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (806.1 - 805.9)

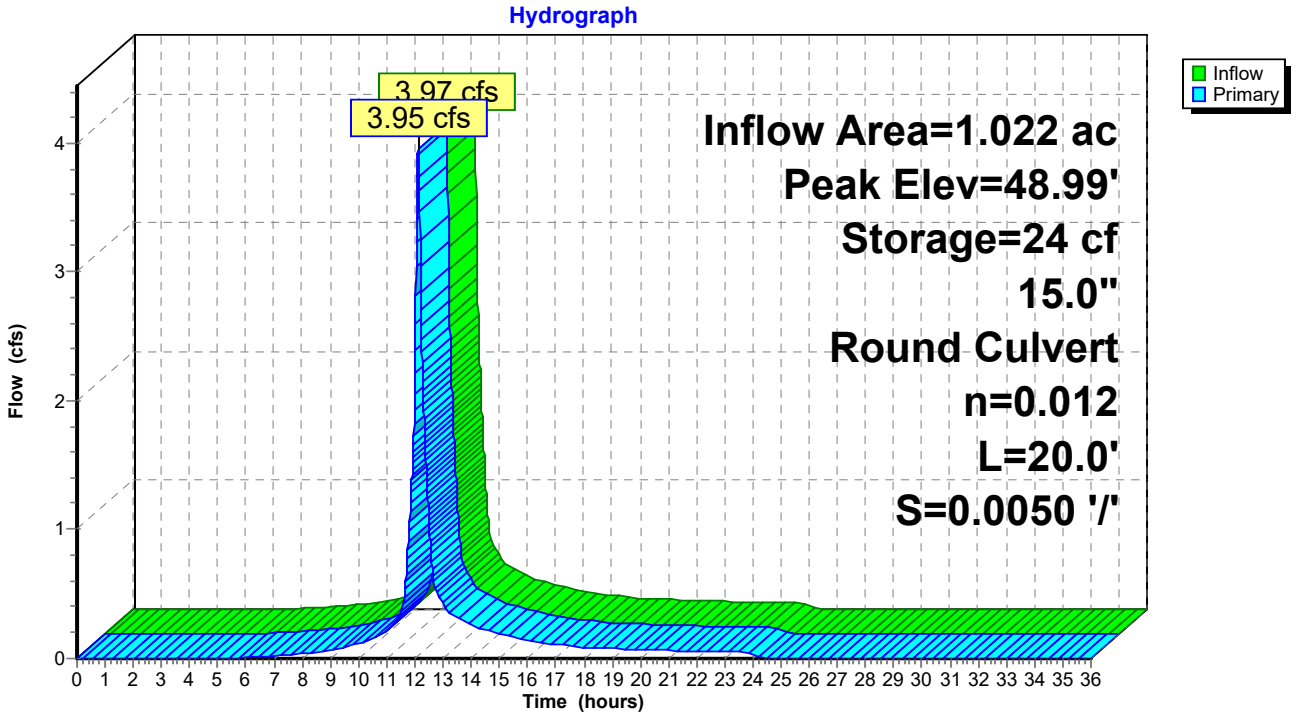
Volume	Invert	Avail.Storage	Storage Description
#1	47.16'	324 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.16	13	0	0
49.25	13	27	27
50.25	4	9	36
51.00	766	289	324

Device	Routing	Invert	Outlet Devices
#1	Primary	47.16'	**15.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 47.16' / 47.06' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=3.88 cfs @ 12.11 hrs HW=48.97' TW=48.54' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 3.88 cfs @ 3.17 fps)

Pond 23P: CB #9


Hydrograph
3.97 cfs
3.95 cfs
Inflow Area=1.022 ac
Peak Elev=48.99'
Storage=24 cf
15.0"
Round Culvert
n=0.012
L=20.0'
S=0.0050 '/'
Inflow
Primary
Flow (cfs)
0
1
2
3
4
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
Time (hours)

Summary for Pond 24P: CB #9-1

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

Inflow Area = 0.405 ac, 63.74% Impervious, Inflow Depth = 3.93" for 10-yr event
Inflow = 1.66 cfs @ 12.13 hrs, Volume= 0.133 af
Outflow = 1.66 cfs @ 12.13 hrs, Volume= 0.133 af, Atten= 0%, Lag= 0.3 min
Primary = 1.66 cfs @ 12.13 hrs, Volume= 0.133 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 6
Peak Elev= 49.08' @ 12.13 hrs Surf.Area= 13 sf Storage= 23 cf

Plug-Flow detention time= 0.4 min calculated for 0.133 af (100% of inflow)
Center-of-Mass det. time= 0.4 min (806.4 - 806.0)

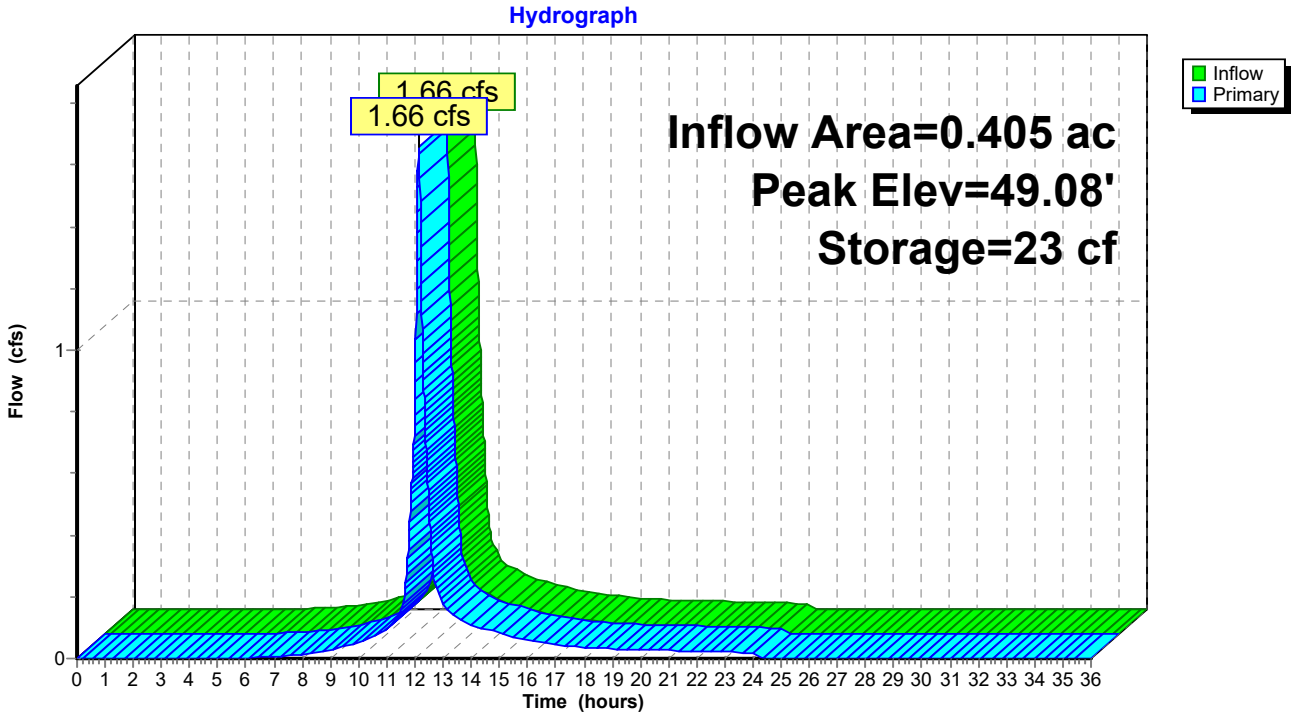
Volume	Invert	Avail.Storage	Storage Description
#1	47.30'	275 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.30	13	0	0
49.30	13	26	26
50.30	4	9	35
51.00	684	241	275

Device	Routing	Invert	Outlet Devices
#1	Primary	47.30'	**15.0" Round Culvert** L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 47.30' / 47.26' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Primary	50.83'	**Asymmetrical Weir, C= 3.27** Offset (feet) -19.00 0.00 12.00 Height (feet) 0.12 0.00 0.12

Primary OutFlow Max=1.70 cfs @ 12.13 hrs HW=49.07' TW=48.99' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.70 cfs @ 1.39 fps)
2=Asymmetrical Weir (Controls 0.00 cfs)

Pond 24P: CB #9-1



Summary for Pond 25P: YD #8

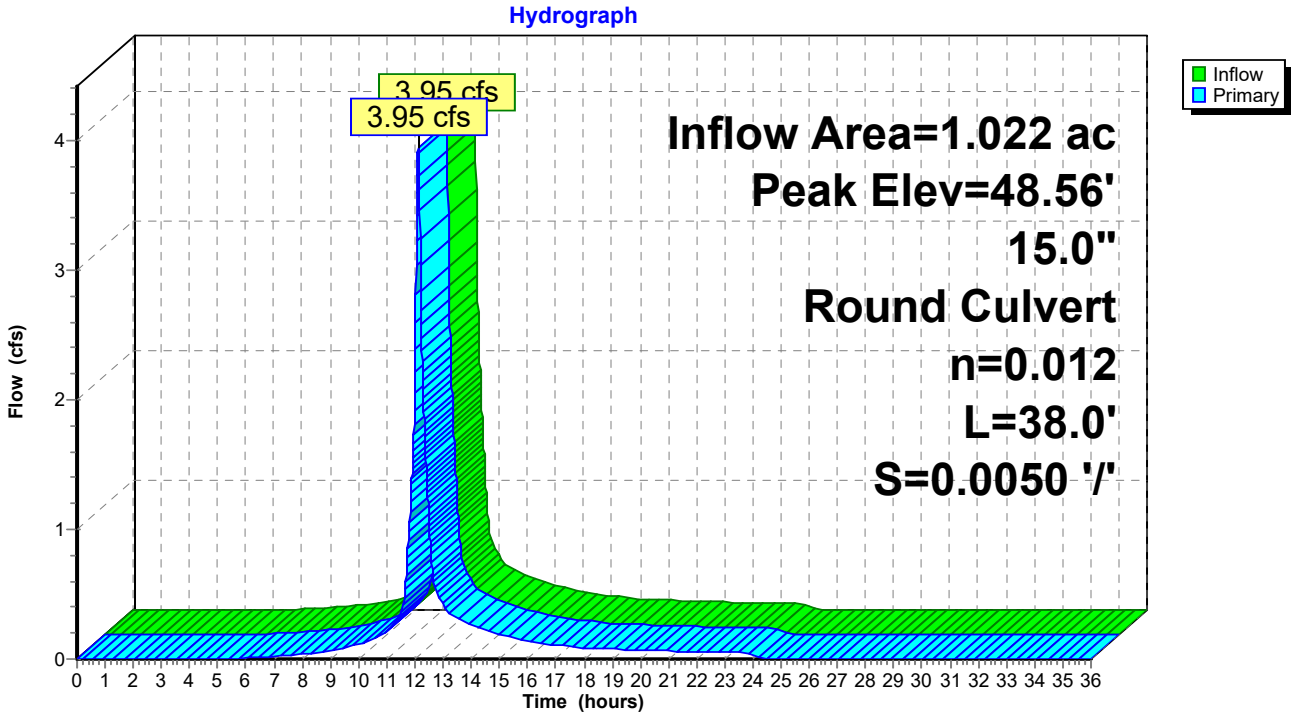
Inflow Area = 1.022 ac, 58.31% Impervious, Inflow Depth = 3.68" for 10-yr event
Inflow = 3.95 cfs @ 12.11 hrs, Volume= 0.313 af
Outflow = 3.95 cfs @ 12.11 hrs, Volume= 0.313 af, Atten= 0%, Lag= 0.0 min
Primary = 3.95 cfs @ 12.11 hrs, Volume= 0.313 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 6
Peak Elev= 48.56' @ 12.13 hrs
Flood Elev= 50.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.96'	**15.0" Round Culvert** L= 38.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.96' / 46.77' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=3.82 cfs @ 12.11 hrs HW=48.54' TW=48.12' (Dynamic Tailwater)
↳**1=Culvert** (Inlet Controls 3.82 cfs @ 3.11 fps)

Pond 25P: YD #8



Summary for Pond 26P: YD #7

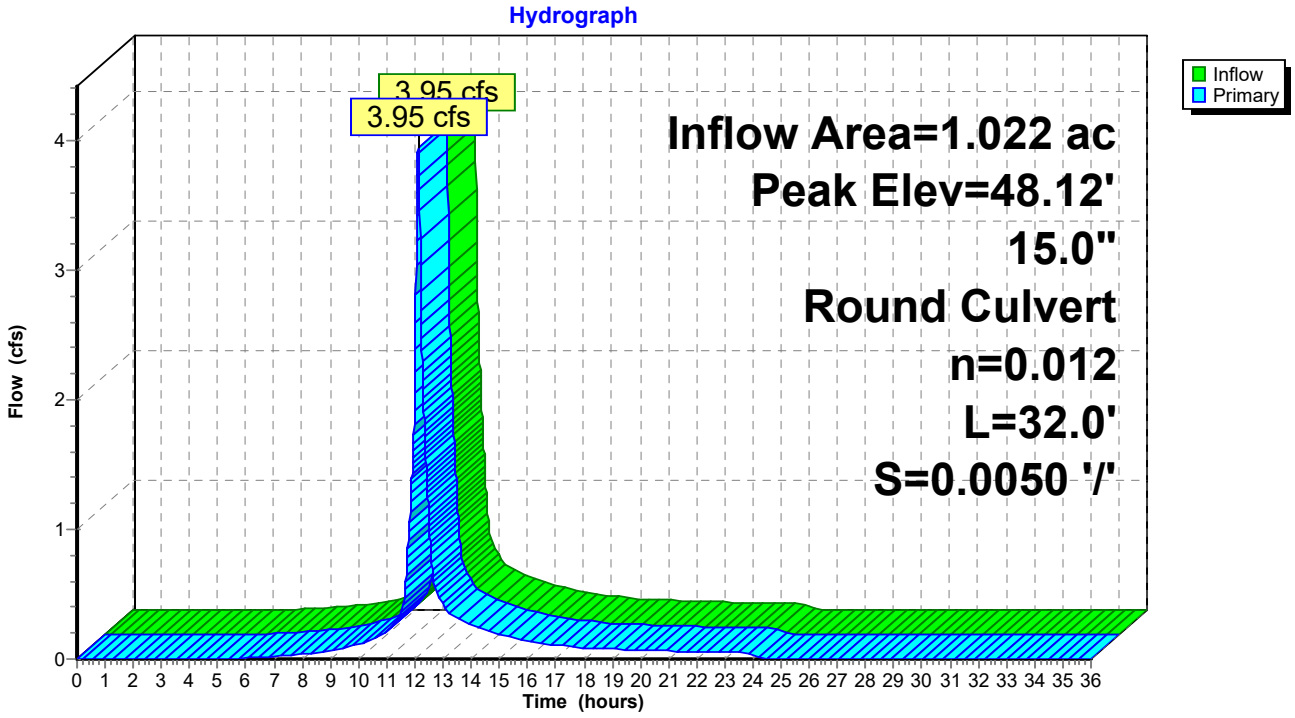
Inflow Area = 1.022 ac, 58.31% Impervious, Inflow Depth = 3.68" for 10-yr event
Inflow = 3.95 cfs @ 12.11 hrs, Volume= 0.313 af
Outflow = 3.95 cfs @ 12.11 hrs, Volume= 0.313 af, Atten= 0%, Lag= 0.0 min
Primary = 3.95 cfs @ 12.11 hrs, Volume= 0.313 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 6
Peak Elev= 48.12' @ 12.12 hrs
Flood Elev= 50.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.67'	**15.0" Round Culvert** L= 32.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.67' / 46.51' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=3.86 cfs @ 12.11 hrs HW=48.12' TW=47.69' (Dynamic Tailwater)
↳**1=Culvert** (Inlet Controls 3.86 cfs @ 3.14 fps)

Pond 26P: YD #7



Summary for Pond 27P: YD #6

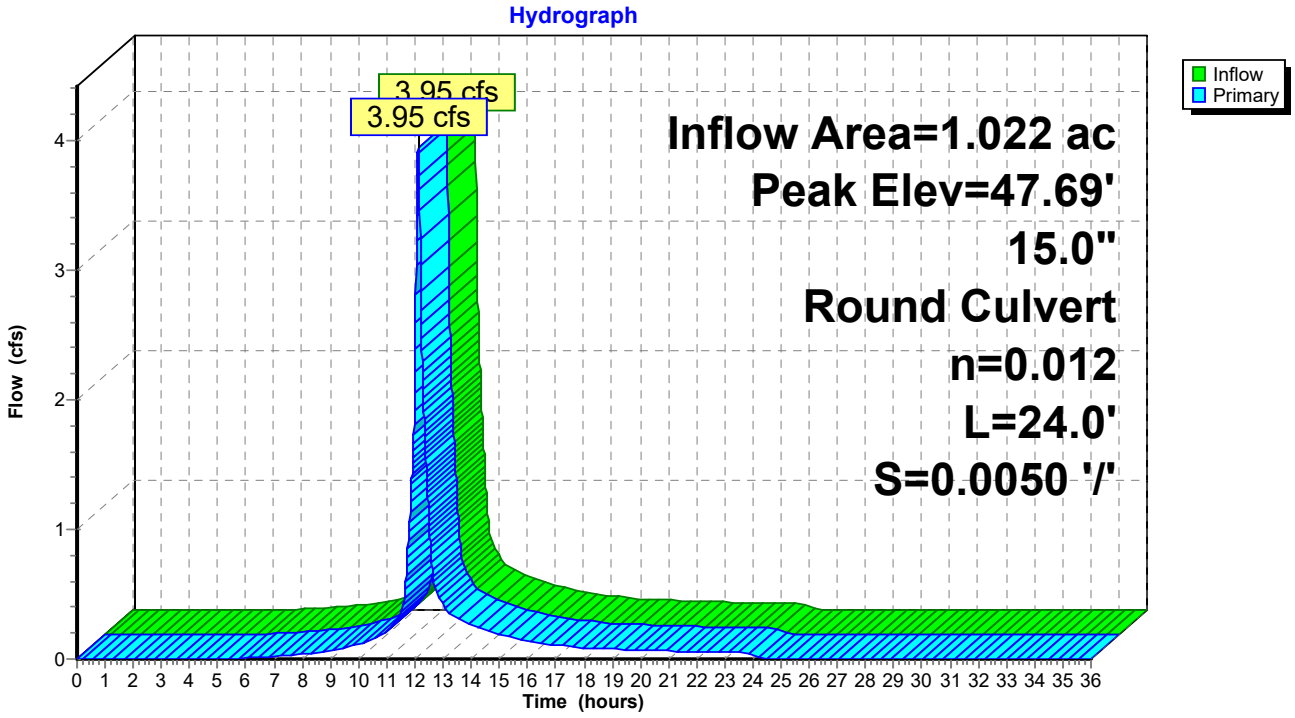
Inflow Area = 1.022 ac, 58.31% Impervious, Inflow Depth = 3.68" for 10-yr event
Inflow = 3.95 cfs @ 12.11 hrs, Volume= 0.313 af
Outflow = 3.95 cfs @ 12.11 hrs, Volume= 0.313 af, Atten= 0%, Lag= 0.0 min
Primary = 3.95 cfs @ 12.11 hrs, Volume= 0.313 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 6
Peak Elev= 47.69' @ 12.11 hrs
Flood Elev= 49.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.41'	**15.0" Round Culvert** L= 24.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.41' / 46.29' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=3.95 cfs @ 12.11 hrs HW=47.69' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 3.95 cfs @ 3.90 fps)

