



**Civil  
Site Planning  
Environmental  
Engineering**

133 Court Street  
Portsmouth, NH  
03801-4413

July 28, 2021

Juliet T. H. Walker, Planning Director  
City of Portsmouth Municipal Complex  
1 Junkins Avenue  
Portsmouth, New Hampshire 03801

**Re: Site Plan Review  
Margeson Bros. Building  
Assessor's Map 126, Lot 1  
64 Vaughn Mall**

Dear Juliet,

Attached please find the updated application materials for 64 Vaughn Mall. In addition to the updated plans, we are also submitting a waiver request from Site Plan Review Section 2.5.4.3.j, Photometric Plan. The downtown site is almost entirely comprised of building, not parking areas, and no lighting typical of a large commercial site is proposed. Given the nature and location of the site, we feel that a waiver is reasonable in this instance.

We are also seeking relief from Site Plan Review Section, 2.5.4.3.k, Landscaping Plan. Given that the area available for landscaping in this site is relatively minimal, we feel that a full-scale plan is not warranted in this case and respectfully ask that a waiver be granted.

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

Sincerely,

**ALTUS ENGINEERING, INC.**

A handwritten signature in red ink, appearing to read "Erik Saari", is written over the printed name.

Erik Saari  
Vice President

ebs/5042-APP-PB-CovLtr-072821b

Encl.: Application Materials

eCopy: Steve Wilson  
Shayne Forsley  
John Bosen



## 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.

Bendetson-Portsmouth Realty Trust (Owner)

Name of Owner/Applicant: Hampshire Development Corp. (Applicant) Date Submitted: March 22, 2021

Phone Number: (603) 778-9999 E-mail: spwilson56@hotmail.com

Site Address: 64 Vaughan Mall Map: 126 Lot: 1

Zoning District: CD5 Lot area: 14,097 sq. ft.

Application Requirements			
<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page or Plan Sheet/Note #)	Waiver Requested
<input checked="" type="checkbox"/>	Fully executed and signed Application form. (2.5.2.3)	Viewpoint	N/A
<input checked="" type="checkbox"/>	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			
<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
<input checked="" type="checkbox"/>	Statement that lists and describes "green" building components and systems. (2.5.3.1A)	Viewpoint	
<input checked="" type="checkbox"/>	Gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. (2.5.3.1B)	Sheet C-2, Note 4	N/A
<input checked="" type="checkbox"/>	Tax map and lot number, and current zoning of all parcels under Site Plan Review. (2.5.3.1C)	All applicable sheets	N/A
<input checked="" type="checkbox"/>	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. (2.5.3.1D)	All applicable sheets, LOA, Viewpoint	N/A

Site Plan Review Application Required Information			
<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
<input checked="" type="checkbox"/>	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. <b>(2.5.3.1E)</b>	Sheet 1 of 2	N/A
<input checked="" type="checkbox"/>	Names, addresses and telephone numbers of all professionals involved in the site plan design. <b>(2.5.3.1F)</b>	Cover Sheet	N/A
<input checked="" type="checkbox"/>	List of reference plans. <b>(2.5.3.1G)</b>	Sheet 1 of 2	N/A
<input checked="" type="checkbox"/>	List of names and contact information of all public or private utilities servicing the site. <b>(2.5.3.1H)</b>	Sheet C-1, Notes 11-15	N/A

Site Plan Specifications			
<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
<input checked="" type="checkbox"/>	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. <b>(2.5.4.1A)</b>	Required on all plan sheets	N/A
<input checked="" type="checkbox"/>	Scale: Not less than 1 inch = 60 feet and a graphic bar scale shall be included on all plans. <b>(2.5.4.1B)</b>	Required on all plan sheets	N/A
<input checked="" type="checkbox"/>	GIS data should be referenced to the coordinate system New Hampshire State Plane, NAD83 (1996), with units in feet. <b>(2.5.4.1C)</b>	Sheet 1 of 2, Note 2	N/A
<input checked="" type="checkbox"/>	Plans shall be drawn to scale. <b>(2.5.4.1D)</b>	Required on all plan sheets	N/A
<input checked="" type="checkbox"/>	Plans shall be prepared and stamped by a NH licensed civil engineer. <b>(2.5.4.1D)</b>	All applicable sheets	N/A
<input type="checkbox"/>	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. <b>(2.5.4.1E)</b>	N/A (no wetlands)	N/A
<input checked="" type="checkbox"/>	Title (name of development project), north point, scale, legend. <b>(2.5.4.2A)</b>	All applicable sheets	N/A
<input checked="" type="checkbox"/>	Date plans first submitted, date and explanation of revisions. <b>(2.5.4.2B)</b>	All applicable sheets	N/A
<input checked="" type="checkbox"/>	Individual plan sheet title that clearly describes the information that is displayed. <b>(2.5.4.2C)</b>	Required on all plan sheets	N/A
<input checked="" type="checkbox"/>	Source and date of data displayed on the plan. <b>(2.5.4.2D)</b>	Sheet C-2, Note 2	N/A

Site Plan Specifications			
<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
<input checked="" type="checkbox"/>	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." <b>(2.5.4.2E)</b>	Sheet C-2, Note 16	N/A
<input checked="" type="checkbox"/>	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." <b>(2.13.3)</b>	Sheet C-2, Note 18  Sheet C-2, Note 17	N/A
<input type="checkbox"/>	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." <b>(2.13.4)</b>	Landscaping Plans pending	N/A



Site Plan Specifications – Required Exhibits and Data			
<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
	<b>1. Existing Conditions: (2.5.4.3A)</b>		
<input checked="" type="checkbox"/>	a. Surveyed plan of site showing existing natural and built features;	Sheet 1 of 1	
<input checked="" type="checkbox"/>	b. Zoning boundaries;	Sheet C-2	
<input checked="" type="checkbox"/>	c. Dimensional Regulations;	Sheet C-2, Note 4	
<input type="checkbox"/>	d. Wetland delineation, wetland function and value assessment;	N/A (no wetlands)	
<input type="checkbox"/>	e. SFHA, 100-year flood elevation line and BFE data.	N/A (no floodplain)	
	<b>2. Buildings and Structures: (2.5.4.3B)</b>		
<input checked="" type="checkbox"/>	a. Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation;	Sheet C-2	
<input checked="" type="checkbox"/>	b. Elevations: Height, massing, placement, materials, lighting, façade treatments;	Exterior Elevations	
<input checked="" type="checkbox"/>	c. Total Floor Area;	Sheet C-2, Note 26	
<input checked="" type="checkbox"/>	d. Number of Usable Floors;	Exterior Elevations	
<input checked="" type="checkbox"/>	e. Gross floor area by floor and use.	Sheet C-2, Note 26	
	<b>3. Access and Circulation: (2.5.4.3C)</b>		
<input checked="" type="checkbox"/>	a. Location/width of access ways within site;	Sheet C-2	
<input checked="" type="checkbox"/>	b. Location of curbing, right of ways, edge of pavement and sidewalks;	Sheet C-2	
<input checked="" type="checkbox"/>	c. Location, type, size and design of traffic signing (pavement markings);	Sheet C-2	
<input checked="" type="checkbox"/>	d. Names/layout of existing abutting streets;	Sheet C-2	
<input checked="" type="checkbox"/>	e. Driveway curb cuts for abutting prop. and public roads;	Sheet C-2	
<input type="checkbox"/>	f. If subdivision; Names of all roads, right of way lines and easements noted;	N/A (site plan)	
<input checked="" type="checkbox"/>	g. AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	Viewpoint (WB-40 per TAC)	
	<b>4. Parking and Loading: (2.5.4.3D)</b>		
<input checked="" type="checkbox"/>	a. Location of off street parking/loading areas, landscaped areas/buffers;	Sheet C-2	
<input checked="" type="checkbox"/>	b. Parking Calculations (# required and the # provided).	Sheet C-2, Note 5	
	<b>5. Water Infrastructure: (2.5.4.3E)</b>		
<input checked="" type="checkbox"/>	a. Size, type and location of water mains, shut-offs, hydrants & Engineering data;	Sheet C-4	
<input type="checkbox"/>	b. Location of wells and monitoring wells (include protective radii).	N/A (no wells)	
	<b>6. Sewer Infrastructure: (2.5.4.3F)</b>		
<input checked="" type="checkbox"/>	a. Size, type and location of sanitary sewage facilities & Engineering data.	Sheet C-4	
	<b>7. Utilities: (2.5.4.3G)</b>		
<input checked="" type="checkbox"/>	a. The size, type and location of all above & below ground utilities;	Sheet C-4	
<input checked="" type="checkbox"/>	b. Size type and location of generator pads, transformers and other fixtures.	Sheet C-4	

Site Plan Specifications – Required Exhibits and Data			
<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
<input type="checkbox"/>	<b>8. Solid Waste Facilities: (2.5.4.3H)</b>		
<input checked="" type="checkbox"/>	a. The size, type and location of solid waste facilities.	Sheet C-2, Note 20	
	<b>9. Storm water Management: (2.5.4.3I)</b>		
<input checked="" type="checkbox"/>	a. The location, elevation and layout of all storm-water drainage.	Sheet C-3	
	<b>10. Outdoor Lighting: (2.5.4.3J)</b>		
<input type="checkbox"/>	a. Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and; b. photometric plan.	N/A (no onsite parking)	
<input type="checkbox"/>	<b>11. Indicate where dark sky friendly lighting measures have been implemented. (10.1)</b>	N/A (no onsite parking)	
	<b>12. Landscaping: (2.5.4.3K)</b>		
<input type="checkbox"/>	a. Identify all undisturbed area, existing vegetation and that which is to be retained;	N/A (no landscaping on site)	
<input checked="" type="checkbox"/>	b. Location of any irrigation system and water source.	Sheet C-4	
	<b>13. Contours and Elevation: (2.5.4.3L)</b>		
<input checked="" type="checkbox"/>	a. Existing/Proposed contours (2 foot minimum) and finished grade elevations.	Sheet C-3	
	<b>14. Open Space: (2.5.4.3M)</b>		
<input checked="" type="checkbox"/>	a. Type, extent and location of all existing/proposed open space.	Sheet C-2	
<input checked="" type="checkbox"/>	<b>15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)</b>	Sheet 2 of 2	
<input checked="" type="checkbox"/>	<b>16. Location of snow storage areas and/or off-site snow removal. (2.5.4.3O)</b>	Sheet C-2, Note 25	
<input checked="" type="checkbox"/>	<b>17. Character/Civic District (All following information shall be included): (2.5.4.3Q)</b>		
	a. Applicable Building Height (10.5A21.20 & 10.5A43.30);	Exterior Elevations	
	b. Applicable Special Requirements (10.5A21.30);	Exterior Elevations	
	c. Proposed building form/type (10.5A43);	Exterior Elevations	
	d. Proposed community space (10.5A46).	Sheet C-2	

Other Required Information			
<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
<input type="checkbox"/>	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) <b>(3.2.1-2)</b>	Not requested by TAC	
<input checked="" type="checkbox"/>	Indicate where Low Impact Development Design practices have been incorporated. <b>(7.1)</b>	None (site is 100% impervious)	
<input checked="" type="checkbox"/>	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. <b>(7.3.1)</b>	Not in a wellhead area	
<input checked="" type="checkbox"/>	Indicate where measures to minimize impervious surfaces have been implemented. <b>(7.4.3)</b>	Sheet C-2	
<input checked="" type="checkbox"/>	Calculation of the maximum effective impervious surface as a percentage of the site. <b>(7.4.3.2)</b>	Sheet C-2, note 4	
<input type="checkbox"/>	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) <b>(7.4.4.1)</b>		Waiver

Final Site Plan Approval Required Information			
<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
<input checked="" type="checkbox"/>	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. <b>(2.5.3.2A)</b>	Variance Pending	
<input checked="" type="checkbox"/>	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. <b>(2.5.3.2B)</b>	Waiver Sheet C-4  None required at this time  None required at this time None required at this time Waiver None required at this time None required at this time None required at this time	Waiver       Waiver

**Final Site Plan Approval Required Information**

<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
<input type="checkbox"/>	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	
<input checked="" type="checkbox"/>	A list of any required state and federal permit applications required for the project and the status of same. (2.5.3.2E)	N/A (none required)	

Applicant's Signature:  Date: March 22, 2021  
Erik Saari, Agent

**“Green” Statement**  
**Assessor’s Map 126 Lot 1**  
**Margeson Bros. Building**  
**64 Vaughan Mall**  
**Altus Project 5042**

Pursuant to Section 2.5.3.1(a) of the Site Plan Review Regulations, Altus Engineering, Inc. (Altus) respectfully submits the following list of the project’s “green” components for the renovation of the Margeson Bros. building at 64 Vaughan Mall:

- The renovation will meet or exceed all applicable current energy codes.
- New accessibility features will be installed to meet or exceed the ADA.
- The construction of a new sidewalk from Vaughan Mall to the BankProv building will enhance pedestrian connectivity and safety.
- All runoff that is currently directed to the municipal sanitary sewer will be redirected to the stormwater drainage system.
- Large granite blocks removed from the basement of the building will be reused on site to the greatest extent possible.
- The site plan increases green space on the site and in the adjacent Worth parking lot.

ebs/5042-APP-PB-GreenStatment-041921

# 64 VAUGHAN MALL BUILDING RESTORATION

**Owner:**

64 Vaughan Mall, LLC

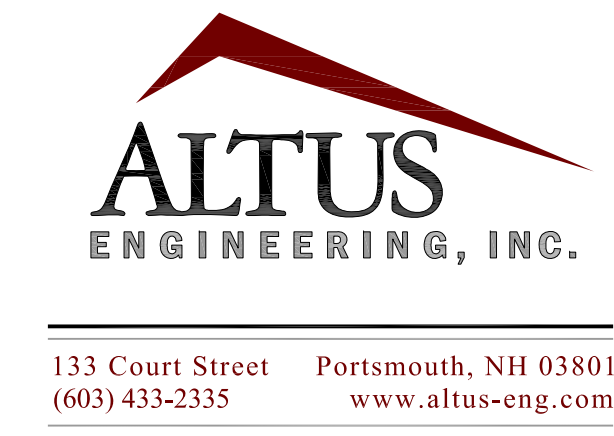
41 Industrial Drive  
Exeter, NH 03833

**Applicant:**

Hampshire  
Development Corp.

41 Industrial Drive  
Exeter, NH 03833  
(603) 778-9999

**Civil Engineer:**



**Architect:**

JSA Design

273 Corporate Drive, Suite 100  
Portsmouth, NH 03801  
(603) 436-2551

**Surveyor:**

James Verra  
& Associates Inc.  
LAND SURVEYORS  
101 SHATTUCK WAY, SUITE 8  
Newington, New Hampshire  
03801-7876  
Tel 603-436-3557

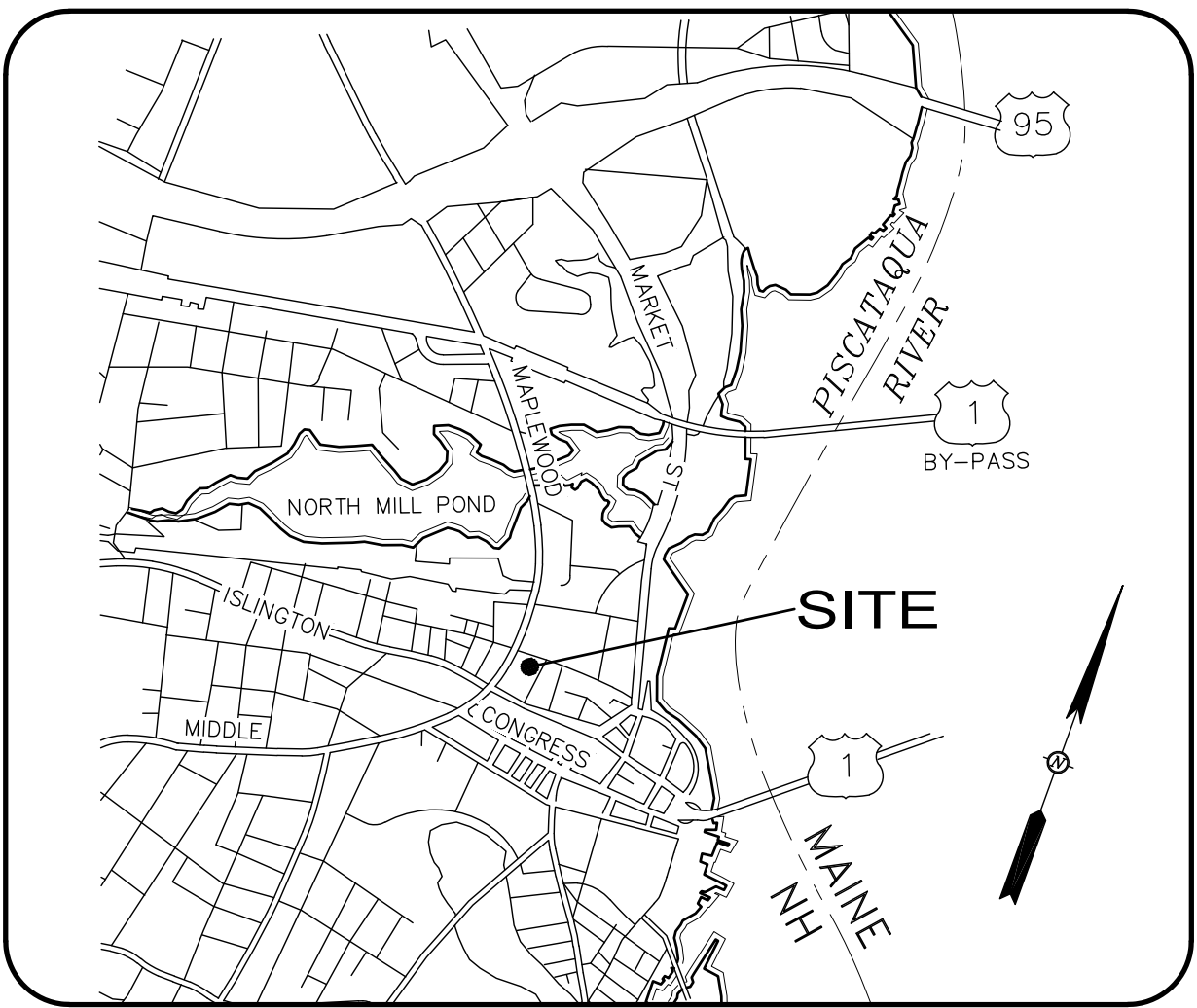
64 Vaughan Mall,  
Portsmouth, New Hampshire

Assessor's Parcel 126, Lot 1

Issued for: Planning Board

Plan Issue Date:

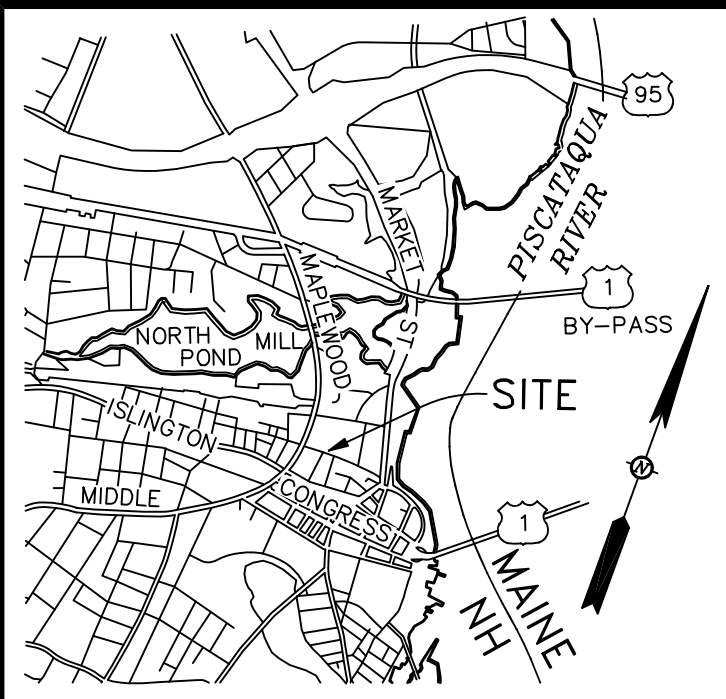
July 28, 2021



LOCUS MAP  
Not to Scale

Sheet Index Title	Sheet No.:	Rev.	Date
Existing Conditions Plan	1 of 1	1	04/19/20
Lot Line Adjustment Plan	C-1	1	07/28/21
Demolition Plan	C-2	8	07/28/21
Site Plan	C-3	10	07/28/21
Grading and Drainage Plan	C-4	8	07/28/21
Utilities Plan	C-5	8	07/28/21
Detail Sheet	D-1	3	06/21/21
Detail Sheet	D-2	5	07/28/21
Detail Sheet	D-3	2	03/22/21
Detail Sheet	D-4	2	03/22/21
Exterior Elevations	A3		07/28/21
Exterior Elevations	A4		07/28/21
Perspective Views	A5		07/28/21





TEMPORARY BENCHMARK TABLE

TBM#	DESCRIPTION	ELEV.
1	SURVEY NAIL SET IN TOP OF GRANITE CURBING	12.81
2	BOLT W/ "X" OUT - HYDRANT TOP FLANGE	13.58
3	SURVEY NAIL SET IN TOP OF TRANSFORMER PAD	17.71
4	TOP RIGHT OUTSIDE CORNER OF CONCRETE STEP	15.62

DRAIN TABLE

CB# 1	RIM EL= 17.62
CB# 2	RIM EL= 13.77
(1) INV OUT 12"RCP= 10.12	
CB# 3	RIM EL= 11.98
(1) INV OUT 12"HDPE= 7.74	
CB# 4	RIM EL= 9.57
(1) INV OUT 12"PVC= 7.32±	
W/ TRAP ON OUTLET	

CB# 3763	RIM EL= 14.71
(1) INV IN 12"HDPE= 12.03	
CB# 3764	RIM EL= 15.05
WATER LEVEL= 11.10	
CB# 3765	RIM EL= 15.35
PLUGGED 13.5±	

CB# 3766	RIM EL= 17.59
CB# 25851	RIM EL= 16.26
(1) INV IN 12"HDPE= 12.08	
(2) INV OUT 12"HDPE= 12.01	

CB# 25852	RIM EL= 16.81
(1) INV IN 10"HDPE= 12.29	
(2) INV OUT 12"HDPE= 12.26	
CB# 25853	RIM EL= 17.12
(1) INV OUT 10"HDPE= 12.78	

DMH# 1	RIM EL= 13.75
(1) 12"RCP (PLUGGED)	
(2) INV IN 12"RCP= 9.76	
(3) INV IN 18"RCP= 8.75	
(4) 12"RCP (PLUGGED)	
(5) INV OUT 12"RCP= 8.77	

DMH# 2	RIM EL= 9.68
(1) INV IN 6"PVC= 7.10	
(2) INV OUT 12"RCP= 6.99	

DMH# 5195	RIM EL= 12.56
(1) INV IN 12"HDPE= 6.81	
(2) INV IN 12"HDPE= 6.11	
(3) INV OUT 12"HDPE= 5.92	

DMH# 5197	RIM EL= 10.14
(1) INV IN 12"HDPE= 6.79	
(2) INV IN 12"RCP= 6.83	
(3) CL FLOW 36"RCP= 5.26	

DMH# 5198	RIM EL= 12.50
(1) INV IN 12"HDPE= 5.95	
(2) INV IN 12"RCP= 7.60	
(3) CL FLOW 36"RCP= 5.85	

DMH# 5202	RIM EL= 15.14
(1) INV IN 12"RCP= 11.47	
(2) INV IN 12"RCP= 11.51	
(3) INV IN 18"RCP= 9.96	
(4) INV IN 12"RCP= 11.60	
(5) INV OUT 18"RCP= 9.91	

DMH# 5203	RIM EL= 17.38
(1) INV IN 12"DI= 13.82	
(2) INV IN 15"DI= 11.30	
(3) INV IN 12"DI= 11.63	
(4) INV OUT 15"DI= 11.32	

DMH# 25178	RIM EL= 12.66
(1) INV IN 12"HDPE= 7.48	
(2) 12"HDPE W/ TRAP	

SEWER TABLE

SMH# 1	RIM EL= 11.80
(1) INV OUT 4"PVC FM= 7.47	
SMH# 2	RIM EL= 11.53
(COULD NOT OPEN)	

SMH# 1567	RIM EL= 12.96
(1) PLUGGED	
(2) INV IN 12"RCP= 5.19	
(3) INACTIVE	
(4) INV OUT 12"____= 4.71	

SMH# 1568	RIM EL= 12.86
(1) INV IN 8"PVC= 4.88	
(2) INV IN 12"____= 4.68	
(3) INV IN 24"RCP= 5.05	
(4) INV OUT 12"RCP= 6.83	

SMH# 1570	RIM EL= 10.16
(2) INV IN 15"RCP= 3.74	

SMH# 2306	RIM EL= 13.84
(1) INV IN 10"PVC= 6.86	
(2) INV IN 24"RCP= 8.88	
(3) INV IN 6"PVC= 11.24	
(4) INV OUT 24"RCP= 6.83	

(23" CSU PER DPW)	
SMH# 2307	RIM EL= 15.50
CL FLOW= 10.66	
(OVAL RCP 15" W X 18" H)	
(23" CSU PER DPW)	

LEGEND:

110-5	TAX SHEET - LOT NUMBER
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
RCSC	ROCKINGHAM COUNTY SUPERIOR COURT
VGC	VERTICAL FACED GRANITE CURB
RWBL	MODULAR BLOCK RETAINING WALL
Ⓚ	PARK METER KIOSK
Ⓚ	BOLLARD
Ⓚ	SIGN
Ⓚ	HANDICAP SPACE
Ⓚ	LIGHT POLE
Ⓚ	UTILITY POLE WITH ARM & LIGHT
Ⓚ	ELECTRICAL MANHOLE
Ⓚ	ELECTRICAL CONDUIT
Ⓚ	ELECTRIC METER
Ⓚ	GAS SHUT OFF
Ⓚ	GAS VALVE
Ⓚ	WATER GATE VALVE
Ⓚ	WATER SHUT OFF VALVE
Ⓚ	HYDRANT
Ⓚ	FIRE CONNECTION
Ⓚ	CATCH BASIN
Ⓚ	DRAIN MANHOLE
Ⓚ	ROOF DOWNSPOUT
Ⓚ	SEWER MANHOLE
Ⓚ	DECIDUOUS TREE
Ⓚ	CONIFEROUS SHRUB
Ⓚ	DECIDUOUS SHRUB
Ⓚ	WATER LINE
Ⓚ	SEWER LINE
Ⓚ	DRAIN LINE
Ⓚ	GAS LINE
Ⓚ	UNDERGROUND ELECTRIC
Ⓚ	UNDERGROUND COMMUNICATIONS
Ⓚ	CEMENT CONCRETE
Ⓚ	BRICK PAVERS
Ⓚ	RETAINING WALL
Ⓚ	LANDSCAPED AREA
Ⓚ	SPOT GRADE
Ⓚ	SEE SIGNAGE TABLE
Ⓚ	SEE BUILDING ELEVATION TABLE
Ⓚ	EXISTING TRAFFIC FLOW SYMBOL

ABUTTERS LIST

MAP-LOT	OWNER OF RECORD	DEED REF.
117-2	JAMER REALTY, INC. 80 HANOVER ST, PORTSMOUTH, NH 03801	3093/1283
117-4	SJW LTD C/O GENE FISK & ASSOCIATES, LLC 4 GREENLEAF WOODS DR, SUITE 102 PORTSMOUTH, NH 03801	2574/495
125-1	HANOVER APARTMENTS, LLC (195 HANOVER ST #1) C/O CATHARTES PRIVATE INVESTMENTS 100 SUMMER STREET, SUITE 1600, BOSTON, MA 02110	N/A
125-1	PORTWALK HI, LLC (195 HANOVER ST #2) C/O CATHARTES PRIVATE INVESTMENTS 100 SUMMER STREET, SUITE 1600, BOSTON, MA 02110	N/A
126-1A	NORTHERN TIER REAL ESTATE ACQUISITION & DEVELOPMENT, LLC C/O JOHN J. DUSSI 4 MOODY LN, WEST NEWBURY, MA 01985	4814/563
126-3	CITY OF PORTSMOUTH 1 JUNKINS AVE, PORTSMOUTH, NH 03801	4701/534

NOTES:

- OWNER OF RECORD..... 64 VAUGHAN MALL, LLC  
ADDRESS..... 41 INDUSTRIAL DRIVE, UNIT 20, EXETER, NH 03833  
DEED REFERENCE..... 6163/19  
TAX SHEET / LOT..... 126-1
- THIS PLAN IS BASED ON A FIELD SURVEY BY JAMES VERRA AND ASSOCIATES, INC. 3/2014, 4/2017 & 12/2019. ON SITE CONTROL ESTABLISHED USING SURVEY GRADE GPS UNITS. HORIZONTAL DATUM: NAD 1983 (1986 ADJUSTMENT) PRIMARY BM: NHDOT 379-0150 (PORTSMOUTH TRAFFIC CIRCLE) VERTICAL DATUM: NAVD 1988 PRIMARY BM: CITY CONTROL POINT "ALBA"
- CONTRACTOR TO VERIFY SITE BENCHMARKS BY LEVELING BETWEEN 2 BENCHMARKS PRIOR TO THE SETTING OR ESTABLISHMENT OF ANY GRADES/ELEVATIONS. DISCREPANCIES ARE TO BE REPORTED TO JAMES VERRA AND ASSOC., INC.
- 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.
- SEE ROCKINGHAM COUNTY SUPERIOR COURT NOTICE OF DECISION DATED 3/18/2015, RCRD BOOK 5626, PAGE 1529. ALSO SEE STIPULATION DATED 1/30/2015, RCRD BOOK 5626, PAGE 1531.
- THE SUBJECT TRACT LIES IN ZONE X (UNSHADED), AS SHOWN ON FLOOD INSURANCE RATE MAP 33015C0259F, EFFECTIVE DATE JANUARY 29, 2021, BY FEMA.

REFERENCE PLANS:

- PLAT OF LAND, 64 VAUGHAN MALL, PORTSMOUTH, N.H., FOR BENDETSON-PORTSMOUTH REALTY TRUST, REVISED TO 9/17/2018, RCRD PLAN D-41080.
- CONDOMINIUM SITE PLAN, THE PROVIDENT CONDOMINIUM, 25 MAPLEWOOD AVENUE, PORTSMOUTH, N.H., FOR 25 MAPLEWOOD AVENUE, LLC., DATED 12/20/2019, RCRD PLAN D-41922.
- EXISTING CONDITIONS PLAN, PROPOSED SITE DEVELOPMENT PLANS, 25 MAPLEWOOD AVENUE, PORTSMOUTH, N.H., BY JAMES VERRA AND ASSOCIATES, INC., DATED 4/18/2017, NOT RECORDED.

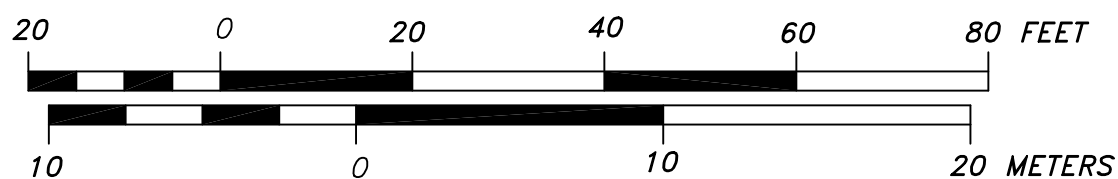


SIGNAGE TABLE

KEY	DESCRIPTION
A	HANDICAP PARKING
B	3 HOUR PARKING/PAY AT KIOSK
C	RESERVED PARKING 7AM-7PM
D	PAID PARKING 24/7
E	STOP

BUILDING ELEVATION TABLE

KEY	DESCRIPTION	ELEV.
A	FF CONCRETE AT ENTRANCE	15.17
B	FF CONCRETE AT LOADING DOCK	15.12
C	FF CONCRETE AT LOADING DOCK	15.09
D	CONCRETE THRESHOLD AT ENTRY	12.56
E	CONCRETE THRESHOLD AT ENTRY	12.13
F	CONCRETE THRESHOLD AT ENTRY	18.91
G	ALUMINUM THRESHOLD AT ENTRY	15.14
H	TOP OF CONCRETE LANDING	15.62
I	ALUMINUM THRESHOLD AT ENTRY	16.55
J	TOP OF CONCRETE LANDING	12.69
K	INVERT OUT 6"PVC CULVERT	12.56
L	TOP OF CONCRETE BASEMENT	6.95
M	TOP OF CONCRETE BASEMENT FLOOR	6.64
N	TOP OF CONCRETE BASEMENT FLOOR	6.42
O	TOP OF CONCRETE BASEMENT FLOOR	7.17
P	TOP OF CONCRETE BASEMENT FLOOR	6.92
Q	TOP OF CONCRETE BASEMENT FLOOR	6.67
R	TOP OF CONCRETE BASEMENT FLOOR	7.07
S	TOP OF CONCRETE BASEMENT FLOOR	6.77
T	TOP OF CONCRETE BASEMENT FLOOR	6.26



SURVEYOR:

James Verra and  
Associates, Inc.  
LAND SURVEYORS

101 SHATTUCK WAY - SUITE 8  
NEWINGTON, N.H. 03801- 7876  
603-436-3557  
JOB NO: 23524-A  
PLAN NO: 23524-A

ENGINEER:

**ALTUS**  
ENGINEERING, INC.

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

ISSUED FOR:

APPROVAL

ISSUE DATE:

APRIL 19, 2021

REVISIONS

NO.	DESCRIPTION	BY	DATE
1	APPROVAL	JV	4/19/21

DRAWN BY:

JCS

APPROVED BY:

JV

DRAWING FILE:

23524-A.DWG

SCALE:

22" x 34" - 1" = 20'  
11" x 17" - 1" = 40'

OWNER:

64 VAUGHAN MALL, LLC  
41 INDUSTRIAL DRIVE  
UNIT 20  
EXETER, NH 03833

ASSESSOR'S PARCEL  
126-1

PROJECT:

PROPOSED SITE  
DEVELOPMENT  
PLANS

64 VAUGHAN MALL  
PORTSMOUTH, N.H.

ASSESSOR'S PARCEL  
126-1

TITLE:

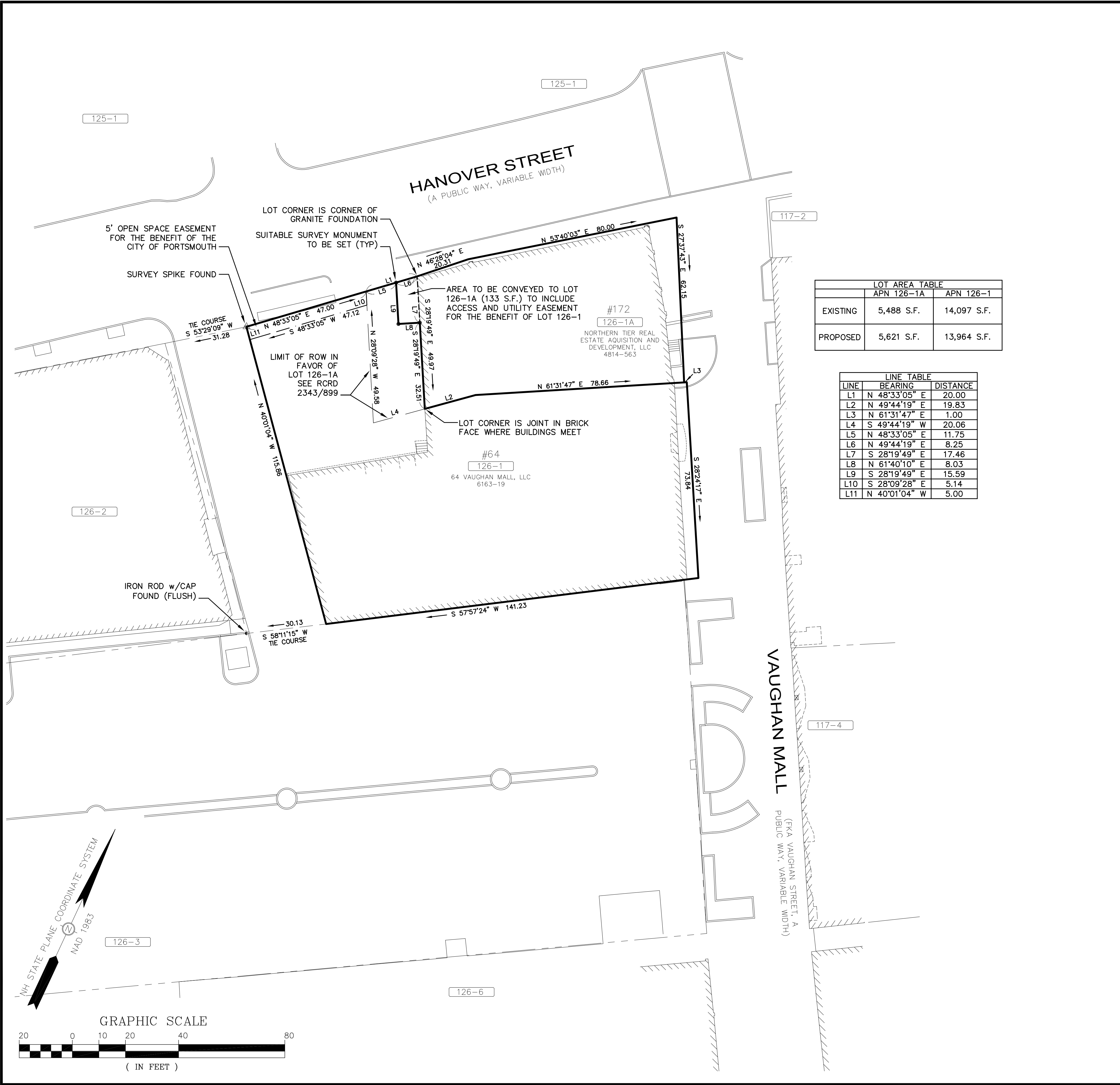
EXISTING  
CONDITIONS  
PLAN

SHEET NUMBER:

1 OF 1

P5042





NOTES

1. OWNER OF RECORD: 64 VAUGHAN MALL, LLC  
ADDRESS: 41 INDUSTRIAL DRIVE, EXETER, NH 03833  
DEED REFERENCE: 6163/19  
TAX SHEET / LOT: 126/1
- OWNER OF RECORD: NORTHERN TIER REAL ESTATE ACQUISITION & DEVELOPMENT, LLC C/O JOHN J. DUSSI  
ADDRESS: 4 MOODY LANE, WEST NEWBURY, MA 01985  
DEED REFERENCE: 4814/563  
TAX SHEET / LOT: 126/1A
2. THIS PLAN IS BASED ON A FIELD SURVEY BY JAMES VERRA AND ASSOCIATES, INC. PERFORMED 3/2014, 4/2017 & 12/2019. ON SITE CONTROL ESTABLISHED USING SURVEY GRADE GPS UNITS. HORIZONTAL DATUM: NAD 1983 (1986 ADJUSTMENT) PRIMARY BM: NHDOT 379-0150 (PORTSMOUTH TRAFFIC CIRCLE)
3. SEE ROCKINGHAM COUNTY SUPERIOR COURT NOTICE OF DECISION DATED 3/18/2015, RCRD BOOK 5626, PAGE 1529. ALSO SEE STIPULATION DATED 1/30/2015, RCRD BOOK 5626, PAGE 1531.
4. THE SUBJECT TRACT LIES IN ZONE X (UNSHADED), AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN, AS SHOWN ON FLOOD INSURANCE RATE MAP 33015CO259E, EFFECTIVE DATE MAY 17, 2005, BY FEMA.
5. ZONE: CD5 (CHARACTER 5)  
OVERLAY: DOWNTOWN OVERLAY DISTRICT  
HISTORIC OVERLAY DISTRICT
6. **DIMENSIONAL REQUIREMENTS:**  
FRONT YARD: 5' MAX.  
SECONDARY FRONT YARD: 5' MAX.  
SIDE YARD: 5' NR (NO REQUIREMENT)  
REAR YARD: 5' NR (NO REQUIREMENT)  
FRONT LOT LINE BUILDOUT: 80% WIDTH MIN.  
SECONDARY BUILDOUT: 80% WIDTH MIN.  
MAX. BUILDING COVERAGE: 95%  
MAX. BUILDING FOOTPRINT: 20,000 S.F.  
MIN. LOT AREA: NR  
LOT AREA/DWELLING: NR  
MIN. OPEN SPACE: 5%  
BUILDING HEIGHT: 3 STORIES OR 40'

LOT AREA TABLE		
	APN 126-1A	APN 126-1
EXISTING	5,488 S.F.	14,097 S.F.
PROPOSED	5,621 S.F.	13,964 S.F.

LINE TABLE		
LINE	BEARING	DISTANCE
L1	N 48°33'05" E	20.00
L2	N 49°44'19" E	19.83
L3	N 61°31'47" E	1.00
L4	S 49°44'19" W	20.06
L5	N 48°33'05" E	11.75
L6	N 49°44'19" E	8.25
L7	S 28°19'49" E	17.46
L8	N 61°40'10" E	8.03
L9	S 28°19'49" E	15.59
L10	S 28°09'28" E	5.14
L11	N 40°01'04" W	5.00

REFERENCE PLANS:

1. PLAT OF LAND, 64 VAUGHAN MALL, PORTSMOUTH, N.H., FOR BENDETSON-PORTSMOUTH REALTY TRUST, REVISED TO 9/17/2018, RCRD PLAN D-41080.
2. CONDOMINIUM SITE PLAN, THE PROVIDENT CONDOMINIUM, 25 MAPLEWOOD AVENUE, PORTSMOUTH, N.H., FOR 25 MAPLEWOOD AVENUE, LLC., DATED 12/20/2019, RCRD PLAN D-41922.
3. EXISTING CONDITIONS PLAN, PROPOSED SITE DEVELOPMENT PLANS, 25 MAPLEWOOD AVENUE, PORTSMOUTH, N.H., BY JAMES VERRA AND ASSOCIATES, INC., DATED 4/18/2017, NOT RECORDED.

ABUTTERS LIST

MAP-LOT	OWNER OF RECORD	DEED REF.
117-2	JAMER REALTY, INC. 80 HANOVER ST, PORTSMOUTH, NH 03801	3093/1283
117-4	SWJ LTD C/O GENE FISK & ASSOCIATES, LLC 4 GREENLEAF WOODS DR, SUITE 102 PORTSMOUTH, NH 03801	2574/495
125-1	PARADE OFFICE, LLC C/O CATHARTES PRIVATE INVESTMENTS 31 MILK STREET, SUITE 501, BOSTON, MA 02109	N/A
126-2	25 MAPLEWOOD AVENUE, LLC 41 INDUSTRIAL DR, EXETER, NH 03833	6068/2230
126-3	CITY OF PORTSMOUTH 1 JUNKINS AVE, PORTSMOUTH, NH 03801	4701/534

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN

DATE

James Verra

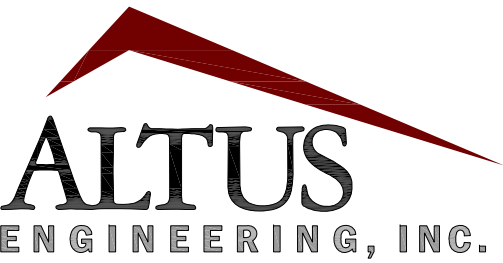
and Associates Inc.

LAND SURVEYORS

101 SHATTUCK WAY, SUITE 8  
Newington, New Hampshire  
03801-7876

Tel 603-436-3557

JOB NO.: 23524-A  
PLAN NO.: 23524-A2



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

NOT FOR CONSTRUCTION

ISSUED FOR:

PLANNING BOARD

ISSUE DATE:

JULY 28, 2021

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC	EBS	06/21/21
1	PLANNING BOARD	EBS	07/28/21

DRAWN BY:

EBS

APPROVED BY:

EDW

DRAWING FILE:

5042-SITE.dwg

SCALE:

22"x34" 1" = 20'

11"x17" 1" = 40'

OWNER:

64 VAUGHAN MALL, LLC  
41 INDUSTRIAL DRIVE  
EXETER, NH 03833

NORTHERN TIER REAL  
ESTATE ACQUISITION  
& DEVELOPMENT, LLC  
c/o JOHN DUSSI  
4 MOODY LANE  
WEST NEWBURY, MA 01985

APPLICANT:

HAMPSHIRE  
DEVELOPMENT CORP.

