Findings of Fact | Site Plan Review
City of Portsmouth Planning Board

Date: March 6, 2023
Property Address: 212, 214, & 216 Woodbury Avenue
Application #: LU-22-129
Decision: □ Approve □ Deny □ Approve with Conditions

Findings of Fact:

Effective August 23, 2022, amended RSA 676:3, I now reads as follows: The local land use board shall issue a final written decision which either approves or disapproves an application for a local permit and make a copy of the decision available to the applicant. **The decision shall include specific written findings of fact that support the decision. Failure of the board to make specific written findings of fact supporting a disapproval shall be grounds for automatic reversal and remand by the superior court upon appeal, in accordance with the time periods set forth in RSA 677:5 or RSA 677:15, unless the court determines that there are other factors warranting the disapproval.** If the application is not approved, the board shall provide the applicant with written reasons for the disapproval. If the application is approved with conditions, the board shall include in the written decision a detailed description of the all conditions necessary to obtain final approval.

Site Plan Regulations Section 2.9 Evaluation Criteria - in order to grant site plan review approval, the TAC and the Planning Board shall find that the application satisfies evaluation criteria pursuant to NH State Law and listed herein. In making a finding, the TAC and the Planning Board shall consider all standards provided in Articles 3 through 11 of these regulations.

	Site Plan Review Regulations Section 2.9 Evaluation Criteria	**Finding (Meets Standard/Criteria)**	**Supporting Information**
1	Compliance with all City Ordinances and Codes and these regulations. Applicable standards:	**Meets** **Does Not Meet**	Applicable standards: We received the required zoning relief on April 19, 2022, and have been through the TAC process as well as third party review to make sure that the proposed development complies with the Zoning Ordinance and the Site Plan Review Regulations.
2	Provision for the safe development, change or expansion of use of the site.	**Meets** **Does Not Meet**	We have designed the shared private driveway to safely accommodate Portsmouth's largest fire truck. See Sheet T1. Additionally, we are providing visitor parking to prevent on-street parking. A stormwater management system has been designed to reduce the rate and volume of runoff from this development to below the existing condition. The units will be sprinklered. We have gone through TAC to ensure the development is safe.

	Site Plan Review Regulations Section 2.9 Evaluation Criteria	Finding (Meets Standard/Criteria)	Supporting Information
3	Adequate erosion control and stormwater management practices and other mitigative measures, if needed, to prevent adverse effects on downstream water quality and flooding of the property or that of another.	**Meets** **Does Not Meet**	We are proposing two bioretention systems with adequate pre-treatment as well as four permeable driveways and four subsurface infiltration basins for stormwater management. Rates and volumes of runoff from the subject parcel will be less in the proposed condition compared with the existing condition, as required. The stormwater management system also meets the treatment requirements of the City of Portsmouth and has been reviewed extensively by TAC and Altus Engineering to make sure that it complies with Section 7.6 of the Site Plan Review Regulations. In addition to the proposed stormwater management system, rip rap, erosion control blankets, silt fence, and a stabilized construction entrance are proposed for erosion control during construction.
4	Adequate protection for the quality of groundwater.	**Meets** **Does Not Meet**	All runoff from impervious paved areas will be directed toward bioretention systems for treatment before being infiltrated to groundwater. Treatment will meet the standards of the City of Portsmouth. Additionally, four of the proposed driveways will be constructed from porous pavers. These systems will be built with a filter course to treat stormwater before it recharges groundwater.
5	Adequate and reliable water supply sources.	**Meets** **Does Not Meet**	Each unit will have a domestic water and fire suppression service line through the City of Portsmouth Water Department.
6	Adequate and reliable sewage disposal facilities, lines, and connections.	**Meets** **Does Not Meet**	Each unit will have a separate sewer service.
7	Absence of undesirable and preventable elements of pollution such as smoke, soot, particulates, odor, wastewater, stormwater, sedimentation or any other discharge into the environment which might	**Meets** **Does Not Meet**	As explained above, the proposed stormwater management system meets and exceeds the requirements of Section 7.6 of the Site Plan Review Regulations. Peak rates and volumes of runoff are being reduced compared with the existing condition, and all runoff from paved areas will be treated using Low-Impact

	Site Plan Review Regulations Section 2.9 Evaluation Criteria	Finding (Meets Standard/Criteria)	Supporting Information
	prove harmful to persons, structures, or adjacent properties.		Development (LID) features. As for wastewater, each unit will have a separate sewer service that will be connected to the municipal sewer system, leading to the wastewater treatment plant. Appropriate steps taken for erosion and sediment control include silt fence, rip rap, a stabilized construction entrance, and erosion control blankets. Stormwater, wastewater, and sedimentation will be managed. As this is a simple multi-family residential development, we do not anticipate smoke, soot, particulates, or odor resultant to this development.
8	Adequate provision for fire safety, prevention and control.	**Meets** **Does Not Meet**	Each unit will have a fire service supply and will be sprinklered. Additionally, the proposed private driveway has been designed to accommodate the turning radii of Portsmouth's largest fire truck.
9	Adequate protection of natural features such as, but not limited to, wetlands.	**Meets** **Does Not Meet**	There are no wetlands or other outstanding natural features on the subject parcel. We are keeping as many existing trees as possible while still being able to construct the proposed development. We will be landscaping in areas where existing vegetation must be cut and where buildings, pavement, utilities, or stormwater features are not proposed.
10	Adequate protection of historical features on the site.	**Meets** **Does Not Meet**	There are no known historical features on the site. We coordinated with the New Hampshire Division of Historical Resources as required for the SWPPP and they are in agreement that no known historical properties are affected by the proposed development.
11	Adequate management of the volume and flow of traffic on the site and adequate traffic controls to protect public safety and prevent traffic congestion.	**Meets** **Does Not Meet**	Significant traffic is not anticipated. However, in order to improve traffic safety, the cluster mailbox unit is proposed approximately 95' from the site entrance. This way, vehicle drivers will have adequate time to react to vehicles utilizing the mailbox. Additionally, visitor parking spaces as well as a stop sign and stop bar are proposed.

	Site Plan Review Regulations Section 2.9 Evaluation Criteria	Finding (Meets Standard/Criteria)	Supporting Information
12	Adequate traffic controls and traffic management measures to prevent an unacceptable increase in safety hazards and traffic congestion off-site.	**Meets** **Does Not Meet**	A significant increase in off-site traffic is not anticipated for an 8-unit development, but a stop sign and stop bar are proposed at the intersection with Boyd Road. Certainly, there will not regularly be cueing behind the stop bar due to the relatively small size of the development. The curb cut for the proposed development is strategically and intentionally located directly across Boyd Road from the existing curb cut for Manor Drive.
13	Adequate insulation from external noise sources.	**Meets** **Does Not Meet**	Landscape trees and existing vegetation to remain will provide insulation from noise from nearby highways. From our observations on site, it is not noisy on the subject parcel.
14	Existing municipal solid waste disposal, police, emergency medical, and other municipal services and facilities adequate to handle any new demands on infrastructure or services created by the project.	**Meets** **Does Not Meet**	See Note #21 on Sheet C2: "The owner of each unit shall store trash in their garage. Trash will be picked up by a private hauler." The proposed private driveway is designed for the turning radii of Portsmouth's largest fire truck. We went through the TAC process and third party review to ensure that the proposed infrastructure is adequate for the proposed development.
15	Provision of usable and functional open spaces of adequate proportions, including needed recreational facilities that can reasonably be provided on the site	**Meets** **Does Not Meet**	Open space is provided between and behind units, between Unit 4 and the proposed private driveway, between Unit 2 and the property line with 214 Woodbury Ave., and in any other location on site that is not encumbered by buildings, pavement, or in-ground stormwater management features. In total, approximately 58.7% of the subject parcel will be open space post-construction. Some of this land is encumbered by the proposed bioretention systems, however much of it is available for recreation.
16	Adequate layout and coordination of on-site accessways and sidewalks in relationship to off-site existing or planned streets, accessways, bicycle paths, and sidewalks.	**Meets** **Does Not Meet**	The proposed curb cut for the proposed private driveway is strategically and intentionally placed directly across from the existing one for Manor Drive. Additionally, a sidewalk is proposed along Woodbury Ave. & Boyd Road as and extension of the existing one that currently

	Site Plan Review Regulations Section 2.9 Evaluation Criteria	Finding (Meets Standard/Criteria)	Supporting Information
			ends at the driveway for the Holiday Inn to the north. This was a request of TAC.
17	Demonstration that the land indicated on plans submitted with the application shall be of such character that it can be used for building purposes without danger to health.	**Meets** **Does Not Meet**	Stormwater runoff from impervious surfaces will be treated before leaving the site or recharging the groundwater table. The peak flow rate and volume of runoff will be reduced post-construction. The stormwater management BMPs that were implemented exceed the pollutant removal requirements of the City of Portsmouth as well. Wastewater will enter the municipal sewer system toward the wastewater treatment plant.
18	Adequate quantities, type or arrangement of landscaping and open space for the provision of visual, noise and air pollution buffers.	**Meets** **Does Not Meet**	We are revegetating all areas on site that we can with a wide variety of tree and shrub species, and even providing alternative groundcovers (bearberry) in some areas of the site. The landscaping plan we have provided is adequate for the proposed development, given the constraints of the site. This was a large topic of discussion throughout the TAC process and we amended the landscaping plan to satisfy their requests in order to provide visual, noise, and air pollution buffers.
19	Compliance with applicable City approved design standards.	**Meets** **Does Not Meet**	We have obtained the necessary zoning relief to have more than one free-standing dwelling on a lot, and otherwise meet all requirements of the Zoning Ordinance and the Site Plan Review Regulations.
	Other Board Findings:		

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: Tuck Realty Corp Date Submitted: 6/21/22

Application # (in City's online permitting): _____

Site Address: 212, 214 & 216 Woodbury Avenue Map: 175 Lot: 1, 2, & 3

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)**		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)**		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)**		
☒	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)**		N/A
☒	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1D)**		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)**		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)**		N/A
☒	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1G)**		N/A
☒	List of reference plans. **(2.5.3.1H)**		N/A
☒	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1I)**		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)**		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)**	N/A, none onsite	N/A
☒	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**		N/A
☒	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**		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)**		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**
[x]	**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.	Existing Conditions	
[X]	**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.	Architectural Drawings	
[X]	**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).	Site Plan	
[X]	**4. Parking and Loading: (2.5.4.3D)** • Location of off street parking/loading areas, landscaped areas/buffers; • Parking Calculations (# required and the # provided).	Site Plan Notes	
[X]	**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).	Utility Plan	
[X]	**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.	Utility Plan	

☒	**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.	Utility Plan	
☒	**8. Solid Waste Facilities: (2.5.4.3H)**	Site Plan Notes	
	• 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.	Drainage report	
☒	**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.	Lighting Plan	
☒	**11. Indicate where dark sky friendly lighting measures have been implemented. (10.1)**		
☒	**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.		
☒	**13. Contours and Elevation: (2.5.4.3L)** • Existing/Proposed contours (2 foot minimum) and finished grade elevations.		
☐	**14. Open Space: (2.5.4.3M)** • Type, extent and location of all existing/proposed open space.	N/A	
☒	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**		
☐	**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)**	Grading & Drainage Plan	
☐	Indicate whether the proposed development is located in a wellhead protection or aquifer protection area. Such determination shall be approved by the Director of the Dept. of Public Works. **(7.3.1)**	N/A	
☒	Stormwater Management and Erosion Control Plan. **(7.4)**	Plans & Drainage Report	
☒	Inspection and Maintenance Plan **(7.6.5)**	Drainage Report	

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)**	Site Plan Notes	
☒	Exhibits, data, reports or studies that may have been required as part of the approval process, including but not limited to: • Calculations relating to stormwater runoff; • Information on composition and quantity of water demand and wastewater generated; • Information on air, water or land pollutants to be discharged, including standards, quantity, treatment and/or controls; • Estimates of traffic generation and counts pre- and post-construction; • Estimates of noise generation; • A Stormwater Management and Erosion Control Plan; • Endangered species and archaeological / historical studies; • Wetland and water body (coastal and inland) delineations; • Environmental impact studies. **(2.5.3.2B)**	Drainage Report	
☐	A document from each of the required private utility service providers indicating approval of the proposed site plan and indicating an ability to provide all required private utilities to the site. **(2.5.3.2D)**	Pending	

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)**	Site Plan Notes	
☒	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)**	Site Plan Notes	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)**	Site Plan Notes	N/A

Applicant's Signature: _____ **Date:** 6/21/22

Findings of Fact | Subdivision Rules and Regulations
City of Portsmouth Planning Board

Date: March 6, 2023
Property Address: 212, 214, & 216 Woodbury Avenue
Application #: LU-22-129
Decision: □ Approve □ Deny □ Approve with Conditions

Findings of Fact:
Effective August 23, 2022, amended RSA 676:3, I now reads as follows: The local land use board shall issue a final written decision which either approves or disapproves an application for a local permit and make a copy of the decision available to the applicant. **The decision shall include specific written findings of fact that support the decision. Failure of the board to make specific written findings of fact supporting a disapproval shall be grounds for automatic reversal and remand by the superior court upon appeal, in accordance with the time periods set forth in RSA 677:5 or RSA 677:15, unless the court determines that there are other factors warranting the disapproval.** If the application is not approved, the board shall provide the applicant with written reasons for the disapproval. If the application is approved with conditions, the board shall include in the written decision a detailed description of the all conditions necessary to obtain final approval.

	Subdivision Review Criteria	Finding (Meets Standards/ Requirements)	Supporting Information
1	Subdivision Rules and Regulations III. D. 1 The Board shall act to deny any application which is not in compliance with Section IV or V as appropriate. **SECTION IV - REQUIREMENTS FOR PRELIMINARY PLAT**	**Meets** **Does Not Meet**	We have reviewed Section IV and it appears that the plans address all requirements.
2	**SECTION V - REQUIREMENTS FOR FINAL PLAT**	**Meets** **Does Not Meet**	We have reviewed Section V and it appears that the plans address all requirements.
3	**SECTION VI - GENERAL REQUIREMENTS**	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee (TAC) for conformance with the General Requirements. • The application was recommended for approval on February 7, 2023 at the Technical Advisory Committee Meeting.

	Subdivision Review Criteria	Finding (Meets Standards/ Requirements)	Supporting Information
4	**SECTION VII - DESIGN STANDARDS**	**Meets** **Does Not Meet**	The application has been reviewed by the Technical Advisory Committee (TAC) for conformance with these minimum requirements. • The application was recommended for approval on February 7, 2023 at the Technical Advisory Committee Meeting.
5	**Other Board Findings:**		

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: Frederick J. Bailey & Joyce S. Nelson Date Submitted: June 21, 2022

Applicant: Tuck Realty Corp.

Phone Number: 603-778-6894 E-mail: turnerporterjr@gmail.com

Site Address 1: 212 Woodbury Avenue Map: 175 Lot: 2, 3

Site Address 2: 214 & 216 Woodbury Avenue Map: 175 Lot: 2, 3

Application Requirements			
☑	**Required Items for Submittal**	**Item Location (e.g. Page or Plan Sheet/Note #)**	**Waiver Requested**
☑	Completed Application form. **(III.C.2-3)**		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)**		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)**	Plan Set	☑ 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)**	Existing Conditions Plan	☑ 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)**	Existing Conditions Plan	☑ 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)**	Existing Conditions Plan	☑ 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)**	Existing Conditions Plan	☑ Preliminary Plat ☑ Final Plat	
✓	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)**	Existing Conditions Plan	☑ 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)**	Existing Conditions Plan	☑ Preliminary Plat ☑ Final Plat	

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)**	Existing Conditions Plan	☑ Preliminary Plat ☑ Final Plat	
☑	**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)**	Existing Conditions & Utility Plan	☑ Preliminary Plat ☑ Final Plat	
☑	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)**	Plan & Profile Sheet	☑ Preliminary Plat ☑ Final Plat	
☐	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	
☑	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)**	Existing Conditions, Grading & Drainage Plans	☑ Preliminary Plat ☑ Final Plat	

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)**	Site Plan	☐ Preliminary Plat ☑ Final Plat	
☐	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	☐ Preliminary Plat ☑ Final Plat	
☑	Location of all permanent monuments. **(Section V.12)**	Lot Line Adjustment Plan	☐ Preliminary Plat ☑ Final Plat	

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

☑	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☐ ☐ ☐	**15. Easements (VI.15)** a. Utilities b. Drainage	N/A	
☑	**16. Monuments: (VI.16)**		
☑	**17. Benchmarks: (VI.17)**		
☑	**18. House Numbers (VI.18)**		

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	Complied	
☑	**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	Complied	
☑	**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	Complied	
☑	**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	Complied	

Applicant's/Representative's Signature: _____ **Date:** June 21, 2022

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

Letter of Authorization

We, Frederick Bailey & Joyce Nelson, owners of property located at 212, 214 & 216 Woodbury Avenue & 6 Boyd in Portsmouth, NH, known as Tax Map 175, Lots 1, 2, 3 & 13 do hereby authorize Jones & Beach Engineers, Inc. ("JBE"), Garrepy Planning Consultants, LLC ("GPC"), and Hoefle, Phoenix, Gormley & Roberts, PLLC ("HPGR") to act on its behalf concerning the previously mentioned property.

I hereby appoint JBE, GPC and HPGR as agents to act on our behalf in the Planning Board and Zoning Board application process, to include any required signatures.

Frederick Bailey

As Partners and, Individually — Date: 1/5/22

Joyce Nelson

Joyce S. Nelson

As Partners and, Individually — Date: 1/05/22

Letter of Authorization

I, Turner Porter, Tuck Realty Corporation, PO Box 190, Exeter, NH 03833, developer of property known as Tax Map 175, Lots 1, 2, 3, do hereby authorize Jones & Beach Engineers, Inc., PO Box 219, Stratham, NH, to act on my behalf concerning the previously-mentioned property. The parcels are located on 212, 214 & 216 Woodbury Avenue in Portsmouth, NH.

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

Susan Porter
Witness

Turner Porter
Tuck Realty Corporation

1/5/22
Date

DEED

KNOW ALL MEN BY THESE PRESENTS that we, Seron E. Nelson and Peter A. Nelson, both of 19 Buckingham Drive, Bow, NH 03304 for nominal (less than $1.00) consideration paid, do hereby release and disclaim any and all claim to or interest in and do hereby give and grant to the other parties of interest, to wit, Frederick J. Bailey III of 27 Kirriemuir, Stratham, NH and Joyce S. Nelson of 19 Buckingham Drive, Bow, NH with QUIT-CLAIM COVENANTS, the following undivided interest in the following described tract of land, to wit:

All of the Grantors estate's right, title and interest in and to eight certain tracts of land with the buildings thereon situated in Portsmouth, County of Rockingham, State of New Hampshire, bounded and described as follow:

TRACTS I, III, V, VI, AND VII.

Beginning at land of the State of New Hampshire at a concrete post in the ground which is a New Hampshire Highway Bound situated at the northeasterly corner of the premises hereby conveyed, which bound is also located at the northwesterly corner of land of Spectrum Enterprises, Inc.; thence turning and running S 14 degrees 15' E along land of Spectrum Enterprises, Inc., a distance of two hundred sixty-seven and 40/100 (267.40) feet to a drill hole in a boulder at other land formerly of Colony Motor Hotel, Inc.; thence turning and running S 14 degrees 08' E along land formerly of Colony Motor Hotel, Inc., a distance of ninety-six and 14/100 (96.14) feet to a corner of other land formerly of Colony Motor Hotel, Inc.; thence turning and running N 82 degrees 49' W along other land formerly of Colony Motor Hotel, Inc. a distance of one hundred twelve and no/100 (112.00) feet to the northeast corner of such other land formerly of Colony Motor Hotel, Inc. (There is also included in the aforesaid tract the right to use so much, if any, of the area owned by the grantor south of such line as is now occupied by the pool or cooling tower now located on the aforesaid tract); thence turning and running S 14 degrees 08' E along such other land formerly of Colony Motor Hotel, Inc. a distance of one hundred fifty and no/100 (150.00) feet to the northerly sideline of Boyd Road at the southeasterly corner of the premises hereby conveyed; thence turning and running N 82 degrees 49' W along the northerly sideline of the said Boyd Road a distance of two hundred ninety-eight and no/100 (298.00) feet to a point in such sideline; thence turning and running N 84 degrees 25' 10" W still along the northerly sideline of Boyd Road a distance of one hundred seven and 39/100 (107.39) feet to an iron pipe set in the ground at land of the State of New Hampshire; thence turning and running N 13 degrees 10'55" E along land of the State of New Hampshire a distance of twenty-four and 88/100 (24.88) feet to and iron pipe set in the ground; thence turning and running N 20 degrees 19' 40" E still along land of the State of New Hampshire a distance of two hundred seventy-two and 92/100 (272.92) feet to an iron pipe set in the ground; thence turning and running N 43 degrees 09' 40" E still along land of the State of New Hampshire a distance of seventy-seven and 61/100 (77.61) feet to an iron pipe set in the ground; thence turning and running N 67 degrees 00'10" E still along land of the State of New Hampshire a distance of two

hundred fifty-four and 38/100 (254.38) feet to the New Hampshire Highway Bound at the place of beginning.

The foregoing described premises include (as Tract VII) the whole of the premises conveyed by the State of New Hampshire to Colony Motor Hotel, Inc. by deed dated November 12, 1975, and recorded in the Rockingham County Registry of Deeds, Book 2247, Page 0552; (as Tract VI) the whole of the premises conveyed by Parkwood, Inc. to Colony Motor Hotel, Inc. by deed dated February 6, 1973, and recorded in the Rockingham County Registry of Deeds, Book 2196, Page 1564; the whole of Tract I (original motel lot) and Tract III (original adjunct to pool lot), and Tract V (triangular lot at corner of State land) as conveyed by Frederick J Bailey and Seron W. Bailey to Colony Motor Hotel, Inc. by deed dated June 30, 1976, and recorded in the Rockingham County Registry of Deeds, Book 2261, Page 0479, together with all grantor's right, title and interest in and to rights of way, easements, options, etc., as set forth on the last page of said Baileys to Colony deed in Book 2261, Page 0479.

There is expressly excepted and reserved to the State of New Hampshire as to the tract adjacent to the Portsmouth Traffic Circle the rights by said State reserved to itself in said deed by the State of New Hampshire to Colony Motor Hotel, Inc. dated November 12, 1975 recorded in said Rockingham County Registry of Deeds, Book 2247, Page 0552 in the following terms as therein set forth, namely:

"There is expressly excepted and reserved to the grantor herein all rights of access, light, air and view, appurtenant to the parcel herein conveyed, over, from and to US Route 1 By-Pass and the Woodbury Avenue Ramp along the first four (4) described courses with the exception of two (2) points of access, as presently existing along the fourth described course at the new right of way line established by this conveyance, said two (2) points of access being as shown on the plan herein above referred to.

Attached hereto is a copy of the relevant portion of the plan referred to above."

Former easement reserved by deed of Parkwood, Inc. to Colony Motor Hotel, Inc. dated February 6, 1973, recorded in Rockingham County Registry of Deeds, Book 2196, Page 1564, reserving easement to Frederick J. Bailey and Seron W. Bailey over strip of land 20 feet in width along southerly side of restaurant property, having since become meaningless, was terminated by conveyance of such easement in total by said Frederick J. Bailey and Seron W. Bailey by deed to Colony Motor Hotel, Inc. dated July 24, 1981, recorded on July 29, 1981, in said Rockingham Deeds, Book 2394, Page 1324.

TRACT II.

A certain parcel of land with the buildings thereon, situate in said Portsmouth, and County of Rockingham and State of New Hampshire, on the northerly side of Boyd Road, so -called, and bounded and described as follows:

DEED

Beginning on said Road at the southwesterly corner of land formerly owned by one Taccetta at a stake in the ground and thence running in a northerly direction in part by said land formerly of said Taccetta and in part by Tract IV in this deed one hundred and fifty (150) feet to a stake in the ground at land formerly of Joseph Cohen, (now Tract III in this deed); thence turning and running in a generally westerly direction by said land (Tract III herein) one hundred and twelve (112) feet to a stake in the ground; thence turning and running still by land formerly of said Hazel E. Wood (Tract I in this deed) in a generally southerly direction one hundred and fifty (150) feet to said Boyd Road to a stake in the ground; thence turning and running by said Boyd Road in a generally easterly direction one hundred and twelve (112) feet to said stake in the ground at said southwesterly corner of said land formerly of said Taccetta to the place begun at.

Tract II above described being the same premises as Tract II conveyed by deed of Frederick J. Bailey and Seron W. Bailey dated June 30, 1976, recorded Rockingham County Registry of Deeds, Book 2261, Page 0479.

TRACT IV.

A certain lot or parcel of land with the buildings thereon, situated on the westerly side of Woodbury Avenue, in said Portsmouth, and County of Rockingham and State of New Hampshire, and more particularly bounded and described as follows:

Beginning at the northeasterly side of the premises herein described at the southeast corner of land now or formerly of Priscilla Hamilton; thence running by said Woodbury Avenue, S 21 degrees 30' E, 85.0 feet, to land formerly of Vincent Taccetta, Jr.; thence turning and running by said Taccetta, Jr. land S 68 degrees 30' W, 99.2 feet to a point at said Taccetta Jr., land; thence turning and running still by said Taccetta, Jr. land S 85 degrees 23' W, 203.8 feet to land formerly of Parkwood, Inc., (now Tract II in this deed), thence turning and running by said land (Tracts II and III in this deed and other land formerly of Colony Motor Hotel, Inc.) N 14 degrees 50' W, 86.5 feet to land formerly of said Hamilton; thence turning and running by said Hamilton land, N 80 degrees 24' E, 290.4 feet to Woodbury Avenue and the point of the beginning.

Reserving and excepting from the above described premises a strip of land along the southerly side thereof conveyed to Vincent Taccetta, Jr. et al by deed dated June 21, 1966, recorded in the Rockingham County Registry of Deeds, Book 1833, Page 435.

Tract IV being the same premises as Tract IV conveyed by deed of Frederick J. Bailey and Seron W. Bailey, dated June 30, 1976, and recorded in the Rockingham County Registry of Deeds, Book 2261, Page 0479.

DEED

The foregoing premises all being that portion of the same premises conveyed by deed of Colony Motor Hotel, Inc. dated December 15, 1986, recorded in the Rockingham County Registry of Deeds, Book 2652, Page 550.

The foregoing premises all being conveyed to by deed of Frederick J. Bailey and Frederick J. Bailey III as co-executors Estate of Seron W. Bailey dated January 1, 1987, recorded in the Rockingham County Registry of Deeds, Book , Page and by Frederick J. Bailey, Frederick J. Bailey III, and Joyce S. Nelson as Trustees of Seron W. Bailey Trust A by Deed dated December 31, 1989 and recorded in Book 2823 Page 1009.

The premises hereby conveyed, namely Tracts I-VII inclusive, are also conveyed subject to any and all existing rights or easements or record with respect to poles, wires or other facilities of public utilities and to any and all existing access, view and other rights and easements of the State of New Hampshire and/or others for highway or right of way purposes.

TRACT VIII.

Beginning at the intersection of the Easterly Sideline of said By-Pass and the Southerly sideline of Boyd Road; thence running Easterly by said Road Forty-five (45) feet, more or less, to the Westerly sideline of a proposed street known as Center Street; thence turning and running Southeasterly by said proposed street Two Hundred Forty-nine (249) feet to the Northerly sideline of a proposed street known as Garden Street; thence continuing in a straight line across said Garden Street Fifty (50) feet and continuing further in a straight line Fifty (50) feet to land now, or formerly of, one Regan; thence turning and running Westerly by land of said Regan and land of another Two Hundred (200) feet, more or less, to the Easterly sideline of said By-Pass One Hundred (100) feet, more or less, to land of Harry E. Yoken, et. al or Darley Realty Company; thence continuing in a general Northeasterly direction Three Hundred Nine (309) feet, more or less, by the Easterly sideline of said By-Pass to the point of beginning; subject , however, to such rights, if any, as the public or adjoining owners may have in that portion of Garden and Inland Street , so called, included in the above description, and meaning and intending to convey all right of the grantor in Center Street, Garden Street, and Inland Street as shown on Plan of Land belonging to Frank Jones, recorded in Rockingham County Records, Book 584, Page 481, and also shown on Plan of Spadea Lots, Garden and Center Streets, Portsmouth, New Hampshire, by John W. Durgin, C. E. , recorded in Rockingham Records, Plat 53, page 10, excepting, however, from the above description a parcel of land one hundred twenty (120) feet in length and twenty-five (25) feet in depth extending from the Northerly sideline of Garden Street Northeasterly along the Easterly sideline of said By-Pass, all as shown on said Plan.

To have and to hold the same, with all the rights, privileges, and appurtenances thereunto appertaining unto and to the use of the said Frederick J. Bailey III, and Joyce S. Nelson, and their successors and assigns forever.

DEED

Either statutory minimum or no Documentary Stamps are required, as this is a release and disclaimer of an interest. Non capital trust.

IN WITNESS WHEREOF Seron E. Nelson and Peter A. Nelson have affixed their hands under seal this 27th day of December, 2002.

In the presence of:

Sheila Castelley-Cook

Seron E. Nelson

Sheila Castelley-Cook

Peter A. Nelson

STATE OF NEW HAMPSHIRE
ROCKINGHAM, SS.

December 27, 2002

Personally appeared the above named, Seron E. Nelson and acknowledges the foregoing instrument be of her free act and deed.

Before me,

Notary Public

JANE H. DODGE, Notary Public
My Commission Expires September 25, 2007

JANE H. DODGE NOTARY PUBLIC NEW HAMPSHIRE

STATE OF NEW HAMPSHIRE
ROCKINGHAM, SS.

December 27, 2002

Personally appeared the above named Peter A. Nelson and acknowledges the foregoing instrument to of his free act and deed.

Before me,

Notary Public

JANE H. DODGE, Notary Public
My Commission Expires September 25, 2007

JANE H. DODGE NOTARY PUBLIC NEW HAMPSHIRE

WARRANTY DEED

We, Mitchell A. Hyder, Edward A. Hyder, Henry K. Hyder, Jr., A. Robert McGuire, and Henry K. Hyder III, all as Trustee's of the Mitchell A. Hyder and Edward A. Hyder Irrevocable Trust of 1993, of One Raynes Avenue, Portsmouth, Rockingham County, New Hampshire

FOR CONSIDERATION PAID GRANT TO / Frederick J. Bailey, III and Joyce S. Nelson with a mailing address of 27 Kirriemuir Road, Stratham, New Hampshire 03885, as tenants in partnership in accordance with the Bailey Nelson Partnership.

with **Warranty Covenants**

085503

A certain tract or parcel of land, with the buildings thereon, situate in Portsmouth, County of Rockingham and State of New Hampshire, and more particularly bounded and described as follows:

Beginning on the Westerly side of Woodbury Avenue at the Northeasterly corner of land now or formerly of James and Mary Verna; thence running S 68° 30' W, by said Verna land, ninety-nine and two-tenths (99.2) feet, more or less, to other land of said Verna; thence N 21° 30' W by said Verna land, ten (10) feet, thence S 68° 30' W by said Verna land, seventy-two (72) feet, thence S 80° 24' W, by said Verna land in part, and by land of John F. and Gloria C. Collins in part sixty-eight and three-tenths (68.3) feet; thence N 84° 6' N by said Collins land, seventy-four and five-tenths (74.5) feet to land formerly of Edward C. Berry; thence by said Berry land in part and by land of Parkwood, Inc. in part, N 14° 50' W, eighty-six and five-tenths (86.5) feet to land formerly of Vincent Taccetta; thence by land formerly of Vincent Taccetta, N 85° 23' E. one hundred sixteen and nine-tenths (116.9) feet; thence still by land formerly of Vincent Taccetta, N 70° 23' 30" W, one hundred eighty-two and four-tenths (182.4) feet to Woodbury Avenue; thence S 21° 30' E, by said Woodbury Avenue, one hundred four and four-tenths (104.4) feet to the point of beginning.

2005 NOV 18 AM 8:08

Being parcel No. 6 as described in Deed at Registry of Deeds in Book 3005, Page 1883 dated August 31, 1993.

Executed as a sealed instrument this 16 day of Nov. 2005.

MITCHELL A. HYDER
EDWARD A. HYDER
IRREVOCABLE TRUST OF 1993

Mitchell A. Hyder, Trustee

Edward A. Hyder, Trustee

A. Robert McGuire, Jr. Trustee

Henry K. Hyder, Jr. Trustee

Henry K. Hyder, Jr., Trustee

ROCKINGHAM COUNTY
REGISTRY OF DEEDS

STATE OF NEW HAMPSHIRE
DEPARTMENT OF REVENUE ADMINISTRATION
REAL ESTATE TRANSFER TAX
6 THOUSAND 7 HUNDRED AND 50 DOLLARS
111805 751521 $6750.00

State of New Hampshire
~~THE COMMONWEALTH OF MASSACHUSETTS~~

Rockingham
~~ESSEX~~, ss

November 16 2005

On this 16 day of November 2005, before me, the undersigned notary public, personally appeared Henry K. Hyder III proved to me through satisfactory evidence of identification, which was personal knowledge, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose,

Susan Covey
Notary Public
My Commission Expires:

Susan Covey
NOTARY PUBLIC
New Hampshire
My Commission Expires

STATE of New Hampshire
~~THE COMMONWEALTH OF MASSACHUSETTS~~

Rockingham
~~ESSEX~~, ss

NOV 16, 2005

On this 16th day of NOV. 2005, before me, the undersigned notary public, personally appeared Henry K. Hyder, Jr., proved to me through satisfactory evidence of identification, which was personal knowledge, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose,

Pamela J. Starkey
Notary Public
My Commission Expires:

PAMELA J. STARKEY, Commissioner of
My Commission Expires August

State of New Hampshire
County of Rockingham

On this the 16th day of November, 2005, before me, Michael Sanders II, the undersigned officer, personally appeared Mitchell A. Hyder, known to me (or satisfactorily proven) to be the person whose name is subscribed to the within instrument and acknowledged that he executed the same for the purposes therein contained.

In witness whereof I hereunto set my hand and official seal.

MICHAEL P. SANDERS II
MY COMMISSION EXPIRES APR. 21, 2009
NOTARY PUBLIC
NEW HAMPSHIRE

Michael A Sanders II
Notary Public
My Commission Expires: 4/21/09

State of New Hampshire
County of Rockingham

On this the 16 day of November, 2005, before me, the undersigned officer, personally appeared Edward A. Hyder, known to me (or satisfactorily proven) to be the person whose name is subscribed to the within instrument and acknowledged that he executed the same for the purposes therein contained.

In witness whereof I hereunto set my hand and official seal.

Michael A Sanderell
Notary Public
My Commission Expires: 4/21/09

State of New Hampshire
County of Rockingham

On this the 16 day of NOVEMBER, 2005, before me, the undersigned officer, personally appeared A. Robert McGuire, known to me (or satisfactorily proven) to be the person whose name is subscribed to the within instrument and acknowledged that he executed the same for the purposes therein contained.

In witness whereof I hereunto set my hand and official seal.

Michael A Sanderell
Notary Public
My Commission Expires: 4/21/09

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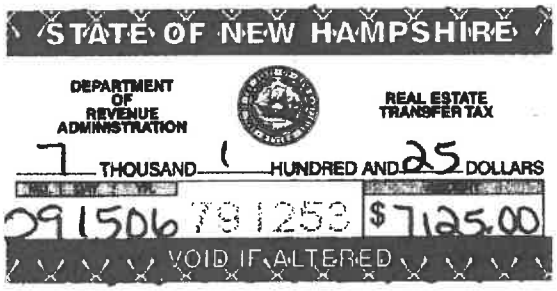

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2006 SEP 15 PM 2:09

ROCKINGHAM COUNTY
REGISTRY OF DEEDS

WARRANTY DEED

KNOW ALL MEN BY THESE PRESENTS, that JOSEPH M. VERNA, married, of 347 Meadow Road, Portsmouth, Rockingham County, New Hampshire, and GLORIA C. COLLINS, an unremarried widow, of 6 Boyd Road, Portsmouth, New Hampshire,

for consideration paid, grants to FREDERICK J. BAILEY, III, and JOYCE NELSON, of 27 Kirriemuir Road, Stratham, Rockingham County, New Hampshire, as tenants in partnership in accordance with the Bailey Nelson Partnership, with WARRANTY COVENANTS, the following described premises:

A certain tract or parcel of land with the buildings thereon situate in Portsmouth, County of Rockingham, State of New Hampshire, being shown as Lot 1 on a plan entitled "Lot Line Adjustment Plan for John & Gloria Collins in Portsmouth, NH" dated October 27, 1988, Scale 1"=20', prepared by Seacoast Engineering Associates, Inc., recorded at the Rockingham County Registry of Deeds as Plan D#18914, and being more particularly bounded and described as follows:

Beginning on Woodbury Avenue at land now or formerly of Margaret H. Taccetta, and running by said Woodbury Avenue South 21°30"East 141.9 feet to a point; thence by a curve whose radius is 12.97 feet, Southerly and Westerly to a point on Boyd Road; thence by said last named road North 86°8'West 240.56 feet to land now or formerly of John F. and Gloria C. Collins; thence turning and running North 01°16'23" West, by land now or formerly of said Collins, a distance of 74.00 feet to a point; thence turning and running North 80°24'02" East, by land now or formerly of Hyder Management, a distance of 36.83 feet to a point; thence turning and running North 68°30'00" East, by land now or formerly of said Hyder Management a distance of 72.00 feet to a point; thence turning and running South 21°30'01" East by land of said Hyder Management, a distance of 10.0 feet to a point; thence turning and running North 68°30'00"East, a distance of 99.20 feet to the point of beginning.

Together with a right of way for all purposes to and from said conveyed premises and Woodbury Avenue over adjoining land now or formerly of Margaret H. Taccetta ten feet wide and carrying that width back 99.2 feet from said Avenue; and subject to a similar right of way, as appurtenant to said land of Margaret H. Taccetta over the land conveyed,

to and from said premises now or formerly of said Margaret H. Taccetta and said Woodbury Avenue, adjoining the aforementioned right of way and similarly ten feet wide and carrying that width back 99.2 feet form said Avenue; the two rights of way together constituting a strip of land 20 feet wide and 99.2 feet deep, over which the two adjoining properties have mutual rights of way. Being a part of the premises described in the deed from Guisseppe Vincini to Croce Taccetta, dated October, 5, 1923, and recording in the Rockingham County Registry of Deeds in Book 781, Page 24.

SUBJECT TO all plans, easements, covenants and restrictions of record, if any.

The is not homestead property of the Grantors and the Grantors release all other interest in the property.

Meaning and intending to describe and convey the same premises conveyed by Corrective Quitclaim Deed to Christine V. Harris, having a life estate, and remainder interest of Joseph M. Verna, and Gloria C. Collins, from Christine V. Harris, Trustee under the Trust created under the Will of James Verna, dated September 15, 2006, and recorded contemporaneously with this deed at the Rockingham County Registry of Deeds.

IN WITNESS WHEREOF, signed this 15th day of September, 2006.

Joseph M. Verna
JOSEPH M. VERNA

Gloria C. Collins
GLORIA C. COLLINS

STATE OF NEW HAMPSHIRE
COUNTY OF ROCKINGHAM

Personally appeared this 15th day of September, 2006, the above-named Joseph M. Verna and Gloria C. Collins, acknowledged the foregoing instrument to be their voluntary act and deed. Before me,

Victoria Lynn Knight
Notary Public
My commission expires: 6/15/11

VICTORIA LYNN KNIGHT NOTARY PUBLIC NEW HAMPSHIRE

GOVE ENVIRONMENTAL SERVICES, INC.

TEST PIT DATA

Project: 212 Woodbury Ave, Portsmouth
Client: Tuck Realty Corp.
GES Project No. 2021307
MM/DD/YY Staff 3-18-2022 JPG

Test Pit No. 1
ESHWT: 21"
Termination @ 43"
Refusal: None
Obs. Water: 40"

2" gravel at surface.

NRCS : Woodbridge

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–9"	10YR 3/2	FSL	GR	FR	NONE
9–21"	10YR 4/6	FSL	GR	FR	NONE
21–43"	2.5Y 5/2	FSL	PL	FI	30%, Distinct

Test Pit No. 2
ESHWT: 30"
Termination @ 51"
Refusal: None
Obs. Water: None

NRCS : Woodbridge

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–9"	10YR 3/2	FSL	GR	FR	NONE
9–30"	10YR 4/6	FSL	GR	FR	NONE
30–51"	2.5Y 5/3	FSL	PL	FI	20%, Distinct

Test Pit No. 3
ESHWT: 27"
Termination @ 45"
Refusal: None
Obs. Water: None

NRCS : Woodbridge

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–9"	10YR 3/2	FSL	GR	FR	NONE
9–27"	10YR 4/6	FSL	GR	FR	NONE
27–45"	2.5Y 5/3	FSL	PL	FI	20%, Distinct

8 Continental Dr Bldg 2 Unit H, Exeter, NH 03833-7526
Ph (603) 778 0644 / *Fax* (603) 778 0654
info@gesinc.biz
www.gesinc.biz

Test Pit No. 4
ESHWT: 15"
Termination @ 41"
Refusal: None - boulder
Obs. Water: None

NRCS : Woodbridge

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–8"	10YR 3/2	FSL	GR	FR	NONE
8–15"	2.5Y 5/4	FSL	GR	FR	NONE
15–41"	2.5Y 5/3	FSL	PL	FI	10%, Distinct

Test Pit No. 5
ESHWT: 27"
Termination @ 50"
Refusal: None - stony
Obs. Water: None

NRCS : Woodbridge

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–12"	10YR 3/2	FSL	GR	FR	NONE
12–27"	10YR 4/6	FSL	GR	FR	NONE
27–50"	2.5Y 5/3	FSL	PL	FI	10%, Distinct

Test Pit No. 6
ESHWT: 26"
Termination @ 45"
Refusal: None
Obs. Water: None

NRCS : Woodbridge

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–10"	10YR 3/2	FSL	GR	FR	NONE
10–26"	10YR 5/6	FSL	GR	FR	NONE
26–45"	2.5Y 5/3	FSL	PL	FI	10%, Distinct

Test Pit No. 7
ESHWT: 26"
Termination @ 40"
Refusal: None
Obs. Water: None

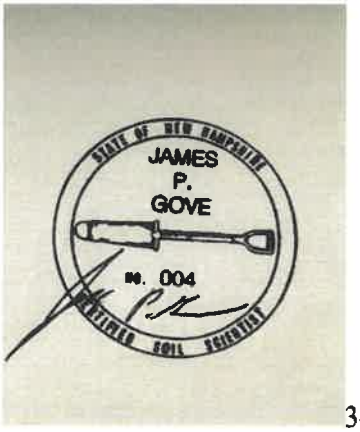
NRCS : Woodbridge

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–9"	10YR 3/2	FSL	GR	FR	NONE
9–26"	10YR 4/6	FSL	GR	FR	NONE
26–40"	2.5Y 5/3	FSL	PL	FI	10%, Distinct

Legend:

FSL = fine sandy loam
GR = granular
FR = friable
PL = platy
FI = firm

Soil Colors at Munsell.



3-22-2022

TEST PITS
FOR
214 WOODBURY AVENUE
PORTSMOUTH, NEW HAMPSHIRE
SEPTEMBER 7, 2022
JBE Project No. 21254

Performed by: Anthony Jones, Jones & Beach Engineers, Inc., SSD #1900

Test Pit #8

0"- 8"	10YR 3/2	very dark grayish brown fine sandy loam granular, friable many roots
8"- 22"	10YR 4/6	dark yellowish brown fine sandy loam granular, friable common roots
22" – 35"	2.5Y 5/3	light olive brown fine sandy loam platey, firm few, distinct redox

SHWT = 22"
Roots: 22"
No H_2O observed
Refusal @ 35"
Perc Rate = 14 min/inch

Test Pit #9

0"- 8"	10YR 3/2	very dark grayish brown fine sandy loam granular, friable many roots
8"- 27"	10YR 4/6	dark yellowish brown fine sandy loam granular, friable common roots
27" – 40"	2.5Y 5/3	light olive brown fine sandy loam platey, firm common, distinct redox

SHWT = 27"
Roots: 27"
No H_2O observed
Refusal @ 40"
Perc Rate = 14 min/inch

GOVE ENVIRONMENTAL SERVICES, INC.

TEST PIT DATA

Project – Woodbury Avenue, Portsmouth, NH
Client - Jones & Beach Engineers, Inc.
GES Project No. 2022091
MM/DD/YY Staff 11-17-2022 JPG

Test Pit No. 10
ESHWT: 24"
Termination @ 72"
Refusal: None
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox %, Layer
0–24"	10YR 3/3	FSL	GR	FR	NONE , Fill
24–47"	2.5Y 6/4	FSL	GR	FR	5%, Bw
47–72"	2.5Y5/3	SL	PL	FI	5%, Cd

Test Pit No. 11
ESHWT: 37"
Termination @ 72"
Refusal: None
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox %, Layer
0–20"	10YR 3/2	FSL	GR	FR	NONE , Ap
20–37"	10YR 5/4	FSL	GR	FR	NONE, Bw
37–72"	2.5Y5/3	SL	PL	FI	5%, Cd

8 Continental Dr Bldg 2 Unit H, Exeter, NH 03833-7526
Ph (603) 778 0644 / *Fax* (603) 778 0654
info@gesinc.biz
www.gesinc.biz

Art Form Architecture, Inc.

PO Box 535,44 Lafayette Road, North Hampton, NH 03862 Wendy@ArtForm.us (603) 431-9559 Phone

June 10, 2022

City of Portsmouth
Planning Department
Attn: Peter Stith, Principal Planner
1 Junkins Ave, 3rd Floor
Portsmouth, NH 03801

RE: Grapevine Run, 212-216 Woodbury Ave, Portsmouth NH

Dear Mr. Stith

The residential units proposed for the project referenced above are being designed to meet or exceed the applicable green building standards as set forth in the 2015 set of iCodes adopted by the State of New Hampshire along with associated amendments codified by the City of Portsmouth.

We have identified the following areas where components of these buildings can exceed code.

- Low maintenance exterior materials, reducing both replacement of the materials, and of chemicals needed to maintain them.
- Air quality and energy cost considerations on the mechanical systems, such as whole house ventilation, programmable thermostats, and high efficiency hot water, heat and cooling equipment.
- High efficiency lighting.
- Energy Star appliances.
- We've already designed with a relatively modest window area by modern standards.
- Designing for modern life is a green move in and of itself. The four bedrooms plus a study in these units was not done with the assumption that large families will live in downtown condos with minimal private yards. It was done assuming that the smallest front bedroom would also be used as a home office, allowing both parents to work from home. With this location enabling walking to all shopping and other amenities, we had in mind to minimize car use

Assemblies and systems for the units will be specified during the Building Permit application phase. Where some of these items are permitted separately from the architectural drawings, our client has committed to these same measures.

Sincerely,

Wendy Welton, RA
President

ALTUS ENGINEERING

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

February 2, 2023

Peter Stith, Principal Planner
City of Portsmouth
Department of Planning and Sustainability
1 Junkins Avenue, 3rd Floor
Portsmouth, New Hampshire 03801

Re: Peer Review for Proposed "Grapevine Run" – Review 5
Portsmouth Tax Map 175, Lots 1, 2 & 3
Altus Project No. 5367

Transmitted via email to: pmstith@cityofportsmouth.com

Dear Peter:

In accordance with the Three-Party Services agreement between the City, Tuck Realty Corporation and Altus Engineering, Inc. (Altus) dated January 19, 2023 and January 23, 2023, Altus has reviewed the following documents prepared by Jones & Beach Engineers, Inc. and received by this office on January 23, 2023 and January 31, 2023.

- Plan set titled "Grapevine Run" Tax Map 175, Lots 1, 2, & 3; 212, 214 & 216 Woodbury Avenue, Portsmouth, NH", revised January 19, 2023 (Sheet D4 and D5, dated January 23, 2023
- Drainage Analysis Sediment and Erosion Control Plan, 212, 214 & 216 Woodbury Avenue, Portsmouth, NH 03801, revised December 15, 2022
- Response letter dated January 19, 2023
- Architectural renderings dated May 16, 2022
- Stormwater Management Operation and Maintenance Manual dated January 19, 2023

On August 26, 2022, Altus visited the site to familiarize ourselves with the site conditions. On September 15th, we revisited the site with the applicant and his engineering consultant.

It is Altus Engineering's opinion that the Applicant and their Designer has satisfactorily addressed all our concerns in our correspondence dated January 11, 2023.

Peter Stith, Principal Planner
Planning Department
February 2, 2023

Altus had some minor concerns with the clay core detail depicted on the January 19, 2023 submission set. We discussed this with JBE. They revised the detail and resubmitted sheets D4 and D5 on January 31, 2023. The new submission addressed the concern.

Please contact me directly should you have any questions or need any further assistance.

Respectfully submitted,

ALTUS ENGINEERING

Eric D. Weinrieb, PE
President

Ecopy: Michael Garrepy
Paige Libbey, PE
Peter Britz, Director of Planning and Sustainability
David Desfosses, Portsmouth DPW

wde/5367 rev 5.DOCX

From:	Daniel Meditz
To:	Mike Garrepy (mgarrepy@gmail.com); Joseph Coronati; Front Desk
Subject:	FW: JBE 21254 - Woodbury Ave, Utility Plan Modified per TAC Condition
Date:	Wednesday, February 22, 2023 9:20:48 AM
Attachments:	image001.jpg image002.jpg image003.png 2023-02-22 21254-PLAN-C4 (UTILITY) 22x34.pdf

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21254 DPW Signoff on Water Services

Dan Meditz, E.I.T
Project Engineer
Jones&Beach Engineers, Inc.
85 Portsmouth Avenue
PO Box 219
Stratham, NH 03885
(603) 772-4746 (ext. #128)
http://www.jonesandbeach.com

From: Dave Desfosses <djdesfosses@cityofportsmouth.com>
Sent: Wednesday, February 22, 2023 9:18 AM
To: Daniel Meditz <DMeditz@jonesandbeach.com>
Subject: RE: JBE 21254 - Woodbury Ave, Utility Plan Modified per TAC Condition

Good to go.

From: Daniel Meditz <DMeditz@jonesandbeach.com>
Sent: Wednesday, February 22, 2023 8:59 AM
To: Dave Desfosses <djdesfosses@cityofportsmouth.com>
Subject: RE: JBE 21254 - Woodbury Ave, Utility Plan Modified per TAC Condition

Dave,

How does this look? I think this is the least circuitous I can make the domestic and fire services given the site constraints, even though there are still a couple of bends. I'm trying to avoid putting the services under the decks or the garage, and it can't come in on the south side of the building because then it would be too close to the sewer.

Thanks,

JONES&BEACH
ENGINEERS INC.
85 Portsmouth Avenue, PO Box 219, Stratham, NH 03885
603.772.4746 - JonesandBeach.com

STORMWATER MANAGEMENT OPERATIONS AND MAINTENANCE MANUAL

"Grapevine Run"
212, 214, & 216 Woodbury Ave.
Portsmouth, NH 03801
Tax Map 175, Lots 1, 2, & 3

Prepared for:

Tuck Realty Corp.
ATTN: Turner Porter
P.O. Box 190
Exeter, NH 03833

Prepared by:
Jones & Beach Engineers, Inc.
85 Portsmouth Avenue
P.O. Box 219
Stratham, NH 03885
(603) 772-4746
June 21, 2022
REVISED July 27, 2022
REVISED September 20, 2022
REVISED November 30, 2022
REVISED January 19, 2023
JBE Project No. 21254

Inspection and Maintenance of Facilities and Property

A. Maintenance of Common Facilities or Property

1. The Condominium Association, future owners and assigns are responsible to perform the maintenance obligations or hire a Professional Engineer to review the site on an annual basis for maintenance and certification of the stormwater system. The Association shall keep receipts and records of all maintenance companies hired throughout the year to submit along with the following form.

B. General Inspection and Maintenance Requirements

1. Permanent stormwater and sediment and erosion control facilities to be maintained on the site include, but are not limited to, the following:

    a. Roadway and driveways
    b. Vegetation and landscaping
    c. Bioretention systems
    d. Sediment Forebays
    e. Permeable Paver Driveways
    f. Stone Drip Edge
    g. Subsurface Stone Infiltration Areas
    h. Pre-Tx Curb Inlet Structure
    i. Culverts
    j. Rip-Rap Outlet Protection Aprons
    k. Swales
    l. Sump Pump Drain Outfall Pipes

2. Maintenance of permanent measures shall follow the following schedule:

    a. Normal winter roadway maintenance including plowing and snow removal. Road sweeping at the end of every winter, preferably at the start of the spring rain season.

    b. **Annual inspection** of the site for erosion, destabilization, settling, and sloughing. Any needed repairs are to be conducted immediately. **Annual inspection** of site's vegetation and landscaping. Any areas that are bare shall be reseeded and mulched with hay or, if the case is extreme, loamed and seeded or sodded to ensure adequate vegetative cover. Landscape specimens shall be replaced in kind, if they are found to be dead or dying.

    c. Bioretention Systems:

        - Visually inspect monthly and repair erosion. Use small stones to stabilize erosion along drainage paths.
        - Check the pH once a year if grass is not surviving. Apply an alkaline product, such as limestone, if needed.

- Re-seed any bare areas by hand as needed.
- Immediately after the completion of cell construction, water grass for 14 consecutive days unless there is sufficient natural rainfall.
- Once a month (more frequently in the summer), residents are encouraged to visually inspect vegetation for disease or pest problems and treat as required.
- During times of extended drought, look for physical features of stress. Water in the early morning as needed.
- Weed regularly, if needed.
- After rainstorms, inspect the cell and make sure that drainage paths are clear and that ponding water dissipates over 4-6 hours. (Water may pond for longer times during the winter and early spring.)
- Twice annually, inspect the outlet control structures to ensure that they are not clogged and correct any clogging found as needed.
- Any debris and sediment accumulations should be removed from the outlet structures, overflow risers, and emergency spillways and disposed of properly.
- Inspect outlet structure for deterioration and or clogging.
- If erosion is evident on the berm or emergency spillway, stabilize the affected area by seeding. Trees should not be allowed to grow in these areas.
- KEEP IN MIND, THE BIORETENTION CELL IS NOT A POND. IT SHOULD NOT PROVIDE A BREEDING GROUND FOR MOSQUITOES. MOSQUITOES NEED AT LEAST FOUR (4) DAYS OF STANDING WATER TO DEVELOP AS LARVA.

d. Cleaning Criteria for all Sedimentation Forebays: Sediment should be removed from the sedimentation chamber (forebay) when it accumulates to a depth of more than 12 inches (30 cm) or 10 percent of the pretreatment volume. The sedimentation forebay should be cleaned of vegetation if persistent standing water and wetland vegetation becomes dominant. The cleaning interval is once every year. A dry sedimentation forebay is the optimal condition while in practice this condition is rarely achieved. The sedimentation chamber, forebay, and treatment cell outlet devices should be cleaned when drawdown times exceed 60 to 72 hours. Materials can be removed with heavy construction equipment; however, this equipment should not track on the wetland surface. Revegetate disturbed areas as necessary. Removed sediments should be dewatered (if necessary) and disposed of in an acceptable manner.

e. Permeable paver driveways:

Units 6-8 feature permeable paver driveways for stormwater management; the remainder of road surface on site is constructed from standard asphalt. The following recommendations will help assure that the pavement is maintained to preserve its hydrologic effectiveness.

Winter maintenance:

- Sanding for winter traction is prohibited. Deicing is permitted (NaCl, $MgCl_2$, or equivalent). Reduced salt application is possible and can be a cost savings for winter maintenance. Nontoxic, organic deicers, applied either as blended, magnesium chloride-based liquid products or as pretreated salt, are preferable.
- Plowing is allowed, blade should be set approximately 1" above the paver surface. Ice and light snow accumulation are generally not as problematic as for standard asphalt. Snow will accumulate during heavier storms and should be plowed. (more than usual, about an inch).

Routine maintenance:

- Seal coating is absolutely forbidden. Surface seal coating is not reversible.
- The paver surface should be vacuumed 2 or 3 times per year, and at any additional times sediment is spilled, eroded, or tracked onto the surface.
- Planted areas adjacent to permeable pavers should be well maintained to prevent soil washout onto the pavers. If any bare spots or eroded areas are observed within the planted areas, they should be replanted and/or stabilized at once.
- Immediately clean any soil deposited on pavers. Superficial dirt does not necessarily clog the paver voids. However, dirt that is ground in repeatedly by tires can lead to clogging. Therefore, trucks or other heavy vehicles should be prevented from tracking or spilling dirt onto the pavers.
- Do not allow construction staging, soil/mulch storage, etc. on unprotected paver surface. Contractor to lay down tarps, plywood or removable item and take care not to track material onto unprotected pavers.
- Repairs: Potholes or other surface blemishes shall be replaced in kind. Any required repair of drainage structures should be done promptly to ensure continued proper functioning of the system.
- Written and verbal communication to the future owner should make clear the pavement's special purpose and special maintenance requirements such as those listed here.

f. Stone Drip Edge:

A stone drip edge is behind Units 3 & 4 to collect roof runoff into a pipe in order to direct it into a subsurface stone infiltration bed. This practice shall be lined and is not intended for infiltration. The following recommendations will help assure that the roof drip edges are maintained to preserve its effectiveness.

In the spring and fall, visually inspect the area around the edges and repair any erosion. Use small stones to stabilize erosion along drainage paths. Inspect stone area to ensure that it has not been displaced, undermined, or otherwise damaged. Displaced rock should be replaced, or additional rock added in order to maintain the structure(s) in their undamaged state. Woody vegetation should not be allowed to become established in stone areas, and/or any debris removed from the void spaces between the stones.

g. Subsurface Stone Infiltration Beds:

The following recommendations will help assure that the stone areas are maintained to preserve their effectiveness. These are located between Units 4 and the road, between Units 5&6, between Units 7&8, and behind Unit 1 and each one has a cleanout within the footprint of the system to be used for inspections.

In the spring and fall, visually inspect the area around these underground systems and repair any erosion. Use small stones to stabilize erosion along drainage paths. Twice a year open the cleanout and check for signs of debris, sediment build-up, or standing water. If more than 12" of sediment is observed, plug the outlet and flush the system thoroughly. Pump water into system until at least 1" of standing water covers the system bottom. Capture sediment-laden water for proper disposal according to local state, and EPA regulation. **If the practice cannot be remediated as noted, it shall be replaced, and the City of Portsmouth shall be notified that the system has failed.**

h. Pre-Tx Curb Inlet Structure
See attached Pre-Tx operations and maintenance guidelines.

i. **Inspection** of culvert inlets and outlets at least **once per month** during the rainy season (March to November). Any debris is to be removed and disposed of properly.

j. Rock riprap should be **inspected annually** in order to ensure that it has not been displaced, undermined, or otherwise damaged. Displaced rock should be replaced, or additional rock added in order to maintain the structure(s) in their undamaged state. Woody vegetation should not be allowed to become established in riprap areas, and/or any debris removed from the void spaces between the rocks. If the riprap is adjacent to a stream or other waterbody, the water should be kept clear of obstructions, debris, and sediment deposits

k. Swales - Inspect swales annually for erosion, sediment accumulation, vegetation loss, and presence of invasive species. Perform periodic mowing; frequency depends on location and type of grass. Remove debris and accumulated sediment, based on inspection. Repair eroded areas, remove invasive species and dead vegetation, and reseed as warranted by inspection

l. Sump Pump Drain Outfall Pipes – If basement flooding occurs or otherwise twice annually, open the sump pump drain inspection ports and check for signs of debris, sediment build-up, or standing water. If more than 12" of sediment is observed, plug the outlet and flush the system thoroughly. Pump water into system until at least 1" of standing water covers the system bottom. Capture sediment-laden water for proper disposal according to local state, and EPA regulation.

See attached sample forms as a guideline.

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

Jones & Beach Engineers, Inc.
85 Portsmouth Avenue
P.O. Box 219
Stratham, NH 03885

T#: (603) 772-4746
F#: (603) 772-0227

Commitment to maintenance requirements

I agree to complete and/or observe all of the required maintenance practices and their respective schedules as outlined above.

_____

Signature

_____

Print Name

_____

Title

_____

Date

Annual Operations and Maintenance Report

The Condominium Association, future owners and assigns are responsible to perform the maintenance obligations or hire a Professional Engineer to review the site on an annual basis for maintenance and certification of the stormwater system. The Association shall keep receipts and records of all maintenance companies hired throughout the year to submit along with the following form.

Construction Activity	Date of Inspection	Who Inspected	Findings of Inspector
Roadway and Driveways			
Vegetation and Landscaping			
Bioretention #1			
Bioretention #2			
Permeable Paver Driveways (Units 6-8)			

Sediment Forebay			
Stone Drip Edge			
Subsurface Stone Infiltration Beds			
Pre-Tx Curb Inlet Structure			
Culverts			
Rip Rap Outlet Protection			
Swales			
Sump Pump Drain Outfall Pipes			
Other (please note):			

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 the occurrence of large storm events, overly wet or dry (I.E., drought), regional hydrologic conditions, and the upstream land use.

ACTIVITIES

The most common maintenance activity is the removal of leaves from the system and bypass structure. 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. Mulch and/or 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
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 biannually.
Check to insure the filter surface remains well draining after storm event. **Remedy**: If filter bed is clogged, draining poorly, or standing water covers more than 15% 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, biannually, frequency adjusted as needed after 3 inspections
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.	
Check to insure the filter bed does not contain more than 2 inches accumulated material **Remedy**: Remove sediment as necessary. If 2 inches or more of filter bed has been removed, replace media with either mulch or a (50% sand, 20% woodchips, 20% compost, 10% soil) mixture.	
During extended periods without rainfall, inspect plants for signs of distress. **Remedy**: Plants should be watered until established (typical only for first few months) or as needed thereafter.	
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.	Annually
Check for robust vegetation coverage throughout the system. **Remedy**: If at least 50% vegetation coverage is not established after 2 years, reinforcement planting should be performed.	
Check for dead or dying plants, and general long term plant health. **Remedy**: This vegetation should be cut and removed from the system. If woody vegetation is present, care should be taken to remove dead or decaying plant Material. Separation of Herbaceous vegetation rootstock should occur when overcrowding is observed.	As needed

CHECKLIST FOR INSPECTION OF BIORETENTION SYSTEM / TREE FILTERS

Location: Inspector:

Date: Time: Site Conditions:

Date Since Last Rain Event:

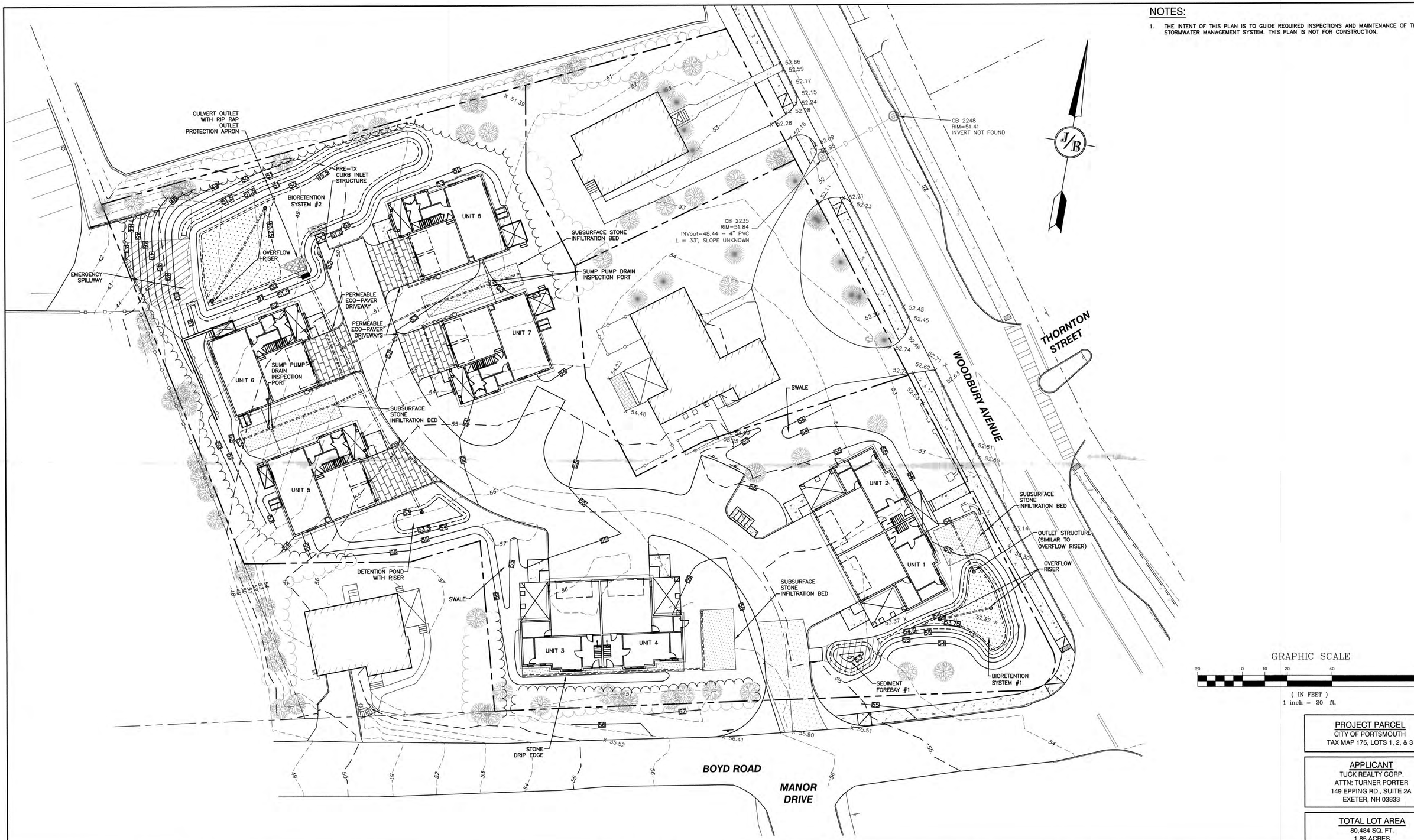
Inspection Items	Satisfactory (S) or Unsatisfactory (U)		Comments/Corrective Action
1. Initial Inspection After Planting and Mulching			
Plants are stable, roots not exposed	S	U	
Surface is at design level, typically 4" below overpass	S	U	
Overflow bypass / inlet (if available) is functional	S	U	
2. Debris Cleanup (2 times a year minimum, Spring & Fall)			
Litter, leaves, and dead vegetation removed from the system	S	U	
Prune perennial vegetation	S	U	
3. Standing Water (1 time a year, After large storm events)			
No evidence of standing water after 72 hours	S	U	
4. Short Circuiting & Erosion (1 time a year, After large storm events)			
No evidence of animal burrows or other holes	S	U	
No evidence of erosion	S	U	
5. Drought Conditions (As needed)			
Water plants as needed	S	U	
Dead or dying plants			
6. Overflow Bypass / Inlet Inspection (1 time a year, After large storm events)			
No evidence of blockage or accumulated leaves	S	U	
Good condition, no need for repair	S	U	
7. Vegetation Coverage (once a year)			
50% coverage established throughout system by first year	S	U	
Robust coverage by year 2 or later	S	U	
8. Mulch Depth (if applicable)(once every 2 years)			
Mulch at original design depth after tilling or replacement	S	U	
9. Vegetation Health (once every 3 years)			
Dead or decaying plants removed from the system	S	U	
10. Tree Pruning (once every 3 years)			
Prune dead, diseased, or crossing branches	S	U	
Corrective Action Needed			**Due Date**
1.			
2.			
3.			

1/15/2011, University of New Hampshire Stormwater Center

JONES&BEACH ENGINEERS INC.

NOTES:

1. THE INTENT OF THIS PLAN IS TO GUIDE REQUIRED INSPECTIONS AND MAINTENANCE OF THE STORMWATER MANAGEMENT SYSTEM. THIS PLAN IS NOT FOR CONSTRUCTION.



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1, 2, & 3

APPLICANT
TUCK REALTY CORP.
ATTN: TURNER PORTER
149 EPPING RD., SUITE 2A
EXETER, NH 03833

TOTAL LOT AREA
80,484 SQ. FT.
1.85 ACRES

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: 1"=20'	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: **OPERATIONS AND MAINTENANCE PLAN**

Project: "GRAPEVINE RUN"
212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

Owner of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON
4 SHORE RD., WOLFEBORO, NH 03894
LOT 1: BK 4708 PG 979
LOT 2: BK 4582 PG 888
LOT 3: BK 3919 PG 1345

DRAWING No.
OM1
SHEET 1 OF 1
JBE PROJECT NO. 21254

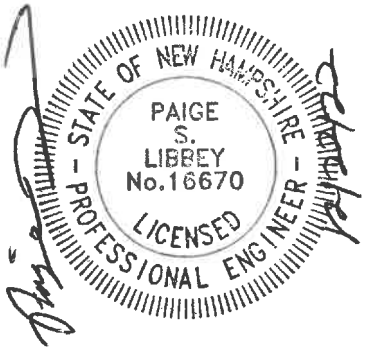
DRAINAGE ANALYSIS

SEDIMENT AND EROSION CONTROL PLAN

Grapevine Run
212, 214, & 216 Woodbury Ave.
Portsmouth, NH 03801
Tax Map 175, Lots 1, 2, & 3

Prepared for:

Tuck Realty Corp
ATTN: Turner Porter
P.O. Box 190
Exeter, NH 03833



Prepared by:
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JBE Project No. 21254

EXECUTIVE SUMMARY

Tuck Realty Corp proposes to construct eight (8) residential condominium units along a 338' proposed private driveway on a 1.38-acre parcel of land (after lot line adjustment) located at 212, 214, & 216 Woodbury Avenue (Tax Map 175, Lots 1-3 respectively) in Portsmouth, NH, with access from Boyd Rd. In the existing condition, Lots 1-3 each contain a single-family residence with a paved driveway, and there is a detached garage on Lot 1. The house, garage, driveway, and other site features on Lot 1 are to be removed to make available land for the proposed development.

A drainage analysis of the entire site was conducted for the purpose of estimating the peak rate of stormwater runoff and to subsequently design adequate drainage structures. Two models were compiled, one for the area in its existing (pre-construction) condition, and a second for its proposed (post-construction) condition. The analysis was conducted using data for the 2 Year – 24 Hour (3.21"), 10 Year – 24 Hour (4.87"), 25 Year – 24 Hour (6.17"), and 50 Year – 24 Hour (7.39") storm events using the USDA SCS TR-20 method within the HydroCAD Stormwater Modeling System environment. This data was taken from the Extreme Precipitation Tables developed by the Northeast Regional Climate Center (NRCC). A summary of the existing and proposed conditions peak rates of runoff in units of cubic feet per second (cfs) is as follows:

Analysis Point	2 Year		10 Year		25 Year		50 Year	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Analysis Point #1	1.37	1.29	2.79	2.24	3.99	2.99	5.04	3.69
Analysis Point #2	0.06	0.06	0.12	0.12	0.17	0.17	0.21	0.21
Analysis Point #3	0.50	0.16	1.33	0.46	2.00	0.73	2.63	1.57
Analysis Point #4	0.14	0.13	0.28	0.24	0.40	0.34	0.51	0.43
Analysis Point #5	0.15	0.13	0.37	0.28	0.55	0.41	0.74	0.53

A similar summary of the existing and proposed peak volumes in units of acre-feet is as follows:

Analysis Point	2 Year		10 Year		25 Year		50 Year	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Analysis Point #1	0.145	0.112	0.282	0.198	0.395	0.268	0.504	0.334
Analysis Point #2	0.005	0.005	0.009	0.009	0.013	0.013	0.016	0.016
Analysis Point #3	0.071	0.022	0.161	0.050	0.240	0.093	0.318	0.172
Analysis Point #4	0.011	0.010	0.023	0.020	0.032	0.028	0.042	0.035
Analysis Point #5	0.015	0.010	0.033	0.021	0.050	0.031	0.066	0.041

The subject parcels are located in the General Residence A (GRA) Zoning District. The subject parcels currently consist of the aforementioned single-family residences with associated driveways, sheds, and a detached garage, all of which is proposed to be demolished. The topography of the site as well as a stretch of Woodbury Ave. and Boyd Rd. that is considered in this analysis define nine (9) subcatchments, which drain to five (5) analysis points. Subcatchments 1S-4S drain directly toward their respective analysis points while subcatchments 5S-8S drains toward four separate depressions, modelled as 1P-4P respectively. When the aforementioned depressions fills with water, the runoff crests over the berms and drains toward one of the five analysis points. Depressions 2P, 3P, and 4P drain overland toward the catch basin represented as Analysis Point 1, while depression 1P drains over land toward Analysis Point 3.

The proposed site development consists of the aforementioned eight (8) condominium units with an associated shared private driveway and individual driveways coming off of it. The addition of the proposed impervious paved areas and buildings causes an increase in the curve number (C_n) and a decrease in the time of concentration (T_c), the net result being a potential increase in peak rates of runoff from the site. A stormwater management system was designed in order to mitigate this possibility. The proposed site development divides the site into fifteen (15) subcatchments, representing both the periphery of the site that will continue its existing flow pattern toward the aforementioned analysis points as well as the developed portions that will be routed into the site's stormwater management system for treatment and reduction of peak flows. Additionally, four links are included in the model to represent the discharge from the sump pumps of units 5, 6, 7, and 8. The proposed stormwater management system consists of two bioretention systems designed for treatment and infiltration of road and roof water up to the 10-Year storm, individual permeable Eco-Paver driveways for Units 6-8, four subsurface stone infiltration areas, and a small detention area. Through the use of these practices, the peak rates and volumes of runoff are reduced toward Analysis Points #1-5 during all analyzed storm events. All runoff from proposed paved areas and some of the runoff from proposed roofs will be treated, while some of the runoff from the proposed roofs will be piped into the stone underneath the aforementioned permeable pavers for infiltration and a small section of proposed roofs simply allowed to runoff.

The use of Best Management Practices per the NHDES Stormwater Manual have been applied to the design of this drainage system and will be observed during all stages of construction. All land disturbed during construction will be stabilized within thirty days of groundbreaking and abutting property owners will suffer minimal adversity resultant of this development.

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1.0 RAINFALL CHARACTERISTICS

This drainage report includes an existing conditions analysis of the area involved in the proposed development, as well as a proposed condition, or post-construction analysis, of the same location. These analyses were accomplished using the USDA SCS TR-20 Method within the HydroCAD Stormwater Modeling System. The curve numbers were developed using the SCS TR-55 Runoff Curve numbers for Urban Areas. A Type III SCS 24-hour rainfall distribution was utilized in analyzing the data for the 2 Year – 24 Hour (3.21"), 10 Year – 24 Hour (4.87"), 25 Year – 24 Hour (6.17"), and 50 Year – 24 Hour (7.39") storm events. This data was taken from the Extreme Precipitation Tables developed by the Northeast Regional Climate Center (NRCC).

The peak rates and volumes of runoff will be reduced from the existing condition and stormwater treatment will exceed requirements in the proposed condition, thereby minimizing the potential for a negative impact on abutting properties or downstream waterbodies.

2.0 EXISTING CONDITIONS ANALYSIS

The three existing single-family residential properties each feature a single-family house with a paved driveway, and Lot 1 also includes a detached garage. Otherwise, the undeveloped areas of the three parcels are covered by both woods and grass, and no wetlands were observed on site. The abutting properties include several residential uses as well as two hotels.

In the existing condition, the topography of the subject parcel as well as a stretch of Woodbury Ave. and Boyd Rd. that was considered is such that the study area is split into 9 Subcatchments draining toward 5 Analysis Points.

Analysis Point 1 is a catch basin just off of Woodbury Ave along the driveway leading to the house on Lot 2, which receives runoff from part of the study area in both the existing and proposed condition. This is near the northeast area of the study area. Analysis Point 2 represents a slope adjacent to what appears to be a single-family residence that is apparently in the southeastern corner of Tax Map 175, Lot 11 per Portsmouth tax maps, abutting Boyd Rd. This analysis point receives a small amount of runoff from a section of the study area in the existing and proposed conditions. Analysis Point 3 represents a catch basin in the parking lot on Tax Map 174, Lot 11, which is home to a Best Western Plus hotel, and receives a fair amount of runoff from the site in the existing condition. In the proposed condition, steps are being taken to eliminate this situation to the extent practicable. Runoff directed toward Analysis Point 3 ultimately drains into a catch basin in the center of the Best Western Plus parking lot. Analysis Point 4 represents the Boyd Rd. drainage system. This receives a small amount of runoff from the study area in both the existing and proposed conditions, mostly from abutting Tax Map 175, Lot 13, although it is modelled because a small part of the subcatchment draining toward this Analysis Point is on the subject property and therefore is affected by this development. Finally, Analysis Point 5 represents a yard area between the home that is apparently on Tax Map 175, Lot 11 and the Best Western Plus parking lot. This receives some runoff from the subject parcel in the existing condition as well.

Subcatchments 1S-4S drain directly toward Analysis Points AP1-AP4, while Subcatchments 5S-8S drain toward shallow depressions which fill up with water and eventually overflow toward the analysis points. Subcatchment 9S drains directly toward Analysis Point 5. Peak rates and volumes of runoff are reduced in the proposed condition during all analyzed storm events.

The existing soil type for the entire subject parcel is 29B – Woodbridge Fine Sandy Loam, as classified by a Certified Soil Scientist. This soil type is classified by Hydrologic Soil Group "C". According to "Ksat Values for New Hampshire Soils" sponsored by the Society of Soil Scientists of Northern New England SSSNNE Special Publication No. 5, this soil type has a saturated hydraulic conductivity (Ksat) of 0.6-2.0 in/hr in the B Horizon and a Ksat of 0.0-0.6 in/hr in the C horizon.
To further determine the appropriate Ksat to use for design, infiltration testing was performed on site using a Compact Constant Head Permeameter (CCHP, also known as an amoozemeter) on July 19, 2022. Two (2) pits were dug using a shovel in the soil and three (3) infiltration tests were performed in each pit. The two pits were dug in the footprints of the two proposed bioretention systems, further discussed in the proposed conditions analysis. "Pit #1" refers to the pit that was dug in the footprint of proposed bioretention system #1 in the south end of the site near Boyd Rd., and "Pit #2" refers to the pit that was dug in the footprint of proposed bioretention system #2 in the north end of the site.