Pond 27P: YD #6



Summary for Pond 30P: Drip Edge

Inflow Area = 0.110 ac, 41.52% Impervious, Inflow Depth = 1.90" for 10-yr event
Inflow = 0.23 cfs @ 12.10 hrs, Volume= 0.017 af
Outflow = 0.23 cfs @ 12.10 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.1 min
Discarded = 0.23 cfs @ 12.10 hrs, Volume= 0.017 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 6
Peak Elev= 51.01' @ 12.10 hrs Surf.Area= 398 sf Storage= 1 cf

Plug-Flow detention time= 0.1 min calculated for 0.017 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (859.3 - 859.2)

Volume	Invert	Avail.Storage	Storage Description
#1	51.00'	308 cf	**Custom Stage Data (Conic)**Listed below (Recalc) 796 cf Overall - 26 cf Embedded = 770 cf x 40.0% Voids
#2	51.50'	26 cf	**6.0" Round Pipe Storage** Inside #1 L= 130.0'
		334 cf	Total Available Storage

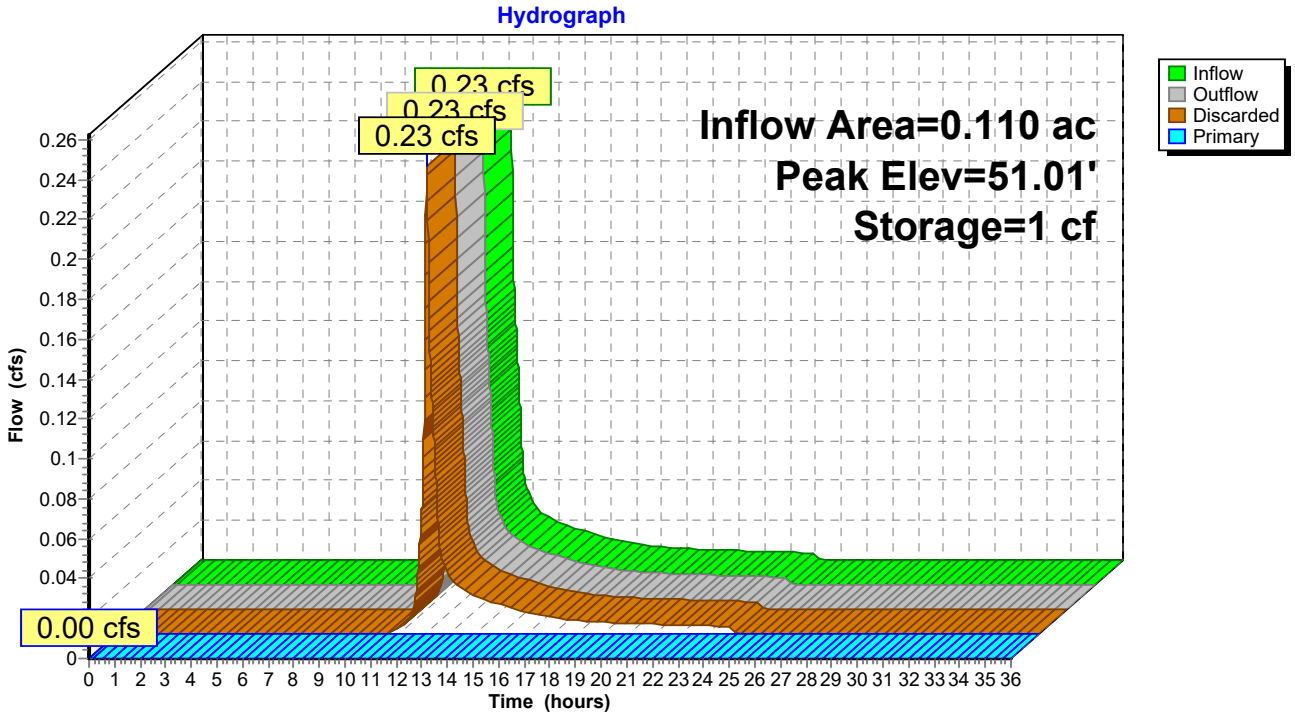
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
51.00	398	0	0	398
53.00	398	796	796	539

Device	Routing	Invert	Outlet Devices
#1	Discarded	51.00'	**30.000 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	51.50'	**6.0" Round Culvert** L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 51.50' / 48.35' S= 0.4500 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Discarded OutFlow Max=0.23 cfs @ 12.10 hrs HW=51.01' (Free Discharge)
↑└**1=Exfiltration** (Exfiltration Controls 0.23 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.00' TW=43.50' (Dynamic Tailwater)
↑└**2=Culvert** (Controls 0.00 cfs)

Pond 30P: Drip Edge



Summary for Pond 32P: CB #5-2

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=12)

Inflow Area = 0.262 ac, 69.54% Impervious, Inflow Depth = 4.03" for 10-yr event
Inflow = 1.22 cfs @ 12.09 hrs, Volume= 0.088 af
Outflow = 1.19 cfs @ 12.07 hrs, Volume= 0.088 af, Atten= 2%, Lag= 0.0 min
Primary = 1.19 cfs @ 12.07 hrs, Volume= 0.088 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 6
Peak Elev= 51.02' @ 12.27 hrs Surf.Area= 6 sf Storage= 32 cf

Plug-Flow detention time= 0.7 min calculated for 0.088 af (100% of inflow)
Center-of-Mass det. time= 0.6 min (800.8 - 800.2)

Volume	Invert	Avail.Storage	Storage Description
#1	48.35'	663 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

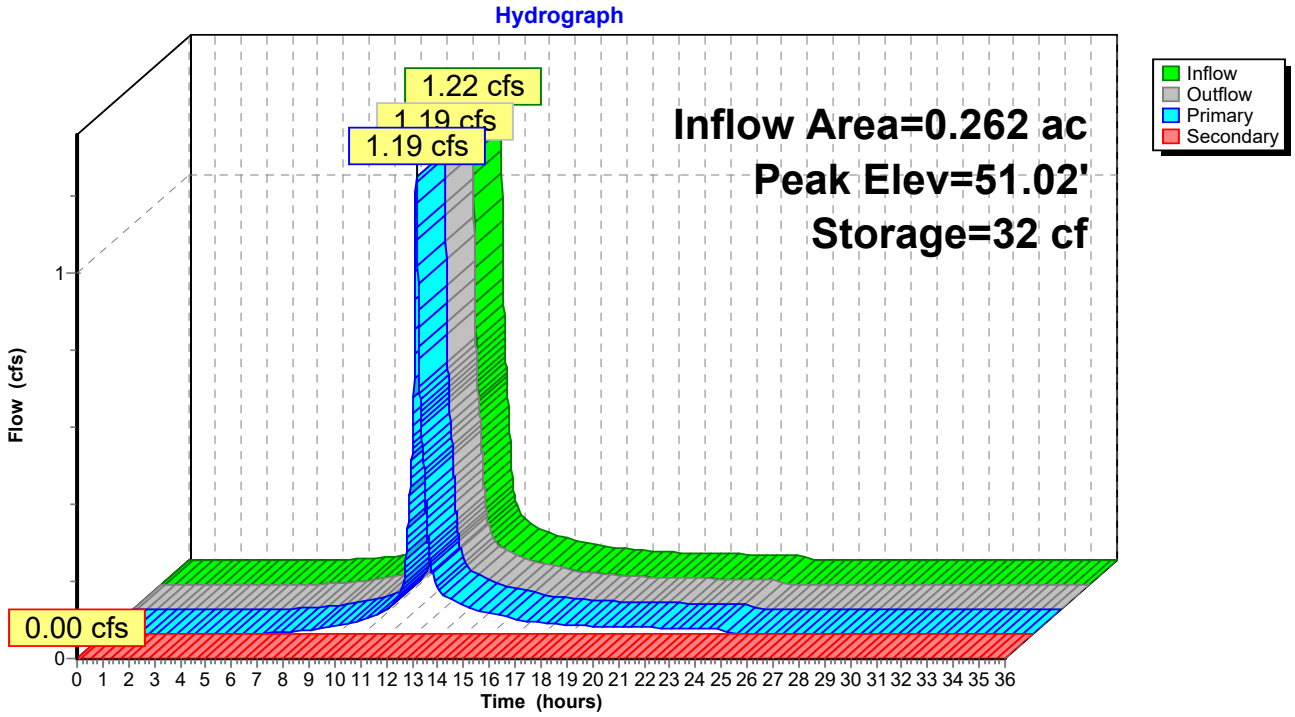
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
48.35	13	0	0
50.20	13	24	24
51.20	4	9	33
51.62	526	111	144
52.00	2,204	519	663

Device	Routing	Invert	Outlet Devices
#1	Primary	48.35'	**12.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.35' / 48.25' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Secondary	51.62'	**Asymmetrical Weir, C= 3.27** Offset (feet) -50.00 0.00 0.50 Height (feet) 0.50 0.00 0.50

Primary OutFlow Max=1.19 cfs @ 12.07 hrs HW=49.03' TW=48.73' (Dynamic Tailwater)
1=Culvert (Barrel Controls 1.19 cfs @ 2.93 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=48.35' TW=47.30' (Dynamic Tailwater)
2=Asymmetrical Weir (Controls 0.00 cfs)

Pond 32P: CB #5-2



Summary for Pond 34P: Drip Edge

Inflow Area = 0.062 ac, 86.35% Impervious, Inflow Depth = 4.68" for 10-yr event
Inflow = 0.32 cfs @ 12.08 hrs, Volume= 0.024 af
Outflow = 0.26 cfs @ 12.14 hrs, Volume= 0.024 af, Atten= 17%, Lag= 3.2 min
Discarded = 0.26 cfs @ 12.14 hrs, Volume= 0.024 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 6
Peak Elev= 51.09' @ 12.14 hrs Surf.Area= 374 sf Storage= 15 cf

Plug-Flow detention time= 0.2 min calculated for 0.024 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (779.4 - 779.2)

Volume	Invert	Avail.Storage	Storage Description
#1	51.00'	288 cf	**Custom Stage Data (Conic)**Listed below (Recalc) 748 cf Overall - 28 cf Embedded = 720 cf x 40.0% Voids
#2	51.00'	28 cf	**6.0" Round Pipe Storage** Inside #1 L= 144.0'
		316 cf	Total Available Storage

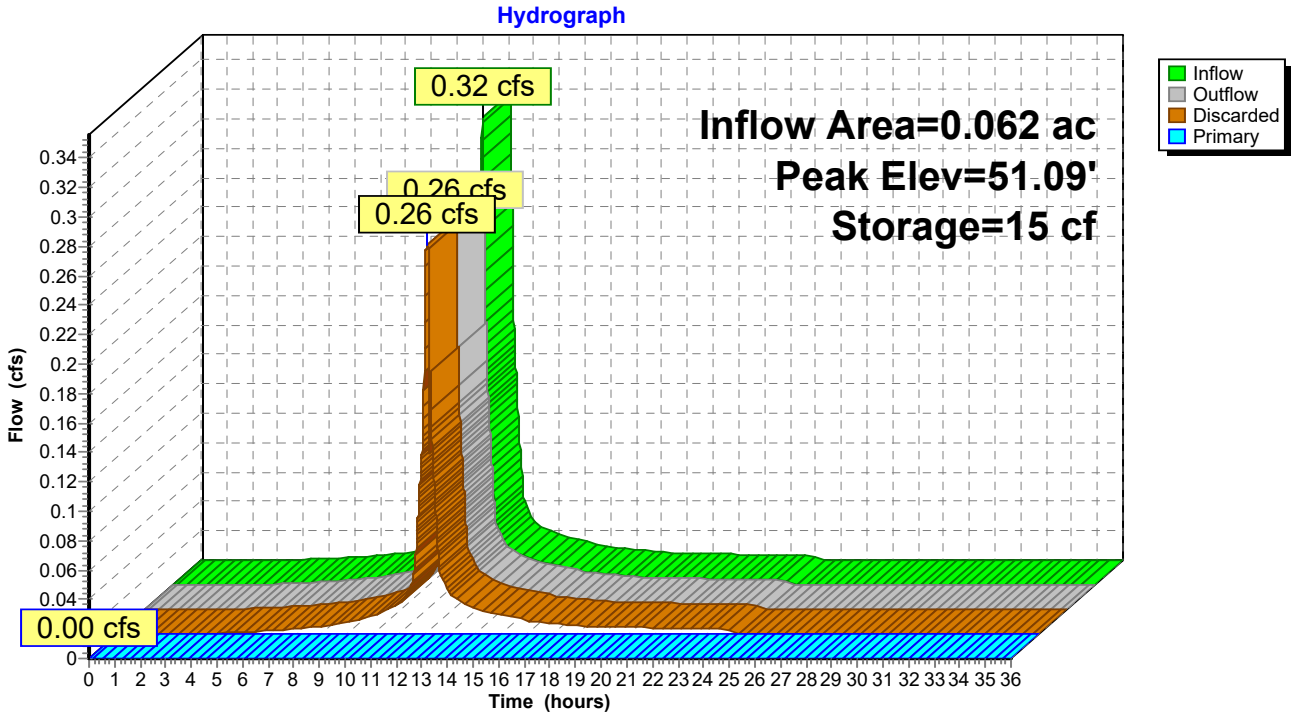
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
51.00	374	0	0	374
53.00	374	748	748	511

Device	Routing	Invert	Outlet Devices
#1	Discarded	51.00'	**30.000 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	51.50'	**6.0" Round Culvert** L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 51.50' / 48.75' S= 0.2292 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Discarded OutFlow Max=0.26 cfs @ 12.14 hrs HW=51.09' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.26 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.00' TW=43.50' (Dynamic Tailwater)
↑**2=Culvert** (Controls 0.00 cfs)

Pond 34P: Drip Edge



Summary for Pond 36P: CB #4-2

Inflow Area = 0.522 ac, 73.29% Impervious, Inflow Depth = 4.14" for 10-yr event
Inflow = 2.38 cfs @ 12.10 hrs, Volume= 0.180 af
Outflow = 2.36 cfs @ 12.09 hrs, Volume= 0.180 af, Atten= 1%, Lag= 0.0 min
Primary = 2.36 cfs @ 12.09 hrs, Volume= 0.180 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 6
Peak Elev= 51.10' @ 12.27 hrs Surf.Area= 13 sf Storage= 36 cf

Plug-Flow detention time= 0.4 min calculated for 0.180 af (100% of inflow)
Center-of-Mass det. time= 0.4 min (798.5 - 798.1)

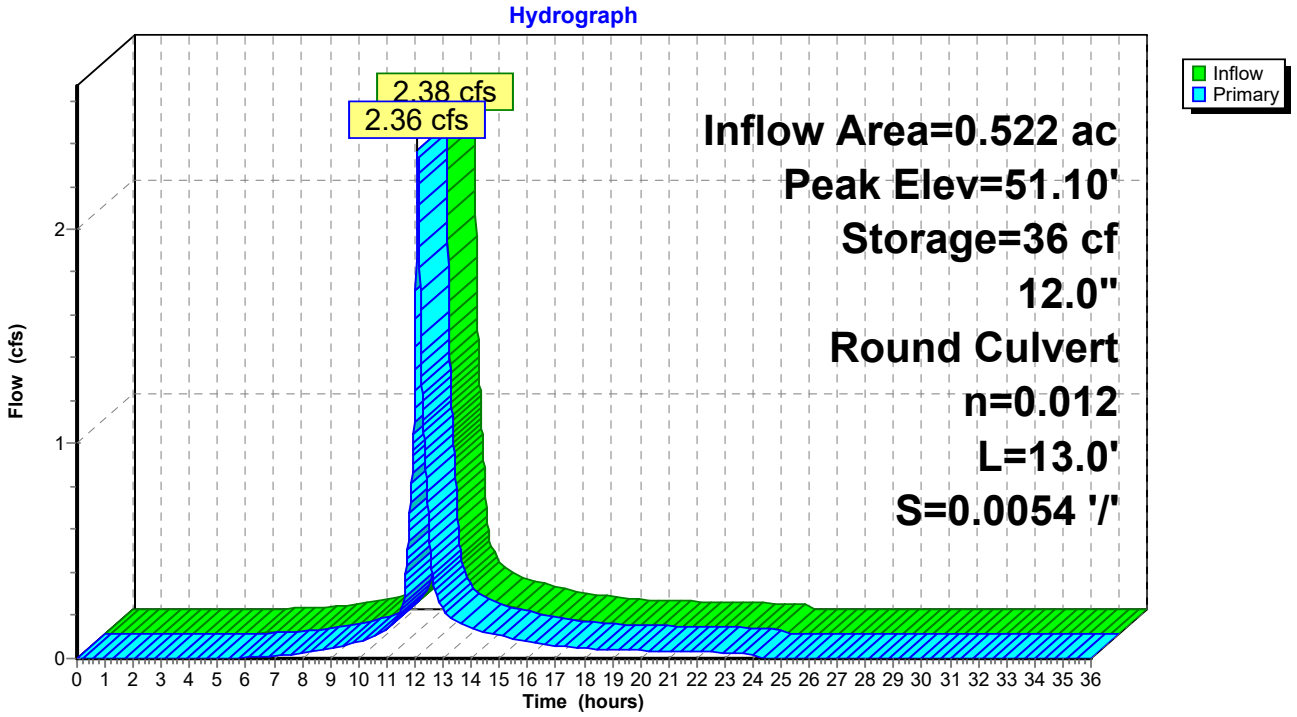
Volume	Invert	Avail.Storage	Storage Description
#1	48.32'	805 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
48.32	13	0	0
51.20	13	37	37
52.20	4	9	46
52.75	2,755	759	805

Device	Routing	Invert	Outlet Devices
#1	Primary	48.32'	**12.0" Round Culvert** L= 13.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.32' / 48.25' S= 0.0054 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.36 cfs @ 12.09 hrs HW=49.39' TW=48.99' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.36 cfs @ 3.50 fps)

Pond 36P: CB #4-2



Summary for Pond 38P: LCB #3-1

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=14)

Inflow Area = 0.170 ac, 21.57% Impervious, Inflow Depth = 1.09" for 10-yr event
Inflow = 0.17 cfs @ 12.11 hrs, Volume= 0.015 af
Outflow = 0.16 cfs @ 12.15 hrs, Volume= 0.015 af, Atten= 5%, Lag= 2.6 min
Discarded = 0.16 cfs @ 12.15 hrs, Volume= 0.015 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 6
Peak Elev= 47.27' @ 12.15 hrs Surf.Area= 179 sf Storage= 51 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 3.9 min (897.2 - 893.4)