41 INDUSTRIAL DRIVE  
EXETER, NH 03833

PROJECT:

64 VAUGHAN MALL  
BUILDING RESTORATION

TAX MAP 126, LOT 1

64 VAUGHAN MALL  
PORTSMOUTH, NH 03801

TITLE:

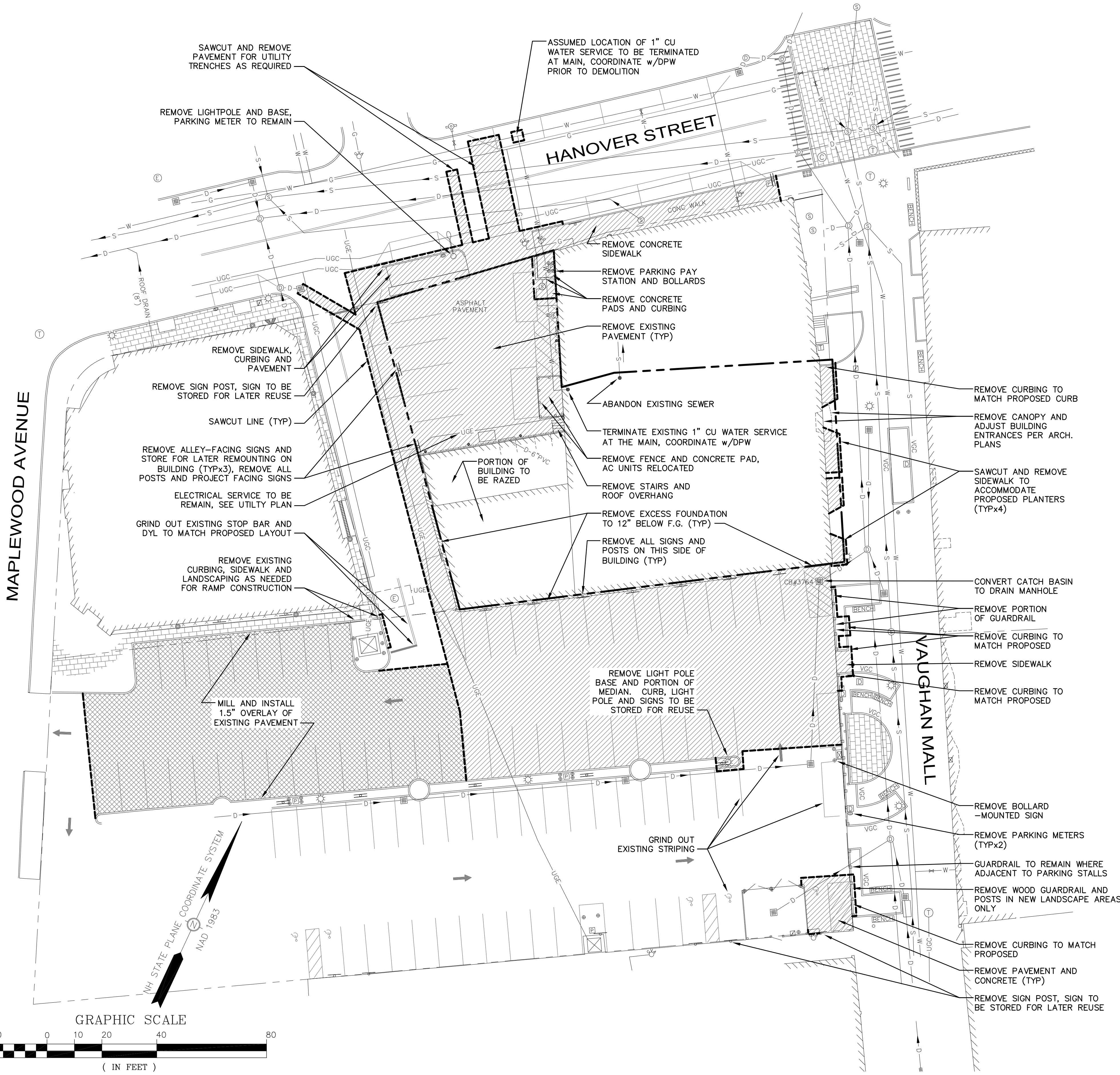
LOT LINE  
ADJUSTMENT PLAN

SHEET NUMBER:

C-1

P5042



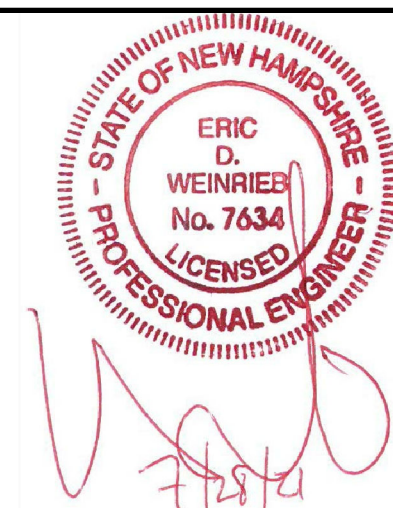


DEMOLITION NOTES

1. CITY DEMOLITION PERMIT REQUIRED PRIOR TO ANY 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. CONTRACTOR SHALL OBTAIN AN ENCUMBRANCE PERMIT FROM THE CITY OF PORTSMOUTH TO USE PORTIONS OF THE ALLEYWAY, PUBLIC STREETS AND THE WORTH LOT DURING CONSTRUCTION AS STAGING AND CONSTRUCTION AREAS.
8. SEE EROSION CONTROL PLANS FOR EROSION AND SEDIMENT CONTROL MEASURES THAT SHALL BE IN PLACE PRIOR TO DEMOLITION ACTIVITIES.
9. ALL MATERIALS SCHEDULED FOR DEMOLITION OR REMOVAL ON PRIVATE PROPERTY SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. GRANITE CURBING AND BRICK SCHEDULED TO BE REMOVED FROM PUBLIC PROPERTY SHALL BE SALVAGED TO PORTSMOUTH DPW.
10. ALL MATERIAL SCHEDULED TO BE REMOVED SHALL BE LEGALLY DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS/CODES.
11. WATER: PORTSMOUTH DPW, JIM TOW, (603) 427-1530.
12. TELECOMMUNICATIONS: FAIRPOINT, JOE CONSIDINE, (603) 427-5525.
13. CABLE: COMCAST, MIKE COLLINS, (603) 679-5695, EXT. 1037.
14. ELECTRICAL: EVERSOURCE, MICHAEL BUSBY, (603) 332-4227, EXT. 5555334.
15. GAS: UNITIL, DAVID BEAULIEU, (603) 294-5144.
16. 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.
17. ALL WATER MAIN AND SERVICE DISCONNECTIONS SHALL CONFORM TO PORTSMOUTH DPW STANDARDS.
18. NO BURNING SHALL BE PERMITTED PER LOCAL REGULATIONS.
19. HAZARDOUS MATERIALS ENCOUNTERED DURING DEMOLITION AND CONSTRUCTION ACTIVITIES SHALL BE ABATED IN STRICT ACCORDANCE WITH ALL APPLICABLE STATE AND LOCAL REGULATIONS.
20. AT NO TIME SHALL ANY UTILITY SERVICE OR VEHICULAR ACCESS TO ABUTTING PROPERTIES BE COMPLETELY INTERRUPTED UNLESS A FULL SHUTDOWN IS COORDINATED WITH ALL AFFECTED PARTIES AND UTILITY PROVIDER(S).
21. 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.
22. THIS PLAN IS INTENDED TO PROVIDE MINIMUM GUIDELINES FOR THE DEMOLITION OF EXISTING SITE FEATURES. UNLESS OTHERWISE NOTED TO REMAIN, 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.

133 Court Street  
(603) 433-2335

Portsmouth, NH 03801  
www.altus-eng.com



NOT FOR CONSTRUCTION

ISSUED FOR: PLANNING BOARD

ISSUE DATE: JULY 28, 2021

REVISIONS		
NO.	DESCRIPTION	BY DATE
0	TAC WORK SESSION	EBS 05/05/20
1	TAC WORK SESSION	EBS 07/07/20
2	TAC	EBS 10/19/20
3	PB CONSULTATION	EBS 11/02/20
4	TAC	EBS 03/22/21
5	TAC	EBS 04/19/21
6	TAC	EBS 05/19/21
7	TAC	EBS 06/21/21
8	PLANNING BOARD	EBS 07/28/21

DRAWN BY: EBS

APPROVED BY: EDW

DRAWING FILE: 5042-SITE.dwg

SCALE: 22"x34" 1" = 20'

11"x17" 1" = 40'

OWNER:

64 VAUGHAN MALL, LLC

41 INDUSTRIAL DRIVE  
EXETER, NH 03833

APPLICANT:

HAMPSHIRE DEVELOPMENT CORP.

41 INDUSTRIAL DRIVE  
EXETER, NH 03833

PROJECT:

64 VAUGHAN MALL BUILDING RESTORATION

TAX MAP 126, LOT 1

64 VAUGHAN MALL  
PORTSMOUTH, NH 03801

TITLE:

DEMOLITION PLAN

SHEET NUMBER:

C-2



APPROVED BY THE PORTSMOUTH PLANNING BOARD

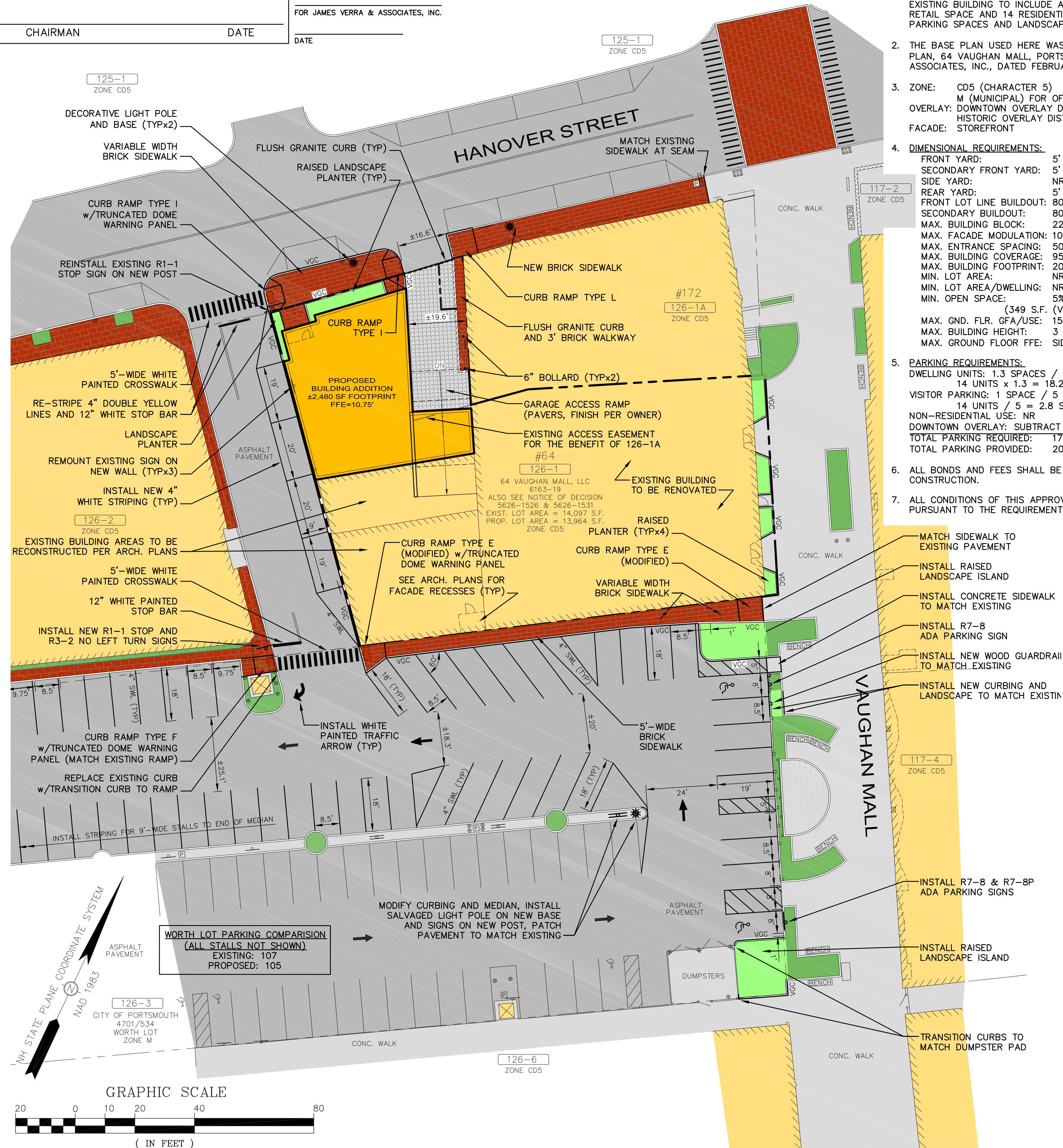
THE SOLE PURPOSE OF THIS PLAN IS TO DEPICT THE LOCATION OF EXISTING AND PROPOSED IMPROVEMENTS ON THE SITE. RECORDING OF THIS PLAN WAS A REQUIREMENT OF THE PORTSMOUTH PLANNING BOARD AS PART OF THEIR APPROVAL.

FOR JAMES VERRA & ASSOCIATES, INC.

CHAIRMAN

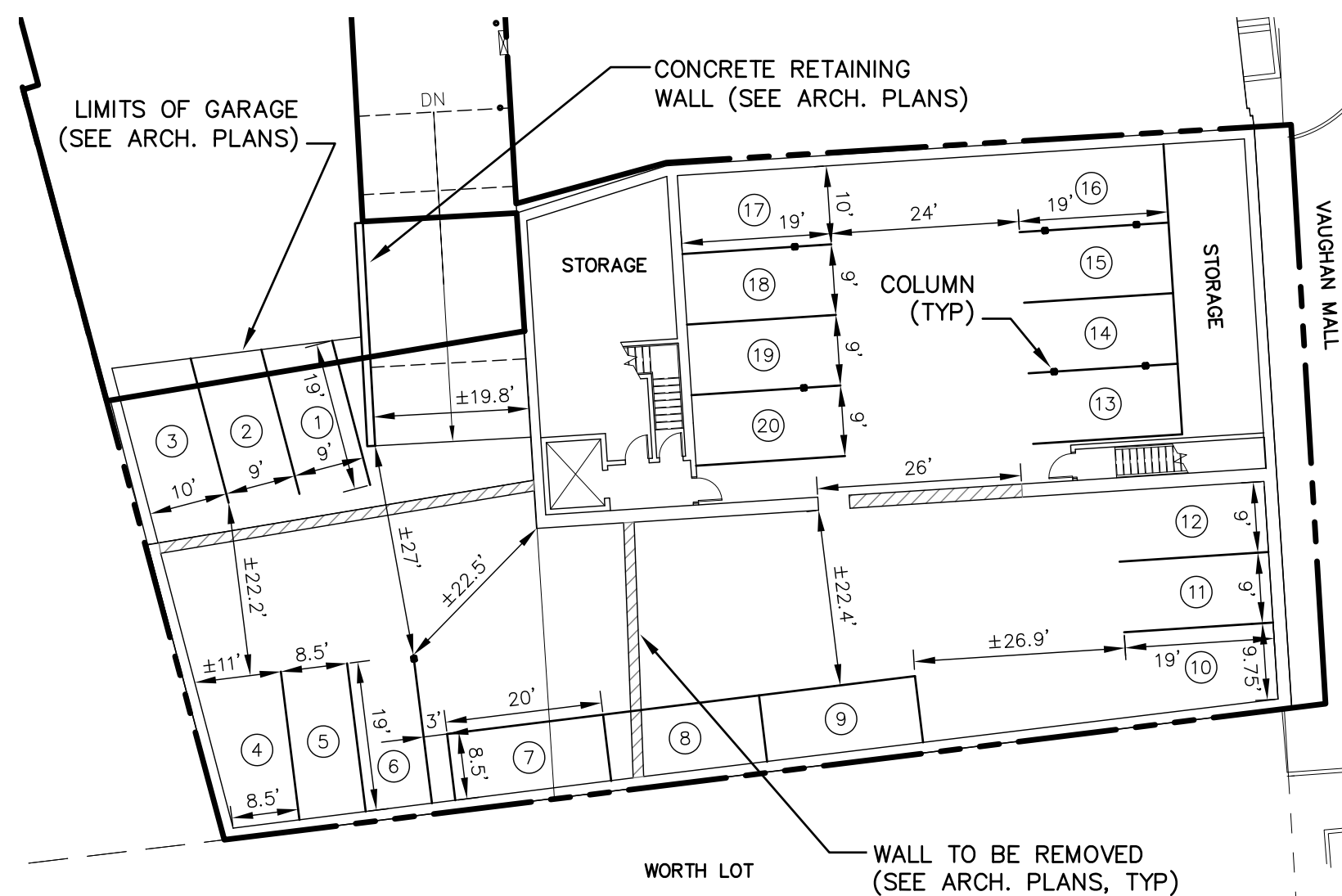
DATE

DATE



## NOTES

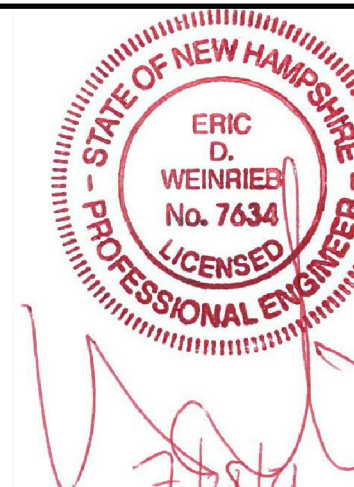
- DESIGN INTENT -- THIS PLAN IS INTENDED TO DEPICT THE RETROFIT OF THE EXISTING BUILDING TO INCLUDE AN ADDITION, UNDERGROUND PARKING GARAGE, RETAIL SPACE AND 14 RESIDENTIAL UNITS ALONG WITH A SIDEWALK, MODIFIED PARKING SPACES AND LANDSCAPE ISLANDS ON THE ADJUTING WORTH LOT.
- THE BASE PLAN USED HERE WAS DEVELOPED FROM "EXISTING CONDITIONS PLAN, 64 VAUGHAN MALL, PORTSMOUTH, NH" BY JAMES VERRA AND ASSOCIATES, INC., DATED FEBRUARY 3, 2020.
- ZONE: CD5 (CHARACTER 5)  
M (MUNICIPAL) FOR OFFSITE IMPROVEMENTS ON WORTH LOT  
OVERLAY: DOWNTOWN OVERLAY DISTRICT  
HISTORIC OVERLAY DISTRICT  
FACADE: STOREFRONT
- | DIMENSIONAL REQUIREMENTS: | EXISTING  | PROPOSED     |
|---------------------------|---|--------------|
| FRONT YARD:               | 5' MAX.   | 4.3'         |
| SECONDARY FRONT YARD:     | 5' MAX.   | 58.1'        |
| SIDE YARD:                | NR  | 0'           |
| REAR YARD:                | 5'  | 0.15'        |
| FRONT LOT LINE BUILDOUT:  | 80% WIDTH MIN.  | 100%         |
| SECONDARY BUILDOUT:       | 80% WIDTH MIN.  | 0%           |
| MAX. BUILDING BLOCK:      | 225'  | 80% (47')    |
| MAX. FACADE MODULATION:   | 100'  |              |
| MAX. ENTRANCE SPACING:    | 50'   |              |
| MAX. BUILDING COVERAGE:   | 95%   | 70.0%        |
| MAX. BUILDING FOOTPRINT:  | 20,000 S.F.   | 10,008 S.F.  |
| MIN. LOT AREA:            | NR  | 14,097 S.F.  |
| MIN. LOT AREA/DWELLING:   | NR  | 13,964 S.F.  |
| MIN. OPEN SPACE:          | 5%  | 0% (0 SF)    |
|                           | (349 S.F. (VAUGHAN)) + 349 S.F. (HANOVER) = 698 S.F.) | 5% (698 SF)  |
| MAX. GND. FLR. GFA/USE:   | 15,000 S.F.   | ±10,014 S.F. |
| MAX. BUILDING HEIGHT:     | 3 STORIES OR 40'                                      | 12,476 S.F.  |
| MAX. GROUND FLOOR FFE:    | SIDEWALK GRADE +3'                                    | 40'          |
- | PARKING REQUIREMENTS:  |
|--|
| DWELLING UNITS: 1.3 SPACES / DWELLING UNIT OVER 750 S.F.             |
| 14 UNITS x 1.3 = 18.2 SPACES REQUIRED                                |
| VISITOR PARKING: 1 SPACE / 5 DWELLING UNITS (FOR LOT w/OVER 4 UNITS) |
| 14 UNITS / 5 = 2.8 SPACES REQUIRED                                   |
| NON-RESIDENTIAL USE: NR  |
| DOWNTOWN OVERLAY: SUBTRACT 4 SPACES/LOT                              |
| TOTAL PARKING REQUIRED: 17 SPACES                                    |
| TOTAL PARKING PROVIDED: 20 SPACES (UNDERGROUND)                      |
- ALL BONDS AND FEES SHALL BE PAID/POSTED PRIOR TO INITIATING CONSTRUCTION.
- ALL CONDITIONS OF THIS APPROVAL SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
- ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH & NHDOT'S STANDARD SPECIFICATIONS FOR ROAD & BRIDGE, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
- CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAWCUT LINE WITH RS-1 IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
- THE CONTRACTOR SHALL VERIFY ALL BENCHMARKS AND TOPOGRAPHY IN THE FIELD PRIOR TO CONSTRUCTION.
- AREA OF DISTURBANCE IS UNDER 43,560 SF. COVERAGE UNDER EPA NPDES PHASE II CONSTRUCTION GENERAL PERMIT IS NOT REQUIRED.
- 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. PAVEMENT MARKINGS SHALL BE INSTALLED AT LEAST 14-DAYS AFTER INSTALLATION OF WEARING COURSE PAVEMENT. CONTRACTOR SHALL APPLY TWO (2) COATS OF ALL PAVEMENT MARKINGS.
- 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.
- UNLESS OTHERWISE NOTED, ALL NEW CURBING SHALL BE VERTICAL GRANITE WITH A MINIMUM RADIUS OF 4'.
- THE CONTRACTOR SHALL VERIFY ALL BUILDING DIMENSIONS WITH THE ARCHITECTURAL AND STRUCTURAL DRAWINGS PRIOR TO CONSTRUCTION. ANY AND ALL DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF BOTH THE ARCHITECT AND CIVIL ENGINEER FOR RESOLUTION.
- ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
- 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
- THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
- SITWORK 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.
- TRASH AND RECYCLING SHALL BE STORED INSIDE BUILDING.
- THIS DEVELOPMENT IS SUBJECT TO LICENSING AGREEMENTS w/THE PORTSMOUTH CITY COUNCIL.
- RESTAURANTS SHALL NOT OCCUPY BUILDING WITHOUT THE INSTALLATION OF A GREASE TRAP MEETING CITY CODE.
- ALL SIDEWALKS TO BE CONSTRUCTED WITHIN PROJECT LIMITS SHALL BE BRICK. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING PORTSMOUTH DPW TO CONFIRM BRICK SPECIFICATIONS.
- STREET ADDRESSES FOR EACH USE SHALL BE DETERMINED BY PORTSMOUTH FIRE DEPARTMENT & DPW.
- SNOW SHALL BE STORED AT THE EDGE OF PAVEMENT, IN AREAS SHOWN ON THE PLAN, OR TRUCKED OFF SITE.
- | BUILDING USES BY FLOOR (BY FOOTPRINT, ACTUAL SPACE MAY VARY): |                          |
|---|--------------------------|
| BASEMENT:   | ±9,326 S.F. PARKING      |
| FLOOR 1:  | ±12,334 S.F. RETAIL      |
| FLOORS 2-4:   | ±12,488 S.F. RESIDENTIAL |
| TOTAL:  | ±59,124 S.F.             |



BASEMENT GARAGE PARKING LAYOUT

**ALTUS**  
ENGINEERING, INC.

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



NOT FOR CONSTRUCTION

ISSUED FOR:

PLANNING BOARD

ISSUE DATE:

JULY 28, 2021

### REVISIONS

NO.	DESCRIPTION	BY	DATE
0	CLIENT REVIEW	EBS	05/21/20
1	TAC WORK SESSION	EBS	07/07/20
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4	REV. BLDG. HEIGHT	EBS	01/26/21
5	TAC	EBS	03/22/21
6	REV. FOOTPRINT FOR HDC	EBS	04/08/21
7	TAC	EBS	04/19/21
8	TAC	EBS	05/19/21
9	TAC	EBS	06/21/21
10	PLANNING BOARD	EBS	07/28/21

DRAWN BY: EBS

APPROVED BY: EDW

DRAWING FILE: 5042-SITE.dwg

SCALE: 22"x34" 1" = 20'

11"x17" 1" = 40'

OWNER:

**64 VAUGHAN MALL, LLC**

**41 INDUSTRIAL DRIVE  
EXETER, NH 0383**

APPLICANT:

**HAMPSHIRE  
DEVELOPMENT CORP.**

**41 INDUSTRIAL DRIVE  
EXETER, NH 03833**

PROJECT:

**64 VAUGHAN MALL  
BUILDING RESTORATION**

**TAX MAP 126, LOT 1**

**64 VAUGHAN MALL  
PORTSMOUTH, NH 03801**

TITLE:

SITE PLAN

SHEET NUMBER:

C-3

P5042



APPROVED BY THE PORTSMOUTH PLANNING BOARD

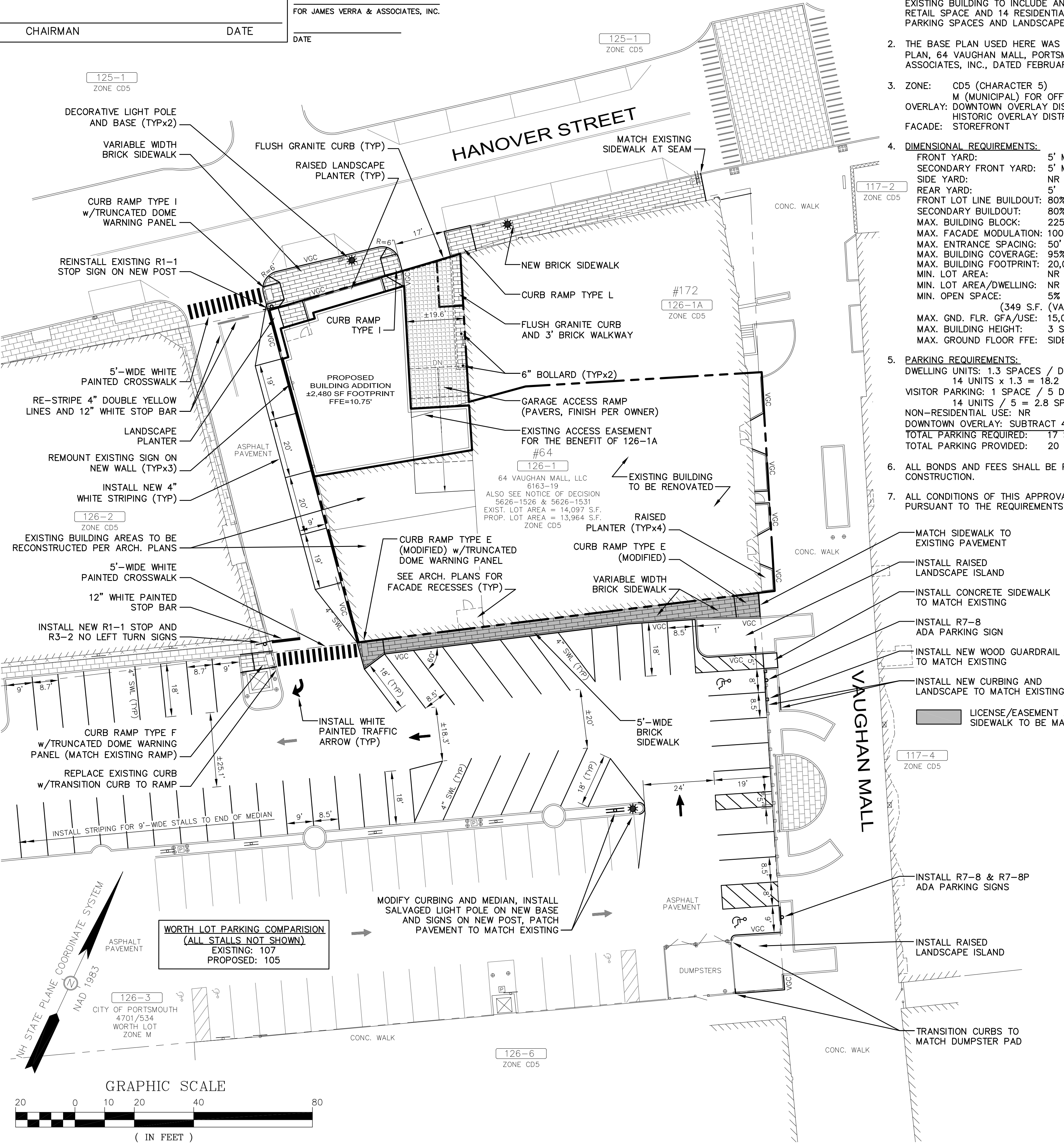
THE SOLE PURPOSE OF THIS PLAN IS TO DEPICT THE LOCATION OF EXISTING AND PROPOSED IMPROVEMENTS ON THE SITE. RECORDING OF THIS PLAN WAS A REQUIREMENT OF THE PORTSMOUTH PLANNING BOARD AS PART OF THEIR APPROVAL.

FOR JAMES VERRA & ASSOCIATES, INC.

CHAIRMAN

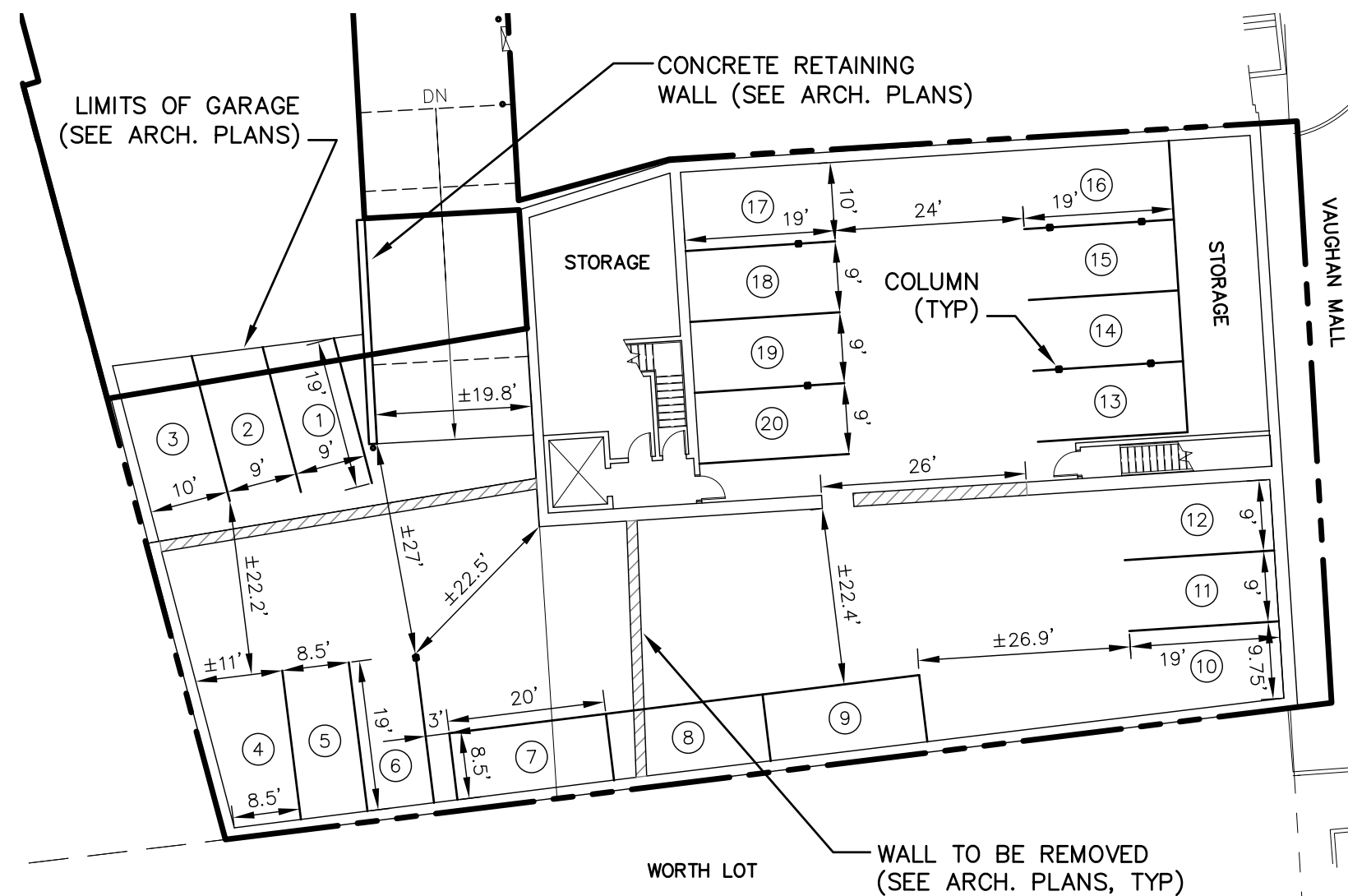
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DATE



## NOTES

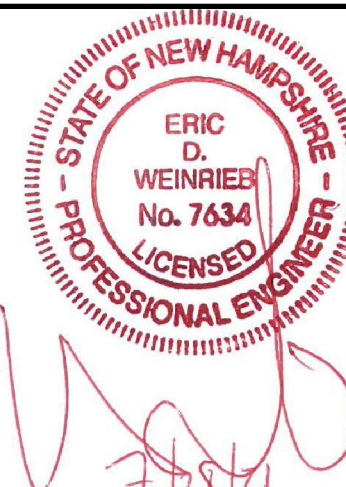
- DESIGN INTENT -- THIS PLAN IS INTENDED TO DEPICT THE RETROFIT OF THE EXISTING BUILDING TO INCLUDE AN ADDITION, UNDERGROUND PARKING GARAGE, RETAIL SPACE AND 14 RESIDENTIAL UNITS ALONG WITH A SIDEWALK, MODIFIED PARKING SPACES AND LANDSCAPE ISLANDS ON THE ADJUTING WORTH LOT.
- THE BASE PLAN USED HERE WAS DEVELOPED FROM "EXISTING CONDITIONS PLAN, 64 VAUGHAN MALL, PORTSMOUTH, NH" BY JAMES VERRA AND ASSOCIATES, INC., DATED FEBRUARY 3, 2020.
- ZONE: CD5 (CHARACTER 5)  
M (MUNICIPAL) FOR OFFSITE IMPROVEMENTS ON WORTH LOT  
OVERLAY: DOWNTOWN OVERLAY DISTRICT  
HISTORIC OVERLAY DISTRICT  
FACADE: STOREFRONT
- | DIMENSIONAL REQUIREMENTS: |  | EXISTING     | PROPOSED    |
|---------------------------|--|--------------|-------------|
| FRONT YARD:               | 5' MAX.  | 4.3'         | SAME        |
| SECONDARY FRONT YARD:     | 5' MAX.  | 58.1'        | 5'          |
| SIDE YARD:                | NR   | 0'           | SAME        |
| REAR YARD:                | 5'   | 0.15'        | SAME        |
| FRONT LOT LINE BUILDOUT:  | 80% WIDTH MIN.                                       | 100%         | SAME        |
| SECONDARY BUILDOUT:       | 80% WIDTH MIN.                                       | 0%           | 80% (47')   |
| MAX. BUILDING BLOCK:      | 225'   |              |             |
| MAX. FACADE MODULATION:   | 100'   |              |             |
| MAX. ENTRANCE SPACING:    | 50'  |              |             |
| MAX. BUILDING COVERAGE:   | 95%  | 70.0%        | 89.4%       |
| MAX. BUILDING FOOTPRINT:  | 20,000 S.F.  | 10,008 S.F.  | 12,488 S.F. |
| MIN. LOT AREA:            | NR   | 14,097 S.F.  | 13,964 S.F. |
| MIN. LOT AREA/DWELLING:   | NR   |              |             |
| MIN. OPEN SPACE:          | 5%   | 0% (0 SF)    | 5% (698 SF) |
|                           | (349 S.F. (VAUGHAN) + 349 S.F. (HANOVER) = 698 S.F.) |              |             |
| MAX. GND. FLR. GFA/USE:   | 15,000 S.F.  | ±10,014 S.F. | 12,476 S.F. |
| MAX. BUILDING HEIGHT:     | 3 STORIES OR 40'                                     | ±40'         | 40'         |
| MAX. GROUND FLOOR FFE:    | SIDEWALK GRADE +3'                                   |              |             |
- | PARKING REQUIREMENTS:  |  |
|--|--|
| DWELLING UNITS: 1.3 SPACES / DWELLING UNIT OVER 750 S.F.             |  |
| 14 UNITS x 1.3 = 18.2 SPACES REQUIRED                                |  |
| VISITOR PARKING: 1 SPACE / 5 DWELLING UNITS (FOR LOT w/OVER 4 UNITS) |  |
| 14 UNITS / 5 = 2.8 SPACES REQUIRED                                   |  |
| NON-RESIDENTIAL USE: NR  |  |
| DOWNTOWN OVERLAY: SUBTRACT 4 SPACES/LOT                              |  |
| TOTAL PARKING REQUIRED: 17 SPACES                                    |  |
| TOTAL PARKING PROVIDED: 20 SPACES (UNDERGROUND)                      |  |
- ALL BONDS AND FEES SHALL BE PAID/POSTED PRIOR TO INITIATING CONSTRUCTION.
- ALL CONDITIONS OF THIS APPROVAL SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
- ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH & NHDOT'S STANDARD SPECIFICATIONS FOR ROAD & BRIDGE, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
- CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAWCUT LINE WITH RS-1 IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
- THE CONTRACTOR SHALL VERIFY ALL BENCHMARKS AND TOPOGRAPHY IN THE FIELD PRIOR TO CONSTRUCTION.
- AREA OF DISTURBANCE IS UNDER 43,560 SF, COVERAGE UNDER EPA NPDES PHASE II CONSTRUCTION GENERAL PERMIT IS NOT REQUIRED.
- 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. PAVEMENT MARKINGS SHALL BE INSTALLED AT LEAST 14-DAYS AFTER INSTALLATION OF WEARING COURSE PAVEMENT. CONTRACTOR SHALL APPLY TWO (2) COATS OF ALL PAVEMENT MARKINGS.
- 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.
- UNLESS OTHERWISE NOTED, ALL NEW CURBING SHALL BE VERTICAL GRANITE WITH A MINIMUM RADIUS OF 4'.
- THE CONTRACTOR SHALL VERIFY ALL BUILDING DIMENSIONS WITH THE ARCHITECTURAL AND STRUCTURAL DRAWINGS PRIOR TO CONSTRUCTION. ANY AND ALL DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF BOTH THE ARCHITECT AND CIVIL ENGINEER FOR RESOLUTION.
- ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
- 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
- THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
- SITWORK 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.
- TRASH AND RECYCLING SHALL BE STORED INSIDE BUILDING.
- THIS DEVELOPMENT IS SUBJECT TO LICENSING AGREEMENTS w/THE PORTSMOUTH CITY COUNCIL.
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APPLICANT:

HAMPSHIRE  
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41 INDUSTRIAL DRIVE  
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PROJECT:

64 VAUGHAN MALL  
BUILDING RESTORATION

TAX MAP 126, LOT 1

64 VAUGHAN MALL  
PORTSMOUTH, NH 03801

TITLE:

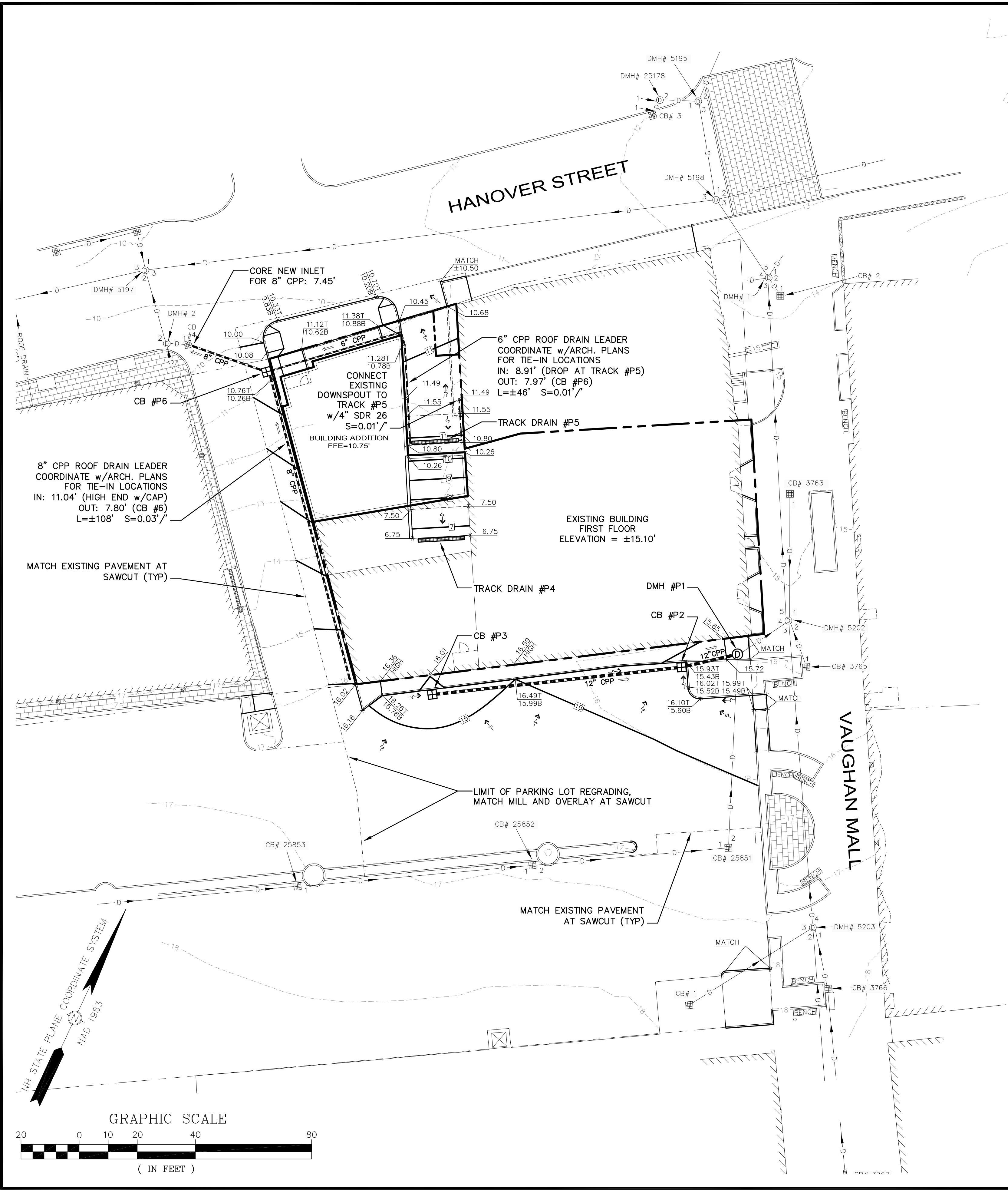
SITE PLAN

SHEET NUMBER:

C-3

P5042





DRAINAGE SCHEDULE

CB #4 (EXISTING)  
RIM=9.57'  
IN: 7.45' (NEW 8" ROOF LEADER)  
OUT: ±7.32' (EXISTING TO DMH #2)  
12" PVC (EXISTING)

DMH #P1  
(FORMER CB #3764)  
RIM=±15.45'(ADJUST RIM TO MATCH RAMP SLOPE)  
IN: 11.30' (NEW 12" CB #P2)  
IN: ±11.20' (EXIST. 12" CB #25851)  
OUT: ±11.10' (TO DMH #5202)  
12" RCP (EXISTING)

CB #P2  
RIM=15.30'  
IN: 11.46' (12" CB #P3)  
OUT: 11.36' (TO DMH #P1)  
12" CPP  
L=±12' S=0.005'/'

CB #P3  
RIM=15.35'  
OUT: 11.89' (TO CB #P2)  
12" CPP  
L=±86' S=0.005'/'

TRACK DRAIN #P4  
RIM=6.75'  
16' LONG x 1.17' WIDE  
w/EVAPORATOR (COORDINATE w/ARCH. PLANS FOR MODEL, CONDUIT, WIRING AND CIRCUITRY)

TRACK DRAIN #P5  
RIM=10.82'  
16' LONG x 1.17' WIDE  
IN: 9.57' (4" ROOF LEADER)  
OUT: 9.57' (TO CB #P6)  
w/EXTERNAL DROP TO 8.91'  
6" CPP  
L=±94' S=0.01'/'

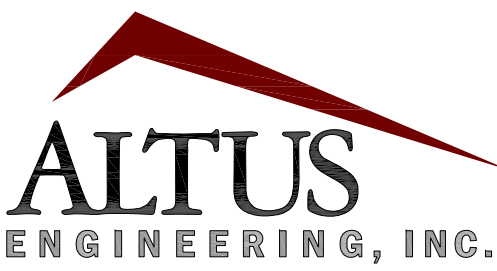
CB #P6  
RIM=10.20'  
IN: 7.97' (6" TRACK DRAIN #P5)  
IN: 7.80' (8" CPP)  
OUT: 7.70' (TO CB#4)  
8" CPP  
L=±25' S=0.01'/'

GRADING AND DRAINAGE NOTES

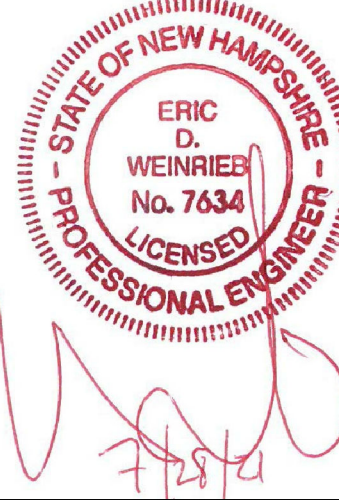
- DO NOT BEGIN CONSTRUCTION UNTIL ALL STATE AND LOCAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.
- CONTRACTOR SHALL OBTAIN A "DIGSAFE" NUMBER AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION.
- ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH AND NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
- ALL BENCHMARKS AND TOPOGRAPHY SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO INITIATING CONSTRUCTION.
- UNLESS OTHERWISE AGREED IN WRITING, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING TEMPORARY BENCHMARKS (TBMS) AND PERFORMING ALL CONSTRUCTION SURVEY LAYOUT.
- PRIOR TO CONSTRUCTION, FIELD VERIFY JUNCTIONS, LOCATIONS AND ELEVATIONS/INVERTS OF ALL EXISTING STORMWATER AND UTILITY LINES. PRESERVE AND PROTECT LINES TO BE RETAINED.
- 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.
- 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.
- 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.
- 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.
- ALL SPOT GRADES ARE AT FINISH GRADE AND BOTTOM OF CURB WHERE APPLICABLE.
- 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.