Standard size auger holes, 4 cm in diameter were dug within each pit to the depth of the bottom of each respective practice to obtain an accurate permeability reading below the bottom of the proposed systems. Water was then discharged through the soil and the drop in water level on the tube in which the water was stored before being discharged was recorded at several time intervals. The comparison between the drop in water level and the elapsed time from the start of the test was used to calculate the Ksat value. For example, if the water level dropped 3 cm after 5 minutes and 5 cm after 10 minutes, this was recorded and used as data to calculate the Ksat using the formulas listed in the data spreadsheets in Appendix VII. The Ksat values from each time increment were then averaged to determine the mean Ksat, and this value divided by a factor of safety of two to determine the saturated hydraulic conductivity to use for design purposes.

The permeability tests were performed. The results of the permeability testing are as summarized below:

Test	Ksat (in/hr)
Pit #1 – Test #1	3.69
Pit #1 – Test #2	6.83
Pit #1 – Test #3	1.77
Pit #1 – Mean Ksat	**4.10**
Pit #2 – Test #1	0.73
Pit #2 – Test #2	0.69
Pit #2 – Test #3	0.48
Pit #2 – Mean Ksat	**0.63**

A further breakdown of the data used to arrive at the final Ksat values is included in Appendix VII.

For Pit #1, the Ksat from Test #3 was utilized for design because the raw number obtained from this test is below the result of averaging the three tests performed in Pit #1 and dividing by a factor of safety of two (4.1/2 = 2.05, and 1.77 in/hr is lower than 2.05 in/hr). For this reason, it seems that the average may be skewed by the high result obtained in Test #2. Therefore, the third test is a better representation of the true permeability of the soil and is the most conservative rate to use for design. The infiltration rate obtained from Test #3 was divided by a factor of safety of two to arrive at a Ksat of **0.89 in/hr** to use for design of stormwater features in the south end of the site.

For Pit #2, the mean Ksat of all three tests was utilized and divided by a factor of safety of two to arrive at a design Ksat of 0.315 in/hr, rounded down to **0.3 in/hr** which is the same as the published value after providing a factor of safety and is below the raw result of the most conservative test. This value was used to design stormwater features in the north end of the site and, because a factor of safety of two was used, it happens to be below even the lowest raw infiltration rate obtained from any of the tests performed in Pit #2. Therefore, this is a valid Ksat to use for design purposes.

3.0 PROPOSED CONDITIONS ANALYSIS

The addition of the proposed impervious paved areas and buildings causes an increase in the curve number (C_n) and a decrease in the time of concentration (T_c), the net result being a potential increase in peak rates of runoff from the site. A stormwater management system was designed in order to mitigate this potential. The proposed development, consisting of the aforementioned eight (8) condominium units with an associated paved shared driveway as well as individual unit driveways and stormwater management features divide the same study area from the existing conditions analysis into fifteen (15) subcatchments, all still draining toward the five same analysis points. Although there are 15 subcatchments, the subcatchment numbers go up to 17 because three subcatchments (including 18S) have been removed but the subcatchment numbers that remain have been kept the same for consistency.

Subcatchments 1S-4S drain directly toward corresponding Analysis Points AP1-AP4, and Subcatchment 5S drains toward the offsite depression modelled as 1P in which water puddles and eventually overflows toward Analysis Point AP3; so far identical to the existing conditions analysis routing. However, the remainder of the isolated depressions from the existing conditions analysis are proposed to be developed over. Subcatchment 6S represents the watershed of bioretention system #2, modelled as Pond 2P. Subcatchment 7S represents a roof area that drains toward the subsurface stone infiltration bed modelled as Ponds 4P. The runoff from Subcatchment 7S first falls on to lined stone drip edge 3P so that water will enter an underdrain and be carried through a pipe into stone infiltration bed 4P, where a gutter and downspout system would not be feasible due to shape the of the proposed roofline. Subcatchment 9S represents the watershed of bioretention system #1, modelled as Pond 6P. Overflow from Pond 6P is routed toward a subsurface stone infiltration area modelled as Pond 12P. Subcatchments 10S-12S represent the watersheds directed toward Ponds 7P-9P, which are the permeable Eco-Paver driveways of Units 6-8, respectively. These Eco-Paver driveways provide treatment for runoff before discharge to groundwater by way of a filter course. These features treat direct run-on, and also a portion of the roofs of the corresponding units is piped into each permeable driveway.

Additionally, a swale leading to a small detention pond is proposed along the property line with 6 Boyd Road. The subcatchments draining toward the swale is represented as Subcatchments 13S, and the swale is represented as 1R. The subcatchment draining toward the detention pond is modelled as 14S and the detention pond itself is modelled as 10P. The detention pond provides some attenuation, and flows from the detention pond are then routed through a closed drainage system to bioretention pond #2 for further detention, treatment, and infiltration.

Subcatchment 16S represents a small area of the periphery of the site that runs off directly toward Analysis Point #5. Subcatchment 17S represents the area that drains toward a vee channel that is created by the intersection of the proposed grading for bioretention pond #2 with the existing topography. The vee channel itself is modelled as Reach 3R, which drains toward Analysis Point 3.

Units 5-8 will have basements in the groundwater table and therefore will require sump pumps. Estimated sump pump discharge rates and volumes were calculated based on the footprint and depth of each foundation as well as the void ratio and permeability rate of the soil. The finished floor elevation of each unit was subtracted by 8 feet to determine the bottom of foundation for each unit. Then the average seasonal high water table elevation throughout the foundation footprint was calculated. The difference between the depth of foundation and the average SHWT depth is effectively the depth by which the foundation is within the water table. This resultant depth was then multiplied by the footprint area of the foundation to determine the volume of the foundation, and this was multiplied by a conservative void ratio of 0.5 to determine the volume of groundwater displaced by each unit's foundation in a worst-case scenario in which the water table elevation is equal to the SHWT.

The sump pump discharge rate lags from the beginning of operation to peak discharge, at which time the highest point of groundwater displaced by the foundation has reached the sump pump. The permeability rate of the soil was determined by the aforementioned infiltration tests and multiplied by a factor of safety of two. The depth of the bottom of the foundation below the seasonal high water table elevation was then divided by the permeability rate of the soil with the factor of safety applied in order to determine the lag time to peak sump pump discharge in units of seconds.

Finally, the volume was divided by the lag time to determine the peak flow rate of sump pump discharge. These calculations are located in Appendix X within this drainage report.

The peak discharge rate and lag time were then used to manually generate a 24-hour hydrograph for each sump pump at one-hour increments. The peak discharge rate that was calculated was placed on the hydrograph at the lag time that was calculated and instantaneous flow rates at 1-hour increments were determined by interpolating between 0 cfs at 0 hours and at the end of the cycle, and the peak flow rate at the lag time. For example, if the peak flow rate was calculated to be 0.05 cfs and the lag time 5 hours, 0.05 cfs was put into the hydrograph at 5 hours, and each 1-hour increment would add 0.05/5 = 0.01 cfs. The flow rate at 2 hours would be 0.02 cfs, the flow rate at 3 hours would be 0.03 cfs, etc. Then flows would be subtracted by the same increment for each subsequent hour and the flow would again be zero at 10 hours. This results in a representation of the discharge rate over time and the volume of sump pump discharge that can be modelled into a 24-hour storm modelling software.

The resulting per-hour flows were then modelled into HydroCAD as four separate links; one representing the sump pump discharge for each respective unit. Two subsurface infiltration systems were designed to fully infiltrate the 24-hour discharge from the sump pumps, and each was designed with an overflow fully above the calculated peak elevation of discharge water within the system. Pond 5P is a subsurface stone infiltration bed designed to infiltrate the sump pump discharge from units 5&6, and Pond 11P is a subsurface stone infiltration bed designed to infiltrate the sump pump discharge from units 7&8. Any overflow would be piped into bioretention system #2, though as modelled the sump pump discharge appears to fully infiltrate.

As explained in the executive summary, the proposed stormwater management features help to reduce peak rates and volumes of runoff toward AP1-AP5 to below the existing condition in the 2-, 10-, 25-, and 50-Year storm events. The two bioretention ponds are designed to treat and infiltrate all runoff directed to them up to the at least the 10-Year storm event. Each bioretention pond has a proposed mechanism for positive overflow in extreme storm events. Overflow risers are additionally incorporated just above the elevation of the water quality volume on each of the bioretention ponds in order to maintain infiltration during winter. This exceeds the requirements of the City of Portsmouth,

which state, among other things, that peak flows and volumes must be reduced and that the water quality volume must be treated to achieve certain removal efficiencies as discussed at the end of the proposed conditions analysis. However, this design approach was used so that abutting properties would not be inundated by runoff from the subject parcel.

The methodology described in the existing conditions analysis was used to determine the design infiltration rates for each infiltration practice. The design Ksat that was used was half of the mean Ksat determined via the field tests. Pit #1 delivered the results that were used for the design of bioretention #1 (6P) and two of the subsurface stone infiltration systems (4P and 11P). A design Ksat value of 0.89 in/hr was used for these practices per the results of the infiltration tests performed using the CCHP. Pit #2 delivered the results that were used for the design of the remainder of the practices, giving a design Ksat value of 0.3 in/hr.

The seasonal high water table (SHWT) beneath each infiltration and filtration practice was determined based off nearby test pits. The SHWT depth from the test pit was subtracted from the highest existing ground elevation within the footprint of the practice. For the subsurface stone infiltration bed next to Units 3 & 4, Test Pit 8 was used, where SHWT was found at 22" below ground and the highest existing ground elevation was slightly below 56.3. Therefore, the groundwater elevation used for design was 56.3 - 22/12 = 54.47. For the subsurface stone infiltration bed next to Units 5 & 6, Test Pit 9 was used, where SHWT was found at 27". Highest existing ground elevation within this footprint of this practice is 53.0 so the groundwater elevation was modelled is 50.75. Test Pit #11 was used for the subsurface stone infiltration bed between units 7&8, where SHWT was also found at 37". Highest existing ground elevation within the footprint of this practice is 52.20, so the groundwater elevation was modelled at 49.12.

Test Pit 6 is located within the footprint of the proposed bioretention system #1. SHWT on this test pit was found at a depth of 26". Where the filter course and infiltration components of the system are located in an area where the highest existing ground elevation is 53.3, the modelled groundwater elevation is 51.13. The bioretention system is designed so that the bottom of the filter course is at least 1' above the SHWT. The same test pit was used to design the subsurface stone infiltration basin toward which overflwos from the bioretention pond are routed. The groundwater elevation beneath this practice was modelled at 51.2 because the highest existing ground elevation in the footprint of the practice is 53.2.

Test Pit 1 is located within the footprint of the proposed bioretention system #2. SHWT on this test pit was found at a depth of 21". Where the filter course and infiltration components are located in an area where the highest existing ground elevation is 48.0, the modelled groundwater elevation is 46.25. The bioretention system is designed so that the bottom of the filter course is at least 1' above the SHWT.

For the three proposed permeable paver driveways, proposed grade is variable, so the SHWT at the highest ground elevation was not necessarily the one used for design. Rather, the location at which proposed grade is closest to existing grade and by extension closest to SHWT was used to determine both the design SHWT and the elevations to use for the overall profile of the system to model. The permeable paver driveways were designed based on the following data:

Unit #	Test Pit #	SHWT Depth	Existing Grade	Design SHWT
6	2	30"	51.9	49.4
7	3	27"	53.5	51.25
8	1	21"	50.8	49.05

According to the NH Stormwater Manual, bioretention systems provide a pollutant removal efficiency of 90% for TSS and 65% for nitrogen, and permeable pavers provide a pollutant removal efficiency of 90% for TSS and 60% for nitrogen. The City of Portsmouth Site Plan Review Regulations stipulate that stormwater BMPs should either be designed for 80% TSS removal and 50% nitrogen removal, or to retain and treat the Water Quality Volume. Per the pollutant removal efficiency calculation worksheet included in Appendix IX, the proposed stormwater management system provides a removal efficiency of 84% TSS, 60% total phosphorous, and 61% total nitrogen. This plan exceeds the requirements for pollutant removal because appropriate treatment / groundwater recharge systems are utilized and all runoff from paved surfaces is treated and infiltrated up to the 10-Year storm event, exceeding the water quality volume requirement.

5.0 CONCLUSION

This proposed site development will have minimal adverse effect on abutting infrastructures, and properties by way of stormwater runoff or siltation. Appropriate steps will be taken to eliminate erosion and sedimentation; these will be accomplished through the construction of a drainage system consisting of site grading, bioretention systems with associated pre-treatment practices, permeable pavers with a filter course, and subsurface stone infiltration beds, as well as temporary erosion control measures including but not limited to silt fence and the use of a stabilized construction entrance. The peak rate and volumes of runoff will be reduced toward all analysis points during all analyzed storm events in the post-construction condition and the bioretention systems are designed to treat and infiltrate runoff up to at least the 25-Year storm, exceeding requirements. Best Management Practices developed by the State of New Hampshire have been utilized in the design of this system and their application will be enforced throughout the construction process.

This project disturbs less than 100,000 S.F. and does not require a NHDES Alteration of Terrain Permit.

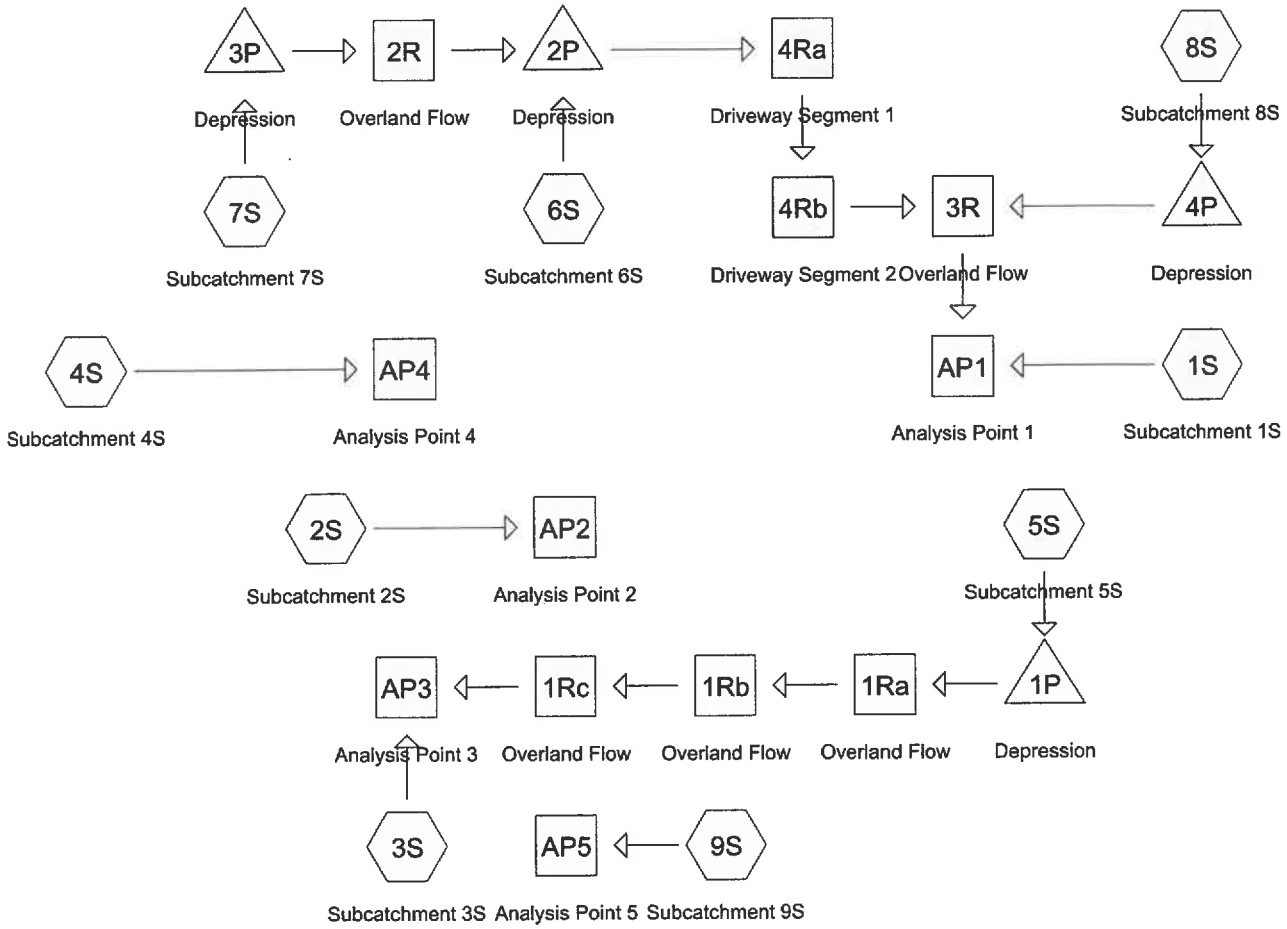
Respectfully Submitted,
JONES & BEACH ENGINEERS, INC.

Daniel Meditz, E.I.T
Project Engineer

APPENDIX I

EXISTING CONDITIONS DRAINAGE ANALYSIS

Summary 2 YEAR
Complete 10 YEAR
Summary 25 YEAR
Complete 50 YEAR



Subcat Reach Pond Link

Routing Diagram for 21254-EXISTING
Prepared by Jones & Beach Engineers Inc, Printed 12/2/2022

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.258	74	>75% Grass cover, Good, HSG C (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S)
0.369	98	Paved parking, HSG C (1S, 4S, 8S)
0.174	98	Roofs, HSG C (1S, 2S, 3S, 4S, 5S, 6S, 8S, 9S)
0.582	70	Woods, Good, HSG C (2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S)
2.382	**78**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
2.382	HSG C	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S
0.000	HSG D	
0.000	Other	
2.382		**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=30,350 sf 51.45% Impervious Runoff Depth>1.84"
Flow Length=254' Tc=19.4 min CN=86 Runoff=1.03 cfs 0.107 af

Subcatchment2S: Subcatchment2S Runoff Area=1,702 sf 28.08% Impervious Runoff Depth>1.41"
Flow Length=67' Tc=7.6 min CN=80 Runoff=0.06 cfs 0.005 af

Subcatchment3S: Subcatchment3S Runoff Area=35,181 sf 4.23% Impervious Runoff Depth>0.98"
Flow Length=187' Tc=29.1 min CN=73 Runoff=0.50 cfs 0.066 af

Subcatchment4S: Subcatchment4S Runoff Area=4,408 sf 26.97% Impervious Runoff Depth>1.34"
Flow Length=55' Slope=0.0500 '/' Tc=9.1 min CN=79 Runoff=0.14 cfs 0.011 af

Subcatchment5S: Subcatchment5S Runoff Area=3,966 sf 15.05% Impervious Runoff Depth>1.22"
Flow Length=67' Tc=13.1 min CN=77 Runoff=0.10 cfs 0.009 af

Subcatchment6S: Subcatchment6S Runoff Area=2,101 sf 15.37% Impervious Runoff Depth>1.22"
Flow Length=76' Slope=0.0260 '/' Tc=9.4 min CN=77 Runoff=0.06 cfs 0.005 af

Subcatchment7S: Subcatchment7S Runoff Area=4,509 sf 0.00% Impervious Runoff Depth>0.99"
Flow Length=42' Slope=0.0240 '/' Tc=9.6 min CN=73 Runoff=0.10 cfs 0.009 af

Subcatchment8S: Subcatchment8S Runoff Area=13,227 sf 27.07% Impervious Runoff Depth>1.41"
Flow Length=136' Tc=12.3 min CN=80 Runoff=0.40 cfs 0.036 af

Subcatchment9S: Subcatchment9S Runoff Area=8,332 sf 4.42% Impervious Runoff Depth>0.93"
Flow Length=164' Tc=12.9 min CN=72 Runoff=0.15 cfs 0.015 af

Reach 1Ra: Overland Flow Avg. Flow Depth=0.04' Max Vel=0.11 fps Inflow=0.05 cfs 0.005 af
n=0.150 L=35.0' S=0.0100 '/' Capacity=0.54 cfs Outflow=0.03 cfs 0.005 af

Reach 1Rb: Overland Flow Avg. Flow Depth=0.04' Max Vel=0.23 fps Inflow=0.03 cfs 0.005 af
n=0.150 L=122.0' S=0.0443 '/' Capacity=0.43 cfs Outflow=0.02 cfs 0.005 af

Reach 1Rc: Overland Flow Avg. Flow Depth=0.01' Max Vel=0.16 fps Inflow=0.02 cfs 0.005 af
n=0.150 L=30.0' S=0.1167 '/' Capacity=74.58 cfs Outflow=0.02 cfs 0.005 af

Reach 2R: Overland Flow Avg. Flow Depth=0.02' Max Vel=0.10 fps Inflow=0.01 cfs 0.004 af
n=0.150 L=37.0' S=0.0297 '/' Capacity=1.78 cfs Outflow=0.01 cfs 0.004 af

Reach 3R: Overland Flow Avg. Flow Depth=0.20' Max Vel=0.21 fps Inflow=0.43 cfs 0.039 af
n=0.150 L=171.0' S=0.0068 '/' Capacity=0.14 cfs Outflow=0.13 cfs 0.031 af Overflow=0.29 cfs 0.007 af

Reach 4Ra: Driveway Segment 1 Avg. Flow Depth=0.01' Max Vel=0.61 fps Inflow=0.06 cfs 0.008 af
n=0.016 L=50.0' S=0.0260 '/' Capacity=56.25 cfs Outflow=0.06 cfs 0.008 af

Reach 4Rb: Driveway Segment 2 Avg. Flow Depth=0.01' Max Vel=0.49 fps Inflow=0.06 cfs 0.008 af
n=0.016 L=72.0' S=0.0139 '/' Capacity=41.11 cfs Outflow=0.05 cfs 0.008 af

Reach AP1: Analysis Point 1		Inflow=1.37 cfs 0.145 af Outflow=1.37 cfs 0.145 af
Reach AP2: Analysis Point 2		Inflow=0.06 cfs 0.005 af Outflow=0.06 cfs 0.005 af
Reach AP3: Analysis Point 3		Inflow=0.50 cfs 0.071 af Outflow=0.50 cfs 0.071 af
Reach AP4: Analysis Point 4		Inflow=0.14 cfs 0.011 af Outflow=0.14 cfs 0.011 af
Reach AP5: Analysis Point 5		Inflow=0.15 cfs 0.015 af Outflow=0.15 cfs 0.015 af
Pond 1P: Depression	Peak Elev=51.31' Storage=167 cf	Inflow=0.10 cfs 0.009 af Outflow=0.05 cfs 0.005 af
Pond 2P: Depression	Peak Elev=55.31' Storage=33 cf	Inflow=0.06 cfs 0.009 af Outflow=0.06 cfs 0.008 af
Pond 3P: Depression	Peak Elev=56.21' Storage=189 cf	Inflow=0.10 cfs 0.009 af Outflow=0.01 cfs 0.004 af
Pond 4P: Depression	Peak Elev=53.11' Storage=236 cf	Inflow=0.40 cfs 0.036 af Outflow=0.38 cfs 0.030 af

Total Runoff Area = 2.382 ac Runoff Volume = 0.262 af Average Runoff Depth = 1.32"
77.22% Pervious = 1.840 ac 22.78% Impervious = 0.543 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=30,350 sf 51.45% Impervious Runoff Depth>3.34"
Flow Length=254' Tc=19.4 min CN=86 Runoff=1.85 cfs 0.194 af

Subcatchment2S: Subcatchment2S Runoff Area=1,702 sf 28.08% Impervious Runoff Depth>2.78"
Flow Length=67' Tc=7.6 min CN=80 Runoff=0.12 cfs 0.009 af

Subcatchment3S: Subcatchment3S Runoff Area=35,181 sf 4.23% Impervious Runoff Depth>2.16"
Flow Length=187' Tc=29.1 min CN=73 Runoff=1.17 cfs 0.146 af

Subcatchment4S: Subcatchment4S Runoff Area=4,408 sf 26.97% Impervious Runoff Depth>2.69"
Flow Length=55' Slope=0.0500 '/' Tc=9.1 min CN=79 Runoff=0.28 cfs 0.023 af

Subcatchment5S: Subcatchment5S Runoff Area=3,966 sf 15.05% Impervious Runoff Depth>2.51"
Flow Length=67' Tc=13.1 min CN=77 Runoff=0.21 cfs 0.019 af

Subcatchment6S: Subcatchment6S Runoff Area=2,101 sf 15.37% Impervious Runoff Depth>2.51"
Flow Length=76' Slope=0.0260 '/' Tc=9.4 min CN=77 Runoff=0.12 cfs 0.010 af

Subcatchment7S: Subcatchment7S Runoff Area=4,509 sf 0.00% Impervious Runoff Depth>2.17"
Flow Length=42' Slope=0.0240 '/' Tc=9.6 min CN=73 Runoff=0.23 cfs 0.019 af

Subcatchment8S: Subcatchment8S Runoff Area=13,227 sf 27.07% Impervious Runoff Depth>2.77"
Flow Length=136' Tc=12.3 min CN=80 Runoff=0.80 cfs 0.070 af

Subcatchment9S: Subcatchment9S Runoff Area=8,332 sf 4.42% Impervious Runoff Depth>2.09"
Flow Length=164' Tc=12.9 min CN=72 Runoff=0.37 cfs 0.033 af

Reach 1Ra: Overland Flow Avg. Flow Depth=0.12' Max Vel=0.20 fps Inflow=0.21 cfs 0.015 af
n=0.150 L=35.0' S=0.0100 '/' Capacity=0.54 cfs Outflow=0.20 cfs 0.015 af

Reach 1Rb: Overland Flow Avg. Flow Depth=0.13' Max Vel=0.42 fps Inflow=0.20 cfs 0.015 af
n=0.150 L=122.0' S=0.0443 '/' Capacity=0.43 cfs Outflow=0.17 cfs 0.015 af

Reach 1Rc: Overland Flow Avg. Flow Depth=0.03' Max Vel=0.31 fps Inflow=0.17 cfs 0.015 af
n=0.150 L=30.0' S=0.1167 '/' Capacity=74.58 cfs Outflow=0.17 cfs 0.015 af

Reach 2R: Overland Flow Avg. Flow Depth=0.07' Max Vel=0.22 fps Inflow=0.22 cfs 0.014 af
n=0.150 L=37.0' S=0.0297 '/' Capacity=1.78 cfs Outflow=0.19 cfs 0.014 af

Reach 3R: Overland Flow Avg. Flow Depth=0.20' Max Vel=0.21 fps Inflow=0.96 cfs 0.089 af
n=0.150 L=171.0' S=0.0068 '/' Capacity=0.14 cfs Outflow=0.14 cfs 0.056 af Overflow=0.82 cfs 0.032 af

Reach 4Ra: Driveway Segment 1 Avg. Flow Depth=0.02' Max Vel=1.10 fps Inflow=0.26 cfs 0.024 af
n=0.016 L=50.0' S=0.0260 '/' Capacity=56.25 cfs Outflow=0.26 cfs 0.024 af

Reach 4Rb: Driveway Segment 2 Avg. Flow Depth=0.02' Max Vel=0.91 fps Inflow=0.26 cfs 0.024 af
n=0.016 L=72.0' S=0.0139 '/' Capacity=41.11 cfs Outflow=0.26 cfs 0.024 af

Reach AP1: Analysis Point 1 Inflow=2.79 cfs 0.282 af
Outflow=2.79 cfs 0.282 af

Reach AP2: Analysis Point 2 Inflow=0.12 cfs 0.009 af
Outflow=0.12 cfs 0.009 af

Reach AP3: Analysis Point 3 Inflow=1.33 cfs 0.161 af
Outflow=1.33 cfs 0.161 af

Reach AP4: Analysis Point 4 Inflow=0.28 cfs 0.023 af
Outflow=0.28 cfs 0.023 af

Reach AP5: Analysis Point 5 Inflow=0.37 cfs 0.033 af
Outflow=0.37 cfs 0.033 af

Pond 1P: Depression Peak Elev=51.31' Storage=167 cf Inflow=0.21 cfs 0.019 af
Outflow=0.21 cfs 0.015 af

Pond 2P: Depression Peak Elev=55.31' Storage=33 cf Inflow=0.28 cfs 0.024 af
Outflow=0.26 cfs 0.024 af

Pond 3P: Depression Peak Elev=56.21' Storage=189 cf Inflow=0.23 cfs 0.019 af
Outflow=0.22 cfs 0.014 af

Pond 4P: Depression Peak Elev=53.11' Storage=236 cf Inflow=0.80 cfs 0.070 af
Outflow=0.78 cfs 0.065 af

Total Runoff Area = 2.382 ac Runoff Volume = 0.522 af Average Runoff Depth = 2.63"
77.22% Pervious = 1.840 ac 22.78% Impervious = 0.543 ac

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 1.85 cfs @ 12.26 hrs, Volume= 0.194 af, Depth> 3.34"
Routed to Reach AP1 : Analysis Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
12,369	98	Paved parking, HSG C
3,246	98	Roofs, HSG C
14,735	74	>75% Grass cover, Good, HSG C
30,350	86	Weighted Average
14,735		48.55% Pervious Area
15,615		51.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0100	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
2.4	22	0.0330	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
4.5	48	0.0330	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.2	22	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	66	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	18	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
19.4	254	Total			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 0.12 cfs @ 12.11 hrs, Volume= 0.009 af, Depth> 2.78"
Routed to Reach AP2 : Analysis Point 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
836	74	>75% Grass cover, Good, HSG C
478	98	Roofs, HSG C
388	70	Woods, Good, HSG C
1,702	80	Weighted Average
1,224		71.92% Pervious Area
478		28.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	26	0.0310	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
1.3	16	0.0750	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
1.7	13	0.1900	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
1.3	7	0.1140	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.5	5	0.5000	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
7.6	67	Total			

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 1.17 cfs @ 12.42 hrs, Volume= 0.146 af, Depth> 2.16"
Routed to Reach AP3 : Analysis Point 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
1,489	98	Roofs, HSG C
19,916	74	>75% Grass cover, Good, HSG C
13,776	70	Woods, Good, HSG C
35,181	73	Weighted Average
33,692		95.77% Pervious Area
1,489		4.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	48	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
9.8	41	0.0240	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
2.5	11	0.0520	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.3	22	0.0520	1.14		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.6	45	0.0670	1.29		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	20	0.1220	1.75		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
29.1	187	Total			

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 0.28 cfs @ 12.13 hrs, Volume= 0.023 af, Depth> 2.69"
Routed to Reach AP4 : Analysis Point 4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
1,661	74	>75% Grass cover, Good, HSG C
453	98	Paved parking, HSG C
736	98	Roofs, HSG C
1,558	70	Woods, Good, HSG C
4,408	79	Weighted Average
3,219		73.03% Pervious Area
1,189		26.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	5	0.0500	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
8.5	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
9.1	55	Total			

Summary for Subcatchment 5S: Subcatchment 5S

Runoff = 0.21 cfs @ 12.19 hrs, Volume= 0.019 af, Depth> 2.51"
Routed to Pond 1P : Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
597	98	Roofs, HSG C
2,345	74	>75% Grass cover, Good, HSG C
1,024	70	Woods, Good, HSG C
3,966	77	Weighted Average
3,369		84.95% Pervious Area
597		15.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	20	0.0200	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
10.3	40	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.1	7	0.1400	1.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.1	67	Total			

Summary for Subcatchment 6S: Subcatchment 6S

Runoff = 0.12 cfs @ 12.14 hrs, Volume= 0.010 af, Depth> 2.51"
Routed to Pond 2P : Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
323	98	Roofs, HSG C
1,641	74	>75% Grass cover, Good, HSG C
137	70	Woods, Good, HSG C
2,101	77	Weighted Average
1,778		84.63% Pervious Area
323		15.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	10	0.0260	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
6.3	66	0.0260	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
9.4	76	Total			

Summary for Subcatchment 7S: Subcatchment 7S

Runoff = 0.23 cfs @ 12.14 hrs, Volume= 0.019 af, Depth> 2.17"
Routed to Pond 3P : Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
3,271	74	>75% Grass cover, Good, HSG C
1,238	70	Woods, Good, HSG C
4,509	73	Weighted Average
4,509		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	34	0.0240	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
1.2	8	0.0240	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
9.6	42	Total			

Summary for Subcatchment 8S: Subcatchment 8S

Runoff = 0.80 cfs @ 12.17 hrs, Volume= 0.070 af, Depth> 2.77"
Routed to Pond 4P : Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
324	98	Roofs, HSG C
3,257	98	Paved parking, HSG C
9,288	74	>75% Grass cover, Good, HSG C
358	70	Woods, Good, HSG C
13,227	80	Weighted Average
9,646		72.93% Pervious Area
3,581		27.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	30	0.0330	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
1.3	10	0.0330	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.6	27	0.0100	0.80		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.21"
3.2	33	0.0360	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.5	36	0.0360	1.33		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.3	136	Total			

Summary for Subcatchment 9S: Subcatchment 9S

Runoff = 0.37 cfs @ 12.19 hrs, Volume= 0.033 af, Depth> 2.09"
Routed to Reach AP5 : Analysis Point 5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
1,091	74	>75% Grass cover, Good, HSG C
368	98	Roofs, HSG C
6,873	70	Woods, Good, HSG C
8,332	72	Weighted Average
7,964		95.58% Pervious Area
368		4.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	38	0.0370	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
8.5	62	0.0770	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.2	14	0.0857	1.46		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	50	0.0640	1.26		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.9	164	Total			

Summary for Reach 1Ra: Overland Flow

[80] Warning: Exceeded Pond 1P by 1.05' @ 0.00 hrs (2.56 cfs 5.434 af)

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 2.00" for 10 Yr 24 Hr event
Inflow = 0.21 cfs @ 12.21 hrs, Volume= 0.015 af
Outflow = 0.20 cfs @ 12.27 hrs, Volume= 0.015 af, Atten= 4%, Lag= 3.3 min
Routed to Reach 1Rb : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.20 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 0.07 fps, Avg. Travel Time= 8.0 min

Peak Storage= 35 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.12' , Surface Width= 10.73'
Bank-Full Depth= 0.20' Flow Area= 2.0 sf, Capacity= 0.54 cfs

6.00' x 0.20' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 20.0 '/' Top Width= 14.00'
Length= 35.0' Slope= 0.0100 '/'
Inlet Invert= 51.55', Outlet Invert= 51.20'

‡

Summary for Reach 1Rb: Overland Flow

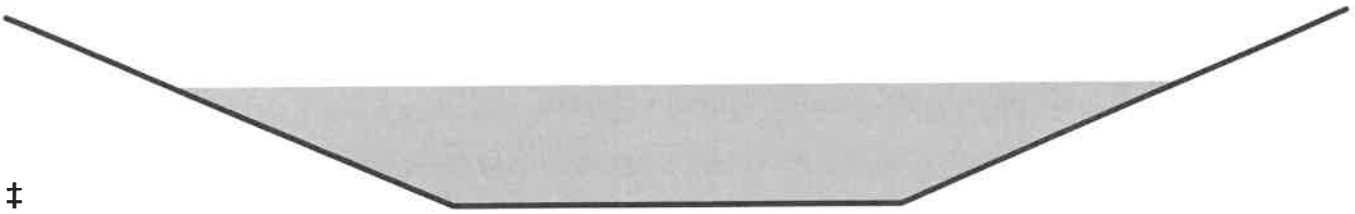
[62] Hint: Exceeded Reach 1Ra OUTLET depth by 0.02' @ 12.45 hrs

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 1.99" for 10 Yr 24 Hr event
Inflow = 0.20 cfs @ 12.27 hrs, Volume= 0.015 af
Outflow = 0.17 cfs @ 12.36 hrs, Volume= 0.015 af, Atten= 14%, Lag= 5.4 min
Routed to Reach 1Rc : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.42 fps, Min. Travel Time= 4.8 min
Avg. Velocity = 0.17 fps, Avg. Travel Time= 12.0 min

Peak Storage= 50 cf @ 12.36 hrs
Average Depth at Peak Storage= 0.13' , Surface Width= 4.51'
Bank-Full Depth= 0.20' Flow Area= 0.8 sf, Capacity= 0.43 cfs

2.00' x 0.20' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 10.0 '/' Top Width= 6.00'
Length= 122.0' Slope= 0.0443 '/'
Inlet Invert= 51.20', Outlet Invert= 45.80'



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Summary for Reach 1Rc: Overland Flow

[61] Hint: Exceeded Reach 1Rb outlet invert by 0.03' @ 12.35 hrs

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 1.98" for 10 Yr 24 Hr event
Inflow = 0.17 cfs @ 12.36 hrs, Volume= 0.015 af
Outflow = 0.17 cfs @ 12.37 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.9 min
Routed to Reach AP3 : Analysis Point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.31 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 0.16 fps, Avg. Travel Time= 3.1 min

Peak Storage= 17 cf @ 12.37 hrs
Average Depth at Peak Storage= 0.03' , Surface Width= 20.28'
Bank-Full Depth= 1.00' Flow Area= 25.0 sf, Capacity= 74.58 cfs

20.00' x 1.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 5.0 '/' Top Width= 30.00'
Length= 30.0' Slope= 0.1167 '/'
Inlet Invert= 45.80', Outlet Invert= 42.30'

‡

Summary for Reach 2R: Overland Flow

[80] Warning: Exceeded Pond 3P by 0.50' @ 0.00 hrs (1.16 cfs 2.439 af)

Inflow Area = 0.104 ac, 0.00% Impervious, Inflow Depth > 1.67" for 10 Yr 24 Hr event
Inflow = 0.22 cfs @ 12.21 hrs, Volume= 0.014 af
Outflow = 0.19 cfs @ 12.27 hrs, Volume= 0.014 af, Atten= 13%, Lag= 3.1 min
Routed to Pond 2P : Depression

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.22 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 0.09 fps, Avg. Travel Time= 6.8 min

Peak Storage= 32 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.07' , Surface Width= 17.93'
Bank-Full Depth= 0.20' Flow Area= 4.0 sf, Capacity= 1.78 cfs

30.00' x 0.20' deep Parabolic Channel, n= 0.150 Sheet flow over Short Grass
Length= 37.0' Slope= 0.0297 '/'
Inlet Invert= 56.40', Outlet Invert= 55.30'

‡

Summary for Reach 3R: Overland Flow

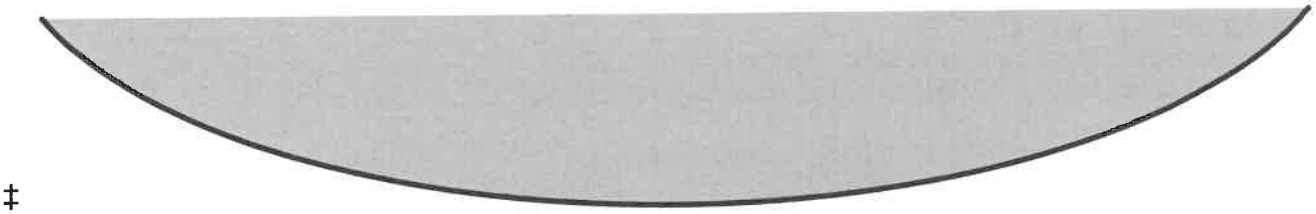
[62] Hint: Exceeded Reach 4Rb OUTLET depth by 0.19' @ 13.15 hrs
[80] Warning: Exceeded Pond 4P by 0.09' @ 13.10 hrs (0.81 cfs 0.184 af)

Inflow Area = 0.455 ac, 19.68% Impervious, Inflow Depth > 2.34" for 10 Yr 24 Hr event
Inflow = 0.96 cfs @ 12.23 hrs, Volume= 0.089 af
Outflow = 0.14 cfs @ 13.10 hrs, Volume= 0.056 af, Atten= 85%, Lag= 52.0 min
Routed to Reach AP1 : Analysis Point 1
Overflow = 0.82 cfs @ 12.23 hrs, Volume= 0.032 af
Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.21 fps, Min. Travel Time= 13.4 min
Avg. Velocity = 0.15 fps, Avg. Travel Time= 19.1 min

Peak Storage= 114 cf @ 13.10 hrs
Average Depth at Peak Storage= 0.20' , Surface Width= 5.00'
Bank-Full Depth= 0.20' Flow Area= 0.7 sf, Capacity= 0.14 cfs
Any excess flow will be diverted to the secondary overflow

5.00' x 0.20' deep Parabolic Channel, n= 0.150 Sheet flow over Short Grass
Length= 171.0' Slope= 0.0068 '/'
Inlet Invert= 53.00', Outlet Invert= 51.84'



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Summary for Reach 4Ra: Driveway Segment 1

[80] Warning: Exceeded Pond 2P by 0.01' @ 12.30 hrs (0.06 cfs 0.002 af)

Inflow Area = 0.152 ac, 4.89% Impervious, Inflow Depth > 1.88" for 10 Yr 24 Hr event
Inflow = 0.26 cfs @ 12.29 hrs, Volume= 0.024 af
Outflow = 0.26 cfs @ 12.30 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.6 min
Routed to Reach 4Rb : Driveway Segment 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.10 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 0.47 fps, Avg. Travel Time= 1.8 min

Peak Storage= 12 cf @ 12.30 hrs
Average Depth at Peak Storage= 0.02' , Surface Width= 12.04'
Bank-Full Depth= 0.50' Flow Area= 6.3 sf, Capacity= 56.25 cfs

12.00' x 0.50' deep channel, n= 0.016 Asphalt, rough
Side Slope Z-value= 1.0 '/' Top Width= 13.00'
Length= 50.0' Slope= 0.0260 '/'
Inlet Invert= 55.30', Outlet Invert= 54.00'

‡

Summary for Reach 4Rb: Driveway Segment 2

[61] Hint: Exceeded Reach 4Ra outlet invert by 0.02' @ 12.30 hrs

Inflow Area = 0.152 ac, 4.89% Impervious, Inflow Depth > 1.87" for 10 Yr 24 Hr event
Inflow = 0.26 cfs @ 12.30 hrs, Volume= 0.024 af
Outflow = 0.26 cfs @ 12.31 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.9 min
Routed to Reach 3R : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.91 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 0.36 fps, Avg. Travel Time= 3.3 min

Peak Storage= 21 cf @ 12.31 hrs
Average Depth at Peak Storage= 0.02' , Surface Width= 12.05'
Bank-Full Depth= 0.50' Flow Area= 6.3 sf, Capacity= 41.11 cfs

12.00' x 0.50' deep channel, n= 0.016 Asphalt, rough
Side Slope Z-value= 1.0 '/' Top Width= 13.00'
Length= 72.0' Slope= 0.0139 '/'
Inlet Invert= 54.00', Outlet Invert= 53.00'

‡

Summary for Reach AP1: Analysis Point 1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.152 ac, 38.89% Impervious, Inflow Depth > 2.93" for 10 Yr 24 Hr event
Inflow = 2.79 cfs @ 12.25 hrs, Volume= 0.282 af
Outflow = 2.79 cfs @ 12.25 hrs, Volume= 0.282 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP2: Analysis Point 2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.039 ac, 28.08% Impervious, Inflow Depth > 2.78" for 10 Yr 24 Hr event
Inflow = 0.12 cfs @ 12.11 hrs, Volume= 0.009 af
Outflow = 0.12 cfs @ 12.11 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP3: Analysis Point 3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.899 ac, 5.33% Impervious, Inflow Depth > 2.15" for 10 Yr 24 Hr event
Inflow = 1.33 cfs @ 12.41 hrs, Volume= 0.161 af
Outflow = 1.33 cfs @ 12.41 hrs, Volume= 0.161 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP4: Analysis Point 4

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.101 ac, 26.97% Impervious, Inflow Depth > 2.69" for 10 Yr 24 Hr event
Inflow = 0.28 cfs @ 12.13 hrs, Volume= 0.023 af
Outflow = 0.28 cfs @ 12.13 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP5: Analysis Point 5

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.191 ac, 4.42% Impervious, Inflow Depth > 2.09" for 10 Yr 24 Hr event
Inflow = 0.37 cfs @ 12.19 hrs, Volume= 0.033 af
Outflow = 0.37 cfs @ 12.19 hrs, Volume= 0.033 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Pond 1P: Depression

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 2.51" for 10 Yr 24 Hr event
Inflow = 0.21 cfs @ 12.19 hrs, Volume= 0.019 af
Outflow = 0.21 cfs @ 12.21 hrs, Volume= 0.015 af, Atten= 1%, Lag= 1.7 min
Primary = 0.21 cfs @ 12.21 hrs, Volume= 0.015 af
Routed to Reach 1Ra : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 51.31' @ 12.15 hrs Surf.Area= 593 sf Storage= 167 cf

Plug-Flow detention time= 114.8 min calculated for 0.015 af (80% of inflow)
Center-of-Mass det. time= 37.3 min (873.3 - 836.0)

Volume	Invert	Avail.Storage	Storage Description
#1	50.50'	167 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
50.50	45	30.0	0	0	45
51.00	177	68.0	52	52	342
51.30	593	121.0	109	161	1,140
51.31	593	121.0	6	167	1,141

Device	Routing	Invert	Outlet Devices
#0	Primary	51.31'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	51.30'	**8.0' 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

Primary OutFlow Max=0.00 cfs @ 12.21 hrs HW=51.31' TW=51.66' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 2P: Depression

[62] Hint: Exceeded Reach 2R OUTLET depth by 0.01' @ 11.80 hrs

Inflow Area = 0.152 ac, 4.89% Impervious, Inflow Depth > 1.93" for 10 Yr 24 Hr event
Inflow = 0.28 cfs @ 12.26 hrs, Volume= 0.024 af
Outflow = 0.26 cfs @ 12.29 hrs, Volume= 0.024 af, Atten= 5%, Lag= 1.8 min
Primary = 0.26 cfs @ 12.29 hrs, Volume= 0.024 af
Routed to Reach 4Ra : Driveway Segment 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 55.31' @ 11.80 hrs Surf.Area= 126 sf Storage= 33 cf

Plug-Flow detention time= 24.2 min calculated for 0.024 af (97% of inflow)
Center-of-Mass det. time= 7.8 min (874.2 - 866.4)

Volume	Invert	Avail.Storage	Storage Description
#1	55.00'	33 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.00	88	0	0
55.30	126	32	32
55.31	126	1	33

Device	Routing	Invert	Outlet Devices
#0	Primary	55.31'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	55.30'	**45.0 deg x 8.0' long x 0.20' rise Sharp-Crested Vee/Trap Weir** Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 12.29 hrs HW=55.31' TW=55.32' (Dynamic Tailwater)
↑—**1=Sharp-Crested Vee/Trap Weir**(Controls 0.00 cfs)

Summary for Pond 3P: Depression

Inflow Area = 0.104 ac, 0.00% Impervious, Inflow Depth > 2.17" for 10 Yr 24 Hr event
Inflow = 0.23 cfs @ 12.14 hrs, Volume= 0.019 af
Outflow = 0.22 cfs @ 12.21 hrs, Volume= 0.014 af, Atten= 4%, Lag= 4.3 min
Primary = 0.22 cfs @ 12.21 hrs, Volume= 0.014 af
Routed to Reach 2R : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 56.21' @ 12.15 hrs Surf.Area= 1,071 sf Storage= 189 cf

Plug-Flow detention time= 127.5 min calculated for 0.014 af (77% of inflow)

Center-of-Mass det. time= 42.7 min (886.2 - 843.5)

Volume	Invert	Avail.Storage	Storage Description
#1	55.90'	189 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.90	52	0	0
56.00	456	25	25
56.20	1,071	153	178
56.21	1,071	11	189

Device	Routing	Invert	Outlet Devices
#0	Primary	56.21'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	56.20'	**45.0 deg x 4.0' long x 0.20' rise Sharp-Crested Vee/Trap Weir** Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 12.21 hrs HW=56.21' TW=56.46' (Dynamic Tailwater)
↑—**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Summary for Pond 4P: Depression

Inflow Area = 0.304 ac, 27.07% Impervious, Inflow Depth > 2.77" for 10 Yr 24 Hr event
Inflow = 0.80 cfs @ 12.17 hrs, Volume= 0.070 af
Outflow = 0.78 cfs @ 12.20 hrs, Volume= 0.065 af, Atten= 2%, Lag= 1.8 min
Primary = 0.78 cfs @ 12.20 hrs, Volume= 0.065 af
Routed to Reach 3R : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 53.11' @ 11.55 hrs Surf.Area= 1,846 sf Storage= 236 cf

Plug-Flow detention time= 56.0 min calculated for 0.065 af (92% of inflow)
Center-of-Mass det. time= 18.5 min (846.0 - 827.4)

Volume	Invert	Avail.Storage	Storage Description
#1	52.82'	236 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.82	5	0	0
53.00	889	80	80
53.10	1,846	137	217
53.11	1,846	18	236

Device	Routing	Invert	Outlet Devices
#0	Primary	53.11'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	53.10'	**45.0 deg x 8.0' long x 0.20' rise Sharp-Crested Vee/Trap Weir** Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 12.20 hrs HW=53.11' TW=53.20' (Dynamic Tailwater)
↑—**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=30,350 sf 51.45% Impervious Runoff Depth>4.56"
Flow Length=254' Tc=19.4 min CN=86 Runoff=2.49 cfs 0.265 af

Subcatchment2S: Subcatchment2S Runoff Area=1,702 sf 28.08% Impervious Runoff Depth>3.93"
Flow Length=67' Tc=7.6 min CN=80 Runoff=0.17 cfs 0.013 af

Subcatchment3S: Subcatchment3S Runoff Area=35,181 sf 4.23% Impervious Runoff Depth>3.21"
Flow Length=187' Tc=29.1 min CN=73 Runoff=1.75 cfs 0.216 af

Subcatchment4S: Subcatchment4S Runoff Area=4,408 sf 26.97% Impervious Runoff Depth>3.83"
Flow Length=55' Slope=0.0500 '/' Tc=9.1 min CN=79 Runoff=0.40 cfs 0.032 af

Subcatchment5S: Subcatchment5S Runoff Area=3,966 sf 15.05% Impervious Runoff Depth>3.62"
Flow Length=67' Tc=13.1 min CN=77 Runoff=0.31 cfs 0.027 af

Subcatchment6S: Subcatchment6S Runoff Area=2,101 sf 15.37% Impervious Runoff Depth>3.62"
Flow Length=76' Slope=0.0260 '/' Tc=9.4 min CN=77 Runoff=0.18 cfs 0.015 af

Subcatchment7S: Subcatchment7S Runoff Area=4,509 sf 0.00% Impervious Runoff Depth>3.22"
Flow Length=42' Slope=0.0240 '/' Tc=9.6 min CN=73 Runoff=0.34 cfs 0.028 af

Subcatchment8S: Subcatchment8S Runoff Area=13,227 sf 27.07% Impervious Runoff Depth>3.93"
Flow Length=136' Tc=12.3 min CN=80 Runoff=1.13 cfs 0.099 af

Subcatchment9S: Subcatchment9S Runoff Area=8,332 sf 4.42% Impervious Runoff Depth>3.13"
Flow Length=164' Tc=12.9 min CN=72 Runoff=0.55 cfs 0.050 af

Reach 1Ra: Overland Flow Avg. Flow Depth=0.15' Max Vel=0.23 fps Inflow=0.30 cfs 0.024 af
n=0.150 L=35.0' S=0.0100 '/' Capacity=0.54 cfs Outflow=0.29 cfs 0.024 af

Reach 1Rb: Overland Flow Avg. Flow Depth=0.16' Max Vel=0.48 fps Inflow=0.29 cfs 0.024 af
n=0.150 L=122.0' S=0.0443 '/' Capacity=0.43 cfs Outflow=0.28 cfs 0.023 af

Reach 1Rc: Overland Flow Avg. Flow Depth=0.04' Max Vel=0.37 fps Inflow=0.28 cfs 0.023 af
n=0.150 L=30.0' S=0.1167 '/' Capacity=74.58 cfs Outflow=0.28 cfs 0.023 af

Reach 2R: Overland Flow Avg. Flow Depth=0.09' Max Vel=0.26 fps Inflow=0.33 cfs 0.023 af
n=0.150 L=37.0' S=0.0297 '/' Capacity=1.78 cfs Outflow=0.32 cfs 0.023 af

Reach 3R: Overland Flow Avg. Flow Depth=0.20' Max Vel=0.21 fps Inflow=1.58 cfs 0.131 af
n=0.150 L=171.0' S=0.0068 '/' Capacity=0.14 cfs Outflow=0.14 cfs 0.074 af Overflow=1.44 cfs 0.057 af

Reach 4Ra: Driveway Segment 1 Avg. Flow Depth=0.03' Max Vel=1.39 fps Inflow=0.48 cfs 0.037 af
n=0.016 L=50.0' S=0.0260 '/' Capacity=56.25 cfs Outflow=0.48 cfs 0.037 af

Reach 4Rb: Driveway Segment 2 Avg. Flow Depth=0.03' Max Vel=1.15 fps Inflow=0.48 cfs 0.037 af
n=0.016 L=72.0' S=0.0139 '/' Capacity=41.11 cfs Outflow=0.48 cfs 0.037 af

Reach AP1: Analysis Point 1		Inflow=3.99 cfs 0.395 af Outflow=3.99 cfs 0.395 af
Reach AP2: Analysis Point 2		Inflow=0.17 cfs 0.013 af Outflow=0.17 cfs 0.013 af
Reach AP3: Analysis Point 3		Inflow=2.00 cfs 0.240 af Outflow=2.00 cfs 0.240 af
Reach AP4: Analysis Point 4		Inflow=0.40 cfs 0.032 af Outflow=0.40 cfs 0.032 af
Reach AP5: Analysis Point 5		Inflow=0.55 cfs 0.050 af Outflow=0.55 cfs 0.050 af
Pond 1P: Depression	Peak Elev=51.31' Storage=167 cf	Inflow=0.31 cfs 0.027 af Outflow=0.30 cfs 0.024 af
Pond 2P: Depression	Peak Elev=55.31' Storage=33 cf	Inflow=0.49 cfs 0.038 af Outflow=0.48 cfs 0.037 af
Pond 3P: Depression	Peak Elev=56.21' Storage=189 cf	Inflow=0.34 cfs 0.028 af Outflow=0.33 cfs 0.023 af
Pond 4P: Depression	Peak Elev=53.11' Storage=236 cf	Inflow=1.13 cfs 0.099 af Outflow=1.11 cfs 0.094 af

Total Runoff Area = 2.382 ac Runoff Volume = 0.745 af Average Runoff Depth = 3.75"
77.22% Pervious = 1.840 ac 22.78% Impervious = 0.543 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=30,350 sf 51.45% Impervious Runoff Depth>5.72"
Flow Length=254' Tc=19.4 min CN=86 Runoff=3.10 cfs 0.332 af

Subcatchment2S: Subcatchment2S Runoff Area=1,702 sf 28.08% Impervious Runoff Depth>5.05"
Flow Length=67' Tc=7.6 min CN=80 Runoff=0.21 cfs 0.016 af

Subcatchment3S: Subcatchment3S Runoff Area=35,181 sf 4.23% Impervious Runoff Depth>4.25"
Flow Length=187' Tc=29.1 min CN=73 Runoff=2.32 cfs 0.286 af

Subcatchment4S: Subcatchment4S Runoff Area=4,408 sf 26.97% Impervious Runoff Depth>4.94"
Flow Length=55' Slope=0.0500 '/' Tc=9.1 min CN=79 Runoff=0.51 cfs 0.042 af

Subcatchment5S: Subcatchment5S Runoff Area=3,966 sf 15.05% Impervious Runoff Depth>4.71"
Flow Length=67' Tc=13.1 min CN=77 Runoff=0.40 cfs 0.036 af

Subcatchment6S: Subcatchment6S Runoff Area=2,101 sf 15.37% Impervious Runoff Depth>4.71"
Flow Length=76' Slope=0.0260 '/' Tc=9.4 min CN=77 Runoff=0.23 cfs 0.019 af

Subcatchment7S: Subcatchment7S Runoff Area=4,509 sf 0.00% Impervious Runoff Depth>4.27"
Flow Length=42' Slope=0.0240 '/' Tc=9.6 min CN=73 Runoff=0.45 cfs 0.037 af

Subcatchment8S: Subcatchment8S Runoff Area=13,227 sf 27.07% Impervious Runoff Depth>5.05"
Flow Length=136' Tc=12.3 min CN=80 Runoff=1.44 cfs 0.128 af

Subcatchment9S: Subcatchment9S Runoff Area=8,332 sf 4.42% Impervious Runoff Depth>4.15"
Flow Length=164' Tc=12.9 min CN=72 Runoff=0.74 cfs 0.066 af

Reach 1Ra: Overland Flow Avg. Flow Depth=0.17' Max Vel=0.24 fps Inflow=0.39 cfs 0.032 af
n=0.150 L=35.0' S=0.0100 '/' Capacity=0.54 cfs Outflow=0.38 cfs 0.032 af

Reach 1Rb: Overland Flow Avg. Flow Depth=0.18' Max Vel=0.52 fps Inflow=0.38 cfs 0.032 af
n=0.150 L=122.0' S=0.0443 '/' Capacity=0.43 cfs Outflow=0.36 cfs 0.032 af

Reach 1Rc: Overland Flow Avg. Flow Depth=0.04' Max Vel=0.42 fps Inflow=0.36 cfs 0.032 af
n=0.150 L=30.0' S=0.1167 '/' Capacity=74.58 cfs Outflow=0.36 cfs 0.032 af

Reach 2R: Overland Flow Avg. Flow Depth=0.10' Max Vel=0.29 fps Inflow=0.44 cfs 0.032 af
n=0.150 L=37.0' S=0.0297 '/' Capacity=1.78 cfs Outflow=0.43 cfs 0.032 af

Reach 3R: Overland Flow Avg. Flow Depth=0.20' Max Vel=0.21 fps Inflow=2.04 cfs 0.173 af
n=0.150 L=171.0' S=0.0068 '/' Capacity=0.14 cfs Outflow=0.14 cfs 0.089 af Overflow=1.90 cfs 0.083 af

Reach 4Ra: Driveway Segment 1 Avg. Flow Depth=0.03' Max Vel=1.56 fps Inflow=0.63 cfs 0.051 af
n=0.016 L=50.0' S=0.0260 '/' Capacity=56.25 cfs Outflow=0.63 cfs 0.051 af

Reach 4Rb: Driveway Segment 2 Avg. Flow Depth=0.04' Max Vel=1.29 fps Inflow=0.63 cfs 0.051 af
n=0.016 L=72.0' S=0.0139 '/' Capacity=41.11 cfs Outflow=0.63 cfs 0.051 af

Reach AP1: Analysis Point 1 Inflow=5.04 cfs 0.504 af
Outflow=5.04 cfs 0.504 af

Reach AP2: Analysis Point 2 Inflow=0.21 cfs 0.016 af
Outflow=0.21 cfs 0.016 af

Reach AP3: Analysis Point 3 Inflow=2.63 cfs 0.318 af
Outflow=2.63 cfs 0.318 af

Reach AP4: Analysis Point 4 Inflow=0.51 cfs 0.042 af
Outflow=0.51 cfs 0.042 af

Reach AP5: Analysis Point 5 Inflow=0.74 cfs 0.066 af
Outflow=0.74 cfs 0.066 af

Pond 1P: Depression Peak Elev=51.31' Storage=167 cf Inflow=0.40 cfs 0.036 af
Outflow=0.39 cfs 0.032 af

Pond 2P: Depression Peak Elev=55.31' Storage=33 cf Inflow=0.64 cfs 0.051 af
Outflow=0.63 cfs 0.051 af

Pond 3P: Depression Peak Elev=56.21' Storage=189 cf Inflow=0.45 cfs 0.037 af
Outflow=0.44 cfs 0.032 af

Pond 4P: Depression Peak Elev=53.11' Storage=236 cf Inflow=1.44 cfs 0.128 af
Outflow=1.41 cfs 0.122 af

Total Runoff Area = 2.382 ac Runoff Volume = 0.962 af Average Runoff Depth = 4.84"
77.22% Pervious = 1.840 ac 22.78% Impervious = 0.543 ac

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 3.10 cfs @ 12.26 hrs, Volume= 0.332 af, Depth> 5.72"
Routed to Reach AP1 : Analysis Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
12,369	98	Paved parking, HSG C
3,246	98	Roofs, HSG C
14,735	74	>75% Grass cover, Good, HSG C
30,350	86	Weighted Average
14,735		48.55% Pervious Area
15,615		51.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	78	0.0100	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
2.4	22	0.0330	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
4.5	48	0.0330	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.2	22	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	66	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	18	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
19.4	254	Total			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 0.21 cfs @ 12.11 hrs, Volume= 0.016 af, Depth> 5.05"
Routed to Reach AP2 : Analysis Point 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
836	74	>75% Grass cover, Good, HSG C
478	98	Roofs, HSG C
388	70	Woods, Good, HSG C
1,702	80	Weighted Average
1,224		71.92% Pervious Area
478		28.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	26	0.0310	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
1.3	16	0.0750	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
1.7	13	0.1900	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
1.3	7	0.1140	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.5	5	0.5000	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
7.6	67	Total			

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 2.32 cfs @ 12.41 hrs, Volume= 0.286 af, Depth> 4.25"
Routed to Reach AP3 : Analysis Point 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
1,489	98	Roofs, HSG C
19,916	74	>75% Grass cover, Good, HSG C
13,776	70	Woods, Good, HSG C
35,181	73	Weighted Average
33,692		95.77% Pervious Area
1,489		4.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	48	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
9.8	41	0.0240	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
2.5	11	0.0520	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.3	22	0.0520	1.14		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.6	45	0.0670	1.29		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	20	0.1220	1.75		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
29.1	187	Total			

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 0.51 cfs @ 12.13 hrs, Volume= 0.042 af, Depth> 4.94"
Routed to Reach AP4 : Analysis Point 4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
1,661	74	>75% Grass cover, Good, HSG C
453	98	Paved parking, HSG C
736	98	Roofs, HSG C
1,558	70	Woods, Good, HSG C
4,408	79	Weighted Average
3,219		73.03% Pervious Area
1,189		26.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	5	0.0500	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
8.5	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
9.1	55	Total			

Summary for Subcatchment 5S: Subcatchment 5S

Runoff = 0.40 cfs @ 12.18 hrs, Volume= 0.036 af, Depth> 4.71"
Routed to Pond 1P : Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
597	98	Roofs, HSG C
2,345	74	>75% Grass cover, Good, HSG C
1,024	70	Woods, Good, HSG C
3,966	77	Weighted Average
3,369		84.95% Pervious Area
597		15.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	20	0.0200	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
10.3	40	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.1	7	0.1400	1.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.1	67	Total			

Summary for Subcatchment 6S: Subcatchment 6S

Runoff = 0.23 cfs @ 12.13 hrs, Volume= 0.019 af, Depth> 4.71"
Routed to Pond 2P : Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
323	98	Roofs, HSG C
1,641	74	>75% Grass cover, Good, HSG C
137	70	Woods, Good, HSG C
2,101	77	Weighted Average
1,778		84.63% Pervious Area
323		15.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	10	0.0260	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
6.3	66	0.0260	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
9.4	76	Total			

Summary for Subcatchment 7S: Subcatchment 7S

Runoff = 0.45 cfs @ 12.14 hrs, Volume= 0.037 af, Depth> 4.27"
Routed to Pond 3P : Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
3,271	74	>75% Grass cover, Good, HSG C
1,238	70	Woods, Good, HSG C
4,509	73	Weighted Average
4,509		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	34	0.0240	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
1.2	8	0.0240	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
9.6	42	Total			

Summary for Subcatchment 8S: Subcatchment 8S

Runoff = 1.44 cfs @ 12.17 hrs, Volume= 0.128 af, Depth> 5.05"
Routed to Pond 4P : Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
324	98	Roofs, HSG C
3,257	98	Paved parking, HSG C
9,288	74	>75% Grass cover, Good, HSG C
358	70	Woods, Good, HSG C
13,227	80	Weighted Average
9,646		72.93% Pervious Area
3,581		27.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	30	0.0330	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
1.3	10	0.0330	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.6	27	0.0100	0.80		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.21"
3.2	33	0.0360	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.5	36	0.0360	1.33		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.3	136	Total			

Summary for Subcatchment 9S: Subcatchment 9S

Runoff = 0.74 cfs @ 12.18 hrs, Volume= 0.066 af, Depth> 4.15"
Routed to Reach AP5 : Analysis Point 5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
1,091	74	>75% Grass cover, Good, HSG C
368	98	Roofs, HSG C
6,873	70	Woods, Good, HSG C
8,332	72	Weighted Average
7,964		95.58% Pervious Area
368		4.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	38	0.0370	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
8.5	62	0.0770	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.2	14	0.0857	1.46		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	50	0.0640	1.26		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.9	164	Total			

Summary for Reach 1Ra: Overland Flow

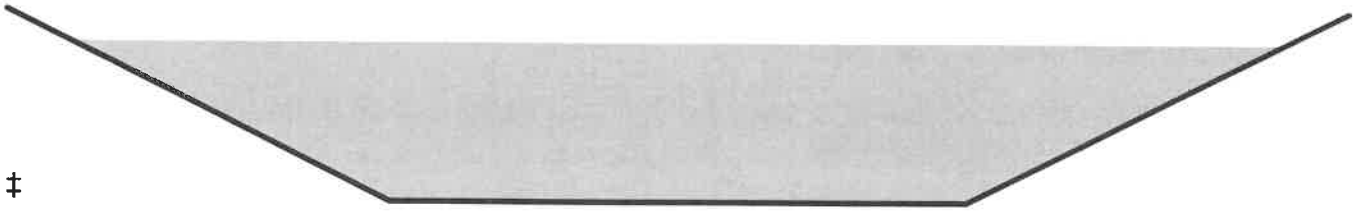
[80] Warning: Exceeded Pond 1P by 1.05' @ 0.00 hrs (2.56 cfs 5.636 af)

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 4.20" for 50 Yr 24 Hr event
Inflow = 0.39 cfs @ 12.21 hrs, Volume= 0.032 af
Outflow = 0.38 cfs @ 12.24 hrs, Volume= 0.032 af, Atten= 2%, Lag= 1.9 min
Routed to Reach 1Rb : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.24 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 0.09 fps, Avg. Travel Time= 6.4 min

Peak Storage= 54 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.17' , Surface Width= 12.67'
Bank-Full Depth= 0.20' Flow Area= 2.0 sf, Capacity= 0.54 cfs

6.00' x 0.20' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 20.0 '/' Top Width= 14.00'
Length= 35.0' Slope= 0.0100 '/'
Inlet Invert= 51.55', Outlet Invert= 51.20'



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Summary for Reach 1Rb: Overland Flow

[62] Hint: Exceeded Reach 1Ra OUTLET depth by 0.03' @ 12.40 hrs

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 4.19" for 50 Yr 24 Hr event
Inflow = 0.38 cfs @ 12.24 hrs, Volume= 0.032 af
Outflow = 0.36 cfs @ 12.29 hrs, Volume= 0.032 af, Atten= 5%, Lag= 3.0 min
Routed to Reach 1Rc : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.52 fps, Min. Travel Time= 3.9 min
Avg. Velocity = 0.21 fps, Avg. Travel Time= 9.8 min

Peak Storage= 85 cf @ 12.29 hrs
Average Depth at Peak Storage= 0.18' , Surface Width= 5.66'
Bank-Full Depth= 0.20' Flow Area= 0.8 sf, Capacity= 0.43 cfs

2.00' x 0.20' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 10.0 '/' Top Width= 6.00'
Length= 122.0' Slope= 0.0443 '/'
Inlet Invert= 51.20', Outlet Invert= 45.80'

‡

Summary for Reach 1Rc: Overland Flow

[61] Hint: Exceeded Reach 1Rb outlet invert by 0.04' @ 12.30 hrs

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 4.18" for 50 Yr 24 Hr event
Inflow = 0.36 cfs @ 12.29 hrs, Volume= 0.032 af
Outflow = 0.36 cfs @ 12.30 hrs, Volume= 0.032 af, Atten= 0%, Lag= 0.8 min
Routed to Reach AP3 : Analysis Point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.42 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 0.17 fps, Avg. Travel Time= 2.9 min

Peak Storage= 26 cf @ 12.30 hrs
Average Depth at Peak Storage= 0.04' , Surface Width= 20.43'
Bank-Full Depth= 1.00' Flow Area= 25.0 sf, Capacity= 74.58 cfs

20.00' x 1.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 5.0 '/' Top Width= 30.00'
Length= 30.0' Slope= 0.1167 '/'
Inlet Invert= 45.80', Outlet Invert= 42.30'

‡

Summary for Reach 2R: Overland Flow

[80] Warning: Exceeded Pond 3P by 0.50' @ 0.00 hrs (1.16 cfs 2.485 af)

Inflow Area = 0.104 ac, 0.00% Impervious, Inflow Depth > 3.76" for 50 Yr 24 Hr event
Inflow = 0.44 cfs @ 12.16 hrs, Volume= 0.032 af
Outflow = 0.43 cfs @ 12.19 hrs, Volume= 0.032 af, Atten= 3%, Lag= 1.8 min
Routed to Pond 2P : Depression

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.29 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 0.11 fps, Avg. Travel Time= 5.6 min

Peak Storage= 55 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.10' , Surface Width= 21.60'
Bank-Full Depth= 0.20' Flow Area= 4.0 sf, Capacity= 1.78 cfs

30.00' x 0.20' deep Parabolic Channel, n= 0.150 Sheet flow over Short Grass
Length= 37.0' Slope= 0.0297 '/'
Inlet Invert= 56.40', Outlet Invert= 55.30'

‡

Summary for Reach 3R: Overland Flow

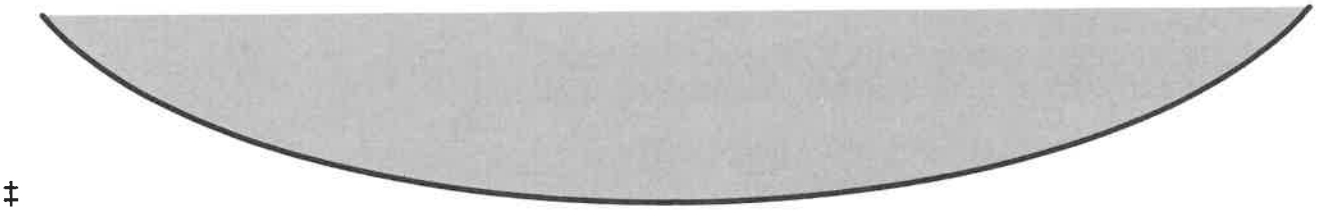
[62] Hint: Exceeded Reach 4Rb OUTLET depth by 0.19' @ 14.40 hrs
[80] Warning: Exceeded Pond 4P by 0.09' @ 14.35 hrs (0.81 cfs 0.360 af)

Inflow Area = 0.455 ac, 19.68% Impervious, Inflow Depth > 4.55" for 50 Yr 24 Hr event
Inflow = 2.04 cfs @ 12.20 hrs, Volume= 0.173 af
Outflow = 0.14 cfs @ 14.35 hrs, Volume= 0.089 af, Atten= 93%, Lag= 128.8 min
Routed to Reach AP1 : Analysis Point 1
Overflow = 1.90 cfs @ 12.20 hrs, Volume= 0.083 af
Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.21 fps, Min. Travel Time= 13.4 min
Avg. Velocity = 0.17 fps, Avg. Travel Time= 16.9 min

Peak Storage= 114 cf @ 14.35 hrs
Average Depth at Peak Storage= 0.20' , Surface Width= 5.00'
Bank-Full Depth= 0.20' Flow Area= 0.7 sf, Capacity= 0.14 cfs
Any excess flow will be diverted to the secondary overflow

5.00' x 0.20' deep Parabolic Channel, n= 0.150 Sheet flow over Short Grass
Length= 171.0' Slope= 0.0068 '/'
Inlet Invert= 53.00', Outlet Invert= 51.84'



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Summary for Reach 4Ra: Driveway Segment 1

[80] Warning: Exceeded Pond 2P by 0.02' @ 12.20 hrs (0.15 cfs 0.006 af)

Inflow Area = 0.152 ac, 4.89% Impervious, Inflow Depth > 4.00" for 50 Yr 24 Hr event
Inflow = 0.63 cfs @ 12.20 hrs, Volume= 0.051 af
Outflow = 0.63 cfs @ 12.20 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.3 min
Routed to Reach 4Rb : Driveway Segment 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.56 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.52 fps, Avg. Travel Time= 1.6 min

Peak Storage= 20 cf @ 12.20 hrs
Average Depth at Peak Storage= 0.03' , Surface Width= 12.07'
Bank-Full Depth= 0.50' Flow Area= 6.3 sf, Capacity= 56.25 cfs

12.00' x 0.50' deep channel, n= 0.016 Asphalt, rough
Side Slope Z-value= 1.0 '/' Top Width= 13.00'
Length= 50.0' Slope= 0.0260 '/'
Inlet Invert= 55.30', Outlet Invert= 54.00'

‡

Summary for Reach 4Rb: Driveway Segment 2

[62] Hint: Exceeded Reach 4Ra OUTLET depth by 0.01' @ 12.25 hrs

Inflow Area = 0.152 ac, 4.89% Impervious, Inflow Depth > 4.00" for 50 Yr 24 Hr event
Inflow = 0.63 cfs @ 12.20 hrs, Volume= 0.051 af
Outflow = 0.63 cfs @ 12.21 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.6 min
Routed to Reach 3R : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.29 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 0.41 fps, Avg. Travel Time= 3.0 min

Peak Storage= 35 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.04' , Surface Width= 12.08'
Bank-Full Depth= 0.50' Flow Area= 6.3 sf, Capacity= 41.11 cfs

12.00' x 0.50' deep channel, n= 0.016 Asphalt, rough
Side Slope Z-value= 1.0 '/' Top Width= 13.00'
Length= 72.0' Slope= 0.0139 '/'
Inlet Invert= 54.00', Outlet Invert= 53.00'

Summary for Reach AP1: Analysis Point 1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	1.152 ac,	38.89% Impervious,	Inflow Depth >	5.25"	for 50 Yr 24 Hr event
Inflow =	5.04 cfs @	12.23 hrs, Volume=	0.504 af		
Outflow =	5.04 cfs @	12.23 hrs, Volume=	0.504 af,	Atten= 0%,	Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP2: Analysis Point 2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	0.039 ac,	28.08% Impervious,	Inflow Depth >	5.05"	for 50 Yr 24 Hr event
Inflow =	0.21 cfs @	12.11 hrs, Volume=	0.016 af		
Outflow =	0.21 cfs @	12.11 hrs, Volume=	0.016 af,	Atten= 0%,	Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP3: Analysis Point 3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	0.899 ac,	5.33% Impervious,	Inflow Depth >	4.24"	for 50 Yr 24 Hr event
Inflow =	2.63 cfs @	12.39 hrs, Volume=	0.318 af		
Outflow =	2.63 cfs @	12.39 hrs, Volume=	0.318 af,	Atten= 0%,	Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP4: Analysis Point 4

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.101 ac, 26.97% Impervious, Inflow Depth > 4.94" for 50 Yr 24 Hr event
Inflow = 0.51 cfs @ 12.13 hrs, Volume= 0.042 af
Outflow = 0.51 cfs @ 12.13 hrs, Volume= 0.042 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP5: Analysis Point 5

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.191 ac, 4.42% Impervious, Inflow Depth > 4.15" for 50 Yr 24 Hr event
Inflow = 0.74 cfs @ 12.18 hrs, Volume= 0.066 af
Outflow = 0.74 cfs @ 12.18 hrs, Volume= 0.066 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Pond 1P: Depression

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 4.71" for 50 Yr 24 Hr event
Inflow = 0.40 cfs @ 12.18 hrs, Volume= 0.036 af
Outflow = 0.39 cfs @ 12.21 hrs, Volume= 0.032 af, Atten= 1%, Lag= 1.6 min
Primary = 0.39 cfs @ 12.21 hrs, Volume= 0.032 af
Routed to Reach 1Ra : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 51.31' @ 11.60 hrs Surf.Area= 593 sf Storage= 167 cf

Plug-Flow detention time= 74.2 min calculated for 0.032 af (89% of inflow)
Center-of-Mass det. time= 24.4 min (842.6 - 818.1)

Volume	Invert	Avail.Storage	Storage Description
#1	50.50'	167 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
50.50	45	30.0	0	0	45
51.00	177	68.0	52	52	342
51.30	593	121.0	109	161	1,140
51.31	593	121.0	6	167	1,141

Device	Routing	Invert	Outlet Devices
#0	Primary	51.31'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	51.30'	**8.0' 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

Primary OutFlow Max=0.00 cfs @ 12.21 hrs HW=51.31' TW=51.71' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 2P: Depression

[62] Hint: Exceeded Reach 2R OUTLET depth by 0.01' @ 11.60 hrs

Inflow Area = 0.152 ac, 4.89% Impervious, Inflow Depth > 4.06" for 50 Yr 24 Hr event
Inflow = 0.64 cfs @ 12.17 hrs, Volume= 0.051 af
Outflow = 0.63 cfs @ 12.20 hrs, Volume= 0.051 af, Atten= 2%, Lag= 1.7 min
Primary = 0.63 cfs @ 12.20 hrs, Volume= 0.051 af
Routed to Reach 4Ra : Driveway Segment 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 55.31' @ 11.60 hrs Surf.Area= 126 sf Storage= 33 cf

Plug-Flow detention time= 13.6 min calculated for 0.050 af (98% of inflow)
Center-of-Mass det. time= 5.3 min (843.3 - 838.0)

Volume	Invert	Avail.Storage	Storage Description
#1	55.00'	33 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.00	88	0	0
55.30	126	32	32
55.31	126	1	33

