GPI

Engineering | Design | Planning | Construction Management

Letter of Transmittal

Date: January 21, 2020 **Project:** 1400 Lafayette Rd. (Map 252 Lots 4,5,9)

To: Juliet Walker, Planning Director
Planning Department
One Junkins Ave
Portsmouth, NH 03801

From: Chris Tymula, Project Manager
44 Stiles Road, Suite One
Salem, NH 03079
GPI File # 458219

We are sending you ☒ Attached ☐ Under a separate cover **via** _____ **following items:**

☐ Shop drawings ☐ Prints ☒ Plans ☐ Samples

☐ Specifications ☒ Copy of Letter ☐ Change Order ☐_____

Originals	Copies	Date	Description
	1	1/20/20	Site Development Plans (Full Size)
	9	1/20/20	Site Development Plans (11x17)
	4	1/20/20	Stormwater Management Report (Full Package)
	6	1/20/20	Stormwater Management Report (Narrative Only)
	6	1/17/20	Trip-Generation & Site Access Letter
	1	1/20/20	Site Plan Application, Checklist, Fees, Authorization Letter
			Green Statement, Community Space Outline
	1	1/20/20	PDF Set of Entire Submittal Package

These are transmitted as checked below:

☐ Approved as Submitted ☐ Approval/Action ☐ Approved as Noted ☒ For your use
☐ Returned for Corrections ☐ Review & Comment ☐ Use as Requested ☐ Bids Due

☐___Prints Returned After Loan to Us ☐ Submit Copies for Distribution

☐ Return Corrected Prints ☐ Resubmit Copies for Approval ☐ Other_____

REMARKS:

Plans and documents provided for the upcoming TAC Meeting on 2/4/20
Filing Fee to be submitted under separate cover
Application and submittal materials uploaded to City Website Viewpointcloud on 1/21/20

Copy to: ___4-Amigos_____ Signed: _____

City of Portsmouth, New Hampshire

Site Plan Application Checklist

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

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

Name of Owner/Applicant: 4-Amigos, LLC Date Submitted: 1/21/20

Phone Number: 603-475-6510 E-mail: grousewing1@gmail.com

Site Address: 1400 Lafayette Road Map: 252 Lot: 4,5,9

Zoning District: Gateway Neighborhood Mixed Use Center (G2) Lot area: 248,691 sq. ft.

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

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Statement that lists and describes "green" building components and systems. **(2.5.3.1A)**	See Attached	
☑	Gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. **(2.5.3.1B)**	See Sheet 5 & Arch. Drawings	N/A
☑	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1C)**	Sheet 4	N/A
☑	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. **(2.5.3.1D)**	Sheet 2	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. **(2.5.3.1E)**	Sheet 2	N/A
☑	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1F)**	Sheet 1	N/A
☑	List of reference plans. **(2.5.3.1G)**	Sheet 2	N/A
☑	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1H)**	Sheet 7	N/A

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

Site Plan Specifications			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	A note shall be provided on the Site Plan stating: "All conditions on this Plan shall remain in effect in perpetuity pursuant to the requirements of the Site Plan Review Regulations." **(2.5.4.2E)**	Sheet 5, Note 21	N/A
☑	Plan sheets submitted for recording shall include the following notes: a. "This Site Plan shall be recorded in the Rockingham County Registry of Deeds." b. "All improvements shown on this Site Plan shall be constructed and maintained in accordance with the Plan by the property owner and all future property owners. No changes shall be made to this Site Plan without the express approval of the Portsmouth Planning Director." **(2.13.3)**	Sheet 5, Notes 22 & 23	N/A
☑	Plan sheets showing landscaping and screening shall also include the following additional notes: a. "The property owner and all future property owners shall be responsible for the maintenance, repair and replacement of all required screening and landscape materials." b. "All required plant materials shall be tended and maintained in a healthy growing condition, replaced when necessary, and kept free of refuse and debris. All required fences and walls shall be maintained in good repair." c. "The property owner shall be responsible to remove and replace dead or diseased plant materials immediately with the same type, size and quantity of plant materials as originally installed, unless alternative plantings are requested, justified and approved by the Planning Board or Planning Director." **(2.13.4)**	Sheet 9, Notes 14, 15 & 16	N/A

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
	1. Existing Conditions: (2.5.4.3A)		
☑	a. Surveyed plan of site showing existing natural and built features;	Sheet 2	
☑	b. Zoning boundaries;	Sheet 2	
☑	c. Dimensional Regulations;	Sheet 2	
☐	d. Wetland delineation, wetland function and value assessment;	N/A	
☑	e. SFHA, 100-year flood elevation line and BFE data.	Sheet 2, Note 6	
	2. Buildings and Structures: (2.5.4.3B)		
☑	a. Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation;	Sheet 4 & 5	
☑	b. Elevations: Height, massing, placement, materials, lighting, façade treatments;	See Arch Plans	
☑	c. Total Floor Area;	Sheet 2	
☑	d. Number of Usable Floors;	Sheet 5	
☑	e. Gross floor area by floor and use.	Sheet 5	
	3. Access and Circulation: (2.5.4.3C)		
☑	a. Location/width of access ways within site;	Sheet 5	
☑	b. Location of curbing, right of ways, edge of pavement and sidewalks;	Sheet 5	
☑	c. Location, type, size and design of traffic signing (pavement markings);	Sheet 5	
☑	d. Names/layout of existing abutting streets;	Sheet 2	
☑	e. Driveway curb cuts for abutting prop. and public roads;	Sheet 5	
☐	f. If subdivision; Names of all roads, right of way lines and easements noted;	N/A	
☐	g. AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	N/A	
	4. Parking and Loading: (2.5.4.3D)		
☑	a. Location of off street parking/loading areas, landscaped areas/buffers;	Sheet 5	
☑	b. Parking Calculations (# required and the # provided).	Sheet 4	
	5. Water Infrastructure: (2.5.4.3E)		
☑	a. Size, type and location of water mains, shut-offs, hydrants & Engineering data;	Sheet 7	
☐	b. Location of wells and monitoring wells (include protective radii).	N/A	
	6. Sewer Infrastructure: (2.5.4.3F)		
☑	a. Size, type and location of sanitary sewage facilities & Engineering data.	Sheet 7	
	7. Utilities: (2.5.4.3G)		
☑	a. The size, type and location of all above & below ground utilities;	Sheet 7	
☑	b. Size type and location of generator pads, transformers and other fixtures.	Sheet 7	

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	**8. Solid Waste Facilities: (2.5.4.3H)**	Sheet 5	
☑	a. The size, type and location of solid waste facilities.	Sheet 5	
	9. Storm water Management: (2.5.4.3I)		
☑	a. The location, elevation and layout of all storm-water drainage.	Sheet 6	
	10. Outdoor Lighting: (2.5.4.3J)		
☑	a. Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and; b. photometric plan.	Sheet 5 & Lighting Plan	
☑	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**	Lighting Plan	
	12. Landscaping: (2.5.4.3K)		
☑	a. Identify all undisturbed area, existing vegetation and that which is to be retained;	Sheet 3 & 9	
☑	**b.** Location of any irrigation system and water source.	Sheet 9, Note 13	
	13. Contours and Elevation: (2.5.4.3L)		
☑	a. Existing/Proposed contours (2 foot minimum) and finished grade elevations.	Sheet 2 & 6	
	14. Open Space: (2.5.4.3M)		
☑	a. Type, extent and location of all existing/proposed open space.	Community Space	Plan
☑	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	Sheet 2	
☑	**16. Location of snow storage areas and/or off-site snow removal. (2.5.4.3O)**	Sheet 5	
☐	**17. Character/Civic District (All following information shall be included): (2.5.4.3Q)**	N/A	
	a. Applicable Building Height (10.5A21.20 & 10.5A43.30);		
	b. Applicable Special Requirements (10.5A21.30);		
	c. Proposed building form/type (10.5A43);		
	d. Proposed community space (10.5A46).		

Other Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Traffic Impact Study or Trip Generation Report, as required. (*Four (4) hardcopies of the full study/report and Six (6) summaries to be submitted with the Site Plan Application*) **(3.2.1-2)**	See Attached	
☑	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**	See Attached Letters/Memos	
☐	Indicate whether the proposed development is located in a wellhead protection or aquifer protection area. Such determination shall be approved by the Director of the Dept. of Public Works. **(7.3.1)**	N/A	
☑	Indicate where measures to minimize impervious surfaces have been implemented. **(7.4.3)**	See Attached Letters/Memos	
☑	Calculation of the maximum effective impervious surface as a percentage of the site. **(7.4.3.2)**	Sheet 5, Note 3	
☑	Stormwater Management and Erosion Control Plan. (*Four (4) hardcopies of the full plan/report and Six (6) summaries to be submitted with the Site Plan Application*) **(7.4.4.1)**	See Attached Letters/Memos	

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

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	A document from each of the required private utility service providers indicating approval of the proposed site plan and indicating an ability to provide all required private utilities to the site. **(2.5.3.2D)**	Letters Pending	
☑	A list of any required state and federal permit applications required for the project and the status of same. **(2.5.3.2E)**	Sheet 5, Note 25	

Applicant's Signature: _____ **Date:** 1/20/20

AUTHORIZED AGENT

LETTER OF AUTHORIZATION

1400 Lafayette Road, Tax Map 252 Lots 4,5,7,9

Portsmouth, NH

I, Ken Linseman, as Member of 4 Amigos, LLC, do hereby authorize GPI to act on behalf of 4 Amigos, LLC as agent concerning Planning Board applications related to the proposed development located at 1400 Lafayette Road, Tax Map 252 Lots 4,5,7,9 in Portsmouth, NH.

Ken Linseman, Member

4 Amigos, LLC

1/21/20

Date

Statement of "Green" Building Components
Proposed Industrial Building
1400 Lafayette Road
Portsmouth, NH

The proposed residential project is not proposed to be LEED certified. However, the following "green" building components and systems have been utilized in the design of the project:

SITE

- Construction Activity Pollution Prevention - The site construction drawings provide an erosion and sedimentation control plan.
- Site Development – Community/Open Space – The site development proposes to minimize paved surfaces with the use of garage parking and creates substantial community spaces areas intended for use by the general public.
- Stormwater Design – Quantity Control – A stormwater management plan has been developed to reduce post development stormwater runoff.
- Stormwater Design – Quality Control – The project provides stormwater infiltration from the development, captures and treats the stormwater from the site.

BUILDING

The will be designed using the following sustainable design strategies to reduce the development impact on the environment.

- The development is an infill project on a previously developed site.
- The multi-family buildings (A and C) include bicycle storage. Secure indoor storage in Building A and undercover storage at building C. Building(s) bicycle storage will be within the individual dwelling units.
- The buildings will be constructed to meet or exceed the provisions of Chapter 4 of the International Energy Conservation Code 2015 as amended by the state of New Hampshire Energy Code or the current edition adopted at the time of building permit application as verified by prescriptive means or Department of Energy ComCheck software.
- A minimum of 75% of the lamps in permanently installed light fixtures will be high efficiency lamps.
- Buildings will be tested or visually inspected for air sealing to less than 3 air changes per hour at 50 Pa.
- Mechanical Systems will be sized in accordance with adopted code. Each zone will have programmable thermostats.
- Construction Materials will be locally sourced when practicable.
- The applicant does not plan to include any on-site energy generation at this time, but reserves the right to include on-site generation in the future.

GPI Greenman-Pedersen, Inc.
Design, Planning, Engineering and Construction Services

Description of compatibility with Article 5 Gateway neighborhood mixed use districts

As proposed, the 1400 Lafayette Road residential project application is under the auspices of the G2-Gateway Neighborhood Mixed Use District. The intention of the district is to create a regulatory structure that would allow the development of walkable mixed - uses particularly with the addition of residential density to the previous commercial zone, and with the inclusion of enhanced surroundings of open space in public/community spaces in a neighborhood center.

The project includes a total of 52 residential units within five buildings; 29 garden style and 23 townhouse style units. The Residential units as proposed create a variety of housing types the translate to different pricing opportunities but the combination of housing types within the neighborhood layout of streets accomplishes the objective of the neighborhood center.

From the standpoint of compliance with landscape issues for the project there are several components to be considered:

- The amount of open space – 20%.
- The amount, configuration and design of community spaces.
- Compatibility of the design of community spaces in the context of Portsmouth neighborhoods.
- The use of neighborhood design techniques in the project.

Community space:
It has been the objective of the project to maximize community space for the cohesiveness of the neighborhood and it was self as well as it's outreach to the adjacent parcels and land uses around it.

> *As proposed, the site plan for a 5.7-acre parcel includes 21.4% of the site coverage as "Green/Community space" in the form of landscaped areas that are preserved or created by the project. These are the aggregation of green spaces and hardscapes along the sidewalks along the buildings, and other areas. This amounts to 53,135 sf. The standard for the district is 20% required - 49,738 sf.*

This residential neighborhood represents a new direction for the Lafayette Road corridor as made possible by the new gateway zoning district. In consideration of the community spaces - there are several community space types that are outlined in the bylaws that have excellent application to the neighborhood design. While the standards in the bylaws do not actually list a quantitative standard to be achieved, 20% opens space is the requirement that we have met and exceeded. We are also looking at it from the standpoint of qualitative measures – does the community space look attractive and compatible - perhaps even exemplify the community spaces of Portsmouth's other neighborhoods. With that in mind, the following community spaces are defined in the project design:

Wide pedestrian sidewalks
It is been a goal to have community space frontage for as much of the entire street perimeter of the project as possible. To meet this, we have used the "wide pedestrian sidewalk" typology for the design of the streetscapes of the project. The wide pedestrian sidewalk requires the definition of a minimum 10-foot depth through with the placement of street trees and street furniture may also occur. As proposed, the following streets utilize the wide pedestrian sidewalk typology:

The frontage of Peverley Hill Road has a 10-foot-wide sidewalk with adjacent landscaping. The sidewalk is proposed as concrete to match the other municipal sidewalks of the area, but it is also noted that the 10-foot path could also potentially function as a bicycle shared - used path if the city sees a benefit to the designation and use. The city might prefer an asphalt paved surface in that case. With bicycle racks inside of the residential buildings, there will be some bicycle travel along this path in any case. The landscaped community space along Peverley Hill also enhances the buildings with landscape plantings of Honey Locust shade trees, ground covers and shrubs.