LEGEND

	PROPERTY LINE
	EASEMENT LINE
	EXISTING PAVEMENT/CURB
	PROPOSED PAVEMENT/VERTICAL GRANITE CURB
	EXISTING CONTOUR
	PROPOSED CONTOUR
	PROPOSED SPOT GRADE/TOP & BOTTOM OR CURB/WALL
	EXISTING WATER/CURB STOP/VALVE/HYDRANT
	EXISTING SEWER/MANHOLE
	EXISTING GAS/VALVE
	EXIST. OVER/UNDERGROUND UTILITIES/POLE
	EXISTING DRAINAGE/CB/DMH
	PROPOSED THRUST BLOCK/WATER/CURB STOP/VALVE/HYDRANT
	PROPOSED DOMESTIC WATER SERVICE/FIRE WATER SERVICE
	PROPOSED SEWER/MANHOLE/CLEANOUT
	PROPOSED GAS SERVICE
	PROPOSED OVERHEAD UTILITIES/UTILITY POLE
	PROPOSED UNDERGROUND ELECTRIC/PHONE/TV
	PROPOSED DRAINAGE (HARD PIPE)/CB/DCB/DMH/FES
	CORRUGATED PLASTIC PIPE/FLARED END SECTION/HEADWALL
	PROPOSED GROUND SLOPE/APPROX. GRADE/STONE CHECK DAM
	SILTFENCE/SEDIMENT BARRIER/CONST. FENCE
	STABILIZED CONSTRUCTION EXIT
	PROPOSED SAWCUT LINE



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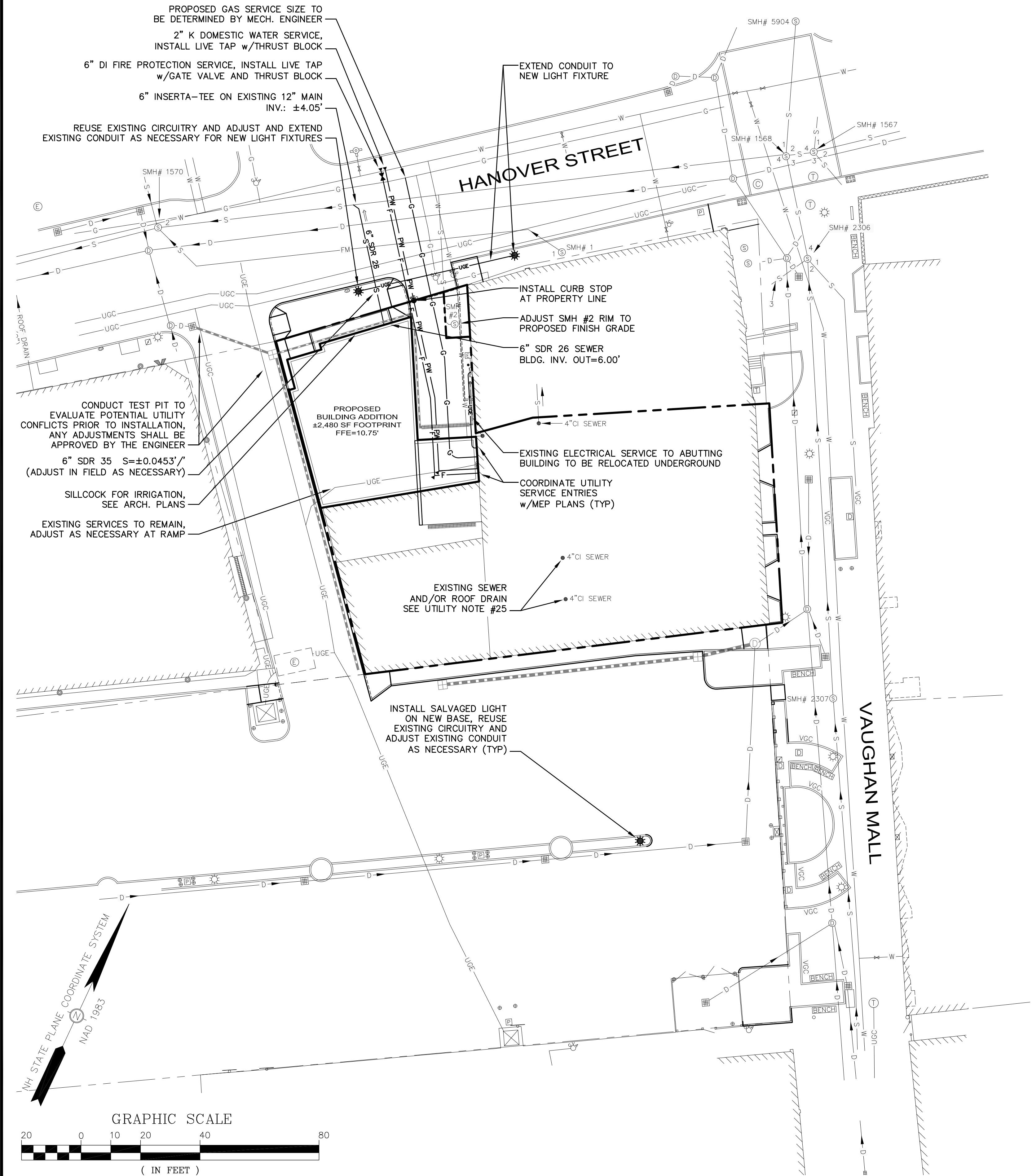
GRADING AND DRAINAGE PLAN

SHEET NUMBER:

C-4

P5042





SEWER TABLE

SMH# 1  
RIM EL= 11.80  
(1) INV OUT 4\"/>

SMH# 2  
RIM EL= 11.53  
(COULD NOT OPEN)

SMH# 1567  
RIM EL= 12.96  
(1) PLUGGED  
(2) INV IN 12\"/>

SMH# 1568  
RIM EL= 12.86  
(1) INV IN 8\"/>

SMH# 1570  
RIM EL= 10.16  
(2) INV IN 15\"/>

SMH# 2306  
RIM EL= 13.84  
(1) INV IN 10\"/>

SMH# 2307  
RIM EL= 15.50  
CL FLOW= 10.66  
(OVAL RCP 15\"/>

SEWER FLOW CALCS.

APARTMENT:  
38 GPD/PERSON  
(14) 2 PERSON UNITS = 28 PEOPLE  
28 x 38 GPD = 1,064 GPD

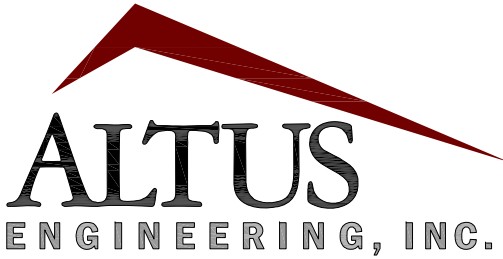
SHOPPING CENTER:  
ASSUME 4 RETAIL SPACES  
8 GPD/EMPLOYEE  
1.5 GPD/PARKING SPACE  
4 x 2 EMPL./EA. = 8 EMPLOYEES  
8 x 8 GPD = 64 GPD  
(NO ONSITE RETAIL PARKING)

1,064 + 64 = 1,028 GPD TOTAL

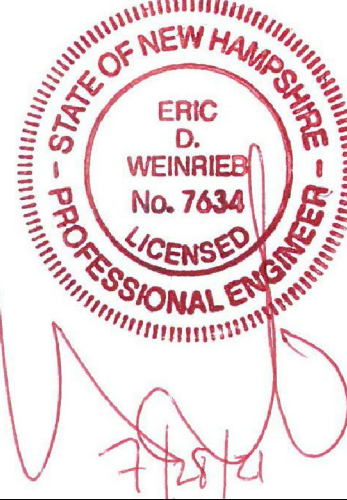
\*AVERAGE DAILY PER CAPITA FLOW  
CALCULATED FROM METCALF &  
EDDY/AECOM "WASTEWATER  
ENGINEERING TREATMENT AND  
RESOURCE RECOVERY", 5TH EDITION

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 THE PORTSMOUTH POLICE DEPARTMENT AND DPW AT LEAST TWO WEEKS PRIOR TO COMMENCING RELATED CONSTRUCTION.
5. 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.
6. 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.
7. ALL TRENCHING, PIPE LAYING AND BACKFILLING SHALL CONFORM TO FEDERAL OSHA AND CITY REGULATIONS.
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. WATER: PORTSMOUTH DPW, JIM TOW, (603) 427-1530.
11. TELECOMMUNICATIONS: CONSOLIDATED, JOE CONSIDINE, (603) 427-5525.
12. CABLE: COMCAST, MIKE COLLINS, (603) 679-5695, EXT. 1037.
13. ELECTRICAL: EVERSOURCE, MICHEAL BUSBY, (603) 332-4227, EXT. 5555334. ALL ELECTRIC CONDUIT INSTALLATION SHALL BE INSPECTED BY EVERSOURCE PRIOR TO BACKFILL, 48-HOUR MINIMUM NOTICE REQUIRED.
14. GAS: UNITIL, DAVID BEAULIEU, (603) 294-5144.
15. DETECTABLE WARNING TAPE SHALL BE PLACED OVER THE ENTIRE LENGTH OF ALL BURIED UTILITIES, COLORS PER THE RESPECTIVE UTILITY PROVIDERS.
16. 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.
17. 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.
18. PER PORTSMOUTH DPW SPECIFICATIONS, ALL NEW WATERLINES SHALL BE WRAPPED WAITH 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.
19. 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.
20. SOLAR PANEL INSTALLATION, IF PROPOSED, SHALL COMPLY WITH NFPA 1, 2012, SECTION 11.12. AS AMENDED.
21. ALL STORM WATER CONNECTIONS/RECONNECTIONS TO THE CITY DRAINAGE SYSTEM SHALL REQUIRE A STORM WATER CONNECTION PERMIT. A CAPACITY USE SURCHARGE MAY APPLY.
22. FIRE ALARM PANEL SHALL BE MONITORED THROUGH A THIRD-PARTY SECURITY COMPANY. CONTRACTOR SHALL COORDINATE PANEL LOCATION AND INTERCONNECTION WITH CITY FIRE DEPT. AND ARCHITECT.
23. 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.
24. CONTRACTOR/OWNER SHALL PROVIDE DPW WITH DETAILS OF TEMPORARY & PERMANENT GROUNDWATER DEWATERING DESIGN IF NECESSARY.
25. CONTRACTOR SHALL VERIFY USE OF ALL INTERIOR STORM & SANITARY PIPING. CONTRATOR SHALL TAKE ALL NECESSARY MEASURES TO ENSURE THAT ALL STORMWATER IS SEPARATED FROM SANITARY FLOW.



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



NOT FOR CONSTRUCTION

ISSUED FOR:

PLANNING BOARD

ISSUE DATE:

JULY 28, 2021

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC WORK SESSION	EBS	05/05/20
1	TAC WORK SESSION	EBS	07/07/20
2	TAC	EBS	10/19/20
3	PB CONSULTATION	EBS	11/02/20
4	TAC	EBS	03/22/21
5	TAC	EBS	04/19/21
6	TAC	EBS	05/19/21
7	TAC	EBS	06/21/21
8	PLANNING BOARD	EBS	07/28/21

DRAWN BY: EBS

APPROVED BY: EDW

DRAWING FILE: 5042-SITE.dwg

SCALE: 22"x34" 1" = 20'  
11"x17" 1" = 40'

OWNER:

64 VAUGHAN MALL, LLC

41 INDUSTRIAL DRIVE  
EXETER, NH 03833

APPLICANT:

HAMPSHIRE  
DEVELOPMENT CORP.

41 INDUSTRIAL DRIVE  
EXETER, NH 03833

PROJECT:

64 VAUGHAN MALL  
BUILDING RESTORATION

TAX MAP 126, LOT 1

64 VAUGHAN MALL  
PORTSMOUTH, NH 03801

TITLE:

UTILITIES PLAN

SHEET NUMBER:

C-5

P5042



SEDIMENT AND EROSION CONTROL NOTES

PROJECT NAME AND LOCATION

64 VAUGHAN MALL  
PORTSMOUTH, NEW HAMPSHIRE  
TAX MAP 126 LOT 1

LATITUDE: 043° 04' 36" N  
LONGITUDE: 070° 45' 40" W

OWNER:

64 VAUGHAN MALL, LLC  
10 INDUSTRIAL WAY  
AMESBURY, MA 01913

APPLICANT:

HAMPSHIRE DEVELOPMENT CORP.  
41 INDUSTRIAL PARK DRIVE  
EXETER, NH 03833

DESCRIPTION

The project consists of the redevelopment of the existing building for commercial and residential purposes along with associated site improvements.

DISTURBED AREA

The total area to be disturbed for the redevelopment is approximately ±9,500 S.F. (±0.22 acres). USEPA NPDES Phase II compliance not required.

PROJECT PHASING

The proposed project will be completed in one phase.

NAME OF RECEIVING WATER

The site drains via an existing municipal closed drainage system to the Piscataqua River.

SEQUENCE OF MAJOR ACTIVITIES

1. Install temporary erosion control measures including silt fences, 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. Demolish existing building and utilities as shown on Demolition Plan and reclaim pavement.
3. Rough grade site including placement of borrow materials.
4. Construct buildings and associated improvements.
5. Construct drainage structures, culverts, utilities, swales & pavement base course materials.
6. Install base course paving & curbing.
7. Install top course paving.
8. Install pavement markings and signs.
9. Loam (6" min) and seed all disturbed areas not paved or otherwise stabilized.
10. 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, the silt fences 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, silt fences and any earth/dikes will be removed once permanent measures are established.

During construction, runoff will be diverted around the site with stabilized channels where possible. Sheet runoff from the site shall be filtered through hay bale barriers, stone check dams, and silt fences. All storm drain inlets shall be provided with hay bale filters or stone check dams. Stone rip rap shall be provided at the outlets of drain pipes and culverts where shown on the drawings.

Stabilize all ditches, swales, & level spreaders prior to directing flow to them.

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 silt fence or other barriers when it has reached one-third the height of the fence or bale, 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 coarse 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 or 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.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES (CON'T)

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 shrub plantings.
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)	<ul style="list-style-type: none"><li>* The organic matter content is between 80 and 100%, dry weight basis.</li><li>* Particle size by weight is 100% passing a 6" screen and a minimum of 70 % maximum of 85%, passing a 0.75" screen.</li><li>* The organic portion needs to be fibrous and elongated.</li><li>* Large portions of silts, clays or fine sands are not acceptable in the mix.</li><li>* Soluble salts content is less than 4.0 mmhos/cm.</li><li>* The pH should fall between 5.0 and 8.0.</li></ul>

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. FILTERS

1. Silt Fence
  - a. Synthetic filter fabric shall be a pervious sheet of propylene, nylon, polyester or ethylene yarn and shall be certified by the manufacturer or supplier as conforming to the following requirements:

Physical Property	Test	Requirements
Filtering Efficiency	VTM-51	75% minimum
Tensile Strength at 20% Maximum Elongation*	VTM-52	Extra Strength 50 lb./lin in (min) Standard Strength 30 lb./lin in (min)
Flow Rate	VTM-51	0.3 gal/sf/min (min)

\* Requirements reduced by 50 percent after six (6) months of installation.

Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizer to provide a minimum of six (6) months of expected usable construction life at a temperature range of 0 degrees F to 120° F.

- b. Posts shall be spaced a maximum of ten (10) feet apart at the barrier location or as recommended by the manufacturer and driven securely into the ground (minimum of 16 inches).
- c. A trench shall be excavated approximately six (6) inches wide and eight (8) inches deep along the line of posts and upslope from the barrier.
- d. When standard strength filter fabric is used, a wire mesh support fence shall be fastened securely to the upslope side of the posts using heavy duty wire staples at least one (1) inch long, tie wires or hog rings. The wire shall extend no more than 36 inches above the original ground surfaces.
- e. The "standard strength" filter fabric shall be stapled or wired to the fence, and eight (8) inches of the fabric shall be extended into the trench. The fabric shall not extend more than 36 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.
- f. When extra strength filter fabric and closer post spacing are used, the wire mesh support fence may be eliminated. In such a case, the filter fabric is stapled or wired directly to the posts with all other provisions of item (g) applying.
- g. The trench shall be backfilled and the soil compacted over the filter fabric.
- h. Silt fences shall be removed when they have served their useful purpose but not before the upslope areas has been permanently stabilized.

2. Sequence of Installation –

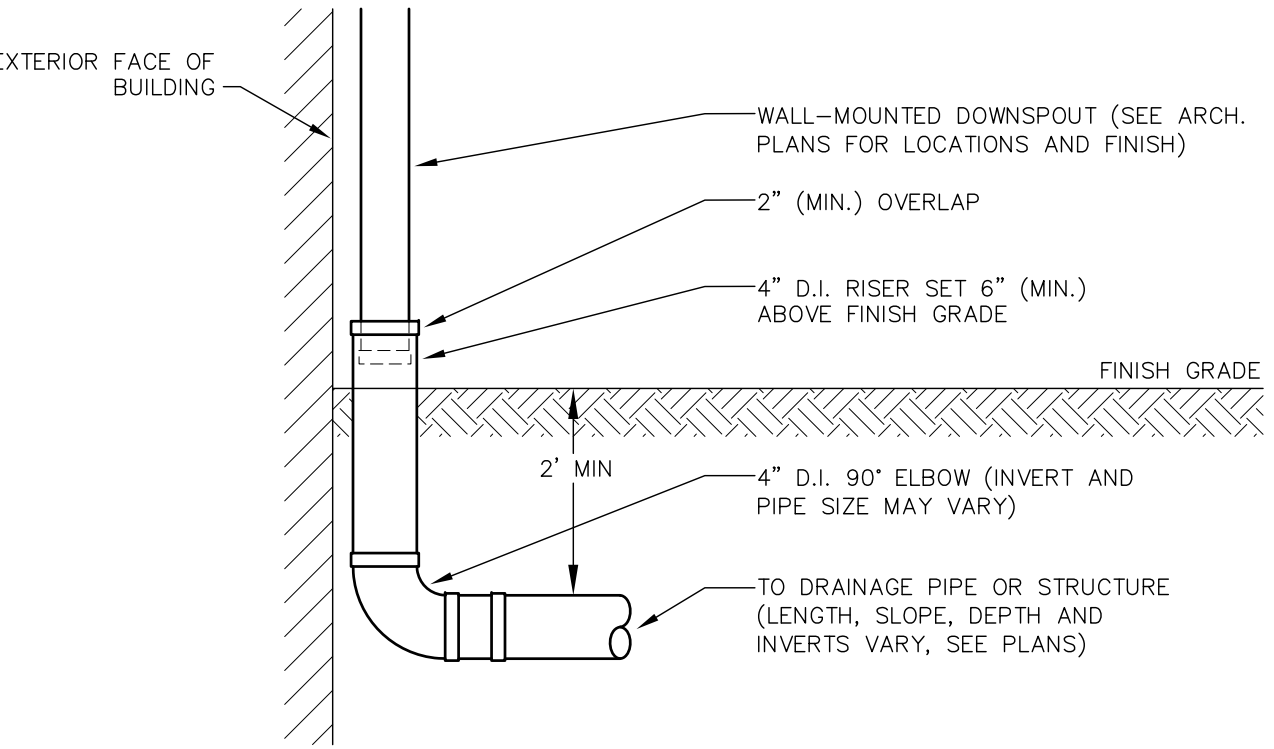
Sediment barriers shall be installed prior to any soil disturbance of the contributing upslope drainage area.

3. Maintenance –

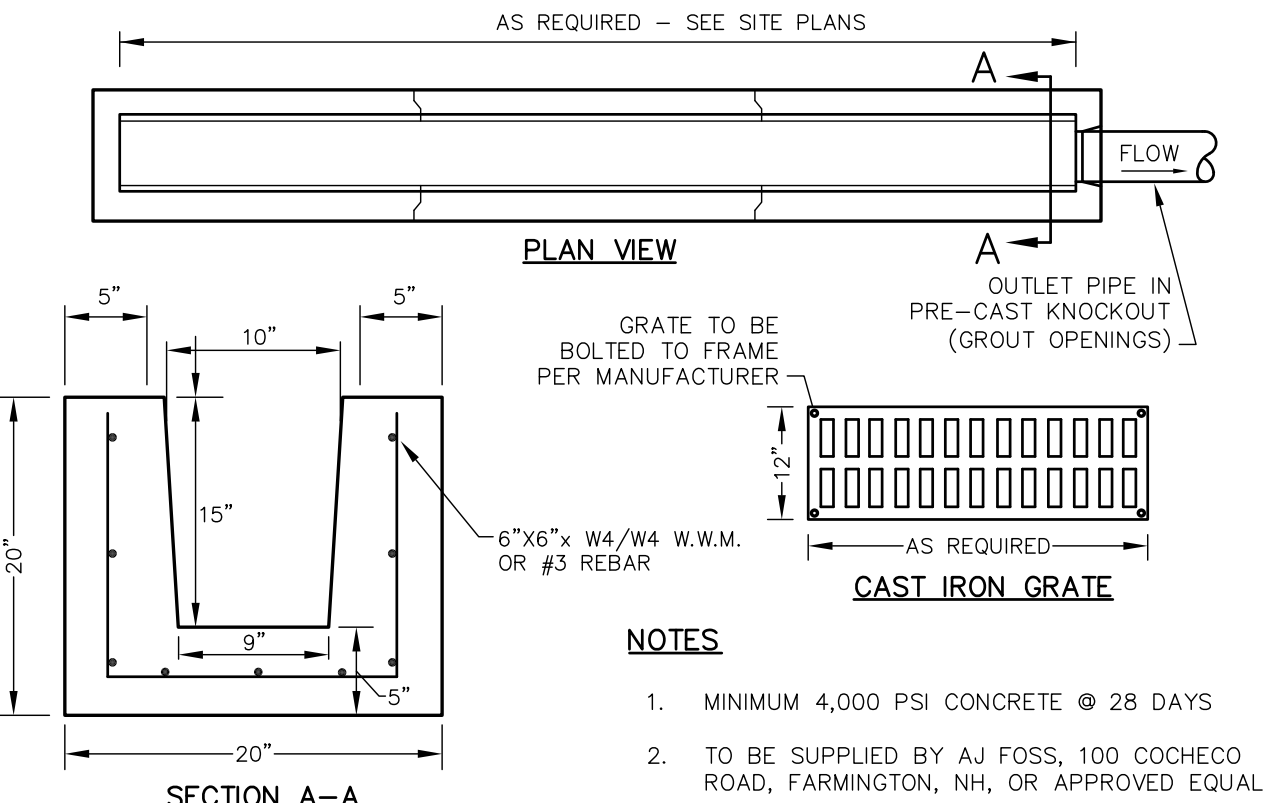
- a. Silt fence barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. They shall be repaired if there are any signs of erosion or sedimentation below them. Any required repairs shall be made immediately. If there are signs of undercutting at the center or the edges, or impounding of large volumes of water, the sediment barriers shall be replaced with a temporary stone check dam.
- b. Should the fabric on a silt fence or filter barrier decompose or become ineffective prior to the end of the expected usable life and the barrier still is necessary, the fabric shall be replaced promptly.
- c. Sediment deposits must be removed when deposits reach approximately one-third (1/3) the height of the barrier.
- d. Any sediment deposits remaining in place after the silt fence or other barrier is no longer required shall be removed. The area shall be prepared and seeded.
- e. Additional stone may have to be added to the construction entrance, rock barrier and riprap lined swales, etc., periodically to maintain proper function of the erosion control structure.

WINTER CONSTRUCTION NOTES

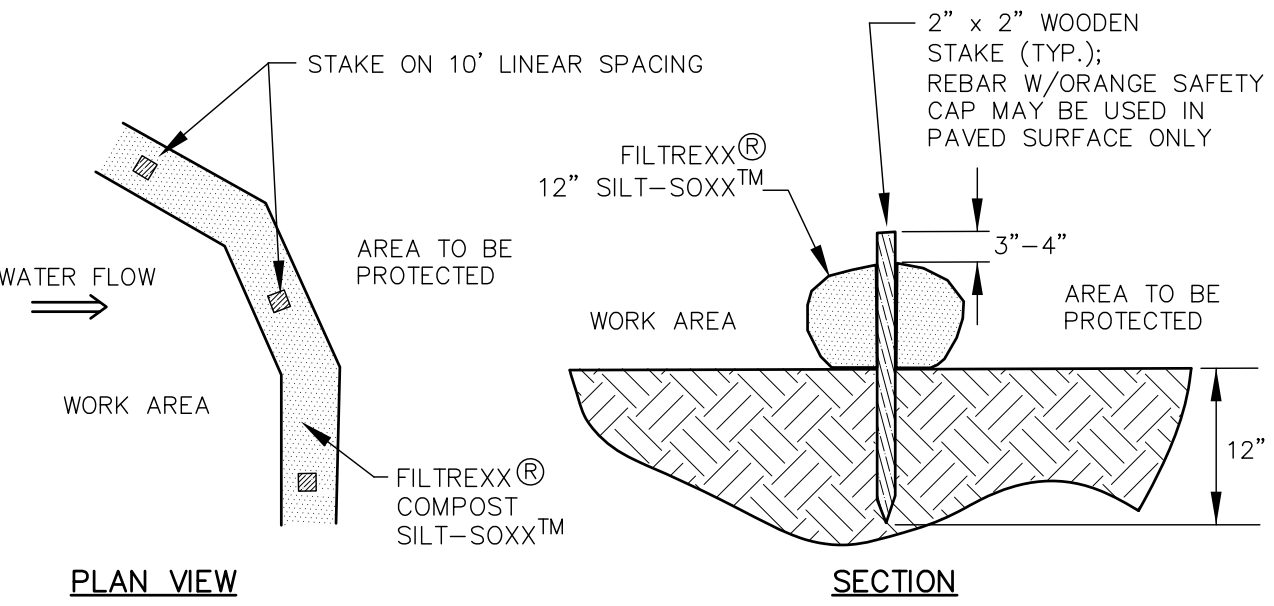
1. All proposed vegetated areas which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and elsewhere seeding and placing 3 to 4 tons of mulch 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.



EXTERIOR ROOF DRAIN CONNECTION NOT TO SCALE

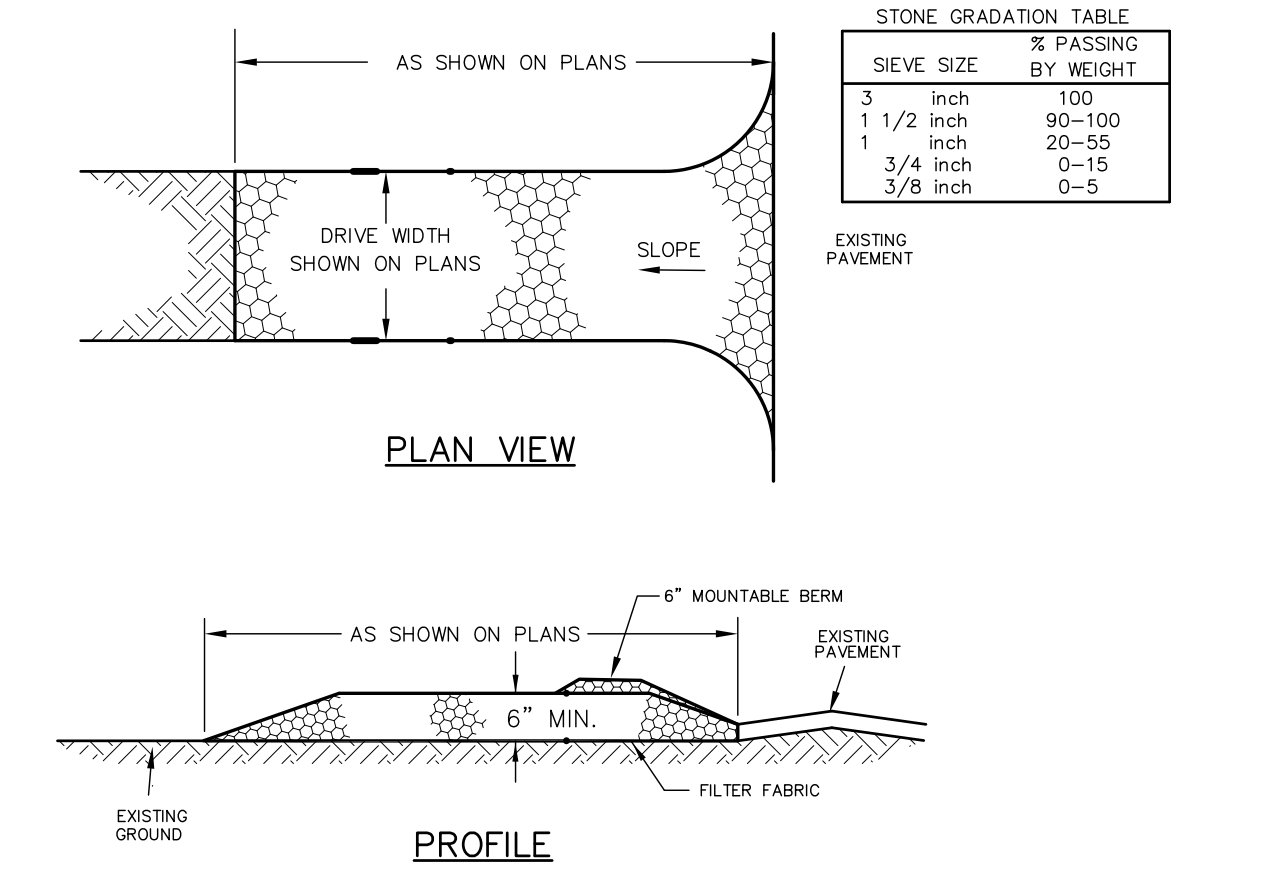


TRENCH DRAIN NOT TO SCALE



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

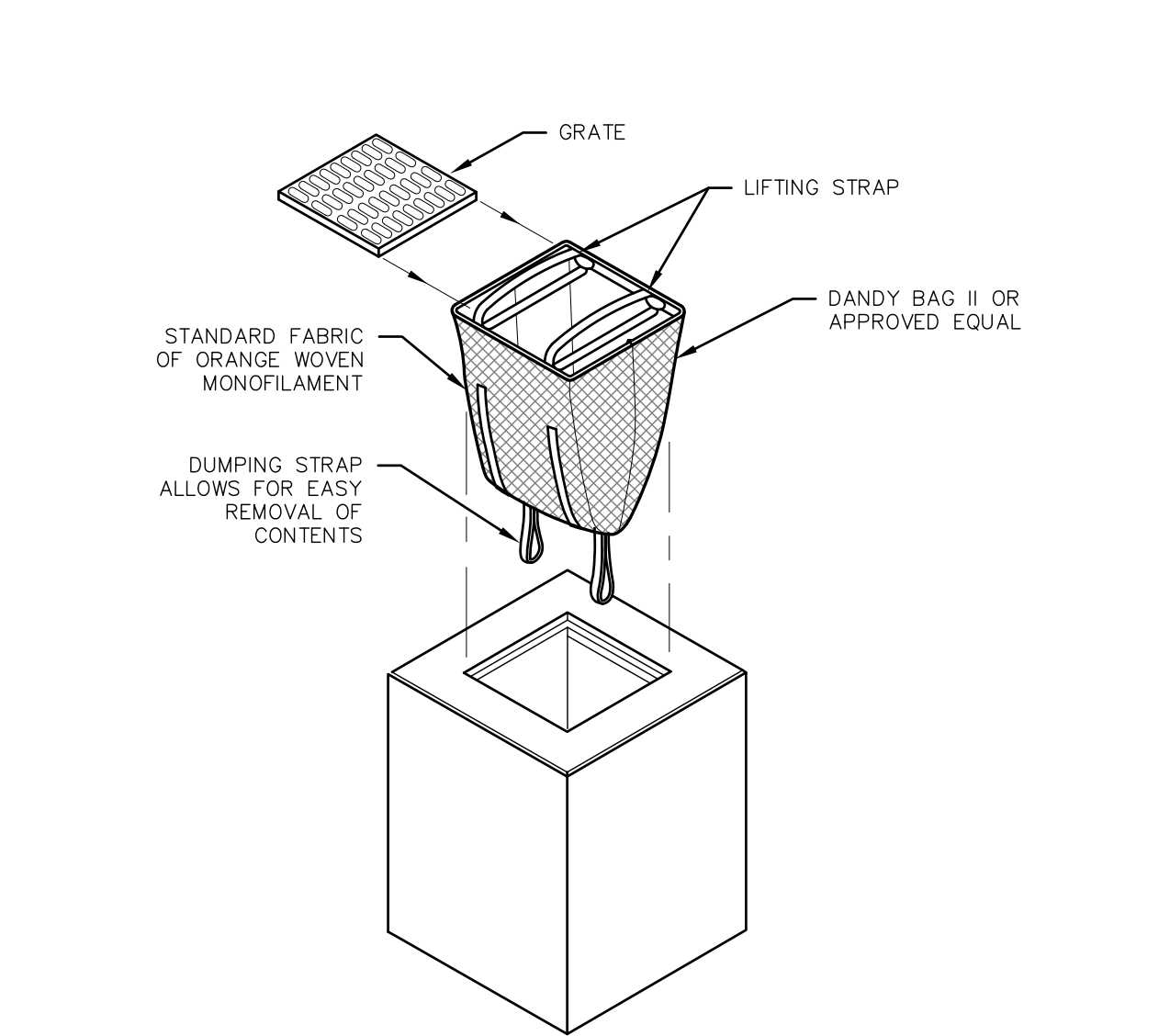
TUBULAR SEDIMENT BARRIER NOT TO SCALE



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



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

**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  
10/21/21

NOT FOR CONSTRUCTION

ISSUED FOR:

TAC

ISSUE DATE:

JUNE 21, 2021

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC WORK SESSION	EBS	05/05/20
1	TAC	EBS	10/19/20
2	TAC	EBS	03/22/21
3	TAC	EBS	06/21/21

DRAWN BY: EBS

APPROVED BY: EDW

DRAWING FILE: 5042-SITE.dwg

SCALE: 22"x34" 1" = 20'  
11"x17" 1" = 40'

OWNER:

64 VAUGHAN MALL, LLC  
41 INDUSTRIAL DRIVE  
EXETER, NH 03833

APPLICANT:

HAMPSHIRE DEVELOPMENT CORP.  
41 INDUSTRIAL DRIVE  
EXETER, NH 03833

PROJECT:

64 VAUGHAN MALL  
BUILDING RESTORATION  
TAX MAP 126, LOT 1  
64 VAUGHAN MALL  
PORTSMOUTH, NH 03801

TITLE:

DETAIL SHEET

SHEET NUMBER:

D-1

PS042

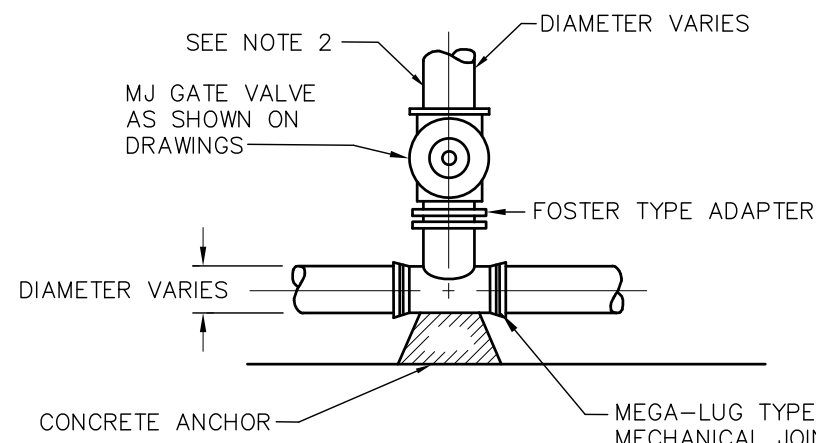




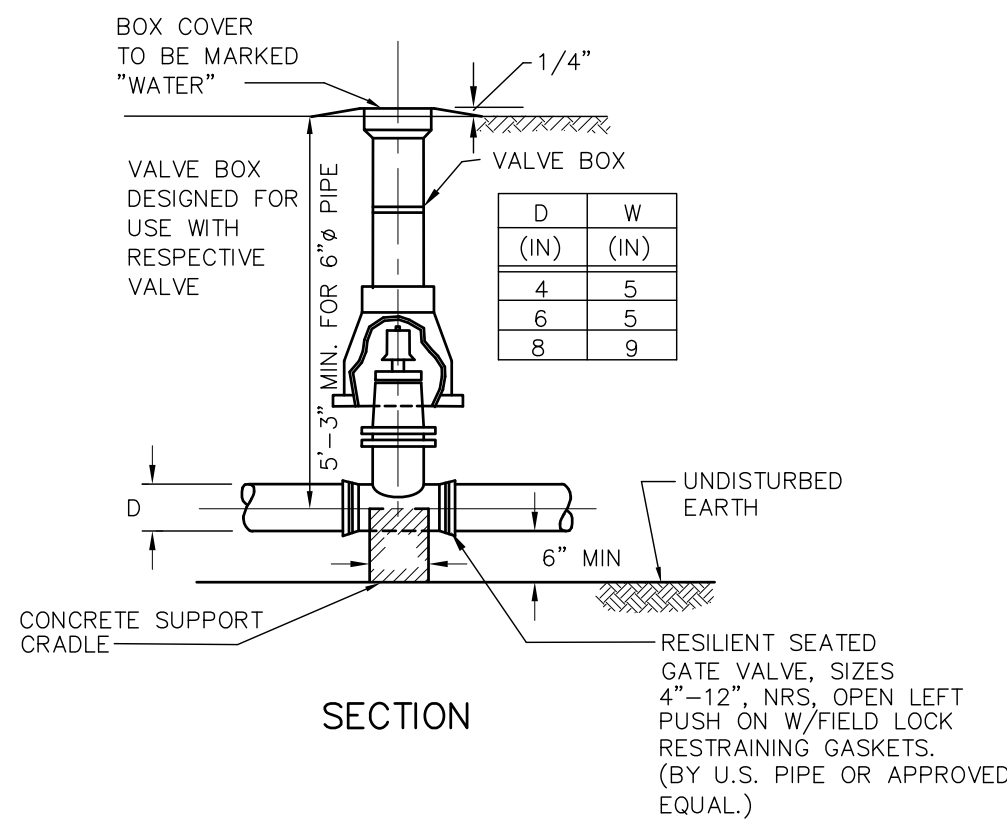


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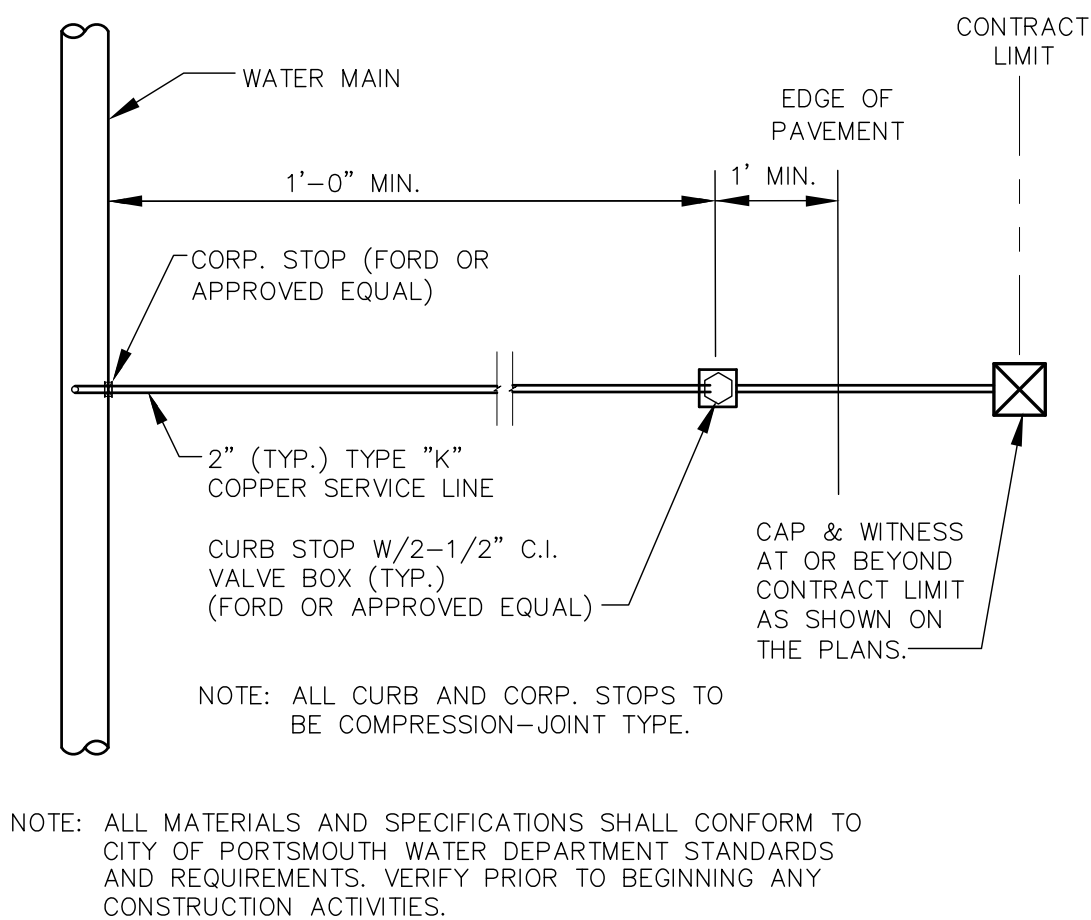




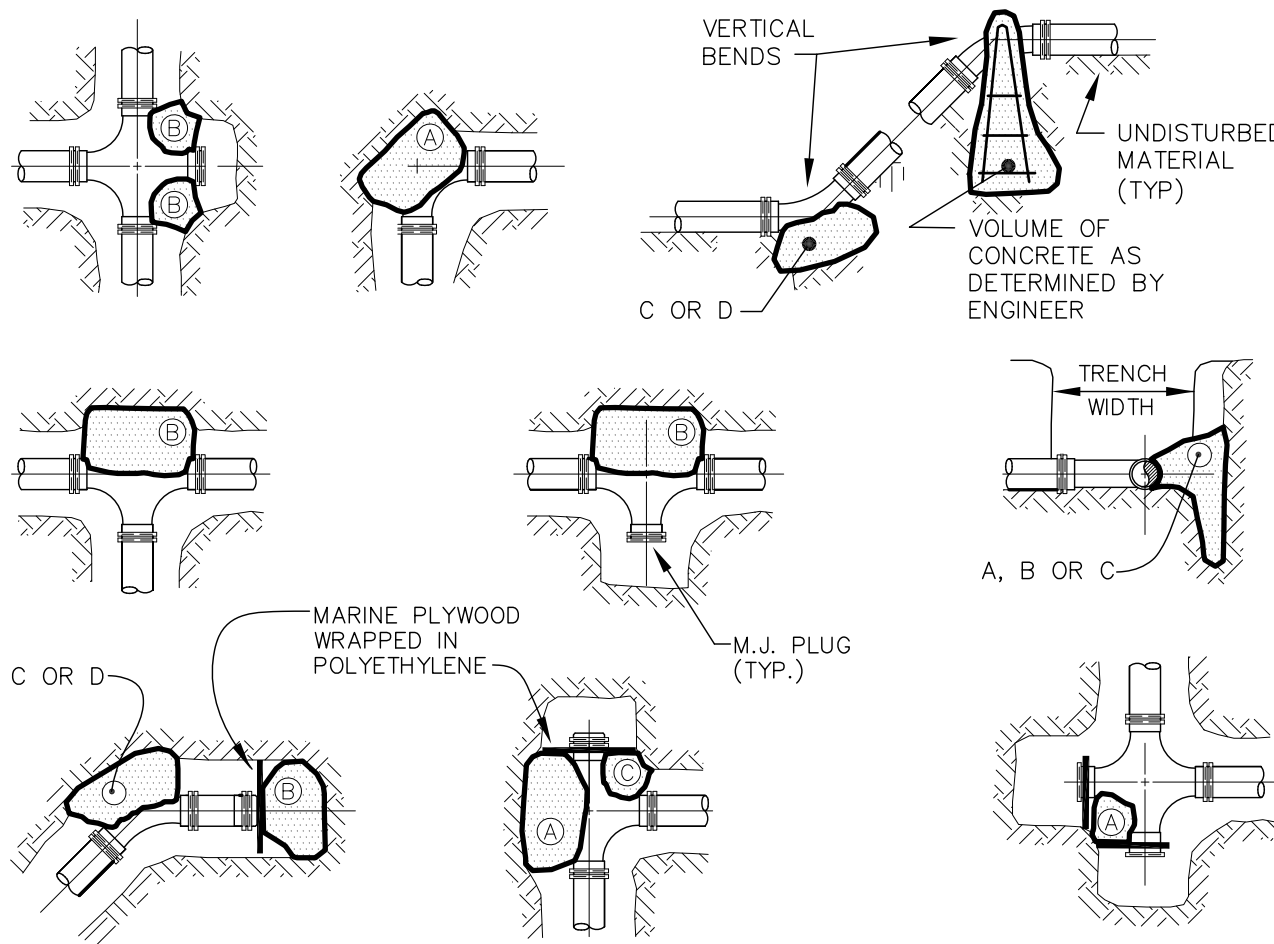
TEE & GATE VALVE ASSEMBLY DETAIL NOT TO SCALE



WATER VALVE DETAIL NOT TO SCALE



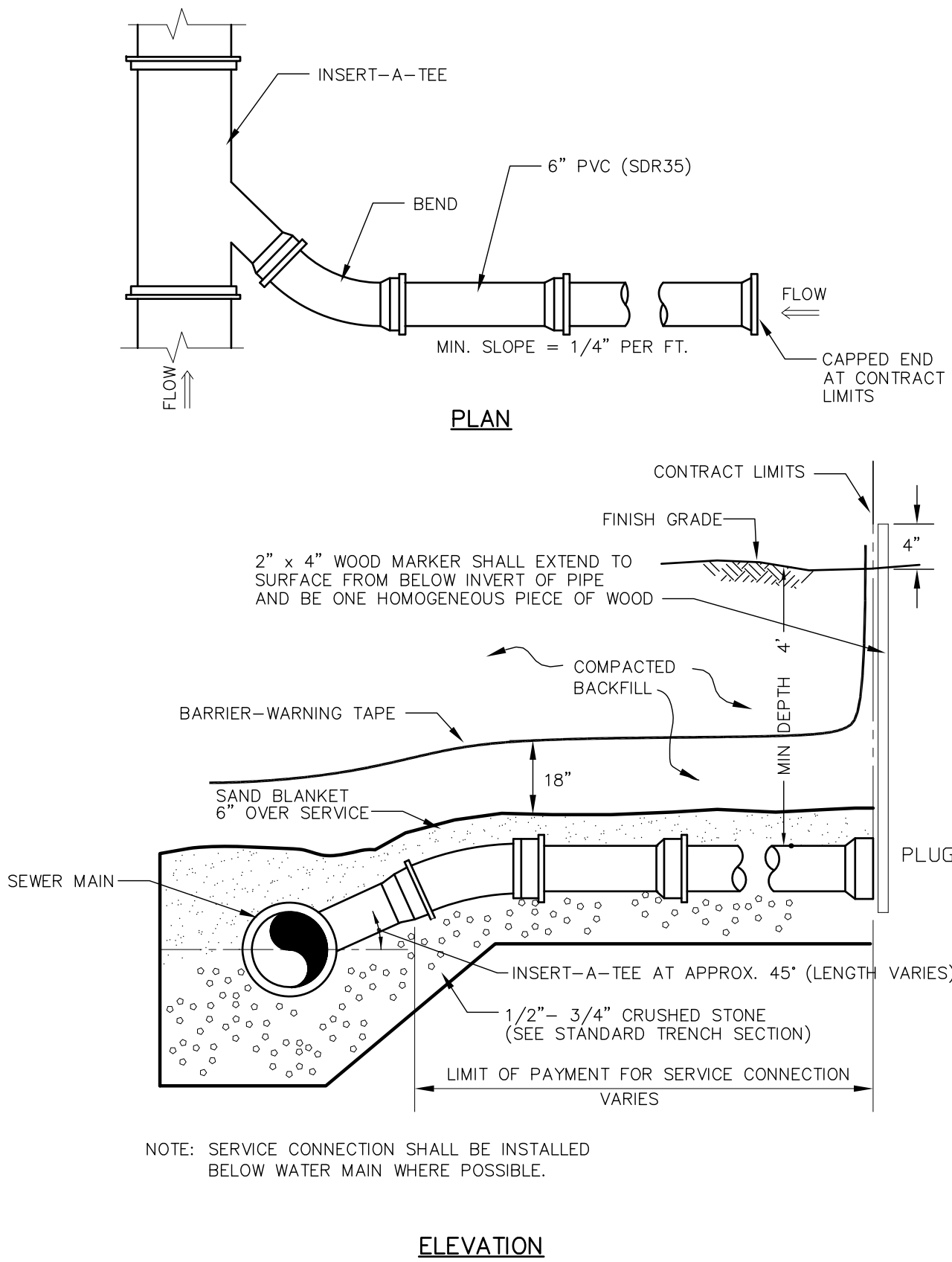
WATER SERVICE CONNECTION NOT TO SCALE



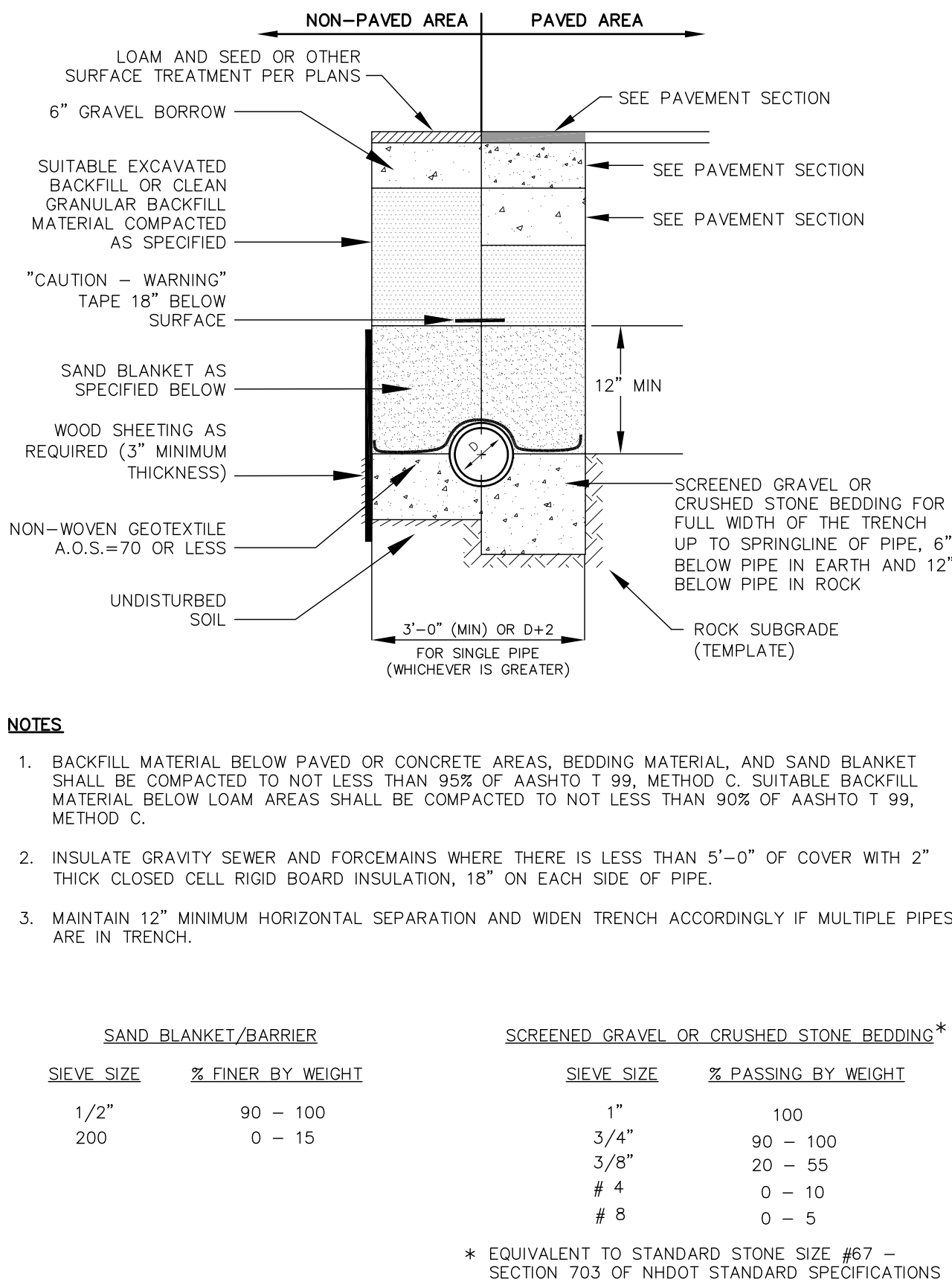
REACTION TYPE	PIPE SIZE				
	4"	6"	8"	10"	12"
A 90'	0.89	2.19	3.82	11.14	17.24
B 180'	0.65	1.55	2.78	8.38	12.00
C 45'	0.48	1.19	2.12	6.02	9.32
D 22-1/2"	0.25	0.60	1.06	3.08	4.74
E 11-1/4"	0.13	0.30	0.54	1.54	2.38

- NOTES
- POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL. WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL.
  - NO JOINTS SHALL BE COVERED WITH CONCRETE. POLYETHYLENE (6 MIL) SHALL BE PLACED AROUND FITTINGS PRIOR TO CONCRETE PLACEMENT.
  - ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
  - 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.
  - X
  - POLYETHYLENE (6 MIL) SHALL BE PLACED AROUND ALL FITTINGS PRIOR TO CONCRETE PLACEMENT.