Device	Routing	Invert	Outlet Devices
#0	Primary	55.31'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	55.30'	**45.0 deg x 8.0' long x 0.20' rise Sharp-Crested Vee/Trap Weir** Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 12.20 hrs HW=55.31' TW=55.33' (Dynamic Tailwater)
↑—**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Summary for Pond 3P: Depression

Inflow Area = 0.104 ac, 0.00% Impervious, Inflow Depth > 4.27" for 50 Yr 24 Hr event
Inflow = 0.45 cfs @ 12.14 hrs, Volume= 0.037 af
Outflow = 0.44 cfs @ 12.16 hrs, Volume= 0.032 af, Atten= 2%, Lag= 1.5 min
Primary = 0.44 cfs @ 12.16 hrs, Volume= 0.032 af
Routed to Reach 2R : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 56.21' @ 11.80 hrs Surf.Area= 1,071 sf Storage= 189 cf

Plug-Flow detention time= 77.9 min calculated for 0.032 af (88% of inflow)

Center-of-Mass det. time= 24.3 min (848.5 - 824.2)

Volume	Invert	Avail.Storage	Storage Description
#1	55.90'	189 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.90	52	0	0
56.00	456	25	25
56.20	1,071	153	178
56.21	1,071	11	189

Device	Routing	Invert	Outlet Devices
#0	Primary	56.21'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	56.20'	**45.0 deg x 4.0' long x 0.20' rise Sharp-Crested Vee/Trap Weir** Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 12.16 hrs HW=56.21' TW=56.50' (Dynamic Tailwater)
↑—**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Summary for Pond 4P: Depression

Inflow Area = 0.304 ac, 27.07% Impervious, Inflow Depth > 5.05" for 50 Yr 24 Hr event
Inflow = 1.44 cfs @ 12.17 hrs, Volume= 0.128 af
Outflow = 1.41 cfs @ 12.20 hrs, Volume= 0.122 af, Atten= 2%, Lag= 1.7 min
Primary = 1.41 cfs @ 12.20 hrs, Volume= 0.122 af
Routed to Reach 3R : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 53.11' @ 10.10 hrs Surf.Area= 1,846 sf Storage= 236 cf

Plug-Flow detention time= 37.1 min calculated for 0.122 af (96% of inflow)
Center-of-Mass det. time= 13.9 min (824.4 - 810.5)

Volume	Invert	Avail.Storage	Storage Description
#1	52.82'	236 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.82	5	0	0
53.00	889	80	80
53.10	1,846	137	217
53.11	1,846	18	236

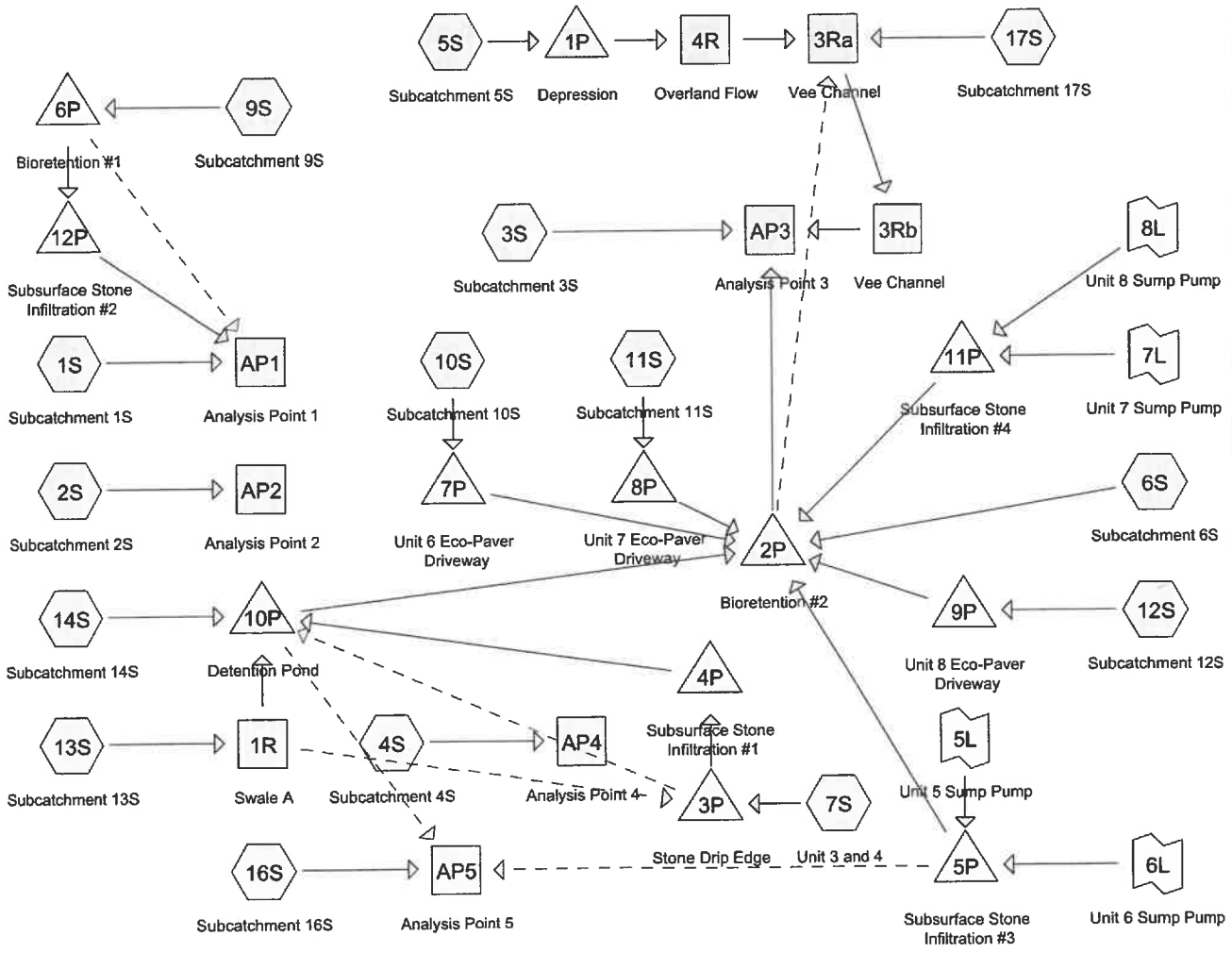
Device	Routing	Invert	Outlet Devices
#0	Primary	53.11'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	53.10'	**45.0 deg x 8.0' long x 0.20' rise Sharp-Crested Vee/Trap Weir** Cv= 2.56 (C= 3.20)

Primary OutFlow Max=0.00 cfs @ 12.20 hrs HW=53.11' TW=53.20' (Dynamic Tailwater)
↑—**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

APPENDIX II

PROPOSED CONDITIONS DRAINAGE ANALYSIS

Summary 2 YEAR
Complete 10 YEAR
Summary 25 YEAR
Complete 50 YEAR



Routing Diagram for 21254-PROPOSED
Prepared by Jones & Beach Engineers Inc, Printed 12/21/2022

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.169	74	>75% Grass cover, Good, HSG C (1S, 2S, 3S, 4S, 5S, 6S, 9S, 12S, 13S, 14S, 16S, 17S)
0.652	98	Paved parking, HSG C (1S, 4S, 6S, 9S, 10S, 11S, 12S, 17S)
0.406	98	Roofs, HSG C (1S, 2S, 4S, 5S, 6S, 7S, 9S, 10S, 11S, 12S, 13S, 14S, 16S, 17S)
0.006	98	Water Surface, HSG C (7S)
0.149	70	Woods, Good, HSG C (2S, 3S, 4S, 5S, 6S, 9S, 13S, 14S, 16S, 17S)
2.382	**84**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
2.382	HSG C	1S, 2S, 3S, 4S, 5S, 6S, 7S, 9S, 10S, 11S, 12S, 13S, 14S, 16S, 17S
0.000	HSG D	
0.000	Other	
2.382		**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=29,271 sf 57.36% Impervious Runoff Depth>2.00"
Flow Length=221' Tc=11.9 min CN=88 Runoff=1.29 cfs 0.112 af

Subcatchment2S: Subcatchment2S Runoff Area=1,702 sf 28.08% Impervious Runoff Depth>1.41"
Flow Length=67' Tc=7.6 min CN=80 Runoff=0.06 cfs 0.005 af

Subcatchment3S: Subcatchment3S Runoff Area=1,237 sf 0.00% Impervious Runoff Depth>0.99"
Flow Length=34' Tc=6.0 min CN=73 Runoff=0.03 cfs 0.002 af

Subcatchment4S: Subcatchment4S Runoff Area=3,492 sf 34.05% Impervious Runoff Depth>1.54"
Flow Length=47' Slope=0.0250 '/' Tc=9.4 min CN=82 Runoff=0.13 cfs 0.010 af

Subcatchment5S: Subcatchment5S Runoff Area=3,966 sf 15.05% Impervious Runoff Depth>1.22"
Flow Length=67' Tc=13.1 min CN=77 Runoff=0.10 cfs 0.009 af

Subcatchment6S: Subcatchment6S Runoff Area=28,965 sf 45.86% Impervious Runoff Depth>1.76"
Flow Length=133' Tc=19.6 min CN=85 Runoff=0.93 cfs 0.097 af

Subcatchment7S: Unit 3 and 4 Runoff Area=1,232 sf 100.00% Impervious Runoff Depth>2.98"
Tc=6.0 min CN=98 Runoff=0.09 cfs 0.007 af

Subcatchment9S: Subcatchment9S Runoff Area=10,560 sf 57.77% Impervious Runoff Depth>2.00"
Flow Length=72' Slope=0.0100 '/' Tc=6.0 min CN=88 Runoff=0.56 cfs 0.040 af

Subcatchment10S: Subcatchment10S Runoff Area=1,309 sf 100.00% Impervious Runoff Depth>2.98"
Tc=6.0 min CN=98 Runoff=0.09 cfs 0.007 af

Subcatchment11S: Subcatchment11S Runoff Area=1,297 sf 100.00% Impervious Runoff Depth>2.98"
Tc=6.0 min CN=98 Runoff=0.09 cfs 0.007 af

Subcatchment12S: Subcatchment12S Runoff Area=1,970 sf 66.04% Impervious Runoff Depth>2.18"
Tc=6.0 min CN=90 Runoff=0.11 cfs 0.008 af

Subcatchment13S: Subcatchment13S Runoff Area=1,624 sf 4.99% Impervious Runoff Depth>1.04"
Flow Length=43' Tc=7.1 min CN=74 Runoff=0.04 cfs 0.003 af

Subcatchment14S: Subcatchment14S Runoff Area=6,327 sf 19.36% Impervious Runoff Depth>1.34"
Flow Length=50' Slope=0.0230 '/' Tc=6.0 min CN=79 Runoff=0.22 cfs 0.016 af

Subcatchment16S: Subcatchment16S Runoff Area=4,616 sf 12.56% Impervious Runoff Depth>1.16"
Flow Length=64' Tc=7.8 min CN=76 Runoff=0.13 cfs 0.010 af

Subcatchment17S: Subcatchment17S Runoff Area=6,175 sf 14.35% Impervious Runoff Depth>1.21"
Flow Length=95' Slope=0.0050 '/' Tc=16.3 min CN=77 Runoff=0.14 cfs 0.014 af

Reach 1R: Swale A Avg. Flow Depth=0.22' Max Vel=0.22 fps Inflow=0.04 cfs 0.003 af
n=0.150 L=100.0' S=0.0100 '/' Capacity=0.70 cfs Outflow=0.03 cfs 0.003 af Overflow=0.00 cfs 0.000 af

Reach 3Ra: Vee Channel Avg. Flow Depth=0.30' Max Vel=0.54 fps Inflow=0.14 cfs 0.020 af
n=0.150 L=50.0' S=0.0400 '/' Capacity=3.62 cfs Outflow=0.14 cfs 0.020 af

Reach 3Rb: Vee Channel Avg. Flow Depth=0.27' Max Vel=0.67 fps Inflow=0.14 cfs 0.020 af
n=0.150 L=35.0' S=0.0714 '/' Capacity=4.83 cfs Outflow=0.14 cfs 0.020 af

Reach 4R: Overland Flow Avg. Flow Depth=0.12' Max Vel=0.10 fps Inflow=0.05 cfs 0.005 af
n=0.150 L=83.0' S=0.0047 '/' Capacity=1.01 cfs Outflow=0.02 cfs 0.005 af

Reach AP1: Analysis Point 1 Inflow=1.29 cfs 0.112 af
Outflow=1.29 cfs 0.112 af

Reach AP2: Analysis Point 2 Inflow=0.06 cfs 0.005 af
Outflow=0.06 cfs 0.005 af

Reach AP3: Analysis Point 3 Inflow=0.16 cfs 0.022 af
Outflow=0.16 cfs 0.022 af

Reach AP4: Analysis Point 4 Inflow=0.13 cfs 0.010 af
Outflow=0.13 cfs 0.010 af

Reach AP5: Analysis Point 5 Inflow=0.13 cfs 0.010 af
Outflow=0.13 cfs 0.010 af

Pond 1P: Depression Peak Elev=51.31' Storage=167 cf Inflow=0.10 cfs 0.009 af
Outflow=0.05 cfs 0.005 af

Pond 2P: Bioretention #2 Peak Elev=49.85' Storage=2,206 cf Inflow=1.08 cfs 0.117 af
Discarded=0.18 cfs 0.112 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.112 af

Pond 3P: Stone Drip Edge Peak Elev=55.29' Storage=20 cf Inflow=0.09 cfs 0.007 af
Primary=0.08 cfs 0.007 af Secondary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.007 af

Pond 4P: Subsurface Stone Infiltration #1 Peak Elev=54.97' Storage=0.001 af Inflow=0.08 cfs 0.007 af
Discarded=0.03 cfs 0.007 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.007 af

Pond 5P: Subsurface Stone Infiltration #3 Peak Elev=51.38' Storage=0.002 af Inflow=0.05 cfs 0.051 af
Discarded=0.04 cfs 0.050 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.050 af

Pond 6P: Bioretention #1 Peak Elev=53.87' Storage=384 cf Inflow=0.56 cfs 0.040 af
Discarded=0.26 cfs 0.040 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.26 cfs 0.040 af

Pond 7P: Unit 6 Eco-Paver Driveway Peak Elev=50.44' Storage=131 cf Inflow=0.09 cfs 0.007 af
Discarded=0.01 cfs 0.007 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.007 af

Pond 8P: Unit 7 Eco-Paver Driveway Peak Elev=51.91' Storage=97 cf Inflow=0.09 cfs 0.007 af
Discarded=0.02 cfs 0.007 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.007 af

Pond 9P: Unit 8 Eco-Paver Driveway Peak Elev=49.83' Storage=117 cf Inflow=0.11 cfs 0.008 af
Discarded=0.03 cfs 0.008 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.008 af

Pond 10P: Detention Pond Peak Elev=53.06' Storage=14 cf Inflow=0.24 cfs 0.019 af
Primary=0.24 cfs 0.019 af Secondary=0.00 cfs 0.000 af Outflow=0.24 cfs 0.019 af

Pond 11P: Subsurface Stone Infiltration #4 Peak Elev=50.59' Storage=0.006 af Inflow=0.06 cfs 0.056 af
Discarded=0.06 cfs 0.056 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.056 af

Pond 12P: Subsurface Stone Infiltration #2 Peak Elev=51.30' Storage=0.000 af Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Link 5L: Unit 5 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.044 af
Primary=0.04 cfs 0.044 af

Link 6L: Unit 6 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.007 af
Primary=0.04 cfs 0.007 af

Link 7L: Unit 7 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.036 af
Primary=0.04 cfs 0.036 af

Link 8L: Unit 8 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.020 af
Primary=0.04 cfs 0.020 af

Total Runoff Area = 2.382 ac Runoff Volume = 0.351 af Average Runoff Depth = 1.77"
55.32% Pervious = 1.318 ac 44.68% Impervious = 1.064 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=29,271 sf 57.36% Impervious Runoff Depth>3.54"
Flow Length=221' Tc=11.9 min CN=88 Runoff=2.24 cfs 0.198 af

Subcatchment2S: Subcatchment2S Runoff Area=1,702 sf 28.08% Impervious Runoff Depth>2.78"
Flow Length=67' Tc=7.6 min CN=80 Runoff=0.12 cfs 0.009 af

Subcatchment3S: Subcatchment3S Runoff Area=1,237 sf 0.00% Impervious Runoff Depth>2.18"
Flow Length=34' Tc=6.0 min CN=73 Runoff=0.07 cfs 0.005 af

Subcatchment4S: Subcatchment4S Runoff Area=3,492 sf 34.05% Impervious Runoff Depth>2.96"
Flow Length=47' Slope=0.0250 '/' Tc=9.4 min CN=82 Runoff=0.24 cfs 0.020 af

Subcatchment5S: Subcatchment5S Runoff Area=3,966 sf 15.05% Impervious Runoff Depth>2.51"
Flow Length=67' Tc=13.1 min CN=77 Runoff=0.21 cfs 0.019 af

Subcatchment6S: Subcatchment6S Runoff Area=28,965 sf 45.86% Impervious Runoff Depth>3.24"
Flow Length=133' Tc=19.6 min CN=85 Runoff=1.71 cfs 0.179 af

Subcatchment7S: Unit 3 and 4 Runoff Area=1,232 sf 100.00% Impervious Runoff Depth>4.63"
Tc=6.0 min CN=98 Runoff=0.13 cfs 0.011 af

Subcatchment9S: Subcatchment9S Runoff Area=10,560 sf 57.77% Impervious Runoff Depth>3.54"
Flow Length=72' Slope=0.0100 '/' Tc=6.0 min CN=88 Runoff=0.96 cfs 0.072 af

Subcatchment10S: Subcatchment10S Runoff Area=1,309 sf 100.00% Impervious Runoff Depth>4.63"
Tc=6.0 min CN=98 Runoff=0.14 cfs 0.012 af

Subcatchment11S: Subcatchment11S Runoff Area=1,297 sf 100.00% Impervious Runoff Depth>4.63"
Tc=6.0 min CN=98 Runoff=0.14 cfs 0.011 af

Subcatchment12S: Subcatchment12S Runoff Area=1,970 sf 66.04% Impervious Runoff Depth>3.75"
Tc=6.0 min CN=90 Runoff=0.19 cfs 0.014 af

Subcatchment13S: Subcatchment13S Runoff Area=1,624 sf 4.99% Impervious Runoff Depth>2.26"
Flow Length=43' Tc=7.1 min CN=74 Runoff=0.09 cfs 0.007 af

Subcatchment14S: Subcatchment14S Runoff Area=6,327 sf 19.36% Impervious Runoff Depth>2.69"
Flow Length=50' Slope=0.0230 '/' Tc=6.0 min CN=79 Runoff=0.45 cfs 0.033 af

Subcatchment16S: Subcatchment16S Runoff Area=4,616 sf 12.56% Impervious Runoff Depth>2.43"
Flow Length=64' Tc=7.8 min CN=76 Runoff=0.28 cfs 0.021 af

Subcatchment17S: Subcatchment17S Runoff Area=6,175 sf 14.35% Impervious Runoff Depth>2.51"
Flow Length=95' Slope=0.0050 '/' Tc=16.3 min CN=77 Runoff=0.30 cfs 0.030 af

Reach 1R: Swale A Avg. Flow Depth=0.31' Max Vel=0.27 fps Inflow=0.09 cfs 0.007 af
n=0.150 L=100.0' S=0.0100 '/' Capacity=0.70 cfs Outflow=0.08 cfs 0.007 af Overflow=0.00 cfs 0.000 af

Reach 3Ra: Vee Channel Avg. Flow Depth=0.45' Max Vel=0.71 fps Inflow=0.42 cfs 0.045 af
n=0.150 L=50.0' S=0.0400 '/' Capacity=3.62 cfs Outflow=0.42 cfs 0.045 af

Reach 3Rb: Vee Channel Avg. Flow Depth=0.40' Max Vel=0.88 fps Inflow=0.42 cfs 0.045 af
n=0.150 L=35.0' S=0.0714 '/' Capacity=4.83 cfs Outflow=0.43 cfs 0.045 af

Reach 4R: Overland Flow Avg. Flow Depth=0.25' Max Vel=0.17 fps Inflow=0.21 cfs 0.015 af
n=0.150 L=83.0' S=0.0047 '/' Capacity=1.01 cfs Outflow=0.15 cfs 0.015 af

Reach AP1: Analysis Point 1 Inflow=2.24 cfs 0.198 af
Outflow=2.24 cfs 0.198 af

Reach AP2: Analysis Point 2 Inflow=0.12 cfs 0.009 af
Outflow=0.12 cfs 0.009 af

Reach AP3: Analysis Point 3 Inflow=0.46 cfs 0.050 af
Outflow=0.46 cfs 0.050 af

Reach AP4: Analysis Point 4 Inflow=0.24 cfs 0.020 af
Outflow=0.24 cfs 0.020 af

Reach AP5: Analysis Point 5 Inflow=0.28 cfs 0.021 af
Outflow=0.28 cfs 0.021 af

Pond 1P: Depression Peak Elev=51.31' Storage=167 cf Inflow=0.21 cfs 0.019 af
Outflow=0.21 cfs 0.015 af

Pond 2P: Bioretention #2 Peak Elev=50.65' Storage=4,756 cf Inflow=2.01 cfs 0.219 af
Discarded=0.23 cfs 0.205 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.23 cfs 0.205 af

Pond 3P: Stone Drip Edge Peak Elev=55.34' Storage=25 cf Inflow=0.13 cfs 0.011 af
Primary=0.12 cfs 0.011 af Secondary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.011 af

Pond 4P: Subsurface Stone Infiltration #1 Peak Elev=55.21' Storage=0.002 af Inflow=0.12 cfs 0.011 af
Discarded=0.05 cfs 0.011 af Primary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.011 af

Pond 5P: Subsurface Stone Infiltration #3 Peak Elev=51.38' Storage=0.002 af Inflow=0.05 cfs 0.051 af
Discarded=0.04 cfs 0.050 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.050 af

Pond 6P: Bioretention #1 Peak Elev=54.43' Storage=787 cf Inflow=0.96 cfs 0.072 af
Discarded=0.32 cfs 0.072 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.32 cfs 0.072 af

Pond 7P: Unit 6 Eco-Paver Driveway Peak Elev=51.73' Storage=201 cf Inflow=0.14 cfs 0.012 af
Discarded=0.03 cfs 0.012 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.012 af

Pond 8P: Unit 7 Eco-Paver Driveway Peak Elev=52.98' Storage=130 cf Inflow=0.14 cfs 0.011 af
Discarded=0.06 cfs 0.011 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.011 af

Pond 9P: Unit 8 Eco-Paver Driveway Peak Elev=50.37' Storage=209 cf Inflow=0.19 cfs 0.014 af
Discarded=0.05 cfs 0.014 af Primary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.014 af

Pond 10P: Detention Pond Peak Elev=53.10' Storage=23 cf Inflow=0.51 cfs 0.040 af
Primary=0.51 cfs 0.039 af Secondary=0.00 cfs 0.000 af Outflow=0.51 cfs 0.039 af

Pond 11P: Subsurface Stone Infiltration #4 Peak Elev=50.59' Storage=0.006 af Inflow=0.06 cfs 0.056 af
Discarded=0.06 cfs 0.056 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.056 af

Pond 12P: Subsurface Stone Infiltration #2 Peak Elev=51.30' Storage=0.000 af Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Link 5L: Unit 5 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.044 af
Primary=0.04 cfs 0.044 af

Link 6L: Unit 6 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.007 af
Primary=0.04 cfs 0.007 af

Link 7L: Unit 7 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.036 af
Primary=0.04 cfs 0.036 af

Link 8L: Unit 8 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.020 af
Primary=0.04 cfs 0.020 af

Total Runoff Area = 2.382 ac Runoff Volume = 0.641 af Average Runoff Depth = 3.23"
55.32% Pervious = 1.318 ac 44.68% Impervious = 1.064 ac

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 2.24 cfs @ 12.16 hrs, Volume= 0.198 af, Depth> 3.54"
Routed to Reach AP1 : Analysis Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
14,174	98	Paved parking, HSG C
2,616	98	Roofs, HSG C
12,481	74	>75% Grass cover, Good, HSG C
29,271	88	Weighted Average
12,481		42.64% Pervious Area
16,790		57.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0220	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.3	15	0.0167	0.90		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	22	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.0	84	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.9	221	Total			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 0.12 cfs @ 12.11 hrs, Volume= 0.009 af, Depth> 2.78"
Routed to Reach AP2 : Analysis Point 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
836	74	>75% Grass cover, Good, HSG C
478	98	Roofs, HSG C
388	70	Woods, Good, HSG C
1,702	80	Weighted Average
1,224		71.92% Pervious Area
478		28.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	26	0.0310	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
1.3	16	0.0750	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
1.7	13	0.1900	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
1.3	7	0.1140	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.5	5	0.5000	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
7.6	67	Total			

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 0.07 cfs @ 12.10 hrs, Volume= 0.005 af, Depth> 2.18"
Routed to Reach AP3 : Analysis Point 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
951	74	>75% Grass cover, Good, HSG C
286	70	Woods, Good, HSG C
1,237	73	Weighted Average
1,237		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	17	0.3300	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.5	11	0.3300	0.34		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
1.0	6	0.1670	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
3.2	34	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 0.24 cfs @ 12.13 hrs, Volume= 0.020 af, Depth> 2.96"
Routed to Reach AP4 : Analysis Point 4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
1,717	74	>75% Grass cover, Good, HSG C
453	98	Paved parking, HSG C
736	98	Roofs, HSG C
586	70	Woods, Good, HSG C
3,492	82	Weighted Average
2,303		65.95% Pervious Area
1,189		34.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	20	0.0250	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
6.9	27	0.0250	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
9.4	47	Total			

Summary for Subcatchment 5S: Subcatchment 5S

Runoff = 0.21 cfs @ 12.19 hrs, Volume= 0.019 af, Depth> 2.51"
Routed to Pond 1P : Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
597	98	Roofs, HSG C
2,345	74	>75% Grass cover, Good, HSG C
1,024	70	Woods, Good, HSG C
3,966	77	Weighted Average
3,369		84.95% Pervious Area
597		15.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	20	0.0200	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
10.3	40	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.1	7	0.1400	1.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.1	67	Total			

Summary for Subcatchment 6S: Subcatchment 6S

Runoff = 1.71 cfs @ 12.27 hrs, Volume= 0.179 af, Depth> 3.24"
Routed to Pond 2P : Bioretention #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
8,011	98	Paved parking, HSG C
5,272	98	Roofs, HSG C
14,477	74	>75% Grass cover, Good, HSG C
1,205	70	Woods, Good, HSG C
28,965	85	Weighted Average
15,682		54.14% Pervious Area
13,283		45.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	22	0.0450	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
16.6	78	0.0230	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.4	11	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.5	22	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
19.6	133	Total			

Summary for Subcatchment 7S: Unit 3 and 4

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af, Depth> 4.63"
Routed to Pond 3P : Stone Drip Edge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
984	98	Roofs, HSG C
248	98	Water Surface, HSG C
1,232	98	Weighted Average
1,232		100.00% Impervious Area

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

Summary for Subcatchment 9S: Subcatchment 9S

Runoff = 0.96 cfs @ 12.09 hrs, Volume= 0.072 af, Depth> 3.54"
Routed to Pond 6P : Bioretention #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
4,178	98	Paved parking, HSG C
1,922	98	Roofs, HSG C
4,331	74	>75% Grass cover, Good, HSG C
129	70	Woods, Good, HSG C
10,560	88	Weighted Average
4,460		42.23% Pervious Area
6,100		57.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	14	0.0100	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.8	45	0.0100	0.89		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.21"
0.3	13	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.8	72	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 10S: Subcatchment 10S

Runoff = 0.14 cfs @ 12.09 hrs, Volume= 0.012 af, Depth> 4.63"
Routed to Pond 7P : Unit 6 Eco-Paver Driveway

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
876	98	Roofs, HSG C
433	98	Paved parking, HSG C
1,309	98	Weighted Average
1,309		100.00% Impervious Area

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

Summary for Subcatchment 11S: Subcatchment 11S

Runoff = 0.14 cfs @ 12.09 hrs, Volume= 0.011 af, Depth> 4.63"
Routed to Pond 8P : Unit 7 Eco-Paver Driveway

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
876	98	Roofs, HSG C
421	98	Paved parking, HSG C
1,297	98	Weighted Average
1,297		100.00% Impervious Area

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

Summary for Subcatchment 12S: Subcatchment 12S

Runoff = 0.19 cfs @ 12.09 hrs, Volume= 0.014 af, Depth> 3.75"
Routed to Pond 9P : Unit 8 Eco-Paver Driveway

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
876	98	Roofs, HSG C
425	98	Paved parking, HSG C
669	74	>75% Grass cover, Good, HSG C
1,970	90	Weighted Average
669		33.96% Pervious Area
1,301		66.04% Impervious Area

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

Summary for Subcatchment 13S: Subcatchment 13S

Runoff = 0.09 cfs @ 12.11 hrs, Volume= 0.007 af, Depth> 2.26"
Routed to Reach 1R : Swale A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
1,013	74	>75% Grass cover, Good, HSG C
530	70	Woods, Good, HSG C
81	98	Roofs, HSG C
1,624	74	Weighted Average
1,543		95.01% Pervious Area
81		4.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	28	0.0210	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
3.3	10	0.0210	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.3	5	0.3300	0.29		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
7.1	43	Total			

Summary for Subcatchment 14S: Subcatchment 14S

Runoff = 0.45 cfs @ 12.09 hrs, Volume= 0.033 af, Depth> 2.69"
Routed to Pond 10P : Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
5,067	74	>75% Grass cover, Good, HSG C
35	70	Woods, Good, HSG C
1,225	98	Roofs, HSG C
6,327	79	Weighted Average
5,102		80.64% Pervious Area
1,225		19.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0230	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
5.3	50	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 16S: Subcatchment 16S

Runoff = 0.28 cfs @ 12.11 hrs, Volume= 0.021 af, Depth> 2.43"
Routed to Reach AP5 : Analysis Point 5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
3,173	74	>75% Grass cover, Good, HSG C
863	70	Woods, Good, HSG C
580	98	Roofs, HSG C
4,616	76	Weighted Average
4,036		87.44% Pervious Area
580		12.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	41	0.0120	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.6	12	0.3300	0.34		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.6	5	0.0500	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.7	6	0.3300	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
7.8	64	Total			

Summary for Subcatchment 17S: Subcatchment 17S

Runoff = 0.30 cfs @ 12.23 hrs, Volume= 0.030 af, Depth> 2.51"
Routed to Reach 3Ra : Vee Channel

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr Rainfall=4.87"

Area (sf)	CN	Description
3,861	74	>75% Grass cover, Good, HSG C
1,428	70	Woods, Good, HSG C
301	98	Paved parking, HSG C
585	98	Roofs, HSG C
6,175	77	Weighted Average
5,289		85.65% Pervious Area
886		14.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	95	0.0050	0.10		**Sheet Flow, Longest path to enter the Vee Channel** Grass: Short n= 0.150 P2= 3.21"

Summary for Reach 1R: Swale A

Inflow Area = 0.037 ac, 4.99% Impervious, Inflow Depth > 2.26" for 10 Yr 24 Hr event
Inflow = 0.09 cfs @ 12.11 hrs, Volume= 0.007 af
Outflow = 0.08 cfs @ 12.17 hrs, Volume= 0.007 af, Atten= 18%, Lag= 4.0 min
Routed to Pond 10P : Detention Pond
Overflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 3P : Stone Drip Edge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.27 fps, Min. Travel Time= 6.1 min
Avg. Velocity = 0.12 fps, Avg. Travel Time= 13.4 min

Peak Storage= 28 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.31' , Surface Width= 1.84'
Bank-Full Depth= 0.70' Flow Area= 1.5 sf, Capacity= 0.70 cfs
Any excess flow will be diverted to the secondary overflow

0.00' x 0.70' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 3.0 '/' Top Width= 4.20'
Length= 100.0' Slope= 0.0100 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'

Summary for Reach 3Ra: Vee Channel

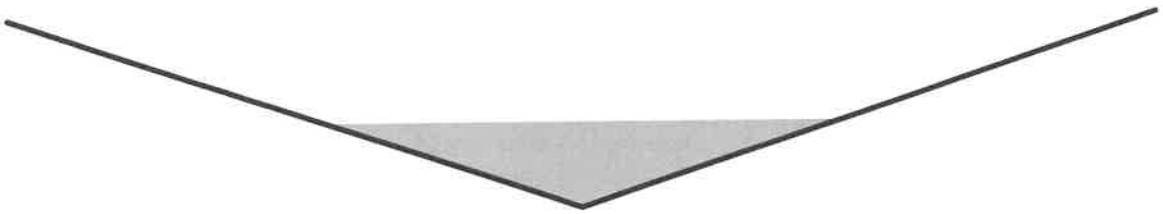
[62] Hint: Exceeded Reach 4R OUTLET depth by 0.33' @ 12.10 hrs

Inflow Area = 0.233 ac, 14.62% Impervious, Inflow Depth > 2.30" for 10 Yr 24 Hr event
Inflow = 0.42 cfs @ 12.28 hrs, Volume= 0.045 af
Outflow = 0.42 cfs @ 12.30 hrs, Volume= 0.045 af, Atten= 0%, Lag= 1.1 min
Routed to Reach 3Rb : Vee Channel

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.71 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 0.33 fps, Avg. Travel Time= 2.5 min

Peak Storage= 30 cf @ 12.30 hrs
Average Depth at Peak Storage= 0.45' , Surface Width= 2.69'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 3.62 cfs

0.00' x 1.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 50.0' Slope= 0.0400 '/'
Inlet Invert= 51.00', Outlet Invert= 49.00'



Summary for Reach 3Rb: Vee Channel

[61] Hint: Exceeded Reach 3Ra outlet invert by 0.40' @ 12.30 hrs

Inflow Area = 0.233 ac, 14.62% Impervious, Inflow Depth > 2.30" for 10 Yr 24 Hr event
Inflow = 0.42 cfs @ 12.30 hrs, Volume= 0.045 af
Outflow = 0.43 cfs @ 12.31 hrs, Volume= 0.045 af, Atten= 0%, Lag= 0.5 min
Routed to Reach AP3 : Analysis Point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.88 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 0.41 fps, Avg. Travel Time= 1.4 min

Peak Storage= 17 cf @ 12.31 hrs
Average Depth at Peak Storage= 0.40' , Surface Width= 2.41'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 4.83 cfs

0.00' x 1.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 35.0' Slope= 0.0714 '/'
Inlet Invert= 49.00', Outlet Invert= 46.50'

Summary for Reach 4R: Overland Flow

[80] Warning: Exceeded Pond 1P by 0.89' @ 0.00 hrs (0.55 cfs 2.092 af)

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 2.00" for 10 Yr 24 Hr event
Inflow = 0.21 cfs @ 12.21 hrs, Volume= 0.015 af
Outflow = 0.15 cfs @ 12.36 hrs, Volume= 0.015 af, Atten= 26%, Lag= 8.9 min
Routed to Reach 3Ra : Vee Channel

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.17 fps, Min. Travel Time= 8.2 min
Avg. Velocity = 0.08 fps, Avg. Travel Time= 16.4 min

Peak Storage= 76 cf @ 12.36 hrs
Average Depth at Peak Storage= 0.25' , Surface Width= 7.40'
Bank-Full Depth= 0.50' Flow Area= 3.8 sf, Capacity= 1.01 cfs

0.00' x 0.50' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 15.0 '/' Top Width= 15.00'
Length= 83.0' Slope= 0.0047 '/'
Inlet Invert= 51.39', Outlet Invert= 51.00'

‡

Summary for Reach AP1: Analysis Point 1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.914 ac, 57.47% Impervious, Inflow Depth > 2.60" for 10 Yr 24 Hr event
Inflow = 2.24 cfs @ 12.16 hrs, Volume= 0.198 af
Outflow = 2.24 cfs @ 12.16 hrs, Volume= 0.198 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP2: Analysis Point 2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.039 ac, 28.08% Impervious, Inflow Depth > 2.78" for 10 Yr 24 Hr event
Inflow = 0.12 cfs @ 12.11 hrs, Volume= 0.009 af
Outflow = 0.12 cfs @ 12.11 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP3: Analysis Point 3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.242 ac, 39.21% Impervious, Inflow Depth > 0.48" for 10 Yr 24 Hr event
Inflow = 0.46 cfs @ 12.30 hrs, Volume= 0.050 af
Outflow = 0.46 cfs @ 12.30 hrs, Volume= 0.050 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP4: Analysis Point 4

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.080 ac, 34.05% Impervious, Inflow Depth > 2.96" for 10 Yr 24 Hr event
Inflow = 0.24 cfs @ 12.13 hrs, Volume= 0.020 af
Outflow = 0.24 cfs @ 12.13 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP5: Analysis Point 5

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.106 ac, 12.56% Impervious, Inflow Depth > 2.43" for 10 Yr 24 Hr event
Inflow = 0.28 cfs @ 12.11 hrs, Volume= 0.021 af
Outflow = 0.28 cfs @ 12.11 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Pond 1P: Depression

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 2.51" for 10 Yr 24 Hr event
Inflow = 0.21 cfs @ 12.19 hrs, Volume= 0.019 af
Outflow = 0.21 cfs @ 12.21 hrs, Volume= 0.015 af, Atten= 1%, Lag= 1.7 min
Primary = 0.21 cfs @ 12.21 hrs, Volume= 0.015 af
Routed to Reach 4R : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 51.31' @ 12.15 hrs Surf.Area= 593 sf Storage= 167 cf

Plug-Flow detention time= 114.8 min calculated for 0.015 af (80% of inflow)
Center-of-Mass det. time= 37.3 min (873.3 - 836.0)

Volume	Invert	Avail.Storage	Storage Description
#1	50.50'	167 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
50.50	45	30.0	0	0	45
51.00	177	68.0	52	52	342
51.30	593	121.0	109	161	1,140
51.31	593	121.0	6	167	1,141

Device	Routing	Invert	Outlet Devices
#0	Primary	51.31'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	51.30'	**8.0' 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

Primary OutFlow Max=0.00 cfs @ 12.21 hrs HW=51.31' TW=51.58' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 2P: Bioretention #2

Inflow Area = 0.981 ac, 46.18% Impervious, Inflow Depth > 2.68" for 10 Yr 24 Hr event
Inflow = 2.01 cfs @ 12.25 hrs, Volume= 0.219 af
Outflow = 0.23 cfs @ 13.67 hrs, Volume= 0.205 af, Atten= 89%, Lag= 85.4 min
Discarded = 0.23 cfs @ 13.67 hrs, Volume= 0.205 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach AP3 : Analysis Point 3
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach 3Ra : Vee Channel

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 50.65' @ 13.67 hrs Surf.Area= 3,523 sf Storage= 4,756 cf

Plug-Flow detention time= 238.3 min calculated for 0.204 af (93% of inflow)
Center-of-Mass det. time= 204.2 min (1,025.2 - 821.0)

Volume	Invert	Avail.Storage	Storage Description
#1	46.41'	8,120 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
46.41	1,080	138.0	0.0	0	0	1,080
46.42	1,080	138.0	40.0	4	4	1,081
47.74	1,080	138.0	40.0	570	575	1,264
47.75	1,080	138.0	15.0	2	576	1,265
49.24	1,080	138.0	15.0	241	818	1,471
49.25	1,080	138.0	100.0	11	828	1,472
49.50	2,550	271.0	100.0	441	1,269	5,801
50.00	2,971	283.0	100.0	1,379	2,648	6,348
51.00	3,839	301.0	100.0	3,396	6,044	7,234
51.50	4,298	310.0	100.0	2,033	8,077	7,697
51.51	4,331	315.0	100.0	43	8,120	7,946

Device	Routing	Invert	Outlet Devices
#1	Secondary	51.50'	**100.0' 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
#2	Primary	51.00'	**2.0' long + 3.0 '/' SideZ x 28.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#3	Discarded	46.41'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 46.25' Phase-In= 0.01'

Discarded OutFlow Max=0.23 cfs @ 13.67 hrs HW=50.65' (Free Discharge)
↑—**3=Exfiltration** (Controls 0.23 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.41' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.41' TW=51.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 3P: Stone Drip Edge

Inflow Area = 0.028 ac,100.00% Impervious, Inflow Depth > 4.63" for 10 Yr 24 Hr event
Inflow = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af
Outflow = 0.12 cfs @ 12.12 hrs, Volume= 0.011 af, Atten= 5%, Lag= 1.7 min
Primary = 0.12 cfs @ 12.12 hrs, Volume= 0.011 af
Routed to Pond 4P : Subsurface Stone Infiltration #1
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 10P : Detention Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 55.34' @ 12.12 hrs Surf.Area= 248 sf Storage= 25 cf

Plug-Flow detention time= 14.0 min calculated for 0.011 af (99% of inflow)
Center-of-Mass det. time= 9.5 min (757.5 - 748.0)

Volume	Invert	Avail.Storage	Storage Description
#1	55.09'	93 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.09	248	0.0	0	0
55.10	248	40.0	1	1
56.00	248	40.0	89	90
56.01	248	100.0	2	93

Device	Routing	Invert	Outlet Devices
#1	Primary	55.10'	**6.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 55.10' / 54.98' S= 0.0150 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Device 1	55.10'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	56.00'	**72.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.12 cfs @ 12.12 hrs HW=55.34' TW=55.01' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.12 cfs @ 1.31 fps)
└─**2=Orifice/Grate** (Passes 0.12 cfs of 0.15 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=55.09' TW=53.00' (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 4P: Subsurface Stone Infiltration #1

Inflow Area = 0.028 ac,100.00% Impervious, Inflow Depth > 4.60" for 10 Yr 24 Hr event
Inflow = 0.12 cfs @ 12.12 hrs, Volume= 0.011 af
Outflow = 0.05 cfs @ 12.37 hrs, Volume= 0.011 af, Atten= 62%, Lag= 15.3 min
Discarded = 0.05 cfs @ 12.37 hrs, Volume= 0.011 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 10P : Detention Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 55.21' @ 12.37 hrs Surf.Area= 0.009 ac Storage= 0.002 af

Plug-Flow detention time= 17.6 min calculated for 0.011 af (100% of inflow)
Center-of-Mass det. time= 17.3 min (774.8 - 757.5)

Volume	Invert	Avail.Storage	Storage Description
#1	54.60'	0.004 af	**15.00'W x 27.00'L x 1.01'H Prismatoid** 0.009 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	54.60'	**0.890 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 54.47' Phase-In= 0.01'
#2	Primary	55.60'	**20.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.05 cfs @ 12.37 hrs HW=55.21' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=54.60' TW=53.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 5P: Subsurface Stone Infiltration #3

Inflow	=	0.05 cfs @	2.01 hrs, Volume=	0.051 af
Outflow	=	0.04 cfs @	15.05 hrs, Volume=	0.050 af, Atten= 21%, Lag= 782.5 min
Discarded	=	0.04 cfs @	15.05 hrs, Volume=	0.050 af
Primary	=	0.00 cfs @	0.00 hrs, Volume=	0.000 af
Routed to Pond 2P : Bioretention #2				
Secondary	=	0.00 cfs @	0.00 hrs, Volume=	0.000 af
Routed to Reach AP5 : Analysis Point 5				

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 51.38' @ 15.05 hrs Surf.Area= 0.010 ac Storage= 0.002 af

Plug-Flow detention time= 41.9 min calculated for 0.050 af (99% of inflow)
Center-of-Mass det. time= 34.1 min (753.2 - 719.2)

Volume	Invert	Avail.Storage	Storage Description
#1	50.80'	0.006 af	**10.00'W x 45.00'L x 1.41'H Prismatoid** 0.015 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	50.80'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 50.75' Phase-In= 0.01'
#2	Secondary	52.20'	**45.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

2.50 3.00
Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

#3	Device 4	51.50'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	51.40'	**6.0" Round Culvert** L= 12.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 51.40' / 50.23' S= 0.0975 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.04 cfs @ 15.05 hrs HW=51.38' (Free Discharge)
└**1=Exfiltration** (Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=50.80' TW=46.41' (Dynamic Tailwater)
└**4=Culvert** (Controls 0.00 cfs)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=50.80' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 6P: Bioretention #1

Inflow Area = 0.242 ac, 57.77% Impervious, Inflow Depth > 3.54" for 10 Yr 24 Hr event
Inflow = 0.96 cfs @ 12.09 hrs, Volume= 0.072 af
Outflow = 0.32 cfs @ 12.39 hrs, Volume= 0.072 af, Atten= 67%, Lag= 17.9 min
Discarded = 0.32 cfs @ 12.39 hrs, Volume= 0.072 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 12P : Subsurface Stone Infiltration #2
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 54.43' @ 12.39 hrs Surf.Area= 965 sf Storage= 787 cf

Plug-Flow detention time= 27.4 min calculated for 0.072 af (100% of inflow)
Center-of-Mass det. time= 27.1 min (825.4 - 798.4)

Volume	Invert	Avail.Storage	Storage Description
#1	51.24'	1,473 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
51.24	502	118.0	0.0	0	0	502
51.25	502	118.0	40.0	2	2	503
52.24	502	118.0	40.0	199	201	620
52.25	502	118.0	15.0	1	202	621
53.74	502	118.0	15.0	112	314	797
53.75	502	118.0	100.0	5	319	798
54.00	595	130.0	100.0	137	456	1,037
54.50	1,035	224.0	100.0	402	858	3,687
55.00	1,376	234.0	100.0	601	1,459	4,069
55.01	1,376	234.0	100.0	14	1,473	4,071

Device	Routing	Invert	Outlet Devices
#1	Primary	52.00'	**6.0" Round Culvert** L= 6.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 52.00' / 51.90' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Secondary	55.00'	**30.0' 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
#3	Device 1	54.70'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	51.24'	**0.890 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 51.13' Phase-In= 0.01'

Discarded OutFlow Max=0.32 cfs @ 12.39 hrs HW=54.43' (Free Discharge)
└**4=Exfiltration** (Controls 0.32 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.24' TW=51.30' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.24' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 7P: Unit 6 Eco-Paver Driveway

Inflow Area = 0.030 ac,100.00% Impervious, Inflow Depth > 4.63" for 10 Yr 24 Hr event
Inflow = 0.14 cfs @ 12.09 hrs, Volume= 0.012 af
Outflow = 0.03 cfs @ 12.53 hrs, Volume= 0.012 af, Atten= 81%, Lag= 26.5 min
Discarded = 0.03 cfs @ 12.53 hrs, Volume= 0.012 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 2P : Bioretention #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 51.73' @ 12.53 hrs Surf.Area= 421 sf Storage= 201 cf

Plug-Flow detention time= 120.3 min calculated for 0.012 af (100% of inflow)
Center-of-Mass det. time= 118.6 min (866.7 - 748.0)

Volume	Invert	Avail.Storage	Storage Description
#1	49.66'	338 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
49.66	421	0.0	0	0
49.67	421	40.0	2	2
50.49	421	40.0	138	140
50.50	421	5.0	0	140
51.49	421	5.0	21	161
51.50	421	40.0	2	163
52.49	421	40.0	167	329
52.50	421	100.0	4	333
52.51	421	100.0	4	338

Device	Routing	Invert	Outlet Devices
#1	Primary	52.50'	**100.0' long x 50.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	49.66'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 49.40' Phase-In= 0.01'

Discarded OutFlow Max=0.03 cfs @ 12.53 hrs HW=51.73' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.66' TW=46.41' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 8P: Unit 7 Eco-Paver Driveway

Inflow Area = 0.030 ac,100.00% Impervious, Inflow Depth > 4.63" for 10 Yr 24 Hr event
Inflow = 0.14 cfs @ 12.09 hrs, Volume= 0.011 af
Outflow = 0.06 cfs @ 12.26 hrs, Volume= 0.011 af, Atten= 54%, Lag= 10.6 min
Discarded = 0.06 cfs @ 12.26 hrs, Volume= 0.011 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 2P : Bioretention #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 52.98' @ 12.26 hrs Surf.Area= 421 sf Storage= 130 cf

Plug-Flow detention time= 41.2 min calculated for 0.011 af (100% of inflow)
Center-of-Mass det. time= 40.2 min (788.2 - 748.0)

Volume	Invert	Avail.Storage	Storage Description
#1	51.33'	225 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
51.33	421	0.0	0	0
51.34	421	40.0	2	2
51.91	421	40.0	96	98
51.92	421	5.0	0	98
52.91	421	5.0	21	119
52.92	421	40.0	2	120
53.49	421	40.0	96	216
53.50	421	100.0	4	221
53.51	421	100.0	4	225

Device	Routing	Invert	Outlet Devices
#1	Primary	53.50'	**100.0' long x 50.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	51.33'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 51.25' Phase-In= 0.01'

Discarded OutFlow Max=0.06 cfs @ 12.26 hrs HW=52.97' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.33' TW=46.41' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 9P: Unit 8 Eco-Paver Driveway

Inflow Area = 0.045 ac, 66.04% Impervious, Inflow Depth > 3.75" for 10 Yr 24 Hr event
Inflow = 0.19 cfs @ 12.09 hrs, Volume= 0.014 af
Outflow = 0.05 cfs @ 12.46 hrs, Volume= 0.014 af, Atten= 74%, Lag= 22.5 min
Discarded = 0.05 cfs @ 12.46 hrs, Volume= 0.014 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 2P : Bioretention #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 50.37' @ 12.46 hrs Surf.Area= 421 sf Storage= 209 cf

Plug-Flow detention time= 56.1 min calculated for 0.014 af (100% of inflow)
Center-of-Mass det. time= 55.0 min (846.2 - 791.1)

Volume	Invert	Avail.Storage	Storage Description
#1	49.13'	393 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
49.13	421	0.0	0	0
49.14	421	40.0	2	2
50.71	421	40.0	264	266
50.72	421	5.0	0	266
51.71	421	5.0	21	287
51.72	421	40.0	2	289
52.29	421	40.0	96	385
52.30	421	100.0	4	389
52.31	421	100.0	4	393

Device	Routing	Invert	Outlet Devices
#1	Primary	52.30'	**100.0' long x 50.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	49.13'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 49.05' Phase-In= 0.01'

Discarded OutFlow Max=0.05 cfs @ 12.46 hrs HW=50.37' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.13' TW=46.41' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 10P: Detention Pond

Inflow Area = 0.211 ac, 27.64% Impervious, Inflow Depth > 2.25" for 10 Yr 24 Hr event
Inflow = 0.51 cfs @ 12.10 hrs, Volume= 0.040 af
Outflow = 0.51 cfs @ 12.11 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.5 min
Primary = 0.51 cfs @ 12.11 hrs, Volume= 0.039 af
Routed to Pond 2P : Bioretention #2
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach AP5 : Analysis Point 5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 53.10' @ 12.11 hrs Surf.Area= 238 sf Storage= 23 cf

Plug-Flow detention time= 1.5 min calculated for 0.039 af (100% of inflow)
Center-of-Mass det. time= 1.1 min (830.0 - 828.9)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	337 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	213	0	0
54.00	451	332	332
54.01	451	5	337

Device	Routing	Invert	Outlet Devices
#1	Primary	50.50'	**8.0" Round Culvert** L= 117.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 50.50' / 49.80' S= 0.0060 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	53.00'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	54.00'	**6.0' long x 4.0' 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 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.50 cfs @ 12.11 hrs HW=53.10' TW=49.63' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 0.50 cfs of 1.59 cfs potential flow)
↑—**2=Orifice/Grate** (Weir Controls 0.50 cfs @ 1.04 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' TW=0.00' (Dynamic Tailwater)
↑—**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 11P: Subsurface Stone Infiltration #4

Inflow	=	0.06 cfs @	6.13 hrs, Volume=	0.056 af
Outflow	=	0.06 cfs @	8.24 hrs, Volume=	0.056 af, Atten= 4%, Lag= 127.0 min
Discarded	=	0.06 cfs @	8.24 hrs, Volume=	0.056 af
Primary	=	0.00 cfs @	0.00 hrs, Volume=	0.000 af

Routed to Pond 2P : Bioretention #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 50.59' @ 8.24 hrs Surf.Area= 0.010 ac Storage= 0.006 af

Plug-Flow detention time= 69.2 min calculated for 0.056 af (100% of inflow)
Center-of-Mass det. time= 69.1 min (623.2 - 554.1)

Volume	Invert	Avail.Storage	Storage Description
#1	49.20'	0.009 af	**10.00'W x 45.00'L x 2.21'H Prismatoid** 0.023 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	49.20'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 49.12' Phase-In= 0.01'
#2	Primary	51.40'	**45.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#3	Device 4	50.70'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	50.60'	**6.0" Round Culvert** L= 42.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 50.60' / 50.08' S= 0.0124 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.06 cfs @ 8.24 hrs HW=50.59' (Free Discharge)
└**1=Exfiltration** (Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.20' TW=46.41' (Dynamic Tailwater)
├**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)
└**4=Culvert** (Controls 0.00 cfs)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 12P: Subsurface Stone Infiltration #2

Inflow Area = 0.242 ac, 57.77% Impervious, Inflow Depth = 0.00" for 10 Yr 24 Hr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 51.30' @ 0.00 hrs Surf.Area= 0.008 ac Storage= 0.000 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	51.30'	0.007 af	**17.00'W x 20.00'L x 2.21'H Prismatoid** 0.017 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	51.30'	**0.890 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 51.20' Phase-In= 0.01'
#2	Primary	53.50'	**14.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.30' (Free Discharge)
└**1=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.30' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Link 5L: Unit 5 Sump Pump

Factor of safety of 2 provided

Inflow = 0.04 cfs @ 13.00 hrs, Volume= 0.044 af
Primary = 0.04 cfs @ 13.00 hrs, Volume= 0.044 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 5P : Subsurface Stone Infiltration #3

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

29 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.03
0.03	0.03	0.03	0.04	0.04	0.04	0.03	0.03	0.03	0.03
0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.00	0.00	

Summary for Link 6L: Unit 6 Sump Pump

Factor of safety of 2 provided

Inflow = 0.04 cfs @ 2.00 hrs, Volume= 0.007 af
Primary = 0.04 cfs @ 2.00 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 5P : Subsurface Stone Infiltration #3

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

5 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

0.00	0.02	0.04	0.02	0.00

Summary for Link 7L: Unit 7 Sump Pump

Factor of safety of 2 provided

Inflow = 0.04 cfs @ 10.00 hrs, Volume= 0.036 af
Primary = 0.04 cfs @ 10.00 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 11P : Subsurface Stone Infiltration #4

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

23 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03
0.04	0.04	0.04	0.03	0.03	0.03	0.02	0.02	0.01	0.01
0.01	0.00	0.00							

Summary for Link 8L: Unit 8 Sump Pump

Factor of safety of 2 provided

Inflow = 0.04 cfs @ 6.00 hrs, Volume= 0.020 af
Primary = 0.04 cfs @ 6.00 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 11P : Subsurface Stone Infiltration #4

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

16 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

0.00	0.01	0.01	0.02	0.03	0.03	0.04	0.03	0.03	0.02
0.01	0.01	0.00	0.00	0.00	0.00				

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=29,271 sf 57.36% Impervious Runoff Depth>4.78"
Flow Length=221' Tc=11.9 min CN=88 Runoff=2.99 cfs 0.268 af

Subcatchment2S: Subcatchment2S Runoff Area=1,702 sf 28.08% Impervious Runoff Depth>3.93"
Flow Length=67' Tc=7.6 min CN=80 Runoff=0.17 cfs 0.013 af

Subcatchment3S: Subcatchment3S Runoff Area=1,237 sf 0.00% Impervious Runoff Depth>3.23"
Flow Length=34' Tc=6.0 min CN=73 Runoff=0.11 cfs 0.008 af

Subcatchment4S: Subcatchment4S Runoff Area=3,492 sf 34.05% Impervious Runoff Depth>4.14"
Flow Length=47' Slope=0.0250 '/' Tc=9.4 min CN=82 Runoff=0.34 cfs 0.028 af

Subcatchment5S: Subcatchment5S Runoff Area=3,966 sf 15.05% Impervious Runoff Depth>3.62"
Flow Length=67' Tc=13.1 min CN=77 Runoff=0.31 cfs 0.027 af

Subcatchment6S: Subcatchment6S Runoff Area=28,965 sf 45.86% Impervious Runoff Depth>4.45"
Flow Length=133' Tc=19.6 min CN=85 Runoff=2.32 cfs 0.247 af

Subcatchment7S: Unit 3 and 4 Runoff Area=1,232 sf 100.00% Impervious Runoff Depth>5.93"
Tc=6.0 min CN=98 Runoff=0.17 cfs 0.014 af

Subcatchment9S: Subcatchment9S Runoff Area=10,560 sf 57.77% Impervious Runoff Depth>4.79"
Flow Length=72' Slope=0.0100 '/' Tc=6.0 min CN=88 Runoff=1.28 cfs 0.097 af

Subcatchment10S: Subcatchment10S Runoff Area=1,309 sf 100.00% Impervious Runoff Depth>5.93"
Tc=6.0 min CN=98 Runoff=0.18 cfs 0.015 af

Subcatchment11S: Subcatchment11S Runoff Area=1,297 sf 100.00% Impervious Runoff Depth>5.93"
Tc=6.0 min CN=98 Runoff=0.18 cfs 0.015 af

Subcatchment12S: Subcatchment12S Runoff Area=1,970 sf 66.04% Impervious Runoff Depth>5.01"
Tc=6.0 min CN=90 Runoff=0.25 cfs 0.019 af

Subcatchment13S: Subcatchment13S Runoff Area=1,624 sf 4.99% Impervious Runoff Depth>3.32"
Flow Length=43' Tc=7.1 min CN=74 Runoff=0.14 cfs 0.010 af

Subcatchment14S: Subcatchment14S Runoff Area=6,327 sf 19.36% Impervious Runoff Depth>3.83"
Flow Length=50' Slope=0.0230 '/' Tc=6.0 min CN=79 Runoff=0.64 cfs 0.046 af

Subcatchment16S: Subcatchment16S Runoff Area=4,616 sf 12.56% Impervious Runoff Depth>3.52"
Flow Length=64' Tc=7.8 min CN=76 Runoff=0.41 cfs 0.031 af

Subcatchment17S: Subcatchment17S Runoff Area=6,175 sf 14.35% Impervious Runoff Depth>3.62"
Flow Length=95' Slope=0.0050 '/' Tc=16.3 min CN=77 Runoff=0.44 cfs 0.043 af

Reach 1R: Swale A Avg. Flow Depth=0.36' Max Vel=0.30 fps Inflow=0.14 cfs 0.010 af
n=0.150 L=100.0' S=0.0100 '/' Capacity=0.70 cfs Outflow=0.12 cfs 0.010 af Overflow=0.00 cfs 0.000 af

Reach 3Ra: Vee Channel Avg. Flow Depth=0.53' Max Vel=0.79 fps Inflow=0.68 cfs 0.066 af
n=0.150 L=50.0' S=0.0400 '/' Capacity=3.62 cfs Outflow=0.68 cfs 0.066 af

Reach 3Rb: Vee Channel Avg. Flow Depth=0.48' Max Vel=0.98 fps Inflow=0.68 cfs 0.066 af
n=0.150 L=35.0' S=0.0714 '/' Capacity=4.83 cfs Outflow=0.68 cfs 0.066 af

Reach 4R: Overland Flow Avg. Flow Depth=0.30' Max Vel=0.19 fps Inflow=0.30 cfs 0.024 af
n=0.150 L=83.0' S=0.0047 '/' Capacity=1.01 cfs Outflow=0.26 cfs 0.023 af

Reach AP1: Analysis Point 1 Inflow=2.99 cfs 0.268 af
Outflow=2.99 cfs 0.268 af

Reach AP2: Analysis Point 2 Inflow=0.17 cfs 0.013 af
Outflow=0.17 cfs 0.013 af

Reach AP3: Analysis Point 3 Inflow=0.73 cfs 0.093 af
Outflow=0.73 cfs 0.093 af

Reach AP4: Analysis Point 4 Inflow=0.34 cfs 0.028 af
Outflow=0.34 cfs 0.028 af

Reach AP5: Analysis Point 5 Inflow=0.41 cfs 0.031 af
Outflow=0.41 cfs 0.031 af

Pond 1P: Depression Peak Elev=51.31' Storage=167 cf Inflow=0.31 cfs 0.027 af
Outflow=0.30 cfs 0.024 af

Pond 2P: Bioretention #2 Peak Elev=51.11' Storage=6,485 cf Inflow=2.75 cfs 0.303 af
Discarded=0.26 cfs 0.243 af Primary=0.23 cfs 0.019 af Secondary=0.00 cfs 0.000 af Outflow=0.49 cfs 0.262 af

Pond 3P: Stone Drip Edge Peak Elev=55.39' Storage=29 cf Inflow=0.17 cfs 0.014 af
Primary=0.16 cfs 0.014 af Secondary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.014 af

Pond 4P: Subsurface Stone Infiltration #1 Peak Elev=55.36' Storage=0.003 af Inflow=0.16 cfs 0.014 af
Discarded=0.06 cfs 0.014 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.014 af

Pond 5P: Subsurface Stone Infiltration #3 Peak Elev=51.38' Storage=0.002 af Inflow=0.05 cfs 0.051 af
Discarded=0.04 cfs 0.050 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.050 af

Pond 6P: Bioretention #1 Peak Elev=54.73' Storage=1,119 cf Inflow=1.28 cfs 0.097 af
Discarded=0.36 cfs 0.095 af Primary=0.10 cfs 0.001 af Secondary=0.00 cfs 0.000 af Outflow=0.46 cfs 0.097 af

Pond 7P: Unit 6 Eco-Paver Driveway Peak Elev=52.11' Storage=265 cf Inflow=0.18 cfs 0.015 af
Discarded=0.03 cfs 0.015 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.015 af

Pond 8P: Unit 7 Eco-Paver Driveway Peak Elev=53.19' Storage=167 cf Inflow=0.18 cfs 0.015 af
Discarded=0.07 cfs 0.015 af Primary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.015 af

Pond 9P: Unit 8 Eco-Paver Driveway Peak Elev=51.15' Storage=275 cf Inflow=0.25 cfs 0.019 af
Discarded=0.08 cfs 0.019 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.019 af

Pond 10P: Detention Pond Peak Elev=53.13' Storage=30 cf Inflow=0.73 cfs 0.057 af
Primary=0.73 cfs 0.057 af Secondary=0.00 cfs 0.000 af Outflow=0.73 cfs 0.057 af

Pond 11P: Subsurface Stone Infiltration #4 Peak Elev=50.59' Storage=0.006 af Inflow=0.06 cfs 0.056 af
Discarded=0.06 cfs 0.056 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.056 af

Pond 12P: Subsurface Stone Infiltration #2 Peak Elev=51.60' Storage=0.001 af Inflow=0.10 cfs 0.001 af
Discarded=0.03 cfs 0.001 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.001 af

Link 5L: Unit 5 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.044 af
Primary=0.04 cfs 0.044 af

Link 6L: Unit 6 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.007 af
Primary=0.04 cfs 0.007 af

Link 7L: Unit 7 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.036 af
Primary=0.04 cfs 0.036 af

Link 8L: Unit 8 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.020 af
Primary=0.04 cfs 0.020 af

Total Runoff Area = 2.382 ac Runoff Volume = 0.879 af Average Runoff Depth = 4.43"
55.32% Pervious = 1.318 ac 44.68% Impervious = 1.064 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=29,271 sf 57.36% Impervious Runoff Depth>5.96"
Flow Length=221' Tc=11.9 min CN=88 Runoff=3.69 cfs 0.334 af

Subcatchment2S: Subcatchment2S Runoff Area=1,702 sf 28.08% Impervious Runoff Depth>5.05"
Flow Length=67' Tc=7.6 min CN=80 Runoff=0.21 cfs 0.016 af

Subcatchment3S: Subcatchment3S Runoff Area=1,237 sf 0.00% Impervious Runoff Depth>4.27"
Flow Length=34' Tc=6.0 min CN=73 Runoff=0.14 cfs 0.010 af

Subcatchment4S: Subcatchment4S Runoff Area=3,492 sf 34.05% Impervious Runoff Depth>5.28"
Flow Length=47' Slope=0.0250 '/' Tc=9.4 min CN=82 Runoff=0.43 cfs 0.035 af

Subcatchment5S: Subcatchment5S Runoff Area=3,966 sf 15.05% Impervious Runoff Depth>4.71"
Flow Length=67' Tc=13.1 min CN=77 Runoff=0.40 cfs 0.036 af

Subcatchment6S: Subcatchment6S Runoff Area=28,965 sf 45.86% Impervious Runoff Depth>5.61"
Flow Length=133' Tc=19.6 min CN=85 Runoff=2.90 cfs 0.311 af

Subcatchment7S: Unit 3 and 4 Runoff Area=1,232 sf 100.00% Impervious Runoff Depth>7.15"
Tc=6.0 min CN=98 Runoff=0.20 cfs 0.017 af

Subcatchment9S: Subcatchment9S Runoff Area=10,560 sf 57.77% Impervious Runoff Depth>5.97"
Flow Length=72' Slope=0.0100 '/' Tc=6.0 min CN=88 Runoff=1.58 cfs 0.121 af

Subcatchment10S: Subcatchment10S Runoff Area=1,309 sf 100.00% Impervious Runoff Depth>7.15"
Tc=6.0 min CN=98 Runoff=0.21 cfs 0.018 af

Subcatchment11S: Subcatchment11S Runoff Area=1,297 sf 100.00% Impervious Runoff Depth>7.15"
Tc=6.0 min CN=98 Runoff=0.21 cfs 0.018 af

Subcatchment12S: Subcatchment12S Runoff Area=1,970 sf 66.04% Impervious Runoff Depth>6.20"
Tc=6.0 min CN=90 Runoff=0.30 cfs 0.023 af

Subcatchment13S: Subcatchment13S Runoff Area=1,624 sf 4.99% Impervious Runoff Depth>4.38"
Flow Length=43' Tc=7.1 min CN=74 Runoff=0.18 cfs 0.014 af

Subcatchment14S: Subcatchment14S Runoff Area=6,327 sf 19.36% Impervious Runoff Depth>4.94"
Flow Length=50' Slope=0.0230 '/' Tc=6.0 min CN=79 Runoff=0.82 cfs 0.060 af

Subcatchment16S: Subcatchment16S Runoff Area=4,616 sf 12.56% Impervious Runoff Depth>4.60"
Flow Length=64' Tc=7.8 min CN=76 Runoff=0.53 cfs 0.041 af

Subcatchment17S: Subcatchment17S Runoff Area=6,175 sf 14.35% Impervious Runoff Depth>4.70"
Flow Length=95' Slope=0.0050 '/' Tc=16.3 min CN=77 Runoff=0.57 cfs 0.056 af

Reach 1R: Swale A Avg. Flow Depth=0.40' Max Vel=0.33 fps Inflow=0.18 cfs 0.014 af
n=0.150 L=100.0' S=0.0100 '/' Capacity=0.70 cfs Outflow=0.16 cfs 0.014 af Overflow=0.00 cfs 0.000 af

Reach 3Ra: Vee Channel Avg. Flow Depth=0.59' Max Vel=0.85 fps Inflow=0.90 cfs 0.087 af
n=0.150 L=50.0' S=0.0400 '/' Capacity=3.62 cfs Outflow=0.90 cfs 0.087 af

Reach 3Rb: Vee Channel Avg. Flow Depth=0.53' Max Vel=1.06 fps Inflow=0.90 cfs 0.087 af
n=0.150 L=35.0' S=0.0714 '/' Capacity=4.83 cfs Outflow=0.90 cfs 0.087 af

Reach 4R: Overland Flow Avg. Flow Depth=0.33' Max Vel=0.21 fps Inflow=0.39 cfs 0.032 af
n=0.150 L=83.0' S=0.0047 '/' Capacity=1.01 cfs Outflow=0.34 cfs 0.032 af

Reach AP1: Analysis Point 1 Inflow=3.69 cfs 0.334 af
Outflow=3.69 cfs 0.334 af

Reach AP2: Analysis Point 2 Inflow=0.21 cfs 0.016 af
Outflow=0.21 cfs 0.016 af

Reach AP3: Analysis Point 3 Inflow=1.57 cfs 0.172 af
Outflow=1.57 cfs 0.172 af

Reach AP4: Analysis Point 4 Inflow=0.43 cfs 0.035 af
Outflow=0.43 cfs 0.035 af

Reach AP5: Analysis Point 5 Inflow=0.53 cfs 0.041 af
Outflow=0.53 cfs 0.041 af

Pond 1P: Depression Peak Elev=51.31' Storage=167 cf Inflow=0.40 cfs 0.036 af
Outflow=0.39 cfs 0.032 af

Pond 2P: Bioretention #2 Peak Elev=51.29' Storage=7,196 cf Inflow=3.44 cfs 0.384 af
Discarded=0.27 cfs 0.258 af Primary=1.13 cfs 0.074 af Secondary=0.00 cfs 0.000 af Outflow=1.40 cfs 0.333 af

Pond 3P: Stone Drip Edge Peak Elev=55.51' Storage=42 cf Inflow=0.20 cfs 0.017 af
Primary=0.18 cfs 0.017 af Secondary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.017 af

Pond 4P: Subsurface Stone Infiltration #1 Peak Elev=55.50' Storage=0.003 af Inflow=0.18 cfs 0.017 af
Discarded=0.07 cfs 0.017 af Primary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.017 af

Pond 5P: Subsurface Stone Infiltration #3 Peak Elev=51.38' Storage=0.002 af Inflow=0.05 cfs 0.051 af
Discarded=0.04 cfs 0.050 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.050 af

Pond 6P: Bioretention #1 Peak Elev=54.81' Storage=1,214 cf Inflow=1.58 cfs 0.121 af
Discarded=0.36 cfs 0.110 af Primary=0.58 cfs 0.010 af Secondary=0.00 cfs 0.000 af Outflow=0.95 cfs 0.120 af

Pond 7P: Unit 6 Eco-Paver Driveway Peak Elev=52.47' Storage=326 cf Inflow=0.21 cfs 0.018 af
Discarded=0.03 cfs 0.017 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.017 af

Pond 8P: Unit 7 Eco-Paver Driveway Peak Elev=53.41' Storage=203 cf Inflow=0.21 cfs 0.018 af
Discarded=0.08 cfs 0.018 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.018 af

Pond 9P: Unit 8 Eco-Paver Driveway Peak Elev=51.91' Storage=320 cf Inflow=0.30 cfs 0.023 af
Discarded=0.10 cfs 0.023 af Primary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.023 af

Pond 10P: Detention Pond Peak Elev=53.16' Storage=36 cf Inflow=0.95 cfs 0.073 af
Primary=0.95 cfs 0.073 af Secondary=0.00 cfs 0.000 af Outflow=0.95 cfs 0.073 af

Pond 11P: Subsurface Stone Infiltration #4 Peak Elev=50.59' Storage=0.006 af Inflow=0.06 cfs 0.056 af
Discarded=0.06 cfs 0.056 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.056 af

Pond 12P: Subsurface Stone Infiltration #2 Peak Elev=53.46' Storage=0.007 af Inflow=0.58 cfs 0.010 af
Discarded=0.16 cfs 0.010 af Primary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.010 af

Link 5L: Unit 5 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.044 af
Primary=0.04 cfs 0.044 af

Link 6L: Unit 6 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.007 af
Primary=0.04 cfs 0.007 af

Link 7L: Unit 7 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.036 af
Primary=0.04 cfs 0.036 af

Link 8L: Unit 8 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.020 af
Primary=0.04 cfs 0.020 af

Total Runoff Area = 2.382 ac Runoff Volume = 1.108 af Average Runoff Depth = 5.58"
55.32% Pervious = 1.318 ac 44.68% Impervious = 1.064 ac

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 3.69 cfs @ 12.16 hrs, Volume= 0.334 af, Depth> 5.96"
Routed to Reach AP1 : Analysis Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
14,174	98	Paved parking, HSG C
2,616	98	Roofs, HSG C
12,481	74	>75% Grass cover, Good, HSG C
29,271	88	Weighted Average
12,481		42.64% Pervious Area
16,790		57.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0220	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.3	15	0.0167	0.90		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	22	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.0	84	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.9	221	Total			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 0.21 cfs @ 12.11 hrs, Volume= 0.016 af, Depth> 5.05"
Routed to Reach AP2 : Analysis Point 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
836	74	>75% Grass cover, Good, HSG C
478	98	Roofs, HSG C
388	70	Woods, Good, HSG C
1,702	80	Weighted Average
1,224		71.92% Pervious Area
478		28.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	26	0.0310	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
1.3	16	0.0750	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
1.7	13	0.1900	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
1.3	7	0.1140	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.5	5	0.5000	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
7.6	67	Total			

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 0.14 cfs @ 12.09 hrs, Volume= 0.010 af, Depth> 4.27"
Routed to Reach AP3 : Analysis Point 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
951	74	>75% Grass cover, Good, HSG C
286	70	Woods, Good, HSG C
1,237	73	Weighted Average
1,237		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	17	0.3300	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.5	11	0.3300	0.34		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
1.0	6	0.1670	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
3.2	34	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 0.43 cfs @ 12.13 hrs, Volume= 0.035 af, Depth> 5.28"
Routed to Reach AP4 : Analysis Point 4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
1,717	74	>75% Grass cover, Good, HSG C
453	98	Paved parking, HSG C
736	98	Roofs, HSG C
586	70	Woods, Good, HSG C
3,492	82	Weighted Average
2,303		65.95% Pervious Area
1,189		34.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	20	0.0250	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
6.9	27	0.0250	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
9.4	47	Total			

Summary for Subcatchment 5S: Subcatchment 5S

Runoff = 0.40 cfs @ 12.18 hrs, Volume= 0.036 af, Depth> 4.71"
Routed to Pond 1P : Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
597	98	Roofs, HSG C
2,345	74	>75% Grass cover, Good, HSG C
1,024	70	Woods, Good, HSG C
3,966	77	Weighted Average
3,369		84.95% Pervious Area
597		15.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	20	0.0200	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
10.3	40	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.1	7	0.1400	1.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.1	67	Total			

Summary for Subcatchment 6S: Subcatchment 6S

Runoff = 2.90 cfs @ 12.26 hrs, Volume= 0.311 af, Depth> 5.61"
Routed to Pond 2P : Bioretention #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
8,011	98	Paved parking, HSG C
5,272	98	Roofs, HSG C
14,477	74	>75% Grass cover, Good, HSG C
1,205	70	Woods, Good, HSG C
28,965	85	Weighted Average
15,682		54.14% Pervious Area
13,283		45.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	22	0.0450	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
16.6	78	0.0230	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.4	11	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.5	22	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
19.6	133	Total			

Summary for Subcatchment 7S: Unit 3 and 4

Runoff = 0.20 cfs @ 12.09 hrs, Volume= 0.017 af, Depth> 7.15"
Routed to Pond 3P : Stone Drip Edge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
984	98	Roofs, HSG C
248	98	Water Surface, HSG C
1,232	98	Weighted Average
1,232		100.00% Impervious Area

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

Summary for Subcatchment 9S: Subcatchment 9S

Runoff = 1.58 cfs @ 12.09 hrs, Volume= 0.121 af, Depth> 5.97"
Routed to Pond 6P : Bioretention #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
4,178	98	Paved parking, HSG C
1,922	98	Roofs, HSG C
4,331	74	>75% Grass cover, Good, HSG C
129	70	Woods, Good, HSG C
10,560	88	Weighted Average
4,460		42.23% Pervious Area
6,100		57.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	14	0.0100	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.8	45	0.0100	0.89		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.21"
0.3	13	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.8	72	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 10S: Subcatchment 10S

Runoff = 0.21 cfs @ 12.09 hrs, Volume= 0.018 af, Depth> 7.15"
Routed to Pond 7P : Unit 6 Eco-Paver Driveway

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
876	98	Roofs, HSG C
433	98	Paved parking, HSG C
1,309	98	Weighted Average
1,309		100.00% Impervious Area

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

Summary for Subcatchment 11S: Subcatchment 11S

Runoff = 0.21 cfs @ 12.09 hrs, Volume= 0.018 af, Depth> 7.15"
Routed to Pond 8P : Unit 7 Eco-Paver Driveway

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
876	98	Roofs, HSG C
421	98	Paved parking, HSG C
1,297	98	Weighted Average
1,297		100.00% Impervious Area

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

Summary for Subcatchment 12S: Subcatchment 12S

Runoff = 0.30 cfs @ 12.09 hrs, Volume= 0.023 af, Depth> 6.20"
Routed to Pond 9P : Unit 8 Eco-Paver Driveway

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
876	98	Roofs, HSG C
425	98	Paved parking, HSG C
669	74	>75% Grass cover, Good, HSG C
1,970	90	Weighted Average
669		33.96% Pervious Area
1,301		66.04% Impervious Area

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

Summary for Subcatchment 13S: Subcatchment 13S

Runoff = 0.18 cfs @ 12.10 hrs, Volume= 0.014 af, Depth> 4.38"
Routed to Reach 1R : Swale A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
1,013	74	>75% Grass cover, Good, HSG C
530	70	Woods, Good, HSG C
81	98	Roofs, HSG C
1,624	74	Weighted Average
1,543		95.01% Pervious Area
81		4.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	28	0.0210	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
3.3	10	0.0210	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.3	5	0.3300	0.29		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
7.1	43	Total			

Summary for Subcatchment 14S: Subcatchment 14S

Runoff = 0.82 cfs @ 12.09 hrs, Volume= 0.060 af, Depth> 4.94"
Routed to Pond 10P : Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
5,067	74	>75% Grass cover, Good, HSG C
35	70	Woods, Good, HSG C
1,225	98	Roofs, HSG C
6,327	79	Weighted Average
5,102		80.64% Pervious Area
1,225		19.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0230	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
5.3	50	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 16S: Subcatchment 16S