Inner neighborhood streets:
The block that was designed originally for this project was for a commercial building of approximately 20,000 ft.^{2} This application, in accordance with the G2 district, uses the same street layout as it has been built to be the frontage for the residential neighborhood.

The wide pedestrian sidewalk through this area uses a 10 - foot wide paved concrete sidewalk with openings for deciduous canopy street trees typically spaced at 30 feet on center. These trees are placed within the paved spaces as allowed by the Community space design guidelines. The 5‘x 10‘dimension street tree openings are for the depth of street tree planting mix and are surfaced with a paving material called “Flexi - pave “which is recently been used in some areas of downtown Portsmouth where urban tree planting conditions have been present. The opening fits with the 5’ grid sidewalk scoring patterns. The Flexi - pave protects the tree soil from compaction but is also permeable, allowing water to drain in to the tree chambers. The stone aggregate of the Flexi - pave would be indigenous washed stone from the Portsmouth region.

The street section shows the plan and cross-section of this paving detail.

Both streets that are perpendicular to Peverley Hill Road use the same design and the trees that are proposed are Princeton Elms to create a distinguished canopy above the street level to which the residential units face on either side of the street.

In front of the townhouses and the 10 - foot sidewalk in front of bldgs. B-C-D-E-F are front gardens 6 - 15’ deep. Different design options have been provided for those variable garden sizes and solar exposures. The plant selections may vary, but each garden as proposed has between 14-23 plants. This is an identical streetscape proportion to many historical neighborhood streets in the city most prominent which would be the residential sections of state street in the historic downtown.

Innermost Street: limitation on building scale to fit the site plan has this is a smaller 5’ wide sidewalk facing the hotel and therefore is not categorized in the Wide Sidewalk Community space.

Other community spaces:
The courtyard space best classified as a “Pocket Park” on the interior of Building A is a landscaped space that fronts on the public sidewalk of the cross - street as well as ancillary entrances to the building level for parking to the units above. This courtyard will be accessible to both the residents and visitors to the area much the same as other pocket parks that are available in other parts of Portsmouth.

Pedestrian alleys:
The cut - through from the side street is defined for pedestrian access and permeability into the courtyard spaces of the town houses. Not all this cut-through pathway is the required 10 - feet but it is a continuous walkway with paving, landscaping and connectivity to the units.

Preserved landscape area:
The area of the site furthest to the west in the vicinity of the present house and garages has a wonderful plantation of native ground cover and trees and the siding of the new units has created an offset from the property line for the preservation of this area. The landscape plan contemplates selective clearing pruning and clean - up of the area with supplemental native tree and understory plantings to replace a large dominance of Norway Maple and other invasive in the area. The Pocket Park is the best classification for this area as well.

Notes on the other design elements of the project:

Lighting:
A lighting plan has been prepared for the neighborhood using fixtures that are LED for energy efficiency and flexible in terms of their ability to use cut off - photometrics to focus and limit the light patterns of illumination. The Cree fixture shown as a detail looks attractive and the photometric output plan has a smooth level of lighting along the public walkways of the wide pedestrian sidewalks and other landscaped areas of the site.

The light fixture chosen at a height of 15‘ (including base and luminaire) provides a smooth distribution of illumination between 1-2-foot candles along the sidewalks in most cases. The lighting is not attempting to illuminate the entire street but to create a residential scale and comfort of visibility in darkness hours.

No lighting is proposed along Peverley Hill Road because there is cobra head lighting attached to the power poles. The photometric values of light from these poles is not reflected in the proposed lighting analysis.

Additional architectural lighting is also proposed.

Landscape amenities:

Public seating: benches for rest are provided in some areas of the neighborhood in places where people may linger.

The courtyard parking area:
A shared space of courtyard pavement is defined between the town houses which have garages at the back entrances. The paving area out here includes an oval of ornamental paving to make it a more decorative space.

We look forward to seeing you at TAC to discuss these issues further.

Robert A. White, Senior Landscape Architect

SITE DEVELOPMENT PLANS

for

TAX MAP 252 LOTS 4, 5 & 9

1400 LAFAYETTE ROAD

PORTSMOUTH, NEW HAMPSHIRE 03801

Prepared for:

4 AMIGOS, LLC

321D LAFAYETTE ROAD

HAMPTON, NEW HAMPSHIRE 03842

ENGINEER:

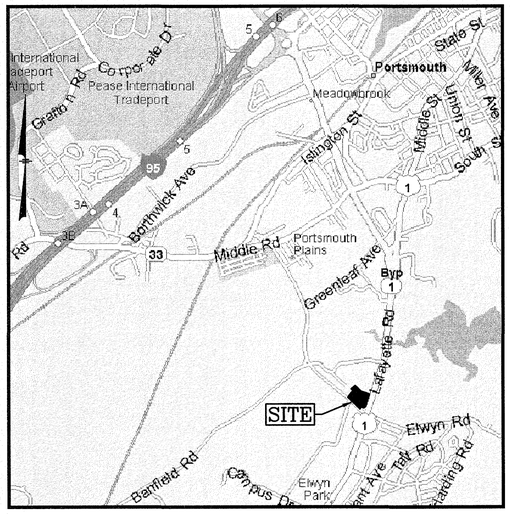
GREENMAN-PEDERSEN, INC. (GPI)
FRANK C. MONTEIRO, PE
44 STILES ROAD, SUITE ONE
SALEM, NH 03079
(603) 893-0720

SURVEYOR:

GREENMAN-PEDERSEN, INC. (GPI)
JOEL A. CONNOLLY, LLS
44 STILES ROAD, SUITE ONE
SALEM, NH 03079
(603) 893-0720

ARCHITECT:

MICHAEL J KEANE ARCHITECTS PLLC
MICAHEL KEANE
101 KENT PLACE
NEWMARKET, NH 03857
(603) 292-1400



LOCATION MAP

NOT TO SCALE

INDEX TO DRAWINGS

NO.	DESCRIPTION	BY	DATE

REVISIONS

TITLE SHEET

ASSESSORS MAP 252 – LOTS 4, 5 & 9
1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

CITY OF PORTSMOUTH PLANNING BOARD

CHAIRPERSON _____ DATE _____

STATE OF NEW HAMPSHIRE – FRANK C. MONTEIRO No. 7152 LICENSED PROFESSIONAL ENGINEER – 1/21/20

GPI
Engineering
Design
Planning
Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: NONE	DATE: JANUARY 20, 2020		DRAWING NO. 4582CVR.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CPS	CMT	458219	1 OF 15

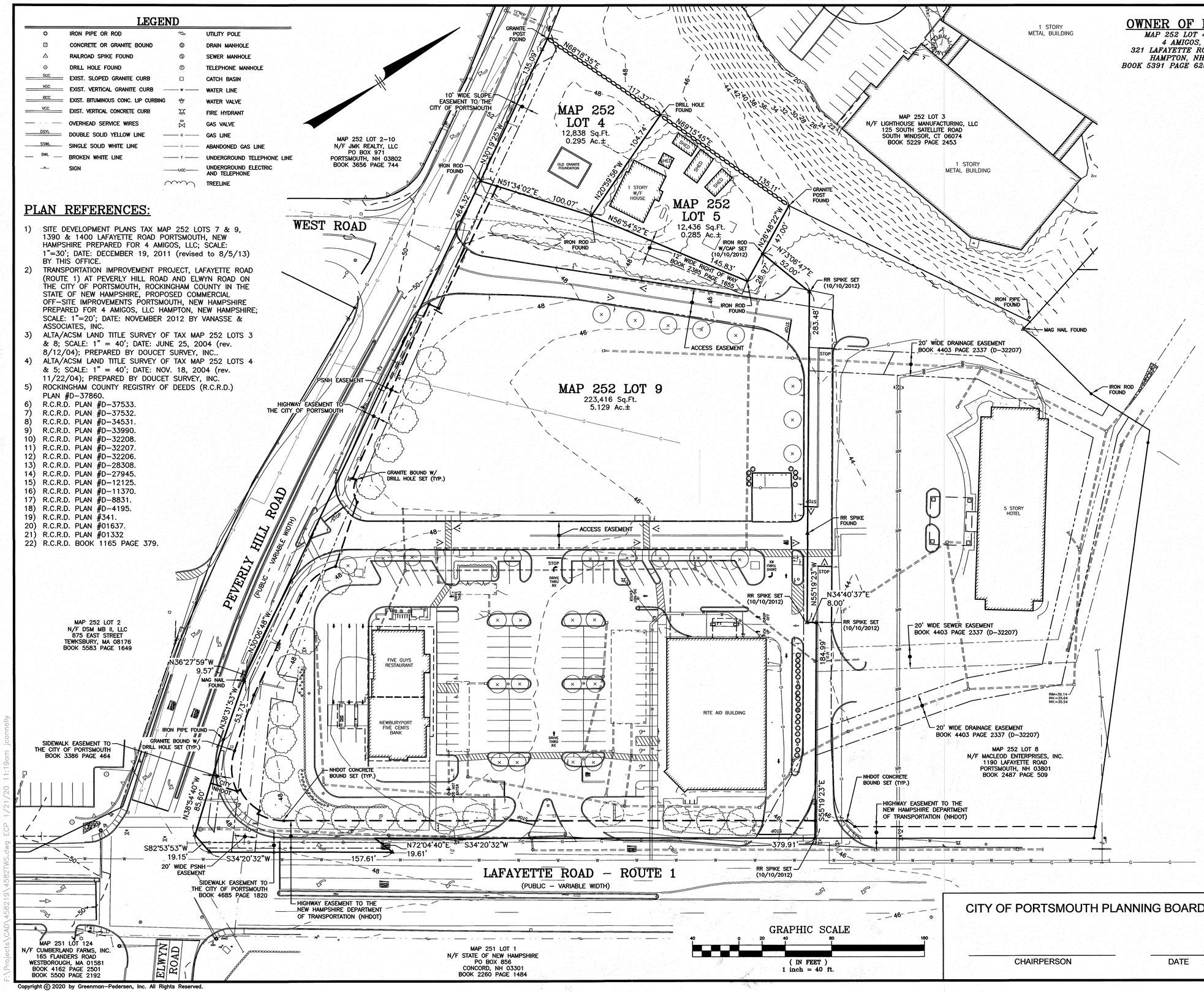
F:\Projects\CAD\458219\4582CVR.dwg COVER 1/20/20 1:24pm ccoll

LEGEND

○	IRON PIPE OR ROD	UP	UTILITY POLE
⊡	CONCRETE OR GRANITE BOUND	Ⓓ	DRAIN MANHOLE
△	RAILROAD SPIKE FOUND	Ⓢ	SEWER MANHOLE
⊙	DRILL HOLE FOUND	Ⓣ	TELEPHONE MANHOLE
SGC	EXIST. SLOPED GRANITE CURB	□	CATCH BASIN
VCC	EXIST. VERTICAL GRANITE CURB	W	WATER LINE
BCC	EXIST. BITUMINOUS CONC. LIP CURBING		WATER VALVE
VCC	EXIST. VERTICAL CONCRETE CURB		FIRE HYDRANT
OHW	OVERHEAD SERVICE WIRES	GV	GAS VALVE
DSYL	DOUBLE SOLID YELLOW LINE	G	GAS LINE
SSWL	SINGLE SOLID WHITE LINE	C	ABANDONED GAS LINE
BWL	BROKEN WHITE LINE	T	UNDERGROUND TELEPHONE LINE
	SIGN	UGE	UNDERGROUND ELECTRIC AND TELEPHONE
			TREELINE

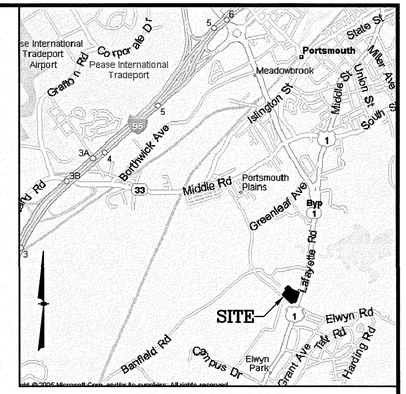
PLAN REFERENCES:

1) SITE DEVELOPMENT PLANS TAX MAP 252 LOTS 7 & 9, 1390 & 1400 LAFAYETTE ROAD PORTSMOUTH, NEW HAMPSHIRE PREPARED FOR 4 AMIGOS, LLC; SCALE: 1"=30'; DATE: DECEMBER 19, 2011 (revised to 8/5/13) BY THIS OFFICE.
2) TRANSPORTATION IMPROVEMENT PROJECT, LAFAYETTE ROAD (ROUTE 1) AT PEVERLY HILL ROAD AND ELWYN ROAD ON THE CITY OF PORTSMOUTH, ROCKINGHAM COUNTY IN THE STATE OF NEW HAMPSHIRE, PROPOSED COMMERCIAL OFF-SITE IMPROVEMENTS PORTSMOUTH, NEW HAMPSHIRE PREPARED FOR 4 AMIGOS, LLC HAMPTON, NEW HAMPSHIRE; SCALE: 1"=20'; DATE: NOVEMBER 2012 BY VANASSE & ASSOCIATES, INC.
3) ALTA/ACSM LAND TITLE SURVEY OF TAX MAP 252 LOTS 3 & 8; SCALE: 1" = 40'; DATE: JUNE 25, 2004 (rev. 8/12/04); PREPARED BY DOUCET SURVEY, INC..
4) ALTA/ACSM LAND TITLE SURVEY OF TAX MAP 252 LOTS 4 & 5; SCALE: 1" = 40'; DATE: NOV. 18, 2004 (rev. 11/22/04); PREPARED BY DOUCET SURVEY, INC.
5) ROCKINGHAM COUNTY REGISTRY OF DEEDS (R.C.R.D.) PLAN #D-37860.
6) R.C.R.D. PLAN #D-37533.
7) R.C.R.D. PLAN #D-37532.
8) R.C.R.D. PLAN #D-34531.
9) R.C.R.D. PLAN #D-33990.
10) R.C.R.D. PLAN #D-32208.
11) R.C.R.D. PLAN #D-32207.
12) R.C.R.D. PLAN #D-32206.
13) R.C.R.D. PLAN #D-28308.
14) R.C.R.D. PLAN #D-27945.
15) R.C.R.D. PLAN #D-12125.
16) R.C.R.D. PLAN #D-11370.
17) R.C.R.D. PLAN #D-8831.
18) R.C.R.D. PLAN #D-4195.
19) R.C.R.D. PLAN #341.
20) R.C.R.D. PLAN #01637.
21) R.C.R.D. PLAN #01332
22) R.C.R.D. BOOK 1165 PAGE 379.