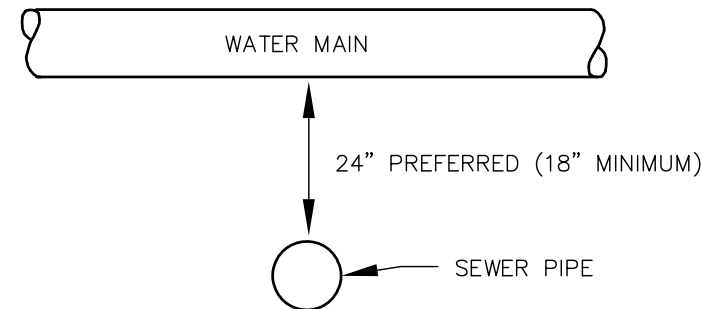
THRUST BLOCKING NOT TO SCALE



SEWER SERVICE CONNECTION NOT TO SCALE

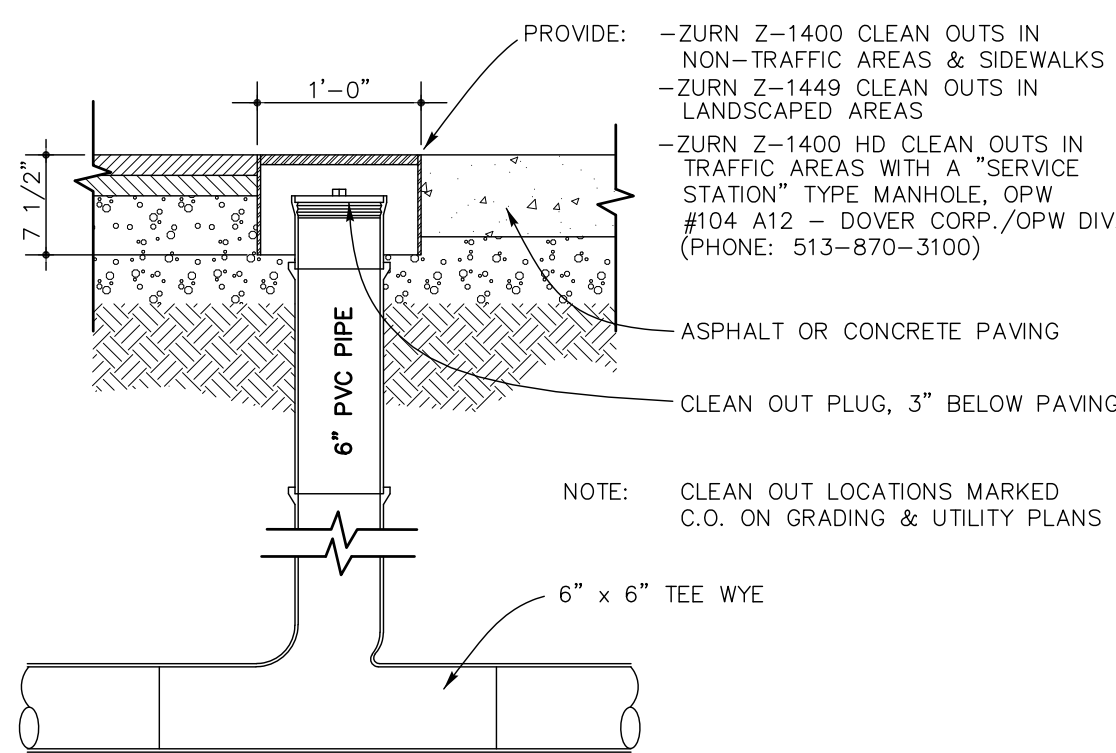


SEWER & FORCEMAIN TRENCH NOT TO SCALE



- NOTES
- 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.
  - SEWER PIPE JOINTS SHALL BE LOCATED A MINIMUM OF 6 FEET HORIZONTALLY FROM WATER MAIN.
  - 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

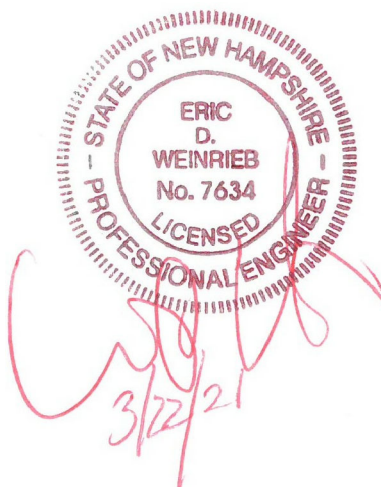


SEWER CLEANOUT NOT TO SCALE

- STANDARD TRENCH NOTES
- ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE: BACKFILL AS STATED IN THE TECHNICAL SPECIFICATIONS OR AS SHOWN ON THE DRAWING.
  - 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.
  - 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.
  - 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, 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.
  - 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.
  - 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 THAN 1 FOOT ABOVE THE TOP OF THE PIPE.
  - 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.
  - FOR CROSS COUNTRY CONSTRUCTION, BACKFILL, FILL AND/OR LOAM SHALL BE MOUNDED TO A HEIGHT OF 6 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
  - 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.
  - 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.
  - 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.

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ENGINEERING, INC.

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



NOT FOR CONSTRUCTION

ISSUED FOR:

TAC

ISSUE DATE:

MARCH 22, 2021

NO.	DESCRIPTION	BY	DATE
0	TAC WORK SESSION	EBS	05/05/20
1	TAC	EBS	10/19/20
2	TAC	EBS	03/22/21

DRAWN BY: EBS

APPROVED BY: EDW

DRAWING FILE: 5042-SITE.dwg

SCALE: 22"x34" 1" = 20'  
11"x17" 1" = 40'

OWNER:

64 VAUGHAN MALL, LLC

41 INDUSTRIAL DRIVE  
EXETER, NH 03833

APPLICANT:

HAMPSHIRE  
DEVELOPMENT CORP.

41 INDUSTRIAL DRIVE  
EXETER, NH 03833

PROJECT:

64 VAUGHAN MALL  
BUILDING RESTORATION

TAX MAP 126, LOT 1

64 VAUGHAN MALL  
PORTSMOUTH, NH 03801

TITLE:

DETAIL SHEET

SHEET NUMBER:

D-4

PS042



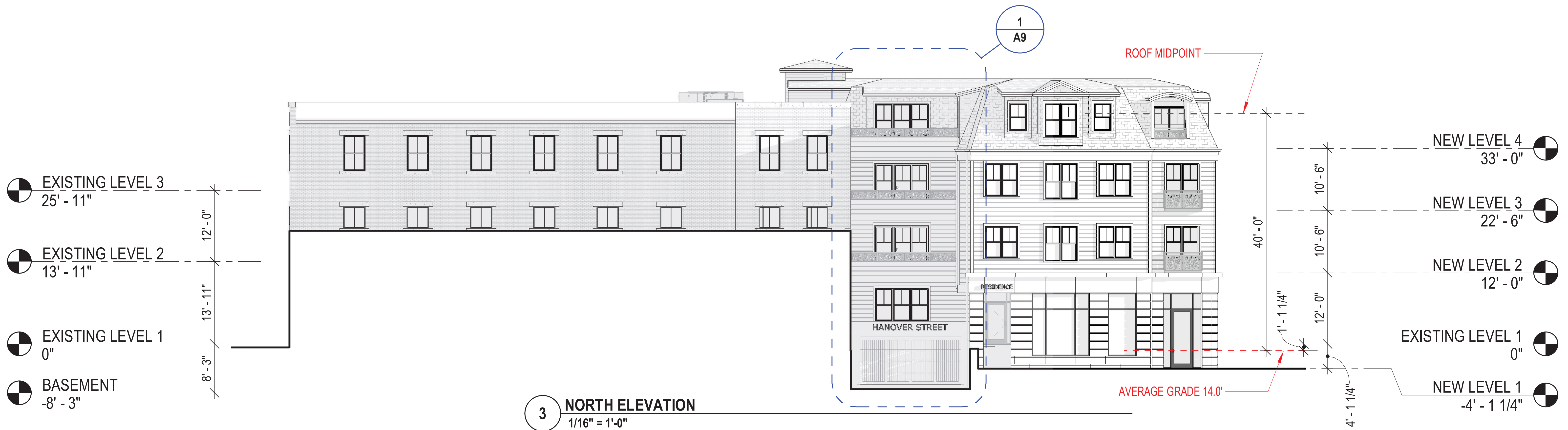


1 SOUTH ELEVATION  
1/16" = 1'-0"



2 EAST ELEVATION  
1/16" = 1'-0"









2 VIEW 02



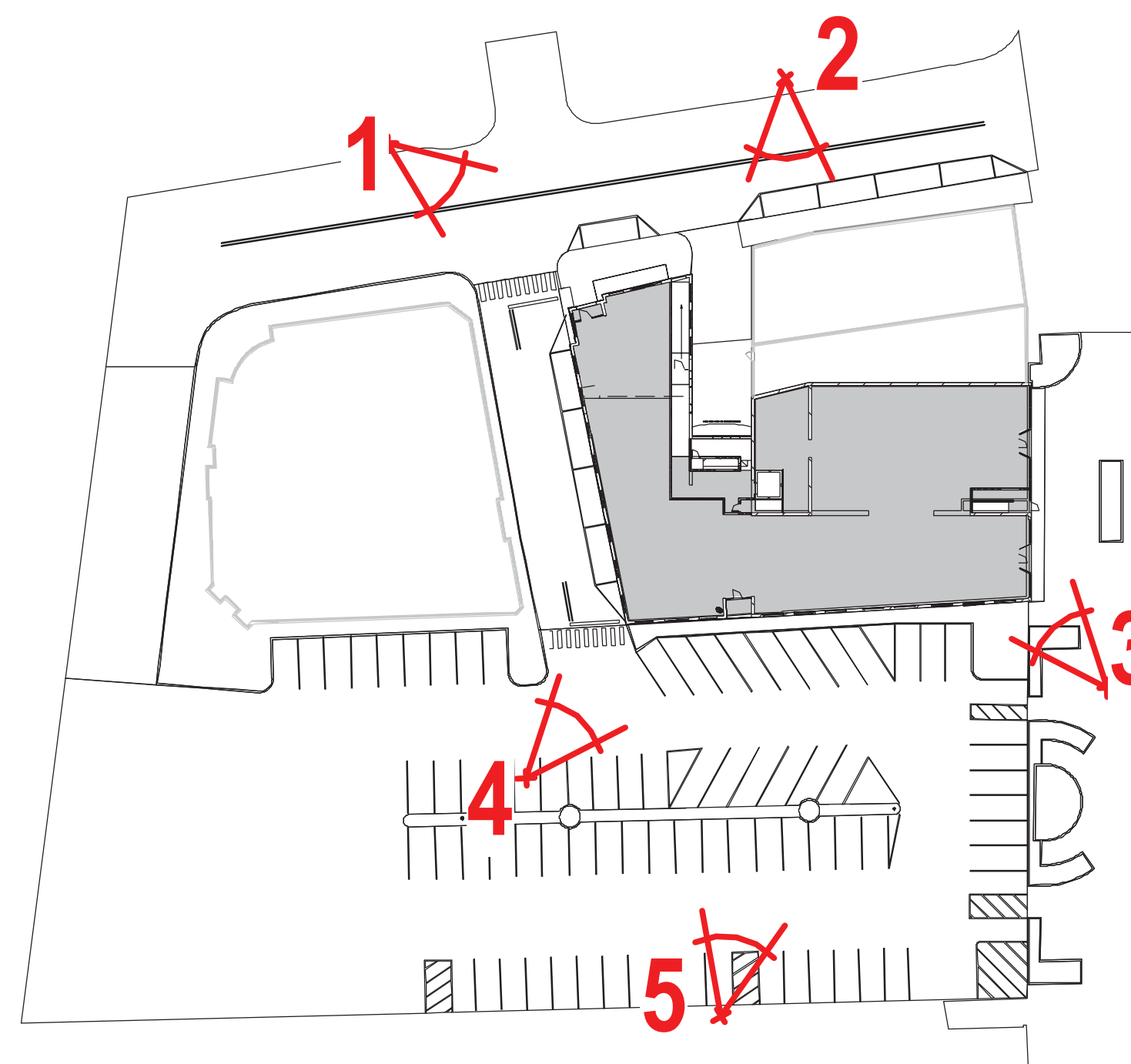
3 VIEW 03



4 VIEW 04



1 VIEW 01



P LEVEL 1 - PERSPECTIVE PLAN  
1" = 100'-0"



5 VIEW 05

A5

## PERSPECTIVE VIEWS 64 Vaughan Mall

07/28/2021

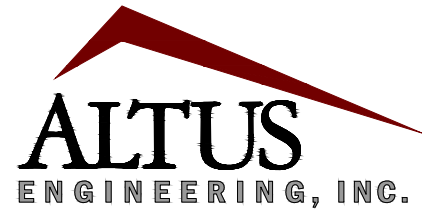
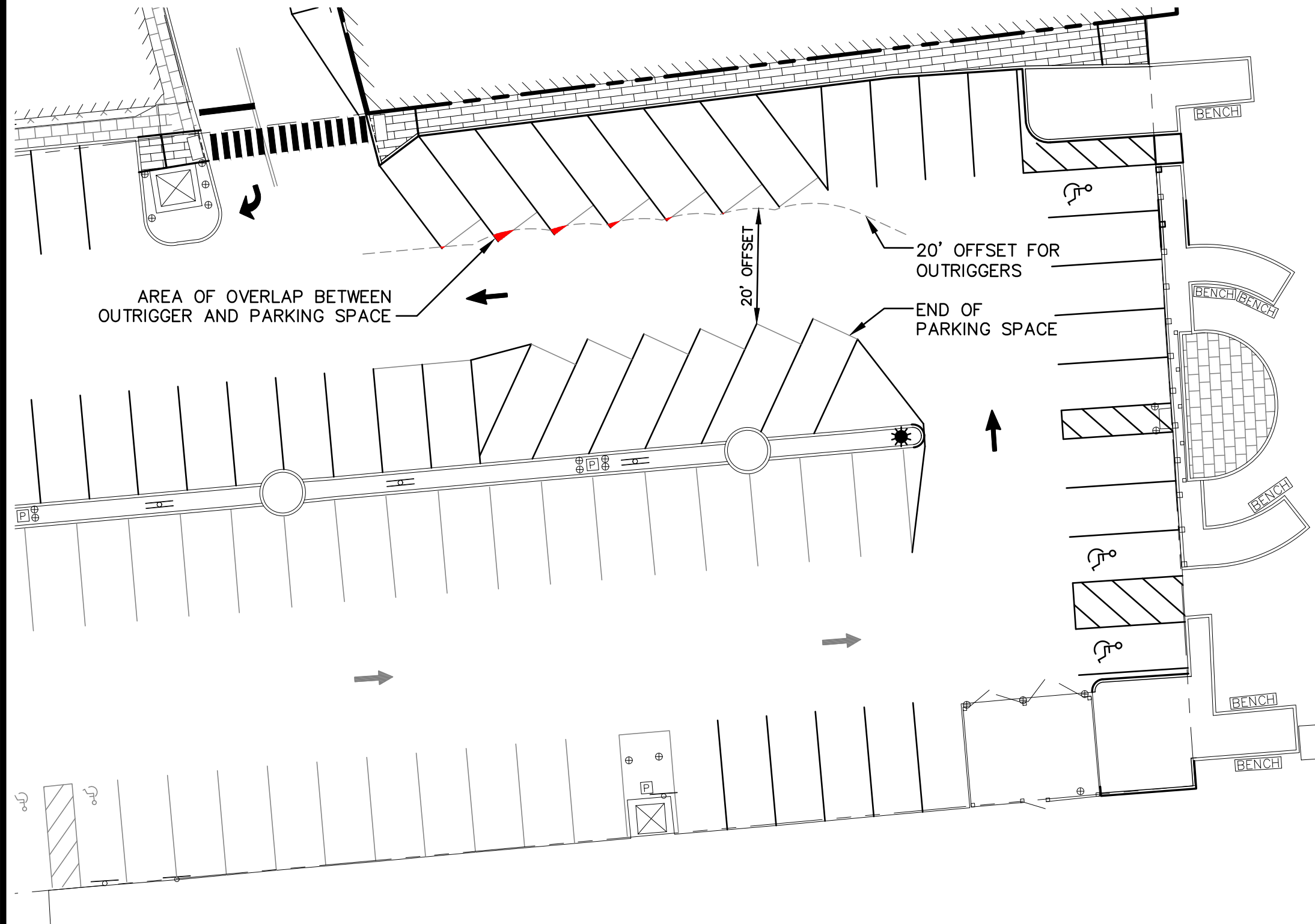
SCALE: 1" = 100'-0"



ARCHITECTS  
INTERIORS  
PLANNERS

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SCALE: 11"x17" 1" = 20'

ISSUED FOR: TAC

ISSUE DATE: MAY 19, 2021

REVISIONS:	NO.	DESCRIPTION	BY
	0	TAC	EBS 05/19/21

OWNER:  
**64 VAUGHAN MALL, LLC**  
**41 INDUSTRIAL DRIVE**  
**EXETER, NH 03833**

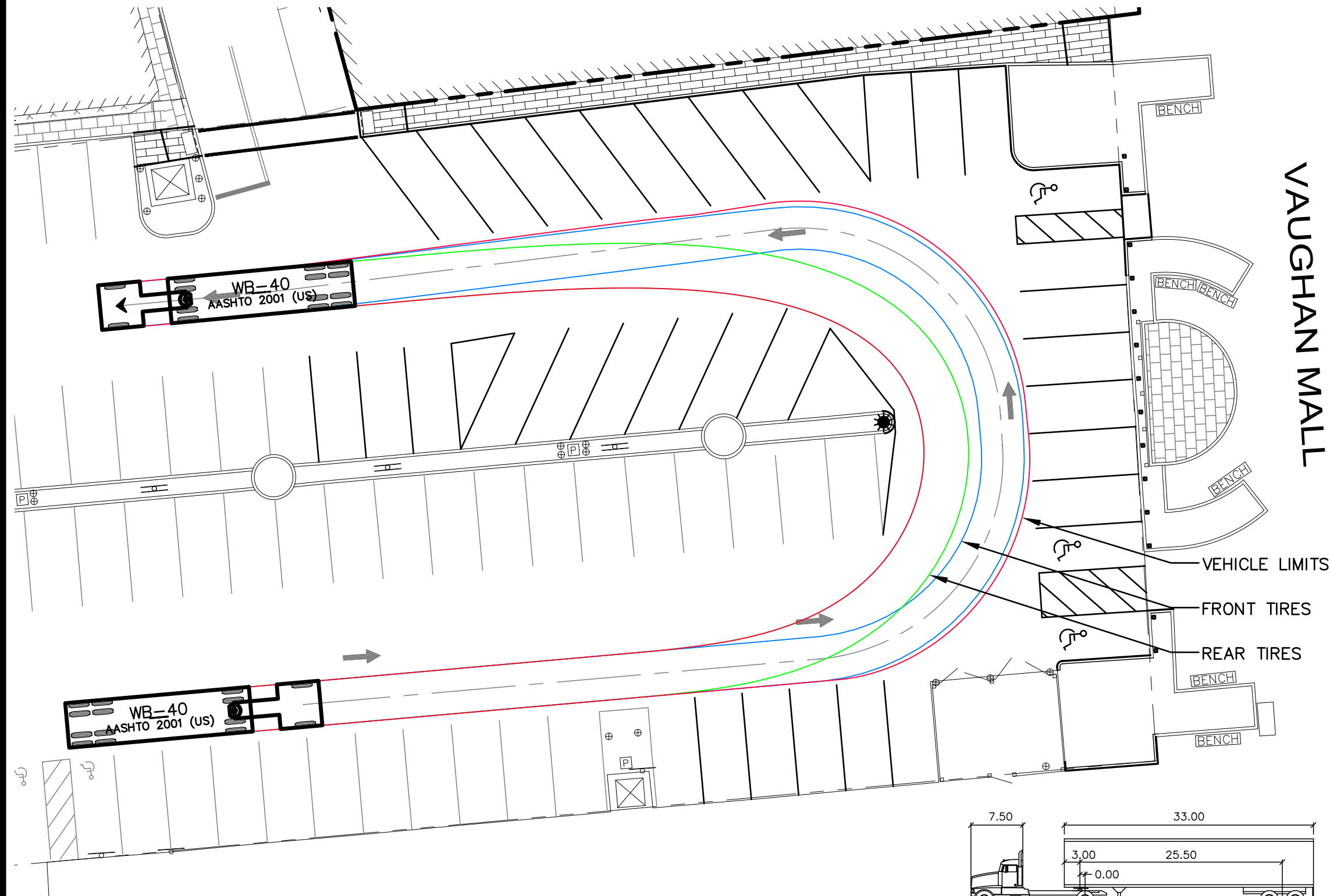
APPLICANT:  
**HAMPSHIRE DEVELOPMENT CORP.**  
**41 INDUSTRIAL DRIVE**  
**EXETER, NH 03833**

PROJECT:  
**64 VAUGHAN MALL BUILDING RESTORATION**  
**TAX MAP 126, LOT 1**  
**64 VAUGHAN MALL**  
**PORTSMOUTH, NH 03801**

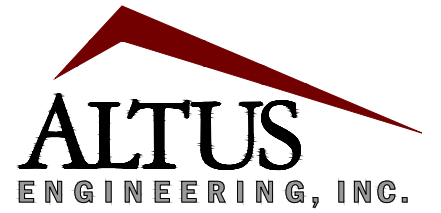
TITLE:  
**FIRE APPARATUS OUTRIGGER EXHIBIT**

SHEET NUMBER:  
**EXH-4**

P5042



VAUGHAN MALL



133 Court Street Portsmouth, NH 03801  
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SCALE: 11"x17" 1" = 20'

ISSUED FOR: TAC

ISSUE DATE: OCTOBER 19, 2020

REVISIONS:	
NO.	DESCRIPTION
0	TAC WORK SESSION
1	ISSUED FOR TAC

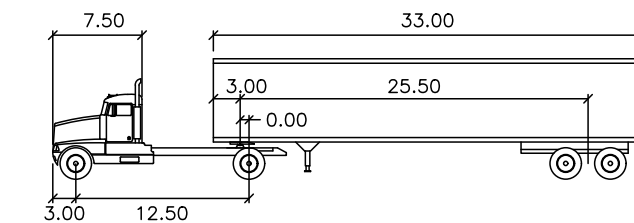
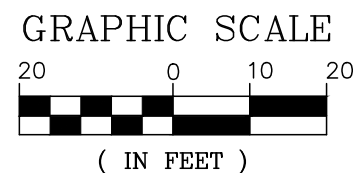
OWNER: **BENDETSON  
-PORTSMOUTH  
REALTY TRUST**  
c/o CABOT HOUSE, INC.  
10 INDUSTRIAL WAY  
AMESBURY, MA 01913

APPLICANT: **HAMPSHIRE  
DEVELOPMENT CORP.**  
41 INDUSTRIAL DRIVE  
EXETER, NH 03833

PROJECT: **MARGESON BROS.  
BUILDING RESTORATION**  
TAX MAP 126, LOT 1  
64 VAUGHAN MALL  
PORTSMOUTH, NH 03801

TITLE:  
**TRUCK TURNING  
EXHIBIT**

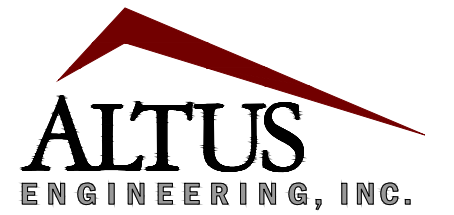
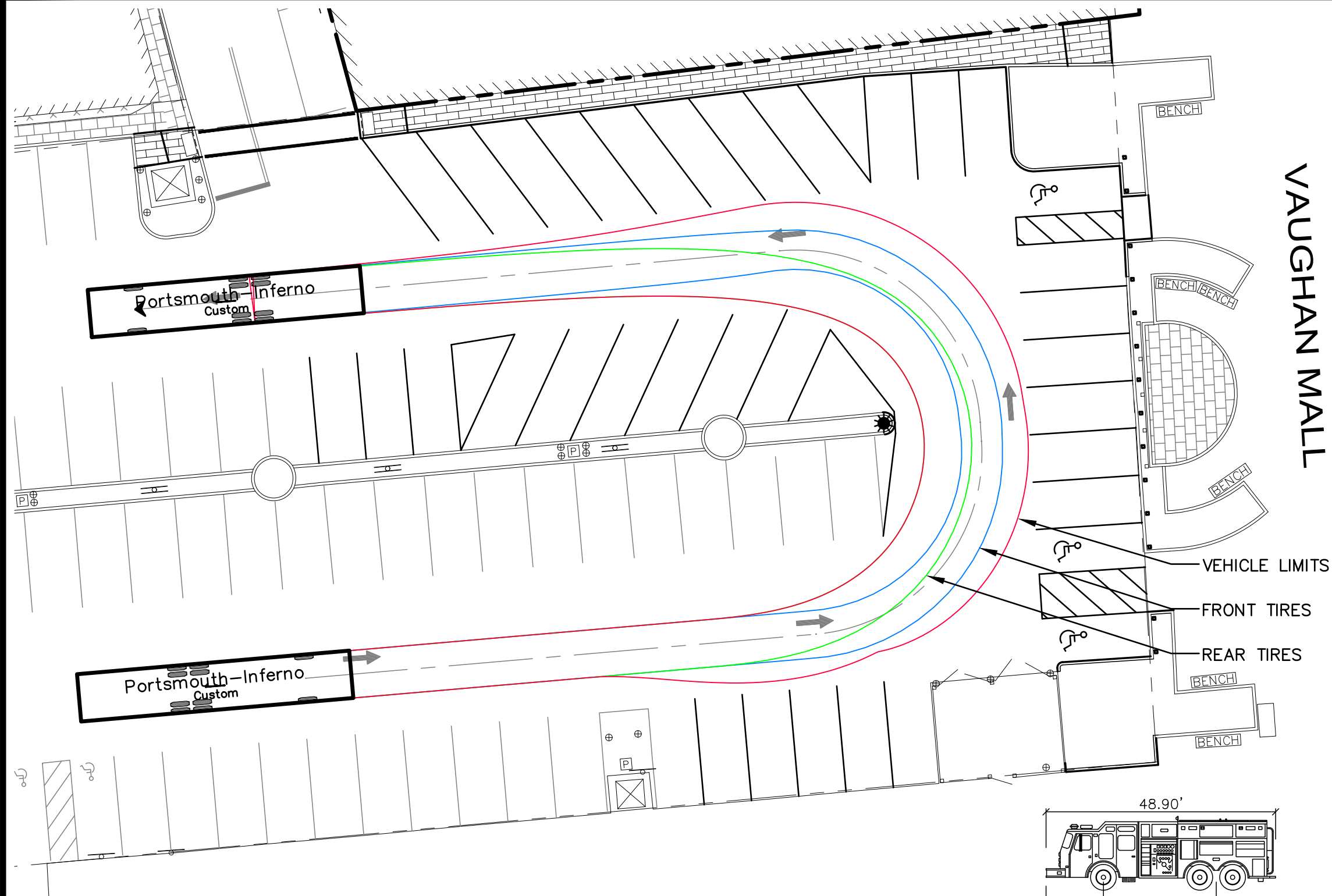
SHEET NUMBER:  
**EXH-2**



WB-40

	feet		
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.00	Steering Angle	: 20.3
Tractor Track	: 8.00	Articulating Angle	: 70.0
Trailer Track	: 8.00		

P5042



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SCALE: 11"x17" 1" = 20'

ISSUED FOR: TAC

ISSUE DATE: OCTOBER 19, 2020

REVISIONS:	
NO.	DESCRIPTION
0	TAC WORK SESSION
1	ISSUED FOR TAC

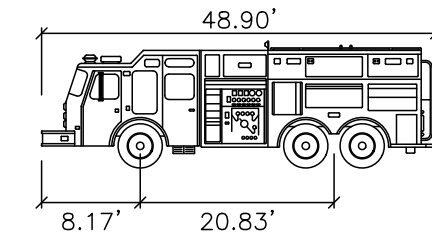
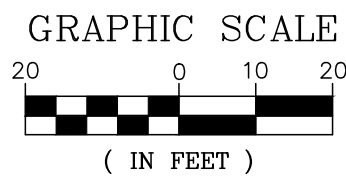
OWNER: **BENDETSON  
-PORTSMOUTH  
REALTY TRUST**  
c/o CABOT HOUSE, INC.  
10 INDUSTRIAL WAY  
AMESBURY, MA 01913

APPLICANT: **HAMPSHIRE  
DEVELOPMENT CORP.**  
41 INDUSTRIAL DRIVE  
EXETER, NH 03833

PROJECT: **MARGESON BROS.  
BUILDING RESTORATION**  
TAX MAP 126, LOT 1  
64 VAUGHAN MALL  
PORTSMOUTH, NH 03801

TITLE: **FIRE APPARATUS  
TURNING EXHIBIT**

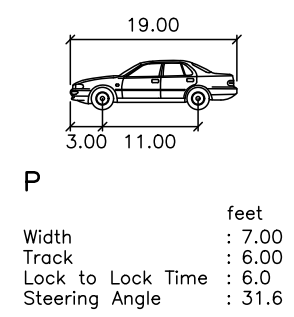
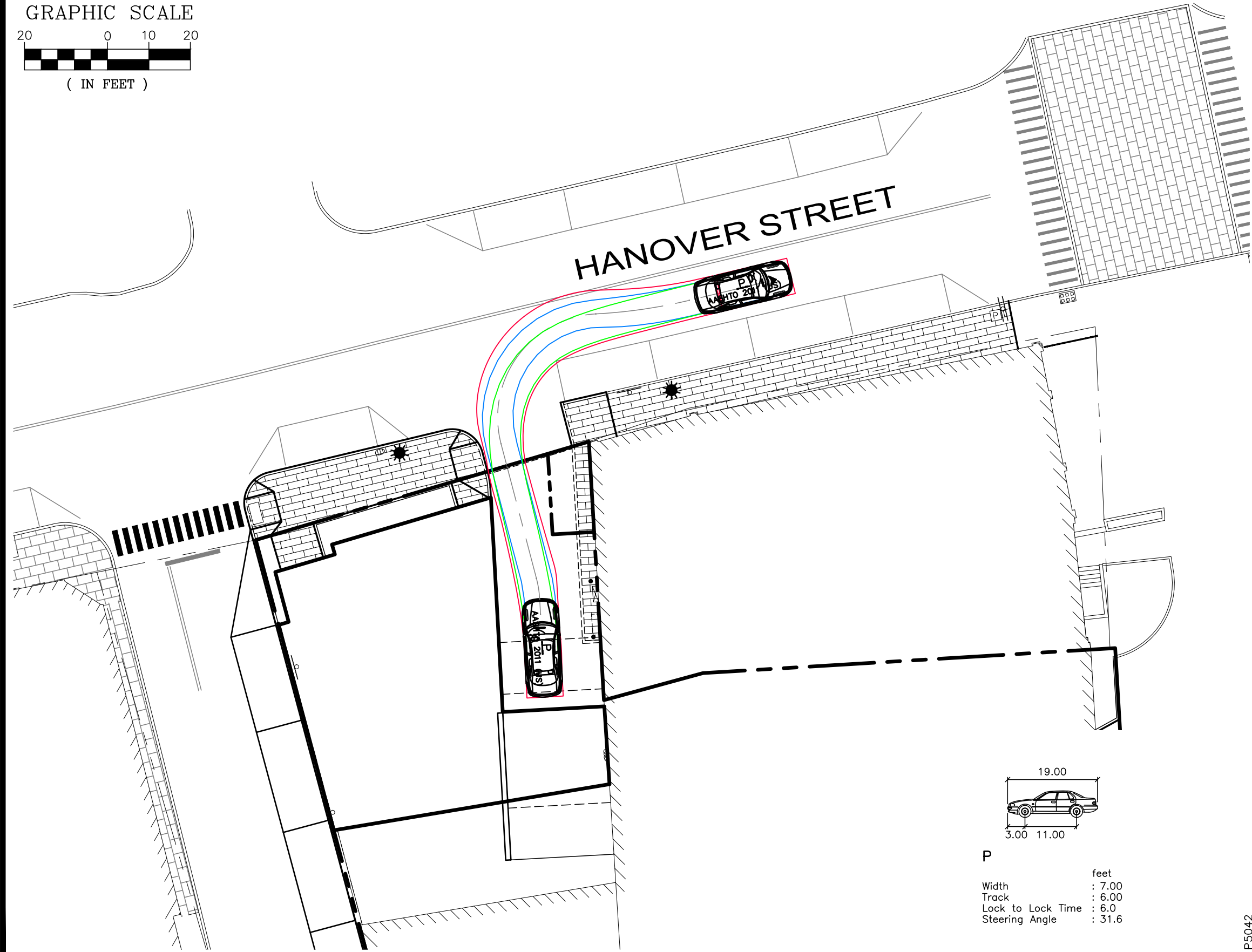
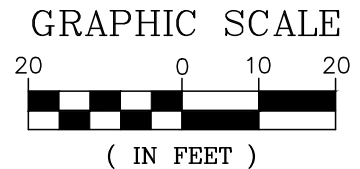
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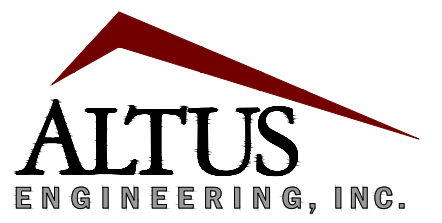
Portsmouth-Inferno

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

P5042



P5042



133 Court Street Portsmouth, NH 03801  
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SCALE: 11"x17" 1" = 20'

ISSUED FOR: TAC

ISSUE DATE: JULY 28, 2021

REVISIONS:	
NO.	DESCRIPTION
0	TAC

BY	
EBS	07/28/21

OWNER:

**64 VAUGHAN MALL, LLC**  
**41 INDUSTRIAL DRIVE**  
**EXETER, NH 03833**

APPLICANT:

**HAMPSHIRE DEVELOPMENT CORP.**  
**41 INDUSTRIAL DRIVE**  
**EXETER, NH 03833**

PROJECT:

**64 VAUGHAN MALL BUILDING RESTORATION**  
**TAX MAP 126, LOT 1**  
**64 VAUGHAN MALL**  
**PORTSMOUTH, NH 03801**

TITLE:

**CAR TURNING EXHIBIT**

SHEET NUMBER:

**EXH-5**



# **DRAINAGE ANALYSIS**

**FOR**

## **Site Redevelopment of 64 Vaughan Street**

**64 Vaughan Street  
Portsmouth, NH**

**Tax Map 126, Lot 1**

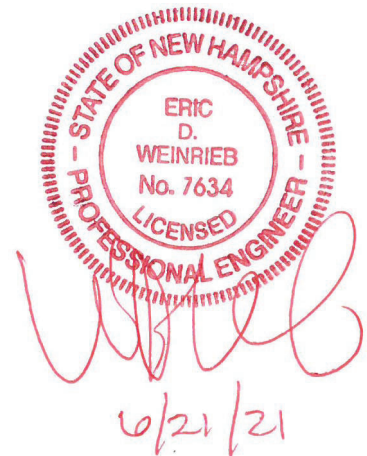
**June 21, 2021**

*Prepared For:*

**Hampshire Development Corp.**  
41 Industrial Drive  
Exeter, NH 03833

*Prepared By:*

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



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	Proposed Site Design
	Calculation Methods
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	Conclusions
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Section 3	Drainage Analysis, Pre-Development
Section 4	Drainage Analysis, Post-Development
Section 5	NRCC Extreme Precipitation Table (Rainfall Data)
Section 6	NRCS Soils Report
Section 7	Stormwater Operations and Maintenance Plan
Section 8	Watershed Plans
	Pre-Development Watershed Plan
	Post-Development Watershed Plan

# Section 1

## Narrative

## **PROJECT DESCRIPTION**

Hampshire Development Corp. is proposing to redevelop an existing urban site located at 64 Vaughan Street in Portsmouth, NH. Identified as Assessor's Map 126, Lot 1, the property is approximately 0.32 (+/-) acres in size and is located in the City's Character District 5 (CD-5), Downtown and Historic Overlay zoning districts. The site is currently 99.94% impervious and hosts a building formerly used as a furniture store and a paved parking lot.

The proposed project will rehabilitate a portion of the existing structure, raze and rebuild another portion, construct an addition and install an underground parking garage in the existing basement. The finished product will consist of fourteen residential units and over 12,000sf of ground floor retail space. The project also envisions constructing a new sidewalk along the adjacent City-owned Worth parking lot and installing new landscape areas in the Worth lot and along the site's frontage on Vaughan Mall and Hanover Street.

Runoff from the redevelopment will be directed to an existing municipal closed drainage system by way of two new catch basins in the Worth lot and roof leaders that will collect the building downspouts along Hanover Street and the adjacent alley.

### ***Site Soils***

The NRCS indicates that the subject property consists of one primary soil classification:  
699 – Urban Land, HSG C

### ***Pre-Development (Existing Conditions)***

The pre-development site conditions reflect the existing conditions of the site, which include the existing building and parking lot in addition to the surrounding area. The site discharges to the City's closed drainage systems in Hanover Street and Vaughan Mall. Identified as Point of Analysis (POA) #'s 1 (CB #4) and 2 (DMH #5202), these drainage systems are the analysis points for the Pre-Development drainage model.

The majority of the grades and elevations shown on the plans are based on a site survey completed by James Verra and Associates, Inc. One limited offsite area on Hanover Street was modeled using data from the City's GIS system. The study pre-development area was analyzed as four (4) watersheds, which discharge to POA #'s 1 and 2 as identified above.

### ***Post-Development (Proposed Site Design)***

A portion of the existing building will remain and be rehabilitated, another portion reconstructed and an addition added for a total of fourteen residential units and ground floor retail space. The adjacent Worth parking lot will be also reconfigured to add a new sidewalk and landscape islands.

The proposed stormwater system is depicted on the attached Post-Development Watershed Plan. For the post development analysis, the site was divided into eight (8) watershed areas to more accurately depict the post-development conditions. 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. Times of concentration (Tc) were set to a minimum of 6 minutes per TR-55. 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 as identified by the NHDES Alteration of Terrain Bureau, 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	<b>2-Yr Storm (3.69 inch)</b>	<b>10-Yr Storm (5.60 inch)</b>	<b>25-Yr Storm (7.10 inch)</b>	<b>50-Yr Storm (8.50 inch)</b>
<b>POA #1 (Hanover Street)</b>				
Pre	2.59	3.95	5.01	6.01
Post	2.56	3.92	4.99	5.98
<b>Change</b>	<b>-0.03</b>	<b>-0.03</b>	<b>-0.02</b>	<b>-0.03</b>
<b>POA #2 (Vaughan Mall)</b>				
Pre	1.47	2.25	2.86	3.43
Post	1.45	2.23	2.84	3.40
<b>Change</b>	<b>-0.02</b>	<b>-0.02</b>	<b>-0.02</b>	<b>-0.03</b>

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 64 Vaughan Mall 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. Appropriate steps will be taken to properly mitigate erosion and sedimentation through the use of Best Management Practices for sediment and erosion control, including perimeter barriers during construction and permanent deep sump catch basins with grease hoods.