Runoff = 0.53 cfs @ 12.11 hrs, Volume= 0.041 af, Depth> 4.60"
Routed to Reach AP5 : Analysis Point 5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
3,173	74	>75% Grass cover, Good, HSG C
863	70	Woods, Good, HSG C
580	98	Roofs, HSG C
4,616	76	Weighted Average
4,036		87.44% Pervious Area
580		12.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	41	0.0120	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.6	12	0.3300	0.34		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.6	5	0.0500	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.7	6	0.3300	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
7.8	64	Total			

Summary for Subcatchment 17S: Subcatchment 17S

Runoff = 0.57 cfs @ 12.22 hrs, Volume= 0.056 af, Depth> 4.70"
Routed to Reach 3Ra : Vee Channel

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 Yr 24 Hr Rainfall=7.39"

Area (sf)	CN	Description
3,861	74	>75% Grass cover, Good, HSG C
1,428	70	Woods, Good, HSG C
301	98	Paved parking, HSG C
585	98	Roofs, HSG C
6,175	77	Weighted Average
5,289		85.65% Pervious Area
886		14.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	95	0.0050	0.10		**Sheet Flow, Longest path to enter the Vee Channel** Grass: Short n= 0.150 P2= 3.21"

Summary for Reach 1R: Swale A

Inflow Area = 0.037 ac, 4.99% Impervious, Inflow Depth > 4.38" for 50 Yr 24 Hr event
Inflow = 0.18 cfs @ 12.10 hrs, Volume= 0.014 af
Outflow = 0.16 cfs @ 12.16 hrs, Volume= 0.014 af, Atten= 14%, Lag= 3.4 min
Routed to Pond 10P : Detention Pond
Overflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 3P : Stone Drip Edge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.33 fps, Min. Travel Time= 5.1 min
Avg. Velocity = 0.14 fps, Avg. Travel Time= 11.9 min

Peak Storage= 48 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.40' , Surface Width= 2.39'
Bank-Full Depth= 0.70' Flow Area= 1.5 sf, Capacity= 0.70 cfs
Any excess flow will be diverted to the secondary overflow

0.00' x 0.70' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 3.0 '/' Top Width= 4.20'
Length= 100.0' Slope= 0.0100 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'

Summary for Reach 3Ra: Vee Channel

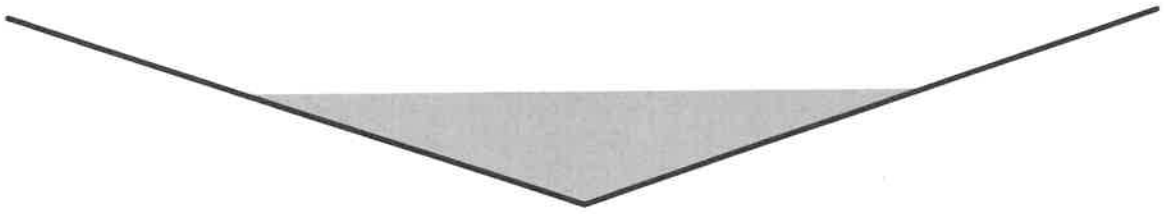
[62] Hint: Exceeded Reach 4R OUTLET depth by 0.26' @ 12.25 hrs
[80] Warning: Exceeded Pond 2P by 1.21' @ 12.15 hrs (2.13 cfs 0.120 af)

Inflow Area = 0.233 ac, 14.62% Impervious, Inflow Depth > 4.50" for 50 Yr 24 Hr event
Inflow = 0.90 cfs @ 12.25 hrs, Volume= 0.087 af
Outflow = 0.90 cfs @ 12.26 hrs, Volume= 0.087 af, Atten= 0%, Lag= 0.8 min
Routed to Reach 3Rb : Vee Channel

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.85 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 0.37 fps, Avg. Travel Time= 2.3 min

Peak Storage= 53 cf @ 12.26 hrs
Average Depth at Peak Storage= 0.59' , Surface Width= 3.56'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 3.62 cfs

0.00' x 1.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 50.0' Slope= 0.0400 '/'
Inlet Invert= 51.00', Outlet Invert= 49.00'



Summary for Reach 3Rb: Vee Channel

[61] Hint: Exceeded Reach 3Ra outlet invert by 0.53' @ 12.25 hrs

Inflow Area = 0.233 ac, 14.62% Impervious, Inflow Depth > 4.50" for 50 Yr 24 Hr event
Inflow = 0.90 cfs @ 12.26 hrs, Volume= 0.087 af
Outflow = 0.90 cfs @ 12.27 hrs, Volume= 0.087 af, Atten= 0%, Lag= 0.4 min
Routed to Reach AP3 : Analysis Point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.06 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 0.45 fps, Avg. Travel Time= 1.3 min

Peak Storage= 30 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.53' , Surface Width= 3.19'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 4.83 cfs

0.00' x 1.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 35.0' Slope= 0.0714 '/'
Inlet Invert= 49.00', Outlet Invert= 46.50'

Summary for Reach 4R: Overland Flow

[80] Warning: Exceeded Pond 1P by 0.89' @ 0.00 hrs (0.55 cfs 2.484 af)

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 4.20" for 50 Yr 24 Hr event
Inflow = 0.39 cfs @ 12.21 hrs, Volume= 0.032 af
Outflow = 0.34 cfs @ 12.29 hrs, Volume= 0.032 af, Atten= 12%, Lag= 4.8 min
Routed to Reach 3Ra : Vee Channel

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.21 fps, Min. Travel Time= 6.7 min
Avg. Velocity = 0.10 fps, Avg. Travel Time= 14.1 min

Peak Storage= 138 cf @ 12.29 hrs
Average Depth at Peak Storage= 0.33' , Surface Width= 10.00'
Bank-Full Depth= 0.50' Flow Area= 3.8 sf, Capacity= 1.01 cfs

0.00' x 0.50' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 15.0 '/' Top Width= 15.00'
Length= 83.0' Slope= 0.0047 '/'
Inlet Invert= 51.39', Outlet Invert= 51.00'

‡

Summary for Reach AP1: Analysis Point 1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.914 ac, 57.47% Impervious, Inflow Depth > 4.38" for 50 Yr 24 Hr event
Inflow = 3.69 cfs @ 12.16 hrs, Volume= 0.334 af
Outflow = 3.69 cfs @ 12.16 hrs, Volume= 0.334 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP2: Analysis Point 2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.039 ac, 28.08% Impervious, Inflow Depth > 5.05" for 50 Yr 24 Hr event
Inflow = 0.21 cfs @ 12.11 hrs, Volume= 0.016 af
Outflow = 0.21 cfs @ 12.11 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP3: Analysis Point 3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.242 ac, 39.21% Impervious, Inflow Depth > 1.66" for 50 Yr 24 Hr event
Inflow = 1.57 cfs @ 12.60 hrs, Volume= 0.172 af
Outflow = 1.57 cfs @ 12.60 hrs, Volume= 0.172 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP4: Analysis Point 4

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.080 ac, 34.05% Impervious, Inflow Depth > 5.28" for 50 Yr 24 Hr event
Inflow = 0.43 cfs @ 12.13 hrs, Volume= 0.035 af
Outflow = 0.43 cfs @ 12.13 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP5: Analysis Point 5

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.106 ac, 12.56% Impervious, Inflow Depth > 4.60" for 50 Yr 24 Hr event
Inflow = 0.53 cfs @ 12.11 hrs, Volume= 0.041 af
Outflow = 0.53 cfs @ 12.11 hrs, Volume= 0.041 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Summary for Pond 1P: Depression

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 4.71" for 50 Yr 24 Hr event
Inflow = 0.40 cfs @ 12.18 hrs, Volume= 0.036 af
Outflow = 0.39 cfs @ 12.21 hrs, Volume= 0.032 af, Atten= 1%, Lag= 1.6 min
Primary = 0.39 cfs @ 12.21 hrs, Volume= 0.032 af
Routed to Reach 4R : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 51.31' @ 11.60 hrs Surf.Area= 593 sf Storage= 167 cf

Plug-Flow detention time= 74.2 min calculated for 0.032 af (89% of inflow)
Center-of-Mass det. time= 24.4 min (842.6 - 818.1)

Volume	Invert	Avail.Storage	Storage Description
#1	50.50'	167 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
50.50	45	30.0	0	0	45
51.00	177	68.0	52	52	342
51.30	593	121.0	109	161	1,140
51.31	593	121.0	6	167	1,141

Device	Routing	Invert	Outlet Devices
#0	Primary	51.31'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	51.30'	**8.0' 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

Primary OutFlow Max=0.00 cfs @ 12.21 hrs HW=51.31' TW=51.71' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 2P: Bioretention #2

[80] Warning: Exceeded Pond 11P by 1.18' @ 18.30 hrs (0.00 cfs 0.120 af)

Inflow Area = 0.981 ac, 46.18% Impervious, Inflow Depth > 4.70" for 50 Yr 24 Hr event
Inflow = 3.44 cfs @ 12.24 hrs, Volume= 0.384 af
Outflow = 1.40 cfs @ 12.65 hrs, Volume= 0.333 af, Atten= 59%, Lag= 24.4 min
Discarded = 0.27 cfs @ 12.65 hrs, Volume= 0.258 af
Primary = 1.13 cfs @ 12.65 hrs, Volume= 0.074 af
Routed to Reach AP3 : Analysis Point 3
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach 3Ra : Vee Channel

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 51.29' @ 12.65 hrs Surf.Area= 4,102 sf Storage= 7,196 cf

Plug-Flow detention time= 212.3 min calculated for 0.332 af (86% of inflow)
Center-of-Mass det. time= 154.3 min (959.7 - 805.4)

Volume	Invert	Avail.Storage	Storage Description
#1	46.41'	8,120 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
46.41	1,080	138.0	0.0	0	0	1,080
46.42	1,080	138.0	40.0	4	4	1,081
47.74	1,080	138.0	40.0	570	575	1,264
47.75	1,080	138.0	15.0	2	576	1,265
49.24	1,080	138.0	15.0	241	818	1,471
49.25	1,080	138.0	100.0	11	828	1,472
49.50	2,550	271.0	100.0	441	1,269	5,801
50.00	2,971	283.0	100.0	1,379	2,648	6,348
51.00	3,839	301.0	100.0	3,396	6,044	7,234
51.50	4,298	310.0	100.0	2,033	8,077	7,697
51.51	4,331	315.0	100.0	43	8,120	7,946

Device	Routing	Invert	Outlet Devices
#1	Secondary	51.50'	**100.0' 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
#2	Primary	51.00'	**2.0' long + 3.0 '/' SideZ x 28.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#3	Discarded	46.41'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 46.25' Phase-In= 0.01'

Discarded OutFlow Max=0.27 cfs @ 12.65 hrs HW=51.29' (Free Discharge)
↑—**3=Exfiltration** (Controls 0.27 cfs)

Primary OutFlow Max=1.13 cfs @ 12.65 hrs HW=51.29' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 1.13 cfs @ 1.36 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.41' TW=51.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 3P: Stone Drip Edge

Inflow Area = 0.028 ac,100.00% Impervious, Inflow Depth > 7.15" for 50 Yr 24 Hr event
Inflow = 0.20 cfs @ 12.09 hrs, Volume= 0.017 af
Outflow = 0.18 cfs @ 12.09 hrs, Volume= 0.017 af, Atten= 9%, Lag= 0.5 min
Primary = 0.18 cfs @ 12.09 hrs, Volume= 0.017 af
Routed to Pond 4P : Subsurface Stone Infiltration #1
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 10P : Detention Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 55.51' @ 12.37 hrs Surf.Area= 248 sf Storage= 42 cf

Plug-Flow detention time= 12.3 min calculated for 0.017 af (99% of inflow)
Center-of-Mass det. time= 8.9 min (750.7 - 741.8)

Volume	Invert	Avail.Storage	Storage Description
#1	55.09'	93 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.09	248	0.0	0	0
55.10	248	40.0	1	1
56.00	248	40.0	89	90
56.01	248	100.0	2	93

Device	Routing	Invert	Outlet Devices
#1	Primary	55.10'	**6.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 55.10' / 54.98' S= 0.0150 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Device 1	55.10'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	56.00'	**72.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.18 cfs @ 12.09 hrs HW=55.41' TW=55.25' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.18 cfs @ 2.03 fps)
↑—**2=Orifice/Grate** (Passes 0.18 cfs of 0.25 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=55.09' TW=53.00' (Dynamic Tailwater)
↑—**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 4P: Subsurface Stone Infiltration #1

Inflow Area = 0.028 ac,100.00% Impervious, Inflow Depth > 7.11" for 50 Yr 24 Hr event
Inflow = 0.18 cfs @ 12.09 hrs, Volume= 0.017 af
Outflow = 0.07 cfs @ 12.37 hrs, Volume= 0.017 af, Atten= 64%, Lag= 16.6 min
Discarded = 0.07 cfs @ 12.37 hrs, Volume= 0.017 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 10P : Detention Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 55.50' @ 12.37 hrs Surf.Area= 0.009 ac Storage= 0.003 af

Plug-Flow detention time= 21.1 min calculated for 0.017 af (100% of inflow)
Center-of-Mass det. time= 20.8 min (771.5 - 750.7)

Volume	Invert	Avail.Storage	Storage Description
#1	54.60'	0.004 af	**15.00'W x 27.00'L x 1.01'H Prismatoid** 0.009 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	54.60'	**0.890 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 54.47' Phase-In= 0.01'
#2	Primary	55.60'	**20.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.07 cfs @ 12.37 hrs HW=55.50' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=54.60' TW=53.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 5P: Subsurface Stone Infiltration #3

Inflow	=	0.05 cfs @	2.01 hrs, Volume=	0.051 af
Outflow	=	0.04 cfs @	15.05 hrs, Volume=	0.050 af, Atten= 21%, Lag= 782.5 min
Discarded	=	0.04 cfs @	15.05 hrs, Volume=	0.050 af
Primary	=	0.00 cfs @	0.00 hrs, Volume=	0.000 af
Routed to Pond 2P : Bioretention #2				
Secondary	=	0.00 cfs @	0.00 hrs, Volume=	0.000 af
Routed to Reach AP5 : Analysis Point 5				

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 51.38' @ 15.05 hrs Surf.Area= 0.010 ac Storage= 0.002 af

Plug-Flow detention time= 41.9 min calculated for 0.050 af (99% of inflow)
Center-of-Mass det. time= 34.1 min (753.2 - 719.2)

Volume	Invert	Avail.Storage	Storage Description
#1	50.80'	0.006 af	**10.00'W x 45.00'L x 1.41'H Prismatoid** 0.015 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	50.80'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 50.75' Phase-In= 0.01'
#2	Secondary	52.20'	**45.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

2.50 3.00
Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

#3	Device 4	51.50'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	51.40'	**6.0" Round Culvert** L= 12.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 51.40' / 50.23' S= 0.0975 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.04 cfs @ 15.05 hrs HW=51.38' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=50.80' TW=46.41' (Dynamic Tailwater)
↑—**4=Culvert** (Controls 0.00 cfs)
↑—**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=50.80' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 6P: Bioretention #1

Inflow Area = 0.242 ac, 57.77% Impervious, Inflow Depth > 5.97" for 50 Yr 24 Hr event
Inflow = 1.58 cfs @ 12.09 hrs, Volume= 0.121 af
Outflow = 0.95 cfs @ 12.22 hrs, Volume= 0.120 af, Atten= 40%, Lag= 7.7 min
Discarded = 0.36 cfs @ 12.22 hrs, Volume= 0.110 af
Primary = 0.58 cfs @ 12.22 hrs, Volume= 0.010 af
Routed to Pond 12P : Subsurface Stone Infiltration #2
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 54.81' @ 12.22 hrs Surf.Area= 1,243 sf Storage= 1,214 cf

Plug-Flow detention time= 30.3 min calculated for 0.120 af (100% of inflow)
Center-of-Mass det. time= 28.7 min (812.8 - 784.1)

Volume	Invert	Avail.Storage	Storage Description
#1	51.24'	1,473 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
51.24	502	118.0	0.0	0	0	502
51.25	502	118.0	40.0	2	2	503
52.24	502	118.0	40.0	199	201	620
52.25	502	118.0	15.0	1	202	621
53.74	502	118.0	15.0	112	314	797
53.75	502	118.0	100.0	5	319	798
54.00	595	130.0	100.0	137	456	1,037
54.50	1,035	224.0	100.0	402	858	3,687
55.00	1,376	234.0	100.0	601	1,459	4,069
55.01	1,376	234.0	100.0	14	1,473	4,071

Device	Routing	Invert	Outlet Devices
#1	Primary	52.00'	**6.0" Round Culvert** L= 6.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 52.00' / 51.90' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Secondary	55.00'	**30.0' 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
#3	Device 1	54.70'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	51.24'	**0.890 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 51.13' Phase-In= 0.01'

Discarded OutFlow Max=0.36 cfs @ 12.22 hrs HW=54.81' (Free Discharge)
↑└**4=Exfiltration** (Controls 0.36 cfs)

Primary OutFlow Max=0.54 cfs @ 12.22 hrs HW=54.81' TW=52.14' (Dynamic Tailwater)
↑└**1=Culvert** (Passes 0.54 cfs of 1.19 cfs potential flow)
↑└**3=Orifice/Grate** (Weir Controls 0.54 cfs @ 1.07 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.24' TW=0.00' (Dynamic Tailwater)
↑└**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 7P: Unit 6 Eco-Paver Driveway

Inflow Area = 0.030 ac,100.00% Impervious, Inflow Depth > 7.15" for 50 Yr 24 Hr event
Inflow = 0.21 cfs @ 12.09 hrs, Volume= 0.018 af
Outflow = 0.03 cfs @ 12.56 hrs, Volume= 0.017 af, Atten= 84%, Lag= 28.5 min
Discarded = 0.03 cfs @ 12.56 hrs, Volume= 0.017 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 2P : Bioretention #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 52.47' @ 12.56 hrs Surf.Area= 421 sf Storage= 326 cf

Plug-Flow detention time= 131.5 min calculated for 0.017 af (97% of inflow)
Center-of-Mass det. time= 116.6 min (858.4 - 741.8)

Volume	Invert	Avail.Storage	Storage Description
#1	49.66'	338 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
49.66	421	0.0	0	0
49.67	421	40.0	2	2
50.49	421	40.0	138	140
50.50	421	5.0	0	140
51.49	421	5.0	21	161
51.50	421	40.0	2	163
52.49	421	40.0	167	329
52.50	421	100.0	4	333
52.51	421	100.0	4	338

Device	Routing	Invert	Outlet Devices
#1	Primary	52.50'	**100.0' long x 50.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	49.66'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 49.40' Phase-In= 0.01'

Discarded OutFlow Max=0.03 cfs @ 12.56 hrs HW=52.47' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.66' TW=46.41' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 8P: Unit 7 Eco-Paver Driveway

Inflow Area = 0.030 ac,100.00% Impervious, Inflow Depth > 7.15" for 50 Yr 24 Hr event
Inflow = 0.21 cfs @ 12.09 hrs, Volume= 0.018 af
Outflow = 0.08 cfs @ 12.33 hrs, Volume= 0.018 af, Atten= 63%, Lag= 14.5 min
Discarded = 0.08 cfs @ 12.33 hrs, Volume= 0.018 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 2P : Bioretention #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 53.41' @ 12.33 hrs Surf.Area= 421 sf Storage= 203 cf

Plug-Flow detention time= 43.0 min calculated for 0.018 af (100% of inflow)
Center-of-Mass det. time= 42.0 min (783.8 - 741.8)

Volume	Invert	Avail.Storage	Storage Description
#1	51.33'	225 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
51.33	421	0.0	0	0
51.34	421	40.0	2	2
51.91	421	40.0	96	98
51.92	421	5.0	0	98
52.91	421	5.0	21	119
52.92	421	40.0	2	120
53.49	421	40.0	96	216
53.50	421	100.0	4	221
53.51	421	100.0	4	225

Device	Routing	Invert	Outlet Devices
#1	Primary	53.50'	**100.0' long x 50.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	51.33'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 51.25' Phase-In= 0.01'

Discarded OutFlow Max=0.08 cfs @ 12.33 hrs HW=53.41' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.33' TW=46.41' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 9P: Unit 8 Eco-Paver Driveway

Inflow Area = 0.045 ac, 66.04% Impervious, Inflow Depth > 6.20" for 50 Yr 24 Hr event
Inflow = 0.30 cfs @ 12.09 hrs, Volume= 0.023 af
Outflow = 0.10 cfs @ 12.36 hrs, Volume= 0.023 af, Atten= 65%, Lag= 16.6 min
Discarded = 0.10 cfs @ 12.36 hrs, Volume= 0.023 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 2P : Bioretention #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 51.91' @ 12.36 hrs Surf.Area= 421 sf Storage= 320 cf

Plug-Flow detention time= 57.2 min calculated for 0.023 af (100% of inflow)
Center-of-Mass det. time= 55.9 min (833.7 - 777.8)

Volume	Invert	Avail.Storage	Storage Description
#1	49.13'	393 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
49.13	421	0.0	0	0
49.14	421	40.0	2	2
50.71	421	40.0	264	266
50.72	421	5.0	0	266
51.71	421	5.0	21	287
51.72	421	40.0	2	289
52.29	421	40.0	96	385
52.30	421	100.0	4	389
52.31	421	100.0	4	393

Device	Routing	Invert	Outlet Devices
#1	Primary	52.30'	**100.0' long x 50.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	49.13'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 49.05' Phase-In= 0.01'

Discarded OutFlow Max=0.10 cfs @ 12.36 hrs HW=51.91' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.13' TW=46.41' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 10P: Detention Pond

Inflow Area = 0.211 ac, 27.64% Impervious, Inflow Depth > 4.17" for 50 Yr 24 Hr event
Inflow = 0.95 cfs @ 12.10 hrs, Volume= 0.073 af
Outflow = 0.95 cfs @ 12.10 hrs, Volume= 0.073 af, Atten= 0%, Lag= 0.5 min
Primary = 0.95 cfs @ 12.10 hrs, Volume= 0.073 af
Routed to Pond 2P : Bioretention #2
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach AP5 : Analysis Point 5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 53.16' @ 12.10 hrs Surf.Area= 250 sf Storage= 36 cf

Plug-Flow detention time= 1.3 min calculated for 0.073 af (100% of inflow)
Center-of-Mass det. time= 1.0 min (812.2 - 811.2)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	337 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	213	0	0
54.00	451	332	332
54.01	451	5	337

Device	Routing	Invert	Outlet Devices
#1	Primary	50.50'	**8.0" Round Culvert** L= 117.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 50.50' / 49.80' S= 0.0060 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	53.00'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	54.00'	**6.0' long x 4.0' 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 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.94 cfs @ 12.10 hrs HW=53.15' TW=50.18' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 0.94 cfs of 1.60 cfs potential flow)
↑—**2=Orifice/Grate** (Weir Controls 0.94 cfs @ 1.29 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' TW=0.00' (Dynamic Tailwater)
↑—**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 11P: Subsurface Stone Infiltration #4

Inflow	=	0.06 cfs @	6.13 hrs, Volume=	0.056 af
Outflow	=	0.06 cfs @	8.24 hrs, Volume=	0.056 af, Atten= 4%, Lag= 127.0 min
Discarded	=	0.06 cfs @	8.24 hrs, Volume=	0.056 af
Primary	=	0.00 cfs @	0.00 hrs, Volume=	0.000 af

Routed to Pond 2P : Bioretention #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 50.59' @ 8.24 hrs Surf.Area= 0.010 ac Storage= 0.006 af

Plug-Flow detention time= 69.2 min calculated for 0.056 af (100% of inflow)
Center-of-Mass det. time= 69.1 min (623.2 - 554.1)

Volume	Invert	Avail.Storage	Storage Description
#1	49.20'	0.009 af	**10.00'W x 45.00'L x 2.21'H Prismatoid** 0.023 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	49.20'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 49.12' Phase-In= 0.01'
#2	Primary	51.40'	**45.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#3	Device 4	50.70'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	50.60'	**6.0" Round Culvert** L= 42.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 50.60' / 50.08' S= 0.0124 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.06 cfs @ 8.24 hrs HW=50.59' (Free Discharge)
└**1=Exfiltration** (Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.20' TW=46.41' (Dynamic Tailwater)
├**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└**4=Culvert** (Controls 0.00 cfs)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 12P: Subsurface Stone Infiltration #2

Inflow Area = 0.242 ac, 57.77% Impervious, Inflow Depth = 0.51" for 50 Yr 24 Hr event
Inflow = 0.58 cfs @ 12.22 hrs, Volume= 0.010 af
Outflow = 0.16 cfs @ 12.45 hrs, Volume= 0.010 af, Atten= 73%, Lag= 13.9 min
Discarded = 0.16 cfs @ 12.45 hrs, Volume= 0.010 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 53.46' @ 12.45 hrs Surf.Area= 0.008 ac Storage= 0.007 af

Plug-Flow detention time= 28.7 min calculated for 0.010 af (100% of inflow)
Center-of-Mass det. time= 28.6 min (765.8 - 737.2)

Volume	Invert	Avail.Storage	Storage Description
#1	51.30'	0.007 af	**17.00'W x 20.00'L x 2.21'H Prismatoid** 0.017 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	51.30'	**0.890 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 51.20' Phase-In= 0.01'
#2	Primary	53.50'	**14.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.16 cfs @ 12.45 hrs HW=53.46' (Free Discharge)
└**1=Exfiltration** (Controls 0.16 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.30' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 5L: Unit 5 Sump Pump

Factor of safety of 2 provided

Inflow = 0.04 cfs @ 13.00 hrs, Volume= 0.044 af
Primary = 0.04 cfs @ 13.00 hrs, Volume= 0.044 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 5P : Subsurface Stone Infiltration #3

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

29 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.03
0.03	0.03	0.03	0.04	0.04	0.04	0.03	0.03	0.03	0.03
0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.00	0.00	

Summary for Link 6L: Unit 6 Sump Pump

Factor of safety of 2 provided

Inflow = 0.04 cfs @ 2.00 hrs, Volume= 0.007 af
Primary = 0.04 cfs @ 2.00 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 5P : Subsurface Stone Infiltration #3

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

5 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

0.00	0.02	0.04	0.02	0.00

Summary for Link 7L: Unit 7 Sump Pump

Factor of safety of 2 provided

Inflow = 0.04 cfs @ 10.00 hrs, Volume= 0.036 af
Primary = 0.04 cfs @ 10.00 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 11P : Subsurface Stone Infiltration #4

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

23 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03
0.04	0.04	0.04	0.03	0.03	0.03	0.02	0.02	0.01	0.01
0.01	0.00	0.00							

Summary for Link 8L: Unit 8 Sump Pump

Factor of safety of 2 provided

Inflow = 0.04 cfs @ 6.00 hrs, Volume= 0.020 af
Primary = 0.04 cfs @ 6.00 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 11P : Subsurface Stone Infiltration #4

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

16 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

0.00	0.01	0.01	0.02	0.03	0.03	0.04	0.03	0.03	0.02
0.01	0.01	0.00	0.00	0.00	0.00				

APPENDIX III

Test Pit Logs

GOVE ENVIRONMENTAL SERVICES, INC.

TEST PIT DATA

Project: 212 Woodbury Ave, Portsmouth
Client: Tuck Realty Corp.
GES Project No. 2021307
MM/DD/YY Staff 3-18-2022 JPG

Test Pit No. 1
ESHWT: 21"
Termination @ 43"
Refusal: None
Obs. Water: 40"

2" gravel at surface.

NRCS : Woodbridge

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–9"	10YR 3/2	FSL	GR	FR	NONE
9–21"	10YR 4/6	FSL	GR	FR	NONE
21–43"	2.5Y 5/2	FSL	PL	FI	30%, Distinct

Test Pit No. 2
ESHWT: 30"
Termination @ 51"
Refusal: None
Obs. Water: None

NRCS : Woodbridge

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–9"	10YR 3/2	FSL	GR	FR	NONE
9–30"	10YR 4/6	FSL	GR	FR	NONE
30–51"	2.5Y 5/3	FSL	PL	FI	20%, Distinct

Test Pit No. 3
ESHWT: 27"
Termination @ 45"
Refusal: None
Obs. Water: None

NRCS : Woodbridge

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–9"	10YR 3/2	FSL	GR	FR	NONE
9–27"	10YR 4/6	FSL	GR	FR	NONE
27–45"	2.5Y 5/3	FSL	PL	FI	20%, Distinct

8 Continental Dr Bldg 2 Unit H, Exeter, NH 03833-7526
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info@gesinc.biz
www.gesinc.biz

Test Pit No. 4
ESHWT: 15"
Termination @ 41"
Refusal: None - boulder
Obs. Water: None

NRCS : Woodbridge

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–8"	10YR 3/2	FSL	GR	FR	NONE
8–15"	2.5Y 5/4	FSL	GR	FR	NONE
15–41"	2.5Y 5/3	FSL	PL	FI	10%, Distinct

Test Pit No. 5
ESHWT: 27"
Termination @ 50"
Refusal: None - stony
Obs. Water: None

NRCS : Woodbridge

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–12"	10YR 3/2	FSL	GR	FR	NONE
12–27"	10YR 4/6	FSL	GR	FR	NONE
27–50"	2.5Y 5/3	FSL	PL	FI	10%, Distinct

Test Pit No. 6
ESHWT: 26"
Termination @ 45"
Refusal: None
Obs. Water: None

NRCS : Woodbridge

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–10"	10YR 3/2	FSL	GR	FR	NONE
10–26"	10YR 5/6	FSL	GR	FR	NONE
26–45"	2.5Y 5/3	FSL	PL	FI	10%, Distinct

Test Pit No. 7
ESHWT: 26"
Termination @ 40"
Refusal: None
Obs. Water: None

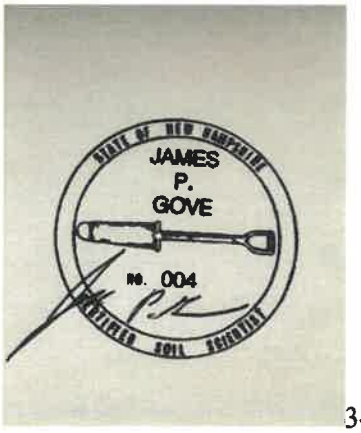
NRCS : Woodbridge

Depth	Color	Texture	Structure	Consistence	Redox; Quantity/Contrast
0–9"	10YR 3/2	FSL	GR	FR	NONE
9–26"	10YR 4/6	FSL	GR	FR	NONE
26–40"	2.5Y 5/3	FSL	PL	FI	10%, Distinct

Legend:

FSL = fine sandy loam
GR = granular
FR = friable
PL = platy
FI = firm

Soil Colors at Munsell.



3-22-2022

TEST PITS
FOR
214 WOODBURY AVENUE
PORTSMOUTH, NEW HAMPSHIRE
SEPTEMBER 7, 2022
JBE Project No. 21254

Performed by: Anthony Jones, Jones & Beach Engineers, Inc., SSD #1900

Test Pit #8

0"- 8"	10YR 3/2	very dark grayish brown fine sandy loam granular, friable many roots
8"- 22"	10YR 4/6	dark yellowish brown fine sandy loam granular, friable common roots
22" – 35"	2.5Y 5/3	light olive brown fine sandy loam platey, firm few, distinct redox

SHWT = 22"
Roots: 22"
No H_2O observed
Refusal @ 35"
Perc Rate = 14 min/inch

Test Pit #9

0"- 8"	10YR 3/2	very dark grayish brown fine sandy loam granular, friable many roots
8"- 27"	10YR 4/6	dark yellowish brown fine sandy loam granular, friable common roots
27" – 40"	2.5Y 5/3	light olive brown fine sandy loam platey, firm common, distinct redox

SHWT = 27"
Roots: 27"
No H_2O observed
Refusal @ 40"
Perc Rate = 14 min/inch

GOVE ENVIRONMENTAL SERVICES, INC.

TEST PIT DATA

Project – Woodbury Avenue, Portsmouth, NH
Client - Jones & Beach Engineers, Inc.
GES Project No. 2022091
MM/DD/YY Staff 11-17-2022 JPG

Test Pit No. 10
ESHWT: 24"
Termination @ 72"
Refusal: None
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox %, Layer
0–24"	10YR 3/3	FSL	GR	FR	NONE , Fill
24–47"	2.5Y 6/4	FSL	GR	FR	5%, Bw
47–72"	2.5Y5/3	SL	PL	FI	5%, Cd

Test Pit No. 11
ESHWT: 37"
Termination @ 72"
Refusal: None
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox %, Layer
0–20"	10YR 3/2	FSL	GR	FR	NONE , Ap
20–37"	10YR 5/4	FSL	GR	FR	NONE, Bw
37–72"	2.5Y5/3	SL	PL	FI	5%, Cd

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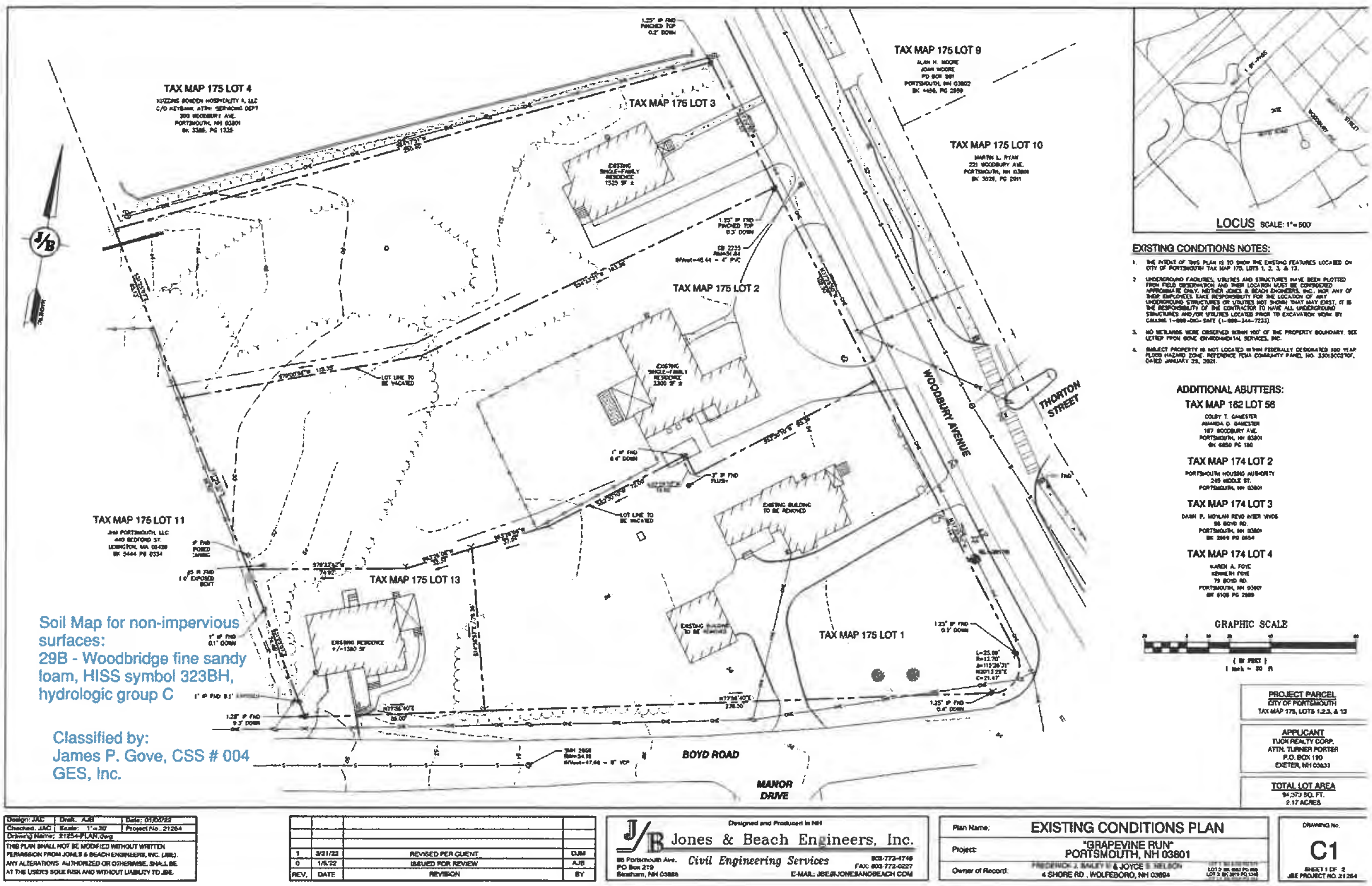
www.gesinc.biz

APPENDIX IV

Professional Soil Classification Exhibit


TAX MAP 175 LOT 4
TAX MAP 175 LOT 3
TAX MAP 175 LOT 9
TAX MAP 175 LOT 10
TAX MAP 175 LOT 2
TAX MAP 175 LOT 11
TAX MAP 175 LOT 13
TAX MAP 175 LOT 1
EXISTING SINGLE-FAMILY RESIDENCE 1525 SF ±
EXISTING SINGLE-FAMILY RESIDENCE 2300 SF ±
EXISTING BUILDING TO BE REMOVED
EXISTING RESIDENCE +/-1380 SF
LOT LINE TO BE VACATED
WOODBURY AVENUE
THORTON STREET
BOYD ROAD
MANOR DRIVE
Soil Map for non-impervious surfaces:
29B - Woodbridge fine sandy loam, HISS symbol 323BH, hydrologic group C
Classified by:
James P. Gove, CSS # 004
GES, Inc.
LOCUS SCALE: 1"=500'
EXISTING CONDITIONS NOTES:
ADDITIONAL ABUTTERS:
TAX MAP 162 LOT 56
COLBY T. GAMESTER
AMANDA D. GAMESTER
PORTSMOUTH, NH 03801
TAX MAP 174 LOT 2
TAX MAP 174 LOT 3
TAX MAP 174 LOT 4
GRAPHIC SCALE
PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1,2,3, & 13
APPLICANT
TUCK REALTY CORP.
ATTN. TURNER PORTER
P.O. BOX 190
EXETER, NH 03833
TOTAL LOT AREA
94,373 SQ. FT.
2.17 ACRES
1 | 3/21/22 | REVISED PER CLIENT | DJM
0 | 1/5/22 | ISSUED FOR REVIEW | AJB
REV. | DATE | REVISION | BY
Designed and Produced in NH
Jones & Beach Engineers, Inc.
Civil Engineering Services
Stratham, NH 03885
E-MAIL: JBE@JONESANDBEACH.COM
Plan Name: EXISTING CONDITIONS PLAN
Project: "GRAPEVINE RUN" PORTSMOUTH, NH 03801
Owner of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON
4 SHORE RD., WOLFEBORO, NH 03894
DRAWING No.
C1
SHEET 1 OF 2
JBE PROJECT NO. 21264

APPENDIX V

NRCS Soil Map

Soil Map—Rockingham County, New Hampshire
(Grapevine Run)

Map Scale: 1:995 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 45 90 180 270

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: Sep 19, 2021—Nov 1, 2021

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
799	Urban land-Canton complex, 3 to 15 percent slopes	2.4	100.0%
Totals for Area of Interest		**2.4**	**100.0%**

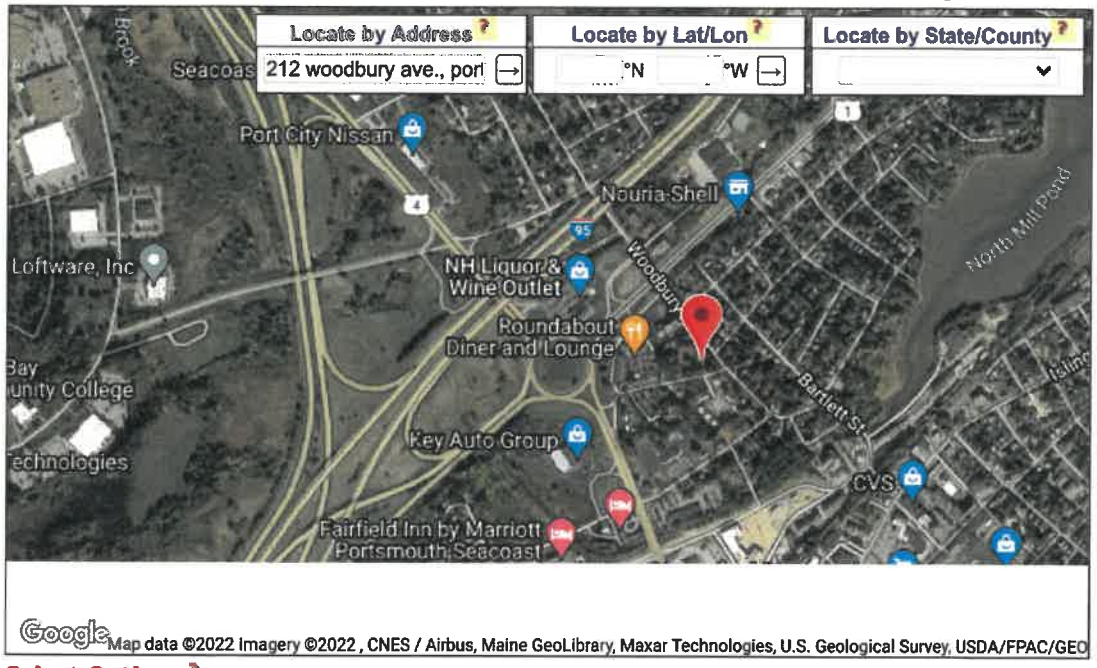
APPENDIX VI

Extreme Precipitation Estimates

Select Product

- Extreme Precipitation Tables - HTML
- Extreme Precipitation Tables - Text/CSV
- Partial Duration Series - by Point
- Partial Duration Series - by Station
- Distribution Curves - Graphical
- Distribution Curves - Text/TBL
- Intensity Frequency Duration Graphs
- Precipitation Frequency Duration Graphs
- GIS Data Files
- Regional/State Maps

Select Location *Double-click the map to place a marker, or enter address or latitude/longitude.*



Select Options

Smoothing	Delivery
Yes	Popup

Submit

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	70.777 degrees West
Latitude	43.073 degrees North
Elevation	0 feet
Date/Time	Wed, 04 May 2022 15:24:32 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.81	1.04	**1yr**	0.70	0.98	1.21	1.56	2.03	2.66	2.92	**1yr**	2.35	2.81	3.22	3.94	4.55	**1yr**
2yr	0.32	0.50	0.62	0.81	1.02	1.30	**2yr**	0.88	1.18	1.52	1.94	2.49	3.21	3.57	**2yr**	2.84	3.43	3.94	4.68	5.33	**2yr**
5yr	0.37	0.58	0.73	0.97	1.25	1.60	**5yr**	1.08	1.46	1.88	2.43	3.14	4.07	4.58	**5yr**	3.60	4.40	5.04	5.93	6.70	**5yr**
10yr	0.41	0.65	0.82	1.11	1.45	1.89	**10yr**	1.25	1.72	2.23	2.89	3.75	4.87	5.53	**10yr**	4.31	5.32	6.08	7.11	7.98	**10yr**
25yr	0.48	0.76	0.96	1.33	1.77	2.33	**25yr**	1.53	2.14	2.77	3.62	4.74	6.17	7.10	**25yr**	5.46	6.83	7.80	9.02	10.05	**25yr**
50yr	0.53	0.86	1.10	1.53	2.06	2.75	**50yr**	1.78	2.52	3.28	4.32	5.66	7.39	8.58	**50yr**	6.54	8.25	9.42	10.81	11.98	**50yr**
100yr	0.59	0.96	1.24	1.76	2.41	3.24	**100yr**	2.08	2.97	3.89	5.15	6.76	8.86	10.38	**100yr**	7.84	9.98	11.37	12.96	14.28	**100yr**
200yr	0.67	1.10	1.42	2.04	2.81	3.82	**200yr**	2.43	3.50	4.60	6.11	8.07	10.61	12.55	**200yr**	9.39	12.07	13.74	15.55	17.04	**200yr**
500yr	0.79	1.31	1.70	2.47	3.46	4.74	**500yr**	2.98	4.36	5.74	7.68	10.21	13.49	16.15	**500yr**	11.94	15.53	17.65	19.78	21.52	**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	0.89	1yr	0.63	0.87	0.92	1.32	1.67	2.22	2.51	1yr	1.97	2.41	2.86	3.16	3.88	1yr
2yr	0.31	0.49	0.60	0.81	1.00	1.19	2yr	0.86	1.16	1.37	1.82	2.34	3.06	3.45	2yr	2.70	3.32	3.82	4.55	5.08	2yr
5yr	0.35	0.54	0.67	0.92	1.17	1.40	5yr	1.01	1.37	1.61	2.12	2.74	3.79	4.20	5yr	3.36	4.04	4.72	5.54	6.25	5yr
10yr	0.39	0.59	0.73	1.03	1.33	1.60	10yr	1.14	1.56	1.81	2.39	3.06	4.38	4.87	10yr	3.87	4.69	5.45	6.42	7.21	10yr

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
25yr	0.44	0.67	0.83	1.19	1.56	1.90	**25yr**	1.35	1.86	2.10	2.76	3.54	4.70	5.91	**25yr**	4.16	5.69	6.67	7.81	8.70	**25yr**
50yr	0.48	0.73	0.91	1.31	1.77	2.17	**50yr**	1.52	2.12	2.35	3.08	3.94	5.31	6.83	**50yr**	4.70	6.57	7.76	9.07	10.04	**50yr**
100yr	0.54	0.81	1.02	1.47	2.01	2.47	**100yr**	1.74	2.42	2.63	3.43	4.37	5.96	7.89	**100yr**	5.27	7.59	9.02	10.54	11.59	**100yr**
200yr	0.59	0.89	1.13	1.64	2.28	2.82	**200yr**	1.97	2.75	2.94	3.80	4.82	6.67	9.12	**200yr**	5.90	8.77	10.49	12.27	13.41	**200yr**
500yr	0.69	1.02	1.32	1.91	2.72	3.37	**500yr**	2.35	3.29	3.41	4.34	5.49	7.75	11.03	**500yr**	6.86	10.61	12.81	15.02	16.23	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.44	0.54	0.72	0.89	1.08	**1yr**	0.77	1.06	1.26	1.74	2.21	2.99	3.15	**1yr**	2.65	3.03	3.58	4.38	5.05	**1yr**
2yr	0.34	0.52	0.64	0.86	1.06	1.27	**2yr**	0.92	1.24	1.48	1.96	2.51	3.43	3.70	**2yr**	3.03	3.56	4.08	4.83	5.64	**2yr**
5yr	0.40	0.62	0.76	1.05	1.33	1.62	**5yr**	1.15	1.58	1.88	2.53	3.25	4.34	4.95	**5yr**	3.84	4.76	5.37	6.36	7.14	**5yr**
10yr	0.47	0.72	0.89	1.24	1.61	1.97	**10yr**	1.39	1.93	2.28	3.10	3.94	5.34	6.19	**10yr**	4.72	5.95	6.79	7.82	8.74	**10yr**
25yr	0.57	0.87	1.09	1.55	2.04	2.56	**25yr**	1.76	2.50	2.95	4.06	5.13	7.81	8.31	**25yr**	6.91	7.99	9.10	10.31	11.39	**25yr**
50yr	0.67	1.02	1.27	1.82	2.45	3.12	**50yr**	2.11	3.05	3.59	4.99	6.29	9.78	10.41	**50yr**	8.66	10.01	11.37	12.69	13.93	**50yr**
100yr	0.78	1.19	1.49	2.15	2.94	3.79	**100yr**	2.54	3.71	4.36	6.14	7.72	12.25	13.04	**100yr**	10.84	12.54	14.20	15.65	17.05	**100yr**
200yr	0.92	1.38	1.75	2.53	3.53	4.63	**200yr**	3.05	4.52	5.32	7.55	9.47	15.38	16.35	**200yr**	13.61	15.72	17.75	19.28	20.87	**200yr**
500yr	1.14	1.69	2.18	3.16	4.50	6.00	**500yr**	3.88	5.87	6.90	9.98	12.44	20.79	22.06	**500yr**	18.40	21.21	23.87	25.41	27.28	**500yr**

APPENDIX VII

Amoozemeter Test Results

Pit #1 - Test #1

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
6.8	20	0.5	0.008333	16320.0	17.2339	6.7850
10.5	20	1	0.016667	12600.0	13.3056	5.2384
13	20	1.5	0.025	10400.0	10.9824	4.3238
15.1	20	2	0.033333	9060.0	9.5674	3.7667
19.5	20	3	0.05	7800.0	8.2368	3.2428
23.6	20	4	0.066667	7080.0	7.4765	2.9435
28.1	20	5	0.083333	6744.0	7.1217	2.8038
32.3	20	6	0.1	6460.0	6.8218	2.6857
36.5	20	7	0.116667	6257.1	6.6075	2.6014
40.2	20	8	0.133333	6030.0	6.3677	2.5070
				Mean		3.6898
				σ (Std. Dev.)		1.3236

Constant	20	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 153 cm^2 for two tubes (one tube used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Pit #1 - Test #2

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
10.5	20	0.5	0.008333	25200.0	26.6112	10.4769
22.1	20	1.25	0.020833	21216.0	22.4041	8.8205
27.1	20	2	0.033333	16260.0	17.1706	6.7601
30.8	20	2.5	0.041667	14784.0	15.6119	6.1464
33.9	20	3	0.05	13560.0	14.3194	5.6375
36	20	3.5	0.058333	12342.9	13.0341	5.1315
38.9	20	4	0.066667	11670.0	12.3235	4.8518
	105		0	#DIV/0!	#DIV/0!	
	105		0	#DIV/0!	#DIV/0!	
	105		0	#DIV/0!	#DIV/0!	

Mean	6.8321
σ (Std. Dev.)	1.9255

Constant	20	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 153 cm^2 for two tubes (one tube used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Pit #1 - Test #3

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
2.2	20	0.5	0.008333	5280.0	5.5757	2.1951
3	20	1	0.016667	3600.0	3.8016	1.4967
5.7	20	1.5	0.025	4560.0	4.8154	1.8958
7.5	20	2	0.033333	4500.0	4.7520	1.8709
10.8	20	3	0.05	4320.0	4.5619	1.7960
14.1	20	4	0.066667	4230.0	4.4669	1.7586
17.3	20	5	0.083333	4152.0	4.3845	1.7262
20.7	20	6	0.1	4140.0	4.3718	1.7212
23.8	20	7	0.116667	4080.0	4.3085	1.6963
27	20	8	0.133333	4050.0	4.2768	1.6838
30.4	20	9	0.15	4053.3	4.2803	1.6852
33.6	20	10	0.166667	4032.0	4.2578	1.6763
				Mean		1.7668
				σ (Std. Dev.)		0.1621

Constant	20	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 153 cm^2 for two tubes (one tube used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Pit #2 - Test #1

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
5	20	2	0.033333	3000.0	3.1680	1.2472
7.6	20	5	0.083333	1824.0	1.9261	0.7583
12	20	10	0.166667	1440.0	1.5206	0.5987
15.9	20	15	0.25	1272.0	1.3432	0.5288
20	20	20	0.333333	1200.0	1.2672	0.4989
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	

Mean	0.7264
σ (Std. Dev.)	0.2755

Constant	20	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 153 cm^2 for two tubes (one tube used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Pit #2 - Test #2

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
9.1	20	5	0.083333	2184.0	2.3063	0.9080
15.2	20	10	0.166667	1824.0	1.9261	0.7583
17.5	20	15	0.25	1400.0	1.4784	0.5820
21.5	20	20	0.333333	1290.0	1.3622	0.5363
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	

Mean	0.6962
σ (Std. Dev.)	0.1477

Constant	20	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 153 cm^2 for two tubes (one tube used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Pit #2 - Test #3

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
5.6	20	5	0.083333	1344.0	1.4193	0.5588
9.4	20	10	0.166667	1128.0	1.1912	0.4690
13.4	20	15	0.25	1072.0	1.1320	0.4457
17.6	20	20	0.333333	1056.0	1.1151	0.4390
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	

Mean	0.4781
σ (Std. Dev.)	0.0479

Constant	20	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 153 cm^2 for two tubes (one tube used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

APPENDIX VIII

BMP Worksheets

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Bioretention #1 (6P)**

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).	
0.24	ac	A = Area draining to the practice	
0.14	ac	A_I = Impervious area draining to the practice	
0.58	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.57	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.14	ac-in	WQV= 1" x Rv x A	
501	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
125	cf	25% x WQV (check calc for sediment forebay volume)	
375	cf	75% x WQV (check calc for surface sand filter volume)	
Sediment Forebay		Method of Pretreatment? (not required for clean or roof runoff)	
165	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
Calculate time to drain if system IS NOT underdrained:			
502	sf	A_{SA} = Surface area of the practice	
0.89	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
13.4	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
52.25	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
51.13	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
49.95	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
52.25	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	≥ 1'
2.30	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	≥ 1'
1.12	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	≥ 1'
54.81	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
55.00	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
531	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	D4	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	≥ 3:1
Sheet	L1	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
Sheet		Note what sheet in the plan set contains the filter course spec.	mod. 304.1 (see 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:

Stage-Area-Storage for Pond 6P: Bioretention #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
51.24	502	0
51.29	502	10
51.34	502	20
51.39	502	30
51.44	502	40
51.49	502	50
51.54	502	60
51.59	502	70
51.64	502	80
51.69	502	90
51.74	502	100
51.79	502	110
51.84	502	120
51.89	502	131
51.94	502	141
51.99	502	151
52.04	502	161
52.09	502	171
52.14	502	181
52.19	502	191
52.24	502	201
52.29	502	205
52.34	502	208
52.39	502	212
52.44	502	216
52.49	502	220
52.54	502	223
52.59	502	227
52.64	502	231
52.69	502	235
52.74	502	238
52.79	502	242
52.84	502	246
52.89	502	250
52.94	502	254
52.99	502	257
53.04	502	261
53.09	502	265
53.14	502	269
53.19	502	272
53.24	502	276
53.29	502	280
53.34	502	284
53.39	502	287
53.44	502	291
53.49	502	295
53.54	502	299
53.59	502	302
53.64	502	306
53.69	502	310
53.74	502	314
53.79	516	339
53.84	535	365
53.89	553	393
53.94	572	421
53.99	591	450
54.04	626	480
54.09	665	512
54.14	706	547
54.19	748	583
54.24	791	622
54.29	835	662
54.34	881	705
54.39	928	750
54.44	976	798
54.49	1,025	848
54.54	1,060	900
54.59	1,093	954
54.64	1,126	1,009
54.69	1,159	1,066
54.74	1,193	1,125
54.79	1,227	1,186
54.84	1,262	1,248
54.89	1,297	1,312
54.94	1,333	1,378
54.99	**1,369**	**1,445**

Bottom of filter course El. = 52.25
Vol. below = 201 cf
Excluded from WQV Calculation

Elevation of overflow risers = 54.15
Vol. below = 547 cf
Vol. Sediment forebay (included in WQV calculation) = 165 cf
Vol. below filter course (excluded from WQV calculation) = 201 cf

WQV Required = 501 cf

WQV Provided
547+165-201 = 511 cf

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Bioretention #2 (2P) SEE DESIGNER NOTES BELOW**

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).	
0.88	ac	A = Area draining to the practice	
0.36	ac	A_I = Impervious area draining to the practice	
0.41	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.42	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.37	ac-in	WQV= 1" x Rv x A	
1,346	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
336	cf	25% x WQV (check calc for sediment forebay volume)	
1,009	cf	75% x WQV (check calc for surface sand filter volume)	
Pre-Tx		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:			
1,080	sf	A_{SA} = Surface area of the practice	
0.30	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
49.8	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
47.75	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
46.25	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
44.42	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
47.75	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	≥ 1'
3.33	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	≥ 1'
1.50	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	≥ 1'
51.29	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
51.50	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
1,361	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	D4	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	≥ 3:1
Sheet	L1	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:
"Area draining to practice" excludes Eco-Paver driveways and subsurface stone basins, which are hydraulically routed to the bioretention in HydroCAD. Therefore there is a slight discrepancy, but these practices do not actually overflow to the bioretention system.

Stage-Area-Storage for Pond 2P: Bioretention #2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
46.41	1,080	0
46.46	1,080	22
46.51	1,080	43
46.56	1,080	65
46.61	1,080	86
46.66	1,080	108
46.71	1,080	130
46.76	1,080	151
46.81	1,080	173
46.86	1,080	194
46.91	1,080	216
46.96	1,080	238
47.01	1,080	259
47.06	1,080	281
47.11	1,080	302
47.16	1,080	324
47.21	1,080	346
47.26	1,080	367
47.31	1,080	389
47.36	1,080	410
47.41	1,080	432
47.46	1,080	454
47.51	1,080	475
47.56	1,080	497
47.61	1,080	518
47.66	1,080	540
47.71	1,080	562
47.76	1,080	578
47.81	1,080	586
47.86	1,080	594
47.91	1,080	602
47.96	1,080	610
48.01	1,080	618
48.06	1,080	626
48.11	1,080	635
48.16	1,080	643
48.21	1,080	651
48.26	1,080	659
48.31	1,080	667
48.36	1,080	675
48.41	1,080	683
48.46	1,080	691
48.51	1,080	699
48.56	1,080	707
48.61	1,080	716
48.66	1,080	724
48.71	1,080	732
48.76	1,080	740
48.81	1,080	748
48.86	1,080	756
48.91	1,080	764
48.96	1,080	772

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
49.01	1,080	780
49.06	1,080	788
49.11	1,080	797
49.16	1,080	805
49.21	1,080	813
49.26	1,127	839
49.31	1,376	902
49.36	1,650	977
49.41	1,949	1,067
49.46	2,273	1,173
49.51	2,558	1,295
49.56	2,599	1,424
49.61	2,640	1,555
49.66	2,681	1,688
49.71	2,723	1,823
49.76	2,765	1,960
49.81	2,807	2,099
49.86	2,850	2,241
49.91	2,893	2,384
49.96	2,936	2,530
50.01	2,979	2,678
50.06	3,020	2,828
50.11	3,061	2,980
50.16	3,102	3,134
50.21	3,144	3,290
50.26	3,186	3,448
50.31	3,228	3,609
50.36	3,271	3,771
50.41	3,313	3,936
50.46	3,356	4,102
50.51	3,400	4,271
50.56	3,443	4,442
50.61	3,487	4,616
50.66	3,531	4,791
50.71	3,576	4,969
50.76	3,621	5,149
50.81	3,666	5,331
50.86	3,711	5,515
50.91	3,756	5,702
50.96	3,802	5,891
51.01	3,848	6,082
51.06	3,893	6,276
51.11	3,938	6,472
51.16	3,983	6,670
51.21	4,029	6,870
51.26	4,074	7,072
51.31	4,121	7,277
51.36	4,167	7,484
51.41	4,213	7,694
51.46	4,260	7,906
51.51	**4,331**	**8,120**

Bottom of filter course el. = 47.75
Vol. below = 576 cf
Excluded from WQV calculation

Overflow riser el. = 49.75
Vol. below riser = 1,937 cf
WQV Required = 1,346 cf

WQV Provided
1937-576 = 1,361 cf

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Unit 6 Permeable Paver Driveway (7P)**

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).	
0.03	ac	A = Area draining to the practice	
0.03	ac	A_I = Impervious area draining to the practice	
1.00	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.95	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.03	ac-in	WQV= 1" x Rv x A	
103	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
26	cf	25% x WQV (check calc for sediment forebay volume)	
78	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:			
421	sf	A_{SA} = Surface area of the practice	
0.30	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)	
9.8	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
	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
-	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	≥ 1'
-	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	≥ 1'
-	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	≥ 1'
	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
	ft	Elevation of the top of the practice	
-		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
	cf	V = Volume of storage[3] (attach a stage-storage table)	≥ 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	
	:1	Pond side slopes	≥ 3:1
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
Pavers		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
0.0	acres	A_{SA} = Surface area of the pervious pavement	
3.0	:1	Ratio of the contributing area to the pervious surface area	≤ 5:1
12.0	inches	D_{FC} = Filter course thickness	12", or 18" if within GPA
Sheet	D4	Note what sheet in the plan set contains the filter course spec.	mod. 304.1 (see 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:

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Unit 7 Permeable Paver Driveway (8P)**

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).	
0.03	ac	A = Area draining to the practice	
0.03	ac	A_I = Impervious area draining to the practice	
1.00	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.95	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.03	ac-in	WQV= 1" x Rv x A	
103	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
26	cf	25% x WQV (check calc for sediment forebay volume)	
78	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:			
421	sf	A_{SA} = Surface area of the practice	
0.30	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)	
9.8	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
	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
-	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	≥ 1'
-	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	≥ 1'
-	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	≥ 1'
	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
	ft	Elevation of the top of the practice	
-		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
	cf	V = Volume of storage[3] (attach a stage-storage table)	≥ 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	
	:1	Pond side slopes	≥ 3:1
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
Pavers		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
0.0	acres	A_{SA} = Surface area of the pervious pavement	
3.0	:1	Ratio of the contributing area to the pervious surface area	≤ 5:1
12.0	inches	D_{FC} = Filter course thickness	12", or 18" if within GPA mod. 304.1 (see spec)
Sheet	D4	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:

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Unit 8 Permeable Paver Driveway (9P)**

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	
0.67	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.65	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.03	ac-in	WQV= 1" x Rv x A	
106	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
27	cf	25% x WQV (check calc for sediment forebay volume)	
80	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:			
421	sf	A_{SA} = Surface area of the practice	
0.30	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)	
10.1	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
	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
-	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	≥ 1'
-	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	≥ 1'
-	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	≥ 1'
	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
	ft	Elevation of the top of the practice	
-		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
	cf	V = Volume of storage[3] (attach a stage-storage table)	≥ 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	
	:1	Pond side slopes	≥ 3:1
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
Pavers		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
0.0	acres	A_{SA} = Surface area of the pervious pavement	
4.5	:1	Ratio of the contributing area to the pervious surface area	≤ 5:1
12.0	inches	D_{FC} = Filter course thickness	12", or 18" if within GPA mod. 304.1 (see spec)
Sheet	D4	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:

APPENDIX IX

Pollutant Removal Efficiency Data & Worksheet

Pollutant Removal Efficiencies for Best Management Practices for Use in Pollutant Loading Analysis				Values Accepted for Loading Analyses		
BMP Type	**BMP**	**Notes**	**Lit. Ref.**	**TSS**	**TN**	**TP**
Stormwater Ponds	Wet Pond		B, F	70%	35%	45%
	Wet Extended Detention Pond		A, B	80%	55%	68%
	Micropool Extended Detention Pond	TBA				
	Multiple Pond System	TBA				
	Pocket Pond	TBA				
Stormwater Wetlands	Shallow Wetland		A, B, F, I	80%	55%	45%
	Extended Detention Wetland		A, B, F, I	80%	55%	45%
	Pond/Wetland System	TBA				
	Gravel Wetland		H	95%	85%	64%
Infiltration Practices	Infiltration Trench (≥75 ft from surface water)		B, D, I	90%	55%	60%
	Infiltration Trench (<75 ft from surface water)		B, D, I	90%	10%	60%
	Infiltration Basin (≥75 ft from surface water)		A, F, B, D, I	90%	60%	65%
	Infiltration Basin (<75 ft from surface water)		A, F, B, D, I	90%	10%	65%
	Dry Wells			90%	55%	60%
	Drip Edges			90%	55%	60%
Filtering Practices	Aboveground or Underground Sand Filter that infiltrates WQV (≥75 ft from surface water)		A, F, B, D, I	90%	60%	65%
	Aboveground or Underground Sand Filter that infiltrates WQV (<75 ft from surface water)		A, F, B, D, I	90%	10%	65%
	Aboveground or Underground Sand Filter with underdrain		A, I, F, G, H	85%	10%	45%
	Tree Box Filter	TBA				
	Bioretention System		I, G, H	90%	65%	65%
	Permeable Pavement that infiltrates WQV (≥75 ft from surface water)		A, F, B, D, I	90%	60%	65%
	Permeable Pavement that infiltrates WQV (<75 ft from surface water)		A, F, B, D, I	90%	10%	65%
	Permeable Pavement with underdrain		Use TN and TP values for sand filter w/ underdrain and outlet pipe	90%	10%	45%

Pollutant Removal Efficiencies for Best Management Practices for Use in Pollutant Loading Analysis				Values Accepted for Loading Analyses		
BMP Type	**BMP**	**Notes**	**Lit. Ref.**	**TSS**	**TN**	**TP**
Treatment Swales	Flow Through Treatment Swale	TBA				
Vegetated Buffers	Vegetated Buffers		A, B, I	73%	40%	45%
Pre-Treatment Practices	Sediment Forebay	TBA				
	Vegetated Filter Strip		A, B, I	73%	40%	45%
	Vegetated Swale		A, B, C, F, H, I	65%	20%	25%
	Flow-Through Device - Hydrodynamic Separator		A, B, G, H	35%	10%	5%
	Flow-Through Device - ADS Underground Multichamber Water Quality Unit (WQU)		G, H	72%	10%	9%
	Other Flow-Through Devices	TBA				
	Off-line Deep Sump Catch Basin		J, K, L, M	15%	5%	5%

TSS Removal	A Non-Roof Impervious Area (acres)	B Removal Efficiency	C (A*B) Amount Removed	D (C/A) Total Removal Efficiency
Bioretention	0.390	90%	0.351	
Porous Pavers	0.029	90%	0.026	
Infiltration	0.022	90%	0.020	
Untreated	0.030	0%	0.000	
Total Impervious	0.472		0.398	84%

Phosphorous Removal	A Non-Roof Impervious Area (acres)	B Removal Efficiency	C (A*B) Amount Removed	D (C/A) Total Removal Efficiency
Bioretention Pond #1	0.390	65%	0.254	
Porous Pavers	0.029	60%	0.018	
Infiltration	0.022	60%	0.013	
Untreated	0.030	0%	0.000	
Total Impervious	0.472		0.285	60%

Nitrogen Removal	A Non-Roof Impervious Area (acres)	B Removal Efficiency	C (A*B) Amount Removed	D (C/A) Total Removal Efficiency
Bioretention Pond #1	0.390	65%	0.254	
Porous Pavers	0.029	65%	0.019	
Infiltration	0.022	65%	0.015	
Untreated	0.030	0%	0.000	
Total Impervious	0.472		0.287	61%

APPENDIX X

Sump Pump Discharge Calculation Worksheet

Sump Pump Discharge Calculation Worksheet

Y	Surface Area	953	SF		
Permeability		1.78	iph		
		3.56	iph	Factor of Safety = 2	
		0.296667	fph		
	Z	8.24E-05	fps	Void ratio	0.5
	Unit 5				
A	FF	55.5	feet		
B	Excavation Depth	47.5	feet	B=A-8	
C	Average Ex Grade	52.85	feet		
D	SHWT Depth	1.25	feet		
E	SHWT El.	51.6	feet	E=C-D	
F	Depth in SHWT	4.1	feet	F=E-B	
G	Volume	1953.65	cf	G=Y*F*0.5	
H	Lag	49752.81	seconds	H=F/Z	13.82022 hours
Q	Flow	0.039267	cfs	Q=G/H	
	Unit 6				
A	FF	55.5	feet		
B	Excavation Depth	47.5	feet	B=A-8	
C	Average Ex Grade	49.4	feet		
D	SHWT Depth	2.5	feet		
E	SHWT El.	46.9	feet	E=C-D	
F	Depth in SHWT	0.6	feet	F=E-B	
G	Volume	285.9	cf	G=Y*F*0.5	
H	Lag	7280.899	seconds	H=F/Z	2.022472 hours
Q	Flow	0.039267	cfs	Q=G/H	
	Unit 7				
A	FF	55.5	feet		
B	Excavation Depth	47.5	feet	B=A-8	
C	Average Ex Grade	53	feet		
D	SHWT Depth	2.25	feet		
E	SHWT El.	50.75	feet	E=C-D	
F	Depth in SHWT	3.25	feet	F=E-B	
G	Volume	1548.625	cf	G=Y*F*0.5	
H	Lag	39438.2	seconds	H=F/Z	10.95506 hours
Q	Flow	0.039267	cfs	Q=G/H	
	Unit 8				
A	FF	55	feet		
B	Excavation Depth	47	feet	B=A-8	
C	Average Ex Grade	50.5	feet		
D	SHWT Depth	1.75	feet		
E	SHWT El.	48.75	feet	E=C-D	
F	Depth in SHWT	1.75	feet	F=E-B	
G	Volume	833.875	cf	G=Y*F*0.5	
H	Lag	21235.96	seconds	H=F/Z	5.898876 hours
Q	Flow	0.039267	cfs	Q=G/H	

Unit 5 Hydrograph

Hour	Discharge rate (cfs)
0	0.000
1	0.003
2	0.006
3	0.009
4	0.011
5	0.014
6	0.017
7	0.020
8	0.023
9	0.026
10	0.028
11	0.031
12	0.034
13	0.037
14	0.040
15	0.037
16	0.034
17	0.031
18	0.028
19	0.026
20	0.023
21	0.020
22	0.017
23	0.014
24	0.011
25	0.009
26	0.006
27	0.003
28	0.000

Unit 6 Hydrograph

Hour	Discharge rate (cfs)
0	0.000
1	0.019
2	0.039
3	0.019
4	0.000

Unit 7 Hydrograph

Hour	Discharge rate (cfs)
0	0.000
1	0.004
2	0.007
3	0.011
4	0.014
5	0.018
6	0.022
7	0.025
8	0.029
9	0.032
10	0.036
11	0.039
12	0.036
13	0.032
14	0.029
15	0.025
16	0.022
17	0.018
18	0.014
19	0.011
20	0.007
21	0.004
22	0.000

Unit 8 Hydrograph

Hour	Discharge rate (cfs)
0	0.000
1	0.007
2	0.013
3	0.020
4	0.027
5	0.033
6	0.040
7	0.033
8	0.027
9	0.020
10	0.013
11	0.007
12	0.000

APPENDIX XI

Rip Rap Sizing Calculations

RIP RAP CALCULATIONS
Grapevine Run
212, 214, & 216 Woodbury Ave
Portsmouth, NH 03801

Jones & Beach Engineers, Inc.
P.O. Box 219
Stratham, NH 03885
28-Nov-22

Rip Rap equations were obtained from the *Stormwater Management and Erosion Control Handbook for Urban and Developing Areas in New Hampshire.*
Aprons are sized for the 25-Year storm event.

TAILWATER < HALF THE D_o

$L_a = (1.8 \times Q) / D_0^{3/2} + (7 \times D_o)$
$W = L_a + (3 \times D_o)$ or defined channel width
$d_{50} = (0.02 \times Q^{4/3}) / (T_w \times D_0)$

Culvert or Catch Basin (Sta. No.)	Tailwater (Feet) T_w	Discharge (C.F.S.) Q	Diameter of Pipe D_o	Length of Rip Rap L_a (feet)	Width of Rip Rap W (feet)	d_{50}-Median Stone Rip Rap d50 (feet)
				#DIV/0!	#DIV/0!	#DIV/0!

TAILWATER > HALF THE D_o

$L_a = (3.0 \times Q) / D_0^{3/2} + (7 \times D_o)$
$W = (0.4 \times L_a) + (3 \times D_o)$ or defined channel width
$d_{50} = (0.02 \times Q^{4/3}) / (T_w \times D_0)$

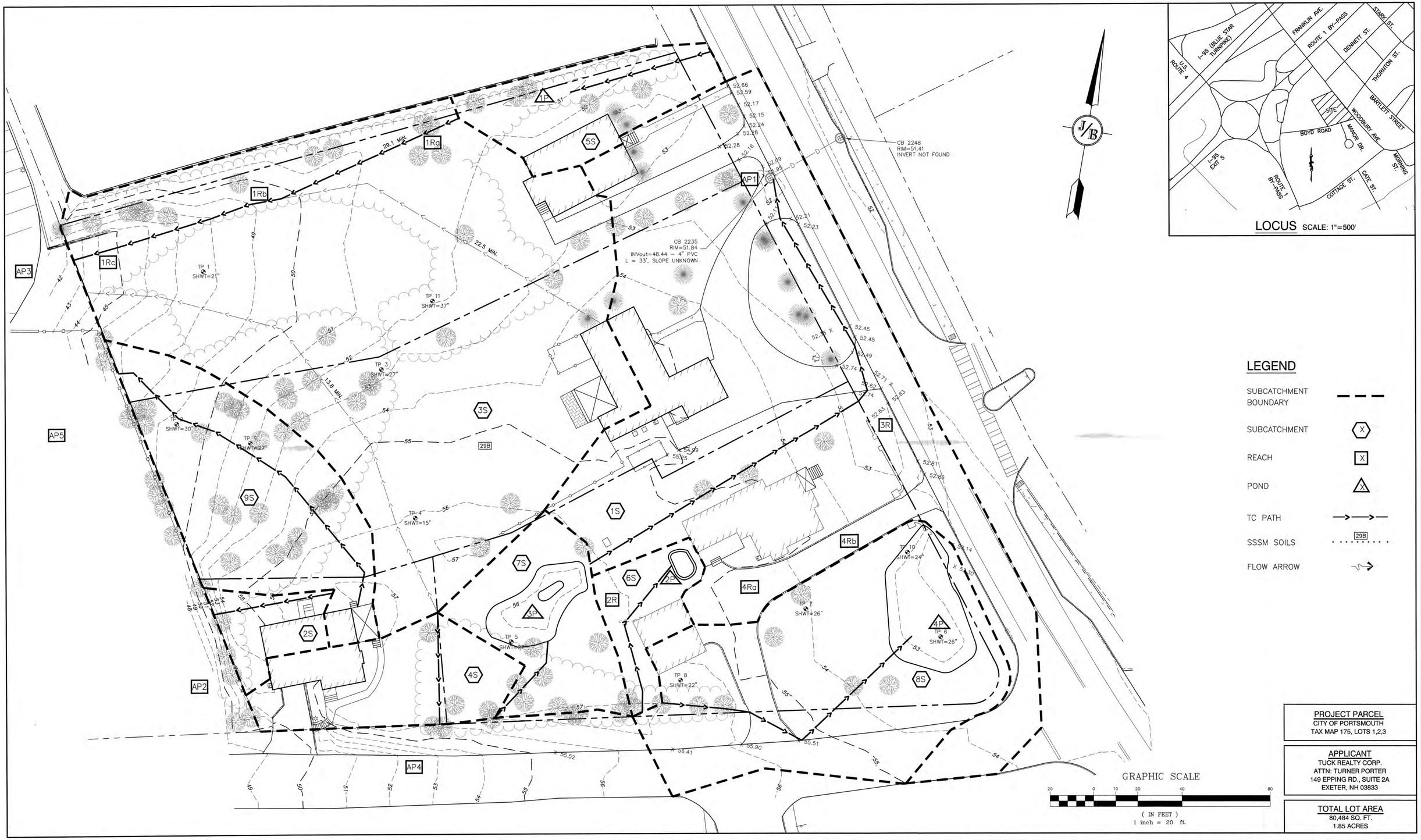
Culvert or Catch Basin (Sta. No.)	Tailwater (Feet) T_w	Discharge (C.F.S.) Q	Diameter of Pipe D_o	Length of Rip Rap L_a (feet)	Width of Rip Rap W (feet)	d_{50}-Median Stone Rip Rap d50 (feet)
8" HDPE (Pond 10P)	0.44	0.73	0.67	8.7	5	0.04

Table 7-24 -- Recommended Rip Rap Gradation Ranges				
d_{50} Size =	0.25	Feet	3	Inches
% of Weight Smaller		Size of Stone (Inches)		
Than the Given d_{50} Size		From		To
100%		5		6
85%		4		5
50%		3		5
15%		1		2

Table 7-24 -- Recommended Rip Rap Gradation Ranges				
d_{50} Size =	0.5	Feet	6	Inches
% of Weight Smaller		Size of Stone (Inches)		
Than the Given d_{50} Size		From		To
100%		9		12
85%		8		11
50%		6		9
15%		2		3

APPENDIX XII

Pre- and Post-Construction Watershed Plans



LOCUS SCALE: 1"=500'

LEGEND

- SUBCATCHMENT BOUNDARY
- SUBCATCHMENT (X)
- REACH [X]
- POND (X)
- TC PATH
- SSSM SOILS [29B]
- FLOW ARROW

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1,2,3

APPLICANT
TUCK REALTY CORP.
ATTN: TURNER PORTER
149 EPPING RD., SUITE 2A
EXETER, NH 03833

TOTAL LOT AREA
80,484 SQ. FT.
1.85 ACRES

Design: DJM	Draft: DJM
Checked: PSL	Scale: 1"=20'
Date: 01/05/22	Project No.: 21254
Drawing Name: 21254-WATERSHED.dwg	

STATE OF NEW HAMPSHIRE — PAIGE S. LIBBEY No.16670 — LICENSED PROFESSIONAL ENGINEER

REV.	DATE	REVISION	BY
5	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
4	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
3	9/16/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM
2	8/1/22	REVISED PER TAC COMMENTS	DJM
1	6/21/22	ISSUED FOR REVIEW	DJM

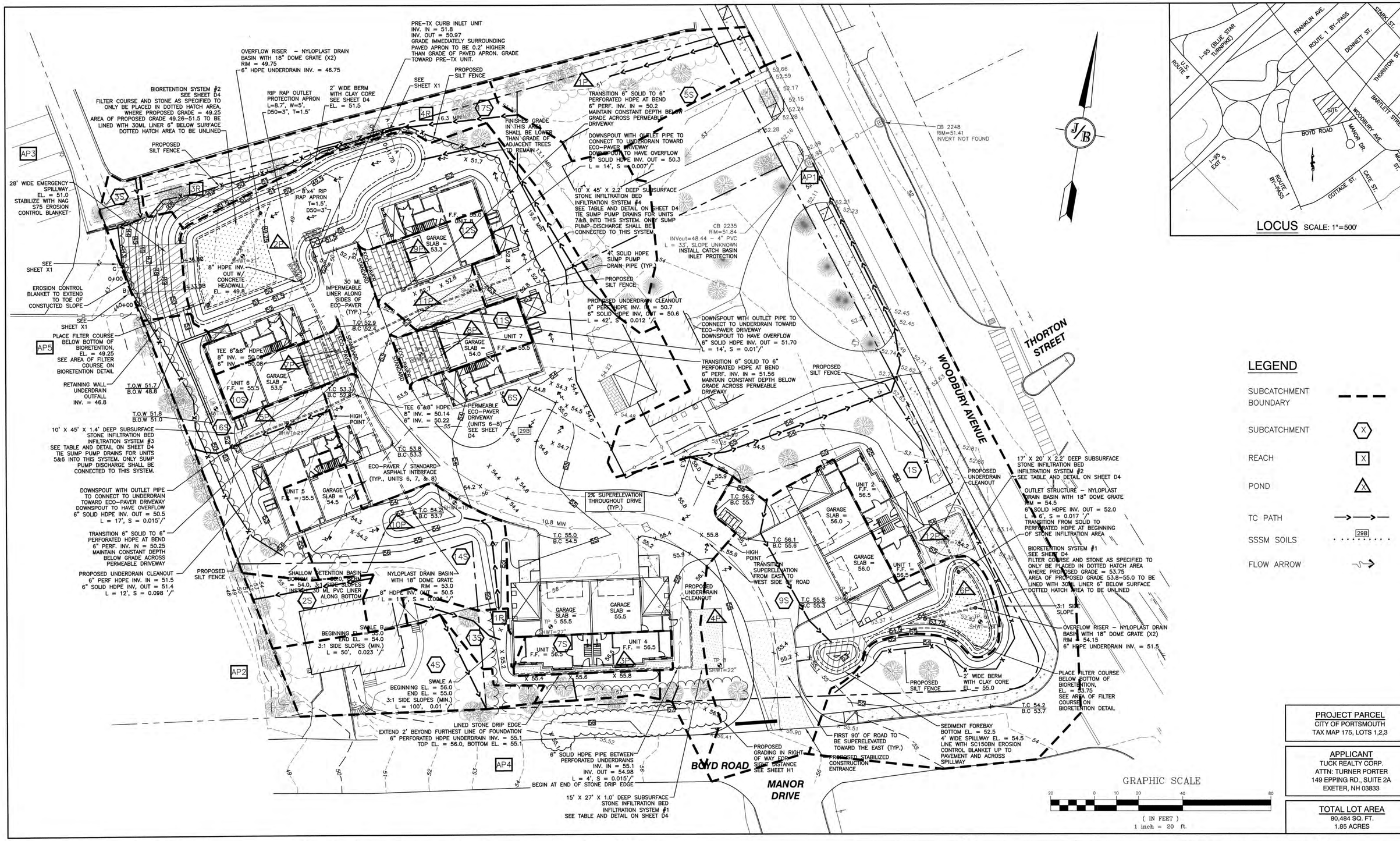
Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: EXISTING WATERSHED PLAN

Project: "GRAPEVINE RUN"
212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

Owner of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON
4 SHORE RD., WOLFEBORO, NH 03894
LOT 1: BK 4708 PG 979
LOT 2: BK 4592 PG 888
LOT 3: BK 3919 PG 1345

DRAWING No.
W1
SHEET 1 OF 2
JBE PROJECT NO. 21254



PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1,2,3

APPLICANT
TUCK REALTY CORP.
ATTN: TURNER PORTER
149 EPPING RD., SUITE 2A
EXETER, NH 03833

TOTAL LOT AREA
80,484 SQ. FT.
1.85 ACRES

Design: DJM	Draft: DJM
Checked: PSL	Scale: 1"=20'
Date: 01/05/22	Project No.: 21254
Drawing Name: 21254-WATERSHED.dwg	

PAIGE S LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

REV.	DATE	REVISION	BY
5	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
4	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
3	9/16/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM
2	8/1/22	REVISED PER TAC COMMENTS	DJM
1	6/21/22	ISSUED FOR REVIEW	DJM

Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: PROPOSED WATERSHED PLAN

Project: "GRAPEVINE RUN"
212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

Owner of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON
4 SHORE RD., WOLFEBORO, NH 03894
LOT 1: BK 4708 PG 979
LOT 2: BK 4582 PG 888
LOT 3: BK 3919 PG 1345

DRAWING No.
W2
SHEET 2 OF 2
JBE PROJECT NO. 21254

Tarquin

1108.124 GR (5/16/2022)

Art Form Architecture, Inc.