Volume	Invert	Avail.Storage	Storage Description
#1	44.75'	79 cf	**Custom Stage Data (Conic)**Listed below (Recalc) 284 cf Overall - 87 cf Embedded = 198 cf x 40.0% Voids
#2	45.75'	87 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) Inside #1
#3	47.25'	146 cf	**Custom Stage Data (Conic)**Listed below (Recalc) 423 cf Overall - 58 cf Embedded = 365 cf x 40.0% Voids
#4	48.25'	37 cf	**12.0" Round Pipe Storage** Inside #3 L= 47.0' 58 cf Overall - 1.5" Wall Thickness = 37 cf
		349 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
44.75	38	0	0	38
51.75	38	266	266	191
52.75	4	18	284	228

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.75	13	0	0
51.75	13	78	78
52.75	4	9	87

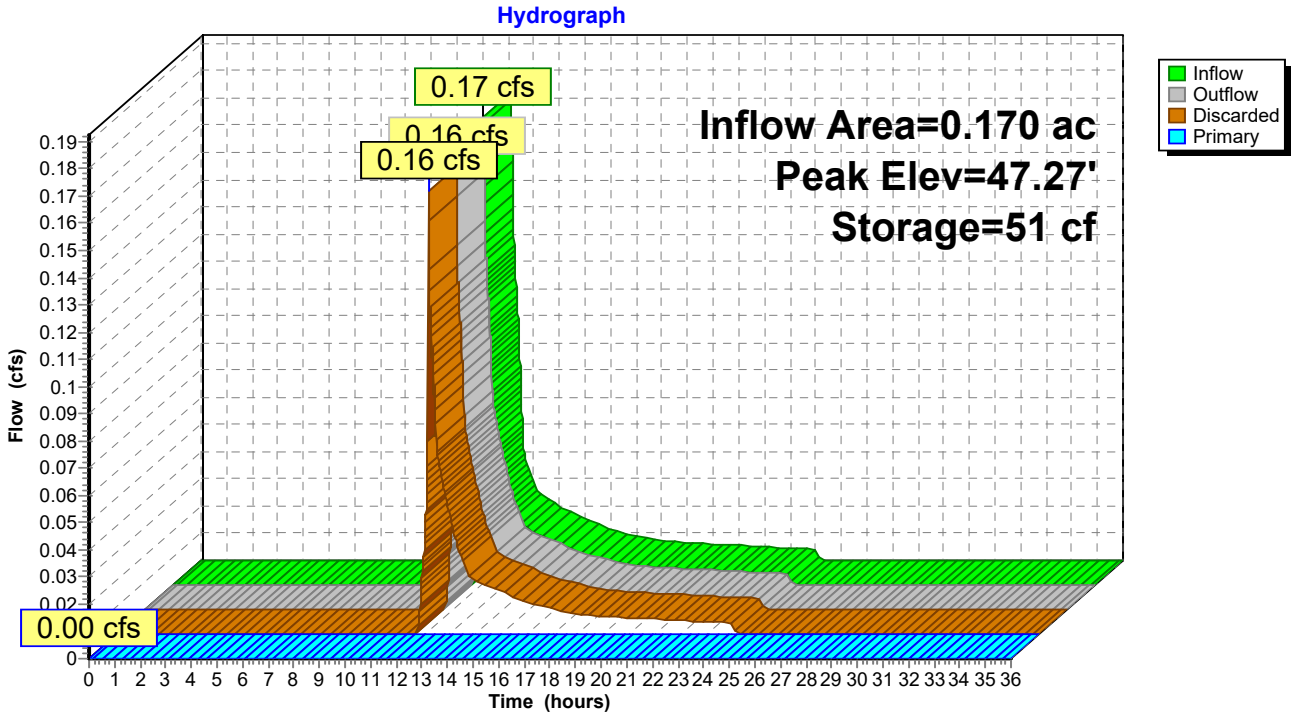
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
47.25	141	0	0	141
50.25	141	423	423	267

Device	Routing	Invert	Outlet Devices
#1	Discarded	44.75'	**30.000 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	48.25'	**12.0" Round Culvert** L= 1.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.25' / 48.25' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.16 cfs @ 12.15 hrs HW=47.27' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=44.75' TW=43.50' (Dynamic Tailwater)
└**2=Culvert** (Controls 0.00 cfs)

Pond 38P: LCB #3-1



Summary for Pond 39P: CB #3-2

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=16)

Inflow Area = 0.183 ac, 87.51% Impervious, Inflow Depth = 4.57" for 10-yr event
Inflow = 0.93 cfs @ 12.08 hrs, Volume= 0.070 af
Outflow = 0.90 cfs @ 12.07 hrs, Volume= 0.070 af, Atten= 3%, Lag= 0.0 min
Primary = 0.90 cfs @ 12.07 hrs, Volume= 0.070 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 6
Peak Elev= 51.01' @ 12.27 hrs Surf.Area= 13 sf Storage= 35 cf

Plug-Flow detention time= 0.8 min calculated for 0.070 af (100% of inflow)
Center-of-Mass det. time= 0.7 min (783.9 - 783.2)

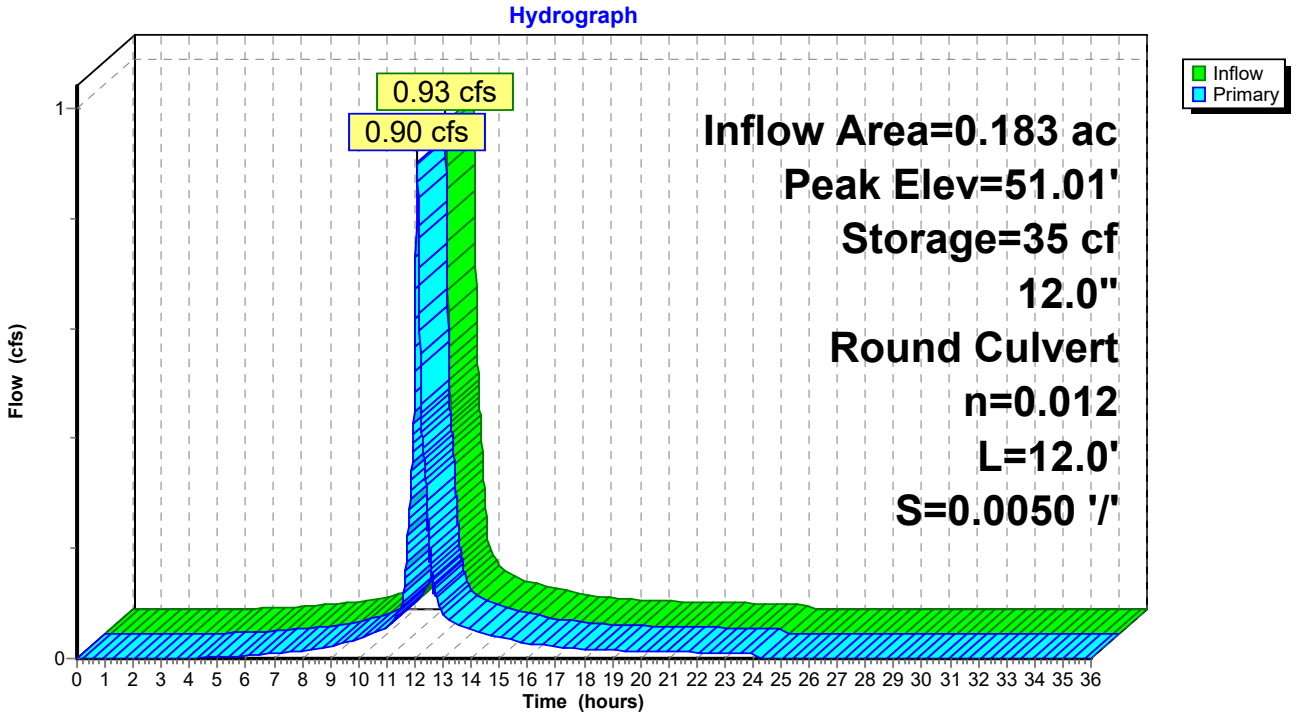
Volume	Invert	Avail.Storage	Storage Description
#1	48.31'	274 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
48.31	13	0	0
51.75	13	45	45
52.75	4	9	53
53.00	521	66	119
53.14	1,693	155	274

Device	Routing	Invert	Outlet Devices
#1	Primary	48.31'	**12.0" Round Culvert** L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.31' / 48.25' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.90 cfs @ 12.07 hrs HW=48.93' TW=48.74' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.90 cfs @ 2.54 fps)

Pond 39P: CB #3-2



Summary for Pond 41P: Drip Edge

Inflow Area = 0.095 ac, 89.64% Impervious, Inflow Depth = 4.68" for 10-yr event
Inflow = 0.49 cfs @ 12.08 hrs, Volume= 0.037 af
Outflow = 0.46 cfs @ 12.11 hrs, Volume= 0.037 af, Atten= 6%, Lag= 1.8 min
Discarded = 0.18 cfs @ 12.11 hrs, Volume= 0.033 af
Primary = 0.28 cfs @ 12.11 hrs, Volume= 0.004 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 6
Peak Elev= 52.84' @ 12.11 hrs Surf.Area= 219 sf Storage= 83 cf

Plug-Flow detention time= 1.3 min calculated for 0.037 af (100% of inflow)
Center-of-Mass det. time= 1.3 min (780.5 - 779.2)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	167 cf	**Custom Stage Data (Conic)**Listed below (Recalc) 438 cf Overall - 22 cf Embedded = 416 cf x 40.0% Voids
#2	52.50'	22 cf	**6.0" Round Pipe Storage** Inside #1 L= 110.0'
		188 cf	Total Available Storage

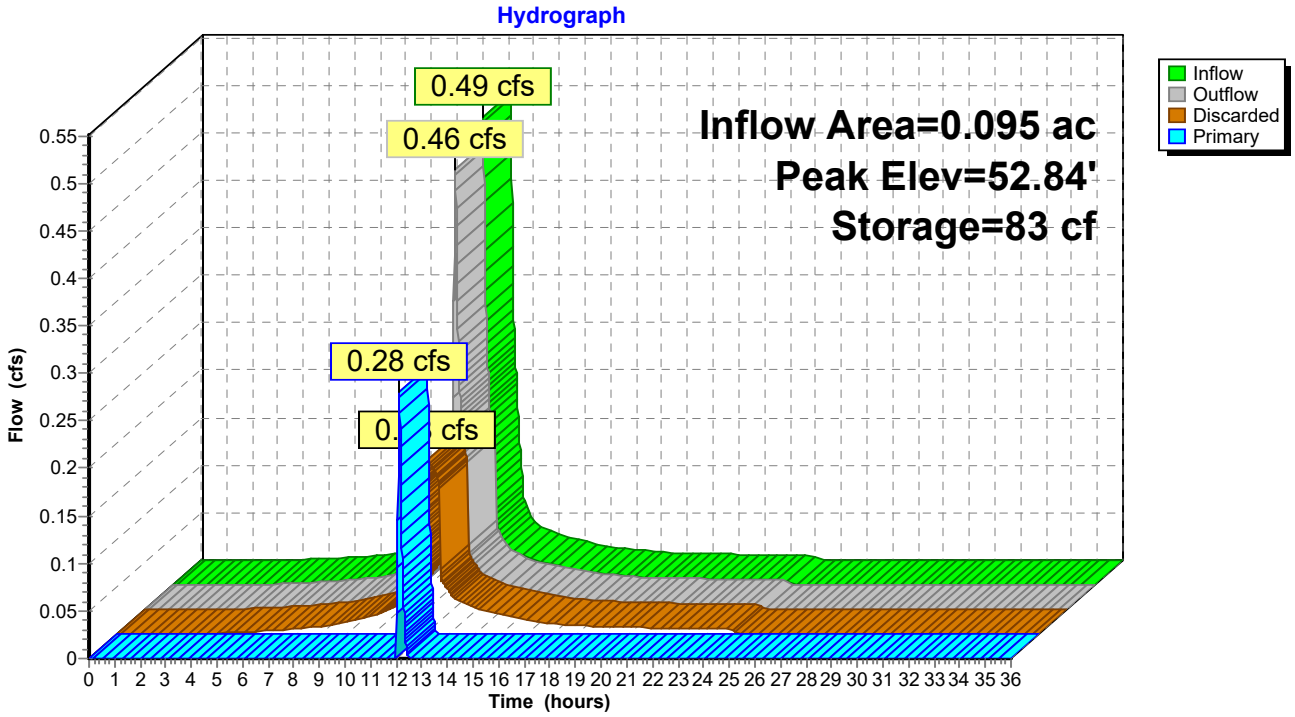
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
52.00	219	0	0	219
54.00	219	438	438	324

Device	Routing	Invert	Outlet Devices
#1	Discarded	52.00'	**30.000 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	52.50'	**6.0" Round Culvert** L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 52.50' / 51.00' S= 0.0938 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Discarded OutFlow Max=0.18 cfs @ 12.11 hrs HW=52.84' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.28 cfs @ 12.11 hrs HW=52.84' TW=51.03' (Dynamic Tailwater)
2=Culvert (Inlet Controls 0.28 cfs @ 1.98 fps)

Pond 41P: Drip Edge



Summary for Pond 42P: Drip Edge

Inflow Area = 0.133 ac, 56.29% Impervious, Inflow Depth = 2.58" for 10-yr event
Inflow = 0.40 cfs @ 12.09 hrs, Volume= 0.029 af
Outflow = 0.25 cfs @ 12.19 hrs, Volume= 0.029 af, Atten= 37%, Lag= 6.1 min
Discarded = 0.25 cfs @ 12.19 hrs, Volume= 0.029 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 6
Peak Elev= 52.47' @ 12.19 hrs Surf.Area= 336 sf Storage= 63 cf

Plug-Flow detention time= 0.8 min calculated for 0.029 af (100% of inflow)
Center-of-Mass det. time= 0.8 min (840.1 - 839.3)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	260 cf	**Custom Stage Data (Conic)**Listed below (Recalc) 672 cf Overall - 22 cf Embedded = 650 cf x 40.0% Voids
#2	52.50'	22 cf	**6.0" Round Pipe Storage** Inside #1 L= 110.0'
		282 cf	Total Available Storage

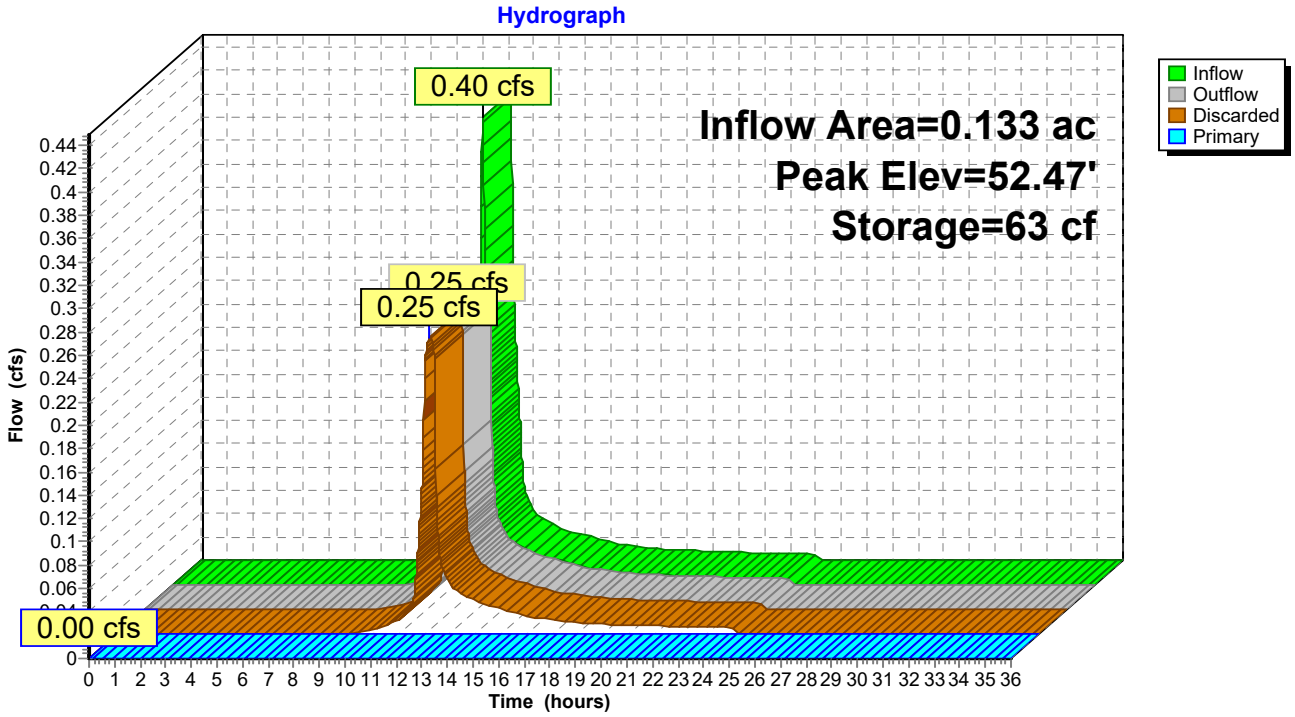
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
52.00	336	0	0	336
54.00	336	672	672	466

Device	Routing	Invert	Outlet Devices
#1	Discarded	52.00'	**30.000 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	52.50'	**6.0" Round Culvert** L= 64.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 52.50' / 51.00' S= 0.0234 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Discarded OutFlow Max=0.25 cfs @ 12.19 hrs HW=52.47' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.25 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=52.00' TW=51.00' (Dynamic Tailwater)
2=Culvert (Controls 0.00 cfs)

Pond 42P: Drip Edge



Summary for Pond 44P: Infiltration Pond / LCB #'s2 & 2-1 / OS #1

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=23)
[80] Warning: Exceeded Pond 38P by 3.75' @ 12.27 hrs (5.67 cfs 0.203 af)

Inflow Area =	2.001 ac, 66.29% Impervious, Inflow Depth = 3.22" for 10-yr event			
Inflow =	7.17 cfs @	12.09 hrs, Volume=	0.537 af	
Outflow =	3.45 cfs @	12.27 hrs, Volume=	0.537 af, Atten= 52%, Lag= 10.9 min	
Discarded =	3.45 cfs @	12.27 hrs, Volume=	0.537 af	
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 6
Peak Elev= 51.00' @ 12.27 hrs Surf.Area= 1,975 sf Storage= 3,903 cf

Plug-Flow detention time= 11.1 min calculated for 0.537 af (100% of inflow)
Center-of-Mass det. time= 11.1 min (810.9 - 799.9)