OWNER OF RECORD:

MAP 252 LOT 4, 5 & 9
4 AMIGOS, LLC
321 LAFAYETTE ROAD, UNIT D
HAMPTON, NH 03842
BOOK 5391 PAGE 625 & PAGE 638



LOCATION MAP

(NOT TO SCALE)

NOTES:

1) ZONE: GATEWAY NEIGHBORHOOD MIXED USE CENTER (G2)
   MIN. LOT SIZE: 10,000 Sq.Ft.
   MIN. LOT FRONTAGE: 50 Ft.
   SETBACKS:
   FRONT: 80 Ft. FROM CL LAFAYETTE ROAD; 30 Ft. FROM PEVERLY HILL R.O.W.
   SIDE: 30 Ft.
   REAR: 50 Ft.
   REFER TO THE CITY OF PORTSMOUTH ZONING ORDINANCE FOR VERIFICATION, ADDITIONAL RESTRICTIONS AND PERMITTED USES.
2) THIS PLAN IS THE RESULT OF ON-THE-GROUND FIELD SURVEY PERFORMED BY THIS OFFICE BETWEEN 2008 AND 2019.
3) BEARINGS SHOWN HEREON ARE BASED ON PLAN REFERENCE #3.
4) ELEVATIONS SHOWN HEREON ARE BASED ON NAVD88. CURB ELEVATIONS SHOWN ARE AT THE "TOE" OF CURB. CURBS ARE 0.50'± HIGH.
5) LOCATION OF UNDERGROUND UTILITIES IS APPROXIMATE ONLY. ADDITIONAL UNDERGROUND UTILITIES OTHER THAN THOSE SHOWN MAY BE ENCOUNTERED.
6) THE SURVEY TRACT IS NOT LOCATED IN A SPECIAL FLOOD HAZARD AREA (100 YEAR FLOOD) PER FLOOD INSURANCE RATE MAP NUMBER 33015C0270E, WITH AN EFFECTIVE DATE OF MAY 17, 2005.

CERTIFICATION:

I CERTIFY THAT THIS SURVEY AND PLAN WAS PREPARED BY ME OR THOSE UNDER MY DIRECT SUPERVISION AND THAT THIS PLAN IS THE RESULT OF AN ACTUAL SURVEY PERFORMED ON THE GROUND AND HAS AN ERROR OF CLOSURE OF NOT MORE THAN ONE PART IN TEN THOUSAND.

1/21/2020

JOEL A. CONNOLLY, LLS 997 — DATE

NO.	DESCRIPTION	BY	DATE

REVISIONS

EXISTING CONDITIONS PLAN

ASSESSORS MAP 252 - LOTS 4, 5 & 9
1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD, UNIT D
HAMPTON, NEW HAMPSHIRE 03842

GPI — Engineering, Design, Planning, Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: 1"=40'	DATE: JANUARY 20, 2020		DRAWING NO. 4582TWS.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
JJW/JAC	JAC	458219	2 OF 15

CITY OF PORTSMOUTH PLANNING BOARD

CHAIRPERSON — DATE

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

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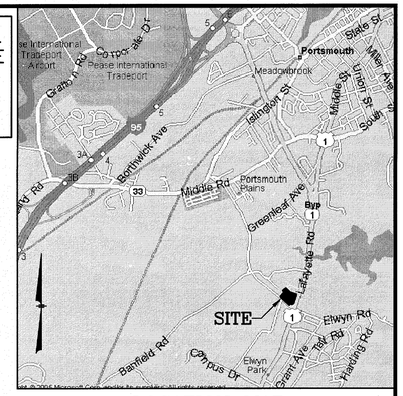
LEGEND

○	IRON PIN FOUND	UP	UTILITY POLE
⊡	CONCRETE BOUND FOUND	D	DRAIN MANHOLE
△	RAILROAD SPIKE FOUND	S	SEWER MANHOLE
⊙	DRILL HOLE FOUND	T	TELEPHONE MANHOLE
SGC	EXIST. SLOPED GRANITE CURB	C	CATCH BASIN
VGC	EXIST. VERTICAL GRANITE CURB	W	WATER LINE
BCC	EXIST. BITUMINOUS CONC. LIP CURBING		WATER VALVE
VCC	EXIST. VERTICAL CONCRETE CURB		FIRE HYDRANT
	OVERHEAD SERVICE WIRES	GV	GAS VALVE
DSYL	DOUBLE SOLID YELLOW LINE	G	GAS LINE
SSWL	SINGLE SOLID WHITE LINE	T	UNDERGROUND TELEPHONE LINE
BWL	BROKEN WHITE LINE	UGE	UNDERGROUND ELECTRIC AND TELEPHONE
	SIGN		WETLAND LINE
TBR	TO BE REMOVED		TREELINE
x x x x x x -	TO BE REMOVED		

SEE EROSION & SEDIMENT CONTROL PLAN FOR CONSTRUCTION SEQUENCE AND TEMPORARY EROSION CONTROL MEASURES PRIOR TO BEGINNING DEMOLITION ACTIVITIES.



LOCATION MAP

(NOT TO SCALE)

PROP. PEVERLY HILL ROAD RECONSTRUCTION PROJECT BY THE CITY OF PORTSMOUTH

MAP 252 LOT 4
12,838 Sq. Ft.
0.295 Ac.±

MAP 252 LOT 5
12,437 Sq. Ft.
0.285 Ac.±

MAP 252 LOT 9
223,416 Sq. Ft.
5.129 Ac.±

WEST ROAD

PEVERLY HILL ROAD
(PUBLIC - VARIABLE WIDTH)

PROP. TREELINE

EXIST. FENCE TO BE REMOVED

PORTION OF EXISTING CURB TO BE REMOVED

TO BE REMOVED

YOKEN'S COMMON SIGN TO REMAIN

EXIST. TREES TO BE REMOVED

EXISTING "ABANDONED/DEAD" GAS LINE TO BE REMOVED FROM PEVERLY HILL ROAD GATE VALVE

REMOVE PORTION OF EXISTING CURBING. SEE SITE PLAN

PAVEMENT SAWCUT LINE (TYP.)

REMOVE EXIST. RAMP AND REBUILD SIDEWALK TO MATCH TOP GRADE OF SPEED TABLE

EXISTING FIVE GUYS

EXISTING RITE AID

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

NOTES:

1) ALL EXISTING UTILITY DISCONNECTIONS MUST BE COORDINATED WITH RESPECTIVE UTILITY COMPANIES PRIOR TO BEGINNING DEMOLITION ACTIVITIES.

2) ALL DEMOLITION ACTIVITIES ARE TO BE PERFORMED IN STRICT ADHERENCE TO ALL FEDERAL, STATE AND LOCAL REGULATIONS. CONTRACTOR TO INSTALL EROSION CONTROL DEVICES PRIOR TO BEGINNING DEMOLITION ACTIVITIES.

3) CONDUCT ALL DEMOLITION OPERATIONS IN A MANNER THAT WILL PREVENT INJURY, DAMAGE TO STRUCTURES, ADJACENT BUILDINGS AND ALL PERSONS.

4) REFRAIN FROM USING EXPLOSIVES WITHOUT PRIOR WRITTEN CONSENT OF THE DEVELOPER AND APPLICABLE GOVERNMENTAL AUTHORITIES.

5) CONDUCT DEMOLITION SERVICES IN SUCH A MANNER TO INSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, WALKS AND OTHER ADJACENT FACILITIES. DO NOT CLOSE OR OBSTRUCT STREETS, WALKS OR OTHER OCCUPIED FACILITIES WITHOUT PRIOR WRITTEN PERMISSION OF THE DEVELOPER AND APPLICABLE GOVERNMENTAL AUTHORITIES. PROVIDE ALTERNATIVE ROUTES AROUND CLOSED OR OBSTRUCTED TRAFFIC WAYS IF REQUIRED BY APPLICABLE GOVERNMENTAL REGULATIONS.

6) USE WATERING, TEMPORARY ENCLOSURES AND OTHER SUITABLE METHODS, AS NECESSARY TO LIMIT THE AMOUNT OF DUST AND DIRT RISING AND SCATTERING IN THE AIR. CLEAN ADJACENT STRUCTURE AND IMPROVEMENTS OF ALL DUST AND DEBRIS CAUSED BY THE DEMOLITION OPERATIONS. RETURN ALL ADJACENT AREAS TO THE CONDITIONS EXISTING PRIOR TO THE START OF WORK.

7) ACCOMPLISH AND PERFORM THE DEMOLITION IN SUCH A MANNER AS TO PREVENT THE UNAUTHORIZED ENTRY OF PERSONS AT ANY TIME.

8) COMPLETELY FILL BELOW GRADE AREAS AND VOIDS RESULTING FROM THE DEMOLITION OF STRUCTURES AND FOUNDATIONS WITH SOIL MATERIALS CONSISTING OF STONE, GRAVEL AND SAND, FREE FROM DEBRIS, TRASH, FROZEN MATERIALS, ROOTS AND OTHER ORGANIC MATTER. STONES USED WILL NOT BE LARGER THAT 6 INCHES IN DIMENSION. MATERIAL FROM DEMOLITION MAY NOT BE USED AS FILL. PRIOR TO PLACEMENT OF FILL MATERIALS, UNDERTAKE ALL NECESSARY ACTION IN ORDER TO INSURE THAT AREAS TO BE FILLED ARE FREE OF STANDING WATER, FROZEN MATERIAL, TRASH, DEBRIS. PLACE FILL MATERIALS LAYERS NOT EXCEEDING 6 INCHES IN LOOSE DEPTH AND COMPACT EACH LAYER AT PLACEMENT TO 95% OPTIMUM DENSITY, GRADE SURFACE TO MEET ADJACENT CONTOURS AND TO PROVIDE SURFACE DRAINAGE.

9) REMOVE FROM THE DESIGNATED SITE, AT THE EARLIEST POSSIBLE TIME, ALL DEBRIS RUBBISH, SALVAGEABLE ITEMS, HAZARDOUS AND COMBUSTIBLE SERVICES. REMOVED MATERIALS MAY NOT BE STORED, SOLD OR BURNED ON SITE. REMOVAL OF HAZARDOUS AND COMBUSTIBLE MATERIALS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THE PROCEDURES AS AUTHORIZED BY THE FIRE DEPARTMENT OR OTHER APPROPRIATE REGULATORY AGENCIES AND DEPARTMENTS.

10) PROTECT EXISTING DRAINAGE SYSTEM(S) AS NECESSARY TO PREVENT SEDIMENT FROM ENTERING DURING CONSTRUCTION. SEE EROSION & SEDIMENT CONTROL PLAN.

11) ALL WORK WITHIN ROADWAY RIGHT-OF-WAYS TO CONFORM TO CITY AND NHDOT STANDARDS.

12) THE LIMITS OF WORK SHALL BE CLEARLY MARKED IN THE FIELD PRIOR TO THE START OF CONSTRUCTION OR SITE CLEARING.

13) IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO NOTIFY "DIG SAFE" (1-888-344-7233) 72 HOURS PRIOR TO ANY EXCAVATION ON THIS SITE. CONTRACTOR SHALL ALSO NOTIFY LOCAL WATER DEPARTMENT TO MARK OUT THEIR UTILITIES.

14) NOTES ON THIS PLAN THAT READ "TBR" REPRESENT FEATURES TO BE REMOVED. ANY FEATURES NOT LABELED "TBR" OR "TO BE REMOVED" SHALL BE CONSIDERED EXISTING TO REMAIN.

15) SEE LANDSCAPE PLAN FOR LIMITS OF CLEARING AND GRUBBING. AFTER CLEARING, STRIP AND STOCKPILE TOP SOIL PER LANDSCAPE PLAN, IF APPLICABLE.

16) THE SITE CONTRACTOR SHALL TAKE NOTICE THAT THIS SITE MIGHT CONTAIN AN UNMARKED BURIAL GROUND WHICH IS REGISTERED WITH THE STATE AS AN ARCHAEOLOGICAL SITE KNOWN AS THE "WILLEY/LIGHTFORD" BURIAL GROUND. ACCORDING TO RECORDS FROM THE 1800'S, THIS BURIAL PLOT WAS 10'x10' LOCATED IN THE SOUTHWEST CORNER OF THE LOT NEAR PEVERLY HILL ROAD. IF THE CONTRACTOR ENCOUNTERS ANY REMAINS, HE SHALL CEASE OPERATIONS AND NOTIFY THE CITY AND THE NH DIVISION OF HISTORICAL RESOURCES (603-271-2813).

17) THE SITE CONTRACTOR SHALL COORDINATE DEMOLITION ACTIVITIES WITH THE COMFORT INN TO MINIMIZE DISTURBANCE TO THEIR OPERATION.