603-431-9559

Dear Builders and Home Buyers,

In addition to our Terms and Conditions (the "Terms"), please be aware of the following:

This design may not yet have Construction Drawings (as defined in the Terms), and is, therefore, only available as a Design Drawing (as defined in the Terms and together with Construction Drawings, "Drawings'). It is possible that during the conversion of a Design Drawing to a final Construction Drawing, changes may be necessary including, but not limited to, dimensional changes. Please see Plan Data Explained on www.artform.us to understand room sizes, dimensions and other data provided. We are not responsible for typographical errors.

Art Form Architecture ("Art Form") requires that our Drawings be built substantially as designed. Art Form will not be obligated by or liable for use of this design with markups as part of any builder agreement. While we attempt to accommodate where possible and reasonable, and where the changes do not denigrate our design, any and all changes to Drawings must be approved in writing by Art Form. It is recommended that you have your Drawing updated by Art Form prior to attaching any Drawing to any builder agreement. Art Form shall not be responsible for the misuse of or unauthorized alterations to any of its Drawings.

Facade Changes:
• To maintain design integrity, we pay particular attention to features on the front facade, including but not limited to door surrounds, window casings, finished porch column sizes, and roof friezes. While we may allow builders to add their own flare to aesthetic elements, we don't allow our designs to be stripped of critical details. Any such alterations require the express written consent of Art Form.
• Increasing ceiling heights usually requires adjustments to window sizes and other exterior elements.
Floor plan layout and/or Structural Changes:
• Structural changes always require the express written consent of Art Form
• If you wish to move or remove walls or structural elements (such as removal of posts, increases in house size, ceiling height changes, addition of dormers, etc), please do not assume it can be done without other additional changes (even if the builder or lumber yard says you can).

Tarquin

1108.124 GR (5/16/2022)

Art Form Architecture, Inc.

603-431-9559

Tarquin

1108.124 GR (5/16/2022)

Art Form Architecture, Inc.

603-431-9559

Tarquin

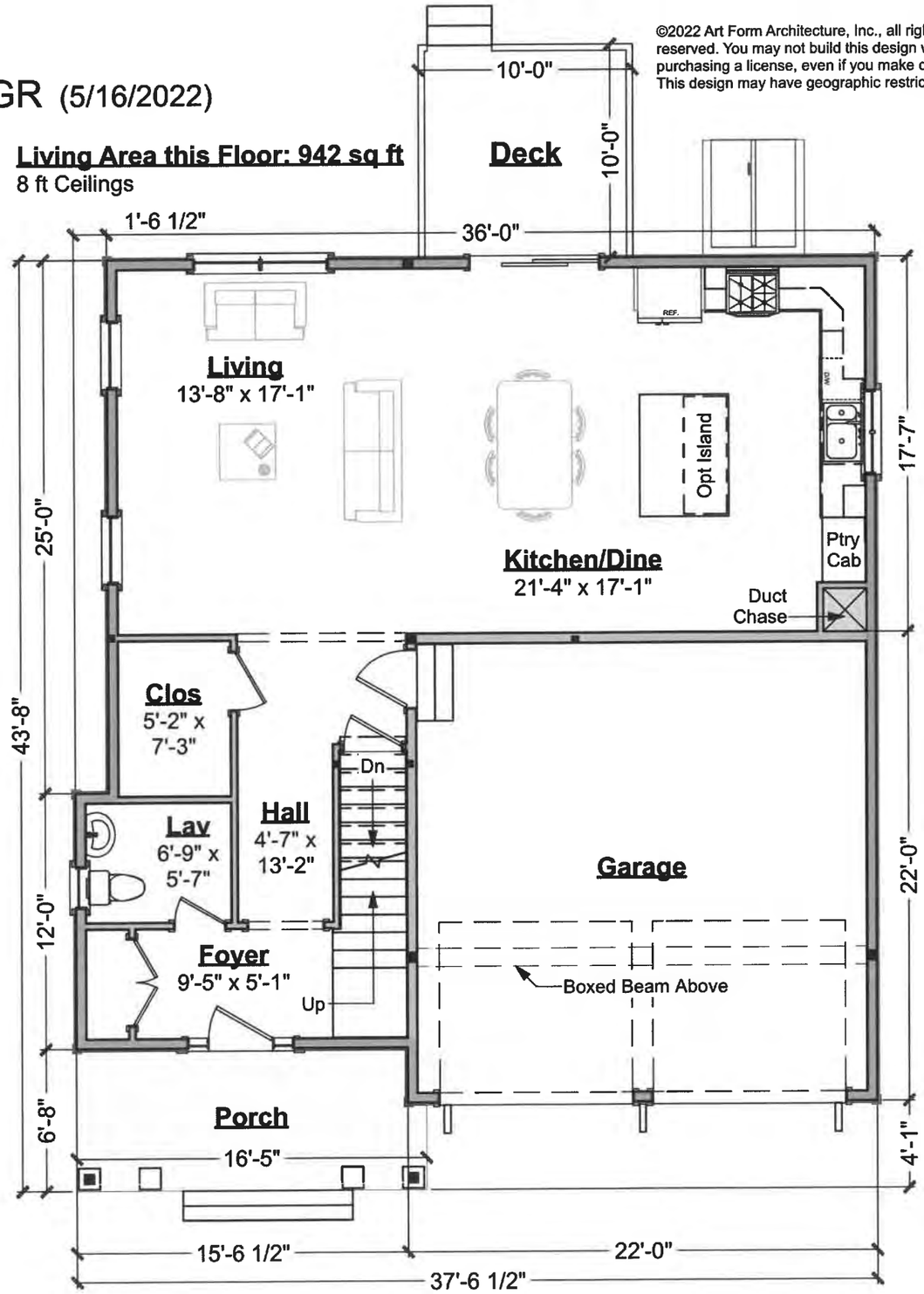
1108.124 GR (5/16/2022)

Art Form Architecture, Inc.

603-431-9559

Living Area this Floor: 942 sq ft

8 ft Ceilings



First Floor Plan

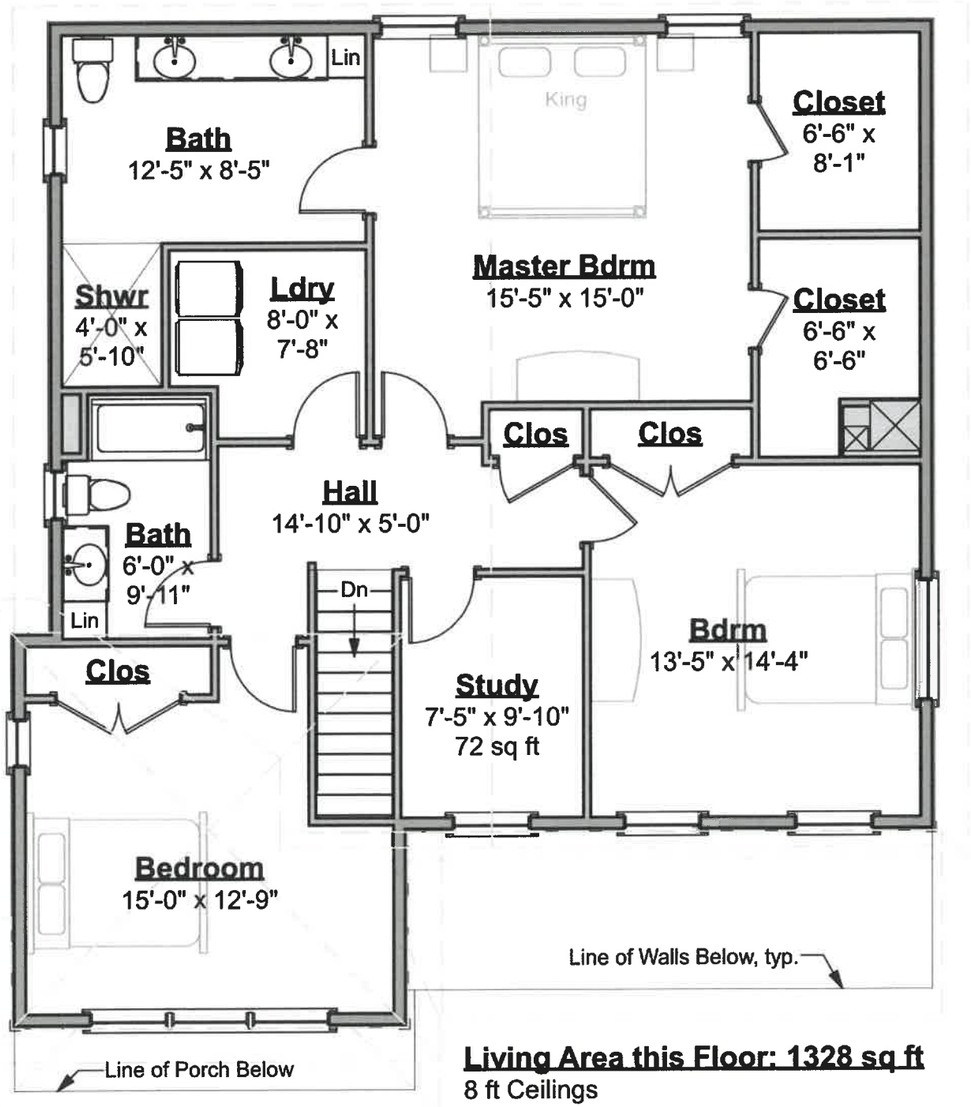
Scale: 1/8" = 1'-0"

Tarquin

1108.124 GR (5/16/2022)

Art Form Architecture, Inc.

603-431-9559



Living Area this Floor: 1328 sq ft
8 ft Ceilings

Second Floor Plan

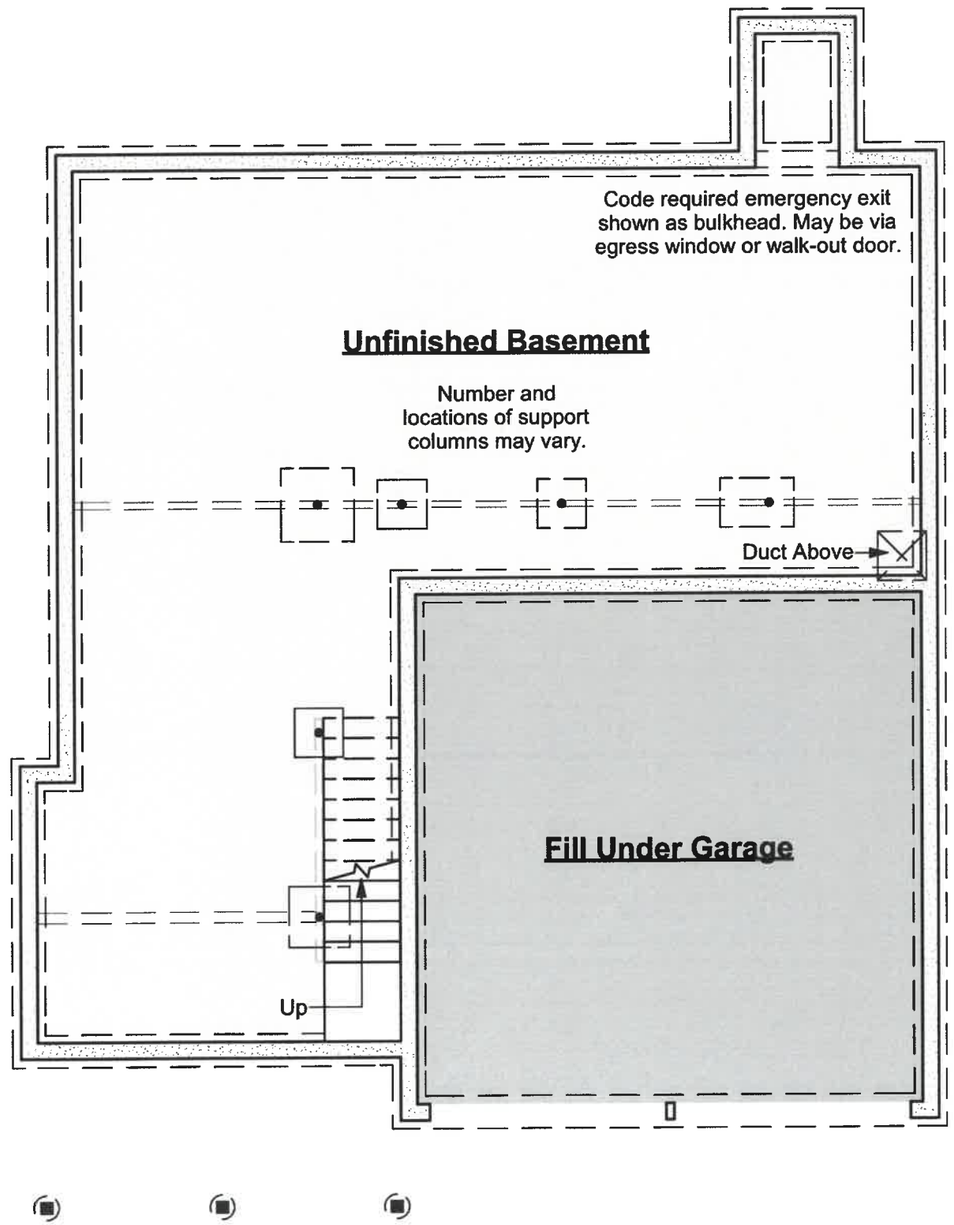
Scale: 1/8" = 1'-0"

Tarquin

1108.124 GR (5/16/2022)

Art Form Architecture, Inc.

603-431-9559



Foundation Plan

Scale: 1/8" = 1'-0"

Tarquin

1108.124 GR (5/16/2022)

Art Form Architecture, Inc.

603-431-9559

Front Elevation

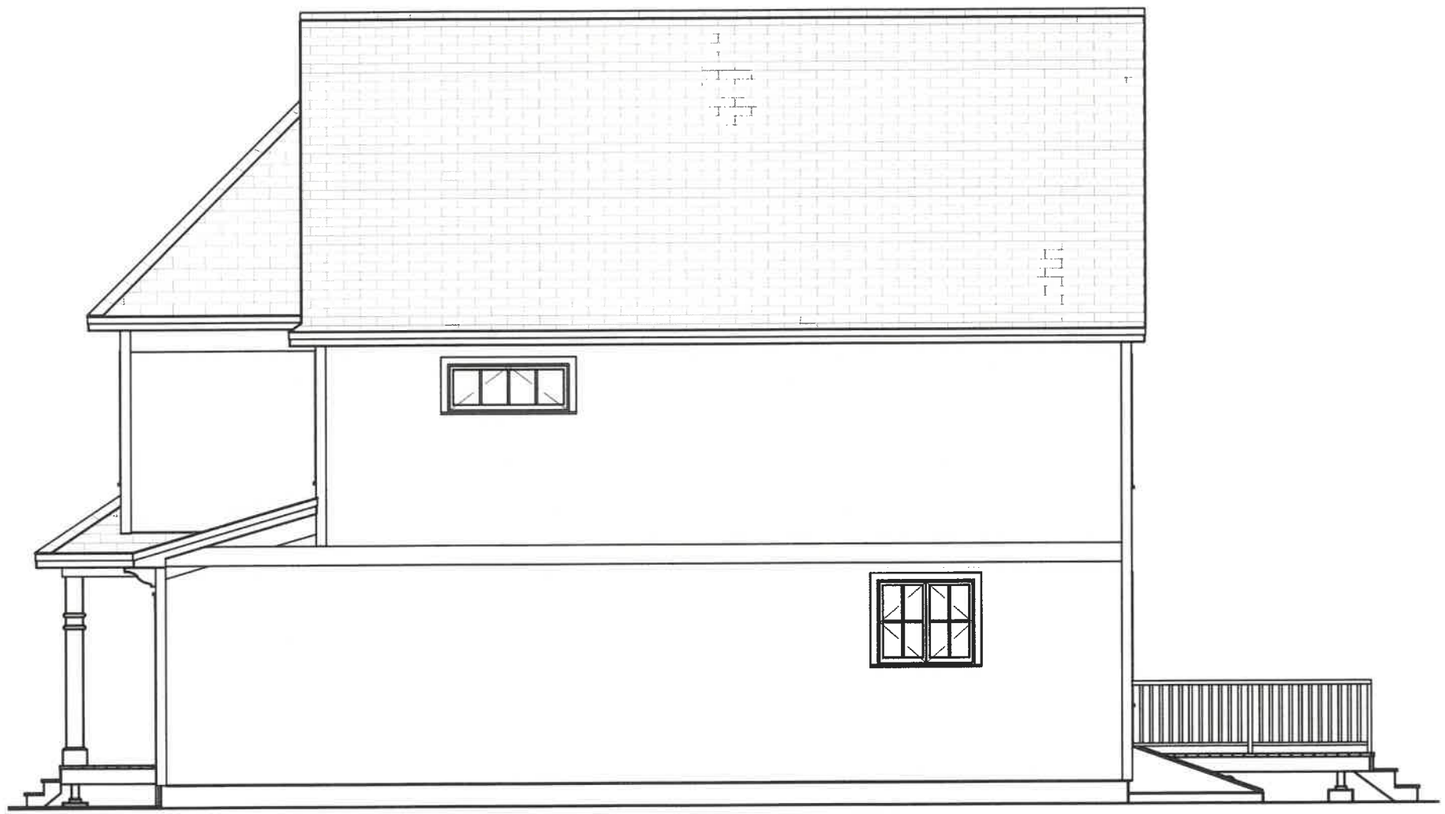
Scale: 1/8" = 1'-0"

Tarquin

1108.124 GR (5/16/2022)

Art Form Architecture, Inc.

603-431-9559



Right Elevation

Scale: 1/8" = 1'-0"

Tarquin

1108.124 GR (5/16/2022)

Art Form Architecture, Inc.

603-431-9559

Rear Elevation

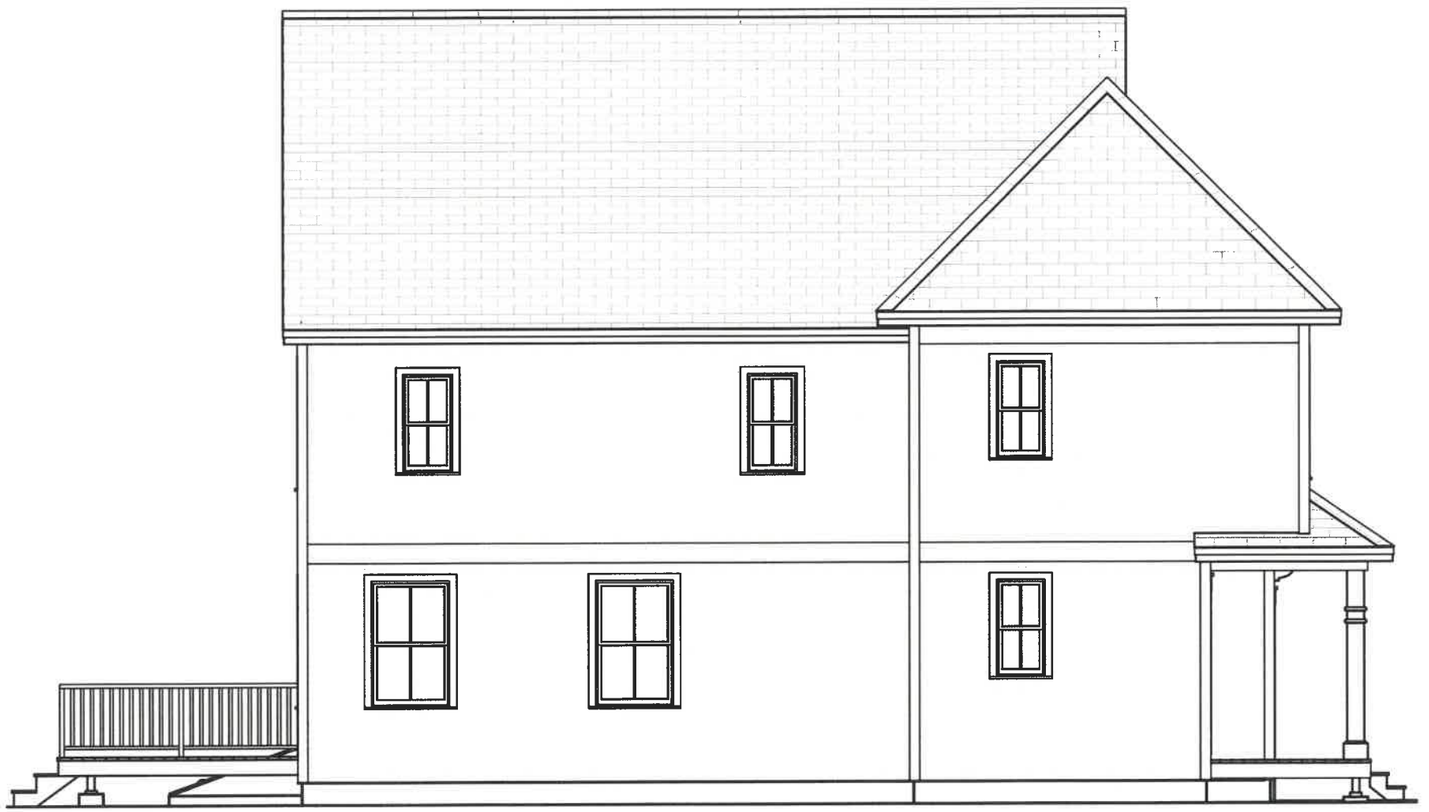
Scale: 1/8" = 1'-0"

Tarquin

1108.124 GR (5/16/2022)

Art Form Architecture, Inc.

603-431-9559



Left Elevation

Scale: 1/8" = 1'-0"

Matthias Duplex

1107.224 (5/13/2022)

NOTE: To scale as noted only if printed on 11x17 paper with "no scaling" (do not "Fit").

Art Form Architecture, Inc.

603-431-9559

Dear Builders and Home Buyers,

In addition to our Terms and Conditions (the "Terms"), please be aware of the following:

This design may not yet have Construction Drawings (as defined in the Terms), and is, therefore, only available as a Design Drawing (as defined in the Terms and together with Construction Drawings, "Drawings'). It is possible that during the conversion of a Design Drawing to a final Construction Drawing, changes may be necessary including, but not limited to, dimensional changes. Please see Plan Data Explained on www.artform.us to understand room sizes, dimensions and other data provided. We are not responsible for typographical errors.

Art Form Architecture ("Art Form") requires that our Drawings be built substantially as designed. Art Form will not be obligated by or liable for use of this design with markups as part of any builder agreement. While we attempt to accommodate where possible and reasonable, and where the changes do not denigrate our design, any and all changes to Drawings must be approved in writing by Art Form. It is recommended that you have your Drawing updated by Art Form prior to attaching any Drawing to any builder agreement. Art Form shall not be responsible for the misuse of or unauthorized alterations to any of its Drawings.

Facade Changes:
• To maintain design integrity, we pay particular attention to features on the front facade, including but not limited to door surrounds, window casings, finished porch column sizes, and roof friezes. While we may allow builders to add their own flare to aesthetic elements, we don't allow our designs to be stripped of critical details. Any such alterations require the express written consent of Art Form.
• Increasing ceiling heights usually requires adjustments to window sizes and other exterior elements.
Floor plan layout and/or Structural Changes:
• Structural changes always require the express written consent of Art Form
• If you wish to move or remove walls or structural elements (such as removal of posts, increases in house size, ceiling height changes, addition of dormers, etc), please do not assume it can be done without other additional changes (even if the builder or lumber yard says you can).

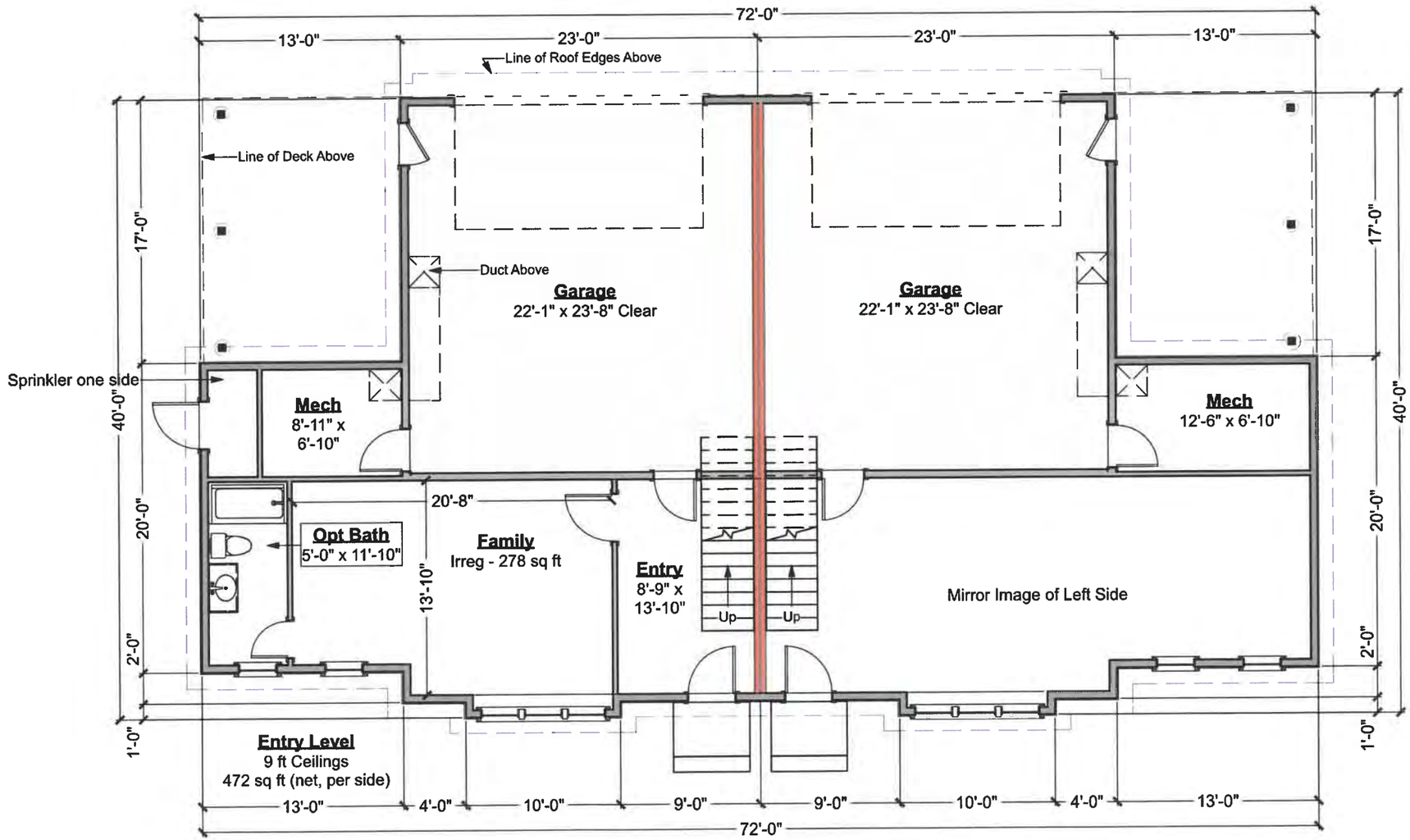
Matthias Duplex

1107.224 (5/13/2022)

NOTE: To scale as noted only if printed on 11x17 paper with "no scaling" (do not "Fit").

Art Form Architecture, Inc.

603-431-9559



First Floor Plan

Scale: 1/8" = 1'-0"

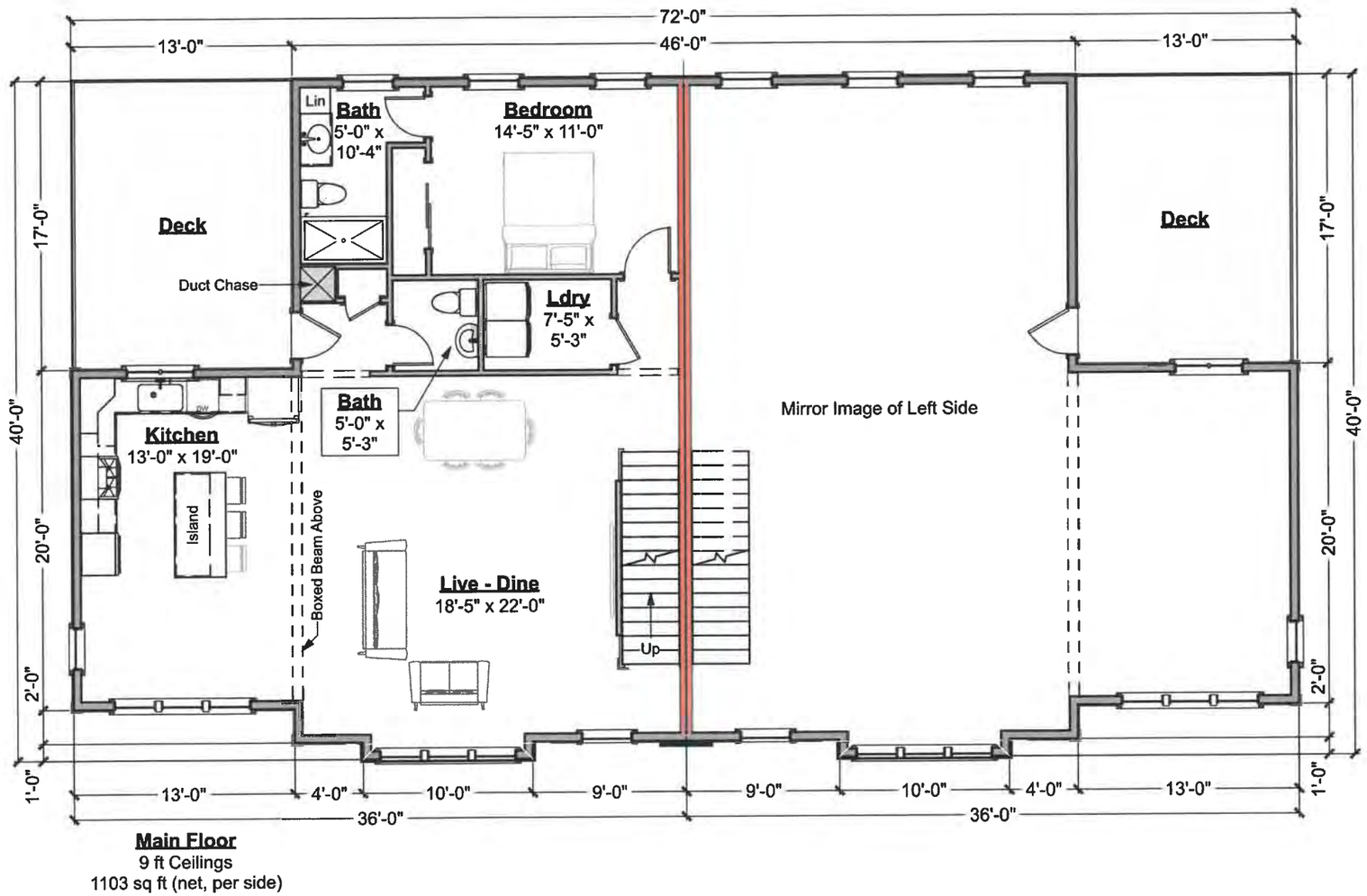
Matthias Duplex

1107.224 (5/13/2022)

NOTE: To scale as noted only if printed on 11x17 paper with "no scaling" (do not "Fit").

Art Form Architecture, Inc.

603-431-9559



Main Floor
9 ft Ceilings
1103 sq ft (net, per side)

Second Floor Plan

Scale: 1/8" = 1'-0"

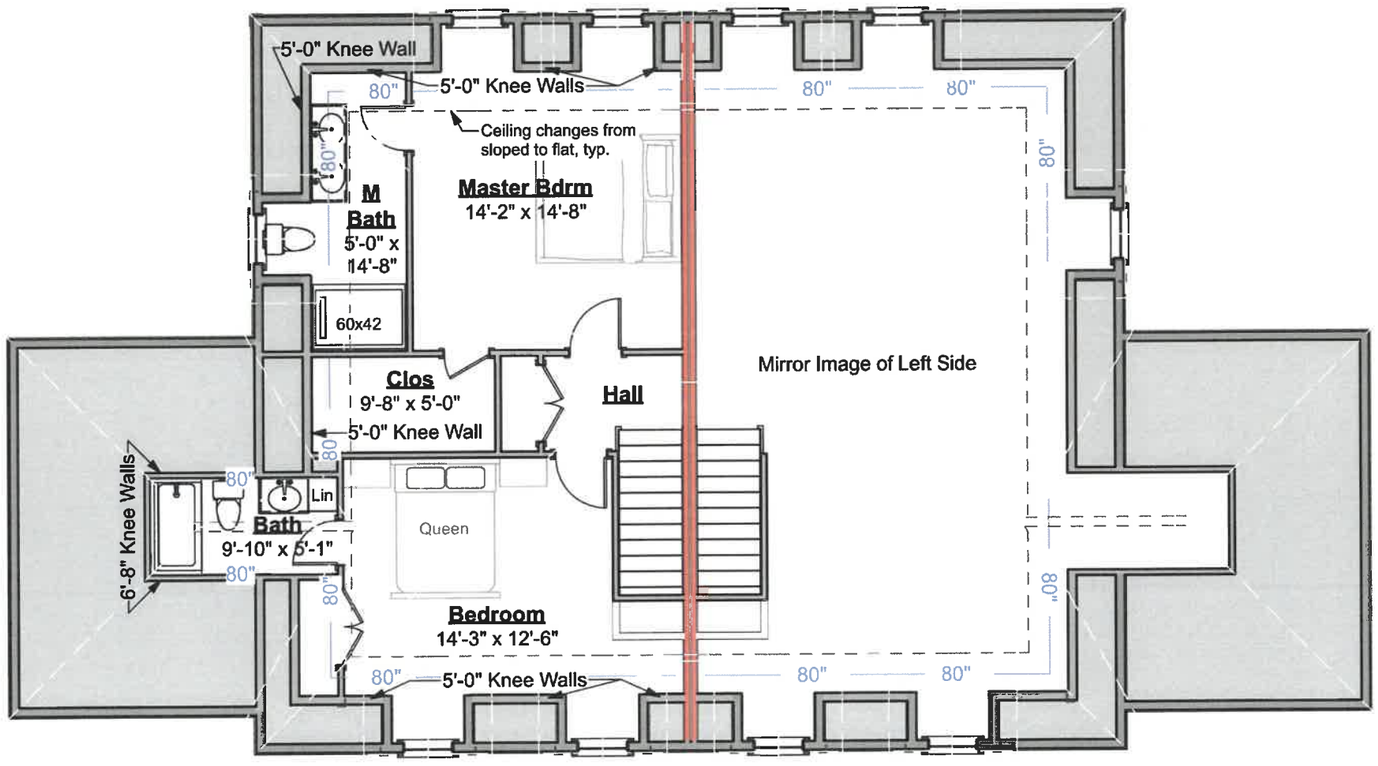
Matthias Duplex

1107.224 (5/13/2022)

NOTE: To scale as noted only if printed on 11x17 paper with "no scaling" (do not "Fit").

Art Form Architecture, Inc.

603-431-9559



Top Floor
9 ft Ceilings
742 sq ft (net, per side)

Third Floor Plan

Scale: 1/8" = 1'-0"

Matthias Duplex

1107.224 (5/13/2022)

NOTE: To scale as noted only if printed on 11x17 paper with "no scaling" (do not "Fit").

Art Form Architecture, Inc.

603-431-9559

Front

Right

Elevations

Scale: 1/8" = 1'-0"

Matthias Duplex

1107.224 (5/13/2022)

NOTE: To scale as noted only if printed on 11x17 paper with "no scaling" (do not "Fit").

Art Form Architecture, Inc.

603-431-9559

Rear

Left

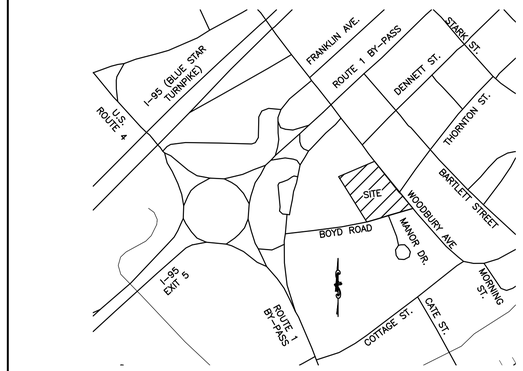
Elevations

Scale: 1/8" = 1'-0"

MULTI-FAMILY RESIDENTIAL SITE PLAN
"GRAPEVINE RUN"
TAX MAP 175, LOTS 1, 2, & 3
212, 214, & 216 WOODBURY AVE.,PORTSMOUTH, NH

GENERAL LEGEND

EXISTING	PROPOSED	DESCRIPTION
		PROPERTY LINES
		SETBACK LINES
		CENTERLINE
		TREE LINE
		STONEWALL
		FENCE
		SOIL BOUNDARY
		ZONELINE
		EASEMENT
100	100	MAJOR CONTOUR
98	98	MINOR CONTOUR
VGC	VGC	EDGE OF PAVEMENT
SGC	SGC	VERTICAL GRANITE CURB
x	x	SLOPE GRANITE CURB
D	D	SILT FENCE
S	S	DRAINAGE LINE
FM	FM	SEWER LINE
G	G	SEWER FORCE MAIN
W	W	GAS LINE
WS	WS	WATER LINE
OHE	OHE	WATER SERVICE
UGE	UGE	OVERHEAD ELECTRIC
F	F	UNDERGROUND ELECTRIC
	W	FIRE PROTECTION LINE
		THRUST BLOCK
		IRON PIPE/IRON ROD
		DRILL HOLE
		IRON ROD/DRILL HOLE
		STONE/GRANITE BOUND
100x0	100x0	SPOT GRADE
100.00	100.00	PAVEMENT SPOT GRADE
100.00 / 99.50	100.00 / 99.50	CURB SPOT GRADE
		BENCHMARK (TBM)
		DOUBLE POST SIGN
		SINGLE POST SIGN
TP1		TEST PIT
TP1		FAILED TEST PIT
		TREES AND BUSHES
		UTILITY POLE
		LIGHT POLES
		SEWER MANHOLE
		HYDRANT
		WATER GATE
		WATER SHUT OFF
		REDUCER
		SINGLE GRATE CATCH BASIN
		DOUBLE GRATE CATCH BASIN
		TRANSFORMER
D		CULVERT W/WINGWALLS
D		CULVERT W/FLARED END SECTION
D		CULVERT W/STRAIGHT HEADWALL
		DRAINAGE FLOW DIRECTION
		RIPRAP
		STABILIZED CONSTRUCTION ENTRANCE
		CONCRETE
		SNOW STORAGE
		RETAINING WALL



LOCUS MAP
SCALE 1" = 500'

SHEET INDEX

CIVIL ENGINEER / SURVEYOR
JONES & BEACH ENGINEERS, INC.
85 PORTSMOUTH AVENUE
PO BOX 219
STRATHAM, NH 03885
(603) 772-4746
CONTACT: JOSEPH CORONATI
EMAIL: JCORONATI@JONESANDBEACH.COM

LIGHTING CONSULTANT
CHARRON, INC.
P.O BOX 4550
MANCHESTER, NH 03108
(603) 945-3500
CONTACT: DANIEL HEBERT
EMAIL: DHEBERT@CHARRONINC.COM

SOILS CONSULTANT
GOVE ENVIRONMENTAL SERVICES, INC.
8 CONTINENTAL DR., BLDG 2, UNIT H
EXETER, NH 03833-7507
(603) 418-7260
CONTACT: JAMES GOVE
EMAIL: JGOVE@GESINC.BIZ

LANDSCAPE DESIGNER
LM LAND DESIGN, LLC
11 SOUTH ROAD
BRENTWOOD, NH 03833
(603) 770-7728
CONTACT: LISE MCNAUGHTON

WATER
CITY OF PORTMOUTH
DEPARTMENT OF PUBLIC WORKS
WATER DIVISION
680 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
CONTACT: BRIAN GOETZ, P.E.
(603) 427-1530

SEWER
CITY OF PORTMOUTH
DEPARTMENT OF PUBLIC WORKS
SEWER DIVISION
680 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
CONTACT: ZACHARY CRONIN
(603) 766-1421

ELECTRIC
EVERSOURCE
1700 LAFAYETTE ROAD
PORTSMOUTH, NH 03801
(603) 634-3029
CONTACT: CASEY MACDONALD

TELEPHONE
FAIRPOINT COMMUNICATIONS
1575 GREENLAND ROAD
GREENLAND, NH 03840
(800) 427-5525
CONTACT: JOE CONSIDINE

CABLE TV
COMCAST COMMUNICATION CORPORATION
334-B CALEF HIGHWAY
EPPING, NH 03042-2325
(603) 679-5695

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1, 2, & 3

APPLICANT
TUCK REALTY CORP.
ATTN: TURNER PORTER
149 EPPING RD., SUITE 2A
EXETER, NH 03833

TOTAL LOT AREA
80,484 SQ. FT.
1.85 ACRES

APPROVED - PORTSMOUTH, NH
PLANNING BOARD

DATE:

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: AS NOTED	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

STATE OF NEW HAMPSHIRE — PAIGE S. LIBBEY No.16670 — LICENSED PROFESSIONAL ENGINEER — 01/19/2023

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
85 Portsmouth Ave. PO Box 219 Stratham, NH 03885
Civil Engineering Services
603-772-4746 FAX: 603-772-0227 E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	COVER SHEET
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 — LOT 1: BK 4708 PG 979; LOT 2: BK 4582 PG 888; LOT 3: BK 3919 PG 1345

DRAWING No.
CS
SHEET 1 OF 23
JBE PROJECT NO. 21254

GRAPEVINE RUN, PORTSMOUTH, NH
JBE # 21254 REVISION 8, 1/19/23

GENERAL LEGEND

PROPERTY LINE
ABUTTER PROPERTY LINE
BUILDING SETBACK
TREE LINE
EDGE OF PAVEMENT
EDGE OF GRAVEL
OVERHEAD ELECTRIC LINES
STONE WALL
MAJOR CONTOUR
MINOR CONTOUR
SEWER LINE
UTILITY POLE

ADDITIONAL ABUTTERS:

TAX MAP 162 LOT 56
COLBY T. GAMESTER
AMANDA D. GAMESTER
187 WOODBURY AVE.
PORTSMOUTH, NH 03801
BK 6050 PG 180

TAX MAP 174 LOT 2
PORTSMOUTH HOUSING AUTHORITY
245 MIDDLE ST.
PORTSMOUTH, NH 03801

TAX MAP 174 LOT 3
DAWN P. MOYLAN REVO INTER VIVOS
55 BOYD RD.
PORTSMOUTH, NH 03801
BK 2969 PG 0654

TAX MAP 174 LOT 4
KAREN A. FOYE
KENNETH FOYE
79 BOYD RD.
PORTSMOUTH, NH 03801
BK 6108 PG 2989

TAX MAP 175 LOT 11
JHM PORTSMOUTH, LLC
440 BEDFORD ST.
LEXINGTON, MA 02420
BK 5444 PG 0334

TAX MAP 175 LOT 4
KUZZINS BOWDEN HOSPITALITY II, LLC
C/O KEYBANK ATTN: SERVICING DEPT
300 WOODBURY AVE.
PORTSMOUTH, NH 03801
BK 3355, PG 1325

TAX MAP 175 LOT 9
ALAN H. MOORE
JOAN MOORE
PO BOX 591
PORTSMOUTH, NH 03802
BK 4459, PG 2659

TAX MAP 175 LOT 10
MARTIN L. RYAN
221 WOODBURY AVE.
PORTSMOUTH, NH 03801
BK 3526, PG 2011

TAX MAP 175 LOT 3
216 WOODBURY AVE.

TAX MAP 175 LOT 2
214 WOODBURY AVE.

TAX MAP 175 LOT 1
212 WOODBURY AVE.

TAX MAP 175 LOT 13
FREDERICK J. BAILEY III &
JOYCE S. NELSON
4 SHORE ROAD
WOLFEBORO, NH 03894
BK 5500 PG 0334
EXISTING RESIDENCE
+/-1380 SF
6 BOYD RD.

HOTEL DRIVEWAY EDGE OF PAVEMENT LOCATION IS APPROXIMATE PER AERIAL IMAGERY

ZONELINE BETWEEN GENERAL RESIDENCE "A" (GRA) AND GENERAL BUSINESS (GB) ZONE

EXISTING RETAINING WALL WITH FENCE

EXISTING ZONELINE (TYP.)

EXISTING TREELINE (TYP.)

EXISTING WOODEN FENCE

EXISTING BRICK BENCH

EXISTING SINGLE-FAMILY RESIDENCE 1525 SF ±

EXISTING SINGLE-FAMILY RESIDENCE 2200 SF ±

EXISTING PAVED DRIVEWAY

EXISTING GARAGE

EXISTING MAILBOX

EXISTING STONE PILLARS

EXISTING GATE VALVE AND FIRE HYDRANT

APPROX. EXISTING GAS SERVICE

APPROX. EXISTING WATER SERVICE

APPROXIMATE EXISTING WATER SERVICE

APPROXIMATE EXISTING 12" CAST IRON WATER MAIN

APPROXIMATE EXISTING 4" COATED STEEL GAS MAIN (TYP.) CONTRACTOR TO FIELD VERIFY LOCATION

APPROXIMATE EXISTING 2" PLASTIC GAS MAIN (TYP.) CONTRACTOR TO FIELD VERIFY LOCATION

APPROXIMATE EXISTING 12" CAST IRON WATER MAIN

CB 2248 RIM=51.41 INV

CB 2235 RIM=51.84 INVout=48.44 – 4" PVC L = 33', SLOPE UNKNOWN

SMH 2154 RIM=52.93

SMH 2056 RIM=54.16 INVout=47.66 – 8" VCP L = 257', S = 0.036 +/-

TP 1 SHWT=27"
TP 2 SHWT=30"
TP 3 SHWT=27"
TP 4 SHWT=15"
TP 5 SHWT=27"
TP 6 SHWT=26"
TP 7 SHWT=26"
TP 8 SHWT=24"
TP 9 SHWT=27"
TP 10 HWT=24"
TP 11 SHWT=37"

IR FND ROBER SURVEY

1.25" IP FND PINCHED TOP 0.2' DOWN

1" IP FND 0.4' DOWN

3" IP FND FLUSH

#5 IR FND 1.0' EXPOSED BENT

1.25" IP FND 1.0' EXPOSED LEANING

1" IP FND 0.1' EXPOSED

1.25" IP FND 0.3' DOWN

1.25" IP FND 0.2' DOWN

1.25" IP FND 0.4' DOWN

FND WELL RUSH

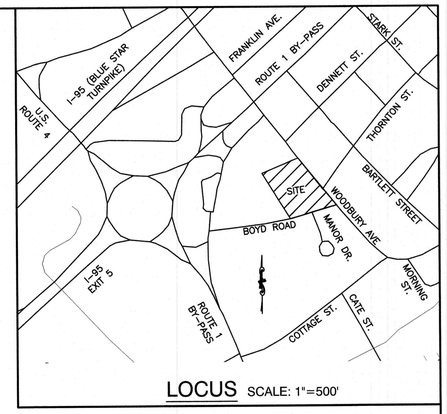
DH FND

BOYD ROAD

MANOR DRIVE

WOODBURY AVENUE

THORNTON STREET



LOCUS SCALE: 1"=500'

NOTES:

1. THE INTENT OF THIS PLAN IS TO SHOW THE BOUNDARY AND EXISTING CONDITIONS OF PORTSMOUTH TAX MAP 175, LOTS 1, 2, 3, AND 13.
2. THE UTILITY LOCATIONS SHOWN HEREON WERE DETERMINED BY OBSERVED ABOVE GROUND EVIDENCE AND SHOULD BE CONSIDERED APPROXIMATE IN LOCATION ONLY. LOCATION, DEPTH, SIZE, TYPE, EXISTENCE OR NONEXISTENCE OF UNDERGROUND UTILITIES AND/OR UNDERGROUND STORAGE TANKS WAS NOT VERIFIED BY THIS SURVEY. ALL CONTRACTORS SHOULD NOTIFY IN WRITING ALL UTILITY COMPANIES AND GOVERNMENT AGENCIES PRIOR TO ANY EXCAVATION WORK OR CALL DIG-SAFE AT 1-888-DIG-SAFE.
3. 4. SUBJECT PROPERTY IS NOT LOCATED WITHIN FEDERALLY DESIGNATED 100 YEAR FLOOD HAZARD ZONE. REFERENCE FEMA COMMUNITY PANEL NO. 33015C0270F, DATED JANUARY 29, 2021.
4. BASIS OF BEARING:
   HORIZONTAL – NAD83 NH STATE PLANE.
   VERTICAL – NAVD88.
5. NO WETLANDS WERE OBSERVED WITHIN 100' OF THE PROPERTY BOUNDARY. SEE LETTER FROM GOVE ENVIRONMENTAL SERVICES, INC.
6. SURVEY TIE LINES SHOWN HEREON ARE NOT BOUNDARY LINES. THEY SHOULD ONLY BE USED TO LOCATE THE PARCEL SURVEYED FROM THE FOUND MONUMENTS SHOWN AND LOCATED BY THIS SURVEY.

PLAN REFERENCES:

1. "PLAN OF LOT, NO. 276 WOODBURY AVE., PORTSMOUTH, N.H." DATED MARCH 1944. PREPARED BY JOHN W. DURGIN. R.C.R.D. 01219.
2. "PLAN OF LAND, PORTSMOUTH, N.H. FOR SPECTRUM ENTERPRISES." DATED APRIL 1966. PREPARED BY JOHN W. DURGIN. R.C.R.D. 1155.
3. "PLAN OF LAND, PORTSMOUTH, N.H. FOR COLONY MOTOR HOTEL, INC." DATED JULY 1, 1980. PREPARED BY JOHN W. DURGIN ASSOCIATES. R.C.R.D. 9644.
4. "LOT LINE ADJUSTMENT PLAN FOR JOHN & GLORIA COLLINS IN PORTSMOUTH, NH" DATED OCTOBER 27, 1988. PREPARED BY SEACOAST ENGINEERING ASSOCIATES. R.C.R.D. 18914.
5. "ALTA / ACSM LAND TITLE SURVEY IN PORTSMOUTH, NH, OWNER: JHM PORTSMOUTH, LLC" DATED JULY 16, 2013. PREPARED BY ROBER SURVEY. R.C.R.D. 38205.
6. "PLAN OF LAND, NO. 216 WOODBURY AVE., PORTSMOUTH, N.H." DATED SEPTEMBER 1951. PREPARED BY JOHN W. DURGIN. NOT RECORDED.

SOIL NOTES:

SOILS SHOWN HEREON WERE CLASSIFIED IN SPRING 2022 BY JAMES GOVE, CSS # 004, GOVE ENVIRONMENTAL SERVICES, INC. THE SURVEY AREA IS LOCATED ON 212, 214, AND 216 WOODBURY AVE, PORTSMOUTH, NH.

SOILS WERE IDENTIFIED WITH THE NEW HAMPSHIRE STATE-WIDE NUMERICAL SOILS LEGEND, USDA NRCS, DURHAM, NH. ISSUE # 10, JANUARY 2011. THE NUMERIC LEGEND WAS AMENDED TO IDENTIFY THE CORRECT SOIL COMPONENTS OF THE COMPLEX.

HYDROLOGIC SOIL GROUP FROM KSAT VALUES FOR NEW HAMPSHIRE SOILS, SOCIETY OF SOIL SCIENTISTS OF NEW ENGLAND, SPECIAL PUBLICATION NO. 5, SEPTEMBER, 2009

SSSM SYM.	SSS MAP NAME	HISS SYM.	HYDROLOGIC SOIL GRP.
29	WOODBRIDGE FINE SANDY LOAM	229BH	C

SLOPE PHASE:

0–8%	B	15–25%	D
8–15%	C	25%+	E

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

STATE OF NEW HAMPSHIRE JAMES P. GOVE No. 004 CERTIFIED SOIL SCIENTIST 6-2-22

CERTIFICATION:

PURSUANT TO RSA 676:18-III AND RSA 672:14
I CERTIFY THAT THIS SURVEY PLAT IS NOT A SUBDIVISION PURSUANT TO THIS TITLE AND THAT THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED AND THAT NO NEW WAYS ARE SHOWN.

I CERTIFY THAT THIS PLAT WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN UNADJUSTED LINEAR ERROR OF CLOSURE THAT EXCEED BOTH THE MINIMUM OF 1:10,000 AS DEFINED IN SECTION 503.04 OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES AND THE MINIMUM OF 1:15,000 AS DEFINED IN SECTION 4.2 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

STATE OF NEW HAMPSHIRE No. 1030 MATTHEW J. SALVUCCI LAND SURVEYOR SIGNATURE

MATTHEW J. SALVUCCI, LLS 1030 DATE: 1/19/23
ON BEHALF OF JONES & BEACH ENGINEERS, INC.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1, 2, & 3

APPLICANT
TUCK REALTY CORP.
ATTN: TURNER PORTER
149 EPPING RD., SUITE 2A
EXETER, NH 03833

TOTAL LOT AREA
80,484 SQ. FT.
1.85 ACRES

Design: JAC	Draft: DJM
Checked: JAC	Scale: 1"=20'
Drawing Name: 21254-PLAN.dwg	Date: 01/05/22
	Project No.: 21254

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.

STATE OF NEW HAMPSHIRE PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER 07/19/2023

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

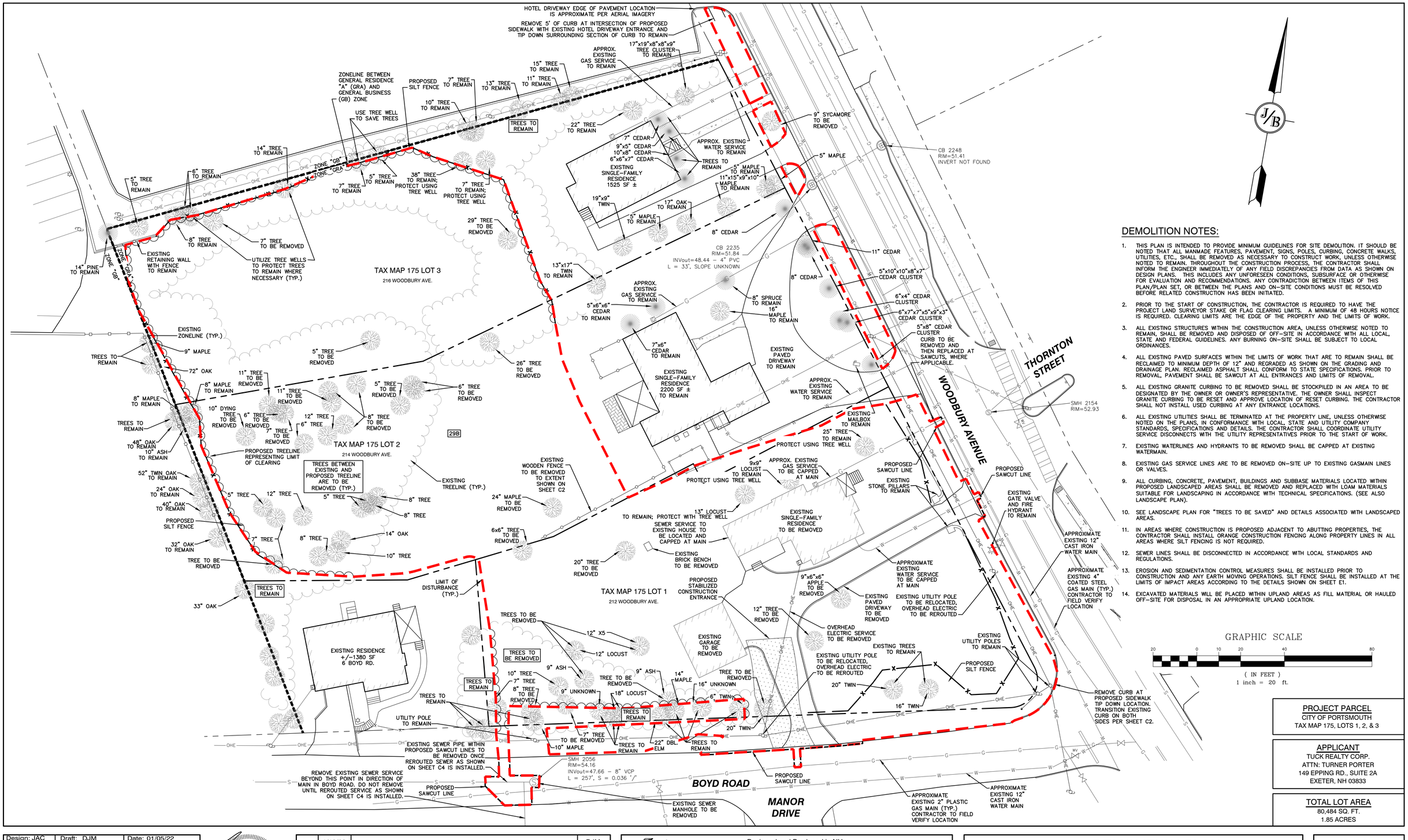
Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: EXISTING CONDITIONS PLAN

Project: "GRAPEVINE RUN"
212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

Owner of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON
4 SHORE RD., WOLFEBORO, NH 03894
LOT 1: BK 4708 PG 979
LOT 2: BK 4582 PG 888
LOT 3: BK 3919 PG 1345

DRAWING No.
C1
SHEET 2 OF 23
JBE PROJECT NO. 21254



DEMOLITION NOTES:

1. THIS PLAN IS INTENDED TO PROVIDE MINIMUM GUIDELINES FOR SITE DEMOLITION. IT SHOULD BE NOTED THAT ALL MANMADE FEATURES, PAVEMENT, SIGNS, POLES, CURBING, CONCRETE WALKS, UTILITIES, ETC., SHALL BE REMOVED AS NECESSARY TO CONSTRUCT WORK, UNLESS OTHERWISE NOTED TO REMAIN. THROUGHOUT THE CONSTRUCTION PROCESS, THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY OF ANY FIELD DISCREPANCIES FROM DATA AS SHOWN ON DESIGN PLANS. THIS INCLUDES ANY UNFORESEEN CONDITIONS, SUBSURFACE OR OTHERWISE FOR EVALUATION AND RECOMMENDATIONS. ANY CONTRADICTION BETWEEN ITEMS OF THIS PLAN/PLAN SET, OR BETWEEN THE PLANS AND ON-SITE CONDITIONS MUST BE RESOLVED BEFORE RELATED CONSTRUCTION HAS BEEN INITIATED.
2. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR IS REQUIRED TO HAVE THE PROJECT LAND SURVEYOR STAKE OR FLAG CLEARING LIMITS. A MINIMUM OF 48 HOURS NOTICE IS REQUIRED. CLEARING LIMITS ARE THE EDGE OF THE PROPERTY AND THE LIMITS OF WORK.
3. ALL EXISTING STRUCTURES WITHIN THE CONSTRUCTION AREA, UNLESS OTHERWISE NOTED TO REMAIN, SHALL BE REMOVED AND DISPOSED OF OFF-SITE IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL GUIDELINES. ANY BURNING ON-SITE SHALL BE SUBJECT TO LOCAL ORDINANCES.
4. ALL EXISTING PAVED SURFACES WITHIN THE LIMITS OF WORK THAT ARE TO REMAIN SHALL BE RECLAIMED TO MINIMUM DEPTH OF 12" AND REGRADED AS SHOWN ON THE GRADING AND DRAINAGE PLAN. RECLAIMED ASPHALT SHALL CONFORM TO STATE SPECIFICATIONS. PRIOR TO REMOVAL, PAVEMENT SHALL BE SAWCUT AT ALL ENTRANCES AND LIMITS OF REMOVAL.
5. ALL EXISTING GRANITE CURBING TO BE REMOVED SHALL BE STOCKPILED IN AN AREA TO BE DESIGNATED BY THE OWNER OR OWNER'S REPRESENTATIVE. THE OWNER SHALL INSPECT GRANITE CURBING TO BE RESET AND APPROVE LOCATION OF RESET CURBING. THE CONTRACTOR SHALL NOT INSTALL USED CURBING AT ANY ENTRANCE LOCATIONS.
6. ALL EXISTING UTILITIES SHALL BE TERMINATED AT THE PROPERTY LINE, UNLESS OTHERWISE NOTED ON THE PLANS, IN CONFORMANCE WITH LOCAL, STATE AND UTILITY COMPANY STANDARDS, SPECIFICATIONS AND DETAILS. THE CONTRACTOR SHALL COORDINATE UTILITY SERVICE DISCONNECTS WITH THE UTILITY REPRESENTATIVES PRIOR TO THE START OF WORK.
7. EXISTING WATERLINES AND HYDRANTS TO BE REMOVED SHALL BE CAPPED AT EXISTING WATERMAIN.
8. EXISTING GAS SERVICE LINES ARE TO BE REMOVED ON-SITE UP TO EXISTING GASMAIN LINES OR VALVES.
9. ALL CURBING, CONCRETE, PAVEMENT, BUILDINGS AND SUBBASE MATERIALS LOCATED WITHIN PROPOSED LANDSCAPED AREAS SHALL BE REMOVED AND REPLACED WITH LOAM MATERIALS SUITABLE FOR LANDSCAPING IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS. (SEE ALSO LANDSCAPE PLAN).
10. SEE LANDSCAPE PLAN FOR "TREES TO BE SAVED" AND DETAILS ASSOCIATED WITH LANDSCAPED AREAS.
11. IN AREAS WHERE CONSTRUCTION IS PROPOSED ADJACENT TO ABUTTING PROPERTIES, THE CONTRACTOR SHALL INSTALL ORANGE CONSTRUCTION FENCING ALONG PROPERTY LINES IN ALL AREAS WHERE SILT FENCING IS NOT REQUIRED.
12. SEWER LINES SHALL BE DISCONNECTED IN ACCORDANCE WITH LOCAL STANDARDS AND REGULATIONS.
13. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO CONSTRUCTION AND ANY EARTH MOVING OPERATIONS. SILT FENCE SHALL BE INSTALLED AT THE LIMITS OF IMPACT AREAS ACCORDING TO THE DETAILS SHOWN ON SHEET E1.
14. EXCAVATED MATERIALS WILL BE PLACED WITHIN UPLAND AREAS AS FILL MATERIAL OR HAULED OFF-SITE FOR DISPOSAL IN AN APPROPRIATE UPLAND LOCATION.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1, 2, & 3

APPLICANT
TUCK REALTY CORP.
ATTN: TURNER PORTER
149 EPPING RD., SUITE 2A
EXETER, NH 03833

TOTAL LOT AREA
80,484 SQ. FT.
1.85 ACRES

Design: JAC	Draft: DJM
Checked: JAC	Scale: 1"=20'
Drawing Name: 21254-PLAN.dwg	Date: 01/05/22
	Project No.: 21254

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STATE OF NEW HAMPSHIRE – PAIGE S. LIBBEY No.16670 – PROFESSIONAL ENGINEER – LICENSED 10/19/2023

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	DEMOLITION PLAN
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 LOT 1: BK 4708 PG 979 LOT 2: BK 4582 PG 888 LOT 3: BK 3919 PG 1345

DRAWING No.
DM-1
SHEET 3 OF 23
JBE PROJECT NO. 21254

PLAN REFERENCES:

1. "PLAN OF LOT, NO. 276 WOODBURY AVE., PORTSMOUTH, N.H." DATED MARCH 1944. PREPARED BY JOHN W. DURGIN. R.C.R.D. 01219.
2. "PLAN OF LAND, PORTSMOUTH, N.H. FOR SPECTRUM ENTERPRISES." DATED APRIL 1966. PREPARED BY JOHN W. DURGIN. R.C.R.D. 1155.
3. "PLAN OF LAND, PORTSMOUTH, N.H. FOR COLONY MOTOR HOTEL, INC." DATED JULY 1, 1980. PREPARED BY JOHN W. DURGIN ASSOCIATES. R.C.R.D. 9644.
4. "LOT LINE ADJUSTMENT PLAN FOR JOHN & GLORIA COLLINS IN PORTSMOUTH. NH" DATED OCTOBER 27, 1988. PREPARED BY SEACOAST ENGINEERING ASSOCIATES. R.C.R.D. 18914.
5. "ALTA / ACSM LAND TITLE SURVEY IN PORTSMOUTH, NH, OWNER: JHM PORTSMOUTH, LLC" DATED JULY 16, 2013. PREPARED BY ROBER SURVEY. R.C.R.D. 38205.
6. "PLAN OF LAND, NO. 216 WOODBURY AVE., PORTSMOUTH, N.H." DATED SEPTEMBER 1951. PREPARED BY JOHN W. DURGIN. NOT RECORDED.

ADDITIONAL ABUTTERS:

TAX MAP 162 LOT 56
COLBY T. GAMESTER
AMANDA D. GAMESTER
187 WOODBURY AVE.
PORTSMOUTH, NH 03801
BK 6050 PG 180

TAX MAP 174 LOT 2
PORTSMOUTH HOUSING AUTHORITY
245 MIDDLE ST.
PORTSMOUTH, NH 03801

TAX MAP 174 LOT 3
DAWN P. MOYLAN REVO INTER VIVOS
55 BOYD RD.
PORTSMOUTH, NH 03801
BK 2969 PG 0654

TAX MAP 174 LOT 4
KAREN A. FOYE
KENNETH FOYE
79 BOYD RD.
PORTSMOUTH, NH 03801
BK 6108 PG 2989

TAX MAP 175 LOT 11
JHM PORTSMOUTH, LLC
440 BEDFORD ST.
LEXINGTON, MA 02420
BK 5444 PG 0334

TAX MAP 175 LOT 4
KUZZINS BOWDEN HOSPITALITY II, LLC
C/O KEYBANK ATTN: SERVICING DEPT
300 WOODBURY AVE.
PORTSMOUTH, NH 03801
BK 3355, PG 1325

TAX MAP 175 LOT 9
ALAN H. MOORE
JOAN MOORE
PO BOX 591
PORTSMOUTH, NH 03802
BK 4459, PG 2659

TAX MAP 175 LOT 10
MARTIN L. RYAN
221 WOODBURY AVE.
PORTSMOUTH, NH 03801
BK 3526, PG 2011

TAX MAP 175 LOT 13
FREDERICK J. BAILEY III &
JOYCE S. NELSON
4 SHORE ROAD
WOLFEBORO, NH 03894
BK 5500 PG 0334

TAX MAP 175 LOT 3
EXISTING LOT AREA:
24,936 SQ. FT.
0.57 AC.
PROPOSED LOT AREA:
7,932 SF
0.18 AC.

TAX MAP 175 LOT 2
EXISTING LOT AREA:
29,536 SQ. FT.
0.68 AC.
PROPOSED LOT AREA:
12,477 SF
0.29 AC.

TAX MAP 175 LOT 1
EXISTING LOT AREA:
26,012 SQ. FT.
0.60 AC.
PROPOSED LOT AREA:
60,075 SF
1.38 AC.

EXISTING SINGLE-FAMILY RESIDENCE
1525 SF ±
216 WOODBURY AVE.

EXISTING SINGLE-FAMILY RESIDENCE
2200 SF ±
214 WOODBURY AVE.

EXISTING SINGLE-FAMILY RESIDENCE
212 WOODBURY AVE.

EXISTING RESIDENCE
+/-1380 SF
6 BOYD RD.

EXISTING GARAGE

HOTEL DRIVEWAY EDGE OF PAVEMENT LOCATION IS APPROXIMATE PER AERIAL IMAGERY

ZONELINE BETWEEN GENERAL RESIDENCE "A" (GRA) AND GENERAL BUSINESS (GB) ZONE

ZONE "GB"
ZONE "GRA"

IRON ROD TO BE SET (TYP. X11)

IRON ROD TO BE REMOVED

IR FND COLWELL FLUSH

IR FND ROBER SURVEY

1.25" IP FND PINCHED TOP 0.2' DOWN

1.25" IP FND PINCHED TOP 0.3' DOWN

1" IP FND 0.4' DOWN

3" IP FND FLUSH

1.25" IP FND 1.0' EXPOSED LEANING

#5 IR FND 1.0' EXPOSED BENT

1" IP FND 0.1' DOWN

1" IP FND 0.1' EXPOSED

1.25" IP FND 0.3' DOWN

1.25" IP FND 0.2' DOWN

1.25" IP FND 0.4' DOWN

DH FND

20' REAR SETBACK (TYP.)

10' SIDE SETBACK (TYP.)

15' FRONT SETBACK (TYP.)

15' SIDE SETBACK (TYP.)

EXISTING ZONELINE (TYP.)

EXISTING LOT LINE BETWEEN TAX MAP 175, LOT 2, AND TAX MAP 175, LOT 3 TO BE ADJSUTED

EXISTING LOT LINE BETWEEN TAX MAP 175, LOT 1, AND TAX MAP 175, LOT 2 TO BE ADJSUTED

PROPOSED RELOCATED LOT LINE BETWEEN TAX MAP 175 LOTS 1&3

PROPOSED RELOCATED LOT LINE BETWEEN TAX MAP 175 LOTS 1&2

N 54°23'51" E 109.33'

N 37°09'53" W 47.47'

N 15°20'42" W 50.47'

N 35°48'19" W 49.56'

S 52°30'10" W 33.54'

S 62°9'44" W 96.95'

N 37°29'50" W 86.07'

N 37°29'50" W 102.50'

N 37°29'50" W 144.32'

N 77°56'40" E 238.55'

S 64°30'15" W 289.89'

S 31°20'06" E 86.43'

S 31°20'06" E 86.50'

S 79°38'15" W 74.59'

S 63°26'08" W 32.37'

S 14°36'57" E 76.38'

N 15°05'04" W 38.73'

196.73'

93.16'

6.23' 139.09'

L=25.59'
R=12.70'
Δ=115°26'31"
N20°13'25"E
C=21.47'

WOODBURY AVENUE

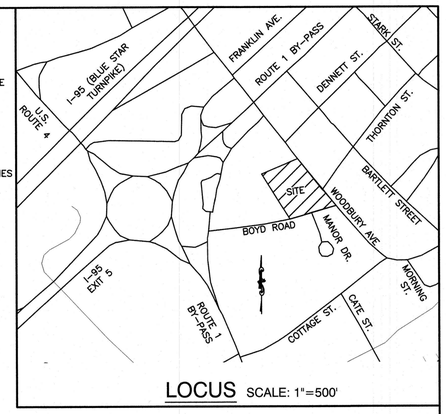
THORNTON STREET

BOYD ROAD

MANOR DRIVE

GENERAL LEGEND

- PROPERTY LINE
- ABUTTER PROPERTY LINE
- BUILDING SETBACK
- EASEMENT
- TREE LINE
- EDGE OF PAVEMENT
- EDGE OF GRAVEL
- OVERHEAD ELECTRIC LINES
- STONE WALL
- MAJOR CONTOUR
- MINOR CONTOUR
- SEWER LINE
- UTILITY POLE



LOCUS SCALE: 1"=500'

SUBDIVISION NOTES:

1. THE INTENT OF THIS PLAN IS TO ADJUST THE LOT LINE BETWEEN TAX MAP 175, LOTS 1, 2, AND 3.
2. ZONING DISTRICT: GENERAL RESIDENTIAL A (GRA)
   LOT AREA MINIMUM = 7,500 S.F.
   MAX DENSITY = 1 DWELLING UNIT PER 7,500 S.F. LOT AREA
   LOT FRONTAGE MINIMUM = 100'
   LOT DEPTH MINIMUM = 70'
   BUILDING SETBACKS (MINIMUM):
   FRONT SETBACK = 15'
   SIDE SETBACK = 10'
   REAR SETBACK = 20'
   MAX. BUILDING HEIGHT = 35' WITH SLOPED ROOF, 30' WITH FLAT ROOF
   MAX. BUILDING COVERAGE = 25%
   MIN. OPEN SPACE = 30%
3. THIS PLAN SET HAS BEEN PREPARED BY JONES & BEACH ENGINEERS, INC., FOR MUNICIPAL AND STATE APPROVALS AND FOR CONSTRUCTION BASED ON DATA OBTAINED FROM ON-SITE FIELD SURVEY AND EXISTING MUNICIPAL RECORDS. THROUGHOUT THE CONSTRUCTION PROCESS, THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY OF ANY FIELD DISCREPANCY FROM DATA AS SHOWN ON THE DESIGN PLANS, INCLUDING ANY UNFORESEEN CONDITIONS, SUBSURFACE OR OTHERWISE, FOR EVALUATION AND RECOMMENDATIONS. ANY CONTRADICTION BETWEEN ITEMS ON THIS PLAN/PLAN SET, OR BETWEEN THE PLANS AND ON-SITE CONDITIONS, MUST BE RESOLVED BEFORE RELATED CONSTRUCTION HAS BEEN INITIATED.
4. SUBJECT PROPERTY IS NOT LOCATED WITHIN FEDERALLY DESIGNATED 100 YEAR FLOOD HAZARD ZONE. REFERENCE FEMA COMMUNITY PANEL NO. 33015C0270F, DATED JANUARY 29, 2021.
5. IRON RODS WITH SURVEY CAPS TO BE SET AT ALL PROPERTY CORNERS AND ANGLE POINTS, UNLESS OTHERWISE INDICATED. ALL MONUMENTS SET ARE 5/8" IRON RODS WITH ALUMINUM CAPS MARKED "JONES & BEACH ENGINEERS BOUNDARY, DO NOT DISTURB, STRATHAM, N.H." AS SHOWN.
6. NO WETLANDS WERE OBSERVED ON THE SUBJECT PREMISES.
7. ALL BOOK AND PAGE NUMBERS REFER TO THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
8. THE TAX MAP AND LOT NUMBERS AND ABUTTING OWNERS ARE BASED ON THE CITY OF PORTSMOUTH TAX RECORDS AND ARE SUBJECT TO CHANGE.
9. RESEARCH WAS PERFORMED AT THE CITY OF PORTSMOUTH ASSESSORS OFFICE AND THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
10. THIS SURVEY IS NOT A CERTIFICATION TO OWNERSHIP OR TITLE OF LANDS SHOWN. OWNERSHIP AND ENCUMBRANCES ARE MATTERS OF TITLE EXAMINATION NOT OF A BOUNDARY SURVEY. THE INTENT OF THIS PLAN IS TO RETRACE THE BOUNDARY LINES OF DEEDS REFERENCED HEREON. OWNERSHIP OF ADJOINING PROPERTIES IS ACCORDING TO ASSESSOR'S RECORDS. THIS PLAN MAY OR MAY NOT INDICATE ALL ENCUMBRANCES EXPRESSED, IMPLIED OR PRESCRIPTIVE.
11. ANY USE OF THIS PLAN AND OR ACCOMPANYING DESCRIPTIONS SHOULD BE DONE WITH LEGAL COUNSEL TO BE CERTAIN THAT TITLES ARE CLEAR, THAT INFORMATION IS CURRENT, AND THAT ANY NECESSARY CERTIFICATES ARE IN PLACE FOR A PARTICULAR CONVEYANCE, OR OTHER USES.