Volume	Invert	Avail.Storage	Storage Description
#1	43.50'	150 cf	**Stone Envelope - LCBs 2 & 2-1 (Conic)** Listed below (Recalc) x 2 548 cf Overall - 173 cf Embedded = 375 cf x 40.0% Voids
#2	44.50'	173 cf	**LCBs 2 & 2-1 (Prismatic)** Listed below (Recalc) x 2 Inside #1
#3	48.25'	104 cf	**Stone Envelope - Pipes 2 & 2-1 (Conic)** Listed below (Recalc) 300 cf Overall - 39 cf Embedded = 261 cf x 40.0% Voids
#4	48.25'	39 cf	**12.0" Round Pipe Storage - 2 & 2-1** Inside #3 L= 50.0'
#5	51.00'	3,117 cf	**Infiltration Pond (Conic)** Listed below (Recalc)
#6	45.05'	117 cf	**Stone Envelope - LDMH 3 (Conic)** Listed below (Recalc) 476 cf Overall - 184 cf Embedded = 292 cf x 40.0% Voids
#7	46.05'	184 cf	**LDMH 3 (Prismatic)** Listed below (Recalc) Inside #6
#8	47.00'	422 cf	**Stone Envelope - Pipe 3 (Conic)** Listed below (Recalc) 1,193 cf Overall - 139 cf Embedded = 1,054 cf x 40.0% Voids
#9	48.00'	139 cf	**15.0" Round Pipe Storage - 3** Inside #8 L= 113.0'
#10	44.75'	79 cf	**Stone Evelope - LCB 3-1 (Conic)** Listed below (Recalc) 284 cf Overall - 87 cf Embedded = 198 cf x 40.0% Voids
#11	45.75'	87 cf	**LCB 3-1 (Prismatic)** Listed below (Recalc) Inside #10
#12	47.25'	154 cf	**Stone Envelope - Pipe 3-1 (Conic)** Listed below (Recalc) 423 cf Overall - 37 cf Embedded = 386 cf x 40.0% Voids
#13	48.25'	37 cf	**12.0" Round Pipe Storage - 3-1** Inside #12 L= 47.0'
#14	44.35'	117 cf	**Stone Envelope - LDMH 4 (Conic)** Listed below (Recalc) 476 cf Overall - 184 cf Embedded = 292 cf x 40.0% Voids
#15	45.35'	184 cf	**LDMH 4 (Prismatic)** Listed below (Recalc) Inside #14
#16	47.00'	259 cf	**Stone Envelope - Pipe 4 (Conic)** Listed below (Recalc) 741 cf Overall - 93 cf Embedded = 648 cf x 40.0% Voids
#17	48.00'	93 cf	**15.0" Round Pipe Storage - Pipe 4** Inside #16 L= 76.0'
#18	44.30'	79 cf	**Stone Envelope - LCB 4-1 (Conic)** Listed below (Recalc) 284 cf Overall - 87 cf Embedded = 198 cf x 40.0% Voids
#19	45.30'	87 cf	**LCB 4-1 (Prismatic)** Listed below (Recalc) Inside #18
#20	47.25'	141 cf	**Stone Envelope - Pipe 4-1 (Conic)** Listed below (Recalc) 387 cf Overall - 34 cf Embedded = 353 cf x 40.0% Voids
#21	48.25'	34 cf	**12.0" Round Pipe Storage - Pipe 4-1** Inside #20 L= 43.0'
#22	43.70'	117 cf	**Stone Envelope - LDMH 5 (Conic)** Listed below (Recalc) 476 cf Overall - 184 cf Embedded = 292 cf x 40.0% Voids
#23	44.70'	184 cf	**LDMH 5 (Prismatic)** Listed below (Recalc) Inside #22
#24	47.00'	519 cf	**Stone Envelope - Pipe 5 (Conic)** Listed below (Recalc) 1,469 cf Overall - 171 cf Embedded = 1,298 cf x 40.0% Voids
#25	48.00'	171 cf	**15.0" Round Pipe Storage** Inside #24 L= 139.0'
#26	44.20'	79 cf	**Stone Envelope - LCB 5-1 (Conic)** Listed below (Recalc) 284 cf Overall - 87 cf Embedded = 198 cf x 40.0% Voids
#27	45.20'	87 cf	**LCB 5-1 (Prismatic)** Listed below (Recalc) Inside #26
#28	47.25'	204 cf	**Stone Envelope - Pipe 5-1 (Conic)** Listed below (Recalc) 558 cf Overall - 49 cf Embedded = 509 cf x 40.0% Voids
#29	48.25'	49 cf	**12.0" Round Pipe Storage - Pipe 5-1** Inside #28 L= 62.0'
		7,204 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
43.50	38	0	0	38
50.00	38	247	247	180
51.50	4	27	274	220

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.50	13	0	0
50.50	13	78	78
51.50	4	9	87

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
48.25	150	0	0	150
50.25	150	300	300	237

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
51.00	955	0	0	955
52.00	1,449	1,193	1,193	1,464
53.00	2,440	1,923	3,117	2,467

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
45.05	64	0	0	64
52.05	64	448	448	263
53.05	4	28	476	325

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.05	28	0	0
52.05	28	168	168
53.05	4	16	184

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
47.00	367	0	0	367
50.25	367	1,193	1,193	588

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
44.75	38	0	0	38
51.75	38	266	266	191
52.75	4	18	284	228

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.75	13	0	0
51.75	13	78	78
52.75	4	9	87

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
47.25	141	0	0	141
50.25	141	423	423	267

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
44.35	64	0	0	64
51.35	64	448	448	263
52.35	4	28	476	325

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.35	28	0	0
51.35	28	168	168
52.35	4	16	184

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
47.00	247	0	0	247
50.00	247	741	741	414

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
44.30	38	0	0	38
51.30	38	266	266	191
52.30	4	18	284	228

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.30	13	0	0
51.30	13	78	78
52.30	4	9	87

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
47.25	129	0	0	129
50.25	129	387	387	250

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
43.70	64	0	0	64
50.70	64	448	448	263
51.70	4	28	476	325

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.70	28	0	0
50.70	28	168	168
51.70	4	16	184

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
47.00	452	0	0	452
50.25	452	1,469	1,469	697

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
44.20	38	0	0	38
51.20	38	266	266	191
52.20	4	18	284	228

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.20	13	0	0
51.20	13	78	78
52.20	4	9	87

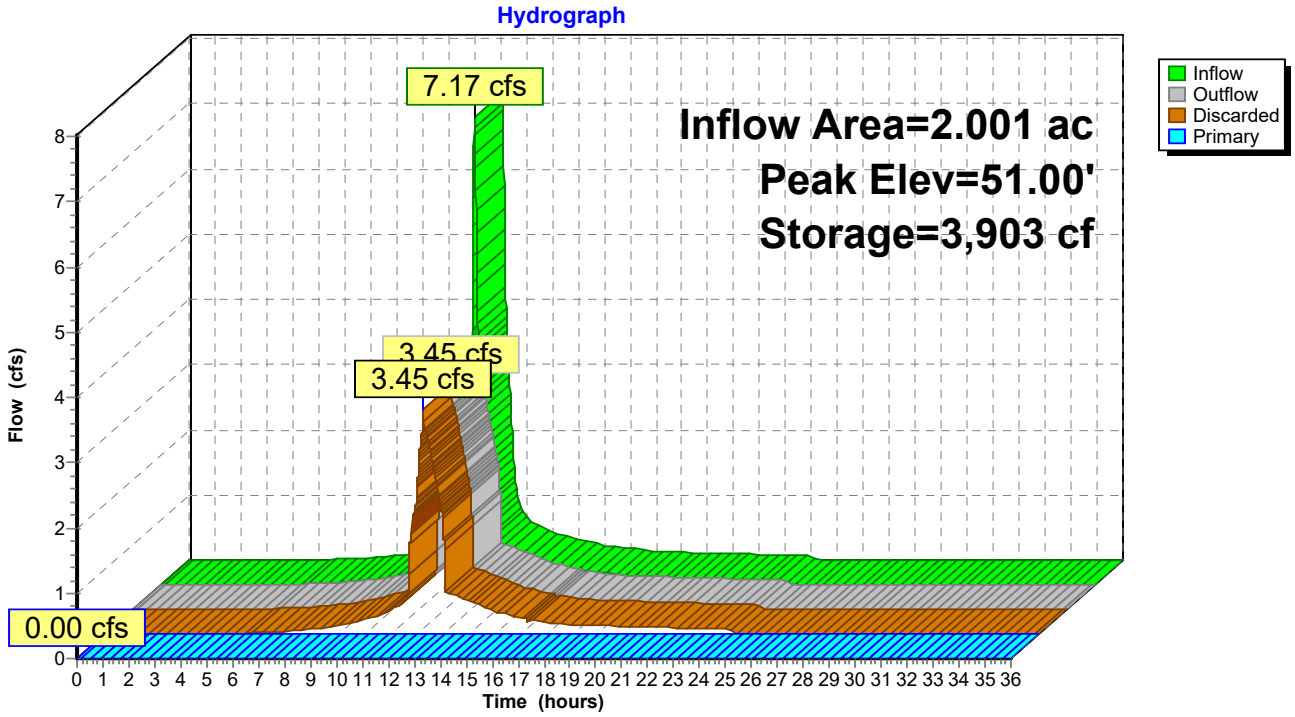
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
47.25	186	0	0	186
50.25	186	558	558	331

Device	Routing	Invert	Outlet Devices
#1	Discarded	43.50'	**30.000 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	49.06'	**12.0" Round Culvert** L= 62.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 49.06' / 48.75' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#3	Device 2	51.75'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=3.14 cfs @ 12.27 hrs HW=51.00' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 3.14 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=43.50' TW=48.85' (Dynamic Tailwater)
└**2=Culvert** (Controls 0.00 cfs)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 44P: Infiltration Pond / LCB #'s2 & 2-1 / OS #1

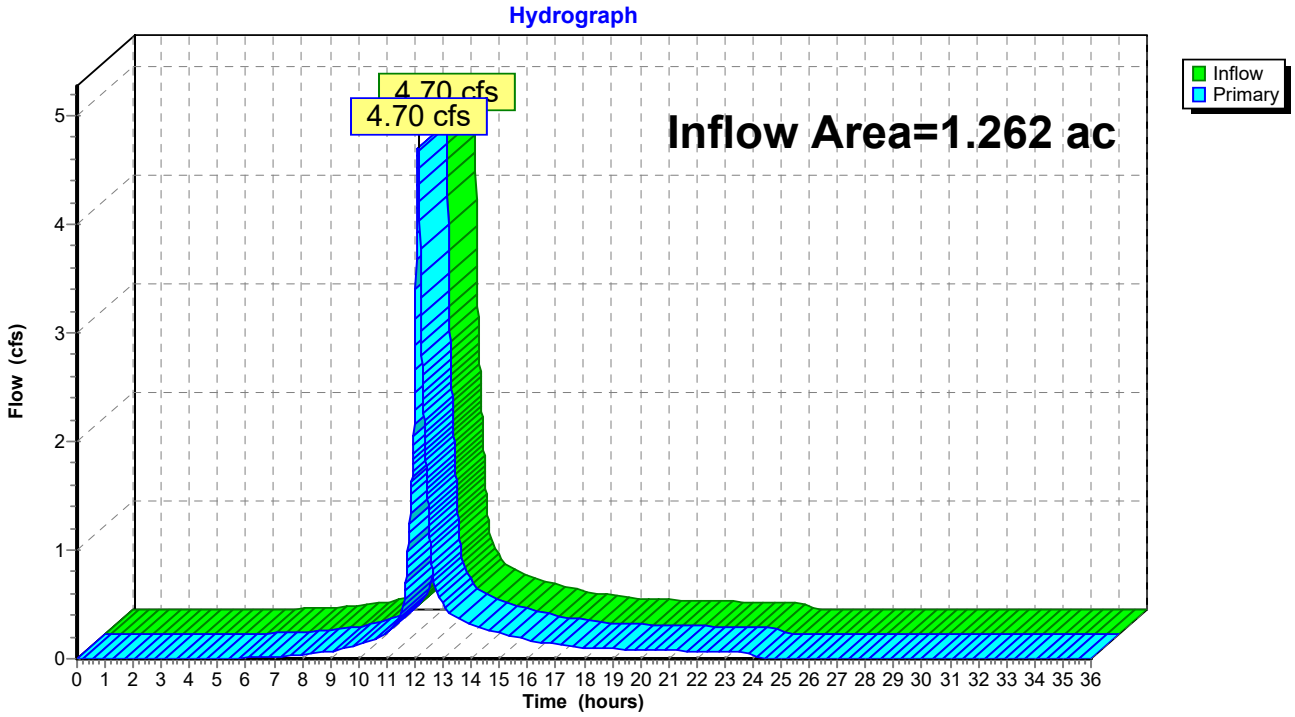


Summary for Link POA1: POA #1

Inflow Area = 1.262 ac, 53.58% Impervious, Inflow Depth = 3.50" for 10-yr event
Inflow = 4.70 cfs @ 12.11 hrs, Volume= 0.368 af
Primary = 4.70 cfs @ 12.11 hrs, Volume= 0.368 af, Atten= 0%, Lag= 0.0 min

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

Link POA1: POA #1

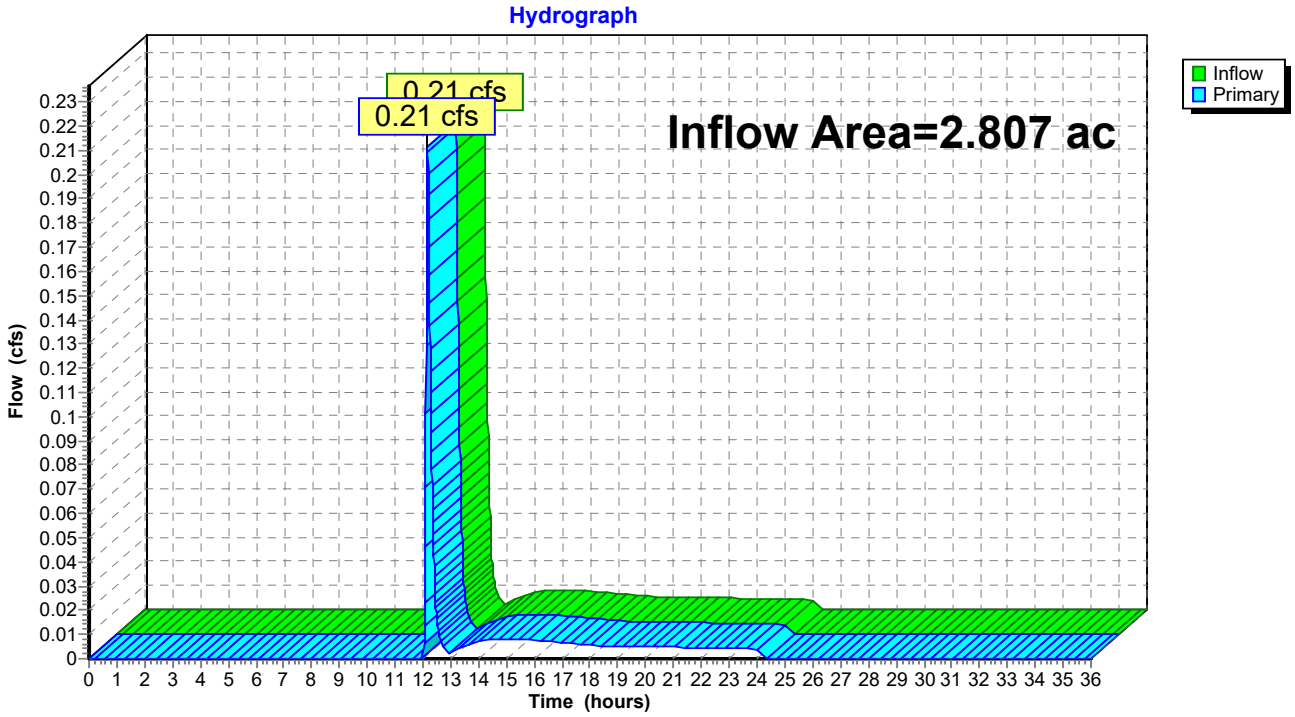


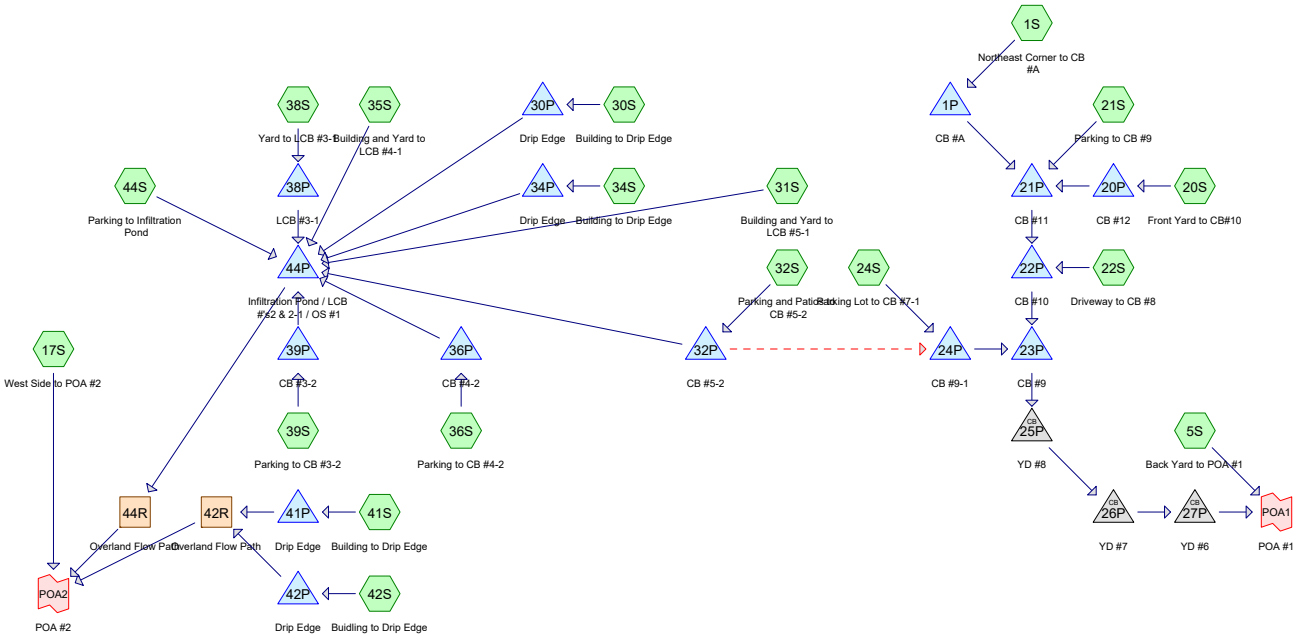
Summary for Link POA2: POA #2

Inflow Area = 2.807 ac, 53.29% Impervious, Inflow Depth = 0.04" for 10-yr event
Inflow = 0.21 cfs @ 12.17 hrs, Volume= 0.009 af
Primary = 0.21 cfs @ 12.17 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min

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

Link POA2: POA #2





Subcat Reach Pond Link

Routing Diagram for 5161-Post-110921

Prepared by Altus Engineering, Inc., Printed 11/9/2021

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points x 6
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Northeast Corner to CB Runoff Area=12,050 sf 27.65% Impervious Runoff Depth=3.60"
Flow Length=180' Tc=6.0 min CN=69 Runoff=1.17 cfs 0.083 af

