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NEW HAMPSHIRE 200

April 19, 2022

Peter Stith, Chair
City of Portsmouth Planning Department
Technical Advisory Committee
1 Junkins Ave, 3rd Floor
Portsmouth, NH 03801

RE: TAC Review for Proposed 3-Lot Subdivision, Tax Map 299, Lot 1

Dear Mr. Stith:

On behalf of our client, Artwill, LLC, TFMoran, Inc. is submitting the following plans and materials for review by the Technical Advisory Committee (TAC). The following materials are included in this submission and have also been uploaded to the City's online Land Use Application portal:

- **Letter of Authorization (1 copy);**
- **Site Plan Application Checklist (1 copy);**
- **Subdivision Application Checklist (1 copy);**
- **Abutter's List (1 copy);**
- **Abutter's Mail Labels (3 set of labels);**
- **Eversource Will Serve Letter (1 copy);**
- **Unitil Will Serve Letter (1 copy)**
- **Drainage Analysis (1 copy);**
- **Site Development Plans entitled "Site Development Plans, Tax Map 229 Lot 1, Proposed 3 Lot Subdivision, 437 Lafayette Road, Portsmouth, New Hampshire", prepared by TFMoran, Inc., dated April 19, 2022 (1 copy at 22"x34")**
- **Architectural Drawings (1 copy); and**
- **Fee Schedule (1 copy).**

Project Description

The project includes the subdivision of a single lot into three proposed lots, and the construction of two new single-family dwelling units and an attached accessory dwelling unit. Associated improvements include, but are not limited to, grading, utility installation, construction of stormwater management systems, landscaping, and residential driveways. The existing lot is located at 437 Lafayette Road and is identified on the City of Portsmouth Assessor's Map 229 as Lot 1, and is approximately 65,365 sf (1.50 ac) in size. The site is located in the Single Residence B (SRB) Zone and currently contains one single-family residential building.

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TAC Review for Proposed 3-Lot Subdivision, Tax Map 229, Lot 1 **April 19, 2022**

The site is bordered by Lafayette Road to the west, Andrew Jarvis Drive to the north, Artwill Avenue to the south, and Saint Nicholas Greek Orthodox Church to the east. The immediate area surrounding the site consists of mostly residential buildings, and the Portsmouth High School is located at the end of Andrew Jarvis Drive to the east.

Based on our review of the City of Portsmouth's Zoning Ordinance, Site Plan Review Regulations and Subdivision Regulations, it is our understanding that this project requires the following Planning Board approvals:

- Site Plan Review
- Subdivision Review
- Conditional Use Permit for an Attached Accessory Dwelling Unit (AADU)

We appreciate your consideration of these matters and look forward to presenting this project to you in the near future.

We respectfully request that we be placed on the upcoming agenda for the Technical Advisory Committee (TAC) meeting on May 3, 2022.

If you have any questions or concerns, please do not hesitate to contact us.

Respectfully,
TFMoran, Inc.

Justin Macek, EIT
Project Manager

JSK/jsm

cc: Joe Caldarola, Smithfield Construction, Inc. (via joe@smithfield.com)

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Letter of Authorization

I, Joeseph Caldarola of Artwill, LLC, PO Box 370, Portsmouth, NH, hereby authorize TFMoran, Inc., 170 Commerce Way, Suite 102, Portsmouth, NH, to act on my behalf concerning property owned by Artwill, LLC, located at 437 Lafayette Road, Portsmouth, NH, known as Tax Map 229, Lot 1.

I hereby appoint TFMoran, Inc. as my agent to act on my behalf in the review process, to include any required signatures.

Joseph Caldarola — Client Name

3/1/22 — Date

TFMoran, Inc.
48 Constitution Drive, Bedford, NH 03110
NH 03801
T(603) 472-4488 www.tfmoran.com

TFMoran, Inc. Seacoast Division
170 Commerce Way–Suite 102, Portsmouth,
T(603) 431-2222

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. The checklist is required to be completed and uploaded to the Site Plan application in the City's online permitting system. A pre-application conference with a member of the planning department is strongly encouraged as additional project information may be required depending on the size and scope. The applicant is cautioned that this checklist is only a guide and is not intended to be a complete list of all site plan review requirements. Please refer to the Site Plan review regulations for full details.

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

Name of Applicant: Artwill, LLC Date Submitted: 4/19/2022

Application # (in City's online permitting): To Be Provided

Site Address: 437 Lafayette Road Map: 229 Lot: 1

Application Requirements			
☑	**Required Items for Submittal**	**Item Location (e.g. Page or Plan Sheet/Note #)**	**Waiver Requested**
☑	Complete application form submitted via the City's web-based permitting program (2.5.2.1**(2.5.2.3A)**	Submitted via Viewpoint	N/A
☑	All application documents, plans, supporting documentation and other materials uploaded to the application form in viewpoint in digital Portable Document Format (PDF). One hard copy of all plans and materials shall be submitted to the Planning Department by the published deadline. **(2.5.2.8)**	Submitted digitally via Viewpoint, and one hard copy submitted to Planning Dept.	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☐	Statement that lists and describes "green" building components and systems. **(2.5.3.1B)**	N/A	N/A
☑	Existing and proposed gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. **(2.5.3.1C)**	C-03	N/A
☑	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1D)**	S-01 (Existing) C-03 (Proposed)	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. **(2.5.3.1E)**	C-00	N/A
☑	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. **(2.5.3.1F)**	S-01	N/A
☑	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1G)**	C-00	N/A
☑	List of reference plans. **(2.5.3.1H)**	S-01 & S-03	N/A
☑	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1I)**	C-01	N/A

Site Plan Specifications			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Full size plans shall not be larger than 22 inches by 34 inches with match lines as required, unless approved by the Planning Director.. **(2.5.4.1A)**	Required on all plan sheets	N/A
☑	Scale: Not less than 1 inch = 60 feet and a graphic bar scale shall be included on all plans. **(2.5.4.1B)**	Required on all plan sheets	N/A
☑	GIS data should be referenced to the coordinate system New Hampshire State Plane, NAD83 (1996), with units in feet. **(2.5.4.1C)**	S-01	N/A
☑	Plans shall be drawn to scale and stamped by a NH licensed civil engineer. **(2.5.4.1D)**	Required on all plan sheets	N/A
☐	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. **(2.5.4.1E)**	No wetlands within project vicinity	N/A
☑	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**	All plan sheets	N/A
☑	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**	C-00	N/A
☑	Individual plan sheet title that clearly describes the information that is displayed. **(2.5.4.2C)**	Required on all plan sheets	N/A
☑	Source and date of data displayed on the plan. **(2.5.4.2D)**	S-01	N/A

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	**1. Existing Conditions: (2.5.4.3A)** • Surveyed plan of site showing existing natural and built features; • Existing building footprints and gross floor area; • Existing parking areas and number of parking spaces provided; • Zoning district boundaries; • Existing, required, and proposed dimensional zoning requirements including building and open space coverage, yards and/or setbacks, and dwelling units per acre; • Existing impervious and disturbed areas; • Limits and type of existing vegetation; • Wetland delineation, wetland function and value assessment (including vernal pools); • SFHA, 100-year flood elevation line and BFE data, as required.	S-01 & S-03	
☑	**2. Buildings and Structures: (2.5.4.3B)** • Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation; • Elevations: Height, massing, placement, materials, lighting, façade treatments; • Total Floor Area; • Number of Usable Floors; • Gross floor area by floor and use.	- Plan sheet C-03 -Architectural Drawings	
☑	**3. Access and Circulation: (2.5.4.3C)** • Location/width of access ways within site; • Location of curbing, right of ways, edge of pavement and sidewalks; • Location, type, size and design of traffic signing (pavement markings); • Names/layout of existing abutting streets; • Driveway curb cuts for abutting prop. and public roads; • If subdivision; Names of all roads, right of way lines and easements noted; • AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	C-03 & C-09	
☑	**4. Parking and Loading: (2.5.4.3D)** • Location of off street parking/loading areas, landscaped areas/buffers; • Parking Calculations (# required and the # provided).	C-03	
☑	**5. Water Infrastructure: (2.5.4.3E)** • Size, type and location of water mains, shut-offs, hydrants & Engineering data; • Location of wells and monitoring wells (include protective radii).	S-01 & C-05	
☑	**6. Sewer Infrastructure: (2.5.4.3F)** • Size, type and location of sanitary sewage facilities & Engineering data, including any onsite temporary facilities during construction period.	S-01 & C-05	

☑	**7. Utilities: (2.5.4.3G)** • The size, type and location of all above & below ground utilities; • Size type and location of generator pads, transformers and other fixtures.	S-01, C-05, C-11	
☐	**8. Solid Waste Facilities: (2.5.4.3H)**	N/A (Residential Trash Pickup)	
	• The size, type and location of solid waste facilities.		
☑	**9. Storm water Management: (2.5.4.3I)** • The location, elevation and layout of all storm-water drainage. • The location of onsite snow storage areas and/or proposed off-site snow removal provisions. • Location and containment measures for any salt storage facilities • Location of proposed temporary and permanent material storage locations and distance from wetlands, water bodies, and stormwater structures.	C-03: Snow storage C-04: Stormwater design C-11: Stormwater design	
☐	**10. Outdoor Lighting: (2.5.4.3J)** • Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and photometric plan.	N/A	
☐	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**	N/A	
☑	**12. Landscaping: (2.5.4.3K)** • Identify all undisturbed area, existing vegetation and that which is to be retained; • Location of any irrigation system and water source.	S-01, C-02, C-06, C-15	
☑	**13. Contours and Elevation: (2.5.4.3L)** • Existing/Proposed contours (2 foot minimum) and finished grade elevations.	S-01, C-04	
☑	**14. Open Space: (2.5.4.3M)** • Type, extent and location of all existing/proposed open space.	S-01, S-03, C-03	
☑	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	S-01 & S-03	
☐	**16. Character/Civic District (All following information shall be included): (2.5.4.3P)** • Applicable Building Height (10.5A21.20 & 10.5A43.30); • Applicable Special Requirements (10.5A21.30); • Proposed building form/type (10.5A43); • Proposed community space (10.5A46).	N/A	
☐	**17. Special Flood Hazard Areas (2.5.4.3Q)** • The proposed development is consistent with the need to minimize flood damage; • All public utilities and facilities are located and construction to minimize or eliminate flood damage; • Adequate drainage is provided so as to reduce exposure to flood hazards.	N/A	

Other Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☐	Traffic Impact Study or Trip Generation Report, as required. **(3.2.1-2)**	N/A	
☑	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**	-C-05 (Drainage Plan) -Drainage Report	
☑	Indicate whether the proposed development is located in a wellhead protection or aquifer protection area. Such determination shall be approved by the Director of the Dept. of Public Works. **(7.3.1)**	Drainage Report Appendix J (NHDES OneStop Map)	
☑	Stormwater Management and Erosion Control Plan. **(7.4)**	-C-05, C-07, C-08, C-10 -Drainage Report	
☑	Inspection and Maintenance Plan **(7.6.5)**	Drainage Report Appendix L	

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	All local approvals, permits, easements and licenses required, including but not limited to: • Waivers; • Driveway permits; • Special exceptions; • Variances granted; • Easements; • Licenses. **(2.5.3.2A)**	C-00	
☑	Exhibits, data, reports or studies that may have been required as part of the approval process, including but not limited to: a. Calculations relating to stormwater runoff; b. Information on composition and quantity of water demand and wastewater generated; c. Information on air, water or land pollutants to be discharged, including standards, quantity, treatment and/or controls; d. Estimates of traffic generation and counts pre- and post-construction; e. Estimates of noise generation; f. A Stormwater Management and Erosion Control Plan; g. Endangered species and archaeological / historical studies; h. Wetland and water body (coastal and inland) delineations; i. Environmental impact studies. **(2.5.3.2B)**	a. Drainage Report b. NHDES Sewer Connection Application and Water Demand Report to be provided at Planning Board submittal. c. N/A d. N/A e. N/A f. C-04, C-07, C-08; and Drainage Report g. N/A h. N/A i. N/A	
☑	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)**	Will Serve Letters (Eversource and Unitil)	

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	A list of any required state and federal permit applications required for the project and the status of same. **(2.5.3.2E)**	C-00	
☑	A note shall be provided on the Site Plan stating: "All conditions on this Plan shall remain in effect in perpetuity pursuant to the requirements of the Site Plan Review Regulations." **(2.5.4.2E)**	C-03 Note #5	N/A
☐	For site plans that involve land designated as "Special Flood Hazard Areas" (SFHA) by the National Flood Insurance Program (NFIP) confirmation that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law, including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334. **(2.5.4.2F)**	N/A	
☑	Plan sheets submitted for recording shall include the following notes: a. "This Site Plan shall be recorded in the Rockingham County Registry of Deeds." b. "All improvements shown on this Site Plan shall be constructed and maintained in accordance with the Plan by the property owner and all future property owners. No changes shall be made to this Site Plan without the express approval of the Portsmouth Planning Director." **(2.13.3)**	C-03 Note #6 Note #7	N/A

Applicant's Signature: _____ **Date:** 4/19/2022

City of Portsmouth, New Hampshire

Subdivision Application Checklist

This subdivision 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 subdivision review requirements. Please refer to the Subdivision review regulations for full details.

Applicant Responsibilities (Section III.C): Applicable fees are due upon application submittal along with required number of copies of the Preliminary or final plat and supporting documents and studies. Please consult with Planning staff for submittal requirements.

Owner: Artwill, LLC Date Submitted: 4/19/2022

Applicant: Joe Cardarola

Phone Number: 603-674-5204 E-mail: joe@smithfieldconstruction.com

Site Address 1: 437 Lafayette Road Map: 229 Lot: 1

Site Address 2: _____ Map: _____ Lot: _____

Application Requirements			
☑	**Required Items for Submittal**	**Item Location (e.g. Page or Plan Sheet/Note #)**	**Waiver Requested**
✓	Completed Application form. **(III.C.2-3)**	Submitted online & (1) copy to City	N/A
✓	All application documents, plans, supporting documentation and other materials provided in digital Portable Document Format (PDF) on compact disc, DVD or flash drive. **(III.C.4)**	Submitted online & (1) copy to City	N/A

Requirements for Preliminary/Final Plat				
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Required for Preliminary / Final Plat**	**Waiver Requested**
✓	Name and address of record owner, any option holders, descriptive name of subdivision, engineer and/or surveyor or name of person who prepared the plat. **(Section IV.1/V.1)**	C-00	☑ Preliminary Plat ☑ Final Plat	N/A

Requirements for Preliminary/Final Plat				
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Required for Preliminary / Final Plat**	**Waiver Requested**
✓	**Preliminary Plat** Names and addresses of all adjoining property owners. **(Section IV.2)** **Final Plat** Names and addresses of all abutting property owners, locations of buildings within one hundred (100) feet of the parcel, and any new house numbers within the subdivision. **(Section V.2)**	S-01 & S-03	☑ Preliminary Plat ☑ Final Plat	N/A
✓	North point, date, and bar scale. **(Section IV.3/V3)**	Required on all Plan Sheets	☑ Preliminary Plat ☑ Final Plat	N/A
✓	Zoning classification and minimum yard dimensions required. **(Section IV.4/V.4)**	S-01 & S-03	☑ Preliminary Plat ☑ Final Plat	N/A
✓	**Preliminary Plat** Scale (not to be smaller than one hundred (100) feet = 1 inch) and location map (at a scale of 1" = 1000'). **(Section IV.5)** **Final Plat** Scale (not to be smaller than 1"=100'), Location map (at a scale of 1"=1,000') showing the property being subdivided and its relation to the surrounding area within a radius of 2,000 feet. Said location map shall delineate all streets and other major physical features that my either affect or be affected by the proposed development. **(Section V.5)**	S-01 & S-03	☑ Preliminary Plat ☑ Final Plat	N/A
✓	Location and approximate dimensions of all existing and proposed property lines including the entire area proposed to be subdivided, the areas of proposed lots, and any adjacent parcels in the same ownership. **(Section IV.6)**	S-01 & S-03	☑ Preliminary Plat ☑ Final Plat	N/A
✓	Dimensions and areas of all lots and any and all property to be dedicated or reserved for schools, parks, playgrounds, or other public purpose. Dimensions shall include radii and length of all arcs and calculated bearing for all straight lines. **(Section V.6/ IV.7)**	S-01 & S-03	☑ Preliminary Plat ☑ Final Plat	N/A
✓	Location, names, and present widths of all adjacent streets, with a designation as to whether public or private and approximate location of existing utilities to be used. Curbs and sidewalks shall be shown. **(Section IV.8/V.7)**	S-01 & S-03	☑ Preliminary Plat ☑ Final Plat	N/A

Requirements for Preliminary/Final Plat				
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Required for Preliminary / Final Plat**	**Waiver Requested**
✓	Location of significant physical features, including bodies of water, watercourses, wetlands, railroads, important vegetation, stone walls and soils types that my influence the design of the subdivision. **(Section IV.9/V.8)**	S-01 & S-03	☑ Preliminary Plat ☑ Final Plat	N/A
✓	**Preliminary Plat** Proposed locations, widths and other dimensions of all new streets and utilities, including water mains, storm and sanitary sewer mains, catch basins and culverts, street lights, fire hydrants, sewerage pump stations, etc. **(Section IV.10)** **Final Plat** Proposed locations and profiles of all proposed streets and utilities, including water mains, storm and sanitary sewer mains, catchbasins and culverts, together with typical cross sections. Profiles shall be drawn to a horizontal scale of 1"=50' and a vertical scale of 1"=5', showing existing centerline grade, existing left and right sideline grades, and proposed centerline grade. **(Section V.9)**	S-03, C-03, C-05	☑ Preliminary Plat ☑ Final Plat	N/A
✓	When required by the Board, the plat shall be accompanied by profiles of proposed street grades, including extensions for a reasonable distance beyond the subject land; also grades and sizes of proposed utilities. **(Section IV.10)**	S-01 & C-04 (Existing & Proposed contours and grades shown on plans)	☑ Preliminary Plat ☑ Final Plat	N/A
☐	Base flood elevation (BFE) for subdivisions involving greater than five (5) acres or fifty (50) lots. **(Section IV.11)**	N/A	☑ Preliminary Plat ☑ Final Plat	N/A
☐	For subdivisions of five (5) lots or more, or at the discretion of the Board otherwise, the preliminary plat shall show contours at intervals no greater than two (2) feet. Contours shall be shown in dotted lines for existing natural surface and in solid lines for proposed final grade, together with the final grade elevations shown in figures at all lot corners. If existing grades are not to be changed, then the contours in these areas shall be solid lines. **(Section IV.12/ V.12)**	S-01 (Subdivision only contains 3 proposed lots)	☑ Preliminary Plat ☑ Final Plat	N/A

Requirements for Preliminary/Final Plat				
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Required for Preliminary / Final Plat**	**Waiver Requested**
✓	Dates and permit numbers of all necessary permits from governmental agencies from which approval is required by Federal or State law. **(Section V.10)**	C-00 (Dates and permit numbers pending)	☐ Preliminary Plat ☑ Final Plat	N/A
	For subdivisions involving greater than five (5) acres or fifty (50) lots, the final plat shall show hazard zones and shall include elevation data for flood hazard zones. **(Section V.11)**	N/A (Subdivision only contains 3 proposed lots)	☐ Preliminary Plat ☑ Final Plat	N/A
✓	Location of all permanent monuments. **(Section V.12)**	S-01	☐ Preliminary Plat ☑ Final Plat	N/A

General Requirements[1]			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	**1. Basic Requirements: (VI.1)**		N/A
☑	a. Conformity to Official Plan or Map	All sheets	
☐	b. Hazards	N/A	
☑	c. Relation to Topography	S-01	
☐	d. Planned Unit Development	NA	
☑	**2. Lots: (VI.2)**		N/A
☑	a. Lot Arrangement	S-03 & C-03	
☑	b. Lot sizes	S-03 & C-03	
☐	c. Commercial and Industrial Lots	N/A	
☑	**3. Streets: (VI.3)**		N/A
☑	a. Relation to adjoining Street System	a. S-03 & C-03	
☑	b. Street Rights-of-Way	b. S-03 & C-03	
☑	c. Access	c. S-03 & C-03	
☑	d. Parallel Service Roads	d. S-03 & C-03	
☑	e. Street Intersection Angles	e. S-03 (To be prov.)	
☑	f. Merging Streets	f. S-03 & C-03	
☑	g. Street Deflections and Vertical Alignment	g. S-03 & C-03	
☐	h. Marginal Access Streets	h. N/A	
☐	i. Cul-de-Sacs	i. N/A	
☑	j. Rounding Street Corners	j. C-03	
☐	k. Street Name Signs	k. NA	
☑	l. Street Names	l. S-03 & C-03	
☐	m. Block Lengths	m. N/A	
☐	n. Block Widths	n. N/A	
☑	o. Grade of Streets	o. S-01 & C-04	
☐	p. Grass Strips	p. N/A	
☑	**4. Curbing: (VI.4)**	C-03 & C-04	N/A
☑	**5. Driveways: (VI.5)**	S-03 & C-03	N/A
☑	**6. Drainage Improvements: (VI.6)**	C-04	N/A
☑	**7. Municipal Water Service: (VI.7)**	S-01 & C-05	N/A
☑	**8. Municipal Sewer Service: (VI.8)**	S-01 & C-05	N/A
☑	**9. Installation of Utilities: (VI.9)**	C-05	N/A
☐	a. All Districts		
☐	b. Indicator Tape		
☑	**10. On-Site Water Supply: (VI.10)**	C-05	N/A
☐	**11. On-Site Sewage Disposal Systems: (VI.11)**	N/A	N/A
☑	**12. Open Space: (VI.12)**	S-03 & C-03	N/A
☑	a. Natural Features	a. S-01	
☑	b. Buffer Strips	b. C-03 & C-06	
☐	c. Parks	c. NA	
☑	d. Tree Planting	d. C-06	
☐	**13. Flood Hazard Areas: (VI.13)**	N/A	N/A
☐	a. Permits		
☐	b. Minimization of Flood Damage		
☐	c. Elevation and Flood-Proofing Records		
☐	d. Alteration of Watercourses		
☑	**14. Erosion and Sedimentation Control (VI.14)**	C-07 & C-08	N/A

☑	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☑ ☑ ☐	**15. Easements (VI.15)** a. Utilities b. Drainage	a. S-03 b. NA	N/A
☑	**16. Monuments: (VI.16)**	S-01	N/A
☑	**17. Benchmarks: (VI.17)**	S-01	N/A
☑	**18. House Numbers (VI.18)**	S-03 & C-03 (Final unit numbers TBD)	N/A

Design Standards			
	Required Items for Submittal	**Indicate compliance and/or provide explanation as to alternative design**	**Waiver Requested**
☑	**1. Streets have been designed according to the design standards required under Section (VII.1).** a. Clearing b. Excavation c. Rough Grade and Preparation of Sub-Grade d. Base Course e. Street Paving f. Side Slopes g. Approval Specifications h. Curbing i. Sidewalks j. Inspection and Methods	Yes	N/A
☑	**2. Storm water Sewers and Other Drainage Appurtenances have been designed according to the design standards required under Section (VII.2).** a. Design b. Standards of Construction	Yes	
☑	**3. Sanitary Sewers have been designed according to the design standards required under Section (VII.3).** a. Design b. Lift Stations c. Materials d. Construction Standards	Yes	
☑	**4. Water Mains and Fire Hydrants have been designed according to the design standards required under Section (VII.4).** a. Connections to Lots b. Design and Construction c. Materials d. Notification Prior to Construction	Yes	

Applicant's/Representative's Signature: _____ **Date:** 4/19/2022

[1] See City of Portsmouth, NH Subdivision Rules and Regulations for details.

TFM Since 1968

Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

Abutters List

Smithfield Construction
437 Lafayette Road, Portsmouth, NH 03801
April 19, 2022
45407.120

Assessors Map		Abutter Name	Mailing Address
Map	Lot		
LOCUS 229	1	ARTWILL LLC	PO BOX 370 PORTSMOUTH, NH 03802
229	2	ST. NICHOLAS GREEK ORTHODOX CHURCH	40 ANDREW JARVIS DR PORTSMOUTH, NH 03801
229	4	KARONA LLC	36 ARTWILL AVE PORTSMOUTH, NH 03801
229	5	KRISTIN M. & CHRISTOPHER M. CHASE	34 ARTWILL AVE PORTSMOUTH, NH 03801
230	23A	FRIENDS OF LAFAYETTE HOUSE	PO BOX 4545 PORTSMOUTH, NH 03802
230	24	CHURCH OF JESUS CHRIST C/O TAX DIVISION	50 E. NORTH TEMPLE ST. FL 22 SALT LAKE CITY, UT 84150
230	25	TERRY A. & ANDREA C. SMITH	7 ANDREW JARVIS DR PORTSMOUTH, NH 03801
230	1	VINCENT A. & ALICIA B. RICCO	440 LAFAYETTE RD PORTSMOUTH, NH 03801
231	59	CINDI S. BLANCHETTE	95 GREENLEAF AVE PORTSMOUTH, NH 03801
Civil Engineers / Surveyor		TFMoran, Inc.	170 Commerce Way - Suite 102 Portsmouth, NH 03801

EVERSOURCE ENERGY

March 1, 2022

1700 Lafayette Road
Portsmouth, NH 03801

Michael J Busby
603-436-7708 x555-5678
michael.busby@eversource.com

Joseph Caldarola, Manager
Artwill LLC
170 Dennett Street #2
Portsmouth, NH 03801

Dear Mr. Caldarola:

I am responding to your request to confirm the availability of electric service for the proposed 437 Lafayette Road Lots 1, 2 and 3, Portsmouth, NH project being constructed for/by Artwill LLC.

The proposed project consists of two new single family building lots, each with one with one residential unit; the proposed development will be constructed along Artwill Street.

The developer will be responsible for the installation of all underground facilities and infrastructure required to service the new building. The service will be as shown on attached marked up Utility Plan 2-22. The proposed building service will be fed from a pole to be determined by Eversource Engineering as depicted on Site Layout Plan 3 lot subdivision. The developer will work with Eversource to obtain all necessary easements and licenses for the proposed overhead and underground facilities listed above.

This letter serves as confirmation that Eversource has sufficient capacity in the area to provide service to this proposed development. The cost of extending service to the aforementioned location and any associated infrastructure improvements necessary to provide service will be borne by the developer unless otherwise agreed upon.

The attached drawing titled "Eversource Utility Plan" dated January 7, 2022, shows transformer locations to service your proposed project.

Eversource approves the locations shown; assuming the final installed locations meet all clearances, physical protection, and access requirements as outlined in Eversource's "Information & Requirements For Electric Supply" (https://www.eversource.com/content/docs/default-source/pdfs/requirements-for-electric-service-connections.pdf?sfvrsn=2).

If you require additional information or I can be of further assistance please do not hesitate to contact me at our Portsmouth Office, 603-436-7708 Ext. 555-5678

Respectfully.

Paul Bednarz
NH Eastern Regional Engineering, Eversource

cc: (via e-mail)
Thomas Boulter, Eastern Region Operations Manager, Eversource
Nickolai Kosko, Field Supervisor, Electric Design, Eversource

February 24, 2022

Artwill LLC
PO Box 267
Portsmouth NH 03802-0267

RE: Natural Gas Availability to 437 Lafayette Rd Portsmouth NH Project

Dear Mr. Caldarola

Unitil's natural gas division has reviewed the requested site for natural gas service.

Unitil hereby confirms natural gas service will be available to 437 Lafayette Rd Portsmouth NH Project, to serve two single family homes.

Installation is pending an authorized installation agreement with Artwill, LLC and a street opening approval from the City of Portsmouth DPW.

Let me know if you have any questions. You can email me at oliver@unitil.com. My phone number is 603-294-5174.

Sincerely,

Janet Oliver
Senior Business Development Representative

CUSTOMER ENERGY SOLUTIONS
325 West Road
Portsmouth, NH 03801

T 888.486.4845 www.unitil.com

Project #45407.120

DRAINAGE ANALYSIS

F O R

Proposed 3 Lot Subdivision

437 Lafayette Road
Portsmouth, NH
Rockingham County

Tax Map 229, Lot 1

April 19, 2022

Prepared By:

TFM Since 1968

Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

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Contents

Table of Figures

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1.0 - SUMMARY & PROJECT DESCRIPTION

This project includes the subdivision of a single lot into three proposed lots, and the construction of two new homes. The existing lot is located at 437 Lafayette Road and is identified on the City of Portsmouth Assessor's Map 229 as Lot 1, and is approximately 65,365 sf (1.50 ac) in size. The site is located in the Single Residence B (SRB) Zone and currently contains one residential building. The site is bordered by Lafayette Road to the west, Andrew Jarvis Drive to the north, Artwill Avenue to the south, and Saint Nocholas Greek Orthodox Church to the east. The immediate area surrounding the site consists of mostly residential buildings, and the Portsmouth High School is located at the end of Andrew Jarvis Drive to the east.

The proposed subdivision includes three lots in total with access being provided through Artwill Avenue. The first lot is located at the intersection of Lafayette Road and Artwill Avenue and is 18,434 sf (0.42 ac) in size. A two-story residential house (1,832 sf footprint) is proposed on the first lot, with a screened porch and backyard patio area. The second lot is located in the middle of the subdivision and is 16,606 sf (0.38 ac) in size. This lot contains the existing one-story residential house (2,143 sf footprint). The existing house footprint is to remain the same in proposed conditions, and a new walkway is being proposed along the west property line. The third lot is located to the east of lot two and is 30,325 sf (0.70 ac) in size. A one-story residential house (4,249 sf footprint) is proposed on the third lot, with an attached accessory dwelling unit (AADU), backyard patio, and deck. The ADDU is located on the east side of the principle dwelling unit and has a gross area of 747 sf. Associated improvements include, but are not limited to, utility installation, stormwater management, grading, residential driveways, and landscaping.

This analysis has been completed to verify the project will not pose adverse stormwater effects on-site and off-site. The post-development stormwater management system has been designed to reduce peak runoff rates, runoff volume, risk of erosion and sedimentation, and to improve stormwater runoff quality. There is no increase in runoff from the post-development conditions compared to the pre-development conditions in any of the analyzed storm events. In addition, Best Management Practices will be employed to assure stormwater quality both during and after construction. The following summarizes the findings from the study.

2.0 - CALCULATION METHODS

The design storms analyzed in this study are the 2-year, 10-year, 25-year and 50-year 24-hour storm events. The software program, HydroCAD version 10.10-7a[1] was utilized to calculate the peak runoff rates from these storm events. The program estimates the peak rates using the TR-20 method. A Type III storm pattern was used in the model. Rainfall frequencies for the analyzed region were also incorporated into the model. Rainfall frequencies from the higher of the Extreme Precipitation Rates from Cornell University's Northeast Regional Climate Center (see Appendix A) were used to determine the storm-event intensities, see Table 1. The site lies within the Great Bay Region, and the rainfalls were increased to take this into account. Design standards were taken from the New Hampshire Stormwater Manual, December 2008[2].

[1] HydroCAD version 10.10-7a, HydroCAD Software Solutions LLC, Chocorua, NH, 2013.
[2] New Hampshire Stormwater Manual: Volume One - Stormwater and Antidegradation, December 2008; Volume Two - Post-Construction Best Management Practices Selection and Design, December 2008; Volume Three - Erosion and Sediment Controls During Construction, December 2008.

	24-HOUR RAINFALL RATES		
Storm-Event (year)	Cornell University Rainfall (in)	Factor of Increase For the Great Bay Region	Design Rainfall (in)
2	3.22	115%	3.70
10	4.88	115%	5.61
25	6.19	115%	7.12
50	7.41	115%	8.52

Table 1 – 24-Hour Rainfall Rates

Time of Concentration (Tc) is the time it takes for water to flow from the hydraulically most remote point in the watershed (with the longest travel time) to the watershed outlet. This time is determined by calculating the time it takes runoff to travel this route under one of three hydrologic conditions: sheet flow, shallow concentrated flow, or channel flow. Because the Intensity-Duration-Frequency (IDF) curve is steep with short Tc's, estimating the actual intensity is subject to error and overestimates actual runoff. Due to this, the Tc's are adjusted to a minimum of 6 minutes.

The proposed stormwater management system has been designed to capture the majority of new impervious area introduced to the site as part of this development, consisting of residential roofs, driveways, patios, and walkways. Within the drainage analysis limits, the amount of impervious area not treated in pre-development conditions (18,435 s.f.) is less than the impervious area not treated in post-development conditions (14,689 s.f.).

3.0 – EXISTING SITE CONDITIONS

The soils within the proposed area of disturbance are identified in accordance with the Natural Resources Conservation Service (NRCS) Web Soil Survey Report (see Appendix H). This report identifies the soils within the disturbed project area entirely as Urban Land-Canton Complex. The soil composition is estimated to consist of approximately 55% urban land, 20% canton and similar soils, and 25% minor components. This soil type is considered to be well drained and NRCS categorizes the soil as hydrologic soil group (HSG) A. Test pits were performed throughout the project site, and the western half of the existing lot displayed significantly higher infiltration rates than the eastern half. To account for these field observations, the western half of the analysis area was modeled as HSG-A soils and the eastern half as HSG-B soils in both pre- and post-development conditions.

Due to existing grade along the north and west borders of the subject lot, very minimal runoff enters the project analysis area from off-site locations. The site currently drains to the southeast corner of the property to a flatter area where runoff ultimately discharges to adjacent properties to the south and east. The NRCS Web Soil Survey Report identifies an area downstream of the analysis limits as Udorthents (smoothed). Limited information is provided with regards to this soil's physical and hydrologic attributes.

4.0 - PRE-DEVELOPMENT CONDITIONS

The pre-development condition is characterized by three watersheds. Pre-development subcatchment areas are depicted on the attached plan entitled "Pre-Development Drainage Map," Sheet D-01 (see Appendix K).

Stormwater runoff from the site that does not infiltrate into the ground, drains to the southeast corner of the site to existing point of interest (EPOI-01). Runoff throughout the existing site is generated from grassed and paved areas, as well as the roof of the existing house.

In the pre-development conditions, the total impervious area is 18,434 sf over a total drainage analysis area of 65,306 sf.

5.0 - POST-DEVELOPMENT CONDITIONS

The post-development condition is characterized by seven watersheds. Post-development subcatchment areas are depicted on the attached plan entitled "Post-Development Drainage Map," sheet D-02 (see Appendix K).

In the post-development condition, the total impervious area is 23,198 sf over a total drainage analysis area of 65,306 sf. Impervious area from the project consists of three residential buildings, driveways, patios, decks, walkways, and pavement on Artwill Avenue. Four raingardens are proposed to treat and mitigate the stormwater runoff from the impact of the new impervious area from the proposed development.

The proposed project maintains or reduces peak rates of runoff compared to existing conditions for all storm events, in accordance with City stormwater regulations. For Channel protection, the State Regulations require analysis between the pre-development to post-development 2-year 24-hour storm event volumes that flow into major water bodies. In post-development condition, there is not an increase in in runoff volume during the 2-year 24-hour storm event, and there are no adverse effects on the abutting properties from the proposed stormwater management system. See Table 2 for storm event flow and volume summary.

Appendices B and D summarizes all 24-hour storm events for pre- and post-development drainage calculations using HydroCAD analysis. Appendices C and E provide a full summary of the 10-year, 24-hour storm for the pre- and post-development drainage calculations using HydroCAD analysis.

Analysis Point ID	2-Year (Flow - cfs)		2-Year (Volume – acre/ft)		10-Year (Flow - cfs)		25-Year (Flow - cfs)		50-Year (Flow - cfs)	
	Pre-Dev.	Post Dev.	Pre-Dev.	Post Dev.	Pre-Dev.	Post Dev.	Pre-Dev.	Post Dev.	Pre-Dev.	Post Dev.
POI-1	1.9	1.2	0.2	0.1	3.6	3.0	5.3	5.1	7.0	6.5

Table 2- Pre and Post Flows

6.0 – REGULATORY COMPLIANCE

The project shall meet the stricter of the stormwater standards identified in the New Hampshire Department of Environmental Services (DES) Env-Wq 1500 Alteration of Terrain Regulations and City stormwater management regulations.

6.1 – ALTERATION OF TERRAIN (AOT) CRITERIA

The following regulatory requirements are provided to show the project conformance to the applicable criteria of the NHDES Env-Wq 1500 Alteration of Terrain Regulations which include and are not limited to the following:

Env-Wq 1507.03(a) Pollutant Discharge Minimization Requirements: Stormwater treatment practices described in Env-Wq 1508.03 through Env-Wq 1508.10 shall be acceptable methods for minimizing pollutant discharges to surface waters.

Stormwater is treated using bioretention systems which are considered a filtration BMP. Specifically, there are a total of four rain gardens throughout the site that provide filtration treatment and have the ability to infiltrate some runoff into the ground. The rain gardens are designed in accordance with the applicable criteria of Env-Wq 1508.06 as follows:

Per 1508.06(e), the volume of the practice shall be large enough to contain the WQV without depending on infiltration. Refer to the corresponding BMP Worksheet in Appendix F for verification.

Per 1508.06(f), the practice completely drains the WQV within 72 hours or less. Refer to the corresponding BMP Worksheet in Appendix F for verification.

Env-Wq 1507.03(c) Pollutant Discharge Minimization Requirements: Stormwater treatment practices shall be designed with infiltration rates in accordance with Env-Wq 1504.14

Per 1508.06(a), the design infiltration rate of underlaying native soil was considered in accordance with Env-Wq 1504.14. The design infiltration rate for each subsurface infiltration basin is the average from each infiltration test in each basin. Refer to the corresponding Infiltration Rate Calculations in Appendix I for verification.

Env-Wq 1507.03(e) Pollutant Discharge Minimization Requirements: Stormwater treatment practices shall be designed for the WQV/WQF, calculated in accordance with Env-Wq 1504.10 and Env-Wq 1504.11.

The regulation is met. Refer to the corresponding BMP Worksheets in Appendix F.

Env-Wq 1507.04(a) Groundwater Recharge Requirements: The proposed development shall reduce to the maximum extent practicable by using groundwater recharge practices as described in Env-Wq 1508.16.

The regulation is met. Refer to the corresponding BMP Worksheet in Appendix F for verification.

Env-Wq 1507.04(c) Groundwater Recharge Requirements: Design Infiltration rates for groundwater recharge practices shall be determined in accordance with Env-Wq 1504.14.

Design infiltration rates were obtained per Ksat testing using a Guelph Permeameter (Amoozemeter) per Env-Wq 1504.14(d). The design infiltration rate for each subsurface

infiltration basin is the average from each infiltration test in each basin. Refer to the corresponding Infiltration Rate Calculations in Appendix I for verification.

Env-Wq 1507.05 Channel Protection Requirements: The 2-year 24-hour post development peak rate shall not exceed the pre-development peak flow rate for all flows leaving the site and the conditions of Env-Wq 1507.05(b), Env-Wq 1507.05(b)(2), or Env-Wq 1507.05(b)(3).

The 2-year, 24-hour post-development peak flow rate generated from the proposed disturbance is equal to or less than the 2-year, 24-hour pre-development peak flow rate and the 2 year, 24-hour post-development storm volume, directed to the nearest water body has not increased over the pre-development volume by more than 0.1 acre-feet.

The regulation is met. Refer to Table 2 for peak discharge rate and 2-year stormwater volume comparisons.

Env-Wq 1507.06 Control Peak Runoff: The 2-year, 10-year and 50-year 24-hour post development peak rate shall not exceed the pre-development peak flow rate for all flows leaving the site.

The regulation is met. Refer to Table 2 for peak discharge rate comparison.

7.0 – BEST MANAGEMENT PRACTICES

Best Management Practices will be developed in accordance with the *New Hampshire Stormwater Manual, Volumes Two and Three, December 2008*[3] to formulate a plan that assures stormwater quality both during and after construction. The intent of the outlined measures is to minimize erosion and sedimentation during construction, stabilize and protect the site from erosion after construction is complete and mitigate any adverse impacts to stormwater quality resulting from development. Best Management Practices for this project include:

- Temporary practices to be implemented during construction.

- Permanent practices to be implemented after construction.

7.1 – TEMPORARY PRACTICES

1. Erosion, sediment, and stormwater detention measures must be installed as directed by the engineer.
2. All disturbed areas, as well as loam stockpiles, shall be seeded and contained by a silt barrier.
3. Silt barriers must be installed prior to any construction commencing. All erosion control devices including silt barriers and storm drain inlet filters shall be inspected

[3] New Hampshire Stormwater Manual: Volume One - Stormwater and Antidegradation, December 2008; Volume Two - Post-Construction Best Management Practices Selection and Design, December 2008; Volume Three - Erosion and Sediment Controls During Construction, December 2008.

at least once per week and following any rainfall. All necessary maintenance shall be completed within twenty-four (24) hours.

4. Any silt barriers found to be failing must be replaced immediately. Sediment is to be removed from behind the silt fence if found to be one-third the height of the silt barrier or greater.
5. Any area of the site, which has been disturbed and where construction activity will not occur for more than twenty-one (21) days, shall be temporarily stabilized by mulching and seeding.
6. No construction materials shall be buried on-site.
7. After all areas have been stabilized, temporary practices are to be removed, and the area they are removed from must be smoothed and revegetated.
8. Areas must be temporarily stabilized within 14 days of disturbance or seeded and mulched within 3 days of final stabilization.
9. After November 15th, incomplete driveways or parking areas must be protected with a minimum of 3" of crushed gravel, meeting the standards of NHDOT item 304.3.
10. An area shall be considered stable if one of the following has occurred:
    a) Base course gravels are installed in areas to be paved.
    b) A minimum of 85% vegetated growth has been established.
    c) A minimum of 3" of non-erosive material such as stone or rip rap has been installed.
    d) Erosion control blankets have been properly installed.

7.2 – PERMANENT PRACTICES

The objectives for developing permanent Best Management Practices for this site include the following:

1. Maintain existing runoff flow characteristics.
    a) Drainage is structured to minimize any offsite increase in runoff.
2. Treatment BMP's are established to ensure the water quality.
3. Maintenance schedules are set to safeguard the long term working of the stormwater BMP's.

A Stormwater Management Operations & Maintenance Manual is provided to ensure the proper functioning of the system over time.

7.3 – BEST MANAGEMENT PRACTICE EFFICIENCIES

Appendix E of Volume 2 of the New Hampshire Stormwater [4] lists the pollutant removal efficiencies of various BMP's. All proposed BMP's meet all state and City requirements for

[4] New Hampshire Stormwater Manual: Volume One - Stormwater and Antidegradation, December 2008; Volume Two - Post-Construction Best Management Practices Selection and Design, December 2008; Volume Three - Erosion and Sediment Controls During Construction, December 2008.

total suspended solids (TSS) and pollutant removal, Total Nitrogen (TN), and Total Phosphorous (TP).

Bioretention Systems (rain gardens) have a 90% TSS removal efficiency, 65% TN removal efficiency, and 65% TP efficiency.

Proposed Rain Gardens #1-4 receive runoff from yards, residential roofs, and potions of residential driveways. Due to the nature of the areas contributing runoff to the rain gardens, no pretreatment is required.

7.3.1 – LID PRACTICES

Bioretention Areas, including rain gardens, are considered to be a Low Impact Design (LID) filtering practice. The goal of LID systems is to mimic a site's precondition hydrology by infiltrating, filtering, storming, evaporating and detaining stormwater but use of natural landscape features. These treatments filter and detain the stormwater. They use natural processes, such as soil filtration, evapotranspiration (from the vegetation in the system) and anaerobic and aerobic treatment of stormwater. They detain the stormwater and release it to mimic the predevelopment storm flows.

The inclusion of rain gardens in the proposed site design allows for stormwater to infiltrate back into the ground. During heavier storm events, a perforated subdrain located below each rain garden's filtration layer has the ability to convey treated flows to other areas on-site to prevent extended ponding periods. Each rain garden is equipped with an outlet control structure that regulates discharge rates during these heavier storms through the implementation of orifices and overflow grates.

8.0 – CONCLUSION

The proposed stormwater management system will treat, infiltrate, and mitigate the runoff generated from the proposed development and provide protection of groundwater and surface waters as required through the Alteration of Terrain Bureau and City stormwater management regulations. Furthermore, the stormwater management for this project has been designed to pose no adverse effects on the surrounding properties.

Respectfully,
TFMoran, Inc.

Justin Macek, EIT
Project Manager

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APPENDIX A – EXTREME PRECIPITATION RATES

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Extreme Precipitation Tables

Northeast Regional Climate Center

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

Smoothing	Yes
State	New Hampshire
Location	
Longitude	70.769 degrees West
Latitude	43.058 degrees North
Elevation	0 feet
Date/Time	Fri, 07 Jan 2022 14:42:09 -0500

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.82	1.04	**1yr**	0.70	0.98	1.21	1.56	2.03	2.66	2.93	**1yr**	2.36	2.82	3.23	3.95	4.56	**1yr**
2yr	0.32	0.50	0.62	0.81	1.02	1.30	**2yr**	0.88	1.18	1.52	1.94	2.49	3.22	3.58	**2yr**	2.85	3.44	3.94	4.69	5.34	**2yr**
5yr	0.37	0.58	0.73	0.98	1.25	1.61	**5yr**	1.08	1.47	1.89	2.43	3.14	4.08	4.59	**5yr**	3.61	4.41	5.05	5.95	6.72	**5yr**
10yr	0.41	0.65	0.82	1.12	1.45	1.89	**10yr**	1.25	1.73	2.23	2.90	3.76	4.88	5.54	**10yr**	4.32	5.33	6.10	7.12	8.00	**10yr**
25yr	0.48	0.76	0.97	1.34	1.77	2.34	**25yr**	1.53	2.14	2.78	3.63	4.75	6.19	7.12	**25yr**	5.47	6.84	7.82	9.05	10.08	**25yr**
50yr	0.54	0.86	1.10	1.54	2.07	2.76	**50yr**	1.79	2.53	3.29	4.33	5.67	7.41	8.60	**50yr**	6.56	8.27	9.45	10.84	12.01	**50yr**
100yr	0.60	0.97	1.25	1.77	2.42	3.26	**100yr**	2.09	2.98	3.91	5.16	6.78	8.88	10.40	**100yr**	7.85	10.00	11.42	13.00	14.31	**100yr**
200yr	0.67	1.10	1.43	2.05	2.83	3.84	**200yr**	2.44	3.52	4.62	6.14	8.10	10.64	12.58	**200yr**	9.41	12.10	13.80	15.59	17.07	**200yr**
500yr	0.80	1.31	1.71	2.49	3.48	4.77	**500yr**	3.00	4.38	5.77	7.72	10.24	13.52	16.18	**500yr**	11.96	15.56	17.73	19.84	21.56	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.73	0.88	**1yr**	0.63	0.86	0.92	1.33	1.68	2.24	2.51	**1yr**	1.98	2.42	2.87	3.18	3.90	**1yr**
2yr	0.32	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.82	2.34	3.06	3.46	**2yr**	2.71	3.33	3.83	4.56	5.09	**2yr**
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.12	2.73	3.80	4.21	**5yr**	3.36	4.05	4.73	5.55	6.26	**5yr**
10yr	0.39	0.59	0.74	1.03	1.33	1.60	**10yr**	1.15	1.57	1.81	2.39	3.06	4.39	4.88	**10yr**	3.88	4.70	5.47	6.44	7.22	**10yr**
25yr	0.44	0.67	0.83	1.19	1.56	1.90	**25yr**	1.35	1.86	2.10	2.76	3.54	4.73	5.93	**25yr**	4.19	5.70	6.69	7.84	8.72	**25yr**
50yr	0.48	0.73	0.91	1.31	1.77	2.17	**50yr**	1.53	2.12	2.35	3.07	3.93	5.35	6.85	**50yr**	4.73	6.58	7.78	9.10	10.07	**50yr**
100yr	0.54	0.81	1.02	1.47	2.02	2.47	**100yr**	1.74	2.42	2.63	3.41	4.35	6.01	7.91	**100yr**	5.32	7.61	9.06	10.58	11.63	**100yr**
200yr	0.59	0.89	1.13	1.64	2.29	2.82	**200yr**	1.97	2.75	2.94	3.78	4.79	6.74	9.14	**200yr**	5.97	8.79	10.54	12.32	13.45	**200yr**
500yr	0.69	1.02	1.32	1.92	2.72	3.37	**500yr**	2.35	3.29	3.41	4.31	5.46	7.85	11.06	**500yr**	6.94	10.63	12.87	15.10	16.29	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.29	0.44	0.54	0.72	0.89	1.08	**1yr**	0.77	1.06	1.26	1.74	2.20	2.99	3.16	**1yr**	2.65	3.04	3.59	4.38	5.06	**1yr**
2yr	0.34	0.52	0.64	0.86	1.07	1.27	**2yr**	0.92	1.24	1.48	1.96	2.51	3.43	3.71	**2yr**	3.04	3.56	4.09	4.84	5.64	**2yr**
5yr	0.40	0.62	0.77	1.05	1.34	1.62	**5yr**	1.15	1.58	1.88	2.53	3.25	4.35	4.96	**5yr**	3.85	4.77	5.39	6.38	7.16	**5yr**
10yr	0.47	0.72	0.89	1.25	1.61	1.98	**10yr**	1.39	1.93	2.28	3.10	3.95	5.35	6.20	**10yr**	4.73	5.96	6.81	7.84	8.75	**10yr**
25yr	0.58	0.88	1.09	1.56	2.05	2.57	**25yr**	1.77	2.51	2.95	4.07	5.14	7.80	8.33	**25yr**	6.90	8.01	9.13	10.34	11.41	**25yr**
50yr	0.67	1.02	1.27	1.83	2.46	3.13	**50yr**	2.12	3.06	3.59	5.00	6.31	9.76	10.44	**50yr**	8.64	10.04	11.41	12.72	13.96	**50yr**
100yr	0.79	1.19	1.49	2.16	2.96	3.81	**100yr**	2.55	3.72	4.37	6.15	7.75	12.21	13.07	**100yr**	10.81	12.57	14.25	15.68	17.08	**100yr**
200yr	0.92	1.39	1.76	2.55	3.55	4.65	**200yr**	3.07	4.55	5.33	7.57	9.51	15.32	16.39	**200yr**	13.56	15.76	17.82	19.33	20.90	**200yr**
500yr	1.15	1.70	2.19	3.19	4.53	6.04	**500yr**	3.91	5.90	6.92	10.01	12.52	20.70	22.10	**500yr**	18.32	21.25	23.96	25.47	27.32	**500yr**

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APPENDIX B – PRE-DEVELOPMENT CALCULATIONS

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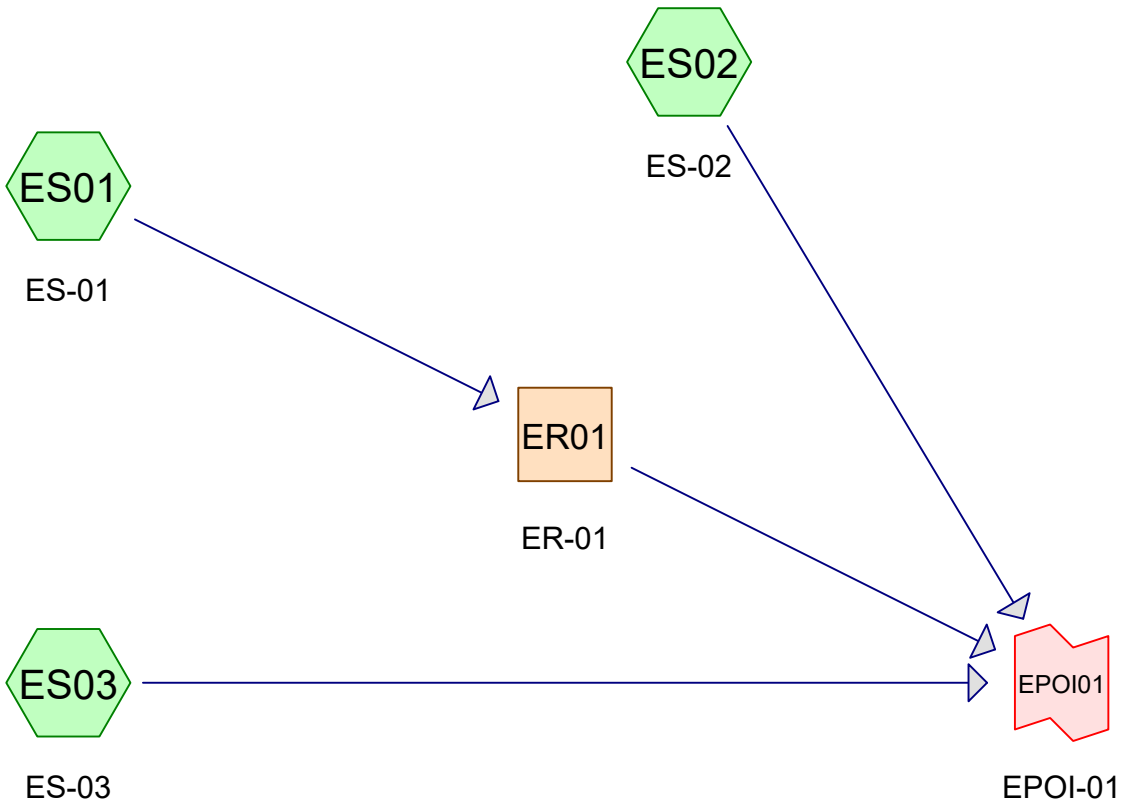
Pre-Development
Drainage



Subcat Reach Pond Link

Routing Diagram for 45407-120_Pre & Post Development
Prepared by TFMoran Inc., Printed 4/18/2022
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45407-120_Pre & Post Development

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.03	68	<50% Grass cover, Poor, HSG A (ES01)
0.04	79	<50% Grass cover, Poor, HSG B (ES02)
0.30	39	>75% Grass cover, Good, HSG A (ES01, ES03)
0.63	61	>75% Grass cover, Good, HSG B (ES02, ES03)
0.12	98	Paved parking, HSG A (ES01)
0.17	98	Paved parking, HSG B (ES02, ES03)
0.08	98	Roofs, HSG A (ES01, ES03)
0.06	98	Roofs, HSG B (ES02)
0.08	60	Woods, Fair, HSG B (ES02, ES03)
1.50	**68**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.53	HSG A	ES01, ES03
0.97	HSG B	ES02, ES03
0.00	HSG C	
0.00	HSG D	
0.00	Other	
1.50		**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ES01: ES-01 Runoff Area=19,795 sf 29.23% Impervious Runoff Depth>1.10"
Flow Length=165' Tc=6.5 min CN=WQ Runoff=0.5 cfs 0.0 af

Subcatchment ES02: ES-02 Runoff Area=38,970 sf 17.93% Impervious Runoff Depth>1.20"
Flow Length=286' Tc=7.6 min CN=WQ Runoff=1.0 cfs 0.1 af

Subcatchment ES03: ES-03 Runoff Area=6,541 sf 86.52% Impervious Runoff Depth>3.05"
Flow Length=390' Tc=6.0 min CN=WQ Runoff=0.5 cfs 0.0 af

Reach ER01: ER-01 Avg. Flow Depth=0.06' Max Vel=1.36 fps Inflow=0.5 cfs 0.0 af
n=0.023 L=250.0' S=0.0220 '/' Capacity=23.0 cfs Outflow=0.5 cfs 0.0 af

Link EPOI01: EPOI-01 Inflow=1.9 cfs 0.2 af
Primary=1.9 cfs 0.2 af

Total Runoff Area = 1.50 ac Runoff Volume = 0.2 af Average Runoff Depth = 1.36"
71.77% Pervious = 1.08 ac 28.23% Impervious = 0.42 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ES01: ES-01 Runoff Area=19,795 sf 29.23% Impervious Runoff Depth>1.95"
Flow Length=165' Tc=6.5 min CN=WQ Runoff=0.8 cfs 0.1 af

Subcatchment ES02: ES-02 Runoff Area=38,970 sf 17.93% Impervious Runoff Depth>2.45"
Flow Length=286' Tc=7.6 min CN=WQ Runoff=2.2 cfs 0.2 af

Subcatchment ES03: ES-03 Runoff Area=6,541 sf 86.52% Impervious Runoff Depth>4.81"
Flow Length=390' Tc=6.0 min CN=WQ Runoff=0.7 cfs 0.1 af

Reach ER01: ER-01 Avg. Flow Depth=0.08' Max Vel=1.61 fps Inflow=0.8 cfs 0.1 af
n=0.023 L=250.0' S=0.0220 '/' Capacity=23.0 cfs Outflow=0.7 cfs 0.1 af

Link EPOI01: EPOI-01 Inflow=3.6 cfs 0.3 af
Primary=3.6 cfs 0.3 af

Total Runoff Area = 1.50 ac Runoff Volume = 0.3 af Average Runoff Depth = 2.54"
71.77% Pervious = 1.08 ac 28.23% Impervious = 0.42 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ES01: ES-01 Runoff Area=19,795 sf 29.23% Impervious Runoff Depth>2.77"
Flow Length=165' Tc=6.5 min CN=WQ Runoff=1.1 cfs 0.1 af

Subcatchment ES02: ES-02 Runoff Area=38,970 sf 17.93% Impervious Runoff Depth>3.58"
Flow Length=286' Tc=7.6 min CN=WQ Runoff=3.3 cfs 0.3 af

Subcatchment ES03: ES-03 Runoff Area=6,541 sf 86.52% Impervious Runoff Depth>6.22"
Flow Length=390' Tc=6.0 min CN=WQ Runoff=0.9 cfs 0.1 af

Reach ER01: ER-01 Avg. Flow Depth=0.10' Max Vel=1.83 fps Inflow=1.1 cfs 0.1 af
n=0.023 L=250.0' S=0.0220 '/' Capacity=23.0 cfs Outflow=1.1 cfs 0.1 af

Link EPOI01: EPOI-01 Inflow=5.3 cfs 0.4 af
Primary=5.3 cfs 0.4 af

Total Runoff Area = 1.50 ac Runoff Volume = 0.5 af Average Runoff Depth = 3.60"
71.77% Pervious = 1.08 ac 28.23% Impervious = 0.42 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ES01: ES-01 Runoff Area=19,795 sf 29.23% Impervious Runoff Depth>3.63"
Flow Length=165' Tc=6.5 min CN=WQ Runoff=1.6 cfs 0.1 af

Subcatchment ES02: ES-02 Runoff Area=38,970 sf 17.93% Impervious Runoff Depth>4.71"
Flow Length=286' Tc=7.6 min CN=WQ Runoff=4.4 cfs 0.4 af

Subcatchment ES03: ES-03 Runoff Area=6,541 sf 86.52% Impervious Runoff Depth>7.55"
Flow Length=390' Tc=6.0 min CN=WQ Runoff=1.1 cfs 0.1 af

Reach ER01: ER-01 Avg. Flow Depth=0.12' Max Vel=2.03 fps Inflow=1.6 cfs 0.1 af
n=0.023 L=250.0' S=0.0220 '/' Capacity=23.0 cfs Outflow=1.5 cfs 0.1 af

Link EPOI01: EPOI-01 Inflow=7.0 cfs 0.6 af
Primary=7.0 cfs 0.6 af

Total Runoff Area = 1.50 ac Runoff Volume = 0.6 af Average Runoff Depth = 4.67"
71.77% Pervious = 1.08 ac 28.23% Impervious = 0.42 ac

APPENDIX C – PRE-DEVELOPMENT CALCULATIONS (10-YEAR STORM EVENT)

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Summary for Subcatchment ES01: ES-01

Runoff = 0.8 cfs @ 12.09 hrs, Volume= 0.1 af, Depth> 1.95"
Routed to Reach ER01 : ER-01

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
12,608	39	>75% Grass cover, Good, HSG A
1,400	68	<50% Grass cover, Poor, HSG A
664	98	Roofs, HSG A
5,123	98	Paved parking, HSG A
19,795		Weighted Average
14,008		70.77% Pervious Area
5,787		29.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	100	0.0550	0.27		**Sheet Flow, Grass Yard** Grass: Short n= 0.150 P2= 3.70"
0.4	65	0.0230	3.08		**Shallow Concentrated Flow, Grass Yard** Paved Kv= 20.3 fps
6.5	165	Total			

Summary for Subcatchment ES02: ES-02

Runoff = 2.2 cfs @ 12.11 hrs, Volume= 0.2 af, Depth> 2.45"
Routed to Link EPOI01 : EPOI-01

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
26,796	61	>75% Grass cover, Good, HSG B
1,553	79	<50% Grass cover, Poor, HSG B
3,632	60	Woods, Fair, HSG B
2,444	98	Roofs, HSG B
4,545	98	Paved parking, HSG B
38,970		Weighted Average
31,981		82.07% Pervious Area
6,989		17.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	100	0.0750	0.31		**Sheet Flow, Grass Yard (East)** Grass: Short n= 0.150 P2= 3.70"
1.7	141	0.0375	1.36		**Shallow Concentrated Flow, Grass Yard (East)** Short Grass Pasture Kv= 7.0 fps
0.5	45	0.0750	1.37		**Shallow Concentrated Flow, Brush** Woodland Kv= 5.0 fps
7.6	286	Total			

Summary for Subcatchment ES03: ES-03

Runoff = 0.7 cfs @ 12.09 hrs, Volume= 0.1 af, Depth> 4.81"
Routed to Link EPOI01 : EPOI-01

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
525	61	>75% Grass cover, Good, HSG B
0	79	<50% Grass cover, Poor, HSG B
0	98	Roofs, HSG B
2,744	98	Paved parking, HSG B
337	39	>75% Grass cover, Good, HSG A
2,915	98	Roofs, HSG A
20	60	Woods, Fair, HSG B
6,541		Weighted Average
882		13.48% Pervious Area
5,659		86.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0425	2.00		**Sheet Flow, Paved Road** Smooth surfaces n= 0.011 P2= 3.70"
1.0	190	0.0250	3.21		**Shallow Concentrated Flow, Paved Road** Paved Kv= 20.3 fps
1.8	100	0.0170	0.91		**Shallow Concentrated Flow, Grass Shoulder** Short Grass Pasture Kv= 7.0 fps
2.4					**Direct Entry, Min Tc**
6.0	390	Total			

Summary for Reach ER01: ER-01

The Manning's Number used is an average of rough pavement and short grassed area. The reach channel is off the shoulder of the road in grassed area, however as the channel water elevation rises, pavement is introduced to the channel side slopes.