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

CERTIFICATION:

I CERTIFY THAT THIS PLAT WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN UNADJUSTED LINEAR ERROR OF CLOSURE THAT EXCEED BOTH THE MINIMUM OF 1:10,000 AS DEFINED IN SECTION 503.04 OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES AND THE MINIMUM OF 1:15,000 AS DEFINED IN SECTION 4.2 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

THIS SURVEY CONFORMS TO A CATEGORY 1 CONDITION 1 SURVEY AS DEFINED IN SECTION 4.1 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

STATE OF NEW HAMPSHIRE — No. 1030 — MATTHEW J. SALVUCCI — LICENSED LAND SURVEYOR — SIGNATURE

1/19/23
MATTHEW J. SALVUCCI, LLS 1030 DATE:
ON BEHALF OF JONES & BEACH ENGINEERS, INC.

APPROVED - PORTSMOUTH, NH
PLANNING BOARD

DATE:

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1, 2, & 3

APPLICANT
TUCK REALTY CORP.
ATTN: TURNER PORTER
149 EPPING RD., SUITE 2A
EXETER, NH 03833

TOTAL LOT AREA
80,484 SQ. FT.
1.85 ACRES

Design: JAC	Draft: DJM
Checked: JAC	Scale: 1"=20'
Drawing Name: 21254-PLAN.dwg	Project No.: 21254

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STATE OF NEW HAMPSHIRE — PAIGE S. LIBBEY No.16670 — LICENSED PROFESSIONAL ENGINEER — 01/19/2023

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

Designed and Produced in NH
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85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: LOT LINE ADJUSTMENT PLAN
TAX MAP 175, LOTS 1, 2, & 3

Project: "GRAPEVINE RUN"
212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

Owner of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON
4 SHORE RD., WOLFEBORO, NH 03894
LOT 1: BK 4708 PG 979
LOT 2: BK 4582 PG 888
LOT 3: BK 3919 PG 1345

DRAWING No.
A1
SHEET 4 OF 23
JBE PROJECT NO. 21254

CERTIFICATION:

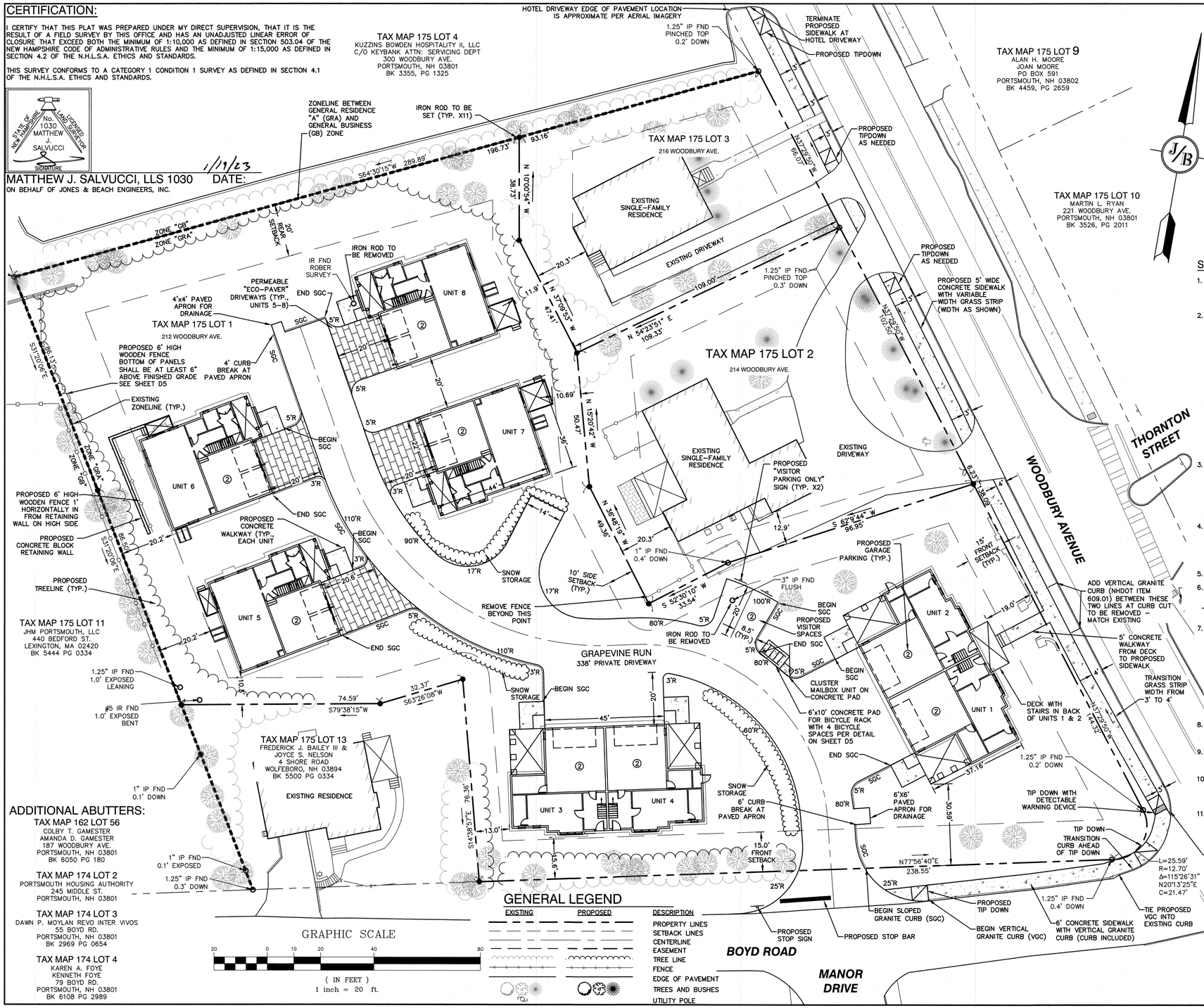
I CERTIFY THAT THIS PLAT WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN UNADJUSTED LINEAR ERROR OF CLOSURE THAT EXCEED BOTH THE MINIMUM OF 1:10,000 AS DEFINED IN SECTION 503.04 OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES AND THE MINIMUM OF 1:15,000 AS DEFINED IN SECTION 4.2 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

THIS SURVEY CONFORMS TO A CATEGORY 1 CONDITION 1 SURVEY AS DEFINED IN SECTION 4.1 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

STATE OF NEW HAMPSHIRE — No. 1030 — MATTHEW J. SALVUCCI — LICENSED LAND SURVEYOR — SIGNATURE

1/19/23

MATTHEW J. SALVUCCI, LLS 1030 DATE:
ON BEHALF OF JONES & BEACH ENGINEERS, INC.



PLAN REFERENCES:

1. "PLAN OF LOT, NO. 276 WOODBURY AVE., PORTSMOUTH, N.H." DATED MARCH 1944. PREPARED BY JOHN W. DURGIN. R.C.R.D. 01219.
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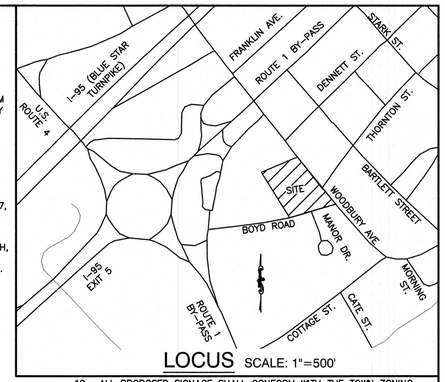
6. "PLAN OF LAND, NO. 216 WOODBURY AVE., PORTSMOUTH, N.H." DATED SEPTEMBER 1951. PREPARED BY JOHN W. DURGIN. NOT RECORDED.



LOCUS SCALE: 1"=500'

SITE NOTES:

1. THE INTENT OF THIS PLAN IS TO REMOVE THE HOUSE AND GARAGE ON LOT 1, ADJUST THE LOT LINE BETWEEN LOT 1 WITH LOTS 2 & 3, AND PROPOSE AN 8-UNIT MULTI-FAMILY RESIDENTIAL DEVELOPMENT ON LOT 1 WITH ACCESS FROM BOYD ROAD.
2. ZONING DISTRICT: GENERAL RESIDENTIAL A (GRA)
   LOT AREA MINIMUM = 7,500 S.F.
   MAX DENSITY = 1 DWELLING UNIT PER 7,500 S.F. LOT AREA
   PROPOSED ON LOT 1 = 60,075 S.F. / 8 = 1 UNIT PER 7,509 S.F PROVIDED
   LOT FRONTAGE MINIMUM = 100'
   LOT DEPTH MINMUM = 70'
   BUILDING SETBACKS (MINIMUM):
   FRONT SETBACK = 15'
   SIDE SETBACK = 10'
   REAR SETBACK = 20'
   MAX. BUILDING HEIGHT = 35' WITH SLOPED ROOF, 30' WITH FLAT ROOF
   MAX. BUILDING COVERAGE = 25%
   PROPOSED, LOT 1 = 21.1%
   PROPOSED, LOT 2 = 17.6%
   PROPOSED, LOT 3 = 19.3%
   MAX. OPEN SPACE = 30%
   PROPOSED, LOT 1 = 58.7%
   PROPOSED, LOT 2 = 58.1%
   PROPOSED, LOT 3 = 68.2%
3. PARKING CALCULATIONS
   UNITS OVER 750 S.F. = 1.3 SPACES REQUIRED PER UNIT PLUS 1 VISITOR SPACE PER EVERY 5 DWELLING UNITS OR PORTION THEREOF
   8 UNITS * 1.3 SPACES REQUIRED = 11 SPACES REQUIRED, 16 SPACES PROVIDED IN GARAGES
   8 UNITS: 2 VISITOR SPACES REQUIRED, 2 VISITOR SPACES PROVIDED
   TOTAL: 13 SPACES REQUIRED, 18 SPACES PROVIDED.
4. LOT 1 CALCULATIONS
   TOTAL BUILDING FOOTPRINT = 12,700 SF
   TOTAL IMPERVIOUS PAVED AREA = 10,900 SF
   TOTAL IMPERVIOUS ON LOT 1 = 23,600 S.F. = 39.2% OF LOT 1
   PERVIOUS PAVERS = 1,350 S.F. = 2.2% OF LOT 1
   TOTAL OPEN SPACE ON LOT 1 = 100% - 39.2% - 2.2% = 58.6%
5. NHDES SEWER CONNECTION PERMIT NO. , DATED .
6. AT ITS MEETING ON APRIL 19, 2022, THE CITY OF PORTSMOUTH ZONING BOARD OF ADJUSTMENT VOTED TO GRANT A VARIANCE FROM THE FOLLOWING REQUIREMENT:
   - SECTION 10.513 - TO ALLOW MORE THAN ONE FREE-STANDING DWELLING ON A SINGLE LOT WITHIN THE GRA ZONE
7. THIS PLAN SET HAS BEEN PREPARED BY JONES & BEACH ENGINEERS, INC., FOR MUNICIPAL AND STATE APPROVALS AND FOR CONSTRUCTION BASED ON DATA OBTAINED FROM ON-SITE FIELD SURVEY AND EXISTING MUNICIPAL RECORDS. THROUGHOUT THE CONSTRUCTION PROCESS, THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY OF ANY FIELD DISCREPANCY FROM DATA AS SHOWN ON THE DESIGN PLANS, INCLUDING ANY UNFORESEEN CONDITIONS, SUBSURFACE OR OTHERWISE, FOR EVALUATION AND RECOMMENDATIONS. ANY CONTRADICTION BETWEEN ITEMS ON THIS PLAN/PLAN SET, OR BETWEEN THE PLANS AND ON-SITE CONDITIONS, MUST BE RESOLVED BEFORE RELATED CONSTRUCTION HAS BEEN INITIATED. CONTRACTOR TO ALWAYS CONTACT DIG SAFE PRIOR TO DIGGING ONSITE OR OFFSITE TO ENSURE SAFETY AND OBEY THE LAW.
8. ALL CONSTRUCTION SHALL CONFORM TO TOWN STANDARDS AND REGULATIONS, AND NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, WHICHEVER IS MORE STRINGENT.
9. SUBJECT PROPERTY IS NOT LOCATED WITHIN FEDERALLY DESIGNATED 100 YEAR FLOOD HAZARD ZONE. REFERENCE FEMA COMMUNITY PANEL NO. 33015C0270F, DATED JANUARY 29, 2021.
10. ALL CONSTRUCTION ACTIVITIES SHALL BE PERFORMED IN ACCORDANCE WITH THE STORMWATER POLLUTION PREVENTION PLAN (S.W.P.P.P.). THIS DOCUMENT IS TO BE KEPT ONSITE AT ALL TIMES AND UPDATED AS REQUIRED.
11. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER, ARCHITECT AND/OR OWNER, IN ORDER TO OBTAIN AND/OR PAY ALL THE NECESSARY LOCAL PERMITS, FEES AND BONDS.
12. ALL PROPOSED SIGNAGE SHALL CONFORM WITH THE TOWN ZONING REGULATIONS, UNLESS A VARIANCE IS OTHERWISE REQUESTED.
13. ALL SIGNAGE AND PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D.) AND NHDOT STANDARDS AND SPECIFICATIONS (NON-REFLECTORIZED PAVEMENT MARKINGS), UNLESS OTHERWISE NOTED.
14. ALL STOP BARS SHALL BE 18" IN WIDTH IN A COLOR OF WHITE; ALL TRAFFIC ARROWS SHALL BE PAINTED IN A COLOR OF WHITE.
15. ALL BUILDING DIMENSIONS SHALL BE VERIFIED WITH THE ARCHITECTURAL AND STRUCTURAL PLANS PROVIDED BY THE OWNER. ANY DISCREPANCIES SHOULD BE BROUGHT TO THE ATTENTION OF THE ENGINEER AND OWNER PRIOR TO THE START OF CONSTRUCTION. BUILDING DIMENSIONS AND AREAS TO BE TO OUTSIDE OF MASONRY, UNLESS OTHERWISE NOTED.
16. SNOW TO BE STORED AT EDGE OF PAVEMENT AND IN AREAS SHOWN ON THE PLANS, OR TRUCKED OFFSITE TO AN APPROVED SNOW DUMPING LOCATION.
17. ALL CONSTRUCTION ACTIVITIES SHALL CONFORM TO LABOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) RULES AND REGULATIONS.
18. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
19. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
20. 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 THE SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.
21. THE OWNER OF EACH UNIT SHALL STORE TRASH IN THEIR GARAGE. TRASH WILL BE PICKED UP BY A PRIVATE HAULER.
22. THE TAX MAP AND LOT NUMBERS ARE BASED ON THE CITY OF PORTSMOUTH TAX RECORDS AND ARE SUBJECT TO CHANGE.
23. THIS SURVEY IS NOT A CERTIFICATION TO OWNERSHIP OR TITLE OF LANDS SHOWN. OWNERSHIP AND ENCUMBRANCES ARE MATTERS OF TITLE EXAMINATION NOT OF A BOUNDARY SURVEY. THE INTENT OF THIS PLAN IS TO RETRACE THE BOUNDARY LINES OF DEEDS REFERENCED HEREON. OWNERSHIP OF ADJOINING PROPERTIES IS ACCORDING TO ASSESSOR'S RECORDS. THIS PLAN MAY OR MAY NOT INDICATE ALL ENCUMBRANCES EXPRESSED, IMPLIED OR PRESCRIPTIVE.
24. SURVEY TIE LINES SHOWN HEREON ARE NOT BOUNDARY LINES. THEY SHOULD ONLY BE USED TO LOCATE THE PARCEL SURVEYED FROM THE FOUND MONUMENTS SHOWN AND LOCATED BY THIS SURVEY.
25. AN ACCESS EASEMENT SHALL BE GRANTED TO THE CITY OF PORTSMOUTH FOR ACCESS AND LEAK DETECTION OF THE WATER MAIN, SHUTOFFS, AND METERS ON THE PROPERTY. EASEMENT DESCRIPTION MUST BE APPROVED BY THE CITY'S LEGAL DEPARTMENT AND ACCEPTED BY THE CITY COUNCIL.
26. THIS PLAN IS THE RESULT OF A CLOSED TRAVERSE WITH A RAW, UNADJUSTED LINEAR ERROR OF CLOSURE GREATER THAN 1 IN 15,000.
27. ON-SITE SALT STORAGE IS PROHIBITED WITHIN 250' OF AN INLAND WETLAND UNLESS COMPLETELY COVERED AND CONTAINED IN A STRUCTURE.
28. BUILDINGS SHALL BE CONSTRUCTED IN THE FOOTPRINTS SHOWN HEREON. NOTIFY THE PROJECT ENGINEER IF THE PROPOSED ROOF LAYOUT, GUTTERS, AND/OR ROOF LINES ARE MODIFIED AFTER FINAL PLANS ARE SUBMITTED. UNITS 1-4 WILL NOT HAVE BASEMENTS, SUMP PUMPS, OR FOUNDATION DRAINS.
29. AREA OF DISTURBANCE = 58,000 S.F. (ON AND OFF SITE)
30. IF BOYD ROAD IS RECONSTRUCTED PRIOR TO THE SITE WORK IN BOYD ROAD BEING CONSTRUCTED, BOYD ROAD WILL REQUIRE A MILL AND FILL PAVEMENT RESURFACING FOR ALL DISTURBED AREAS TO THE SATISFACTION OF THE DEPARTMENT OF PUBLIC WORKS.

APPROVED - PORTSMOUTH, NH
PLANNING BOARD

DATE:

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1, 2, & 3

APPLICANT
TUCK REALTY CORP.
ATTN: TURNER PORTER
149 EPPING RD., SUITE 2A
EXETER, NH 03833

TOTAL LOT AREA
80,484 SQ. FT.
1.85 ACRES

Design: JAC	Draft: DJM
Checked: JAC	Scale: 1"=20'
Drawing Name: 21254-PLAN.dwg	Date: 01/05/22
	Project No.: 21254

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.

STATE OF NEW HAMPSHIRE — PAIGE S. LIBBEY No.16670 — PROFESSIONAL ENGINEER — LICENSED — 01/19/2023

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

Designed and Produced in NH

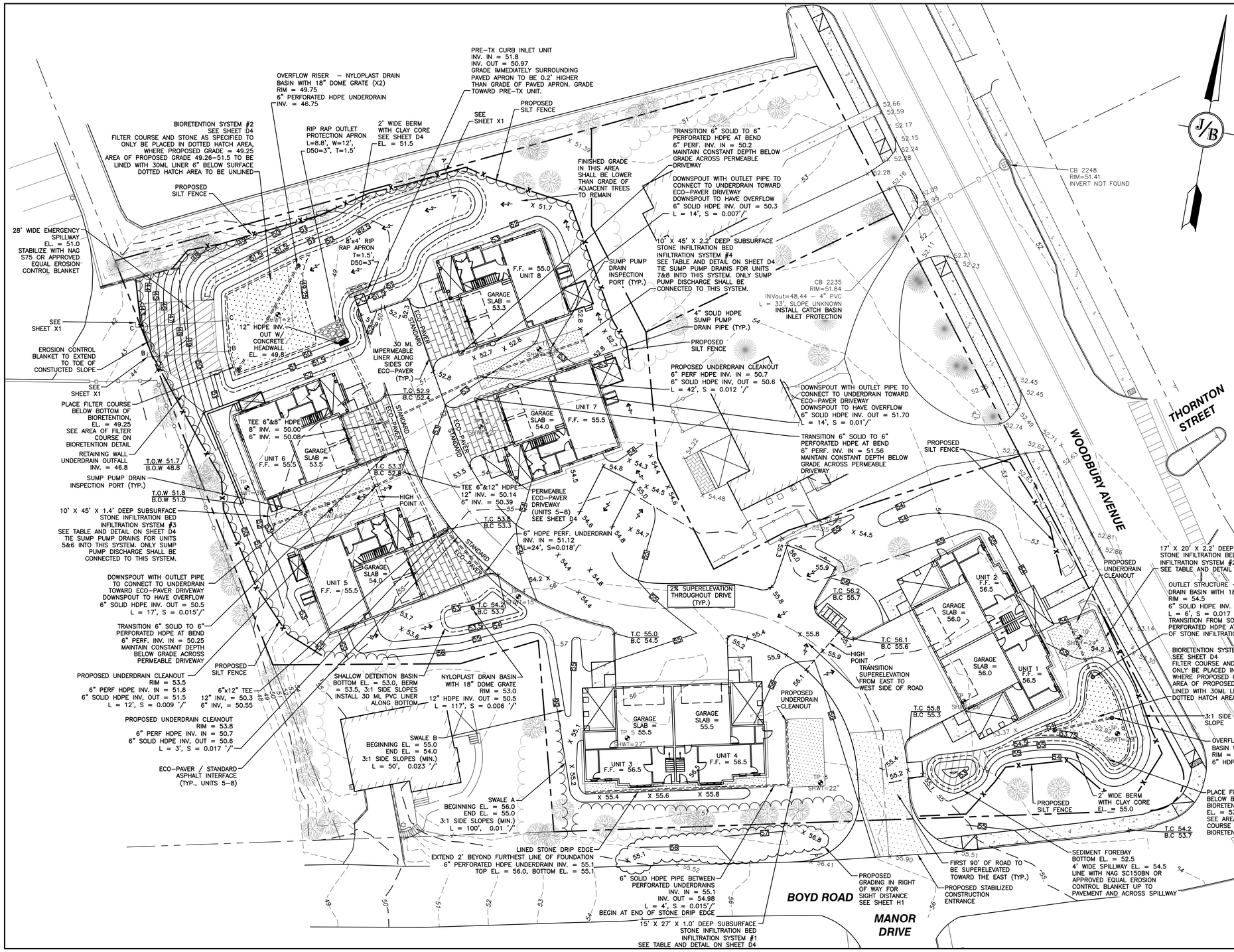
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: SITE PLAN

Project: "GRAPEVINE RUN"
212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

Owners of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON
4 SHORE RD., WOLFEBORO, NH 03894
LOT 1: BK 4708 PG 979
LOT 2: BK 4582 PG 888
LOT 3: BK 3919 PG 1345

DRAWING No.
C2
SHEET 5 OF 23
JBE PROJECT NO. 21254



GRADING AND DRAINAGE NOTES:

1. UNDERGROUND FACILITIES, UTILITIES AND STRUCTURES HAVE BEEN PLOTTED FROM FIELD OBSERVATION AND THEIR LOCATION MUST BE CONSIDERED APPROXIMATE ONLY. NEITHER JONES & BEACH ENGINEERS, INC., NOR ANY OF THEIR EMPLOYEES TAKE RESPONSIBILITY FOR THE LOCATION OF ANY UNDERGROUND STRUCTURES AND/OR UTILITIES NOT SHOWN THAT MAY EXIST. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL UNDERGROUND STRUCTURES AND/OR UTILITIES LOCATED PRIOR TO EXCAVATION WORK BY CALLING 888-DIG-SAFE (888-344-7233).
2. ALL BENCHMARKS AND TOPOGRAPHY SHALL BE FIELD VERIFIED BY THE CONTRACTOR.
3. SITE GRADING SHALL NOT PROCEED UNTIL EROSION CONTROL MEASURES HAVE BEEN INSTALLED. SEE CONSTRUCTION SEQUENCE ON SHEET E1.
4. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR IS REQUIRED TO HAVE THE PROJECT'S LAND SURVEYOR STAKE OR FLAG CLEARING LIMITS. A MINIMUM OF 48 HOURS NOTICE IS REQUIRED.
5. ALL ROOF DRAINS FROM BUILDING SHALL BE PROVIDED WITH A TEMPORARY PLUG AND WITNESS AT THE END. ALL EXTERIOR ROOF DOWNSPOUTS ARE TO BE INSTALLED WITH OVERFLOW DEVICES.
6. ALL SWALES AND BIORETENTION SYSTEMS ARE TO BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
7. ALL SLOPES SHALL BE 3:1 OR FLATTER AS DIRECTED.
8. ALL DRAINAGE AND SANITARY STRUCTURE INTERIOR DIAMETERS (4' MIN) SHALL BE DETERMINED BY THE MANUFACTURER BASED ON THE PIPE CONFIGURATIONS SHOWN ON THESE PLANS. CATCH BASINS SHALL HAVE 3' DEEP SUMPS WITH GREASE HOODS, UNLESS OTHERWISE NOTED.
9. ALL DRAINAGE STRUCTURES SHALL BE PRECAST, UNLESS OTHERWISE SPECIFIED. SEE DETAIL SHEETS FOR DRAINAGE DETAILS.
10. ALL DRAINAGE STRUCTURES AND STORMWATER PIPES SHALL MEET HEAVY DUTY TRAFFIC H20 LOADING AND SHALL BE INSTALLED ACCORDINGLY.
11. IMMEDIATELY APPLY AND COMPACT STONE BASE FOR BUILDING PAD TO +/-½" PRIOR TO EXCAVATING INTERIOR AND PERIMETER FOOTINGS.
12. IN AREAS WHERE CONSTRUCTION IS PROPOSED ADJACENT TO ABUTTING PROPERTIES, THE CONTRACTOR SHALL INSTALL ORANGE CONSTRUCTION FENCING ALONG PROPERTY LINES IN ALL AREAS WHERE SILT FENCING IS NOT REQUIRED.
13. ALL DRAINAGE PIPE SHALL BE NON-PERFORATED ADS N-12 OR APPROVED EQUAL.
14. STONE INLET PROTECTION SHALL BE PLACED AT ALL CATCH BASINS. SEE DETAIL WITHIN THE DETAIL SHEETS.
15. LAND DISTURBING ACTIVITIES SHALL NOT COMMENCE UNTIL APPROVAL TO DO SO HAS BEEN RECEIVED BY ALL GOVERNING AUTHORITIES. THE GENERAL CONTRACTOR SHALL STRICTLY ADHERE TO THE EPA SWPPP DURING CONSTRUCTION OPERATIONS.
16. ALL EXPOSED AREAS SHALL BE SEEDED AS SPECIFIED WITHIN 3 DAYS OF FINAL GRADING AND ANYTIME CONSTRUCTION STOPS FOR LONGER THAN 3 DAYS.
17. MAINTAIN EROSION CONTROL MEASURES AFTER EACH RAIN EVENT OF 0.25" OR GREATER IN A 24 HOUR PERIOD AND AT LEAST ONCE A WEEK.
18. THIS PLAN SHALL NOT BE CONSIDERED ALL INCLUSIVE, AS THE GENERAL CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SEDIMENT FROM LEAVING THE SITE.
19. CONSTRUCTION VEHICLES SHALL UTILIZE THE STABILIZED CONSTRUCTION ENTRANCE TO THE EXTENT POSSIBLE THROUGHOUT CONSTRUCTION.
20. IF INSTALLATION OF STORM DRAINAGE SYSTEM SHOULD BE INTERRUPTED BY WEATHER OR NIGHTFALL, THE PIPE ENDS SHALL BE COVERED WITH FILTER FABRIC.
21. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO TAKE WHATEVER MEANS NECESSARY TO ESTABLISH PERMANENT SOIL STABILIZATION.
22. SEDIMENT SHALL BE REMOVED FROM ALL SEDIMENT BASINS BEFORE THEY ARE 25% FULL.
23. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH PROJECT SPECIFICATIONS.
24. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED, IF DEEMED NECESSARY BY ON-SITE INSPECTION BY ENGINEER AND/OR REGULATORY OFFICIALS.
25. SEE ALSO EROSION AND SEDIMENT CONTROL SPECIFICATIONS ON SHEET E1.
26. POST-CONSTRUCTION EFFECTIVE IMPERVIOUS AREA ON TAX MAP 175, LOT 1, 2, & 3 = 7,600 S.F. (9.4% OF PARCELS).
27. UNITS 5-8 SHALL HAVE BASEMENTS WITH SUMP PUMPS. UNITS 1-4 SHALL NOT HAVE BASEMENTS, SUMP PUMPS, OR FOUNDATION DRAINS.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1, 2, & 3

APPLICANT
TUCK REALTY CORP.
ATTN: TURNER PORTER
149 EPPING RD., SUITE 2A
EXETER, NH 03833

TOTAL LOT AREA
80,484 SQ. FT.
1.85 ACRES

Design: JAC	Draft: DJM
Checked: JAC	Scale: 1"=20'
Drawing Name: 21254-PLAN.dwg	Date: 01/05/22
	Project No.: 21254

STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY
No. 16670
LICENSED PROFESSIONAL ENGINEER
01/19/2023

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
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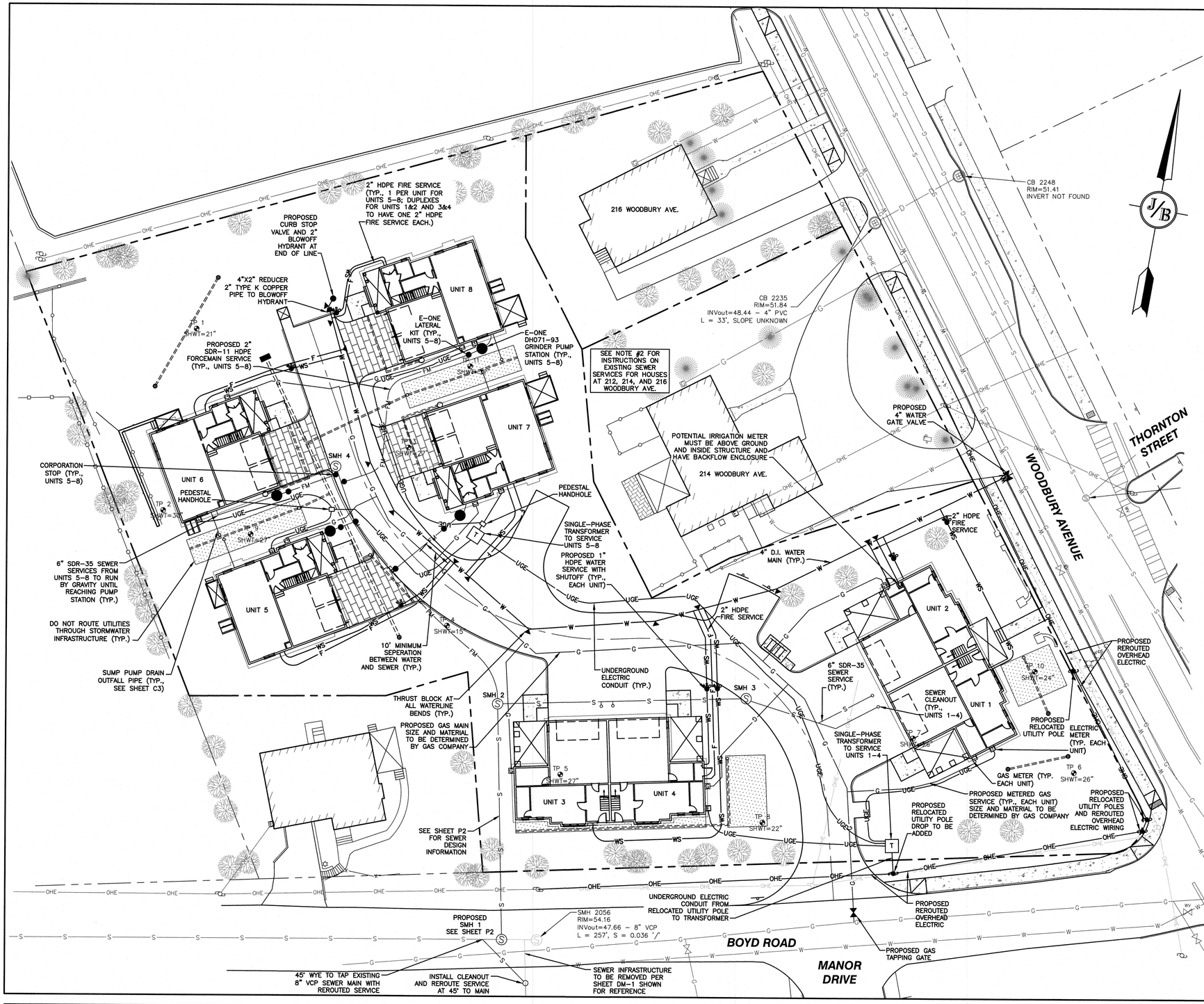
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	GRADING AND DRAINAGE PLAN
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 LOT 1: BK 4708 PG 979 LOT 2: BK 4582 PG 888 LOT 3: BK 3919 PG 1345

DRAWING No.
C3
SHEET 6 OF 23
JBE PROJECT NO. 21254



UTILITY NOTES:

1. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER, ARCHITECT AND/OR OWNER, IN ORDER TO OBTAIN AND/OR PAY ALL THE NECESSARY LOCAL PERMITS, CONNECTION FEES AND BONDS.
2. CUT & CAP SEWER SERVICE FOR 212 WOODBURY AVENUE TO PROPERTY LINE. SEWER SERVICES FOR 214 AND 216 WOODBURY AVENUE ARE TO REMAIN. NOTIFY PROJECT ENGINEER IF EITHER OF THE TWO SEWER SERVICES TO REMAIN CONFLICT WITH THE PROPOSED DEVELOPMENT.
3. THE CONTRACTOR SHALL PROVIDE A MINIMUM NOTICE OF FOURTEEN (14) DAYS TO ALL CORPORATIONS, COMPANIES AND/OR LOCAL AUTHORITIES OWNING OR HAVING A JURISDICTION OVER UTILITIES RUNNING TO, THROUGH OR ACROSS PROJECT AREAS PRIOR TO DEMOLITION AND/OR CONSTRUCTION ACTIVITIES.
4. THE LOCATION, SIZE, DEPTH AND SPECIFICATIONS FOR CONSTRUCTION OF PROPOSED PRIVATE UTILITY SERVICES SHALL BE TO THE STANDARDS AND REQUIREMENTS OF THE RESPECTIVE UTILITY COMPANY (ELECTRIC, TELEPHONE, CABLE TELEVISION, FIRE ALARM, GAS, WATER, AND SEWER).
5. A PRECONSTRUCTION MEETING SHALL BE HELD WITH THE OWNER, ENGINEER, ARCHITECT, CONTRACTOR, LOCAL OFFICIALS, AND ALL PROJECT-RELATED UTILITY COMPANIES (PUBLIC AND PRIVATE) PRIOR TO START OF CONSTRUCTION.
6. ALL CONSTRUCTION SHALL CONFORM TO THE TOWN STANDARDS AND REGULATIONS, AND NHDES STANDARDS AND SPECIFICATIONS, WHICHEVER ARE MORE STRINGENT, UNLESS A WAIVER IS OTHERWISE OBTAINED.
7. ALL CONSTRUCTION ACTIVITIES SHALL CONFORM TO LABOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) RULES AND REGULATIONS. ALL TRENCHING, PIPE LAYING, AND BACKFILLING SHALL BE IN ACCORDANCE WITH FEDERAL OSHA REGULATIONS
8. BUILDING TO BE SERVICED BY UNDERGROUND UTILITIES UNLESS OTHERWISE NOTED.
9. THE CONTRACTOR IS TO VERIFY LOCATION AND DEPTH OF ALL EXISTING UTILITY STUBS PRIOR TO CONSTRUCTION AND DISCONNECT ALL EXISTING SERVICE CONNECTIONS AT THEIR RESPECTIVE MAINS IN ACCORDANCE WITH THE RESPECTIVE UTILITY COMPANY'S STANDARDS AND SPECIFICATIONS. ENGINEER TO BE NOTIFIED.
10. AS-BUILT PLANS SHALL BE SUBMITTED TO DEPARTMENT OF PUBLIC WORKS.
11. INVERTS AND SHELVES: MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT, CONSTRUCTED TO CONFORM TO THE SIZE OF PIPE AND FLOW AT CHANGES IN DIRECTION. THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE THROUGH CHANNEL UNDERLAYMENT OF INVERT, AND SHELF SHALL CONSIST OF BRICK MASONRY.
12. FRAMES AND COVERS: MANHOLE FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30 INCH DIA. CLEAR OPENING. THE WORD "SEWER" OR "DRAIN" SHALL BE CAST INTO THE CENTER OF THE UPPER FACE OF EACH COVER WITH RAISED, 3" LETTERS.
13. 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 H20 LOADS.
14. CONTRACTOR SHALL PLACE 2" WIDE METAL WIRE IMPREGNATED RED PLASTIC WARNING TAPE OVER ENTIRE LENGTH OF ALL GRAVITY SEWERS, SERVICES, AND FORCE MAINS.
15. SANITARY SEWER FLOW CALCULATIONS:
    8 - THREE BEDROOM UNITS @ 150 GPD/BEDROOM = 3,600 GPD
    IRRIGATION USE = 1,000 GPD ±
16. ALL SANITARY STRUCTURE INTERIOR DIAMETERS (4' MIN) SHALL BE DETERMINED BY THE MANUFACTURER BASED ON THE PIPE CONFIGURATIONS SHOWN ON THESE PLANS.
17. PROPOSED RIM ELEVATIONS OF DRAINAGE AND SANITARY MANHOLES ARE APPROXIMATE. FINAL ELEVATIONS ARE TO BE SET FLUSH WITH FINISH GRADES. ADJUST ALL OTHER RIM ELEVATIONS OF MANHOLES, WATER GATES, GAS GATES AND OTHER UTILITIES TO FINISH GRADE AS SHOWN ON THE GRADING AND DRAINAGE PLAN.
18. ALL WATER MAINS AND SERVICE PIPES SHALL HAVE A MINIMUM 12" VERTICAL AND 24" HORIZONTAL SEPARATION TO MANHOLES, OR CONTRACTOR SHALL INSTALL BOARD INSULATION FOR FREEZING PROTECTION.
19. WATER MAINS SHALL BE HYDROSTATICALLY PRESSURE TESTED FOR LEAKAGE PRIOR TO ACCEPTANCE. WATERMAINS SHALL BE TESTED AT 1.5 TIMES THE WORKING PRESSURE OR 150 PSI, WHICH EVER IS GREATER. TESTING SHALL BE CONDUCTED IN ACCORDANCE WITH SECTION 4 OF AWWA STANDARD C 600. WATERMAINS SHALL BE DISINFECTED AFTER THE ACCEPTANCE OF THE PRESSURE AND LEAKAGE TESTS ACCORDING TO AWWA STANDARD C 651.
20. ALL WATER AND SANITARY LEADS TO BUILDING(S) SHALL END 5' OUTSIDE THE BUILDING LIMITS AS SHOWN ON PLANS AND SHALL BE PROVIDED WITH A TEMPORARY PLUG AND WITNESS AT END.
21. THRUST BLOCKS SHALL BE PROVIDED AT ALL BENDS, TEES, MECHANICAL JOINTS AND FIRE HYDRANTS.
22. DIMENSIONS ARE SHOWN TO CENTERLINE OF PIPE OR FITTING.
23. THE CONTRACTOR SHALL HAVE THE APPROVAL OF ALL GOVERNING AGENCIES HAVING JURISDICTION OVER FIRE PROTECTION SYSTEM PRIOR TO INSTALLATION.
24. CONTRACTOR TO FURNISH SHOP DRAWINGS FOR UTILITY RELATED ITEMS TO ENSURE CONFORMANCE WITH THE PLANS AND SPECIFICATIONS. SHOP DRAWINGS SHALL BE SENT IN TRIPLICATE TO THE DESIGN ENGINEER FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.
25. EXISTING UTILITIES SHALL BE DIGSAFED BEFORE CONSTRUCTION.
26. ALL WATER LINES SHOULD HAVE TESTABLE BACKFLOW PREVENTERS AT THE ENTRANCE TO EACH BUILDING.
27. ALL GRAVITY SEWER PIPE, MANHOLES, AND FORCE MAINS SHALL BE TESTED ACCORDING TO NHDES STANDARDS OF DESIGN AND CONSTRUCTION FOR SEWAGE AND WASTEWATER TREATMENT FACILITIES, CHAPTER ENV-WQ 700. ADOPTED ON 10-15-14.
28. ENV-WQ 704.06 GRAVITY SEWER PIPE TESTING: GRAVITY SEWERS SHALL BE TESTED FOR WATER TIGHTNESS BY USE OF LOW-PRESSURE AIR TESTS CONFORMING WITH ASTM F1417-92(2005) OR UNI-BELL PVC PIPE ASSOCIATION UNI-B-6. LINES SHALL BE CLEANED AND VISUALLY INSPECTED AND TRUE TO LINE AND GRADE. DEFLECTION TESTS SHALL TAKE PLACE AFTER 30 DAYS FOLLOWING INSTALLATION AND THE MAXIMUM ALLOWABLE DEFLECTION OF FLEXIBLE SEWER PIPE SHALL BE 5% OF AVERAGE INSIDE DIAMETER. A RIGID BALL OR MANDREL WITH A DIAMETER OF AT LEAST 95% OF THE AVERAGE INSIDE PIPE DIAMETER SHALL BE USED FOR TESTING PIPE DEFLECTION. THE DEFLECTION TEST SHALL BE CONDUCTED WITHOUT MECHANICAL PULLING DEVICES.
29. ENV-WQ 704.17 SEWER MANHOLE TESTING: SHALL BE TESTED FOR LEAKAGE USING A VACUUM TEST PRIOR TO BACKFILLING AND PLACEMENT OF SHELVES AND INVERTS.
30. SANITARY SEWER LINES SHALL BE LOCATED AT LEAST TEN (10) FEET HORIZONTALLY FROM AN EXISTING OR PROPOSED WATER LINE. WHEN A SEWER LINE CROSSES UNDER A WATER LINE, THE SEWER PIPE JOINTS SHALL BE LOCATED AT LEAST 6 FEET HORIZONTALLY FROM THE WATERMAIN. THE SEWER LINE SHALL ALSO MAINTAIN A VERTICAL SEPARATION OF NOT LESS THAN 18 INCHES.
31. SEWERS SHALL BE BURIED TO A MINIMUM DEPTH OF 6 FEET BELOW GRADE IN ALL ROADWAY LOCATIONS, AND TO A MINIMUM DEPTH OF 4 FEET BELOW GRADE IN ALL CROSS-COUNTRY LOCATIONS. PROVIDE TWO-INCHES OF R-10 FOAM BOARD INSULATION 2-FOOT WIDE TO BE INSTALLED 6-INCHES OVER SEWER PIPE IN AREAS WHERE DEPTH IS NOT ACHIEVED. A WAIVER FROM THE DEPARTMENT OF ENVIRONMENTAL SERVICES WASTEWATER ENGINEERING BUREAU IS REQUIRED PRIOR TO INSTALLING SEWER AT LESS THAN MINIMUM COVER.
32. THE CONTRACTOR SHALL MINIMIZE THE DISRUPTIONS TO THE EXISTING SEWER FLOWS AND THOSE INTERRUPTIONS SHALL BE LIMITED TO FOUR (4) HOURS OR LESS AS DESIGNATED BY THE DEPARTMENT OF PUBLIC WORKS.
33. LIGHTING CONDUIT SHALL BE SCHEDULE 40 PVC, AND SHALL BE INSTALLED IN CONFORMANCE WITH THE NATIONAL ELECTRIC CODE. CONTRACTOR SHALL PROVIDE EXCAVATION AND BACKFILL.
38. AN AS-BUILT PLAN OF THE WATER LINE IS TO BE PREPARED AND SUBMITTED TO THE CITY OF PORTSMOUTH WATER DEPARTMENT.
39. WATER LINE TO BE CONSTRUCTED PER CITY OF PORTSMOUTH SPECIFICATIONS.
40. SHOP DRAWINGS TO BE SUBMITTED TO CITY OF PORTSMOUTH FOR REVIEW AND APPROVAL.
41. NEW DUCTILE IRON WATER LINE SHALL BE WRAPPED WITH A WATER TIGHT POLYETHYLENE WRAPPING FOR THE FULL LENGTH. ALL WATER LINE JOINTS SHALL HAVE THREE (3) BRASS WEDGES PER JOINT. CONTRACTOR SHALL CONTACT CITY OF PORTSMOUTH WATER DEPARTMENT (JIM TOW AT 603-766-1439) PRIOR TO WATER LINE INSTALLATION.
42. IF IRRIGATION IS TO BE USED, THE PIPING SYSTEM SHALL BE REVIEWED AND APPROVED BY THE PORTSMOUTH CITY PLANNER, CITY ENGINEER, AND THE WATER DEPARTMENT PRIOR TO INSTALLATION.
43. DISINFECTION OF WATER MAINS SHALL BE CARRIED OUT IN STRICT ACCORDANCE WITH AWWA STANDARD C651, LATEST EDITION. THE BASIC PROCEDURE TO BE FOLLOWED FOR DISINFECTING WATER MAINS IS AS FOLLOWS:
    a. PREVENT CONTAMINATING MATERIALS FROM ENTERING THE WATER MAIN DURING STORAGE, CONSTRUCTION, OR REPAIR.
    b. REMOVE, BY FLUSHING OR OTHER MEANS, THOSE MATERIALS THAT MAY HAVE ENTERED THE WATER MAINS.
    c. CHLORINATE ANY RESIDUAL CONTAMINATION THAT MAY REMAIN, AND FLUSH THE CHLORINATED WATER FROM THE MAIN.
    d. PROTECT THE EXISTING DISTRIBUTION SYSTEM FROM BACKFLOW DUE TO HYDROSTATIC PRESSURE TEST AND DISINFECTION PROCEDURES.
    e. DETERMINE THE BACTERIOLOGICAL QUALITY BY LABORATORY TEST AFTER DISINFECTION.
    f. MAKE FINAL CONNECTION OF THE APPROVED NEW WATER MAIN TO THE ACTIVE DISTRIBUTION SYSTEM
44. DOMESTIC SHUTOFFS & VALVES SHALL BE PAINTED BLUE. FIRE SERVICE SHUTOFFS & VALVES SHALL BE PAINTED RED. COORDINATE WITH CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS FOR EXACT COLORS.
45. SEWER TRENCH DAMS SHALL BE UTILIZED EVERY 75' ALONG GRAVITY SEWER PIPE. REFER TO DETAIL ON SHEET D3.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

Design: JAC	Draft: DJM
Checked: JAC	Scale: 1"=20'
Drawing Name: 21254-PLAN.dwg	
Date: 01/05/22	Project No.: 21254

PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE

REV.	DATE	REVISION	BY
10	2/21/23	REVISED PER TAC CONDITIONS OF APPROVAL	DJM
9	1/23/23	REVISED BIORETENTION BERM DETAIL PER REVIEW ENGINEER	DJM
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM

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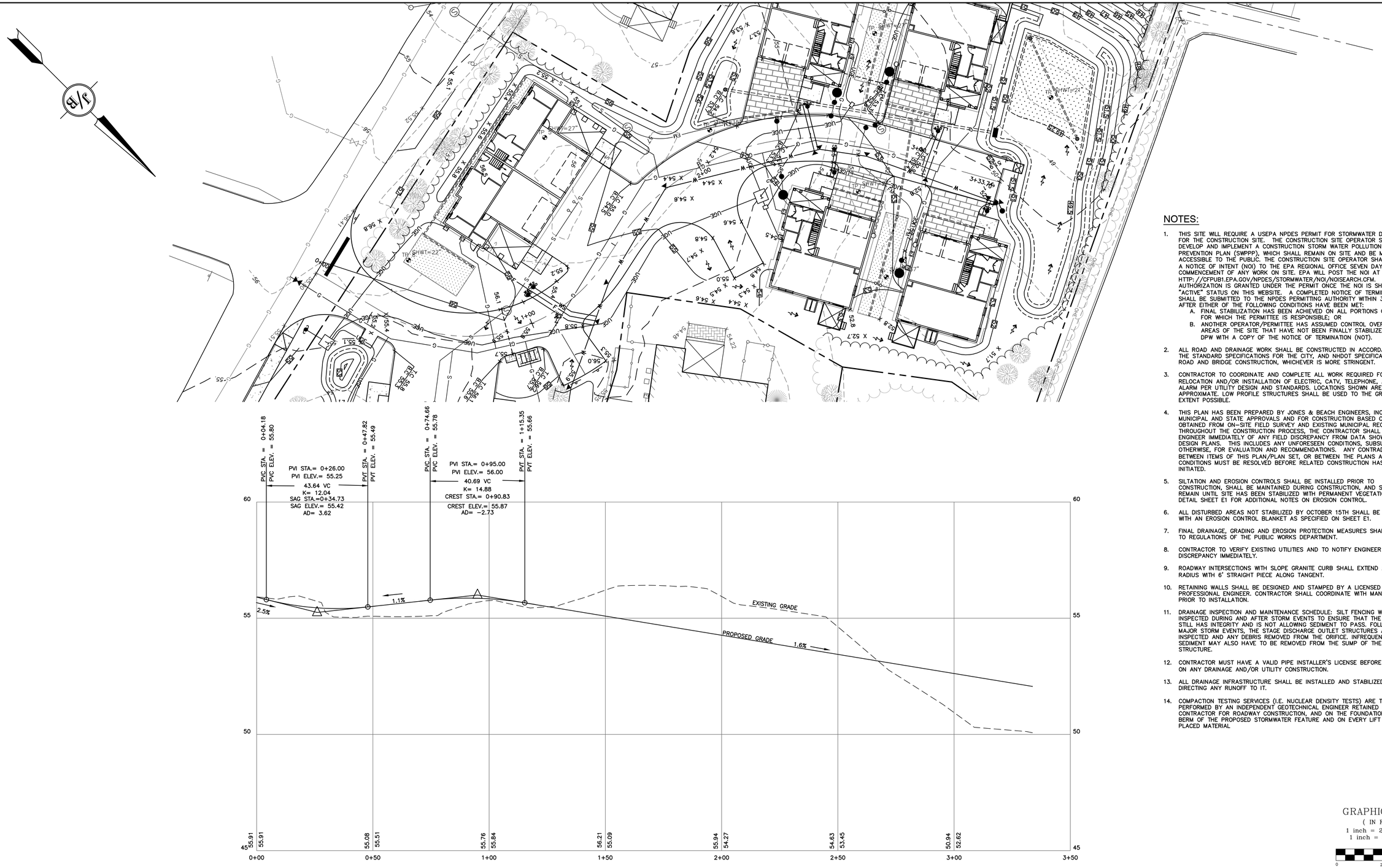
Plan Name: UTILITY PLAN

Project: "GRAPEVINE RUN"
212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

Owner of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON
4 SHORE RD., WOLFEBORO, NH 03894
LOT 1: BK 4708 PG 979
LOT 2: BK 4582 PG 888
LOT 3: BK 3919 PG 1345

DRAWING No.
C4
SHEET 7 OF 23
JBE PROJECT NO. 21254



NOTES:

1. THIS SITE WILL REQUIRE A USEPA NPDES PERMIT FOR STORMWATER DISCHARGE FOR THE CONSTRUCTION SITE. THE CONSTRUCTION SITE OPERATOR SHALL DEVELOP AND IMPLEMENT A CONSTRUCTION STORM WATER POLLUTION PREVENTION PLAN (SWPPP), WHICH SHALL REMAIN ON SITE AND BE MADE ACCESSIBLE TO THE PUBLIC. THE CONSTRUCTION SITE OPERATOR SHALL SUBMIT A NOTICE OF INTENT (NOI) TO THE EPA REGIONAL OFFICE SEVEN DAYS PRIOR TO COMMENCEMENT OF ANY WORK ON SITE. EPA WILL POST THE NOI AT HTTP://CFPUB1.EPA.GOV/NPDES/STORMWATER/NOI/NOISEARCH.CFM. AUTHORIZATION IS GRANTED UNDER THE PERMIT ONCE THE NOI IS SHOWN IN "ACTIVE" STATUS ON THIS WEBSITE. A COMPLETED NOTICE OF TERMINATION SHALL BE SUBMITTED TO THE NPDES PERMITTING AUTHORITY WITHIN 30 DAYS AFTER EITHER OF THE FOLLOWING CONDITIONS HAVE BEEN MET:
   A. FINAL STABILIZATION HAS BEEN ACHIEVED ON ALL PORTIONS OF THE SITE FOR WHICH THE PERMITTEE IS RESPONSIBLE; OR
   B. ANOTHER OPERATOR/PERMITTEE HAS ASSUMED CONTROL OVER ALL AREAS OF THE SITE THAT HAVE NOT BEEN FINALLY STABILIZED. PROVIDE DPW WITH A COPY OF THE NOTICE OF TERMINATION (NOT).
2. ALL ROAD AND DRAINAGE WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR THE CITY, AND NHDOT SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, WHICHEVER IS MORE STRINGENT.
3. CONTRACTOR TO COORDINATE AND COMPLETE ALL WORK REQUIRED FOR THE RELOCATION AND/OR INSTALLATION OF ELECTRIC, CATV, TELEPHONE, AND FIRE ALARM PER UTILITY DESIGN AND STANDARDS. LOCATIONS SHOWN ARE APPROXIMATE. LOW PROFILE STRUCTURES SHALL BE USED TO THE GREATEST EXTENT POSSIBLE.
4. THIS PLAN HAS BEEN PREPARED BY JONES & BEACH ENGINEERS, INC. FOR MUNICIPAL AND STATE APPROVALS AND FOR CONSTRUCTION BASED ON DATA OBTAINED FROM ON-SITE FIELD SURVEY AND EXISTING MUNICIPAL RECORDS. THROUGHOUT THE CONSTRUCTION PROCESS, THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY OF ANY FIELD DISCREPANCY FROM DATA SHOWN ON THE DESIGN PLANS. THIS INCLUDES ANY UNFORESEEN CONDITIONS, SUBSURFACE OR OTHERWISE, FOR EVALUATION AND RECOMMENDATIONS. ANY CONTRADICTION BETWEEN ITEMS OF THIS PLAN/PLAN SET, OR BETWEEN THE PLANS AND ON-SITE CONDITIONS MUST BE RESOLVED BEFORE RELATED CONSTRUCTION HAS BEEN INITIATED.
5. SILTATION AND EROSION CONTROLS SHALL BE INSTALLED PRIOR TO CONSTRUCTION, SHALL BE MAINTAINED DURING CONSTRUCTION, AND SHALL REMAIN UNTIL SITE HAS BEEN STABILIZED WITH PERMANENT VEGETATION. SEE DETAIL SHEET E1 FOR ADDITIONAL NOTES ON EROSION CONTROL.
6. ALL DISTURBED AREAS NOT STABILIZED BY OCTOBER 15TH SHALL BE COVERED WITH AN EROSION CONTROL BLANKET AS SPECIFIED ON SHEET E1.
7. FINAL DRAINAGE, GRADING AND EROSION PROTECTION MEASURES SHALL CONFORM TO REGULATIONS OF THE PUBLIC WORKS DEPARTMENT.
8. CONTRACTOR TO VERIFY EXISTING UTILITIES AND TO NOTIFY ENGINEER OF ANY DISCREPANCY IMMEDIATELY.
9. ROADWAY INTERSECTIONS WITH SLOPE GRANITE CURB SHALL EXTEND AROUND RADIUS WITH 6' STRAIGHT PIECE ALONG TANGENT.
10. RETAINING WALLS SHALL BE DESIGNED AND STAMPED BY A LICENSED PROFESSIONAL ENGINEER. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER PRIOR TO INSTALLATION.
11. DRAINAGE INSPECTION AND MAINTENANCE SCHEDULE: SILT FENCING WILL BE INSPECTED DURING AND AFTER STORM EVENTS TO ENSURE THAT THE FENCE STILL HAS INTEGRITY AND IS NOT ALLOWING SEDIMENT TO PASS. FOLLOWING MAJOR STORM EVENTS, THE STAGE DISCHARGE OUTLET STRUCTURES ARE TO BE INSPECTED AND ANY DEBRIS REMOVED FROM THE ORIFICE. INFREQUENTLY, SEDIMENT MAY ALSO HAVE TO BE REMOVED FROM THE SUMP OF THE STRUCTURE.
12. CONTRACTOR MUST HAVE A VALID PIPE INSTALLER'S LICENSE BEFORE WORKING ON ANY DRAINAGE AND/OR UTILITY CONSTRUCTION.
13. ALL DRAINAGE INFRASTRUCTURE SHALL BE INSTALLED AND STABILIZED PRIOR TO DIRECTING ANY RUNOFF TO IT.
14. COMPACTION TESTING SERVICES (I.E. NUCLEAR DENSITY TESTS) ARE TO BE PERFORMED BY AN INDEPENDENT GEOTECHNICAL ENGINEER RETAINED BY THE CONTRACTOR FOR ROADWAY CONSTRUCTION, AND ON THE FOUNDATION OF THE BERM OF THE PROPOSED STORMWATER FEATURE AND ON EVERY LIFT OF NEWLY PLACED MATERIAL

GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft Horiz.
1 inch = 2 ft Vert.
0 20 40
0 2 4

Design: JAC	Draft: DJM
Checked: JAC	Scale: 1"=20'
Drawing Name: 21254-PLAN.dwg	

Date: 01/05/22
Project No.: 21254

STATE OF NEW HAMPSHIRE — PAIGE S. LIBBEY No.16670 — LICENSED PROFESSIONAL ENGINEER — 01/19/2023

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

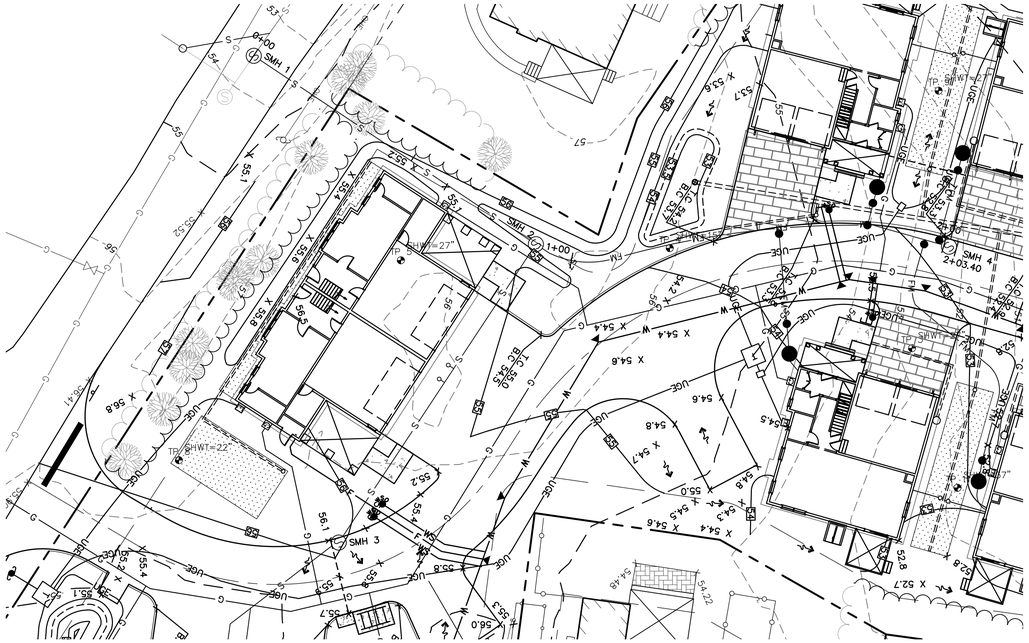
Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

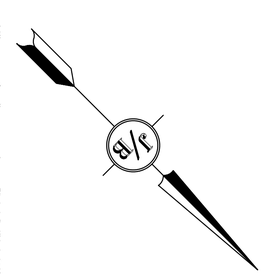
Plan Name: PLAN AND ROAD PROFILE

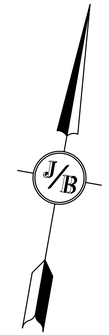
Project: "GRAPEVINE RUN"
212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

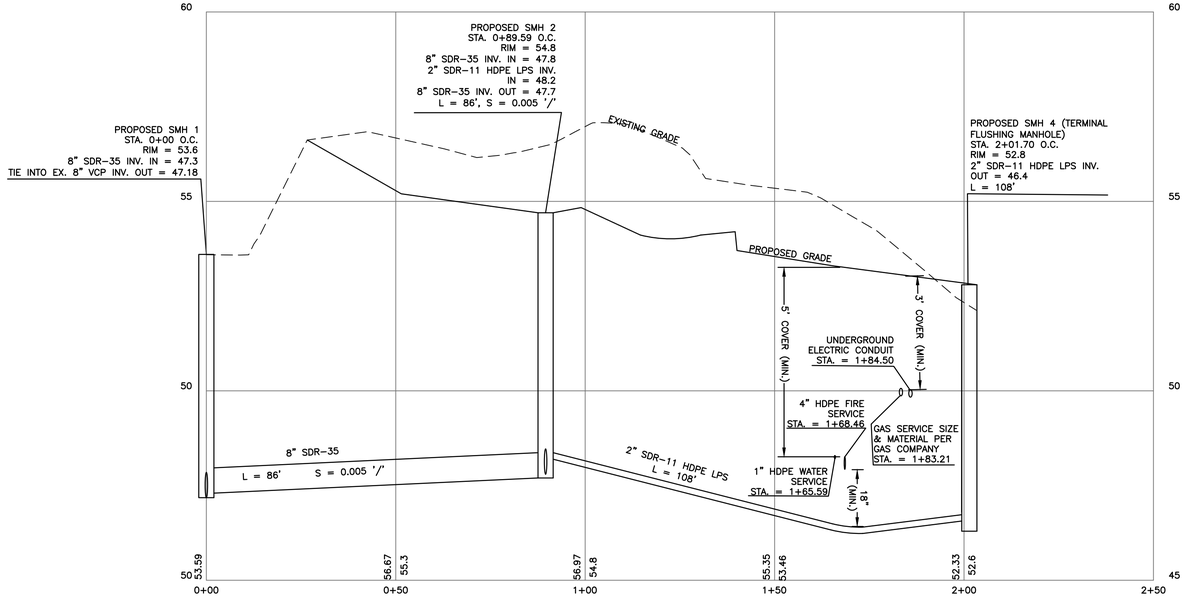
Owner of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON
4 SHORE RD., WOLFEBORO, NH 03894
LOT 1: BK 4708 PG 979
LOT 2: BK 4582 PG 888
LOT 3: BK 3919 PG 1345

DRAWING No.
P1
SHEET 8 OF 23
JBE PROJECT NO. 21254

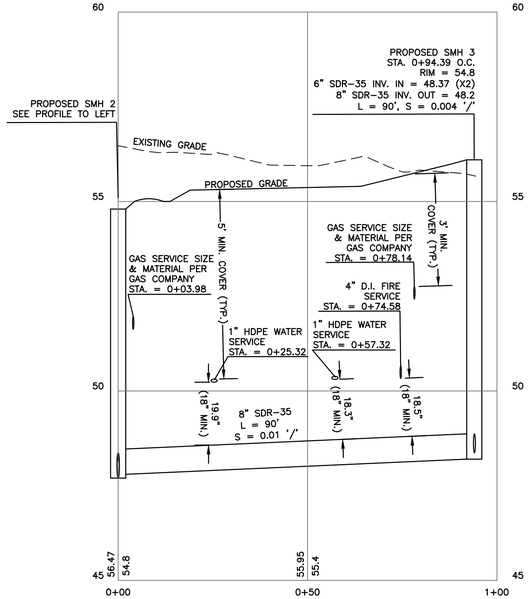








MAIN SEWER THROUGH SITE



SEWER MAIN SERVICING UNITS 1-2

GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft. Horiz.
1 inch = 2 ft. Vert.

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: 1"=20'	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

PAIGE S. LIBBEY No.16670 – STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – 01/05/2023

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85 Portsmouth Ave.
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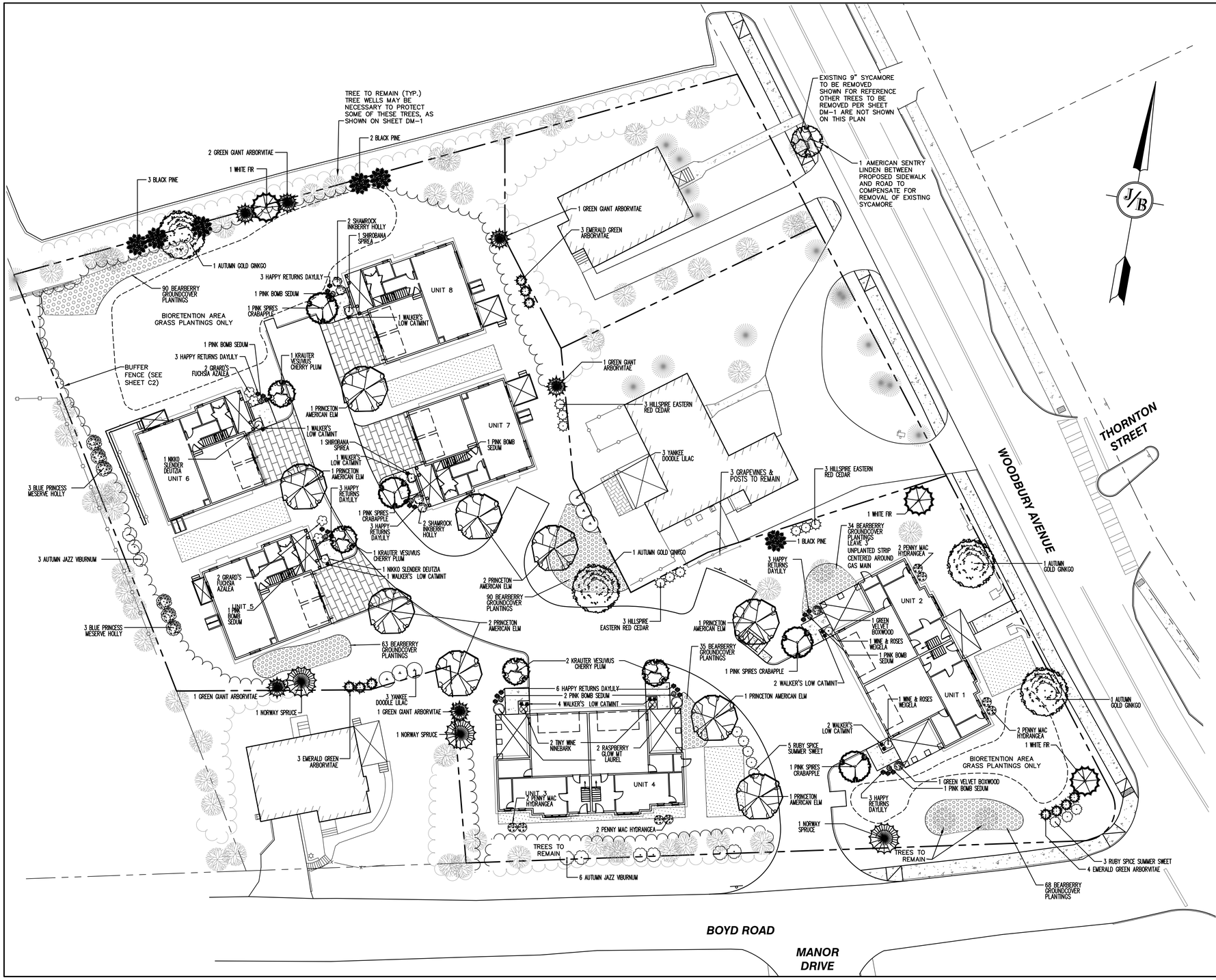
Stratham, NH 03885
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	PLAN AND SEWER PROFILE
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 LOT 1: BK 4708 PG 979 LOT 2: BK 4582 PG 888 LOT 3: BK 3919 PG 1345

DRAWING No.
P2
SHEET 9 OF 23
JBE PROJECT NO. 21254



LANDSCAPE NOTES:

1. THE CONTRACTOR SHALL LOCATE AND VERIFY THE EXISTENCE OF ALL UTILITIES PRIOR TO STARTING WORK.
2. THE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTINGS SHOWN ON THE DRAWINGS.
3. ALL MATERIAL SHALL CONFORM TO THE GUIDELINES ESTABLISHED BY THE CURRENT AMERICAN STANDARD FOR NURSERY STOCK PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
4. PLANTS SHALL BE SUBJECT TO INSPECTION AND APPROVAL AT THE PLACE OF GROWTH, UPON DELIVERY OR AT THE JOB SITE WHILE WORK IS ON-GOING FOR CONFORMITY TO SPECIFIED QUALITY, SIZE AND VARIETY.
5. PLANTS FURNISHED IN CONTAINERS SHALL HAVE THE ROOTS WELL ESTABLISHED IN THE SOIL MASS AND SHALL HAVE AT LEAST ONE (1) GROWING SEASON. ROOT-BOUND PLANTS OR INADEQUATELY SIZED CONTAINERS TO SUPPORT THE PLANT MAY BE DEEMED UNACCEPTABLE.
6. ALL WORK AND PLANTS SHALL BE DONE, INSTALLED AND DETAILED IN STRICT ACCORDANCE WITH PROJECT SPECIFICATIONS.
7. ALL PLANTS SHALL BE WATERED THOROUGHLY TWICE DURING THE FIRST 24-HOUR PERIOD AFTER PLANTING. ALL PLANTS SHALL BE WATERED WEEKLY, OR MORE OFTEN IF NECESSARY, DURING THE FIRST GROWING SEASON. IRRIGATION SHALL BE UTILIZED FOR AT LEAST THE FIRST TWO YEARS OF PLANT GROWTH.
8. ALL LANDSCAPE AREAS TO BE GRASS COMMON TO REGION, EXCEPT FOR INTERIOR LANDSCAPED ISLANDS OR WHERE OTHER PLANT MATERIAL IS SPECIFIED.
9. ALL TREES AND SHRUBS SHALL BE PLANTED IN MULCH BEDS WITH EDGE STRIPS TO SEPARATE TURF GRASS AREAS.
10. THE CONTRACTOR SHALL REMOVE WEEDS, ROCKS, CONSTRUCTION ITEMS, ETC. FROM ANY LANDSCAPE AREA SO DESIGNATED TO REMAIN, WHETHER ON OR OFF-SITE. GRASS SEED OR PINE BARK MULCH SHALL BE APPLIED AS DEPICTED ON PLANS.
11. FINISHED GRADES IN LANDSCAPED ISLANDS SHALL BE INSTALLED SO THAT THEY ARE 1" HIGHER THAN THE TOP OF THE SURROUNDING CURB.
12. ALL LANDSCAPING SHALL MEET THE CITY OF PORTSMOUTH STANDARDS AND REGULATIONS.
13. EXISTING TREES TO REMAIN SHALL BE PROTECTED WITH TEMPORARY SNOW FENCING AT THE DRIPLINE OF THE TREE. THE CONTRACTOR SHALL NOT STORE VEHICLES OR MATERIALS WITHIN THE LANDSCAPED AREAS. ANY DAMAGE TO EXISTING TREES, SHRUBS OR LAWN SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
14. ALL MULCH AREAS SHALL RECEIVE A 3" LAYER OF SHREDDED PINE BARK MULCH OVER A 10 MIL WEED MAT EQUAL TO 'WEEDBLOCK' BY EASY GARDENER OR DEWITT WEED BARRIER.
15. ALL LANDSCAPED AREAS SHALL HAVE SELECT MATERIALS REMOVED TO A DEPTH OF AT LEAST 12" BELOW FINISH GRADE. THE RESULTING VOID IS TO BE FILLED WITH A MINIMUM OF 9" HIGH-QUALITY SCREENED LOAM AMENDED WITH 3" OF AGED ORGANIC COMPOST.
16. THIS PLAN IS INTENDED FOR LANDSCAPING PURPOSES ONLY. REFER TO CIVIL/SITE DRAWINGS FOR OTHER SITE CONSTRUCTION INFORMATION.
17. IRRIGATION PIPING SYSTEM SHALL BE REVIEWED AND APPROVED BY OWNER AND ENGINEER PRIOR TO INSTALLATION.
18. THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS SHALL BE RESPONSIBLE FOR THE MAINTENANCE, REPAIR, AND REPLACEMENT OF ALL REQUIRED SCREENING AND LANDSCAPE MATERIALS.
19. ALL REQUIRED PLANT MATERIALS SHALL BE TENDED AND MAINTAINED IN A HEALTHY GROWING CONDITION, REPLACED WHEN NECESSARY, AND KEPT FREE OF REFUSE AND DEBRIS. ALL REQUIRED FENCES AND WALLS SHALL BE MAINTAINED IN GOOD REPAIR.
20. THE PROPERTY OWNER SHALL BE RESPONSIBLE TO REMOVE AND REPLACE DEAD OR DISEASED PLANT MATERIALS IMMEDIATELY WITH THE SAME TYPE, SIZE, AND QUANTITY OF PLANT MATERIALS AS ORIGINALLY INSTALLED, UNLESS ALTERNATIVE PLANTINGS ARE REQUESTED, JUSTIFIED, AND APPROVED BY THE PLANNING BOARD OR PLANNING DIRECTOR.
21. SEE TYPICAL PLANTING DETAILS ON SHEET D5.
22. IF TREES SCHEDULED TO REMAIN NEED TO BE REMOVED OR BECOME UNHEALTHY, ADDITIONAL TREES WILL NEED TO BE PLANTED TO THE SATISFACTION OF THE PLANNING DEPARTMENT.
23. NO LOAM OR OTHER TOPSOIL SHALL BE REMOVED FROM THE SITE AS PART OF SITE DEVELOPMENT. TOPSOIL SHALL BE APPROPRIATELY STOCKPILED AND STABILIZED FOR REDISTRIBUTION WITHIN NEW PLANTING AREAS.
24. NEW PLANTINGS SHALL BE MONITORED AND MAINTAINED FOR AT LEAST TWO YEARS. IF AFTER ONE YEAR THE PLANTINGS DO NOT HAVE AT LEAST AN 80% SUCCESS RATE, REPLANTING WILL BE REQUIRED.
25. "SMART CONTROLLERS" SHALL BE UTILIZED FOR THE PLANNED IRRIGATION OF LANDSCAPED AREAS FOR MORE EFFICIENT USE OF WATER RESOURCES. USE RECYCLED WATER WHENEVER POSSIBLE FOR IRRIGATION NEEDS.

Quantity	Botanical Name	Common Name	Size
	TREES		
3	Abies concolor	WHITE FIR	7-8 FT. HT.
4	Ginkgo biloba 'Autumn Gold'	AUTUMN GOLD GINKGO	3" CALIPER
9	Juniperus virginiana 'Hillspire'	HILLSPIRE EASTERN RED CEDAR	7-8 FT. HT.
4	Malus x 'Pink Spires'	PINK SPIRES CRABAPPLE	2" CALIPER
3	Picea abies	NORWAY SPRUCE	8-9 FT. HT.
6	Pinus nigra	BLACK PINE	7-8 FT. HT.
4	Prunus cerasifera 'Krauter Vesuvius'	KRAUTER VESUVIUS CHERRY PLUM	2" CALIPER
10	Thuja occidentalis 'Smaragd Emerald'	EMERALD GREEN ARBORVITAE	5-6 FT. HT.
6	Thuja plicata 'Green Giant'	GREEN GIANT ARBORVITAE	7-8 FT. HT.
1	Tilia americana	AMERICAN SENTRY LINDEN	3" CALIPER
9	Ulmus americana 'Princeton'	PRINCETON AMERICAN ELM	3" CALIPER
	SHRUBS		
4	Azalea 'Girard's Fuchsia'	GIRARD'S FUCHSIA AZALEA	5 GALLON
2	Buxus 'Green Velvet'	GREEN VELVET BOXWOOD	5 GALLON
8	Clethra alnifolia 'Ruby Spice'	RUBY SPICE SUMMER SWEET	3 GALLON
2	Deutzia gracilis 'Nikko'	NIKKO SLENDER DEUTZIA	3 GALLON
8	Hydrangea macrophylla 'Penny Mac'	PENNY MAC HYDRANGEA	5 GALLON
4	Ilex glabra 'Shamrock'	SHAMROCK INKBERRY HOLLY	3 GALLON
6	Ilex x meserveae 'Blue Princess®'	BLUE PRINCESS MESERVE HOLLY	7 GALLON
2	Kalmia latifolia 'Raspberry Glow'	RASPBERRY GLOW MT LAUREL	3 GALLON
2	Physocarpus opulifolius 'SMNPOTW'	TINY WINE NINEBARK	3 GALLON
2	Spiraea japonica 'Shirobana'	SHIROBANA SPIREA	3 GALLON
6	Syringa vulgaris 'Yankee Doodle'	YANKEE DOODLE LILAC	5 GALLON
9	Viburnum dentatum 'Autumn Jazz'	AUTUMN JAZZ VIBURNUM	5 GALLON
2	Weigela florida 'Alexandra'	WINE & ROSES WEIGELA	3 GALLON
	PERENNIALS		
374	Arctostaphylos uva-ursi	BEARBERRY	4" POTS
24	Hemerocallis 'Happy Returns'	HAPPY RETURNS DAYLILY	1 GALLON
12	Nepeta x faassenii 'Walker's Low'	WALKER'S LOW CATMINT	1 GALLON
8	Sedum 'Pink Bomb'	PINK BOMB SEDUM	1 GALLON

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

1 inch = 20 ft.