## Section 2

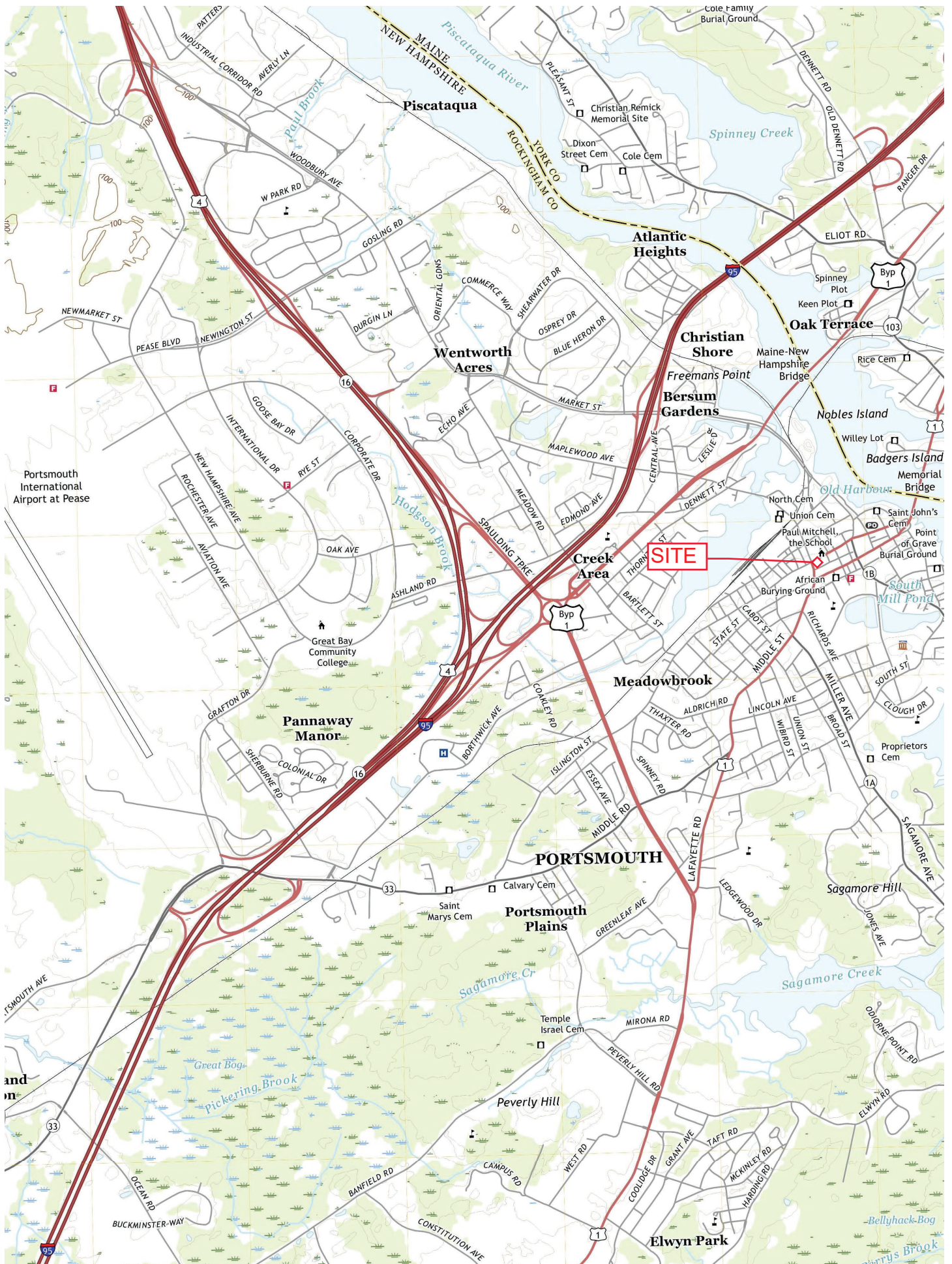
### Aerial Photo and USGS Map





SITE





## Section 3

# Drainage Calculations

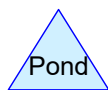
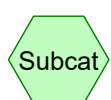
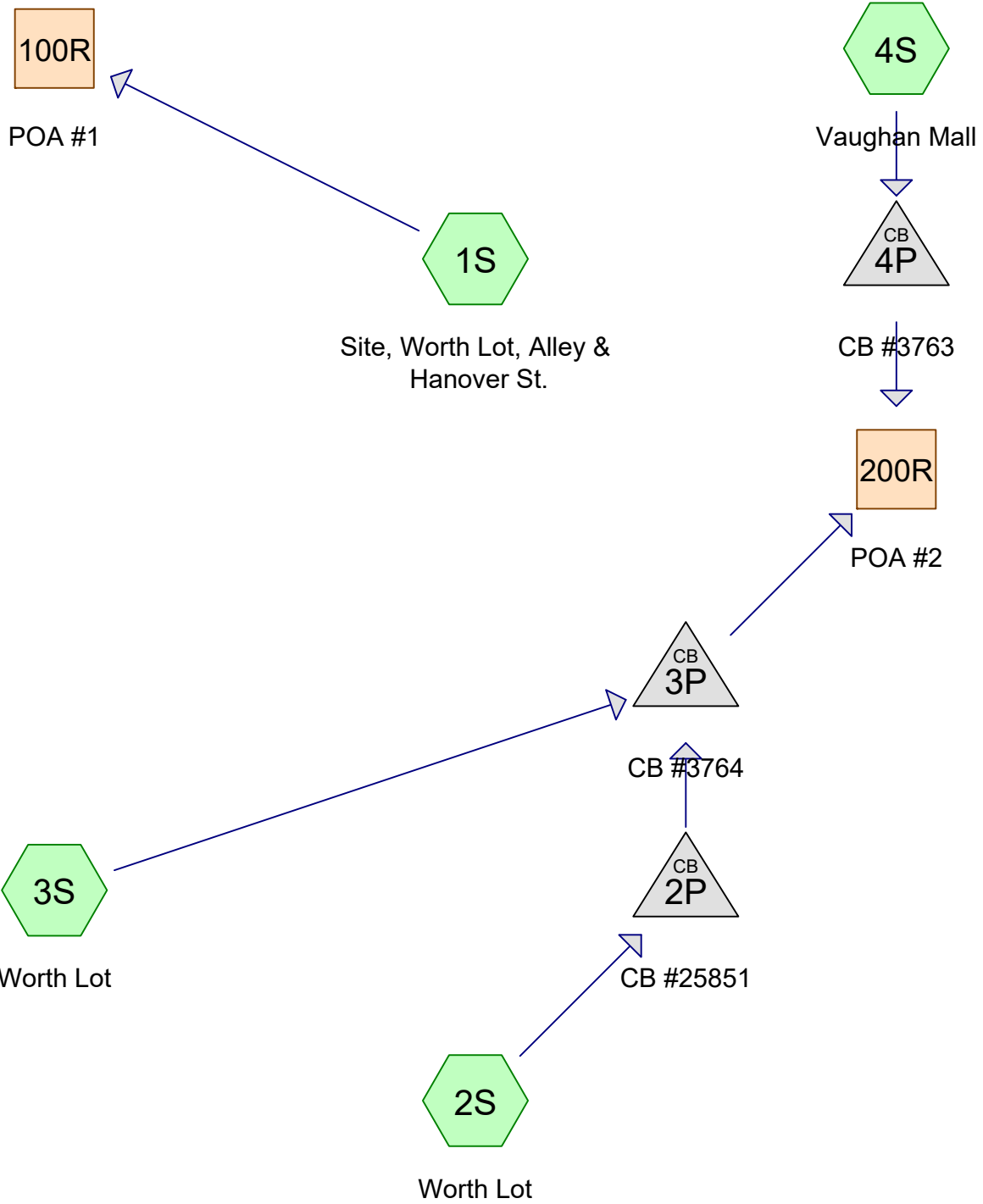
Pre-Development

2-Year, 24-Hour Summary

10-Year, 24-Hour Complete

25-Year, 24-Hour Summary

50-Year, 24-Hour Summary



**5042-Pre***Type III 24-hr 2-yr Rainfall=3.69"*

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Page 2

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 Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: Site, Worth Lot, Alley &** Runoff Area=32,094 sf 99.25% Impervious Runoff Depth=3.46"  
Flow Length=347' Tc=6.0 min CN=98 Runoff=2.59 cfs 0.212 af

**Subcatchment 2S: Worth Lot** Runoff Area=4,739 sf 98.48% Impervious Runoff Depth=3.46"  
Flow Length=124' Tc=6.0 min CN=98 Runoff=0.38 cfs 0.031 af

**Subcatchment 3S: Worth Lot** Runoff Area=10,680 sf 98.58% Impervious Runoff Depth=3.46"  
Flow Length=213' Tc=6.0 min CN=98 Runoff=0.86 cfs 0.071 af

**Subcatchment 4S: Vaughan Mall** Runoff Area=2,908 sf 92.61% Impervious Runoff Depth=3.23"  
Flow Length=61' Tc=6.0 min CN=96 Runoff=0.23 cfs 0.018 af

**Reach 100R: POA #1** Inflow=2.59 cfs 0.212 af  
Outflow=2.59 cfs 0.212 af

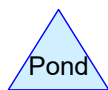
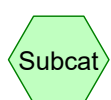
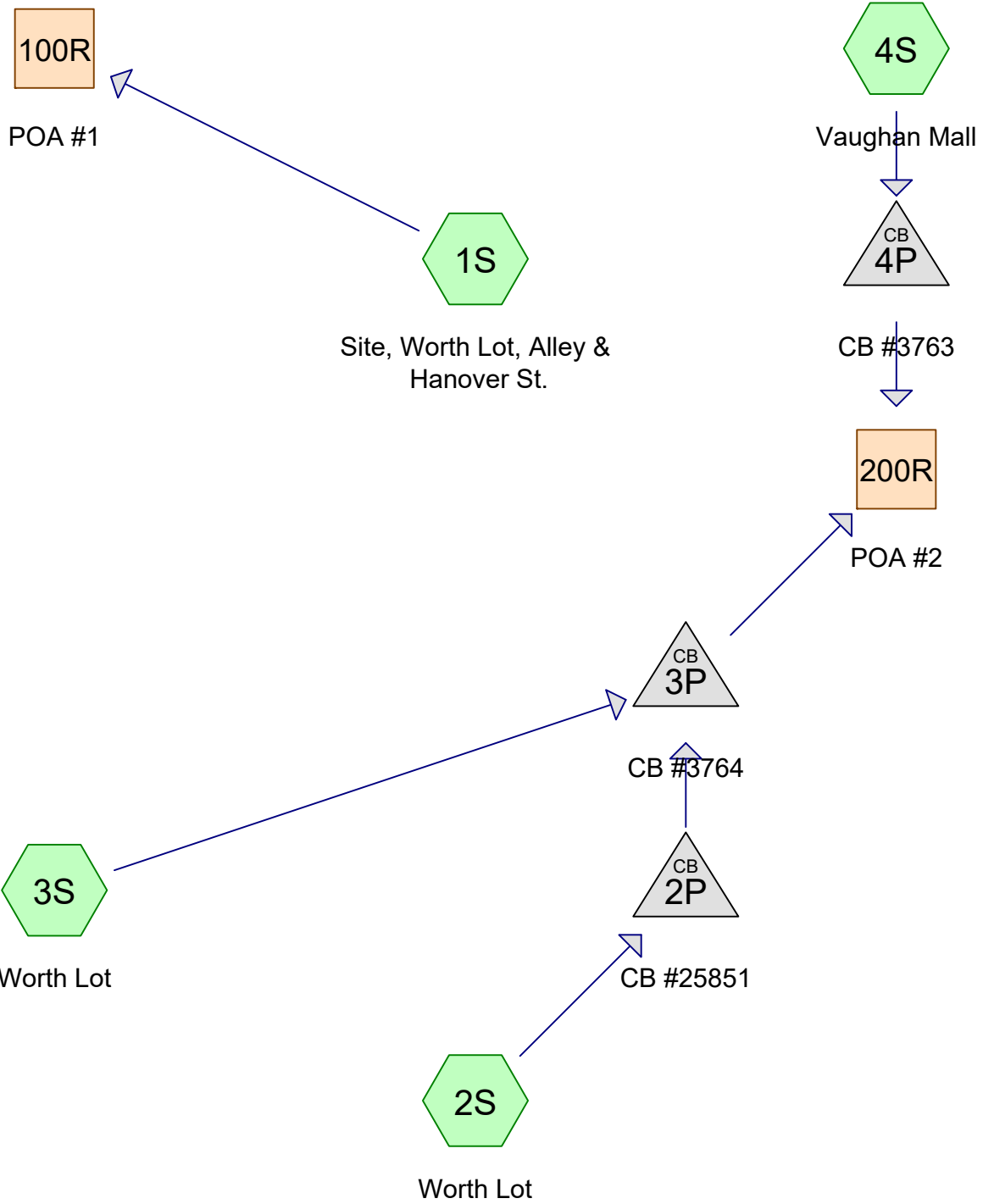
**Reach 200R: POA #2** Inflow=1.47 cfs 0.120 af  
Outflow=1.47 cfs 0.120 af

**Pond 2P: CB #25851** Peak Elev=12.32' Inflow=0.38 cfs 0.031 af  
12.0" Round Culvert n=0.012 L=64.0' S=0.0127 '/' Outflow=0.38 cfs 0.031 af

**Pond 3P: CB #3764** Peak Elev=11.74' Inflow=1.24 cfs 0.102 af  
12.0" Round Culvert n=0.012 L=18.0' S=0.0100 '/' Outflow=1.24 cfs 0.102 af

**Pond 4P: CB #3763** Peak Elev=12.26' Inflow=0.23 cfs 0.018 af  
12.0" Round Culvert n=0.012 L=40.0' S=0.0140 '/' Outflow=0.23 cfs 0.018 af

**Total Runoff Area = 1.158 ac Runoff Volume = 0.332 af Average Runoff Depth = 3.44"**  
**1.35% Pervious = 0.016 ac 98.65% Impervious = 1.142 ac**





**5042-Pre**

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**Area Listing (all nodes)**

Area (acres)	CN	Description (subcatchment-numbers)
0.016	74	>75% Grass cover, Good, HSG C (1S, 2S, 3S, 4S)
0.411	98	Paved parking, HSG C (2S, 3S, 4S)
0.494	98	Paved roads w/curbs & sewers, HSG C (1S)
0.237	98	Roofs, HSG C (1S)
<b>1.158</b>	<b>98</b>	<b>TOTAL AREA</b>

**5042-Pre**

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*Type III 24-hr 10-yr Rainfall=5.60"*

Printed 6/16/2021

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 Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: Site, Worth Lot, Alley &** Runoff Area=32,094 sf 99.25% Impervious Runoff Depth=5.36"  
Flow Length=347' Tc=6.0 min CN=98 Runoff=3.95 cfs 0.329 af

**Subcatchment 2S: Worth Lot** Runoff Area=4,739 sf 98.48% Impervious Runoff Depth=5.36"  
Flow Length=124' Tc=6.0 min CN=98 Runoff=0.58 cfs 0.049 af

**Subcatchment 3S: Worth Lot** Runoff Area=10,680 sf 98.58% Impervious Runoff Depth=5.36"  
Flow Length=213' Tc=6.0 min CN=98 Runoff=1.31 cfs 0.110 af

**Subcatchment 4S: Vaughan Mall** Runoff Area=2,908 sf 92.61% Impervious Runoff Depth=5.13"  
Flow Length=61' Tc=6.0 min CN=96 Runoff=0.35 cfs 0.029 af

**Reach 100R: POA #1** Inflow=3.95 cfs 0.329 af  
Outflow=3.95 cfs 0.329 af

**Reach 200R: POA #2** Inflow=2.25 cfs 0.187 af  
Outflow=2.25 cfs 0.187 af

**Pond 2P: CB #25851** Peak Elev=12.39' Inflow=0.58 cfs 0.049 af  
12.0" Round Culvert n=0.012 L=64.0' S=0.0127 '/' Outflow=0.58 cfs 0.049 af

**Pond 3P: CB #3764** Peak Elev=11.94' Inflow=1.90 cfs 0.158 af  
12.0" Round Culvert n=0.012 L=18.0' S=0.0100 '/' Outflow=1.90 cfs 0.158 af

**Pond 4P: CB #3763** Peak Elev=12.32' Inflow=0.35 cfs 0.029 af  
12.0" Round Culvert n=0.012 L=40.0' S=0.0140 '/' Outflow=0.35 cfs 0.029 af

**Total Runoff Area = 1.158 ac Runoff Volume = 0.516 af Average Runoff Depth = 5.35"**  
**1.35% Pervious = 0.016 ac 98.65% Impervious = 1.142 ac**

**5042-Pre**

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Type III 24-hr 10-yr Rainfall=5.60"

Printed 6/16/2021

**Summary for Subcatchment 1S: Site, Worth Lot, Alley & Hanover St.**

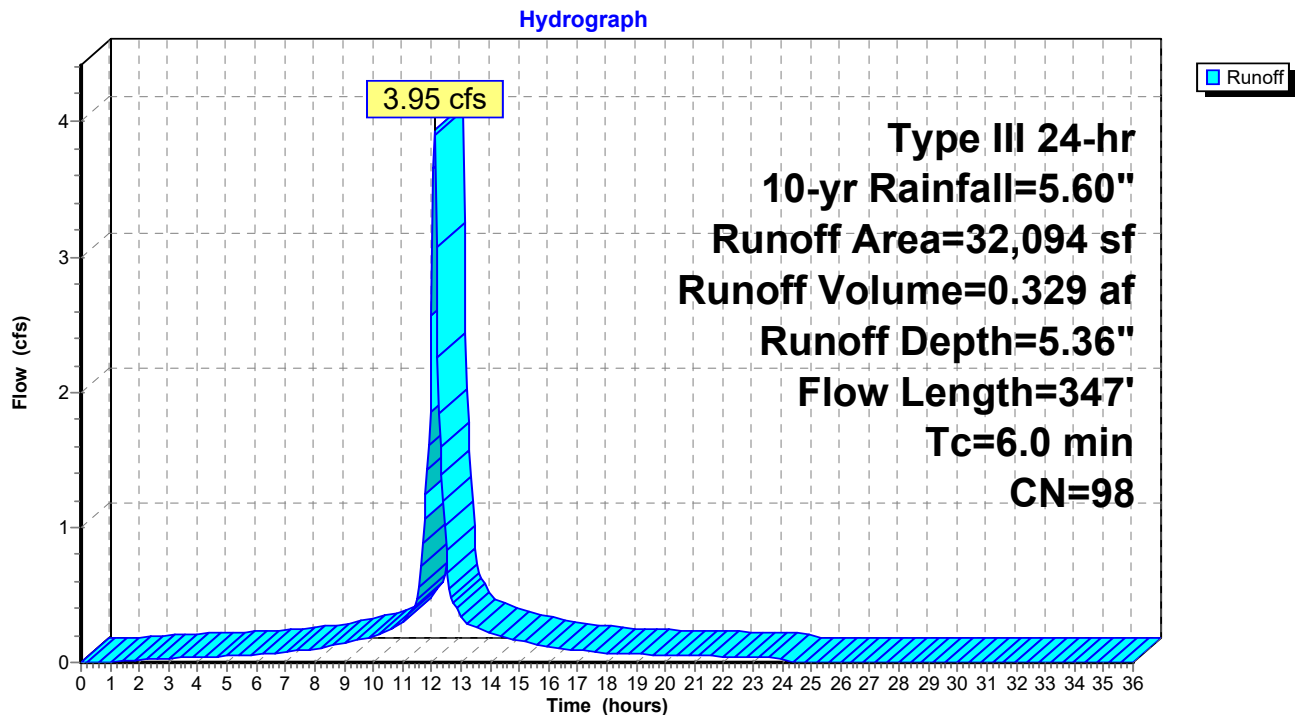
Runoff = 3.95 cfs @ 12.09 hrs, Volume= 0.329 af, Depth= 5.36"

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
242	74	>75% Grass cover, Good, HSG C
21,524	98	Paved roads w/curbs & sewers, HSG C
10,328	98	Roofs, HSG C
32,094	98	Weighted Average
242		0.75% Pervious Area
31,852		99.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	29	0.0200	1.15		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.69"
2.0	318	0.0171	2.65		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
2.4	347	Total, Increased to minimum Tc = 6.0 min			

**Subcatchment 1S: Site, Worth Lot, Alley & Hanover St.**

**5042-Pre**

Prepared by Altus Engineering, Inc.

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Type III 24-hr 10-yr Rainfall=5.60"

Printed 6/16/2021

**Summary for Subcatchment 2S: Worth Lot**

Runoff = 0.58 cfs @ 12.09 hrs, Volume= 0.049 af, Depth= 5.36"

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"

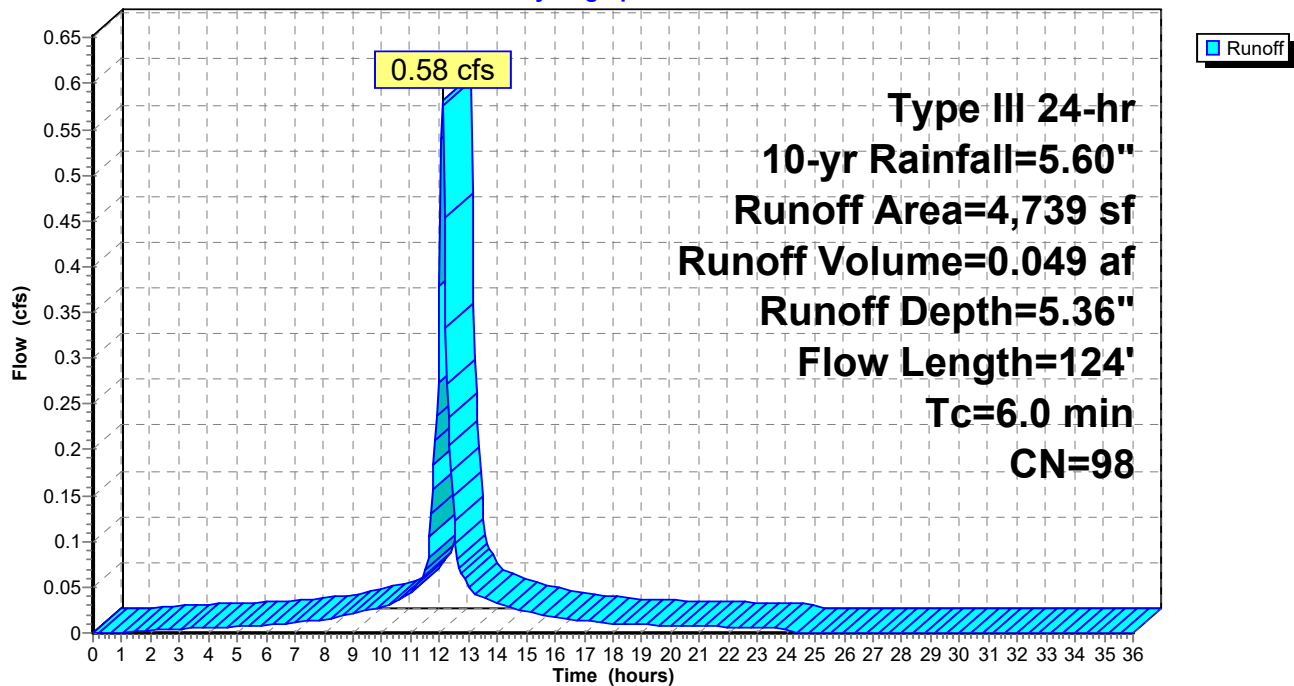
Area (sf)	CN	Description
72	74	>75% Grass cover, Good, HSG C
4,667	98	Paved parking, HSG C
4,739	98	Weighted Average
72		1.52% Pervious Area
4,667		98.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	30	0.0150	1.03		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.69"
0.2	45	0.0281	3.40		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.3	49	0.0240	3.14		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
1.0	124	Total, Increased to minimum Tc = 6.0 min			

**Subcatchment 2S: Worth Lot**

Hydrograph



**5042-Pre**

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Type III 24-hr 10-yr Rainfall=5.60"

Printed 6/16/2021

**Summary for Subcatchment 3S: Worth Lot**

Runoff = 1.31 cfs @ 12.09 hrs, Volume= 0.110 af, Depth= 5.36"

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"

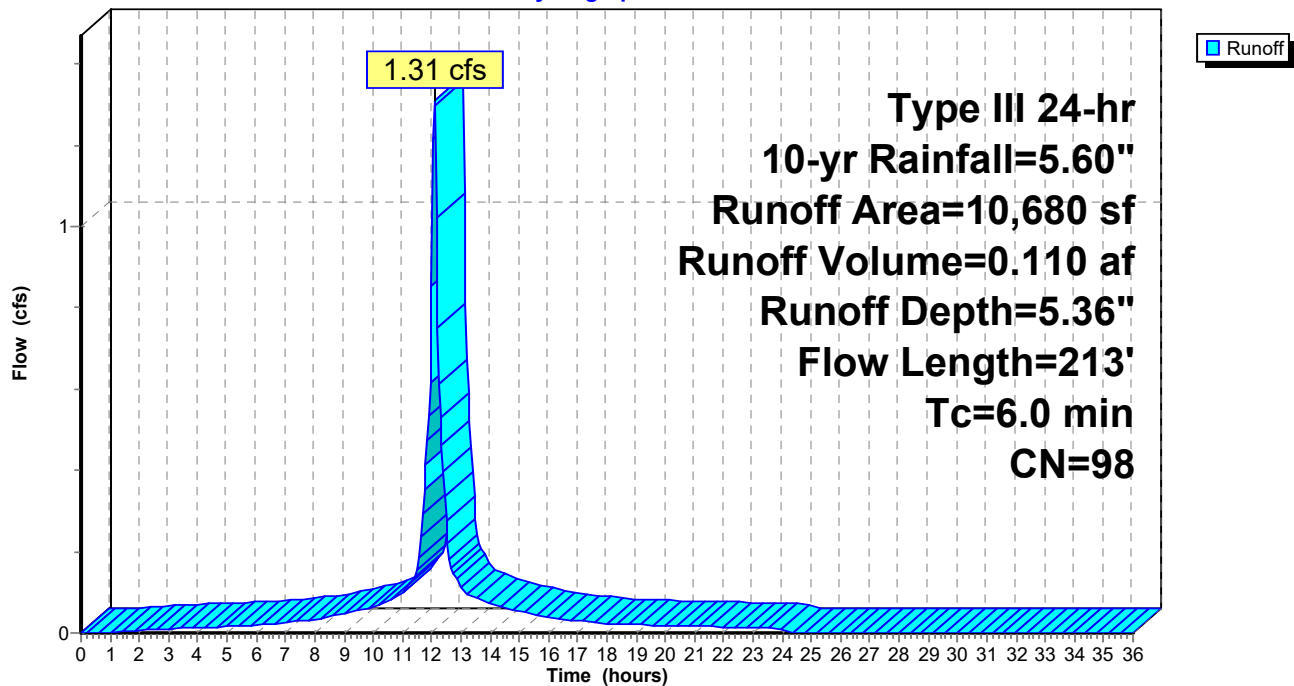
Area (sf)	CN	Description
152	74	>75% Grass cover, Good, HSG C
10,528	98	Paved parking, HSG C
10,680	98	Weighted Average
152		1.42% Pervious Area
10,528		98.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	24	0.0100	0.84		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.69"
0.5	59	0.0100	2.03		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
1.1	130	0.0103	2.06		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
2.1	213	Total, Increased to minimum Tc = 6.0 min			

**Subcatchment 3S: Worth Lot**

Hydrograph





**5042-Pre**

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Type III 24-hr 10-yr Rainfall=5.60"

Printed 6/16/2021

**Summary for Subcatchment 4S: Vaughan Mall**

Runoff = 0.35 cfs @ 12.09 hrs, Volume= 0.029 af, Depth= 5.13"

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"

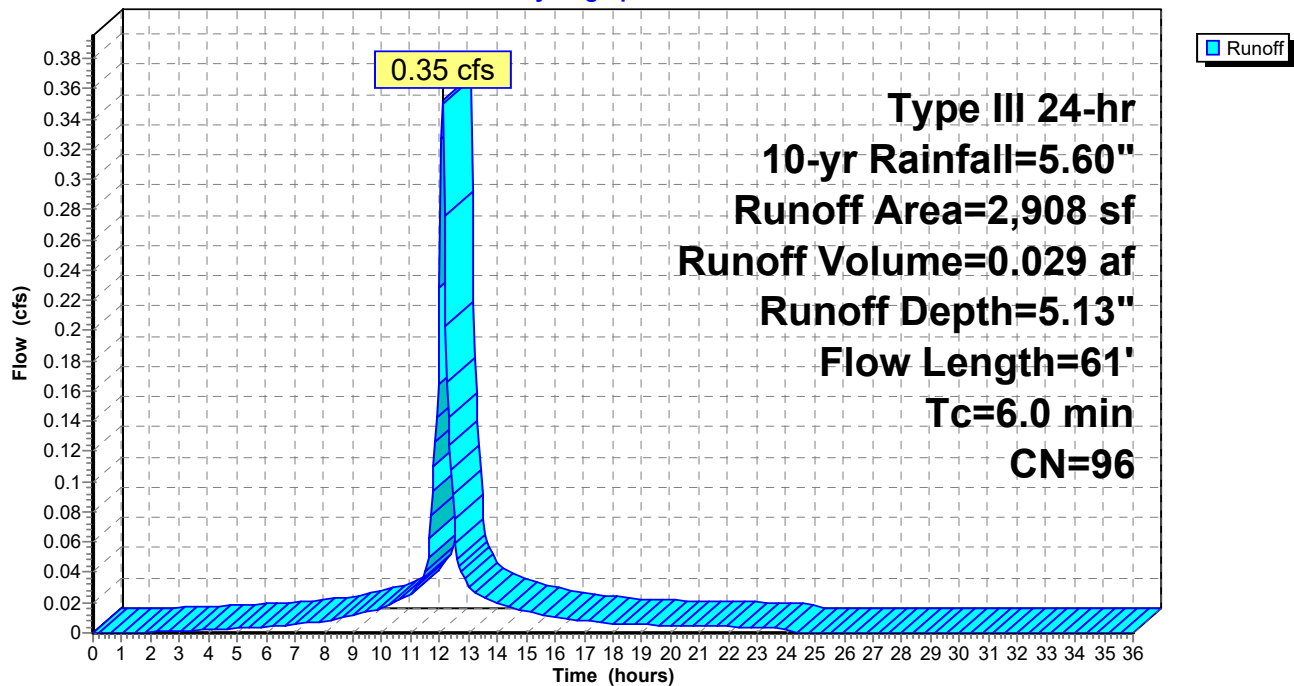
Area (sf)	CN	Description
215	74	>75% Grass cover, Good, HSG C
2,693	98	Paved parking, HSG C
2,908	96	Weighted Average
215		7.39% Pervious Area
2,693		92.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	30	0.0097	0.87		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.69"
0.3	31	0.0093	1.96		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.9	61	Total, Increased to minimum Tc = 6.0 min			

**Subcatchment 4S: Vaughan Mall**

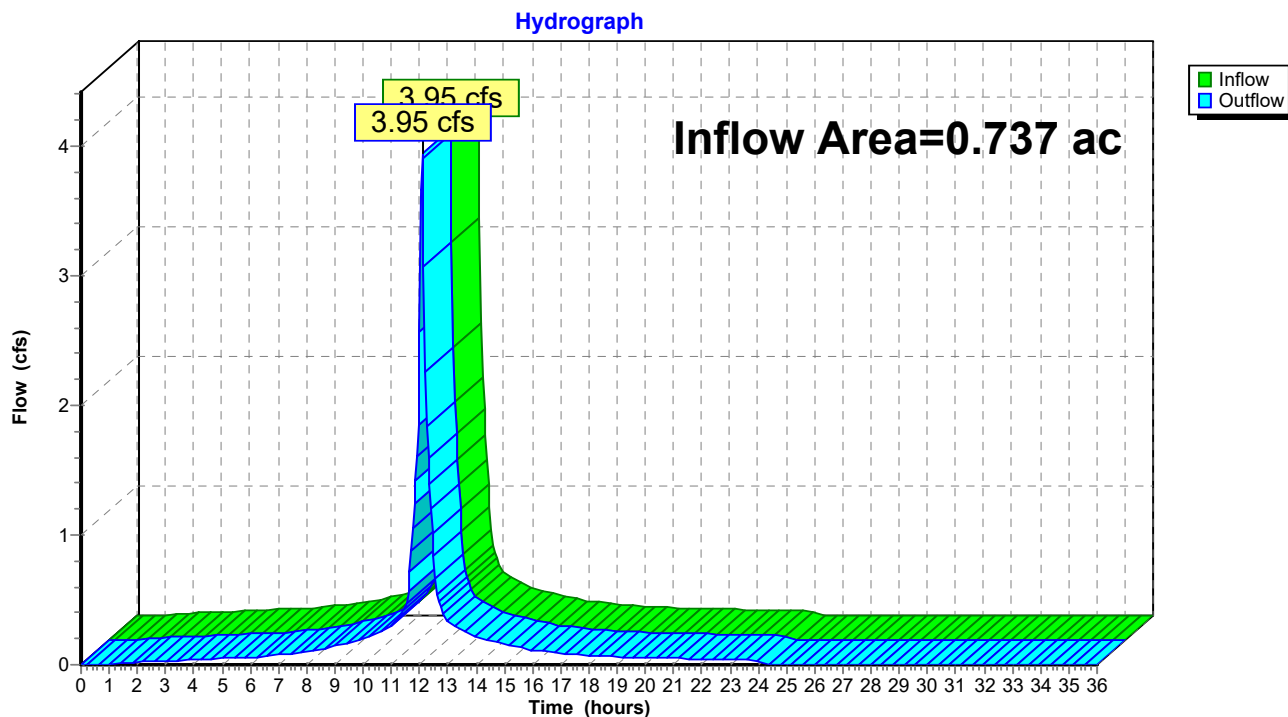
Hydrograph



**Summary for Reach 100R: POA #1**

Inflow Area = 0.737 ac, 99.25% Impervious, Inflow Depth = 5.36" for 10-yr event  
Inflow = 3.95 cfs @ 12.09 hrs, Volume= 0.329 af  
Outflow = 3.95 cfs @ 12.09 hrs, Volume= 0.329 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

**Reach 100R: POA #1**

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Type III 24-hr 10-yr Rainfall=5.60"

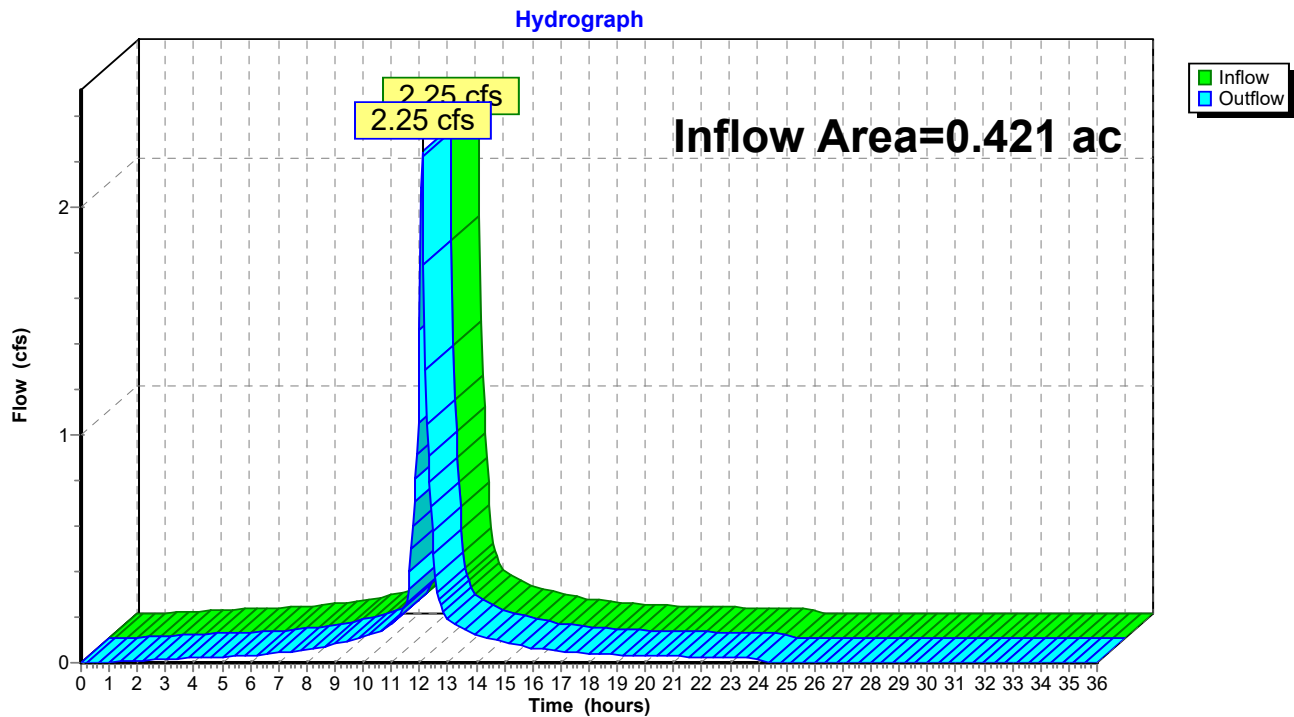
Printed 6/16/2021

### Summary for Reach 200R: POA #2

Inflow Area = 0.421 ac, 97.60% Impervious, Inflow Depth = 5.33" for 10-yr event  
Inflow = 2.25 cfs @ 12.09 hrs, Volume= 0.187 af  
Outflow = 2.25 cfs @ 12.09 hrs, Volume= 0.187 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

### Reach 200R: POA #2



**5042-Pre**

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Type III 24-hr 10-yr Rainfall=5.60"

Printed 6/16/2021

**Summary for Pond 2P: CB #25851**

Inflow Area = 0.109 ac, 98.48% Impervious, Inflow Depth = 5.36" for 10-yr event  
Inflow = 0.58 cfs @ 12.09 hrs, Volume= 0.049 af  
Outflow = 0.58 cfs @ 12.09 hrs, Volume= 0.049 af, Atten= 0%, Lag= 0.0 min  
Primary = 0.58 cfs @ 12.09 hrs, Volume= 0.049 af

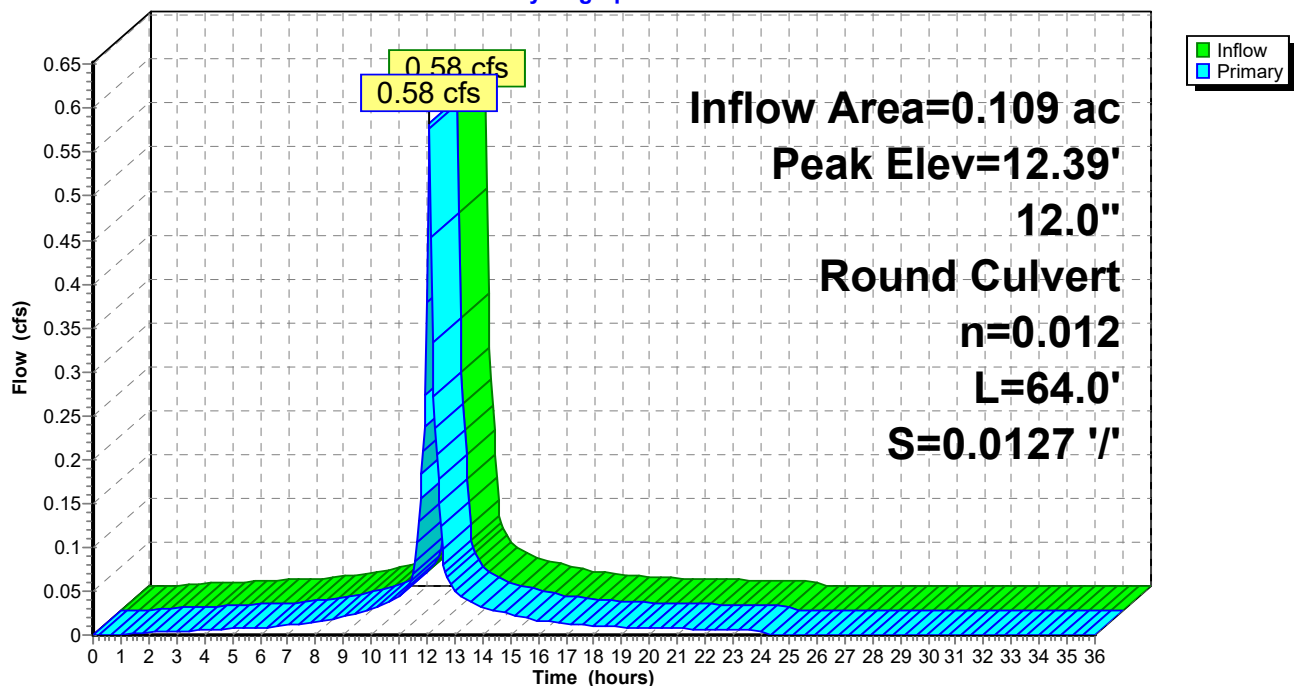
Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 12.39' @ 12.09 hrs

Flood Elev= 16.26'

Device	Routing	Invert	Outlet Devices
#1	Primary	12.01'	<b>12.0" Round Culvert</b> L= 64.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 12.01' / 11.20' S= 0.0127 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

**Primary OutFlow** Max=0.57 cfs @ 12.09 hrs HW=12.39' (Free Discharge)  
↑ **1=Culvert** (Inlet Controls 0.57 cfs @ 2.09 fps)

**Pond 2P: CB #25851****Hydrograph**

**5042-Pre**

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Type III 24-hr 10-yr Rainfall=5.60"

Printed 6/16/2021

**Summary for Pond 3P: CB #3764**

Inflow Area = 0.354 ac, 98.55% Impervious, Inflow Depth = 5.36" for 10-yr event  
Inflow = 1.90 cfs @ 12.09 hrs, Volume= 0.158 af  
Outflow = 1.90 cfs @ 12.09 hrs, Volume= 0.158 af, Atten= 0%, Lag= 0.0 min  
Primary = 1.90 cfs @ 12.09 hrs, Volume= 0.158 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 11.94' @ 12.09 hrs

Flood Elev= 15.05'

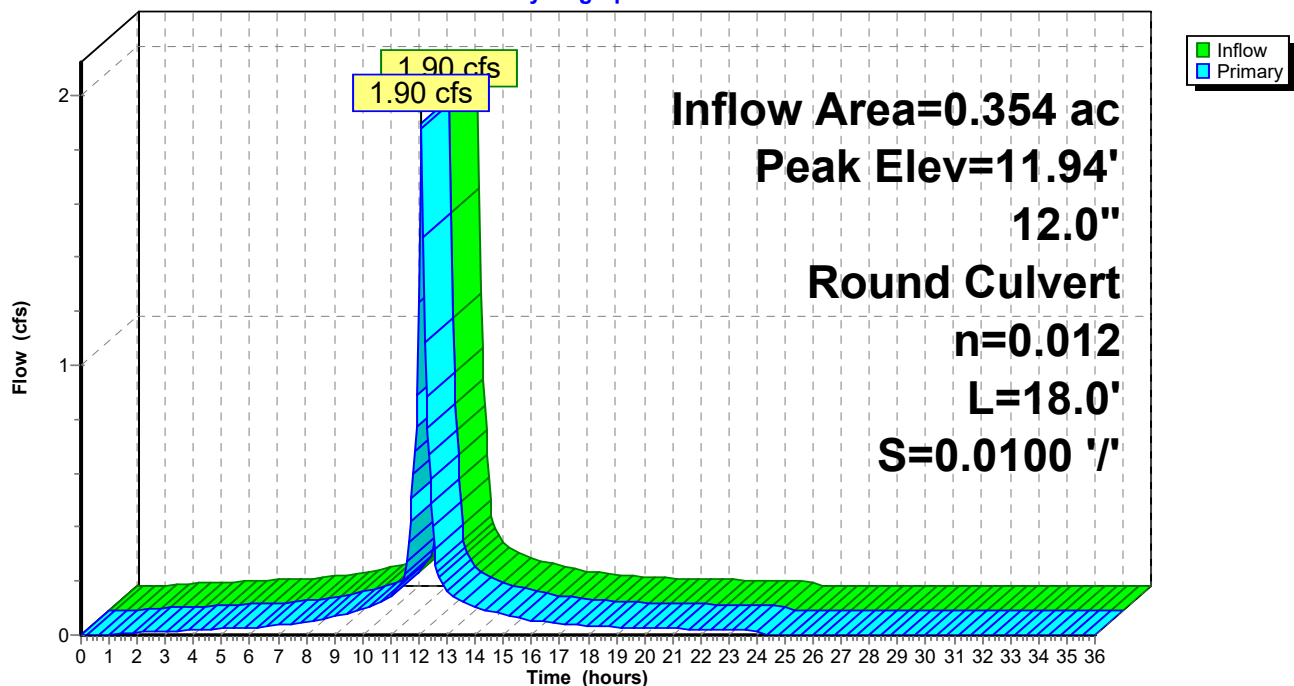
Device	Routing	Invert	Outlet Devices
#1	Primary	11.10'	<b>12.0" Round Culvert</b> L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 11.10' / 10.92' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

**Primary OutFlow** Max=1.84 cfs @ 12.09 hrs HW=11.93' (Free Discharge)

1=Culvert (Barrel Controls 1.84 cfs @ 3.61 fps)

**Pond 3P: CB #3764**

Hydrograph





**5042-Pre**

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Type III 24-hr 10-yr Rainfall=5.60"

Printed 6/16/2021

**Summary for Pond 4P: CB #3763**

Inflow Area = 0.067 ac, 92.61% Impervious, Inflow Depth = 5.13" for 10-yr event  
Inflow = 0.35 cfs @ 12.09 hrs, Volume= 0.029 af  
Outflow = 0.35 cfs @ 12.09 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.0 min  
Primary = 0.35 cfs @ 12.09 hrs, Volume= 0.029 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