Inflow Area = 0.45 ac, 29.23% Impervious, Inflow Depth > 1.95" for 10-Year event
Inflow = 0.8 cfs @ 12.09 hrs, Volume= 0.1 af
Outflow = 0.7 cfs @ 12.12 hrs, Volume= 0.1 af, Atten= 5%, Lag= 1.7 min
Routed to Link EPOI01 : EPOI-01

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.61 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 0.47 fps, Avg. Travel Time= 8.9 min

Peak Storage= 115.1 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.08' , Surface Width= 6.59'
Bank-Full Depth= 0.50' Flow Area= 5.0 sf, Capacity= 23.0 cfs

5.00' x 0.50' deep channel, n= 0.023 Rough Pavement + Short Grass
Side Slope Z-value= 10.0 '/' Top Width= 15.00'
Length= 250.0' Slope= 0.0220 '/'
Inlet Invert= 31.00', Outlet Invert= 25.50'

‡

Summary for Link EPOI01: EPOI-01

Inflow Area = 1.50 ac, 28.23% Impervious, Inflow Depth > 2.53" for 10-Year event
Inflow = 3.6 cfs @ 12.11 hrs, Volume= 0.3 af
Primary = 3.6 cfs @ 12.11 hrs, Volume= 0.3 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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APPENDIX D – POST-DEVELOPMENT CALCULATIONS

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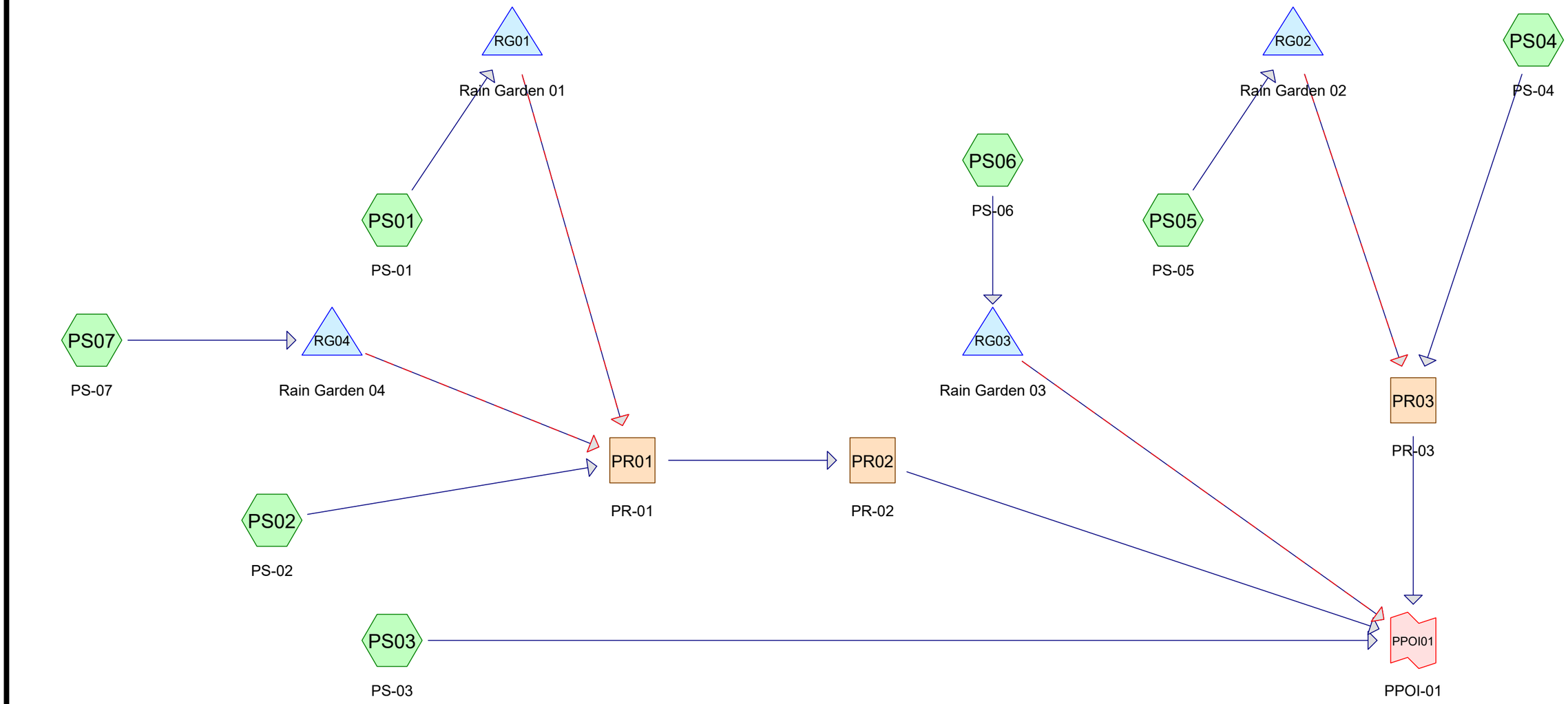
Post-Development
Drainage



Subcat Reach Pond Link

Routing Diagram for 45407-120_Pre & Post Development
Prepared by TFMoran Inc., Printed 4/18/2022
HydroCAD® 10.10-7a s/n 00866 © 2021 HydroCAD Software Solutions LLC

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.04	68	<50% Grass cover, Poor, HSG A (PS01, PS02, PS07)
0.04	79	<50% Grass cover, Poor, HSG B (PS04, PS05, PS06)
0.30	39	>75% Grass cover, Good, HSG A (PS01, PS02, PS03, PS07)
0.54	61	>75% Grass cover, Good, HSG B (PS03, PS04, PS05, PS06)
0.06	98	Paved parking, HSG A (PS01, PS02, PS07)
0.20	98	Paved parking, HSG B (PS03, PS04, PS05, PS06)
0.13	98	Roofs, HSG A (PS01, PS02, PS03, PS07)
0.14	98	Roofs, HSG B (PS04, PS05, PS06)
0.04	60	Woods, Fair, HSG B (PS03, PS04)
1.50	**70**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.53	HSG A	PS01, PS02, PS03, PS07
0.97	HSG B	PS03, PS04, PS05, PS06
0.00	HSG C	
0.00	HSG D	
0.00	Other	
1.50		**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPS01: PS-01 Runoff Area=11,255 sf 16.98% Impervious Runoff Depth>0.72"
Flow Length=71' Slope=0.0280 '/' Tc=6.1 min CN=WQ Runoff=0.2 cfs 0.0 af

SubcatchmentPS02: PS-02 Runoff Area=6,297 sf 34.43% Impervious Runoff Depth>1.29"
Flow Length=149' Tc=6.0 min CN=WQ Runoff=0.2 cfs 0.0 af

SubcatchmentPS03: PS-03 Runoff Area=6,541 sf 86.52% Impervious Runoff Depth>3.05"
Flow Length=390' Tc=6.0 min CN=WQ Runoff=0.5 cfs 0.0 af

SubcatchmentPS04: PS-04 Runoff Area=17,880 sf 38.38% Impervious Runoff Depth>1.74"
Flow Length=245' Tc=8.1 min CN=WQ Runoff=0.7 cfs 0.1 af

SubcatchmentPS05: PS-05 Runoff Area=15,305 sf 22.05% Impervious Runoff Depth>1.38"
Flow Length=70' Tc=6.2 min CN=WQ Runoff=0.5 cfs 0.0 af

SubcatchmentPS06: PS-06 Runoff Area=5,793 sf 35.75% Impervious Runoff Depth>1.72"
Flow Length=72' Slope=0.0694 '/' Tc=6.0 min CN=WQ Runoff=0.2 cfs 0.0 af

SubcatchmentPS07: PS-07 Runoff Area=2,235 sf 51.59% Impervious Runoff Depth>1.85"
Tc=6.0 min CN=WQ Runoff=0.1 cfs 0.0 af

Reach PR01: PR-01 Avg. Flow Depth=0.04' Max Vel=0.99 fps Inflow=0.2 cfs 0.0 af
n=0.022 L=25.0' S=0.0200 '/' Capacity=14.6 cfs Outflow=0.2 cfs 0.0 af

Reach PR02: PR-02 Avg. Flow Depth=0.03' Max Vel=1.04 fps Inflow=0.2 cfs 0.0 af
n=0.022 L=210.0' S=0.0262 '/' Capacity=16.7 cfs Outflow=0.2 cfs 0.0 af

Reach PR03: PR-03 Avg. Flow Depth=0.05' Max Vel=0.73 fps Inflow=0.7 cfs 0.1 af
n=0.030 L=60.0' S=0.0117 '/' Capacity=21.9 cfs Outflow=0.6 cfs 0.1 af

Pond RG01: Rain Garden 01 Peak Elev=33.09' Storage=153.1 cf Inflow=0.2 cfs 0.0 af
Discarded=0.0 cfs 0.0 af Primary=0.0 cfs 0.0 af Secondary=0.0 cfs 0.0 af Outflow=0.0 cfs 0.0 af

Pond RG02: Rain Garden 02 Peak Elev=32.87' Storage=876.7 cf Inflow=0.5 cfs 0.0 af
Discarded=0.0 cfs 0.0 af Primary=0.0 cfs 0.0 af Secondary=0.0 cfs 0.0 af Outflow=0.1 cfs 0.0 af

Pond RG03: Rain Garden 03 Peak Elev=29.94' Storage=363.6 cf Inflow=0.2 cfs 0.0 af
Discarded=0.0 cfs 0.0 af Primary=0.1 cfs 0.0 af Secondary=0.0 cfs 0.0 af Outflow=0.1 cfs 0.0 af

Pond RG04: Rain Garden 04 Peak Elev=31.94' Storage=111.3 cf Inflow=0.1 cfs 0.0 af
Discarded=0.0 cfs 0.0 af Primary=0.0 cfs 0.0 af Secondary=0.0 cfs 0.0 af Outflow=0.0 cfs 0.0 af

Link PPOI01: PPOI-01 Inflow=1.2 cfs 0.1 af
Primary=1.2 cfs 0.1 af

Total Runoff Area = 1.50 ac Runoff Volume = 0.2 af Average Runoff Depth = 1.57"
64.48% Pervious = 0.97 ac 35.52% Impervious = 0.53 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPS01: PS-01 Runoff Area=11,255 sf 16.98% Impervious Runoff Depth>1.42"
Flow Length=71' Slope=0.0280 '/' Tc=6.1 min CN=WQ Runoff=0.3 cfs 0.0 af

SubcatchmentPS02: PS-02 Runoff Area=6,297 sf 34.43% Impervious Runoff Depth>2.23"
Flow Length=149' Tc=6.0 min CN=WQ Runoff=0.3 cfs 0.0 af

SubcatchmentPS03: PS-03 Runoff Area=6,541 sf 86.52% Impervious Runoff Depth>4.81"
Flow Length=390' Tc=6.0 min CN=WQ Runoff=0.7 cfs 0.1 af

SubcatchmentPS04: PS-04 Runoff Area=17,880 sf 38.38% Impervious Runoff Depth>3.14"
Flow Length=245' Tc=8.1 min CN=WQ Runoff=1.2 cfs 0.1 af

SubcatchmentPS05: PS-05 Runoff Area=15,305 sf 22.05% Impervious Runoff Depth>2.69"
Flow Length=70' Tc=6.2 min CN=WQ Runoff=1.0 cfs 0.1 af

SubcatchmentPS06: PS-06 Runoff Area=5,793 sf 35.75% Impervious Runoff Depth>3.13"
Flow Length=72' Slope=0.0694 '/' Tc=6.0 min CN=WQ Runoff=0.4 cfs 0.0 af

SubcatchmentPS07: PS-07 Runoff Area=2,235 sf 51.59% Impervious Runoff Depth>3.04"
Tc=6.0 min CN=WQ Runoff=0.1 cfs 0.0 af

Reach PR01: PR-01 Avg. Flow Depth=0.05' Max Vel=1.17 fps Inflow=0.3 cfs 0.0 af
n=0.022 L=25.0' S=0.0200 '/' Capacity=14.6 cfs Outflow=0.3 cfs 0.0 af

Reach PR02: PR-02 Avg. Flow Depth=0.04' Max Vel=1.24 fps Inflow=0.3 cfs 0.0 af
n=0.022 L=210.0' S=0.0262 '/' Capacity=16.7 cfs Outflow=0.3 cfs 0.0 af

Reach PR03: PR-03 Avg. Flow Depth=0.10' Max Vel=1.07 fps Inflow=1.9 cfs 0.2 af
n=0.030 L=60.0' S=0.0117 '/' Capacity=21.9 cfs Outflow=1.9 cfs 0.2 af

Pond RG01: Rain Garden 01 Peak Elev=33.85' Storage=383.3 cf Inflow=0.3 cfs 0.0 af
Discarded=0.0 cfs 0.0 af Primary=0.0 cfs 0.0 af Secondary=0.0 cfs 0.0 af Outflow=0.0 cfs 0.0 af

Pond RG02: Rain Garden 02 Peak Elev=33.00' Storage=1,023.1 cf Inflow=1.0 cfs 0.1 af
Discarded=0.0 cfs 0.0 af Primary=0.6 cfs 0.0 af Secondary=0.2 cfs 0.0 af Outflow=0.8 cfs 0.1 af

Pond RG03: Rain Garden 03 Peak Elev=29.98' Storage=378.3 cf Inflow=0.4 cfs 0.0 af
Discarded=0.0 cfs 0.0 af Primary=0.2 cfs 0.0 af Secondary=0.2 cfs 0.0 af Outflow=0.4 cfs 0.0 af

Pond RG04: Rain Garden 04 Peak Elev=33.66' Storage=217.1 cf Inflow=0.1 cfs 0.0 af
Discarded=0.0 cfs 0.0 af Primary=0.0 cfs 0.0 af Secondary=0.0 cfs 0.0 af Outflow=0.0 cfs 0.0 af

Link PPOI01: PPOI-01 Inflow=3.0 cfs 0.3 af
Primary=3.0 cfs 0.3 af

Total Runoff Area = 1.50 ac Runoff Volume = 0.4 af Average Runoff Depth = 2.81"
64.48% Pervious = 0.97 ac 35.52% Impervious = 0.53 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPS01: PS-01 Runoff Area=11,255 sf 16.98% Impervious Runoff Depth>2.15"
Flow Length=71' Slope=0.0280 '/' Tc=6.1 min CN=WQ Runoff=0.5 cfs 0.0 af

SubcatchmentPS02: PS-02 Runoff Area=6,297 sf 34.43% Impervious Runoff Depth>3.12"
Flow Length=149' Tc=6.0 min CN=WQ Runoff=0.4 cfs 0.0 af

SubcatchmentPS03: PS-03 Runoff Area=6,541 sf 86.52% Impervious Runoff Depth>6.22"
Flow Length=390' Tc=6.0 min CN=WQ Runoff=0.9 cfs 0.1 af

SubcatchmentPS04: PS-04 Runoff Area=17,880 sf 38.38% Impervious Runoff Depth>4.36"
Flow Length=245' Tc=8.1 min CN=WQ Runoff=1.8 cfs 0.1 af

SubcatchmentPS05: PS-05 Runoff Area=15,305 sf 22.05% Impervious Runoff Depth>3.86"
Flow Length=70' Tc=6.2 min CN=WQ Runoff=1.5 cfs 0.1 af

SubcatchmentPS06: PS-06 Runoff Area=5,793 sf 35.75% Impervious Runoff Depth>4.35"
Flow Length=72' Slope=0.0694 '/' Tc=6.0 min CN=WQ Runoff=0.6 cfs 0.0 af

SubcatchmentPS07: PS-07 Runoff Area=2,235 sf 51.59% Impervious Runoff Depth>4.08"
Tc=6.0 min CN=WQ Runoff=0.2 cfs 0.0 af

Reach PR01: PR-01 Avg. Flow Depth=0.06' Max Vel=1.32 fps Inflow=0.4 cfs 0.0 af
n=0.022 L=25.0' S=0.0200 '/' Capacity=14.6 cfs Outflow=0.4 cfs 0.0 af

Reach PR02: PR-02 Avg. Flow Depth=0.05' Max Vel=1.40 fps Inflow=0.4 cfs 0.0 af
n=0.022 L=210.0' S=0.0262 '/' Capacity=16.7 cfs Outflow=0.4 cfs 0.0 af

Reach PR03: PR-03 Avg. Flow Depth=0.14' Max Vel=1.30 fps Inflow=3.3 cfs 0.2 af
n=0.030 L=60.0' S=0.0117 '/' Capacity=21.9 cfs Outflow=3.2 cfs 0.2 af

Pond RG01: Rain Garden 01 Peak Elev=35.61' Storage=748.8 cf Inflow=0.5 cfs 0.0 af
Discarded=0.0 cfs 0.0 af Primary=0.0 cfs 0.0 af Secondary=0.0 cfs 0.0 af Outflow=0.0 cfs 0.0 af

Pond RG02: Rain Garden 02 Peak Elev=33.04' Storage=1,028.1 cf Inflow=1.5 cfs 0.1 af
Discarded=0.0 cfs 0.0 af Primary=0.9 cfs 0.1 af Secondary=0.7 cfs 0.0 af Outflow=1.5 cfs 0.1 af

Pond RG03: Rain Garden 03 Peak Elev=29.99' Storage=383.3 cf Inflow=0.6 cfs 0.0 af
Discarded=0.0 cfs 0.0 af Primary=0.3 cfs 0.0 af Secondary=0.3 cfs 0.0 af Outflow=0.6 cfs 0.0 af

Pond RG04: Rain Garden 04 Peak Elev=33.87' Storage=280.8 cf Inflow=0.2 cfs 0.0 af
Discarded=0.0 cfs 0.0 af Primary=0.0 cfs 0.0 af Secondary=0.0 cfs 0.0 af Outflow=0.0 cfs 0.0 af

Link PPOI01: PPOI-01 Inflow=5.1 cfs 0.4 af
Primary=5.1 cfs 0.4 af

Total Runoff Area = 1.50 ac Runoff Volume = 0.5 af Average Runoff Depth = 3.92"
64.48% Pervious = 0.97 ac 35.52% Impervious = 0.53 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPS01: PS-01 Runoff Area=11,255 sf 16.98% Impervious Runoff Depth>2.93"
Flow Length=71' Slope=0.0280 '/' Tc=6.1 min CN=WQ Runoff=0.7 cfs 0.1 af

SubcatchmentPS02: PS-02 Runoff Area=6,297 sf 34.43% Impervious Runoff Depth>4.02"
Flow Length=149' Tc=6.0 min CN=WQ Runoff=0.6 cfs 0.0 af

SubcatchmentPS03: PS-03 Runoff Area=6,541 sf 86.52% Impervious Runoff Depth>7.55"
Flow Length=390' Tc=6.0 min CN=WQ Runoff=1.1 cfs 0.1 af

SubcatchmentPS04: PS-04 Runoff Area=17,880 sf 38.38% Impervious Runoff Depth>5.55"
Flow Length=245' Tc=8.1 min CN=WQ Runoff=2.3 cfs 0.2 af

SubcatchmentPS05: PS-05 Runoff Area=15,305 sf 22.05% Impervious Runoff Depth>5.02"
Flow Length=70' Tc=6.2 min CN=WQ Runoff=1.9 cfs 0.1 af

SubcatchmentPS06: PS-06 Runoff Area=5,793 sf 35.75% Impervious Runoff Depth>5.54"
Flow Length=72' Slope=0.0694 '/' Tc=6.0 min CN=WQ Runoff=0.8 cfs 0.1 af

SubcatchmentPS07: PS-07 Runoff Area=2,235 sf 51.59% Impervious Runoff Depth>5.11"
Tc=6.0 min CN=WQ Runoff=0.3 cfs 0.0 af

Reach PR01: PR-01 Avg. Flow Depth=0.07' Max Vel=1.47 fps Inflow=0.6 cfs 0.1 af
n=0.022 L=25.0' S=0.0200 '/' Capacity=14.6 cfs Outflow=0.6 cfs 0.1 af

Reach PR02: PR-02 Avg. Flow Depth=0.06' Max Vel=1.56 fps Inflow=0.6 cfs 0.1 af
n=0.022 L=210.0' S=0.0262 '/' Capacity=16.7 cfs Outflow=0.5 cfs 0.1 af

Reach PR03: PR-03 Avg. Flow Depth=0.16' Max Vel=1.41 fps Inflow=4.0 cfs 0.3 af
n=0.030 L=60.0' S=0.0117 '/' Capacity=21.9 cfs Outflow=4.1 cfs 0.3 af

Pond RG01: Rain Garden 01 Peak Elev=35.87' Storage=1,103.8 cf Inflow=0.7 cfs 0.1 af
Discarded=0.0 cfs 0.0 af Primary=0.0 cfs 0.0 af Secondary=0.0 cfs 0.0 af Outflow=0.1 cfs 0.1 af

Pond RG02: Rain Garden 02 Peak Elev=33.06' Storage=1,028.1 cf Inflow=1.9 cfs 0.1 af
Discarded=0.0 cfs 0.0 af Primary=1.0 cfs 0.1 af Secondary=0.8 cfs 0.0 af Outflow=1.8 cfs 0.1 af

Pond RG03: Rain Garden 03 Peak Elev=29.99' Storage=387.6 cf Inflow=0.8 cfs 0.1 af
Discarded=0.0 cfs 0.0 af Primary=0.3 cfs 0.0 af Secondary=0.5 cfs 0.0 af Outflow=0.8 cfs 0.1 af

Pond RG04: Rain Garden 04 Peak Elev=33.90' Storage=291.8 cf Inflow=0.3 cfs 0.0 af
Discarded=0.0 cfs 0.0 af Primary=0.1 cfs 0.0 af Secondary=0.0 cfs 0.0 af Outflow=0.1 cfs 0.0 af

Link PPOI01: PPOI-01 Inflow=6.5 cfs 0.5 af
Primary=6.5 cfs 0.5 af

Total Runoff Area = 1.50 ac Runoff Volume = 0.6 af Average Runoff Depth = 5.01"
64.48% Pervious = 0.97 ac 35.52% Impervious = 0.53 ac

APPENDIX E – POST-DEVELOPMENT CALCULATIONS (10-YEAR STORM EVENT)

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Summary for Subcatchment PS01: PS-01

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 0.0 af, Depth> 1.42"
Routed to Pond RG01 : Rain Garden 01

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
8,038	39	>75% Grass cover, Good, HSG A
1,306	68	<50% Grass cover, Poor, HSG A
1,624	98	Roofs, HSG A
287	98	Paved parking, HSG A
11,255		Weighted Average
9,344		83.02% Pervious Area
1,911		16.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	71	0.0280	0.20		**Sheet Flow, Grass Yard** Grass: Short n= 0.150 P2= 3.70"

Summary for Subcatchment PS02: PS-02

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 0.0 af, Depth> 2.23"
Routed to Reach PR01 : PR-01

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
3,621	39	>75% Grass cover, Good, HSG A
508	68	<50% Grass cover, Poor, HSG A
0	36	Woods, Fair, HSG A
157	98	Roofs, HSG A
2,011	98	Paved parking, HSG A
6,297		Weighted Average
4,129		65.57% Pervious Area
2,168		34.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	65	0.0400	0.22		**Sheet Flow, Grass Yard**
					Grass: Short n= 0.150 P2= 3.70"
0.4	35	0.0250	1.31		**Sheet Flow, Driveway/Road**
					Smooth surfaces n= 0.011 P2= 3.70"
0.1	27	0.0250	3.21		**Shallow Concentrated Flow, Road**
					Paved Kv= 20.3 fps
0.1	22	0.0250	2.87	5.75	**Channel Flow, Swale**
					Area= 2.0 sf Perim= 9.0' r= 0.22'
					n= 0.030 Short grass
0.5					**Direct Entry, Min Tc**
6.0	149	Total			

Summary for Subcatchment PS03: PS-03

Runoff = 0.7 cfs @ 12.09 hrs, Volume= 0.1 af, Depth> 4.81"
Routed to Link PPOI01 : PPOI-01

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
525	61	>75% Grass cover, Good, HSG B
0	79	<50% Grass cover, Poor, HSG B
0	98	Roofs, HSG B
2,744	98	Paved parking, HSG B
337	39	>75% Grass cover, Good, HSG A
2,915	98	Roofs, HSG A
20	60	Woods, Fair, HSG B
6,541		Weighted Average
882		13.48% Pervious Area
5,659		86.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0425	2.00		**Sheet Flow, Paved Road**
					Smooth surfaces n= 0.011 P2= 3.70"
1.0	190	0.0250	3.21		**Shallow Concentrated Flow, Paved Road**
					Paved Kv= 20.3 fps
1.8	100	0.0170	0.91		**Shallow Concentrated Flow, Grass Shoulder**
					Short Grass Pasture Kv= 7.0 fps
2.4					**Direct Entry, Min Tc**
6.0	390	Total			

Summary for Subcatchment PS04: PS-04

Runoff = 1.2 cfs @ 12.12 hrs, Volume= 0.1 af, Depth> 3.14"
Routed to Reach PR03 : PR-03

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
9,038	61	>75% Grass cover, Good, HSG B
154	79	<50% Grass cover, Poor, HSG B
1,352	98	Roofs, HSG B
5,502	98	Paved parking, HSG B
1,826	60	Woods, Fair, HSG B
8	98	Paved parking, HSG B
17,880		Weighted Average
11,018		61.62% Pervious Area
6,862		38.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.0500	0.26		**Sheet Flow, Grass Yard** Grass: Short n= 0.150 P2= 3.70"
0.9	80	0.0450	1.48		**Shallow Concentrated Flow, Side Yard (East Property Line)** Short Grass Pasture Kv= 7.0 fps
0.4	30	0.0600	1.22		**Shallow Concentrated Flow, Woods Side Yard** Woodland Kv= 5.0 fps
0.5	35	0.0140	1.20	4.57	**Channel Flow, Wooded Swale** Area= 3.8 sf Perim= 19.0' r= 0.20' n= 0.050 Scattered brush, heavy weeds
8.1	245	Total			

Summary for Subcatchment PS05: PS-05

Runoff = 1.0 cfs @ 12.10 hrs, Volume= 0.1 af, Depth> 2.69"
Routed to Pond RG02 : Rain Garden 02

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
10,534	61	>75% Grass cover, Good, HSG B
1,397	79	<50% Grass cover, Poor, HSG B
3,141	98	Roofs, HSG B
233	98	Paved parking, HSG B
0	60	Woods, Fair, HSG B
15,305		Weighted Average
11,931		77.95% Pervious Area
3,374		22.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	20	0.0250	0.10		**Sheet Flow, Landscape** Grass: Dense n= 0.240 P2= 3.70"
2.9	50	0.0900	0.29		**Sheet Flow, Back Yard** Grass: Short n= 0.150 P2= 3.70"
6.2	70	Total			

Summary for Subcatchment PS06: PS-06

Runoff = 0.4 cfs @ 12.09 hrs, Volume= 0.0 af, Depth> 3.13"
Routed to Pond RG03 : Rain Garden 03

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
3,415	61	>75% Grass cover, Good, HSG B
307	79	<50% Grass cover, Poor, HSG B
1,803	98	Roofs, HSG B
268	98	Paved parking, HSG B
0	60	Woods, Fair, HSG B
5,793		Weighted Average
3,722		64.25% Pervious Area
2,071		35.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	72	0.0694	0.28		**Sheet Flow, Grass Yard** Grass: Short n= 0.150 P2= 3.70"
1.7					**Direct Entry, Min Tc**
6.0	72	Total			

Summary for Subcatchment PS07: PS-07

Explanation for "Tc to Account for Porous Pavers"
Per HydroCAD.net - When modeling porous pavement, a Tc value of 790 minutes has produced good predictions for final discharge from porous pavement with a 41" base (this approach has been studied by UNH Stormwater Center). It is believed that a proportional Tc can be used for smaller base thicknesses, as long as the layers remain proportional and in accordance with the UNH Specifications.

Since the proposed porous paver thickness is 20" (4" paver, 2" bedding course, 6" base course, 8" sub-base course), a proportional Tc value of 385 min would be consistent with the aforementioned information from HydroCAD.net. As a result, a direct value of 380.5 minutes is being entered to create a total Tc value of 385 minutes for the subcatchment.

Runoff = 0.1 cfs @ 12.09 hrs, Volume= 0.0 af, Depth> 3.04"
Routed to Pond RG04 : Rain Garden 04

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
962	39	>75% Grass cover, Good, HSG A
120	68	<50% Grass cover, Poor, HSG A
898	98	Roofs, HSG A
255	98	Paved parking, HSG A
2,235		Weighted Average
1,082		48.41% Pervious Area
1,153		51.59% Impervious Area

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

Summary for Reach PR01: PR-01

Inflow Area = 0.45 ac, 26.44% Impervious, Inflow Depth > 0.71" for 10-Year event
Inflow = 0.3 cfs @ 12.09 hrs, Volume= 0.0 af
Outflow = 0.3 cfs @ 12.09 hrs, Volume= 0.0 af, Atten= 0%, Lag= 0.3 min
Routed to Reach PR02 : PR-02

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.17 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 0.32 fps, Avg. Travel Time= 1.3 min

Peak Storage= 6.4 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.05' , Surface Width= 5.93'
Bank-Full Depth= 0.40' Flow Area= 3.6 sf, Capacity= 14.6 cfs

5.00' x 0.40' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 10.0 '/' Top Width= 13.00'
Length= 25.0' Slope= 0.0200 '/'
Inlet Invert= 31.50', Outlet Invert= 31.00'

‡

Summary for Reach PR02: PR-02

[61] Hint: Exceeded Reach PR01 outlet invert by 0.04' @ 12.10 hrs

Inflow Area = 0.45 ac, 26.44% Impervious, Inflow Depth > 0.71" for 10-Year event
Inflow = 0.3 cfs @ 12.09 hrs, Volume= 0.0 af
Outflow = 0.3 cfs @ 12.12 hrs, Volume= 0.0 af, Atten= 6%, Lag= 1.7 min
Routed to Link PPOI01 : PPOI-01

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.24 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 0.36 fps, Avg. Travel Time= 9.8 min

Peak Storage= 47.3 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.04' , Surface Width= 5.83'
Bank-Full Depth= 0.40' Flow Area= 3.6 sf, Capacity= 16.7 cfs

5.00' x 0.40' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 10.0 '/' Top Width= 13.00'
Length= 210.0' Slope= 0.0262 '/'
Inlet Invert= 31.00', Outlet Invert= 25.50'

‡

Summary for Reach PR03: PR-03

Inflow Area = 0.76 ac, 30.85% Impervious, Inflow Depth > 2.48" for 10-Year event
Inflow = 1.9 cfs @ 12.16 hrs, Volume= 0.2 af
Outflow = 1.9 cfs @ 12.17 hrs, Volume= 0.2 af, Atten= 2%, Lag= 0.8 min
Routed to Link PPOI01 : PPOI-01

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.07 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 0.27 fps, Avg. Travel Time= 3.7 min

Peak Storage= 103.5 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.10' , Surface Width= 19.05'
Bank-Full Depth= 0.40' Flow Area= 9.2 sf, Capacity= 21.9 cfs

15.00' x 0.40' deep channel, n= 0.030 Short grass
Side Slope Z-value= 20.0 '/' Top Width= 31.00'
Length= 60.0' Slope= 0.0117 '/'
Inlet Invert= 26.00', Outlet Invert= 25.30'

‡

Summary for Pond RG01: Rain Garden 01

Inflow Area = 0.26 ac, 16.98% Impervious, Inflow Depth > 1.42" for 10-Year event
Inflow = 0.3 cfs @ 12.09 hrs, Volume= 0.0 af
Outflow = 0.0 cfs @ 11.75 hrs, Volume= 0.0 af, Atten= 88%, Lag= 0.0 min
Discarded = 0.0 cfs @ 11.75 hrs, Volume= 0.0 af
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0.0 af
Routed to Reach PR01 : PR-01
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0.0 af
Routed to Reach PR01 : PR-01

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 33.85' @ 13.06 hrs Surf.Area= 753 sf Storage= 383.3 cf

Plug-Flow detention time= 75.7 min calculated for 0.0 af (100% of inflow)
Center-of-Mass det. time= 75.4 min (879.1 - 803.7)

Volume	Invert	Avail.Storage	Storage Description
#1	35.50'	720.0 cf	**Pond Area (Irregular)** Listed below (Recalc) -Impervious
#2	34.00'	225.9 cf	**Filter Media (Irregular)** Listed below (Recalc) -Impervious 1,129.5 cf Overall x 20.0% Voids
#3	32.58'	427.7 cf	**Gravel & Pea Gravel (Irregular)** Listed below (Recalc) 1,069.3 cf Overall x 40.0% Voids
		1,373.6 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
35.50	753	309.0	0.0	0.0	753
36.00	2,262	329.0	720.0	720.0	1,781

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
34.00	753	309.0	0.0	0.0	753
35.50	753	309.0	1,129.5	1,129.5	1,217

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
32.58	753	309.0	0.0	0.0	753
34.00	753	309.0	1,069.3	1,069.3	1,192

Device	Routing	Invert	Outlet Devices
#1	Primary	32.83'	**8.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 32.83' / 32.00' S= 0.0151 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Discarded	32.58'	**2.150 in/hr Exfiltration over Horizontal area** Phase-In= 0.01'
#3	Secondary	35.95'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68

2.72 2.81 2.92 2.97 3.07 3.32

#4	Device 1	35.85'	**12.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	35.75'	**1.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.0 cfs @ 11.75 hrs HW=32.62' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=32.58' TW=31.50' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.0 cfs)
  ├**4=Grate** (Controls 0.0 cfs)
  └**5=Orifice** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=32.58' TW=31.50' (Dynamic Tailwater)
└**3=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Pond RG02: Rain Garden 02

Inflow Area = 0.35 ac, 22.05% Impervious, Inflow Depth > 2.69" for 10-Year event
Inflow = 1.0 cfs @ 12.10 hrs, Volume= 0.1 af
Outflow = 0.8 cfs @ 12.17 hrs, Volume= 0.1 af, Atten= 20%, Lag= 4.7 min
Discarded = 0.0 cfs @ 6.85 hrs, Volume= 0.0 af
Primary = 0.6 cfs @ 12.17 hrs, Volume= 0.0 af
  Routed to Reach PR03 : PR-03
Secondary = 0.2 cfs @ 12.17 hrs, Volume= 0.0 af
  Routed to Reach PR03 : PR-03

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 33.00' @ 12.17 hrs Surf.Area= 637 sf Storage= 1,023.1 cf

Plug-Flow detention time= 140.5 min calculated for 0.1 af (75% of inflow)
Center-of-Mass det. time= 48.4 min (855.3 - 806.9)

Volume	Invert	Avail.Storage	Storage Description
#1	32.50'	475.2 cf	**Pond Area (Irregular)** Listed below (Recalc) -Impervious
#2	31.00'	191.1 cf	**Filter Media (Irregular)** Listed below (Recalc) -Impervious 955.5 cf Overall x 20.0% Voids
#3	29.58'	361.8 cf	**Gravel & Pea Gravel (Irregular)** Listed below (Recalc) 904.5 cf Overall x 40.0% Voids
		1,028.1 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
32.50	637	202.0	0.0	0.0	637
33.00	1,303	324.0	475.2	475.2	5,745

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
31.00	637	202.0	0.0	0.0	637
32.50	637	202.0	955.5	955.5	940

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
29.58	637	202.0	0.0	0.0	637
31.00	637	202.0	904.5	904.5	924

Device	Routing	Invert	Outlet Devices
#1	Primary	29.33'	**8.0" Round Culvert** L= 112.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 29.33' / 26.00' S= 0.0297 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Discarded	29.58'	**0.350 in/hr Exfiltration over Horizontal area** Phase-In= 0.01'
#3	Device 1	32.85'	**12.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	32.75'	**1.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#5	Secondary	32.95'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.0 cfs @ 6.85 hrs HW=29.62' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.5 cfs @ 12.17 hrs HW=32.99' TW=26.10' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.5 cfs of 2.6 cfs potential flow)
  ├**3=Grate** (Weir Controls 0.5 cfs @ 1.22 fps)
  └**4=Orifice** (Orifice Controls 0.0 cfs @ 2.14 fps)

Secondary OutFlow Max=0.2 cfs @ 12.17 hrs HW=32.99' TW=26.10' (Dynamic Tailwater)
└**5=Broad-Crested Rectangular Weir** (Weir Controls 0.2 cfs @ 0.48 fps)

Summary for Pond RG03: Rain Garden 03

Inflow Area = 0.13 ac, 35.75% Impervious, Inflow Depth > 3.13" for 10-Year event
Inflow = 0.4 cfs @ 12.09 hrs, Volume= 0.0 af
Outflow = 0.4 cfs @ 12.10 hrs, Volume= 0.0 af, Atten= 0%, Lag= 0.5 min
Discarded = 0.0 cfs @ 2.95 hrs, Volume= 0.0 af
Primary = 0.2 cfs @ 12.10 hrs, Volume= 0.0 af
Routed to Link PPOI01 : PPOI-01
Secondary = 0.2 cfs @ 12.10 hrs, Volume= 0.0 af
Routed to Link PPOI01 : PPOI-01

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 29.98' @ 12.10 hrs Surf.Area= 240 sf Storage= 378.3 cf

Plug-Flow detention time= 144.4 min calculated for 0.0 af (77% of inflow)
Center-of-Mass det. time= 57.5 min (846.3 - 788.8)

Volume	Invert	Avail.Storage	Storage Description
#1	29.50'	182.2 cf	**Pond Area (Irregular)** Listed below (Recalc) -Impervious
#2	28.00'	72.0 cf	**Filter Media (Irregular)** Listed below (Recalc) -Impervious 360.0 cf Overall x 20.0% Voids
#3	26.58'	136.3 cf	**Gravel & Pea Gravel (Irregular)** Listed below (Recalc) 340.8 cf Overall x 40.0% Voids
		390.5 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
29.50	240	125.0	0.0	0.0	240
30.00	505	140.0	182.2	182.2	563

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
28.00	240	125.0	0.0	0.0	240
29.50	240	125.0	360.0	360.0	428

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
26.58	240	125.0	0.0	0.0	240
28.00	240	125.0	340.8	340.8	418

Device	Routing	Invert	Outlet Devices
#1	Primary	28.00'	**6.0" Round Culvert** L= 13.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 28.00' / 27.70' S= 0.0231 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Discarded	26.58'	**0.150 in/hr Exfiltration over Horizontal area** Phase-In= 0.01'
#3	Device 1	29.90'	**12.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	29.83'	**1.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#5	Secondary	29.95'	**20.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.0 cfs @ 2.95 hrs HW=26.61' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.2 cfs @ 12.10 hrs HW=29.98' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.2 cfs of 1.2 cfs potential flow)
  ├**3=Grate** (Weir Controls 0.2 cfs @ 0.90 fps)
  └**4=Orifice** (Orifice Controls 0.0 cfs @ 1.55 fps)

Secondary OutFlow Max=0.2 cfs @ 12.10 hrs HW=29.98' TW=0.00' (Dynamic Tailwater)
└**5=Broad-Crested Rectangular Weir** (Weir Controls 0.2 cfs @ 0.40 fps)

Summary for Pond RG04: Rain Garden 04

Inflow Area = 0.05 ac, 51.59% Impervious, Inflow Depth > 3.04" for 10-Year event
Inflow = 0.1 cfs @ 12.09 hrs, Volume= 0.0 af
Outflow = 0.0 cfs @ 11.35 hrs, Volume= 0.0 af, Atten= 93%, Lag= 0.0 min
Discarded = 0.0 cfs @ 11.35 hrs, Volume= 0.0 af
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0.0 af
Routed to Reach PR01 : PR-01
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0.0 af
Routed to Reach PR01 : PR-01

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 33.66' @ 13.75 hrs Surf.Area= 205 sf Storage= 217.1 cf

Plug-Flow detention time= 167.2 min calculated for 0.0 af (100% of inflow)
Center-of-Mass det. time= 167.0 min (927.8 - 760.8)

Volume	Invert	Avail.Storage	Storage Description
#1	33.50'	156.7 cf	**Pond Area (Irregular)** Listed below (Recalc) -Impervious
#2	32.00'	61.5 cf	**Filter Media (Irregular)** Listed below (Recalc) -Impervious 307.5 cf Overall x 20.0% Voids
#3	30.58'	116.4 cf	**Gravel & Pea Gravel (Irregular)** Listed below (Recalc) 291.1 cf Overall x 40.0% Voids
		334.6 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
33.50	205	108.0	0.0	0.0	205
34.00	436	121.0	156.7	156.7	449

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
32.00	205	108.0	0.0	0.0	205
33.50	205	108.0	307.5	307.5	367

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
30.58	205	108.0	0.0	0.0	205
32.00	205	108.0	291.1	291.1	358

Device	Routing	Invert	Outlet Devices
#1	Primary	31.50'	**6.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 31.50' / 31.40' S= 0.0067 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Discarded	30.58'	**2.150 in/hr Exfiltration over Horizontal area** Phase-In= 0.01'
#3	Secondary	33.95'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88

2.85 3.07 3.20 3.32

#4	Device 1	33.85'	**12.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	33.75'	**1.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.0 cfs @ 11.35 hrs HW=30.62' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=30.58' TW=31.50' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.0 cfs)
  ├**4=Grate** (Controls 0.0 cfs)
  └**5=Orifice** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=30.58' TW=31.50' (Dynamic Tailwater)
└**3=Broad-Crested Rectangular Weir**(Controls 0.0 cfs)

Summary for Link PPOI01: PPOI-01

Inflow Area = 1.50 ac, 35.52% Impervious, Inflow Depth > 2.16" for 10-Year event
Inflow = 3.0 cfs @ 12.15 hrs, Volume= 0.3 af
Primary = 3.0 cfs @ 12.15 hrs, Volume= 0.3 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

APPENDIX F – BMP WORKSHEETS

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NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Rain Garden 01 (RG-01)**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.26	ac	A = Area draining to the practice	
0.04	ac	A_I = Impervious area draining to the practice	
0.17	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.20	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.05	ac-in	WQV= 1" x Rv x A	
191	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
48	cf	25% x WQV (check calc for sediment forebay volume)	
143	cf	75% x WQV (check calc for surface sand filter volume)	
		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
Calculate time to drain if system IS NOT underdrained:			
753	sf	A_{SA} = Surface area of the practice	
2.15	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
	Yes/No	(Use the calculations below)	
1.4	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	≤ 72-hrs
Calculate time to drain if system IS underdrained:			
	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	≤ 72-hrs
34.00	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
30.40	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
26.64	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
34.00	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	≥ 1'
7.36	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	≥ 1'
3.60	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	≥ 1'
35.87	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
36.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	← yes
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	< 10 ac
	cf	V = Volume of storage[3] (attach a stage-storage table)	≥ 75%WQV
	inches	D_{FC} = Filter course thickness	18", or 24" if within GPA
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	← yes

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
501	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	C-11	Note what sheet in the plan set contains the filter course specification	
4.0	:1	Pond side slopes	**≥ 3:1**
Sheet	C-06	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes: The rain garden is equipped with an underdrain to promote pond drainage during heavier storm events. The pond drains via infiltration alone in less than 72 hours.

Stage-Area-Storage for Pond RG01: Rain Garden 01

Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)
32.58	**753**	0.0
32.63	753	15.1
32.68	753	30.1
32.73	753	45.2
32.78	753	60.2
32.83	753	75.3
32.88	753	90.4
32.93	753	105.4
32.98	753	120.5
33.03	753	135.5
33.08	753	150.6
33.13	753	165.7
33.18	753	180.7
33.23	753	195.8
33.28	753	210.8
33.33	753	225.9
33.38	753	241.0
33.43	753	256.0
33.48	753	271.1
33.53	753	286.1
33.58	753	301.2
33.63	753	316.3
33.68	753	331.3
33.73	753	346.4
33.78	753	361.4
33.83	753	376.5
33.88	753	391.6
33.93	753	406.6
33.98	753	421.7
34.03	753	432.2
34.08	753	439.8
34.13	753	447.3
34.18	753	454.8
34.23	753	462.3
34.28	753	469.9
34.33	753	477.4
34.38	753	484.9
34.43	753	492.5
34.48	753	500.0
34.53	753	507.5
34.58	753	515.1
34.63	753	522.6
34.68	753	530.1
34.73	753	537.6
34.78	753	545.2
34.83	753	552.7
34.88	753	560.2
34.93	753	567.8
34.98	753	575.3
35.03	753	582.8
35.08	753	590.4
35.13	753	597.9

Bottom Filter Elev

Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)
35.18	753	605.4
35.23	753	612.9
35.28	753	620.5
35.33	753	628.0
35.38	753	635.5
35.43	753	643.1
35.48	753	650.6
35.53	753	677.2
35.58	753	721.2
35.63	753	771.3
35.68	753	828.1
35.73	753	891.8
35.78	753	962.9
35.83	753	1,041.7
35.88	753	1,128.8
35.93	753	1,224.5
35.98	753	**1,329.1**

1" Orifice Elevation

Volume of Storage
927 cf - 426 cf = 501 cf
(See BMP Worksheet)

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NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Rain Garden 02 (RG-02)**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.35	ac	A = Area draining to the practice	
0.08	ac	A_I = Impervious area draining to the practice	
0.22	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.25	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.09	ac-in	WQV= 1" x Rv x A	
315	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
79	cf	25% x WQV (check calc for sediment forebay volume)	
236	cf	75% x WQV (check calc for surface sand filter volume)	
		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
Calculate time to drain if system IS NOT underdrained:			
637	sf	A_{SA} = Surface area of the practice	
0.35	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
	Yes/No	(Use the calculations below)	
17.0	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	≤ 72-hrs
Calculate time to drain if system IS underdrained:			
	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	≤ 72-hrs
31.00	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
30.00	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
28.03	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
31.00	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	≥ 1'
2.97	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	≥ 1'
1.00	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	≥ 1'
33.06	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
33.00	ft	Elevation of the top of the practice	
NO		50 peak elevation ≤ Elevation of the top of the practice	← yes
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	< 10 ac
	cf	V = Volume of storage[3] (attach a stage-storage table)	≥ 75%WQV
	inches	D_{FC} = Filter course thickness	18", or 24" if within GPA
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	← yes

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
494	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	C-11	Note what sheet in the plan set contains the filter course specification	
4.0	:1	Pond side slopes	**≥ 3:1**
Sheet	C-06	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes: The rain garden is equipped with an underdrain to promote pond drainage during heavier storm events. The pond drains via infiltration alone in less than 72 hours.

Stage-Area-Storage for Pond RG02: Rain Garden 02

Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)
29.58	**637**	0.0
29.63	637	12.7
29.68	637	25.5
29.73	637	38.2
29.78	637	51.0
29.83	637	63.7
29.88	637	76.4
29.93	637	89.2
29.98	637	101.9
30.03	637	114.7
30.08	637	127.4
30.13	637	140.1
30.18	637	152.9
30.23	637	165.6
30.28	637	178.4
30.33	637	191.1
30.38	637	203.8
30.43	637	216.6
30.48	637	229.3
30.53	637	242.1
30.58	637	254.8
30.63	637	267.5
30.68	637	280.3
30.73	637	293.0
30.78	637	305.8
30.83	637	318.5
30.88	637	331.2
30.93	637	344.0
30.98	637	356.7
31.03	637	365.6
31.08	637	372.0
31.13	637	378.4
31.18	637	384.7
31.23	637	391.1
31.28	637	397.5
31.33	637	403.9
31.38	637	410.2
31.43	637	416.6
31.48	637	423.0
31.53	637	429.3
31.58	637	435.7
31.63	637	442.1
31.68	637	448.4
31.73	637	454.8
31.78	637	461.2
31.83	637	467.6
31.88	637	473.9
31.93	637	480.3
31.98	637	486.7
32.03	637	493.0
32.08	637	499.4
32.13	637	505.8
32.18	637	512.1
32.23	637	518.5
32.28	637	524.9
32.33	637	531.3
32.38	637	537.6
32.43	637	544.0
32.48	637	550.4
32.53	637	572.5
32.58	637	607.5
32.63	637	645.3
32.68	637	686.3
32.73	637	730.3
32.78	637	777.7
32.83	637	828.5
32.88	637	882.7
32.93	637	940.7
32.98	637	**1,002.3**
33.03	637	**1,028.1**
33.08	637	1,028.1
33.13	637	1,028.1

Bottom Filter Elev

1" Orifice Elevation

Volume of Storage
855 cf - 361 cf = 494 cf
(See BMP Worksheet)

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NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Rain Garden 03 (RG-03)**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.13	ac	A = Area draining to the practice	
0.05	ac	A_I = Impervious area draining to the practice	
0.36	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.38	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.05	ac-in	WQV= 1" x Rv x A	
177	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
44	cf	25% x WQV (check calc for sediment forebay volume)	
133	cf	75% x WQV (check calc for surface sand filter volume)	
		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
Calculate time to drain if system IS NOT underdrained:			
240	sf	A_{SA} = Surface area of the practice	
0.15	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
	Yes/No	(Use the calculations below)	
59.0	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	≤ 72-hrs
Calculate time to drain if system IS underdrained:			
	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	≤ 72-hrs
28.00	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
26.75	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
23.08	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
28.00	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	≥ 1'
4.92	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	≥ 1'
1.25	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	≥ 1'
29.99	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
30.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	← yes
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	< 10 ac
	cf	V = Volume of storage[3] (attach a stage-storage table)	≥ 75%WQV
	inches	D_{FC} = Filter course thickness	18", or 24" if within GPA
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	← yes

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
178	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	C-11	Note what sheet in the plan set contains the filter course specification	
4.0	:1	Pond side slopes	**≥ 3:1**
Sheet	C-06	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes: The rain garden is equipped with an underdrain to promote pond drainage during heavier storm events. The pond drains via infiltration alone in less than 72 hours.

Stage-Area-Storage for Pond RG03: Rain Garden 03

Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)
26.58	**240**	0.0
26.63	240	4.8
26.68	240	9.6
26.73	240	14.4
26.78	240	19.2
26.83	240	24.0
26.88	240	28.8
26.93	240	33.6
26.98	240	38.4
27.03	240	43.2
27.08	240	48.0
27.13	240	52.8
27.18	240	57.6
27.23	240	62.4
27.28	240	67.2
27.33	240	72.0
27.38	240	76.8
27.43	240	81.6
27.48	240	86.4
27.53	240	91.2
27.58	240	96.0
27.63	240	100.8
27.68	240	105.6
27.73	240	110.4
27.78	240	115.2
27.83	240	120.0
27.88	240	124.8
27.93	240	129.6
27.98	240	134.4
28.03	240	137.8
28.08	240	140.2
28.13	240	142.6
28.18	240	145.0
28.23	240	147.4
28.28	240	149.8
28.33	240	152.2
28.38	240	154.6
28.43	240	157.0
28.48	240	159.4
28.53	240	161.8
28.58	240	164.2
28.63	240	166.6
28.68	240	169.0
28.73	240	171.4
28.78	240	173.8
28.83	240	176.2
28.88	240	178.6
28.93	240	181.0
28.98	240	183.4
29.03	240	185.8
29.08	240	188.2
29.13	240	190.6
29.18	240	193.0
29.23	240	195.4
29.28	240	197.8
29.33	240	200.2
29.38	240	202.6
29.43	240	205.0
29.48	240	207.4
29.53	240	215.7
29.58	240	228.9
29.63	240	243.3
29.68	240	258.9
29.73	240	275.8
29.78	240	293.9
29.83	240	313.4
29.88	240	334.3
29.93	240	356.7
29.98	240	**380.5**
30.03	240	**390.5**

Bottom Filter Elev

1" Orifice Elevation

Volume of Storage
313 cf - 135 cf = 178 cf
(See BMP Worksheet)

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NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Rain Garden 04 (RG-04)**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.05	ac	A = Area draining to the practice	
0.03	ac	A_I = Impervious area draining to the practice	
0.51	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.51	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.03	ac-in	WQV= 1" x Rv x A	
94	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
24	cf	25% x WQV (check calc for sediment forebay volume)	
71	cf	75% x WQV (check calc for surface sand filter volume)	
		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
Calculate time to drain if system IS NOT underdrained:			
205	sf	A_{SA} = Surface area of the practice	
1.20	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
	Yes/No	(Use the calculations below)	
4.6	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	≤ 72-hrs
Calculate time to drain if system IS underdrained:			
	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	≤ 72-hrs
32.00	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
30.15	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
27.97	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
32.00	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	≥ 1'
4.03	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	≥ 1'
1.85	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	≥ 1'
33.90	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
34.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	← yes
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	< 10 ac
	cf	V = Volume of storage[3] (attach a stage-storage table)	≥ 75%WQV
	inches	D_{FC} = Filter course thickness	18", or 24" if within GPA
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	← yes

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
129	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	C-11	Note what sheet in the plan set contains the filter course specification	
4.0	:1	Pond side slopes	**≥ 3:1**
Sheet	C-06	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes: The rain garden is equipped with an underdrain to promote pond drainage during heavier storm events. The pond drains via infiltration alone in less than 72 hours.

Stage-Area-Storage for Pond RG04: Rain Garden 04

Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)	
30.58	**205**	0.0	
30.63	205	4.1	
30.68	205	8.2	
30.73	205	12.3	
30.78	205	16.4	
30.83	205	20.5	
30.88	205	24.6	
30.93	205	28.7	
30.98	205	32.8	
31.03	205	36.9	
31.08	205	41.0	
31.13	205	45.1	
31.18	205	49.2	
31.23	205	53.3	
31.28	205	57.4	
31.33	205	61.5	
31.38	205	65.6	
31.43	205	69.7	
31.48	205	73.8	
31.53	205	77.9	
31.58	205	82.0	
31.63	205	86.1	
31.68	205	90.2	
31.73	205	94.3	
31.78	205	98.4	
31.83	205	102.5	
31.88	205	106.6	
31.93	205	110.7	
31.98	205	114.8	Bottom Filter Elev
32.03	205	117.7	
32.08	205	119.7	
32.13	205	121.8	
32.18	205	123.8	
32.23	205	125.9	
32.28	205	127.9	
32.33	205	130.0	
32.38	205	132.0	
32.43	205	134.1	
32.48	205	136.1	
32.53	205	138.2	
32.58	205	140.2	
32.63	205	142.3	
32.68	205	144.3	
32.73	205	146.4	
32.78	205	148.4	
32.83	205	150.5	
32.88	205	152.5	
32.93	205	154.6	
32.98	205	156.6	
33.03	205	158.7	
33.08	205	160.7	
33.13	205	162.8	
33.18	205	164.8	
33.23	205	166.9	
33.28	205	168.9	
33.33	205	171.0	
33.38	205	173.0	
33.43	205	175.1	
33.48	205	177.1	
33.53	205	184.3	
33.58	205	195.6	
33.63	205	207.9	
33.68	205	221.3	
33.73	205	235.7	1" Orifice Elevation
33.78	205	251.3	
33.83	205	268.1	
33.88	205	286.1	
33.93	205	305.4	
33.98	205	**326.0**	

Volume of Storage
244 cf - 115 cf = 129 cf
(See BMP Worksheet)

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APPENDIX G – RIPRAP CALCULATIONS

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Proposed 3 Lot Subdivision
437 Lafayette Road
4/19/2022

RIPRAP OUTLET PROTECTION

Location: FES-01

Design Flow =	Q =	0.01	cfs
Tailwater =	Tw =	0.446667	feet
Pipe Dia.=	Do =	0.67	feet

TW>=1/2Do -> La = Length = 3.0Q/Do^(3/2) + 7Do = **0.0** feet

Implementing a 2ft x 2ft pad

W_1 = Width = 3Do+(0.4)(La)= **2.0** feet **(or Width of Channel)**

W_2 = Width = 3Do= **2.0** feet

D = Depth = (1.5)(d50)= **9** inches **(or Min. 9")**

d_{50} = (0.02/Tw)(Q/Do)$^{\wedge(4/3)}$= **6.00** inches **(or Min. 6")**

Rock Riprap Gradation

% by weight passing given the D_{50} Size		Size of stone (inches)		
100		9.00	-	12.00
85		7.80	-	10.80
50		6.00	-	9.00
15		1.80	-	3.00

(See Last Page of Calculations for 25-Year Flows)

Proposed 3 Lot Subdivision
437 Lafayette Road
4/19/2022

RIPRAP OUTLET PROTECTION

Location: FES-02

Design Flow =	Q =	0.87	cfs
Tailwater =	Tw =	0.446667	feet
Pipe Dia.=	Do =	0.67	feet

TW>=1/2Do -> La = Length = 3.0Q/Do^(3/2) + 7Do = **3.0** feet

W_1 = Width = 3Do+(0.4)(La)= **3.0** feet **(or Width of Channel)**

W_2 = Width = 3Do= **2.0** feet

D = Depth = (1.5)(d50)= **9** inches **(or Min. 9")**

d_{50} = (0.02/Tw)(Q/Do)^(4/3)= **6.00** inches **(or Min. 6")**

Rock Riprap Gradation

% by weight passing given the D_{50} Size		Size of stone (inches)		
100		9.00	-	12.00
85		7.80	-	10.80
50		6.00	-	9.00
15		1.80	-	3.00

(See Last Page of Calculations for 25-Year Flows)

Proposed 3 Lot Subdivision
437 Lafayette Road
4/19/2022

RIPRAP OUTLET PROTECTION

Location: FES-03

Design Flow =	Q =	0.27	cfs
Tailwater =	Tw =	0.333333	feet
Pipe Dia.=	Do =	0.5	feet

TW>=1/2Do -> La = Length = 3.0Q/Do^(3/2) + 7Do = **1.0** feet

Implementing a 2ft x 2ft pad

W_1 = Width = 3Do+(0.4)(La)= **2.0** feet **(or Width of Channel)**

W_2 = Width = 3Do= **1.5** feet

D = Depth = (1.5)(d50)= **9** inches **(or Min. 9")**

d_{50} = (0.02/Tw)(Q/Do)$^{\wedge(4/3)}$= **6.00** inches **(or Min. 6")**

Rock Riprap Gradation

% by weight passing given the D_{50} Size		Size of stone (inches)		
100		9.00	-	12.00
85		7.80	-	10.80
50		6.00	-	9.00
15		1.80	-	3.00

(See Last Page of Calculations for 25-Year Flows)

Proposed 3 Lot Subdivision
437 Lafayette Road
4/19/2022

RIPRAP OUTLET PROTECTION

Location: FES-04

Design Flow =	Q =	0.03	cfs
Tailwater =	Tw =	0.333333	feet
Pipe Dia.=	Do =	0.5	feet

TW>=1/2Do -> La = Length = 3.0Q/Do^(3/2) + 7Do = **0.0** feet

Implementing a 2ft x 2ft pad

W_1 = Width = 3Do+(0.4)(La)= **1.5** feet **(or Width of Channel)**

W_2 = Width = 3Do= **1.5** feet

D = Depth = (1.5)(d50)= **9** inches **(or Min. 9")**

d_{50} = (0.02/Tw)(Q/Do)$^{\wedge(4/3)}$= **6.00** inches **(or Min. 6")**

Rock Riprap Gradation

% by weight passing given the D_{50} Size		Size of stone (inches)		
100		9.00	-	12.00
85		7.80	-	10.80
50		6.00	-	9.00
15		1.80	-	3.00

(See Last Page of Calculations for 25-Year Flows)

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Pond RG01: Rain Garden 01 Peak Elev=35.61' Storage=748.8 cf Inflow=0.49 cfs 0.0 af
Discarded=0.04 cfs 0.0 af Primary=0.00 cfs 0.0 af Secondary=0.00 cfs 0.0 af Outflow=0.04 cfs 0.0 af

Pond RG02: Rain Garden 02 Peak Elev=33.04' Storage=1,028.1 cf Inflow=1.45 cfs 0.1 af
Discarded=0.01 cfs 0.0 af Primary=0.87 cfs 0.1 af Secondary=0.67 cfs 0.0 af Outflow=1.54 cfs 0.1 af

Pond RG03: Rain Garden 03 Peak Elev=29.99' Storage=383.3 cf Inflow=0.61 cfs 0.0 af
Discarded=0.00 cfs 0.0 af Primary=0.27 cfs 0.0 af Secondary=0.34 cfs 0.0 af Outflow=0.61 cfs 0.0 af

Pond RG04: Rain Garden 04 Peak Elev=33.87' Storage=280.8 cf Inflow=0.20 cfs 0.0 af
Discarded=0.01 cfs 0.0 af Primary=0.03 cfs 0.0 af Secondary=0.00 cfs 0.0 af Outflow=0.04 cfs 0.0 af

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APPENDIX H - NRCS WEB SOIL SURVEY

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United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Rockingham County, New Hampshire

437 Lafayette Road

January 7, 2022

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:2,470 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

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

MAP LEGEND

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

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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

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

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

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

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

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 24, Aug 31, 2021

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

Date(s) aerial images were photographed: Dec 31, 2009—Jun 14, 2017

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
299	Udorthents, smoothed	2.6	12.8%
799	Urban land-Canton complex, 3 to 15 percent slopes	17.9	87.2%
Totals for Area of Interest		**20.5**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Rockingham County, New Hampshire

299—Udorthents, smoothed

Map Unit Setting

National map unit symbol: 9cmt
Elevation: 0 to 840 feet
Mean annual precipitation: 44 to 49 inches
Mean annual air temperature: 48 degrees F
Frost-free period: 155 to 165 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Properties and qualities

Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

799—Urban land-Canton complex, 3 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9cq0
Elevation: 0 to 1,000 feet
Mean annual precipitation: 42 to 46 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 55 percent
Canton and similar soils: 20 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton

Setting

Parent material: Till

Typical profile

H1 - 0 to 5 inches: gravelly fine sandy loam
H2 - 5 to 21 inches: gravelly fine sandy loam
H3 - 21 to 60 inches: loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Udorthents

Percent of map unit: 5 percent
Hydric soil rating: No

Squamscott and scitico

Percent of map unit: 4 percent
Landform: Marine terraces
Hydric soil rating: Yes

Walpole

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Chatfield

Percent of map unit: 4 percent
Hydric soil rating: No

Scituate and newfields

Percent of map unit: 4 percent
Hydric soil rating: No

Boxford and eldridge

Percent of map unit: 4 percent
Hydric soil rating: No

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APPENDIX I - TEST PIT LOGS & INFILTRATION CALCULATIONS

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Test Pit Report

For

Smith Field Construction

437 Lafayette Road,

Portsmouth, NH

Prepared For

437 Lafayette Road Subdivision

45407.120

PREPARED BY

TFMoran, Inc.

48 Constitution Drive

Bedford, NH 03110

January 25th & February 1st, 2022

Test Pit 1 January 25th, 2022

0-13" 10YR 5/3 Brown, Loam, Massive, Friable, Anthropogenic Fill (Asphalt, Brick)

13-20" AB 10YR 7/6 Yellow, Loam, Blocky, Friable, Gravely <5% Rock (Iron Stone)

20-55" B1 Gley 1 7N Gray, Sandy Loam, massive, pliable

55- 65" B2 10YR 5/1 Gray, Coarse Sand, Friable, Massive, > 15% Angular Rock Fragment (Iron Stone)

REDOX @ 20" 10YR 7/8 Common Distinct >15%

Soil Series: Walpole

EST Wet: 20" Below Grade

OBS WT: 39" Below Grade (Apparent →)

Ledge: > 65" Below Grade

Test Pit 2 January 25th, 2022

0-15" A 10YR 4/3 Brown, Loam, Massive

15-17" 10YR 7/6 Yellow, Sandy Loam, friable, granular

17-27" Gley 1 7/N light gray, Sandy Loam, friable, granular

27-52" 10YR 6/6 Brownish Yellow, Loam, friable, massive

52-77" 10YR 5/1 Gray, Course Sand, Friable, Gravely, granular

REDOX @ 26" 10YR 7/8 Common Distinct

Soil Series: Walpole

EST Wet: 26" Below Grade

OBS WT: 51" Below Grade (Apparent ↑)

Ledge: 77" Below Grade

Test Pit 3 January 25th, 2022

0-16” 10YR 4/3 Brown, Loam, aggregated, friable

16-27” 10YR 6/6 Brownish Yellow, Loam, aggregated, friable, Gravely >5%

27-52” 10YR 7/2 Light Gray, Loamy Sand, aggregated, Friable Gravely >15%

52-84” 10YR 8/1 White, Sandy Clay Loam, Platey, indurate

REDOX @: 41” 10YR 7/8 Common Distinct >15%

Soil Series: Canton - Chatfield Complex

EST Wet: 41” Below Grade

OBS WT: 84” Below Grade (Apparent ↘)

Ledge: 84” Below Grade

Test Pit 4 January 25th, 2022

0-18” 10YR 5/4 Yellowish Brown, Loam, Friable, Aggregate

18-27” 10YR 6/6 Brownish Yellow, Sandy Loam, Gravely >5%, Friable, Aggregate

27-37” 10YR 6/2 Light Brownish Grey, Loamy Sand, > 15% Angular Rock Fragment (Iron Stone)

37-65” 10YR 7/8 Yellow, Decaying Bedrock, Angular Cobble, Iron Stone

REDOX @: 5R 3/8 Common Distinct >15%

Soil Series: Chatfield

EST Wet: 37” Below Grade

OBS WT: 56” Below Grade (Apparent ↑)

Ledge: 65” Below Grade

Test Pit 5 January 25th, 2022

0-10” 10YR 4/3 Brown, Loamy Sand, aggregate, friable, gravely >5%

10-31” 10YR 5/4 Yellowish Brown, Course Sand, Granular, Friable, gravely >15%

31-57” Gley 1 5/N Gray, Clay, Decayed Bedrock, Boulders >5%, Massive

REDOX @: 31” 5R 3/8 Common Distinct >15%

Soil Series: Chatfield – Maybid Complex

EST Wet: 31” Below Grade

OBS WT: > 57”

Ledge: 57” Below Grade

Test Pit 6 January 25th, 2022

0-12” 10YR 4/3 Brown, Sandy Loam, Aggregate, Friable

12-16” 10YR 7/2 Light Gray, Sand, granular, friable, gravely >5%

16-28” 10YR 7/1 Light Gray, Fine Sand, Granular, Friable

28-42” 10YR 7/3 Very Pale Brown, Sandy Loam, Aggregate, friable, heterogeneous

42-47” Gley 1 5/5G-1 Greenish Gray, Sandy Clay Loam, Platey, Indurate

47-96” Gley 2 8/5BG Light Greenish Gray, Clay, Massive, Indurate, homogeneous

REDOX @42” 5R 3/8 Common Distinct >15%

Soil Series: Canton Complex (Anthropogenic)

EST Wet: 42” Below Grade

OBS WT: 79” Below Grade (Apparent →)

Ledge: > 96”

Test Pit 7 January 25th, 2022

0-18” 10YR 4/2 Dark Grayish Brown, Sandy Loam, Friable, blocky

18-42” 10YR 7/4 Very pale Brown, Fine Sand, granular, friable

42-54” 10YR 6/6 Brownish Yellow, Course Sand, granular, friable

54-65” 10YR 5/8 Yellowish Brown, Sandy Loam, heterogeneous, friable

65-72” Gley 2 4/10B Dark Blueish Gray, Sandy Clay Loam, Platey, Indurate

72-102” Gley 2 7/10B Light Blueish Gray, Clay, Massive, Indurate

REDOX @ 57” 5R 3/8 Common Distinct >15%

Soil Series: Canton Complex (Anthropogenic)

EST Wet: 57” Below Grade

OBS WT: 93” Below Grade (Apparent ↑)

Ledge: >102”

Test Pit 8 January 25th, 2022

0-14” 10YR 4/2 Dark Grayish Brown, Loamy Sand, friable, blocky

14-42” 10YR 7/4 Very pale Brown, Fine Sand, aggregate, friable, > 15% Cobble River Stone

42-50” Gley 1 5/5G_/1 Greenish Gray, Sandy Clay Loam, Aquatard present (Iron Stone), Massive, Indurate

50-55” 10YR 6/4 Light Yellowish Brown, Sandy Clay Loam, Inclusion, heterogeneous, Massive, Indurate

55-103” Gley 2 8/5BG Light Greenish Gray, Clay, Indurate, massive

REDOX @ 42 5R 3/8 Common Distinct >15% (Aquatard (Potentially Anthropogenic))

Soil Series: Canton Complex (Anthropogenic)

EST Wet: 42” Below Grade

Test Pit 8 January 25th, 2022 (Cont'd)

OBS WT: 101" Below Grade (Apparent ↑)

Ledge: > 103"

Test Pit 9 January 25th, 2022

0-9" 10YR 4/3 Brown, Loam, blocky, friable, gravely >5%

9-23" 10YR 5/6 Yellowish Brown, Loamy Sand, granular, , > 15% Angular Rock Fragment (Iron Stone)

23-54" 10YR 7/2 light Grey, Sandy Loam, Indurate, massive, heterogeneous, > 15% Angular Rock Fragment (Iron Stone)

REDOX @ 5R 4/6 Common Distinct >15%

Soil Series: Walpole

EST Wet: 30" Below Grade

OBS WT: > 54"

Ledge: 54" Below Grade

Test Pit 10 February 1st, 2022

0-12" 10YR 4/4 Dark Yellowish Brown, Loamy Sand, Blocky, Friable, Cobble >15%, Homogeneous Soil

12-23" 10YR 6/3 Pale Brown, Sandy Loam, aggregate, friable, Cobble >15%, Homogeneous soil

23-36" 10YR 6/2 Light Brownish Grey, Course Sand, granular, Heterogeneous, Cobble >15%, Very Course particles <5%

36-66" 10YR 5/4 Yellowish Brown, Loamy Sand, massive, Indurate > 25% Angular Rock Fragment (Iron Stone)

Test Pit 10 February 1st, 2022 (Cont'd)

66-76" 10YR 5/4 Yellowish Brown, Sandy Loam, massive, Indurate, decaying ledge, > 55% Angular Rock Fragment (Iron Stone)

REDOX @ 52 – 58 10YR 5/6 Common Distinct >15%

Soil Series: Canton – Walpole Complex

EST Wet: 52" Below Grade

OBS WT: >76"

Ledge: 76" Below Grade

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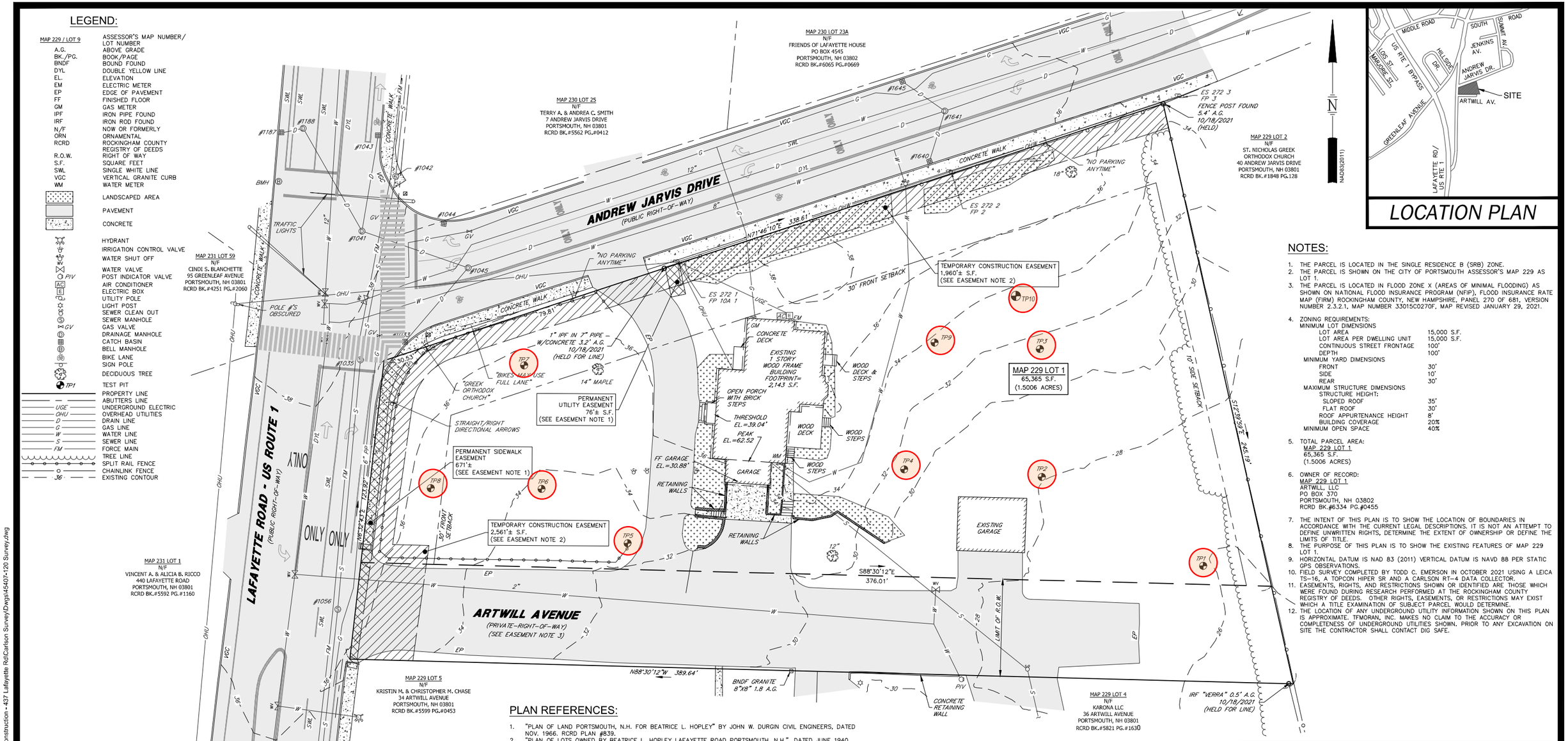

NOTES:

1. THE PARCEL IS LOCATED IN THE SINGLE RESIDENCE B (SRB) ZONE.
2. THE PARCEL IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 229 AS LOT 1.
3. THE PARCEL IS LOCATED IN FLOOD ZONE X (AREAS OF MINIMAL FLOODING) AS SHOWN ON NATIONAL FLOOD INSURANCE PROGRAM (NFIP), FLOOD INSURANCE RATE MAP (FIRM) ROCKINGHAM COUNTY, NEW HAMPSHIRE, PANEL 270 OF 681, VERSION NUMBER 2.3.2.1, MAP NUMBER 33015C0270F, MAP REVISED JANUARY 29, 2021.
4. ZONING REQUIREMENTS:

MINIMUM LOT DIMENSIONS	
LOT AREA	15,000 S.F.
LOT AREA PER DWELLING UNIT	15,000 S.F.
CONTINUOUS STREET FRONTAGE	100'
DEPTH	100'
MINIMUM YARD DIMENSIONS	
FRONT	30'
SIDE	10'
REAR	30'
MAXIMUM STRUCTURE DIMENSIONS	
STRUCTURE HEIGHT:	
SLOPED ROOF	35'
FLAT ROOF	30'
ROOF APPURTENANCE HEIGHT	8'
BUILDING COVERAGE	20%
MINIMUM OPEN SPACE	40%

5. TOTAL PARCEL AREA:
   MAP 229 LOT 1
   65,365 S.F.
   (1.5006 ACRES)
6. OWNER OF RECORD:
   MAP 229 LOT 1
   ARTWILL, LLC
   PO BOX 370
   PORTSMOUTH, NH 03802
   RCRD BK.#6334 PG.#0455
7. THE INTENT OF THIS PLAN IS TO SHOW THE LOCATION OF BOUNDARIES IN ACCORDANCE WITH THE CURRENT LEGAL DESCRIPTIONS. IT IS NOT AN ATTEMPT TO DEFINE UNWRITTEN RIGHTS, DETERMINE THE EXTENT OF OWNERSHIP OR DEFINE THE LIMITS OF TITLE.
8. THE PURPOSE OF THIS PLAN IS TO SHOW THE EXISTING FEATURES OF MAP 229 LOT 1.
9. HORIZONTAL DATUM IS NAD 83 (2011) VERTICAL DATUM IS NAVD 88 PER STATIC GPS OBSERVATIONS.
10. FIELD SURVEY COMPLETED BY TODD C. EMERSON IN OCTOBER 2021 USING A LEICA TS-16, A TOPCON HIPER SR AND A CARLSON RT-4 DATA COLLECTOR.
11. EASEMENTS, RIGHTS, AND RESTRICTIONS SHOWN OR IDENTIFIED ARE THOSE WHICH WERE FOUND DURING RESEARCH PERFORMED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS. OTHER RIGHTS, EASEMENTS, OR RESTRICTIONS MAY EXIST WHICH A TITLE EXAMINATION OF SUBJECT PARCEL WOULD DETERMINE.
12. THE LOCATION OF ANY UNDERGROUND UTILITY INFORMATION SHOWN ON THIS PLAN IS APPROXIMATE. TFMORAN, INC. MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF UNDERGROUND UTILITIES SHOWN. PRIOR TO ANY EXCAVATION ON SITE THE CONTRACTOR SHALL CONTACT DIG SAFE.