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: 1"=20'	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

REV.	DATE	REVISION	BY
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Designed and Produced in NH
Jones & Beach Engineers, Inc.
Civil Engineering Services
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: LANDSCAPE PLAN

Project: "GRAPEVINE RUN"
212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

Owner of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON
4 SHORE RD., WOLFEBORO, NH 03894
LOT 1: BK 4708 PG 979
LOT 2: BK 4582 PG 888
LOT 3: BK 3919 PG 1345

DRAWING No.

L1

SHEET 10 OF 23
JBE PROJECT NO. 21254

Calvin Wall

TMSLIGHTING
ESTABLISHED 1923

Features

- Provides excellent coverage and uniformity with cut-off
- Practical and aesthetic options for application and design flexibility
- Weatherproof construction to withstand the elements
- Quality components combined with the most current technology for high efficiency and reduced lighting costs

Applications

The Calvin wall-mount luminaire is ideal for illuminating areas where localized distribution is necessary, such as doorways and entrances, laneways, patios and could provide adequate night time security lighting. It lends itself to commercial, and industrial applications that could benefit from materials and maintenance cost reductions. Calvin could either augment the existing lighting, or illuminate a small to medium-sized area.

Calvin is also available as a pendant-style model.

Construction

High grade spun aluminum, brushed solid copper, or brushed 316L stainless steel reflector, with stainless steel mounting hardware, for indoor and outdoor applications.

Lamp

Operates with Cree™ LED (19W max.), compact fluorescent (42W max.), metal halide (100W max.) or incandescent (150W max.). Specify 3000K, 3500K or 4000K CCT for LED systems. A dimmable, screw-type, 17W LED lamp is also available (PAR 38, E26 base, 120V, 4000K CCT).

Note: LED systems are available with 120-277V supply voltage only.

LED modules do not require a socket, and are wired directly to the integral driver.

Incandescent and metal halide systems, and those using the 17W LED PAR 38 lamp, use a medium base socket (E26).

Diffuser

Globe: clear and prismatic, elongated, glass globes are available.

Lens: the clear, flat lens provides slight diffusion, and protects any components located in the reflector.

Note: G3 is used with 100IN, 32CF, and 15LED max.

Only prismatic globes are compatible with LED systems.

Globes are not available with the 17W LED PAR 38 lamps.

Option

Wire Guard: a steel, chrome-plated wire guard is available for lamp protection against light projectiles, wildlife, and serves as a vandal deterrent.

Ballast/LED Driver

Ballasts are efficient with a high power factor greater than 90%, and quiet with an "A" sound rating.

The LED source is controlled by an advanced electronic driver that delivers consistent power.

Ballast and LED drivers are electronic, and available for integral and remote mounting, indoor or outdoor.

cULus cSAus CE IP23

Luminaire Schedule				
Symbol	Qty	Label	Arrangement	Description
⊸	8	W	Single	2W-O-15LED-30K-120-WM-CXX / WALL MTD 9' AFG

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

LIGHTING AND ELECTRICAL NOTES:

1. ALL OUTDOOR LIGHTING SYSTEMS SHALL BE EQUIPPED WITH TIMERS TO REDUCE ILLUMINATION LEVELS TO NON-OPERATIONAL VALUES PER CITY REGULATIONS.
2. LIGHTING CONDUIT SHALL BE SCHEDULE 40 PVC, AND SHALL BE INSTALLED IN CONFORMANCE WITH THE NATIONAL ELECTRICAL CODE. CONTRACTOR SHALL PROVIDE EXCAVATION AND BACKFILL.
3. ILLUMINATION READINGS SHOWN ARE BASED ON A TOTAL LLF OF 0.75 AT GRADE. ILLUMINATION READINGS SHOWN ARE IN UNITS OF FOOT-CANDLES.
4. LIGHTING CALCULATIONS SHOWN ARE NOT A SUBSTITUTE FOR INDEPENDENT ENGINEERING ANALYSIS OF LIGHTING SYSTEM AND SAFETY.
5. ALL LIGHTING FIXTURES SHALL BE FULL CUT-OFF DARK-SKY COMPLIANT, UNLESS OTHERWISE NOTED.
6. THE PROPOSED LIGHTING CALCULATIONS AND DESIGN WAS PERFORMED BY CHARRON, INC., P.O. BOX 4550, MANCHESTER, NH 03108. ALL LIGHTS SHOULD BE PURCHASED FROM THIS COMPANY, OR AN EQUAL LIGHTING DESIGN SHOULD BE SUBMITTED FOR REVIEW IF EQUAL SUBSTITUTIONS ARE PROPOSED BY THE CONTRACTOR OR OWNER.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1, 2, & 3

APPLICANT
TUCK REALTY CORP.
ATTN: TURNER PORTER
149 EPPING RD., SUITE 2A
EXETER, NH 03833

TOTAL LOT AREA
80,484 SQ. FT.
1.85 ACRES

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: 1"=20'	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

STATE OF NEW HAMPSHIRE · PAIGE S. LIBBEY No.16670 · LICENSED PROFESSIONAL ENGINEER · 01/05/2023

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85 Portsmouth Ave. PO Box 219 Stratham, NH 03885
Civil Engineering Services
603-772-4746 FAX: 603-772-0227 E-MAIL: JBE@JONESANDBEACH.COM

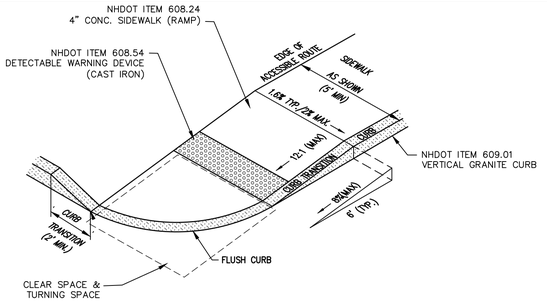
Plan Name: LIGHTING PLAN

Project: "GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

Owner of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON, 4 SHORE RD., WOLFEBORO, NH 03894 — LOT 1: BK 4708 PG 979; LOT 2: BK 4582 PG 888; LOT 3: BK 3919 PG 1345

DRAWING No. L2

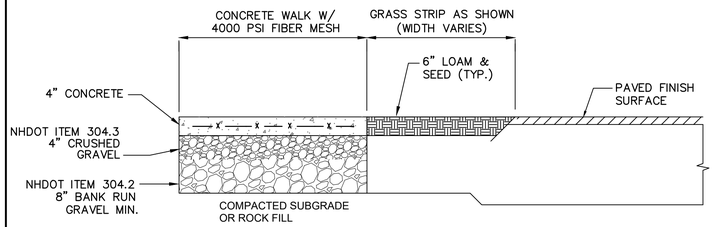
SHEET 11 OF 23
JBE PROJECT NO. 21254



NOTES:
1. THE MAXIMUM ALLOWABLE CROSS SLOPE OF ACCESSIBLE ROUTE (SIDEWALK) AND CURB SHALL BE 1.5%.
2. THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE 5%.
3. THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE (SIDEWALK) CURB RAMPS SHALL BE 8.3%.
4. A MINIMUM OF 4 FEET CLEAR SHALL BE MAINTAINED AT ANY PERMANENT OBSTACLE IN ACCESSIBLE ROUTE (i.e., HYDRANTS, UTILITY POLES, TREE WELLS, SIGNS, ETC.).
5. CURB TREATMENT VARIES, SEE PLANS FOR CURB TYPE.
6. BASE OF RAMP SHALL BE GRADED TO PREVENT PONDING.
7. SEE TYPICAL SECTION FOR RAMP CONSTRUCTION.
8. WHERE A CHANGE IN DIRECTION IS REQUIRED TO UTILIZE A CURB RAMP, A TURNING SPACE SHALL BE PROVIDED AT THE BASE AND/OR THE TOP OF THE CURB RAMP. TURNING SPACES SHALL BE PERMITTED TO OVERLAP CLEAR SPACES.
9. TURNING SPACE MAXIMUM CROSS SLOPE IS 2% IN ANY DIRECTION.
10. BEYOND THE BOTTOM GRADE BREAK, A CLEAR SPACE OF 4'x4' MINIMUM SHALL BE PROVIDED WITHIN THE WIDTH OF THE PEDESTRIAN CROSSWALK, AND OUTSIDE THE PARALLEL VEHICLE TRAVEL LANE. THE CLEAR SPACE MAY OVERLAP TURNING SPACES, DETECTABLE WARNING SURFACES AND DROP CURBS.

ACCESSIBLE CURB RAMP (NHDOT TYPE 1)

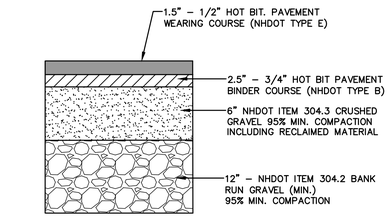
NOT TO SCALE



NOTES:
1. CONCRETE TO BE 4000 PSI.
2. CONTRACTION JOINTS SPACE TO BE EQUAL TO SIDEWALK WIDTH.
3. ALL JOINTS SEALED PER SPECIFICATIONS.
4. PROVIDE A 1/2" NON-EXTRUDING EXPANSION JOINT EVERY 16' ALONG SIDEWALK.

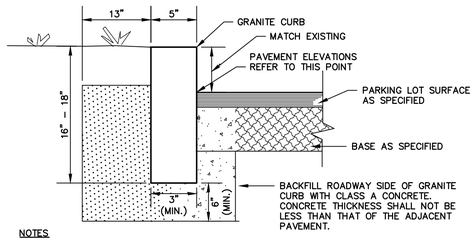
CONCRETE SIDEWALK WITH GRASS STRIP

NOT TO SCALE



TYPICAL BITUMINOUS PAVEMENT

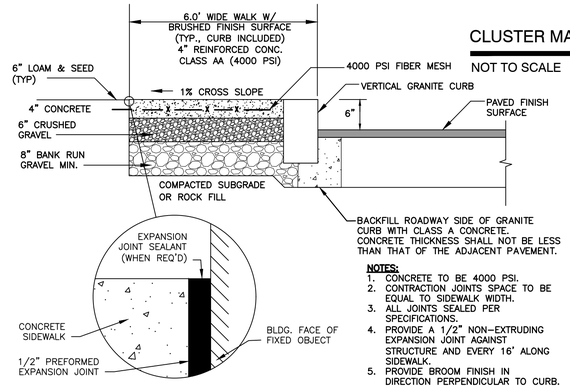
NOT TO SCALE



NOTES
1. EDGING TO BE PLACED PRIOR TO PLACING TOP SURFACE COURSE.
2. JOINTS BETWEEN STONES SHALL BE MORTARED.
3. PROPOSED VERTICAL GRANITE CURB ALONG WOODBURY AVE. AT CURB CUT TO BE REMOVED SHALL MEET THE REQUIREMENTS OF NHDOT STANDARD SPECIFICATIONS SECTION 609.

VERTICAL GRANITE CURB

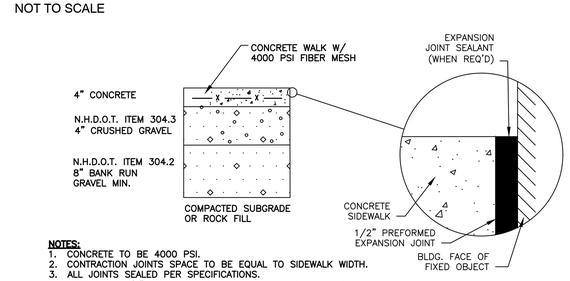
NOT TO SCALE



NOTES:
1. CONCRETE TO BE 4000 PSI.
2. CONTRACTION JOINTS SPACE TO BE EQUAL TO SIDEWALK WIDTH.
3. ALL JOINTS SEALED PER SPECIFICATIONS.
4. PROVIDE A 1/2" NON-EXTRUDING EXPANSION JOINT AGAINST STRUCTURE AND EVERY 16' ALONG SIDEWALK.
5. PROVIDE BROOM FINISH IN DIRECTION PERPENDICULAR TO CURB.

CONCRETE SIDEWALK W/ VERTICAL GRANITE CURB

NOT TO SCALE



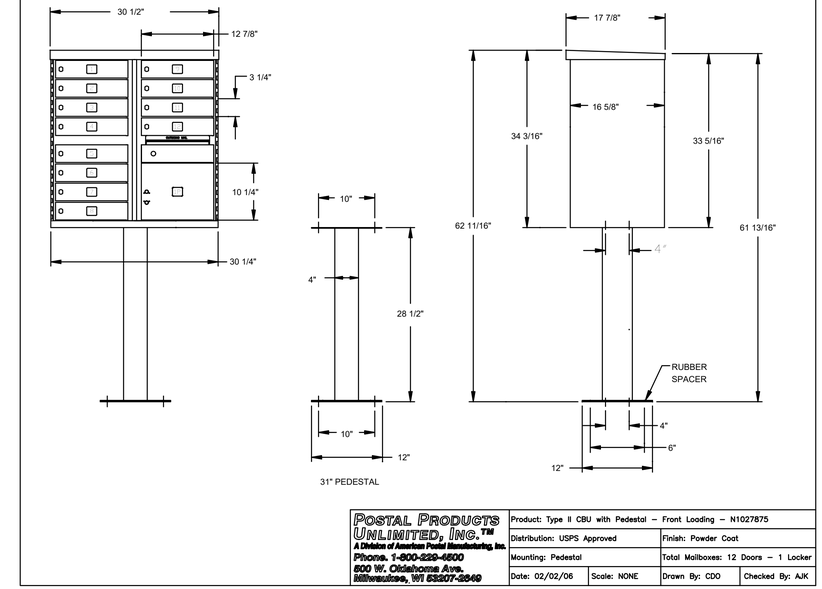
NOTES:
1. CONCRETE TO BE 4000 PSI.
2. CONTRACTION JOINTS SPACE TO BE EQUAL TO SIDEWALK WIDTH.
3. ALL JOINTS SEALED PER SPECIFICATIONS.
4. PROVIDE A 1/2" NON-EXTRUDING EXPANSION JOINT AGAINST STRUCTURE AND EVERY 16' ALONG SIDEWALK.

CONCRETE SIDEWALK

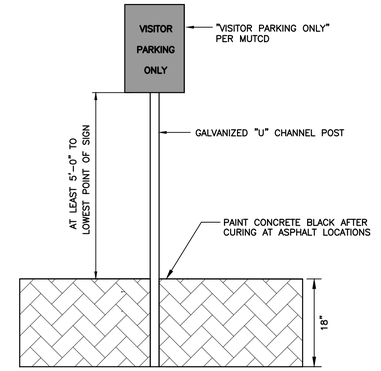
NOT TO SCALE

CLUSTER MAILBOX UNIT DETAIL

NOT TO SCALE

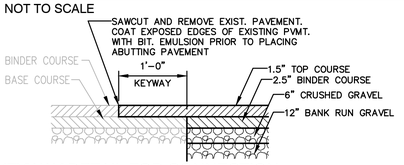


POSTAL PRODUCTS UNLIMITED, INC.™ A Division of American Postal Manufacturing, Inc. Phone: 1-800-229-4500 800 W. Oklahoma Ave. Milwaukee, WI 53207-2549	Product: Type II CBU with Pedestal – Front Loading – N1027875		
	Distribution: USPS Approved		Finish: Powder Coat
	Mounting: Pedestal		Total Mailboxes: 12 Doors – 1 Locker
	Date: 02/02/06	Scale: NONE	Drawn By: CDO / Checked By: AJK



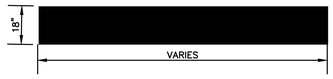
VISITOR PARKING SIGN

NOT TO SCALE



KEYWAY DETAIL FOR CONNECTION TO EXISTING PAVEMENT

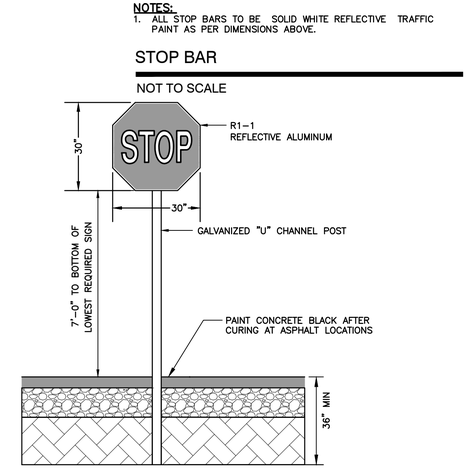
NOT TO SCALE



NOTES:
1. ALL STOP BARS TO BE SOLID WHITE REFLECTIVE TRAFFIC PAINT AS PER DIMENSIONS ABOVE.

STOP BAR

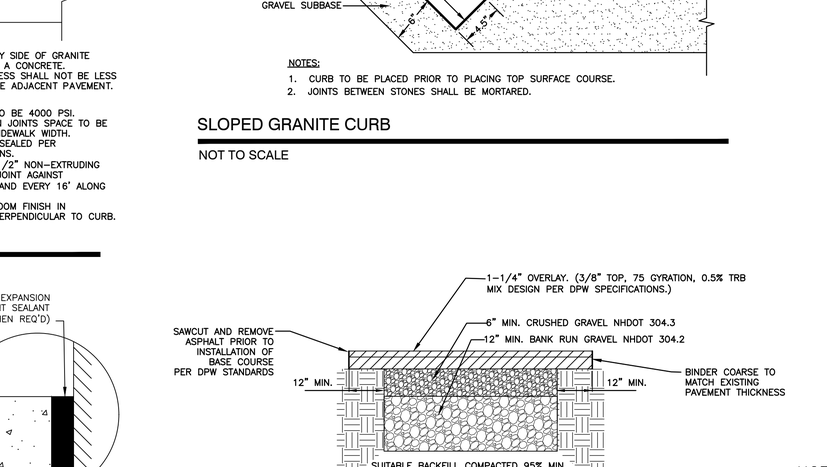
NOT TO SCALE



NOTES:
1. ALL SIGNAGE SHALL BE TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) STANDARDS AND NHDOT STANDARDS.
2. SIGN, HARDWARE, AND INSTALLATION TO CONFORM TO 2016 NHDOT STANDARD SPECIFICATION, SECTION 615 – TRAFFIC SIGNS.
3. THE CONTRACTOR SHALL PROVIDE SHOP DRAWINGS/CATALOG CUTS TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO ERECTING SIGNS.
4. THE LOCATION OF THE SIGNS SHALL BE AS INDICATED ON THE DRAWINGS AND/OR AS DIRECTED BY THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS.

STOP SIGN (R1-1)

NOT TO SCALE



NOTES:
1. CURB TO BE PLACED PRIOR TO PLACING TOP SURFACE COURSE.
2. JOINTS BETWEEN STONES SHALL BE MORTARED.

SLOPED GRANITE CURB

NOT TO SCALE

1. AFTER PROPER BACKFILLING AND COMPACTION, ADJACENT PAVEMENT MUST BE "SAW CUT" (STRAIGHT CUTS) A MINIMUM OF ONE FOOT (1') AROUND THE PERIMETER OF THE EXCAVATION. PAVEMENT MUST BE REMOVED.
2. INSTALL BASE COURSE LEAVING A REVEAL FOR SURFACE COURSE.
3. INSTALL SURFACE COURSE OF ASPHALT PAVING.
4. APPLY EMULSION SEALANT AT PERIMETER OF JOINT OVERLAPPING BASE COURSE. INSTALL WEARING COURSE OF ASPHALT TO GRADE. APPLY LIGHT SAND TO ABSORB EXCESS JOINT SEALANT.
5. GRAVEL COMPACTIONS TO MEET 95% MINIMUM.

TYPICAL PAVEMENT REPAIR DETAIL

NOT TO SCALE

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: AS NOTED	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

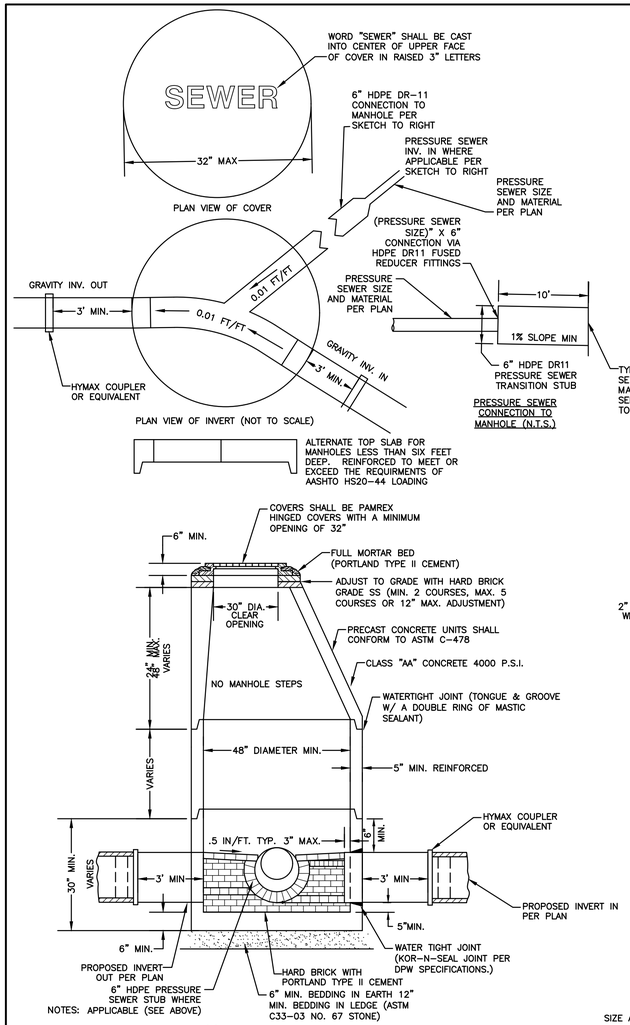
STATE OF NEW HAMPSHIRE – PAIGE S. LIBBEY No.16670 – LICENSED PROFESSIONAL ENGINEER – 01/05/2023

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	DETAIL SHEET
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 — LOT 1: BK 4708 PG 979; LOT 2: BK 4582 PG 888; LOT 3: BK 3919 PG 1345

DRAWING No.
D1
SHEET 12 OF 23
JBE PROJECT NO. 21254

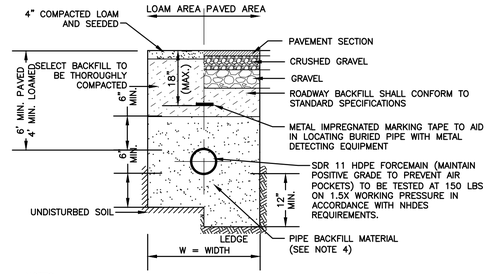


NOTES: APPLICABLE (SEE ABOVE)

1. PER NHDES ENV-WQ 704.13(C), THE MORTAR SPECIFICATION SHALL BE AS FOLLOWS:
   1. MORTAR SHALL BE COMPOSED OF PORTLAND CEMENT AND SAND WITH OR WITHOUT HYDRATED LIME ADDITION;
   2. 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, ONE PART CEMENT AND 0.5 PART HYDRATED LIME;
   3. CEMENT SHALL BE TYPE II PORTLAND CEMENT CONFORMING TO ASTM C150-05;
   4. HYDRATED LIME SHALL BE TYPE S CONFORMING TO THE ASTM C207-06 'STANDARD SPECIFICATIONS FOR HYDRATED LIME FOR MASONRY PURPOSES';
   5. SAND SHALL CONSIST OF INERT NATURAL SAND CONFORMING TO THE ASTM C33-03 'STANDARD SPECIFICATIONS FOR CONCRETE, FINE AGGREGATES';
2. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPED TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL IN ACCORDANCE WITH ENV-WQ 704.12 (K).
3. ALL MANHOLES SHALL BE TESTED FOR LEAKAGE IN ACCORDANCE WITH ENV-WQ 704.17 (a) THROUGH (e).
4. SEWER MANHOLE COVERS SHALL CONFORM TO ASTM A48 WITH A CASTING EQUAL TO CLASS 30 IN ACCORDANCE WITH ENV-WQ 704.13 (a).
5. ALL ASBESTOS CONTAINING WASTE MATERIALS MUST BE PROPERLY IDENTIFIED, PACKAGED AND DELIVERED TO A LANDFILL LICENCED BY THE NHDES SOLID WASTE MANAGEMENT PROGRAM FOR DISPOSAL. CALL (603) 271-2925 FOR MORE INFORMATION.
6. PORTSMOUTH STANDARD SEWER MANHOLE SHALL BE USED.
7. CONTRACTOR TO PURCHASE SEWER MANHOLE COVERS FROM THE CITY OF PORTSMOUTH DIRECTLY.
8. MANHOLE BASE SECTIONS SHALL BE MONOLITHIC TO A POINT AT LEAST 6" ABOVE THE HIGHEST INCOMING SEWER PIPE PER ENV-WQ 704.12 (e).
9. MANHOLE CASTINGS SHALL CONFORM TO ASTM A48 PER ENV-WQ 704.13 (a) (8).
10. ON-SITE SEWER MANHOLE COVERS WILL NEED TO BE PURCHASED BY THE APPLICANT. THE CITY OF PORTSMOUTH WILL NOT BE PROVIDING THESE.

PORTSMOUTH SEWER MANHOLE

NOT TO SCALE

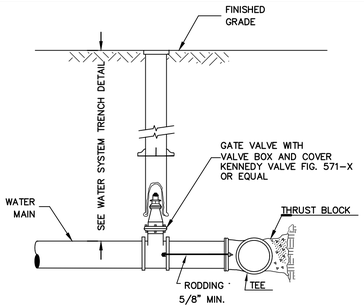


NOTES:

1. ALL JOINTS TO BE MECHANICALLY RESTRAINED.
2. W=MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12" INCHES ABOVE THE PIPE. W SHALL BE NO MORE THAN 36"
3. SAND BEDDING AND BLANKET SHALL BE CLEAN SAND FREE FROM ORGANIC MATTER, SO GRADED THAT 90-100% PASSES A 1/2 INCH SIEVE AND NO MORE THAN 15% WILL PASS A #200 SIEVE.

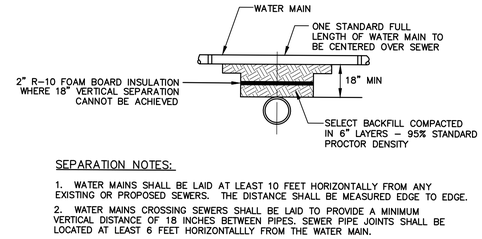
FORCE MAIN SEWER TRENCH

NOT TO SCALE



BURIED GATE VALVE DETAIL

NOT TO SCALE

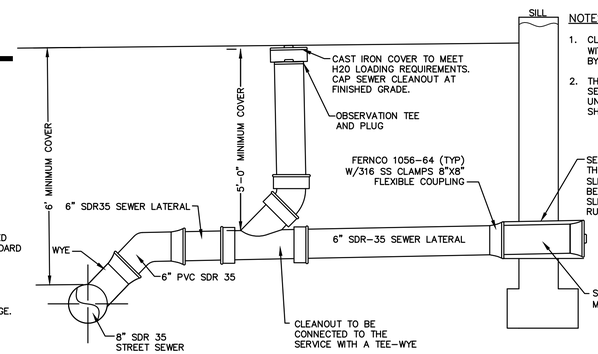


SEPARATION NOTES:

1. WATER MAINS SHALL BE LAID AT LEAST 10 FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED SEWERS. THE DISTANCE SHALL BE MEASURED EDGE TO EDGE.
2. WATER MAINS CROSSING SEWERS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18 INCHES BETWEEN PIPES. SEWER PIPE JOINTS SHALL BE LOCATED AT LEAST 6 FEET HORIZONTALLY FROM THE WATER MAIN.

TYPICAL WATER / SEWER SEPARATION

NOT TO SCALE



NOTES:

1. CLEANOUT COVER SHALL BE RAISED TO GRADE WITHIN 5' OF EACH UNIT THAT IS SERVICED BY GRAVITY.
2. THIS DETAIL ONLY APPLIES TO UNITS SERVICED BY GRAVITY SEWER. SERVICE FOR UNITS SERVICED BY LOW PRESSURE SEWER SHALL FOLLOW E-ONE DETAILS ON SHEET D3.

HOUSE SEWER SERVICE

NOT TO SCALE

NOTES:

1. PAVEMENT REPAIR IN EXISTING ROADWAYS SHALL CONFORM TO PAVEMENT DETAILS.
2. NEW ROADWAY CONSTRUCTION SHALL CONFORM TO SUBDIVISION SPECIFICATIONS.
3. TRENCH BACKFILL SHALL CONFORM WITH ENV. Wq 704.11(h) AND BE FREE OF DEBRIS, PAVEMENT, ORGANIC MATTER, TOP SOIL, WET OR SOFT MUCK, PEAT OR CLAY, EXCAVATED LEDGE OR ROCKS OVER SIX INCHES.
4. W= MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12" INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, WIDTH SHALL BE NO MORE THAN 36"; FOR PIPES GREATER THAN 15 INCHES NOMINAL DIAMETER, WIDTH SHALL BE 24 INCHES PLUS PIPE O.D. WIDTH SHALL ALSO BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE.
5. RIGID FOAM INSULATION TO BE PROVIDED WHERE COVER IN THE ROADWAY IS LESS THAN 6' AND CROSS COUNTRY IS LESS THAN 4', PURSUANT TO DES WAIVER BEING ISSUED.
6. PIPE SAND BLANKET MATERIAL SHALL BE GRADED SAND, FREE FROM ORGANIC MATERIALS, GRADED SUCH THAT 100% PASSES A 1/2 " SIEVE AND A MAXIMUM OF 15% PASSES A #200 SIEVE IN ACCORDANCE WITH Env-Wq 704.11(b).
7. JOINT SEALS FOR PVC PIPE SHALL BE OIL RESISTANT COMPRESSION RINGS OF ELASTOMERIC MATERIAL AND CERTIFIED BY THE MANUFACTURER AS CONFORMING TO THE ASTM D3212 STANDARD IN EFFECT WHEN THE JOINT SEALS WERE MANUFACTURED, AND SHALL BE PUSH-ON, BELL-AND-SPIGOT TYPE PER Env-Wq 704.05 (e).

SEWER TRENCH

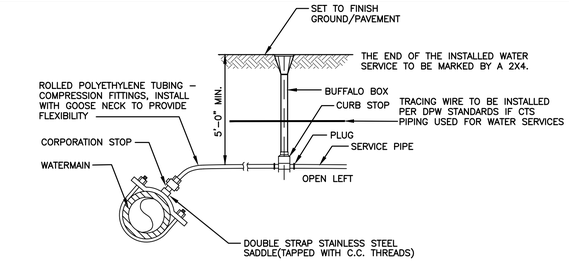
NOT TO SCALE

POST HYDRANTS SHALL BE NON-FREEZING, SELF DRAINING TYPE WITH A 5' BURY. THESE HYDRANTS WILL BE FURNISHED WITH A 2" FIP HORIZONTAL INLET, A NON-TURNING OPERATING ROD, AND SHALL OPEN LEFT. BRONZE OPERATING MECHANISM AND ALUMINUM PLUNGER, DESIGN, AND BE SERVICABLE FROM ABOVE GRADE WITH NO DIGGING. THE OUTLET SHALL ALSO BE BRONZE AND BE 2-1/2" NST. HYDRANTS SHALL BE LOCKABLE TO PREVENT UNAUTHORIZED USE AS MANUFACTURED BY KUPFERLE FOUNDRY CO., ST. LOUIS, MO, OR APPROVED EQUAL.

INLET PRESSURE (PSI)	FLOW RATE (GPM)
75	675
100	742
125	800
150	856

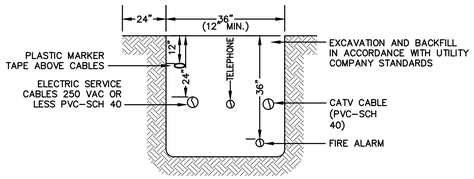
BLOW-OFF HYDRANT DETAIL

NOT TO SCALE



WATER SERVICE CONNECTION-POLYETHYLENE

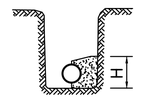
NOT TO SCALE



NOTE: ALL UTILITIES SHALL BE REVIEWED AND APPROVED BY APPROPRIATE UTILITY COMPANY.

UTILITY TRENCH

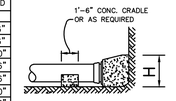
NOT TO SCALE



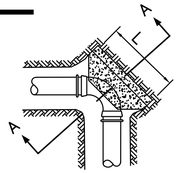
SECTION A-A

CONCRETE THRUST BLOCK DIMENSIONS								
PIPE DIA. (IN.)	TEE		90° BEND OR STUB		45° BEND		22.5° BEND	
	H	L	H	L	H	L	H	L
4"/6"	1'-6"	1'-6"	1'-6"	2'-0"	1'-6"	1'-6"	1'-6"	1'-6"
8"	2'-0"	2'-0"	2'-0"	3'-0"	1'-6"	2'-0"	1'-6"	1'-6"
10"	2'-0"	3'-0"	2'-6"	3'-6"	2'-0"	2'-6"	1'-6"	2'-0"
12"	2'-6"	3'-6"	3'-0"	4'-0"	2'-0"	3'-6"	1'-6"	2'-6"
15"	3'-0"	4'-6"	3'-6"	5'-6"	3'-0"	3'-6"	2'-0"	2'-6"
18"	4'-0"	5'-0"	4'-6"	6'-0"	3'-6"	4'-0"	2'-6"	3'-0"
24"	5'-0"	7'-0"	6'-0"	8'-0"	4'-0"	6'-0"	3'-0"	4'-6"

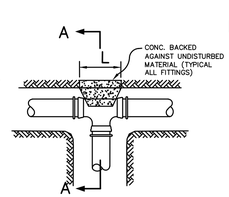
PIPING W/ MECHANICAL JOINT FITTINGS SHALL HAVE RETAINING GLANDS



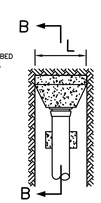
SECTION B-B



PLAN



PLAN



PLAN

THRUST BLOCK DETAILS

NOT TO SCALE

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: AS NOTED	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.

STATE OF NEW HAMPSHIRE - PAIGE S. LIBBEY No.16670 - PROFESSIONAL ENGINEER - LICENSED - 01/20/2023

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

Designed and Produced in NH

J/B Jones & Beach Engineers, Inc.

85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885

Civil Engineering Services

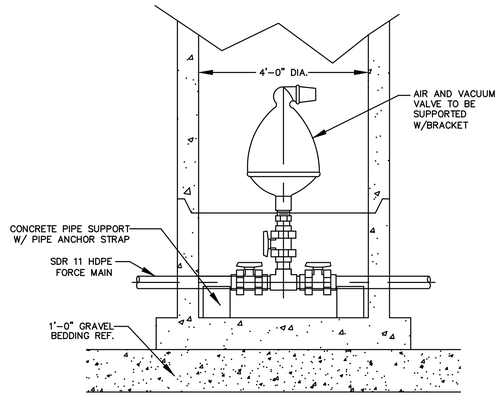
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	DETAIL SHEET
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 LOT 1: BK 4708 PG 979 LOT 2: BK 4582 PG 888 LOT 3: BK 3919 PG 1345

DRAWING No.

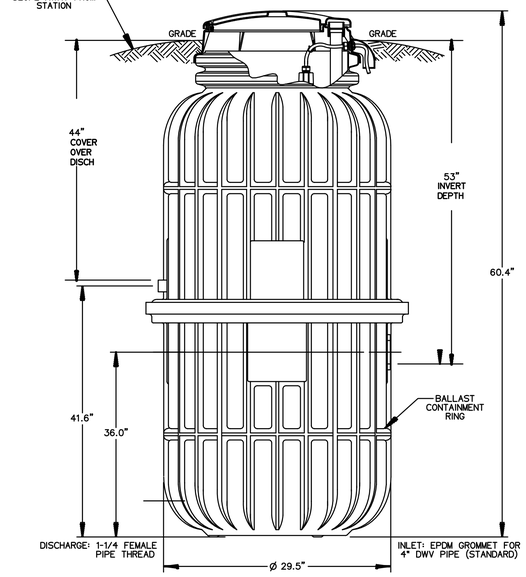
D2

SHEET 13 OF 23
JBE PROJECT NO. 21254



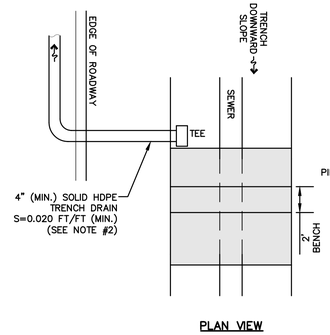
TERMINAL FLUSHING MANHOLE - OPTIONAL ELEV. VIEW

NOT TO SCALE

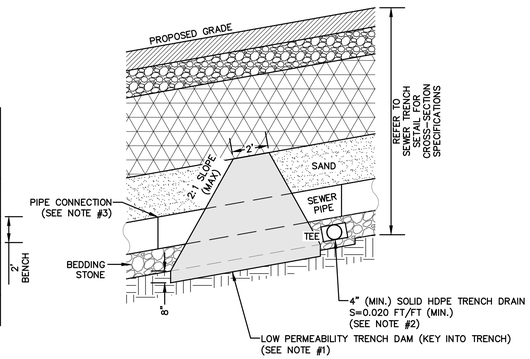


DH071-93 GRINDER PUMP STATION

NOT TO SCALE



PLAN VIEW



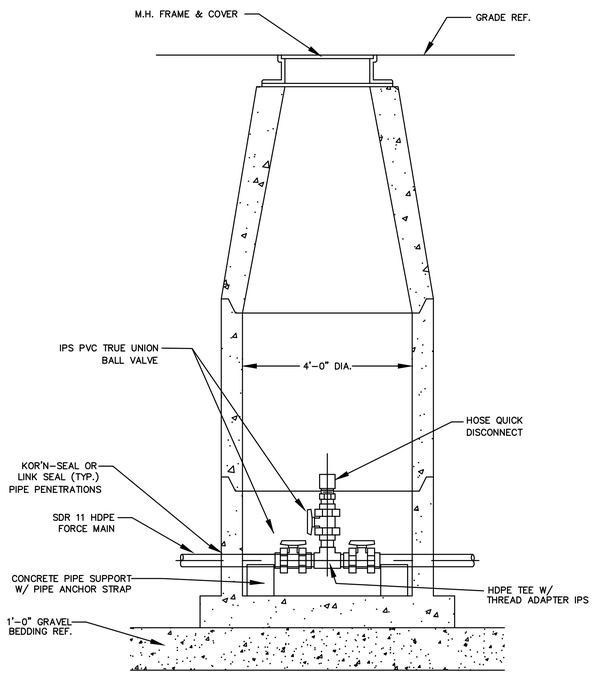
SECTION VIEW

NOTES:

1. LOW PERMEABILITY SOIL USED FOR TRENCH DAM SHALL MEET THE FOLLOWING SPECIFICATION: CLAYEY SOIL – MIN. 15% PASSING THE #200 SIEVE AND A MIN. PERMEABILITY OF $1x10^{-5}$ CM/SEC
2. REFER TO PROJECT SITE PLANS FOR LOCATION OF TRENCH DRAINS AND OUTLET ROUTING. DRAINS SHALL DAYLIGHT TO NEAREST AT-GRADE POINT, TIE-INTO A DRAINAGE STRUCTURE, OR INTO A NETWORK OR TRENCH DRAINS.
3. CONTRACTOR SHALL NOT LOCATE A PIPE CONNECTION WITHIN THE LIMITS OF THE TRENCH DAM. A 2' SEPARATION BETWEEN LIMIT OF TRENCH DAM AND CONNECTION IS RECOMMENDED.
4. IF TRENCH DAMS & DRAINS ARE SPECIFIED ON THE PROJECT, THE CONTRACTOR SHALL INSTALL DAMS & DRAINS AT A MAXIMUM. 75' SPACING. REFER TO PROJECT PLANS FOR DESIGN SPACING.

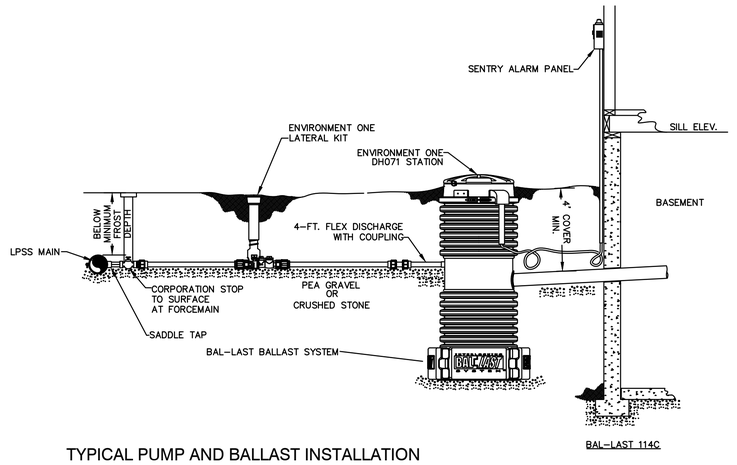
SEWER TRENCH DAM & DRAIN

NOT TO SCALE



TERMINAL FLUSHING MANHOLE

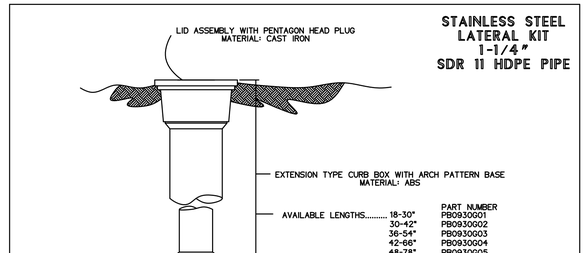
NOT TO SCALE



BAL-LAST 114C

TYPICAL PUMP AND BALLAST INSTALLATION

NOT TO SCALE



STAINLESS STEEL LATERAL KIT 1-1/4" SDR 11 HDPE PIPE

KIT PARTS ARE NOT ASSEMBLED

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 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 NC0193G01
6. CURB BOX IS TO BE ORDERED SEPARATELY, SEE ABOVE

SGS	DN	11/02/11	B	3/16
DR BY	CHK'D	DATE	ISSUE	SCALE

eone SEWER SYSTEMS

STAINLESS STEEL LATERAL KIT
1-1/4" SDR 11 HDPE PIPE

NA0330P02

STAINLESS STEEL LATERAL KIT

NOT TO SCALE

Design: JAC	Draft: DJM
Checked: JAC	Scale: AS NOTED
Drawing Name: 21254-PLAN.dwg	

Date: 01/05/22
Project No.: 21254

STATE OF NEW HAMPSHIRE – PAIGE S. LIBBEY No.16670 – LICENSED PROFESSIONAL ENGINEER – 01/10/2023

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

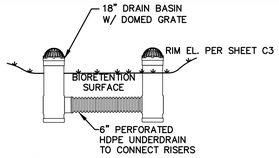
Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	DETAIL SHEET
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 LOT 1: BK 4708 PG 979 LOT 2: BK 4582 PG 888 LOT 3: BK 3919 PG 1345

DRAWING No.

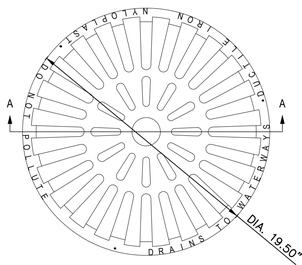
D3

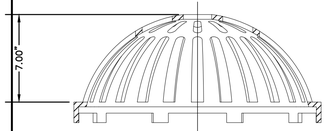
SHEET 14 OF 23
JBE PROJECT NO. 21254



NYOPLAST DRAIN BASIN AND INLINE DRAIN

NOT TO SCALE



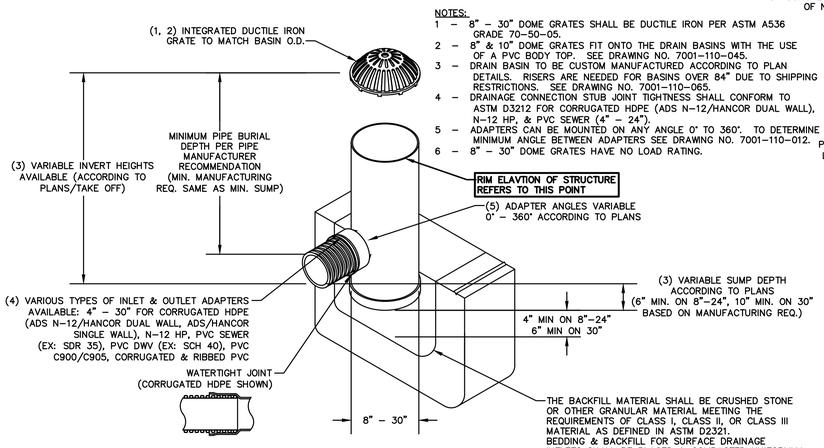


SECTION A-A

NOTES:
1. DIMENSIONS ARE FOR REFERENCE ONLY
2. ACTUAL DIMENSIONS MAY VARY
3. DIMENSIONS ARE IN INCHES
4. QUALITY: MATERIALS SHALL CONFORM TO ASTM A536 GRADE 70-50-05
5. PAINT: CASTINGS ARE FURNISHED WITH A BLACK PAINT
6. LOCKING DEVICE AVAILABLE UPON REQUEST

18" NYLOPLAST DOME GRATE

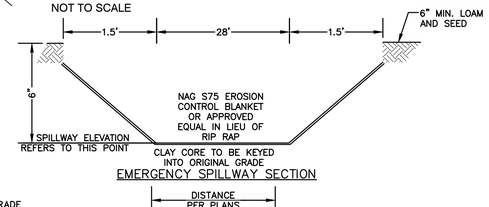
NOT TO SCALE



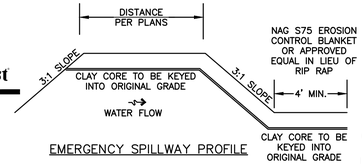
NOTES:
1 – 8" – 30" DOME GRATES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70–50–05.
2 – 8" & 10" DOME GRATES FIT ONTO THE DRAIN BASINS WITH THE USE OF A PVC BODY TOP. SEE DRAWING NO. 7001–110–045.
3 – DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASINS OVER 84" DUE TO SHIPPING RESTRICTIONS. SEE DRAWING NO. 7001–110–065.
4 – DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N–12/HANCOR DUAL WALL), N–12 HP, & PVC SEWER (4" – 24").
5 – ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001–110–012.
6 – 8" – 30" DOME GRATES HAVE NO LOAD RATING.

NYLOPLAST DRAIN BASIN (W/ DOME GRATE) (BIORETENTION RISER & YARD DRAIN SPECIFICATION)

NOT TO SCALE



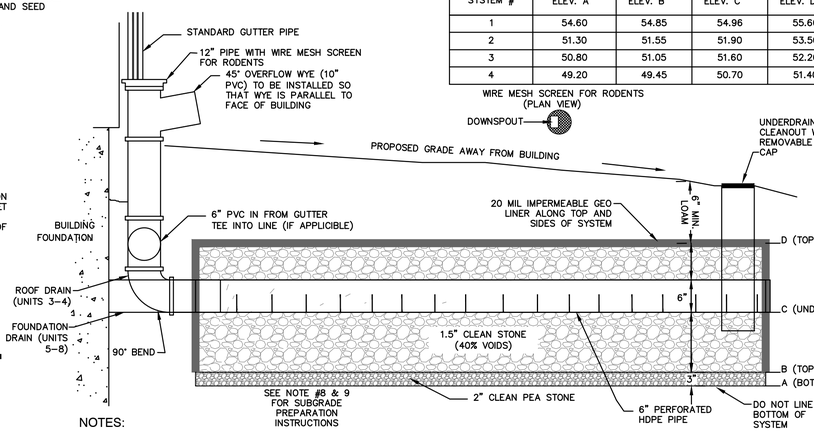
EMERGENCY SPILLWAY SECTION



EMERGENCY SPILLWAY PROFILE

EMERGENCY SPILLWAY

NOT TO SCALE



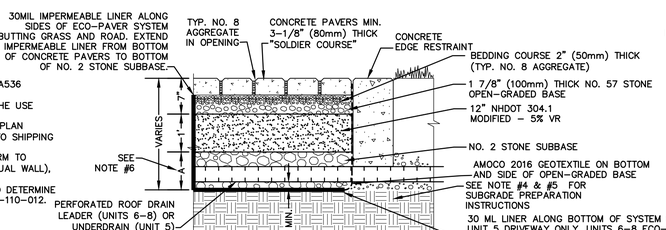
NOTES:
1. ONCE THE SYSTEM HAS BEEN CONSTRUCTED, IT SHOULD BE TESTED BY INSERTING A GARDEN HOSE INTO THE INLET AND ALLOWING THE WATER TO RUN FOR A MINIMUM OF ONE (1) HOUR. THE WATER SHOULD STAY UNDERGROUND WITHIN THE GRAVEL. IF WATER COMES OUT OF THE OVERFLOW, THE SYSTEM SHOULD BE FURTHER INSPECTED AND POSSIBLY REPLACED. THIS PROCEDURE SHOULD BE PERFORMED EVERY YEAR DURING THE FALL INSPECTION.
2. IN THE SPRING AND FALL, VISUALLY INSPECT THE AREA AROUND THE SYSTEM AND REPAIR ANY EROSION. USE SMALL STONES TO STABILIZE EROSION ALONG DRAINAGE PATHS. RE–MULCH ANY VOID AREAS BY HAND AS NEEDED. ALSO INSPECT THE ROOF COLLECTION AND PIPING AND CLEAN AND REPAIR AS NECESSARY.
3. KEEP HEAVY VEHICLES FROM DRIVING OR PARKING OVER THE SYSTEM.
4. FOR ALL DEPTHS OF COVER LESS THAN TWO (2) FEET, PIPE MUST BE SCHEDULE 40 PVC. FOR DEPTHS OF COVER GREATER THAN TWO (2) FEET, FLEXIBLE PIPE MAY BE USED. REFER TO SPECIFICATIONS FOR ALLOWABLE PIPE TYPES.
5. A WATERTIGHT CONNECTION SHALL BE MAINTAINED WITH ANY TRANSITION FROM SCHEDULE 40 PVC PIPE TO ANY OTHER PIPE TYPE.
6. THE DOWNSPOUT DRAIN LEADING INTO THE INFILTRATION PRACTICE AS WELL AS THE PERFORATED PVC UNDERDRAIN SHALL BE INSTALLED BEFORE THE DOWNSPOUTS ARE INSTALLED ON THE BUILDINGS. SITEWORK CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK INCLUDING THE RODENT SCREEN. BUILDING CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONNECTION AT THE POINT OF THE RODENT SCREEN.
7. OVERFLOWS ARE TO BE INSTALLED ON EXTERIOR DOWNSPOUT LEADERS ONLY.
8. THE EXISTING NATIVE SUBGRADE MATERIAL UNDER ALL BED AREAS SHALL NOT BE COMPACTED OR SUBJECT TO EXCESSIVE CONSTRUCTION EQUIPMENT TRAFFIC PRIOR TO STONE BED PLACEMENT. WHERE EROSION OF THE NATIVE MATERIAL SUBGRADE HAS CAUSED ACCUMULATION OF FINE MATERIALS AND/OR SURFACE PONDING AT THE BASE OF THE EXCAVATION, THIS MATERIAL SHALL BE REMOVED WITH LIGHT EQUIPMENT AND THE UNDERLYING SOILS SCARIFIED TO A MINIMUM DEPTH OF 6 INCHES (15 CM) WITH A YORK RAKE OR EQUIVALENT AND LIGHT TRACTOR.
9. BRING SUBGRADE OF STONE POROUS MEDIA TO LINE, GRADE, AND ELEVATIONS INDICATED. FILL AND LIGHTLY REGRADE ANY AREAS DAMAGED BY EROSION, PONDING, OR TRAFFIC COMPACTION BEFORE PLACING OF THE STONE. THE BOTTOM OF EXCAVATION SHALL BE LEVEL PRIOR TO INSTALLATION OF THE POROUS STONE MEDIA.
10. UNITS 3&4: STONE INFILTRATION IS FOR ROOF WATER ONLY. UNITS 5–8: STONE INFILTRATION IS FOR FOUNDATION DRAINAGE ONLY. DO NOT TIE ROOF LEADERS FROM UNITS 5–8 INTO THESE SYSTEMS.

SUBSURFACE STONE INFILTRATION BED DETAIL

NOT TO SCALE

INFILTRATION SYSTEM ELEVATIONS

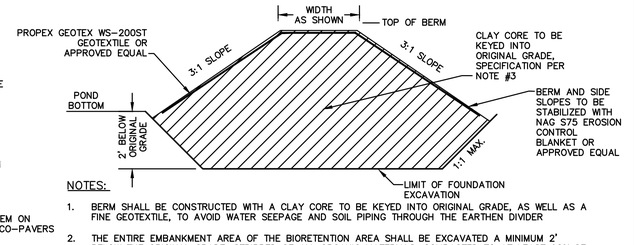
SYSTEM #	ELEV. A	ELEV. B	ELEV. C	ELEV. D
1	54.60	54.85	54.96	55.60
2	51.30	51.55	51.90	53.50
3	50.80	51.05	51.60	52.20
4	49.20	49.45	50.70	51.40



NOTES:
1. 2 3/8" (60 MM) THICK PAVERS MAY BE USED IN PEDESTRIAN APPLICATIONS.
2. NO. 2 STONE SUBBASE THICKNESS VARIES WITH DESIGN. CONSULT ICPI PERMEABLE INTERLOCKING CONCRETE PAVEMENT MANUAL.
3. INSTALLATION TO BE PERFORMED TO MANUFACTURER'S GUIDLINES AND THE PERMEABLE INTERLOCKING CONCRETE PAVEMENT SPECIFICATIONS.
4. THE EXISTING NATIVE SUBGRADE MATERIAL UNDER ALL BED AREAS SHALL NOT BE COMPACTED OR SUBJECT TO EXCESSIVE CONSTRUCTION EQUIPMENT TRAFFIC PRIOR TO STONE BED PLACEMENT. WHERE EROSION OF THE NATIVE MATERIAL SUBGRADE HAS CAUSED ACCUMULATION OF FINE MATERIALS AND/OR SURFACE PONDING AT THE BASE OF THE EXCAVATION, THIS MATERIAL SHALL BE REMOVED WITH LIGHT EQUIPMENT AND THE UNDERLYING SOILS SCARIFIED TO A MINIMUM DEPTH OF 6 INCHES (15 CM) WITH A YORK RAKE OR EQUIVALENT AND LIGHT TRACTOR.
5. BRING SUBGRADE OF STONE POROUS MEDIA TO LINE, GRADE, AND ELEVATIONS INDICATED. FILL AND LIGHTLY REGRADE ANY AREAS DAMAGED BY EROSION, PONDING, OR TRAFFIC COMPACTION BEFORE PLACING OF THE STONE. THE SLOPE OF THE BOTTOM OF EXCAVATION SHALL PARALLEL THAT OF THE PROPOSED DRIVEWAY SURFACE.
6. UNIT 5: A=14"; UNIT 6: A=10"; UNIT 7: A=7"; UNIT 8: A=19"

PERMEABLE CONCRETE PAVER DETAIL ("ECO-PAVER")

NOT TO SCALE



NOTES:
1. BERM SHALL BE CONSTRUCTED WITH A CLAY CORE TO BE KEYED INTO ORIGINAL GRADE, AS WELL AS A FINE GEOTEXTILE, TO AVOID WATER SEEPAGE AND SOIL PIPING THROUGH THE EARTHEN DIVIDER
2. THE ENTIRE EMBANKMENT AREA OF THE BIORETENTION AREA SHALL BE EXCAVATED A MINIMUM 2' BELOW THE ORIGINAL GRADE, STRIPPED OF ALL ORGANIC MATERIALS, COMPACTED TO AT LEAST 92% OF ASTM D–1557, AND SCARIFIED PRIOR TO THE PLACEMENT OF THE EMBANKMENT MATERIAL. PLACEMENT AND COMPACTION SHOULD OCCUR AT A MOISTURE CONTENT OF OPTIMUM PLUS OR MINUS 3%, AND NO FROZEN OR ORGANIC MATERIAL SHOULD BE PLACED FOR ANY REASON.
3. EMBANKMENT MATERIAL SHALL BE CLEAN MINERAL SOIL FREE OF ROOTS, ORGANIC MATTER, AND OTHER DELETERIOUS SUBSTANCES. IT SHALL CONTAIN NO ROCKS OR LUMPS OVER FOUR INCHES (4") IN DIAMETER. THIS MATERIAL SHALL BE INSTALLED IN 6" LIFTS COMPACTED TO 92% OF ASTM D–1557, AND SHALL MEET THE FOLLOWING SPECIFICATIONS: 6" PASSING 100%, #4 SIEVE 40–90%, #40 SIEVE 50–80%, #100 SIEVE 25–40%, #200 SIEVE 15–30% (OF THE TOTAL SAMPLE).
4. CLAY CORE MATERIAL SHALL BE CLEAN SILTY–CLAY BORROW FREE OF ROOTS, ORGANIC MATTER, AND OTHER DELETERIOUS SUBSTANCES, AND SHALL CONTAIN NO ROCKS OR LUMPS OVER THREE INCHES (3") IN DIAMETER. THIS MATERIAL SHALL BE INSTALLED IN 6" LIFTS COMPACTED TO 92% OF ASTM D–1557, AND SHALL MEET THE FOLLOWING SPECIFICATIONS: 6" PASSING 100%, #4 SIEVE 95–100%, #40 SIEVE 60–90%, #100 SIEVE 40–60%, #200 SIEVE 25–45% (OF THE FRACTION PASSING THE #4 SIEVE). THE CLAY COMPONENT SHALL HAVE A PLASTICITY INDEX OF AT LEAST 8 AND A HYDRAULIC CONDUCTIVITY OF 10 TO THE –6 CM/SEC.
5. COMPACTION AND MATERIALS TESTING SERVICES SHALL BE PERFORMED BY AN INDEPENDENT GEOTECHNICAL ENGINEER RETAINED BY THE OWNER.

BIORETENTION SYSTEM BERM WITH CLAY CORE

NOT TO SCALE

BIORETENTION SYSTEM ELEVATIONS

BIORETENTION	SIZE OF BOTTOM (S.F.)	ELEV. A	ELEV. B	ELEV. C	ELEV. D	ELEV. E	ELEV. F	SHWT	LEDGE
1	502	55.0	N/A	53.75	52.25	52.0	51.25	51.13	< 49.55 *
2	1,080	51.5	51.0	49.25	47.75	47.5	46.42	46.25	< 44.42 *

* TEST PITS TERMINATED AT THESE DEPTHS BELOW REFERENCE POINT WITHOUT ENCOUNTERING LEDGE.

SAND SPECIFICATION

SIEVE SIZE	% BY WEIGHT
⅜"	100
#4	95–100
#8	80–100
#16	50–85
#30	25–60
#60	10–30
#100	2–10
#200	0–5

TOPSOIL SPECIFICATION

LOAMY SAND TOPSOIL WITH MINIMAL CLAY CONTENT AND BETWEEN 15 TO 25% FINES PASSING THE #200 SIEVE.

MULCH SPECIFICATION

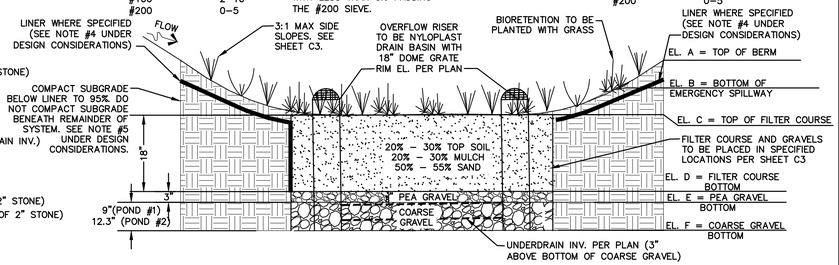
MODERATELY FINE, SHREDDED BARK OR WOOD FIBER MULCH WITH LESS THAN 5% PASSING THE #200 SIEVE.

PEA GRAVEL SPECIFICATION

SIEVE SIZE	% BY WEIGHT
1"	100
¾"	85–100
#4	10–30
#8	0–10
#16	0–15

COARSE GRAVEL SPECIFICATION

SIEVE SIZE	% BY WEIGHT
1"	90–100
¾"	75–100
#4	50–100
#20	15–80
#50	0–15
#200	0–5

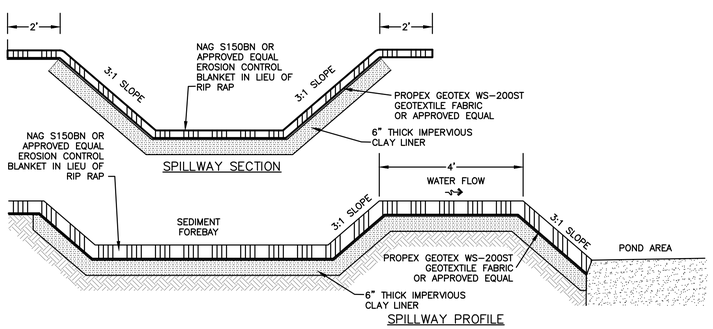


DESIGN CONSIDERATIONS

1. DO NOT DIRECT RUNOFF TO THE BIORETENTION SYSTEMS UNTIL IT HAS BEEN PLANTED AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
2. DO NOT DISCHARGE SEDIMENT–LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUN–OFF, WATER FROM EXCAVATIONS) TO THE BIORETENTION AREA DURING ANY STAGE OF CONSTRUCTION.
3. DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT OUTSIDE THE LIMITS OF THE INFILTRATION COMPONENTS OF THE SYSTEM.
4. ONLY PLACE FILTER MEDIA AND STONE BENEATH DOTTED HATCH AREA ON SHEET C3. REMAINDER OF POND TO BE LINED WITH 30MIL LINER 6" BELOW SURFACE. FILTER MEDIA AND STONE SECTIONS ARE NOT TO BE LINED. LINER SHALL CONTINUE DOWN THE SIDES OF THE FILTER COURSE BUT MUST NOT BE PLACED ON THE SIDES OF THE PEA GRAVEL OR COARSE GRAVEL OR PLACED BENEATH THE FILTER COURSE AND/OR GRAVELS.
5. THE EXISTING NATIVE SUBGRADE MATERIAL SHALL NOT BE COMPACTED OR SUBJECT TO EXCESSIVE CONSTRUCTION EQUIPMENT TRAFFIC PRIOR TO STONE PLACEMENT. IF SOIL MEDIA OR SUBGRADE IS OVER COMPACTED, DISTURBED, OR CONTRAMINATED BY FOREIGN OR DELETERIOUS MATERIALS OR LIQUIDS, REMOVE THE SOIL MEDIA AND CONTAMINATION; RESTORE THE SUBGRADE AS DIRECTED BY ENGINEER AND REPLACE CONTAMINATED SOIL MEDIA WITH NEW SOIL MEDIA.
6. IN ADDITION TO DESIGN CRITERIA LISTED HERE, REFER TO GUIDELINES LISTED IN UNIVERSITY OF NEW HAMPSHIRE (UNH) STORMWATER CENTER BIORETENTION SOIL SPECIFICATION.
7. BIORETENTION SYSTEM #1 HAS A SEDIMENT FOREBAYS FOR PRE–TREATMENT AND BIORETENTION SYSTEM #2 HAS A PRETX CURB INLET STRUCTURE FOR PRE–TREATMENT.

MAINTENANCE REQUIREMENTS:

1. SYSTEMS SHOULD BE INSPECTED AT LEAST TWICE ANNUALLY, AND FOLLOWING ANY RAINFALL EVENT EXCEEDING 2.5 INCHES IN A 24 HOUR PERIOD, WITH MAINTENANCE OR REHABILITATION CONDUCTED AS WARRANTED BY SUCH INSPECTION.
2. TRASH AND DEBRIS SHOULD BE REMOVED AT EACH INSPECTION.
3. AT LEAST ONCE ANNUALLY, SYSTEM SHOULD BE INSPECTED FOR DRAWDOWN TIME. IF BIORETENTION SYSTEM DOES NOT DRAIN WITHIN 72 HOURS FOLLOWING A RAINFALL EVENT, THEN A QUALIFIED PROFESSIONAL SHOULD ASSESS THE CONDITION OF THE FACILITY TO DETERMINE MEASURES REQUIRED TO RESTORE FILTRATION FUNCTION OR INFILTRATION FUNCTION (AS APPLICABLE), INCLUDING BUT NOT LIMITED TO REMOVAL OF ACCUMULATED SEDIMENTS OR RECONSTRUCTION OF THE FILTER MEDIA.
4. VEGETATION SHOULD BE INSPECTED AT LEAST ANNUALLY, AND MAINTAINED IN HEALTHY CONDITION, INCLUDING PRUNING, REMOVAL AND REPLACEMENT OF DEAD OR DISEASED VEGETATION, AND REMOVAL OF INVASIVE SPECIES.



SPILLWAY PROFILE

SEDIMENT FOREBAY SPILLWAY

NOT TO SCALE

BIORETENTION SYSTEM

NOT TO SCALE

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: AS NOTED	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

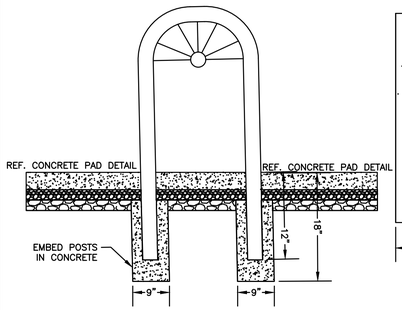
STATE OF NEW HAMPSHIRE – PAIGE S LIBBEY No.16670 – LICENSED PROFESSIONAL ENGINEER – 01/31/2023

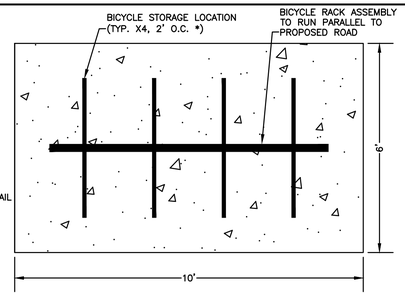
REV.	DATE	REVISION	BY
9	1/23/23	REVISED BIORETENTION BERM DETAIL PER REVIEW ENGINEER	DJM
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM

Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
85 Portsmouth Ave. PO Box 219 Stratham, NH 03885
Civil Engineering Services
603-772-4746 FAX: 603-772-0227 E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	DETAIL SHEET
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 — LOT 1: BK 4708 PG 979; LOT 2: BK 4582 PG 888; LOT 3: BK 3919 PG 1345

DRAWING No.
D4
SHEET 15 OF 23
JBE PROJECT NO. 21254

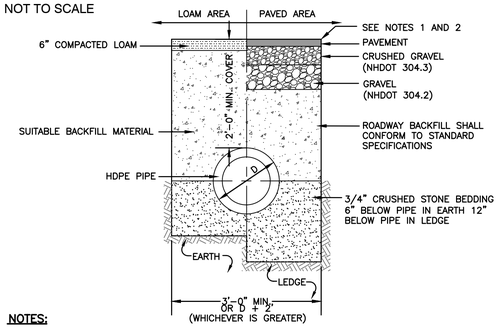




BICYCLE RACK PLAN VIEW (NOT TO SCALE)
* SEPARATION BETWEEN BICYCLE LOCATIONS MAY VARY PER PRODUCT SPECIFICATIONS AS LONG AS 4 BICYCLES CAN BE STORED ON 6'x10' CONCRETE PAD.

BICYCLE RACK

NOT TO SCALE

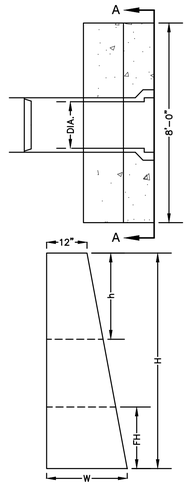


NOTES:

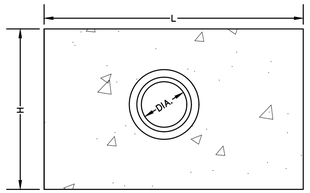
1. PAVEMENT REPAIR IN EXISTING ROADWAYS SHALL CONFORM TO STREET OPENING REGULATIONS.
2. NEW ROADWAY CONSTRUCTION SHALL CONFORM WITH PROJECT AND TOWN SPECIFICATIONS.
3. ALL MATERIALS ARE TO BE COMPACTED TO 95% OF ASTM D-1557.

DRAINAGE TRENCH

NOT TO SCALE



LONGITUDINAL SECTION



SECTION A-A

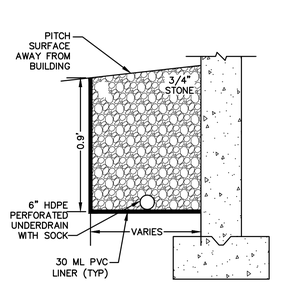
DIA.	HEADWALL LENGTH	HEADWALL HEIGHT	FILL HEIGHT	PIPE COVER	HEADWALL BOTTOM WIDTH
D	L	H	FH	h	W
8"	2'-0"	1'-6"	0'-6"	0'-3"	VARIES
12"	4'-2"	3'-9"	1'-6"	1'-3"	1'-11"
15"	5'-11"	4'-2"	1'-6"	1'-5"	2'-0"
18"	6'-11"	4'-5"	1'-6"	1'-5"	2'-1"
24"	8'-10"	4'-11"	1'-6"	1'-5"	2'-3"

NOTES:

1. ALL DIMENSIONS GIVEN IN FEET & INCHES.
2. PROVIDE BELL END AT INLET HEADWALL, AND SPIGOT END AT OUTLET END HEADWALL.
3. CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS. CEMENT TO BE TYPE III PER ASTM C-150. REINFORCING TO MEET OR EXCEED ASTM A-615 GRADE 60 DEFORMED BARS.
4. 1" THREADED INSERTS PROVED FOR FINAL ATTACHMENT IN FIELD BY OTHERS.

PRECAST CONCRETE HEADWALL

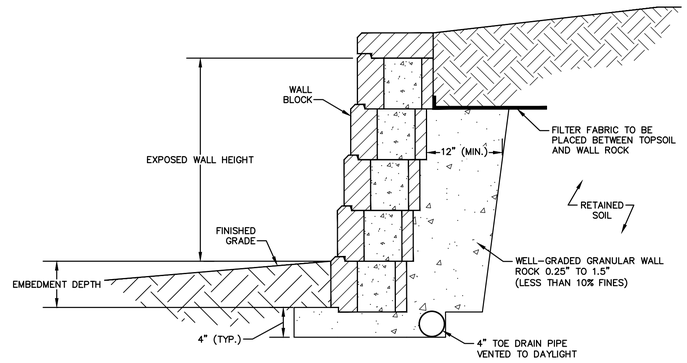
NOT TO SCALE



THE INTENT OF THIS FEATURE IS TO COLLECT ROOF WATER INTO THE PERFORATED UNDERDRAIN. LINE SYSTEM AS SPECIFIED TO PREVENT INFILTRATION.

LINED DRIP EDGE DETAIL

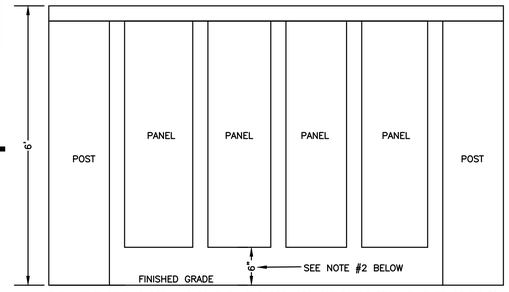
NOT TO SCALE



THE CONTRACTOR IS RESPONSIBLE FOR RETAINING THE SERVICES OF A STRUCTURAL ENGINEER LICENSED IN THE STATE OF NEW HAMPSHIRE TO DESIGN THE PROPOSED RETAINING WALL. JONES & BEACH ENGINEERS, INC. DOES NOT ACCEPT ANY LIABILITY FOR THE STRUCTURAL DESIGN AND/OR INSTALLATION OF THE WALL. THIS DETAIL IS INTENDED TO PROVIDE AN EXAMPLE OF THE RETAINING WALL FOR PLANNING PURPOSES ONLY AND IS SPECIFICALLY NOT INTENDED FOR USE BY THE CONTRACTOR IN ANY CONSTRUCTION-RELATED ACTIVITY.

TYPICAL GRAVITY WALL DETAIL

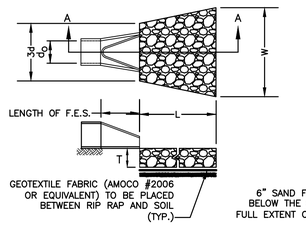
NOT TO SCALE



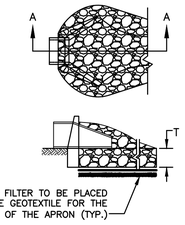
1. THE INTENT OF THIS DETAIL IS TO SHOW THE REQUIRED CLEARANCE FROM FINISHED GRADE TO THE BOTTOM OF THE WOODEN PANELS ON THE PROPOSED FENCE. THIS DETAIL SHALL NOT CONSTRUE A REQUIREMENT WITH REGARDS TO POST OR PANEL PLACEMENT ALONG THE LENGTH OF THE FENCE.
2. A 6" CLEARANCE MUST BE PROVIDED BETWEEN FINISHED GRADE AND THE BOTTOM OF WOODEN PANELS ON THE FENCE BEHIND BIORETENTION #2 EMERGENCY SPILLWAY. HOWEVER, 6" CLEARANCE IS NOT NECESSARY FOR THE FENCE ATOP THE RETAINING WALL BEHIND UNIT 6.

6' HIGH WOODEN FENCE DETAIL

NOT TO SCALE



SECTION A-A
PIPE OUTLET TO FLAT AREA WITH NO DEFINED CHANNEL



SECTION A-A
PIPE OUTLET TO WELL-DEFINED CHANNEL

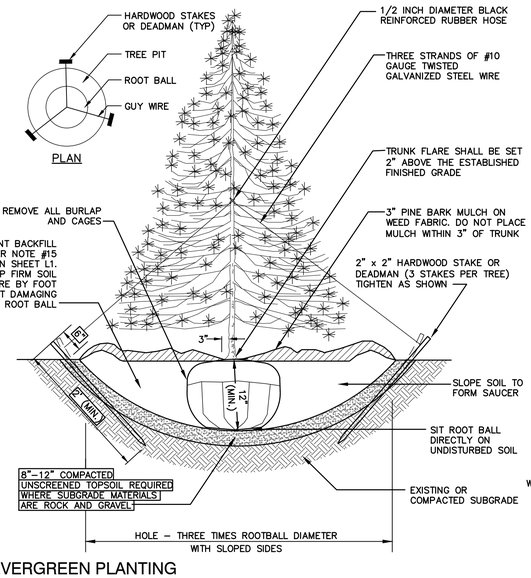
TABLE 7-24--RECOMMENDED RIP RAP GRADATION RANGES		
THICKNESS OF RIP RAP = 1.5 FEET		
d50 SIZE= 0.25 FEET	3 INCHES	
% OF WEIGHT SMALLER THAN THE GIVEN d50 SIZE	SIZE OF STONE (INCHES) FROM	TO
100%	5	6
85%	4	5
50%	3	5
15%	1	2

NOTES:

1. THE SUBGRADE FOR THE GEOTEXTILE FABRIC AND RIP RAP SHALL BE PREPARED TO THE LINES AND GRADES SHOWN ON THE PLANS.
2. THE 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. 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 INCHES.
4. STONE FOR THE RIP RAP MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.
5. OUTLETS TO A DEFINED CHANNEL SHALL HAVE 2:1 OR FLATTER SIDE SLOPES AND SHOULD BEGIN AT THE TOP OF THE CULVERT AND TAPER DOWN TO THE CHANNEL BOTTOM THROUGH THE LENGTH OF THE APRON.
6. 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 REPAIRED IMMEDIATELY. THE CHANNEL IMMEDIATELY BELOW THE OUTLET SHOULD BE CHECKED TO SEE THAT EROSION IS NOT OCCURRING. THE DOWNSTREAM CHANNEL SHOULD BE KEPT CLEAR OF OBSTRUCTIONS SUCH AS FALLEN TREES, DEBRIS, AND SEDIMENT THAT COULD CHANGE FLOW PATTERNS AND/OR TAILWATER DEPTHS ON THE PIPES. REPAIRS MUST BE CARRIED OUT IMMEDIATELY TO AVOID ADDITIONAL DAMAGE TO OUTLET PROTECTION.

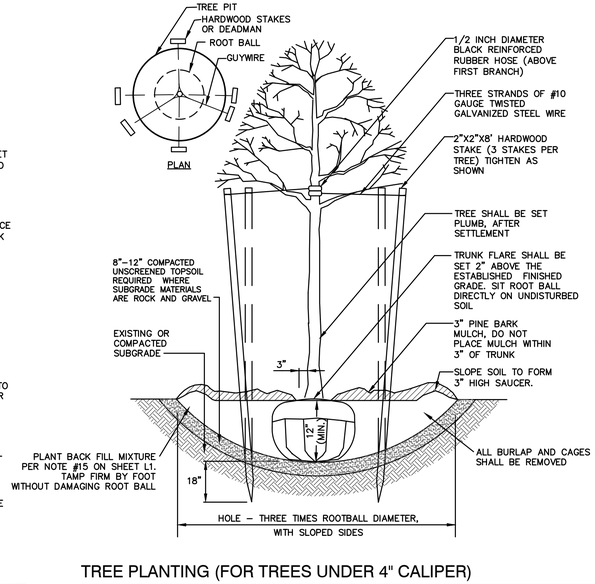
RIP RAP OUTLET PROTECTION APRON

NOT TO SCALE



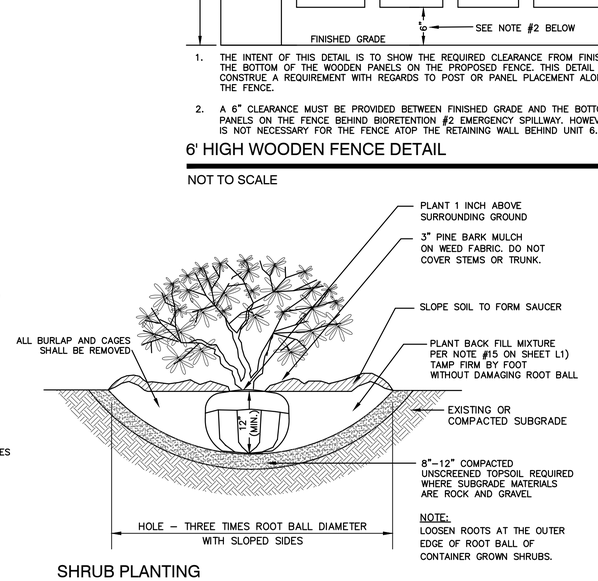
EVERGREEN PLANTING

NOT TO SCALE



TREE PLANTING (FOR TREES UNDER 4" CALIPER)

NOT TO SCALE



NOTE:
LOOSEN ROOTS AT THE OUTER EDGE OF ROOT BALL OF CONTAINER GROWN SHRUBS.