OWNER OF RECORD:

MAP 252 LOTS 4, 5 & 9
4 AMIGOS LLC
321 LAFAYETTE ROAD, UNIT D
HAMPTON, NH 03842

NO.	DESCRIPTION	BY	DATE

REVISIONS

DEMOLITION PLAN

ASSESSORS MAP 252 - LOTS 4,5 & 9
1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

FRANK C. MONTEIRO No. 7152 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE - 1/21/20

GPI Engineering Design Planning Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: 1"=30'	DATE: JANUARY 20, 2020		DRAWING NO. 4582SP.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CCC	CMT	458219	3 OF 15

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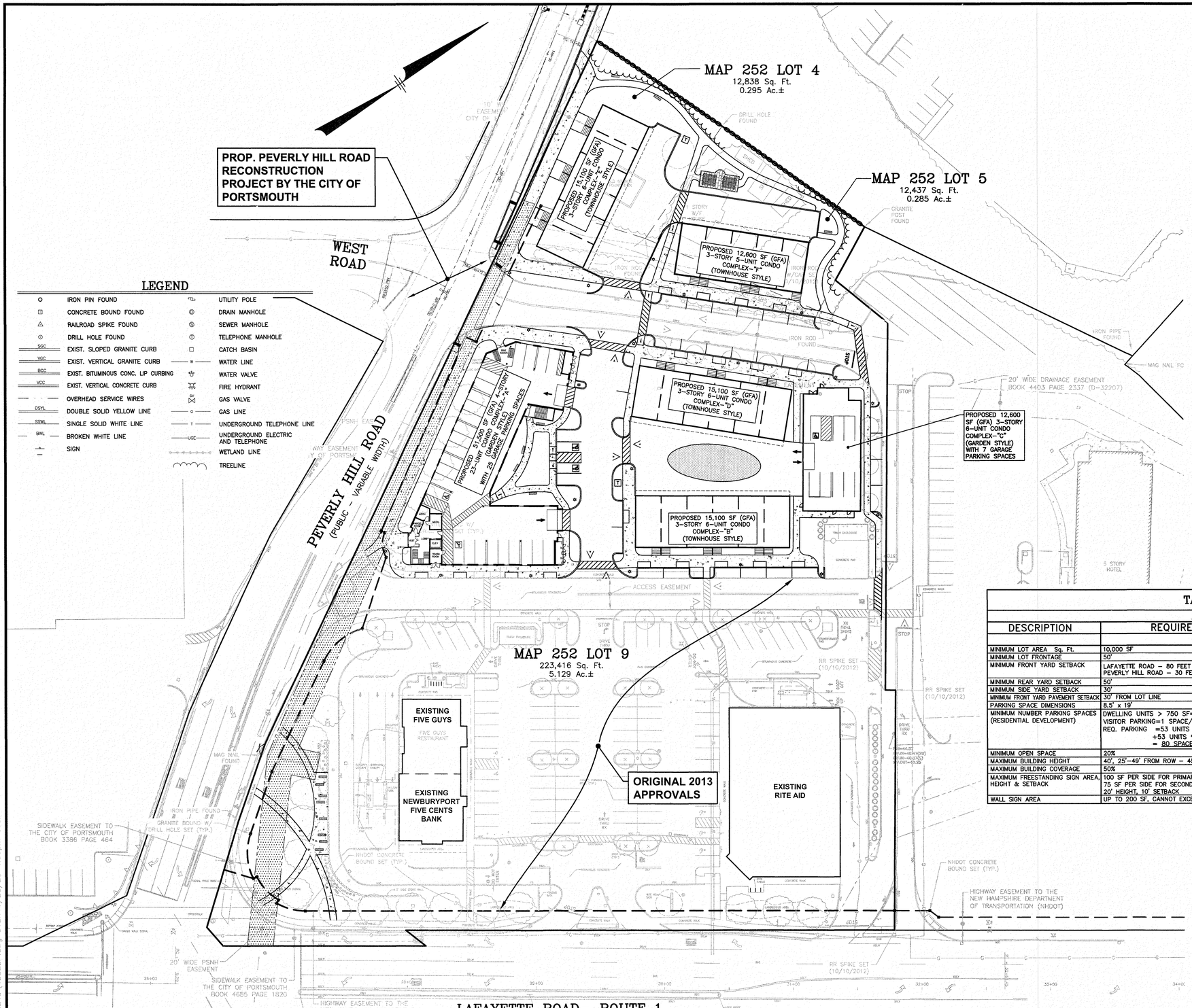

LEGEND

○	IRON PIN FOUND	UP	UTILITY POLE
□	CONCRETE BOUND FOUND	D	DRAIN MANHOLE
△	RAILROAD SPIKE FOUND	S	SEWER MANHOLE
⊙	DRILL HOLE FOUND	T	TELEPHONE MANHOLE
SGC	EXIST. SLOPED GRANITE CURB		CATCH BASIN
VGC	EXIST. VERTICAL GRANITE CURB	W	WATER LINE
BCC	EXIST. BITUMINOUS CONC. LIP CURBING		WATER VALVE
VCC	EXIST. VERTICAL CONCRETE CURB		FIRE HYDRANT
OHW	OVERHEAD SERVICE WIRES	GV	GAS VALVE
DSYL	DOUBLE SOLID YELLOW LINE	G	GAS LINE
SSWL	SINGLE SOLID WHITE LINE	T	UNDERGROUND TELEPHONE LINE
BWL	BROKEN WHITE LINE	UGE	UNDERGROUND ELECTRIC AND TELEPHONE
	SIGN		WETLAND LINE
			TREELINE

GRAPHIC SCALE
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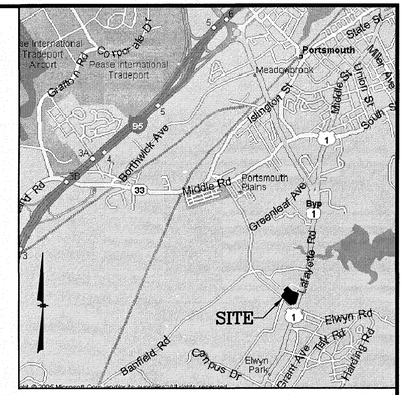
(IN FEET)
1 inch = 40 ft.



LOCATION MAP
(NOT TO SCALE)

NOTES:

1) CURRENT ZONE IS GATEWAY NEIGHBORHOOD MIXED USE CENTER (G2). REFER TO CITY OF PORTSMOUTH ZONING DISTRICTS AND USE REGULATIONS FOR ADDITIONAL INFORMATION.

2) PROPOSED RESIDENTIAL PARKING BREAKDOWN:
= 32 GARAGE SPACES (GARDEN STYLE)
+ 46 GARAGE SPACES (TOWNHOUSE STYLE)
(INCLUDES 2 GARAGE SPACES/UNIT)
+ 28 EXTERIOR SPACES
= 106 SPACES PROPOSED

PROPOSED EXTERIOR PARKING ONLY:
(EXCLUDING GARAGE OR BELOW GRADE PARKING) = 28 SPACES

3) TOTAL REQUIRED OPEN SPACE/COMMUNITY SPACE = 20% (49,738 SF)
TOTAL PROVIDED = 21.4% (53,135 SF)

4) SEE SHEET 5 FOR ADDITIONAL NOTES & INFORMATION.

TABLE OF ZONING REGULATIONS - PORTSMOUTH, NH

ZONE: GATEWAY NEIGHBORHOOD MIXED USE CENTER (G2)

DESCRIPTION	REQUIRED	RETAIL DEVELOPMENT (PROVIDED)	GATEWAY TOWNHOUSE REQUIRED	GATEWAY TOWNHOUSE (PROVIDED)	APARTMENT BUILDING REQUIRED	APARTMENT BUILDING (PROVIDED)
MINIMUM LOT AREA Sq. Ft.	10,000 SF	248,691 SF	10,000 SF	248,691 SF	10,000 SF	248,691 SF
MINIMUM LOT FRONTAGE	50'	>200'	20'	>200'	50'	>200'
MINIMUM FRONT YARD SETBACK	LAFAYETTE ROAD - 80 FEET FROM CENTERLINE PEVERLY HILL ROAD - 30 FEET	84' LAFAYETTE ROAD > 30' PEVERLY ROAD	5' MIN. TO 15' MAX.	25'	10' MIN. TO 30' MAX.	25.2'
MINIMUM REAR YARD SETBACK	50'	> 50'	15'	32.1'	20'	58.3'
MINIMUM SIDE YARD SETBACK	30'	> 30'	10'	24.5'	15'	20'
MINIMUM FRONT YARD PAVEMENT SETBACK	30' FROM LOT LINE	> 30'		> 30'		> 30'
PARKING SPACE DIMENSIONS	8.5' x 19'	9' x 19'		8.5' x 19'		8.5' x 19'
MINIMUM NUMBER PARKING SPACES (RESIDENTIAL DEVELOPMENT)	DWELLING UNITS > 750 SF=1.3 SPACES/UNIT VISITOR PARKING=1 SPACE/5 DWELLING UNITS REQ. PARKING =53 UNITS * 1.3 SP./UNITS +53 UNITS * 1 SP/5 UNITS = 80 SPACES REQUIRED	NO CHANGE TO PREVIOUSLY APPROVED PARKING - 92 SPACES ONSITE		SEE PARKING BREAKDOWN ABOVE		SEE PARKING BREAKDOWN ABOVE
MINIMUM OPEN SPACE	20%	53,135/248,691=21.4%	20%	53,135/248,691=21.4%	20%	53,135/248,691=21.4%
MAXIMUM BUILDING HEIGHT	40', 25'-49' FROM ROW - 45 FEET	< 40'	2.5 STORIES OR 35'	34.2'	4 STORIES OR 50'	45'
MAXIMUM BUILDING COVERAGE	50%	17,186/248,691 = 6.9%	50%	20,675/248,691=8.4%	50%	16,900/248,691=6.8%
MAXIMUM FREESTANDING SIGN AREA, HEIGHT & SETBACK	100 SF PER SIDE FOR PRIMARY SIGN 75 SF PER SIDE FOR SECONDARY SIGN (N/A) 20' HEIGHT, 10' SETBACK	EXISTING SIGNAGE TO REMAIN		N/A		N/A
WALL SIGN AREA	UP TO 200 SF, CANNOT EXCEED AGGREGATE	EXISTING SIGNAGE TO REMAIN		N/A		N/A

NO.	DESCRIPTION	BY	DATE

REVISIONS

SITE OVERVIEW PLAN

ASSESSORS MAP 252 - LOTS 4,5 & 9
1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

OWNER OF RECORD:
MAP 252 LOTS 4, 5 & 9
4 AMIGOS LLC
321 LAFAYETTE ROAD, UNIT D
HAMPTON, NH 03842

STATE OF NEW HAMPSHIRE - FRANK C. MONTEIRO No. 7152 LICENSED PROFESSIONAL ENGINEER - 1/21/20

GPI
Engineering
Design
Planning
Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: 1"=40'	DATE: JANUARY 20, 2020		DRAWING NO. 4582SP.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CCC	CMT	458219	4 OF 15

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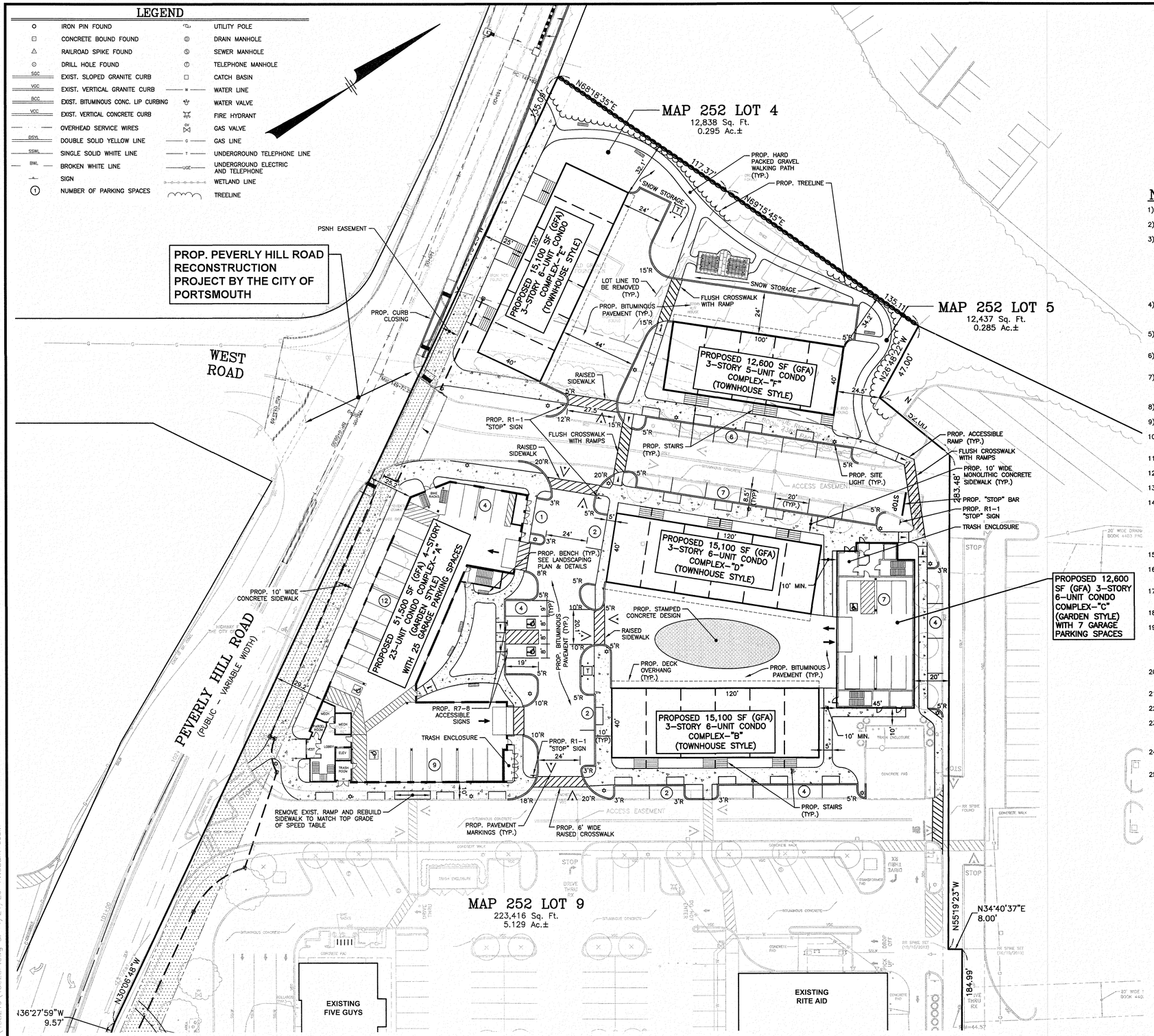
LEGEND

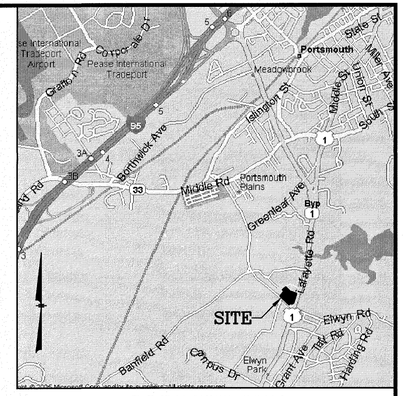
○	IRON PIN FOUND	UP	UTILITY POLE
□	CONCRETE BOUND FOUND	D	DRAIN MANHOLE
△	RAILROAD SPIKE FOUND	S	SEWER MANHOLE
⊙	DRILL HOLE FOUND	T	TELEPHONE MANHOLE
SGC	EXIST. SLOPED GRANITE CURB	CB	CATCH BASIN
VGC	EXIST. VERTICAL GRANITE CURB	W	WATER LINE
BCC	EXIST. BITUMINOUS CONC. LIP CURBING	WV	WATER VALVE
VCC	EXIST. VERTICAL CONCRETE CURB	FH	FIRE HYDRANT
	OVERHEAD SERVICE WIRES	GV	GAS VALVE
DSYL	DOUBLE SOLID YELLOW LINE	G	GAS LINE
SSWL	SINGLE SOLID WHITE LINE	T	UNDERGROUND TELEPHONE LINE
BWL	BROKEN WHITE LINE	UGE	UNDERGROUND ELECTRIC AND TELEPHONE
	SIGN		WETLAND LINE
(1)	NUMBER OF PARKING SPACES		TREELINE



GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.