EASEMENT NOTES:

1. MAP 229 LOT 1 IS SUBJECT TO PERMANENT EASEMENTS FOR THE INSTALLATION & MAINTENANCE OF A PUBLIC SIDEWALK AND FOR THE INSTALLATION & MAINTENANCE OF TRAFFIC SIGNAL EQUIPMENT. SEE RCRD BK. 5888 PG. 1860 AND PLAN REFERENCE 10 (PARCELS 1 & 3).
2. MAP 229 LOT 1 IS SUBJECT TO TEMPORARY EASEMENTS FOR THE PURPOSE OF INSTALLING AND MAINTAINING A SIDEWALK. SEE RCRD BK. 5888 PG. 1860 AND PLAN REFERENCE 10 (PARCELS 2 & 4).
3. MAP 229 LOT 1 IS SUBJECT TO RIGHTS OVER A PORTION OF THE PREMISES SHOWN AS "ARTWILL AVENUE" GRANTED TO MAP 229 LOT 2 FOR THE PURPOSES OF INGRESS & EGRESS, CONNECTION TO A 2 INCH WATERLINE AND THE EXTENSION THEREOF, CONNECTION TO THE CITY SEWER ON LAFAYETTE ROAD AND THE RIGHT TO FIRST REFUSAL TO PURCHASE A 50 FOOT STRIP OF LAND. SEE RCRD BK.1848 PG. 128.
4. MAP 229 LOT 1 HAS THE BENEFIT OF A 20' WIDE SEWER EASEMENT FOR REPAIR AND MAINTENANCE ACROSS LAND OF MAP 229 LOT 4. SEE RCRD BK. 6236 PG. 731 AND PLAN REFERENCE 6.

PLAN REFERENCES:

1. "PLAN OF LAND PORTSMOUTH, N.H. FOR BEATRICE L. HOPLEY" BY JOHN W. DURGIN CIVIL ENGINEERS, DATED NOV. 1966. RCRD PLAN #839.
2. "PLAN OF LOTS OWNED BY BEATRICE L. HOPLEY LAFAYETTE ROAD PORTSMOUTH, N.H.", DATED JUNE 1940, REVISED FROM ORIGINAL PLAN BY JOHN W. DURGIN, REVISED MAY, 1946, REVISED FEB. 1957. RCRD PLAN #2637.
3. "STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION CONSTRUCTION PLANS FEDERAL AID PROJECT OF PROPOSED BRIDGE REMOVAL BRIDGE NO. 173/071 & RECONFIGURATION OF US ROUTE 1 BYPASS AND US ROUTE 1 (LAFAYETTE ROAD) FEDERAL PROJECT X-A000(994) NH PROJECT NO. 13455-A, CITY OF PORTSMOUTH COUNTY OF ROCKINGHAM", APPROVED 6/27/12. RCRD PLAN #13455.
4. "STATE OF NEW HAMPSHIRE STATE HIGHWAY DEPARTMENT PLAN AND PROFILE OF PROPOSED FEDERAL AID PROJECT LAFAYETTE ROAD NO-R37-A, CITY OF PORTSMOUTH ROCKINGHAM COUNTY". PLAN #50031.
5. "STATE OF NEW HAMPSHIRE STATE HIGHWAY DEPARTMENT PLAN AND PROFILE OF PROPOSED FEDERAL AID PROJECT LAFAYETTE ROAD NO. 37 LAFAYETTE ROAD". PLAN #50147.
6. "CORRECTIVE SEWER EASEMENT PLAN OVER LAND OF KARONA, LLC 36 ARTWILL AVENUE PORTSMOUTH, NEW HAMPSHIRE ASSESSOR'S PARCEL 229-4 FOR KARONA, LLC" BY JAMES VERRA AND ASSOCIATES, INC., DATED 1/19/2021. RCRD PLAN #C-42611.
7. "SUBDIVISION PLAN OF LAND OF J. PHILIP MCCAFFERY FOR GREAT BAY SCHOOL AND TRAINING CENTER LAFAYETTE RD. COUNTY OF ROCKINGHAM PORTSMOUTH NH", BY RICHARD P. MILLETTE AND ASSOCIATES, DATED DEC. 1981, WITH REV.1 FROM 1/7/82. RCRD PLAN #D-10590.
8. "SUBDIVISION PLAN TAX MAP 230 – LOT 23 OWNER: GREAT BAY SCHOOL AND TRAINING CENTER FOR LEMIEUX BUILDERS, INC." 417 LAFAYETTE ROAD CITY OF PORTSMOUTH COUNTY OF ROCKINGHAM STATE NEW HAMPSHIRE" BY AMBIT ENGINEERING, INC., DATED SEPTEMBER 2013, WITH REVISION 2 DATED 12/23/13. RCRD PLAN #D-38079.
9. "EASEMENT PLAN TAX MAP 230 – LOT 25 D.R. LEMIEUX BUILDERS, INC. TO THE CITY OF PORTSMOUTH 7 ANDREW JARVIS DRIVE CITY OF PORTSMOUTH COUNTY OF ROCKINGHAM STATE OF NEW HAMPSHIRE" BY AMBIT ENGINEERING, INC., DATED JUNE 2014, WITH REVISION 2 DATED 7/25/14. RCRD PLAN #D-38417.
10. "EASEMENT PLAN TAX MAP 229 – LOT 1 HARLON P. WILLIS REVOCABLE TRUST AND JEAN P. WILLIS REVOCABLE TRUST TO THE CITY OF PORTSMOUTH 437 LAFAYETTE ROAD CITY OF PORTSMOUTH COUNTY OF ROCKINGHAM STATE OF NEW HAMPSHIRE" BY GPI GREENMAN-PEDERSEN, INC., DATED OCTOBER 26, 2015, WITH REVISION 1 DATED 10/26/2015. RCRD PLAN #D-40626.
11. "EASEMENT PLAN TAX MAP 229 – LOT 5 KRISTEN M. CHASE AND CHRISTOPHER M. CHASE TO THE CITY OF PORTSMOUTH 34 ARTWILL AVENUE CITY OF PORTSMOUTH COUNTY OF ROCKINGHAM STATE OF NEW HAMPSHIRE" BY GPI GREENMAN-PEDERSEN, INC., DATED JANUARY 20, 2016, WITH REVISION 2 DATED 12/2/2016. RCRD PLAN #D-40627.
12. "INTERSECTION IMPROVEMENT PROJECT U.S. ROUTE 1 AT ANDREW JARVIS DRIVE IN THE CITY OF PORTSMOUTH ROCKINGHAM COUNTY STATE OF NEW HAMPSHIRE PREPARED FOR CITY OF PORTSMOUTH DEPT OF PUBLIC WORKS" BY GREENMAN-PEDERSON, INC., DATED 12/22/17.

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This plan is not effective unless signed by a duly authorized officer of TFMoran, Inc.

I CERTIFY THAT THIS SURVEY AND PLAN WERE PREPARED BY THOSE UNDER MY DIRECT SUPERVISION AND ARE THE RESULT OF A FIELD SURVEY CONDUCTED IN OCTOBER, 2021. THIS SURVEY CONFORMS TO THE ACCURACY REQUIREMENTS OF AN URBAN SURVEY OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSURE FOR LAND SURVEYORS.
I FURTHER CERTIFY THAT THIS SURVEY IS CORRECT TO THE BEST OF MY PROFESSIONAL KNOWLEDGE, AND THE FIELD TRAVERSE SURVEY EXCEEDS A PRECISION OF 1:15,000.

DIG SAFE
CALL US UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM
811
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

20 10 0 20
Graphic Scale in Feet

LICENSED LAND SURVEYOR _____ DATE _____

REV.	DATE	DESCRIPTION	DR	CK

TAX MAP 229 LOT 1
EXISTING CONDITIONS PLAN
SMITHFIELD CONSTRUCTION
437 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
COUNTY OF ROCKINGHAM
OWNED BY
ARTWILL, LLC

SCALE: 1" = 20' (22x34)
1" = 40' (11x17) **MARCH 1, 2022**

Seacoast Division
TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.tfmoran.com

FILE	45407-120	DR		FB		S-1
		CK		CADFILE		

Mar 01, 2022 - 2:30pm
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TEST PIT LOG

SITE: 437 LAFAYETTE ROAD, PORTSMOUTH, NH
LOGGED BY: PAUL O'HANLON, TFM, INC.
DATE: 1/25/2022

Test Pit #1:

0–13" 10YR 5/3 BROWN, LOAM, MASSIVE, FRIABLE, ANTHROPOGENIC FILL (ASPHALT, BRICK)
13–20" AB 10YR 7/6 YELLOW, LOAM, BLOCKY, FRIABLE, GRAVELY <5% ROCK (IRON STONE)
20–55" B1 GLEY 1 7N GRAY, SANDY LOAM, MASSIVE, PLIABLE
55– 65" B2 10YR 5/1 GRAY, COARSE SAND, FRIABLE, MASSIVE, > 15% ANGULAR ROCK FRAGMENT (IRON STONE)
REDOX @ 20" 10YR 7/8 COMMON DISTINCT >15%
SOIL SERIES: WALPOLE
EST WET: 20" BELOW GRADE
OBS WT: 39" BELOW GRADE (APPARENT →)
LEDGE: > 65" BELOW GRADE

Test Pit #2:

0–15" A 10YR 4/3 BROWN, LOAM, MASSIVE
15–17" 10YR 7/6 YELLOW, SANDY LOAM, FRIABLE, GRANULAR
17–27" GLEY 1 7/N LIGHT GRAY, SANDY LOAM, FRIABLE, GRANULAR
27–52" 10YR 6/8 BROWNISH YELLOW, LOAM, FRIABLE, MASSIVE
52–77" 10YR 5/1 GRAY, COURSE SAND, FRIABLE, GRAVELY, GRANULAR
REDOX @ 26" 10YR 7/8 COMMON DISTINCT
SOIL SERIES: WALPOLE
EST WET: 26" BELOW GRADE
OBS WT: 51" BELOW GRADE (APPARENT ↑)
LEDGE: 77" BELOW GRADE

Test Pit #3:

0–16" 10YR 4/3 BROWN, LOAM, AGGREGATED, FRIABLE
16–27" 10YR 6/6 BROWNISH YELLOW, LOAM, AGGREGATED, FRIABLE, GRAVELY >5%
27–52" 10YR 7/2 LIGHT GRAY, LOAMY SAND, AGGREGATED, FRIABLE GRAVELY >15%
52–84" 10YR 8/1 WHITE, SANDY CLAY LOAM, PLATEY, INDURATE
REDOX @: 41" 10YR 7/8 COMMON DISTINCT >15%
SOIL SERIES: CANTON – CHATFIELD COMPLEX
EST WET: 41" BELOW GRADE
OBS WT: 84" BELOW GRADE (APPARENT ↘)
LEDGE: 84" BELOW GRADE

Test Pit #4:

0–18" 10YR 5/4 YELLOWISH BROWN, LOAM, FRIABLE, AGGREGATE
18–27" 10YR 6/6 BROWNISH YELLOW, SANDY LOAM, GRAVELY >5%, FRIABLE, AGGREGATE
27–37" 10YR 6/2 LIGHT BROWNISH GREY, LOAMY SAND, > 15% ANGULAR ROCK FRAGMENT (IRON STONE)
37–65" 10YR 7/8 YELLOW, DECAYING BEDROCK, ANGULAR COBBLE, IRON STONE
REDOX @: 5R 3/8 COMMON DISTINCT >15%
SOIL SERIES: CHATFIELD
EST WET: 37" BELOW GRADE
OBS WT: 56" BELOW GRADE (APPARENT ↑)
LEDGE: 65" BELOW GRADE

Test Pit #5:

0–10" 10YR 4/3 BROWN, LOAMY SAND, AGGREGATE, FRIABLE, GRAVELY >5%
10–31" 10YR 5/4 YELLOWISH BROWN, COURSE SAND, GRANULAR, FRIABLE, GRAVELY >15%
31–57" GLEY 1 5/N GRAY, CLAY, DECAYED BEDROCK, BOULDERS >5%, MASSIVE
REDOX @: 31" 5R 3/8 COMMON DISTINCT >15%
SOIL SERIES: CHATFIELD – MAYBID COMPLEX
EST WET: 31" BELOW GRADE
OBS WT: > 57"
LEDGE: 57" BELOW GRADE

TEST PIT LOG

SITE: 437 LAFAYETTE ROAD, PORTSMOUTH, NH
LOGGED BY: PAUL O'HANLON, TFM, INC.
DATE: 1/25/2022

Test Pit #6:

0–12" 10YR 4/3 BROWN, SANDY LOAM, AGGREGATE, FRIABLE
12–16" 10YR 7/2 LIGHT GRAY, SAND, GRANULAR, FRIABLE, GRAVELY >5%
16–28" 10YR 7/1 LIGHT GRAY, FINE SAND, GRANULAR, FRIABLE
28–42" 10YR 7/3 VERY PALE BROWN, SANDY LOAM, AGGREGATE, FRIABLE, HETEROGENEOUS
42–47" GLEY 1 5/5G–1 GREENISH GRAY, SANDY CLAY LOAM, PLATEY, INDURATE
47–96" GLEY 2 8/5BG LIGHT GREENISH GRAY, CLAY, MASSIVE, INDURATE, HOMOGENEOUS
REDOX @42" 5R 3/8 COMMON DISTINCT >15%
SOIL SERIES: CANTON COMPLEX (ANTHROPOGENIC)
EST WET: 42" BELOW GRADE
OBS WT: 79" BELOW GRADE (APPARENT →)
LEDGE: > 96"

Test Pit #7:

0–18" 10YR 4/2 DARK GRAYISH BROWN, SANDY LOAM, FRIABLE, BLOCKY
18–42" 10YR 7/4 VERY PALE BROWN, FINE SAND, GRANULAR, FRIABLE
42–54" 10YR 6/6 BROWNISH YELLOW, COURSE SAND, GRANULAR, FRIABLE
54–65" 10YR 5/8 YELLOWISH BROWN, SANDY LOAM, HETEROGENEOUS, FRIABLE
65–72" GLEY 2 4/10B DARK BLUEISH GRAY, SANDY CLAY LOAM, PLATEY, INDURATE
72–102" GLEY 2 7/10B LIGHT BLUEISH GRAY, CLAY, MASSIVE, INDURATE
REDOX @ 57" 5R 3/8 COMMON DISTINCT >15%
SOIL SERIES: CANTON COMPLEX (ANTHROPOGENIC)
EST WET: 57" BELOW GRADE
OBS WT: 93" BELOW GRADE (APPARENT ↑)
LEDGE: >102"

Test Pit #8:

0–14" 10YR 4/2 DARK GRAYISH BROWN, LOAMY SAND, FRIABLE, BLOCKY
14–42" 10YR 7/4 VERY PALE BROWN, FINE SAND, AGGREGATE, FRIABLE, > 15% COBBLE RIVER STONE
42–50" GLEY 1 5/5G_/1 GREENISH GRAY, SANDY CLAY LOAM, AQUATARD PRESENT (IRON STONE), MASSIVE, INDURATE
50–55" 10YR 6/4 LIGHT YELLOWISH BROWN, SANDY CLAY LOAM, INCLUSION, HETEROGENEOUS, MASSIVE, INDURATE
55–103" GLEY 2 8/5BG LIGHT GREENISH GRAY, CLAY, INDURATE, MASSIVE
REDOX @ 42 5R 3/8 COMMON DISTINCT >15% (AQUATARD (POTENTIALLY ANTHROPOGENIC))
SOIL SERIES: CANTON COMPLEX (ANTHROPOGENIC)
EST WET: 42" BELOW GRADE
OBS WT: 101" BELOW GRADE (APPARENT ↑)
LEDGE: > 103"

Test Pit #9:

0–9"10YR 4/3 BROWN, LOAM, BLOCKY, FRIABLE, GRAVELY >5%
9–23" 10YR 5/6 YELLOWISH BROWN, LOAMY SAND, GRANULAR, , > 15% ANGULAR ROCK FRAGMENT (IRON STONE)
23–54" 10YR 7/2 LIGHT GREY, SANDY LOAM, INDURATE, MASSIVE, HETEROGENEOUS, > 15% ANGULAR ROCK FRAGMENT (IRON STONE)
REDOX @ 5R 4/6 COMMON DISTINCT >15%
SOIL SERIES: WALPOLE
EST WET: 30" BELOW GRADE
OBS WT: > 54"
LEDGE: 54" BELOW GRADE

TEST PIT LOG

SITE: 437 LAFAYETTE ROAD, PORTSMOUTH, NH
LOGGED BY: PAUL O'HANLON, TFM, INC.
DATE: 2/1/2022

Test Pit #10:

0–12" 10YR 4/4 DARK YELLOWISH BROWN, LOAMY SAND, BLOCKY, FRIABLE, COBBLE >15%, HOMOGENEOUS SOIL
12–23" 10YR 6/3 PALE BROWN, SANDY LOAM, AGGREGATE, FRIABLE, COBBLE >15%, HOMOGENEOUS SOIL
23–36" 10YR 6/2 LIGHT BROWNISH GREY, COURSE SAND, GRANULAR, HETEROGENEOUS, COBBLE >15%, VERY COURSE PARTICLES <5%
36–66" 10YR 5/4 YELLOWISH BROWN, LOAMY SAND, MASSIVE, INDURATE > 25% ANGULAR ROCK FRAGMENT (IRON STONE)
66–76" 10YR 5/4 YELLOWISH BROWN, SANDY LOAM, MASSIVE, INDURATE, DECAYING LEDGE, > 55% ANGULAR ROCK FRAGMENT (IRON STONE)
REDOX @ 52 – 58 10YR 5/6 COMMON DISTINCT >15%
SOIL SERIES: CANTON – WALPOLE COMPLEX
EST WET: 52" BELOW GRADE
OBS WT: >76"
LEDGE: 76" BELOW GRADE

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REV.	DATE	DESCRIPTION	DR	CK

TAX MAP 229 LOT 1

TEST PITS LOGS

SMITHFIELD CONSTRUCTION

437 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
COUNTY OF ROCKINGHAM

OWNED BY

ARTWILL, LLC

SCALE: N.T.S.

MARCH 1, 2022

Seacoast Division

TFM

Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.tfmoran.com

FILE	45407-120	DR		FB		S-2
		CK		CADFILE		

Mar 01, 2022 - 2:31pm
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Project No: 45407.12
Project Name: 437 Lafatette Road - Portsmouth, NH

Date: 1/25/2022
Location: TP-3 - Back Yard of Lot 3 - Hole #1

For 5 cm Auger

A of Auger Hole = 19.6 cm^2
Radius of Hole = 2.5 cm
Depth of Auger Hole = 45.0 cm
Depth to Impervious Layer or ESHWT = 104.1 cm 41 in (From Ground Surface

										Approximate Glover Solution		Glover Solution						
															if s>2H		if s<2H	
Reading #	Time Interval	H	Coefficient A	Reading	Δ	Elapsed Time	# On Azm	Conv. Factor (Area)	Outflow	Saturated Hydraulic Conductivity (K_{sat})		s	A1	B1	Saturated Hydraulic Conductivity (K_{sat})		Saturated Hydraulic Conductivity (K_{sat})	
	min	cm	l/cm	cm	cm	hrs	cm	cm^3	cm^3/hr	cm/hr	in/hr	cm			cm/hr	in/hr	cm/hr	in/hr
1	0	-	-	26.5	-	-		-	-	-	-	-	-	-	-			
2	0.5	20	0.000753	25.5	1.0	0.008	1	20	2400	1.8072	0.711	59.1	0.000753	0.0006	1.808	0.712	1.337	0.526
3	1	20	0.000753	24.9	0.6	0.008	1	20	1440	1.08432	0.427	59.1	0.000753	0.0006	1.085	0.427	0.802	0.316
4	1.5	20	0.000753	24.2	0.7	0.008	1	20	1680	1.26504	0.498	59.1	0.000753	0.0006	1.266	0.498	0.936	0.368
5	2	20	0.000753	23.5	0.7	0.008	1	20	1680	1.26504	0.498	59.1	0.000753	0.0006	1.266	0.498	0.936	0.368
6	2.5	20	0.000753	22.8	0.7	0.008	1	20	1680	1.26504	0.498	59.1	0.000753	0.0006	1.266	0.498	0.936	0.368
7	3	20	0.000753	22.2	0.6	0.008	1	20	1440	1.08432	0.427	59.1	0.000753	0.0006	1.085	0.427	0.802	0.316
8	3.5	20	0.000753	21.7	0.5	0.008	1	20	1200	0.9036	0.356	59.1	0.000753	0.0006	0.904	0.356	0.668	0.263
Average Ksat based on readings 2-7											0.470					0.470		0.347

NOTE: Could not keep a steady H reading in the Hole - Infiltrating beyond equipment ability to read

H Steady Head (amount of water in auger hole from bottom of the hole to the surface of the water
A Coefficient A from CCHP Manual - Approximate for Glover Solution
d Distinance from top of water to outflow of CCHP (D-H)
A1 Calculated Coefficient A for Glover Solution (H>2s)
B1 Calculated Coefficient A for Glover Solution (H<2s)
s Distance from bottom of auger hole to impereable layer

Project No: 45407.12
Project Name: 437 Lafatette Road - Portsmouth, NH

Date: 1/25/2022
Location: TP-3 - Back Yard of Lot 3 - Hole #2

For 5 cm Auger

A of Auger Hole = 19.6 cm^2
Radius of Hole = 2.5 cm
Depth of Auger Hole = 52.0 cm
Depth to Impervious Layer or ESHWT = 104.1 cm 41 in (From Ground Surface

										Approximate Glover Solution		Glover Solution						
															if s>2H		if s<2H	
Reading #	Time Interval	H	Coefficient A	Reading	Δ	Elapsed Time	# On Azm	Conv. Factor (Area)	Outflow	Saturated Hydraulic Conductivity (K_{sat})		s	A1	B1	Saturated Hydraulic Conductivity (K_{sat})		Saturated Hydraulic Conductivity (K_{sat})	
	min	cm	l/cm	cm	cm	hrs	cm	cm^3	cm^3/hr	cm/hr	in/hr	cm			cm/hr	in/hr	cm/hr	in/hr
1	0	-	-	27	-	-		-	-	-	-	-	-	-	-			
2	0.5	16	0.001057	25.4	1.6	0.008	1	20	3840	4.05888	1.5980	52.1	0.001057	0.0007	4.058	1.5974	2.794	1.100
3	1	16	0.001057	24.5	0.9	0.008	1	20	2160	2.28312	0.8989	52.1	0.001057	0.0007	2.282	0.899	1.571	0.619
4	1.5	16	0.001057	23.4	1.1	0.008	1	20	2640	2.79048	1.0986	52.1	0.001057	0.0007	2.790	1.0982	1.921	0.756
5	2	16	0.001057	22.5	0.9	0.008	1	20	2160	2.28312	0.8989	52.1	0.001057	0.0007	2.282	0.899	1.571	0.619
6	2.5	16	0.001057	21.6	0.9	0.008	1	20	2160	2.28312	0.8989	52.1	0.001057	0.0007	2.282	0.899	1.571	0.619
7	3	16	0.001057	20.7	0.9	0.008	1	20	2160	2.28312	0.8989	52.1	0.001057	0.0007	2.282	0.899	1.571	0.619
8	3.5	16	0.001057	19.9	0.8	0.008	1	20	1920	2.02944	0.7990	52.1	0.001057	0.0007	2.029	0.799	1.397	0.550
Average Ksat based on readings 2,4-8											0.8789					0.879		0.605

NOTE: Could not keep a steady H reading in the Hole - Infiltrating beyond equipment ability to read

H Steady Head (amount of water in auger hole from bottom of the hole to the surface of the water
A Coefficient A from CCHP Manual - Approximate for Glover Solution
d Distinance from top of water to outflow of CCHP (D-H)
A1 Calculated Coefficient A for Glover Solution (H>2s)
B1 Calculated Coefficient A for Glover Solution (H<2s)
s Distance from bottom of auger hole to impereable layer

Project No: 45407.12
Project Name: 437 Lafatette Road - Portsmouth, NH

Date: 1/25/2022
Location: TP-3 - Back Yard of Lot 3 - Hole #3

For 5 cm Auger

A of Auger Hole = 19.6 cm^2
Radius of Hole = 2.5 cm
Depth of Auger Hole = 46.0 cm
Impervious Layer or ESHWT = 104.1 cm 41 in (From Ground Surface

										Approximate Glover Solution		Glover Solution						
															if s>2H		if s<2H	
Reading #	Time Interval	H	Coefficient A	Reading	Δ	Elapsed Time	# On Azm	Conv. Factor (Area)	Outflow	Saturated Hydraulic Conductivity (K_{sat})		s	A1	B1	Saturated Hydraulic Conductivity (K_{sat})		Saturated Hydraulic Conductivity (K_{sat})	
	min	cm	l/cm	cm	cm	hrs	cm	cm^3	cm^3/hr	cm/hr	in/hr	cm			cm/hr	in/hr	cm/hr	in/hr
1	0	-	-	42.0	-	-		-	-	-	-	-	-	-	-			
2	0.5	19	0.000815	40.8	1.2	0.008	1	20	2880	2.3472	0.924	58.1	0.000815	0.0006	2.347	0.924	1.694	0.667
3	1	19	0.000815	39.9	0.9	0.008	1	20	2160	1.7604	0.693	58.1	0.000815	0.0006	1.760	0.693	1.271	0.500
4	1.5	19	0.000815	39.0	0.9	0.008	1	20	2160	1.7604	0.693	58.1	0.000815	0.0006	1.760	0.693	1.271	0.500
5	2	19	0.000815	38.0	1.0	0.008	1	20	2400	1.956	0.770	58.1	0.000815	0.0006	1.956	0.770	1.412	0.556
6	2.5	19	0.000815	37.2	0.8	0.008	1	20	1920	1.5648	0.616	58.1	0.000815	0.0006	1.565	0.616	1.129	0.445
7	3	19	0.000815	36.4	0.8	0.008	1	20	1920	1.5648	0.616	58.1	0.000815	0.0006	1.565	0.616	1.129	0.445
8	3.5	19	0.000815	35.6	0.8	0.008	1	20	1920	1.5648	0.616	58.1	0.000815	0.0006	1.565	0.616	1.129	0.445
											0.724					0.724		0.522

* NOTE: Could not keep a steady H reading in the Hole - Infiltrating beyond equipment ability to read
H Steady Head (amount of water in auger hole from bottom of the hole to the surface of the water
A Coefficient A from CCHP Manual - Approximate for Glover Solution
d Distinance from top of water to outflow of CCHP (D-H)
A1 Calculated Coefficient A for Glover Solution (H>2s)
B1 Calculated Coefficient A for Glover Solution (H<2s)
s Distance from bottom of auger hole to impereable layer

Hole #1	0.5
Hole #2	0.9
Hole #3	0.7
Average	**0.7**

Project No: 45407.12
Project Name: 437 Lafatette Road - Portsmouth, NH

Date: 4/25/2024
Location: TP-4 Between Lots 2 and 3

For 5 cm Auger

A of Auger Hole = 19.6 cm^2
Radius of Hole = 2.5 cm
Depth of Auger Hole = 46.0 cm
Depth to Impervious Layer or ESHWT = 94.0 cm 37 in (From Ground Surface

										Approximate Glover Solution		Glover Solution						
															if s>2H		if s<2H	
Reading #	Time Interval	H	Coefficient A	Reading	Δ	Elapsed Time	# On Azm	Conv. Factor (Area)	Outflow	Saturated Hydraulic Conductivity (K_{sat})		s	A1	B1	Saturated Hydraulic Conductivity (K_{sat})		Saturated Hydraulic Conductivity (K_{sat})	
	min	cm	l/cm	cm	cm	hrs	cm	cm^3	cm^3/hr	cm/hr	in/hr	cm			cm/hr	in/hr	cm/hr	in/hr
1	0	-	-	33.0	-	-		-	-	-	-	-	-	-	-			
2	1	14	0.001288	32.4	0.6	0.017	1	20	720	0.92736	0.3651	48.0	0.001288	0.0009	0.928	0.365	0.613	0.241
3	2	14	0.001288	31.8	0.6	0.017	1	20	720	0.92736	0.3651	48.0	0.001288	0.0009	0.928	0.365	0.613	0.241
4	3	14	0.001288	31.3	0.5	0.017	1	20	600	0.7728	0.3043	48.0	0.001288	0.0009	0.773	0.304	0.511	0.201
5	4	14	0.001288	30.8	0.5	0.017	1	20	600	0.7728	0.3043	48.0	0.001288	0.0009	0.773	0.304	0.511	0.201
6	5	14	0.001288	30.4	0.4	0.017	1	20	480	0.61824	0.2434	48.0	0.001288	0.0009	0.618	0.243	0.409	0.161
7	6	14	0.001288	22.2	8.2	0.017	1	20	9840	12.67392	4.9897	48.0	0.001288	0.0009	12.677	4.991	8.381	3.300
Average Ksat based on readings 1-6											0.3164					0.316		0.724

NOTE: Could not keep a steady H reading in the Hole - Infiltrating beyond equipment ability to read

H Steady Head (amount of water in auger hole from bottom of the hole to the surface of the water
A Coefficient A from CCHP Manual - Approximate for Glover Solution
d Distinance from top of water to outflow of CCHP (D-H)
A1 Calculated Coefficient A for Glover Solution (H>2s)
B1 Calculated Coefficient A for Glover Solution (H<2s)
s Distance from bottom of auger hole to impereable layer

Project No: 45407.12
Project Name: 437 Lafatette Road - Portsmouth, NH

Date: 1/25/2022
Location: TP-4 Between Lots 2 and 3

For 5 cm Auger

A of Auger Hole = 19.6 cm^2
Radius of Hole = 2.5 cm
Depth of Auger Hole = 38.0 cm
Depth to Impervious Layer or ESHWT = 94.0 cm 37 in (From Ground Surface

										Approximate Glover Solution		Glover Solution						
															if s>2H		if s<2H	
Reading #	Time Interval	H	Coefficient A	Reading	Δ	Elapsed Time	# On Azm	Conv. Factor (Area)	Outflow	Saturated Hydraulic Conductivity (K_{sat})		s*	A1	B1	Saturated Hydraulic Conductivity (K_{sat})		Saturated Hydraulic Conductivity (K_{sat})	
	min	cm	l/cm	cm	cm	hrs	cm	cm^3	cm^3/hr	cm/hr	in/hr	cm			cm/hr	in/hr	cm/hr	in/hr
1	0	-	-	27.2	-	-		-	-	-	-	-	-	-	-			
2	2	15	0.001163	26.5	0.7	0.033	1	20	420	0.48846	0.1923	56.0	0.001163	0.0007	0.489	0.192	0.305	0.120
3	4	15	0.001163	26	0.5	0.033	1	20	300	0.3489	0.1374	56.0	0.001163	0.0007	0.349	0.137	0.218	0.086
4	6	15	0.001163	25.9	0.1	0.033	1	20	60	0.06978	0.0275	56.0	0.001163	0.0007	0.070	0.027	0.044	0.017
5	8	15	0.001163	25.4	0.5	0.033	1	20	300	0.3489	0.1374	56.0	0.001163	0.0007	0.349	0.137	0.218	0.086
Average Ksat based on readings 1-3											0.1648					0.165		0.103

NOTE: Could not keep a steady H reading in the Hole - Infiltrating beyond equipment ability to read

H Steady Head (amount of water in auger hole from bottom of the hole to the surface of the water
A Coefficient A from CCHP Manual - Approximate for Glover Solution
d Distinance from top of water to outflow of CCHP (D-H)
A1 Calculated Coefficient A for Glover Solution (H>2s)
B1 Calculated Coefficient A for Glover Solution (H<2s)
s Distance from bottom of auger hole to impereable layer (ESHW - Depth of Auger Hole in cm)

Project No: 45407.12 Date: 4/25/2024

Project Name: 437 Lafatette Road - Portsmouth, NH Location: TP-4 Between Lots 2 and 3

For 5 cm Auger

A of Auger Hole = 19.6 cm^2

Radius of Hole = 2.5 cm

Depth of Auger Hole = 43.0 cm

Impervious Layer or ESHWT = 94.0 cm 37 in (From Ground Surface

										Approximate Glover Solution		Glover Solution						
															if s>2H		if s<2H	
Reading #	Time Interval	H	Coefficient A	Reading	Δ	Elapsed Time	# On Azm	Conv. Factor (Area)	Outflow	Saturated Hydraulic Conductivity (K_{sat})		s	A1	B1	Saturated Hydraulic Conductivity (K_{sat})		Saturated Hydraulic Conductivity (K_{sat})	
	min	cm	l/cm	cm	cm	hrs	cm	cm^3	cm^3/hr	cm/hr	in/hr	cm			cm/hr	in/hr	cm/hr	in/hr
1	0	-	-	37.0	-	-		-	-	-	-	-	-	-	-			
2	1	15	0.001163	36.0	1.0	0.017	1	20	1200	1.3956	0.549	51.0	0.001163	0.0008	1.396	0.550	0.931	0.367
3	2	15	0.001163	35.5	0.5	0.017	1	20	600	0.6978	0.275	51.0	0.001163	0.0008	0.698	0.275	0.466	0.183
4	3	15	0.001163	35.0	0.5	0.017	1	20	600	0.6978	0.275	51.0	0.001163	0.0008	0.698	0.275	0.466	0.183
5	4	15	0.001163	34.5	0.5	0.017	1	20	600	0.6978	0.275	51.0	0.001163	0.0008	0.698	0.275	0.466	0.183
6	5	15	0.001163	34.0	0.5	0.017	1	20	600	0.6978	0.275	51.0	0.001163	0.0008	0.698	0.275	0.466	0.183
Average Ksat based on readings 3-6											0.275					0.275		0.183

* NOTE: Could not keep a steady H reading in the Hole - Infiltrating beyond equipment ability to read

H Steady Head (amount of water in auger hole from bottom of the hole to the surface of the water

A Coefficient A from CCHP Manual - Approximate for Glover Solution

d Distinance from top of water to outflow of CCHP (D-H)

A1 Calculated Coefficient A for Glover Solution (H>2s)

B1 Calculated Coefficient A for Glover Solution (H<2s)

s Distance from bottom of auger hole to impereable layer

Hole #1	0.3
Hole #2	0.2
Hole #3	0.3
Average	**0.3**

Project No: 45407.12
Project Name: 437 Lafatette Road - Portsmouth, NH

Date: 1/25/2022
Location: TP 5 - SE Corner of Lot 3

For 5 cm Auger

A of Auger Hole = 19.6 cm^2
Radius of Hole = 2.5 cm
Depth of Auger Hole = 32.0 cm
Depth to Impervious Layer or ESHWT = 78.7 cm 31 in (From Ground Surface

										Approximate Glover Solution		Glover Solution						
															if s>2H		if s<2H	
Reading #	Time Interval	H	Coefficient A	Reading	Δ	Elapsed Time	# On Azm	Conv. Factor (Area)	Outflow	Saturated Hydraulic Conductivity (K_{sat})		s*	A1	B1	Saturated Hydraulic Conductivity (K_{sat})		Saturated Hydraulic Conductivity (K_{sat})	
	min	cm	l/cm	cm	cm	hrs	cm	cm^3	cm^3/hr	cm/hr	in/hr	cm			cm/hr	in/hr	cm/hr	in/hr
1	0	-	-	46.8	-	-		-	-	-	-	-	-	-	-			
2	2	11	0.00182817	44.5	2.3	0.033	2	105	7245	13.24512	5.2146	46.7	0.001827	0.0010	13.238	5.212	7.368	2.901
3	3	11	0.00182817	43.8	0.7	0.017	2	105	4410	8.062249	3.1741	46.7	0.001827	0.0010	8.058	3.173	4.485	1.766
4	4	11	0.00182817	43.3	0.5	0.017	2	105	3150	5.75875	2.2672	46.7	0.001827	0.0010	5.756	2.266	3.203	1.261
5	5	11	0.00182817	42.8	0.5	0.017	2	105	3150	5.75875	2.2672	46.7	0.001827	0.0010	5.756	2.266	3.203	1.261
6	6	11	0.00182817	42.2	0.6	0.017	2	105	3780	6.910499	2.7207	46.7	0.001827	0.0010	6.907	2.719	3.844	1.513
Average Ksat based on readings 3-6											2.6073					2.606		1.450

NOTE: Could not keep a steady H reading in the Hole - Infiltrating beyond equipment ability to read

H Steady Head (amount of water in auger hole from bottom of the hole to the surface of the water
A Coefficient A from CCHP Manual - Approximate for Glover Solution
d Distinance from top of water to outflow of CCHP (D-H)
A1 Calculated Coefficient A for Glover Solution (H>2s)
B1 Calculated Coefficient A for Glover Solution (H<2s)
s Distance from bottom of auger hole to impereable layer (ESHW - Depth of Auger Hole in cm)

Project No: 45407.12
Project Name: 437 Lafatette Road - Portsmouth, NH

Date: 1/25/2022
Location: TP 5 - SE Corner of Lot 3

For 5 cm Auger

A of Auger Hole = 19.6 cm^2
Radius of Hole = 2.5 cm
Depth of Auger Hole = 37.0 cm
Depth to Impervious Layer or ESHWT = 78.7 cm 31 in (From Ground Surface

										Approximate Glover Solution		Glover Solution						
															if s>2H		if s<2H	
Reading #	Time Interval	H	Coefficient A	Reading	Δ	Elapsed Time	# On Azm	Conv. Factor (Area)	Outflow	Saturated Hydraulic Conductivity (K_{sat})		s	A1	B1	Saturated Hydraulic Conductivity (K_{sat})		Saturated Hydraulic Conductivity (K_{sat})	
	min	cm	l/cm	cm	cm	hrs	cm	cm^3	cm^3/hr	cm/hr	in/hr	cm			cm/hr	in/hr	cm/hr	in/hr
1	0	-	-	32.7	-	-		-	-	-	-	-	-	-	-			
2	1	16	0.001057	31.8	0.9	0.017	2	105	5670	5.99319	2.360	41.7	0.001057	0.0008	5.991	2.359	4.778	1.881
3	2	16	0.001057	31.1	0.7	0.017	2	105	4410	4.66137	1.835	41.7	0.001057	0.0008	4.660	1.835	3.716	1.463
4	3	16	0.001057	30.2	0.9	0.017	2	105	5670	5.99319	2.360	41.7	0.001057	0.0008	5.991	2.359	4.778	1.881
5	4	16	0.001057	29.4	0.8	0.017	2	105	5040	5.32728	2.097	41.7	0.001057	0.0008	5.325	2.097	4.247	1.672
6	5	16	0.001057	28.7	0.7	0.017	2	105	4410	4.66137	1.835	41.7	0.001057	0.0008	4.660	1.835	3.716	1.463
7	6	16	0.001057	28	0.7	0.017	2	105	4410	4.66137	1.835	41.7	0.001057	0.0008	4.660	1.835	3.716	1.463
Average Ksat based on readings											2.054					2.053		1.637

NOTE: Could not keep a steady H reading in the Hole - Infiltrating beyond equipment ability to read

H Steady Head (amount of water in auger hole from bottom of the hole to the surface of the water
A Coefficient A from CCHP Manual - Approximate for Glover Solution
d Distinance from top of water to outflow of CCHP (D-H)
A1 Calculated Coefficient A for Glover Solution (H>2s)
B1 Calculated Coefficient A for Glover Solution (H<2s)
s Distance from bottom of auger hole to impereable layer

Hole #1	2.6
Hole #2	2.1
Average	**2.4**

Project No: 45407.12
Project Name: 437 Lafatette Road - Portsmouth, NH

Date: 1/25/2022
Location: TP-7 Back of Lot 1

For 5 cm Auger

A of Auger Hole = 19.6 cm^2
Radius of Hole = 2.5 cm
Depth of Auger Hole = 28.0 cm
Depth to Impervious Layer or ESHWT = 236.2 cm 93 in (From Ground Surface

										Approximate Glover Solution		Glover Solution						
															if s>2H		if s<2H	
Reading #	Time Interval	H	Coefficient A	Reading	Δ	Elapsed Time	# On Azm	Conv. Factor (Area)	Outflow	Saturated Hydraulic Conductivity (K_{sat})		s	A1	B1	Saturated Hydraulic Conductivity (K_{sat})		Saturated Hydraulic Conductivity (K_{sat})	
	min	cm	l/cm	cm	cm	hrs	cm	cm^3	cm^3/hr	cm/hr	in/hr	cm			cm/hr	in/hr	cm/hr	in/hr
1	0	-	-	26.0	-	-		-	-	-	-	-	-	-	-			
2	1	12	0.0016137	24.8	1.2	0.017	2	105	7560	12.19959	4.8030	208.2	0.001613	0.0003	12.193	4.801	2.086	0.821
3	2	12	0.0016137	24.1	0.7	0.017	2	105	4410	7.11643	2.8017	208.2	0.001613	0.0003	7.113	2.800	1.217	0.479
4	3	12	0.0016137	23.3	0.8	0.017	2	105	5040	8.133062	3.2020	208.2	0.001613	0.0003	8.129	3.200	1.391	0.547
5	4	12	0.0016137	22.5	0.8	0.017	2	105	5040	8.133062	3.2020	208.2	0.001613	0.0003	8.129	3.200	1.391	0.547
6	5	12	0.0016137	21.8	0.7	0.017	2	105	4410	7.11643	2.8017	208.2	0.001613	0.0003	7.113	2.800	1.217	0.479
7	6	12	0.0016137	20.9	0.9	0.017	2	105	5670	9.149695	3.6022	208.2	0.001613	0.0003	9.145	3.600	1.564	0.616
Average Ksat based on readings 3-7											3.1219					3.120		0.534

NOTE: Could not keep a steady H reading in the Hole - Infiltrating beyond equipment ability to read

H Steady Head (amount of water in auger hole from bottom of the hole to the surface of the water
A Coefficient A from CCHP Manual - Approximate for Glover Solution
d Distinance from top of water to outflow of CCHP (D-H)
A1 Calculated Coefficient A for Glover Solution (H>2s)
B1 Calculated Coefficient A for Glover Solution (H<2s)
s Distance from bottom of auger hole to impereable layer

Project No: 45407.12
Project Name: 437 Lafatette Road - Portsmouth, NH

Date: 1/25/2022
Location: TP-7 Back of Lot 1

For 5 cm Auger

A of Auger Hole = 19.6 cm^2
Radius of Hole = 2.5 cm
Depth of Auger Hole = 36.0 cm
Depth to Impervious Layer or ESHWT = 236.2 cm 93 in (From Ground Surface

										Approximate Glover Solution		Glover Solution						
															if s>2H		if s<2H	
Reading #	Time Interval	H	Coefficient A	Reading	Δ	Elapsed Time	# On Azm	Conv. Factor (Area)	Outflow	Saturated Hydraulic Conductivity (K_{sat})		s*	A1	B1	Saturated Hydraulic Conductivity (K_{sat})		Saturated Hydraulic Conductivity (K_{sat})	
	min	cm	l/cm	cm	cm	hrs	cm	cm^3	cm^3/hr	cm/hr	in/hr	cm			cm/hr	in/hr	cm/hr	in/hr
1	0	-	-	15.5	-	-		-	-	-	-	-	-	-	-			
2	1	8	0.00284801	14.5	1.0	0.017	2	105	6300	17.94247	7.0640	200.2	0.002847	0.0003	17.933	7.060	2.061	0.811
3	2	8	0.00284801	13.7	0.8	0.017	2	105	5040	14.35398	5.6512	200.2	0.002847	0.0003	14.347	5.648	1.649	0.649
4	3	8	0.00284801	12.8	0.9	0.017	2	105	5670	16.14822	6.3576	200.2	0.002847	0.0003	16.140	6.354	1.855	0.730
5	4	8	0.00284801	12.2	0.6	0.017	2	105	3780	10.76548	4.2384	200.2	0.002847	0.0003	10.760	4.236	1.236	0.487
6	5	8	0.00284801	11.5	0.7	0.017	2	105	4410	12.55973	4.9448	200.2	0.002847	0.0003	12.553	4.942	1.443	0.568
7	6	8	0.00284801	10.8	0.7	0.017	2	105	4410	12.55973	4.9448	200.2	0.002847	0.0003	12.553	4.942	1.443	0.568
Average Ksat based on readings 3-7											5.2273					5.225		0.600

NOTE: Could not keep a steady H reading in the Hole - Infiltrating beyond equipment ability to read

H Steady Head (amount of water in auger hole from bottom of the hole to the surface of the water
A Coefficient A from CCHP Manual - Approximate for Glover Solution
d Distinance from top of water to outflow of CCHP (D-H)
A1 Calculated Coefficient A for Glover Solution (H>2s)
B1 Calculated Coefficient A for Glover Solution (H<2s)
s Distance from bottom of auger hole to impereable layer (ESHW - Depth of Auger Hole in cm)

Project No: 45407.12 Date: 1/25/2022

Project Name: 437 Lafatette Road - Portsmouth, NH Location: TP-7 Back of Lot 1

For 5 cm Auger

A of Auger Hole = 19.6 cm^2

Radius of Hole = 2.5 cm

Depth of Auger Hole = 34 cm

Impervious Layer or ESHWT = 236.2 cm 93 in (From Ground Surface

										Approximate Glover Solution		Glover Solution						
															if s>2H		if s<2H	
Reading #	Time Interval	H	Coefficient A	Reading	Δ	Elapsed Time	# On Azm	Conv. Factor (Area)	Outflow	Saturated Hydraulic Conductivity (K_{sat})		s	A1	B1	Saturated Hydraulic Conductivity (K_{sat})		Saturated Hydraulic Conductivity (K_{sat})	
	min	cm	l/cm	cm	cm	hrs	cm	cm^3	cm^3/hr	cm/hr	in/hr	cm			cm/hr	in/hr	cm/hr	in/hr
1	0	-	-	38.5	-	-		-	-	-	-	-	-	-	-			
2	1	8.5	0.00262191	37.9	0.6	0.017	2	105	3780	9.910837	3.902	202.2	0.002621	0.0003	9.906	3.900	1.209	0.476
3	2	8.5	0.00262191	37.1	0.8	0.017	2	105	5040	13.21445	5.203	202.2	0.002621	0.0003	13.208	5.200	1.612	0.635
4	3	8.5	0.00262191	36.4	0.7	0.017	2	105	4410	11.56264	4.552	202.2	0.002621	0.0003	11.557	4.550	1.410	0.555
5	4	8.5	0.00262191	35.7	0.7	0.017	2	105	4410	11.56264	4.552	202.2	0.002621	0.0003	11.557	4.550	1.410	0.555
6	6	8.5	0.00262191	34.5	1.2	0.033	2	105	3780	9.910837	3.902	202.2	0.002621	0.0003	9.906	3.900	1.209	0.476
Average Ksat based on readings 3-6											4.552					4.550		0.555

* NOTE: Could not keep a steady H reading in the Hole - Infiltrating beyond equipment ability to read

H Steady Head (amount of water in auger hole from bottom of the hole to the surface of the water

A Coefficient A from CCHP Manual - Approximate for Glover Solution

d Distinance from top of water to outflow of CCHP (D-H)

A1 Calculated Coefficient A for Glover Solution (H>2s)

B1 Calculated Coefficient A for Glover Solution (H<2s)

s Distance from bottom of auger hole to impereable layer

Hole #1	3.1
Hole #2	5.2
Hole #3	4.6
Average	**4.3**

Project No: 45407.12
Project Name: 437 Lafatette Road - Portsmouth, NH

Date: 1/25/2022
Location: TP-10 Back of Lot 3

For 5 cm Auger

A of Auger Hole = 19.6 cm^2
Radius of Hole = 2.5 cm
Depth of Auger Hole = 34.0 cm
Depth to Impervious Layer or ESHWT = 159.0 cm 63 in (From Ground Surface

										Approximate Glover Solution		Glover Solution						
															if s>2H		if s<2H	
Reading #	Time Interval	H	Coefficient A	Reading	Δ	Elapsed Time	# On Azm	Conv. Factor (Area)	Outflow	Saturated Hydraulic Conductivity (K_{sat})		s	A1	B1	Saturated Hydraulic Conductivity (K_{sat})		Saturated Hydraulic Conductivity (K_{sat})	
	min	cm	l/cm	cm	cm	hrs	cm	cm^3	cm^3/hr	cm/hr	in/hr	cm			cm/hr	in/hr	cm/hr	in/hr
1	0	-	-	34.5	-	-		-	-	-	-	-	-	-	-			
2	1	20	0.00075386	33.3	1.2	0.017	1	20	1440	1.085555	0.4274	125.0	0.000753	0.0003	1.085	0.427	0.461	0.182
3	2	20	0.00075386	31.5	1.8	0.017	1	20	2160	1.628332	0.6411	125.0	0.000753	0.0003	1.628	0.641	0.692	0.272
4	3	20	0.00075386	30.0	1.5	0.017	1	20	1800	1.356944	0.5342	125.0	0.000753	0.0003	1.356	0.534	0.576	0.227
5	4	20	0.00075386	28.5	1.5	0.017	1	20	1800	1.356944	0.5342	125.0	0.000753	0.0003	1.356	0.534	0.576	0.227
5	5	20	0.00075386	27.0	1.5	0.017	1	20	1800	1.356944	0.5342	125.0	0.000753	0.0003	1.356	0.534	0.576	0.227
Average Ksat based on readings 3-7											0.5609					0.561		0.238

NOTE: Could not keep a steady H reading in the Hole - Infiltrating beyond equipment ability to read

H Steady Head (amount of water in auger hole from bottom of the hole to the surface of the water
A Coefficient A from CCHP Manual - Approximate for Glover Solution
d Distinance from top of water to outflow of CCHP (D-H)
A1 Calculated Coefficient A for Glover Solution (H>2s)
B1 Calculated Coefficient A for Glover Solution (H<2s)
s Distance from bottom of auger hole to impereable layer

Project No: 45407.12
Project Name: 437 Lafatette Road - Portsmouth, NH

Date: 1/25/2022
Location: TP-10 Back of Lot 3

For 5 cm Auger

A of Auger Hole = 19.6 cm^2
Radius of Hole = 2.5 cm
Depth of Auger Hole = 46.0 cm
Depth to Impervious Layer or ESHWT = 159.0 cm 63 in (From Ground Surface

										Approximate Glover Solution		Glover Solution						
															if s>2H		if s<2H	
Reading #	Time Interval	H	Coefficient A	Reading	Δ	Elapsed Time	# On Azm	Conv. Factor (Area)	Outflow	Saturated Hydraulic Conductivity (K_{sat})		s*	A1	B1	Saturated Hydraulic Conductivity (K_{sat})		Saturated Hydraulic Conductivity (K_{sat})	
	min	cm	l/cm	cm	cm	hrs	cm	cm^3	cm^3/hr	cm/hr	in/hr	cm			cm/hr	in/hr	cm/hr	in/hr
1	0	-	-	42	-	-		-	-	-	-	-	-	-	-			
2	0.5	26	0.00050145	37.9	4.1	0.008	1	20	9840	4.934274	1.9426	113.0	0.000501	0.0003	4.932	1.942	2.783	1.096
3	1	26	0.00050145	34.4	3.5	0.008	1	20	8400	4.212185	1.6583	113.0	0.000501	0.0003	4.210	1.657	2.376	0.935
4	1.5	26	0.00050145	31.8	2.6	0.008	1	20	6240	3.129052	1.2319	113.0	0.000501	0.0003	3.127	1.231	1.765	0.695
5	2	26	0.00050145	29.8	2.0	0.008	1	20	4800	2.406963	0.9476	113.0	0.000501	0.0003	2.406	0.947	1.358	0.535
6	2.5	26	0.00050145	28.2	1.6	0.008	1	20	3840	1.92557	0.7581	113.0	0.000501	0.0003	1.925	0.758	1.086	0.428
7	3	26	0.00050145	26.6	1.6	0.008	1	20	3840	1.92557	0.7581	113.0	0.000501	0.0003	1.925	0.758	1.086	0.428
8	3.5	26	0.00050145	25.4	1.2	0.008	1	20	2880	1.444178	0.5686	113.0	0.000501	0.0003	1.443	0.568	0.815	0.321
9	4	26	0.00050145	24.2	1.2	0.008	1	20	2880	1.444178	0.5686	113.0	0.000501	0.0003	1.443	0.568	0.815	0.321
10	4.5	26	0.00050145	23	1.2	0.008	1	20	2880	1.444178	0.5686	113.0	0.000501	0.0003	1.443	0.568	0.815	0.321
Average Ksat based on readings 3-7											0.6444					0.644		0.363

NOTE: Could not keep a steady H reading in the Hole - Infiltrating beyond equipment ability to read

H Steady Head (amount of water in auger hole from bottom of the hole to the surface of the water
A Coefficient A from CCHP Manual - Approximate for Glover Solution
d Distinance from top of water to outflow of CCHP (D-H)
A1 Calculated Coefficient A for Glover Solution (H>2s)
B1 Calculated Coefficient A for Glover Solution (H<2s)
s Distance from bottom of auger hole to impereable layer (ESHW - Depth of Auger Hole in cm)

Project No: 45407.12 Date: 1/25/2022

Project Name: 437 Lafatette Road - Portsmouth, NH Location: TP-10 Back of Lot 3

For 5 cm Auger

A of Auger Hole = 19.6 cm^2

Radius of Hole = 2.5 cm

Depth of Auger Hole = 32 cm

Impervious Layer or ESHWT = 159.0 cm 63 in (From Ground Surface

										Approximate Glover Solution		Glover Solution						
															if s>2H		if s<2H	
Reading #	Time Interval	H	Coefficient A	Reading	Δ	Elapsed Time	# On Azm	Conv. Factor (Area)	Outflow	Saturated Hydraulic Conductivity (K_{sat})		s	A1	B1	Saturated Hydraulic Conductivity (K_{sat})		Saturated Hydraulic Conductivity (K_{sat})	
	min	cm	l/cm	cm	cm	hrs	cm	cm^3	cm^3/hr	cm/hr	in/hr	cm			cm/hr	in/hr	cm/hr	in/hr
1	0	-	-	35.0	-	-		-	-	-	-	-	-	-	-			
2	0.5	14	0.001288	33.4	1.6	0.008	1	20	3840	4.94592	1.947	127.0	0.001288	0.0004	4.947	1.948	1.524	0.600
3	1	14	0.001288	32.6	0.8	0.008	1	20	1920	2.47296	0.974	127.0	0.001288	0.0004	2.474	0.974	0.762	0.300
4	1.5	14	0.001288	31.8	0.8	0.008	1	20	1920	2.47296	0.974	127.0	0.001288	0.0004	2.474	0.974	0.762	0.300
5	2	14	0.001288	31.1	0.7	0.008	1	20	1680	2.16384	0.852	127.0	0.001288	0.0004	2.164	0.852	0.667	0.263
6	2.5	14	0.001288	30.4	0.7	0.008	1	20	1680	2.16384	0.852	127.0	0.001288	0.0004	2.164	0.852	0.667	0.263
7	3	14	0.001288	29.6	0.8	0.008	1	20	1920	2.47296	0.974	127.0	0.001288	0.0004	2.474	0.974	0.762	0.300
8	3.5	14	0.001288	28.9	0.7	0.008	1	20	1680	2.16384	0.852	127.0	0.001288	0.0004	2.164	0.852	0.667	0.263
Average Ksat based on readings 3-6											0.913					0.913		0.281

* NOTE: Could not keep a steady H reading in the Hole - Infiltrating beyond equipment ability to read

H Steady Head (amount of water in auger hole from bottom of the hole to the surface of the water

A Coefficient A from CCHP Manual - Approximate for Glover Solution

d Distinance from top of water to outflow of CCHP (D-H)

A1 Calculated Coefficient A for Glover Solution (H>2s)

B1 Calculated Coefficient A for Glover Solution (H<2s)

s Distance from bottom of auger hole to impereable layer

Hole #1	0.6
Hole #2	0.6
Hole #3	0.9
Average	**0.7**

APPENDIX J – NHDES ONE STOP DATAMAPPER

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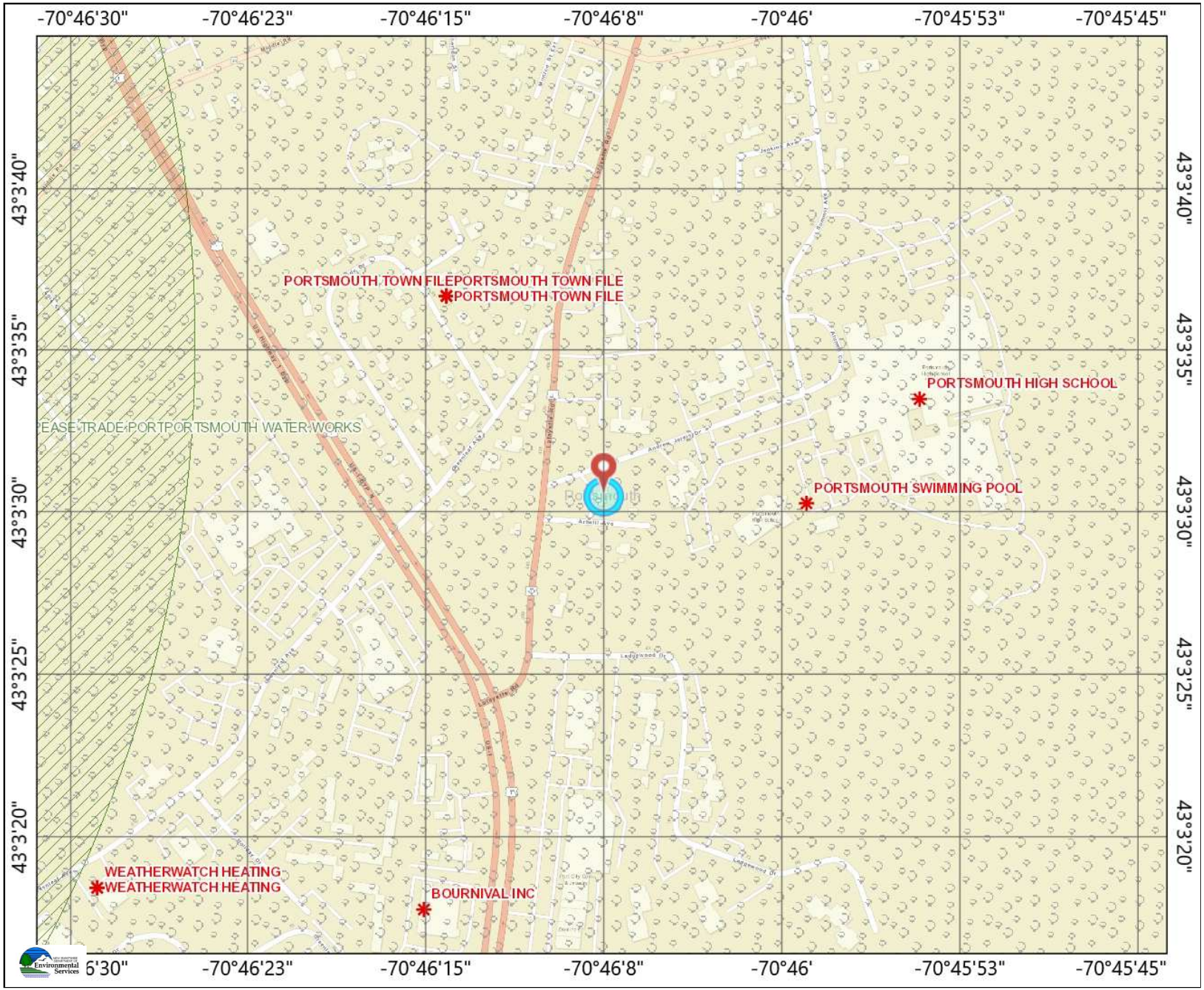
437 Lafayette Road - AoT Screening Layers



Legend

- Remediation Sites
- Coastal and Great Bay Regi Communities
- Designated Rivers Quarterm Buffer
- Public Water Supply Wells
- Groundwater Classification / GA1
- Groundwater Classification / GA2
- Water Supply Intake Protect Areas
- Wellhead Protection Areas
- Class A Lakes with a Quarte Buffer
- Class A - All Features
- All Lakes, with a Quarter Mil Buffer
- Outstanding Resource Wate Watersheds
- Surface Waters with Impairn 2016 with Quarter Mile Buffe
- Watersheds with Chloride Impairments 2016

Map Scale

1: 5,000

© NH DES, http://des.nh.gov

Map Generated: 1/25/2022

Notes

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APPENDIX K - PRE AND POST-DEVELOPMENT DRAINAGE PLANS

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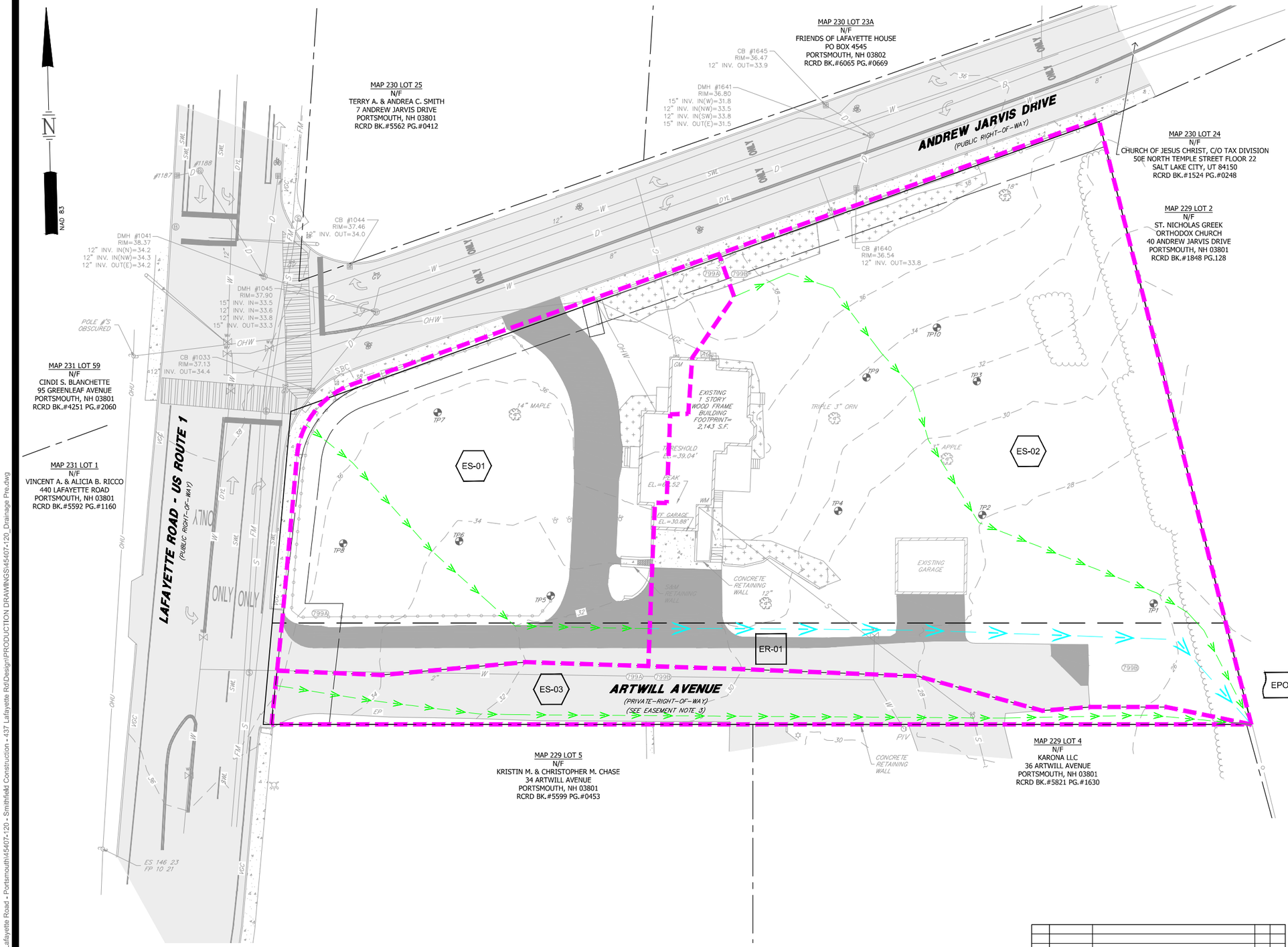

LEGEND

- PROPERTY LINE
- LIMITS OF DRAINAGE SUBCATCHMENT
- SOIL GROUP BREAKLINE
- FLOW PATH (Tc LINE)
- REACH
- EPOI-01 — EXISTING POINT OF INTEREST
- ES-1 — EXISTING SUBCATCHMENT AREA
- ER-1 — EXISTING REACH

SOIL LEGEND (PER SITE SPECIFIC SOIL SURVEY)

SYMBOL	DESCRIPTION	HYDROLOGIC SOIL GROUP
799*	UBRAN LAND-CANTON COMPLEX 3% - 15% SLOPES	A (BASED ON FIELD INFILTRATION RATES)
799*	UBRAN LAND-CANTON COMPLEX 3% - 15% SLOPES	B (BASED ON FIELD INFILTRATION RATES)

*ENTIRE PROPERTY IDENTIFIED AS URBAN LAND-CANTON COMPLEX.