SHRUB PLANTING

NOT TO SCALE

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: AS NOTED	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

STATE OF NEW HAMPSHIRE - PAIGE S. LIBBEY No.16670 - LICENSED PROFESSIONAL ENGINEER

REV.	DATE	REVISION	BY
9	1/23/23	REVISED BIORETENTION BERM DETAIL PER REVIEW ENGINEER	DJM
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM

Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	DETAIL SHEET
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 LOT 1: BK 4708 PG 979 LOT 2: BK 4582 PG 888 LOT 3: BK 3919 PG 1345

DRAWING No.
D5
SHEET 16 OF 23
JBE PROJECT NO. 21254

PRETX SPECIFICATIONS

A. GENERAL

1. PRETX SYSTEMS ARE A PRE-FILTER AND CRITICAL MAINTENANCE DEVICE THAT EXTENDS THE OPERATING LIFE AND REDUCES THE MAINTENANCE BURDEN OF BIORETENTION SYSTEMS, RAIN GARDENS, BIOSWALES AND OTHER TYPES OF SURFACE BEST MANAGEMENT PRACTICES BY FILTERING OUT SEDIMENT, TRASH AND DEBRIS AT THE INLET.

B. PRODUCTS

1. PRETX IS AVAILABLE IN 3 MODELS THAT MANAGE MOST BIORETENTIOIN INLET CONFIGURATIONS: CURB, DROP, AND INLINE.
2. PRETX-CURB IS FOR EDGE OF PAVEMENT RUNOFF AT A CURB CUT IN LIEU OF A STONE SPREADER.
3. PRETX-DROP IS FOR USE AS A DROP INLET CONFIGURATION ALONG A CURB LINE AND WOULD BE INSTALLED WITH A STANDARD DROP INLET GRATE.
4. PRETX-INLINE IS FOR USE WITH SUBSURFACE INLET AND OUTLET PIPE.
5. PRETX IS SIZED TO PRETREAT WATER QUALITY FLOWS AND BYPASS LARGER FLOWS THAT HAVE MINIMAL TRASH AND DEBRIS. PRETX CAN BE USED BOTH IN RETROFIT OR NEW INSTALLATIONS.
6. ACCEPTABLE SYSTEM SUPPLIER:
   CONVERGENT WATER TECHNOLOGIES, INC. OR ITS AUTHORIZED VALUE-ADDED RESELLER
   (800) 711-5428
   WWW.CONVERGENTWATER.COM

C. SUBMITTALS

1. SUBMIT PROPOSED LAYOUT DRAWINGS. DRAWINGS SHALL INCLUDE TYPICAL SECTION DETAILS ANNOTED WITH SYSTEM ELEVATIONS (E.G., RIM, PIPE INVERTS, OUTSIDE BOTTOM OF STRUCTURE, ETC.).
2. SUBMIT MATERIAL CERTIFICATES FOR FRAMES AND COVERS
3. ANY PROPOSED EQUAL ALTERNATE PRODUCT SUBSTITUION TO THIS SPECIFICATON MUST BE SUBMITTED FOR REVIEW AND APPROVED PRIOR TO BID OPENING.

D. EXECUTION

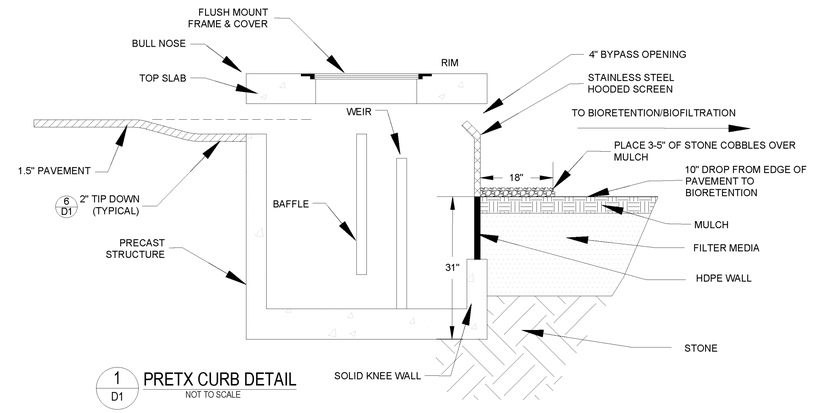
1. All PUBLIC ST ORM DRAINAGE SYSTEMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE STATE DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS AND ACCORDING TO LOCAL MUNICIPAL REQ UIREME NTS.
2. All STORM DRAINAGE SYSTEM CONSTRUCTION IS SUBJECT TO INSPECTION AND APPROVAL BY THE PROJECT ENGINEER.
3. THE CONTRACTOR SHALL NOTIFYTHE PROJECT ENGINEER A MINIMUM OF TWO FULL BUSINESS DAYS PRIOR TO THE START OF CONSTRUCTIO N.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING AND OBTAINING APPROVAL FROM DIG-SAFE AND DETERMINING THE LOCATION OF All UNDERGROUND UTILITIES PRIOR TO THE START OF CONSTRUCTION/ EXCAVATI ON AND SHALL NOTIFY THE PROJECT ENGINEER OF ANY POTENTIAL CONFLICTS.
5. TO PROTECT STORMWATER FLOW CONTROL AND QUALITY TREATMENT FACILITIES FROM SEDIMENTATION, THEY SHALL BE CONNECTED TO THE STORM CONVEYANCE SYSTEM ONLY AFTER ALL SITE WORK, ROAD CONSTRUCTION, UTILITY WORK AND LANDSCAPING ARE IN PLACE IN ALL AREAS ABOVE AND UPSTREAM OF THE FACILITY.
6. THE EXISTING STORM SEWER SYSTEM SHALL STAY ISOLATED FROM THE NEW SYSTEM UNTIL THE NEW SYSTEM IS CLEANED, AND APPROVED FOR USE. THERE SHALL BE NO DEBRIS IN THE LINES OR FURTHER CLEANING Will BE REQUIRED PRIOR TO ACCEPTANCE.
7. PROVIDE A 1.5" MINIMUM GAP BETWEEN THE KNOCKOUT WALL AND THE OUTSIDE OF THE PIPE. AFTER THE PIPE IS INSTALLED, FILL THE GAP WITH JOINT MORTAR
8. THE OPENING SHALL BE MEASURED ATTHE TOP OF THE PRECAST BASE SECTION.
9. All PICKUP HOLES SHALL BE GROUTED FULL AFTER THE BASIN HAS BEEN PLACED.
10. STANDARD CURB INLETS AND TIPDOWNS SHALL BE PRECAST CONCRETE OR ASPHALT.
11. PIPE ENDS SHALL BE FLUSH WITH THE INNER WALL OR 1" MAXIMUM INTRUSION. MASONRY, CINDER BLOCKS, OR SIMILIAR MATERIALS MA Y BE USED TO ADJUST THE RISERS TO GRADE PRIOR TO GROUTING.
12. GROUTING SHALL BE SUFFICIENTTO PREVENT LEAKS BETWEEN THE PRECAST COMPONENTS OF THE COMPLETED STRUCTURE & SHALL BE PERFORMED INSIDE, BETWEEN & OUTSIDE OF All RISERS, JOINTS & PIPE PENETRATIONS.
13. MANHOLES TO BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M-198 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE STANDARD SPECIFICATIONS.
14. All REINFORCED CAST IN PLACE CONCRETE SHALL BE CLASS 4000. All PRECAST CONCRETE SHALL BE CLASS 4000.
15. RECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MINIMUM.
16. MATING SURFACES OF MANHOLE RINGS AND COVERSSHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITIONS.

E. CONSTRUCTION AND SEQUENCING

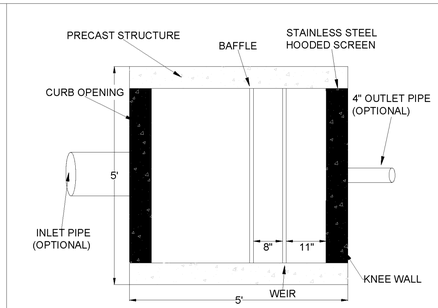
1. EXAMINATION
   A. VERIFY LAYOUT AND ORIENTATION OF PRE-TX SYSTEM AREA INCLUDING EDGE OF PAVEMENT, TIP DOWN, CURBS AND SIDEWALK, BIOFILTRATION SYSTEM, AND CONNECTIONS.
   B. VERIFY EXCAVATION BASE IS READY TO RECEIVE WORK AND EXCAVATIONS, DIMENSIONS, AND ELEVATIONS ARE AS INDICATED ON DRAWINGS.
2. PREPARATION
   A. CALL DIG SAFE AND RECEIVE APPROVAL BEFORE PERFORMING WORK.
   B. REQUEST UNDERGROUND UTILITIES TO BE LOCATED AND MARKED WITHIN AND SURROUNDING CONSTRUCTION AREAS.
   C. IDENTIFY REQUIRED LINES, LEVELS, CONTOURS, AND DATUM.
   D. CLEAR AND GRUB THE PROPOSED PRE-TX SYSTEM AREA.
3. EXCAVATION AND INSTALLATION
   A. THE FOLLOWING CONSTRUCTION SEQUENCE IS TO BE USED AS A GENERAL GUIDELINE. COORDINATE WITH THE OWNER, AND ENGINEERS FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
   B. INSTALL TEMPORARY EROSION AND SEDIMENT CONTROLS TO DIVERT STORM WATER AWAY FROM THE PRE-TX SYSTEM AREA.
   C. EXCAVATE TO THE BOTTOM INVERT OF THE SYSTEM.
   D. TO MINIMIZE COMPACTION OF ADJACENT BIOFILTRATION SYSTEMS, WORK EXCAVATORS OR BACKHOES FROM THE SIDES TO EXCAVATE THE PRE-TX SYSTEM AREA TO ITS APPROPRIATE DESIGN DEPTH AND DIMENSIONS.
   E. ROUGH GRADE THE PRE-TX SYSTEM AREA DURING GENERAL CONSTRUCTION. EXCAVATE THE PRE-TX SYSTEM FACILITIES TO WITHIN 1 FOOT OF STRUCTURE BOTTOM .
   F. PLACE 1 FOOT BED OF COARSE STONE TO ELEVATION OF BASE OF STRUCTURE.
   G. ESTABLISH ELEVATIONS FOR ADJACENT CURBS, EDGE OF PAVEMENT AND TIP DOWN, SIDEWALK, PIPE INVERTS FOR INLETS AND OUTLETS AS INDICATED ON DRAWINGS.
4. INSTALLATION
   A. PLACE THE PRECAST SYSTEM TO NECESSARY ELEVATION.
   B. VERIFY ELEVATIONS FOR ADJACENT CURBS, EDGE OF PAVEMENT, PAVEMENT GRADING FOR INLET GRATE FOR PRETX-DROP, SIDEWALK, PIPE INVERTS FOR INLETS AND OUTLETS, OUTLET INVERT FOR KNEE WALL.
   C. FOR PRETX-SURFACE:
      a. VERIFY ELEVATIONS FOR ADJACENT CURBS.
      b. VERIFY EDGE OF PAVEMENT TIP DOWN PAVEMENT GRADING FOR INLET GRATE.
      c. VERIFY CURB ELEVATION IN RELATION TO PAVEMENT AND TIP DOWN.
      d. VERIFY OUTLET INVERT FOR KNEE WALL IN RELATION TO FILTER MEDIA.
   D. FOR PRETX-DROP.
      a. VERIFY ALL INLET PIPES ENTER THE STRUCTURE UPSTREAM OF BAFFLE.
      b. VERIFY FRAME AND GRATE OFFSET ON INLET SIDE AND UPSTREAM OF BAFFLE.
      c. VERIFY CURB LOCATION WITH RESPECT TO FRAME AND GRATE ORIENTATION.
   E. INSTALL BAFFLES, WEIR, AND SCREENS AS INDICATED ON DRAWINGS.
   F. VERIFY MAINTENANCE ACCESS THROUGH GRATE OR COVER AND CLEARANCE FOR VACTOR.
   G. INSTALL TOP OF STRUCTURE LEVEL WITH ADJACENT CURB OR SIDEWALK AS PER MANUFACTURERS SPECIFICATIONS. ENGINEER FIELD VISIT REQUIRED PRIOR TO BACKFILLING.
5. BACKFILLING
   A. BACKFILL WITH APPROVED SOIL AND STONE TO THE DESIGN GRADE AS SPECIFIED IN THE DRAWINGS.
   B. BACKFILL WITH 12" OF NO. 57 STONE AROUND REAR, LEFT, AND RIGHT SIDES TO LEVEL WITH TOP OF HDPE SCREEN.
   C. BACKFILL WITH BIORETENTION SOIL MIX BEYOND STONE BACKFILL TO EQUAL ELEVATION OF THE TOP OF HDPE SCREEN.
   D. DO NOT BACKFILL SOIL OR STONE AGAINST STAINLESS SCREEN.
   E. DO NOT COMPACT ADJACENT FILTRATION SYSTEM SOIL WITH MECHANICAL EQUIPMENT.
   F. STABILIZE All REMAINING DISTURBED AREAS AND SIDE SLOPES WITH SEEDING, HYDROSEEDING, AND/ OREROSION CONTROL BLANKETS AS INDICATED ON DRAWINGS.
6. CLEAN UP
   A. AFTER COMPLETION OF THE WORK, REMOVE AND PROPERLY DISPOSE ALL DEBRIS, CONSTRUCTION MATERIA LS, RUBBISH, EXCESS SOIL, ETC., FROM THE PROJECT SITE. REPAIR PROMPTL Y ANY IDENTIFIED DEFICIENCIES AND LEAVE THE PROJECT SITE IN A CLEAN AND SATISFACTORY CONDITION.

PRETX-CURB ELEVATION GUIDE

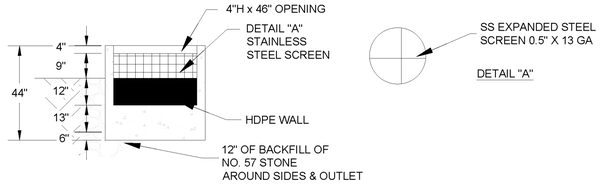
POINT	DESCRIPTION	HEIGHT IN REFERENCE TO PT. A
A	EDGE OF PAVEMENT	0 INCHES
B	OUTSIDE TOP SLAB	8 INCHES
C	TOP OF BIORETENTION	12 INCHES
D	SUMP INVERT	36 INCHES
E	OUTSIDE BOTTOM	42 INCHES



1 D1 PRETX CURB DETAIL
NOT TO SCALE

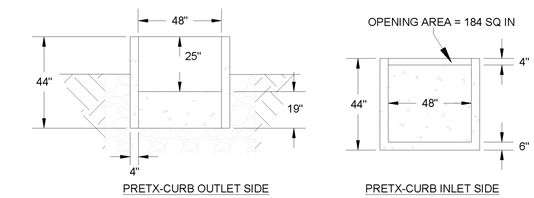


2 D1 PRETREATMENT CATCH BASIN PLAN VIEW
NOT TO SCALE

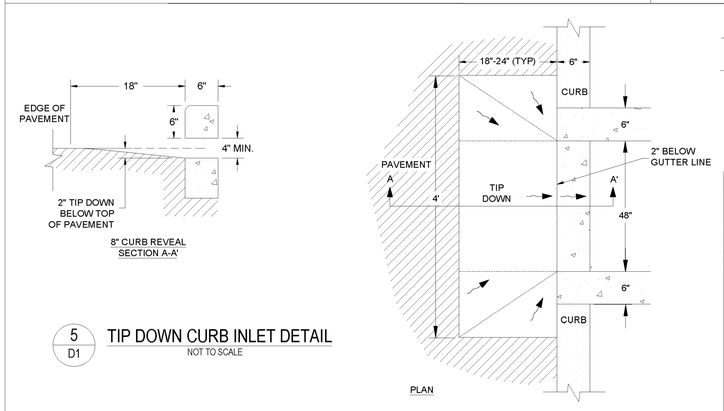


3 D1 PRETX CURB OUTLET SIDE
NOT TO SCALE

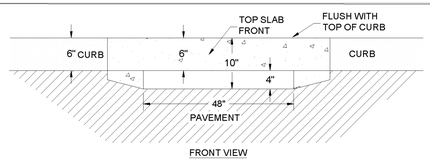
OUTLET SIDE INSTALLED W/ SCREEN



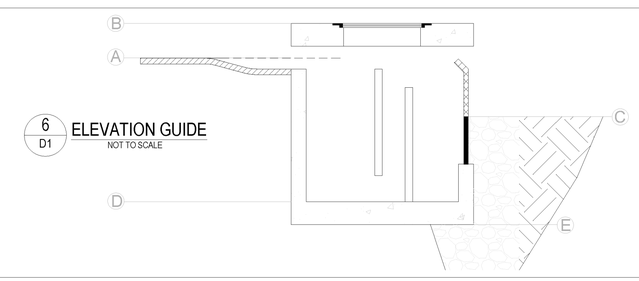
4 D1 PRETX CURB SIDE DETAIL
NOT TO SCALE



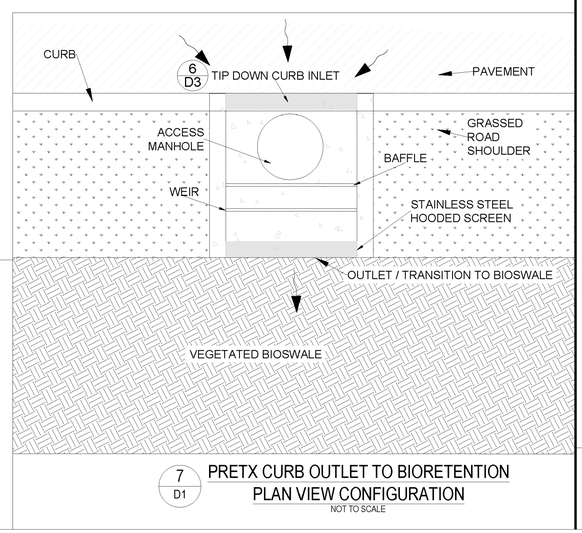
5 D1 TIP DOWN CURB INLET DETAIL
NOT TO SCALE



FRONT VIEW



6 D1 ELEVATION GUIDE
NOT TO SCALE



7 D1 PRETX CURB OUTLET TO BIORETENTION PLAN VIEW CONFIGURATION
NOT TO SCALE

D-1 PRETX™ CURB INLET SOLID HDPE WALL PRETREATMENT DETAIL

TO FIND A VALUE ADDED RESELLER IN YOUR AREA VISIT
WWW.CONVERGENTWATER.COM/STORMWATER-PRODUCTS
OR CONTACT CONVERGENT WATER TECHNOLOGIES AT
1.800.711.5428

REVISED 11/20/18; ELEVATION DETAILS ADDED; CHECKED BY RR

..\..\..\..\Legend\ACF Updated R logo.jpg

..\..\..\..\Legend\PRETx logo transparent Cyan 800 dpi.jpg

..\..\..\..\ICAD Files\Logos\ConvergentLOGO_RGB.tif

Design: JAC	Draft: DJM	Date: 01/05/22	
Checked: JAC	Scale: AS NOTED	Project No.: 21254	
Drawing Name: 21254-PLAN.dwg			

STATE OF NEW HAMPSHIRE - PAIGE S. LIBBEY No.16670 - LICENSED PROFESSIONAL ENGINEER - 01/19/2023

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

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Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
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Civil Engineering Services
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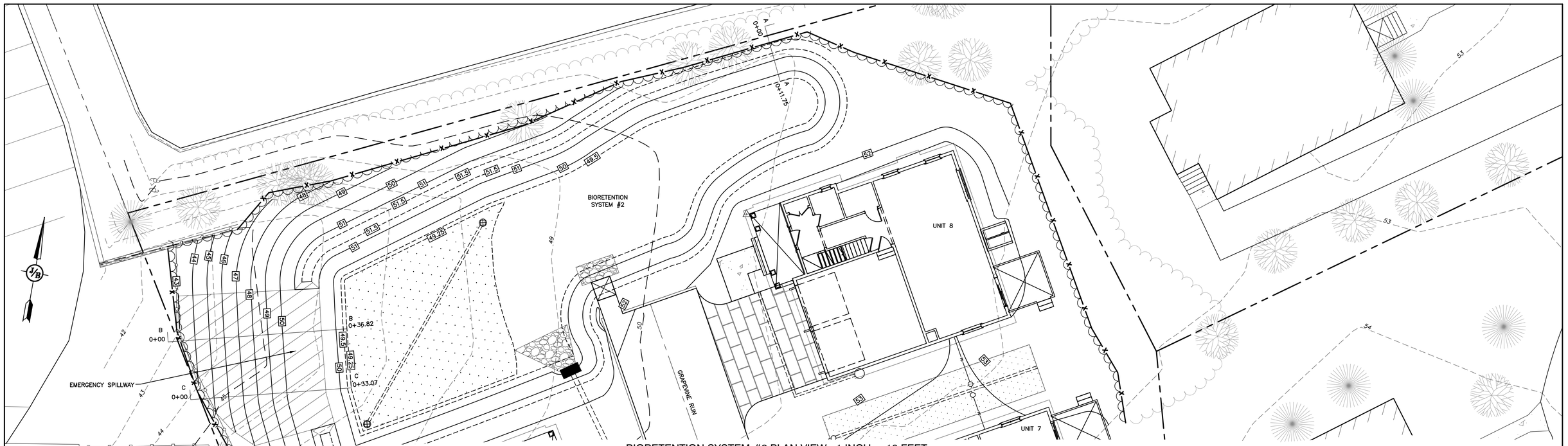
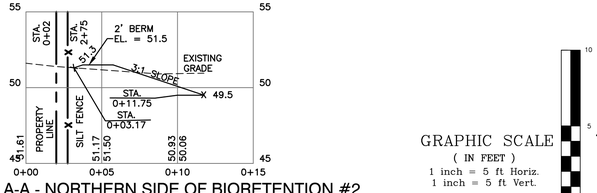
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	DETAIL SHEET
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 LOT 1: BK 4708 PG 979 LOT 2: BK 4582 PG 888 LOT 3: BK 3919 PG 1345

DRAWING No.
D6
SHEET 17 OF 23
JBE PROJECT NO. 21254



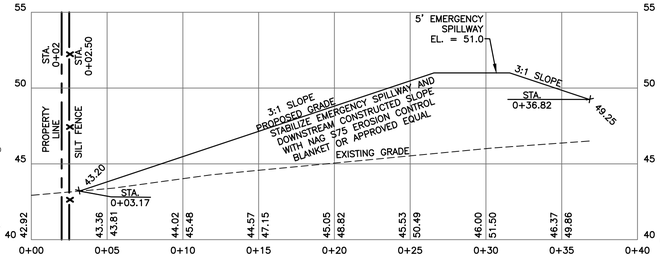
BIORETENTION SYSTEM #2 PLAN VIEW - 1 INCH = 10 FEET



CROSS SECTION A-A - NORTHERN SIDE OF BIORETENTION #2

1 INCH = 5 FEET

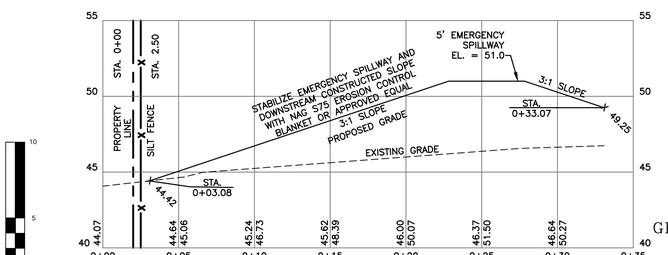
GRAPHIC SCALE
(IN FEET)
1 inch = 5 ft Horiz.
1 inch = 5 ft Vert.



CROSS SECTION B-B - SECTION THROUGH EMERGENCY SPILLWAY

1 INCH = 5 FEET

GRAPHIC SCALE
(IN FEET)
1 inch = 5 ft Horiz.
1 inch = 5 ft Vert.



CROSS SECTION C-C - SECTION THROUGH EMERGENCY SPILLWAY

1 INCH = 5 FEET

GRAPHIC SCALE
(IN FEET)
1 inch = 5 ft Horiz.
1 inch = 5 ft Vert.

Design: JAC	Draft: DJM
Checked: JAC	Scale: AS NOTED
Drawing Name: 21254-PLAN.dwg	

Date: 01/05/22
Project No.: 21254

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER – PAIGE S. LIBBEY No.16670 LICENSED 2023

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

Designed and Produced in NH
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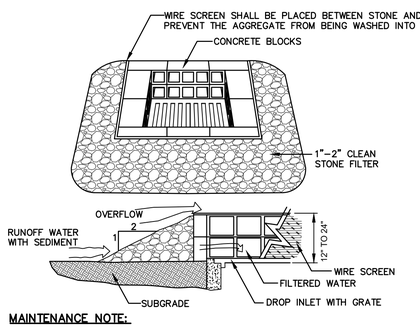
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	SLOPE CROSS SECTIONS
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 LOT 1: BK 4708 PG 979 LOT 2: BK 4582 PG 888 LOT 3: BK 3919 PG 1345

DRAWING No.
X1
SHEET 18 OF 23
JBE PROJECT NO. 21254

TEMPORARY EROSION CONTROL NOTES

1. THE SMALLEST PRACTICAL AREA OF LAND SHALL BE EXPOSED AT ANY ONE TIME. AT NO TIME SHALL AN AREA IN EXCESS OF 5 ACRES BE EXPOSED AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED.
2. EROSION, SEDIMENT AND DETENTION MEASURES SHALL BE INSTALLED AS SHOWN ON THE PLANS AND AT LOCATIONS AS REQUIRED OR DIRECTED BY THE ENGINEER.
3. ALL DISTURBED AREAS (INCLUDING POND AREAS BELOW THE PROPOSED WATERLINE) SHALL BE RETURNED TO PROPOSED GRADES AND ELEVATIONS. DISTURBED AREAS SHALL BE LOAMED WITH A MINIMUM OF 6" OF SCREENED ORGANIC LOAM AND SEEDED WITH SEED MIXTURE 'C' AT A RATE NOT LESS THAN 1.10 POUNDS OF SEED PER 1,000 S.F. OF AREA (48 LBS. / ACRE).
4. SILT FENCES AND OTHER BARRIERS SHALL BE INSPECTED EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS OF A RAINFALL OF 0.5" OR GREATER. ALL DAMAGED AREAS SHALL BE REPAIRED, AND SEDIMENT DEPOSITS SHALL PERIODICALLY BE REMOVED AND DISPOSED OF.
5. AFTER ALL DISTURBED AREAS HAVE BEEN STABILIZED, THE TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED AND THE AREA DISTURBED BY THE REMOVAL SMOOTHED AND RE-VEGETATED.
6. AREAS MUST BE SEEDED AND MULCHED OR OTHERWISE PERMANENTLY STABILIZED WITHIN 3 DAYS OF FINAL GRADING, OR TEMPORARILY STABILIZED WITHIN 14 DAYS OF THE INITIAL DISTURBANCE OF SOIL. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
7. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING NORTH AMERICAN GREEN S150 EROSION CONTROL BLANKETS (OR AN EQUIVALENT APPROVED IN WRITING BY THE ENGINEER) ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
8. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.
9. AFTER OCTOBER 15th, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3" OF CRUSHED GRAVEL PER NHDOT ITEM 304.3.
10. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
    a. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
    b. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
    c. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH STONE OR RIPRAP HAS BEEN INSTALLED; OR
    d. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
11. FUGITIVE DUST CONTROL IS REQUIRED TO BE CONTROLLED IN ACCORDANCE WITH ENV-A 1000, AND THE PROJECT IS TO MEET THE REQUIREMENTS AND INTENT OF RSA 430:53 AND AGR 3800 RELATIVE TO INVASIVE SPECIES.

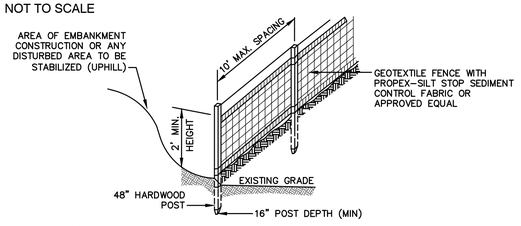


MAINTENANCE NOTE:

1. ALL STRUCTURES SHOULD BE INSPECTED AFTER EVERY RAINFALL AND REPAIRS MADE AS NECESSARY. SEDIMENT SHOULD BE REMOVED FROM TRAPPING DEVICES AFTER THE SEDIMENT HAS REACHED A MAXIMUM OF ONE HALF THE DEPTH OF THE TRAP. THE SEDIMENT SHOULD BE DISPOSED IN A SUITABLE UPLAND AREA AND PROTECTED FROM EROSION BY EITHER STRUCTURE OR VEGETATIVE MEANS. THE TEMPORARY TRAPS SHOULD BE REMOVED AND THE AREA REPAIRED AS SOON AS THE CONTRIBUTING DRAINAGE AREA TO THE INLET HAS BEEN COMPLETELY STABILIZED.

TEMPORARY CATCH BASIN INLET PROTECTION (Block and Gravel Drop Inlet Sediment Filter)

NOT TO SCALE

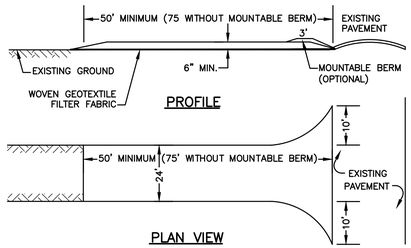


CONSTRUCTION SPECIFICATIONS:

1. WOVEN FABRIC FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. FILTER CLOTH SHALL BE FASTENED TO WOVEN WIRE EVERY 24" AT TOP, MID AND BOTTOM AND EMBEDDED IN THE GROUND A MINIMUM OF 8" AND THEN COVERED WITH SOIL.
2. THE FENCE POSTS SHALL BE A MINIMUM OF 48" LONG, SPACED A MAXIMUM 10' APART, AND DRIVEN A MINIMUM OF 16" INTO THE GROUND.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THE ENDS OF THE FABRIC SHALL BE OVERLAPPED 6", FOLDED AND STAPLED TO PREVENT SEDIMENT FROM BY-PASSING.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND SEDIMENT REMOVED AND PROPERLY DISPOSED OF WHEN IT IS 6" DEEP OR VISIBLE 'BULGES' DEVELOP IN THE SILT FENCE.
5. PLACE THE ENDS OF THE SILT FENCE UP CONTOUR TO PROVIDE FOR SEDIMENT STORAGE.
6. SILT FENCE SHALL REMAIN IN PLACE FOR 24 MONTHS.

SILT FENCE

NOT TO SCALE

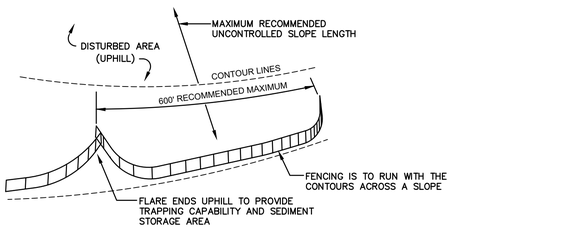


NOTES:

1. STONE FOR STABILIZED CONSTRUCTION ENTRANCE SHALL BE 3 INCH STONE, RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT.
2. THE LENGTH OF THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 50 FEET, 75' WITHOUT A MOUNTABLE BERM, AND EXCEPT FOR A SINGLE RESIDENTIAL LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY.
3. THICKNESS OF THE STONE FOR THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 6 INCHES.
4. THE WIDTH OF THE ENTRANCE SHALL NOT BE LESS THAN THE FULL WIDTH OF THE ENTRANCE WHERE INGRESS OR EGRESS OCCURS, OR 10 FEET, WHICHEVER IS GREATER.
5. GEOTEXTILE FILTER FABRIC SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE. FILTER FABRIC IS NOT REQUIRED FOR A SINGLE FAMILY RESIDENTIAL LOT.
6. ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A STONE BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO THE PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, WASHED, OR TRACKED ONTO THE PUBLIC RIGHT-OF-WAY MUST BE REMOVED PROMPTLY.

STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE



7. SILT FENCES SHALL BE REMOVED WHEN NO LONGER NEEDED AND THE SEDIMENT COLLECTED SHALL BE DISPOSED AS DIRECTED BY THE ENGINEER. THE AREA DISTURBED BY THE REMOVAL SHALL BE SMOOTHED AND REVEGETATED.

MAINTENANCE:

1. SILT FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS THAT ARE REQUIRED SHALL BE DONE IMMEDIATELY.
2. IF THE FABRIC ON A SILT FENCE SHOULD DECOMPOSE OR BECOME INEFFECTIVE DURING THE EXPECTED LIFE OF THE FENCE, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE INSPECTED AFTER EVERY STORM EVENT. THE DEPOSITS SHOULD BE REMOVED WHEN THEY REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER.
4. SEDIMENT DEPOSITS THAT ARE REMOVED, OR LEFT IN PLACE AFTER THE FABRIC HAS BEEN REMOVED, SHALL BE GRADED TO CONFORM WITH THE EXISTING TOPOGRAPHY AND VEGETATED.

SEEDING SPECIFICATIONS

1. GRADING AND SHAPING
   A. SLOPES SHALL NOT BE STEEPER THAN 2:1 WITHOUT APPROPRIATE EROSION CONTROL MEASURES AS SPECIFIED ON THE PLANS (3:1 SLOPES OR FLATTER ARE PREFERRED).
   B. WHERE MOWING WILL BE DONE, 3:1 SLOPES OR FLATTER ARE RECOMMENDED.
2. SEEDBED PREPARATION
   A. SURFACE AND SEEPAGE WATER SHOULD BE DRAINED OR DIVERTED FROM THE SITE TO PREVENT DROWNING OR WINTER KILLING OF THE PLANTS.
   B. STONES LARGER THAN 4 INCHES AND TRASH SHOULD BE REMOVED BECAUSE THEY INTERFERE WITH SEEDING AND FUTURE MAINTENANCE OF THE AREA. WHERE FEASIBLE, THE SOIL SHOULD BE TILLED TO A DEPTH OF ABOUT 4 INCHES TO PREPARE A SEEDBED AND FERTILIZER AND LIME MIXED INTO THE SOIL. THE SEEDBED SHOULD BE LEFT IN A REASONABLY FIRM AND SMOOTH CONDITION. THE LAST TILLAGE OPERATION SHOULD BE PERFORMED ACROSS THE SLOPE WHEREVER PRACTICAL.
3. ESTABLISHING A STAND
   A. LIME AND FERTILIZER SHOULD BE APPLIED PRIOR TO OR AT THE TIME OF SEEDING AND INCORPORATED INTO THE SOIL. TYPES AND AMOUNTS OF LIME AND FERTILIZER SHOULD BE BASED ON AN EVALUATION OF SOIL TESTS. WHEN A SOIL TEST IS NOT AVAILABLE, THE FOLLOWING MINIMUM AMOUNTS SHOULD BE APPLIED:
      AGRICULTURAL LIMESTONE, 2 TONS PER ACRE OR 100 LBS. PER 1,000 SQ.FT.
      NITROGEN(N), 50 LBS. PER ACRE OR 1.1 LBS. PER 1,000 SQ.FT.
      PHOSPHATE(P2O5), 100 LBS. PER ACRE OR 2.2 LBS. PER 1,000 SQ.FT.
      POTASH(K2O), 100 LBS. PER ACRE OR 2.2 LBS. PER 1,000 SQ.FT.
      (NOTE: THIS IS THE EQUIVALENT OF 500 LBS. PER ACRE OF 10-20-20 FERTILIZER OR 1,000 LBS. PER ACRE OF 5-10-10.)
   B. SEED SHOULD BE SPREAD UNIFORMLY BY THE METHOD MOST APPROPRIATE FOR THE SITE. METHODS INCLUDE BROADCASTING, DRILLING AND HYDROSEEDING. WHERE BROADCASTING IS USED, COVER SEED WITH .25 INCH OF SOIL OR LESS, BY CULTIPACKING OR RAKING.
   C. REFER TO THE 'SEEDING GUIDE' AND 'SEEDING RATES' TABLES ON THIS SHEET FOR APPROPRIATE SEED MIXTURES AND RATES OF SEEDING. ALL LEGUMES (CROWNVETCH, BIRDSFOOT, TREFOIL AND FLATPEA) MUST BE INOCULATED WITH THEIR SPECIFIC INOCULANT PRIOR TO THEIR INTRODUCTION TO THE SITE.
   D. WHEN SEEDED AREAS ARE MULCHED, PLANTINGS MAY BE MADE FROM EARLY SPRING TO EARLY OCTOBER. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20th OR FROM AUGUST 10th TO SEPTEMBER 1st.
4. MULCH
   A. HAY, STRAW, OR OTHER MULCH, WHEN NEEDED, SHOULD BE APPLIED IMMEDIATELY AFTER SEEDING.
   B. MULCH WILL BE HELD IN PLACE USING APPROPRIATE TECHNIQUES FROM THE BEST MANAGEMENT PRACTICE FOR MULCHING. HAY OR STRAW MULCH SHALL BE PLACED AT A RATE OF 90 LBS PER 1000 S.F.
5. MAINTENANCE TO ESTABLISH A STAND
   A. PLANTED AREAS SHOULD BE PROTECTED FROM DAMAGE BY FIRE, GRAZING, TRAFFIC, AND DENSE WEED GROWTH.
   B. FERTILIZATION NEEDS SHOULD BE DETERMINED BY ONSITE INSPECTIONS. SUPPLEMENTAL FERTILIZER IS USUALLY THE KEY TO FULLY COMPLETE THE ESTABLISHMENT OF THE STAND BECAUSE MOST PERENNIALS TAKE 2 TO 3 YEARS TO BECOME FULLY ESTABLISHED.
   C. IN WATERWAYS, CHANNELS, OR SWALES WHERE UNIFORM FLOW CONDITIONS ARE ANTICIPATED, ANNUAL MOWING MAY BE NECESSARY TO CONTROL GROWTH OF WOODY VEGETATION.

USE	SEEDING MIXTURE 1/	DROUGHTY	WELL DRAINED	MODERATELY WELL DRAINED	POORLY DRAINED
STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS	A	FAIR	GOOD	GOOD	FAIR
	B	POOR	GOOD	FAIR	FAIR
	C	POOR	GOOD	EXCELLENT	GOOD
	D	FAIR	EXCELLENT	EXCELLENT	POOR
WATERWAYS, EMERGENCY SPILLWAYS, AND OTHER CHANNELS WITH FLOWING WATER.	A	GOOD	GOOD	GOOD	FAIR
	C	GOOD	EXCELLENT	EXCELLENT	FAIR
LIGHTLY USED PARKING LOTS, ODD AREAS, UNUSED LANDS, AND LOW INTENSITY USE RECREATION SITES.	A	GOOD	GOOD	GOOD	FAIR
	B	GOOD	GOOD	FAIR	POOR
	C	GOOD	EXCELLENT	EXCELLENT	FAIR
PLAY AREAS AND ATHLETIC FIELDS. (TOPSOIL IS ESSENTIAL FOR GOOD TURF.)	E	FAIR	EXCELLENT	EXCELLENT	2/
	F	FAIR	EXCELLENT	EXCELLENT	2/

GRAVEL PIT, SEE NH-PM-24 IN APPENDIX FOR RECOMMENDATION REGARDING RECLAMATION OF SAND AND GRAVEL PITS.

1/ REFER TO SEEDING MIXTURES AND RATES IN TABLE BELOW.
2/ POORLY DRAINED SOILS ARE NOT DESIRABLE FOR USE AS PLAYING AREA AND ATHLETIC FIELDS.

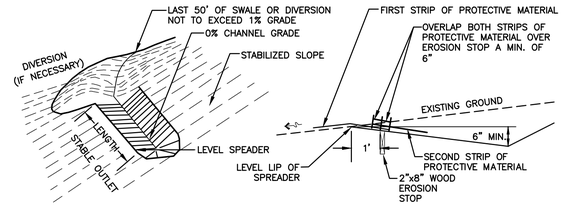
NOTE: TEMPORARY SEED MIX FOR STABILIZATION OF TURF SHALL BE WINTER RYE OR OATS AT A RATE OF 2.5 LBS. PER 1000 S.F. AND SHALL BE PLACED PRIOR TO OCTOBER 15th, IF PERMANENT SEEDING NOT YET COMPLETE.

SEEDING GUIDE

MIXTURE	POUNDS PER ACRE	POUNDS PER 1,000 Sq. Ft.
A. TALL FESCUE	20	0.45
CREEPING RED FESCUE	20	0.45
RED TOP	2	0.05
TOTAL	42	0.95
B. TALL FESCUE	15	0.35
CREEPING RED FESCUE	10	0.25
CROWN VETCH	15	0.35
OR		
FLAT PEA	30	0.75
TOTAL	40 OR 55	0.95 OR 1.35
* C. TALL FESCUE	20	0.45
CREEPING RED FESCUE	20	0.45
BIRDS FOOT TREFOIL	8	0.20
TOTAL	48	1.10
D. TALL FESCUE	20	0.45
FLAT PEA	30	0.75
TOTAL	50	1.20
E. CREEPING RED FESCUE 1/	50	1.15
KENTUCKY BLUEGRASS 1/	50	1.15
TOTAL	100	2.30
F. TALL FESCUE 1	150	3.60

1/ FOR HEAVY USE ATHLETIC FIELDS CONSULT THE UNIVERSITY OF NEW HAMPSHIRE COOPERATIVE EXTENSION TURF SPECIALIST FOR CURRENT VARIETIES AND SEEDING RATES.

SEEDING RATES



ISOMETRIC VIEW — CROSS SECTION

NOTES:

1. CONSTRUCT THE LEVEL SPREADER LIP ON A ZERO PERCENT GRADE TO ENSURE UNIFORM SPREADING OF RUNOFF.
2. LEVEL SPREADER SHALL BE CONSTRUCTED ON UNDISTURBED SOIL AND NOT ON FILL.
3. AN EROSION STOP SHALL BE PLACED VERTICALLY A MINIMUM OF SIX INCHES DEEP IN A SLIT TRENCH ONE FOOT BACK OF THE LEVEL LIP AND PARALLEL TO THE LIP. THE EROSION STOP SHALL EXTEND THE ENTIRE LENGTH OF THE LEVEL LIP.
4. ENTIRE LEVEL LIP AREA SHALL BE PROTECTED BY PLACING TWO STRIPS OF JUTE OR EXCELSIOR MATTING ALONG THE LIP. EACH STRIP SHALL OVERLAP THE EROSION STOP BY AT LEAST SIX INCHES.
5. ENTRANCE CHANNEL TO THE LEVEL SPREADER SHALL NOT EXCEED A 1 PERCENT GRADE FOR AT LEAST 50 FEET BEFORE ENTERING THE SPREADER.
6. THE FLOW FROM THE LEVEL SPREADER SHALL OUTLET ONTO STABILIZED AREAS. WATER MUST NOT RECONCENTRATE IMMEDIATELY BELOW THE SPREADER.
7. PERIODIC INSPECTION AND REQUIRED MAINTENANCE SHALL BE PERFORMED.
8. MAINTENANCE: THE LEVEL SPREADER SHOULD BE CHECKED PERIODICALLY AND AFTER EVERY MAJOR STORM TO DETERMINE IF THE SPREADER HAS BEEN DAMAGED. SEDIMENT DEEPER THAN 4" ACCUMULATION SHOULD BE REMOVED. IF RILLING HAS TAKEN PLACE ON THE LIP, THEN THE DAMAGE SHOULD BE REPAIRED AND REVEGETATED. THE VEGETATION SHOULD BE MOWED OCCASIONALLY TO CONTROL WEEDS AND THE ENCROACHMENT OF WOODY VEGETATION. CLIPPINGS SHOULD BE REMOVED AND DISPOSED OF OUTSIDE THE SPREADER AND AWAY FROM OUTLET AREA. FERTILIZATION SHOULD BE DONE AS NECESSARY TO KEEP THE VEGETATION HEALTHY AND DENSE.

LEVEL SPREADER

NOT TO SCALE

CONSTRUCTION SEQUENCE

1. PRIOR TO THE START OF ANY ACTIVITY, IT IS THE RESPONSIBILITY OF THE SITE'S SITE DEVELOPER (OR OWNER) TO FILE A NOTICE OF INTENT (NOI) FORM WITH THE ENVIRONMENTAL PROTECTION AGENCY (EPA) IN ORDER TO GAIN COVERAGE UNDER THE NPDES GENERAL PERMIT FOR STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITIES. A PRE CONSTRUCTION MEETING IS TO BE HELD WITH ALL DEPARTMENT HEADS PRIOR TO THE START OF CONSTRUCTION.
2. CUT AND REMOVE TREES IN CONSTRUCTION AREA AS REQUIRED OR DIRECTED.
3. INSTALL SILT FENCING, HAY BALES AND CONSTRUCTION ENTRANCES PRIOR TO THE START OF CONSTRUCTION. THESE ARE TO BE MAINTAINED UNTIL THE FINAL PAVEMENT SURFACING AND LANDSCAPING AREAS ARE ESTABLISHED.
4. CLEAR, CUT, GRUB AND DISPOSE OF DEBRIS IN APPROVED FACILITIES. THIS INCLUDES ANY REQUIRED DEMOLITION OF EXISTING STRUCTURES, UTILITIES, ETC.
5. CONSTRUCT AND/OR INSTALL TEMPORARY OR PERMANENT SEDIMENT AND/OR DETENTION BASIN(S) AS REQUIRED. THESE FACILITIES SHALL BE INSTALLED AND STABILIZED PRIOR TO DIRECTING RUN-OFF TO THEM.
6. STRIP LOAM AND PAVEMENT, OR RECLAIM EXISTING PAVEMENT WITHIN LIMITS OF WORK PER THE RECOMMENDATIONS OF THE PROJECT ENGINEER AND STOCKPILE EXCESS MATERIAL. STABILIZE STOCKPILE AS NECESSARY.
7. PERFORM PRELIMINARY SITE GRADING IN ACCORDANCE WITH THE PLANS.
8. PREPARE BUILDING PAD(S) TO ENABLE BUILDING CONSTRUCTION TO BEGIN.
9. INSTALL THE SEWER AND DRAINAGE SYSTEMS FIRST, THEN ANY OTHER UTILITIES IN ACCORDANCE WITH THE PLAN AND DETAILS. ANY CONFLICTS BETWEEN UTILITIES ARE TO BE RESOLVED WITH THE INVOLVEMENT AND APPROVAL OF THE ENGINEER.
10. INSTALL INLET PROTECTION AT ALL CATCH BASINS AS THEY ARE CONSTRUCTED IN ACCORDANCE WITH DETAILS.
11. ALL SWALES AND DRAINAGE STRUCTURES ARE TO BE CONSTRUCTED AND STABILIZED PRIOR TO HAVING RUN-OFF DIRECTED TO THEM.
12. DAILY, OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINAGE DITCHES, CHECK DAMS, SEDIMENT TRAPS, ETC., TO PREVENT EROSION ON THE SITE AND PREVENT ANY SILTATION OF ABUTTING WATERS AND/OR PROPERTY.
13. PERFORM FINAL FINE GRADING, INCLUDING PLACEMENT OF 'SELECT' SUBGRADE MATERIALS.
14. PAVE ROADWAY AND DRIVEWAYS WITH INITIAL 'BASE COURSE'.
15. PERFORM ALL REMAINING SITE CONSTRUCTION (i.e. BUILDING, CURBING, UTILITY CONNECTIONS, ETC.).
16. LOAM AND SEED ALL DISTURBED AREAS AND INSTALL ANY REQUIRED SEDIMENT AND EROSION CONTROL FACILITIES (i.e. RIP RAP, EROSION CONTROL BLANKETS, ETC.).
17. FINISH PAVING ROADWAY AND DRIVEWAYS WITH 'FINISH' COURSE.
18. ROADWAY AND DRIVEWAYS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
19. ALL CUT AND FILL SLOPES SHALL BE SEEDED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
20. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
21. REMOVE TEMPORARY EROSION CONTROL MEASURES AFTER SEEDING AREAS HAVE BEEN 75%-85% ESTABLISHED AND SITE IMPROVEMENTS ARE COMPLETE. SMOOTH AND RE-VEGETATE ALL DISTURBED AREAS.
22. CLEAN SITE AND ALL DRAINAGE STRUCTURES, PIPES AND SUMPS OF ALL SILT AND DEBRIS.
23. INSTALL ALL PAINTED PAVEMENT MARKINGS AND SIGNAGE PER THE PLANS AND DETAILS.
24. ALL EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND AFTER EVERY HALF-INCH OF RAINFALL.
25. UPON COMPLETION OF CONSTRUCTION, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY ANY RELEVANT PERMITTING AGENCIES THAT THE CONSTRUCTION HAS BEEN FINISHED IN A SATISFACTORY MANNER.

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: AS NOTED	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

STATE OF NEW HAMPSHIRE — PAIGE S. LIBBEY No.16670 — LICENSED PROFESSIONAL ENGINEER — 07/08/2023

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

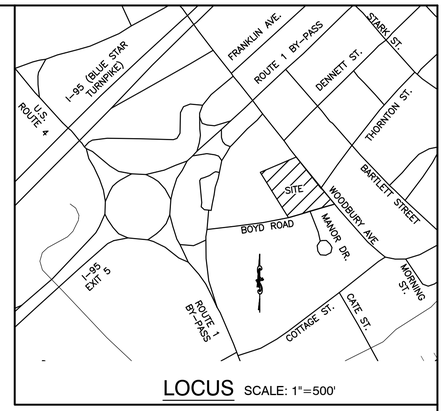
Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
Civil Engineering Services
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: EROSION AND SEDIMENT CONTROL DETAILS

Project: "GRAPEVINE RUN"
212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

Owner of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON
4 SHORE RD., WOLFEBORO, NH 03894
LOT 1: BK 4708 PG 979
LOT 2: BK 4582 PG 888
LOT 3: BK 3919 PG 1345

DRAWING No.
E1
SHEET 19 OF 23
JBE PROJECT NO. 21254



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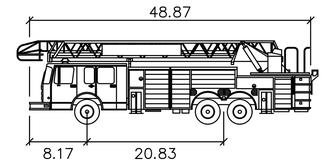

Portsmouth Fire Truck

	feet
Width	: 8.50
Track	: 6.91
Lock to Lock Time	: 6.0
Steering Angle	: 38.7

LEGEND:

= VEHICLE BODY

= FRONT WHEELS

= REAR WHEELS

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1, 2, & 3

APPLICANT
TUCK REALTY CORP.
ATTN: TURNER PORTER
149 EPPING RD., SUITE 2A
EXETER, NH 03833

TOTAL LOT AREA
80,484 SQ. FT.
1.85 ACRES

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: 1"=20'	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 01/19/2023

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
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5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

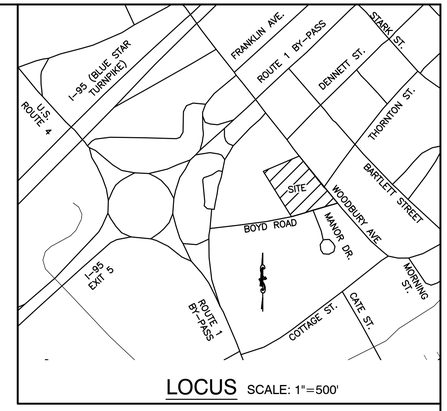
Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	TRUCK TURNING PLAN
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owners of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 LOT 1: BK 4708 PG 979 LOT 2: BK 4582 PG 888 LOT 3: BK 3919 PG 1345

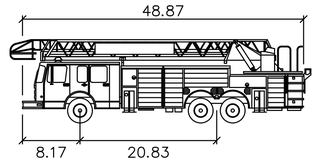
DRAWING No.

T1

SHEET 20 OF 23
JBE PROJECT NO. 21254



LOCUS SCALE: 1"=500'



Portsmouth Fire Truck

	feet
Width	: 8.50
Track	: 6.91
Lock to Lock Time	: 6.0
Steering Angle	: 38.7

LEGEND:

- VEHICLE BODY
- FRONT WHEELS
- REAR WHEELS

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1, 2, & 3

APPLICANT
TUCK REALTY CORP.
ATTN: TURNER PORTER
149 EPPING RD., SUITE 2A
EXETER, NH 03833

TOTAL LOT AREA
80,484 SQ. FT.
1.85 ACRES

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: 1"=20'	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

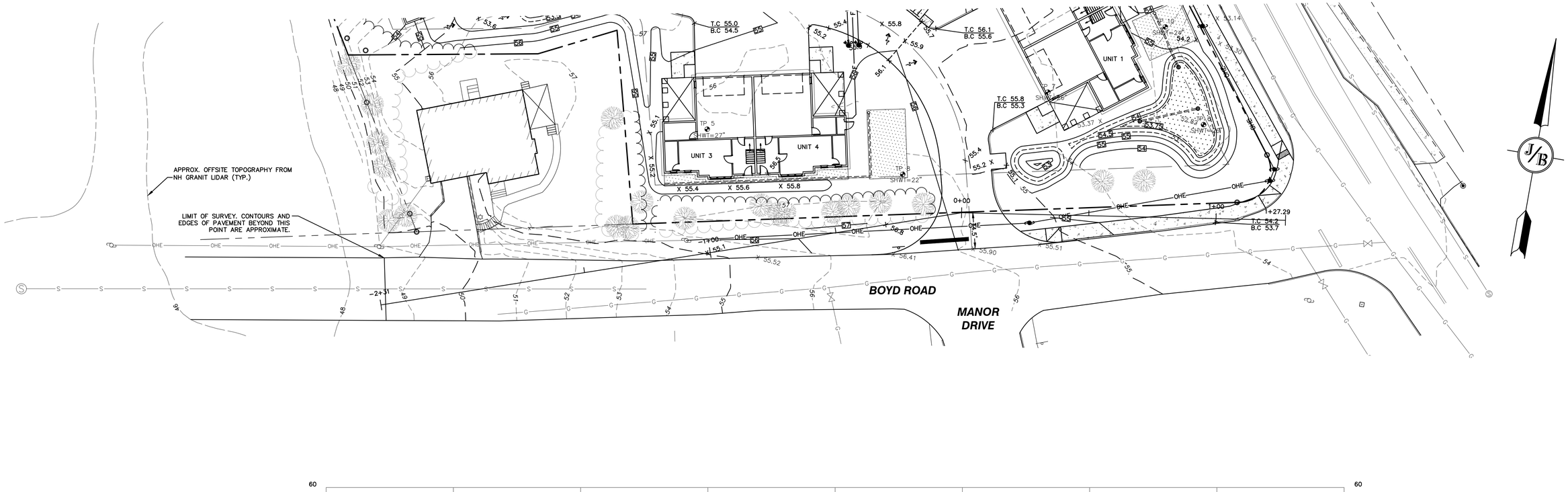
Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

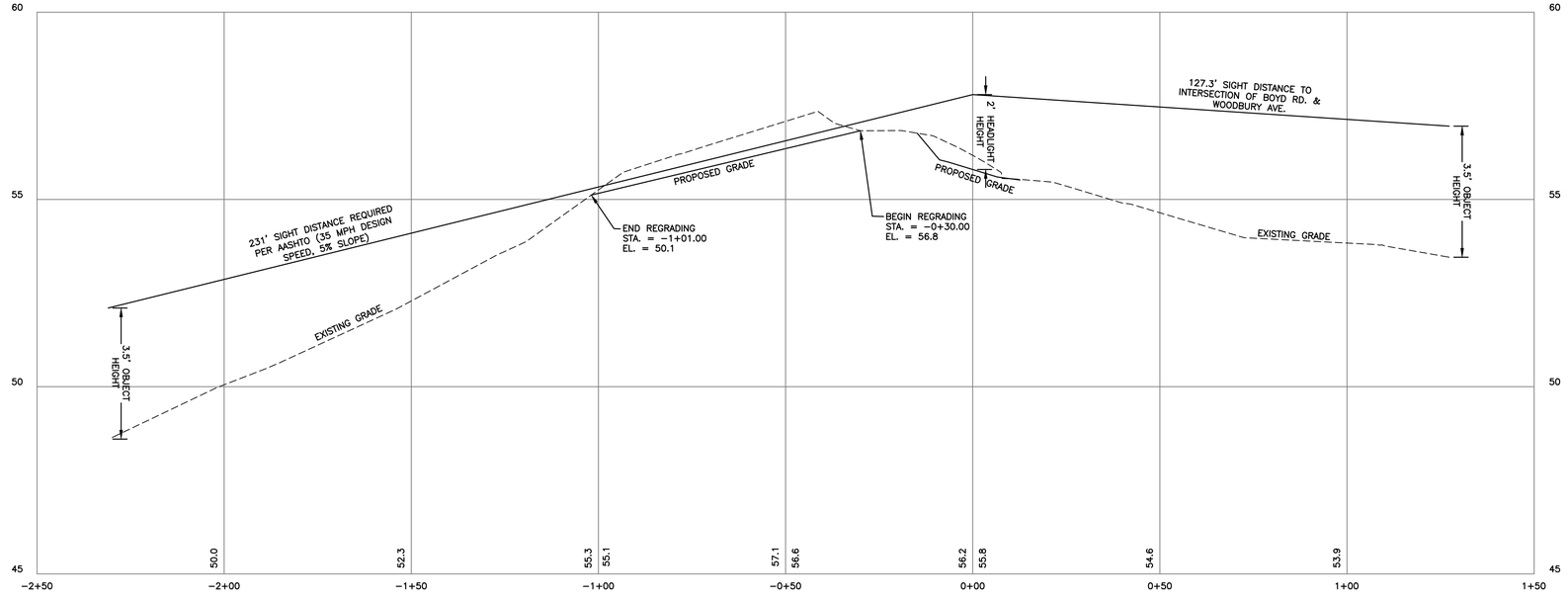
Plan Name: **TRUCK TURNING PLAN**

Project: "GRAPEVINE RUN"
212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

Owners of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON
4 SHORE RD., WOLFEBORO, NH 03894
LOT 1: BK 4708 PG 979
LOT 2: BK 4582 PG 888
LOT 3: BK 3919 PG 1345

DRAWING No.
T2
SHEET 21 OF 23
JBE PROJECT NO. 21254





GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft Horiz.
1 inch = 2 ft Vert.

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: 1"=20'	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

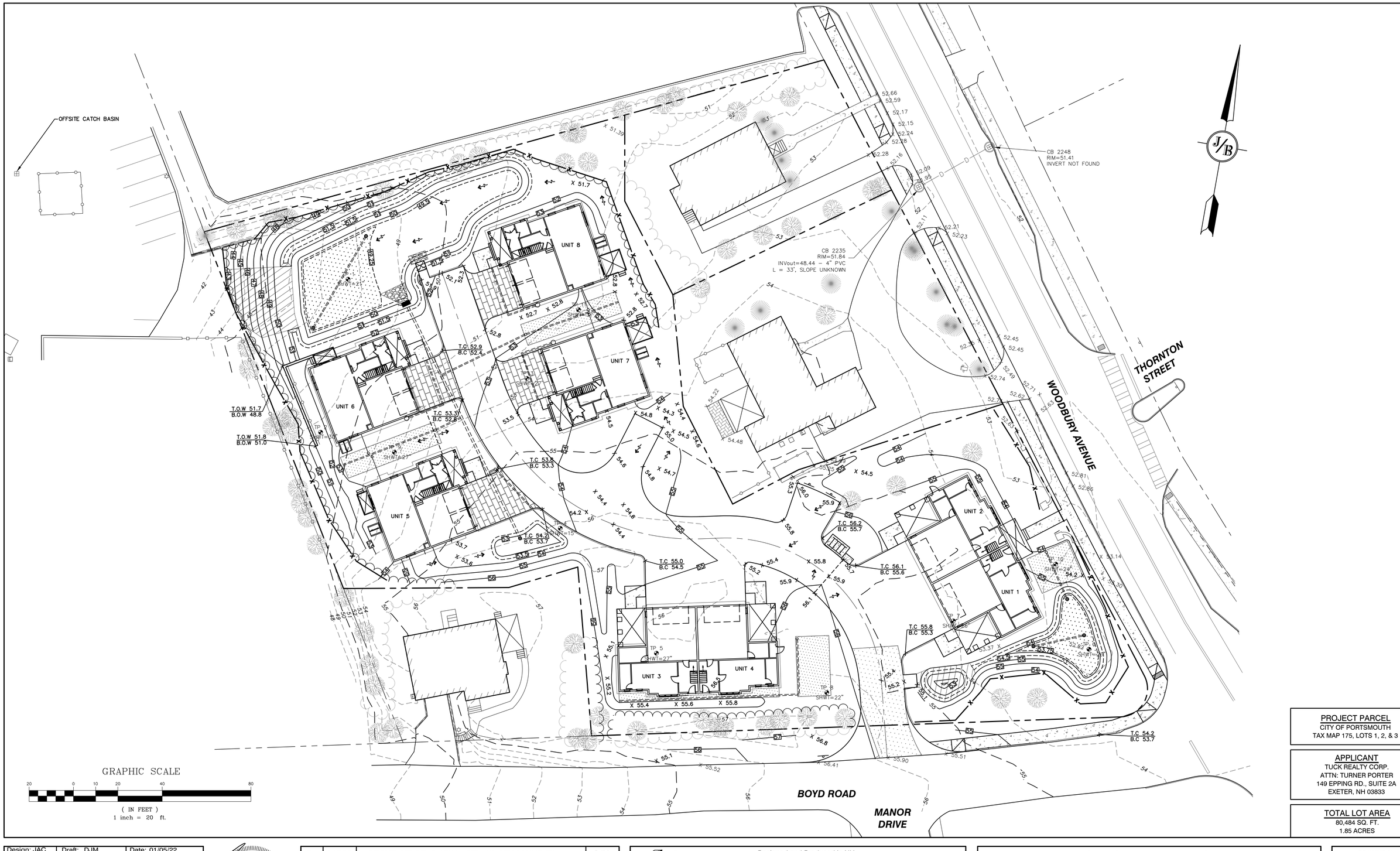
PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 01/19/2023

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	HIGHWAY ACCESS PLAN
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owners of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 LOT 1: BK 4708 PG 979 LOT 2: BK 4582 PG 888 LOT 3: BK 3919 PG 1345

DRAWING No.
H1
SHEET 22 OF 23
JBE PROJECT NO. 21254



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

1 inch = 20 ft.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1, 2, & 3

APPLICANT
TUCK REALTY CORP.
ATTN: TURNER PORTER
149 EPPING RD., SUITE 2A
EXETER, NH 03833

TOTAL LOT AREA
80,484 SQ. FT.
1.85 ACRES

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: 1"=20'	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

STATE OF NEW HAMPSHIRE – PAIGE S. LIBBEY No.16670 – PROFESSIONAL ENGINEER – LICENSED – 01/10/2023

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

Designed and Produced in NH
Jones & Beach Engineers, Inc.
Civil Engineering Services
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	OFFSITE DRAINAGE PLAN
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 LOT 1: BK 4708 PG 979 LOT 2: BK 4582 PG 888 LOT 3: BK 3919 PG 1345

DRAWING No.

DR1

SHEET 23 OF 23
JBE PROJECT NO. 21254

Findings of Fact | Highway Noise Overlay Conditional Use Permit

City of Portsmouth Planning Board

Date: April 3, 2023
Property Address: 212, 214, & 216 Woodbury Ave.
Application #: LU-22-129
Decision: □ Approve □ Deny □ Approve with Conditions

Findings of Fact:
Effective August 23, 2022, amended RSA 676:3, I now reads as follows: The local land use board shall issue a final written decision which either approves or disapproves an application for a local permit and make a copy of the decision available to the applicant. **The decision shall include specific written findings of fact that support the decision. Failure of the board to make specific written findings of fact supporting a disapproval shall be grounds for automatic reversal and remand by the superior court upon appeal, in accordance with the time periods set forth in RSA 677:5 or RSA 677:15, unless the court determines that there are other factors warranting the disapproval.** If the application is not approved, the board shall provide the applicant with written reasons for the disapproval. If the application is approved with conditions, the board shall include in the written decision a detailed description of the all conditions necessary to obtain final approval.

Highway Noise Overlay District Conditional Use Permit
10.674.10 Within the HNOD, noise sensitive land uses shall require a conditional use permit from the Planning Board.

	Highway Nose Overlay Requirements	Finding (Meets Criteria/Requirement)	Supporting Information
1	Section 10.674.20 A noise analysis prepared in compliance with Section 10.675 must be submitted with any application for a conditional use permit under this section.	**Meets** **Does Not Meet**	• A noise analysis demonstrating compliance with Section 10.675 was prepared by Reuter Associates, LLC, and has been submitted to the Planning Department.
2	Section 10.674.30 An application for a conditional use permit for a noise sensitive land use in the Highway Noise Overlay District may be approved only if a noise analysis prepared in compliance with Section 10.675 demonstrates that any applicable exterior and interior sound level standards established in Section 10.673 will be met through one or more of the following measures:	**Meets** **Does Not Meet**	• The key finding of the noise analysis prepared in compliance with Section 10.675 was that the project as proposed complies with the standards of 10.673 without any mitigation. The entire property is located outside of the 65 dB(A) noise contour.

	Highway Nose Overlay Requirements	Finding (Meets Criteria/Requirement)	Supporting Information
	(a) Site design to ensure that noise sensitive land uses are placed outside of the applicable noise contour; (b) Site design that achieves noise mitigation through placement of accessory structures between the noise source and the noise receiver; (c) Installation of a noise barrier; or (d) Superinsulated building design and construction.		
3	Section 10.675 A noise analysis must be prepared by a registered engineer or qualified professional transportation noise analyst who has been trained in the use of the Federal Highway Administration (FHWA) Transportation Noise Model or a replacement model that has been approved by the FHWA. A noise analysis must include the following: (1) A description of the proposed development. (2) A narrative description of the proposed site configuration and any proposed noise mitigation measures. (3) A diagram showing the proposed site configuration including the location of noise sensitive land uses and any proposed noise mitigation measures. (4) Unadjusted 60, 65 and 70 dBA noise contours for the loudest traffic hour sound levels shown as an overlay on the site diagram. Noise contours must be developed using the FHWA Transportation Noise Model (or a replacement model that has been approved by the FHWA).	**Meets** **Does Not Meet**	• The noise analysis was prepared by Eric L. Reuter, FASA, INCE Bd. Cert. (Certified by the Acoustical Society of America and the Institute of Noise Control Engineering). His noise analysis, which we submitted to the Planning Department, incorporates sections 1-4. Section 5 is not applicable because it was found that the proposed project meets the requirements of the Highway Noise Overlay District without needing mitigation.

	Highway Nose Overlay Requirements	Finding (Meets Criteria/Requirement)	Supporting Information
	(5) If the noise analysis shows that projected noise levels will exceed the sound level standard for the applicable activity at the location specified, the noise analysis must include: (a) Any adjusted noise contours and site-specific analyses used to adjust the noise contours based on improved topography; (b) Calculations to support the noise level reduction of any proposed noise mitigation measure; (c) A description of the width, depth, height, length, and materials used in any proposed noise barrier; and (d) A description of construction methods and materials used in any proposed superinsulated building design. The sound transmission class must be provided for materials used.		
6	**<u>Other Board Findings:</u>**		
7	**<u>Additional Conditions of Approval</u>:**		

Reuter Associates LLC
CONSULTANTS IN ACOUSTICS

10 Vaughan Mall, Suite 201A
Portsmouth, NH 03801
603-430-2081

March 16, 2023

Michael Garrepy
Tuck Realty Corporation
PO Box 190
Exeter, NH 03833

SUBJECT: Grapevine Run – Highway Noise Overlay District Analysis

Dear Mike,

I understand that an eight-unit housing development known as Grapevine Run is proposed in Portsmouth. The development will span portions of 212, 214, and 216 Woodbury Ave. A portion of the project site lies within the City of Portsmouth's Highway Noise Overlay District, Section 10.670 of the Zoning Ordinance. As such, any redevelopment of the site is subject to both interior and exterior traffic noise level limits.

Sound Level Limits

The Highway Noise Overlay District was created to discourage construction of residential and other noise sensitive developments within close proximity to Interstate 95 and/or NH Rt. 16. The intent is to reduce the future demand for highway noise barriers by not creating additional impacted properties.

Section 10.673 provides hourly-average limits for the interior of a dwelling (45 dBA) and outdoor activity areas (65 dBA), based on the "Loudest Traffic Hour Sound Level" from the two highways. Typical residential construction provides 20 dB of sound attenuation between the exterior and interior without any special insulation or glazing, making these limits effectively equivalent.

Analysis

The study was conducted in accordance with 10.675 Noise Analysis. Each subsection is addressed below:

(1) Description of the proposed development

> The development includes two duplexes and four single-family homes. The portion of the development that lies within the Highway Noise Overlay district includes parts of three of the single-family homes (Units 5, 6, and 8).

(2) A narrative description of the proposed site configuration and any proposed noise mitigation measures.

> The site is significantly shielded from the highway by the abutting Holiday Inn and Best Western hotels. Only a narrow view of the highway exists between the hotels, as shown

in Figure 1. While this is the loudest point along the site boundary, it is outside of the 65-dBA contour. No noise mitigation is necessary or proposed.

(3) A diagram showing the proposed site configuration including the location of noise sensitive land uses and any proposed noise mitigation measures.

Figure 2, attached, depicts the proposed development. The entire site consists of noise sensitive land uses. No noise mitigation is necessary or proposed.

(4) Unadjusted 60, 65 and 70 dBA noise contours for the loudest traffic hour sound levels shown as an overlay on the site diagram. Noise contours must be developed using the FHWA Transportation Noise Model (or a replacement model that has been approved by the FHWA).

A computer model of the site was constructed in SoundPlan. Calculations were conducted using the required FHWA TNM 2.5 engine. Traffic count data for the relevant section of I-95 were obtained from the NHDOT database, as presented in the attached Figure 3.

As "loudest hour" is not a standard traffic noise metric (average hour and peak hour are typical), the DHV-30 value was used as a conservative surrogate. This design hour volume represents the 30th-highest volume hour of the year. The most recent traffic count was 2021. However, the 2020 and 2021 counts show a decrease in volume that is presumably attributable to the Covid-19 pandemic. As such, the 2019 traffic volume was used in the model. As no DHV-30 value was published for 2019, the 2018 value was scaled proportionally according to the overall increase in volume from 2018 to 2019.

Use of the DHV-30 as a surrogate for the loudest hour was validated with field measurements for the One Clark Drive project permitted in 2020.

Traffic counts used in the model were 8830 automobiles and 768 heavy trucks, divided evenly across the northbound and southbound lanes. This represents the 92% - 8% split between passenger and commercial vehicles from the 2019 traffic data.

Figure 1, attached, depicts the 60-dBA and 65-dBA noise level contours. The 70-dBA contour is well outside of the site and is not depicted.

The entire development is outside of the 65-dBA contour. Any portion of the site may be used for outdoor activities and dwellings of typical design and construction may exist at any location on any of the parcels.

(5) [not applicable]

Summary

The proposed Grapevine Run development will meet the requirements of the Highway Noise Overlay District without noise mitigation.

Please feel free to contact me with any questions.

Sincerely,

Eric L. Reuter, FASA, INCE Bd. Cert.
Principal

Figure 1 – View of I-95 from northwest corner of site

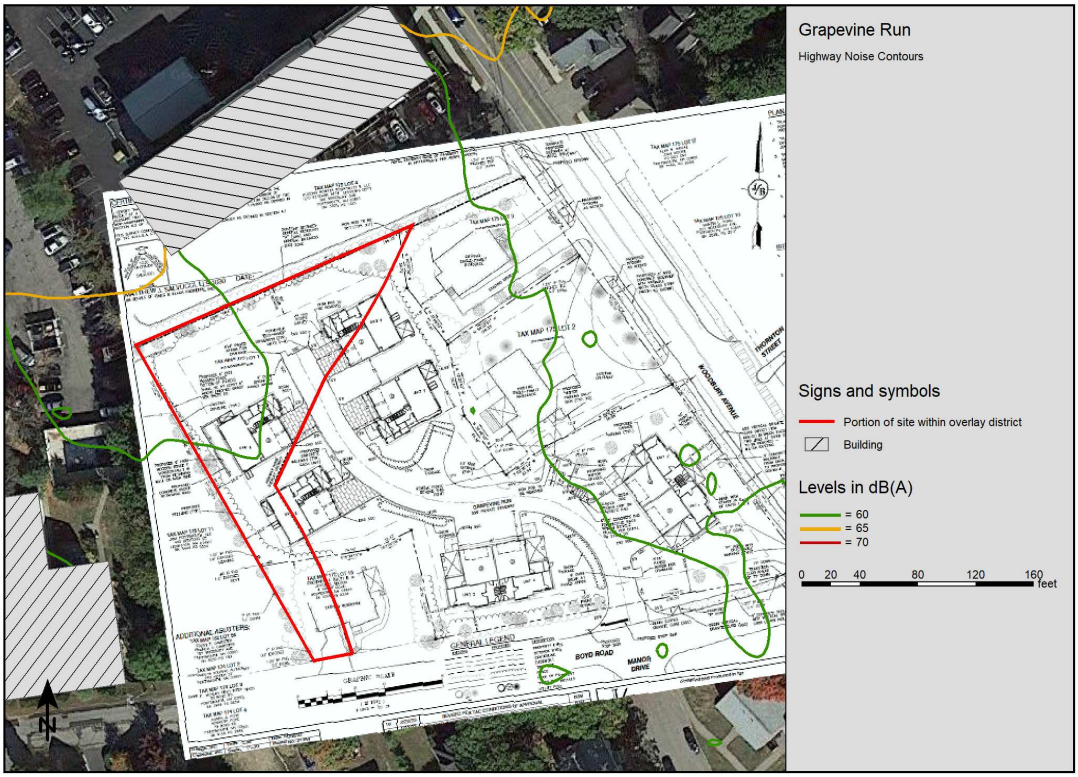


Figure 2 – Site Plan and Noise Contours

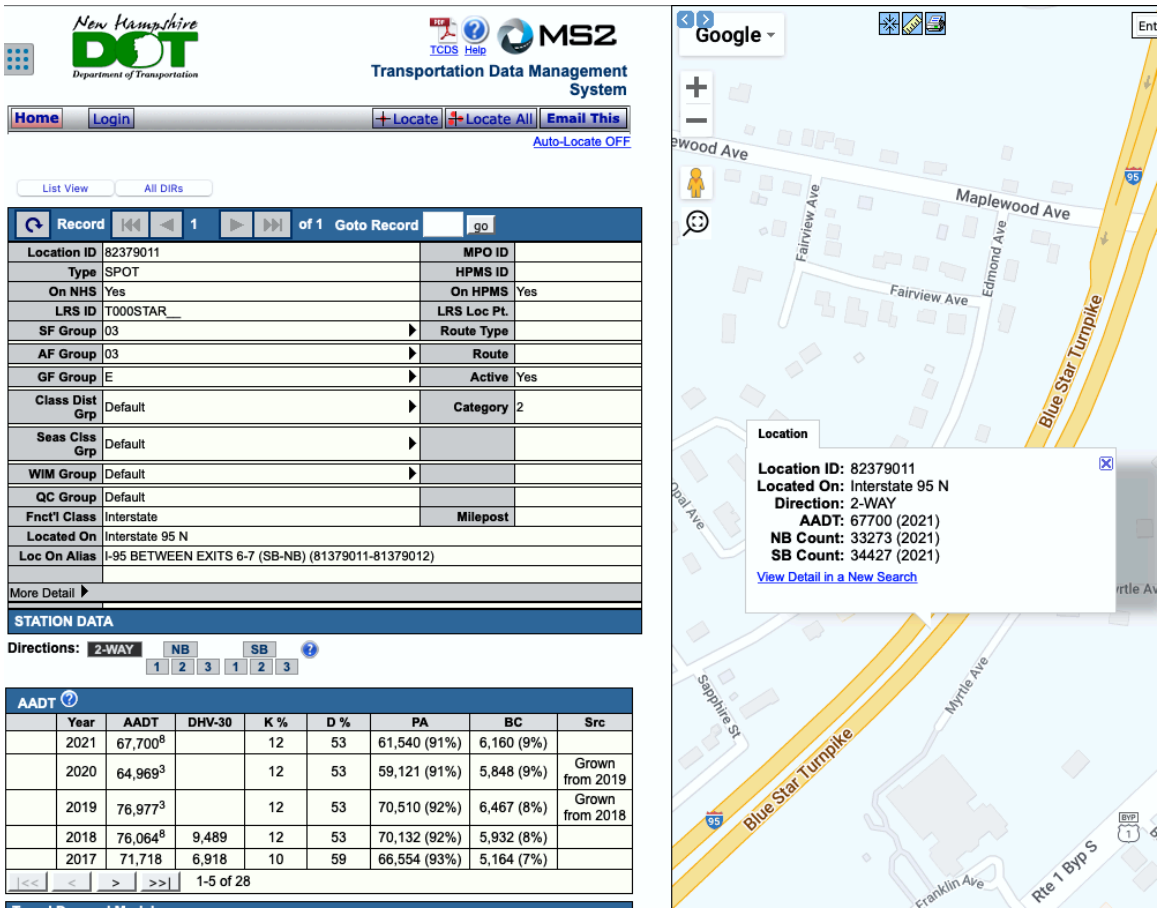


Figure 3 – NHDOT Traffic Data