Subcatchment 5S: Back Yard to POA #1 Runoff Area=10,478 sf 33.46% Impervious Runoff Depth=4.02"
Flow Length=198' Tc=6.0 min CN=73 Runoff=1.13 cfs 0.081 af

Subcatchment 17S: West Side to POA #2 Runoff Area=25,189 sf 1.64% Impervious Runoff Depth=0.40"
Flow Length=357' Tc=11.1 min CN=33 Runoff=0.07 cfs 0.019 af

Subcatchment 20S: Front Yard to CB#10 Runoff Area=6,933 sf 69.88% Impervious Runoff Depth=5.58"
Flow Length=147' Tc=6.0 min CN=87 Runoff=1.00 cfs 0.074 af

Subcatchment 21S: Parking to CB #9 Runoff Area=3,178 sf 77.66% Impervious Runoff Depth=5.92"
Flow Length=46' Slope=0.0181 '/' Tc=6.0 min CN=90 Runoff=0.48 cfs 0.036 af

Subcatchment 22S: Driveway to CB #8 Runoff Area=4,683 sf 86.46% Impervious Runoff Depth=6.27"
Flow Length=152' Tc=6.0 min CN=93 Runoff=0.73 cfs 0.056 af

Subcatchment 24S: Parking Lot to CB #7-1 Runoff Area=17,662 sf 63.74% Impervious Runoff Depth=5.35"
Flow Length=262' Tc=9.0 min CN=85 Runoff=2.23 cfs 0.181 af

Subcatchment 30S: Building to Drip Edge Runoff Area=4,788 sf 41.52% Impervious Runoff Depth=2.98"
Tc=6.0 min CN=63 Runoff=0.38 cfs 0.027 af

Subcatchment 31S: Building and Yard to Runoff Area=2,900 sf 58.93% Impervious Runoff Depth=4.24"
Tc=6.0 min CN=75 Runoff=0.33 cfs 0.024 af

Subcatchment 32S: Parking and Patios to Runoff Area=11,430 sf 69.54% Impervious Runoff Depth=5.46"
Flow Length=105' Tc=6.0 min CN=86 Runoff=1.62 cfs 0.119 af

Subcatchment 34S: Building to Drip Edge Runoff Area=2,681 sf 86.35% Impervious Runoff Depth=6.15"
Tc=6.0 min CN=92 Runoff=0.41 cfs 0.032 af

Subcatchment 35S: Building and Yard to Runoff Area=6,052 sf 23.60% Impervious Runoff Depth=2.28"
Flow Length=134' Tc=6.0 min CN=56 Runoff=0.35 cfs 0.026 af

Subcatchment 36S: Parking to CB #4-2 Runoff Area=22,757 sf 73.29% Impervious Runoff Depth=5.58"
Flow Length=108' Tc=7.1 min CN=87 Runoff=3.16 cfs 0.243 af

Subcatchment 38S: Yard to LCB #3-1 Runoff Area=7,404 sf 21.57% Impervious Runoff Depth=1.91"
Flow Length=103' Tc=6.0 min CN=52 Runoff=0.34 cfs 0.027 af

Subcatchment 39S: Parking to CB #3-2 Runoff Area=7,969 sf 87.51% Impervious Runoff Depth=6.04"
Flow Length=59' Slope=0.0178 '/' Tc=6.0 min CN=91 Runoff=1.21 cfs 0.092 af

Subcatchment 41S: Building to Drip Edge Runoff Area=4,150 sf 89.64% Impervious Runoff Depth=6.15"
Tc=6.0 min CN=92 Runoff=0.64 cfs 0.049 af

Subcatchment 42S: Buidling to Drip Edge Runoff Area=5,811 sf 56.29% Impervious Runoff Depth=3.81"
Tc=6.0 min CN=71 Runoff=0.60 cfs 0.042 af

Subcatchment 44S: Parking to Infiltration Runoff Area=21,163 sf 80.97% Impervious Runoff Depth=5.58"
Flow Length=96' Tc=6.0 min CN=87 Runoff=3.05 cfs 0.226 af

Reach 42R: Overland Flow Path Avg. Flow Depth=0.06' Max Vel=0.86 fps Inflow=0.61 cfs 0.010 af
n=0.035 L=156.0' S=0.0204 '/' Capacity=156.47 cfs Outflow=0.54 cfs 0.010 af

Reach 44R: Overland Flow Path Avg. Flow Depth=0.06' Max Vel=0.55 fps Inflow=0.51 cfs 0.003 af
n=0.035 L=114.0' S=0.0091 '/' Capacity=104.51 cfs Outflow=0.31 cfs 0.003 af

Pond 1P: CB #A Peak Elev=51.37' Storage=217 cf Inflow=1.17 cfs 0.083 af
6.0" Round Culvert n=0.012 L=70.0' S=0.0107 '/' Outflow=0.91 cfs 0.083 af

Pond 20P: CB #12 Peak Elev=50.67' Storage=31 cf Inflow=1.00 cfs 0.074 af
12.0" Round Culvert n=0.012 L=28.0' S=0.0050 '/' Outflow=0.97 cfs 0.074 af

Pond 21P: CB #11 Peak Elev=50.64' Storage=38 cf Inflow=2.05 cfs 0.193 af
12.0" Round Culvert n=0.012 L=34.0' S=0.0050 '/' Outflow=1.98 cfs 0.193 af

Pond 22P: CB #10 Peak Elev=50.29' Storage=34 cf Inflow=2.70 cfs 0.249 af
15.0" Round Culvert n=0.012 L=22.0' S=0.0050 '/' Outflow=2.65 cfs 0.249 af

Pond 23P: CB #9 Peak Elev=50.04' Storage=35 cf Inflow=4.81 cfs 0.441 af
15.0" Round Culvert n=0.012 L=20.0' S=0.0050 '/' Outflow=4.82 cfs 0.441 af

Pond 24P: CB #9-1 Peak Elev=50.25' Storage=34 cf Inflow=2.69 cfs 0.192 af
Outflow=2.69 cfs 0.192 af

Pond 25P: YD #8 Peak Elev=49.32' Inflow=4.82 cfs 0.441 af
15.0" Round Culvert n=0.012 L=38.0' S=0.0050 '/' Outflow=4.82 cfs 0.441 af

Pond 26P: YD #7 Peak Elev=48.61' Inflow=4.82 cfs 0.441 af
15.0" Round Culvert n=0.012 L=32.0' S=0.0050 '/' Outflow=4.82 cfs 0.441 af

Pond 27P: YD #6 Peak Elev=47.92' Inflow=4.82 cfs 0.441 af
15.0" Round Culvert n=0.012 L=24.0' S=0.0050 '/' Outflow=4.82 cfs 0.441 af

Pond 30P: Drip Edge Peak Elev=51.19' Storage=30 cf Inflow=0.38 cfs 0.027 af
Discarded=0.29 cfs 0.027 af Primary=0.00 cfs 0.000 af Outflow=0.29 cfs 0.027 af

Pond 32P: CB #5-2 Peak Elev=51.76' Storage=256 cf Inflow=1.62 cfs 0.119 af
Primary=1.53 cfs 0.109 af Secondary=0.89 cfs 0.011 af Outflow=1.53 cfs 0.119 af

Pond 34P: Drip Edge Peak Elev=51.29' Storage=54 cf Inflow=0.41 cfs 0.032 af
Discarded=0.27 cfs 0.032 af Primary=0.00 cfs 0.000 af Outflow=0.27 cfs 0.032 af

Pond 36P: CB #4-2 Peak Elev=52.19' Storage=46 cf Inflow=3.16 cfs 0.243 af
12.0" Round Culvert n=0.012 L=13.0' S=0.0054 '/' Outflow=3.16 cfs 0.243 af

Pond 38P: LCB #3-1 Peak Elev=48.15' Storage=121 cf Inflow=0.34 cfs 0.027 af
Discarded=0.20 cfs 0.027 af Primary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.027 af

Pond 39P: CB #3-2 Peak Elev=51.87' Storage=46 cf Inflow=1.21 cfs 0.092 af
12.0" Round Culvert n=0.012 L=12.0' S=0.0050 '/' Outflow=1.16 cfs 0.092 af

Pond 41P: Drip Edge Peak Elev=52.95' Storage=96 cf Inflow=0.64 cfs 0.049 af
Discarded=0.19 cfs 0.041 af Primary=0.43 cfs 0.007 af Outflow=0.61 cfs 0.049 af

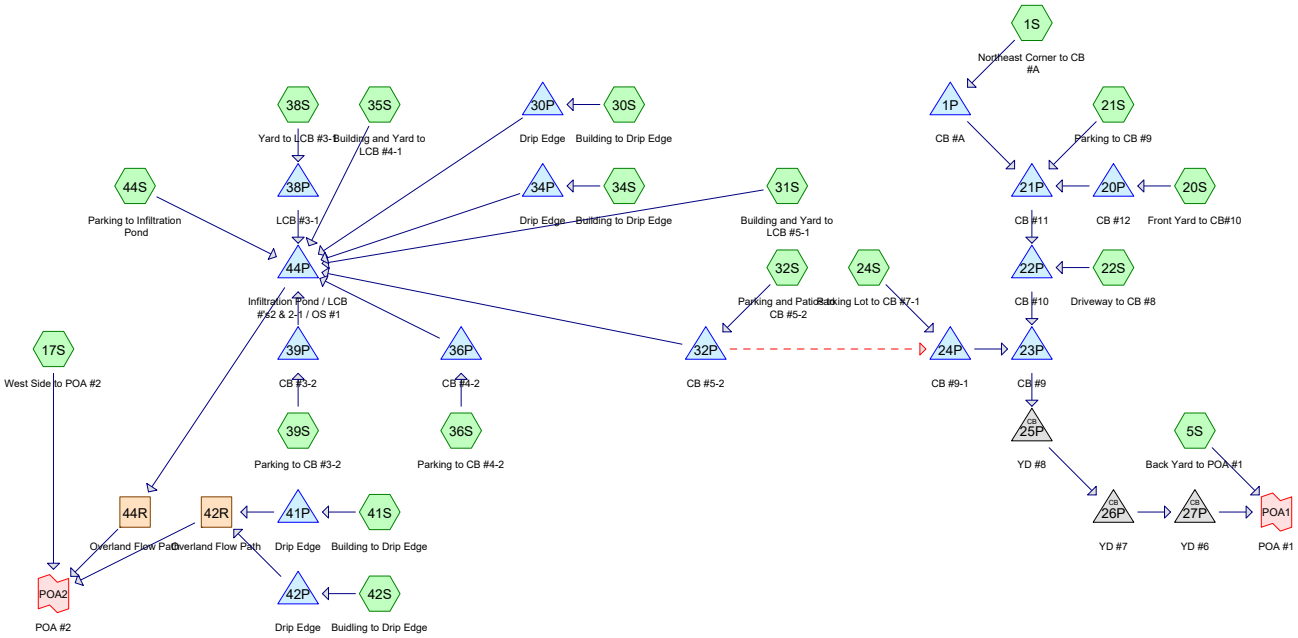
Pond 42P: Drip Edge Peak Elev=52.79' Storage=114 cf Inflow=0.60 cfs 0.042 af
Discarded=0.27 cfs 0.040 af Primary=0.22 cfs 0.003 af Outflow=0.48 cfs 0.042 af

Pond 44P: Infiltration Pond / LCB #'s2 & 2-1 / Peak Elev=51.84' Storage=4,997 cf Inflow=9.33 cfs 0.720 af
Discarded=4.24 cfs 0.717 af Primary=0.51 cfs 0.003 af Outflow=4.76 cfs 0.720 af

Link POA1: POA #1 Inflow=5.85 cfs 0.521 af
Primary=5.85 cfs 0.521 af

Link POA2: POA #2 Inflow=0.70 cfs 0.032 af
Primary=0.70 cfs 0.032 af

Total Runoff Area = 4.070 ac Runoff Volume = 1.436 af Average Runoff Depth = 4.24"
46.62% Pervious = 1.897 ac 53.38% Impervious = 2.172 ac



Subcat Reach Pond Link

Routing Diagram for 5161-Post-110921

Prepared by Altus Engineering, Inc., Printed 11/9/2021

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points x 6
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Northeast Corner to CB Runoff Area=12,050 sf 27.65% Impervious Runoff Depth=4.78"
Flow Length=180' Tc=6.0 min CN=69 Runoff=1.55 cfs 0.110 af

Subcatchment 5S: Back Yard to POA #1 Runoff Area=10,478 sf 33.46% Impervious Runoff Depth=5.26"
Flow Length=198' Tc=6.0 min CN=73 Runoff=1.48 cfs 0.105 af

Subcatchment 17S: West Side to POA #2 Runoff Area=25,189 sf 1.64% Impervious Runoff Depth=0.80"
Flow Length=357' Tc=11.1 min CN=33 Runoff=0.21 cfs 0.038 af

Subcatchment 20S: Front Yard to CB#10 Runoff Area=6,933 sf 69.88% Impervious Runoff Depth=6.94"
Flow Length=147' Tc=6.0 min CN=87 Runoff=1.23 cfs 0.092 af

Subcatchment 21S: Parking to CB #9 Runoff Area=3,178 sf 77.66% Impervious Runoff Depth=7.30"
Flow Length=46' Slope=0.0181 '/' Tc=6.0 min CN=90 Runoff=0.58 cfs 0.044 af

Subcatchment 22S: Driveway to CB #8 Runoff Area=4,683 sf 86.46% Impervious Runoff Depth=7.66"
Flow Length=152' Tc=6.0 min CN=93 Runoff=0.88 cfs 0.069 af

Subcatchment 24S: Parking Lot to CB #7-1 Runoff Area=17,662 sf 63.74% Impervious Runoff Depth=6.70"
Flow Length=262' Tc=9.0 min CN=85 Runoff=2.76 cfs 0.226 af

Subcatchment 30S: Building to Drip Edge Runoff Area=4,788 sf 41.52% Impervious Runoff Depth=4.07"
Tc=6.0 min CN=63 Runoff=0.52 cfs 0.037 af

Subcatchment 31S: Building and Yard to Runoff Area=2,900 sf 58.93% Impervious Runoff Depth=5.50"
Tc=6.0 min CN=75 Runoff=0.43 cfs 0.030 af

Subcatchment 32S: Parking and Patios to Runoff Area=11,430 sf 69.54% Impervious Runoff Depth=6.82"
Flow Length=105' Tc=6.0 min CN=86 Runoff=2.00 cfs 0.149 af

Subcatchment 34S: Building to Drip Edge Runoff Area=2,681 sf 86.35% Impervious Runoff Depth=7.54"
Tc=6.0 min CN=92 Runoff=0.50 cfs 0.039 af

Subcatchment 35S: Building and Yard to Runoff Area=6,052 sf 23.60% Impervious Runoff Depth=3.25"
Flow Length=134' Tc=6.0 min CN=56 Runoff=0.52 cfs 0.038 af

Subcatchment 36S: Parking to CB #4-2 Runoff Area=22,757 sf 73.29% Impervious Runoff Depth=6.94"
Flow Length=108' Tc=7.1 min CN=87 Runoff=3.89 cfs 0.302 af

Subcatchment 38S: Yard to LCB #3-1 Runoff Area=7,404 sf 21.57% Impervious Runoff Depth=2.79"
Flow Length=103' Tc=6.0 min CN=52 Runoff=0.53 cfs 0.039 af

Subcatchment 39S: Parking to CB #3-2 Runoff Area=7,969 sf 87.51% Impervious Runoff Depth=7.42"
Flow Length=59' Slope=0.0178 '/' Tc=6.0 min CN=91 Runoff=1.47 cfs 0.113 af

Subcatchment 41S: Building to Drip Edge Runoff Area=4,150 sf 89.64% Impervious Runoff Depth=7.54"
Tc=6.0 min CN=92 Runoff=0.77 cfs 0.060 af

Subcatchment 42S: Buidling to Drip Edge Runoff Area=5,811 sf 56.29% Impervious Runoff Depth=5.02"
Tc=6.0 min CN=71 Runoff=0.78 cfs 0.056 af

Subcatchment 44S: Parking to Infiltration Runoff Area=21,163 sf 80.97% Impervious Runoff Depth=6.94"
Flow Length=96' Tc=6.0 min CN=87 Runoff=3.75 cfs 0.281 af

Reach 42R: Overland Flow Path Avg. Flow Depth=0.08' Max Vel=1.01 fps Inflow=0.97 cfs 0.018 af
n=0.035 L=156.0' S=0.0204 '/' Capacity=156.47 cfs Outflow=0.89 cfs 0.018 af

Reach 44R: Overland Flow Path Avg. Flow Depth=0.19' Max Vel=1.06 fps Inflow=3.05 cfs 0.039 af
n=0.035 L=114.0' S=0.0091 '/' Capacity=104.51 cfs Outflow=2.73 cfs 0.039 af

Pond 1P: CB #A Peak Elev=51.80' Storage=618 cf Inflow=1.55 cfs 0.110 af
6.0" Round Culvert n=0.012 L=70.0' S=0.0107 '/' Outflow=1.01 cfs 0.110 af

Pond 20P: CB #12 Peak Elev=51.14' Storage=34 cf Inflow=1.23 cfs 0.092 af
12.0" Round Culvert n=0.012 L=28.0' S=0.0050 '/' Outflow=1.26 cfs 0.092 af

Pond 21P: CB #11 Peak Elev=51.09' Storage=41 cf Inflow=2.33 cfs 0.247 af
12.0" Round Culvert n=0.012 L=34.0' S=0.0050 '/' Outflow=2.29 cfs 0.247 af

Pond 22P: CB #10 Peak Elev=50.91' Storage=143 cf Inflow=3.14 cfs 0.315 af
15.0" Round Culvert n=0.012 L=22.0' S=0.0050 '/' Outflow=3.14 cfs 0.315 af

Pond 23P: CB #9 Peak Elev=50.79' Storage=184 cf Inflow=6.51 cfs 0.569 af
15.0" Round Culvert n=0.012 L=20.0' S=0.0050 '/' Outflow=5.74 cfs 0.569 af

Pond 24P: CB #9-1 Peak Elev=50.94' Storage=238 cf Inflow=4.42 cfs 0.254 af
Outflow=4.21 cfs 0.254 af

Pond 25P: YD #8 Peak Elev=50.06' Inflow=5.74 cfs 0.569 af
15.0" Round Culvert n=0.012 L=38.0' S=0.0050 '/' Outflow=5.74 cfs 0.569 af

Pond 26P: YD #7 Peak Elev=49.17' Inflow=5.74 cfs 0.569 af
15.0" Round Culvert n=0.012 L=32.0' S=0.0050 '/' Outflow=5.74 cfs 0.569 af

Pond 27P: YD #6 Peak Elev=48.21' Inflow=5.74 cfs 0.569 af
15.0" Round Culvert n=0.012 L=24.0' S=0.0050 '/' Outflow=5.74 cfs 0.569 af