HORIZONTAL SCALE 1"=20'
20 10 0 20

REV	DATE	DESCRIPTION	DR	CK

SITE DEVELOPMENT PLANS

TAX MAP 229 LOT 1

PRE-DEVELOPMENT DRAINAGE MAP

PROPOSED 3 LOT SUBDIVISION

437 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

OWNED BY & PREPARE FOR
ARTWILL, LLC

1"=40' (11"X17")
SCALE: 1"=20' (22"X34")
APRIL 19, 2022

TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

FILE	DR	JSM	FB		
45407-120	CK	JCC	CADFILE	45407-120_DRAINAGE PRE	D-01

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DIG SAFE
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

Apr 15, 2022 - 11:52am
P:\MSC Projects\45407 - Lafayette Road - Portsmouth\45407-120 - Smithfield Construction - 437 Lafayette Rd\Design\PRODUCTION DRAWINGS\45407-120_Drainage Pre.dwg

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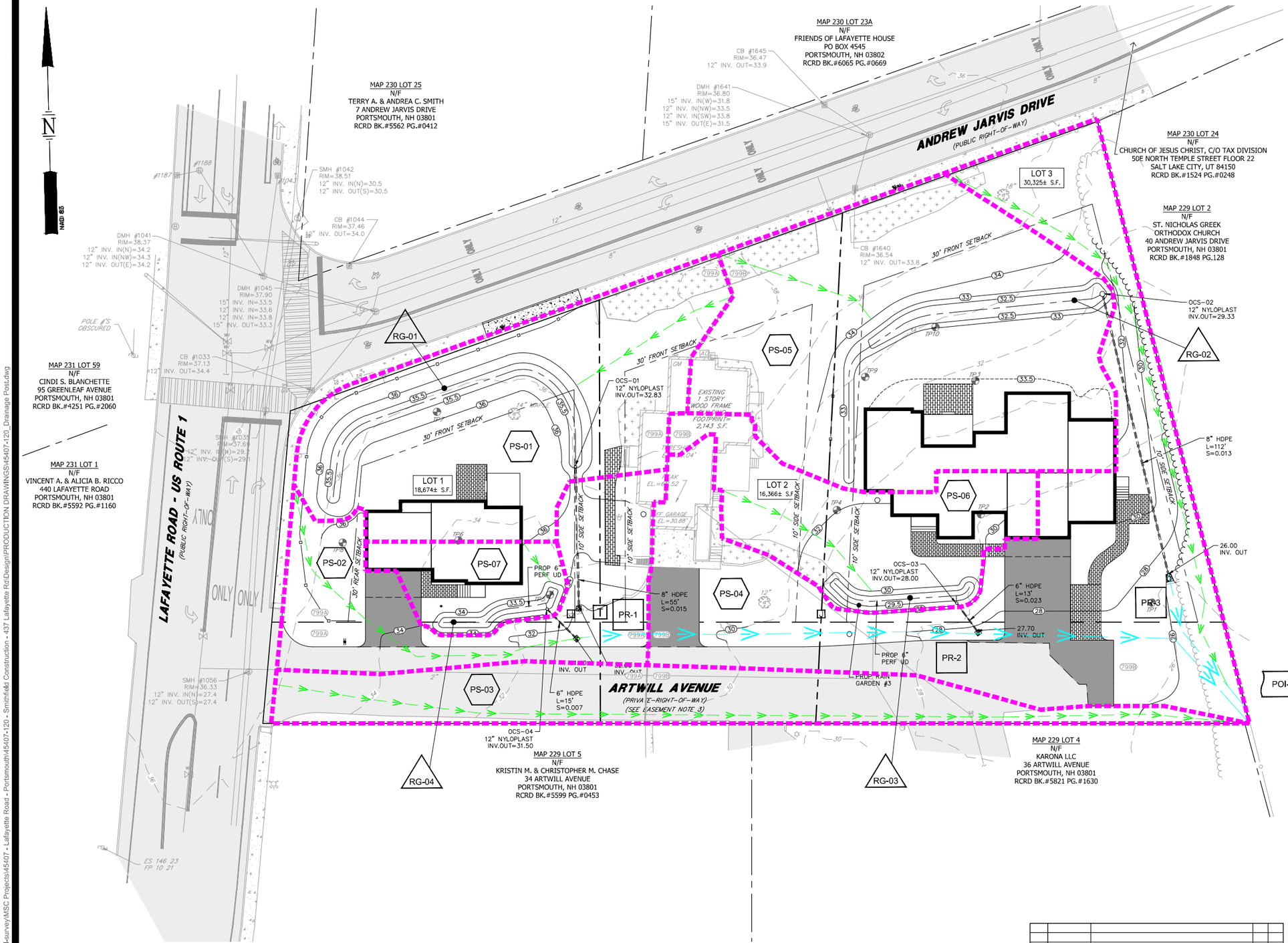

LEGEND

- PROPERTY LINE
- LIMITS OF DRAINAGE SUBCATCHMENT
- XXX — SOIL GROUP BREAKLINE
- FLOW PATH (Tc LINE)
- REACH
- POI-1 — POINT OF INTEREST
- PS-1 — PROPOSED SUBCATCHMENT AREA
- PS-1 — PROPOSED POND
- PR-01 — PROPOSED REACH

SOIL LEGEND (PER SITE SPECIFIC SOIL SURVEY)

SYMBOL	DESCRIPTION	HYDROLOGIC SOIL GROUP
799*	UBRAN LAND-CANTON COMPLEX 3% - 15% SLOPES	A (BASED ON FIELD INFILTRATION RATES)
799*	UBRAN LAND-CANTON COMPLEX 3% - 15% SLOPES	B (BASED ON FIELD INFILTRATION RATES)

*ENTIRE PROPERTY IDENTIFIED AS URBAN LAND-CANTON COMPLEX.

SITE DEVELOPMENT PLANS

TAX MAP 229 LOT 1

POST-DEVELOPMENT DRAINAGE MAP

PROPOSED 3 LOT SUBDIVISION

437 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

OWNED BY & PREPARE FOR
ARTWILL, LLC

1"=40' (11"X17")
SCALE: 1"=20' (22"X34")
APRIL 19, 2022

HORIZONTAL SCALE 1"=20'
20 10 0 20

REV	DATE	DESCRIPTION	DR	CK

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TFM
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Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
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48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

FILE	DR	JSM	FB		
45407-120	CK	JCC	CADFILE	45407-120_DRAINAGE POST	D-02

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APPENDIX L – OPERATION AND MAINTENANCE MANUAL

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Project #45407.120

STORMWATER MANAGEMENT SYSTEM OPERATION & MAINENANCE MANUAL

F O R

Proposed 3 Lot Subdivision

437 Lafayette Road
Portsmouth, New Hampshire
Rockingham County

Tax Map 229, Lot 1

April 19, 2022

Prepared By:

TFM® Since 1968

Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

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Table of Contents

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Maintenance of Property

TFMoran, Inc., has prepared the following Stormwater Management System Operation & Maintenance Plan for Artwill, LLC at 437 Lafayette Road, Portsmouth, New Hampshire. The intent of this plan is to provide the owner (Artwill, LLC), and future property managers/owners of the site with a list of procedures that document the inspection and maintenance requirements of the Stormwater Management System for this development. This includes all temporary and permanent stormwater and erosion control measures during construction.

Plans

Refer to the Site Development Plans prepared by TFMoran, Inc. for Tax Map 229 Lot 1, Proposed 3 Lot Subdivision, 437 Lafayette Road, Portsmouth, New Hampshire, dated April 19, 2022. See Appendix A in this manual for the "Stormwater Operation and Maintenance Plan" identifying locations of stormwater practices described hereon.

Owner Responsibility

The current owners, and their successors of the property, are required to submit a copy of the Operations and Maintenance Report completed on a yearly basis to the City of Portsmouth Planning Department and Public Works Department by December 31st. The future successor includes but is not limited to the individual lot owners. This report should be prepared by a qualified inspector with working knowledge of the site. The owner shall be responsible for the following inspection and maintenance program which is necessary in order to keep the Stormwater Management System functioning properly. These measures will help reduce potential environmental impacts. By following the enclosed procedures, Artwill, LLC and its successors will be able to maintain the functional design of the Stormwater Management System and maximize its ability to remove sediment and other contaminants from site-generated stormwater runoff.

The owner and future owners are the responsible party for the following record keeping activities further identified in this Operation & Maintenance Manual:

- Conduct reporting, inspection, and maintenance activities in accordance with the "Inspection and Maintenance Checklist Requirements" and if applicable "Regular Inspection and Maintenance Guidance" provided by University of New Hampshire Stormwater Center (UNHSC);
- Document each inspection and maintenance activity with the "Inspection and Maintenance Log" and if applicable "Checklist for Inspection" provided by University of New Hampshire Stormwater Center (UNHSC);
- Photograph each practice that is subject to the "Inspection and Maintenance Checklist Requirements" at each inspection of that stormwater practice;
- Document actions taken if invasive species begin to grow in the stormwater management system; and
- Document each application of deicing material applied to the site with the "Deicing Log"

All record keeping required by the Operation & Maintenance Manual shall be maintained by the responsible party and be made available to the applicable regulatory agencies (i.e. NHDES AoT Bureau, City of Portsmouth, etc.) upon request. Logs and reports required by this Operation & Maintenance Manual should be prepared by a qualified inspector with working knowledge of the site. This manual and associated records shall be transferred to any future owners. All current and future owners must comply with RSA 485-A:17, Env-Wq 1500, the permit, and all conditions contained in the permit.

The following inspection and maintenance program is necessary in order to keep the Stormwater Management System functioning properly. These measures will greatly help to reduce potential environmental impacts. By following the enclosed procedures, Artwill, LLC and its successors will be able to maintain the functional design of the Stormwater Management System and maximize its ability to remove sediment and other contaminants from site-generated stormwater runoff.

General Inspection and Maintenance Requirements

Temporary stormwater, sediment and erosion control measures that require maintenance on the site during construction include, but are not limited to, the following:

- Stabilized construction entrance;
- Silt sock barriers;
- Inlet protection; and
- Construction dumpster area, if used.

Permanent stormwater, sediment and erosion control measures that require maintenance on the site include, but are not limited, to the following:

- Litter/trash removal;
- Dumpster area maintenance;
- Pavement sweeping;
- Surface maintenance related to deicing/plowing;
- Rip-rap protection;
- Bioretention systems;
- Outlet control structures;
- Emergency spillway;
- Catch basins;
- Drip line stone trench; and
- Culvert pipes.

Inspection and Maintenance Checklist Requirements

By implementing the following procedures, current owners will be able to maintain the functional design of the Stormwater Management System and maximize the systems ability to remove sediment and other contaminants from site-generated stormwater runoff. The owner shall conduct inspection and maintenance activities in accordance with the following checklist:

	Frequency	***Inspect***	***Action***
Temporary Controls			
Stabilized Construction Entrance	Weekly	• Inspect adjacent roadway for sediment tracking • Inspect stone for sediment accumulation	• Sweep adjacent roadways as soon as sediment is tracked • Top dress with additional stone when necessary to prevent tracking
Litter/Trash Removal	Routinely	• Inspect site especially construction areas	• Remove debris and clean areas as necessary
Construction Dumpster Area Maintenance (if used)	Routinely	• Dumpster Areas	• Remove any accumulated debris and dispose of properly
Silt Sock Barrier	Weekly	• Inspect accumulated sediment level, rips and tears	• Repair or replace damaged lengths • Remove and dispose accumulated sediment once level reaches 1/3 of barrier
Gravel	Spring and Fall	• Inspect gravel for ruts and depth	• Replace gravel as necessary, regrade as necessary to maintain design grades, remove any accumulated gravel washed from roadway

	Frequency	***Inspect***	***Action***
Permanent Controls			
Rip Rap Outlet Protection	Spring and Fall and after rainstorms exceeding 2.5 inches in 24 hrs	• Inspect for damage or displaced stones • Inspect for torn or visible fabric	• Repair and replace stone and / or fabric immediately • Remove accumulated sediment, trash and blocking materials

	Frequency	***Inspect***	***Action***
Permanent Controls			
Infiltration Basin	Spring and Fall and after rainstorms exceeding 2.5 inches in 24 hrs	• Inspect level of accumulated sediment	• Remove accumulated sediment
		• Inspect for debris	• Remove debris from inlet and outlets
		• Inspect outlet structures	• Repair as necessary
		• Inspect vegetative cover	• Mow embankments and removed woody vegetation
		• Inspect embankments and spillways	• Repair embankments and spillways as necessary
		• Inspect infiltration function within 72-hrs following a rainfall event	• Restore infiltration by removing accumulated sediments and reconstruction of the infiltration basin if deemed necessary
Landscape (not including Bioretention Systems)	Spring	• Mulch: Inspect mulch areas for trash and debris and thickness of mulch	• Remove weeds and debris. Top dress with new mulch when necessary
	Spring	• Trees and Shrubs: Inspect for broken, weak or diseased branches and debris	• Prune to maintain shape to avoid splitting, remove broken, weak or diseased branches, replace as necessary
	As necessary	• Lawn	• Mow as required
	Spring and Fall	• Inspect landscaped areas for debris and litter	• Remove debris and litter as necessary
Bioretention System	1st few months when rainfall exceeds 2.5” in a 24 hr period	• Inspect drawdown time: required to drawdown in 72 hrs or the standing water covers more than 15% of the surface after 48 hrs	• Remove the top few inches of discolored material and rake or till the remaining material as needed

	Frequency	***Inspect***	***Action***
Permanent Controls			
	4 times for 1st yr, then Spring and Fall	• Inspect for animal burrows and short circuits in the system	• Repair soil erosion from and fill holes and lightly compact
		• Inspect inlet and outlet for debris and leaves	• Remove material with rakes where possible rather than heavy construction equipment to avoid compaction of the gravel wetland surface
		• Inspect the filter bed	• Remove sediment as necessary. If more than 2" of filter material is removed, replace with the design filter media specified
		• Inspect vegetation for distress during extended periods without rain	• Water as necessary
	Spring and Fall	• Inspect Drawdown time: required to drawdown in 72 hrs or the standing water covers more than 15% of the surface after 48 hrs	• Remove the top few inches of discolored material and rake or till the remaining material as needed
	Annually	• Inspect inlet and outlet for erosion	• Repair or replace as necessary
		• Inspect vegetative cover	• Reinforcement plantings should be performed if 50% cover is not established in 2 yrs.
	Additionally, refer to the most currently available documents from UNHSC (attached for reference): "Regular Inspection Maintenance Guidance" and "Checklist for Inspection". If there are discrepancies between the UNHSC documents and this Manual's checklist requirements, the stricter requirements shall override.		
Conventional Pavement	Spring and Fall	• Inspect pavement for debris	• Sweeping as required

	Frequency	***Inspect***	***Action***
Permanent Controls			
Drainage (Catch Basins / Drop Inlets)	Spring and Fall	• Inspect for sediment • Inspect for hydrocarbons • Inspect Hoods	• If sump is more than half full of sediment, remove sediment as necessary • Remove and dispose of properly • Repair and replace as necessary
Drip Line Stone Trench	Spring and Fall	• Inspect for debris and vegetation	• Clean and remove debris and vegetation as necessary
Drain Manholes and Yard Drains	Spring and Fall	• Inspect for accumulated sediment and debris	• Clean any material upon inspection and deposit of properly
Inlet Protection (temporary during construction)	During construction and after measurable rainfall	• Inspect for accumulated sediment	• Empty sediment bag if more than ½ filled with sediment or debris. Replace bag if torn or punctured to ½" diameter or greater on the lower half of the bag
Culvert Pipe	Spring and Fall	• Inspect for obstructions	• Remove and dispose of debris properly, Remove upstream debris to prevent future clogging • Repair/replace if pipe becomes crushed or deteriorated
Emergency Spillway	Spring and Fall	• Inspect for erosion, sediment accumulation, stone loss, and presence of invasive species	• Remove debris and accumulated sediment (sediment accumulation should not exceed 3") • Repair eroded areas • Remove invasive species and vegetation • Replace stone as necessary

	Frequency	*Inspect*	*Action*
Permanent Controls			
Outlet Control Structure	Annually	• Inspection for debris or sediment buildup • Inspect structure	• Remove sediment and debris as necessary • Remove debris covering orifice or v-notch • Repair as necessary

Landscaping

Maintenance of landscaping to follow the NOFA Standards for Organic Land Care, 6th Edition, Practices for the Design and Maintenance of Ecological Landscapes. ("NOFA Standards for Organic Land Care." NOFA Standards for Organic Land Care 6th Edition Practices for the Design and Maintenance of Ecological Landscapes, Northeast Organic Farming Association of Connecticut, Inc, 2017, http://www.organiclandcare.net/sites/default/files/nofa_organic_land_care_standards_6thedition_2017_opt.pdf.)

Inspection and Maintenance Records and Annual Report

A detailed, written record of all logs, reports, photographs required by this Operation & Maintenance Manual must be kept by the owner and future property owners or assigns and/or condominium association of the property. The property owner shall submit records to the City of Portsmouth Department of Public Works and Planning Department yearly. Addresses listed below:

Planning Director
Portsmouth Planning Department
1 Junkins Avenue
Portsmouth, NH 03801

Director of Public Works
Department of Public Works
680 Peverly Hill Road
Portsmouth, NH 03801

The attached forms are provided to assist the property manager with the inspection and maintenance of the Stormwater Management System. The "Inspection and Maintenance Log" (Attachment 1) and "Deicing Log" (Attachment 2) on the following pages are blank copies to aid in record keeping required by this Operation & Maintenance Manual.

Supplement the "Inspection and Maintenance Log" with the most currently available "Checklist for Inspections" from UNHSC (attached to this Manual for reference). Each inspection or maintenance activity shall include photographs of each practice that is subject to the "Inspection and Maintenance Checklist Requirements" at each inspection of that stormwater practice. Log actions taken if invasive species begin to grow in the stormwater management system as required per the attached "Control of Invasive Plants".

For all surface maintenance related activities related to deicing/plowing, complete the “Deicing Log” to track the amount and type of deicing materials applied to the site. Snow shall be stored in designated snow storage areas which have been designed to drain on-site and receive treatment via the stormwater management system prior to infiltration or discharge.

Owner's Certification

Contact Information

Owner:	Artwill, LLC
Contact Person	Joe Caldarola
	PO Box 370
	Portsmouth, NH 03801
	(603) 674-5204
	joe@smithfieldconstruction.com

I have reviewed this document and understand the responsibilities contained. I agree to perform the required maintenance on the stormwater management system.

Owner's Signature (future owner's and successors, if applicable)

Print Name

Title

Date

Any inquiries in regard to the design, function, and/or maintenance of any one of the above mentioned facilities or tasks shall be directed to the project engineer:

TFMoran, Inc., Seacoast Division
170 Commerce Way, Suite 102
Portsmouth, NH 03801
(603) 431-2222

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ATTACHMENT 1

Inspection and Maintenance Log

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Attachment 1

Inspection and Maintenance Log

BMP/System Component	Date Inspected	Inspector	Cleaning/Repair Needed (list items/comments)	Date of Cleaning/Repair	Performed By

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ATTACHMENT 2

Deicing Log

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Attachment 2

Deicing Log

Deicing Material Used	Amount of Deicing Material Applied	Date of Application	Logged By

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APPENDIX A

Stormwater Operation & Maintenance Plan

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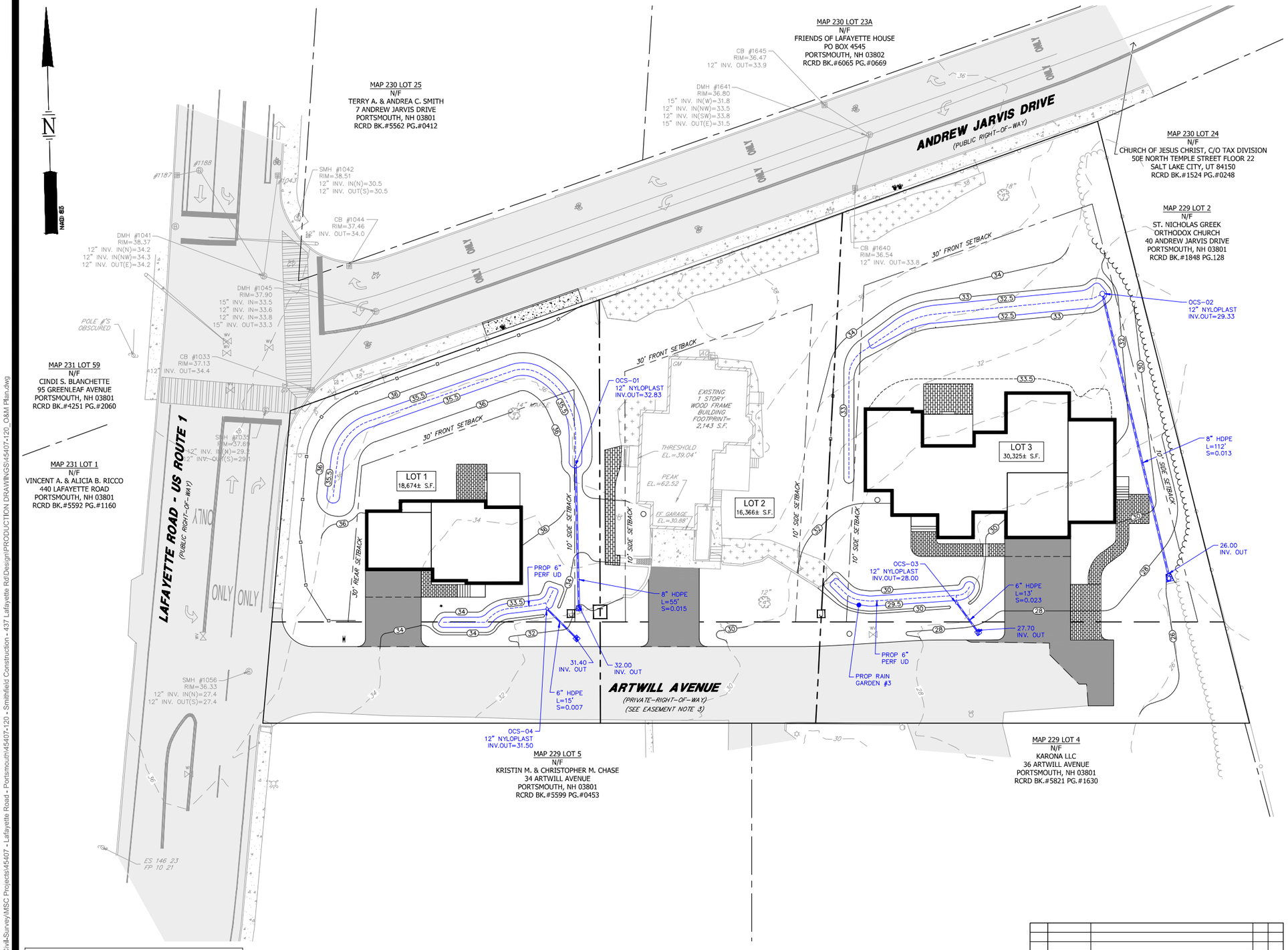

SITE DEVELOPMENT PLANS

TAX MAP 229 LOT 1

STORMWATER OPERATION & MAINTENANCE PLAN

PROPOSED 3 LOT SUBDIVISION

437 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

OWNED BY & PREPARE FOR
ARTWILL, LLC

1"=40' (11"X17")
SCALE: 1"=20' (22"X34") **APRIL 19, 2022**

HORIZONTAL SCALE 1"=20'
20 10 0 20

REV	DATE	DESCRIPTION	DR	CK

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FILE	45407-120	DR	JSM	FB		O&M-01
		CK	JCC	CADFILE	45407-120_O&M PLAN	

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APPENDIX B

UNHSC Regular Inspection and Maintenance Guidelines
for Bioretention Systems

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Regular Inspection and Maintenance Guidance for Bioretention Systems / Tree Filters

Maintenance of bioretention systems and tree filters can typically be performed as part of standard landscaping. Regular inspection and maintenance is critical to the effective operation of bioretention systems and tree filters to insure they remain clear of leaves and debris and free draining. This page provides guidance on maintenance activities that are typically required for these systems, along with the suggested frequency for each activity. Individual systems may have more, or less frequent maintenance needs depending on a variety of factors including but not limited to: the occurrence of large storm events, overly wet or dry periods, regional hydrologic conditions, and the upstream land use.

ACTIVITIES

The most common maintenance activity is the removal of sediment and organic debris from the system and bypass structures. Visual inspections are routine for system maintenance. This includes looking for standing water, accumulated leaves, holes in the soil media, signs of plant distress, and debris and sediment accumulation in the system. Vegetation coverage is integral to the performance of the system, including infiltration rate and nutrient uptake. Vegetation care is important to system productivity and health.

ACTIVITY	FREQUENCY
CLOGGING AND SYSTEM PERFORMANCE	
A record should be kept of the time to drain for the system completely after a storm event. The system should drain completely within 72 hours.	After every major storm in the first few months, then annually at minimum.
Check to insure the filter surface remains well draining after storm events. **Remedy**: If filter bed is clogged, draining poorly, or standing water covers more than 50% of the surface 48 hours after a precipitation event, then remove top few inches of discolored material. Till, or rake remaining material as needed.	
Check inlets and outlets for leaves and debris. **Remedy**: Rake in and around the system to clear it of debris. Also, clear the inlet and overflow if obstructed.	Quarterly initially, annually as a minimum thereafter.
Check for animal burrows and short-circuiting in the system. **Remedy:** Soil erosion from short circuiting or animal boroughs should be repaired when they occur. The holes should be filled and lightly compacted	
Inspect inlets and outlets to ensure good condition and no evidence of deterioration. Check to see if high-flow bypass is functioning. **Remedy:** Repair or replace any damaged structural parts, inlets, outlets, sidewalls.	
VEGETATION	
Check for robust vegetation coverage throughout the system and dead or dying plants. **Remedy:** Vegetation should cover > 75% of the system and should be cared for as needed.	Annually or as needed

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APPENDIX C

UNHSC Checklist for Inspection of Bioretention System

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CHECKLIST FOR INSPECTION OF BIORETENTION SYSTEM / TREE FILTERS

Location:
Inspector:
Date:
Time:
Site Conditions:
Days Since Last Rain Event:

Inspection Items	Satisfactory (S) or Unsatisfactory (U)	Comments/Corrective Action
1. Initial Inspection After Planting		
Plants are stable, roots not exposed	**S** **U**	
Surface is at design level, no evidence of preferential flow/shoving	**S** **U**	
Inlet and outlet/bypass are functional	**S** **U**	
2. Debris Cleanup (1 time/year minimum, Spring/Fall)		
Litter, leaves, and dead vegetation removed from the system	**S** **U**	
Prune/mow vegetation	**S** **U**	
3. Standing Water (1 time/year and/or after large storm events)		
No evidence of standing water after 24-48 hours since rainfall	**S** **U**	
4. Vegetation Condition and Coverage		
Vegetation condition good with good coverage (typically > 75%)	**S** **U**	
5. Other Issues		
Note any additional issues not previously covered.	**S** **U**	

Corrective Action Needed	Due Date
1.	
2.	
3.	
Inspector Signature	**Date**

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APPENDIX D

Control of Invasive Plants

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CONTROL OF INVASIVE PLANTS

During maintenance activities, check for the presence of invasive plants and remove in a safe manner as described on the following pages. They should be controlled as described on the following pages.

Background:

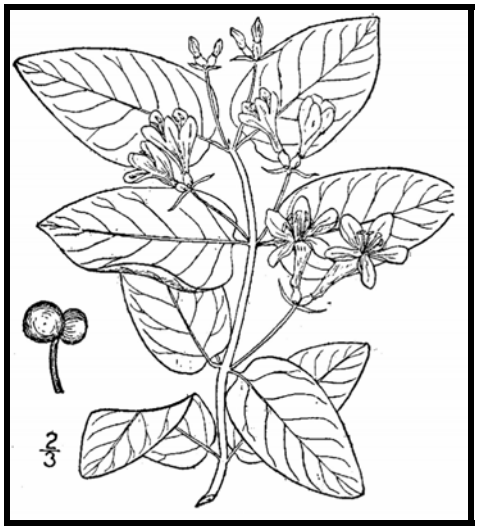
Invasive plants are introduced, alien, or non-native plants, which have been moved by people from their native habitat to a new area. Some exotic plants are imported for human use such as landscaping, erosion control, or food crops. They also can arrive as "hitchhikers" among shipments of other plants, seeds, packing materials, or fresh produce. Some exotic plants become invasive and cause harm by:

- becoming weedy and overgrown;
- killing established shade trees;
- obstructing pipes and drainage systems;
- forming dense beds in water;
- lowering water levels in lakes, streams, and wetlands;
- destroying natural communities;
- promoting erosion on stream banks and hillsides; and
- resisting control except by hazardous chemical.

University of New Hampshire Cooperative Extension

Methods for Disposing Non-Native Invasive Plants

Prepared by the Invasives Species Outreach Group, volunteers interested in helping people control invasive plants. Assistance provided by the Piscataquog Land Conservancy and the NH Invasives Species Committee. Edited by Karen Bennett, Extension Forestry Professor and Specialist.



Tatarian honeysuckle
Lonicera tatarica
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 3: 282.

Non-native invasive plants crowd out natives in natural and managed landscapes. They cost taxpayers billions of dollars each year from lost agricultural and forest crops, decreased biodiversity, impacts to natural resources and the environment, and the cost to control and eradicate them.

Invasive plants grow well even in less than desirable conditions such as sandy soils along roadsides, shaded wooded areas, and in wetlands. In ideal conditions, they grow and spread even faster. There are many ways to remove these non-native invasives, but once removed, care is needed to dispose the removed plant material so the plants don't grow where disposed.

Knowing how a particular plant reproduces indicates its method of spread and helps determine the appropriate disposal method. Most are spread by seed and are dispersed by wind, water, animals, or people. Some reproduce by vegetative means from pieces of stems or roots forming new plants. Others spread through both seed and vegetative means.

Because movement and disposal of viable plant parts is restricted (see NH Regulations), viable invasive parts can't be brought to most transfer stations in the state. Check with your transfer station to see if there is an approved, designated area for invasives disposal. This fact sheet gives recommendations for rendering plant parts non-viable.

Control of invasives is beyond the scope of this fact sheet. For information about control visit www.nhinvasives.org or contact your UNH Cooperative Extension office.

New Hampshire Regulations

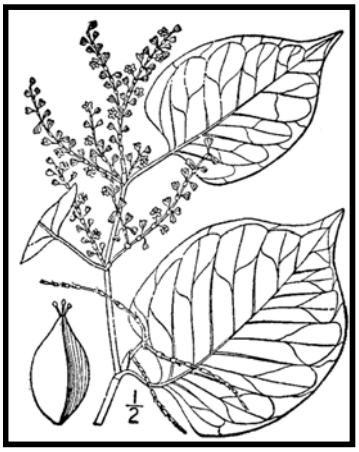
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

No person shall collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living and viable portion of any plant species, which includes all of their cultivars and varieties, listed in Table 3800.1 of the New Hampshire prohibited invasive species list. (Agr 3802.01)

How and When to Dispose of Invasives?

To prevent seed from spreading remove invasive plants before seeds are set (produced). Some plants continue to grow, flower and set seed even after pulling or cutting. Seeds can remain viable in the ground for many years. If the plant has flowers or seeds, place the flowers and seeds in a heavy plastic bag "head first" at the weeding site and transport to the disposal site. The following are general descriptions of disposal methods. See the chart for recommendations by species.

Burning: Large woody branches and trunks can be used as firewood or burned in piles. For outside burning, a written fire permit from the local forest fire warden is required unless the ground is covered in snow. Brush larger than 5 inches in diameter can't be burned. Invasive plants with easily airborne seeds like black swallow-wort with mature seed pods (indicated by their brown color) shouldn't be burned as the seeds may disperse by the hot air created by the fire.



Japanese knotweed
Polygonum cuspidatum
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 1: 676.

Bagging (solarization): Use this technique with softer-tissue plants. Use heavy black or clear plastic bags (contractor grade), making sure that no parts of the plants poke through. Allow the bags to sit in the sun for several weeks and on dark pavement for the best effect.

Tarping and Drying: Pile material on a sheet of plastic and cover with a tarp, fastening the tarp to the ground and monitoring it for escapes. Let the material dry for several weeks, or until it is clearly nonviable.

Chipping: Use this method for woody plants that don't reproduce vegetatively.

Burying: This is risky, but can be done with watchful diligence. Lay thick plastic in a deep pit before placing the cut up plant material in the hole. Place the material away from the edge of the plastic before covering it with more heavy plastic. Eliminate as much air as possible and toss in soil to weight down the material in the pit. Note that the top of the buried material should be at least three feet underground. Japanese knotweed should be at least 5 feet underground!

Drowning: Fill a large barrel with water and place soft-tissue plants in the water. Check after a few weeks and look for rotted plant material (roots, stems, leaves, flowers). Well-rotted plant material may be composted. A word of caution- seeds may still be viable after using this method. Do this before seeds are set. This method isn't used often. Be prepared for an awful stink!

Composting: Invasive plants can take root in compost. Don't compost any invasives unless you know there is no viable (living) plant material left. Use one of the above techniques (bagging, tarping, drying, chipping, or drowning) to render the plants nonviable before composting. Closely examine the plant before composting and avoid composting seeds.

Be diligent looking for seedlings for *years* in areas where removal and disposal took place.

Suggested Disposal Methods for Non-Native Invasive Plants

This table provides information concerning the disposal of removed invasive plant material. If the infestation is treated with herbicide and left in place, these guidelines don't apply. Don't bring invasives to a local transfer station, unless there is a designated area for their disposal, or they have been rendered non-viable. This listing includes wetland and upland plants from the New Hampshire Prohibited Invasive Species List. The disposal of aquatic plants isn't addressed.

<table>
<tr><th>Woody Plants</th><th>Method of Reproducing</th><th>Methods of Disposal</th></tr>
<tr><td rowspan="2">Norway maple
(Acer platanoides)
European barberry
(Berberis vulgaris)
Japanese barberry
(Berberis thunbergii)
autumn olive
(Elaeagnus umbellata)
burning bush
(Euonymus alatus)
Morrow's honeysuckle
(Lonicera morrowii)
Tatarian honeysuckle
(Lonicera tatarica)
showy bush honeysuckle
(Lonicera x bella)
common buckthorn
(Rhamnus cathartica)
glossy buckthorn
(Frangula alnus)</td><td rowspan="2">Fruit and Seeds
  </td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Use as firewood.
▪ Make a brush pile.
▪ Chip.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip once all fruit has dropped from branches.
▪ Leave resulting chips on site and monitor.</td></tr>
<tr><td rowspan="2">oriental bittersweet
(Celastrus orbiculatus)
multiflora rose
(Rosa multiflora)</td><td rowspan="2">Fruits, Seeds, Plant Fragments
  </td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Make a brush pile.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip – only after material has fully dried (1 year) and all fruit has dropped from branches. Leave resulting chips on site and monitor.</td></tr>
</table>

Non-Woody Plants	Method of Reproducing	Methods of Disposal
garlic mustard *(Alliaria petiolata)* spotted knapweed *(Centaurea maculosa)* ▪ Sap of related knapweed can cause skin irritation and tumors. Wear gloves when handling. black swallow-wort *(Cynanchum nigrum)* ▪ May cause skin rash. Wear gloves and long sleeves when handling. pale swallow-wort *(Cynanchum rossicum)* giant hogweed *(Heracleum mantegazzianum)* ▪ Can cause major skin rash. Wear gloves and long sleeves when handling. dame's rocket *(Hesperis matronalis)* perennial pepperweed *(Lepidium latifolium)* purple loosestrife *(Lythrum salicaria)* Japanese stilt grass *(Microstegium vimineum)* mile-a-minute weed *(Polygonum perfoliatum)*	**Fruits and Seeds** 	**Prior to flowering** Depends on scale of infestation Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile. (You can pile onto or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material. **During and following flowering** Do nothing until the following year or remove flowering heads and bag and let rot. Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile remaining material. (You can pile onto plastic or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material.
common reed (*Phragmites australis*) Japanese knotweed *(Polygonum cuspidatum)* Bohemian knotweed *(Polygonum x bohemicum)*	**Fruits, Seeds, Plant Fragments** Primary means of spread in these species is by plant parts. Although all care should be given to preventing the dispersal of seed during control activities, the presence of seed doesn't materially influence disposal activities.	**Small infestation** ▪ Bag all plant material and let rot. ▪ Never pile and use resulting material as compost. ▪ Burn. **Large infestation** ▪ Remove material to unsuitable habitat (dry, hot and sunny or dry and shaded location) and scatter or pile. ▪ Monitor and remove any sprouting material. ▪ Pile, let dry, and burn.

January 2010

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PROPOSED 3 LOT SUBDIVISION

437 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

APRIL 19, 2022

GENERAL INFORMATION

OWNER
MAP 229 LOT 1
ARTWILL, LLC
P.O. BOX 370
PORTSMOUTH, NH 03802

APPLICANT
MAP 229 LOT 1
ARTWILL, LLC
P.O. BOX 370
PORTSMOUTH, NH 03802

PREPARED FOR
MAP 229 LOT 1
ARTWILL, LLC
P.O. BOX 370
PORTSMOUTH, NH 03802

RESOURCE LIST

PLANNING/ZONING DEPARTMENT
1 JUNKINS AVE
PORTSMOUTH, NH 03801
603-610-7216

BUILDING DEPARTMENT
1 JUNKINS AVE
PORTSMOUTH, NH 03801
603-610-7243
ROBERT MARSILIA,
CHIEF BUILDING INSPECTOR

PUBLIC WORKS
600 PEVERLY HILL RD
PORTSMOUTH, NH 03801
603-472-1530
PETER RICE, PUBLIC WORKS DIRECTOR

POLICE DEPARTMENT
3 JUNKINS AVE
PORTSMOUTH, NH 03801
603-427-1510
MARK NEWPORT, CHIEF

FIRE DEPARTMENT
170 COURT ST
PORTSMOUTH, NH 03801
603-427-1515
PATRICK HOWE, CHIEF

VICINITY PLAN

HORIZONTAL SCALE 1"=500'
500 250 0 500

INDEX OF SHEETS

SHEET	SHEET TITLE
C-00	COVER
C-01	NOTES & LEGEND
S-01	EXISTING CONDITIONS PLAN
S-02	SUBDIVISION PLAN
C-02	SITE PREPARATION & DEMOLITION PLAN
C-03	SITE LAYOUT PLAN
C-04	GRADING & DRAINAGE PLAN
C-05	UTILITY PLAN
C-06	LANDSCAPE PLAN
C-07	EROSION CONTROL PLAN
C-08	EROSION CONTROL NOTES
C-09	TRUCK TURNING PLAN
C-10 – C-15	DETAILS
REFERENCE PLANS BY ASSOCIATED PROFESSIONALS	
–	ARCHITECTURAL ELEVATION PLAN

PERMITS/APPROVALS

	NUMBER	APPROVED	EXPIRES
CITY PLANNING BOARD SITE PLAN REVIEW	–	–	–
CITY PLANNING BOARD SUBDIVISION REVIEW	–	–	–
CITY PLANNING BOARD CONDITIONAL USE PERMIT FOR AADU	–	–	–
NHDES SEWER CONNECTION PERMIT	–	–	–

STATE OF NEW HAMPSHIRE
JOHN J. McTIGUE No. 14950 LICENSED PROFESSIONAL ENGINEER

SITE DEVELOPMENT PLANS

TAX MAP 229 LOT 1
COVER
PROPOSED 3 LOT SUBDIVISION
437 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
OWNED BY & PREPARE FOR
ARTWILL, LLC

SCALE: AS SHOWN **APRIL 19, 2022**

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DIG SAFE
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

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REV	DATE	DESCRIPTION	DR	CK

TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

PROJECT #	DR	JSM	FB	–	C-00
45407-120	CK	JCC	CADFILE	45407-120_COVER	

Apr 18, 2022 - 11:03pm
F:\MSC Projects\45407 - Lafayette Road - Portsmouth\45407-120 - Smithfield Construction - 437 Lafayette Rd\Design\PRODUCTION DRAWINGS\45407-120_Cover.dwg

LEGEND

PROPOSED

- PROPERTY LINE
- ZONING LINE
- EASEMENT
- BASELINE
- FLOODPLAIN
- EDGE OF WATERBODY
- EDGE OF WETLAND
- SETBACK (WETLAND)
- SETBACK (STRUCTURE)
- SETBACK (PARKING)
- SETBACK (LANDSCAPE)
- GRAVEL ROAD
- EOP — EDGE OF PAVEMENT
- VGC — VERTICAL GRANITE CURB
- SGC — SLOPED GRANITE CURB
- CC — CONCRETE CURB
- ICC — INTEGRATED CONCRETE CURB
- BIT — BITUMINOUS ASPHALT CURB
- CCB — CAPE COD BERM
- SAWCUT
- BUILDING
- BUILDING ROOF OVERHANG
- BUILDING FOUNDATION
- BUILDING ENTRANCE
- OVERHEAD DOOR
- TREE LINE
- FENCE (CHAIN LINK)
- FENCE (WIRE)
- FENCE (STOCKADE)
- GUARDRAIL
- STONE WALL
- RETAINING WALL
- SILT FENCE
- SILT SOCK
- SOIL BOUNDARY
- LIMIT OF GRADING
- CONTOUR
- 100.50 TC / 100.00 BC OR (100.50) FG — PROPOSED SPOT GRADE
- 100.00 FG — EXISTING SPOT GRADE
- (##) — PARKING COUNT
- DSLY — YELLOW DOUBLE SOLID LINE
- SSLY — YELLOW SINGLE SOLID LINE
- SSLW — WHITE SINGLE SOLID LINE
- SBLW — WHITE SINGLE BROKEN LINE
- STOP — STOP BAR
- CROSSWALK
- ACCESSIBLE PARKING SYMBOL
- PAVEMENT ARROW
- TRAFFIC FLOW ARROW (NOT PAINTED)
- SIGN (SINGLE POST)
- SIGN (DOUBLE POST)
- SIGN (PYLON)
- SIGN (MONUMENT)
- BOLLARD
- D — DUMPSTER PAD

PROPOSED

- CONCRETE
- GRAVEL
- HEAVY DUTY PAVEMENT
- CONSTRUCTION ENTRANCE
- SNOW STORAGE
- RIPRAP
- INLET PROTECTION
- FLOW ARROW
- DRAIN LINE
- DRAINAGE SWALE
- STORMWATER BMP
- S — SEWER LINE
- FM — SEWER FORCE MAIN LINE
- W — WATER LINE
- G — GAS LINE
- OHE — OVERHEAD UTILITY LINE
- UGE — UNDERGROUND UTILITY LINE
- CATCH BASIN
- DRAIN INLET
- OUTLET CONTROL STRUCTURE
- ROOF DRAIN
- DRAIN CLEANOUT
- DRAIN MANHOLE
- FARED END SECTION
- SEWER CLEAN OUT
- SEWER MANHOLE
- SEWER VENT
- DRAIN/SEWER/WATER PLUG OR CAP
- HYDRANT
- FIRE DEPARTMENT CONNECTION
- WATER GATE VALVE
- WATER SHUTOFF
- THRUST BLOCK
- WATER METER
- WATER MANHOLE
- WELL
- GAS GATE VALVE
- GAS SHUT OFF
- GAS METER
- TELEPHONE MANHOLE
- ELECTRIC MANHOLE
- TRAFFIC CONTROL CABINET
- ELECTRIC HANDHOLE
- ELECTRIC PULL BOX
- ELECTRIC METER
- FLOOD LIGHT
- LIGHT POLE
- UTILITY POLE
- GUY POLE
- T — TRANSFORMER PAD
- B-# — BORING LOCATION
- TP-# — TEST PIT LOCATION
- IT-# — INFILTRATION TEST LOCATION
- MW-# — MONITORING WELL

ABBREVIATIONS

GENERAL

ABAN	ABANDON
AC	ACRES
ADJ	ADJUST
APPROX	APPROXIMATE
BC	BOTTOM OF CURB
BIT	BITUMINOUS
BK/PG	BOOK & PAGE
BLDG	BUILDING
BMP	BEST MANAGEMENT PRACTICE
BS	BOTTOM OF SLOPE
BW	BOTTOM OF WALL
CONC	CONCRETE
COORD	COORDINATE
DIA	DIAMETER
ELEV	ELEVATION
EP	EDGE OF PAVEMENT
EXIST	EXISTING
FFE	FINISHED FLOOR ELEVATION
FND	FOUNDATION
HP	HIGH POINT
INV	INVERT ELEVATION
IT	INFILTRATION TEST
L	LENGTH
LF	LINEAR FEET
LSA	LANDSCAPE AREA
MAX	MAXIMUM
MIN	MINIMUM
N/F	NOW OR FORMERLY
NHFG	NEW HAMPSHIRE FISH & GAME
NTS	NOT TO SCALE
OC	ON CENTER
PAVE	PAVEMENT
PERF	PERFORATED
PROP	PROPOSED
R	RADIUS
R&D	REMOVE AND DISPOSE
R&R	REMOVE AND RESET
REM	REMOVE
RET	RETAIN
RIM	RIM ELEVATION
ROW	RIGHT OF WAY
S	SLOPE
SF	SQUARE FEET
SW	SIDEWALK
TBM	TEMPORARY BENCHMARK
TC	TOP OF CURB
TP	TEST PIT
TW	TOP OF WALL
TYP	TYPICAL
UG	UNDERGROUND
WCR	ACCESSIBLE WHEELCHAIR RAMP
W/	WITH

UTILITIES

CB	CATCH BASIN
CIP	CAST IRON PIPE
CMP	CORRUGATED METAL PIPE
CO	CLEANOUT
COND	CONDUIT
DCB	DOUBLE CATCH BASIN
DIP	DUCTILE IRON PIPE
DMH	DRAIN MANHOLE
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FES	FLARED END SECTION
GT	GREASE TRAP
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HH	HANDHOLE
HW	HEADWALL
HYD	HYDRANT
LP	LIGHT POLE
OCS	OUTLET CONTROL STRUCTURE
PVC	POLYVINYL CHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
SMH	SEWER MANHOLE
SOS	SEDIMENT OIL SEPARATOR
TSV	TAPPING SLEEVE, VALVE, AND BOX
UP	UTILITY POLE

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DIG SAFE — CALL 811 OR 1-888-DIG-SAFE — CONTACT DIG SAFE AT LEAST 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

GENERAL NOTES

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3. THE SUBDIVISION PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
4. ALL IMPROVEMENTS SHOWN ON THE 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 CITY PLANNING BOARD.
5. ALL WORK SHALL CONFORM TO THE APPLICABLE REGULATIONS AND STANDARDS OF THE CITY OF PORTSMOUTH, AND SHALL BE BUILT IN A WORKMANLIKE MANNER IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. ALL WORK TO CONFORM TO CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS STANDARD SPECIFICATIONS. ALL WORK WITHIN THE RIGHT-OF-WAY OF THE CITY AND/OR STATE SHALL COMPLY WITH APPLICABLE STANDARDS. COORDINATE ALL WORK WITHIN THE RIGHT-OF-WAY WITH APPROPRIATE CITY, COUNTY, AND/OR STATE AGENCY.
6. THE SITE CONTRACTOR SHALL ENSURE THAT ALL WORK IS PERFORMED IN ACCORDANCE WITH APPLICABLE SECTIONS OF ENV-WQ 1500. THE SITE CONTRACTOR SHALL NOTIFY THE ENGINEER IN ADVANCE OF CONSTRUCTION OF EACH STORMWATER FACILITY TO COORDINATE REQUIRED INSPECTIONS. THE CONTRACTOR SHALL TAKE PROGRESS PHOTOS DURING CONSTRUCTION OF ALL STORMWATER DRAINAGE COMPONENTS AND SEND TO THE ENGINEER.
7. SEE EXISTING CONDITIONS PLAN FOR THE HORIZONTAL AND VERTICAL DATUM.
8. SEE EXISTING CONDITIONS PLAN FOR BENCHMARK INFORMATION. VERIFY TBM ELEVATIONS PRIOR TO CONSTRUCTION.
9. CONTACT EASEMENT OWNERS PRIOR TO COMMENCING ANY WORK WITHIN THE EASEMENTS.
10. PRIOR TO COMMENCING ANY SITE WORK, ALL LIMITS OF WORK SHALL BE CLEARLY MARKED IN THE FIELD.
11. SITE WORK SHALL BE CONSTRUCTED FROM A COMPLETE SET OF PLANS, NOT ALL FEATURES ARE DETAILED ON EVERY PLAN. THE ENGINEER IS TO BE NOTIFIED OF ANY CONFLICT WITHIN THIS PLAN SET.
12. TFMORAN, INC. ASSUMES NO LIABILITY FOR WORK PERFORMED WITHOUT AN ACCEPTABLE PROGRAM OF TESTING AND INSPECTION AS APPROVED BY THE ENGINEER OF RECORD.
13. TEMPORARY FENCING SHALL BE PROVIDED AND COVERED WITH A FABRIC MATERIAL TO CONTROL DUST MITIGATION.
14. ALL DEMOLITION SHALL INSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, WALKWAYS, AND ANY OTHER ADJACENT OPERATING FACILITIES. PRIOR WRITTEN PERMISSION FROM THE OWNER/DEVELOPER AND LOCAL PERMITTING AUTHORITY IS REQUIRED IF CLOSURE/OBSTRUCTIONS TO ROADS, STREET, WALKWAYS, AND OTHERS IS DEEMED NECESSARY. CONTRACTOR TO PROVIDE ALTERNATE ROUTES AROUND CLOSURES/OBSTRUCTIONS PER LOCAL/STATE/FEDERAL REGULATIONS.
15. REFER TO ARCHITECTURAL PLANS FOR LAYOUT OF BUILDING FOUNDATIONS AND CONCRETE ELEMENTS WHICH ABUT THE BUILDING SUCH AS STAIRS, SIDEWALKS, LOADING DOCK RAMPS, PADS, AND COMPACTOR PADS. DO NOT USE SITE PLANS FOR LAYOUT OF FOUNDATIONS.
16. IN THE EVENT OF A CONFLICT BETWEEN PLANS, SPECIFICATIONS, AND DETAILS, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY FOR CLARIFICATION.
17. IF CONDITIONS AT THE SITE ARE DIFFERENT THAN SHOWN ON THE PLANS, THE ENGINEER SHALL BE NOTIFIED PRIOR TO PROCEEDING WITH THE AFFECTED WORK.
18. CONTRACTOR'S GENERAL RESPONSIBILITIES:
    A. BID AND PERFORM THE WORK IN ACCORDANCE WITH ALL LOCAL, STATE, AND NATIONAL CODES, SPECIFICATIONS, REGULATIONS, AND STANDARDS AND CONDITIONS OF ALL PROJECT-SPECIFIC PERMITS AND APPROVALS AS LISTED ON THE COVER SHEET TO THESE PLANS OR OTHERWISE REQUIRED.
    B. NOTIFY ENGINEER IN WRITING OF ANY DISCREPANCIES OF PROPOSED LAYOUT AND/OR EXISTING FEATURES.
    C. EMPLOY A LICENSED SURVEYOR TO DETERMINE ALL LINES AND GRADES AND LAYOUT OF SITE ELEMENTS AND BUILDINGS.
    D. THE CONTRACTOR SHALL BE RESPONSIBLE TO BECOME FAMILIAR WITH THE SITE AND ALL SURROUNDING CONDITIONS. THE CONTRACTOR SHALL ADVISE THE APPROPRIATE AUTHORITY OF INTENTIONS AT LEAST 48 HOURS IN ADVANCE.
    E. TAKE APPROPRIATE MEASURES TO REDUCE, TO THE FULLEST EXTENT POSSIBLE, NOISE, DUST, AND UNSIGHTLY DEBRIS. CONSTRUCTION ACTIVITIES SHALL BE CARRIED OUT BETWEEN THE HOURS OF 7:00 AM AND 9:00 PM, MONDAY THROUGH FRIDAY IN ACCORDANCE WITH THE APPLICABLE MUNICIPAL ORDINANCES AND REGULATIONS OF THE CITY OF PORTSMOUTH, NEW HAMPSHIRE.
    F. MAINTAIN EMERGENCY ACCESS TO ALL AREAS AFFECTED BY WORK AT ALL TIMES.
    G. IN ACCORDANCE WITH RSA 430:53 AND AGR 3800, THE CONTRACTOR SHALL NOT TRANSPORT INVASIVE SPECIES OFF THE PROPERTY, AND SHALL DISPOSE OF INVASIVE SPECIES ON-SITE IN A LEGAL MANNER.
    H. COORDINATE WITH ALL UTILITY COMPANIES AND CONTACT DIGSAFE (811 OR 888-344-7233) AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION.
    I. PROTECT NEW AND EXISTING BURIED UTILITIES DURING INSTALLATION OF ALL SITE ELEMENTS. DAMAGED UTILITIES SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL COST TO THE OWNER.
    J. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION AND FOR CONDITIONS AT THE SITE. THESE PLANS, PREPARED BY TFMORAN, INC., DO NOT EXTEND TO OR INCLUDE SYSTEMS PERTAINING TO THE SAFETY OF THE CONSTRUCTION CONTRACTOR OR THEIR EMPLOYEES, AGENTS, OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE SEAL OF THE SURVEYOR OR ENGINEER HEREON DOES NOT EXTEND TO ANY SUCH SAFETY SYSTEMS THAT MAY NOW OR HEREAFTER BE INCORPORATED INTO THESE PLANS. THE CONSTRUCTION CONTRACTOR SHALL PREPARE OR OBTAIN THE APPROPRIATE SAFETY SYSTEMS WHICH MAY BE REQUIRED BY THE US OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) AND/OR LOCAL REGULATIONS.
    K. WRITTEN DIMENSIONS HAVE PRECEDENCE OVER SCALED DIMENSIONS. THE CONTRACTOR SHALL USE CAUTION WHEN SCALING REPRODUCED PLANS. IN CASE OF CONFLICT BETWEEN THIS PLAN SET AND ANY OTHER DRAWING AND/OR SPECIFICATION, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY FOR CLARIFICATIONS.
    L. VERIFY LAYOUT OF PROPOSED BUILDING FOUNDATIONS WITH ARCHITECT AND THAT PROPOSED FOUNDATION MEETS PROPERTY LINE AND/OR WETLAND SETBACKS PRIOR TO COMMENCING ANY FOUNDATION CONSTRUCTION.
    M. PROVIDE AN AS-BUILT PLAN AT THE COMPLETION OF THE PROJECT TO THE PLANNING DIRECTOR AND PER CITY REGULATIONS.
    N. IF ANY DEVIATIONS FROM THE APPROVED PLANS AND SPECIFICATIONS HAVE BEEN MADE, THE SITE CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS STAMPED BY A LICENSED SURVEYOR OR QUALIFIED ENGINEER ALONG WITH A LETTER STAMPED BY A QUALIFIED ENGINEER DESCRIBING ALL SUCH DEVIATIONS, AND BEAR ALL COSTS FOR PREPARING AND FILING ANY NEW PERMITS OR PERMIT AMENDMENTS THAT MAY BE REQUIRED.
    O. AT COMPLETION OF CONSTRUCTION, THE SITE CONTRACTOR SHALL PROVIDE A LETTER CERTIFYING THAT THE PROJECT WAS COMPLETED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS, AND A LETTER STAMPED BY A QUALIFIED ENGINEER THAT THEY HAVE OBSERVED ALL UNDERGROUND DETENTION SYSTEMS, INFILTRATION SYSTEMS, OR FILTERING SYSTEMS PRIOR TO BACKFILL, AND THAT SUCH SYSTEMS CONFORM TO THE APPROVED PLANS AND SPECIFICATIONS.

GRADING & DRAINAGE NOTES

1. THE CONTRACTOR SHALL PREPARE, MAINTAIN, AND EXECUTE A S.W.P.P.P. IN ACCORDANCE WITH EPA REGULATIONS AND THE CONSTRUCTION GENERAL PERMIT.
2. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER TO SUBMIT AN eNOI AT LEAST 14 DAYS IN ADVANCE OF ANY EARTHWORK ACTIVITIES AT THE SITE.
3. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CHECK THE ACCURACY OF THE TOPOGRAPHY AND REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO ANY EARTHWORK BEING PERFORMED ON THE SITE. NO CLAIM FOR EXTRA WORK WILL BE CONSIDERED FOR PAYMENT AFTER EARTHWORK HAS COMMENCED.
4. THE CONTRACTOR SHALL REFER TO THE GEOTECHNICAL REPORT FOR INFORMATION ABOUT SOIL AND GROUNDWATER CONDITIONS. THE CONTRACTOR SHALL FOLLOW THE GEOTECHNICAL ENGINEER'S RECOMMENDED METHODS TO ADDRESS ANY SOIL AND GROUNDWATER ISSUES THAT ARE FOUND ON SITE, INCLUDING AND NOT LIMITED TO DEWATERING METHODS, PERIMETER DRAINS AND TIE INTO STORMWATER MANAGEMENT SYSTEM, ETC.
5. COORDINATE WITH GEOTECHNICAL/STRUCTURAL PLANS FOR SITE PREPARATION AND OTHER BUILDING INFORMATION.
6. COORDINATE WITH ARCHITECTURAL PLANS FOR DETAILED GRADING AT BUILDING, AND SIZE AND LOCATION OF ALL BUILDING SERVICES.
7. COORDINATE WITH MECHANICAL AND PLUMBING PLANS FOR ROOF DRAIN INFORMATION.
8. LIMITS OF WORK ARE SHOWN AS APPROXIMATE. THE CONTRACTOR SHALL COORDINATE ALL WORK TO PROVIDE SMOOTH TRANSITIONS. THIS INCLUDES GRADING, PAVEMENT, CURBING, SIDEWALKS, AND ALIGNMENTS.
9. THE CONTRACTOR SHALL PROVIDE A FINISH PAVEMENT SURFACE FREE OF LOW SPOTS AND PONDING AREAS. CRITICAL AREAS INCLUDE BUILDING ENTRANCE, RAMPS, AND LOADING AREAS.
10. THE SITE SHALL BE GRADED SO ALL FINISHED PAVEMENT HAS POSITIVE DRAINAGE AND SHALL NOT POND WATER DEEPER THAN 1/4" FOR A PERIOD OF MORE THAN 15 MINUTES AFTER FLOODING.
11. ALL ELEVATIONS SHOWN AT CURB ARE TO THE BOTTOM OF CURB UNLESS OTHERWISE NOTED. CURBS HAVE A 6" REVEAL UNLESS OTHERWISE NOTED.
12. ALL SIDEWALK AND OTHER CURB REVEALS SHALL BE 6" WITH A TOLERANCE OF PLUS OR MINUS 3/8". WHERE SIDEWALK IS TO BE FLUSH, THE PAVEMENT REVEAL SHALL BE 1/4" WITH A TOLERANCE OF 1/8".
13. THE FINISHED GRADE AT BOTTOM OF ALL ACCESSIBLE RAMPS SHALL BE FLUSH WITH PAVEMENT WITH A TOLERANCE OF PLUS OR MINUS 1/4".
14. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE PRIOR TO INSTALLATION OF FINISHED PAVEMENT.
15. ROAD AND DRAINAGE CONSTRUCTION SHALL CONFORM TO THE TYPICAL SECTIONS AND DETAILS SHOWN ON THE PLANS AND SHALL MEET LOCAL STANDARDS AND THE REQUIREMENTS OF THE LATEST NHDOT STANDARD SPECIFICATIONS FOR ROADS AND BRIDGE CONSTRUCTION AND THE NHDOT STANDARD STRUCTURE DRAWINGS UNLESS OTHERWISE NOTED.
16. STORMWATER DRAINAGE SYSTEM SHALL BE CONSTRUCTED TO LINE AND GRADE AS SHOWN ON THE PLANS. CONSTRUCTION METHODS SHALL CONFORM TO NHDOT STANDARD SPECIFICATIONS, SECTION 603. CATCH BASINS AND DRAIN MANHOLES SHALL CONFORM TO SECTION 604. ALL CATCH BASIN GRATES SHALL BE TYPE B AND CONFORM TO NHDOT STANDARDS AND SPECIFICATIONS UNLESS OTHERWISE NOTED.
17. NO FILL SHALL BE PLACED IN ANY WETLAND AREA.
18. ALL EXCAVATIONS SHALL BE THOROUGHLY SECURED ON A DAILY BASIS BY THE CONTRACTOR AT THE COMPLETION OF CONSTRUCTION OPERATIONS IN THE IMMEDIATE AREA.
19. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED, FERTILIZER, AND MULCH.
20. DENSITY REQUIREMENTS:

MINIMUM DENSITY*	LOCATION
95%	BELOW PAVED OR CONCRETE AREAS
95%	TRENCH BEDDING MATERIAL AND SAND BLANKET BACKFILL
90%	BELOW LOAM AND SEED AREAS

*ALL PERCENTAGES OF COMPACTION SHALL BE OF THE MAXIMUM DRY DENSITY AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED AND CONTROLLED IN ACCORDANCE WITH ASTM D-1557, METHOD C. FIELD DENSITY TESTS SHALL BE MADE IN ACCORDANCE WITH ASTM D-1556 OR ASTM D-6938.

UTILITY NOTES

1. LENGTH OF PIPE IS FOR CONVENIENCE ONLY. ACTUAL PIPE LENGTH SHALL BE DETERMINED IN THE FIELD.
2. ALL PROPOSED UTILITY WORK, INCLUDING MATERIAL, INSTALLATION, TERMINATION, EXCAVATION, BEDDING, BACKFILL, COMPACTION, TESTING, CONNECTIONS, AND CONSTRUCTION SHALL BE COORDINATED WITH AND COMPLETED IN ACCORDANCE WITH THE APPROPRIATE REQUIREMENTS, CODES, AND STANDARDS OF ALL CORRESPONDING UTILITY ENTITIES AND SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATION, SIZE, AND ELEVATION OF ALL EXISTING UTILITIES, SHOWN OR NOT SHOWN ON THESE PLANS, PRIOR TO THE START OF ANY CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES FOUND INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTION BE AGREED TO BY THE ENGINEER BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTACT "DIGSAFE" (811) AT LEAST 72 HOURS BEFORE DIGGING.
4. COORDINATE ALL WORK ADJACENT TO PROPOSED BUILDINGS WITH ARCHITECTURAL BUILDING DRAWINGS. CONFIRM UTILITY PENETRATIONS AND INVERT ELEVATIONS ARE COORDINATED PRIOR TO INSTALLATION.
5. THE CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES OWNING UTILITIES, EITHER OVERHEAD OR UNDERGROUND, WITHIN THE CONSTRUCTION AREA AND SHALL COORDINATE AS NECESSARY WITH THE UTILITY COMPANIES OF SAID UTILITIES. THE PROTECTION OR RELOCATION OF UTILITIES IS ULTIMATELY THE RESPONSIBILITY OF THE CONTRACTOR.
6. THE EXACT LOCATION OF NEW UTILITY CONNECTIONS SHALL BE DETERMINED BY THE CONTRACTOR IN COORDINATION WITH UTILITY COMPANY, COUNTY AGENCY, AND/OR PRIVATE UTILITY COMPANY.
7. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANHOLES, BOXES, FITTINGS, CONNECTORS, COVER PLATES, AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED ON THESE DRAWINGS TO RENDER THE UTILITY INSTALLATION COMPLETE AND OPERATIONAL.
8. ALL UTILITY COMPANIES REQUIRE INDIVIDUAL CONDUITS. CONTRACTOR TO COORDINATE WITH TELEPHONE, CABLE, AND ELECTRIC COMPANIES REGARDING NUMBER, SIZE, AND TYPE OF CONDUITS REQUIRED PRIOR TO INSTALLATION OF ANY CONDUIT.
9. SANITARY SEWER SHALL BE CONSTRUCTED TO THE STANDARDS AND SPECIFICATIONS AS SHOWN ON THESE PLANS. ALL SEWER MAINS AND FITTINGS SHALL BE PVC AND SHALL CONFORM TO ASTM F 679 (SDR 35 MINIMUM). FORCE MAINS AND FITTINGS SHALL CONFORM TO NH CODE OF ADMINISTRATIVE RULES ENV-WQ 700. ALL SEWER CONSTRUCTION SHALL BE IN ACCORDANCE WITH NH CODE OF ADMINISTRATIVE RULES ENV-WQ 700. SANITARY MANHOLES SHALL CONFORM TO NHDES WATER DIVISION WASTEWATER ENGINEERING BUREAU STANDARDS AND SPECIFICATIONS SHOWN HEREON.
10. ON-SITE WATER DISTRIBUTION SHALL BE TO CITY OF PORTSMOUTH STANDARDS AND SPECIFICATIONS. WATER MAINS SHALL HAVE A MINIMUM OF 5.5' COVER. WHERE WATER PIPES CROSS SEWER LINES A MINIMUM OF 18" VERTICAL SEPARATION BETWEEN THE TWO OUTSIDE PIPE WALLS SHALL BE OBSERVED. HORIZONTAL SEPARATION BETWEEN WATER AND SEWER SHALL BE 10' MINIMUM. WHERE A SANITARY LINE CROSSES A WATER LINE, SEWER LINE MUST BE CONSTRUCTED OF FORCE MAIN MATERIALS (PER ENV-WQ 704.08) FROM BUILDING OR MANHOLE TO MANHOLE, OR SUBSTITUTE RUBBER-GASKETED PRESSURE PIPE FOR THE SAME DISTANCE. WHEN SANITARY LINES PASS BELOW WATER LINES, LAY PIPE SO THAT NO JOINT IN THE SANITARY LINE WILL BE CLOSER THAN 6' HORIZONTALLY TO THE WATER LINE.
11. THRUST BLOCKS SHALL BE PROVIDED AT ALL LOCATIONS WHERE WATER LINE CHANGES DIRECTIONS OR CONNECTS TO ANOTHER WATER LINE.
12. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR CONDUIT AND WIRING TO ALL SIGNS AND LIGHTS. CONDUIT TO BE A MINIMUM OF 24" BELOW FINISH GRADE.
13. ALL PROPOSED UTILITIES SHALL BE UNDERGROUND. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES.
14. THE CONTRACTOR SHALL ARRANGE AND PAY FOR ALL INSPECTIONS, TESTING, AND RELATED SERVICES AND SUBMIT COPIES OF ACCEPTANCE TO THE OWNER, UNLESS OTHERWISE INDICATED.
15. PROVIDE PERMANENT PAVEMENT REPAIR FOR ALL UTILITY TRENCHES IN EXISTING ROAD OR PAVEMENT TO REMAIN. SAW CUT TRENCH, PAVEMENT, AND GRANULAR BASE THICKNESS TO MATCH EXISTING PAVEMENT. OBTAIN ALL PERMITS REQUIRED FOR TRENCHING.
16. UNLESS OTHERWISE SPECIFIED, ALL UNDERGROUND STRUCTURES, PIPES, CHAMBERS, ETC. SHALL BE COVERED WITH A MINIMUM OF 18" OF COMPACTED SOIL BEFORE EXPOSURE TO VEHICLE LOADS.
17. THE PROPERTY WILL BE SERVICED BY THE FOLLOWING:

DRAINAGE	PRIVATE
SEWER	MUNICIPAL
WATER	MUNICIPAL
GAS	UNITIL
ELECTRIC	EVERSOURCE
TELEPHONE	CONSOLIDATED COMMUNICATIONS FKA FAIRPOINT COMMUNICATIONS
CABLE	COMCAST

STATE OF NEW HAMPSHIRE — JOHN J. McTIGUE No. 14950 LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	DR	CK

SITE DEVELOPMENT PLANS

TAX MAP 229 LOT 1

NOTES & LEGEND

PROPOSED 3 LOT SUBDIVISION

437 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

OWNED BY & PREPARE FOR

ARTWILL, LLC

SCALE: NTS **APRIL 19, 2022**

TFM ©
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

FILE	DR	JSM	FB	–	
45407-120	CK	JCC	CADFILE	45407-120_NOTES	C-01

Apr 18, 2022 - 11:03pm
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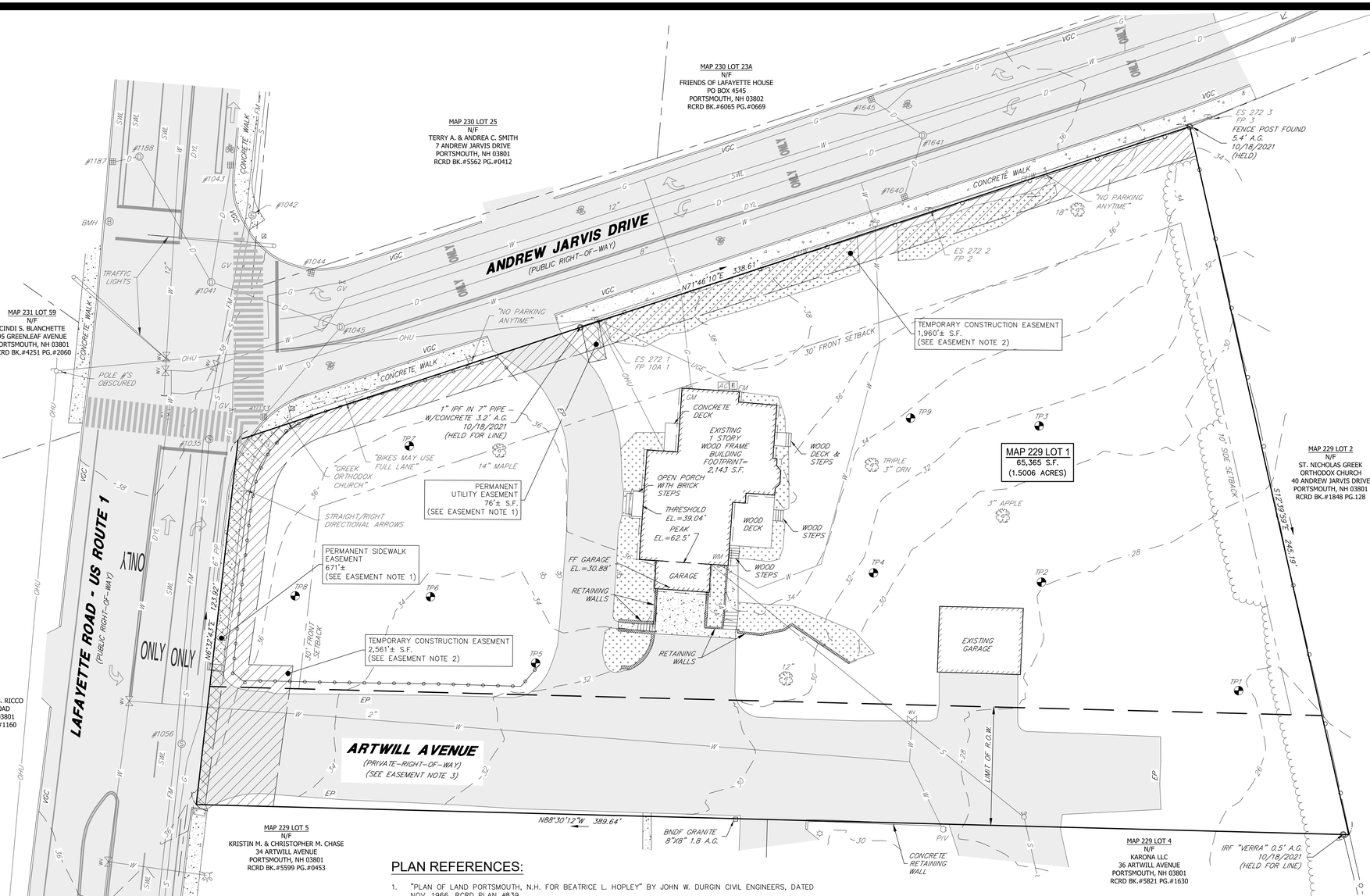
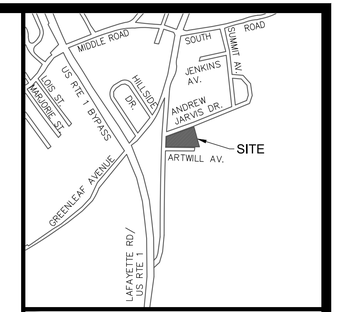
LEGEND:

MAP 229 / LOT 9	ASSESSOR'S MAP NUMBER / LOT NUMBER
A.G.	ABOVE GRADE
BK./PG.	BOOK/PAGE
BNDF	BOUND FOUND
DYL	DOUBLE YELLOW LINE
EL.	ELEVATION
EM	ELECTRIC METER
EP	EDGE OF PAVEMENT
FF	FINISHED FLOOR
GM	GAS METER
IPF	IRON PIPE FOUND
IRF	IRON ROD FOUND
N/F	NOW OR FORMERLY
ORN	ORNAMENTAL
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
R.O.W.	RIGHT OF WAY
S.F.	SQUARE FEET
SWL	SINGLE WHITE LINE
VGC	VERTICAL GRANITE CURB
WM	WATER METER
	LANDSCAPED AREA
	PAVEMENT
	CONCRETE
	HYDRANT
	IRRIGATION CONTROL VALVE
WS	WATER SHUT OFF
WV	WATER VALVE
PIV	POST INDICATOR VALVE
AC	AIR CONDITIONER
E	ELECTRIC BOX
	UTILITY POLE
	LIGHT POST
	SEWER CLEAN OUT
S	SEWER MANHOLE
GV	GAS VALVE
D	DRAINAGE MANHOLE
CB	CATCH BASIN
B	BELL MANHOLE
	BIKE LANE
	SIGN POLE
	DECIDUOUS TREE
TP1	TEST PIT
	PROPERTY LINE
	ABUTTERS LINE
UGE	UNDERGROUND ELECTRIC
OHU	OVERHEAD UTILITIES
D	DRAIN LINE
G	GAS LINE
W	WATER LINE
S	SEWER LINE
FM	FORCE MAIN
	TREE LINE
	SPLIT RAIL FENCE
	CHAINLINK FENCE
36	EXISTING CONTOUR





LOCATION PLAN

NOTES:

1. THE PARCEL IS LOCATED IN THE SINGLE RESIDENCE B (SRB) ZONE.
2. THE PARCEL IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 229 AS LOT 1.
3. THE PARCEL IS LOCATED IN FLOOD ZONE X (AREAS OF MINIMAL FLOODING) AS SHOWN ON NATIONAL FLOOD INSURANCE PROGRAM (NFIP), FLOOD INSURANCE RATE MAP (FIRM) ROCKINGHAM COUNTY, NEW HAMPSHIRE, PANEL 270 OF 681, VERSION NUMBER 2.3.2.1, MAP NUMBER 33015C0270F, MAP REVISED JANUARY 29, 2021.
4. ZONING REQUIREMENTS:

MINIMUM LOT DIMENSIONS	
LOT AREA	15,000 S.F.
LOT AREA PER DWELLING UNIT	15,000 S.F.
CONTINUOUS STREET FRONTAGE	100'
DEPTH	100'
MINIMUM YARD DIMENSIONS	
FRONT	30'
SIDE	10'
REAR	30'
MAXIMUM STRUCTURE DIMENSIONS	
STRUCTURE HEIGHT:	
SLOPED ROOF	35'
FLAT ROOF	30'
ROOF APPURTENANCE HEIGHT	8'
BUILDING COVERAGE	20%
MINIMUM OPEN SPACE	40%

5. TOTAL PARCEL AREA:
   MAP 229 LOT 1
   65,365 S.F.
   (1.5006 ACRES)
6. OWNER OF RECORD:
   MAP 229 LOT 1
   ARTWILL, LLC
   PO BOX 370
   PORTSMOUTH, NH 03802
   RCRD BK.#6334 PG.#0455
7. THE INTENT OF THIS PLAN IS TO SHOW THE LOCATION OF BOUNDARIES IN ACCORDANCE WITH THE CURRENT LEGAL DESCRIPTIONS. IT IS NOT AN ATTEMPT TO DEFINE UNWRITTEN RIGHTS, DETERMINE THE EXTENT OF OWNERSHIP OR DEFINE THE LIMITS OF TITLE.
8. THE PURPOSE OF THIS PLAN IS TO SHOW THE EXISTING FEATURES OF MAP 229 LOT 1.
9. HORIZONTAL DATUM IS NAD 83 (2011) VERTICAL DATUM IS NAVD 88 PER STATIC GPS OBSERVATIONS.
10. FIELD SURVEY COMPLETED BY TODD C. EMERSON IN OCTOBER 2021 USING A LEICA TS-16, A TOPCON HIPER SR AND A CARLSON RT-4 DATA COLLECTOR.
11. EASEMENTS, RIGHTS, AND RESTRICTIONS SHOWN OR IDENTIFIED ARE THOSE WHICH WERE FOUND DURING RESEARCH PERFORMED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS. OTHER RIGHTS, EASEMENTS, OR RESTRICTIONS MAY EXIST WHICH A TITLE EXAMINATION OF SUBJECT PARCEL WOULD DETERMINE.
12. THE LOCATION OF ANY UNDERGROUND UTILITY INFORMATION SHOWN ON THIS PLAN IS APPROXIMATE. TFMORAN, INC. MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF UNDERGROUND UTILITIES SHOWN. PRIOR TO ANY EXCAVATION ON SITE THE CONTRACTOR SHALL CONTACT DIG SAFE.