LOCATION MAP

(NOT TO SCALE)

NOTES:

1) TAX MAP 252 LOTS 4, 5 & 9

2) ZONING DISTRICT: GATEWAY NEIGHBORHOOD MIXED USE CENTER (G2)

3) LOT 9 AREA= 223,416 Sq.Ft. (EXISTING)
= 5.129 Ac.±

LOT 4 AREA = 12,838 Sq.Ft. (EXISTING)
= 0.295 Ac.±

LOT 5 AREA = 12,437 Sq.Ft. (EXISTING)
= 0.285 Ac.±

4) EXISTING USE: VACANT REAR PARCEL ON PORTION OF LOT 9 AND RESIDENTIAL DWELLING ON LOTS 4 & 5. (FORMER YOKEN'S RESTAURANT AND FUNCTION FACILITY)
PROPOSED USE: MULTI-UNIT RESIDENTIAL DEVELOPMENT

5) ALL BUILDINGS AND SITE CONSTRUCTION SHALL COMPLY WITH THE RULES AND REGULATIONS OF THE AMERICANS WITH DISABILITIES ACT (ADA) AS PUBLISHED IN THE FEDERAL REGISTER, REVISED IN 2010.

6) THE LOCATIONS OF EXISTING SUBSURFACE UTILITIES SHOWN ON THIS PLAN WERE COMPILED FROM AVAILABLE RECORD DRAWINGS AND ARE NOT WARRANTED TO BE CORRECT. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING SUBSURFACE UTILITIES PRIOR TO PERFORMING ANY WORK.

7) WRITTEN DIMENSIONS ON THIS PLAN TAKE PRECEDENCE OVER SCALED DIMENSIONS. THE CONTRACTOR SHALL USE CAUTION WHEN SCALING REPRODUCED PLANS. IN THE EVENT OF A CONFLICT BETWEEN THIS PLAN SET AND ANY OTHER DRAWINGS AND/OR SPECIFICATIONS, THE ENGINEER SHALL BE NOTIFIED BY THE CONTRACTOR.

8) THE CONTRACTOR SHALL CALL AND COORDINATE WITH DIGSAFE 1-888-344-7233 (72 HOURS PRIOR TO ANY EXCAVATION).

9) ALL CONSTRUCTION SHALL CONFORM TO THE APPLICABLE REGULATIONS AND STANDARDS OF THE CITY OF PORTSMOUTH AND THE STATE OF NEW HAMPSHIRE.

10) THE SITE IS NOT WITHIN THE 100 YEAR FLOOD BOUNDARY AS SHOWN ON THE FLOOD INSURANCE RATE MAP FOR ROCKINGHAM COUNTY, NEW HAMPSHIRE PANEL 270 OF 681, MAP NUMBER 33015C0270E, EFFECTIVE DATE: MAY 17, 2005.

11) ALL CONSTRUCTION SHALL CONFORM TO THESE PLANS AND THE STANDARD CONSTRUCTION DRAWINGS AS SUPPLIED BY RITE AID CORPORATION.

12) A SIGN PERMIT SHALL BE OBTAINED PRIOR TO INSTALLATION.

13) PROPOSED SNOW STORAGE AREAS AS SHOWN. ANY EXCESS SNOW TO BE TRUCKED OFF-SITE.

14) THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION AND FOR CONDITIONS AT THE SITE. THESE PLANS, PREPARED BY GREENMAN-PEDERSEN, INC., DO NOT EXTEND TO OR INCLUDE SYSTEMS PERTAINING TO THE SAFETY OF THE CONSTRUCTION CONTRACTOR OR THEIR EMPLOYEES, AGENTS OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE SEAL OF THE SURVEYOR AND/OR ENGINEER AS INCLUDED IN THE PLAN SET DOES NOT EXTEND TO ANY SUCH SAFETY SYSTEMS THAT MAY NOW OR HEREAFTER BE INCORPORATED INTO THESE PLANS. THE CONSTRUCTION CONTRACTOR SHALL PREPARE AND/OR OBTAIN THE APPROPRIATE SAFETY SYSTEMS WHICH MAY BE REQUIRED BY THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) AND/OR LOCAL REGULATIONS.

15) ALL PROPOSED UTILITIES SHALL BE UNDERGROUND.

16) THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING ON-SITE PAVEMENT, CONCRETE PADS, BRICKS, FILL PILES, AND ALL OTHER EXISTING SURFACE AND UNDERGROUND STRUCTURES WHICH ARE NOT RE-USED AS PART OF THE CONSTRUCTION. SEE DEMOLITION PLAN.

17) ALL TRAFFIC CONTROL AND TEMPORARY CONSTRUCTION SIGNAGE ARRANGEMENTS ACCEPTABLE TO THE NHDOT AND CITY DEPARTMENT OF PUBLIC WORKS SHALL BE EMPLOYED DURING OPERATIONS WITHIN THE PUBLIC RIGHT-OF-WAY.

18) ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

19) THE SITE CONTRACTOR SHALL TAKE NOTICE THAT THIS SITE IS REGISTERED WITH THE STATE AS AN ARCHAEOLOGICAL SITE KNOWN AS THE "WILLEY/LIGHTFORD" BURIAL GROUND. THE APPLICANT HAS CONSULTED WITH INDEPENDENT ARCHAEOLOGICAL CONSULTING, LLC (IAC) OF PORTSMOUTH, NH TO FURTHER RESEARCH THE ALLEGED UNMARKED BURIAL GROUND. A SUMMARY REPORT WAS PREPARED BY IAC, DATED 6/11/12, WHICH OUTLINES THE GROUND PENETRATING RADAR TECHNOLOGIES THAT WERE USED TO IDENTIFY THE POTENTIAL BURIAL GROUND WHICH WAS SUBSEQUENTLY EXCAVATED. THE ARCHAEOLOGISTS CONCLUDED THAT THERE WAS NO BURIAL GROUND ON SITE.

20) THE SITE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES WITH THE COMFORT INN TO MAINTAIN ACCESS AND MINIMIZE DISRUPTION TO THEIR BUSINESS OPERATION.

21) ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

22) THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.

23) 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.

24) EXISTING IMPERVIOUS AREA = 115,532 SF± (46.5%)
PROPOSED IMPERVIOUS AREA = 195,556 SF± (78.6%)

25) REQUIRED STATE/FEDERAL PERMITS:
NHDES ALTERATION OF TERRAIN (AOT): PENDING
EPA CONSTRUCTION GENERAL PERMIT (SWPPP): PENDING
NHDES SEWER EXTENSION PERMIT: PENDING
NHDOT DRIVEWAY PERMIT: PENDING

OWNER OF RECORD:

MAP 252 LOTS 4, 5 & 9
4 AMIGOS LLC
321 LAFAYETTE ROAD, UNIT D
HAMPTON, NH 03842

NO.	DESCRIPTION	BY	DATE

REVISIONS

SITE PLAN

ASSESSORS MAP 252 – LOTS 4,5 & 9
1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

STATE OF NEW HAMPSHIRE - FRANK C. MONTEIRO No. 7152 LICENSED PROFESSIONAL ENGINEER - 1/24/20

GPI
Engineering
Design
Planning
Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: 1"=30'	DATE: JANUARY 20, 2020		DRAWING NO. 4582SP.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CCC	CMT	458219	5 OF 15

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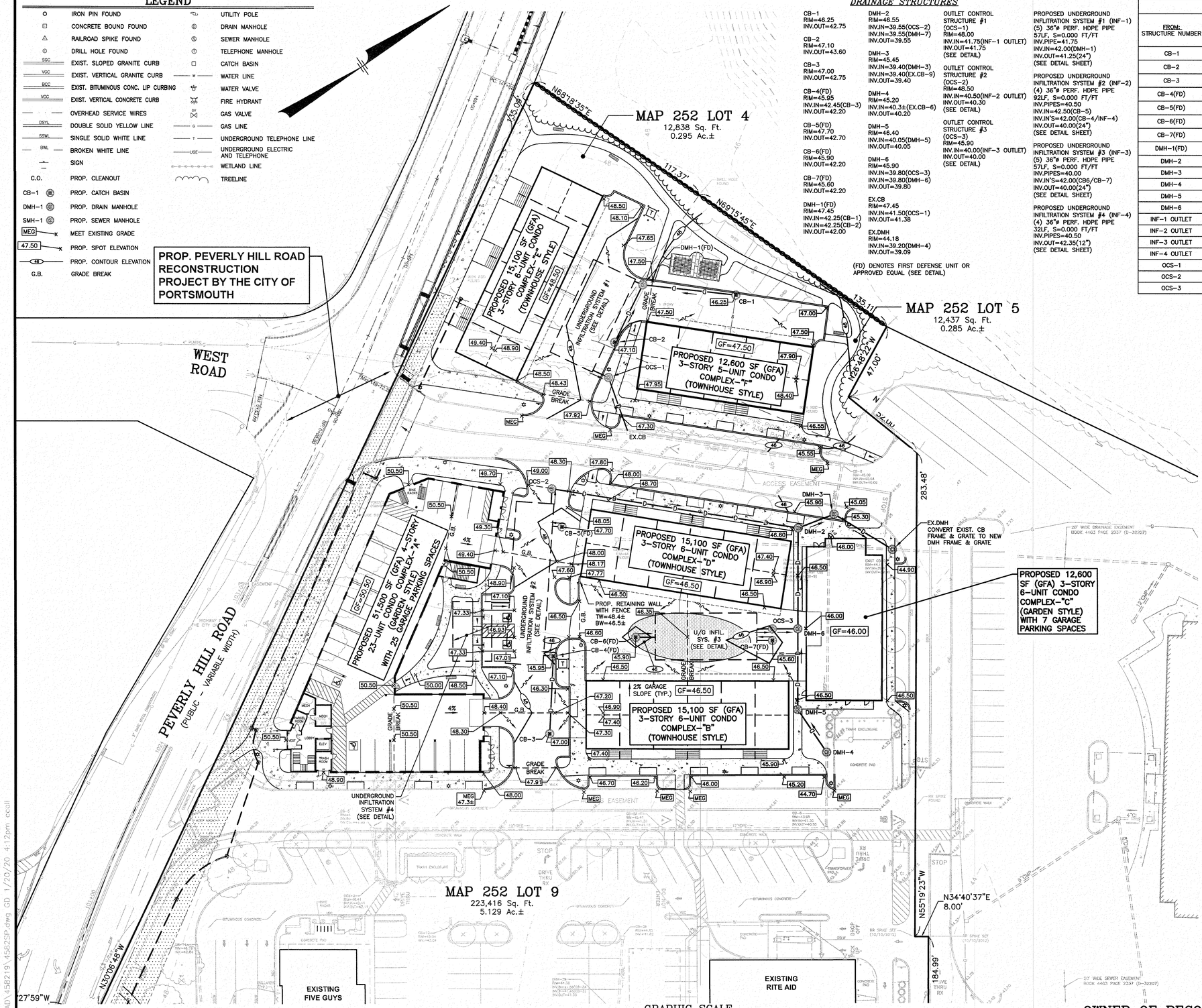
LEGEND

○	IRON PIN FOUND		UTILITY POLE
□	CONCRETE BOUND FOUND		DRAIN MANHOLE
△	RAILROAD SPIKE FOUND		SEWER MANHOLE
⊙	DRILL HOLE FOUND		TELEPHONE MANHOLE
SGC	EXIST. SLOPED GRANITE CURB		CATCH BASIN
VGC	EXIST. VERTICAL GRANITE CURB	W	WATER LINE
BCC	EXIST. BITUMINOUS CONC. LIP CURBING		WATER VALVE
VCC	EXIST. VERTICAL CONCRETE CURB		FIRE HYDRANT
OHW	OVERHEAD SERVICE WIRES		GAS VALVE
DSYL	DOUBLE SOLID YELLOW LINE	G	GAS LINE
SSWL	SINGLE SOLID WHITE LINE	T	UNDERGROUND TELEPHONE LINE
BWL	BROKEN WHITE LINE	UGE	UNDERGROUND ELECTRIC AND TELEPHONE
	SIGN		WETLAND LINE
C.O.	PROP. CLEANOUT		TREELINE
CB-1	PROP. CATCH BASIN		
DMH-1	PROP. DRAIN MANHOLE		
SMH-1	PROP. SEWER MANHOLE		
MEG	MEET EXISTING GRADE		
47.50	PROP. SPOT ELEVATION		
48	PROP. CONTOUR ELEVATION		
G.B.	GRADE BREAK		

PROP. PEVERLY HILL ROAD RECONSTRUCTION PROJECT BY THE CITY OF PORTSMOUTH



DRAINAGE STRUCTURES

CB-1
RIM=46.25
INV.OUT=42.75

CB-2
RIM=47.10
INV.OUT=43.60

CB-3
RIM=47.00
INV.OUT=42.75

CB-4(FD)
RIM=45.95
INV.IN=42.45(CB-3)
INV.OUT=42.20

CB-5(FD)
RIM=47.70
INV.OUT=42.70

CB-6(FD)
RIM=45.90
INV.OUT=42.20

CB-7(FD)
RIM=45.60
INV.OUT=42.20

DMH-1(FD)
RIM=47.45
INV.IN=42.25(CB-1)
INV.IN=42.25(CB-2)
INV.OUT=42.00

DMH-2
RIM=46.55
INV.IN=39.55(OCS-2)
INV.IN=39.55(DMH-7)
INV.OUT=39.55

DMH-3
RIM=45.45
INV.IN=39.40(DMH-3)
INV.IN=39.40(EX.CB-9)
INV.OUT=39.40

DMH-4
RIM=45.20
INV.IN=40.3±(EX.CB-6)
INV.OUT=40.20

DMH-5
RIM=46.40
INV.IN=40.05(DMH-5)
INV.OUT=40.05

DMH-6
RIM=45.90
INV.IN=39.80(OCS-3)
INV.IN=39.80(DMH-6)
INV.OUT=39.80

EX.CB
RIM=47.45
INV.IN=41.50(OCS-1)
INV.OUT=41.38

EX.DMH
RIM=44.18
INV.IN=39.20(DMH-4)
INV.OUT=39.09

OUTLET CONTROL STRUCTURE #1 (OCS-1)
RIM=48.00
INV.IN=41.75(INF-1 OUTLET)
INV.OUT=41.75
(SEE DETAIL)