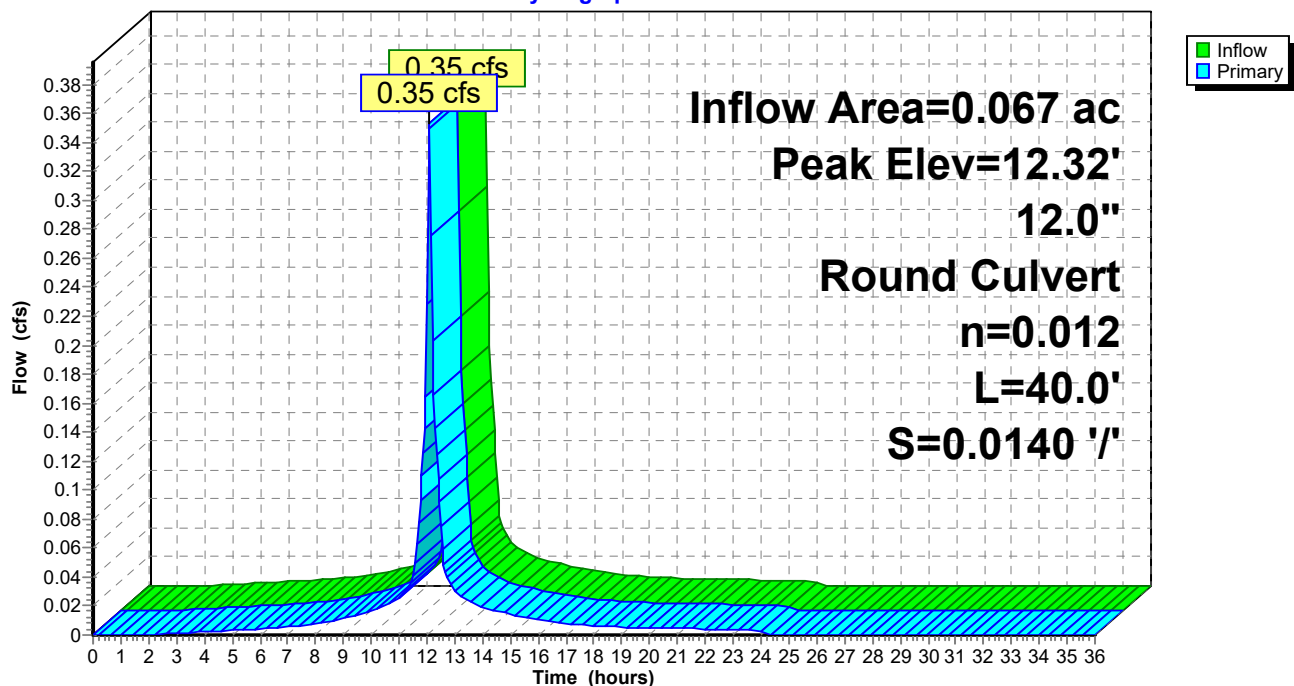
Peak Elev= 12.32' @ 12.09 hrs

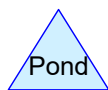
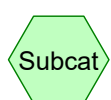
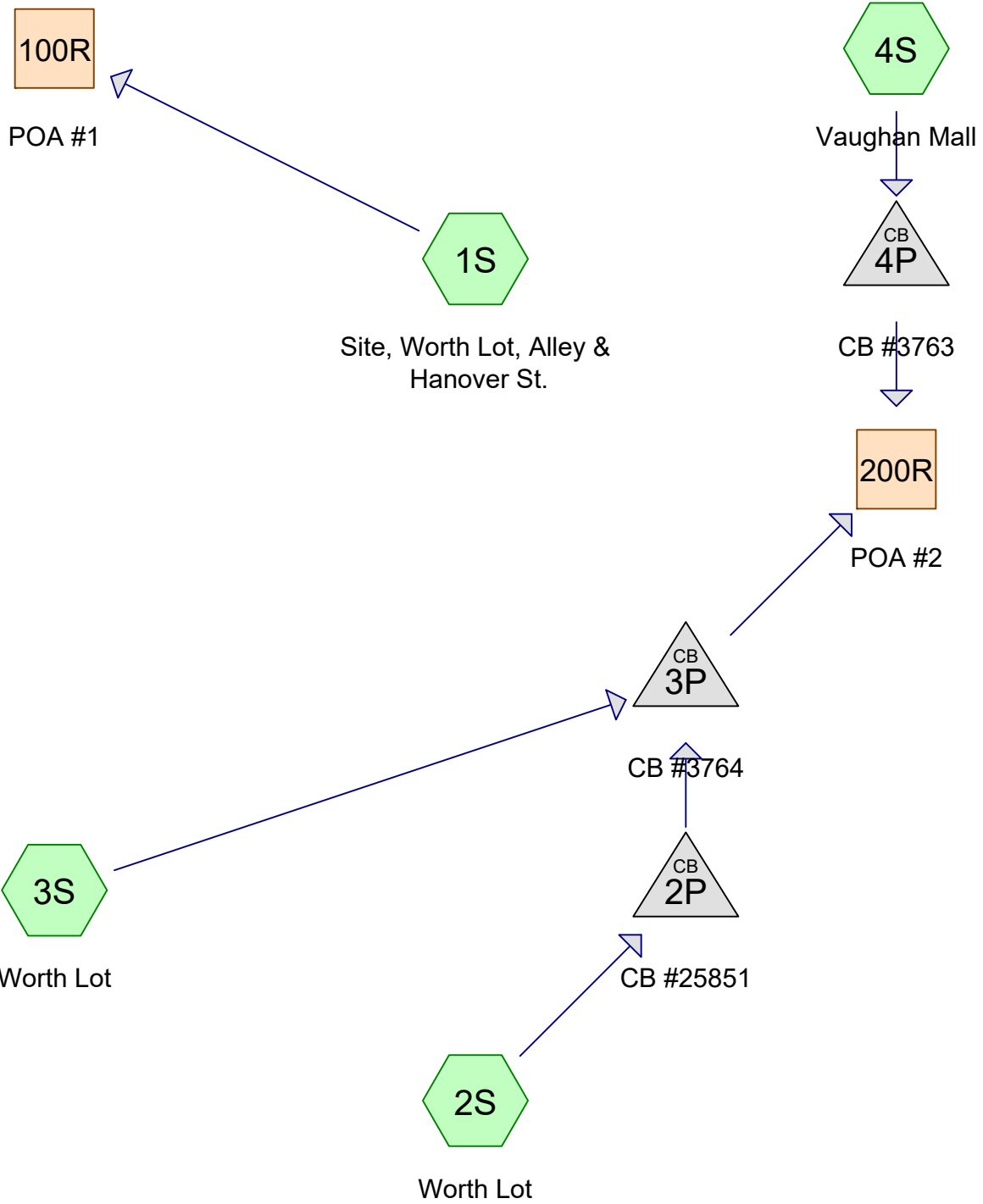
Flood Elev= 14.71'

Device	Routing	Invert	Outlet Devices
#1	Primary	12.03'	<b>12.0" Round Culvert</b> L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 12.03' / 11.47' S= 0.0140 '/ Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

**Primary OutFlow** Max=0.34 cfs @ 12.09 hrs HW=12.32' (Free Discharge)

↑1=Culvert (Inlet Controls 0.34 cfs @ 1.83 fps)

**Pond 4P: CB #3763****Hydrograph**



**5042-Pre***Type III 24-hr 25-yr Rainfall=7.10"*

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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 Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: Site, Worth Lot, Alley &** Runoff Area=32,094 sf 99.25% Impervious Runoff Depth=6.86"  
Flow Length=347' Tc=6.0 min CN=98 Runoff=5.01 cfs 0.421 af

**Subcatchment 2S: Worth Lot** Runoff Area=4,739 sf 98.48% Impervious Runoff Depth=6.86"  
Flow Length=124' Tc=6.0 min CN=98 Runoff=0.74 cfs 0.062 af

**Subcatchment 3S: Worth Lot** Runoff Area=10,680 sf 98.58% Impervious Runoff Depth=6.86"  
Flow Length=213' Tc=6.0 min CN=98 Runoff=1.67 cfs 0.140 af

**Subcatchment 4S: Vaughan Mall** Runoff Area=2,908 sf 92.61% Impervious Runoff Depth=6.62"  
Flow Length=61' Tc=6.0 min CN=96 Runoff=0.45 cfs 0.037 af

**Reach 100R: POA #1** Inflow=5.01 cfs 0.421 af  
Outflow=5.01 cfs 0.421 af

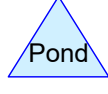
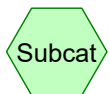
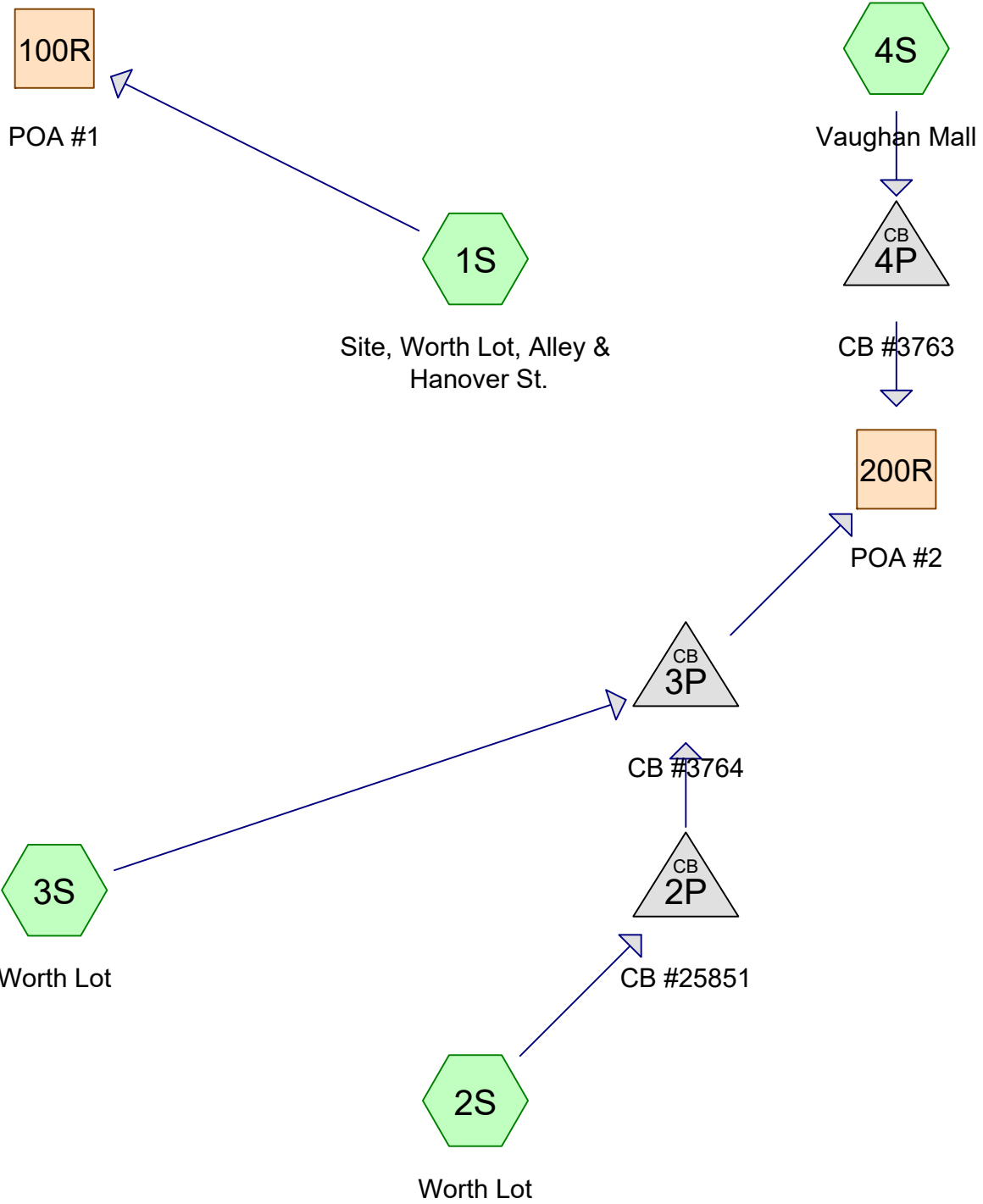
**Reach 200R: POA #2** Inflow=2.86 cfs 0.239 af  
Outflow=2.86 cfs 0.239 af

**Pond 2P: CB #25851** Peak Elev=12.45' Inflow=0.74 cfs 0.062 af  
12.0" Round Culvert n=0.012 L=64.0' S=0.0127 '/' Outflow=0.74 cfs 0.062 af

**Pond 3P: CB #3764** Peak Elev=12.09' Inflow=2.41 cfs 0.202 af  
12.0" Round Culvert n=0.012 L=18.0' S=0.0100 '/' Outflow=2.41 cfs 0.202 af

**Pond 4P: CB #3763** Peak Elev=12.36' Inflow=0.45 cfs 0.037 af  
12.0" Round Culvert n=0.012 L=40.0' S=0.0140 '/' Outflow=0.45 cfs 0.037 af

**Total Runoff Area = 1.158 ac Runoff Volume = 0.660 af Average Runoff Depth = 6.85"**  
**1.35% Pervious = 0.016 ac 98.65% Impervious = 1.142 ac**



**5042-Pre**

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*Type III 24-hr 50-yr Rainfall=8.50"*

Printed 6/16/2021

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 Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: Site, Worth Lot, Alley &** Runoff Area=32,094 sf 99.25% Impervious Runoff Depth=8.26"  
Flow Length=347' Tc=6.0 min CN=98 Runoff=6.01 cfs 0.507 af

**Subcatchment 2S: Worth Lot** Runoff Area=4,739 sf 98.48% Impervious Runoff Depth=8.26"  
Flow Length=124' Tc=6.0 min CN=98 Runoff=0.89 cfs 0.075 af

**Subcatchment 3S: Worth Lot** Runoff Area=10,680 sf 98.58% Impervious Runoff Depth=8.26"  
Flow Length=213' Tc=6.0 min CN=98 Runoff=2.00 cfs 0.169 af

**Subcatchment 4S: Vaughan Mall** Runoff Area=2,908 sf 92.61% Impervious Runoff Depth=8.02"  
Flow Length=61' Tc=6.0 min CN=96 Runoff=0.54 cfs 0.045 af

**Reach 100R: POA #1** Inflow=6.01 cfs 0.507 af  
Outflow=6.01 cfs 0.507 af

**Reach 200R: POA #2** Inflow=3.43 cfs 0.288 af  
Outflow=3.43 cfs 0.288 af

**Pond 2P: CB #25851** Peak Elev=12.49' Inflow=0.89 cfs 0.075 af  
12.0" Round Culvert n=0.012 L=64.0' S=0.0127 '/' Outflow=0.89 cfs 0.075 af

**Pond 3P: CB #3764** Peak Elev=12.25' Inflow=2.89 cfs 0.244 af  
12.0" Round Culvert n=0.012 L=18.0' S=0.0100 '/' Outflow=2.89 cfs 0.244 af

**Pond 4P: CB #3763** Peak Elev=12.40' Inflow=0.54 cfs 0.045 af  
12.0" Round Culvert n=0.012 L=40.0' S=0.0140 '/' Outflow=0.54 cfs 0.045 af

**Total Runoff Area = 1.158 ac Runoff Volume = 0.795 af Average Runoff Depth = 8.25"**  
**1.35% Pervious = 0.016 ac 98.65% Impervious = 1.142 ac**



## Section 4

# Drainage Calculations

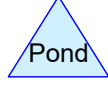
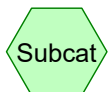
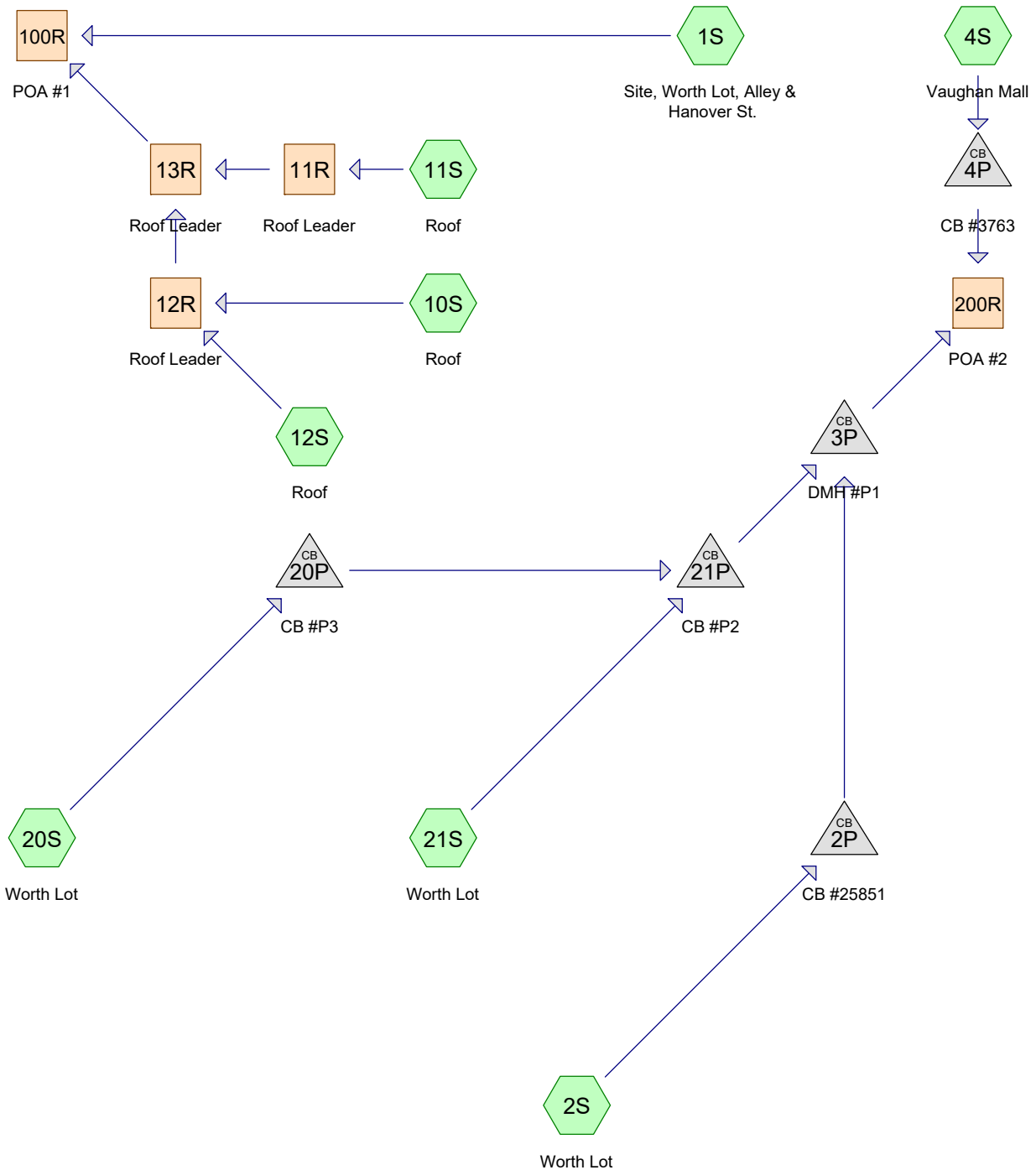
Post-Development

2-Year, 24-Hour Summary

10-Year, 24-Hour Complete

25-Year, 24-Hour Summary

50-Year, 24-Hour Summary



**5042-Post***Type III 24-hr 2-yr Rainfall=3.69"*

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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 Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: Site, Worth Lot, Alley &** Runoff Area=19,157 sf 98.39% Impervious Runoff Depth=3.46"  
 Flow Length=347' Tc=6.0 min CN=98 Runoff=1.54 cfs 0.127 af

**Subcatchment 2S: Worth Lot** Runoff Area=4,739 sf 91.90% Impervious Runoff Depth=3.23"  
 Flow Length=124' Tc=6.0 min CN=96 Runoff=0.37 cfs 0.029 af

**Subcatchment 4S: Vaughan Mall** Runoff Area=2,908 sf 92.61% Impervious Runoff Depth=3.23"  
 Flow Length=61' Tc=6.0 min CN=96 Runoff=0.23 cfs 0.018 af

**Subcatchment 10S: Roof** Runoff Area=8,053 sf 100.00% Impervious Runoff Depth=3.46"  
 Tc=6.0 min CN=98 Runoff=0.65 cfs 0.053 af

**Subcatchment 11S: Roof** Runoff Area=2,409 sf 88.71% Impervious Runoff Depth=3.13"  
 Tc=6.0 min CN=95 Runoff=0.19 cfs 0.014 af

**Subcatchment 12S: Roof** Runoff Area=2,555 sf 100.00% Impervious Runoff Depth=3.46"  
 Tc=6.0 min CN=98 Runoff=0.21 cfs 0.017 af

**Subcatchment 20S: Worth Lot** Runoff Area=4,709 sf 99.17% Impervious Runoff Depth=3.46"  
 Flow Length=100' Tc=6.0 min CN=98 Runoff=0.38 cfs 0.031 af

**Subcatchment 21S: Worth Lot** Runoff Area=5,891 sf 95.25% Impervious Runoff Depth=3.34"  
 Flow Length=105' Tc=6.0 min CN=97 Runoff=0.47 cfs 0.038 af

**Reach 11R: Roof Leader** Avg. Flow Depth=0.19' Max Vel=2.72 fps Inflow=0.19 cfs 0.014 af  
 6.0" Round Pipe n=0.012 L=94.0' S=0.0100 ' Capacity=0.61 cfs Outflow=0.18 cfs 0.014 af

**Reach 12R: Roof Leader** Avg. Flow Depth=0.28' Max Vel=6.04 fps Inflow=0.85 cfs 0.070 af  
 8.0" Round Pipe n=0.012 L=113.0' S=0.0300 ' Capacity=2.27 cfs Outflow=0.85 cfs 0.070 af

**Reach 13R: Roof Leader** Avg. Flow Depth=0.31' Max Vel=6.33 fps Inflow=1.03 cfs 0.085 af  
 8.0" Round Pipe n=0.012 L=21.0' S=0.0300 ' Capacity=2.27 cfs Outflow=1.02 cfs 0.085 af

**Reach 100R: POA #1** Inflow=2.56 cfs 0.211 af  
 Outflow=2.56 cfs 0.211 af

**Reach 200R: POA #2** Inflow=1.45 cfs 0.116 af  
 Outflow=1.45 cfs 0.116 af

**Pond 2P: CB #25851** Peak Elev=12.31' Inflow=0.37 cfs 0.029 af  
 12.0" Round Culvert n=0.012 L=64.0' S=0.0127 ' Outflow=0.37 cfs 0.029 af

**Pond 3P: DMH #P1** Peak Elev=11.74' Inflow=1.22 cfs 0.098 af  
 12.0" Round Culvert n=0.012 L=18.0' S=0.0100 ' Outflow=1.22 cfs 0.098 af

**Pond 4P: CB #3763** Peak Elev=12.26' Inflow=0.23 cfs 0.018 af  
 12.0" Round Culvert n=0.012 L=40.0' S=0.0140 ' Outflow=0.23 cfs 0.018 af



**5042-Post***Type III 24-hr 2-yr Rainfall=3.69"*

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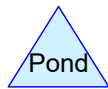
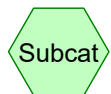
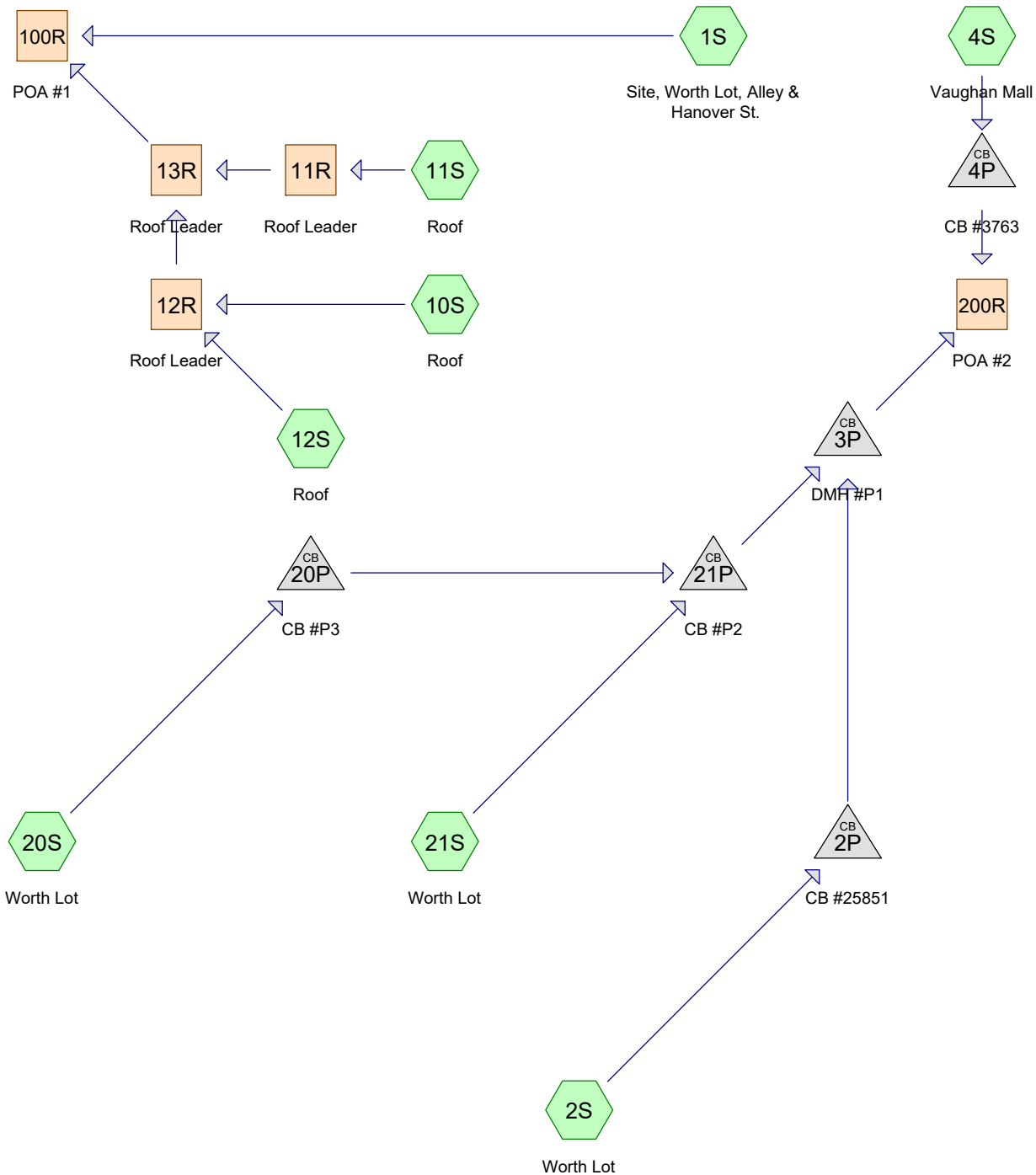
**Pond 20P: CB #P3**

Peak Elev=12.24' Inflow=0.38 cfs 0.031 af  
12.0" Round Culvert n=0.012 L=86.0' S=0.0050 '/' Outflow=0.38 cfs 0.031 af

**Pond 21P: CB #P2**

Peak Elev=11.93' Inflow=0.85 cfs 0.069 af  
12.0" Round Culvert n=0.012 L=12.0' S=0.0050 '/' Outflow=0.85 cfs 0.069 af

**Total Runoff Area = 1.158 ac   Runoff Volume = 0.327 af   Average Runoff Depth = 3.39"**  
**2.97% Pervious = 0.034 ac   97.03% Impervious = 1.123 ac**



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**Area Listing (all nodes)**

Area (acres)	CN	Description (subcatchment-numbers)
0.034	74	>75% Grass cover, Good, HSG C (1S, 2S, 4S, 11S, 20S, 21S)
0.398	98	Paved parking, HSG C (2S, 4S, 20S, 21S)
0.433	98	Paved roads w/curbs & sewers, HSG C (1S)
0.293	98	Roofs, HSG C (10S, 11S, 12S)
<b>1.158</b>	<b>97</b>	<b>TOTAL AREA</b>

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*Type III 24-hr 10-yr Rainfall=5.60"*

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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 Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: Site, Worth Lot, Alley &** Runoff Area=19,157 sf 98.39% Impervious Runoff Depth=5.36"  
Flow Length=347' Tc=6.0 min CN=98 Runoff=2.36 cfs 0.197 af

**Subcatchment 2S: Worth Lot** Runoff Area=4,739 sf 91.90% Impervious Runoff Depth=5.13"  
Flow Length=124' Tc=6.0 min CN=96 Runoff=0.58 cfs 0.047 af

**Subcatchment 4S: Vaughan Mall** Runoff Area=2,908 sf 92.61% Impervious Runoff Depth=5.13"  
Flow Length=61' Tc=6.0 min CN=96 Runoff=0.35 cfs 0.029 af

**Subcatchment 10S: Roof** Runoff Area=8,053 sf 100.00% Impervious Runoff Depth=5.36"  
Tc=6.0 min CN=98 Runoff=0.99 cfs 0.083 af

**Subcatchment 11S: Roof** Runoff Area=2,409 sf 88.71% Impervious Runoff Depth=5.01"  
Tc=6.0 min CN=95 Runoff=0.29 cfs 0.023 af

**Subcatchment 12S: Roof** Runoff Area=2,555 sf 100.00% Impervious Runoff Depth=5.36"  
Tc=6.0 min CN=98 Runoff=0.31 cfs 0.026 af

**Subcatchment 20S: Worth Lot** Runoff Area=4,709 sf 99.17% Impervious Runoff Depth=5.36"  
Flow Length=100' Tc=6.0 min CN=98 Runoff=0.58 cfs 0.048 af

**Subcatchment 21S: Worth Lot** Runoff Area=5,891 sf 95.25% Impervious Runoff Depth=5.25"  
Flow Length=105' Tc=6.0 min CN=97 Runoff=0.72 cfs 0.059 af

**Reach 11R: Roof Leader** Avg. Flow Depth=0.24' Max Vel=3.06 fps Inflow=0.29 cfs 0.023 af  
6.0" Round Pipe n=0.012 L=94.0' S=0.0100 ' Capacity=0.61 cfs Outflow=0.28 cfs 0.023 af

**Reach 12R: Roof Leader** Avg. Flow Depth=0.36' Max Vel=6.72 fps Inflow=1.30 cfs 0.109 af  
8.0" Round Pipe n=0.012 L=113.0' S=0.0300 ' Capacity=2.27 cfs Outflow=1.29 cfs 0.109 af

**Reach 13R: Roof Leader** Avg. Flow Depth=0.41' Max Vel=7.02 fps Inflow=1.58 cfs 0.132 af  
8.0" Round Pipe n=0.012 L=21.0' S=0.0300 ' Capacity=2.27 cfs Outflow=1.57 cfs 0.132 af

**Reach 100R: POA #1** Inflow=3.92 cfs 0.328 af  
Outflow=3.92 cfs 0.328 af

**Reach 200R: POA #2** Inflow=2.23 cfs 0.182 af  
Outflow=2.23 cfs 0.182 af

**Pond 2P: CB #25851** Peak Elev=12.39' Inflow=0.58 cfs 0.047 af  
12.0" Round Culvert n=0.012 L=64.0' S=0.0127 ' Outflow=0.58 cfs 0.047 af

**Pond 3P: DMH #P1** Peak Elev=11.93' Inflow=1.87 cfs 0.154 af  
12.0" Round Culvert n=0.012 L=18.0' S=0.0100 ' Outflow=1.87 cfs 0.154 af

**Pond 4P: CB #3763** Peak Elev=12.32' Inflow=0.35 cfs 0.029 af  
12.0" Round Culvert n=0.012 L=40.0' S=0.0140 ' Outflow=0.35 cfs 0.029 af



**5042-Post***Type III 24-hr 10-yr Rainfall=5.60"*

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**Pond 20P: CB #P3**

Peak Elev=12.32' Inflow=0.58 cfs 0.048 af  
12.0" Round Culvert n=0.012 L=86.0' S=0.0050 '/' Outflow=0.58 cfs 0.048 af

**Pond 21P: CB #P2**

Peak Elev=12.09' Inflow=1.30 cfs 0.107 af  
12.0" Round Culvert n=0.012 L=12.0' S=0.0050 '/' Outflow=1.30 cfs 0.107 af

**Total Runoff Area = 1.158 ac   Runoff Volume = 0.511 af   Average Runoff Depth = 5.30"**  
**2.97% Pervious = 0.034 ac   97.03% Impervious = 1.123 ac**

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Type III 24-hr 10-yr Rainfall=5.60"

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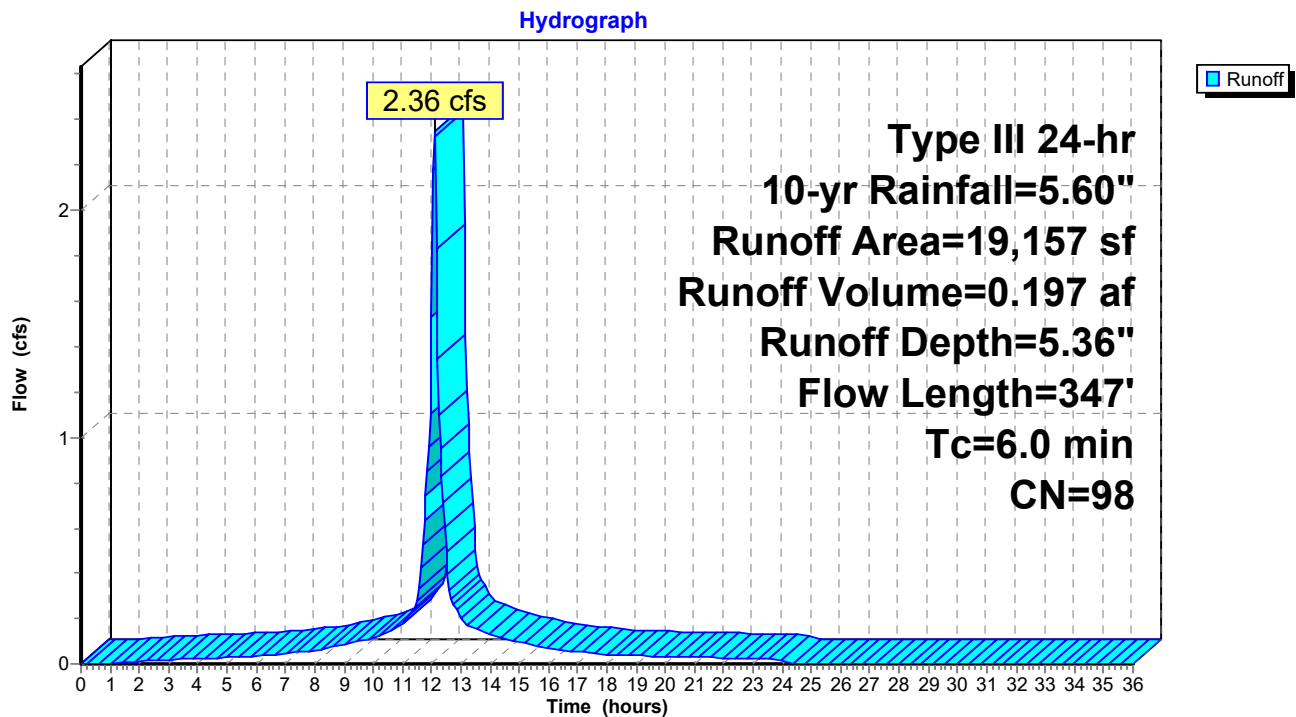
**Summary for Subcatchment 1S: Site, Worth Lot, Alley & Hanover St.**

Runoff = 2.36 cfs @ 12.09 hrs, Volume= 0.197 af, Depth= 5.36"

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
308	74	>75% Grass cover, Good, HSG C
18,849	98	Paved roads w/curbs & sewers, HSG C
19,157	98	Weighted Average
308		1.61% Pervious Area
18,849		98.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	29	0.0200	1.15		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.69"
2.0	318	0.0171	2.65		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
2.4	347	Total, Increased to minimum Tc = 6.0 min			

**Subcatchment 1S: Site, Worth Lot, Alley & Hanover St.**

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Type III 24-hr 10-yr Rainfall=5.60"

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**Summary for Subcatchment 2S: Worth Lot**

Runoff = 0.58 cfs @ 12.09 hrs, Volume= 0.047 af, Depth= 5.13"

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"

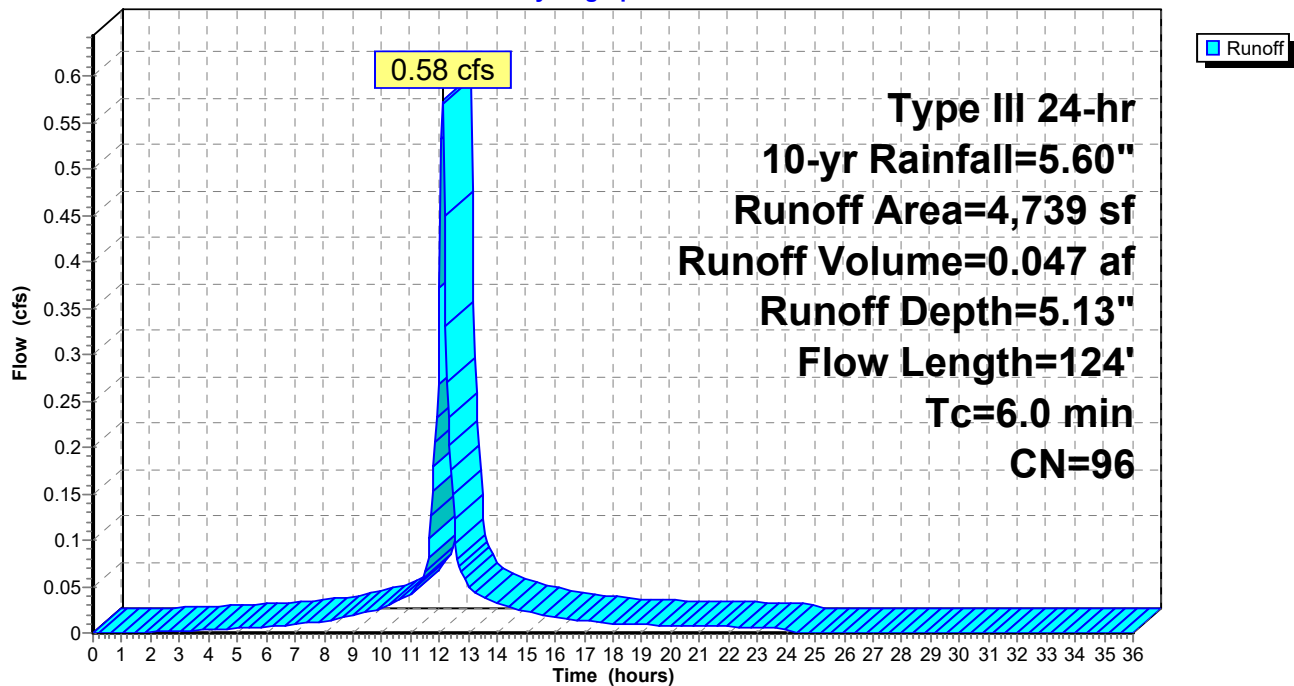
Area (sf)	CN	Description
384	74	>75% Grass cover, Good, HSG C
4,355	98	Paved parking, HSG C
4,739	96	Weighted Average
384		8.10% Pervious Area
4,355		91.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	30	0.0150	1.03		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.69"
0.2	45	0.0281	3.40		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.3	49	0.0240	3.14		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
1.0	124	Total, Increased to minimum Tc = 6.0 min			

**Subcatchment 2S: Worth Lot**

Hydrograph



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Type III 24-hr 10-yr Rainfall=5.60"

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**Summary for Subcatchment 4S: Vaughan Mall**

Runoff = 0.35 cfs @ 12.09 hrs, Volume= 0.029 af, Depth= 5.13"

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"

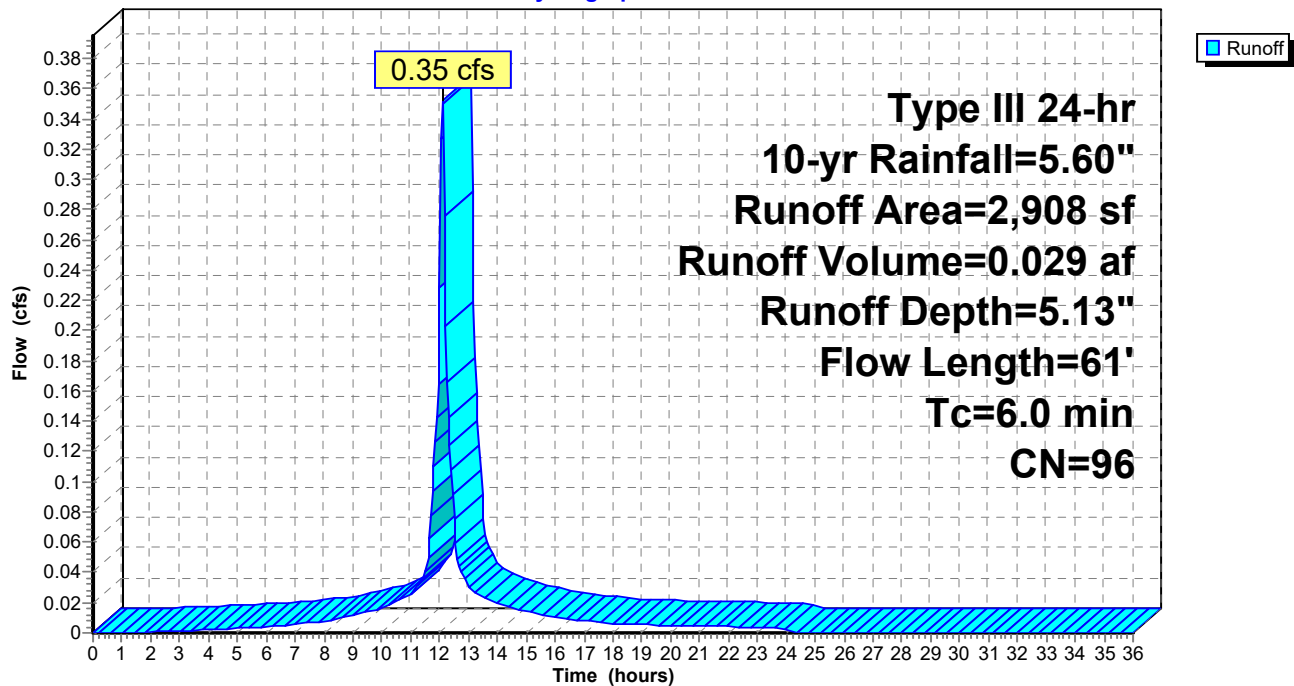
Area (sf)	CN	Description
215	74	>75% Grass cover, Good, HSG C
2,693	98	Paved parking, HSG C
2,908	96	Weighted Average
215		7.39% Pervious Area
2,693		92.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	30	0.0097	0.87		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.69"
0.3	31	0.0093	1.96		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.9	61	Total, Increased to minimum Tc = 6.0 min			

**Subcatchment 4S: Vaughan Mall**

Hydrograph





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Type III 24-hr 10-yr Rainfall=5.60"

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**Summary for Subcatchment 10S: Roof**

Runoff = 0.99 cfs @ 12.09 hrs, Volume= 0.083 af, Depth= 5.36"

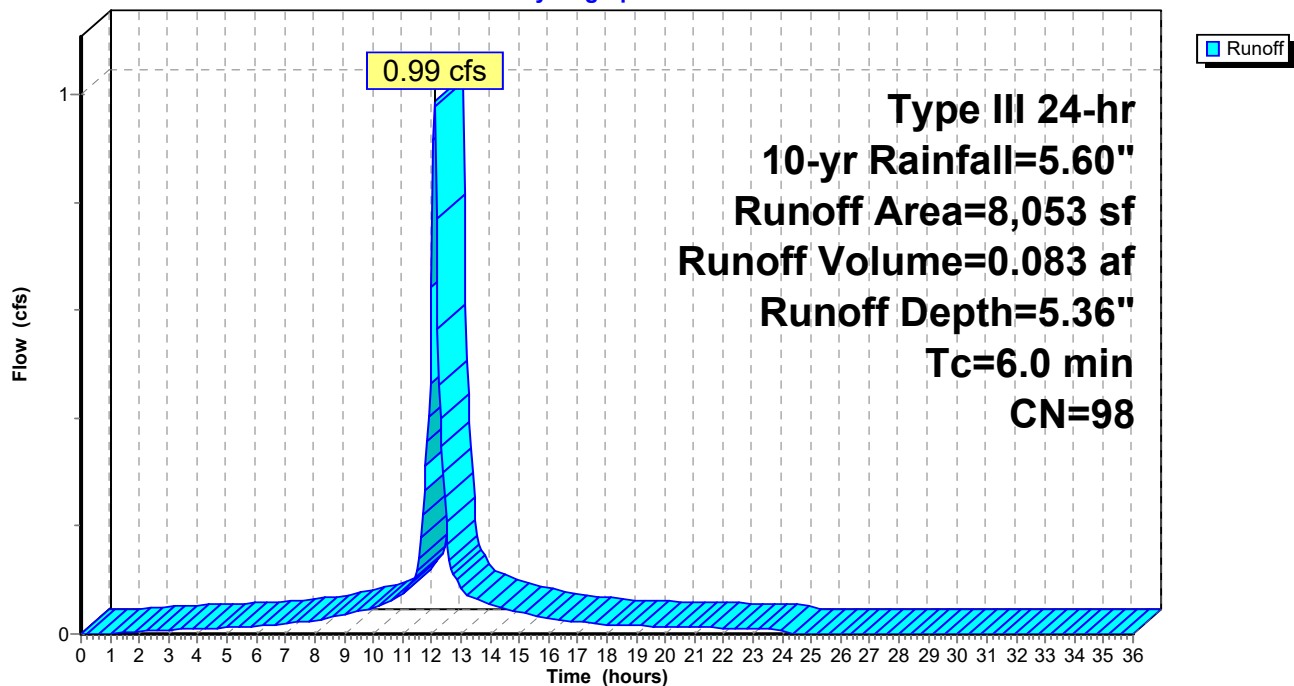
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-yr Rainfall=5.60"

Area (sf)	CN	Description
8,053	98	Roofs, HSG C
8,053		100.00% Impervious Area

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

**Subcatchment 10S: Roof**

Hydrograph



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Type III 24-hr 10-yr Rainfall=5.60"

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**Summary for Subcatchment 11S: Roof**

Runoff = 0.29 cfs @ 12.09 hrs, Volume= 0.023 af, Depth= 5.01"