PLAN REFERENCES:

1. "PLAN OF LAND PORTSMOUTH, N.H. FOR BEATRICE L. HOPLEY" BY JOHN W. DURGIN CIVIL ENGINEERS, DATED NOV. 1966. RCRD PLAN #839.
2. "PLAN OF LOTS OWNED BY BEATRICE L. HOPLEY LAFAYETTE ROAD PORTSMOUTH, N.H.", DATED JUNE 1940, REVISED FROM ORIGINAL PLAN BY JOHN W. DURGIN, REVISED MAY, 1946, REVISED FEB. 1957. RCRD PLAN #2637.
3. "STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION CONSTRUCTION PLANS FEDERAL AID PROJECT OF PROPOSED BRIDGE REMOVAL BRIDGE NO. 173/071 & RECONFIGURATION OF US ROUTE 1 BYPASS AND US ROUTE 1 (LAFAYETTE ROAD) FEDERAL PROJECT X-A000(994) NH PROJECT NO. 13455-A, CITY OF PORTSMOUTH COUNTY OF ROCKINGHAM", APPROVED 6/27/12. RCRD PLAN #13455.
4. "STATE OF NEW HAMPSHIRE STATE HIGHWAY DEPARTMENT PLAN AND PROFILE OF PROPOSED FEDERAL AID PROJECT LAFAYETTE ROAD NO-R37-A, CITY OF PORTSMOUTH ROCKINGHAM COUNTY". PLAN #50031.
5. "STATE OF NEW HAMPSHIRE STATE HIGHWAY DEPARTMENT PLAN AND PROFILE OF PROPOSED FEDERAL AID PROJECT LAFAYETTE ROAD NO. 37 LAFAYETTE ROAD". PLAN #50147.
6. "CORRECTIVE SEWER EASEMENT PLAN OVER LAND OF KARONA, LLC 36 ARTWILL AVENUE PORTSMOUTH, NEW HAMPSHIRE ASSESSOR'S PARCEL 229-4 FOR KARONA, LLC" BY JAMES VERRA AND ASSOCIATES, INC., DATED 1/19/2021. RCRD PLAN #C-42611.
7. "SUBDIVISION PLAN OF LAND OF J. PHILIP MCCAFFERY FOR GREAT BAY SCHOOL AND TRAINING CENTER LAFAYETTE RD. COUNTY OF ROCKINGHAM PORTSMOUTH NH", BY RICHARD P. MILLETTE AND ASSOCIATES, DATED DEC. 1981, WITH REV.1 FROM 1/7/82. RCRD PLAN #D-10590.
8. "SUBDIVISION PLAN TAX MAP 230 – LOT 23 OWNER: GREAT BAY SCHOOL AND TRAINING CENTER FOR LEMIEUX BUILDERS, INC." 417 LAFAYETTE ROAD CITY OF PORTSMOUTH COUNTY OF ROCKINGHAM STATE NEW HAMPSHIRE" BY AMBIT ENGINEERING, INC., DATED SEPTEMBER 2013, WITH REVISION 2 DATED 12/23/13. RCRD PLAN #D-38079.
9. "EASEMENT PLAN TAX MAP 230 – LOT 25 D.R. LEMIEUX BUILDERS, INC. TO THE CITY OF PORTSMOUTH 7 ANDREW JARVIS DRIVE CITY OF PORTSMOUTH COUNTY OF ROCKINGHAM STATE OF NEW HAMPSHIRE" BY AMBIT ENGINEERING, INC., DATED JUNE 2014, WITH REVISION 2 DATED 7/25/14. RCRD PLAN #D-38417.
10. "EASEMENT PLAN TAX MAP 229 – LOT 1 HARLON P. WILLIS REVOCABLE TRUST AND JEAN P. WILLIS REVOCABLE TRUST TO THE CITY OF PORTSMOUTH 437 LAFAYETTE ROAD CITY OF PORTSMOUTH COUNTY OF ROCKINGHAM STATE OF NEW HAMPSHIRE" BY GPI GREENMAN-PEDERSEN, INC., DATED OCTOBER 26, 2015, WITH REVISION 1 DATED 10/26/2015. RCRD PLAN #D-40626.
11. "EASEMENT PLAN TAX MAP 229 – LOT 5 KRISTEN M. CHASE AND CHRISTOPHER M. CHASE TO THE CITY OF PORTSMOUTH 34 ARTWILL AVENUE CITY OF PORTSMOUTH COUNTY OF ROCKINGHAM STATE OF NEW HAMPSHIRE" BY GPI GREENMAN-PEDERSEN, INC., DATED JANUARY 20, 2016, WITH REVISION 2 DATED 12/2/2016. RCRD PLAN #D-40627.
12. "INTERSECTION IMPROVEMENT PROJECT U.S. ROUTE 1 AT ANDREW JARVIS DRIVE IN THE CITY OF PORTSMOUTH ROCKINGHAM COUNTY STATE OF NEW HAMPSHIRE PREPARED FOR CITY OF PORTSMOUTH DEPT OF PUBLIC WORKS" BY GREENMAN-PEDERSON, INC., DATED 12/22/17.

EASEMENT NOTES:

1. MAP 229 LOT 1 IS SUBJECT TO PERMANENT EASEMENTS FOR THE INSTALLATION & MAINTENANCE OF A PUBLIC SIDEWALK AND FOR THE INSTALLATION & MAINTENANCE OF TRAFFIC SIGNAL EQUIPMENT. SEE RCRD BK. 5888 PG. 1860 AND PLAN REFERENCE 10 (PARCELS 1 & 3).
2. MAP 229 LOT 1 IS SUBJECT TO TEMPORARY EASEMENTS FOR THE PURPOSE OF INSTALLING AND MAINTAINING A SIDEWALK. SEE RCRD BK. 5888 PG. 1860 AND PLAN REFERENCE 10 (PARCELS 2 & 4).
3. MAP 229 LOT 1 IS SUBJECT TO RIGHTS OVER A PORTION OF THE PREMISES SHOWN AS "ARTWILL AVENUE" GRANTED TO MAP 229 LOT 2 FOR THE PURPOSES OF INGRESS & EGRESS, CONNECTION TO A 2 INCH WATERLINE AND THE EXTENSION THEREOF, CONNECTION TO THE CITY SEWER ON LAFAYETTE ROAD AND THE RIGHT TO FIRST REFUSAL TO PURCHASE A 50 FOOT STRIP OF LAND. SEE RCRD BK.1848 PG. 128.
4. MAP 229 LOT 1 HAS THE BENEFIT OF A 20' WIDE SEWER EASEMENT FOR REPAIR AND MAINTENANCE ACROSS LAND OF MAP 229 LOT 4. SEE RCRD BK. 6236 PG. 731 AND PLAN REFERENCE 6.

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DIG SAFE
NH ME RI VT
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM
CALL 811 TOLL FREE
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

20 10 0 20
Graphic Scale in Feet

I CERTIFY THAT THIS SURVEY AND PLAN WERE PREPARED BY THOSE UNDER MY DIRECT SUPERVISION AND ARE THE RESULT OF A FIELD SURVEY CONDUCTED IN OCTOBER, 2021. THIS SURVEY CONFORMS TO THE ACCURACY REQUIREMENTS OF AN URBAN SURVEY OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSURE FOR LAND SURVEYORS.
I FURTHER CERTIFY THAT THIS SURVEY IS CORRECT TO THE BEST OF MY PROFESSIONAL KNOWLEDGE, AND THE FIELD TRAVERSE SURVEY EXCEEDS A PRECISION OF 1:15,000.

STATE OF NEW HAMPSHIRE — No. 844 — J. COREY COLWELL — LICENSED LAND SURVEYOR

LICENSED LAND SURVEYOR — 2022-04-19 DATE

REV.	DATE	DESCRIPTION	DR	CK

TAX MAP 229 LOT 1
EXISTING CONDITIONS PLAN
SMITHFIELD CONSTRUCTION
437 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
COUNTY OF ROCKINGHAM
OWNED BY
ARTWILL, LLC

SCALE: 1" = 20' (22x34)
1" = 40' (11x17)
APRIL 19, 2022

Seacoast Division
TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.tfmoran.com

FILE	DR	ID	FB		
45407-120	CK	JCC	CADFILE	583	S-01

Apr 19, 2022 - 11:07am
F:\MSC Projects\45407 - Lafayette Road - Portsmouth\45407-120 - Smithfield Construction - 437 Lafayette Rd\Carlson Survey\Dwgs\45407-120 Survey.dwg

TEST PIT LOG

SITE: 437 LAFAYETTE ROAD, PORTSMOUTH, NH
LOGGED BY: PAUL O'HANLON, TFM, INC.
DATE: 1/25/2022

Test Pit #1:

0–13" 10YR 5/3 BROWN, LOAM, MASSIVE, FRIABLE, ANTHROPOGENIC FILL (ASPHALT, BRICK)
13–20" AB 10YR 7/6 YELLOW, LOAM, BLOCKY, FRIABLE, GRAVELY <5% ROCK (IRON STONE)
20–55" B1 GLEY 1 7N GRAY, SANDY LOAM, MASSIVE, PLIABLE
55– 65" B2 10YR 5/1 GRAY, COARSE SAND, FRIABLE, MASSIVE, > 15% ANGULAR ROCK FRAGMENT (IRON STONE)
REDOX @ 20" 10YR 7/8 COMMON DISTINCT >15%
SOIL SERIES: WALPOLE
EST WET: 20" BELOW GRADE
OBS WT: 39" BELOW GRADE (APPARENT →)
LEDGE: > 65" BELOW GRADE

Test Pit #2:

0–15"A 10YR 4/3 BROWN, LOAM, MASSIVE
15–17" 10YR 7/6 YELLOW, SANDY LOAM, FRIABLE, GRANULAR
17–27" GLEY 1 7/N LIGHT GRAY, SANDY LOAM, FRIABLE, GRANULAR
27–52" 10YR 6/6 BROWNISH YELLOW, LOAM, FRIABLE, MASSIVE
52–77" 10YR 5/1 GRAY, COURSE SAND, FRIABLE, GRAVELY, GRANULAR
REDOX @ 26" 10YR 7/8 COMMON DISTINCT
SOIL SERIES: WALPOLE
EST WET: 26" BELOW GRADE
OBS WT: 51" BELOW GRADE (APPARENT ↑)
LEDGE: 77" BELOW GRADE

Test Pit #3:

0–16" 10YR 4/3 BROWN, LOAM, AGGREGATED, FRIABLE
16–27" 10YR 6/6 BROWNISH YELLOW, LOAM, AGGREGATED, FRIABLE, GRAVELY >5%
27–52" 10YR 7/2 LIGHT GRAY, LOAMY SAND, AGGREGATED, FRIABLE GRAVELY >15%
52–84" 10YR 8/1 WHITE, SANDY CLAY LOAM, PLATEY, INDURATE
REDOX @: 41" 10YR 7/8 COMMON DISTINCT >15%
SOIL SERIES: CANTON – CHATFIELD COMPLEX
EST WET: 41" BELOW GRADE
OBS WT: 84" BELOW GRADE (APPARENT ↘)
LEDGE: 84" BELOW GRADE

Test Pit #4:

0–18" 10YR 5/4 YELLOWISH BROWN, LOAM, FRIABLE, AGGREGATE
18–27" 10YR 6/6 BROWNISH YELLOW, SANDY LOAM, GRAVELY >5%, FRIABLE, AGGREGATE
27–37" 10YR 6/2 LIGHT BROWNISH GREY, LOAMY SAND, > 15% ANGULAR ROCK FRAGMENT (IRON STONE)
37–65" 10YR 7/8 YELLOW, DECAYING BEDROCK, ANGULAR COBBLE, IRON STONE
REDOX @: 5R 3/8 COMMON DISTINCT >15%
SOIL SERIES: CHATFIELD
EST WET: 37" BELOW GRADE
OBS WT: 56" BELOW GRADE (APPARENT ↑)
LEDGE: 65" BELOW GRADE

Test Pit #5:

0–10" 10YR 4/3 BROWN, LOAMY SAND, AGGREGATE, FRIABLE, GRAVELY >5%
10–31" 10YR 5/4 YELLOWISH BROWN, COURSE SAND, GRANULAR, FRIABLE, GRAVELY >15%
31–57" GLEY 1 5/N GRAY, CLAY, DECAYED BEDROCK, BOULDERS >5%, MASSIVE
REDOX @: 31" 5R 3/8 COMMON DISTINCT >15%
SOIL SERIES: CHATFIELD – MAYBID COMPLEX
EST WET: 31" BELOW GRADE
OBS WT: > 57"
LEDGE: 57" BELOW GRADE

TEST PIT LOG

SITE: 437 LAFAYETTE ROAD, PORTSMOUTH, NH
LOGGED BY: PAUL O'HANLON, TFM, INC.
DATE: 1/25/2022

Test Pit #6:

0–12" 10YR 4/3 BROWN, SANDY LOAM, AGGREGATE, FRIABLE
12–16" 10YR 7/2 LIGHT GRAY, SAND, GRANULAR, FRIABLE, GRAVELY >5%
16–28" 10YR 7/1 LIGHT GRAY, FINE SAND, GRANULAR, FRIABLE
28–42" 10YR 7/3 VERY PALE BROWN, SANDY LOAM, AGGREGATE, FRIABLE, HETEROGENEOUS
42–47" GLEY 1 5/5G–1 GREENISH GRAY, SANDY CLAY LOAM, PLATEY, INDURATE
47–96" GLEY 2 8/5BG LIGHT GREENISH GRAY, CLAY, MASSIVE, INDURATE, HOMOGENEOUS
REDOX @42" 5R 3/8 COMMON DISTINCT >15%
SOIL SERIES: CANTON COMPLEX (ANTHROPOGENIC)
EST WET: 42" BELOW GRADE
OBS WT: 79" BELOW GRADE (APPARENT →)
LEDGE: > 96"

Test Pit #7:

0–18" 10YR 4/2 DARK GRAYISH BROWN, SANDY LOAM, FRIABLE, BLOCKY
18–42" 10YR 7/4 VERY PALE BROWN, FINE SAND, GRANULAR, FRIABLE
42–54" 10YR 6/6 BROWNISH YELLOW, COURSE SAND, GRANULAR, FRIABLE
54–65" 10YR 5/8 YELLOWISH BROWN, SANDY LOAM, HETEROGENEOUS, FRIABLE
65–72" GLEY 2 4/10B DARK BLUEISH GRAY, SANDY CLAY LOAM, PLATEY, INDURATE
72–102" GLEY 2 7/10B LIGHT BLUEISH GRAY, CLAY, MASSIVE, INDURATE REDOX @ 57" 5R 3/8 COMMON DISTINCT >15%
SOIL SERIES: CANTON COMPLEX (ANTHROPOGENIC)
EST WET: 57" BELOW GRADE
OBS WT: 93" BELOW GRADE (APPARENT ↑)
LEDGE: >102"

Test Pit #8:

0–14" 10YR 4/2 DARK GRAYISH BROWN, LOAMY SAND, FRIABLE, BLOCKY
14–42" 10YR 7/4 VERY PALE BROWN, FINE SAND, AGGREGATE, FRIABLE, > 15% COBBLE RIVER STONE
42–50" GLEY 1 5/5G_/1 GREENISH GRAY, SANDY CLAY LOAM, AQUATARD PRESENT (IRON STONE), MASSIVE, INDURATE
50–55" 10YR 6/4 LIGHT YELLOWISH BROWN, SANDY CLAY LOAM, INCLUSION, HETEROGENEOUS, MASSIVE, INDURATE
55–103" GLEY 2 8/5BG LIGHT GREENISH GRAY, CLAY, INDURATE, MASSIVE
REDOX @ 42 5R 3/8 COMMON DISTINCT >15% (AQUATARD (POTENTIALLY ANTHROPOGENIC))
SOIL SERIES: CANTON COMPLEX (ANTHROPOGENIC)
EST WET: 42" BELOW GRADE
OBS WT: 101" BELOW GRADE (APPARENT ↑)
LEDGE: > 103"

Test Pit #9:

0–9"10YR 4/3 BROWN, LOAM, BLOCKY, FRIABLE, GRAVELY >5%
9–23" 10YR 5/6 YELLOWISH BROWN, LOAMY SAND, GRANULAR, , > 15% ANGULAR ROCK FRAGMENT (IRON STONE)
23–54" 10YR 7/2 LIGHT GREY, SANDY LOAM, INDURATE, MASSIVE, HETEROGENEOUS, > 15% ANGULAR ROCK FRAGMENT (IRON STONE)
REDOX @ 5R 4/6 COMMON DISTINCT >15%
SOIL SERIES: WALPOLE
EST WET: 30" BELOW GRADE
OBS WT: > 54"
LEDGE: 54" BELOW GRADE

TEST PIT LOG

SITE: 437 LAFAYETTE ROAD, PORTSMOUTH, NH
LOGGED BY: PAUL O'HANLON, TFM, INC.
DATE: 2/1/2022

Test Pit #10:

0–12" 10YR 4/4 DARK YELLOWISH BROWN, LOAMY SAND, BLOCKY, FRIABLE, COBBLE >15%, HOMOGENEOUS SOIL
12–23" 10YR 6/3 PALE BROWN, SANDY LOAM, AGGREGATE, FRIABLE, COBBLE >15%, HOMOGENEOUS SOIL
23–36" 10YR 6/2 LIGHT BROWNISH GREY, COURSE SAND, GRANULAR, HETEROGENEOUS, COBBLE >15%, VERY COURSE PARTICLES <5%
36–66" 10YR 5/4 YELLOWISH BROWN, LOAMY SAND, MASSIVE, INDURATE > 25% ANGULAR ROCK FRAGMENT (IRON STONE)
66–76" 10YR 5/4 YELLOWISH BROWN, SANDY LOAM, MASSIVE, INDURATE, DECAYING LEDGE, > 55% ANGULAR ROCK FRAGMENT (IRON STONE)
REDOX @ 52 – 58 10YR 5/6 COMMON DISTINCT >15%
SOIL SERIES: CANTON – WALPOLE COMPLEX
EST WET: 52" BELOW GRADE
OBS WT: >76"
LEDGE: 76" BELOW GRADE

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This plan is not effective unless signed by a duly authorized officer of TFMoran, Inc.

REV.	DATE	DESCRIPTION	DR	CK

TAX MAP 229 LOT 1

TEST PITS LOGS

SMITHFIELD CONSTRUCTION

437 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
COUNTY OF ROCKINGHAM

OWNED BY

ARTWILL, LLC

SCALE: N.T.S.

APRIL 19, 2022

Seacoast Division
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Land Surveyors
Landscape Architects
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FILE	45407-120	DR		FB		S-02
		CK		CADFILE		

Apr 19, 2022 - 10:58am
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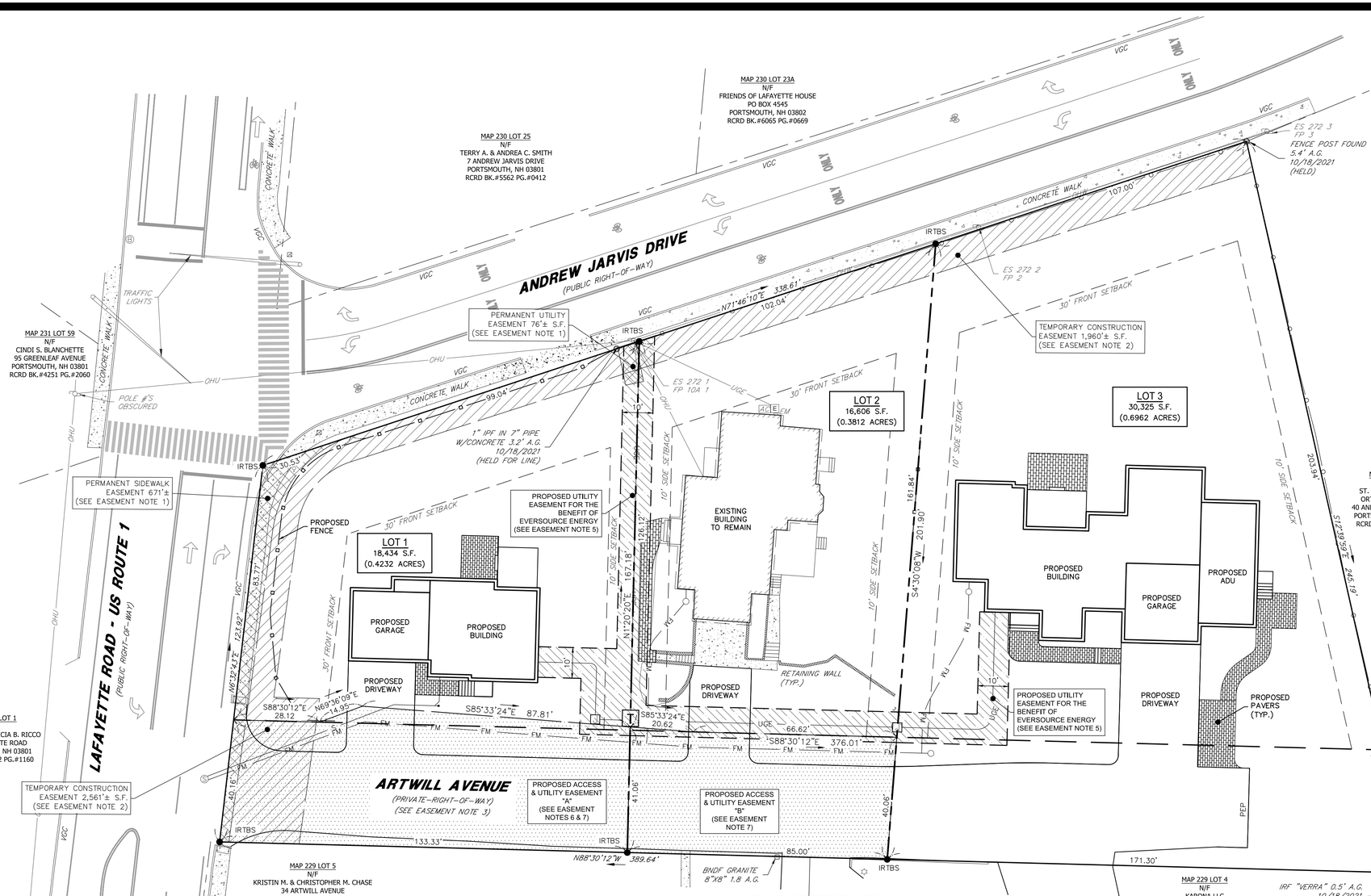

LOCATION PLAN

NOTES:

1. THE PARCEL IS LOCATED IN THE SINGLE RESIDENCE B (SRB) ZONE.
2. THE PARCEL IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 229 AS LOT 1.
3. THE PARCEL IS LOCATED IN FLOOD ZONE X (AREAS OF MINIMAL FLOODING) AS SHOWN ON NATIONAL FLOOD INSURANCE PROGRAM (NFIP), FLOOD INSURANCE RATE MAP (FIRM) ROCKINGHAM COUNTY, NEW HAMPSHIRE, PANEL 270 OF 681, VERSION NUMBER 2.3.2.1, MAP NUMBER 33015C0270F, MAP REVISED JANUARY 29, 2021.
4. ZONING REQUIREMENTS:

MINIMUM LOT DIMENSIONS:	SRB
LOT AREA	15,000 S.F.
LOT AREA PER DWELLING UNIT	15,000 S.F.
CONTINUOUS STREET FRONTAGE	100'
DEPTH	100'
MINIMUM YARD DIMENSIONS	
FRONT	30'
SIDE	10'
REAR	30'
MAXIMUM STRUCTURE DIMENSIONS	
STRUCTURE HEIGHT:	
SLOPED ROOF	35'
FLAT ROOF	30'
ROOF APPURTENANCE HEIGHT	8'
BUILDING COVERAGE	20%
MINIMUM OPEN SPACE	40%

5. TOTAL PARCEL AREA:

MAP 229 LOT 1	PROPOSED LOT 1	PROPOSED LOT 2	PROPOSED LOT 3
65,365 S.F. (1.5006 ACRES)	18,434 S.F. (0.4232 ACRES)	16,606 S.F. (0.3812 ACRES)	30,325 S.F. (0.6962 ACRES)

6. OWNER OF RECORD:
   MAP 229 LOT 1
   ARTWILL, LLC
   P.O. BOX 370
   PORTSMOUTH, NH 03802
   RCRD BK.#6334 PG.#455
7. THE INTENT OF THIS PLAN IS TO SHOW THE LOCATION OF BOUNDARIES IN ACCORDANCE WITH THE CURRENT LEGAL DESCRIPTIONS. IT IS NOT AN ATTEMPT TO DEFINE UNWRITTEN RIGHTS, DETERMINE THE EXTENT OF OWNERSHIP OR DEFINE THE LIMITS OF TITLE.
8. THE PURPOSE OF THIS PLAN IS TO SUBDIVIDE MAP 229 LOT 1 INTO 3 RESIDENTIAL LOTS.
9. HORIZONTAL DATUM IS NAD 83 (2011) VERTICAL DATUM IS NAVD 88 PER STATIC GPS OBSERVATIONS.
10. FIELD SURVEY COMPLETED BY TODD C. EMERSON IN OCTOBER 2021 USING A LEICA TS-16, A TOPCON HIPER SR AND A CARLSON RT-4 DATA COLLECTOR.
11. EASEMENTS, RIGHTS, AND RESTRICTIONS SHOWN OR IDENTIFIED ARE THOSE WHICH WERE FOUND DURING RESEARCH PERFORMED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS. OTHER RIGHTS, EASEMENTS, OR RESTRICTIONS MAY EXIST WHICH A TITLE EXAMINATION OF SUBJECT PARCEL WOULD DETERMINE.
12. THE LOCATION OF ANY UNDERGROUND UTILITY INFORMATION SHOWN ON THIS PLAN IS APPROXIMATE. TFMORAN, INC. MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF UNDERGROUND UTILITIES SHOWN. PRIOR TO ANY EXCAVATION ON SITE, THE CONTRACTOR SHALL CONTACT DIG SAFE.

EASEMENT NOTES:

1. MAP 229 LOT 1 IS SUBJECT TO PERMANENT EASEMENTS FOR THE INSTALLATION & MAINTENANCE OF A PUBLIC SIDEWALK AND FOR THE INSTALLATION & MAINTENANCE OF TRAFFIC SIGNAL EQUIPMENT. SEE RCRD BK. 5888 PG. 1860 AND PLAN REFERENCE 10 (PARCELS 1 & 3).
2. MAP 229 LOT 1 IS SUBJECT TO TEMPORARY EASEMENTS FOR THE PURPOSE OF INSTALLING AND MAINTAINING A SIDEWALK. SEE RCRD BK. 5888 PG. 1860 AND PLAN REFERENCE 10 (PARCELS 2 & 4).
3. MAP 229 LOT 1 IS SUBJECT TO RIGHTS OVER A PORTION OF THE PREMISES SHOWN AS "ARTWILL AVENUE" GRANTED TO MAP 229 LOT 2 FOR THE PURPOSES OF INGRESS & EGRESS, CONNECTION TO A 2 INCH WATERLINE AND THE EXTENSION THEREOF, CONNECTION TO THE CITY SEWER ON LAFAYETTE ROAD AND THE RIGHT TO FIRST REFUSAL TO PURCHASE A 50 FOOT STRIP OF LAND. SEE RCRD BK.1848 PG. 128.
4. MAP 229 LOT 1 HAS THE BENEFIT OF A 20' WIDE SEWER EASEMENT FOR REPAIR AND MAINTENANCE ACROSS LAND OF MAP 229 LOT 4. SEE RCRD BK. 6236 PG. 731 AND PLAN REFERENCE 6.
5. LOTS 1, 2 & 3 ARE SUBJECT TO A PROPOSED UTILITY EASEMENT FOR THE BENEFIT OF EVERSOURCE ENERGY. SAID EASEMENT SHALL BE LOCATED 5 FEET EACH SIDE OF THE AS-BUILT LOCATION OF THE UNDERGROUND UTILITY LINES SERVICING THE BUILDINGS.
6. LOT 1 IS SUBJECT TO PROPOSED ACCESS & UTILITY EASEMENT "A" FOR THE BENEFIT OF LOT 2. SAID EASEMENT IS TO INCLUDE A PORTION OF ARTWILL AVENUE AND 5 FEET EACH SIDE OF THE AS-BUILT LOCATION OF THE PROPOSED SEWER FORCE MAIN.
7. LOTS 1 & 2 ARE SUBJECT TO PROPOSED ACCESS & UTILITY EASEMENTS "A" & "B" FOR THE BENEFIT OF LOT 3. SAID EASEMENT IS TO INCLUDE A PORTION OF ARTWILL AVENUE AND 5 FEET EACH SIDE OF THE AS-BUILT LOCATION OF THE PROPOSED SEWER FORCE MAIN.

LEGEND:

MAP 137 LOT 11	ASSESSORS MAP AND LOT NUMBER
A.G.	ABOVE GRADE
BK. PG.	BOOK / PAGE
BNDF	BOUND FOUND
EM	ELECTRIC METER
EP	EDGE OF PAVEMENT
IPF	IRON PIPE FOUND
IRF	IRON ROD FOUND
IRTBS	IRON ROD TO BE SET
N/F	NOW OR FORMERLY
PEP	PROPOSED EDGE OF PAVEMENT
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
S.F.	SQUARE FEET
VGC	VERTICAL GRANITE CURB
◉	DRILL HOLE FOUND/SET
○	IRON PIPE/ROD FOUND
▫	BOUND FOUND
	UTILITY POLE
S	SEWER MANHOLE
	SIGNAL MAST
OHU	OVERHEAD UTILITIES
	CHAINLINK FENCE
	SPLIT RAIL FENCE
	BOUNDARY LINE
	PROPOSED LOT LINE
	YARD SETBACK
UGU	PROPOSED UNDERGROUND UTILITY LINE
S	PROPOSED SEWER LINE
FM	PROPOSED SEWER FORCE MAIN
	CONCRETE
	PERMANENT EASEMENT
	TEMPORARY EASEMENT
	PROPOSED UTILITY EASEMENT
	PROPOSED ACCESS & UTILITY EASEMENT

PLAN REFERENCES:

1. "PLAN OF LAND PORTSMOUTH, N.H. FOR BEATRICE L. HOPLEY" BY JOHN W. DURGIN CIVIL ENGINEERS, DATED NOV. 1966. RCRD PLAN #839.
2. "PLAN OF LOTS OWNED BY BEATRICE L. HOPLEY LAFAYETTE ROAD PORTSMOUTH, N.H.", DATED JUNE 1940, REVISED FROM ORIGINAL PLAN BY JOHN W. DURGIN, REVISED MAY, 1946, REVISED FEB. 1957. RCRD PLAN #2637.
3. "STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION CONSTRUCTION PLANS FEDERAL AID PROJECT OF PROPOSED BRIDGE REMOVAL BRIDGE NO. 173/071 & RECONFIGURATION OF US ROUTE 1 BYPASS AND US ROUTE 1 (LAFAYETTE ROAD) FEDERAL PROJECT X-A000(994) NH PROJECT NO. 13455-A, CITY OF PORTSMOUTH COUNTY OF ROCKINGHAM", APPROVED 6/27/12. RCRD PLAN #13455.
4. "STATE OF NEW HAMPSHIRE STATE HIGHWAY DEPARTMENT PLAN AND PROFILE OF PROPOSED FEDERAL AID PROJECT LAFAYETTE ROAD NO-R37-A, CITY OF PORTSMOUTH ROCKINGHAM COUNTY". PLAN #50031.
5. "STATE OF NEW HAMPSHIRE STATE HIGHWAY DEPARTMENT PLAN AND PROFILE OF PROPOSED FEDERAL AID PROJECT LAFAYETTE ROAD NO. 37 LAFAYETTE ROAD". PLAN #50147.
6. "CORRECTIVE SEWER EASEMENT PLAN OVER LAND OF KARONA, LLC 36 ARTWILL AVENUE PORTSMOUTH, NEW HAMPSHIRE ASSESSOR'S PARCEL 229-4 FOR KARONA, LLC" BY JAMES VERRA AND ASSOCIATES, INC., DATED 1/19/2021. RCRD PLAN #C-42611.
7. "SUBDIVISION PLAN OF LAND OF J. PHILIP MCCAFFERY FOR GREAT BAY SCHOOL AND TRAINING CENTER LAFAYETTE RD. COUNTY OF ROCKINGHAM PORTSMOUTH NH", BY RICHARD P. MILLETTE AND ASSOCIATES, DATED DEC. 1981, WITH REV.1 FROM 1/7/82. RCRD PLAN #D-10590.
8. "SUBDIVISION PLAN TAX MAP 230 – LOT 23 OWNER: GREAT BAY SCHOOL AND TRAINING CENTER FOR LEMIEUX BUILDERS, INC." 417 LAFAYETTE ROAD CITY OF PORTSMOUTH COUNTY OF ROCKINGHAM STATE NEW HAMPSHIRE" BY AMBIT ENGINEERING, INC., DATED SEPTEMBER 2013, WITH REVISION 2 DATED 12/23/13. RCRD PLAN #D-38079.
9. "EASEMENT PLAN TAX MAP 230 – LOT 25 D.R. LEMIEUX BUILDERS, INC. TO THE CITY OF PORTSMOUTH 7 ANDREW JARVIS DRIVE CITY OF PORTSMOUTH COUNTY OF ROCKINGHAM STATE OF NEW HAMPSHIRE" BY AMBIT ENGINEERING, INC., DATED JUNE 2014, WITH REVISION 2 DATED 7/25/14. RCRD PLAN #D-38417.
10. "EASEMENT PLAN TAX MAP 229 – LOT 1 HARLON P. WILLIS REVOCABLE TRUST AND JEAN P. WILLIS REVOCABLE TRUST TO THE CITY OF PORTSMOUTH 437 LAFAYETTE ROAD CITY OF PORTSMOUTH COUNTY OF ROCKINGHAM STATE OF NEW HAMPSHIRE" BY GPI GREENMAN-PEDERSEN, INC., DATED OCTOBER 26, 2015, WITH REVISION 1 DATED 10/26/2015. RCRD PLAN #D-40626.
11. "EASEMENT PLAN TAX MAP 229 – LOT 5 KRISTEN M. CHASE AND CHRISTOPHER M. CHASE TO THE CITY OF PORTSMOUTH 34 ARTWILL AVENUE CITY OF PORTSMOUTH COUNTY OF ROCKINGHAM STATE OF NEW HAMPSHIRE" BY GPI GREENMAN-PEDERSEN, INC., DATED JANUARY 20, 2016, WITH REVISION 2 DATED 12/2/2016. RCRD PLAN #D-40627.

Graphic Scale in Feet
20 10 0 20

DIG SAFE
MA ME NH RI VT
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM
CALL 811 TOLL FREE
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

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REV.	DATE	DESCRIPTION	DR	CK

PURSUANT TO NEW HAMPSHIRE REVISED STATUTES ANNOTATED 676:18, II, III AND IV AND 672:14:

I CERTIFY THAT THIS SURVEY AND PLAN WERE PREPARED BY THOSE UNDER MY DIRECT SUPERVISION AND ARE THE RESULT OF A FIELD SURVEY CONDUCTED IN OCTOBER 2021. THIS SURVEY CONFORMS TO THE ACCURACY REQUIREMENTS OF AN URBAN SURVEY OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSURE FOR LAND SURVEYORS.
I FURTHER CERTIFY THAT THIS SURVEY IS CORRECT TO THE BEST OF MY PROFESSIONAL KNOWLEDGE, AND THE FIELD TRAVERSE SURVEY EXCEEDS A PRECISION OF 1:15,000.

STATE OF NEW HAMPSHIRE No. 844 LICENSED LAND SURVEYOR JAMES COREY COLWELL

Corey Colwell
SIGNATURE

LICENSED LAND SURVEYOR

2022-04-19
DATE

TAX MAP 229 LOT 1
SUBDIVISION PLAN
PROPOSED 3-LOT SUBDIVISION
437 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
COUNTY OF ROCKINGHAM
OWNED BY
ARTWILL, LLC

SCALE: 1" = 20' (22x34)
1" = 40' (11x17)
APRIL 19, 2022

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45407-120			583		S-03
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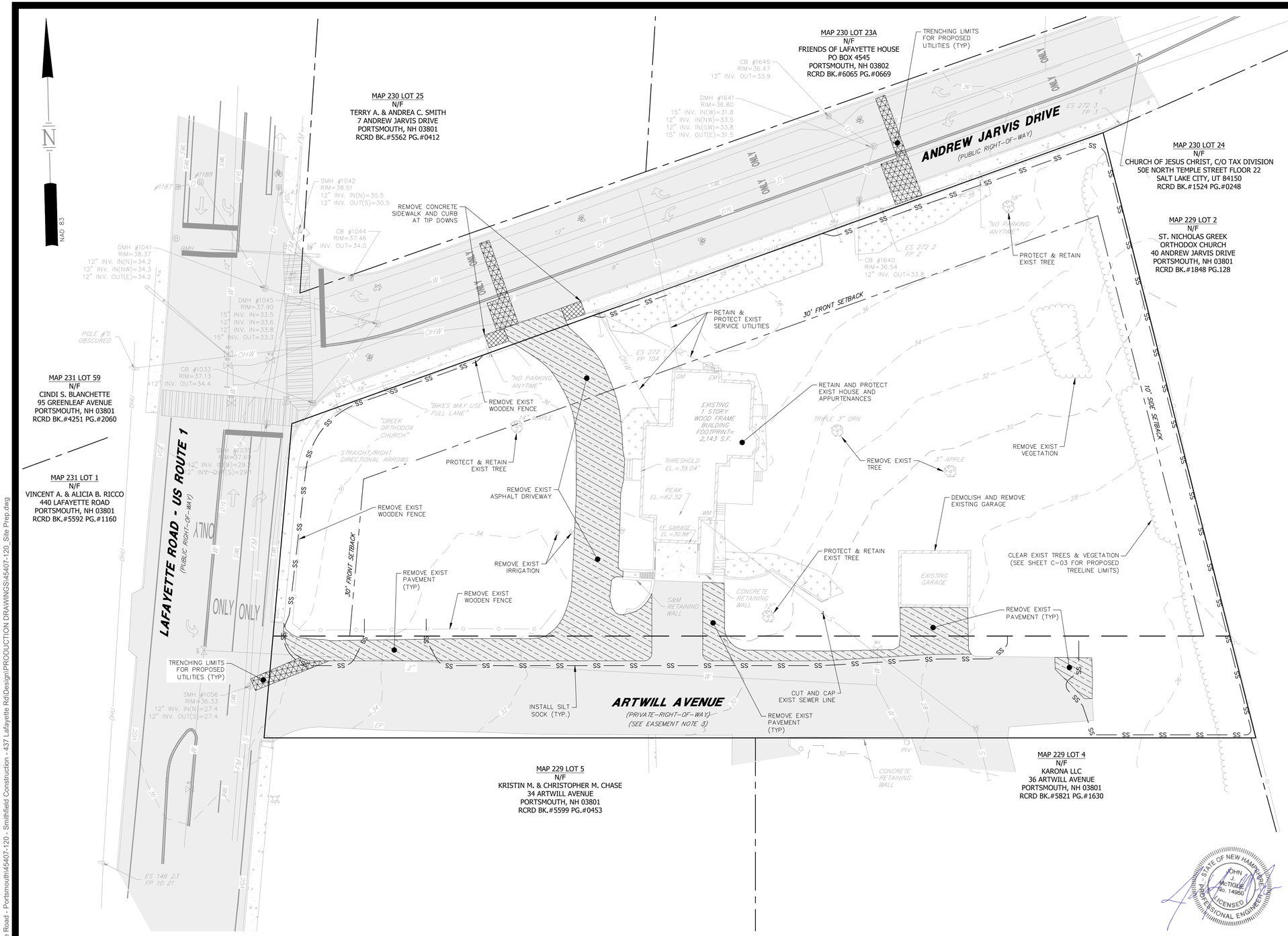

NOTES

1. SEE NOTES ON SHEET C-01.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATIONS, SIZE, AND ELEVATIONS OF ALL EXISTING UTILITIES, SHOWN OR NOT SHOWN ON THESE PLANS PRIOR TO THE START OF ANY DEMOLITION. THE LOCATIONS SHOWN ON THESE PLANS ARE NOT GUARANTEED BY THE OWNER OR THE ENGINEER. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES INTERFERING WITH THE PROPOSED DEMOLITION TO DETERMINE APPROPRIATE ACTION TO BE TAKEN BEFORE PROCEEDING WITH THE WORK. IT IS ALSO THE CONTRACTOR'S RESPONSIBILITY TO ANTICIPATE CONFLICTS AND REPAIR EXISTING UTILITIES AS NECESSARY TO COMPLETE THE WORK AT NO ADDITIONAL COST TO THE OWNER.
3. THE CONTRACTOR SHALL MAINTAIN EMERGENCY ACCESS TO ALL AREAS AFFECTED BY WORK AT ALL TIMES.
4. THE CONTRACTOR SHALL VERIFY ALL SURVEY INFORMATION IN THE FIELD AND REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO THE START OF CONSTRUCTION.
5. EXISTING UTILITY SERVICES TO BE DISCONTINUED ARE TO BE CAPPED AS REQUIRED BY THE RESPECTIVE UTILITY COMPANIES.
6. CONSTRUCTION DEBRIS AND INVASIVE SPECIES SHALL BE REMOVED FROM SITE AND DISPOSED OF IN A LEGAL MANNER.
7. PRIOR TO THE START OF WORK, THE CONTRACTOR SHALL PLACE ORANGE CONSTRUCTION FENCING AROUND EACH TREE TO BE RETAINED THROUGHOUT CONSTRUCTION. NO STOCKPILES OF MATERIAL ARE PERMITTED WITHIN THE DRIP LINE OF THE TREES TO BE SAVED.
8. CONTACT THE LANDSCAPE ARCHITECT IMMEDIATELY IF ANY TREES ARE DAMAGED DURING CONSTRUCTION.

CONSTRUCTION SEQUENCE NOTES

TO MINIMIZE EROSION AND SEDIMENTATION DUE TO CONSTRUCTION, CONSTRUCTION SHALL FOLLOW THIS GENERAL CONSTRUCTION SEQUENCE.

MODIFICATIONS TO THE SEQUENCE NECESSARY DUE TO THE CONTRACTOR'S SCHEDULE SHALL INCLUDE APPROPRIATE TEMPORARY AND PERMANENT EROSION AND SEDIMENTATION CONTROL MEASURES.

THE CONTRACTOR SHALL SCHEDULE WORK SUCH THAT ANY CONSTRUCTION AREA IS STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE EXCEPT AS NOTED BELOW. NO MORE THAN 5 ACRES OF DISTURBED LAND SHALL BE UNSTABILIZED AT ANY ONE TIME.

THE PROJECT SHALL BE MANAGED SO THAT IT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER ARC 3800 RELATIVE TO INVASIVE SPECIES.

DO NOT TRAFFIC EXPOSED SOIL SURFACE OF INFILTRATION SYSTEMS WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION COMPONENTS OF THE SYSTEM.

DO NOT DISCHARGE SEDIMENT-LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF, WATER FROM EXCAVATIONS) TO STORMWATER BMP'S. STORMWATER RUNOFF MUST BE DIRECTED TO TEMPORARY PRACTICES UNTIL STORMWATER BMP'S ARE STABILIZED.

DO NOT PLACE STORMWATER BMP'S INTO SERVICE UNTIL THE CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.

AFTER THE INFILTRATION SYSTEM IS EXCAVATED TO THE FINAL DESIGN ELEVATION, THE FLOOR SHOULD BE DEEPLY TILLED WITH A ROTARY TILLER OR DISC HARROW TO RESTORE THE INFILTRATION RATES, FOLLOWED BY A PASS WITH A LEVELING DRAG.

1. NOTIFY EASEMENT OWNERS PRIOR TO COMMENCEMENT OF WORK.
2. INSTALL ALL PERIMETER EROSION PROTECTION MEASURES AS INDICATED ON THE PLANS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
3. STORMWATER TREATMENT PONDS AND SWALES SHALL BE INSTALLED BEFORE ROUGH GRADING THE SITE.
4. DURING CONSTRUCTION EVERY EFFORT SHALL BE MADE TO MANAGE SURFACE RUNOFF QUALITY.
5. DAILY, OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINS, DITCHES, SILT BARRIERS, SEDIMENT TRAPS, ETC. MULCH AND SEED AS REQUIRED. (TEMPORARY SEED MIXTURE OF WINTER RYE APPLIED AT A RATE OF 2.5 LBS/1000 SF SHALL BE USED).
6. CONDUCT MAJOR EARTHWORK, INCLUDING CLEARING AND GRUBBING, WITHIN THE LIMITS OF WORK. ALL CUT AND FILL SLOPES SHALL BE SEEDED WITHIN 72 HOURS AFTER GRADING.
7. ALL STRIPPED TOPSOIL AND OTHER EARTH MATERIALS SHALL BE STOCKPILED OUTSIDE THE IMMEDIATE WORK AND WETLAND AREAS. A SILT BARRIER SHALL BE CONSTRUCTED AROUND THESE PILES IN A MANNER TO PROVIDE ACCESS AND AVOID SEDIMENT OUTSIDE OF THE WORK AREA.
8. CONSTRUCT BUILDING PAD AND COMMENCE NEW BUILDING CONSTRUCTION.
9. CONSTRUCT TEMPORARY CULVERTS AND DIVERSIONS AS REQUIRED.
10. BEGIN PERMANENT AND TEMPORARY INSTALLATION OF SEED AND MULCH.
11. PERFORM EARTHWORK NECESSARY TO ESTABLISH ROUGH GRADING AROUND PARKING FIELDS AND ACCESS DRIVES. MANAGE EXPOSED SOIL SURFACES TO AVOID TRANSPORTING SEDIMENTS INTO WETLANDS. PARKING LOTS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
12. INSTALL SUBSURFACE UTILITIES (WATER, SEWER, GAS, ELECTRIC, COMMUNICATIONS, DRAINAGE, DRAINAGE FACILITIES, ETC.).
13. CONSTRUCT PROPOSED ROADWAY, RAIN GARDENS, GRAVEL WETLANDS AND DRAINAGE SWALES. ALL DITCHES, SWALES, AND GRAVEL WETLANDS SHALL BE FULLY STABILIZED PRIOR TO DIRECTING FLOW TO THEM.
14. COMPLETE BUILDING AND ALL OFF-SITE IMPROVEMENTS.
15. COMPLETE SEEDING AND MULCHING. SEED TO BE APPLIED WITH BROADCAST SPREADER OR BY HYDRO-SEEDING, THEN ROLLED, RAKED, OR DRAGGED TO ASSURE SEED/SOIL CONTACT.
16. REMOVE TEMPORARY EROSION CONTROL MEASURES AFTER SEEDED AREAS HAVE BECOME FIRMLY ESTABLISHED AND SITE IMPROVEMENTS ARE COMPLETE.
17. DURING THE COURSE OF THE WORK AND UPON COMPLETION, THE CONTRACTOR SHALL REMOVE ALL SEDIMENT DEPOSITS, EITHER ON OR OFF SITE, INCLUDING CATCH BASINS, AND SUMPS, DRAIN PIPES AND DITCHES, CURB LINES, ALONG SILT BARRIERS, ETC. RESULTING FROM SOIL AND/OR CONSTRUCTION OPERATIONS.
18. SEE WINTER CONSTRUCTION SEQUENCE FOR WORK CONDUCTED AFTER OCTOBER 15TH.

SITE DEVELOPMENT PLANS

TAX MAP 229 LOT 1

SITE PREPARATION & DEMOLITION PLAN

PROPOSED 3 LOT SUBDIVISION

437 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

OWNED BY & PREPARE FOR

ARTWILL, LLC

1"=40' (11"X17")
SCALE: 1"=20' (22"X34")

APRIL 19, 2022

STATE OF NEW HAMPSHIRE — JOHN J. McTIGUE No. 14950 — LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	DR	CK

TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
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FILE	45407-120	DR	JSM	FB		C-02
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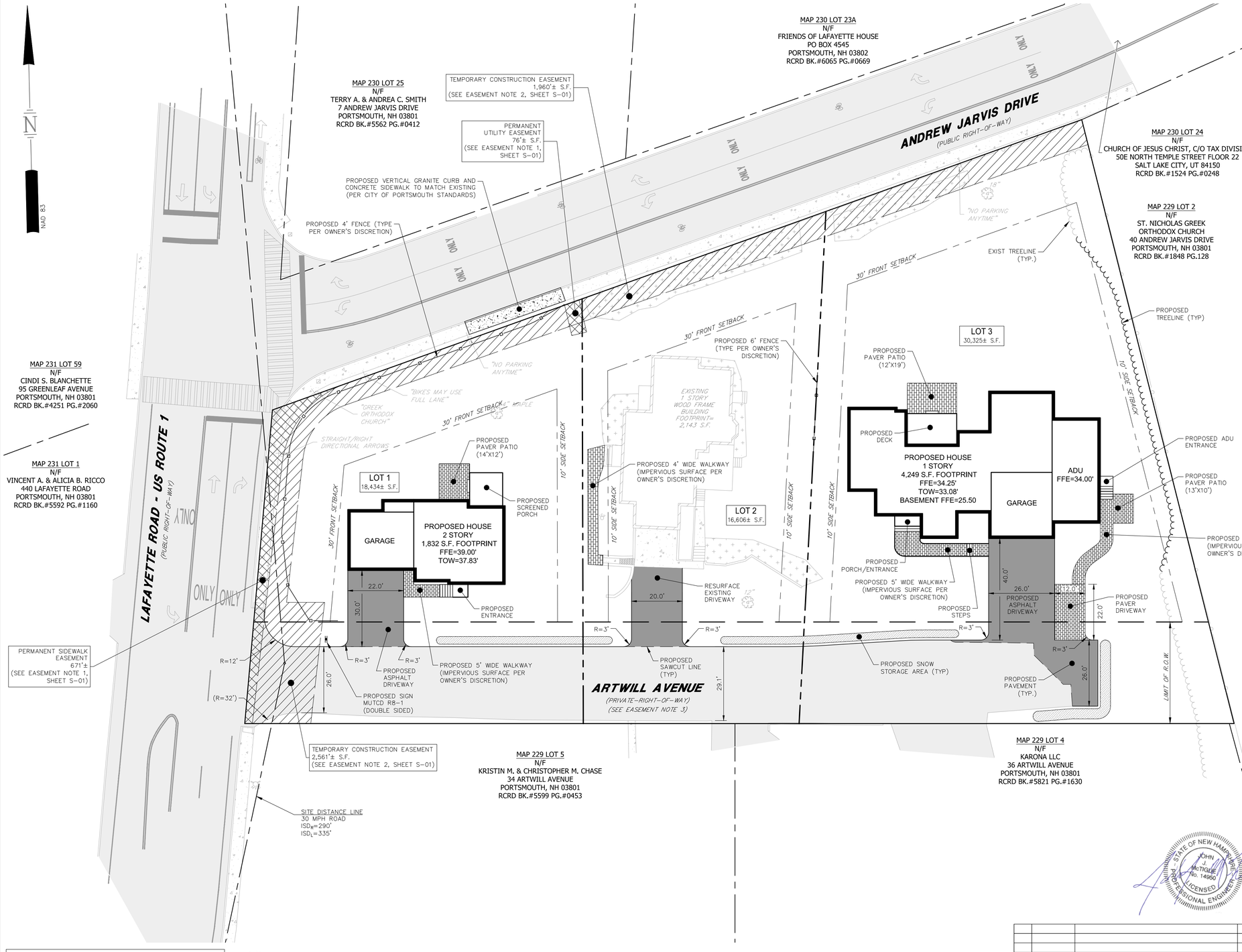

SITE DATA

OWNER OF RECORD OF MAP 229 LOT 1:
HARLON P. WILLIS REVOCABLE TRUST & JEAN P. WILLIS REVOCABLE TRUST
437 LAFAYETTE ROAD, PORTSMOUTH, NH 03801

DEED REFERENCE TO PARCEL IS BK.#3537 PG.#1327

AREA OF PARCEL = 65,365± S.F. OR 1.5006± ACRES

ZONED: SINGLE RESIDENCE B (SRB)
EXISTING USE: 1 LOT, SINGLE FAMILY DWELLING UNIT
PROPOSED USE: 3 LOTS, 3 SINGLE FAMILY DWELLING UNITS

THE PURPOSE OF THIS PLAN IS TO DEPICT TWO PROPOSED SINGLE FAMILY DWELLING UNIT WITH ACCESS ALONG ARTWELL AVENUE. ASSOCIATED IMPROVEMENTS NOT SHOWN ON THIS PLAN INCLUDE AND ARE NOT LIMITED TO GRADING, STORMWATER MANAGEMENT SYSTEMS, UTILITIES, LIGHTING, AND LANDSCAPING.

DIMENSIONAL REQUIREMENTS (CURRENT ZONING)

	REQUIRED:	PROVIDED: LOT 1:	LOT 2:	LOT 3:
MINIMUM LOT DIMENSIONS:				
LOT AREA	15,000 S.F.	18,434 S.F.	16,606 S.F.	30,325 S.F.
LOT FRONTAGE	30 FT	129.6 FT	102.0 FT	107.0 FT
DEPTH	100 FT	105.6 FT	142.4 FT	179.7 FT
MINIMUM YARD DIMENSIONS:				
FRONT	30 FT	30 FT	30 FT	30 FT
SIDE	10 FT	10 FT	10 FT	10 FT
REAR	30 FT	30 FT	30 FT	30 FT
MAXIMUM STRUCTURE DIMENSIONS:				
SLOPED ROOF	35 FT	35 FT	27.5± FT	35 FT
ROOF APPURTENANCE HEIGHT	8 FT	>8 FT	>8 FT	>8 FT
BUILDING LOT COVERAGE	20% (MAX)	11.2%	14.9%	15.1%
MINIMUM SETBACKS/BUFFER:				
BUILDING FRONT	30 FT	30 FT	30 FT	30 FT
BUILDING SIDE	10 FT	10 FT	10 FT	10 FT
BUILDING REAR	30 FT	30 FT	30 FT	30 FT
MINIMUM OPEN SPACE	40%	61.4%	60.6%	66.5%
PARKING REQUIREMENTS				
PARKING SPACES	1.3 SPACES/UNIT	2 SPACES*	2 SPACES	2 SPACES	3 SPACES

*LOT 3 CONTAINS (2) UNITS AND REQUIRES 3 SPACES

NOTES

1. SEE NOTES ON SHEET C-01.
2. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS NOTED OTHERWISE.
3. LIGHTING, SIGNAGE, LANDSCAPING, AND SCREENING SHALL MEET THE REQUIREMENTS OF THE CITY ZONING ORDINANCE AND SITE PLAN REGULATIONS.
4. SNOW SHALL NOT BE STOCKPILED IN STORMWATER BMP'S, WETLAND BUFFERS, OR WETLANDS. SEE SNOW STORAGE LOCATIONS. IN THE EVENT THAT THE SNOW STORAGE AREAS PROVIDED ON THE SITE ARE COMPLETELY UTILIZED, EXCESS SNOW SHALL BE TRANSPORTED OFF SITE FOR DISPOSAL IN ACCORDANCE WITH NHDES REGULATION. IF SNOW IS STORED WITHIN PARKING AREA, KEEP CATCH BASINS CLEAR.
5. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
6. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
7. 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.

SIGN LEGEND

ID	SIGN	SIZE (INCHES) WIDTH	SIZE (INCHES) HEIGHT	DESIGN (COLORING, TEXT SIZE, SPACING, SHAPE, RETROFLECTIVITY, ETC.)	NO. OF SIGNS
R8-1	NO PARKING ON PAVEMENT	18	24	REFER TO THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS	2

NOTE:
1. HANDICAP PARKING SIGNS SHALL BE IN ACCORDANCE WITH CITY OF PORTSMOUTH STANDARDS AND ADA REGULATIONS.

SITE DEVELOPMENT PLANS

TAX MAP 229 LOT 1

SITE LAYOUT PLAN

PROPOSED 3 LOT SUBDIVISION

437 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

OWNED BY & PREPARE FOR

ARTWILL, LLC

1"=40' (11"X17")
SCALE: 1"=20' (22"X34") **APRIL 19, 2022**

STATE OF NEW HAMPSHIRE
JOHN J. McTIGUE
No. 14950
LICENSED PROFESSIONAL ENGINEER

HORIZONTAL SCALE 1"=20'
20 10 0 20

REV	DATE	DESCRIPTION	DR	CK

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Scientists
48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
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		CK	JCC	CADFILE	45407-120_SITE LAYOUT	

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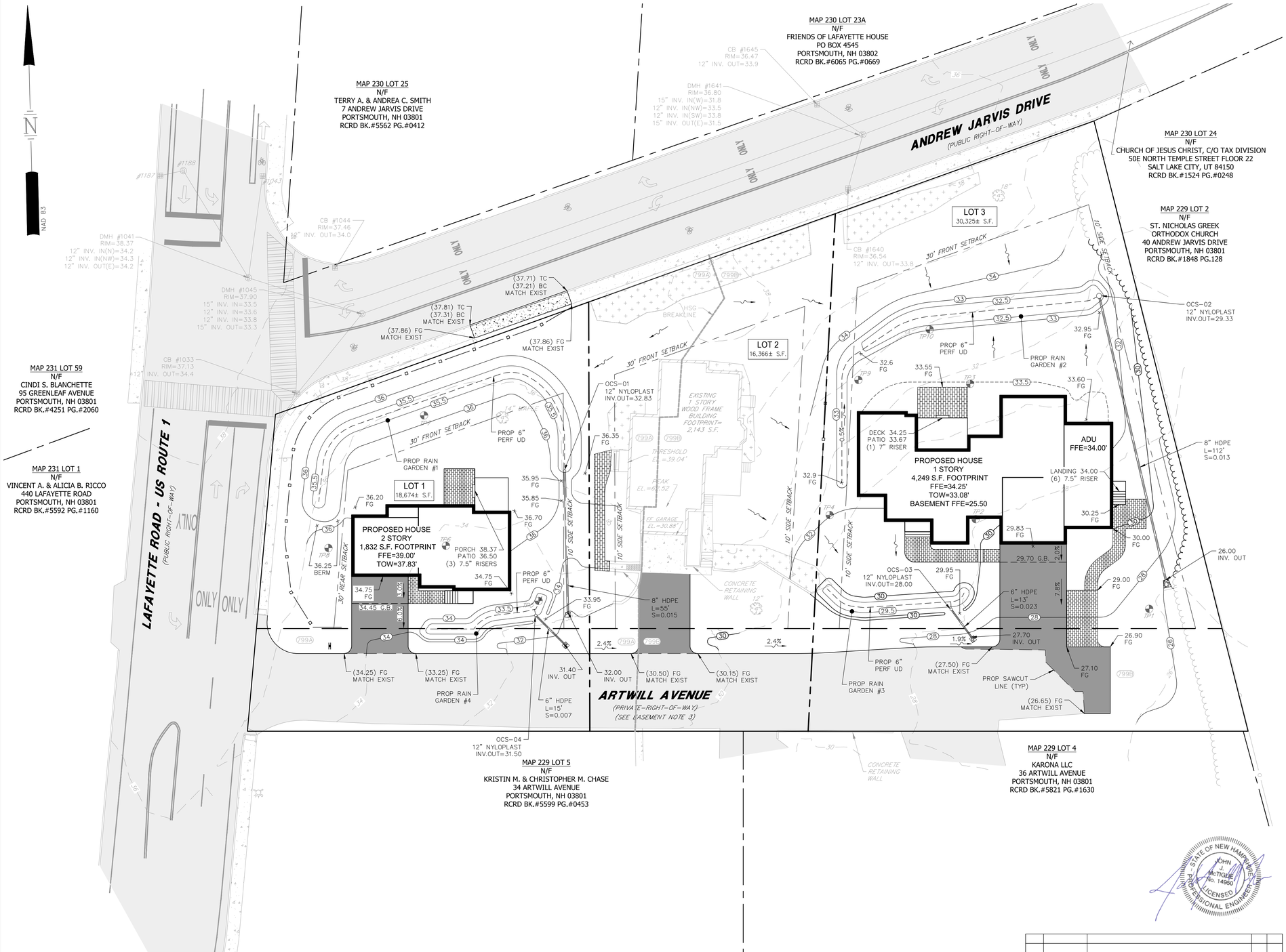

NOTES

1. SEE NOTES ON SHEET C-01.
2. SEE SHEET C-11 FOR RAIN GARDEN DETAILS.
3. ALL DOORS AND GARAGE ENTRANCES SHALL BE AT FINISHED FLOOR ELEVATION UNLESS OTHERWISE NOTED.
4. PROPOSED SPOT GRADES ARE PROVIDED TO THE NEAREST 0.05. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE FINISHED GRADES MEET ADA STANDARDS FOR WHEEL CHAIR RAMPS, HANDICAP SPACES AND ACCESS AISLES, CROSSWALKS, SIDEWALKS, ETC.
5. ALL ELEVATIONS SHOWN AT CURB ARE TO THE BOTTOM OF CURB UNLESS OTHERWISE NOTED. CURBS HAVE A 6" REVEAL UNLESS OTHERWISE NOTED.
6. LENGTH OF PIPE IS FOR CONVENIENCE ONLY. ACTUAL PIPE LENGTH SHALL BE DETERMINED IN THE FIELD.
7. ALL PROPOSED DRAINAGE PIPES SHALL BE 12" AND HDPE, UNLESS OTHERWISE NOTED ON THE PLAN.
8. DRAINAGE PIPES WITH LESS THAN 3' COVER SHALL BE INSULATED (SEE UTILITY TRENCH DETAIL) AND DRAINAGE CATCH BASINS WITH LESS THAN 3.5' OF COVER OVER INVERTS SHALL USE SLAB TOP CATCH BASIN (SEE DETAILS).
9. THE CONTRACTOR SHALL REFER TO THE GEOTECHNICAL REPORT AND ARCHITECTURAL PLANS FOR SUBDRAINAGE SYSTEMS FOR THE BUILDING FOUNDATION. SUBDRAINAGE MUST DAYLIGHT OR TIE INTO THE STORMWATER MANAGEMENT SYSTEM. COORDINATE SUBDRAINAGE SYSMTEM DESIGN WITH THE ENGINEER OF RECORD.