OUTLET CONTROL STRUCTURE #2 (OCS-2)
RIM=48.50
INV.IN=40.50(INF-2 OUTLET)
INV.OUT=40.30
(SEE DETAIL)

OUTLET CONTROL STRUCTURE #3 (OCS-3)
RIM=45.90
INV.IN=40.00(INF-3 OUTLET)
INV.OUT=40.00
(SEE DETAIL)

(FD) DENOTES FIRST DEFENSE UNIT OR APPROVED EQUAL (SEE DETAIL)

PROPOSED UNDERGROUND INFILTRATION SYSTEM #1 (INF-1)
(5) 36"ø PERF. HDPE PIPE
57LF, S=0.000 FT/FT
INV.PIPE=41.75
INV.IN=42.00(DMH-1)
INV.OUT=41.25(24")
(SEE DETAIL SHEET)

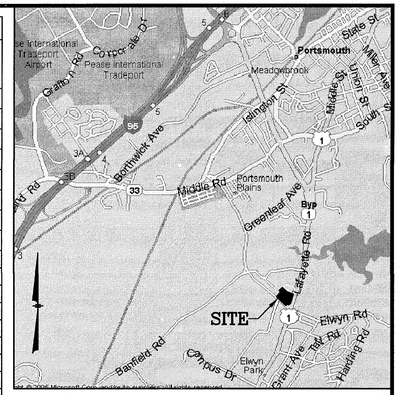
PROPOSED UNDERGROUND INFILTRATION SYSTEM #2 (INF-2)
(4) 36"ø PERF. HDPE PIPE
92LF, S=0.000 FT/FT
INV.PIPES=40.50
INV.IN=42.50(CB-5)
INV.IN'S=42.00(CB-4/INF-4)
INV.OUT=40.00(24")
(SEE DETAIL SHEET)

PROPOSED UNDERGROUND INFILTRATION SYSTEM #3 (INF-3)
(5) 36"ø PERF. HDPE PIPE
57LF, S=0.000 FT/FT
INV.PIPES=40.00
INV.IN'S=42.00(CB6/CB-7)
INV.OUT=40.00(24")
(SEE DETAIL SHEET)

PROPOSED UNDERGROUND INFILTRATION SYSTEM #4 (INF-4)
(4) 36"ø PERF. HDPE PIPE
32LF, S=0.000 FT/FT
INV.PIPES=40.50
INV.OUT=42.35(12")
(SEE DETAIL SHEET)

DRAINAGE PIPE SCHEDULE

FROM: STRUCTURE NUMBER	PIPE SIZE (INCHES)	TYPE OF PIPE	APPROX. PIPE LENGTH (FEET)	SLOPE OF PIPE (FT./FT.)	TO: STRUCTURE NUMBER
CB-1	12	HDPE	55	0.009	DMH-1(FD)
CB-2	12	HDPE	37	0.036	DMH-1(FD)
CB-3	12	HDPE	45	0.007	CB-4(FD)
CB-4(FD)	12	HDPE	6	0.034	INF-2 INLET-1
CB-5(FD)	12	HDPE	6	0.035	INF-2 INLET-2
CB-6(FD)	12	HDPE	12	0.017	INF-3 INLET-1
CB-7(FD)	12	HDPE	9	0.022	INF-3 INLET-2
DMH-1(FD)	12	HDPE	5	0.047	INF-1 INLET
DMH-2	18	HDPE	23	0.007	DMH-3
DMH-3	18	HDPE	40	0.005	EX.DMH
DMH-4	18	HDPE	30	0.005	DMH-5
DMH-5	18	HDPE	47	0.005	DMH-6
DMH-6	18	HDPE	59	0.004	DMH-2
INF-1 OUTLET	24	HDPE	10	0.000	OCS-1
INF-2 OUTLET	24	HDPE	9	0.000	OCS-2
INF-3 OUTLET	24	HDPE	9	0.000	OCS-3
INF-4 OUTLET	12	HDPE	10	0.033	INF-2 INLET 3
OCS-1	12	HDPE	33	0.008	EX.CB
OCS-2	15	HDPE	147	0.005	DMH-2
OCS-3	12	HDPE	15	0.013	DMH-6



LOCATION MAP
(NOT TO SCALE)

NOTES:

1) ALL SITE DRAINAGE PIPE SHALL BE CORRUGATED HIGH-DENSITY POLYETHYLENE PIPE WITH STANDARD JOINTS, DUAL-WALL, SMOOTH INTERIOR AS MANUFACTURED BY ADS, INC., OR APPROVED EQUAL, UNLESS OTHERWISE NOTED ON PLAN.
2) ALL ROOF DRAIN PIPE SHALL BE MINIMUM 6" PVC(SDR-35).
3) ELEVATIONS ARE BASED ON NAVD 1988 DATUM.
4) ALL PROPOSED ELEVATIONS AS SHOWN ARE BOTTOM OF CURB ELEVATIONS, UNLESS OTHERWISE NOTED.
5) ANY UTILITY FIELD ADJUSTMENTS SHALL BE APPROVED BY THE LOCAL AUTHORITIES AND THE DEVELOPER PRIOR TO INSTALLATION.
6) THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE ONLY. THE CONTRACTOR IS TO VERIFY EXACT LOCATION PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO NOTIFY THE DESIGN ENGINEER OF ANY DISCREPANCIES.
7) THE CONTRACTOR SHALL CALL AND COORDINATE WITH DIG-SAFE (1-888-344-7233) 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION.
8) THIS SITE WILL REQUIRE A USEPA NPDES PERMIT FOR STORMWATER DISCHARGE FOR THE SITE CONSTRUCTION SINCE THE DISTURBANCE EXCEEDS ONE ACRE. THE CONSTRUCTION SITE OPERATOR SHALL DEVELOP AND IMPLEMENT A CONSTRUCTION STORM WATER POLLUTION PREVENTION PLAN (SWPPP), WHICH SHALL REMAIN ON SITE AND MADE ACCESSIBLE TO THE PUBLIC. A COMPLETED NOTICE OF TERMINATION (NOT) SHALL BE SUBMITTED TO NPDES PERMITTING AUTHORITY WITHIN 30 DAYS AFTER EITHER OF THE FOLLOWING CONDITIONS HAVE BEEN MET: FINAL STABILIZATION HAS BEEN ACHIEVED ON ALL PORTIONS OF THE SITE FOR WHICH THE PERMITTEE IS RESPONSIBLE; OR ANOTHER OPERATOR/PERMITTEE HAS ASSUMED CONTROL OVER ALL AREAS OF THE SITE THAT HAVE NOT BEEN FINALLY STABILIZED.
9) SEE UTILITIES PLAN FOR SERVICE CONNECTIONS.
10) CONTRACTOR TO USE EXTREME CAUTION TO INSURE THAT NO PONDING OCCURS AT PROPOSED DRIVEWAYS.
11) ALL CONSTRUCTION SHALL CONFORM TO MUNICIPAL DPW AND ALL APPLICABLE STATE AND FEDERAL STANDARDS. ALL CASTINGS ARE PER DPW REQUIREMENTS.
12) ALL TRAFFIC CONTROL AND TEMPORARY CONSTRUCTION SIGNAGE ARRANGEMENTS, ACCEPTABLE TO THE PORTSMOUTH DEPARTMENT OF PUBLIC WORKS AND NHDOT, SHALL BE EMPLOYED DURING OPERATIONS WITHIN THE PUBLIC RIGHT-OF-WAY.
13) ALL ADA ACCESSIBLE WALKWAYS CANNOT EXCEED 5% RUNNING SLOPE AND 2% CROSS SLOPE, RAMPS CANNOT EXCEED 8.33% RUNNING SLOPE AND 2% CROSS SLOPE, AND HC PARKING STALLS AND ACCESS AISLES CANNOT EXCEED 2% SLOPE IN ANY DIRECTION. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL NOTIFY THIS OFFICE OF ANY DISCREPANCIES.
14) SEE EROSION & SEDIMENT CONTROL PLAN FOR CONSTRUCTION SEQUENCE AND EROSION CONTROL MEASURES.
15) THE SITE WILL REQUIRE A NHDES ALTERATION OF TERRAIN (AOT) PERMIT SINCE THE PROJECT WILL DISTURB MORE THAN 100,000 SF OF TERRAIN. CONTRACTOR SHALL COMPLY WITH ALL CONDITIONS IN THAT PERMIT.
16) THE GENERAL CONTRACTOR IS TO PROVIDE 2" RIGID POLYSTYRENE THERMAL INSULATION WITH A MINIMUM "R" VALUE OF 10 AT LOCATIONS WHERE THERE IS LESS THAN 3' OF COVER OVER STORM DRAINS. SEE DETAIL SHEET FOR TRENCH SECTION.
17) ALL CATCH BASINS SHALL BE FITTED WITH A OIL-WATER-DEBRIS HOODS ON THE OUTLET PIPE.
18) FOR DRAINAGE STRUCTURE DETAILS SEE DETAIL SHEETS.
19) ALL PIPE DATA IS CALCULATED TO CENTER OF STRUCTURE, TYP.
20) CONTRACTOR TO REFER TO THE OPERATION & MAINTENANCE (O&M) MANUAL FOR STORMWATER MANAGEMENT SYSTEMS FOR SITE MAINTENANCE DURING AND AFTER CONSTRUCTION.
21) ALL UNDERGROUND SYSTEMS TO BE CONSTRUCTED WITH RISERS AND CLEANOUTS.

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

OWNER OF RECORD:
MAP 252 LOTS 4, 5 & 9
4 AMIGOS LLC
321 LAFAYETTE ROAD, UNIT D
HAMPTON, NH 03842

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

GRADING & DRAINAGE PLAN

ASSESSORS MAP 252 - LOTS 4,5 & 9
1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

STATE OF NEW HAMPSHIRE - FRANK C. MONTEIRO No. 7152 LICENSED PROFESSIONAL ENGINEER - 1/21/20

GPI Engineering Design Planning Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: 1"=30'	DATE: JANUARY 20, 2020		DRAWING NO. 4582SP.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CCC	CMT	458219	6 OF 15

LEGEND

○	IRON PIN FOUND	UP	UTILITY POLE
□	CONCRETE BOUND FOUND	D	DRAIN MANHOLE
△	RAILROAD SPIKE FOUND	S	SEWER MANHOLE
⊙	DRILL HOLE FOUND	T	TELEPHONE MANHOLE
SGC	EXIST. SLOPED GRANITE CURB	CB	CATCH BASIN
VGC	EXIST. VERTICAL GRANITE CURB	W	WATER LINE
BCC	EXIST. BITUMINOUS CONC. LIP CURBING		WATER VALVE
VCC	EXIST. VERTICAL CONCRETE CURB		FIRE HYDRANT
OHW	OVERHEAD SERVICE WIRES		GAS VALVE
DSYL	DOUBLE SOLID YELLOW LINE	G	GAS LINE
SSWL	SINGLE SOLID WHITE LINE	T	UNDERGROUND TELEPHONE LINE
BWL	BROKEN WHITE LINE	UGE	UNDERGROUND ELECTRIC AND TELEPHONE
	SIGN		WETLAND LINE
C.O.	PROP. CLEANOUT		TREELINE
CB–1	PROP. CATCH BASIN		
DMH–1	PROP. DRAIN MANHOLE		
SMH–1	PROP. SEWER MANHOLE		
	PROP. GATE VALVE		

PROP. PEVERLY HILL ROAD RECONSTRUCTION PROJECT BY THE CITY OF PORTSMOUTH

MAP 252 LOT 4
12,838 Sq. Ft.
0.295 Ac.±

MAP 252 LOT 5
12,437 Sq. Ft.
0.285 Ac.±

MAP 252 LOT 9
223,416 Sq. Ft.
5.129 Ac.±

PROPOSED 15,100 SF (GFA) 3–STORY 6–UNIT CONDO COMPLEX–"F" (TOWNHOUSE STYLE) GF=48.50

PROPOSED 12,600 SF (GFA) 3–STORY 5–UNIT CONDO COMPLEX–"E" (TOWNHOUSE STYLE) GF=47.50

PROPOSED 15,100 SF (GFA) 3–STORY 6–UNIT CONDO COMPLEX–"D" (TOWNHOUSE STYLE) GF=46.50

PROPOSED 51,500 SF (GFA) 4–STORY 23–UNIT CONDO COMPLEX–"A" (GARDEN STYLE) WITH 25 GARAGE PARKING SPACES GF=50.50

PROPOSED 15,100 SF (GFA) 3–STORY 6–UNIT CONDO COMPLEX–"B" (TOWNHOUSE STYLE) GF=46.50

PROPOSED 12,600 SF (GFA) 3–STORY 6–UNIT CONDO COMPLEX–"C" (GARDEN STYLE) WITH 7 GARAGE PARKING SPACES GF=46.00

EXISTING FIVE GUYS

EXISTING RITE AID

WEST ROAD

PEVERLY HILL ROAD (PUBLIC – VARIABLE WIDTH)

N68°18'35"E 155.08'

N69°15'45"E 117.37'

N26°48'22"W 135.11'

N55°19'23"W 283.48'

N34°40'37"E 8.00'

N55°19'23"W 184.99'

N30°06'48"W

N36°27'59"W 9.57'

20' WIDE DRAINAGE EASEMENT BOOK 4403 PAGE 2337 (D–32207)

20' WIDE SEWER EASEMENT BOOK 4403 PAGE 2337 (D–32207)

ACCESS EASEMENT

UNDERGROUND INFILTRATION SYSTEM #1 (SEE DETAIL)

UNDERGROUND INFILTRATION SYSTEM #2 (SEE DETAIL)

UNDERGROUND INFILTRATION SYSTEM #3 (SEE DETAIL)

UNDERGROUND INFILTRATION SYSTEM #4 (SEE DETAIL)

U/G INFIL. SYS. #3 (SEE DETAIL)

PROP. TRANSFORMER PAD WITH BOLLARDS

PROP. UNDERGROUND ELECTRIC & TELEPHONE SERVICE

PROP. TAPPING VALVE & SLEEVE (TYP.)