Pond 30P: Drip Edge Peak Elev=51.61' Storage=100 cf Inflow=0.52 cfs 0.037 af
Discarded=0.31 cfs 0.037 af Primary=0.00 cfs 0.000 af Outflow=0.31 cfs 0.037 af

Pond 32P: CB #5-2 Peak Elev=51.79' Storage=302 cf Inflow=2.00 cfs 0.149 af
Primary=1.61 cfs 0.123 af Secondary=1.67 cfs 0.028 af Outflow=1.67 cfs 0.149 af

Pond 34P: Drip Edge Peak Elev=51.55' Storage=100 cf Inflow=0.50 cfs 0.039 af
Discarded=0.29 cfs 0.039 af Primary=0.00 cfs 0.000 af Outflow=0.29 cfs 0.039 af

Pond 36P: CB #4-2 Peak Elev=52.55' Storage=349 cf Inflow=3.89 cfs 0.302 af
12.0" Round Culvert n=0.012 L=13.0' S=0.0054 '/' Outflow=3.73 cfs 0.302 af

Pond 38P: LCB #3-1 Peak Elev=49.40' Storage=234 cf Inflow=0.53 cfs 0.039 af
Discarded=0.26 cfs 0.039 af Primary=0.00 cfs 0.000 af Outflow=0.26 cfs 0.039 af

Pond 39P: CB #3-2 Peak Elev=52.13' Storage=49 cf Inflow=1.47 cfs 0.113 af
12.0" Round Culvert n=0.012 L=12.0' S=0.0050 '/' Outflow=1.63 cfs 0.113 af

Pond 41P: Drip Edge Peak Elev=53.08' Storage=108 cf Inflow=0.77 cfs 0.060 af
Discarded=0.19 cfs 0.049 af Primary=0.55 cfs 0.011 af Outflow=0.74 cfs 0.060 af

Pond 42P: Drip Edge Peak Elev=52.96' Storage=141 cf Inflow=0.78 cfs 0.056 af
Discarded=0.28 cfs 0.049 af Primary=0.43 cfs 0.007 af Outflow=0.71 cfs 0.056 af

Pond 44P: Infiltration Pond / LCB #'s2 & 2-1 / Peak Elev=52.03' Storage=5,291 cf Inflow=11.22 cfs 0.887 af
Discarded=4.35 cfs 0.848 af Primary=3.05 cfs 0.039 af Outflow=7.40 cfs 0.887 af

Link POA1: POA #1 Inflow=6.91 cfs 0.675 af
Primary=6.91 cfs 0.675 af

Link POA2: POA #2 Inflow=3.69 cfs 0.095 af
Primary=3.69 cfs 0.095 af

Total Runoff Area = 4.070 ac Runoff Volume = 1.829 af Average Runoff Depth = 5.39"
46.62% Pervious = 1.897 ac 53.38% Impervious = 2.172 ac

Section 5

NRCC Extreme Precipitation Table

ALTUS
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Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New Hampshire
Location	
Longitude	70.763 degrees West
Latitude	43.072 degrees North
Elevation	0 feet
Date/Time	Wed, 23 Dec 2020 12:00:25 -0500

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.81	1.04	**1yr**	0.70	0.98	1.21	1.56	2.03	2.66	Add 15%		2.35	2.81	3.22	3.94	4.55	**1yr**
2yr	0.32	0.50	0.62	0.81	1.02	1.30	**2yr**	0.88	1.18	1.52	1.94	2.49	3.21	3.69		2.84	3.43	3.94	4.68	5.33	**2yr**
5yr	0.37	0.58	0.73	0.98	1.25	1.61	**5yr**	1.08	1.47	1.89	2.43	3.14	4.07			3.60	4.40	5.04	5.94	6.70	**5yr**
10yr	0.41	0.65	0.82	1.12	1.45	1.89	**10yr**	1.25	1.73	2.23	2.89	3.75	4.87	5.60		4.31	5.32	6.09	7.11	7.98	**10yr**
25yr	0.48	0.76	0.97	1.34	1.77	2.34	**25yr**	1.53	2.14	2.78	3.63	4.74	6.17	7.10		5.46	6.83	7.80	9.03	10.05	**25yr**
50yr	0.54	0.86	1.10	1.54	2.07	2.76	**50yr**	1.79	2.53	3.29	4.32	5.66	7.39	8.50		6.54	8.25	9.42	10.81	11.98	**50yr**
100yr	0.60	0.97	1.25	1.77	2.42	3.26	**100yr**	2.09	2.98	3.90	5.16	6.77	8.85	10.58	**100yr**	7.83	9.98	11.38	12.96	14.27	**100yr**
200yr	0.67	1.10	1.43	2.05	2.82	3.83	**200yr**	2.44	3.52	4.62	6.13	8.08	10.61	12.55	**200yr**	9.39	12.07	13.76	15.55	17.02	**200yr**
500yr	0.80	1.31	1.71	2.48	3.48	4.76	**500yr**	3.00	4.38	5.76	7.70	10.22	13.48	16.14	**500yr**	11.93	15.52	17.67	19.78	21.49	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.72	0.88	**1yr**	0.63	0.86	0.92	1.33	1.68	2.24	2.49	**1yr**	1.98	2.40	2.87	3.18	3.90	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.82	2.34	3.06	3.45	**2yr**	2.71	3.32	3.82	4.55	5.08	**2yr**
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.12	2.73	3.79	4.19	**5yr**	3.35	4.03	4.72	5.53	6.24	**5yr**
10yr	0.39	0.59	0.73	1.03	1.33	1.60	**10yr**	1.14	1.56	1.80	2.39	3.06	4.37	4.86	**10yr**	3.87	4.67	5.44	6.41	7.20	**10yr**
25yr	0.44	0.67	0.83	1.19	1.56	1.90	**25yr**	1.35	1.86	2.10	2.75	3.53	4.72	5.89	**25yr**	4.18	5.66	6.65	7.79	8.68	**25yr**
50yr	0.48	0.73	0.91	1.31	1.76	2.17	**50yr**	1.52	2.12	2.35	3.07	3.93	5.33	6.80	**50yr**	4.72	6.54	7.72	9.04	10.02	**50yr**
100yr	0.54	0.81	1.01	1.47	2.01	2.47	**100yr**	1.73	2.41	2.63	3.41	4.35	6.00	7.85	**100yr**	5.31	7.55	8.98	10.51	11.56	**100yr**
200yr	0.59	0.89	1.13	1.63	2.28	2.81	**200yr**	1.96	2.75	2.93	3.78	4.79	6.72	9.06	**200yr**	5.95	8.71	10.42	12.22	13.37	**200yr**
500yr	0.68	1.02	1.31	1.90	2.71	3.36	**500yr**	2.34	3.29	3.41	4.31	5.45	7.82	10.94	**500yr**	6.92	10.52	12.69	14.96	16.19	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.44	0.54	0.72	0.89	1.08	**1yr**	0.77	1.06	1.26	1.74	2.21	2.98	3.16	**1yr**	2.64	3.04	3.58	4.37	5.04	**1yr**
2yr	0.34	0.52	0.64	0.86	1.07	1.27	**2yr**	0.92	1.24	1.48	1.96	2.51	3.42	3.70	**2yr**	3.03	3.56	4.09	4.84	5.63	**2yr**
5yr	0.40	0.62	0.77	1.05	1.34	1.62	**5yr**	1.15	1.58	1.88	2.53	3.25	4.34	4.96	**5yr**	3.84	4.77	5.38	6.37	7.16	**5yr**
10yr	0.47	0.72	0.89	1.25	1.61	1.98	**10yr**	1.39	1.93	2.28	3.11	3.95	5.34	6.20	**10yr**	4.72	5.96	6.82	7.84	8.75	**10yr**
25yr	0.58	0.88	1.09	1.56	2.05	2.57	**25yr**	1.77	2.51	2.95	4.07	5.15	7.78	8.34	**25yr**	6.88	8.02	9.15	10.34	11.41	**25yr**
50yr	0.67	1.02	1.27	1.83	2.46	3.13	**50yr**	2.12	3.06	3.60	5.00	6.32	9.74	10.46	**50yr**	8.62	10.06	11.44	12.72	13.96	**50yr**
100yr	0.79	1.19	1.49	2.16	2.96	3.81	**100yr**	2.55	3.72	4.37	6.16	7.76	12.18	13.10	**100yr**	10.78	12.60	14.31	15.69	17.09	**100yr**
200yr	0.92	1.39	1.76	2.55	3.56	4.65	**200yr**	3.07	4.55	5.34	7.58	9.54	15.28	16.44	**200yr**	13.53	15.81	17.92	19.35	20.92	**200yr**
500yr	1.15	1.71	2.19	3.19	4.53	6.04	**500yr**	3.91	5.90	6.93	10.02	12.56	20.65	22.20	**500yr**	18.27	21.34	24.13	25.51	27.34	**500yr**

Powered by ACIS Northeast Regional Climate Center

Section 6

NRCS Soils Report
Test Pit Logs

ALTUS
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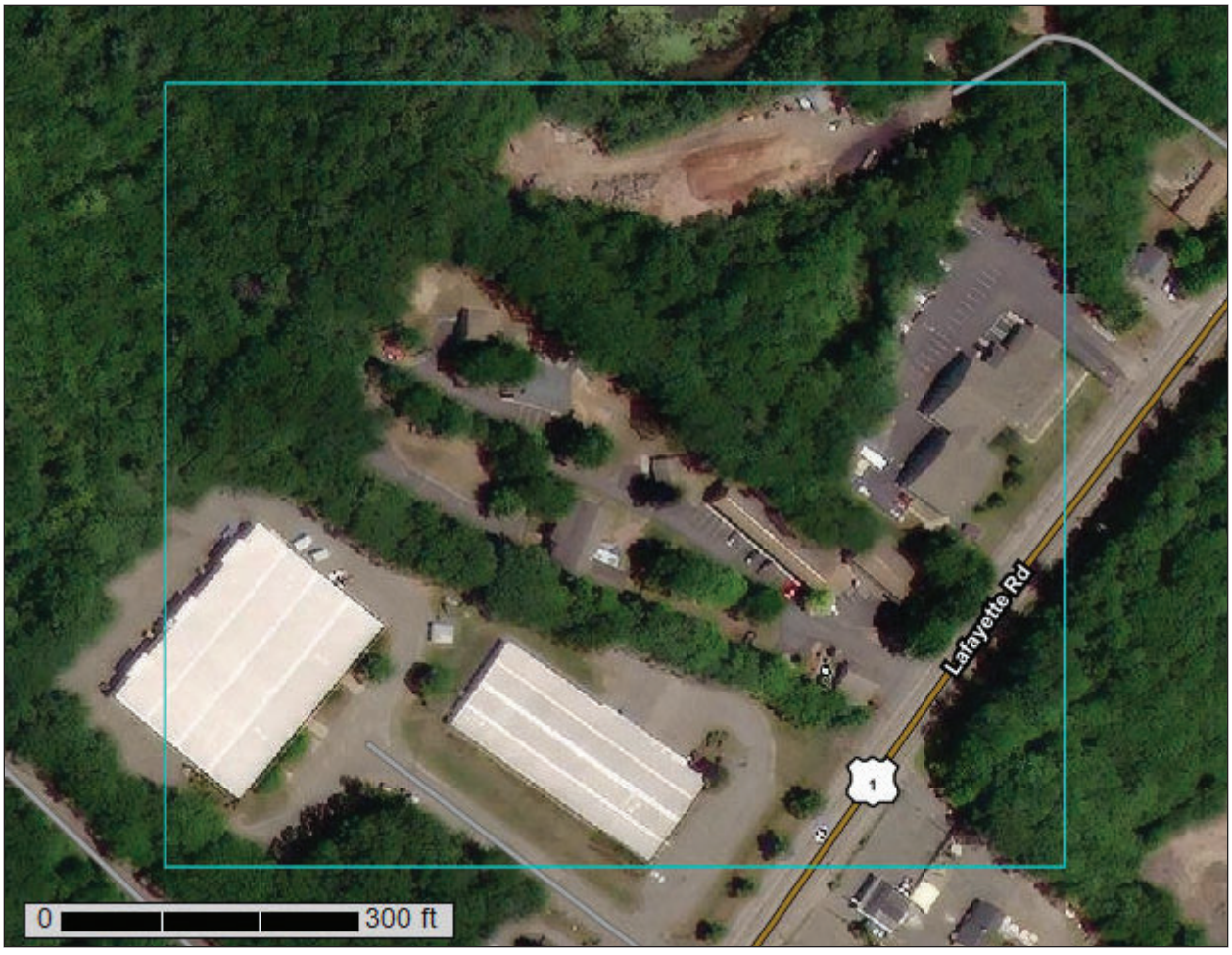
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Rockingham County, New Hampshire



May 20, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:2,030 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 30 60 120 180

Feet
0 50 100 200 300

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

MAP LEGEND

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

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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: Rockingham County, New Hampshire
Survey Area Data: Version 22, May 29, 2020

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

Date(s) aerial images were photographed: Dec 31, 2009—Jun 14, 2017

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
26B	Windsor loamy sand, 3 to 8 percent slopes	3.4	20.5%
299	Udorthents, smoothed	4.4	26.7%
538A	Squamscott fine sandy loam, 0 to 5 percent slopes	1.7	10.3%
699	Urban land	7.0	42.6%
Totals for Area of Interest		**16.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or

landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Rockingham County, New Hampshire

26B—Windsor loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2svkf
Elevation: 0 to 1,210 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of local importance

Map Unit Composition

Windsor, loamy sand, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor, Loamy Sand

Setting

Landform: Dunes, outwash plains, deltas, outwash terraces
Landform position (three-dimensional): Tread, riser
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

Typical profile

O - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: loamy sand
Bw - 3 to 25 inches: loamy sand
C - 25 to 65 inches: sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Hinckley, loamy sand

Percent of map unit: 10 percent
Landform: Eskers, outwash plains, kames, deltas
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Deerfield, loamy sand

Percent of map unit: 5 percent
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

299—Udorthents, smoothed

Map Unit Setting

National map unit symbol: 9cmt
Elevation: 0 to 840 feet
Mean annual precipitation: 44 to 49 inches
Mean annual air temperature: 48 degrees F
Frost-free period: 155 to 165 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Properties and qualities

Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

538A—Squamscott fine sandy loam, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 9cp9
Elevation: 0 to 1,000 feet
Mean annual precipitation: 30 to 55 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

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

Description of Squamscott

Setting

Landform: Marine terraces

Typical profile

H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 12 inches: loamy sand
H3 - 12 to 19 inches: fine sand
H4 - 19 to 65 inches: silt loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: F144AY019NH - Wet Lake Plain
Hydric soil rating: Yes

Minor Components

Scitico

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Maybid

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Eldridge

Percent of map unit: 5 percent
Hydric soil rating: No

699—Urban land

Map Unit Composition

Urban land: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Minor Components

Not named

Percent of map unit: 15 percent
Hydric soil rating: No

Michael Cuomo, Soil Scientist
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TEST PIT DATA

Client: Altus Engineering project 5161
Location: 3548 Lafayette Road, Portsmouth
Date: 16 July 2021

Test Pit Number: One

Depth	Description
0-7"	Dark brown (10YR 3/3) fine sandy loam, granular, friable.
7-32"	Yellowish brown (10YR 5/6) fine sandy loam fill, granular, friable.
32-50"	Very dark grayish brown (2.5Y 3/2) fine sandy loam, granular, friable, redox.
50-72"	Dark grayish brown (2.5Y 4/2) fine sandy loam, massive, friable, redox.
72-84"	Light yellowish brown (2.5Y 6/3) stony fine sandy loam, massive, firm, redox.

Depth to Seasonal High Water Table: 32"
Bedrock: none to 84"
Estimated percolation rate: 6 min/inch

Test Pit Number: Two

Depth	Description
0-12"	Dark brown (10YR 3/3) stony fine sandy loam, granular, friable.
12-33"	Strong brown (7.5YR 5/6) stony fine sandy loam, blocky, friable.
33-44"	Olive brown (2.5Y 4/4) stony fine sandy loam, blocky, firm, redox.

Depth to Seasonal High Water Table: 33"
Bedrock: 44"
Estimated percolation rate: 6 min/inch

Test Pit Number: Three

Depth	Description
0-10"	Dark brown (10YR 3/3) stony fine sandy loam, granular, friable.
10-33"	Yellowish brown (10YR 5/6) stony fine sandy loam, blocky, friable.
33-44"	Light olive brown (2.5Y 5/3) stony fine sandy loam, blocky, friable, redox.
44-76"	Olive brown (2.5Y 4/4) stony fine sandy loam, blocky,

firm, redox.
Depth to Seasonal High Water Table: 33"
Bedrock: 76"
Estimated percolation rate: 6 min/inch

Test Pit Number: Four

Depth	Description
0-14"	Dark brown (10YR 3/3) loamy sand, granular, friable.
14-36"	Yellowish brown (10YR 5/6) loamy sand, blocky, friable.
36-48"	Light yellowish brown (2.5Y 6/4) fine sand, massive, loose, redox.
48-90"	Pale yellow (2.5Y 7/3) fine sand, massive, loose, redox.

Depth to Seasonal High Water Table: 36"
Bedrock: none to 90"
Estimated percolation rate: 2 min/inch

Test Pit Number: Five

Depth	Description
0-14"	Dark brown (10YR 3/3) loamy sand, granular, friable.
14-26"	Yellowish brown (10YR 5/6) loamy sand, blocky, friable.
26-42"	Yellowish brown (10YR 5/4) fine sand, single grain, loose.
42-60"	Light olive brown (2.5Y 5/3) fine sand, massive, loose, redox.
60-90"	Olive brown (2.5Y 4/3) fine sand, massive, loose, redox.

Depth to Seasonal High Water Table: 42"
Bedrock: none to 90"
Estimated percolation rate: 2 min/inch

Test Pit Number: Six

Depth	Description
0-12"	Dark brown (10YR 3/3) loamy sand, granular, friable.
12-28"	Yellowish brown (10YR 5/6) loamy sand, granular, friable.
28-60"	Pale brown (10YR 6/3) fine sand, single grain, loose.
60-72"	Light olive brown (2.5Y 5/4) fine sand, massive, loose, redox.

Depth to Seasonal High Water Table: 60"
Bedrock: 72"
Estimated percolation rate: 2 min/inch

Test Pit Number: Seven

Depth	Description
0-36"	Dark brown (10YR 3/3) loamy sand fill and topsoil, granular, friable.
36-48"	Yellowish brown (10YR 5/6) loamy sand, granular,

friable.

48-60" Light olive brown (2.5Y 5/4) fine sand, massive, loose, redox.

60-90" Light yellowish brown (2.5Y 6/4) fine sand, massive, loose, redox.

Depth to Seasonal High Water Table: 48"

Bedrock: none to 90"

Estimated percolation rate: 2 min/inch

Section 7

Stormwater Operations & Maintenance Plan

ALTUS
ENGINEERING, INC.