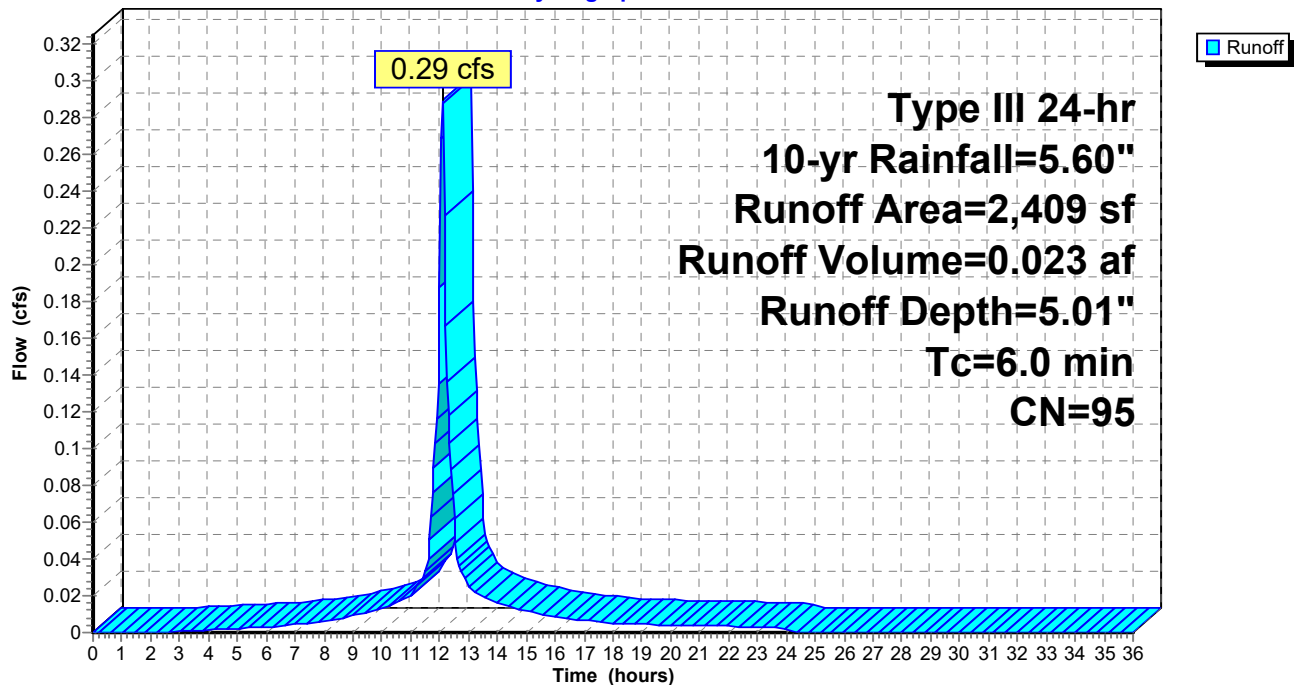
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-yr Rainfall=5.60"

Area (sf)	CN	Description
272	74	>75% Grass cover, Good, HSG C
2,137	98	Roofs, HSG C
2,409	95	Weighted Average
272		11.29% Pervious Area
2,137		88.71% Impervious Area

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

**Subcatchment 11S: Roof**

Hydrograph



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Type III 24-hr 10-yr Rainfall=5.60"

Printed 6/16/2021

**Summary for Subcatchment 12S: Roof**

Runoff = 0.31 cfs @ 12.09 hrs, Volume= 0.026 af, Depth= 5.36"

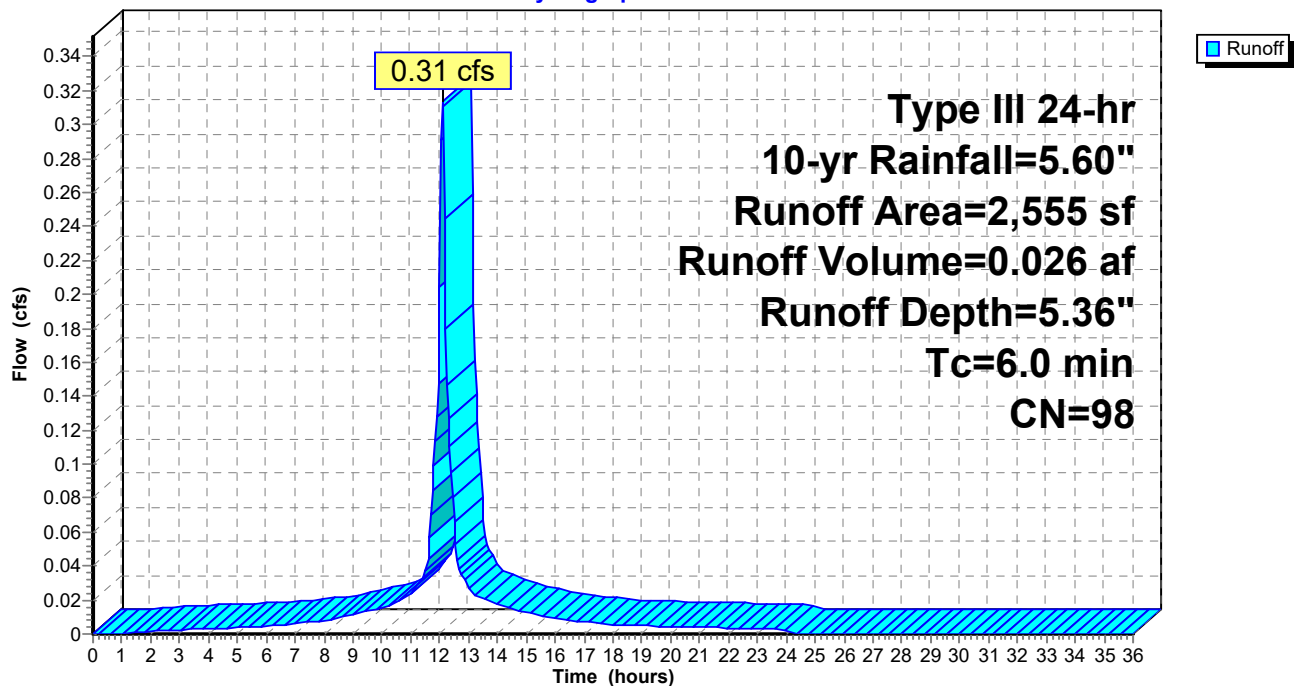
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-yr Rainfall=5.60"

Area (sf)	CN	Description
2,555	98	Roofs, HSG C
2,555		100.00% Impervious Area

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

**Subcatchment 12S: Roof**

Hydrograph



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Type III 24-hr 10-yr Rainfall=5.60"

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**Summary for Subcatchment 20S: Worth Lot**

Runoff = 0.58 cfs @ 12.09 hrs, Volume= 0.048 af, Depth= 5.36"

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"

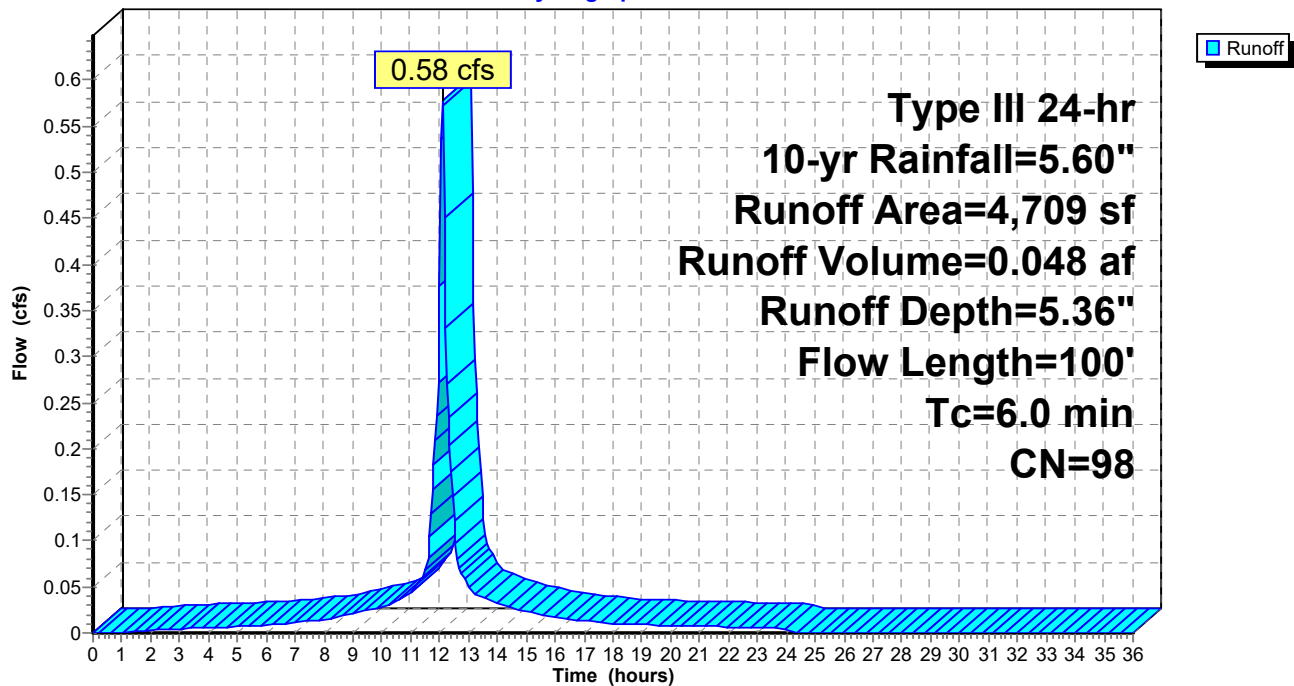
Area (sf)	CN	Description
39	74	>75% Grass cover, Good, HSG C
4,670	98	Paved parking, HSG C
4,709	98	Weighted Average
39		0.83% Pervious Area
4,670		99.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	24	0.0100	0.84		<b>Sheet Flow</b> , Smooth surfaces n= 0.011 P2= 3.69"
0.5	59	0.0100	2.03		<b>Shallow Concentrated Flow</b> , Paved Kv= 20.3 fps
0.1	17	0.0200	2.87		<b>Shallow Concentrated Flow</b> , Paved Kv= 20.3 fps
1.1	100	Total, Increased to minimum Tc = 6.0 min			

**Subcatchment 20S: Worth Lot**

Hydrograph





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Type III 24-hr 10-yr Rainfall=5.60"

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**Summary for Subcatchment 21S: Worth Lot**

Runoff = 0.72 cfs @ 12.09 hrs, Volume= 0.059 af, Depth= 5.25"

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"

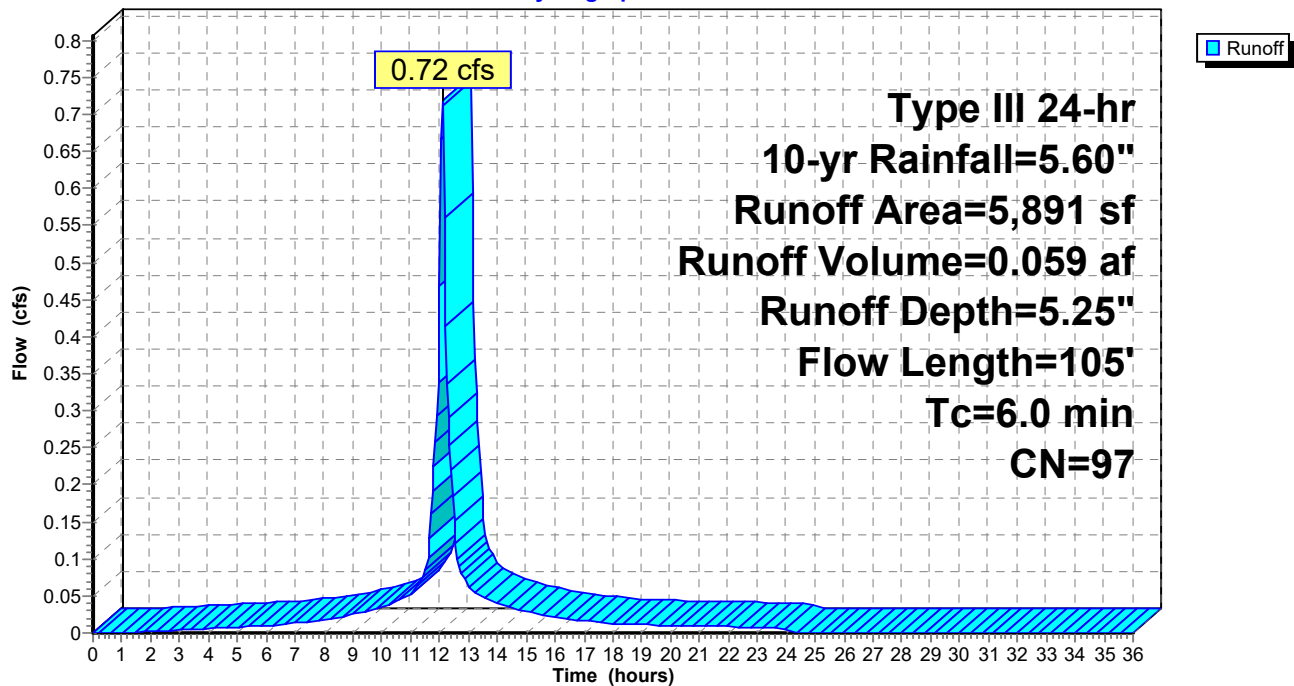
Area (sf)	CN	Description
280	74	>75% Grass cover, Good, HSG C
5,611	98	Paved parking, HSG C
5,891	97	Weighted Average
280		4.75% Pervious Area
5,611		95.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	30	0.0100	0.88		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.69"
0.2	40	0.0180	2.72		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.3	35	0.0100	2.03		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
1.1	105	Total, Increased to minimum Tc = 6.0 min			

**Subcatchment 21S: Worth Lot**

Hydrograph



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Type III 24-hr 10-yr Rainfall=5.60"

Printed 6/16/2021

### Summary for Reach 11R: Roof Leader

Inflow Area = 0.055 ac, 88.71% Impervious, Inflow Depth = 5.01" for 10-yr event  
Inflow = 0.29 cfs @ 12.09 hrs, Volume= 0.023 af  
Outflow = 0.28 cfs @ 12.10 hrs, Volume= 0.023 af, Atten= 2%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Max. Velocity= 3.06 fps, Min. Travel Time= 0.5 min

Avg. Velocity= 1.03 fps, Avg. Travel Time= 1.5 min

Peak Storage= 9 cf @ 12.09 hrs

Average Depth at Peak Storage= 0.24'

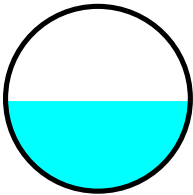
Bank-Full Depth= 0.50' Flow Area= 0.2 sf, Capacity= 0.61 cfs

6.0" Round Pipe

n= 0.012

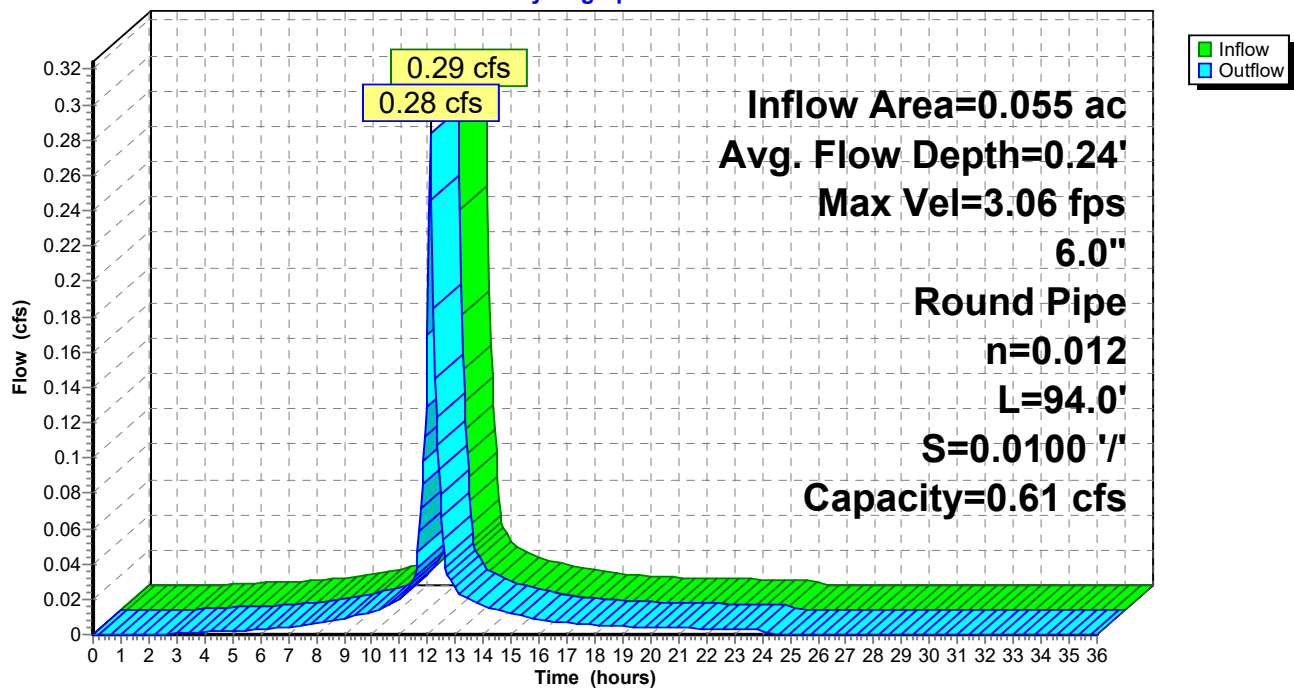
Length= 94.0' Slope= 0.0100 '/'

Inlet Invert= 9.10', Outlet Invert= 8.16'



### Reach 11R: Roof Leader

Hydrograph



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Type III 24-hr 10-yr Rainfall=5.60"

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### Summary for Reach 12R: Roof Leader

Inflow Area = 0.244 ac, 100.00% Impervious, Inflow Depth = 5.36" for 10-yr event  
Inflow = 1.30 cfs @ 12.09 hrs, Volume = 0.109 af  
Outflow = 1.29 cfs @ 12.09 hrs, Volume = 0.109 af, Atten = 1%, Lag = 0.5 min

Routing by Stor-Ind+Trans method, Time Span = 0.00-36.00 hrs, dt = 0.05 hrs

Max. Velocity = 6.72 fps, Min. Travel Time = 0.3 min

Avg. Velocity = 2.31 fps, Avg. Travel Time = 0.8 min

Peak Storage = 22 cf @ 12.09 hrs

Average Depth at Peak Storage = 0.36'

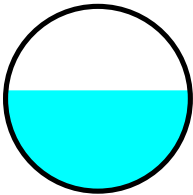
Bank-Full Depth = 0.67' Flow Area = 0.3 sf, Capacity = 2.27 cfs

8.0" Round Pipe

n = 0.012

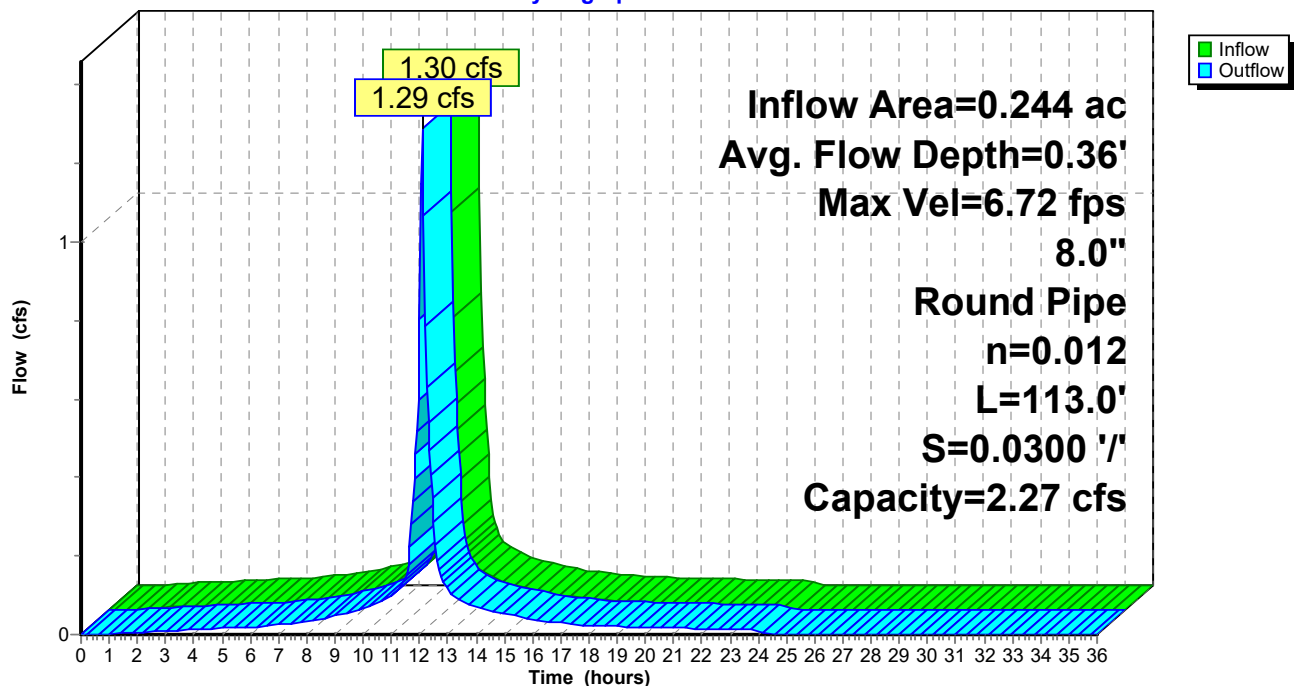
Length = 113.0' Slope = 0.0300 '/'

Inlet Invert = 11.47', Outlet Invert = 8.08'



### Reach 12R: Roof Leader

Hydrograph



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Type III 24-hr 10-yr Rainfall=5.60"

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### Summary for Reach 13R: Roof Leader

Inflow Area = 0.299 ac, 97.91% Impervious, Inflow Depth = 5.30" for 10-yr event  
Inflow = 1.58 cfs @ 12.10 hrs, Volume= 0.132 af  
Outflow = 1.57 cfs @ 12.10 hrs, Volume= 0.132 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Max. Velocity= 7.02 fps, Min. Travel Time= 0.0 min

Avg. Velocity= 2.43 fps, Avg. Travel Time= 0.1 min

Peak Storage= 5 cf @ 12.10 hrs

Average Depth at Peak Storage= 0.41'

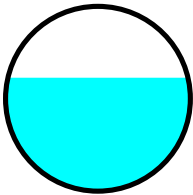
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.27 cfs

8.0" Round Pipe

n= 0.012

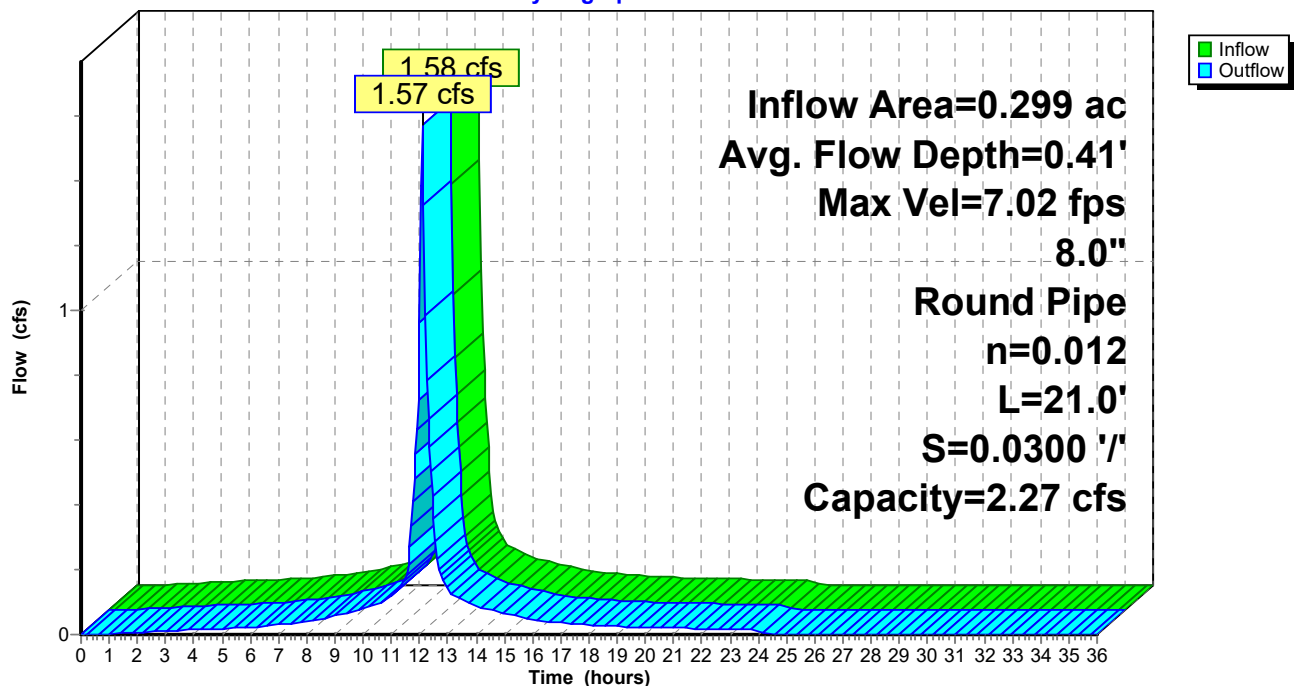
Length= 21.0' Slope= 0.0300 '/'

Inlet Invert= 8.08', Outlet Invert= 7.45'



### Reach 13R: Roof Leader

Hydrograph





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Type III 24-hr 10-yr Rainfall=5.60"

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### Summary for Reach 100R: POA #1

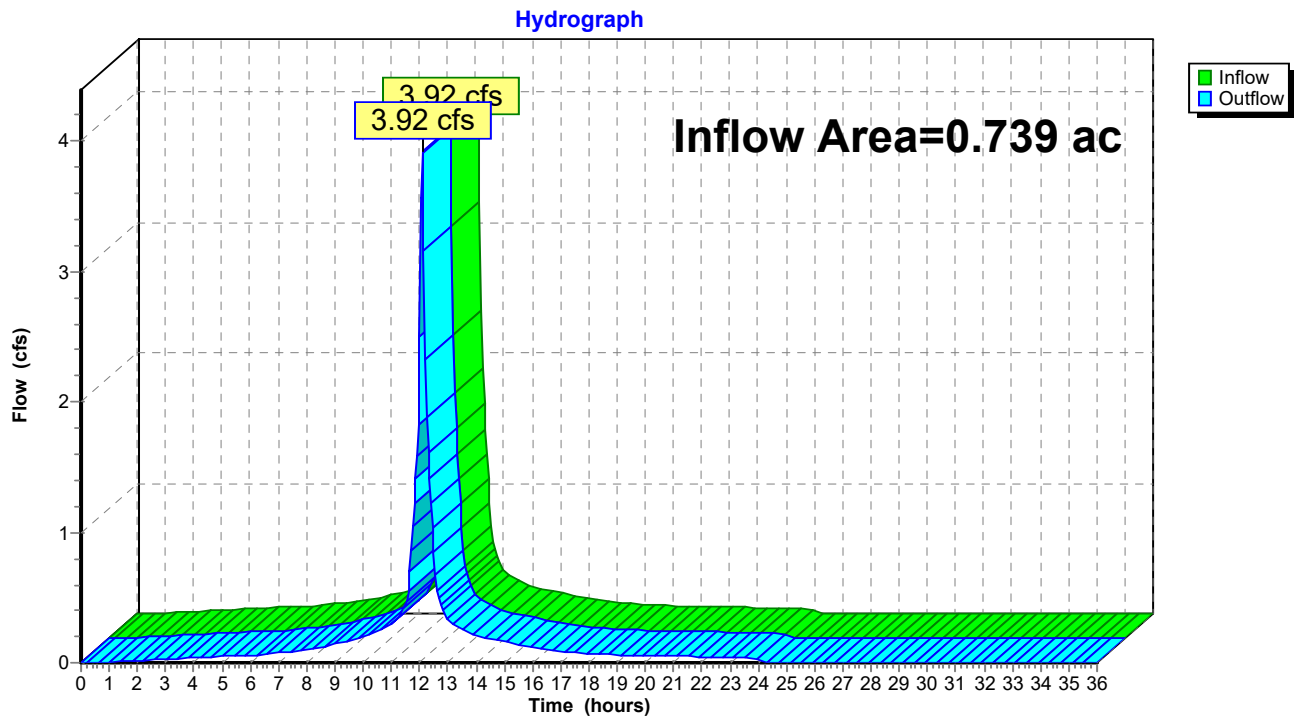
Inflow Area = 0.739 ac, 98.20% Impervious, Inflow Depth = 5.34" for 10-yr event

Inflow = 3.92 cfs @ 12.09 hrs, Volume= 0.328 af

Outflow = 3.92 cfs @ 12.09 hrs, Volume= 0.328 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

### Reach 100R: POA #1



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Type III 24-hr 10-yr Rainfall=5.60"

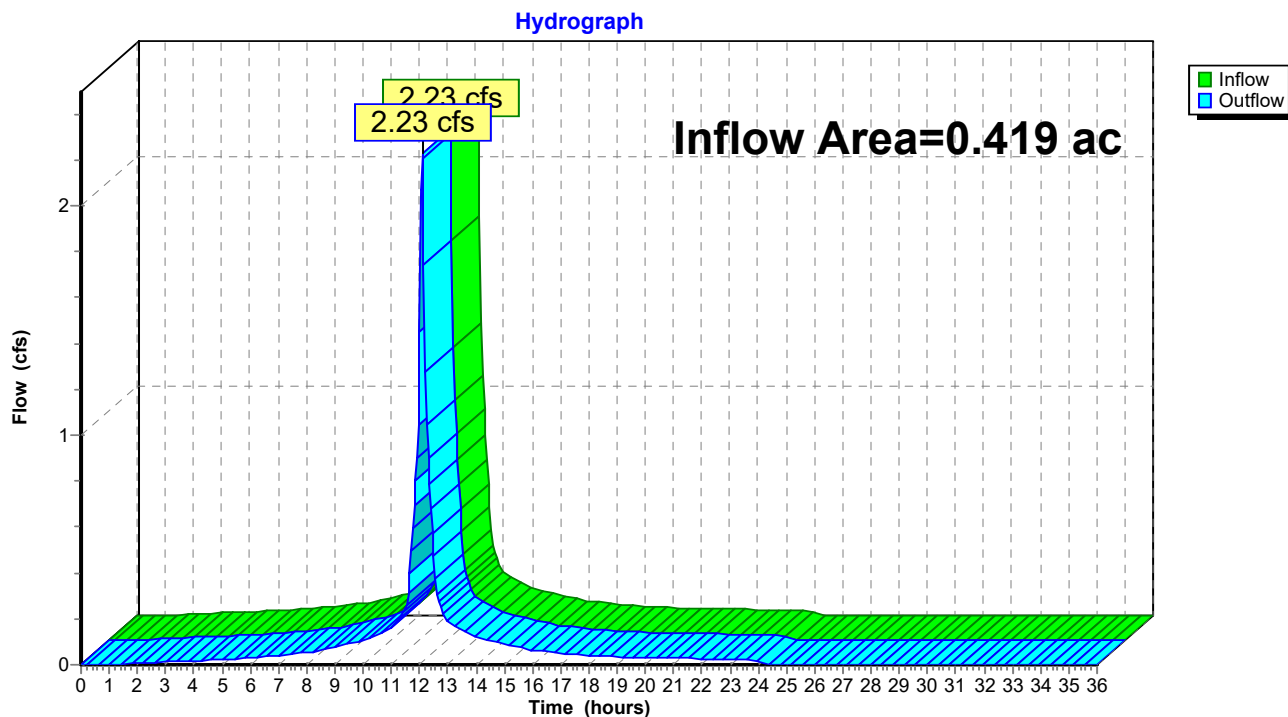
Printed 6/16/2021

### Summary for Reach 200R: POA #2

Inflow Area = 0.419 ac, 94.97% Impervious, Inflow Depth = 5.23" for 10-yr event  
Inflow = 2.23 cfs @ 12.09 hrs, Volume= 0.182 af  
Outflow = 2.23 cfs @ 12.09 hrs, Volume= 0.182 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

### Reach 200R: POA #2



**5042-Post**

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Type III 24-hr 10-yr Rainfall=5.60"

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**Summary for Pond 2P: CB #25851**

Inflow Area = 0.109 ac, 91.90% Impervious, Inflow Depth = 5.13" for 10-yr event  
Inflow = 0.58 cfs @ 12.09 hrs, Volume= 0.047 af  
Outflow = 0.58 cfs @ 12.09 hrs, Volume= 0.047 af, Atten= 0%, Lag= 0.0 min  
Primary = 0.58 cfs @ 12.09 hrs, Volume= 0.047 af

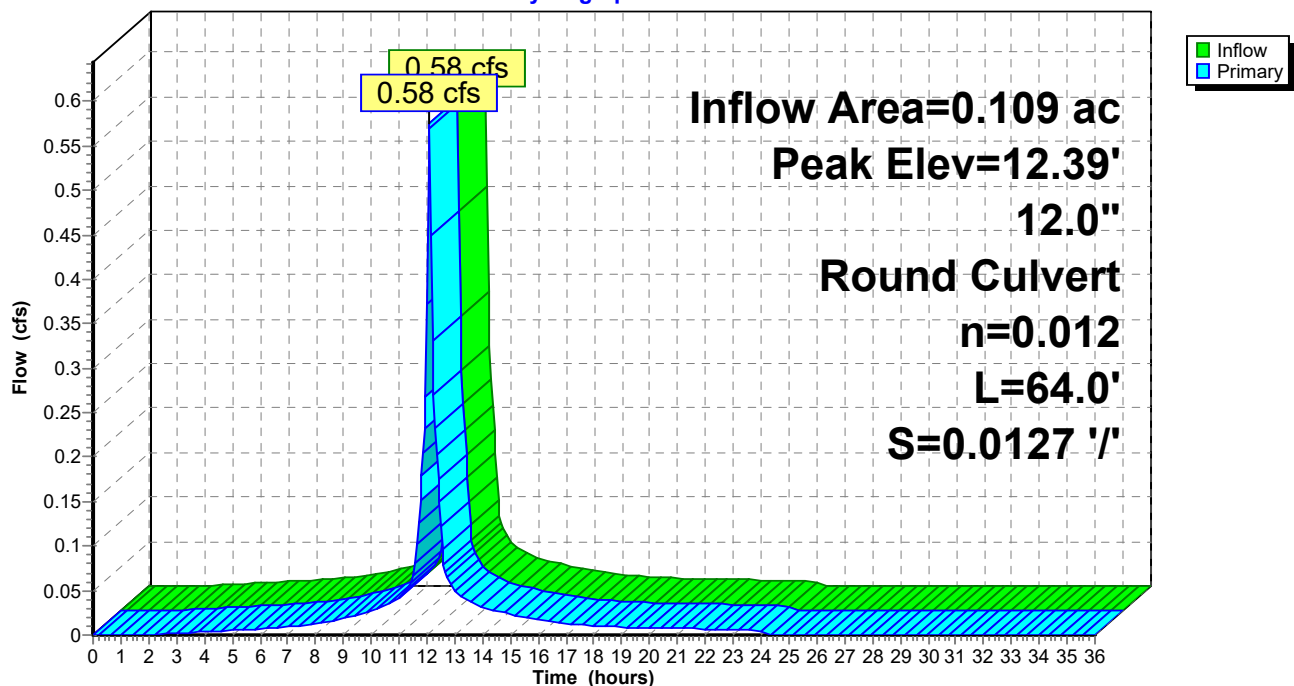
Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 12.39' @ 12.09 hrs

Flood Elev= 16.26'

Device	Routing	Invert	Outlet Devices
#1	Primary	12.01'	<b>12.0" Round Culvert</b> L= 64.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 12.01' / 11.20' S= 0.0127 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

**Primary OutFlow** Max=0.56 cfs @ 12.09 hrs HW=12.38' (Free Discharge)  
↑**1=Culvert** (Inlet Controls 0.56 cfs @ 2.08 fps)

**Pond 2P: CB #25851****Hydrograph**

**5042-Post**

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Type III 24-hr 10-yr Rainfall=5.60"

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**Summary for Pond 3P: DMH #P1**

Inflow Area = 0.352 ac, 95.42% Impervious, Inflow Depth = 5.25" for 10-yr event  
Inflow = 1.87 cfs @ 12.09 hrs, Volume= 0.154 af  
Outflow = 1.87 cfs @ 12.09 hrs, Volume= 0.154 af, Atten= 0%, Lag= 0.0 min  
Primary = 1.87 cfs @ 12.09 hrs, Volume= 0.154 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 11.93' @ 12.09 hrs

Flood Elev= 15.45'

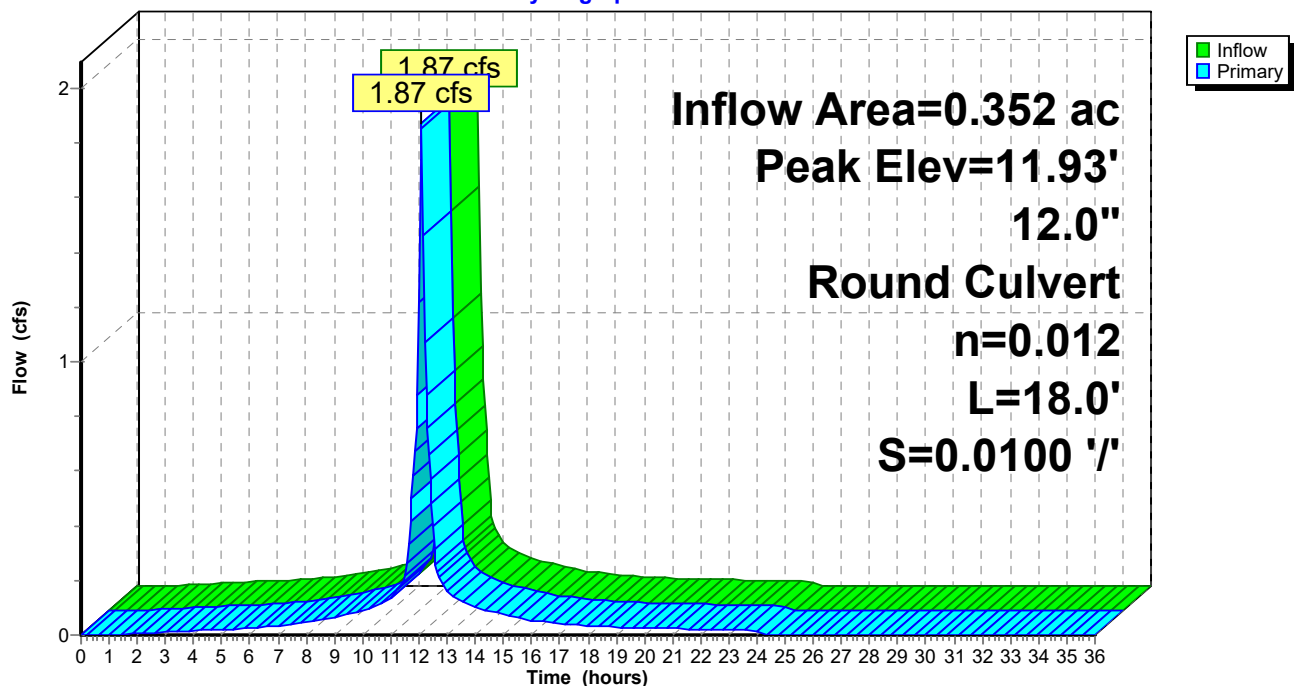
Device	Routing	Invert	Outlet Devices
#1	Primary	11.10'	<b>12.0" Round Culvert</b> L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 11.10' / 10.92' S= 0.0100 '/ Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

**Primary OutFlow** Max=1.82 cfs @ 12.09 hrs HW=11.92' (Free Discharge)

1=Culvert (Barrel Controls 1.82 cfs @ 3.60 fps)

**Pond 3P: DMH #P1**

Hydrograph



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Type III 24-hr 10-yr Rainfall=5.60"

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**Summary for Pond 4P: CB #3763**

Inflow Area = 0.067 ac, 92.61% Impervious, Inflow Depth = 5.13" for 10-yr event  
Inflow = 0.35 cfs @ 12.09 hrs, Volume= 0.029 af  
Outflow = 0.35 cfs @ 12.09 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.0 min  
Primary = 0.35 cfs @ 12.09 hrs, Volume= 0.029 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 12.32' @ 12.09 hrs

Flood Elev= 14.71'

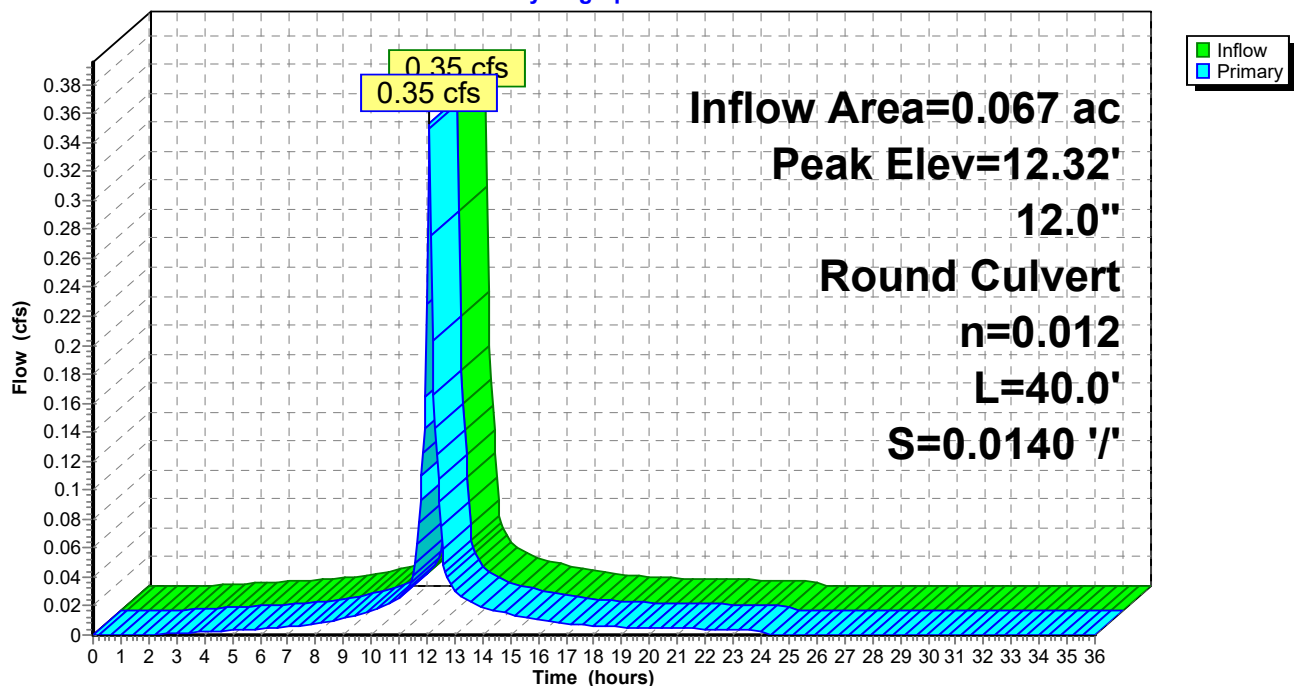
Device	Routing	Invert	Outlet Devices
#1	Primary	12.03'	<b>12.0" Round Culvert</b> L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 12.03' / 11.47' S= 0.0140 '/ Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

**Primary OutFlow** Max=0.34 cfs @ 12.09 hrs HW=12.32' (Free Discharge)

↑1=Culvert (Inlet Controls 0.34 cfs @ 1.83 fps)

**Pond 4P: CB #3763**

Hydrograph





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Type III 24-hr 10-yr Rainfall=5.60"

Printed 6/16/2021

**Summary for Pond 20P: CB #P3**

Inflow Area = 0.108 ac, 99.17% Impervious, Inflow Depth = 5.36" for 10-yr event  
Inflow = 0.58 cfs @ 12.09 hrs, Volume= 0.048 af  
Outflow = 0.58 cfs @ 12.09 hrs, Volume= 0.048 af, Atten= 0%, Lag= 0.0 min  
Primary = 0.58 cfs @ 12.09 hrs, Volume= 0.048 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

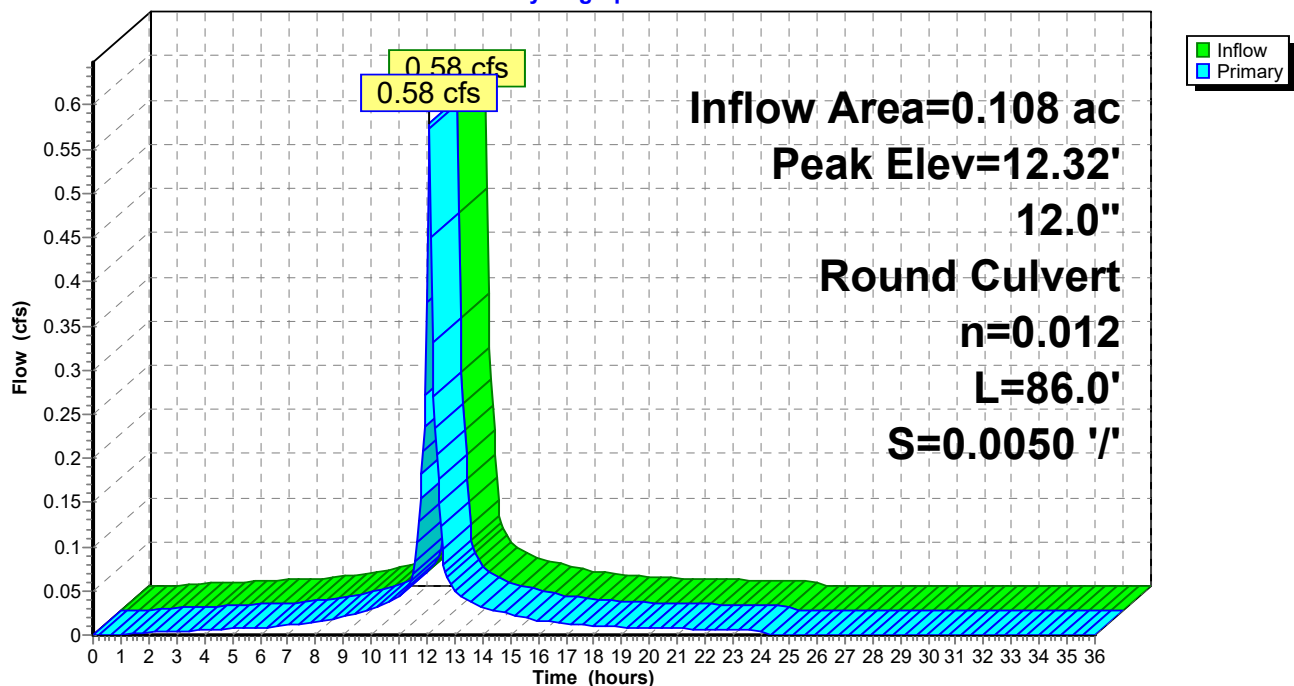
Peak Elev= 12.32' @ 12.09 hrs

Flood Elev= 15.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	11.89'	<b>12.0" Round Culvert</b> L= 86.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 11.89' / 11.46' S= 0.0050 '/ Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

**Primary OutFlow** Max=0.56 cfs @ 12.09 hrs HW=12.32' (Free Discharge)

1=Culvert (Barrel Controls 0.56 cfs @ 2.61 fps)