6"PVC SEWER SERVICE INV.=45.00 50LF, S=0.045

PROP. GAS SERVICE (TYP.)

PROP. UTILITY CROSSING INV.=40.3±(D) INV.=42.5±(S)

PROP. UTILITY CROSSING INV.=43.4±(S) INV.=41.7±(D)

6"PVC SEWER SERVICE INV.=44.00 35LF, S=0.034

6"PVC SEWER SERVICE INV.=43.00 19LF, S=0.020

PROP. HYDRANT & GATE VALVE (TYP.)

PROP. 800 AMP POLE MOUNTED TRANSFORMER. CONTRACTOR TO COORDINATE SIZING & LOCATION WITH UTILITY COMPANIES PRIOR TO CONSTRUCTION.

PROP. 6" FIRE SERVICE

PROP. 2" DOMESTIC WATER SERVICE

PROP. UNDERGROUND ELECTRIC & TELEPHONE SERVICE

PROP. 8" CLDI WATER MAIN

PROP. UTILITY CROSSING INV.=40.3±(D) INV.=42.2±(S)

PROP. UTILITY CROSSING INV.=40.1±(D) INV.=42.2±(S)

PROP. 6"PVC SERVICE (TYP.)

EXIST. 6" SEWER STUB. CONTRACTOR TO VERIFY ELEVATION & LOCATION AND UPGRADE TO A NEW 8"PVC SEWER LINE

EXIST. 6" SEWER STUB, INV.=40.45 (TAKEN FROM DESIGN PLANS) CONTRACTOR TO VERIFY ELEVATION/LOCATION & MODIFY BASED ON NEW BUILDING 'A' CONNECTION

6"PVC SEWER SERVICE INV.=43.00 27LF, S=0.020

PROP. SITE LIGHT (TYP.)

EX.SMH

EX.CB

EX.DMH

SMH–1 SMH–2 SMH–3 SMH–4

DMH–1(FD) DMH–2 DMH–3 DMH–4 DMH–5 DMH–6

CB–1 CB–2 CB–3 CB–4(FD) CB–5(FD) CB–6(FD) CB–7(FD)

OCS–1 OCS–2 OCS–3

10' MIN. (TYP.)

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

SEWER STRUCTURES

EX.SMH
RIM=45.74
INV.IN=38.54(PROP.)
INV.=38.54(EXIST.)

SMH–1
RIM=46.20
INV.IN=38.92
INV.OUT=38.82

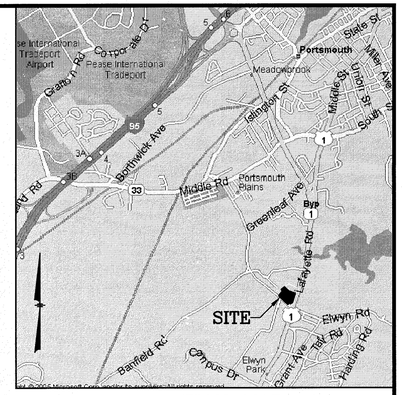
SMH–2
RIM=47.80
INV.IN=39.64
INV.OUT=39.54

SMH–3
RIM=48.20
INV.IN=42.50(DROP)
INV.IN=40.52
INV.OUT=40.42

SMH–4
RIM=47.85
INV.OUT=42.83

SEWER PIPE SCHEDULE

FROM: STRUCTURE NUMBER	PIPE SIZE (INCHES)	TYPE OF PIPE	APPROX. PIPE LENGTH (FEET)	SLOPE OF PIPE (FT./FT.)	TO: STRUCTURE NUMBER
SMH–1	8	HDPE	55	0.005	EX.SMH
SMH–2	8	HDPE	125	0.005	SMH–1
SMH–3	8	HDPE	155	0.005	SMH–2
SMH–4	8	HDPE	65	0.005	SMH–3



LOCATION MAP
(NOT TO SCALE)

NOTES:

1) ALL SANITARY SEWER PIPE SHALL BE PVC (SDR–35), UNLESS OTHERWISE NOTED.
2) ALL WATER PIPE SHALL BE COPPER OR CLDIP, AS NOTED ON PLAN.
3) ANY UTILITY FIELD ADJUSTMENTS SHALL BE APPROVED BY THE LOCAL AUTHORITIES AND THE DEVELOPER PRIOR TO INSTALLATION.
4) THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE ONLY. THE CONTRACTOR IS TO VERIFY EXACT LOCATION PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO NOTIFY THE DESIGN ENGINEER OF ANY DISCREPANCIES.
5) ALL CONSTRUCTION SHALL CONFORM TO MUNICIPAL DPW AND ALL APPLICABLE STATE AND FEDERAL STANDARDS.
6) HE CONTRACTOR SHALL CALL AND COORDINATE WITH DIG–SAFE (1–888–344–7233) PRIOR TO COMMENCING ANY EXCAVATION.
7) ALL WATER AND SEWER CONSTRUCTION SHALL CONFORM TO DEPARTMENT OF PUBLIC WORKS SPECIFICATIONS.
8) ALL ELECTRIC, TELEPHONE AND CABLE TV LINES ARE TO BE UNDERGROUND AND INSTALLED IN CONFORMANCE WITH APPLICABLE UTILITY CO. SPECIFICATIONS. ALL BUILDINGS SHALL BE CONNECTED TO THE CITY FIRE ALARM SYSTEM.
9) THE CONTRACTOR IS TO COORDINATE WITH THE MUNICIPAL DPW REGARDING WATER PRESSURE AT SERVICE. THE CONTRACTOR IS TO VERIFY IF PRESSURE REDUCING VALVE IS REQUIRED.
10) ANY UTILITIES TO BE TAKEN OUT OF SERVICE SHALL BE DISCONNECTED AS DIRECTED BY UTILITY COMPANY AND LOCAL DPW.
11) SEE GRADING & DRAINAGE PLAN FOR DRAINAGE INSTALLATION DETAILS.
12) A MINIMUM OF 18" OF VERTICAL SEPARATION SHALL BE MAINTAINED BETWEEN BOTTOM OF WATER MAIN AND TOP OF SEWER, AND AT ALL DRAINAGE PIPE CROSSINGS. A MINIMUM OF 10' HORIZONTAL SEPARATION SHALL BE MAINTAINED BETWEEN ALL WATER AND SEWER MAINS (INCLUDING SERVICE CONNECTIONS), AND ALL DRAIN PIPE AND SEWER MAINS.
13) THIS SITE WILL REQUIRE A NHDES WASTEWATER CONNECTION PERMIT. THE CONTRACTOR SHALL COMPLY WITH ALL CONDITIONS IN THAT PERMIT. THE CONTRACTOR SHALL ALSO COMPLY WITH THE TECHNICAL SPECIFICATIONS AS PREPARED BY THIS OFFICE, WHICH ARE PART OF THIS PERMIT.

PUBLIC UTILITIES

UTILITIES	AVAILABLE
(SEWER) CITY OF PORTSMOUTH PUBLIC WORKS DEPT., PETER RICE 603–427–1530	YES
(WATER) CITY OF PORTSMOUTH PUBLIC WORKS DEPT., PETER RICE 603–427–1530	YES
(GAS) NORTHERN UTILITIES, DAVID BEAULIEU 603–294–5144	YES
(ELECTRIC) PUBLIC SERVICE OF NEW HAMPSHIRE (PSNH), MARK COLLINS 603–332–4227 x5325	YES
(TELEPHONE) FAIRPOINT COMMUNICATIONS, DAVID KESTNER 623–743–1114	YES

NO.	DESCRIPTION	BY	DATE

REVISIONS

UTILITY PLAN

ASSESSORS MAP 252 – LOTS 4,5 & 9
1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

OWNER OF RECORD:
MAP 252 LOTS 4, 5 & 9
4 AMIGOS LLC
321 LAFAYETTE ROAD, UNIT D
HAMPTON, NH 03842

STATE OF NEW HAMPSHIRE · FRANK C. MONTEIRO No. 7152 LICENSED PROFESSIONAL ENGINEER · 1/21/20

GPI Engineering Design Planning Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: 1"=30'	DATE: JANUARY 20, 2020		DRAWING NO. 458252P.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CCC	CMT	458219	7 OF 15

LEGEND

O	IRON PIN FOUND	UP	UTILITY POLE
□	CONCRETE BOUND FOUND	D	DRAIN MANHOLE
△	RAILROAD SPIKE FOUND	S	SEWER MANHOLE
⊙	DRILL HOLE FOUND	T	TELEPHONE MANHOLE
SGC	EXIST. SLOPED GRANITE CURB		CATCH BASIN
VGC	EXIST. VERTICAL GRANITE CURB	W	WATER LINE
BCC	EXIST. BITUMINOUS CONC. LIP CURBING		WATER VALVE
VCC	EXIST. VERTICAL CONCRETE CURB		FIRE HYDRANT
OHW	OVERHEAD SERVICE WIRES		GAS VALVE
DSYL	DOUBLE SOLID YELLOW LINE	G	GAS LINE
SSWL	SINGLE SOLID WHITE LINE	T	UNDERGROUND TELEPHONE LINE
BWL	BROKEN WHITE LINE	UGE	UNDERGROUND ELECTRIC AND TELEPHONE
	SIGN		WETLAND LINE
C.O.	PROP. CLEANOUT		TREELINE
CB–1	PROP. CATCH BASIN		
DMH–1	PROP. DRAIN MANHOLE		
SMH–1	PROP. SEWER MANHOLE		
46	PROP. CONTOUR ELEVATION		
G.B.	GRADE BREAK		

PROP. PEVERLY HILL ROAD RECONSTRUCTION PROJECT BY THE CITY OF PORTSMOUTH

CONTRACTOR TO INSTALL TEMPORARY SITE CONSTRUCTION FENCING AROUND PERIMETER OF SITE PRIOR TO CONSTRUCTION & ADJUST LOCATION AS DIRECTED

WEST ROAD

PEVERLY HILL ROAD (PUBLIC – VARIABLE WIDTH)

MAP 252 LOT 4
12,838 Sq. Ft.
0.295 Ac.±

MAP 252 LOT 5
12,437 Sq. Ft.
0.285 Ac.±

MAP 252 LOT 9
223,416 Sq. Ft.
5.129 Ac.±

PROPOSED 15,100 SF (GFA) 3–STORY 6–UNIT CONDO COMPLEX–"E" (TOWNHOUSE STYLE)

PROPOSED 12,600 SF (GFA) 3–STORY 5–UNIT CONDO COMPLEX–"F" (TOWNHOUSE STYLE)

PROPOSED 15,100 SF (GFA) 3–STORY 6–UNIT CONDO COMPLEX–"D" (TOWNHOUSE STYLE)

PROPOSED 15,100 SF (GFA) 3–STORY 6–UNIT CONDO COMPLEX–"B" (TOWNHOUSE STYLE)

PROPOSED 51,500 SF (GFA) 4–STORY 23–UNIT CONDO COMPLEX–"A" (GARDEN STYLE) WITH 25 GARAGE PARKING SPACES

PROPOSED 12,600 SF (GFA) 3–STORY 6–UNIT CONDO COMPLEX–"C" (GARDEN STYLE) WITH 7 GARAGE PARKING SPACES

TEMPORARY STOCKPILE AREA

TEMPORARY STOCKPILE AREA

UNDERGROUND INFILTRATION SYSTEM #1 (SEE DETAIL)

UNDERGROUND INFILTRATION SYSTEM #2 (SEE DETAIL)

U/G INFIL. SYS. #3 (SEE DETAIL)

UNDERGROUND INFILTRATION SYSTEM #4 (SEE DETAIL)

PROP. SILT FENCE/EROSION BARRIER (TYP)

PROP. ONSITE INLET PROTECTION (TYP.)

PROP. OFFSITE INLET PROTECTION (TYP.)

PROP. TEMPORARY GRAVEL CONSTRUCTION EXIT (TYP.)

EXISTING FIVE GUYS

EXISTING RITE AUBD

N68°18'35"E 255.09'

N69°15'45"E 117.37'

N25°48'52"W 47.00'

283.48'

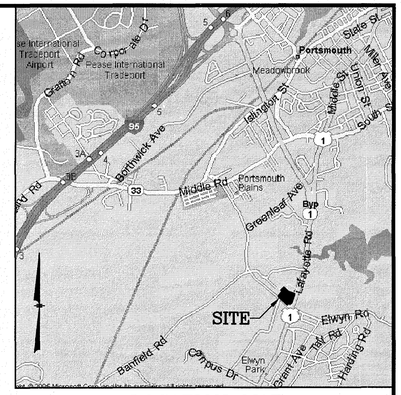
N55°19'23"W 184.99'

N34°40'37"E 8.00'

N36°27'59"W 9.57'

N30°06'48"W

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.



LOCATION MAP
(NOT TO SCALE)

NOTES:

1) SEE DETAIL SHEETS FOR EROSION CONTROL NOTES, CONSTRUCTION SEQUENCE, AND DETAILS.

OWNER OF RECORD:
MAP 252 LOTS 4, 5 & 9
4 AMIGOS LLC
321 LAFAYETTE ROAD, UNIT D
HAMPTON, NH 03842

NO.	DESCRIPTION	BY	DATE

REVISIONS

EROSION & SEDIMENT CONTROL PLAN

ASSESSORS MAP 252 – LOTS 4,5 & 9
1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

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LEGEND

O	IRON PIN FOUND	UP	UTILITY POLE
□	CONCRETE BOUND FOUND	D	DRAIN MANHOLE
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BWL	BROKEN WHITE LINE	UGE	UNDERGROUND ELECTRIC AND TELEPHONE
	SIGN		WETLAND LINE
			TREELINE

SITE PLAN PLANTING REQUIREMENTS:

THE PURPOSE OF PLANTING REQUIREMENTS IS TO ENHANCE THE LONG-TERM SURVIVAL PROSPECTS OF THE PLANT MATERIALS USED IN SITE LANDSCAPING. THESE STANDARDS ARE ALSO MEANT TO ENSURE THAT THE BENEFITS OF SITE LANDSCAPING (BUFFERING, AESTHETIC ENHANCEMENT, EROSION CONTROL, ETC.) ARE REALIZED AS EARLY AFTER PLANTING AS POSSIBLE. THE FOLLOWING STANDARDS FOR PLANTING REQUIREMENTS SHALL APPLY.