STORMWATER INSPECTION AND MAINTENANCE MANUAL

"Monarch Village"
Assessor's Map 297, Lot 6

OWNER AT TIME OF SUBDIVISION APPROVAL:
Monarch Village, LLC
P.O. Box 365
East Hampstead, NH 03826

Proper inspection, maintenance, and repair are key elements in maintaining a successful stormwater management program on a developed property. Routine inspections ensure permit compliance and reduce the potential for deterioration of infrastructure or reduced water quality. The following responsible parties shall be in charge of managing the stormwater facilities:

RESPONSIBLE PARTIES:

Owner:	*Monarch Village, LLC*		*(978) 685-0568*
	Name	*Company*	*Phone*
Inspection:	*Monarch Village, LLC*		*(978) 685-0568*
	Name	*Company*	*Phone*
Maintenance:	*Monarch Village, LLC*		*(978) 685-0568*
	Name	*Company*	*Phone*

NOTES:

Inspection and maintenance responsibilities shall transfer to any future property owner(s).

This manual shall be updated as needed to reflect any changes related to any transfer of ownership and/or any delegation of inspection and maintenance responsibilities to another entity

ALTUS ENGINEERING, INC.

LEACHING CATCH BASINS AND DRAIN MANHOLES

Function – Leaching catch basins and drain manholes allow for the infiltration of and provide treatment to runoff.

Maintenance

- Inspect annually and after significant rainfall events.
- If an infiltration-based practice does not completely drain within 72-hours following a rainfall event, then a qualified professional shall be retained to assess the condition of the facility to determine measures required to restore its filtration and/or infiltration function(s), including but not limited to removal of accumulated sediments and/or replacement or reconstruction of the structure.
- Remove any obstructions, litter and accumulated sediment or debris as warranted but no less than once a year.

LEACHING PIPES

Function – Leaching pipes connect leaching catch basins and drain manholes and consist of perforated pipes installed flat in a stone envelope.

Maintenance

- Inspect annually and after significant rainfall events.
- Remove any obstructions, litter and accumulated sediment or debris as warranted but no less than once a year.
- Where sediment has accumulated to a depth greater than 1", the pipes may need to be cleaned with a JetVac applied in multiple passes until the backflush water in visually clean.
- In extreme cases, if an infiltration-based practice does not completely drain within 72-hours following a rainfall event, then a qualified professional shall be retained to assess the condition of the facility to determine measures required to restore its filtration and/or infiltration function(s), including but not limited to removal of accumulated sediments and/or replacement or reconstruction of the structure.

INFILTRATION PONDS

Function – Infiltration ponds allow for the infiltration of and provide treatment to runoff.

Maintenance

- Inspect annually and after significant rainfall events.
- If an infiltration-based practice does not completely drain within 72-hours following a rainfall event, then a qualified professional shall be retained to assess the condition of the facility to determine measures required to restore its filtration and/or infiltration function(s), including but not limited to removal of accumulated sediments and/or replacement or reconstruction of the structure.
- Remove any obstructions, litter and accumulated sediment or debris as warranted but no less than once a year.
- Mowing of any grassed area in or adjacent to a raingarden, including its berm, shall be performed at least twice per year (when areas are not inundated) to keep the vegetation in vigorous condition. The cut grass shall be removed to prevent the decaying organic litter from clogging the filter media or choking other vegetation.
- Select vegetation should be maintained in healthy condition. This may include pruning, removal and replacement of dead or diseased vegetation.
- Remove any hard wood growth from pond areas, including side slopes and berms.

CULVERTS AND DRAINAGE PIPES

Function – Culverts and drainage pipes convey stormwater away from buildings, walkways, and parking areas and to surface waters or closed drainage systems.

Maintenance

- Culverts and drainage pipes shall be inspected semi-annually, or more often as needed, for accumulation of debris and structural integrity. Leaves and other debris shall be removed from the inlet and outlet to insure the functionality of drainage structures. Debris shall be disposed of on site where it will not concentrate back at the drainage structures or at a solid waste disposal facility.
- Riprap Areas - Culvert outlets and inlets shall be inspected during annual maintenance and operations for erosion and scour. If scour or creek erosion is identified, the outlet owner shall take appropriate means to prevent further erosion. Increased lengths of riprap may require a NHDES Permit and/or local permit.

CATCH BASINS

Function – Catch basins collect stormwater, primarily from paved surfaces and roofs. Stormwater from paved areas often contains sediment and contaminants. Catch basin sumps serve to trap sediment, trace metals, nutrients and debris. Hooded catch basins trap hydrocarbons and floating debris.

Maintenance

- Remove leaves and debris from structure grates on an as-needed basis.
- Sumps shall be inspected and cleaned annually and any removed sediment and debris shall be disposed of at a solid waste disposal facility.

LEVEL SPREADERS AND RIP RAP OUTLETS

Function – Level spreaders and rip rap outlets covert concentrated stormwater flows into less-erosive sheet flow, minimizing erosion and maximizing the treatment capabilities of associated buffers. Vegetated buffers, either forested or meadow, slow runoff which promotes and reduces peak rates of runoff. The reduced velocities and the presence of vegetation encourage the filtration of sediment and the limited bio-uptake of nutrients.

Maintenance

- Inspect level spreaders and buffers at least annually for signs of erosion, sediment buildup, or vegetation loss.
- Inspect level for signs of condensed flows. Level spreader and rip rap shall be maintained to disperse flows evenly over level spreader.
- If a meadow buffer, provide periodic mowing as needed to maintain a healthy stand of herbaceous vegetation.
- If a forested buffer, then the buffer should be maintained in an undisturbed condition, unless erosion occurs.
- If erosion of the buffer (forested or meadow) occurs, eroded areas should be repaired and replanted with vegetation similar to the remaining buffer. Corrective action should include eliminating the source of the erosion problem and may require retrofit or reconstruction of the level spreader.
- Remove debris and accumulated sediment and dispose of properly.

LANDSCAPED AREAS – ORGANIC FERTILIZER MANAGEMENT

Function – All fertilizer used on site shall be certified organic. Organic fertilizer management involves controlling the rate, timing and method of organic fertilizer application so that the nutrients are taken up by the plants thereby reducing the chance of polluting the surface and ground waters. Organic fertilizer management can be effective in reducing the amounts of phosphorus and nitrogen in runoff from landscaped areas, particularly lawns.

Maintenance

- Have the soil tested by your landscaper or local Soil Conservation Service for nutrient requirements and follow the recommendations.
- Do not apply organic fertilizer to frozen ground.
- Clean up any organic fertilizer spills.
- Do not allow organic fertilizer to be broadcast into water bodies.
- When organically fertilizing a lawn, water thoroughly, but do not create a situation where water runs off the surface of the lawn.

LANDSCAPED AREAS - LITTER CONTROL

Function – Landscaped areas tend to filter debris and contaminates that may block drainage systems and pollute the surface and ground waters.

Maintenance

- Litter Control and lawn maintenance involves removing litter such as trash, leaves, lawn clippings, pet wastes, oil and chemicals from streets, parking lots, and lawns before materials are transported into surface waters.
- Litter control shall be implemented as part of the grounds maintenance program.

VEGETATIVE SWALES

Function – Vegetative swales filter sediment from stormwater, promote infiltration, and the uptake of contaminates. They are designed to treat runoff and dispose of it safely into the natural drainage system.

Maintenance

- Timely maintenance is important to keep a swale in good working condition. Mowing of grassed swales shall be monthly to keep the vegetation in vigorous condition. The cut vegetation shall be removed to prevent the decaying organic litter from adding pollutants to the discharge from the swale.
- Fertilizing shall be bi-annual or as recommended from soil testing.
- Inspect swales following significant rainfall events.
- Woody vegetation shall not be allowed to become established in the swales or rock riprap outlet protection and if present shall be removed.
- Accumulated debris disrupts flow and leads to clogging and erosion. Remove debris and litter as necessary.
- Inspect for eroded areas. Determine cause of erosion and correct deficiency as required. Monitor repaired areas.

DE-ICING CHEMICAL USE AND STORAGE

Function – Sand and salt are used for de-icing of drives.

Maintenance

- Salt is highly water-soluble. Contamination of freshwater wetlands and other sensitive areas can occur when salt is stored in open areas. Salt piles shall be covered at all times if not stored in a shed. Runoff from stockpiles shall be contained to keep the runoff from entering the drainage system.
- When shared driveways and walks are free of snow and ice, they should be swept clean. Disposal shall be in a solid waste disposal facility.
- **Salt use shall be minimized.** Sand shall be used for de-icing activities when possible. Salt is highly water-soluble. Contamination of freshwater wetlands and other sensitive areas can occur when salt is stored in open areas. Owner shall not store salt piles on site.

CONTROL OF INVASIVE PLANTS

Function – Invasive plants are introduced, alien, or non-native plants, which have been moved by people from their native habitat to a new area. Some exotic plants are imported for human use such as landscaping, erosion control, or food crops. They also can arrive as "hitchhikers" among shipments of other plants, seeds, packing materials, or fresh produce. Some exotic plants become invasive and cause harm by:

- becoming weedy and overgrown;
- killing established shade trees;
- obstructing pipes and drainage systems;
- forming dense beds in water;
- lowering water levels in lakes, streams, and wetlands;
- destroying natural communities;
- promoting erosion on stream banks and hillsides; and
- resisting control except by hazardous chemical.

Maintenance

During maintenance activities, check for the presence of invasive plants and remove in a safe manner as described in the attached "Methods for Disposing Non-Native Invasive Plants" prepared by the UNH Cooperative Extension.

GENERAL CLEAN UP

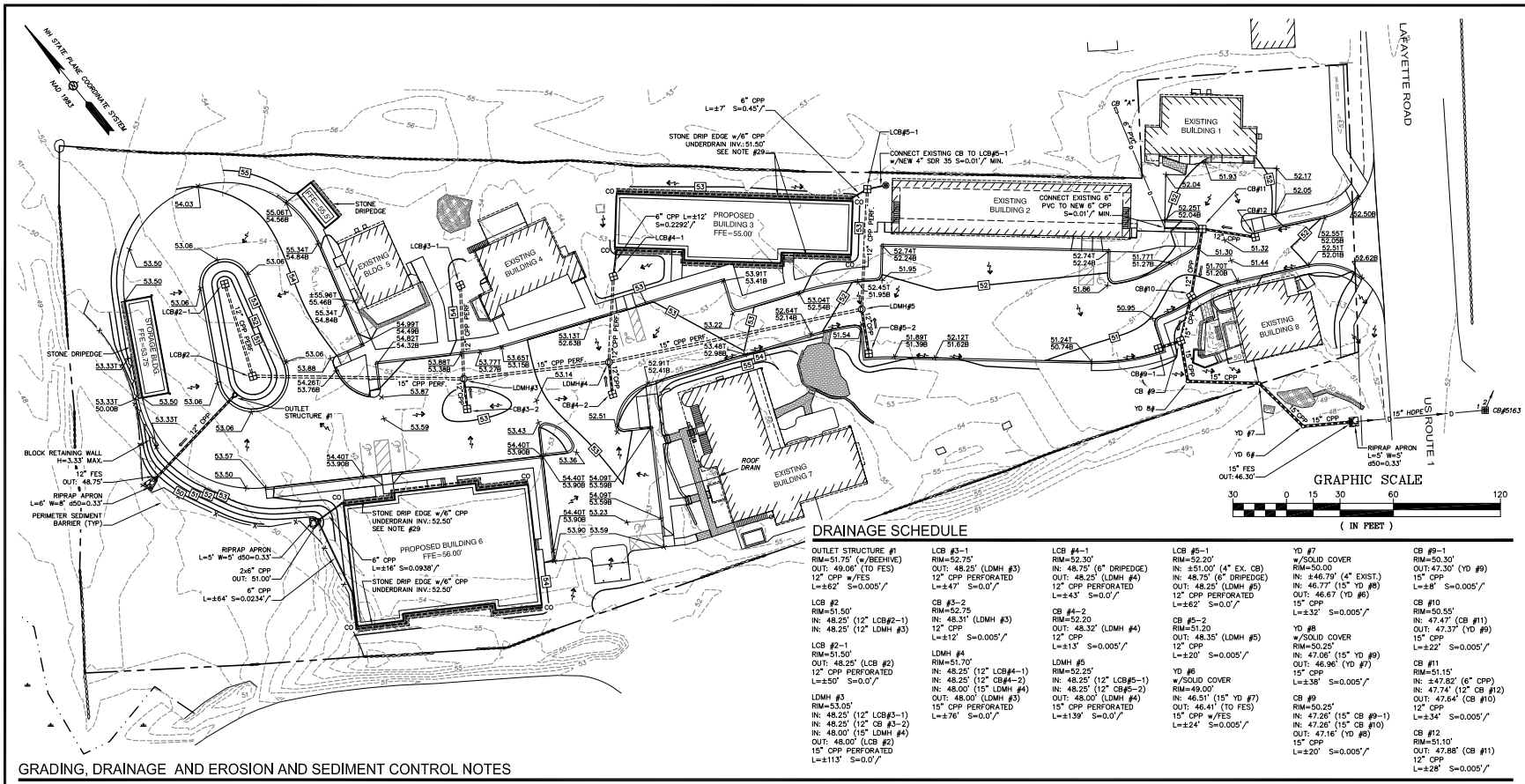
- Upon completion of the project, the contractor shall remove all temporary stormwater structures (i.e., temporary stone check dams, silt fence, temporary diversion swales, catch basin inlet filter, etc.). Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required shall be dressed to conform to the existing grade, prepared, and seeded. Remove any sediment in catch basins and clean drain pipes that may have accumulated during construction.
- Once in operation, all paved areas of the site should be swept at least once annually at the end of winter/early spring prior to significant spring rains.

STORM WATER SYSTEM OPERATION AND MAINTENANCE REPORT

General Information			
Project Name			
Owner			
Inspector's Name(s)			
Inspector's Contact Information			
Date of Inspection		**Start Time:**	**End Time:**
Type of Inspection: ☐ Annual Report ☐ Post-storm event ☐ Due to a discharge of significant amounts of sediment			
Notes:			

General Site Questions and Discharges of Significant Amounts of Sediment			
Subject		**Status**	**Notes**
A discharge of significant amounts of sediment may be indicated by (but is not limited to) observations of the following. Note whether any are observed during this inspection:			*Notes/ Action taken:*
1	Do the current site conditions reflect the attached site plan?	❑Yes ❑No	
2	Is the site permanently stabilized, temporary erosion and sediment controls are removed, and stormwater discharges from construction activity are eliminated?	❑Yes ❑No	
3	Is there evidence of the discharge of significant amounts of sediment to surface waters, or conveyance systems leading to surface waters?	❑Yes ❑No	

Permit Coverage and Plans				
#	**BMP/Facility**	**Inspected**	**Corrective Action Needed and Notes**	**Date Corrected**
	Infiltration Ponds	❑Yes ❑No		
	Catch Basins	❑Yes ❑No		
	Drainage Pipes	❑Yes ❑No		
	Leaching Pipes	❑Yes ❑No		
	Riprap Aprons	❑Yes ❑No		
	Leaching Catch Basins and Drain Manholes	❑Yes ❑No		
	Site Vegetation	❑Yes ❑No		



DRAINAGE SCHEDULE

OUTLET STRUCTURE #1
RIM=51.75' (w/BEEHIVE)
OUT: 49.06' (TO FES)
12" CPP w/FES
L=±62' S=0.005'/'

LCB #2
RIM=51.50'
IN: 48.25' (12" LCB#2-1)
IN: 48.25' (12" LDMH #3)

LCB #2-1
RIM=51.50'
OUT: 48.25' (LCB #2)
12" CPP PERFORATED
L=±50' S=0.0'/'

LDMH #3
RIM=53.05'
IN: 48.25' (12" LCB#3-1)
IN: 48.25' (12" CB #3-2)
IN: 48.00' (15" LDMH #4)
OUT: 48.00' (LCB #2)
15" CPP PERFORATED
L=±113' S=0.0'/'

LCB #3-1
RIM=52.75'
OUT: 48.25' (LDMH #3)
12" CPP PERFORATED
L=±47' S=0.0'/'

CB #3-2
RIM=52.75
IN: 48.31' (LDMH #3)
12" CPP
L=±12' S=0.005'/'

LDMH #4
RIM=51.70'
IN: 48.25' (12" LCB#4-1)
IN: 48.25' (12" CB#4-2)
IN: 48.00' (15" LDMH #4)
OUT: 48.00' (LDMH #3)
15" CPP PERFORATED
L=±76' S=0.0'/'

LCB #4-1
RIM=52.30'
IN: 48.75' (6" DRIPEDGE)
OUT: 48.25' (LDMH #4)
12" CPP PERFORATED
L=±43' S=0.0'/'

CB #4-2
RIM=52.20
OUT: 48.32' (LDMH #4)
12" CPP
L=±13' S=0.005'/'

LDMH #5
RIM=52.25'
IN: 48.25' (12" LCB#5-1)
IN: 48.25' (12" CB#5-2)
OUT: 48.00' (LDMH #4)
15" CPP PERFORATED
L=±139' S=0.0'/'

LCB #5-1
RIM=52.20'
IN: ±51.00' (4" EX. CB)
IN: 48.75' (6" DRIPEDGE)
OUT: 48.25' (LDMH #5)
12" CPP PERFORATED
L=±62' S=0.0'/'

CB #5-2
RIM=51.20
OUT: 48.35' (LDMH #5)
12" CPP
L=±20' S=0.005'/'

YD #6
w/SOLID COVER
RIM=49.00'
IN: 46.51' (15" YD #7)
OUT: 46.41' (TO FES)
15" CPP w/FES
L=±24' S=0.005'/'

YD #7
w/SOLID COVER
RIM=50.00
IN: ±46.79' (4" EXIST.)
IN: 46.77' (15" YD #8)
OUT: 46.67 (YD #6)
15" CPP
L=±32' S=0.005'/'

YD #8
w/SOLID COVER
RIM=50.25'
IN: 47.06' (15" YD #9)
OUT: 46.96' (YD #7)
15" CPP
L=±38' S=0.005'/'

CB #9
RIM=50.25'
IN: 47.26' (15" CB #9-1)
IN: 47.26' (15" CB #10)
OUT: 47.16' (YD #8)
15" CPP
L=±20' S=0.005'/'

CB #9-1
RIM=50.30'
OUT:47.30' (YD #9)
15" CPP
L=±8' S=0.005'/'

CB #10
RIM=50.55'
IN: 47.47' (CB #11)
OUT: 47.37' (YD #9)
15" CPP
L=±22' S=0.005'/'

CB #11
RIM=51.15'
IN: ±47.82' (6" CPP)
IN: 47.74' (12" CB #12)
OUT: 47.64' (CB #10)
12" CPP
L=±34' S=0.005'/'

CB #12
RIM=51.10'
OUT: 47.88' (CB #11)
12" CPP
L=±28' S=0.005'/'