SOIL LEGEND
(PER SITE SPECIFIC SOIL SURVEY)

SYMBOL	DESCRIPTION	HYDROLOGIC SOIL GROUP
799*	UBRAN LAND-CANTON COMPLEX 3% – 15% SLOPES	A (BASED ON FIELD INFILTRATION RATES)
799*	UBRAN LAND-CANTON COMPLEX 3% – 15% SLOPES	B (BASED ON FIELD INFILTRATION RATES)

*ENTIRE PROPERTY IDENTIFIED AS URBAN LAND-CANTON COMPLEX.

HORIZONTAL SCALE 1"=20'
20 10 0 20

REV	DATE	DESCRIPTION	DR	CK

SITE DEVELOPMENT PLANS

TAX MAP 229 LOT 1

GRADING & DRAINAGE PLAN

PROPOSED 3 LOT SUBDIVISION

437 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

OWNED BY & PREPARE FOR

ARTWILL, LLC

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45407-120	CK	JCC	CADFILE	45407-120_GRADING & DRAINAGE	C-04

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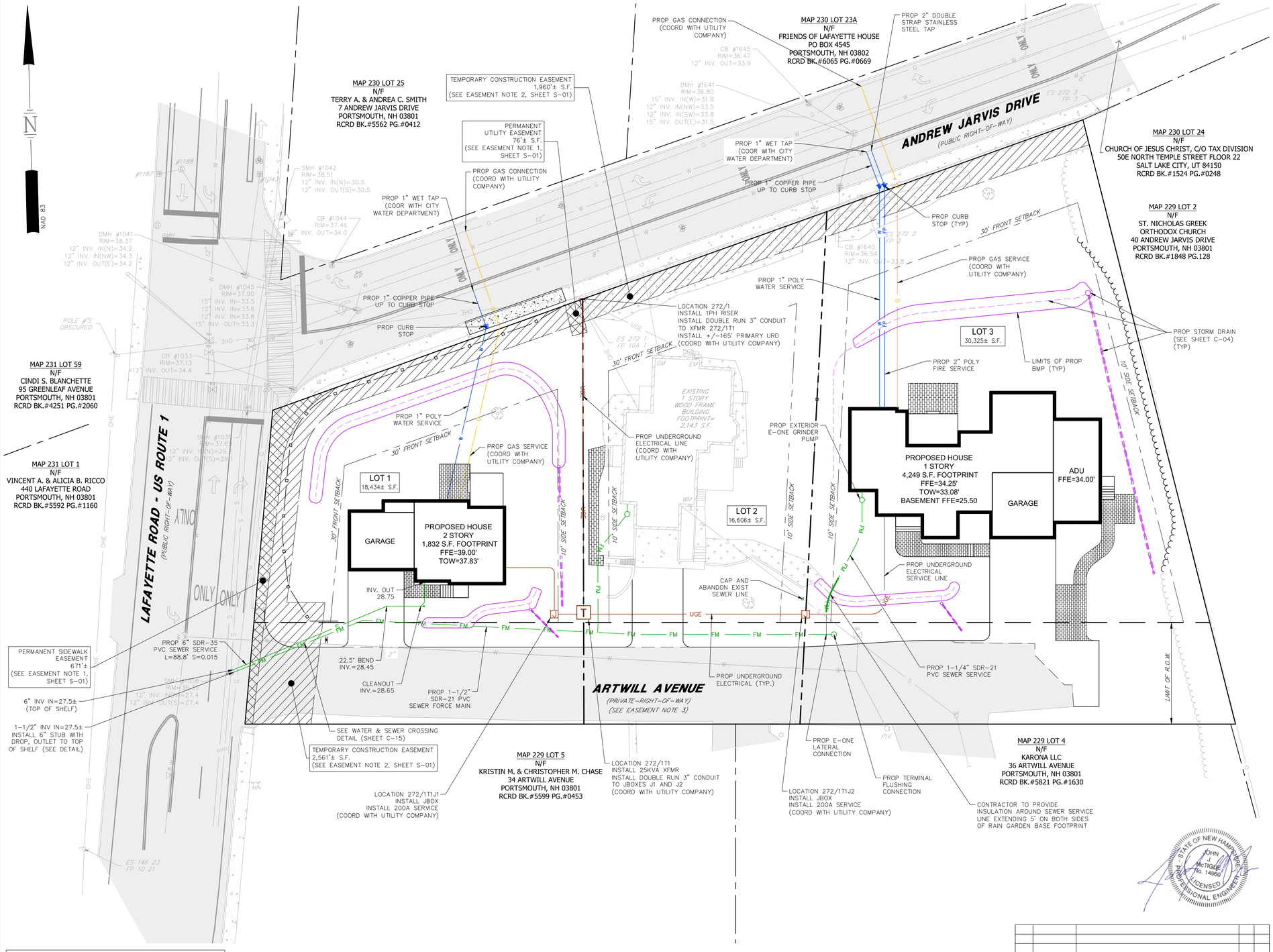
NOTES

1. SEE UTILITY NOTES ON SHEET C-01.
2. CONTRACTOR SHALL COORDINATE WITH CITY OF PORTSMOUTH DPW PRIOR TO CONSTRUCTING SEWER MANHOLE CONNECTION.



SITE DEVELOPMENT PLANS

TAX MAP 229 LOT 1

UTILITY PLAN

PROPOSED 3 LOT SUBDIVISION

437 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

OWNED BY & PREPARE FOR

ARTWILL, LLC

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STATE OF NEW HAMPSHIRE — JOHN J. MCTIGUE No. 14950 — LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	DR	CK

TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
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45407-120	CK	JCC	CADFILE	45407-120_UTILITY	C-05

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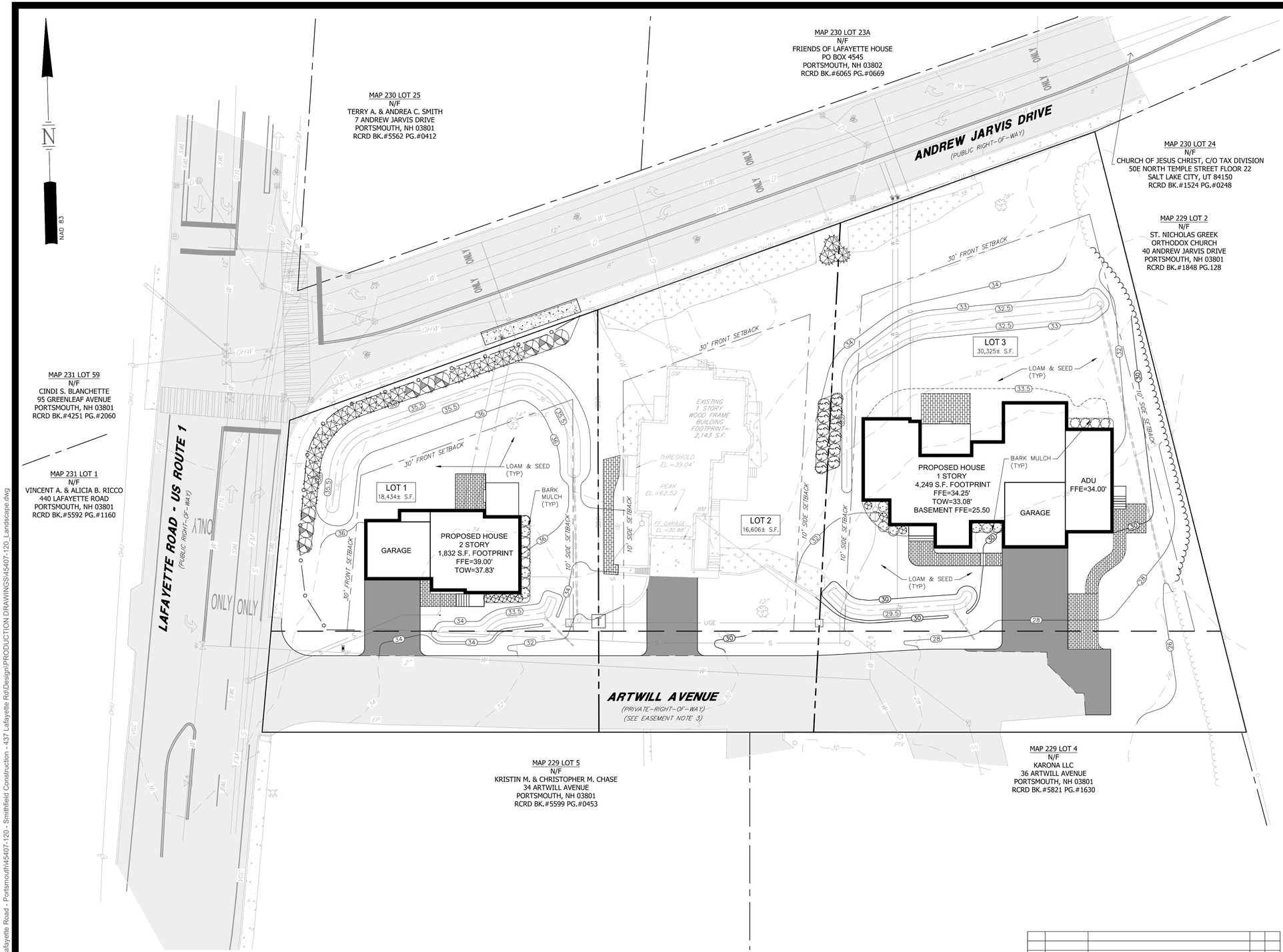

HORIZONTAL SCALE 1"=20'
20 10 0 20

LANDSCAPE LEGEND

SYMBOL	QTY	BOTANICAL NAME COMMON NAME	SIZE	REMARKS
	8	CLETHRA ALNIFOLIA 'HUMMINGBIRD' HUMMINGBIRD SUMMERSWEET	2 GAL.	CONT.
	9	FORSYTHIA 'LYNWOOD GOLD' LYNWOOD GOLD FORSYTHIA	5' TO 6'	B&B
	9	HYDRANGEA ARBORESCENS 'INCREDIBALL' INCREDIBALL SMOOTH HYDRANGEA	3 GAL.	CONT.
	8	JUNIPERUS VIRGINIANA 'GREY OWL' GREY OWL EASTERN RED CEDAR	3 GAL.	CONT.
	12	RHODODENDRON 'PJM' PJM RHODODENDRON	18" TO 24"	B&B
	19	THUJA O. 'TECHNY' MISSION ARBORVITAE	5' TO 6'	B&B

LANDSCAPE NOTES

1. CONTRACTOR WILL LOCATE, VERIFY AND MARK ALL EXISTING AND NEWLY INSTALLED UNDERGROUND UTILITIES PRIOR TO ANY LAWNWORK OR PLANTING. ANY CONFLICTS WHICH MIGHT OCCUR BETWEEN PLANTING AND UTILITIES WILL IMMEDIATELY BE REPORTED TO THE LANDSCAPE ARCHITECT OR OWNERS' REPRESENTATIVE, SO THAT ALTERNATE PLANTING LOCATIONS CAN BE DETERMINED.
2. CONTRACTOR WILL FURNISH AND PLANT ALL PLANTS IN QUANTITIES AS SHOWN ON THIS PLAN. IN CASES OF DISCREPANCY BETWEEN PLAN AND LIST CLARIFY WITH LANDSCAPE ARCHITECT PRIOR TO PLACING PURCHASE ORDER AND AGAIN PRIOR TO PLANTING.
3. SEE PLANTING DETAILS AND IF INCLUDED, SPECIFICATIONS FOR ADDITIONAL INFORMATION.
4. NO SUBSTITUTION OF PLANT MATERIALS WILL BE ALLOWED WITHOUT PRIOR WRITTEN APPROVAL OF THE LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAKE THE APPROPRIATE ARRANGEMENTS TO PROVIDE ALL PLANTS AND MATERIALS TO ACCOMMODATE PLANTING WITHIN THE TIME ALLOWED BY THE CONSTRUCTION SCHEDULE.
6. PLANTING SHALL BE COMPLETED FROM APRIL 15TH THROUGH OCTOBER 15TH UNLESS OTHERWISE NOTED IN SPECIFICATIONS. THERE WILL BE NO PLANTING DURING JULY AND AUGUST UNLESS SPECIAL PROVISIONS ARE MADE FOR DROUGHT BY PROVIDING ADDITIONAL WATERING.
7. ALL PLANTS WILL BE NURSERY GROWN.
8. PLANTS WILL BE IN ACCORDANCE, AT A MINIMUM, WITH CURRENT EDITION OF "AMERICAN STANDARDS FOR NURSERY STOCK" AS PUBLISHED BY THE AMERICAN HORTICULTURE INDUSTRY ASSOCIATION.
9. TREES WILL BE PRUNED IN ACCORDANCE WITH THE LATEST EDITION OF ANSI A300 PART 1, "TREE, SHRUB AND OTHER WOODY PLANT MAINTENANCE STANDARD PRACTICES".
10. PLANTS MATERIAL IS SUBJECT TO APPROVAL / REJECTION BY THE LANDSCAPE ARCHITECT AT THE SITE AND AT THE NURSERY.
11. ALL PLANTS WILL BE MOVED WITH ROOT SYSTEMS AS SOLID UNITS AND WITH BALLS OF EARTH FIRMLY WRAPPED WITH BURLAP. NO PLANT WILL BE ACCEPTED WHEN BALL OF EARTH SURROUNDING ITS ROOTS HAS BEEN BADLY CRACKED OR BROKEN BEFORE PLANTING. ALL PLANTS THAT CANNOT BE PLANTED AT ONCE WILL BE HEELED-IN BY SETTING IN THE GROUND AND COVERING THE BALLS WITH SOIL AND THEN WATERING. DURING TRANSPORT, ALL PLANT MATERIALS WILL BE WRAPPED WITH WIND PROOF COVERING.
12. NEWLY PLANTED MATERIAL WILL BEAR THE SAME RELATIONSHIP TO FINISHED GRADE AS TO THE ORIGINAL GRADE OF THE PLANT PRIOR TO DIGGING.
13. PROPOSED TREES OVERHANGING SIDEWALKS, ROADS OR PARKING WILL BEGIN BRANCHING NATURALLY (NOT PRUNED) AT 6' HEIGHT.
14. MULCH FOR PLANTED AREAS (NOT INCLUDING RAIN GARDENS) WILL BE AGED SHREDDED PINE BARK, PARTIALLY DECOMPOSED, DARK BROWN IN COLOR AND FREE OF WOOD CHIPS UNLESS OTHERWISE SHOWN.
15. PLANT MATERIAL WILL BE LOCATED OUTSIDE BUILDING DRIPLINES AND ROOF VALLEY POINTS OF CONCENTRATION TO PREVENT DAMAGE TO PLANTS. CLARIFY DISCREPANCIES WITH LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
16. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED, WILL RECEIVE SIX (6) INCH LOAM AND SEED AT THE DIRECTION OF THE LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE.
17. TREE STAKES AND WRAP WILL REMAIN IN PLACE FOR NO LESS THAN 6 MONTHS AND NO MORE THAN 1 YEAR. CONTRACTOR WILL REMOVE.
18. ALL PLANT GROUPINGS WILL BE IN MULCH BEDS UNLESS OTHERWISE SPECIFIED OR NOTED ON PLANS. WHERE MULCHED PLANT BED ABUTS LAWN, PROVIDE TURF CUT EDGE.
19. ALL PLANT BEDS WILL INTERSECT WITH PAVEMENT AT 90 DEGREES UNLESS OTHERWISE NOTED ON PLANS.
20. ALL PLANT BED EDGES WILL BE SMOOTH AND CONSISTENT IN LAYOUT OF RADII AND TANGENTS. IRREGULAR, WAVY EDGES WILL NOT BE ACCEPTED.

SITE DEVELOPMENT PLANS

TAX MAP 229 LOT 1

LANDSCAPE PLAN

PROPOSED 3 LOT SUBDIVISION

437 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

OWNED BY & PREPARE FOR

ARTWILL, LLC

1"=40' (11"X17")
SCALE: 1"=20' (22"X34")

APRIL 19, 2022

REV	DATE	DESCRIPTION	DR	CK

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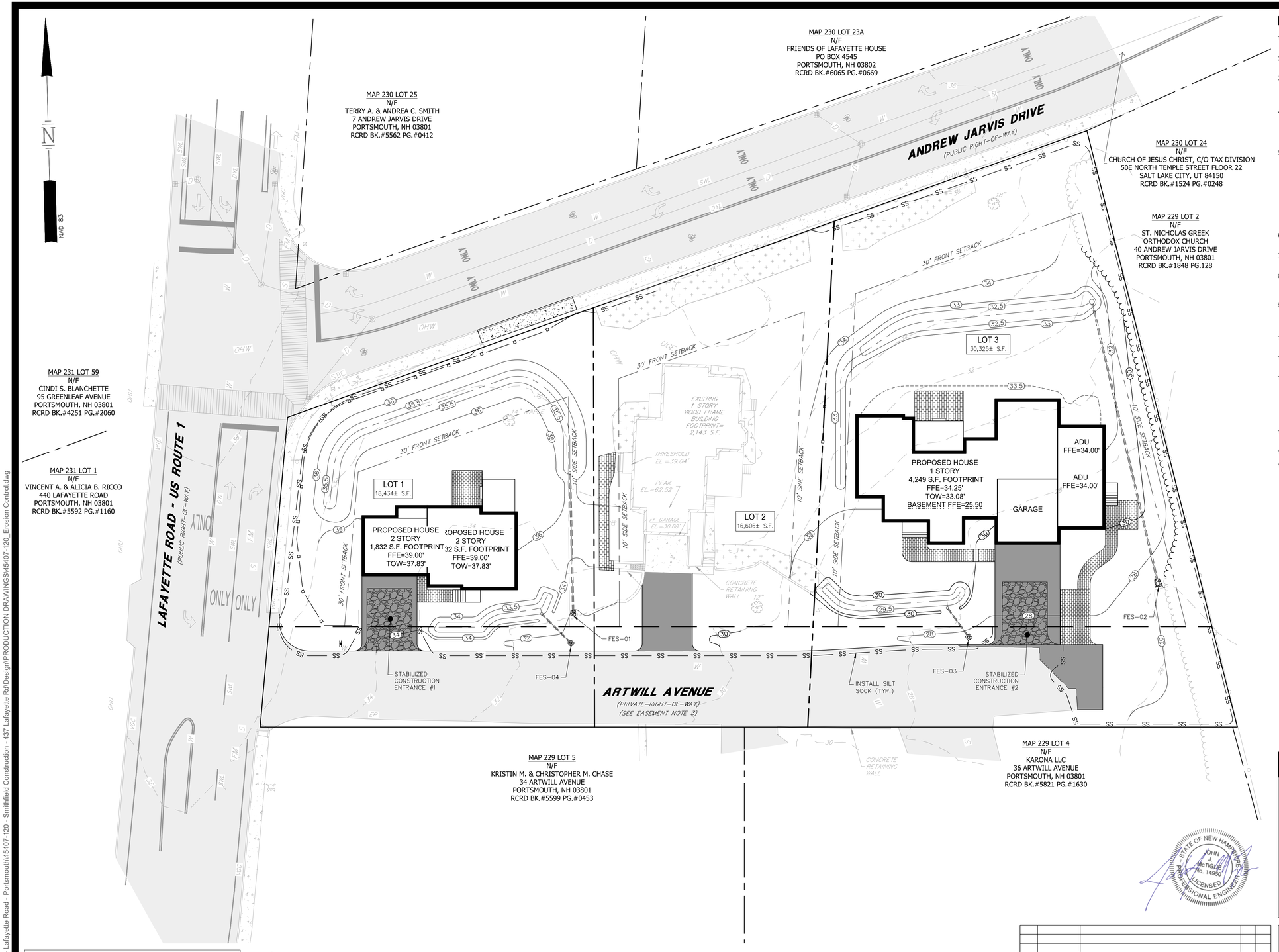

NOTES

1. SEE NOTES ON SHEET C-01, EROSION CONTROL NOTES ON SHEET C-08, EROSION CONTROL DETAILS ON SHEET C-10, AND THE APPROVED SWPPP, AS APPLICABLE.
2. INSTALL SILT BARRIER ALONG THE PERIMETER OF THE AREA TO BE DISTURBED AS FIRST ORDER OF WORK.
3. PROVIDE INLET PROTECTION BARRIERS AROUND ALL EXISTING AND PROPOSED STORM DRAINAGE INLETS WITHIN THE WORK LIMITS AND MAINTAIN FOR THE DURATION OF THE PROJECT UNTIL PAVEMENT HAS BEEN INSTALLED. INLET PROTECTION BARRIERS SHALL BE IN PLACE AT ALL CATCH BASINS PRIOR TO THE DISTURBANCE OF SOIL.
4. DUST CONTROL SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD. IT SHALL BE ACCOMPLISHED BY THE UNIFORM APPLICATION OF CALCIUM CHLORIDE AT THE RATE OF 1-1/2 POUNDS PER SQUARE YARD BY MEANS OF A LIME SPREADER OR OTHER APPROVED METHOD. WATER MAY ALSO BE USED FOR DUST CONTROL, AND APPLIED BY SPRINKLING WITH WATER TRUCK DISTRIBUTORS, AS REQUIRED.
5. THE SITE WILL REQUIRE A USEPA NPDES PERMIT FOR STORMWATER DISCHARGE FOR THE SITE CONSTRUCTION IF THE DISTURBANCE EXCEEDS ONE ACRE. THE CONSTRUCTION SITE OPERATOR SHALL DEVELOP AND IMPLEMENT A CONSTRUCTION STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IN ACCORDANCE WITH EPA REGULATIONS AND THE CONSTRUCTION GENERAL PERMIT WHICH SHALL REMAIN ON SITE AND MADE ACCESSIBLE TO THE PUBLIC. THE SITE CONTRACTOR SHALL COORDINATE WITH THE OWNER TO SUBMIT AN eNOI AT LEAST 14 DAYS IN ADVANCE OF ANY EARTHWORK ACTIVITIES AT THE SITE. A COMPLETED NOTICE OF TERMINATION (NOT) SHALL BE SUBMITTED TO NPDES PERMITTING AUTHORITY WITHIN 30 DAYS AFTER EITHER OF THE FOLLOWING CONDITIONS HAVE BEEN MET: FINAL STABILIZATION HAS BEEN ACHIEVED ON ALL PORTIONS OF THE SITE FOR WHICH THE PERMITTEE IS RESPONSIBLE FOR, OR ANOTHER OPERATOR/PERMITTEE HAS ASSUMED CONTROL OVER ALL AREAS OF THE SITE THAT HAVE NOT BEEN FINALLY STABILIZED.
6. SILT PROTECTION MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAILS CONTAINED IN THIS PLAN SET.
7. CONSTRUCT JUTE MATTING ON ALL SLOPES STEEPER THAN 3:1, DISTURBED AREAS SLOPING TOWARDS WETLANDS AND ALL LOCATIONS SHOWN ON PLAN.
8. INSPECT EROSION CONTROL MEASURES WEEKLY AND AFTER EACH RAIN STORM OF 0.10" OR GREATER. REPAIR/MODIFY SILT BARRIER AS NECESSARY TO MAXIMIZE FILTER EFFICIENCY. REMOVE SEDIMENT WHEN SEDIMENT IS 1/3 THE STRUCTURE HEIGHT.
9. PROVIDE SILT BARRIERS AT THE BASE OF CUT AND FILL SLOPES UNTIL COMPLETION OF THE PROJECT OR UNTIL VEGETATION BECOMES ESTABLISHED ON SLOPES. EROSION PROTECTION BELOW FILL SLOPES SHALL BE PLACED IMMEDIATELY AFTER CLEARING, PRIOR TO EMBANKMENT CONSTRUCTION.
10. ALL DISTURBED AREAS SHALL BE REVEGETATED AS QUICKLY AS POSSIBLE. ALL CUT AND FILL SLOPES SHALL BE SEEDED WITHIN 72 HOURS AFTER GRADING.
11. ALL WORK AREAS TO BE STABILIZED AT THE END OF EACH WORK DAY AND PRIOR TO ANY PREDICTED SIGNIFICANT RAIN EVENT.
12. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
    A. BASE COURSE GRAVELS, WHICH MEET THE REQUIREMENTS OF NHDOT STANDARD FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM 304.2, ARE INSTALLED IN AREAS TO BE PAVED
    B. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED
    C. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP RAP HAS BEEN INSTALLED
    D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED
13. ALL CATCH BASINS, MANHOLES, AND DRAIN LINES SHALL BE THOROUGHLY CLEANED OF ALL SEDIMENT AND DEBRIS AFTER ALL AREAS HAVE BEEN STABILIZED.
14. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING SLOPE STABILITY DURING CONSTRUCTION.
15. THE EROSION CONTROL PRACTICES SHOWN ON THESE PLANS ARE ILLUSTRATIVE ONLY AND SHALL BE SUPPLEMENTED BY THE SITE CONTRACTOR AS NEEDED.

SITE DEVELOPMENT PLANS

TAX MAP 229 LOT 1

EROSION CONTROL PLAN

PROPOSED 3 LOT SUBDIVISION

437 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

OWNED BY & PREPARE FOR

ARTWILL, LLC

1"=40' (11"X17")
SCALE: 1"=20' (22"X34")

APRIL 19, 2022

STATE OF NEW HAMPSHIRE
JOHN J. McTIGUE
No. 14956
LICENSED
PROFESSIONAL ENGINEER

HORIZONTAL SCALE 1"=20'
20 10 0 20

REV	DATE	DESCRIPTION	DR	CK

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TFM
Civil Engineers
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48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
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SOIL CHARACTERISTICS

THE SOIL IN THE VICINITY OF THE SITE CONSIST OF URBAN LAND–CANTON COMPLEX, THE MAJORITY OF THE SOIL IS HSG TYPE A AND TYPE B.

DISTURBED AREA

THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 46,875 SQUARE FEET (1.076 ACRES). CONSTRUCTION SHALL BE PHASED TO LIMIT DISTURBED AREAS TO LESS THAN 5 ACRES.

CRITICAL NOTE: THIS DRAWING IS PROVIDED FOR GENERAL GUIDANCE. ALL SPECIAL EROSION CONTROL MEASURES MUST BE EXECUTED IN ACCORDANCE WITH APPLICABLE CURRENT STATE AND LOCAL REGULATIONS, APPROVED SWPPP, AND PERMIT REQUIREMENTS.

SEQUENCE OF MAJOR ACTIVITIES

1. INSTALL PERIMETER CONTROLS, STABILIZED CONSTRUCTION ENTRANCE, AND TEMPORARY EROSION CONTROL MEASURES PER APPROVED SITE DEVELOPMENT PLANS, PERMITS, OR SWPPP IF REQUIRED, PRIOR TO EARTH MOVING OPERATIONS.
2. DEMOLISH EXISTING SITE WORK DESIGNATED FOR REMOVAL.
3. INSTALL STORMWATER TREATMENT PONDS AND SWALES BEFORE ROUGH GRADING THE SITE.
4. COMPLETE MAJOR GRADING OF SITE.
5. CONSTRUCT BUILDING PAD, STORMWATER SYSTEM, AND SITE UTILITIES.
6. CONSTRUCT PARKING LOT.
7. WHEN ALL CONSTRUCTION ACTIVITY IS COMPLETE AND SITE IS STABILIZED, REMOVE ALL INLET PROTECTION, SILT BARRIERS, AND SEDIMENT THAT HAS BEEN TRAPPED BY THESE DEVICES.
8. CONSULT APPLICABLE REGULATIONS, PERMITS, CONDITIONS, AND APPROVED SWPPP FOR CONDITIONS RELATED TO NOTICE OF TERMINATION, IF REQUIRED.

EROSION AND SEDIMENT CONTROLS AND STABILIZATION PRACTICES

STABILIZATION SHALL BE INITIATED ON ALL LOAM STOCKPILES AND DISTURBED AREAS WHERE CONSTRUCTION ACTIVITY WILL NOT OCCUR FOR MORE THAN TWENTY ONE (21) CALENDAR DAYS BY THE FOURTEENTH (14TH) DAY AFTER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED IN THAT AREA. ALL DISTURBED AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:

1. BASE COURSE GRAVELS, WHICH MEET THE REQUIREMENTS OF NHDOT STANDARD FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM 304.2, HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
2. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
3. A MINIMUM OF 3" OF NON–EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED; OR
4. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.

DURING CONSTRUCTION, RUNOFF WILL BE DIVERTED AROUND THE SITE WITH EARTH DIKES, PIPING OR STABILIZED CHANNELS WHERE POSSIBLE. SHEET RUNOFF FROM THE SITE WILL BE FILTERED THROUGH SILT BARRIERS. ALL STORM DRAIN INLETS SHALL BE PROVIDED WITH BARRIER FILTERS. STONE RIPRAP SHALL BE PROVIDED AT THE OUTLETS OF DRAINAGE PIPES WHERE EROSIVE VELOCITIES ARE ENCOUNTERED.

OFF SITE VEHICLE TRACKING

STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED.

INSTALLATION, MAINTENANCE, AND INSPECTION OF EROSION AND SEDIMENT CONTROLS

A. GENERAL

THESE ARE THE GENERAL INSPECTION AND MAINTENANCE PRACTICES THAT WILL BE USED TO IMPLEMENT THE PLAN.

1. STABILIZATION OF ALL SWALES, DITCHES, AND PONDS IS REQUIRED PRIOR TO DIRECTING FLOW TO THEM.
2. THE SMALLEST PRACTICAL PORTION OF THE SITE WILL BE DENUDED AT ONE TIME. (5 AC MAX)
3. ALL CONTROL MEASURES WILL BE INSPECTED IN ACCORDANCE WITH APPLICABLE REGULATIONS, PERMITS, AND CONDITIONS AND[a] FOR PROJECTS REQUIRING A NPDES EPA CGP AND DISCHARGING TO A NON–SENSITIVE WATERBODY, AT LEAST EVERY 7 DAYS OR EVERY 14 DAYS AND AFTER A 0.25 INCHES RAIN EVENT OR GREATER.
4. ALL MEASURES WILL BE MAINTAINED IN GOOD WORKING ORDER. IF A REPAIR IS NECESSARY, IT WILL BE INITIATED WITHIN 24 HOURS OF REPORT.
5. BUILT UP SEDIMENT WILL BE REMOVED FROM SILT BARRIER WHEN IT HAS REACHED ONE THIRD THE HEIGHT OF THE BARRIER.
6. ALL DIVERSION DIKES WILL BE INSPECTED AND ANY BREACHES PROMPTLY REPAIRED.
7. TEMPORARY SEEDING AND PLANTING WILL BE INSPECTED FOR BARE SPOTS, WASHOUTS, AND UNHEALTHY GROWTH.
8. A MAINTENANCE INSPECTION REPORT WILL BE MADE AFTER EACH INSPECTION.
9. IF INSPECTIONS ARE REQUIRED OR THE PROJECT IS SUBJECT TO A NPDES EPA CGP, THE CONTRACTOR'S SITE SUPERINTENDENT WILL BE RESPONSIBLE FOR INSPECTIONS, MAINTENANCE, AND REPAIR ACTIVITIES, AND FILLING OUT THE INSPECTION AND MAINTENANCE REPORT.

B. FILTERS / BARRIERS

1. SILT SOCKS

   A. KNOTTED MESH NETTING MATERIAL SHALL BE DELIVERED TO SITE IN A 5 MIL CONTINUOUS, TUBULAR, HDPE 3/8" MATERIAL, FILLED WITH COMPOST CONFORMING TO THE FOLLOWING REQUIREMENTS:

PHYSICAL PROPERTY	TEST	REQUIREMENTS
PH	TMECC 04.11–A	5.0 TO 8.0
PARTICLE SIZE	TMECC 02.02–B	2" SIEVE AND MIN. 60% GREATER THAN THE ⅜" SIEVE
MOISTURE CONTENT		STND TESTING < 60%

   MATERIAL SHALL BE RELATIVELY FREE OF INERT OR FOREIGN MAN–MADE MATERIALS

   MATERIAL SHALL BE WEED FREE AND DERIVED FROM A WELL–DECOMPOSED SOURCE OF ORGANIC MATTER, FREE FROM ANY REFUSE, CONTAMINANTS OR OTHER MATERIALS TOXIC TO PLANT GROWTH.

   B. SEDIMENT COLLECTED AT THE BASE OF THE SILT SOCK SHALL BE REMOVED ONCE IT HAS REACHED 1/3 OF THE EXPOSED HEIGHT OF THE SILT SOCK.

   C. SILT BARRIER 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 DRAINAGE AREA ABOVE THEM.

3. MAINTENANCE

   A. SILT BARRIERS SHALL BE INSPECTED WEEKLY AND 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 BEHIND THEM, SEDIMENT BARRIERS SHALL BE REPLACED WITH A TEMPORARY CHECK DAM.

   B. SHOULD THE FABRIC 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 SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY 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 BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFIRM WITH THE EXISTING GRADE, PREPARED AND SEEDED.

C. MULCHING

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' OF WETLANDS. IT WILL BE NECESSARY TO CLOSELY MONITOR WEATHER PREDICTIONS, USUALLY BY CONTACTING THE NATIONAL WEATHER SERVICE, TO HAVE ADEQUATE WARNING OF SIGNIFICANT STORMS.

   B. REQUIRED MULCHING WITHIN A SPECIFIED TIME PERIOD.

   THE TIME PERIOD CAN RANGE FROM 14 TO 21 DAYS OF INACTIVITY ON AN AREA, WHERE THE LENGTH OF TIME VARIES WITH SITE CONDITIONS. PROFESSIONAL JUDGMENT SHALL BE USED TO EVALUATE THE INTERACTION OF SITE CONDITIONS (SOIL ERODIBILITY, SEASON OF YEAR, EXTENT OF DISTURBANCE, PROXIMITY TO SENSITIVE RESOURCES, ETC.) AND THE POTENTIAL IMPACT OF EROSION ON ADJACENT AREAS TO CHOOSE AN APPROPRIATE TIME RESTRICTION.

2. GUIDELINES FOR WINTER MULCH APPLICATION.

   WHEN MULCH IS APPLIED TO PROVIDE PROTECTION OVER WINTER (PAST THE GROWING SEASON) IT SHALL BE AT A RATE OF 6,000 POUNDS OF HAY OR STRAW PER ACRE. A TACKIFIER MAY BE ADDED TO THE MULCH.

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.

D. VEGETATIVE PRACTICE

1. AFTER ROUGH GRADING OF THE SUBGRADE HAS BEEN COMPLETED AND APPROVED, THE SUB GRADE SURFACE SHALL BE SCARIFIED TO A DEPTH OF 4". THEN, FURNISH AND INSTALL A LAYER OF LOAM PROVIDING A ROLLED THICKNESS AS SPECIFIED IN THESE PLANS. ANY DEPRESSIONS WHICH MAY OCCUR DURING ROLLING SHALL BE FILLED WITH ADDITIONAL LOAM, REGRADED AND REROLLED UNTIL THE SURFACE IS TRUE TO THE FINISHED LINES AND GRADES. ALL LOAM NECESSARY TO COMPLETE THE WORK UNDER THIS SECTION SHALL BE SUPPLIED BY THE SITE SUBCONTRACTOR.
2. ALL LARGE STIFF CLODS, LUMPS, BRUSH, ROOTS, DEBRIS, GLASS, STUMPS, LITTER, AND OTHER FOREIGN MATERIAL, AS WELL AS STONES OVER 1" IN DIAMETER, SHALL BE REMOVED FROM THE LOAM AND DISPOSED OF OFF SITE. THE LOAM SHALL BE RAKED SMOOTH AND EVEN.
3. THE LOAM SHALL BE PREPARED TO RECEIVE SEED BY REMOVING STONES, FOREIGN OBJECTS AND GRADING TO ELIMINATE WATER POCKETS AND IRREGULARITIES PRIOR TO PLACING SEED. FINISH GRADING SHALL RESULT IN STRAIGHT UNIFORM GRADES AND SMOOTH, EVEN SURFACES WITHOUT IRREGULARITIES TO LOW POINTS.
4. SHAPE THE AREAS TO THE LINES AND GRADES REQUIRED. THE SITE SUBCONTRACTOR'S ATTENTION IS DIRECTED TO THE SCHEDULING OF LOAMING AND SEEDING OF GRADED AREAS TO PERMIT SUFFICIENT TIME FOR THE STABILIZATION OF THESE AREAS. IT SHALL BE THE SITE SUBCONTRACTOR'S RESPONSIBILITY TO MAINTAIN THE AREAS DURING THE CONSTRUCTION PERIOD AND REGRADE, LOAM AND RESEED ANY DAMAGED AREAS.
5. ALL AREAS DISTURBED BY CONSTRUCTION WITHIN THE PROPERTY LINES AND NOT COVERED BY STRUCTURES, PAVEMENT, OR MULCH SHALL BE LOAMED AND SEEDED.
6. LIMESTONE SHALL BE THOROUGHLY INCORPORATED INTO THE LOAM LAYER AT A RATE OF 2 TONS PER ACRE IN ORDER TO PROVIDE A PH VALUE OF 5.5 TO 6.5.
7. FERTILIZER SHALL BE SPREAD ON THE TOP LAYER OF LOAM AND WORKED INTO THE SURFACE. FERTILIZER APPLICATION RATE SHALL BE 500 POUNDS PER ACRE OF 10–20–20 FERTILIZER.
8. SOIL CONDITIONERS AND FERTILIZER SHALL BE APPLIED AT THE RECOMMENDED RATES AND SHALL BE THOROUGHLY WORKED INTO THE LOAM. LOAM SHALL BE RAKED UNTIL THE SURFACE IS FINELY PULVERIZED, SMOOTH AND EVEN, AND THEN COMPACTED TO AN EVEN SURFACE CONFORMING TO THE REQUIRED LINES AND GRADES WITH APPROVED ROLLERS WEIGHING BETWEEN 4 1/2 POUNDS AND 5 1/2 POUNDS PER INCH OF WIDTH.
9. SEED SHALL BE SOWN AT THE RATE SHOWN BELOW. SOWING SHALL BE DONE ON A CALM, DRY DAY, PREFERABLY BY MACHINE, BUT IF BY HAND, ONLY BY EXPERIENCED WORKMEN. IMMEDIATELY BEFORE SEEDING, THE SOIL SHALL BE LIGHTLY RAKED. ONE HALF THE SEED SHALL BE SOWN IN ONE DIRECTION AND THE OTHER HALF AT RIGHT ANGLES TO THE ORIGINAL DIRECTION. IT SHALL BE LIGHTLY RAKED INTO THE SOIL TO A DEPTH NOT OVER 1/4" AND ROLLED WITH A HAND ROLLER WEIGHING NOT OVER 100 POUNDS PER LINEAR FOOT OF WIDTH.
10. HAY MULCH SHALL BE APPLIED IMMEDIATELY AFTER SEEDING AT A RATE OF 1.5 TO 2 TONS PER ACRE. MULCH THAT BLOWS OR WASHES AWAY SHALL BE REPLACED IMMEDIATELY AND ANCHORED USING APPROPRIATE TECHNIQUES FROM THE EROSION AND SEDIMENT CONTROL HANDBOOK.
11. THE SURFACE SHALL BE WATERED AND KEPT MOIST WITH A FINE SPRAY AS REQUIRED, WITHOUT WASHING AWAY THE SOIL, UNTIL THE GRASS IS WELL ESTABLISHED. ANY AREAS WHICH ARE NOT SATISFACTORILY COVERED WITH GRASS SHALL BE RESEEDED, AND ALL NOXIOUS WEEDS REMOVED.
12. THE SITE SUBCONTRACTOR SHALL PROTECT AND MAINTAIN THE SEEDED AREAS UNTIL ACCEPTED, INCLUDING CUTTING, AS SPECIFIED HEREIN AFTER UNDER MAINTENANCE AND PROTECTION.
13. UNLESS OTHERWISE APPROVED, SEEDING SHALL BE DONE DURING THE APPROXIMATE PERIODS OF EARLY SPRING TO SEPTEMBER 30, WHEN SOIL CONDITIONS AND WEATHER ARE SUITABLE FOR SUCH WORK. IN NO CASE SHALL THE WEED CONTENT EXCEED 1 PERCENT BY WEIGHT. ALL SEED SHALL COMPLY WITH STATE AND FEDERAL SEED LAWS. FOR TEMPORARY PLANTINGS AFTER SEPTEMBER 30, TO EARLY SPRING AND FOR TEMPORARY PROTECTION OF DISTURBED AREAS:

    A. FOLLOW ABOVE SLOPE, LOAM DEPTH AND GRADING REQUIREMENTS.
    B. FERTILIZER SHALL BE SPREAD AND WORKED INTO THE SURFACE AT A RATE OF 500 POUNDS PER ACRE.

    MULCHING AND SEEDING SHALL BE APPLIED AT THE FOLLOWING RATES:

WINTER RYE (FALL SEEDING)	2.5 LBS/1,000 SF
OATS (SPRING SEEDING)	2.0 LBS/1,000 SF
MULCH	1.5 TONS/ACRE

E. CATCH BASIN INLET PROTECTION

1. INLET BASKET STRUCTURE

   A. INLET PROTECTION SHALL BE INSTALLED IMMEDIATELY PRIOR TO DISTURBING PAVEMENT AND SHALL REMAIN IN PLACE AND MAINTAINED UNTIL PAVEMENT BINDER COURSE IS COMPLETE.

   B. MOLD 6X6, 42 LB. WIRE SUPPORT AROUND INLET FRAME AND GRATE AND EXTEND 6" BEYOND SIDES. SECURE FILTER FABRIC TO WIRE SUPPORT.

   C. THE FILTER FABRIC SHALL BE A GEOTEXTILE FABRIC; POLYESTER, POLYPROPYLENE, STABILIZED NYLON, POLYETHYLENE OR POLYVINYLIDENE CHLORIDE MEETING THE FOLLOWING SPECIFICATIONS:

      GRAB STRENGTH: 45 LB. MINIMUM IN ANY PRINCIPAL DIRECTION (ASTM D1682)
      MULLEN BURST STRENGTH: MIN. 60PSI (ASTM D774)

   D. THE FABRIC SHALL HAVE AN OPENING NO GREATER THAN A NUMBER 20 U.S. STANDARD SIEVE AND A MINIMUM PERMEABILITY OF 120 GPM.

   E. THE INLET PROTECTION SHALL BE INSPECTED WITHIN 24 HOURS AFTER EACH RAINFALL OR DAILY DURING EXTENDED PERIODS OF PRECIPITATION. REPAIRS SHALL BE MADE IMMEDIATELY, AS NECESSARY, TO PREVENT PARTICLES FROM REACHING THE DRAINAGE SYSTEM AND/OR CAUSING SURFACE FLOODING.

   F. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT, OR MORE OFTEN IF THE FABRIC BECOMES CLOGGED.

F. WINTER CONSTRUCTION SEQUENCE

1. ALL PROPOSED POST–DEVELOPMENT LANDSCAPED 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 SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE PLACEMENT 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 EVENT.
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 WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.
3. AFTER OCTOBER 15TH, INCOMPLETE PARKING AREAS WHERE ACTIVE CONSTRUCTION HAS STOPPED FOR THE WINTER ALL TRAVEL SURFACES SHALL BE PROTECTED WITH A MINIMUM OF 3" OF CRUSHED GRAVEL PER NHDOT ITEM 304.3, OR IF CONSTRUCTION IS TO CONTINUE THROUGH THE WINTER SEASON BE CLEARED OF ANY ACCUMULATED SNOWFALL AFTER EACH STORM EVENT.

TIMING OF CONTROLS/MEASURES

AS INDICATED IN THE SEQUENCE OF MAJOR ACTIVITIES, SILT BARRIERS SHALL BE INSTALLED PRIOR TO COMMENCING ANY CLEARING OR GRADING OF THE SITE. STRUCTURAL CONTROLS SHALL BE INSTALLED CONCURRENTLY WITH THE APPLICABLE ACTIVITY. AREAS WHERE CONSTRUCTION ACTIVITY TEMPORARILY CEASES FOR MORE THAN TWENTY ONE (21) DAYS WILL BE STABILIZED WITH A TEMPORARY SEED AND MULCH WITHIN FOURTEEN (14) DAYS OF THE LAST DISTURBANCE. ONCE CONSTRUCTION ACTIVITY CEASES PERMANENTLY IN AN AREA, SILT BARRIERS AND ANY EARTH/DIKES WILL BE REMOVED ONCE PERMANENT MEASURES ARE ESTABLISHED.

FOR SINGLE/DUPLEX FAMILY SUBDIVISIONS, WHEN LOT DEVELOPMENT IS NOT PART OF THE PERMIT, THEN LOT DISTURBANCE, OTHER THAN THAT SHOWN ON THE APPROVED PLANS, SHALL NOT COMMENCE UNTIL AFTER THE ROADWAY HAS THE BASE COURSE TO DESIGN ELEVATION AND THE ASSOCIATED DRAINAGE IS COMPLETE AND STABLE.

WASTE DISPOSAL

1. WASTE MATERIALS
   ALL WASTE MATERIALS WILL BE COLLECTED AND STORED IN SECURELY LIDDED RECEPTACLES. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE WILL BE DEPOSITED IN A DUMPSTER. NO CONSTRUCTION WASTE MATERIALS WILL BE BURIED ON SITE. ALL PERSONNEL WILL BE INSTRUCTED REGARDING THE CORRECT PROCEDURE FOR WASTE DISPOSAL BY THE SUPERINTENDENT.
2. HAZARDOUS WASTE
   ALL HAZARDOUS WASTE MATERIALS WILL BE DISPOSED OF IN THE MANNER SPECIFIED BY LOCAL OR STATE REGULATION OR BY THE MANUFACTURER. SITE PERSONNEL WILL BE INSTRUCTED IN THESE PRACTICES BY THE SUPERINTENDENT.
3. SANITARY WASTE
   ALL SANITARY WASTE WILL BE COLLECTED FROM THE PORTABLE UNITS A MINIMUM OF ONCE PER WEEK BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

SPILL PREVENTION

1. MATERIAL MANAGEMENT PRACTICES
   THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT WILL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES DURING CONSTRUCTION TO STORMWATER RUNOFF:

   GOOD HOUSEKEEPING:
   THE FOLLOWING GOOD HOUSEKEEPING PRACTICES WILL BE FOLLOWED ON SITE DURING THE CONSTRUCTION PROJECT:

   A. AN EFFORT WILL BE MADE TO STORE ONLY SUFFICIENT AMOUNTS OF PRODUCTS TO DO THE JOB.

   B. ALL MATERIALS STORED ON SITE WILL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR PROPER (ORIGINAL IF POSSIBLE) CONTAINERS AND, IF POSSIBLE, UNDER A ROOF OR OTHER ENCLOSURE.

   C. MANUFACTURER'S RECOMMENDATIONS FOR PROPER USE AND DISPOSAL WILL BE FOLLOWED.

   D. THE SITE SUPERINTENDENT WILL INSPECT DAILY TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS.

   E. SUBSTANCES WILL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER.

   F. WHENEVER POSSIBLE ALL OF A PRODUCT WILL BE USED UP BEFORE DISPOSING OF THE CONTAINER.

   HAZARDOUS PRODUCTS:
   THE FOLLOWING PRACTICES WILL BE USED TO REDUCE THE RISKS ASSOCIATED WITH HAZARDOUS MATERIALS:

   A. PRODUCTS WILL BE KEPT IN THEIR ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE.

   B. ORIGINAL LABELS AND MATERIAL SAFETY DATA WILL BE RETAINED FOR IMPORTANT PRODUCT INFORMATION.

   C. SURPLUS PRODUCT THAT MUST BE DISPOSED OF WILL BE DISCARDED ACCORDING TO THE MANUFACTURER'S RECOMMENDED METHODS OF DISPOSAL.

2. PRODUCT SPECIFICATION PRACTICES
   THE FOLLOWING PRODUCT SPECIFIC PRACTICES WILL BE FOLLOWED ON SITE:

   PETROLEUM PRODUCTS:
   ALL ON SITE VEHICLES WILL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE LEAKAGE. PETROLEUM PRODUCTS WILL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED. ANY ASPHALT BASED SUBSTANCES USED ON SITE WILL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.

   FERTILIZERS:
   FERTILIZERS USED WILL BE APPLIED ONLY IN THE MINIMUM AMOUNTS DIRECTED BY THE SPECIFICATIONS. ONCE APPLIED FERTILIZER WILL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORMWATER. STORAGE WILL BE IN A COVERED SHED OR ENCLOSED TRAILERS. THE CONTENTS OF ANY PARTIALLY USED BAGS OF FERTILIZER WILL BE TRANSFERRED TO A SEALABLE PLASTIC BIN TO AVOID SPILLS.

   PAINTS:
   ALL CONTAINERS WILL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE. EXCESS PAINT WILL NOT BE DISCHARGED TO THE STORM SEWER SYSTEM BUT WILL BE DISPOSED OF PROPERLY ACCORDING TO MANUFACTURER'S INSTRUCTIONS OR STATE AND LOCAL REGULATIONS.

   CONCRETE TRUCKS:
   CONCRETE TRUCKS WILL DISCHARGE AND WASH OUT SURPLUS CONCRETE OR DRUM WASH WATER IN A CONTAINED AREA DESIGNATED ON SITE.

SPILL CONTROL PRACTICES

IN ADDITION TO GOOD HOUSEKEEPING AND MATERIAL MANAGEMENT PRACTICES DISCUSSED IN THE PREVIOUS SECTION THE FOLLOWING PRACTICES WILL BE FOLLOWED FOR SPILL PREVENTION AND CLEANUP:

A. MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP WILL BE CLEARLY POSTED AND SITE PERSONNEL WILL BE MADE AWARE OF THE PROCEDURES AND THE LOCATION OF THE INFORMATION AND CLEANUP SUPPLIES.

B. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP WILL BE KEPT IN THE MATERIAL STORAGE AREA ON SITE. EQUIPMENT AND MATERIALS WILL INCLUDE BUT NOT BE LIMITED TO BROOMS, DUSTPANS, MOPS, RAGS, GLOVES, GOGGLES, KITTY LITTER, SAND, SAWDUST, AND PLASTIC OR METAL TRASH CONTAINERS SPECIFICALLY FOR THIS PURPOSE.

C. ALL SPILLS WILL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY.

D. THE SPILL AREA WILL BE KEPT WELL VENTILATED AND PERSONNEL WILL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE.

E. SPILLS OF TOXIC OR HAZARDOUS MATERIAL WILL BE REPORTED TO THE APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY, REGARDLESS OF THE SIZE.

F. THE SPILL PREVENTION PLAN WILL BE ADJUSTED TO INCLUDE MEASURES TO PREVENT THIS TYPE OF SPILL FROM RECURRING AND HOW TO CLEANUP THE SPILL IF IT RECURS. A DESCRIPTION OF THE SPILL, ITS CAUSE, AND THE CLEANUP MEASURES WILL BE INCLUDED.

G. THE SITE SUPERINTENDENT RESPONSIBLE FOR DAY–TO–DAY SITE OPERATIONS WILL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR.

DUST CONTROL

THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTROL DUST THROUGHOUT THE CONSTRUCTION PERIOD. DUST CONTROL METHODS SHALL INCLUDE, BUT NOT LIMITED TO SPRINKLING WATER ON EXPOSED AREAS, COVERING LOADED DUMP TRUCKS LEAVING THE SITE, AND TEMPORARY MULCHING. DUST CONTROL MEASURES SHALL BE UTILIZED SO AS TO PREVENT THE MIGRATION OF DUST FROM THE SITE TO ABUTTING AREAS.

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DIG SAFE
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

STATE OF NEW HAMPSHIRE
JOHN J. McTIGUE
No. 14960
LICENSED PROFESSIONAL ENGINEER

SITE DEVELOPMENT PLANS

TAX MAP 229 LOT 1

EROSION CONTROL NOTES

PROPOSED 3 LOT SUBDIVISION

437 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

OWNED BY & PREPARE FOR

ARTWILL, LLC

SCALE: **APRIL 19, 2022**

REV	DATE	DESCRIPTION	DR	CK

TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
48 Constitution Drive
Bedford, NH 03110
Phone (603) 472–4488
Fax (603) 472–9747
www.tfmoran.com

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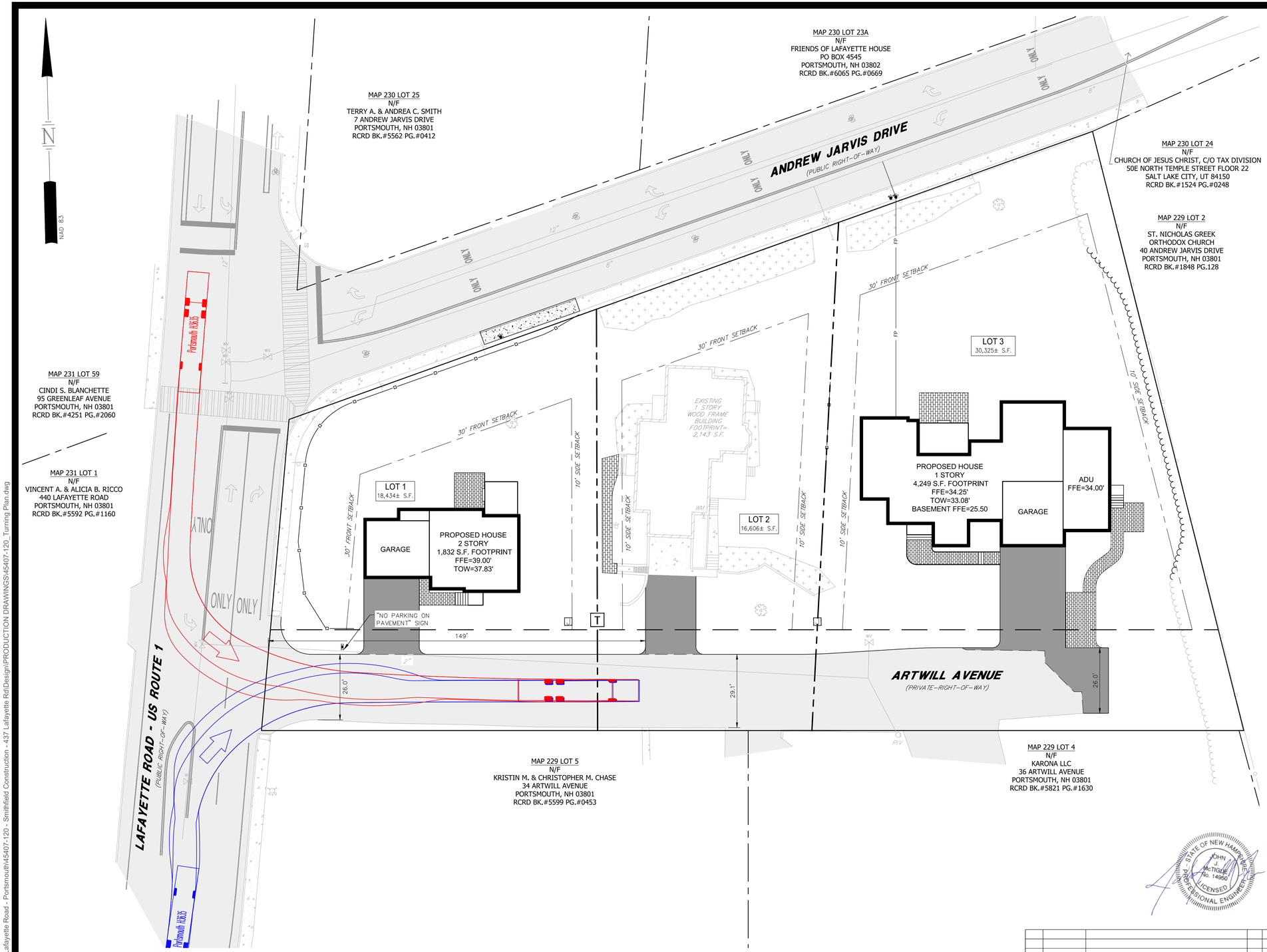

NOTES

1. PROPOSED HOUSE ON LOT #3 SHALL BE EQUIPPED WITH FIRE SPRINKLERS FOR FIRE SUPPRESSION.

HORIZONTAL SCALE 1"=20'
20 10 0 20

REV	DATE	DESCRIPTION	DR	CK

SITE DEVELOPMENT PLANS

TAX MAP 229 LOT 1

TRUCK TURNING PLAN

PROPOSED 3 LOT SUBDIVISION

437 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

OWNED BY & PREPARE FOR

ARTWILL, LLC

1"=40' (11"X17")
SCALE: 1"=20' (22"X34") **APRIL 19, 2022**

JOHN J. McTIGUE No. 14960 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
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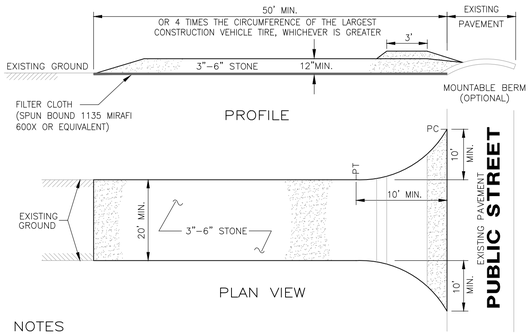
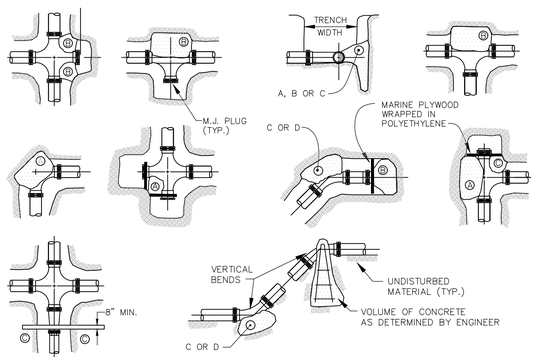


NOTES

1. FILTER CLOTH – WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE SURFACE.
2. WATER – ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
3. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE 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.
4. WASHING – WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
5. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN STORM EVENT.

STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE



NOTES

1. POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL, WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL. NO PIPE JOINTS SHALL BE COVERED WITH CONCRETE.
2. ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
3. PLACE BOARD IN FRONT OF ALL PLUGS BEFORE POURING THRUST BLOCKS.
4. WHERE MECHANICAL JOINT PIPE IS USED, MECHANICAL JOINT PLUG WITH RETAINER GLAND MAY BE SUBSTITUTED FOR END BLOCKINGS.
5. INSTALLATION AND STANDARD DIMENSIONAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE CITY/TOWN ESTABLISHED RULES AND PROCEDURES.

TEST PRESSURE = 200psi

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

THRUST BLOCKS

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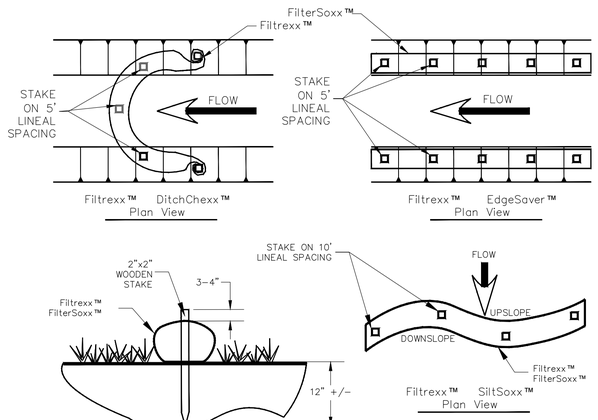
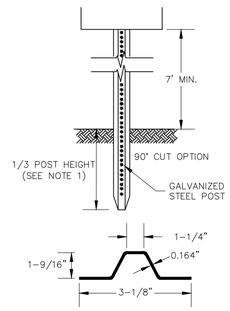


NOTES:

1. ALL MATERIAL TO MEET Filtrexx™ SPECIFICATIONS
2. FilterSoxx™ COMPOST/SOIL/ROCK/SEED FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.
4. SIZE OF SOCK TO BE PER MANUFACTURER'S SPECIFICATIONS

FILTREXX™ FILTERSOXX™ STAKING

NOT TO SCALE

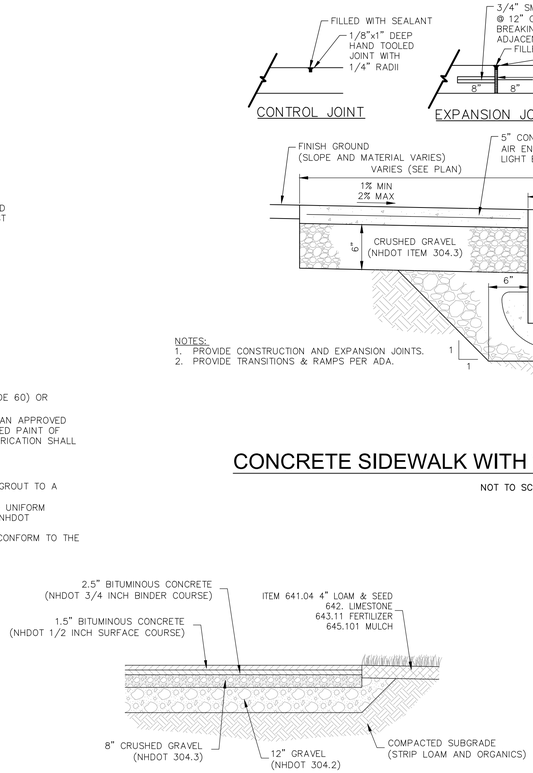


LENGTH: AS REQUIRED
WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN)
HOLES: 3/8" DIAMETER, 1" C-C FULL LENGTH
STEEL: SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASTM A-576 (GRADE 1070 – 1080)
FINISH: SHALL BE PAINTED WITH 2 COATS OF AN APPROVED MEDIUM GREEN BAKED-ON OR AIR-DRIED PAINT OF WEATHER RESISTANT QUALITY. ALL FABRICATION SHALL BE COMPLETE BEFORE PAINTING.

NOTE:
1. WHERE LEDGE APPLICATION EXISTS, DRILL & GROUT TO A MINIMUM OF 2'.
2. ALL SIGNAGE SHALL FOLLOW THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES STANDARDS AND NHDOT STANDARDS.
3. SIGN, HARDWARE, AND INSTALLATION SHALL CONFORM TO THE LATEST NHDOT STANDARD SPECIFICATIONS.

SIGN POST

NOT TO SCALE



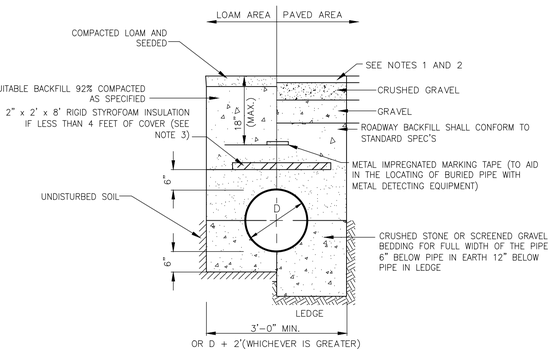
PAVEMENT SECTION/LOAM & SEED DETAIL

NOT TO SCALE

NOTES:
1. PROVIDE CONSTRUCTION AND EXPANSION JOINTS.
2. PROVIDE TRANSITIONS & RAMPS PER ADA.

CONCRETE SIDEWALK WITH VERTICAL GRANITE CURB

NOT TO SCALE

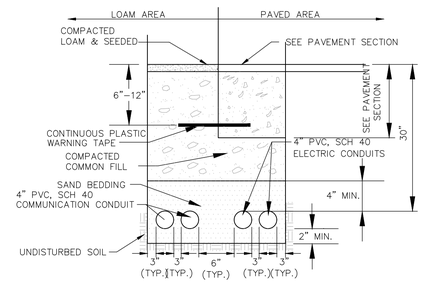


NOTES

1. PAVEMENT REPAIR IN EXISTING ROADWAYS SHALL CONFORM TO STREET OPENING REGULATIONS.
2. NEW ROADWAY CONSTRUCTION SHALL CONFORM TO SUBDIVISION SPEC'S.
3. GAPS BETWEEN SECTIONS OF INSULATION TO BE COVERED WITH 2" x 2' x 2' PIECE OF INSULATION CENTERED OVER GAP.

SEWER TRENCH WITH OPTIONAL INSULATION

NOT TO SCALE

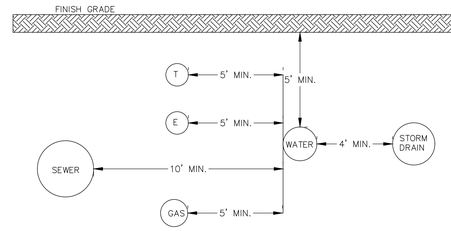


NOTES

1. ELECTRIC SERVICE INSTALLATION AND STANDARD DIMENSIONAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL CODES.
2. COMMUNICATION SERVICE INSTALLATION SHALL MEET ALL CONSTRUCTION REQUIREMENTS.
3. ACTUAL NUMBER OF CONDUITS TO BE DETERMINED BY RESPECTIVE COMPANIES.
4. VERIFY INSTALLATION REQUIREMENTS WITH RESPECTIVE COMPANIES.

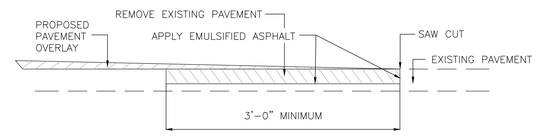
ELECTRIC/COMMUNICATIONS CONDUIT

NOT TO SCALE



TYPICAL UTILITY SEPARATION DETAIL

NOT TO SCALE



PAVEMENT SAWCUT

NOT TO SCALE

SITE DEVELOPMENT PLANS

TAX MAP 229 LOT 1

DETAILS

PROPOSED 3 LOT SUBDIVISION

437 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

OWNED BY & PREPARE FOR

ARTWILL, LLC

SCALE: **APRIL 19, 2022**

STATE OF NEW HAMPSHIRE JOHN J. McTIGUE No. 14960 LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	DR	CK

TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
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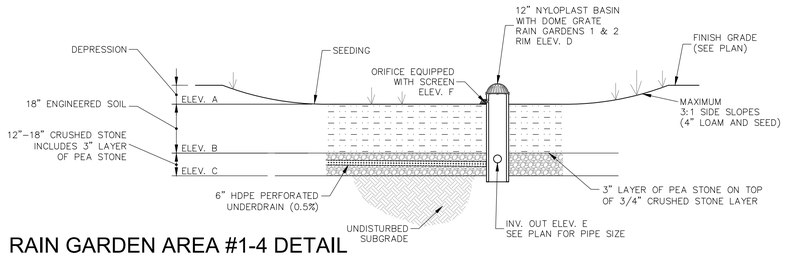


RAIN GARDEN AREA #1-4 DETAIL

NOT TO SCALE

SEEDING

1. USE NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR MOIST SITES BY NEW ENGLAND WETLAND PLANTS, INC. OR EQUIVALENT.
2. SEED AT A RATE OF 1LB/1250SF. APPLY TO BARE SOIL. LIGHTLY MULCH WITH CLEAN WEED FREE STRAW.

	ELEV.			
	RG #1	RG #2	RG #3	RG #4
A	35.50	32.50	29.50	33.50
B	34.00	31.00	28.00	32.00
C	32.58	29.58	26.58	30.58
D	35.85	32.85	29.90	33.85
E*	32.83	29.33	28.00	31.50
F	35.75 1" ORIFICE	32.75 1" ORIFICE	29.83 1" ORIFICE	33.75 1" ORIFICE

* SEE GRADING AND DRAINAGE PLAN FOR CULVERT SIZES.