**Pond 20P: CB #P3****Hydrograph**

**5042-Post**

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Type III 24-hr 10-yr Rainfall=5.60"

Printed 6/16/2021

**Summary for Pond 21P: CB #P2**

Inflow Area = 0.243 ac, 96.99% Impervious, Inflow Depth = 5.30" for 10-yr event  
Inflow = 1.30 cfs @ 12.09 hrs, Volume= 0.107 af  
Outflow = 1.30 cfs @ 12.09 hrs, Volume= 0.107 af, Atten= 0%, Lag= 0.0 min  
Primary = 1.30 cfs @ 12.09 hrs, Volume= 0.107 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 12.09' @ 12.09 hrs

Flood Elev= 15.30'

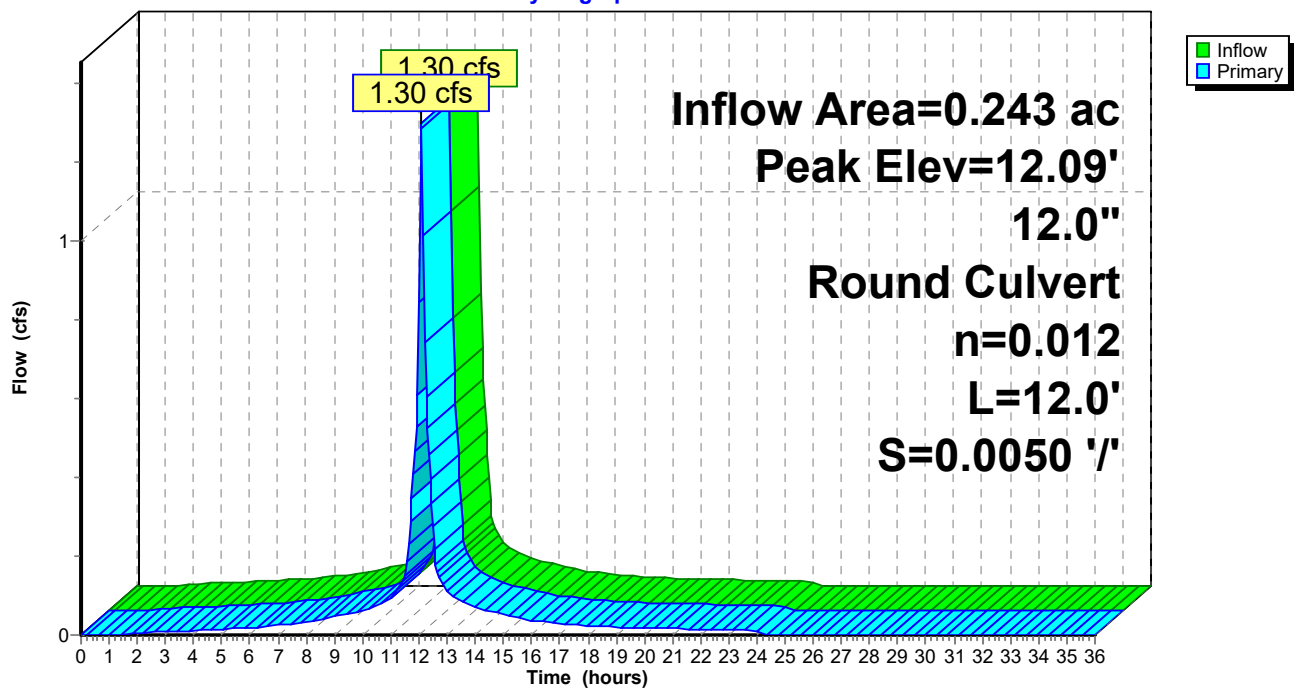
Device	Routing	Invert	Outlet Devices
#1	Primary	11.36'	<b>12.0" Round Culvert</b> L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 11.36' / 11.30' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

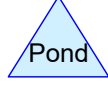
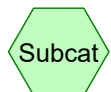
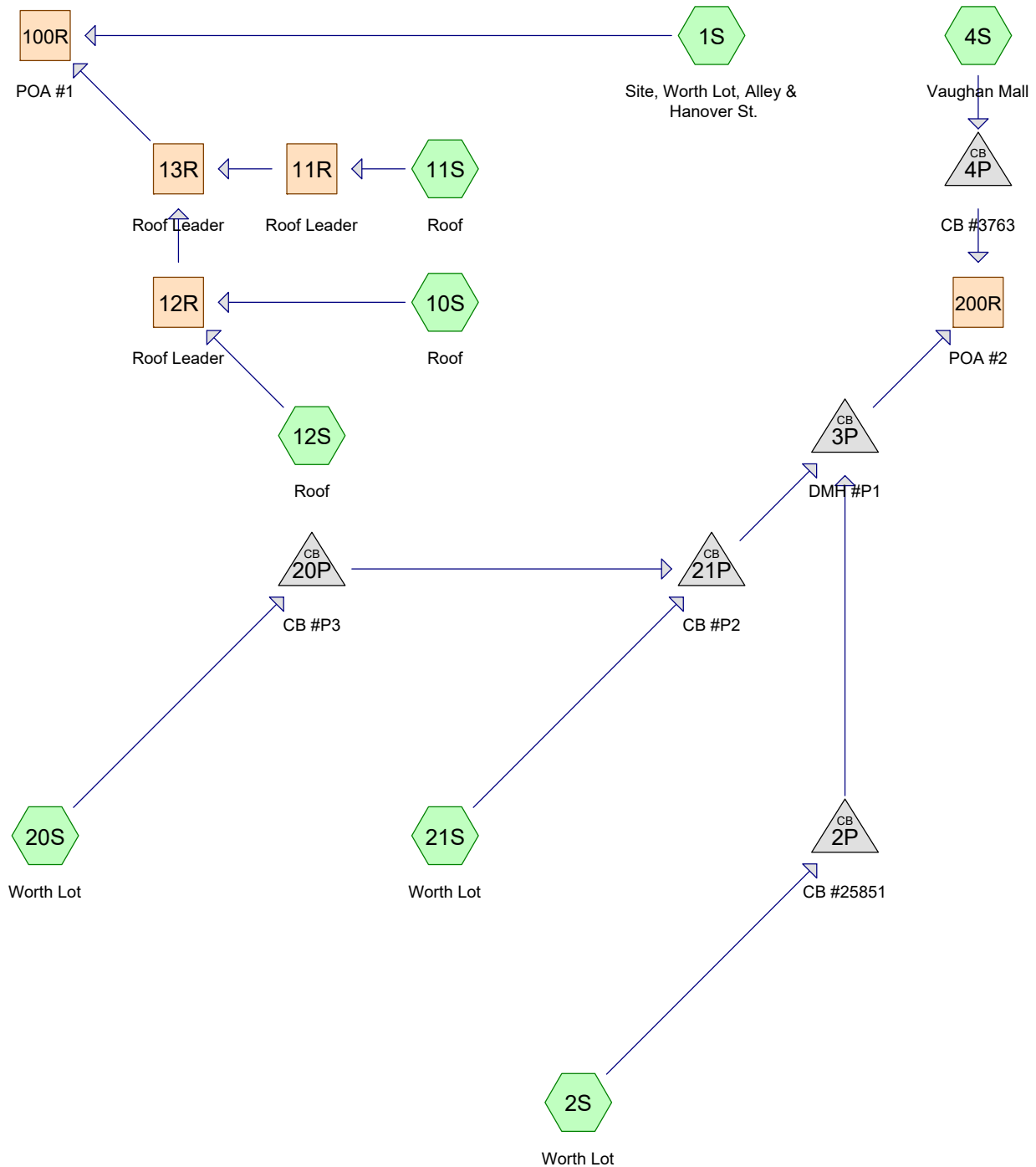
**Primary OutFlow** Max=1.26 cfs @ 12.09 hrs HW=12.08' (Free Discharge)

1=Culvert (Barrel Controls 1.26 cfs @ 2.93 fps)

**Pond 21P: CB #P2**

Hydrograph





**5042-Post**

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*Type III 24-hr 25-yr Rainfall=7.10"*

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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 Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: Site, Worth Lot, Alley &** Runoff Area=19,157 sf 98.39% Impervious Runoff Depth=6.86"  
 Flow Length=347' Tc=6.0 min CN=98 Runoff=2.99 cfs 0.251 af

**Subcatchment 2S: Worth Lot** Runoff Area=4,739 sf 91.90% Impervious Runoff Depth=6.62"  
 Flow Length=124' Tc=6.0 min CN=96 Runoff=0.73 cfs 0.060 af

**Subcatchment 4S: Vaughan Mall** Runoff Area=2,908 sf 92.61% Impervious Runoff Depth=6.62"  
 Flow Length=61' Tc=6.0 min CN=96 Runoff=0.45 cfs 0.037 af

**Subcatchment 10S: Roof** Runoff Area=8,053 sf 100.00% Impervious Runoff Depth=6.86"  
 Tc=6.0 min CN=98 Runoff=1.26 cfs 0.106 af

**Subcatchment 11S: Roof** Runoff Area=2,409 sf 88.71% Impervious Runoff Depth=6.51"  
 Tc=6.0 min CN=95 Runoff=0.37 cfs 0.030 af

**Subcatchment 12S: Roof** Runoff Area=2,555 sf 100.00% Impervious Runoff Depth=6.86"  
 Tc=6.0 min CN=98 Runoff=0.40 cfs 0.034 af

**Subcatchment 20S: Worth Lot** Runoff Area=4,709 sf 99.17% Impervious Runoff Depth=6.86"  
 Flow Length=100' Tc=6.0 min CN=98 Runoff=0.74 cfs 0.062 af

**Subcatchment 21S: Worth Lot** Runoff Area=5,891 sf 95.25% Impervious Runoff Depth=6.74"  
 Flow Length=105' Tc=6.0 min CN=97 Runoff=0.92 cfs 0.076 af

**Reach 11R: Roof Leader** Avg. Flow Depth=0.28' Max Vel=3.25 fps Inflow=0.37 cfs 0.030 af  
 6.0" Round Pipe n=0.012 L=94.0' S=0.0100 ' Capacity=0.61 cfs Outflow=0.36 cfs 0.030 af

**Reach 12R: Roof Leader** Avg. Flow Depth=0.42' Max Vel=7.09 fps Inflow=1.66 cfs 0.139 af  
 8.0" Round Pipe n=0.012 L=113.0' S=0.0300 ' Capacity=2.27 cfs Outflow=1.64 cfs 0.139 af

**Reach 13R: Roof Leader** Avg. Flow Depth=0.49' Max Vel=7.33 fps Inflow=2.01 cfs 0.169 af  
 8.0" Round Pipe n=0.012 L=21.0' S=0.0300 ' Capacity=2.27 cfs Outflow=2.00 cfs 0.169 af

**Reach 100R: POA #1** Inflow=4.99 cfs 0.421 af  
 Outflow=4.99 cfs 0.421 af

**Reach 200R: POA #2** Inflow=2.84 cfs 0.235 af  
 Outflow=2.84 cfs 0.235 af

**Pond 2P: CB #25851** Peak Elev=12.44' Inflow=0.73 cfs 0.060 af  
 12.0" Round Culvert n=0.012 L=64.0' S=0.0127 ' Outflow=0.73 cfs 0.060 af

**Pond 3P: DMH #P1** Peak Elev=12.09' Inflow=2.39 cfs 0.198 af  
 12.0" Round Culvert n=0.012 L=18.0' S=0.0100 ' Outflow=2.39 cfs 0.198 af

**Pond 4P: CB #3763** Peak Elev=12.36' Inflow=0.45 cfs 0.037 af  
 12.0" Round Culvert n=0.012 L=40.0' S=0.0140 ' Outflow=0.45 cfs 0.037 af

**5042-Post***Type III 24-hr 25-yr Rainfall=7.10"*

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**Pond 20P: CB #P3**

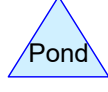
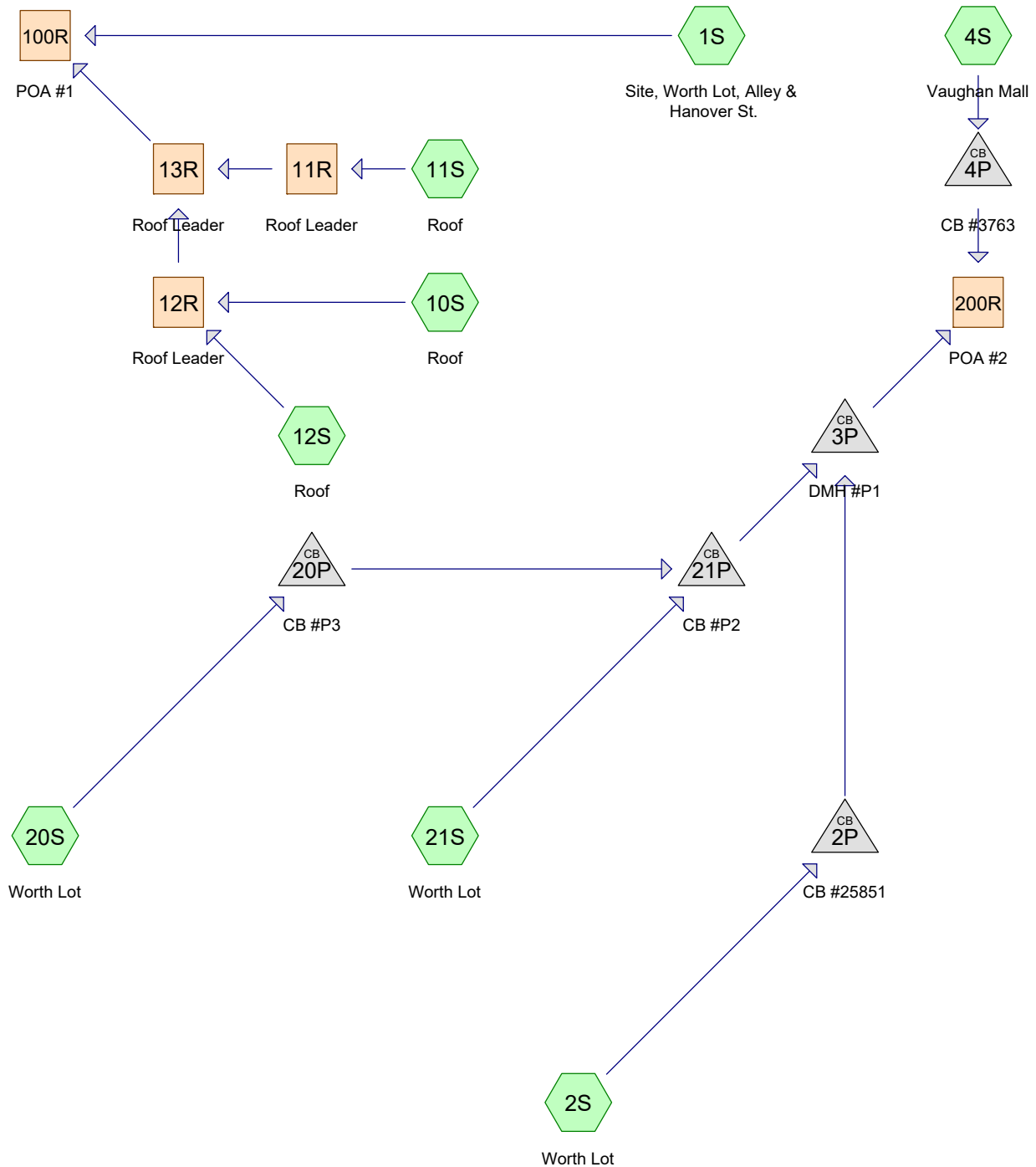
Peak Elev=12.38' Inflow=0.74 cfs 0.062 af  
12.0" Round Culvert n=0.012 L=86.0' S=0.0050 '/' Outflow=0.74 cfs 0.062 af

**Pond 21P: CB #P2**

Peak Elev=12.21' Inflow=1.65 cfs 0.138 af  
12.0" Round Culvert n=0.012 L=12.0' S=0.0050 '/' Outflow=1.65 cfs 0.138 af

**Total Runoff Area = 1.158 ac   Runoff Volume = 0.655 af   Average Runoff Depth = 6.79"**  
**2.97% Pervious = 0.034 ac   97.03% Impervious = 1.123 ac**





**5042-Post**

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*Type III 24-hr 50-yr Rainfall=8.50"*

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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 Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: Site, Worth Lot, Alley &** Runoff Area=19,157 sf 98.39% Impervious Runoff Depth=8.26"  
Flow Length=347' Tc=6.0 min CN=98 Runoff=3.58 cfs 0.303 af

**Subcatchment 2S: Worth Lot** Runoff Area=4,739 sf 91.90% Impervious Runoff Depth=8.02"  
Flow Length=124' Tc=6.0 min CN=96 Runoff=0.88 cfs 0.073 af

**Subcatchment 4S: Vaughan Mall** Runoff Area=2,908 sf 92.61% Impervious Runoff Depth=8.02"  
Flow Length=61' Tc=6.0 min CN=96 Runoff=0.54 cfs 0.045 af

**Subcatchment 10S: Roof** Runoff Area=8,053 sf 100.00% Impervious Runoff Depth=8.26"  
Tc=6.0 min CN=98 Runoff=1.51 cfs 0.127 af

**Subcatchment 11S: Roof** Runoff Area=2,409 sf 88.71% Impervious Runoff Depth=7.90"  
Tc=6.0 min CN=95 Runoff=0.45 cfs 0.036 af

**Subcatchment 12S: Roof** Runoff Area=2,555 sf 100.00% Impervious Runoff Depth=8.26"  
Tc=6.0 min CN=98 Runoff=0.48 cfs 0.040 af

**Subcatchment 20S: Worth Lot** Runoff Area=4,709 sf 99.17% Impervious Runoff Depth=8.26"  
Flow Length=100' Tc=6.0 min CN=98 Runoff=0.88 cfs 0.074 af

**Subcatchment 21S: Worth Lot** Runoff Area=5,891 sf 95.25% Impervious Runoff Depth=8.14"  
Flow Length=105' Tc=6.0 min CN=97 Runoff=1.10 cfs 0.092 af

**Reach 11R: Roof Leader** Avg. Flow Depth=0.32' Max Vel=3.38 fps Inflow=0.45 cfs 0.036 af  
6.0" Round Pipe n=0.012 L=94.0' S=0.0100 ' Capacity=0.61 cfs Outflow=0.44 cfs 0.036 af

**Reach 12R: Roof Leader** Avg. Flow Depth=0.48' Max Vel=7.32 fps Inflow=1.98 cfs 0.168 af  
8.0" Round Pipe n=0.012 L=113.0' S=0.0300 ' Capacity=2.27 cfs Outflow=1.97 cfs 0.168 af

**Reach 13R: Roof Leader** Avg. Flow Depth=0.59' Max Vel=7.38 fps Inflow=2.41 cfs 0.204 af  
8.0" Round Pipe n=0.012 L=21.0' S=0.0300 ' Capacity=2.27 cfs Outflow=2.40 cfs 0.204 af

**Reach 100R: POA #1** Inflow=5.98 cfs 0.507 af  
Outflow=5.98 cfs 0.507 af

**Reach 200R: POA #2** Inflow=3.40 cfs 0.283 af  
Outflow=3.40 cfs 0.283 af

**Pond 2P: CB #25851** Peak Elev=12.49' Inflow=0.88 cfs 0.073 af  
12.0" Round Culvert n=0.012 L=64.0' S=0.0127 ' Outflow=0.88 cfs 0.073 af

**Pond 3P: DMH #P1** Peak Elev=12.24' Inflow=2.86 cfs 0.239 af  
12.0" Round Culvert n=0.012 L=18.0' S=0.0100 ' Outflow=2.86 cfs 0.239 af

**Pond 4P: CB #3763** Peak Elev=12.40' Inflow=0.54 cfs 0.045 af  
12.0" Round Culvert n=0.012 L=40.0' S=0.0140 ' Outflow=0.54 cfs 0.045 af

**5042-Post***Type III 24-hr 50-yr Rainfall=8.50"*

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**Pond 20P: CB #P3**

Peak Elev=12.43' Inflow=0.88 cfs 0.074 af  
12.0" Round Culvert n=0.012 L=86.0' S=0.0050 '/' Outflow=0.88 cfs 0.074 af

**Pond 21P: CB #P2**

Peak Elev=12.31' Inflow=1.98 cfs 0.166 af  
12.0" Round Culvert n=0.012 L=12.0' S=0.0050 '/' Outflow=1.98 cfs 0.166 af

**Total Runoff Area = 1.158 ac   Runoff Volume = 0.790 af   Average Runoff Depth = 8.19"**  
**2.97% Pervious = 0.034 ac   97.03% Impervious = 1.123 ac**

## Section 5

# NRCC Extreme Precipitation Table

## Extreme Precipitation Tables

### Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

<b>Smoothing</b>	Yes
<b>State</b>	New Hampshire
<b>Location</b>	
<b>Longitude</b>	70.763 degrees West
<b>Latitude</b>	43.072 degrees North
<b>Elevation</b>	0 feet
<b>Date/Time</b>	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	
<b>1yr</b>	0.26	0.40	0.50	0.65	0.81	1.04	<b>1yr</b>	0.70	0.98	1.21	1.56	2.03	2.66	2.92	<b>1yr</b>	2.35	2.81	3.22	3.94	4.55	<b>1yr</b>
<b>2yr</b>	0.32	0.50	0.62	0.81	1.02	1.30	<b>2yr</b>	0.88	1.18	1.52	1.94	2.49	3.21	3.57	<b>2yr</b>	2.84	3.43	3.94	4.68	5.33	<b>2yr</b>
<b>5yr</b>	0.37	0.58	0.73	0.98	1.25	1.61	<b>5yr</b>	1.08	1.47	1.89	2.43	3.14	4.07	4.58	<b>5yr</b>	3.60	4.40	5.04	5.94	6.70	<b>5yr</b>
<b>10yr</b>	0.41	0.65	0.82	1.12	1.45	1.89	<b>10yr</b>	1.25	1.73	2.23	2.89	3.75	4.87	5.53	<b>10yr</b>	4.31	5.32	6.09	7.11	7.98	<b>10yr</b>
<b>25yr</b>	0.48	0.76	0.97	1.34	1.77	2.34	<b>25yr</b>	1.53	2.14	2.78	3.63	4.74	6.17	7.10	<b>25yr</b>	5.46	6.83	7.80	9.03	10.05	<b>25yr</b>
<b>50yr</b>	0.54	0.86	1.10	1.54	2.07	2.76	<b>50yr</b>	1.79	2.53	3.29	4.32	5.66	7.39	8.58	<b>50yr</b>	6.54	8.25	9.42	10.81	11.98	<b>50yr</b>
<b>100yr</b>	0.60	0.97	1.25	1.77	2.42	3.26	<b>100yr</b>	2.09	2.98	3.90	5.16	6.77	8.85	10.38	<b>100yr</b>	7.83	9.98	11.38	12.96	14.27	<b>100yr</b>
<b>200yr</b>	0.67	1.10	1.43	2.05	2.82	3.83	<b>200yr</b>	2.44	3.52	4.62	6.13	8.08	10.61	12.55	<b>200yr</b>	9.39	12.07	13.76	15.55	17.02	<b>200yr</b>
<b>500yr</b>	0.80	1.31	1.71	2.48	3.48	4.76	<b>500yr</b>	3.00	4.38	5.76	7.70	10.22	13.48	16.14	<b>500yr</b>	11.93	15.52	17.67	19.78	21.49	<b>500yr</b>

### Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
<b>1yr</b>	0.23	0.36	0.44	0.59	0.72	0.88	<b>1yr</b>	0.63	0.86	0.92	1.33	1.68	2.24	2.49	<b>1yr</b>	1.98	2.40	2.87	3.18	3.90	<b>1yr</b>
<b>2yr</b>	0.31	0.49	0.60	0.81	1.00	1.19	<b>2yr</b>	0.86	1.16	1.37	1.82	2.34	3.06	3.45	<b>2yr</b>	2.71	3.32	3.82	4.55	5.08	<b>2yr</b>
<b>5yr</b>	0.35	0.54	0.67	0.92	1.17	1.40	<b>5yr</b>	1.01	1.37	1.61	2.12	2.73	3.79	4.19	<b>5yr</b>	3.35	4.03	4.72	5.53	6.24	<b>5yr</b>
<b>10yr</b>	0.39	0.59	0.73	1.03	1.33	1.60	<b>10yr</b>	1.14	1.56	1.80	2.39	3.06	4.37	4.86	<b>10yr</b>	3.87	4.67	5.44	6.41	7.20	<b>10yr</b>
<b>25yr</b>	0.44	0.67	0.83	1.19	1.56	1.90	<b>25yr</b>	1.35	1.86	2.10	2.75	3.53	4.72	5.89	<b>25yr</b>	4.18	5.66	6.65	7.79	8.68	<b>25yr</b>
<b>50yr</b>	0.48	0.73	0.91	1.31	1.76	2.17	<b>50yr</b>	1.52	2.12	2.35	3.07	3.93	5.33	6.80	<b>50yr</b>	4.72	6.54	7.72	9.04	10.02	<b>50yr</b>
<b>100yr</b>	0.54	0.81	1.01	1.47	2.01	2.47	<b>100yr</b>	1.73	2.41	2.63	3.41	4.35	6.00	7.85	<b>100yr</b>	5.31	7.55	8.98	10.51	11.56	<b>100yr</b>
<b>200yr</b>	0.59	0.89	1.13	1.63	2.28	2.81	<b>200yr</b>	1.96	2.75	2.93	3.78	4.79	6.72	9.06	<b>200yr</b>	5.95	8.71	10.42	12.22	13.37	<b>200yr</b>
<b>500yr</b>	0.68	1.02	1.31	1.90	2.71	3.36	<b>500yr</b>	2.34	3.29	3.41	4.31	5.45	7.82	10.94	<b>500yr</b>	6.92	10.52	12.69	14.96	16.19	<b>500yr</b>

### Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
<b>1yr</b>	0.28	0.44	0.54	0.72	0.89	1.08	<b>1yr</b>	0.77	1.06	1.26	1.74	2.21	2.98	3.16	<b>1yr</b>	2.64	3.04	3.58	4.37	5.04	<b>1yr</b>
<b>2yr</b>	0.34	0.52	0.64	0.86	1.07	1.27	<b>2yr</b>	0.92	1.24	1.48	1.96	2.51	3.42	3.70	<b>2yr</b>	3.03	3.56	4.09	4.84	5.63	<b>2yr</b>
<b>5yr</b>	0.40	0.62	0.77	1.05	1.34	1.62	<b>5yr</b>	1.15	1.58	1.88	2.53	3.25	4.34	4.96	<b>5yr</b>	3.84	4.77	5.38	6.37	7.16	<b>5yr</b>
<b>10yr</b>	0.47	0.72	0.89	1.25	1.61	1.98	<b>10yr</b>	1.39	1.93	2.28	3.11	3.95	5.34	6.20	<b>10yr</b>	4.72	5.96	6.82	7.84	8.75	<b>10yr</b>
<b>25yr</b>	0.58	0.88	1.09	1.56	2.05	2.57	<b>25yr</b>	1.77	2.51	2.95	4.07	5.15	7.78	8.34	<b>25yr</b>	6.88	8.02	9.15	10.34	11.41	<b>25yr</b>
<b>50yr</b>	0.67	1.02	1.27	1.83	2.46	3.13	<b>50yr</b>	2.12	3.06	3.60	5.00	6.32	9.74	10.46	<b>50yr</b>	8.62	10.06	11.44	12.72	13.96	<b>50yr</b>
<b>100yr</b>	0.79	1.19	1.49	2.16	2.96	3.81	<b>100yr</b>	2.55	3.72	4.37	6.16	7.76	12.18	13.10	<b>100yr</b>	10.78	12.60	14.31	15.69	17.09	<b>100yr</b>
<b>200yr</b>	0.92	1.39	1.76	2.55	3.56	4.65	<b>200yr</b>	3.07	4.55	5.34	7.58	9.54	15.28	16.44	<b>200yr</b>	13.53	15.81	17.92	19.35	20.92	<b>200yr</b>
<b>500yr</b>	1.15	1.71	2.19	3.19	4.53	6.04	<b>500yr</b>	3.91	5.90	6.93	10.02	12.56	20.65	22.20	<b>500yr</b>	18.27	21.34	24.13	25.51	27.34	<b>500yr</b>



## Section 6

# NRCS Soils Report



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**



# 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](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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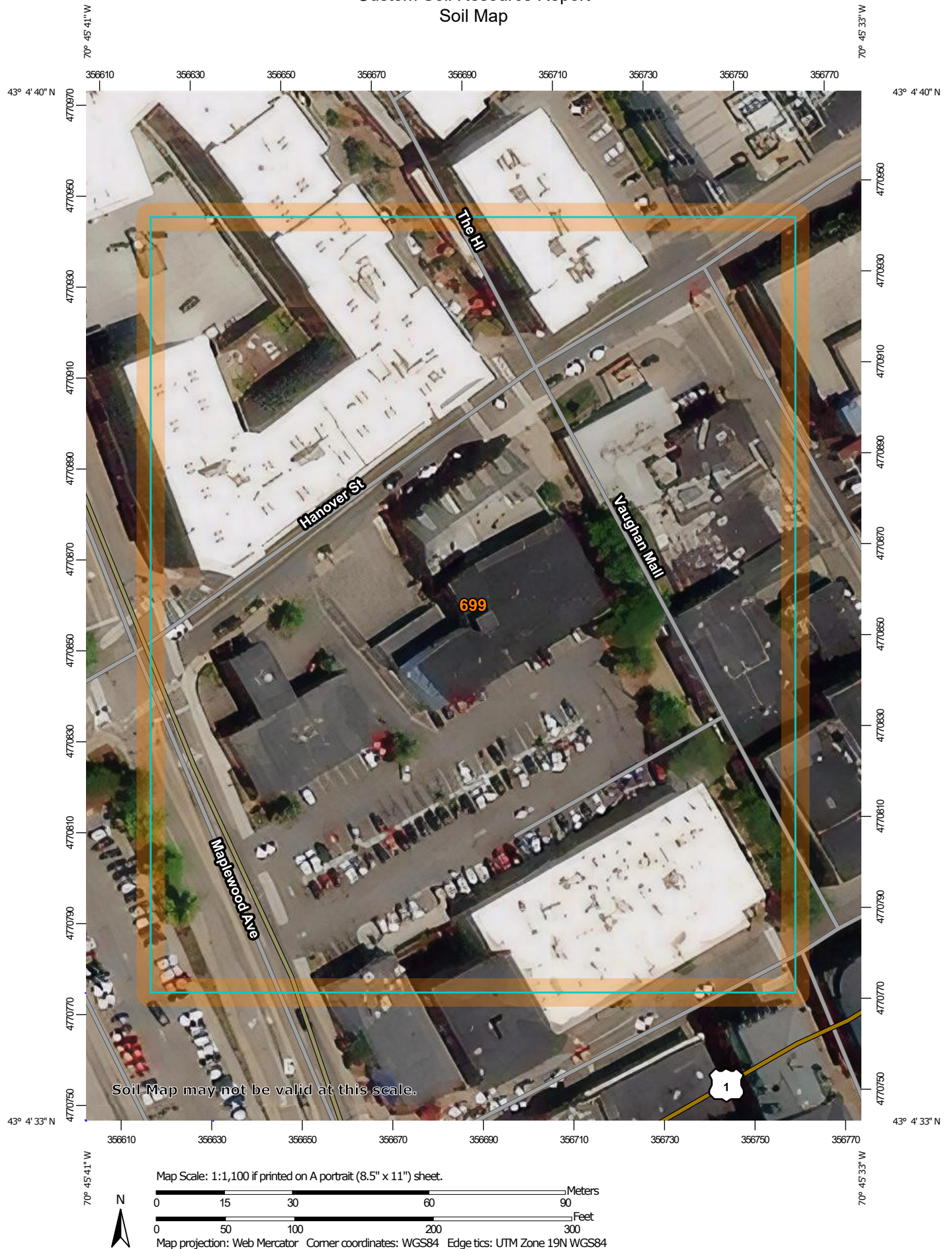
# Soil Map

---

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



# Custom Soil Resource Report

## 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—Sep 9, 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
699	Urban land	6.0	100.0%
<b>Totals for Area of Interest</b>		<b>6.0</b>	<b>100.0%</b>

## 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.

## Custom Soil Resource Report

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

### 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*

## Section 7

# Stormwater Operations & Maintenance Plan

# STORMWATER INSPECTION AND MAINTENANCE MANUAL

## 64 Vaughan Mall Assessor's Map 126, Lot 1

### OWNER AT TIME OF SITE PLAN APPROVAL:

64 Vaughan Mall, LLC  
41 Industrial Drive  
Exeter, NH 03833

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:**

<b>Owner:</b>	<u>64 Vaughan Mall, LLC or Assigns</u>	<u>(603) 778-9999</u>
	Name Company	Phone

<b>Inspection:</b>	<u>64 Vaughan Mall, LLC or Assigns</u>	<u>(603) 778-9999</u>
	Name Company	Phone

<b>Maintenance:</b>	<u>64 Vaughan Mall, LLC or Assigns</u>	<u>(603) 778-9999</u>
	Name Company	Phone

### **NOTES:**

***Inspection and maintenance responsibilities shall transfer to any future property owner(s) and any related homeowner's association (HOA).***

***This manual shall become part of any HOA documents.***

***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 an HOA.***

## **CULVERTS AND DRAINAGE PIPES**

---

*Function* – Culverts and drainage pipes convey stormwater away from buildings, walkways, and parking areas 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 inlets and outlets 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.
- Downspouts connected to a drainage system should be inspected annually to ensure that the connections are directing runoff as intended. Any loose or displaced downspout connections should be reconnected as necessary.

## **TRENCH DRAINS**

---

*Function* – Trench Drains collect stormwater, primarily from paved surfaces. Stormwater from paved areas often contains sediment and contaminants. Trench drains may trap sediment and debris.

*Maintenance*

- Remove leaves, sediment 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.
- Trench drains located in an enclosed areas such as basements and parking garages may be equipped with evaporators. In the event that an evaporator fails, a qualified professional should be retained for assessment and repair.

## **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 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 an area, water thoroughly, but do not create a situation where water runs off the surface towards a water body or drainage structure.



## LANDSCAPED AREAS - LITTER CONTROL

---

*Function* – Landscaped areas tend to filter debris and contaminants that may block drainage systems and pollute the surface and ground waters.

*Maintenance*

- Litter Control and landscape maintenance involves removing litter such as trash, leaves, lawn clippings, pet wastes, oil and chemicals from streets, parking lots and lawns before materials can be transported into surface waters.
- Litter control shall be implemented as part of the grounds maintenance program.

## 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.

## 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 free of sediment at least once annually at the end of winter/early spring prior to significant spring rains.

## APPENDIX

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- A. Stormwater System Operations and Maintenance Report
- B. Site Grading and Drainage Plan

## STORM WATER SYSTEM OPERATION AND MAINTENANCE REPORT

General Information		
<b>Project Name</b>		
<b>Owner</b>		
<b>Inspector's Name(s)</b>		
<b>Inspector's Contact Information</b>		
<b>Date of Inspection</b>	<b>Start Time:</b>	<b>End Time:</b>
<b>Type of Inspection:</b> <input type="checkbox"/> Annual Report <input type="checkbox"/> Post-storm event <input type="checkbox"/> Due to a discharge of significant amounts of sediment		
<b>Notes:</b>		

General Site Questions and Discharges of Significant Amounts of Sediment			
Subject	Status	Notes	
<i>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:</i>			
<i>Notes/ Action taken:</i>			
1	Do the current site conditions reflect the attached site plan?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
2	Is the site permanently stabilized, temporary erosion and sediment controls are removed, and stormwater discharges from construction activity are eliminated?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
3	Is there evidence of the discharge of significant amounts of sediment to surface waters, or conveyance systems leading to surface waters?	<input type="checkbox"/> Yes <input type="checkbox"/> No	

Permit Coverage and Plans				
#	BMP/Facility	Inspected	Corrective Action Needed and Notes	Date Corrected
	Drainage Pipes	<input type="checkbox"/> Yes <input type="checkbox"/> No		
	Downspout Connections	<input type="checkbox"/> Yes <input type="checkbox"/> No		
	Trench Drains	<input type="checkbox"/> Yes <input type="checkbox"/> No		
	Landscape Areas	<input type="checkbox"/> Yes <input type="checkbox"/> No		
		<input type="checkbox"/> Yes <input type="checkbox"/> No		
		<input type="checkbox"/> Yes <input type="checkbox"/> No		



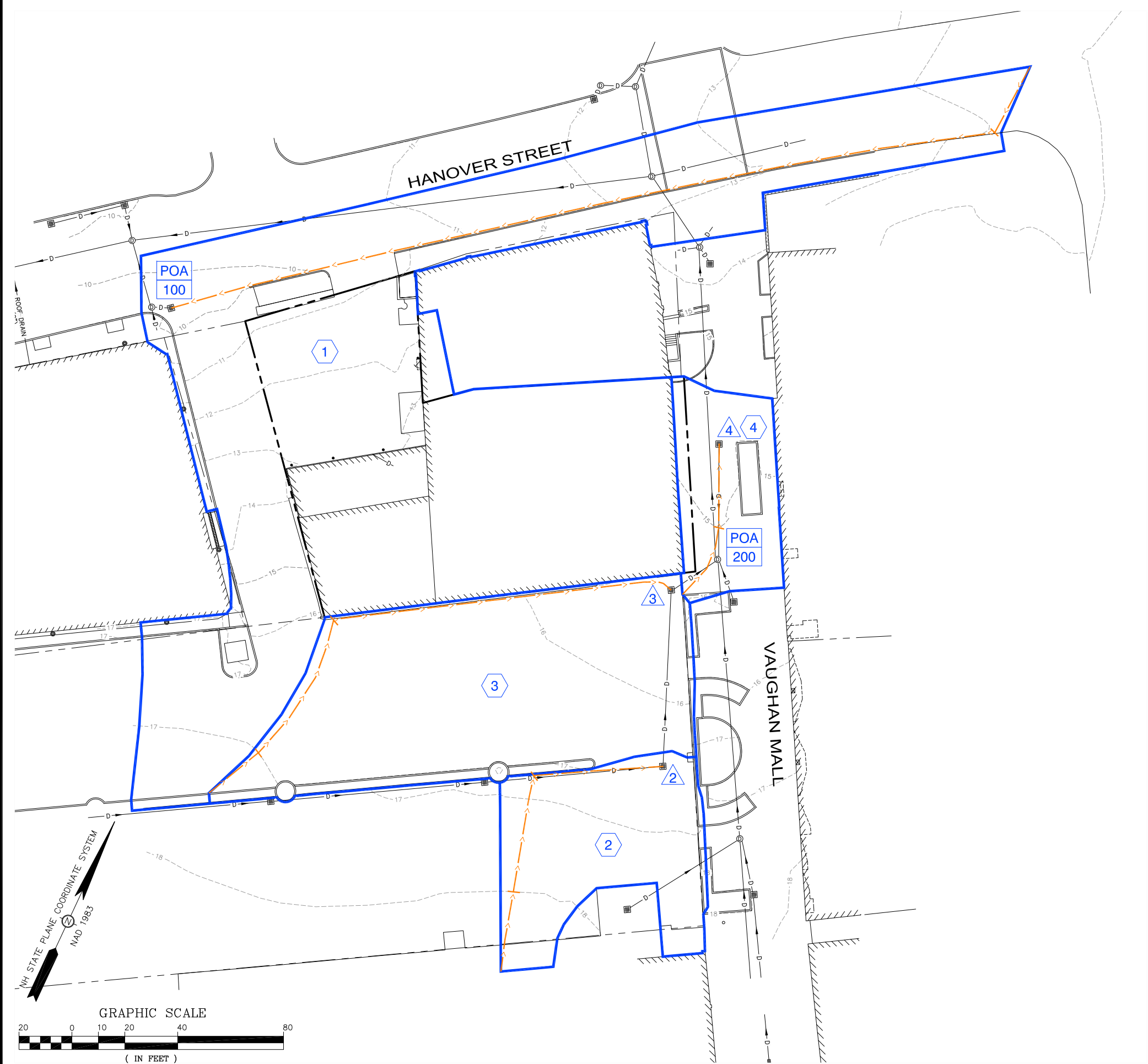
## Section 8

### Watershed Plans

Pre-Development Drainage Area Plan

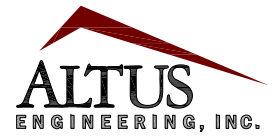
Post-Development Drainage Area Plan





LEGEND

- PROPERTY LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- WATERSHED BOUNDARY
- Tc PATH
- PROPOSED GROUND SLOPE DIRECTION
- SUBCATCHMENT/POND/REACH
- POINT OF ANALYSIS



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

NOT FOR CONSTRUCTION

ISSUED FOR: TAC

ISSUE DATE: JUNE 21, 2021

REVISIONS  
NO. DESCRIPTION BY DATE  
0 TAC EBS 06/21/21

DRAWN BY: EBS  
APPROVED BY: EDW  
DRAWING FILE: 5042-SITE.dwg

SCALE: 22"x34" 1" = 20'  
11"x17" 1" = 40'

OWNER:  
**64 VAUGHAN MALL, LLC**  
41 INDUSTRIAL DRIVE  
EXETER, NH 03833

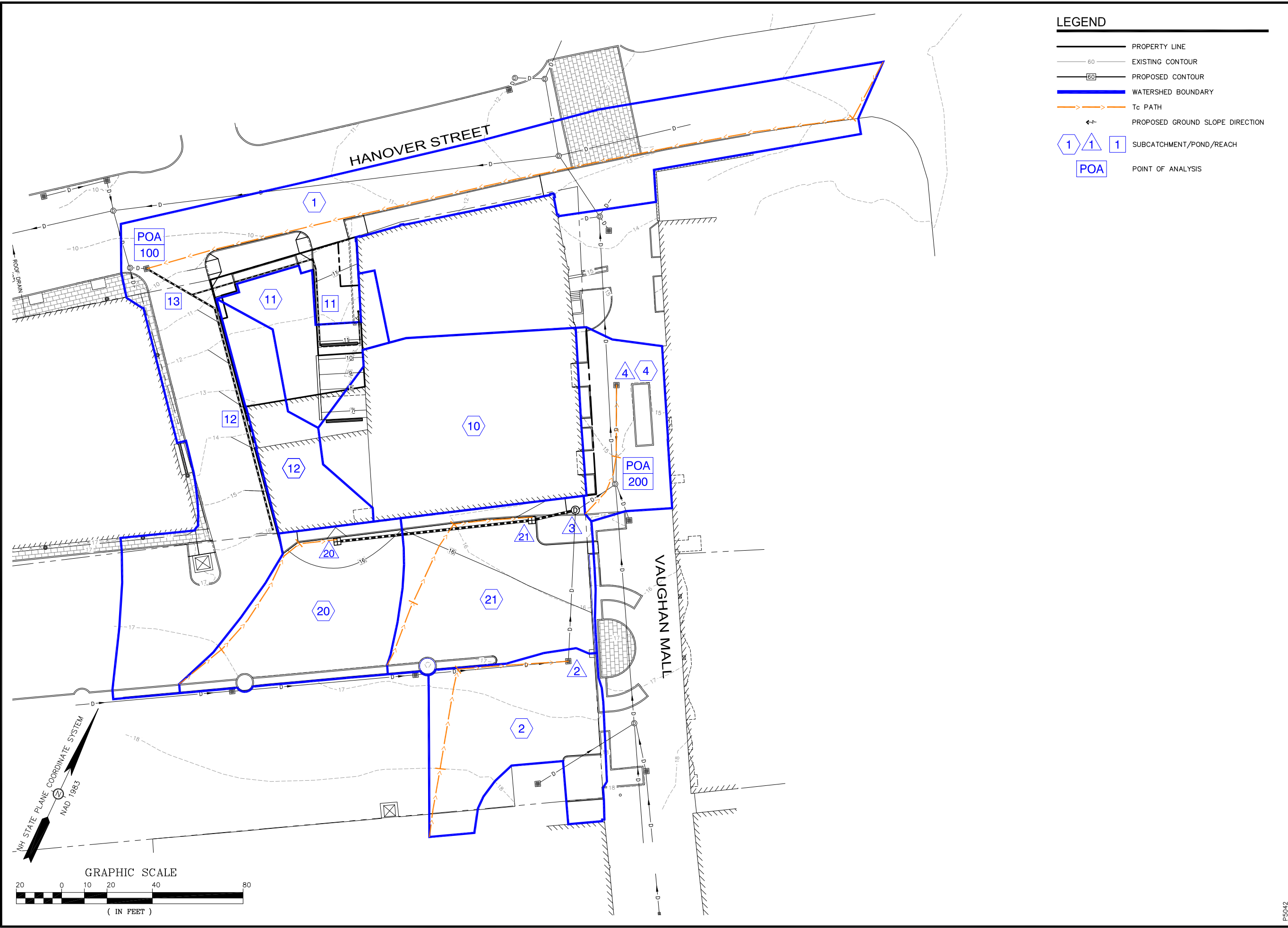
APPLICANT:  
**HAMPSHIRE DEVELOPMENT CORP.**  
41 INDUSTRIAL DRIVE  
EXETER, NH 03833

PROJECT:  
**64 VAUGHAN MALL BUILDING RESTORATION**  
TAX MAP 126, LOT 1  
64 VAUGHAN MALL  
PORTSMOUTH, NH 03801

TITLE:  
**PRE-DEVELOPMENT WATERHSED PLAN**

SHEET NUMBER:  
**WS-1**

P5042



**LEGEND**

- PROPERTY LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- WATERSHED BOUNDARY
- Tc PATH
- PROPOSED GROUND SLOPE DIRECTION
- SUBCATCHMENT/POND/REACH
- POINT OF ANALYSIS

**ALTUS**  
ENGINEERING, INC.

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

**NOT FOR CONSTRUCTION**

ISSUED FOR: TAC

ISSUE DATE: JUNE 21 2021

REVISIONS	NO.	DESCRIPTION	BY	DATE
0	TAC		EBS	06/21/21

DRAWN BY: EBS  
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**HAMPSHIRE DEVELOPMENT CORP.**  
41 INDUSTRIAL DRIVE  
EXETER, NH 03833

PROJECT:  
**64 VAUGHAN MALL BUILDING RESTORATION**  
TAX MAP 126, LOT 1  
64 VAUGHAN MALL  
PORTSMOUTH, NH 03801

TITLE:  
**POST-DEVELOPMENT WATERSHED PLAN**

SHEET NUMBER:  
**WS-2**

PS042