GRADING, DRAINAGE AND EROSION AND SEDIMENT CONTROL NOTES

1. DO NOT BEGIN CONSTRUCTION UNTIL ALL STATE AND LOCAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.
2. CONTRACTOR SHALL OBTAIN A "DIGSAFE" NUMBER AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION.
3. PROJECT SUBJECT TO EPA NPDES PHASE II. NOI, SWPPP AND MINIMUM WEEKLY INSPECTIONS REQUIRED. CONTRACTOR SHALL FILE NOI WITH EPA 2 WEEKS PRIOR TO CONSTRUCTION
4. ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH AND NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
5. ALL BENCHMARKS AND TOPOGRAPHY SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO INITIATING CONSTRUCTION.
6. UNLESS OTHERWISE AGREED IN WRITING, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING TEMPORARY BENCHMARKS (TBMS) AND PERFORMING ALL CONSTRUCTION SURVEY LAYOUT.
7. PRIOR TO CONSTRUCTION, FIELD VERIFY JUNCTIONS, LOCATIONS AND ELEVATIONS/INVERTS OF ALL EXISTING STORMWATER AND UTILITY LINES. PRESERVE AND PROTECT LINES TO BE RETAINED.
8. PERIMETER SEDIMENT CONTROLS AND CULVERT AND CATCH BASIN INLET PROTECTION MEASURES SHALL BE INSTALLED AFTER TREE CLEARING OPERATIONS HAVE CEASED AND BEFORE ANY STUMPING, GRUBBING OR OTHER EARTH DISTURBANCE.
9. GRIND STUMPS AND REUSE GRINDINGS FOR EROSION CONTROL WHERE POSSIBLE. NO STUMPS SHALL BE BURIED ON SITE.
10. TEMPORARY INLET PROTECTION MEASURES SHALL BE INSTALLED IN ALL CATCH BASINS WITHIN 100' OF THE PROJECT SITE WHEN SITE WORK WITHIN CONTRIBUTING AREAS IS ACTIVE OR SAID AREAS HAVE NOT BEEN STABILIZED.
11. NO EARTHWORK SHALL COMMENCE UNTIL ALL APPROPRIATE SEDIMENT AND EROSION CONTROL MEASURES HAVE BEEN INSTALLED. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE PROPERLY MAINTAINED IN GOOD WORKING ORDER FOR THE DURATION OF CONSTRUCTION AND THE SITE IS STABILIZED.
12. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE DESIGN STANDARDS AND SPECIFICATIONS SET FORTH BY THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES.
13. CONTRACTOR SHALL CONTROL DUST BY SPRAYING WATER, SWEEPING PAVED SURFACES, PROVIDING TEMPORARY VEGETATION, AND/OR MULCHING EXPOSED AREAS AND STOCKPILES.
14. CONTRACTOR SHALL TAKE WHATEVER MEANS NECESSARY TO PREVENT EROSION, PREVENT SEDIMENT FROM LEAVING THE SITE AND/OR ENTERING WETLANDS AND ENSURE PERMANENT SOIL STABILIZATION.
15. SEE DETAIL SHEETS FOR PERTINENT SEDIMENT AND EROSION CONTROL DETAILS AND ADDITIONAL NOTES.
16. DRAINAGE PIPE SHALL BE CORRUGATED POLYETHYLENE PIPE (CPP), TYPE ADS N-12 OR HANCOR H1-Q, OR PVC SDR 35 WHERE SPECIFIED. ALL FLARED END SECTIONS SHALL BE METAL.
17. ALL ROOF DRAIN RISERS SHALL BE LOCATED IN COORDINATION WITH THE ARCHITECTURAL PLANS TO MATCH GUTTER DOWNSPOUTS. RISERS SHALL BE SET TO FINISH GRADE PLUS 1' (MIN.).
18. PROTECTION OF SUBGRADE: THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN STABLE, DEWATERED SUBGRADES FOR FOUNDATIONS, PAVEMENT AREAS, UTILITY TRENCHES, AND OTHER AREAS DURING CONSTRUCTION. SUBGRADE DISTURBANCE MAY BE INFLUENCED BY EXCAVATION METHODS, MOISTURE, PRECIPITATION, GROUNDWATER CONTROL, AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT SUBGRADE DISTURBANCE. SUCH PRECAUTIONS MAY INCLUDE DIVERTING STORMWATER RUNOFF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAFFIC IN SENSITIVE AREAS, AND MAINTAINING AN EFFECTIVE DEWATERING PROGRAM. SOILS EXHIBITING HEAVING OR INSTABILITY SHALL BE OVER EXCAVATED TO MORE COMPETENT BEARING SOIL AND REPLACED WITH FREE DRAINING STRUCTURAL FILL. IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER, EXPOSED SUBGRADES ARE SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN GROUND. THIS WILL LIKELY REQUIRE REMOVAL OF A FROZEN SOIL CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATIONS. THE FINAL SUBGRADE ELEVATION WOULD ALSO REQUIRE AN APPROPRIATE DEGREE OF INSULATION AGAINST FREEZING.
19. IF SUITABLE, EXCAVATED MATERIALS SHALL BE PLACED AS FILL WITHIN UPLAND AREAS ONLY AND SHALL NOT BE PLACED WITHIN WETLANDS. PLACEMENT OF BORROW MATERIALS SHALL BE PERFORMED IN A MANNER THAT PREVENTS LONG TERM DIFFERENTIAL SETTLEMENT. EXCESSIVELY WET MATERIALS SHALL BE STOCKPILED AND ALLOWED TO DRAIN BEFORE PLACEMENT. FROZEN MATERIAL SHALL NOT BE USED FOR CONSTRUCTION.
20. ALL CATCH BASIN, MANHOLE AND OTHER DRAINAGE RIMS SHALL BE SET FLUSH WITH OR NO LESS THAN 0.1' BELOW FINISH GRADE. ANY RIM ABOVE SURROUNDING FINISH GRADE SHALL NOT BE ACCEPTED.
21. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE SIX (6") INCHES OF LOAM, LIMESTONE, FERTILIZER, SEED, AND MULCH USING APPROPRIATE SOIL STABILIZATION TECHNIQUES. SEE DETAILS FOR ADDITIONAL INFORMATION.
22. ALL SPOT GRADES ARE AT FINISH GRADE AND BOTTOM OF CURB WHERE APPLICABLE.
23. IN ORDER TO PROVIDE VISUAL CLARITY ON THE PLANS, DRAINAGE AND OTHER UTILITY STRUCTURES MAY NOT BE DRAWN TO SCALE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER SIZING AND LOCATION OF ALL STRUCTURES AND IS DIRECTED TO RESOLVE ANY POTENTIAL DISCREPANCY WITH THE ENGINEER PRIOR TO CONSTRUCTION.
24. ALL SWALES, STORMWATER PONDS AND THEIR CONTRIBUTING AREAS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
25. UPON COMPLETION OF CONSTRUCTION, ALL DRAINAGE INFRASTRUCTURE SHALL BE CLEANED OF ALL DEBRIS AND SEDIMENT.
26. UPON COMPLETION OF CONSTRUCTION, ALL TEMPORARY EROSION AND SEDIMENT CONTROLS SHALL BE REMOVED AND ANY AREAS DISTURBED BY THE REMOVAL SMOOTHED AND REVEGETATED.
27. TOTAL AREA OF DISTURBANCE = ±95,976 S.F., NHDES ALTERATION OF TERRAIN PERMIT NOT REQUIRED.
28. AREA OF DISTURBANCE EXCEEDS 43,560 S.F., COVERAGE UNDER EPA NPDES PHASE II CONSTRUCTION GENERAL PERMIT REQUIRED, NOI(S) TO BE FILED BY CONTRACTOR. SWPPP AND RELATED INSPECTIONS REQUIRED.
29. AREAS OF ROOF THAT WILL NOT DRAIN DIRECTLY TO THE STONE DRIP EDGE DUE TO THE PRESENCE OF SIDEWALK AT GROUND LEVEL SHALL BE EQUIPPED WITH GUTTERS WITH DOWNSPOUTS DIRECTED TO SAID DRIP EDGE.
30. RIGID INSULATION SHALL BE INSTALLED WHERE DRAIN PIPE COVER IS < 2'.
31. SEE SHEET D-6 FOR LEGEND.

P5161

ALTUS ENGINEERING, INC.
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

NOT FOR CONSTRUCTION

ISSUED FOR: REVIEW

ISSUE DATE: NOVEMBER 9, 2021

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC WORK SEESION	EBS	08/03/21
1	TAC	EBS	08/23/21
2	TAC	EBS	10/18/21
3	REV. FRONT DRAINAGE	EBS	10/28/21
4	REV. FRONT DRAINAGE	EBS	11/09/21

DRAWN BY: EBS
APPROVED BY: EDW
DRAWING FILE: 5161-SITE.dwg

SCALE:
22" x 34" - 1" = 30'
11" x 17" - 1" = 60'

OWNER:
NAVEESHA HOSPITALITY, LLC
440 BEDFORD ST.
LEXINGTON, MA 02420

APPLICANT:
MONARCH VILLAGE, LLC
P.O. BOX 365
EAST HAMPSTEAD, NH 03826

PROJECT:
MONARCH VILLAGE
TAX MAP 297, LOT 6
3548 LAFAYETTE ROAD
PORTSMOUTH, NH 03801

TITLE:
STORMWATER MANAGEMENT PLAN

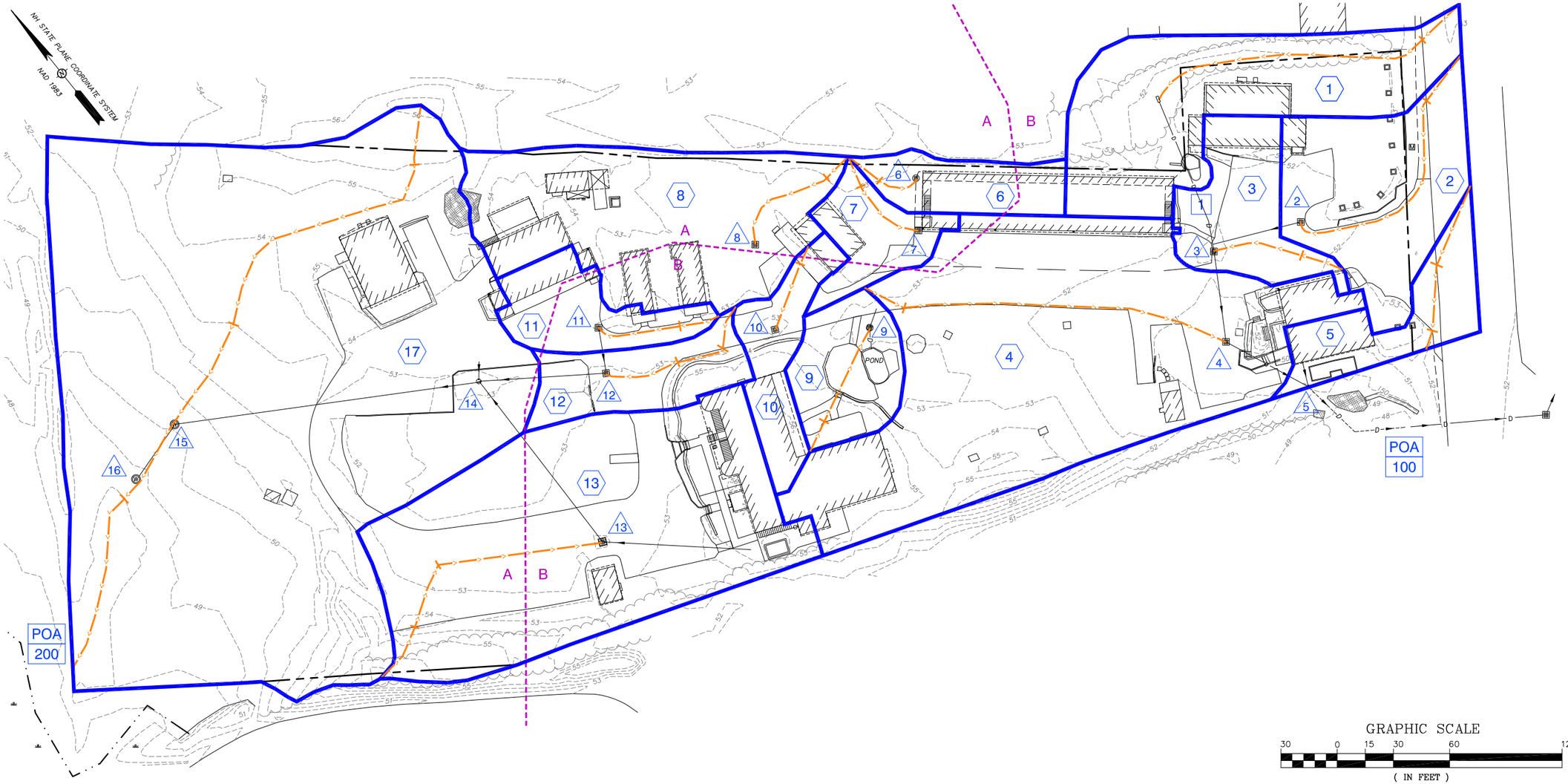
SHEET NUMBER:
C-3

Section 8

Watershed Plans

Pre-Development Drainage Area Plan
Post-Development Drainage Area Plan

ALTUS
ENGINEERING, INC.



GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)

LEGEND

- PROPERTY LINE
- 60 EXISTING CONTOUR
- D SOILS BY HYDROLOGIC SOILS GROUP
- WATERSHED BOUNDARY
- Tc PATH
- 1 1 1 SUBCATCHMENT/POND/REACH
- POA POINT OF ANALYSIS

P5161

ALTUS ENGINEERING, INC.

133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE - ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
10/18/21

NOT FOR CONSTRUCTION

ISSUED FOR: TAC

ISSUE DATE: OCTOBER 18, 2021

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC WORK SESSION	EBS	08/23/21
1	TAC	EBS	08/23/21

DRAWN BY: EBS
APPROVED BY: EDW
DRAWING FILE: 5161-SITE.dwg

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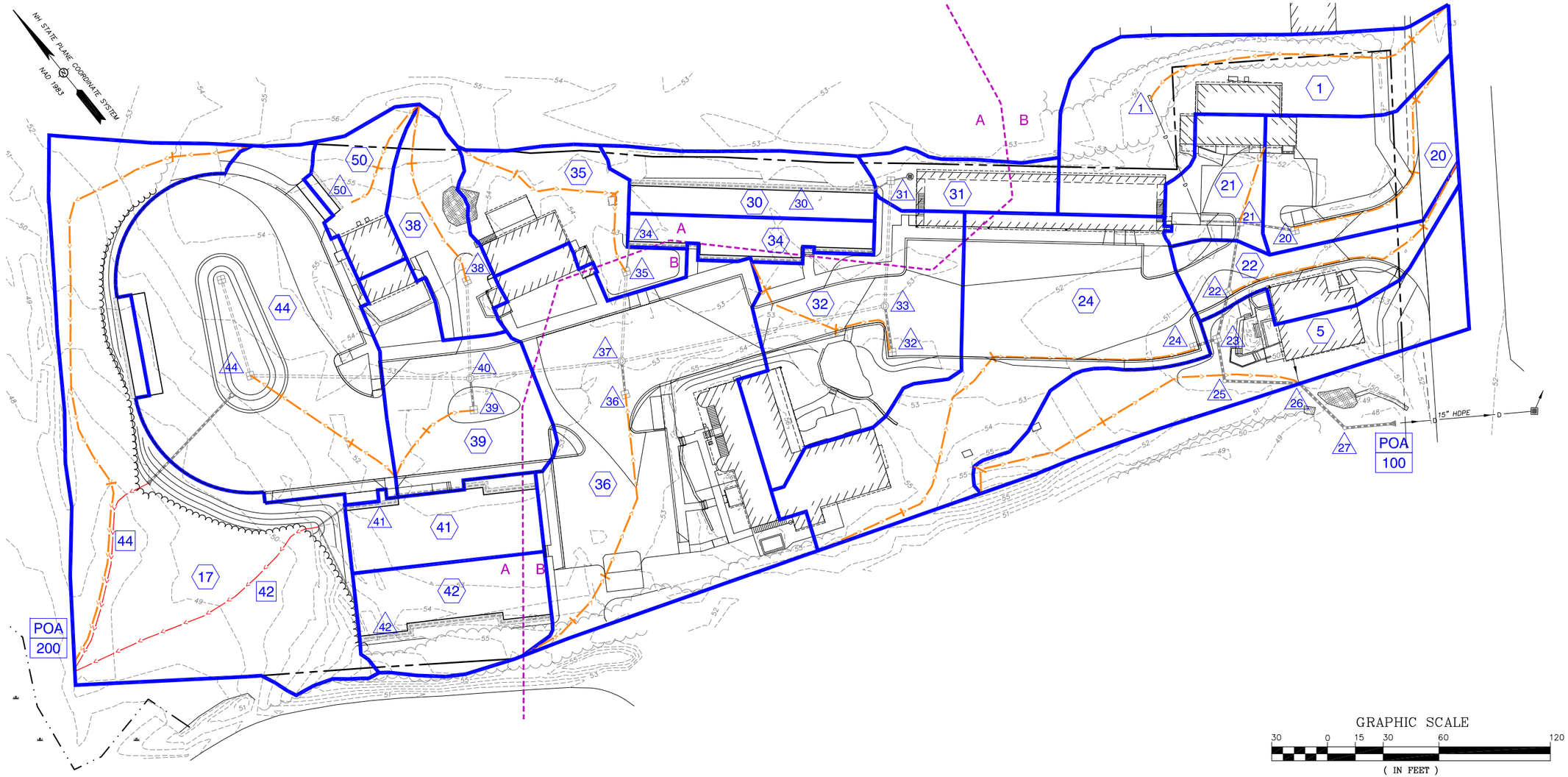
P.O. BOX 365
EAST HAMPSTEAD, NH 03826

PROJECT:
MONARCH VILLAGE
TAX MAP 297, LOT 6
3548 LAFAYETTE ROAD
PORTSMOUTH, NH 03801

TITLE:
PRE-DEVELOPMENT WATERSHED PLAN

SHEET NUMBER:
WS-1



GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)

LEGEND

- PROPERTY LINE
- 60 EXISTING CONTOUR
- 60 PROPOSED CONTOUR
- D SOILS BY HYDROLOGIC SOILS GROUP
- WATERSHED BOUNDARY
- Tc PATH / REACH
- PROPOSED GROUND SLOPE DIRECTION
- 1 1 1 SUBCATCHMENT/POND/REACH
- POA POINT OF ANALYSIS

P5161

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STATE OF NEW HAMPSHIRE
ERIC D. WEINRIEB
No. 7634
LICENSED PROFESSIONAL ENGINEER
11/9/21

NOT FOR CONSTRUCTION

ISSUED FOR:
REVIEW

ISSUE DATE:
NOVEMBER 9, 2021

REVISIONS

NO.	DESCRIPTION	BY	DATE
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1	TAC	EBS	10/18/21
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TITLE:
POST-DEVELOPMENT WATERSHED PLAN

SHEET NUMBER:
WS-2