RAIN GARDEN CONSTRUCTION

1. CLEAR AND GRUB THE AREA WHERE THE RAIN GARDEN AREAS ARE TO BE LOCATED. STOCKPILE LOAM FOR REUSE ON SLOPES.
2. GRADE RAIN GARDEN AREAS ACCORDING TO PLAN AND DETAILS. SIDE SLOPES SHALL HAVE 4" LOAM AND SEED AND A SLOPE NOT TO EXCEED 3:1. BOTTOM OF RAIN GARDEN AREAS TO BE CONSTRUCTED WITH MANUFACTURED SOIL (SEE RAIN GARDEN CONSTRUCTION DETAIL). SPECIFIC PLANTINGS SHALL BE PLACED IN THE FACILITY ACCORDING TO THE LANDSCAPE PLAN PLANTING DETAIL.
3. RAIN GARDEN SOIL MIXTURE SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES EXCLUDING MULCH. NO OTHER MATERIALS OR SUBSTANCES SHALL BE MIXED OR DUMPED WITHIN THE RAIN GARDEN AREA THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVIDE A HINDRANCE TO THE PLANTING OR MAINTENANCE OPERATION.
4. THE USDA TEXTURAL CLASSIFICATION OF THE SANDY SOIL SHALL BE LOAMY SAND OR SANDY LOAM.
5. THE ENGINEERED SOIL – SEE ENGINEERED SOIL MIX NOTES.
   A. SOILS TO BE TESTED AND APPROVED BY THE ENGINEER OF RECORD. ENGINEER SHALL SUBMIT LETTER OF VERIFICATION TO THE CITY.
9. THE CONTRACTOR SHALL TAKE MEASURES TO PREVENT EQUIPMENT & VEHICLE TRAFFIC FROM DRIVING IN THE AREA OF THE PROPOSED RAIN GARDEN AREA DURING CONSTRUCTION.
10. AFTER THE BASIN IS EXCAVATED TO THE FINAL DESIGN ELEVATION, THE FLOOR SHOULD BE DEEPLY TILLED WITH A ROTARY TILLER OR DISC HARROW TO RESTORE INFILTRATION RATES. THE BASIN BOTTOM SHOULD BE LEVELED PRIOR TO BACKFILLING WITH CRUSHED STONE AND RAIN GARDEN SOIL MIXTURE.
11. AASHTO #57 STONE CAN BE USED IN PLACE OF 3/4" CRUSHED STONE.

RAIN GARDEN MAINTENANCE

MAINTENANCE SCHEDULE TO BEGIN AFTER CONSTRUCTION IS FINISHED AND BASIN STABILIZATION IS COMPLETE.

1. CONTRACTOR AND LAND OWNERS TO PERFORM SCHEDULED MAINTENANCE ON THE RAIN GARDENS.
2. REGULAR WATERING DURING THE FIRST FEW WEEKS AFTER PLANTING AND DURING HOT, DRY SPELLS, ESPECIALLY IN THE FIRST TWO YEARS AFTER PLANTING. AFTER THE FIRST TWO YEARS AND ONCE PLANTS ARE ESTABLISHED, WATERING SHOULD ONLY BE NECESSARY DURING DROUGHT CONDITIONS.
3. FOR THE FIRST YEAR, FREQUENT AND AGGRESSIVE WEEDING MONTHLY DURING GROWING SEASON. REMOVE ONLY INVASIVE SPECIES.
4. TWICE PER YEAR, INSPECT SPILLWAYS AND REMOVE ANY ACCUMULATED DEBRIS OR SEDIMENT TO ENSURE PROPER FUNCTIONALITY.
5. ONCE A YEAR TRIM AND PRUNE EXCESS VEGETATION. DEAD, DYING, DISEASED, OR HAZARDOUS BRANCHES SHOULD BE TRIMMED AND REMOVED AS THEY OCCUR.
6. ONCE A YEAR INSPECT RAIN GARDEN FOR DEAD OR DYING VEGETATION. REPLACE VEGETATION AS NEEDED. NEW PLANTS SHOULD BE PLACED IN THE SAME LOCATION AS THE OLD PLANT, OR AS NEAR AS POSSIBLE TO THE OLD LOCATION. NEW PLANTS SHOULD BE THE NATIVE AND SAME OR EQUIVALENT VARIETY.
7. DO NOT MOW GARDEN.
8. ONCE A YEAR, INSPECT BOTTOM OF RAIN GARDEN. MAINTAIN A 2–3" LAYER OF MULCH. REPLACE AS REQUIRED.
9. DURING INSPECTIONS, REMOVE ANY TRASH, ACCUMULATED DEBRIS OR SEDIMENT.
10. ONCE A YEAR INSPECT BERM FOR SETTLING. ADD COMPACTED SOIL AND REPLANT AS NEEDED.
11. ONCE A YEAR IN THE FALL THE SYSTEM SHOULD BE INSPECTED FOR DRAWDOWN TIME AFTER A RAINFALL EVENT THAT EXCEEDS 1.0 INCHES IN A 24–HOUR PERIOD. THE SYSTEM SHOULD BE CHECKED TO CONFIRM THAT IT COMPLETELY DRAINS IN 72–HOUR AFTER THE RAINFALL EVENT. IF THE GARDEN DOES NOT DRAIN, A QUALIFIED PROFESSIONAL SHOULD ASSESS THE CONDITION OF THE FACILITY TO DETERMINE MEASURES REQUIRED TO RESTORE FILTRATION OR INFILTRATION FUNCTIONS, INCLUDING BUT NOT LIMITED TO REMOVAL OF ACCUMULATED SEDIMENTS.
12. ONCE A YEAR TEST PLANTING BED FOR PH. IF THE PH IS BELOW 5.2, LIMESTONE SHOULD BE APPLIED. IF THE PH IS ABOVE 8.0, IRON SULFATE AND SULFUR SHOULD BE APPLIED.

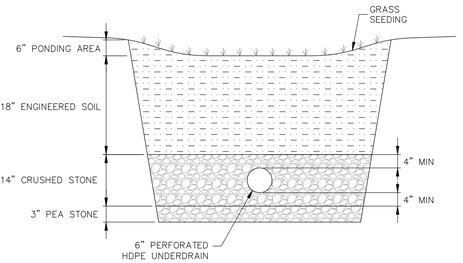
ENGINEERED SOIL MIX

1. THE ENGINEERED SOIL IS MADE OF IS 10% WOOD CHIPS, 35% LOAM, AND 55% SAND.
2. LOAM SHALL MEET THE USDA TEXTURAL CLASSIFICATION OF LOAMY FINE SAND.
3. SAND SHALL BE CONCRETE SAND MEETING ASTM C–33 SPECIFICATION.
4. WOOD CHIPS SHALL BE SHREDDED WOOD, WOOD CHIPS, GROUND BARK, OR WOOD WASTE; OF UNIFORM TEXTURE AND FREE OF STONES, STICKS, SOIL, OR TOXIC MATERIALS
5. SOIL REACTION: PH OF 6 TO 7.
6. CEC OF TOTAL SOIL: MINIMUM 10 MEQ/100 ML AT PH OF 7.0.
7. BASIS–OF–DESIGN PRODUCT: SUBJECT TO COMPLIANCE WITH REQUIREMENTS INDICATED ON DRAWINGS
8. BASIC PROPERTIES: MANUFACTURED SOIL SHALL NOT CONTAIN THE FOLLOWING:
   A. UNACCEPTABLE MATERIALS: CONCRETE SLURRY, CONCRETE LAYERS OR CHUNKS, CEMENT, PLASTER, BUILDING DEBRIS, ASPHALT, BRICKS, OILS, GASOLINE, DIESEL FUEL, PAINT THINNER, TURPENTINE, TAR, ROOFING COMPOUND, ACID, SOLID WASTE, AND OTHER EXTRANEOUS MATERIALS THAT ARE HARMFUL TO PLANT GROWTH.
   B. UNSUITABLE MATERIALS: STONES, ROOTS, PLANTS, SOD, CLAY LUMPS, AND POCKETS OF COARSE SAND THAT EXCEED A COMBINED MAXIMUM OF 5 PERCENT BY DRY WEIGHT OF THE MANUFACTURED SOIL.
   C. LARGE MATERIALS: STONES, CLODS, ROOTS, CLAY LUMPS, AND POCKETS OF COARSE SAND EXCEEDING 0.187 INCHES (4.76 MM) IN ANY DIMENSION.

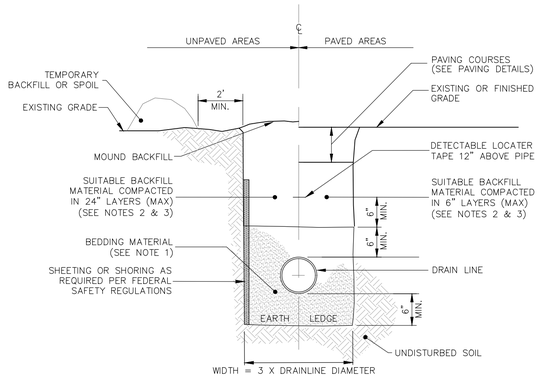
ENGINEERED SOIL MIX PARTICLE SIZE DISTRIBUTION (PSD)			
PSD UPPER LIMIT		PSD LOWER LIMIT	
SIEVE #	% Passing	SIEVE #	% PASSING
4	100	4	100
10	95	10	95
40	40	40	15
200	20	200	15
<200	5	<200	5

RAIN GARDEN INSPECTION SCHEDULE

1. RAIN GARDEN TO BE INSPECTED BY THE DESIGN ENGINEER FOR EACH STAGE OF CONSTRUCTION.
2. PHASES OF CONSTRUCTION BEING:
   A. EXCAVATION OF THE RAIN GARDEN BASIN, INCLUDING ROTOTILLING.
   B. INSTALLATION OF THE CRUSHED STONE
   C. INSTALLATION OF THE ENGINEERED SOIL
   D. INSTALLATION OF THE OUTLET STRUCTURE AND UNDERDRAIN IN THE OUTLET STONE TRENCHES
3. SAMPLE OF THE INDIVIDUAL COMPONENTS OF THE ENGINEERED SOIL TO BE PROVIDED AND APPROVED PRIOR BEING COMBINED AND INSTALLED. SAMPLE CRUSHED STONE TO BE PROVIDED AND APPROVED PRIOR TO INSTALLATION.
4. ENGINEER TO VERIFY MIX RATIO OF ENGINEERED SOIL MIX.



RAIN GARDEN TYPICAL SECTION



NOTES

1. BEDDING – BEDDING FOR PIPES SHALL CONSIST OF PREPARING THE BOTTOM OF THE TRENCH TO SUPPORT THE ENTIRE LENGTH OF THE PIPE AT A UNIFORM SLOPE AND ALIGNMENT. CRUSHED STONE SHALL BE USED TO BED THE PIPE TO THE ELEVATION SHOWN ON THE DRAWINGS. NORMAL PIPE BEDDING IS CRUSHED STONE TO THE HAUNCH OF THE PIPE AND SAND BEDDING 6" ABOVE THE CROWN. IF THE TOP OF THE PIPE IS LESS THAN 30" FROM FINISH GRADE, BED PIPE COMPLETELY IN STONE UP TO 6" ABOVE PIPE CROWN. UNDERDRAIN TO HAVE 4" MINIMUM OF STONE OVER PIPE OR AS NECESSARY TO BE IN CONTACT WITH GRAVEL LAYER OF SELECTS ABOVE.
2. COMPACTION – ALL BACKFILL SHALL BE COMPACTED AT OR NEAR OPTIMUM MOISTURE CONTENT BY PNEUMATIC TAMPERS, VIBRATORY COMPACTORS OR OTHER APPROVED MEANS. BACKFILL BENEATH PAVED SURFACES SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T99, METHOD C.
3. 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; ROCKS OVER 6" IN LARGEST DIMENSION; FROZEN EARTH AND ANY MATERIAL WHICH, AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION.
4. BASE COURSE AND PAVEMENT – SHALL MEET THE REQUIREMENT OF THE NHDOT LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DIVISION 300 AND 400 RESPECTIVELY.

TRENCH FOR DRAIN LINE

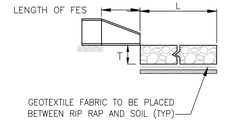
NOT TO SCALE

MAINTENANCE:

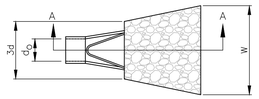
THE OUTLET PROTECTION SHOULD BE CHECKED AT LEAST ANNUALLY AND AFTER EVERY MAJOR STORM. IF THE RIP RAP HAS BEEN DISPLACED, UNDERMINED OR DAMAGED, IT SHOULD BE CHECKED TO SEE THAT EROSION IS NOT OCCURRING. THE DOWNSTREAM CHANNEL SHOULD BE KEPT CLEAR OF OBSTRUCTIONS SUCH AS FALLEN TREES, DEBRIS, AND SEDIMENT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

CONSTRUCTION SPECIFICATIONS:

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



SECTION A–A

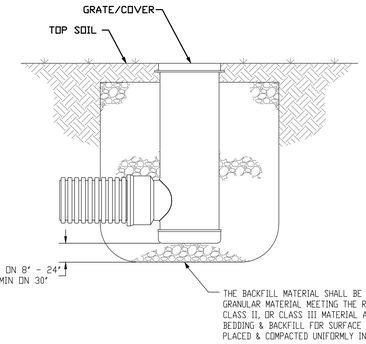


RIPRAP DIMENSIONS				
LOCATION	FES01	FES02	FES03	FES04
d50 STONE SIZE (IN)	6	6	6	6
L– LENGTH OF APRON (FT)	2	3	2	2
W–WIDTH OF APRON (FT)	2	3	2	2
T–DEPTH OF APRON (IN)	9	9	9	9

% OF WEIGHT SMALLER THAN THE GIVEN SIZE	SIZE OF STONE (INCHES)
100	9.00 TO 12.00
85	7.80 TO 10.80
50	6.00 TO 9.00
15	1.80 TO 3.00

RIP RAP AND FLARED END SECTION WITH OUTLET PROTECTION

NOT TO SCALE

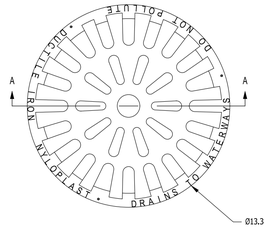


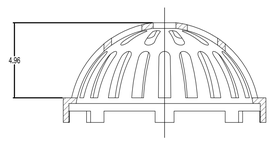
NYLOPAST DRAIN BASIN NON TRAFFIC INSTALLATION

NOT TO SCALE

1299CGD

APPROX. DRAIN AREA = 82.87 SQ IN
APPROX. WEIGHT = 18.50 LBS





SECTION A–A

DIMENSIONS ARE FOR REFERENCE ONLY
ACTUAL DIMENSIONS MAY VARY
DIMENSIONS ARE IN INCHES
QUALITY: MATERIALS SHALL CONFORM TO ASTM A536 GRADE 70–50–05
PAINT: CASTINGS ARE FURNISHED WITH A BLACK PAINT
LOCKING DEVICE AVAILABLE UPON REQUEST

ADS 12" DOME GRATE

NOT TO SCALE

SITE DEVELOPMENT PLANS

TAX MAP 229 LOT 1

DETAILS

PROPOSED 3 LOT SUBDIVISION

437 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

OWNED BY & PREPARE FOR

ARTWILL, LLC

SCALE: **APRIL 19, 2022**

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DIG SAFE
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

STATE OF NEW HAMPSHIRE
JOHN J. McTIGUE
No. 14950
LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	DR	CK

TFM ©
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

FILE	45407-120	DR	JSM	FB		C-11
		CK	JCC	CADFILE	45407-120_DETAILS	

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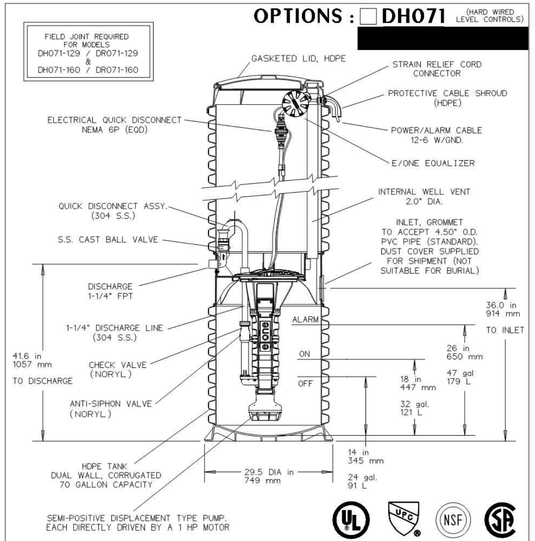
OPTIONS : ☐ DH071 (HARD WIRED LEVEL CONTROLS) [redacted]



CONCRETE BALLAST MAY BE REQUIRED SEE INSTALLATION INSTRUCTION FOR DETAILS

NOTE: DIMENSIONS ARE FOR REF ONLY

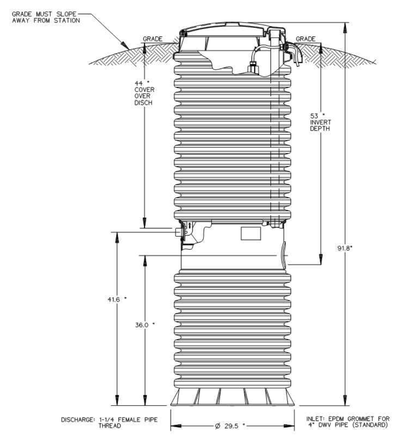
AD	CH	10/20/10	E	
DR BY	CHK'D	DATE	ISSUE	SCALE

e/one SEWER SYSTEMS

MODEL DH071 [redacted]
DETAIL SHEET

NA0050P02

OPTIONS : ☐ DH071-93 (HARD WIRED LEVEL CONTROLS) [redacted]



CONCRETE BALLAST MAY BE REQUIRED SEE INSTALLATION INSTRUCTIONS FOR DETAILS

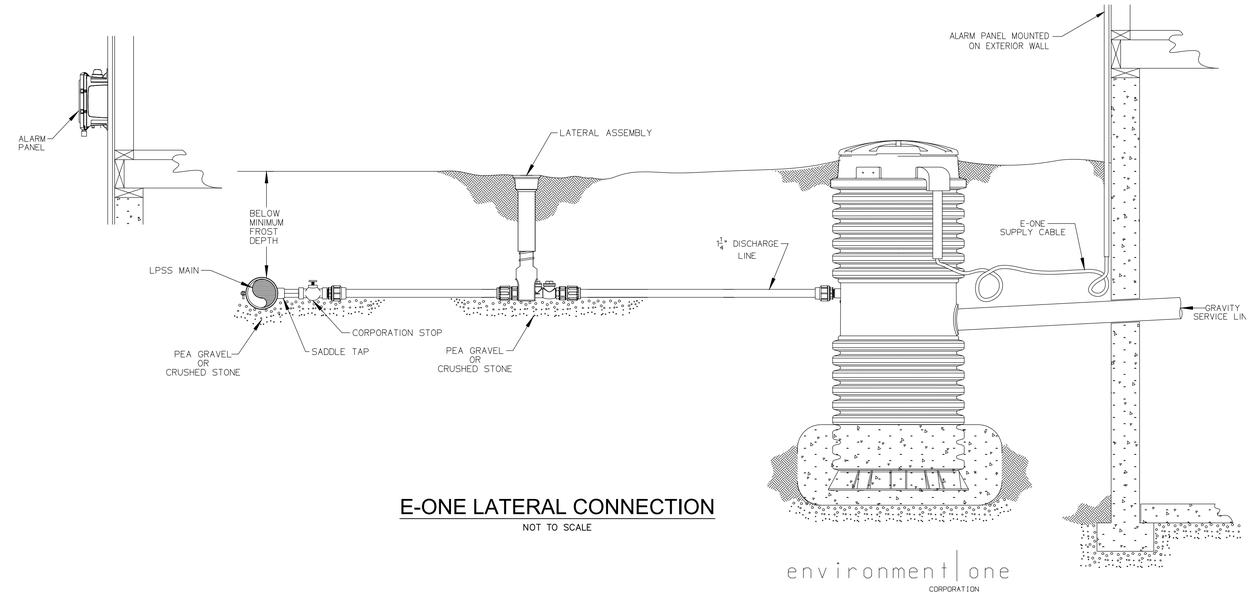
NOTE: DIMENSIONS ARE FOR REF ONLY

AD	CAH	07/12/07	B	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE

e/one SEWER SYSTEMS

MODEL DH071-93 [redacted]

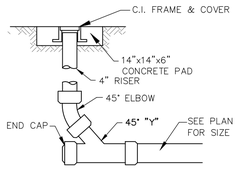
NA0050P06



E-ONE LATERAL CONNECTION

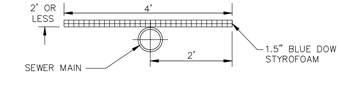
NOT TO SCALE

environment | one CORPORATION

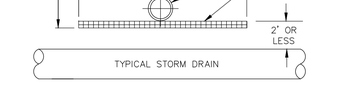


SEWER CLEAN OUT

NOT TO SCALE



CONDITION I

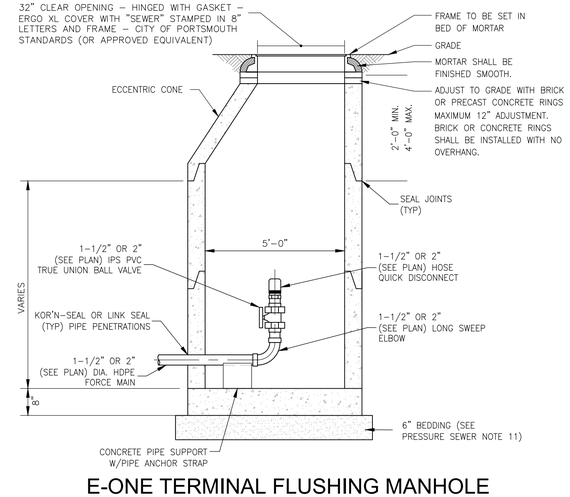


CONDITION II

NOTES:
1. THE LENGTH OR WIDTH OF INSULATION SHALL EXTEND 1 STORM DRAIN PIPE DIAMETER BEYOND THE EDGE OF STORM DRAIN PIPE IN EACH DIRECTION OR A MINIMUM OF 2' BEYOND THE CENTERLINE OF THE STORM DRAIN PIPE, WHICHEVER IS GREATER.
2. ALL BUTT JOINT SEAMS TO BE OVERLAPPED WITH A 1' PIECE OF INSULATION CENTERED OVER SEAM.
3. 18" VERTICAL CLEARANCE SHALL BE PROVIDED BETWEEN WATER MAIN/SERVICES AND SEWER MAIN/SERVICES, WATER OVER SEWER.

INSULATION AT STORM DRAIN & SEWER MAIN CROSSINGS

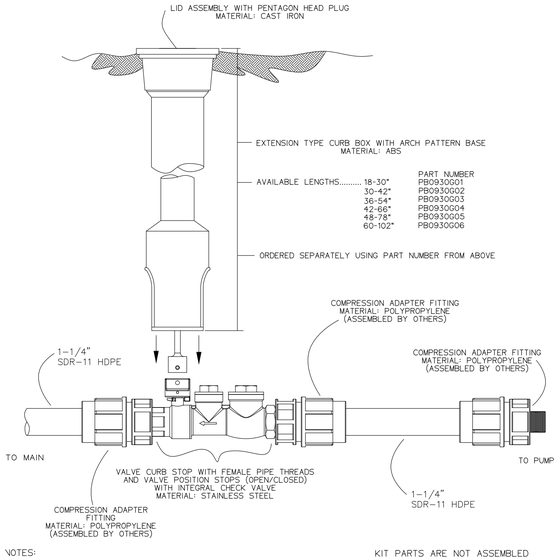
NOT TO SCALE



E-ONE TERMINAL FLUSHING MANHOLE

NOT TO SCALE

NOTES:
1. MANHOLE FRAME & GRATE SHALL BE NEENAH R-3589-A OR APPROVED EQUAL.
2. ALL COMPONENTS SHALL BE DESIGNED FOR HS-20 LOADING.
3. REINFORCING SHALL CONFORM TO ASTM 185 OR ASTM 1497 & ASTM A615, GRADE 60.
4. ALL CONCRETE SHALL BE NHDOT CLASS A.
5. LARGER DIAMETER STRUCTURES SHALL BE USED AS REQUIRED DUE TO NUMBER, ORIENTATION OR SIZE OF PIPES AT THE STRUCTURE.
6. "CL" USED AT ALL LOCATIONS WITHOUT CURB AND "C" TO BE USED AT ALL TO NUMBER, SIZE OR ORIENTATION OF PIPES AT THE BASIN.
7. ALL CASTINGS SHALL BE MADE IN THE USA.
8. INSTALL PIPE SUPPORTS ON THE SWEEP ELBOW.
9. ALL PIPE FITTINGS ARE TO BE RESTRAINED JOINT STYLE.
   A. HDPE TO BE FUSION, ELECTROFUSION OR MECHANICAL JOINT.
   B. PVC WOULD BE SOLVENT GLUE.
   C. ALL JOINTS TO BE THREADED AND PRESSURE RATED TO 200 PSI
10. MANHOLE STRUCTURES SHALL MEET THE DESIGN REQUIREMENTS OF ENV-WQ 704.12 THROUGH ENV-WQ 704.17.
11. A.R.I. D-025 STAINLESS STEEL AIR RELEASE VALVE OR EQUIVALENT.



NOTES:
1. SS CURB STOP/CHECK VALVE AND FITTINGS ARE PROVIDED SEPARATELY, TO BE ASSEMBLED BY OTHERS
2. TO ASSEMBLE, APPLY A DOUBLE LAYER OF TEFLON TAPE, AND A LAYER OF PIPE DOPE (SUPPLIED BY OTHERS) TO THE THREADS ON THE PLASTIC FITTINGS AND INSTALL PER THE MANUFACTURER'S INSTRUCTIONS
   •FOR SS FITTING INTO SS THREAD, USE EITHER PIPE DOPE OR TEFLON TAPE, NOT BOTH
3. ASSEMBLY IS TO BE PRESSURE TESTED (BY OTHERS)
4. ASSEMBLY IS TO BE USED WITH SDR11 HDPE PIPE
5. TO ORDER SS LATERAL KIT, USE PART NUMBER NC0193G02
6. CURB BOX IS TO BE ORDERED SEPARATELY, SEE ABOVE

KIT PARTS ARE NOT ASSEMBLED

SGS	DN	11/02/11	B	3/16
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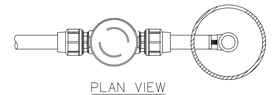
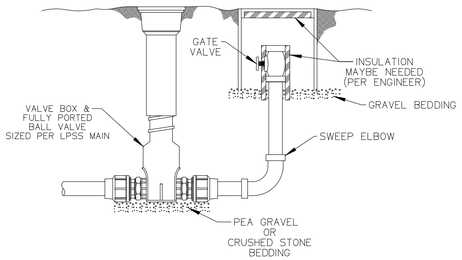
e/one SEWER SYSTEMS

STAINLESS STEEL LATERAL KIT 1-1/2" SDR 11 HDPE PIPE

NA0330P03





E-ONE TERMINAL FLUSHING CONNECTION

NOT TO SCALE

SITE DEVELOPMENT PLANS

TAX MAP 229 LOT 1

DETAILS

PROPOSED 3 LOT SUBDIVISION

437 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

OWNED BY & PREPARE FOR

ARTWILL, LLC

SCALE: AS SHOWN **APRIL 19, 2022**

REV	DATE	DESCRIPTION	DR	CK

TFM Civil Engineers, Structural Engineers, Traffic Engineers, Land Surveyors, Landscape Architects, Scientists
48 Constitution Drive, Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

FILE	45407-120	DR	JSM	FB		C-12
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SEWER SERVICE NOTES

1. MINIMUM SIZE PIPE FOR SEWER SERVICE SHALL BE FOUR INCHES.

2. PIPE AND JOINT MATERIALS:
   A. PLASTIC SEWER PIPE
      1. PIPE AND FITTINGS SHALL CONFORM TO THE FOLLOWING ASTM STANDARDS:

ASTM STANDARDS	GENERIC PIPE MATERIAL	SIZES APPROVED
D3034	*PVC (SOLID WALL)	8" THROUGH 15" (SDR 35)
F679	PVC (SOLID WALL)	18" THROUGH 27" (T-1 & T-2)
F789	PVC (SOLID WALL)	4" THROUGH 18" (T-1 TO T-3)
F794	PVC (RIBBED WALL)	8" THROUGH 36"
D2680	*ABS (COMPOSITES WALL)	8" THROUGH 15"

*PVC: POLY VINYL CHLORIDE
*ABS: ACRYLONITRILE-BUTADIENE-STYRENE

      2. JOINTS SEALS FOR PVC PIPE SHALL BE OIL RESISTANT COMPRESSION RINGS OF ELASTOMERIC MATERIAL CONFORMING TO ASTM D-3212 AND SHALL BE PUSH-ON, BELL AND SPIGOT TYPE.

      ABS TRUSS PIPE AND FITTINGS SHALL CONFORM TO ASTM D-2680, POLYMER COMPOUNDING SHALL BE TO ASTM D-1788 (CLASS 322).

      JOINTS FOR ABS TRUSS PIPE SHALL BE CHEMICAL WELDED COUPLINGS TYPE SC IN ACCORDANCE WITH ASTM D-2680, FORMING A CHEMICAL WELDED JOINT.

   B. DUCTILE-IRON PIPE, FITTINGS AND JOINTS.

      1. DUCTILE IRON PIPE AND FITTINGS SHALL CONFORM TO THE FOLLOWING STANDARDS OF THE UNITED STATES OF AMERICA STANDARDS INSTITUTE:
         A21.50 THICKNESS DESIGN OF DUCTILE IRON PIPE AND WITH ASTM A-536 DUCTILE IRON CASTINGS.
         A21.51 DUCTILE IRON PIPE, CENTRIFUGALLY CAST IN METAL MOLDS OR SAND-LINED MOLDS FOR WATER OR OTHER LIQUIDS.
      2. JOINTS SHALL BE OF THE MECHANICAL OR PUSH-ON TYPE. JOINTS AND GASKETS SHALL CONFORM TO:
         A21.11 RUBBER GASKETS JOINTS FOR CAST IRON PRESSURE PIPE & FITTINGS

3. DAMAGED PIPE SHALL BE REJECTED AND REMOVED FROM THE JOB SITE.

4. JOINTS SHALL BE DEPENDENT UPON A NEOPRENE OR ELASTOMERIC GASKET FOR WATER-TIGHTNESS. ALL JOINTS SHALL BE PROPERLY MATCHED WITH THE PIPE MATERIALS USED. WHERE DIFFERING MATERIALS ARE TO BE CONNECTED, AS AT THE STREET SEWER WYE OR AT THE FOUNDATION WALL, APPROPRIATE MANUFACTURED ADAPTERS SHALL BE USED.

5. TEES AND WYES: WHERE A TEE OR WYE IS NOT AVAILABLE IN THE EXISTING STREET SEWER, AN APPROPRIATE CONNECTION SHALL BE MADE, FOLLOWING MANUFACTURERS' INSTRUCTIONS USING A BOLTED, CLAMPED OR EPOXY-CEMENTED SADDLE TAPPED INTO A SMOOTHLY DRILLED OR SAWN OPENING IN THE SEWER. THE PRACTICE OF BREAKING AN OPENING WITH A SLEDGE HAMMER, STUFFING CLOTH OR OTHER SUCH MATERIAL AROUND THE JOINT, OR APPLYING MORTAR TO HOLD THE CONNECTION, AND ANY OTHER SIMILAR CRUDE PRACTICES OR INEPT OR HASTY IMPROVISATIONS WILL NOT BE PERMITTED. THE CONNECTION SHALL BE CONCRETE ENCASED AS SHOWN IN THE DETAIL UP TO AND INCLUDING 15" DIAMETER.

6. SEWER SERVICE INSTALLATION: THE PIPE SHALL BE HANDLED, PLACED AND JOINTED IN ACCORDANCE WITH INSTALLATION GUIDES OF THE APPROPRIATE MANUFACTURER. IT SHALL BE CAREFULLY BEDDED ON A 6 INCH LAYER OF CRUSHED STONE AND/OR GRAVEL AS SPECIFIED IN NOTE 10. BEDDING AND RE-FILL FOR DEPTH OF 12 INCHES ABOVE THE TOP OF THE PIPE SHALL BE CAREFULLY AND THOROUGHLY TAMPED BY HAND OR WITH APPROPRIATE MECHANICAL DEVICES.

   THE PIPE SHALL BE LAID AT A CONTINUOUS AND CONSTANT GRADE FROM THE STREET SEWER CONNECTION TO THE FOUNDATION AT A GRADE OF NOT LESS THAN 1/4" INCH PER FOOT. PIPE JOINTS MUST BE MADE UNDER DRY CONDITIONS. IF WATER IS PRESENT, ALL NECESSARY STEPS SHALL BE TAKEN TO DEWATER THE TRENCH.

7. TESTING: THE COMPLETED SEWER SERVICE SHALL BE SUBJECTED TO A THIRD PARTY LEAKAGE TEST IN ANY OF THE FOLLOWING MANNERS: (PRIOR TO BACKFILLING)

   A. AN OBSERVATION TEE SHALL BE INSTALLED AS SHOWN AND WHEN READY FOR TESTING, AN INFLATABLE BLADDER OR PLUG SHALL BE INSERTED JUST UPSTREAM FROM THE OPENING IN THE TEE. AFTER INFLATION, WATER SHALL BE INTRODUCED INTO THE SYSTEM ABOVE THE PLUG TO A HEIGHT OF 5 FEET ABOVE THE LEVEL OF THE PLUG.

   B. THE PIPE SHALL BE LEFT EXPOSED AND LIBERALLY HOSED WITH WATER, TO SIMULATE, AS NEARLY AS POSSIBLE, WET TRENCH CONDITIONS OR, IF TRENCH IS WET, THE GROUND WATER SHALL BE PERMITTED TO RISE IN THE TRENCH OVER THE PIPE. INSPECTIONS FOR LEAKS SHALL BE MADE THROUGH THE CLEANOUT WITH A FLASHLIGHT.

   C. DRY FLUORESCENE DYE SHALL BE SPRINKLED INTO THE TRENCH OVER THE PIPE. IF THE TRENCH IS DRY, THE PIPE SHALL BE LIBERALLY HOSED WITH WATER, OR IF THE TRENCH IS WET, GROUND WATER SHALL BE PERMITTED TO RISE IN THE TRENCH OVER THE PIPE. OBSERVATION FOR LEAKS SHALL BE MADE IN THE FIRST DOWN-STREAM MANHOLE.

   LEAKAGE OBSERVED IN ANY ONE OF THE ABOVE ALTERNATE TESTS SHALL BE CAUSE FOR NON-ACCEPTANCE AND THE PIPE SHALL BE DUG-UP IF NECESSARY AND RE-LAID SO AS TO ASSURE WATER TIGHTNESS.

8. ILLEGAL CONNECTIONS: NOTHING BUT SANITARY WASTE FLOW FROM TOILETS, SINKS, LAUNDRY ETC. SHALL BE PERMITTED. ROOF LEADERS, FOOTING DRAINS, SUMP PUMPS OR OTHER SIMILAR CONNECTIONS CARRYING RAIN WATER, DRAINAGE OR GROUND WATER SHALL NOT BE PERMITTED.

9. WATER SERVICE SHALL NOT BE LAID IN SAME TRENCH AS SEWER SERVICE.

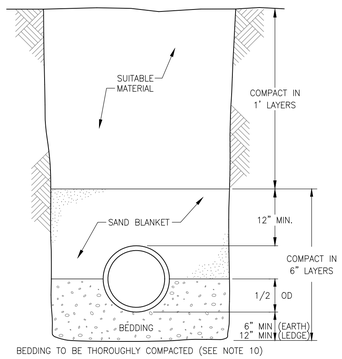
10. BEDDING: SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATERIAL AND MEETING ASTM C33-67.

100% PASSING	1 INCH SCREEN
90%-100% PASSING	3/4 INCH SCREEN
20%-55% PASSING	3/8 INCH SCREEN
0%-10% PASSING	#4 SIEVE
0%-5% PASSING	#8 SIEVE

   WHERE ORDERED BY THE ENGINEER TO STABILIZE THE TRENCH BASE, SCREENED GRAVEL OR CRUSHED STONE 1/2 INCH TO 1 1/2 INCH SHALL BE USED.

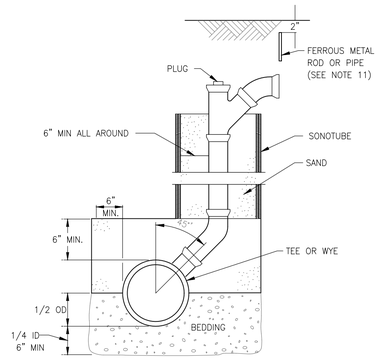
11. LOCATION: THE LOCATION OF THE TEE OR WYE SHALL BE RECORDED AND FILED IN THE MUNICIPAL RECORDS. IN ADDITION, A FERROUS METAL ROD OR PIPE SHALL BE PLACED OVER THE TEE OR WYE AS DESCRIBED IN THE TYPICAL "CHIMNEY" DETAIL, TO AID IN LOCATING THE BURIED PIPE WITH A DIP NEEDLE OR PIPEFINDER.

12. CHIMNEYS: IF VERTICAL DROP INTO SEWER IS GREATER THAN 4 FEET, A CHIMNEY SHALL BE CONSTRUCTED FOR THE SEWER CONNECTION. CHIMNEY INSTALLATION AS RECOMMENDED BY THE PIPE MANUFACTURER MAY BE USED IF APPROVED BY THE ENGINEER.



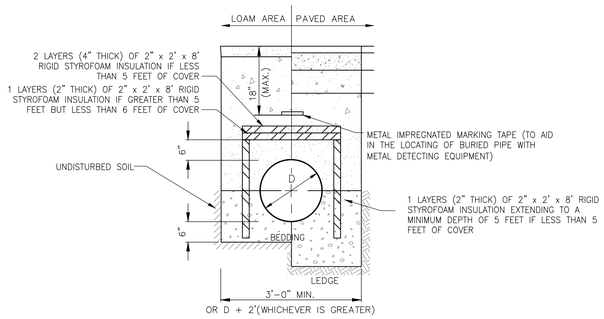
BEDDING TO BE THOROUGHLY COMPACTED (SEE NOTE 10)

TRENCH CROSS-SECTION
NOT TO SCALE



BACKFILLING TO BE BROUGHT UP EVENLY ON ALL SIDES.

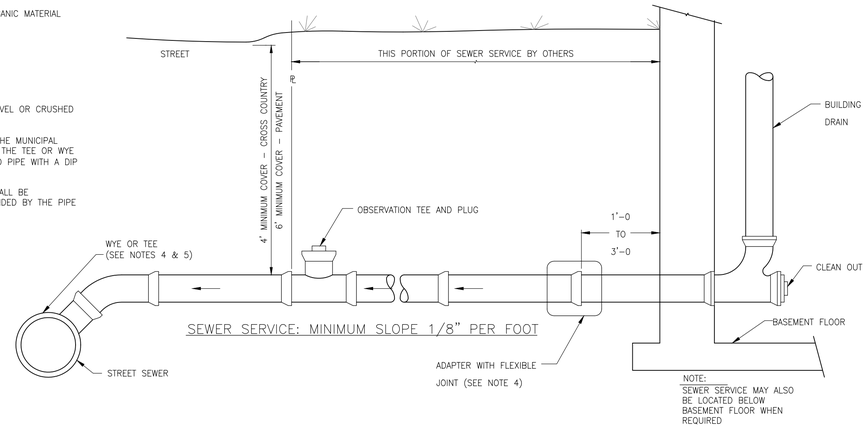
CHIMNEY (SEE NOTE 12)
NOT TO SCALE



NOTES

1. GAPS BETWEEN SECTIONS OF INSULATION TO BE COVERED WITH 2" x 2' x 2' PIECE OF INSULATION CENTERED OVER GAP.

SEWER TRENCH WITH INSULATION
NOT TO SCALE



NOTE:
SEWER SERVICE MAY ALSO BE LOCATED BELOW BASEMENT FLOOR WHEN REQUIRED

SEWER SERVICE DETAILS
NOT TO SCALE

GRAVITY SEWER NOTES

1. MINIMUM SIZE PIPE FOR GRAVITY SEWER SHALL BE 8-INCHES.

2. PIPE AND JOINT MATERIALS FOR PLASTIC SEWER PIPE SHALL CONFORM TO THE FOLLOWING ASTM STANDARDS:

ASTM STANDARDS	GENERIC PIPE MATERIAL	SIZES APPROVED
D3034-04a	* PVC (SOLID WALL)	8" THROUGH 15" (SDR 35)
F679-03	PVC (SOLID WALL)	18" THROUGH 27" (T-1 & T-2)
F794-03	PVC (RIBBED WALL)	8" THROUGH 36"
F1760-01(2005)e1	PVC, RECYCLED	ALL DIAMETERS

*PVC: POLY VINYL CHLORIDE

3. PLASTIC SEWER PIPE SHALL HAVE A PIPE STIFFNESS RATING OF AT LEAST 46 POUNDS PER SQUARE INCH AT 5 PERCENT PIPE DIAMETER DEFLECTION, AS MEASURED IN ACCORDANCE WITH ASTM D2412-02 DURING MANUFACTURE.

4. JOINTS SEALS FOR PVC PIPE SHALL BE OIL RESISTANT COMPRESSION RINGS OF ELASTOMERIC MATERIAL CONFORMING TO ASTM D-3212-96(a)(2003)e1 AND SHALL BE PUSH-ON, BELL AND SPIGOT TYPE.

5. DUCTILE-IRON PIPE, FITTINGS AND JOINTS SHALL CONFORM TO THE FOLLOWING STANDARDS OF THE AMERICAN WATER WORKS ASSOCIATION (AWWA).

   AWWA C151/A21.51-02 THICKNESS DESIGN OF DUCTILE IRON PIPE AND WITH ASTM A-536-84 (2004) DUCTILE IRON CASTINGS.

   AWWA C151/A21.51-02 DUCTILE IRON PIPE, CENTRIFUGALLY CAST IN METAL MOLDS OR SAND-LINED MOLDS FOR WATER OR OTHER LIQUIDS.

   JOINTS SHALL BE OF THE MECHANICAL OR PUSH-ON TYPE. JOINTS AND GASKETS SHALL CONFORM TO AWWA C151/A21.11 RUBBER GASKETS JOINTS FOR CAST IRON PRESSURE PIPE & FITTINGS.

6. CONCRETE PIPE SHALL CONFORM TO AWWA C302-04.

7. PRESTRESSED CONCRETE CYLINDER PIPE AND FITTINGS SHALL CONFORM TO AWWA C301-99.

   JOINTS SEALS FOR CONCRETE CYLINDER PIPE SHALL BE OIL RESISTANT ELASTOMERIC MATERIAL CONFORMING TO ASWWA C301-99 SPECIFICATIONS.

8. DAMAGED PIPE SHALL BE REJECTED AND REMOVED FROM THE JOB SITE.

9. GRAVITY SEWER PIPE TESTING SHALL BE AS FOLLOWS:

   ALL NEW GRAVITY SEWERS SHALL BE TESTED FOR WATER TIGHTNESS BY THE USE OF LOW-PRESSURE AIR TESTS.

   LOW PRESSURE AIR TESTING SHALL BE IN CONFORMANCE WITH:

   ASTM F1417-92(2005) "STANDARD TEST METHOD FOR INSTALLATION ACCEPTANCE OF PLASTIC GRAVITY SEWER LINES USING LOW PRESSURE AIR".

   UNI-BELL PVC PIPE ASSOCIATION UNI-B-6, "LOW PRESSURE AIR TESTING OF INSTALLED SEWER PIPE".

10. ALL NEW GRAVITY SEWERS SHALL BE CLEANED AND VISUALLY INSPECTED AND SHALL BE TRUE TO LINE AND GRADE FOLLOWING INSTALLATION AND PRIOR TO USE AND VISUALLY INSPECT USING LAMP TEST.

11. ALL PLASTIC SEWER PIPE SHALL BE DEFLECTION TESTED NOT LESS THAN 30 DAYS AND NO MORE THAN 90 DAYS FOLLOWING INSTALLATION.

12. THE MAXIMUM ALLOWABLE DEFLECTION OF FLEXIBLE SEWER PIPE SHALL BE 5 PERCENT OF THE AVERAGE INSIDE DIAMETER.

13. TRENCH CONSTUCTION SHALL CONFORM TO THE FOLLOWING:

    SEWERS SHALL BE BURIED TO A MINIMUM DEPTH OF 6' BELOW GRADE IN ALL ROADWAY LOCATIONS AND TO A MINIMUM DEPTH OF 4 FEET BELOW GRADE IN ALL CROSS COUNTRY LOCATIONS.

    WHERE SEWER LINES CROSS WATER PIPES, A MINIMUM OF 18" VERTICAL SEPARATION BETWEEN THE TWO OUTSIDE PIPE WALLS SHALL BE OBSERVED. AT SEWER/WATER INTERSECTIONS, A MINIMUM OF 6 FEET SHALL BE PROVIDED FROM THE WATER LINE TO THE SEWER PIPE JOINT. 12" SEPARATION BETWEEN THE TWO OUTSIDE PIPE WALLS SHALL BE REQUIRED BETWEEN SEWER LINES AND ALL OTHER PIPES.

    TRENCH DIMENSIONS FOR SEWER PIPE LESS THAN 15 INCHES IN DIAMETER, THE ALLOWABLE TRENCH WIDTH AT A PLANE 12 INCHES ABOVE THE PIPE SHALL BE NO MORE THAN 36 INCHES AND FOR PIPE 15 INCHES AND LARGER, THE ALLOWABLE WIDTH SHALL BE EQUAL TO THE PIPES OUTSIDE DIAMETER PLUS 24 INCHES.

    PIPE TRENCH BEDDING MATERIAL AND FILL MATERIAL FOR EXCAVATION BELOW GRADE SHALL BE SCREENED GRAVEL OR CRUSHED STONE TO ASTM C33-03 STONE SIZE NO. 67. THE PIPE SAND BLANKET MATERIAL SHALL BE GRADED SAND FREE FROM ANY ORGANIC MATERIALS, GRADED SUCH THAT 100 PERCENT PASSED THE 1/2-INCH SIEVE AND A MAXIMUM OF 15 PERCENT PASSES A #200 SIEVE. IN LIEU OF A SAND BLANKET, A STONE ENVELOPE 6 INCHES THICK COMPLETELY AROUND THE PIPE USING 3/4-INCH STONE MAY BE USED.

    PIPE BEDDING MATERIAL SHALL EXTEND FROM A HORIZONTAL PLANE THROUGH THE PIPE AXIS TO 6-INCHES BELOW THE BOTTOM OF THE OUTSIDE SURFACE OF THE PIPE.

    PIPE SAND BLANKET MATERIAL SHALL COVER THE PIPE A MINIMUM OF 12 INCHES ABOVE THE CROWN OF THE OUTSIDE SURFACE.

    COMPACTION SHALL BE IN 12-INCH LAYERS FOR BEDDING AND BLANKET MATERIALS.

    BACKFILL MATERIAL SHALL BE IN 3-FOOT LAYERS TO THE GROUND SURFACE EXCEPT FOR ROAD CONSTRUCTION WHERE THE FINAL 3-FEET SHALL BE COMPACTED IN 12-INCH LAYERS TO THE ROAD BASE SURFACE.

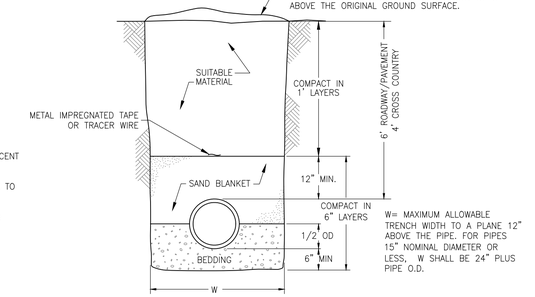
    TRENCH BACKFILL MATERIAL IN ROADWAY LOCATIONS SHALL BE NATURAL MATERIALS EXCAVATED FROM THE TRENCH DURING CONSTRUCTION, EXCLUDING DEBRIS, PAVEMENT PIECES, ORGANIC MATTER, TOP SOIL, WET OR SOFT MUCK, PEAT, CLAY, EXCAVATED LEDGE, ROCKS OVER 6 INCHES IN THE LARGEST DIMENSION, OR ANY OTHER UNSUITABLE MATERIAL NOT APPROVED BY THE ENGINEER.

    TRENCH BACKFILL AT CROSS-COUNTRY LOCATIONS SHALL BE AS DESCRIBED ABOVE EXCEPT THAT THE ENGINEER MAY PERMIT THE USE OF TOP SOIL, LOAM, MUCK OR PEAT, IF HE IS SATISFIED THAT THE COMPLETED CONSTRUCTION WILL BE ENTIRELY STABLE AND PROVIDED THAT EASY ACCESS TO THE SEWER FOR MAINTENANCE AND POSSIBLE RECONSTRUCTION, WHEN NECESSARY WILL BE PRESERVED. BACKFILL SHALL BE MOUNDED 6-INCHES ABOVE ORIGINAL GROUND.

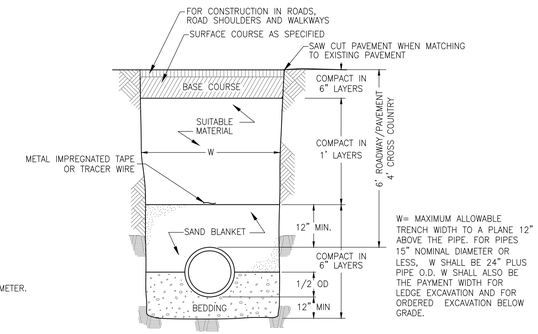
    BASE COURSE MATERIALS FOR TRENCH REPAIRS SHALL MEET THE REQUIREMENTS OF DIVISION 300 OF THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION.

    WHERE SHEETING IS PLACED ALONG SIDE OF THE PIPE AND EXTENDS BELOW MID-DIAMETER, THE SHEETING SHALL BE CUT OFF AND LEFT IN PLACE TO AN ELEVATION NOT LESS THAN ONE FOOT ABOVE THE TOP OF THE PIPE AND AT LEAST 3 FEET BELOW FINISH GRADE.

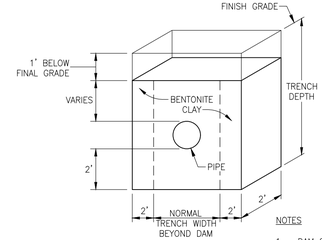
    TRENCHES FOR SEWER PIPES WITH SLOPES OVER 0.08 FEET PER FOOT AND TRENCHES FOR SEWER PIPES BELOW THE SEASONAL HIGH GROUND WATER LEVEL SHALL HAVE IMPERVIOUS TRENCH DAMS CONSTRUCTED EVERY 300 FEET TO PREVENT POTENTIAL DISTURBANCE TO PIPE BEDDING AND BLANKET MATERIALS.



EARTH CONSTRUCTION
NOT TO SCALE



LEDGE CONSTRUCTION
NOT TO SCALE



INSTALL AT CENTER OF EACH GRAVITY PIPE RUN

NOTES

1. DAM SHALL BE LOCATED EVERY 300' OF SEWER PIPE RUN.
2. NO FITTING SHALL BE LOCATED WITHIN 4' OF DAM.

SEWER TRENCH DAM
NOT TO SCALE

SITE DEVELOPMENT PLANS

TAX MAP 229 LOT 1

DETAILS

PROPOSED 3 LOT SUBDIVISION

437 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

OWNED BY & PREPARE FOR

ARTWILL, LLC

SCALE: **APRIL 19, 2022**

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STATE OF NEW HAMPSHIRE
JOHN J. McTIGUE No. 14960
LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	DR	CK

TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

PROJECT #	DR	JSM	FB		
45407-120	CK	JCC	CADFILE	45407-120_DETAILS	C-13

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GENERAL NOTES

1. IT IS THE INTENTION THAT THE MANHOLE, INCLUDING ALL COMPONENT PARTS, HAVE ADEQUATE SPACE, STRENGTH AND LEAKPROOF QUALITIES CONSIDERED NECESSARY FOR THE INTENDED SERVICE. SPACE REQUIREMENTS AND CONFIGURATIONS, SHALL BE AS SHOWN ON THE DRAWING. MANHOLES SHALL BE AN ASSEMBLY OF PRECAST SECTIONS, WITH STEEL REINFORCEMENT, WITH ADEQUATE JOINTING, OR CONCRETE CAST MONOLITHICALLY IN PLACE WITH REINFORCEMENT. IN ANY APPROVED MANHOLE, THE COMPLETE STRUCTURE SHALL BE OF SUCH MATERIAL AND QUALITY AS TO WITHSTAND LOADS OF 8 TONS (H–20 LOADING) WITHOUT FAILURE AND PREVENT LEAKAGE IN EXCESS OF ONE GALLON PER DAY PER VERTICAL FOOT OF MANHOLE, CONTINUOUSLY FOR THE LIFE OF THE STRUCTURE. A PERIOD GENERALLY IN EXCESS OF 25 YEARS IS TO BE UNDERSTOOD IN BOTH CASES.

2. BARRELS, CONE SECTIONS AND CONCRETE GRADE RINGS SHALL BE PRECAST REINFORCED CONCRETE AND SHALL CONFORM ENV–WQ 704.12 & 704.13.

3. PRECAST CONCRETE BARREL SECTIONS, CONES AND BASES SHALL CONFORM TO ASTM C478–06.

4. BASE SECTIONS SHALL BE OF MONOLITHIC CONSTRUCTION TO A POINT AT LEAST 6 INCHES ABOVE THE CROWN OF THE INCOMING PIPE.

5. MANHOLE CONE SECTIONS SHALL BE ECCENTRIC IN SHAPE.

6. ALL PRECAST SECTIONS AND BASES SHALL HAVE THE DATE OF MANUFACTURE AND THE NAME OR TRADEMARK OF THE MANUFACTURER IMPRESSED OR INDELIBLY MARKED ON THE INSIDE WALL.

7. ALL PRECAST SECTIONS AND BASES SHALL BE COATED ON THE EXTERIOR WITH A BITUMINOUS DAMP–PROOFING COATING.

8. SHALLOW MANHOLE: IN LIEU OF A CONE SECTION, WHEN MANHOLE DEPTH IS LESS THAN 6 FEET, A REINFORCED CONCRETE SLAB COVER MAY BE USED HAVING AN ECCENTRIC ENTRANCE OPENING AND CAPABLE OF SUPPORTING H–20 LOADS.

9. HORIZONTAL JOINTS BETWEEN SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE OF AN OVERLAPPING TYPE, SEALED FOR WATERTIGHTNESS USING A DOUBLE ROW OF AN ELASTOMERIC OR MASTIC–LIKE SEALANT. APPROVED ELASTOMERIC SEALANTS ARE:
   - SIKAFLEX–12–SL
   - SONNEBORN BUILING PRODUCTS–SONOLASTIC SL–1

10. THE MINIMUM INTERNAL DIAMETER OF MANHOLES SHALL BE 48 INCHES. FOR SEWERS LARGER THAN 24–INCH DIAMETER. MANHOLE DIAMETERS SHALL BE INCREASED SO AS TO PROVIDE AT LEAST 12–INCHES OF SHELF ON EACH SIDE OF THE SEWER.

11. LEAKAGE TEST SHALL BE PERFORMED IN ACCORDANCE TO ENV–WQ 704.17.

   (a) ALL MANHOLES SHALL BE TESTED FOR LEAKAGE USING A VACUUM TEST IN ACCORDANCE WITH THE ASTM C1244 STARNDARD IN EFFECT WHEN THE TESTING IS PERFORMED.

   (b) THE MANHOLE VACUUM TEST SHALL CONFORM TO THE FOLLOWING:

      1. THE INITIAL VACUUM GUAGE TEST PRESSURE SHALL BE 10 INCHES Hg.

      2. THE MINIMUM ACCEPTABLE TEST HOLD TIME FOR 1–INCH Hg PRESSURE DROP TO 9 INCHES SHALL BE:

         A. NOT LESS THAN 2 MINUTES FOR MANHOLES LESS THAN 10 FEET DEEP.

         B. NOT LESS THAN 2.5 MINUTES FOR MANHOLES 10 TO 15 FEET DEEP.

         C. NOT LESS THAN 3 MINUTES FOR MANHOLES MORE THAN 15 FEET DEEP.

   (c) THE MANHOLE SHALL BE REPAIRED AND RETESTED IF THE TEST HOLD TIMES FAIL TO ACHIEVE THE ACCEPTANCE LIMITS SPECIFIED IN (b) ABOVE.

   (d) INVERTS AND SHELVES SHALL NOT BE INSTALLED UNTIL AFTER SUCCESSFUL TESTING IS COMPLETE.

   (e) FOLLOWING COMPLETION OF THE LEAKAGE TEST, THE FRAME AND COVER SHALL BE PLACED ON TOP OF THE MANHOLE OR SOME OTHER MEANS USED TO PREVENT ACCIDENTAL ENTRY BY UNAUTHORIZED PERSONS, CHILDREN OR ANIMALS, UNTIL THE CONTRACTOR IS READY TO MAKE FINAL ADJUSTMENT TO GRADE.

12. BRICK MASONRY FOR SHELF, INVERT AND GRADE ADJUSTMENT SHALL COMPLY WITH ASTM C32–05, CLAY OR SHALE, FOR GRADE SS HARD BRICK.

13. MORTAR SHALL BE COMPOSED OF PORTLAND CEMENT AND SAND WITH OR WITHOUT HYDRATED LIME ADDITION. PROPORTIONS IN MORTAR OF PARTS BY VOLUMES SHALL BE:
   (a) 4.5 PARTS SAND AND 1.5 PARTS CEMENT; OR
   (b) 4.5 PARTS SAND, 1 PART CEMENT AND 0.5 PART HYDRATED LIME

   CEMENT SHALL BE TYPE II PORTLAND CEMENT CONFORMING TO ASTM C150–05. HYDRATED LIME SHALL BE TYPE S CONFORMING TO ASTM C207–06 "STANDARD SPECIFICATIONS FOR HYDRATED LIME FOR MASONRY PURPOSES". SAND SHALL CONSIST OF INERT NATURAL SAND CONFORMING TO ASTM C33–03 "STANDARD SPECIFICATIONS FOR CONCRETE, FINE AGGREGATES".

14. INVERTS AND SHELVES: MANHOLES SHALL HAVE A BRICK PAVED OR PRECAST CONCRETE SHELF AND INVERT, CONSTRUCTED TO CONFORM TO THE SIZE OF THE PIPE AND FLOW. AT CHANGES IN DIRECTIONS, THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPE TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY.

15. FRAMES AND COVERS: FRAMES AND COVERS: SEWER MANHOLE FRAMES AND COVERS SHALL BE CITY OF PORTSMOUTH STANDARD, AND SHALL BE PURCHASED AND PICKED UP AT PORTSMOUTH DEPARTMENT OF PUBLIC WORKS WATER DEPARTMENT. THEY SHALL BE OF HEAVY DUTY DESIGN, CLASS 30, CONFORMING TO ASTM A48/48M AND PROVIDE A 30–INCH CLEAR OPENING. THE CASTING SHALL BE OF EVEN GRAINED CAST IRON, SMOOTH, AND FREE FROM SCALE, LUMPS, BLISTERS, SAND HOLES AND DEFECTS. CONTACT SURFACES OF COVERS AND FRAMES SHALL BE MACHINED AT THE FOUNDRY TO PREVENT ROCKING OF COVERS IN ANY ORIENTATION.

16. BEDDING: PRECAST BASES SHALL BE PLACED ON A 6–INCH LAYER OF COMPACTED BEDDING MATERIAL THAT CONFORMS TO ASTM C33–03 NO. 67 STONE AND FREE FROM CLAY, LOAM AND ORGANNIC MATTER. THE EXCAVATION SHALL BE PROPERLY DEWATERED WHILE PLACING BEDDING MATERIAL AND SETTING OF THE BASE OR POURING CONCRETE. WATER–STOPS SHALL BE USED AT THE HORIZONTAL JOINT OF THE CAST–IN–PLACE MANHOLES.

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

17. FLEXIBLE JOINT: A FLEXIBLE JOINT SHALL BE PROVIDED WIbHIN THE FOLLOWING DISTANCES FROM ANY MANHOLE CONNECTION: (a) WITHIN 48 INCHES FOR REINFORCED CONCRETE PIPE (RCP). (b) WITHIN 60 INCHES FOR PVC PIPE LARGER THAN 15" DIAMETER.

18. NO FLEXIBLE JOINT SHALL BE REQUIRED FOR DUCTILE IRON PIPE OR PVC PIPE UP THROUGH 15–INCH DIAMETER.

19. INTERNAL STEPS ARE PROHIBITED PER CITY OF PORTSMOUTH DPW STANDARDS.

20. REFERENCE NHDES ENV–WQ 700 IN PLACE OF ASTM STANDARDS.

21. PIPE TO MANHOLE JOINTS SHALL BE ONLY AS FOLLOWS:

   A. ELASTOMERIC, RUBBER SLEEVE WITH WATERTIGHT JOINTS AT THE MANHOLE OPENING AND PIPE SURFACES.

   B. CAST INTO WALL OR SECUREED WITH STAINLESS STEEL CLAMPS.

   C. ELASTOMERIC SEALING RING CAST IN THE MANHOLE OPENING WITH THE SEAL FORMED ON THE SURFACE OF THE PIPE BY COMPRESSION OF THE RING.

   D. NON–SHRINK GROUTED JOINTS WHERE WATERTIGHT BONDING TO THE MANHOLE AND PIPE CAN BE OBTAINED.

22. THE INVERT OF THE INCOMING PIPE SHALL BE NO MORE THAN 6 INCHES ABOVE THE OUTGOING PIPE UNLESS A DROP ENTRY IS USED.

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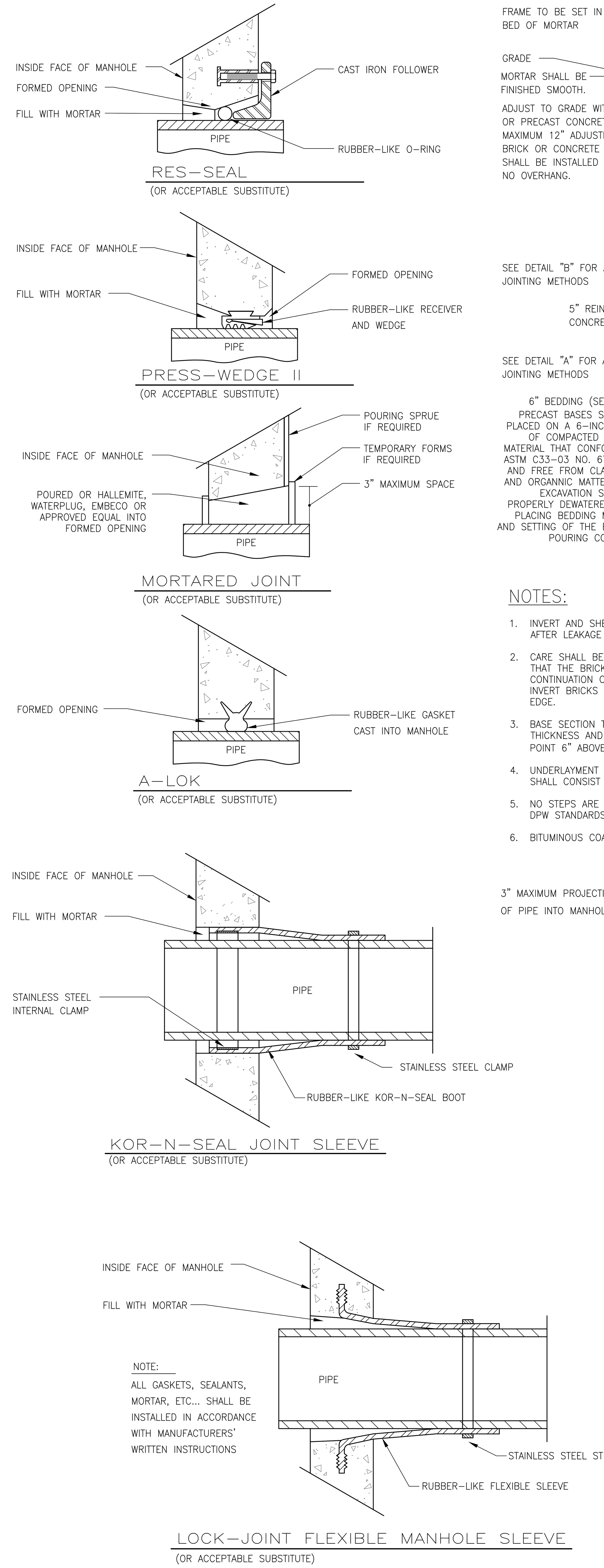
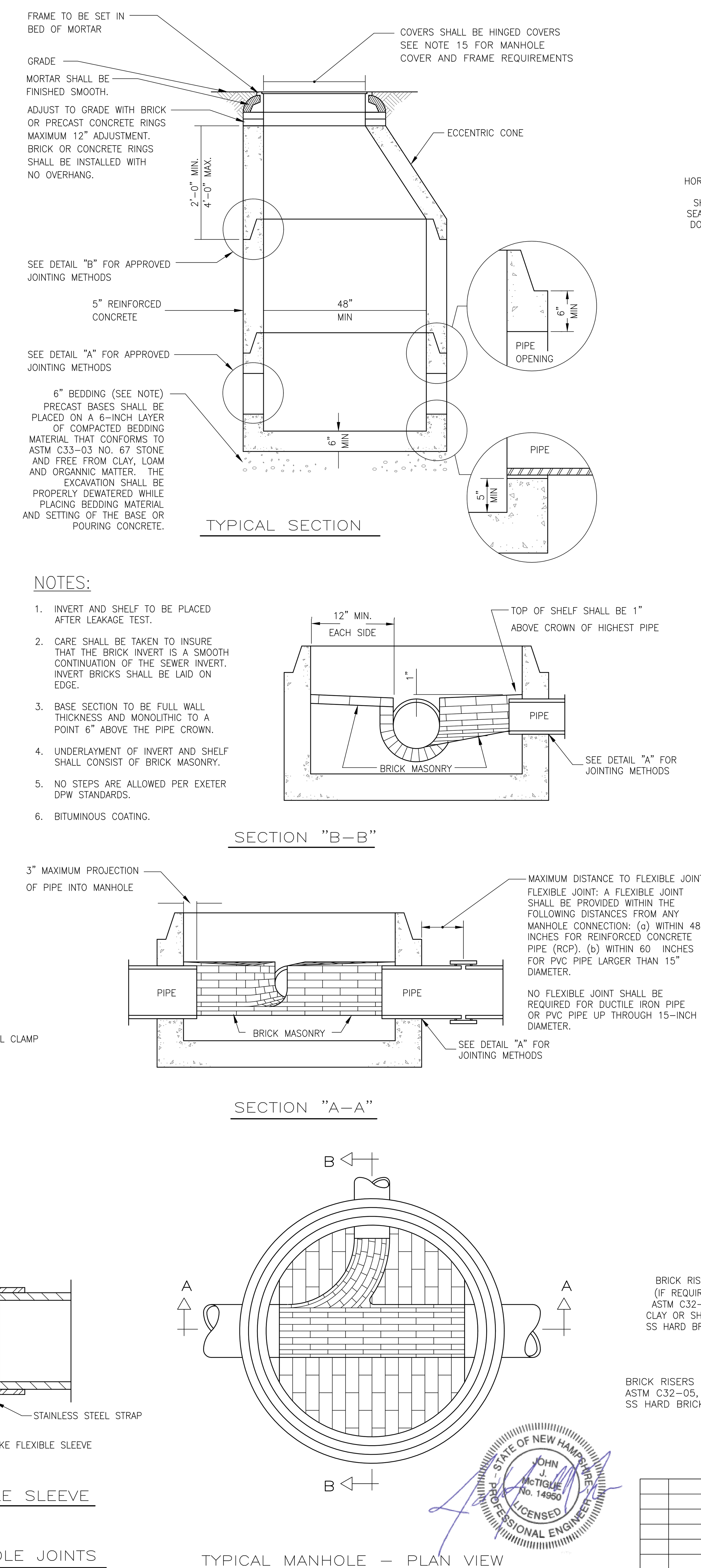
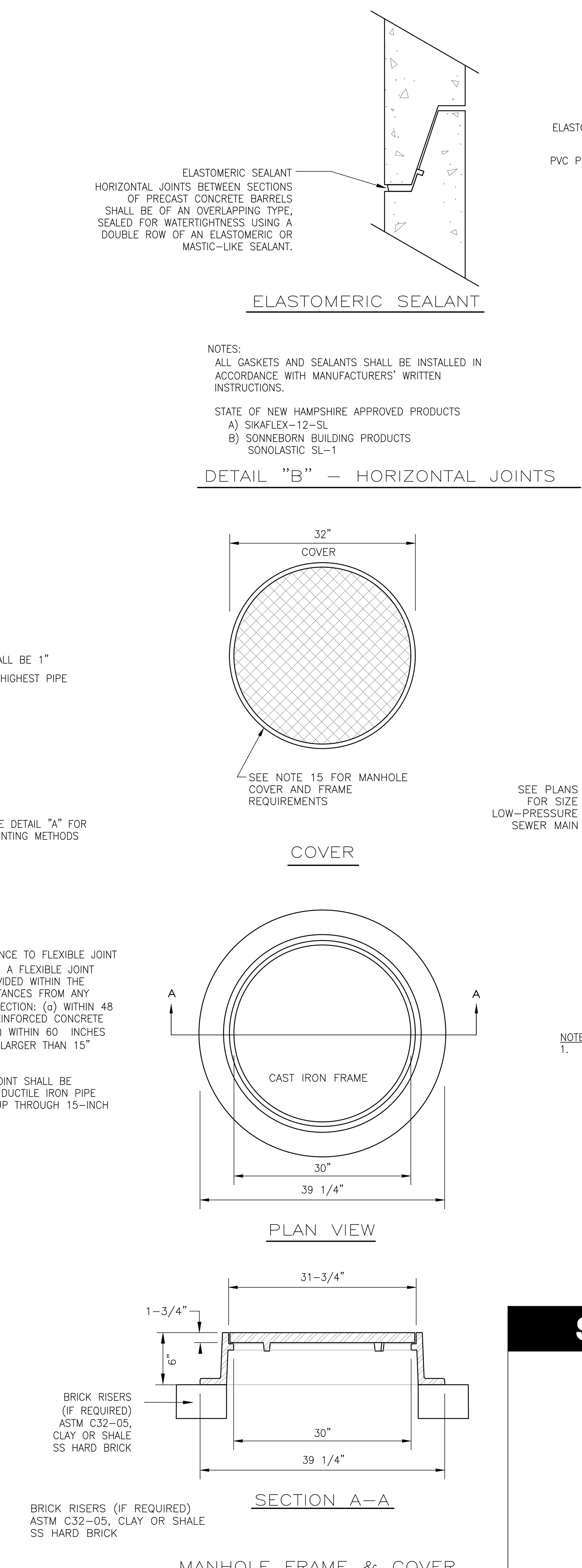
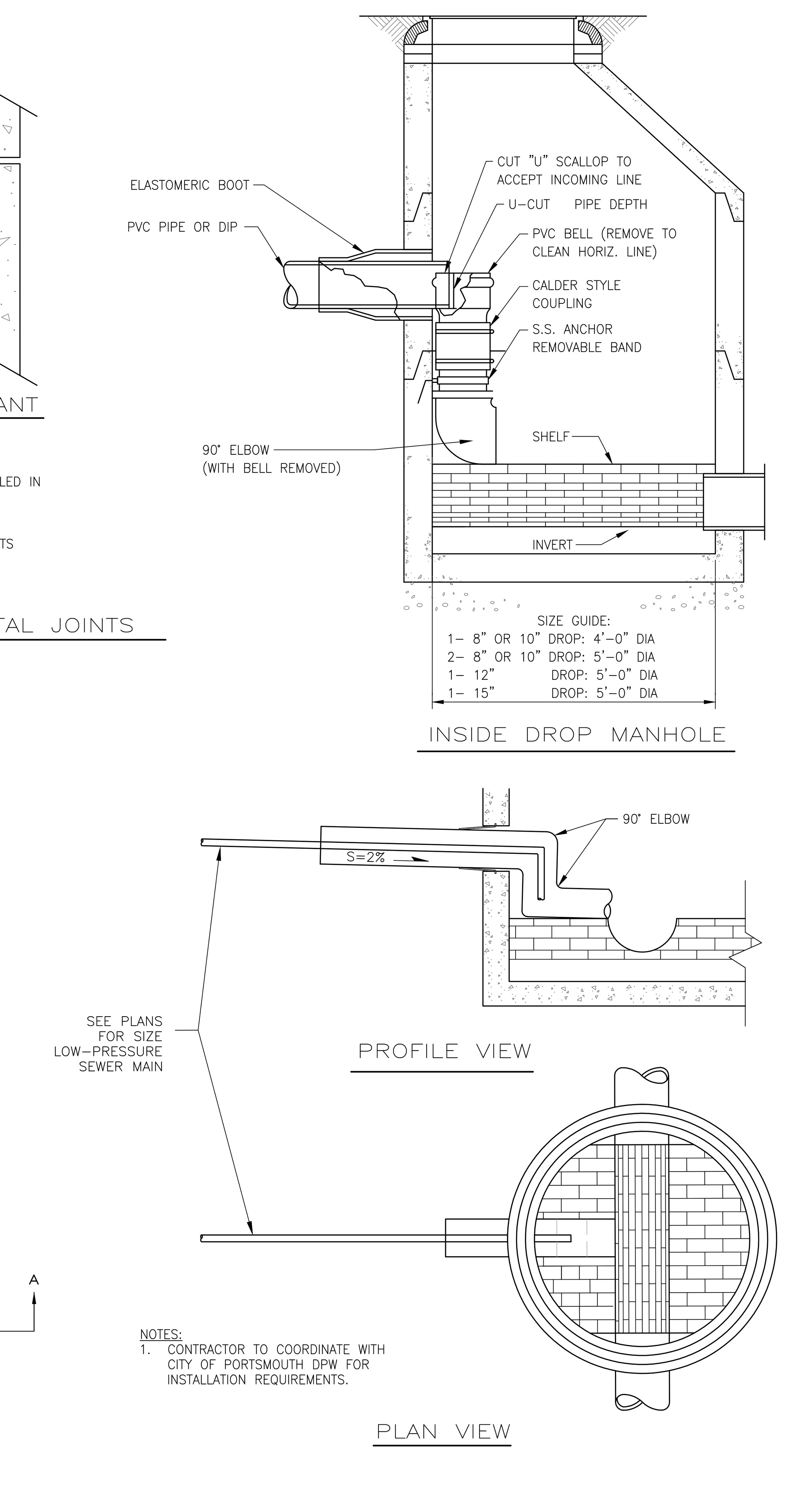

INSIDE FACE OF MANHOLE
FORMED OPENING
FILL WITH MORTAR
CAST IRON FOLLOWER
PIPE
RUBBER–LIKE O–RING
RES–SEAL
(OR ACCEPTABLE SUBSTITUTE)
INSIDE FACE OF MANHOLE
FILL WITH MORTAR
FORMED OPENING
RUBBER–LIKE RECEIVER AND WEDGE
PIPE
PRESS–WEDGE II
(OR ACCEPTABLE SUBSTITUTE)
INSIDE FACE OF MANHOLE
POURING SPRUE IF REQUIRED
TEMPORARY FORMS IF REQUIRED
3" MAXIMUM SPACE
POURED OR HALLEMITE, WATERPLUG, EMBECO OR APPROVED EQUAL INTO FORMED OPENING
PIPE
MORTARED JOINT
(OR ACCEPTABLE SUBSTITUTE)
FORMED OPENING
RUBBER–LIKE GASKET CAST INTO MANHOLE
PIPE
A–LOK
(OR ACCEPTABLE SUBSTITUTE)
INSIDE FACE OF MANHOLE
FILL WITH MORTAR
PIPE
STAINLESS STEEL INTERNAL CLAMP
STAINLESS STEEL CLAMP
RUBBER–LIKE KOR–N–SEAL BOOT
KOR–N–SEAL JOINT SLEEVE
(OR ACCEPTABLE SUBSTITUTE)
INSIDE FACE OF MANHOLE
FILL WITH MORTAR
PIPE
NOTE:
ALL GASKETS, SEALANTS, MORTAR, ETC... SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' WRITTEN INSTRUCTIONS
STAINLESS STEEL STRAP
RUBBER–LIKE FLEXIBLE SLEEVE
LOCK–JOINT FLEXIBLE MANHOLE SLEEVE
(OR ACCEPTABLE SUBSTITUTE)

DETAIL "A" – PIPE TO MANHOLE JOINTS


FRAME TO BE SET IN BED OF MORTAR
GRADE
MORTAR SHALL BE FINISHED SMOOTH.
ADJUST TO GRADE WITH BRICK OR PRECAST CONCRETE RINGS MAXIMUM 12" ADJUSTMENT. BRICK OR CONCRETE RINGS SHALL BE INSTALLED WITH NO OVERHANG.
COVERS SHALL BE HINGED COVERS SEE NOTE 15 FOR MANHOLE COVER AND FRAME REQUIREMENTS
2'–0" MIN.
4'–0" MAX.
ECCENTRIC CONE
SEE DETAIL "B" FOR APPROVED JOINTING METHODS
5" REINFORCED CONCRETE
48" MIN
SEE DETAIL "A" FOR APPROVED JOINTING METHODS
6" BEDDING (SEE NOTE) PRECAST BASES SHALL BE PLACED ON A 6–INCH LAYER OF COMPACTED BEDDING MATERIAL THAT CONFORMS TO ASTM C33–03 NO. 67 STONE AND FREE FROM CLAY, LOAM AND ORGANNIC MATTER. THE EXCAVATION SHALL BE PROPERLY DEWATERED WHILE PLACING BEDDING MATERIAL AND SETTING OF THE BASE OR POURING CONCRETE.
6" MIN
PIPE OPENING
PIPE
TYPICAL SECTION
NOTES:
1. INVERT AND SHELF TO BE PLACED AFTER LEAKAGE TEST.
2. CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT. INVERT BRICKS SHALL BE LAID ON EDGE.
3. BASE SECTION TO BE FULL WALL THICKNESS AND MONOLITHIC TO A POINT 6" ABOVE THE PIPE CROWN.
4. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY.
5. NO STEPS ARE ALLOWED PER EXETER DPW STANDARDS.
6. BITUMINOUS COATING.
12" MIN. EACH SIDE
TOP OF SHELF SHALL BE 1" ABOVE CROWN OF HIGHEST PIPE
PIPE
BRICK MASONRY
SEE DETAIL "A" FOR JOINTING METHODS
SECTION "B–B"
3" MAXIMUM PROJECTION OF PIPE INTO MANHOLE
MAXIMUM DISTANCE TO FLEXIBLE JOINT
FLEXIBLE JOINT: A FLEXIBLE JOINT SHALL BE PROVIDED WITHIN THE FOLLOWING DISTANCES FROM ANY MANHOLE CONNECTION: (a) WITHIN 48 INCHES FOR REINFORCED CONCRETE PIPE (RCP). (b) WITHIN 60 INCHES FOR PVC PIPE LARGER THAN 15" DIAMETER.
NO FLEXIBLE JOINT SHALL BE REQUIRED FOR DUCTILE IRON PIPE OR PVC PIPE UP THROUGH 15–INCH DIAMETER.
PIPE
BRICK MASONRY
SEE DETAIL "A" FOR JOINTING METHODS
SECTION "A–A"
B
A
TYPICAL MANHOLE – PLAN VIEW

STANDARD MANHOLE


ELASTOMERIC SEALANT
HORIZONTAL JOINTS BETWEEN SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE OF AN OVERLAPPING TYPE, SEALED FOR WATERTIGHTNESS USING A DOUBLE ROW OF AN ELASTOMERIC OR MASTIC–LIKE SEALANT.
ELASTOMERIC SEALANT
NOTES:
ALL GASKETS AND SEALANTS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' WRITTEN INSTRUCTIONS.
STATE OF NEW HAMPSHIRE APPROVED PRODUCTS
A) SIKAFLEX–12–SL
B) SONNEBORN BUILDING PRODUCTS SONOLASTIC SL–1
DETAIL "B" – HORIZONTAL JOINTS
32"
COVER
SEE NOTE 15 FOR MANHOLE COVER AND FRAME REQUIREMENTS
COVER
A
CAST IRON FRAME
30"
39 1/4"
PLAN VIEW
31–3/4"
1–3/4"
6"
BRICK RISERS (IF REQUIRED) ASTM C32–05, CLAY OR SHALE SS HARD BRICK
30"
39 1/4"
SECTION A–A
BRICK RISERS (IF REQUIRED) ASTM C32–05, CLAY OR SHALE SS HARD BRICK
MANHOLE FRAME & COVER


ELASTOMERIC BOOT
PVC PIPE OR DIP
CUT "U" SCALLOP TO ACCEPT INCOMING LINE
U–CUT PIPE DEPTH
PVC BELL (REMOVE TO CLEAN HORIZ. LINE)
CALDER STYLE COUPLING
S.S. ANCHOR REMOVABLE BAND
SHELF
90° ELBOW (WITH BELL REMOVED)
INVERT
SIZE GUIDE:
1– 8" OR 10" DROP: 4'–0" DIA
2– 8" OR 10" DROP: 5'–0" DIA
1– 12" DROP: 5'–0" DIA
1– 15" DROP: 5'–0" DIA
INSIDE DROP MANHOLE
90° ELBOW
S=2%
SEE PLANS FOR SIZE LOW–PRESSURE SEWER MAIN
PROFILE VIEW
NOTES:
1. CONTRACTOR TO COORDINATE WITH CITY OF PORTSMOUTH DPW FOR INSTALLATION REQUIREMENTS.
PLAN VIEW

PRESSURE TO GRAVITY SEWER DETAIL

SCALE: N.T.S

STATE OF NEW HAMPSHIRE
JOHN J. McTIGUE
No. 14950
LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	DR	CK

SITE DEVELOPMENT PLANS

TAX MAP 229 LOT 1

DETAILS

PROPOSED 3 LOT SUBDIVISION

437 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

OWNED BY & PREPARE FOR
ARTWILL, LLC

SCALE: **APRIL 19, 2022**

TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
48 Constitution Drive
Bedford, NH 03110
Phone (603) 472–4488
Fax (603) 472–9747
www.tfmoran.com

FILE	45407–120	DR JSM	FB		C–14
		CK JCC	CADFILE	45407–120_DETAILS	

LANDSCAPE GUARANTEE AND MAINTENANCE NOTES

1. CONTRACTOR WILL BE RESPONSIBLE FOR ALL MEANS, METHODS AND TECHNIQUES OF WATERING.
2. CONTRACTOR WILL BEGIN WATERING IMMEDIATELY AFTER PLANTING. ALL PLANTS WILL BE THOROUGHLY WATERED TWICE DURING THE FIRST 24 HOUR PERIOD AFTER PLANTING. ALL PLANTS WILL BE WATERED WEEKLY, OR MORE OFTEN, IF NECESSARY DURING THE FIRST GROWING SEASON BUT NOT LESS THAN ONE YEAR.
3. WATER ALL LAWNS AS REQUIRED. DO NOT LET NEWLY PLANTED LAWNS DRY OUT DURING THE FIRST FOUR WEEKS MINIMUM.
4. ALL NEW LAWNS WILL BE MAINTAINED AND MOWED A MINIMUM THREE (3) TIMES BEFORE REQUESTING REVIEW BY LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE FOR ACCEPTANCE. MAINTENANCE AND MOWING WILL CONTINUE UNTIL ACCEPTED BY LANDSCAPE ARCHITECT OR OWNERS' REPRESENTATIVE IS ISSUED IN WRITING.
5. THE CONTRACTOR WILL MAINTAIN AND GUARANTEE ALL PLANTINGS TO BE IN GOOD HEALTHY, FLOURISHING AND ACCEPTABLE CONDITION FOR A PERIOD OF ONE (1) YEAR BEGINNING AT THE DATE OF ACCEPTANCE BY THE LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE. ALL GRASSES, TREES AND SHRUBS THAT, IN THE OPINION OF THE LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE SHOWING LESS THAN 80% HEALTHY GROWTH AT THE END OF ONE (1) YEAR PERIOD WILL BE IMMEDIATELY REPLACED BY THE CONTRACTOR.
6.
7. ALL DAY LILIES WILL BE DEADHEADED AND CUT BACK EVERY FALL. ALL ORNAMENTAL GRASSES WILL BE CUT BACK EVERY FALL OR EARLY SPRING.
8. DECIDUOUS PLANT MATERIAL INSTALLED AFTER SEPTEMBER 30 AND BEFORE APRIL 15 WILL NOT BE REVIEWED THAT SEASON FOR ACCEPTANCE DUE TO STAGE OF LEAF PHYSIOLOGY. THIS PLANT MATERIAL WILL NOT BE REVIEWED UNTIL FOLLOWING GROWING SEASON. GUARANTEE PERIOD WILL BEGIN ONLY AFTER ACCEPTANCE BY LANDSCAPE ARCHITECT OR OWNERS' REPRESENTATIVE.
9. EVERGREEN PLANT MATERIAL INSTALLED AFTER OCTOBER 30 AND BEFORE APRIL 15 WILL NOT BE REVIEWED THAT SEASON FOR ACCEPTANCE DUE TO END OF GROWTH SEASON. THIS PLANT MATERIAL WILL NOT BE REVIEWED UNTIL FOLLOWING GROWING SEASON. GUARANTEE PERIOD WILL BEGIN ONLY AFTER ACCEPTANCE BY LANDSCAPE ARCHITECT OR OWNERS' REPRESENTATIVE.

HYDROSEEDING NOTES

1. HYDROSEEDING MAY BE USED AS AN ALTERNATE METHOD OF SEEDING. THE APPLICATION OF LIMESTONE AS NECESSARY, FERTILIZER AND GRASS SEED MAY BE ACCOMPLISHED IN ONE OPERATION BY THE USE OF A SPRAYING MACHINE APPROVED BY THE LANDSCAPE ARCHITECT OR CIVIL ENGINEER. THE MATERIALS SHALL BE MIXED WITH WATER IN THE MACHINE AND SHALL CONFORM TO RELATIVE REQUIREMENTS OF SECTION 644 OF NH. STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
2. (FOR MASSACHUSETTS PROJECTS PLUG IN – SECTION 765.65 OF MASS. DPW CURRENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES).

INVASIVE PLANT NOTES

1. EXISTING NON–NATIVE, INVASIVE PLANT SPECIES WILL BE IDENTIFIED, REMOVED, DESTROYED AND LEGALLY DISPOSED OF OFF–SITE IN ACCORDANCE WITH THE LATEST UNIVERSITY OF NEW HAMPSHIRE COOPERATIVE EXTENSION METHODS OF DISPOSING NON–NATIVE INVASIVE PLANTS. SEE "MANAGE AND CONTROL INVASIVES" AND PROPERLY DISPOSE OF INVASIVE PLANTS".

PRICING & CONSTRUCTION DOCUMENT NOTES

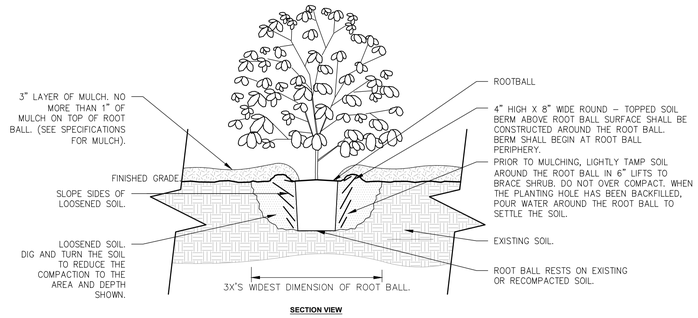
1. CONTRACTOR WILL PRICE PLANT MATERIAL IN QUANTITIES SUFFICIENT TO COMPLETE PLANTINGS GRAPHICALLY SHOWN ON THESE DRAWINGS OR IN PLANT LIST, WHICHEVER IS GREATER. IN CASES OF DISCREPANCY BETWEEN PLAN AND LIST CLARIFY WITH LANDSCAPE ARCHITECT PRIOR TO PLACING PURCHASE ORDER AND AGAIN PRIOR TO PLANTING.
2. CONTRACTOR WILL VERIFY PRIOR TO PRICING IF SITE SOILS ARE VERY POORLY DRAINING OR IF LEDGE IS PRESENT. IF CONTRACTOR ENCOUNTERS VERY POORLY DRAINING SOILS (BATH TUB EFFECT) OR LEDGE THAT IMPACTS PROPOSED PLANTING PLAN, NOTIFY LANDSCAPE ARCHITECT OR OWNERS' REPRESENTATIVE FOR DIRECTION PRIOR TO PRICING AND AGAIN PRIOR TO PERFORMING ANY WORK.
3. PARKING AREA PLANTED ISLANDS WILL HAVE MINIMUM OF 1'–0" TOPSOIL PLACED TO THE TOP OF CURB ELEVATION. REMOVE ALL CONSTRUCTION DEBRIS BEFORE PLACING TOPSOIL.
4. EXISTING TREES SHOWN ON THE PLAN WILL REMAIN UNDISTURBED. ALL EXISTING TREES SHOWN TO REMAIN WILL BE PROTECTED WITH A 4–FOOT SNOW FENCE PLACED AT THE DRIP LINE OF THE BRANCHES OR AT 8 FEET MINIMUM FROM THE TREE TRUNK.
5. CONTRACTOR WILL STAKE OR PLACE ON GROUND ALL PROPOSED PLANT MATERIALS PER PLAN. CONTACT LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.
6. COORDINATE WITH LANDSCAPE ARCHITECT'S CONTRACTED NUMBER OF SITE VISITS WHEN PLANNING FOR INSPECTION. NOTIFY LANDSCAPE ARCHITECT 72 HOURS MINIMUM IN ADVANCE OF REQUESTED SITE VISIT.
7. CONTRACTOR WILL DEVELOP A WRITTEN WATERING SCHEDULE AND WILL SUBMIT WATERING SCHEDULE TO OWNERS' REPRESENTATIVE. CONTRACTOR WILL WATER ALL NEW PLANTS INCLUDING LAWNS THAT ARE NOT "IRRIGATED" VIA A PERMANENT IRRIGATION SYSTEM FOR THE FIRST 12 MONTHS.

PORTSMOUTH NOTES

1. THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNER'S WILL BE RESPONSIBLE FOR THE MAINTENANCE AND OF ALL REQUIRED SCREENING AND LANDSCAPE MATERIALS INDICATED ON THESE PLAN(S).
2. ALL REQUIRED PLANT MATERIAL WILL BE TENDED TO AND KEPT FREE OF REFUSE AND DEBRIS.
3. ALL REQUIRED FENCES AND WALLS WILL BE MAINTAINED IN GOOD REPAIR.
4. THE PROPERTY OWNER WILL 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.
5.
6. ALL IMPROVEMENTS SHOWN ON THIS PLAN WILL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THIS PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES WILL BE MADE TO THIS PLAN WITHOUT THE WRITTEN APPROVAL OF THE PORTSMOUTH PLANNING BOARD OR PLANNING DIRECTOR.
7. THE LANDSCAPE PLAN WILL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
8. MAINTENANCE OF LANDSCAPING TO FOLLOW THE NOFA STANDARDS FOR ORGANIC LAND CARE 6TH EDITION PRACTICES FOR THE DESIGN AND MAINTENANCE OF ECOLOGICAL LANDSCAPES. ("NOFA STANDARDS FOR ORGANIC LAND CARE," NOFA STANDARDS FOR ORGANIC LAND CARE 6TH EDITION PRACTICES FOR THE DESIGN AND MAINTENANCE OF ECOLOGICAL LANDSCAPES, NORTHEAST ORGANIC FARMING ASSOCIATION OF CONNECTICUT, INC, 2017, HTTP://WWW.ORGANICLANDCARE.NET/SITES/DEFAULT/FILES/NOFA_ORGANIC_LAND_CARE_STANDARDS_6THEDITION_2017_OPT.PDF.)

SEEDING NOTES

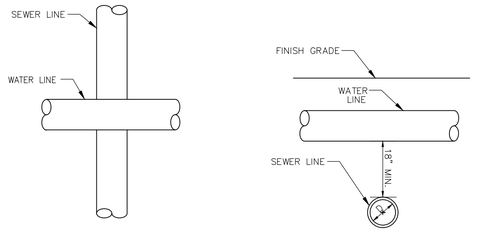
1. SLOPES UP TO AND INCLUDING 3:1 GRADE, SEED WILL BE NEW ENGLAND EROSION CONTROL & RESTORATION MIX PER NEW ENGLAND WETLANDS PLANTS INC., AMHERST, MA.
2. SLOPES STEEPER THAN 3:1 GRADE, SEED WILL BE NEW ENGLAND EROSION CONTROL & RESTORATION MIX PER NEW ENGLAND WETLANDS PLANTS INC., AMHERST, MA. SEE CIVIL FOR ADDITIONAL EROSION CONTROL MEASURES.
3. GENERAL SEED WILL BE NHDOT SPECIFICATION SECTION 644, TABLE 644–1–PARK SEED TYPE 15, INCLUDING NOTES TO TABLE 1, 2 & 3.



SECTION VIEW

SHRUB PLANTING

NOT TO SCALE



PLAN VIEW PROFILE VIEW

NOTES:

1. A 10 FOOT MINIMUM EDGE TO EDGE HORIZONTAL SEPARATION SHALL BE PROVIDED BETWEEN ALL WATER AND SANITARY SEWER LINES. AN 18" MINIMUM OUTSIDE TO OUTSIDE VERTICAL SEPARATION SHALL BE PROVIDED AT ALL WATER AND SANITARY SEWER CROSSINGS.
2. PROTECTION OF WATER SUPPLIES:
   A. THERE SHALL BE NO PHYSICAL CONNECTION BETWEEN A PUBLIC OR PRIVATE POTABLE WATER SUPPLY SYSTEM AND A SEWER OR SEWER APPURTENANCE WHICH WOULD PERMIT THE PASSAGE OF SEWAGE OR POLLUTED WATER INTO THE POTABLE SUPPLY. NO WATER PIPE SHALL PASS THROUGH OR COME IN CONTACT WITH ANY PART OF A SEWER OR SEWER MANHOLE.
   B. NO SEWER SHALL BE LOCATED WITHIN THE WELL PROTECTED RADII ESTABLISHED IN ENV–WS 300 FOR ANY PUBLIC WATER SUPPLY WELLS OR WITHIN 100 FEET OF ANY PRIVATE WATER SUPPLY WELL.
   C. SEWERS SHALL BE LOCATED AT LEAST 10 FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED WATER MAIN.
   D. A DEVIATION FROM THE SEPARATION REQUIREMENTS OF (B) OR (C) ABOVE SHALL BE ALLOWED WHERE NECESSARY TO AVOID CONFLICT WITH SUBSURFACE STRUCTURES, UTILITY CHAMBERS, AND BUILDING FOUNDATIONS, PROVIDED THAT THE SEWER IS CONSTRUCTED IN ACCORDANCE WITH THE FORCE MAIN CONSTRUCTION REQUIREMENTS SPECIFIED IN ENV–WQ 704.06.
   E. WHENEVER SEWERS MUST CROSS WATER MAINS, THE SEWER SHALL BE CONSTRUCTED AS FOLLOWS:
      a. VERTICAL SEPARATION OF THE SEWER AND WATER MAIN SHALL BE NOT LESS THAN 18 INCHES, WITH WATER ABOVE SEWER AND
      b. SEWER PIPE JOINTS SHALL BE LOCATED AT LEAST 6 FEET HORIZONTALLY FROM THE WATER MAIN.

WATER & SEWER CROSSING

NOT TO SCALE

SITE DEVELOPMENT PLANS

TAX MAP 229 LOT 1

DETAILS

PROPOSED 3 LOT SUBDIVISION

437 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

OWNED BY & PREPARE FOR

ARTWILL, LLC

SCALE: **APRIL 19, 2022**

REV	DATE	DESCRIPTION	DR	CK

TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
48 Constitution Drive
Bedford, NH 03110
Phone (603) 472–4488
Fax (603) 472–9747
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		CK	JCC	CADFILE	45407–120_DETAILS	

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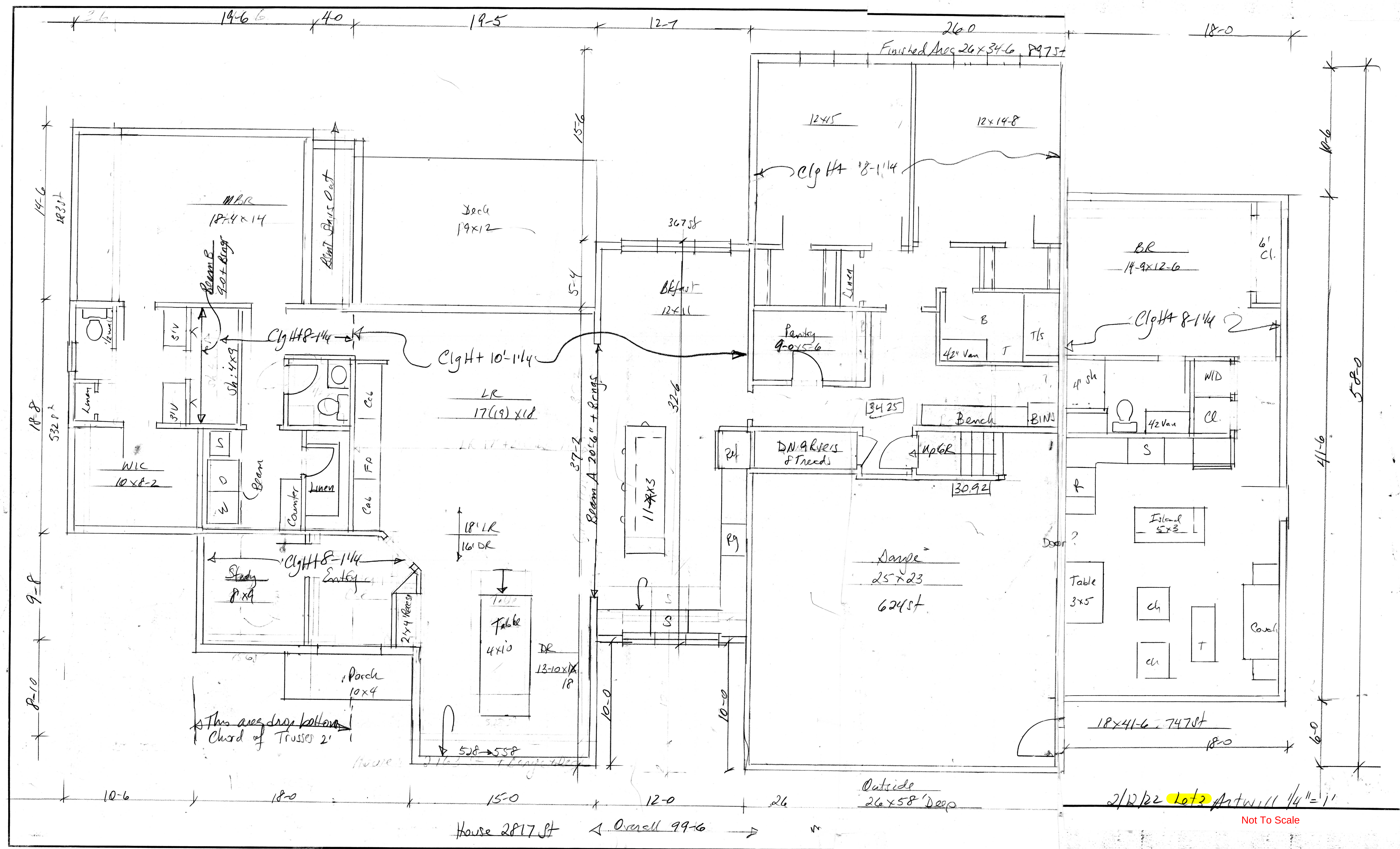
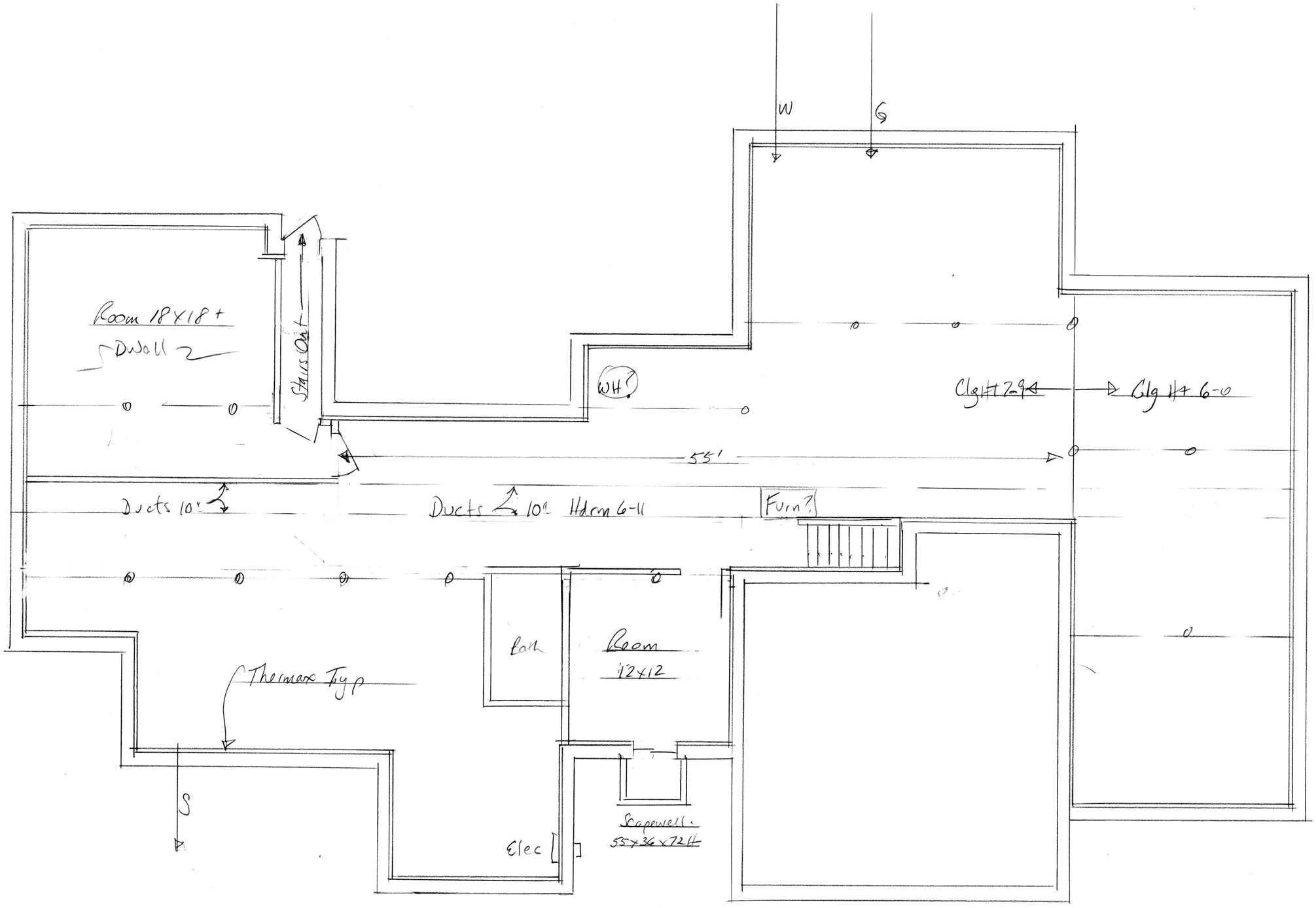
This plan is not effective unless signed by a duly authorized officer of TFMoran, Inc.

DIG SAFE
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

Apr 18, 2022 - 11:06pm
P:\MSC Projects\45407 - Lafayette Road - Portsmouth\45407-120 - Smithfield Construction - 437 Lafayette Rd\Design\PRODUCTION DRAWINGS\45407-120_Details.dwg



Finished Area 26x34-6 897sf
12x15
12x14-8
Clg Ht 8-1 1/4
MBR
18-4x14
Deck
19x12
Bkfast
12x11
Pantry
9-0x5-6
BR
14-9x12-6
Clg Ht 8-1 1/4
Clg Ht 8-1 1/4
Clg Ht 10'-1 1/4
LR
17(19)x18
Linen
WIC
10x8-2
Linen
Counter
Linen
Bench
BINS
DN 9 Risers 8 Treads
Up 6R
42" Van
42 Van
W/D
Cl.
Ref
Garage
25x23
624sf
Island 5x3
Table 3x5
Couch
Study
8x9
Entry
Clg Ht 8-1 1/4
18' LR
16' DR
Table
4x10
DR
13-10x18
Porch
10x4
This area drop bottom Chord of Trusses 2'
Beam A 20-6" + 8rngs
18x41-6 = 747sf
Outside
26x58' Deep
2/12/22 Lot 2 Artwill 1/4"=1'
House 2817 sf
Overall 99-6
Not To Scale



Lot 3 Antwell

SCALE: 3/16	APPROVED BY:	DRAWN BY
DATE: 2/12/22		REVISED

Smithfield

Basement Floor Plan

DRAWING NUMBER

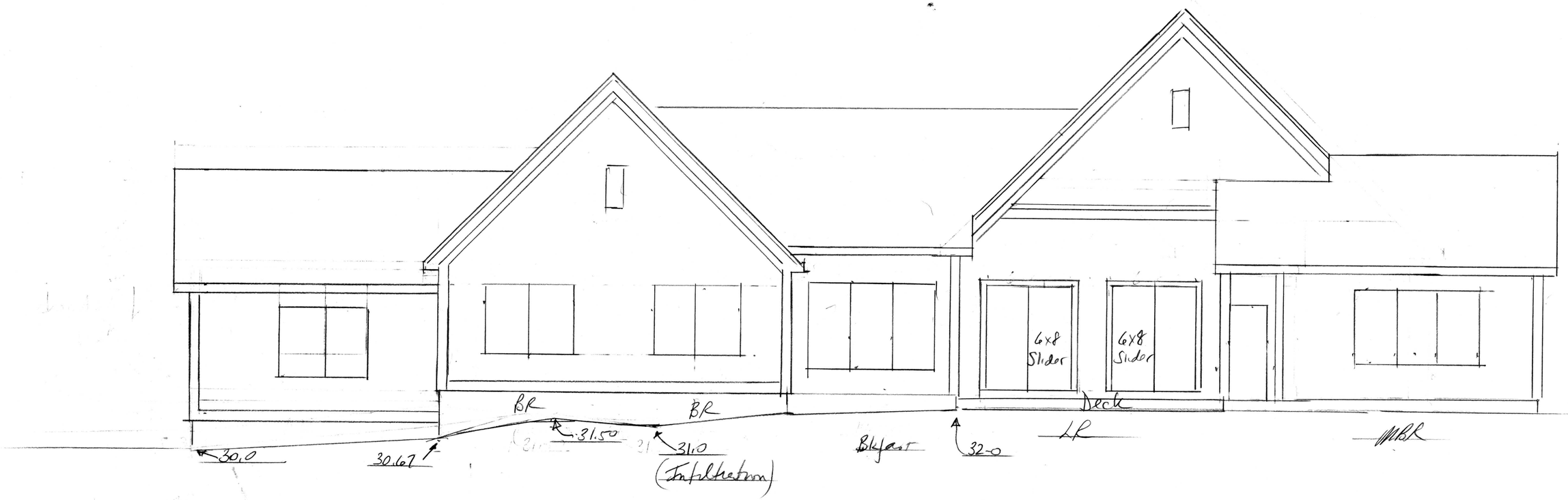
Lot 3 Arctwell

SCALE:	APPROVED BY:	DRAWN BY
DATE: 2/12/22		REVISED

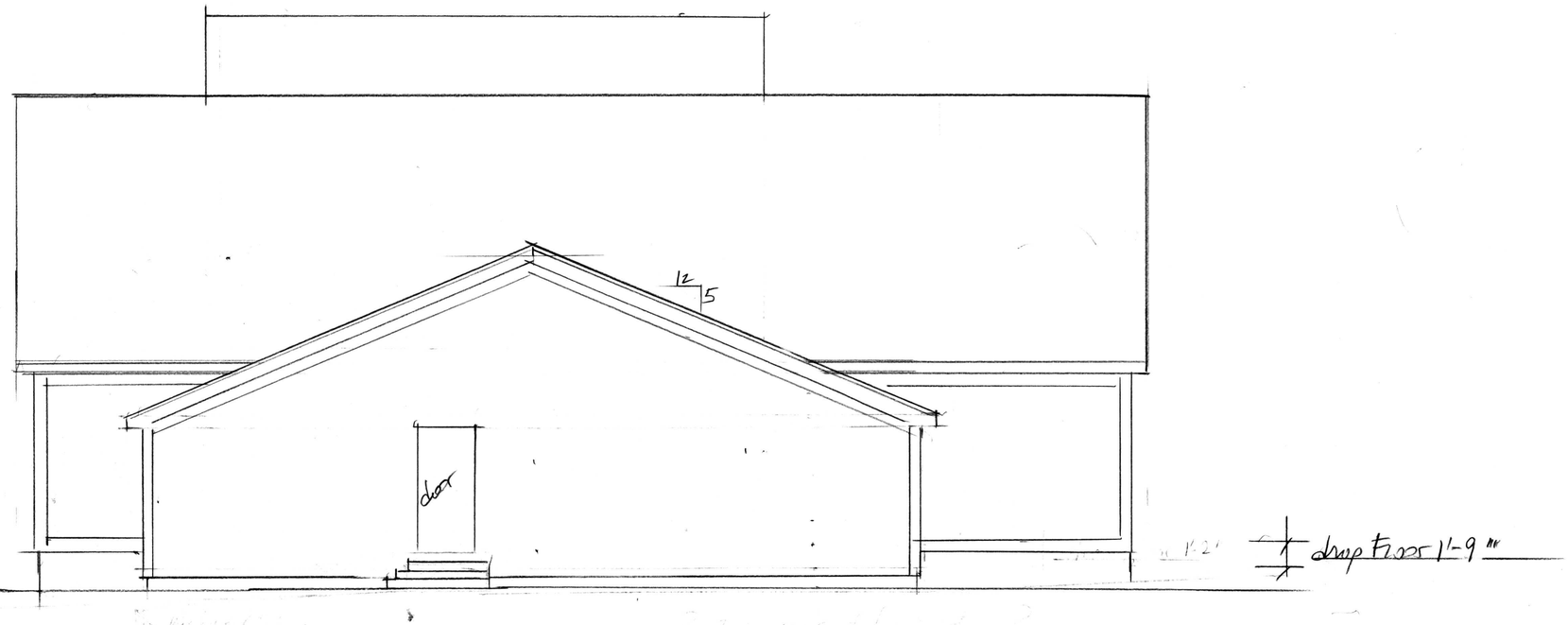
Smithfield

Front Elev w/ ADU - 1/4"

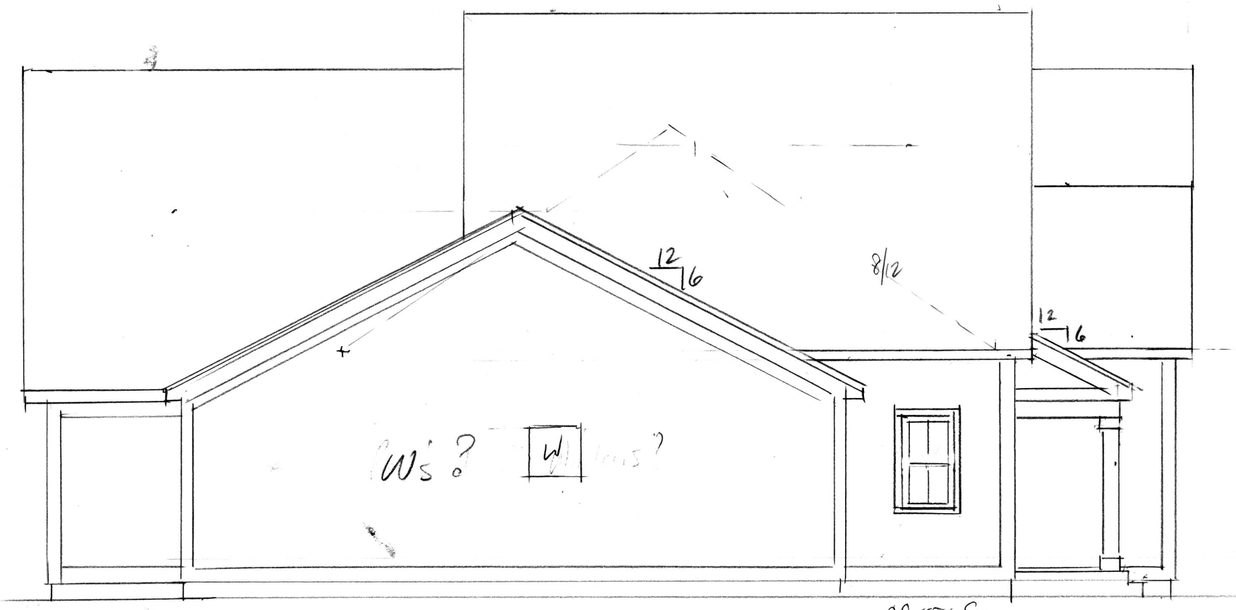
DRAWING NUMBER



Lot 3 Artwell		
SCALE: 3/16	APPROVED BY:	DRAWN BY
DATE: 2/12/22		REVISED
Smithfield		
Rear Elev w/Swale		DRAWING NUMBER



Right Elevation



Left Elevation

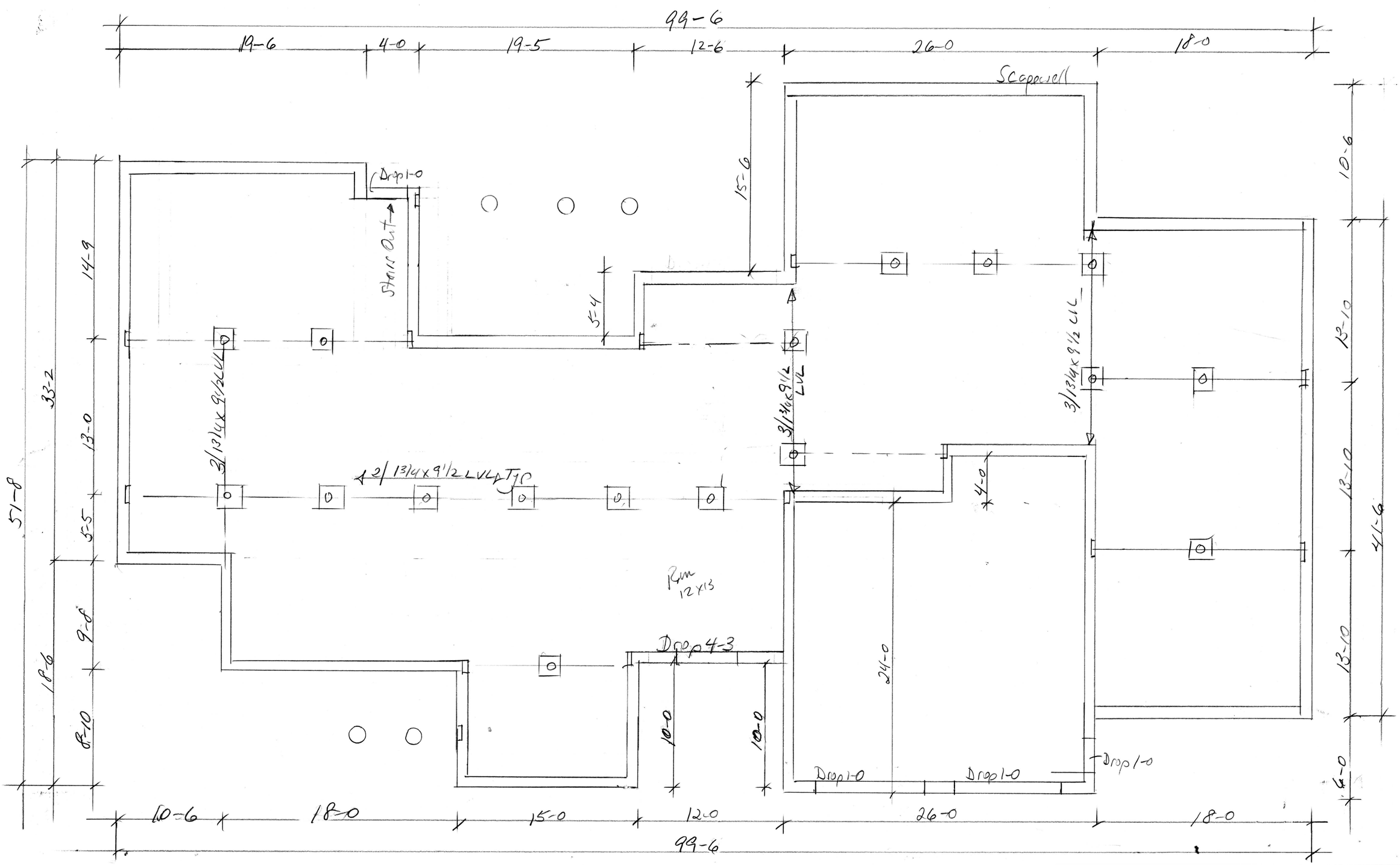
Lot 3 Antwill

SCALE: 3/16	APPROVED BY:	DRAWN BY
DATE: 2/12/22		REVISED

Smithfield

Side Elevations

DRAWING NUMBER



8" PC Walls on 8x16 Footers 3500psi Min Wall HT 7-10, 2/#4 Bars on Footers & on bottom + top tier (6 total)

Int Footers 2'x2'x8"

Lot 3 Artwill

SCALE: 3/16	APPROVED BY:	DRAWN BY
DATE: 2/10/22		REVISED
Smithfield Foundation Plan		DRAWING NUMBER

99-6

19-6 | 23-6 | 12-6 | 26-0 | 18-0

2/PT 2x12 + 1/2" ply

PT 2x10x14 16oc

All AJS 150 11 7/8 24oc

PT 2x6 16oc Tmple Beam

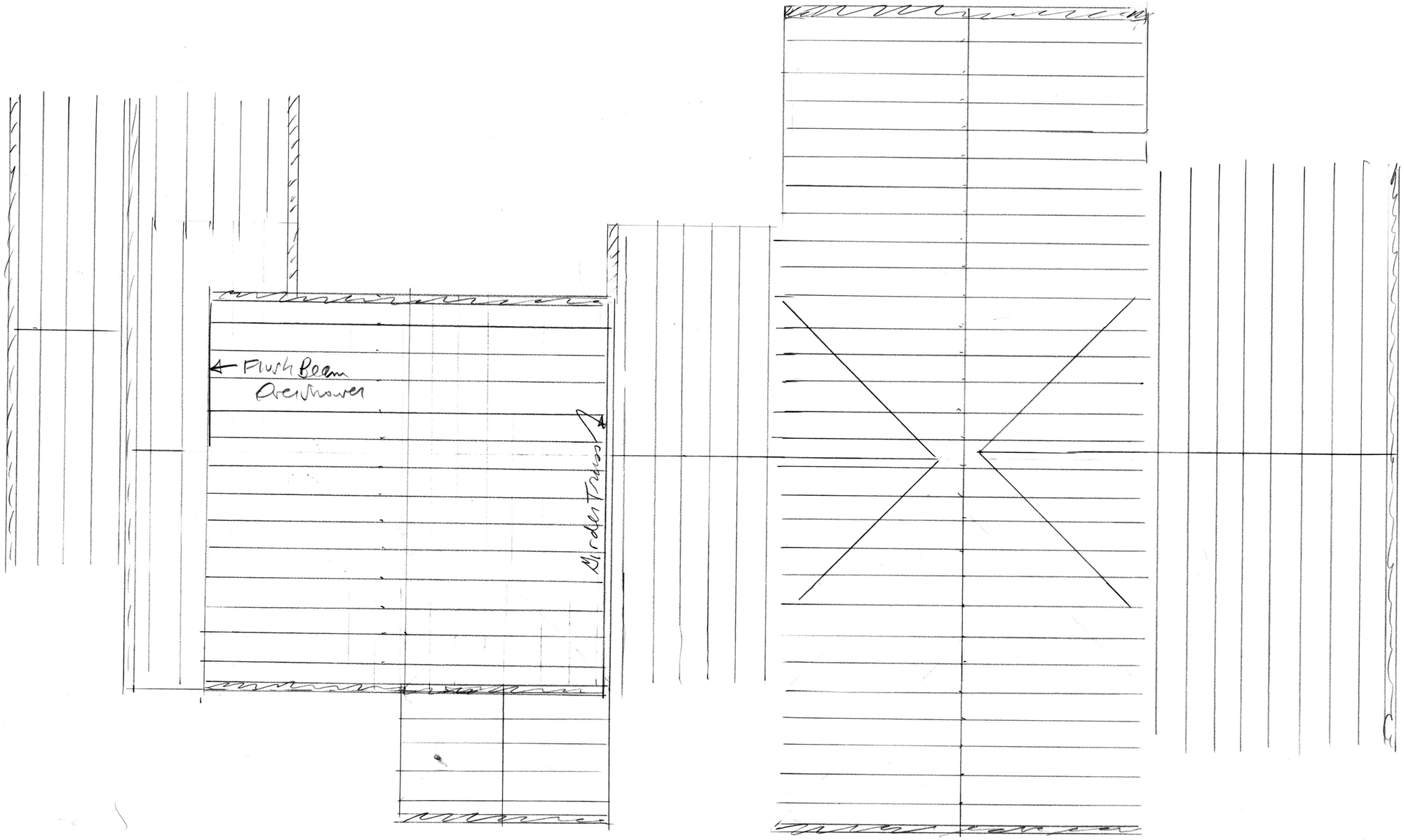
15-6 | 15-3 | 15-3 | 30-6 | 10-6 | 13-10 | 13-10 | 11-6 | 6-0

33-2 | 14-9 | 13-0 | 5-5 | 8-8 | 18-6 | 9-10 | 5-0 | 8-0 | 51-8

8-6 | 20-0 | 15-0 | 12-8 | 25-4 | 18-8

99-6

6 of 3 Artwell	
SCALE: 3/16	APPROVED BY:
DATE: 2/10/22	DRAWN BY
	REVISED
Smith fold	
1st Fl Framing Plan	DRAWING NUMBER



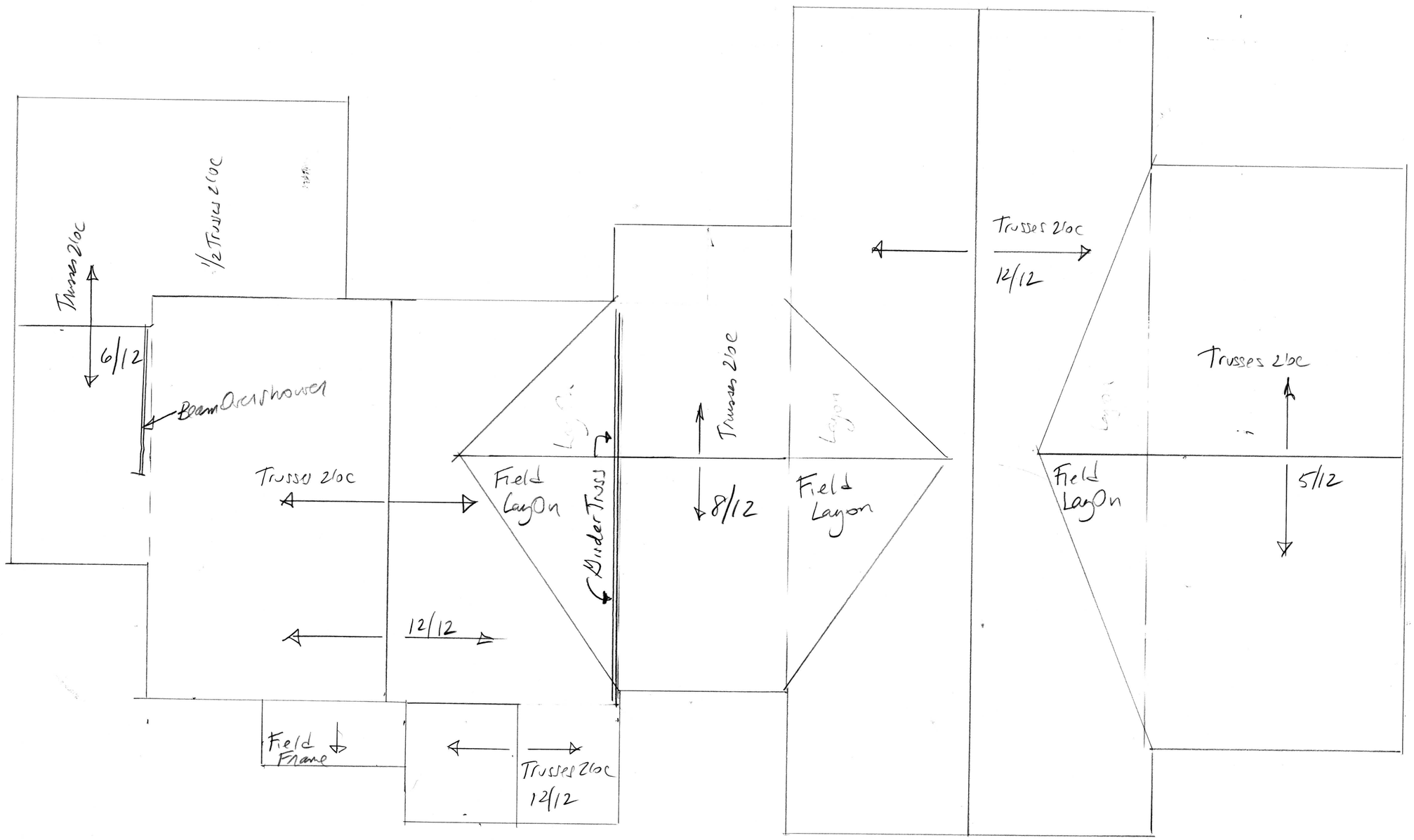
Lot 3 Antwill

SCALE: 3/16	APPROVED BY:	DRAWN BY
DATE: 2/12		REVISED

Smith

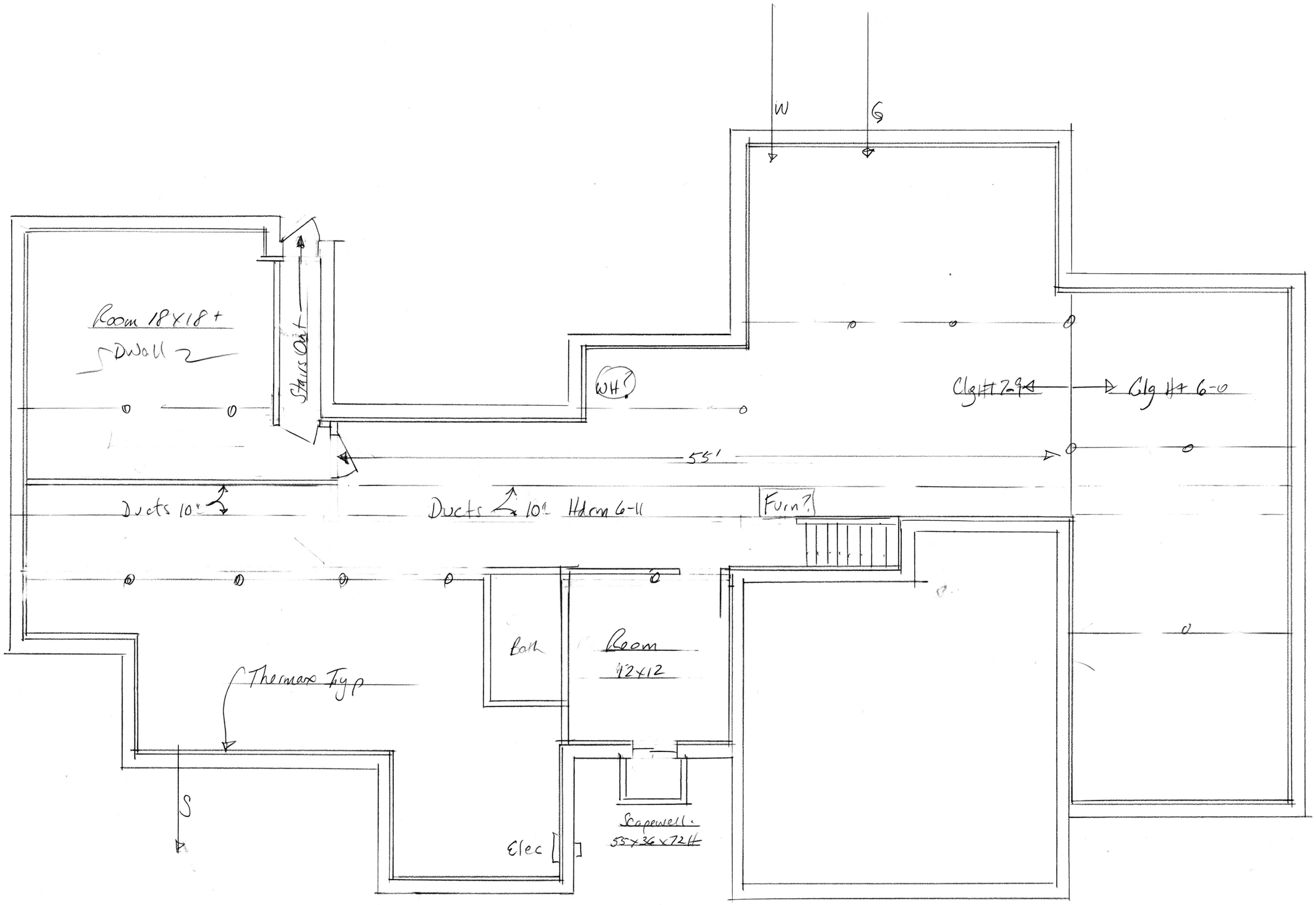
Truss Plan

DRAWING NUMBER



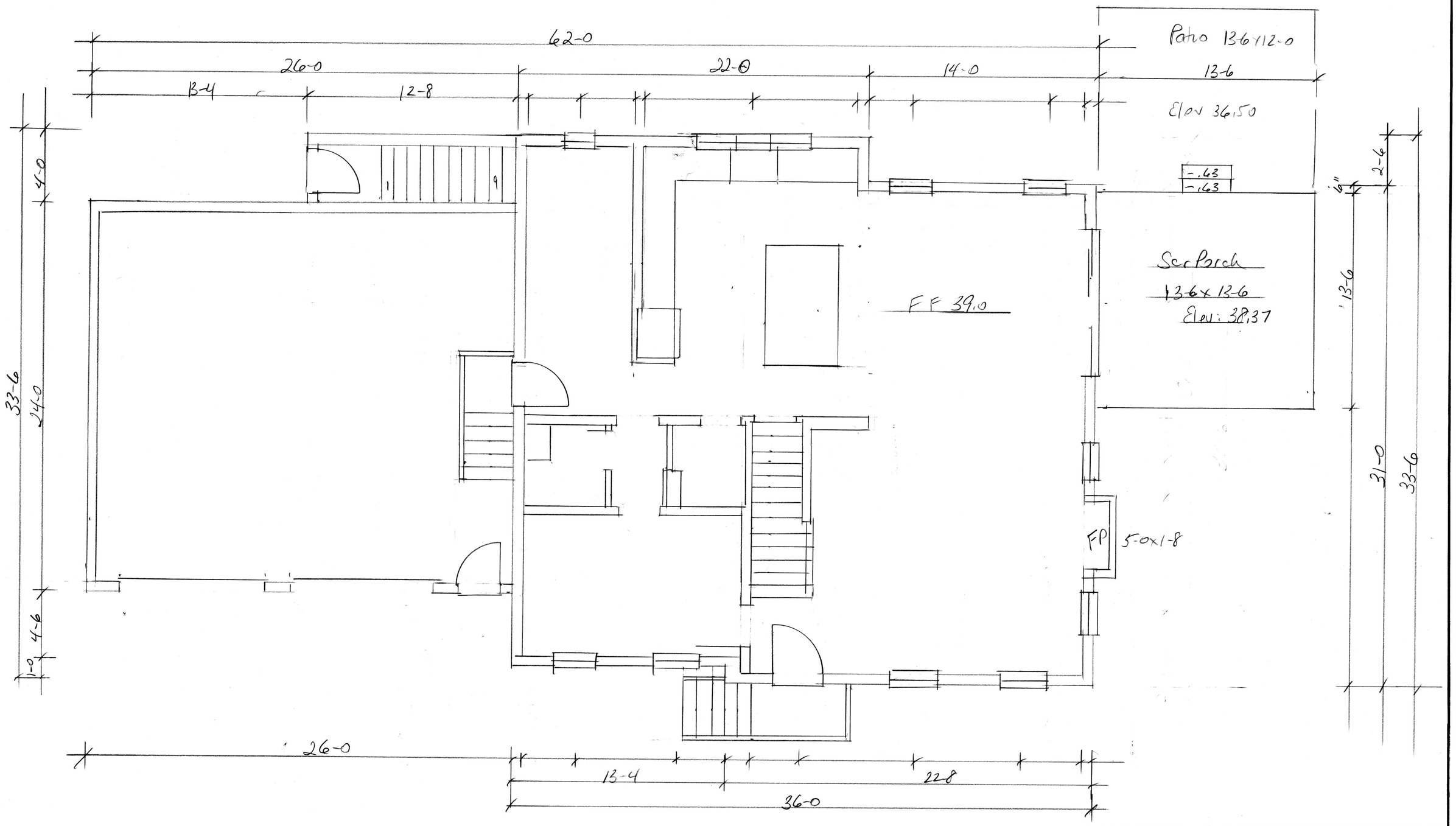
Lot 3 Arctwill

SCALE: 3/16	APPROVED BY:	DRAWN BY
DATE: 2/12		REVISED
Smithfield		
Roof Diagram + Trusses		DRAWING NUMBER



Lot 3 Antwill

SCALE: 3/16	APPROVED BY:	DRAWN BY
DATE: 2/12/22		REVISED
Smithfield		
Basement Floor Plan		DRAWING NUMBER



Lot 1 437 Lafayette Rd

SCALE: 1/4	APPROVED BY:	DRAWN BY
DATE: 4/6/22		REVISED

Smithfield

First Floor Plan

DRAWING NUMBER

FEE SCHEDULE
Planning Department
Effective 07/01/21 – 06/30/22

PLANNING BOARD

Subdivision:

Subdivision
- Residential .....$500.00 plus $200.00 per lot
- Non-Residential .....$700.00 plus $300.00 per lot

Subdivision Amendment:
- Administrative approval $200.00
- TAC or Planning Board approval $500.00

Lot line revision/verification.....$250.00

Lot Line Revision Amendment
- Administrative approval $100.00
- TAC or Planning Board approval $150.00

Lot Consolidation – No Subdivision $175.00

Restoration of Involuntarily Merged Lots $250.00

Preliminary Conceptual Consultation.....$200.00

Design Review.....$500.00

Site Plan Review:

All developments.....$500.00
plus $5.00 per $1,000 of site costs only
plus $10.00 per 1,000 s.f. of site development area

Total fee not to exceed (cap) $15,000.00

Site Plan Minor Amendment:
- Administrative approval $200.00
- Administrative approval after work has been done.....$500.00
- TAC or Planning Board approval $800.00

Preliminary Conceptual Consultation.....$200.00

Design Review.....$500.00

Wetlands Conditional Use Permit:

Area of disturbance in wetland or wetland buffer:
Up to 250 sq. ft. $100.00
Up to 1,000 sq. ft.....$500.00
Greater than 1,000 sq. ft. $1,000.00

Conditional Use Permit (Non-Wetland)

Conditional Use Permit (Non-Wetland).....$200.00

BOARD OF ADJUSTMENT

Residential Applications
1-2 dwelling units $150.00
3 and over ..... $250.00 plus $50.00 for each unit over 4
Total fee not to exceed (cap) $3,000.00

Residential accessory structure only $50.00

Non-Residential Applications ..... $300.00 plus $5.00 per $1,000 of valuation of new construction
Total fee not to exceed (cap) $3,000.00

Signs $200.00

Appeal of Administrative Decision $50.00

HISTORIC DISTRICT COMMISSION

Work Session (prior to application for approval) ..... $200.00 per work session

Residential Applications
1 dwelling unit $100.00
2 dwelling units $100.00
3 dwelling units $250.00
4 dwelling units and over ..... $400.00 plus $100.00 for each unit over 4
Total fee not to exceed (cap) $5,000.00

Accessory structure, mechanical equipment
or replacement of doors/windows only..... $100.00

Non-Residential Applications ..... $500.00 plus $5.00 per $1,000 of valuation of new construction

Total fee not to exceed (cap) $5,000.00

Accessory structure, mechanical equipment or replacement of doors/windows only..... $100.00

Signs $100.00

Amendment to Certificate of Approval:

Administrative approval $100.00
Administrative approval after work has been done..... $500.00
Commission approval $800.00

ZONING PERMITS

Certificate of conformity $50.00

Letter of interpretation..... $100.00