(A) PLANTING HOLES FOR TREES SHALL BE AT LEAST TWO TO THREE TIMES THE WIDTH OF THE ROOT BALL AND SHALL BE NO DEEPER THAN THE ROOT BALL.

(B) SHRUBS SHALL HAVE A PLANTING HOLE THREE TO FIVE TIMES THE WIDTH OF THE ROOT BALL AND SHALL NOT BE DEEPER THAN THE ROOT BALL ITSELF.

(C) EVERGREEN TREES SHALL BE FULLY BRANCHED WITH A MINIMUM 5-FOOT HEIGHT AT THE TIME OF PLANTING.

(D) DECIDUOUS TREES SHALL BE FULLY BRANCHED AND A MINIMUM SIZE OF 2 INCHES IN CALIPER AT THE TIME OF PLANTING.

(E) SHRUBS SHALL BE FULLY BRANCHED WITH A MINIMUM OF 2½ FEET HEIGHT AT PLANTING.

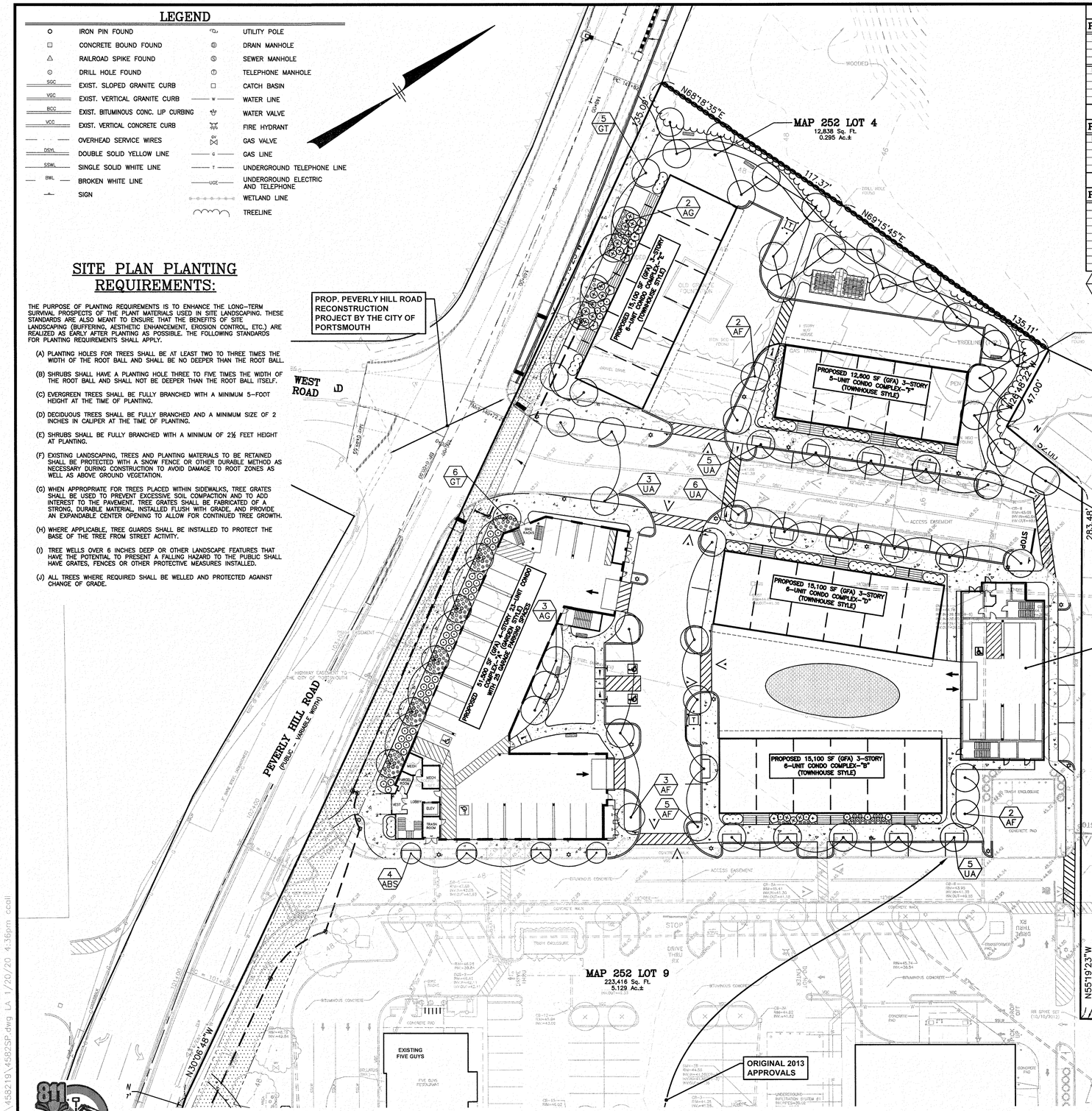
(F) EXISTING LANDSCAPING, TREES AND PLANTING MATERIALS TO BE RETAINED SHALL BE PROTECTED WITH A SNOW FENCE OR OTHER DURABLE METHOD AS NECESSARY DURING CONSTRUCTION TO AVOID DAMAGE TO ROOT ZONES AS WELL AS ABOVE GROUND VEGETATION.

(G) WHEN APPROPRIATE FOR TREES PLACED WITHIN SIDEWALKS, TREE GRATES SHALL BE USED TO PREVENT EXCESSIVE SOIL COMPACTION AND TO ADD INTEREST TO THE PAVEMENT. TREE GRATES SHALL BE FABRICATED OF A STRONG, DURABLE MATERIAL, INSTALLED FLUSH WITH GRADE, AND PROVIDE AN EXPANDABLE CENTER OPENING TO ALLOW FOR CONTINUED TREE GROWTH.

(H) WHERE APPLICABLE, TREE GUARDS SHALL BE INSTALLED TO PROTECT THE BASE OF THE TREE FROM STREET ACTIVITY.

(I) TREE WELLS OVER 6 INCHES DEEP OR OTHER LANDSCAPE FEATURES THAT HAVE THE POTENTIAL TO PRESENT A FALLING HAZARD TO THE PUBLIC SHALL HAVE GRATES, FENCES OR OTHER PROTECTIVE MEASURES INSTALLED.

(J) ALL TREES WHERE REQUIRED SHALL BE WELLED AND PROTECTED AGAINST CHANGE OF GRADE.



COMPLEX 'A' COURTYARD PLANTING SCHEDULE

PLANT	QNTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
SHRUBS					
AD	–	AZALEA 'STEWARTSTONIAN'	STEWARTSTONIAN AZALEA	#5 CONTAINER	MIN. SIZE 30" HT.
RN	–	RHODODENDRON 'CUNNUIINGHAM WHITE'	CUNNINGHAM'S WHITE RHODODENDRON	2 1/2'-3' HT.	MIN. SIZE 30" HT.
IG	–	ILEX GLABRA 'SHAMROCK'	SHAMROCK INKBERRY	#7 CONTAINER	MIN. SIZE 30" HT.
PERENNIALS & GRASSES					
HS	–	HOSTA SIEBOLDIANA 'ELEGANS'	BLUE-LEAF HOSTA	#1 CONTAINER	
HF	–	HOSTA 'FRANCEE'	FRANCEE HOSTA	#1 CONTAINER	
OC	–	OSMUNDASTRUM CINNAMOMEUM	CINNAMON FERN	#1 CONTAINER	
AN	–	ANTHYRIUM NIPONICUM 'PICTUM'	JAPANESE PAINTED FREN	#1 CONTAINER	

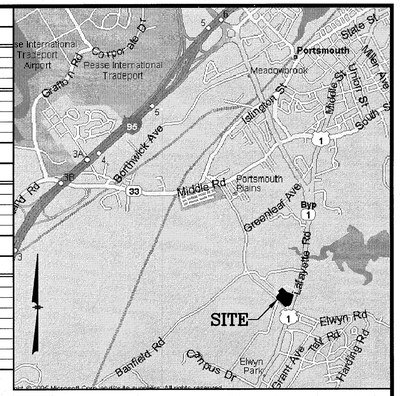
COMPLEX 'A' STREET SIDE PLANTING SCHEDULE

PLANT	QNTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
PERENNIALS & GRASSES					
RG	–	RUDBECKIA 'GOLDSTURM'	GOLDSTURM BLACK-EYED SUSAN	#1 CONTAINER	
EP	–	ECHINACEA PURPUREA	PURPLE CONEFLOWER	#1 CONTAINER	
ES	–	ERAGROSTIS SPECTABILIS	PURPLE LOVE GRASS	#1 CONTAINER	
SS	–	SCHIZACHYRIUM S. 'PRAIRIE BLUES'	LITTLE BLUESTEM PRAIRIE BLUES	#1 CONTAINER	

TREE PLANTING SCHEDULE

PLANT	QNTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
TREES					
ABS	4	AMELANCHIER GRANDIFLORA 'AUTUMN BRILLIANCE'	AUTUMN BRILLIANCE SERVICEBERRY	2"– 2 1/2" CAL.	
AG	5	AMELANCHIER GRANDIFLORA 'AUTUMN BRILLIANCE'	AUTUMN BRILLIANCE SERVICEBERRY	6' – 7' HT.	MULTI-STEM
AF	12	ACER FREEMANII 'AUTUMN BLAZE'	AUTUMN BLAZE MAPLE	3" CAL.	
GT	11	GLEDITSIA TRIACANTHOS 'HALKA'	HALKA HONEYLOCUST	2"– 2 1/2" CAL.	
UA	19	ULMUS AMERICANA 'PRINCETON'	PRINCETON AMERICAN ELM	3"– 3 1/2" CAL.	
AR	7	ACER RUBRUM	RED MAPLE	3" CAL.	
QR	6	QUERCUS RUBRA	RED OAK	2"– 2 1/2" CAL.	
AC	7	AMELANCHIER CANADENSIS	SERVICEBERRY	6' – 7' HT.	MULTI-STEM

1 XX — PLANT QUANTITY / PLANT DESIGNATION



LOCATION MAP

(NOT TO SCALE)

NOTES:

1) ALL PLANT STOCK SHALL CONFORM TO ANSI Z260.1 – NURSERY STOCK, LATEST EDITION (AMERICAN ASSOCIATION OF NURSERYMEN, INC.).

2) 4" AGED PINEBARK MULCH AND A WEED BARRIER (TY-PAR FABRIC OR APPROVED EQUAL) SHALL BE APPLIED TO ALL SHRUB AND GROUNDCOVER BEDS. INSTALL WEED BARRIER AS PER MANUFACTURERS RECOMMENDATIONS.

3) PLANT PIT BACKFILL SHALL BE MIXED AT A RATE OF 7 PARTS OF TOPSOIL TO 2 PART OF DEHYDRATED COW MANURE. SLOW RELEASE FERTILIZER SHALL BE APPLIED AS PER MANUFACTURERS RECOMMENDATIONS. USE EXISTING ON-SITE TOPSOIL AS PART OF BACKFILL WHEN AVAILABLE.

4) ALL LANDSCAPED AREAS NOT PLANTED WITH TREES, SHRUBS OR GROUNDCOVER SHALL BE RESTORED WITH SEED OR SOD AS INDICATED ON PLANS.

5) ALL SOD, SEED, SHRUB AND TREE AREAS SHALL RECEIVE 6" PH CORRECTED TOPSOIL. AFTER TOPSOIL IS SPREAD EVENLY OVER ENTIRE AREA, ALL CLODS, LUMPS, STONES AND OTHER DELETERIOUS MATERIAL SHALL BE RAKED UP AND REMOVED.

6) APPLICATION OF GRASS SEED, FERTILIZERS AND MULCH SHALL BE ACCOMPLISHED BY BROADCAST SEEDING OR HYDROSEEDING AT THE RATES OUTLINED BELOW:

LIMESTONE: 100 LBS./1,000 SQUARE FEET.
FERTILIZER: 500 LBS/ACRE OF 10-20-20 OR 1000 LBS/ACRE OF 5-10-10.
MULCH: HAY MULCH APPROXIMATELY 3 TONS/ACRE

SEED MIX (SLOPES LESS THAN 4:1)	LBS/ACRE
CREEPING RED FESCUE	20
TALL FESCUE	15
PERENNIAL RYEGRASS	5
REDTOP	2
	42

7) FOR TEMPORARY EROSION CONTROL NOTES, SEE EROSION & SEDIMENT CONTROL PLAN.

8) NEWLY GRADED AREAS REQUIRING SLOPE PROTECTION OUTSIDE OF NORMAL SEEDING SEASON SHALL RECEIVE STRAW MULCH AT THE APPROXIMATE RATE OF NO MORE THAN 3 TONS PER ACRE.

9) ANY CHANGES IN PLANT LOCATIONS OR TYPES SHALL BE APPROVED BY THE DEVELOPER AND CITY PRIOR TO INSTALLATION.

10) PLANTINGS SHALL BE GUARANTEED BY THE CONTRACTOR FOR ONE YEAR AFTER WRITTEN ACCEPTANCE BY THE DEVELOPER.

11) EXPOSED SOILS SHALL BE SEEDED OR HAY MULCHED WITHIN 72 HOURS OF FINAL GRADING.

12) ALL WORK SHALL BE COORDINATED WITH APPLICABLE EPA NPDES/SWPPP PERMIT WORK AS REQUIRED.

13) THE CONTRACTOR SHALL INSTALL AN IRRIGATION SYSTEM TO PROVIDE COMPLETE COVERAGE OF ALL SEED, SOD AREAS AND SHRUB BEDS. THE SYSTEM SHALL INCLUDE A TIMER WITH RAIN SENSOR AND SHALL BE INSTALLED IN ACCORDANCE WITH LOCAL CODES.

14) THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS SHALL BE RESPONSIBLE FOR THE MAINTENANCE, REPAIR AND REPLACEMENT OF ALL REQUIRED SCREENING AND LANDSCAPE MATERIALS.

15) 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.

16) 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.

OWNER OF RECORD:

MAP 252 LOTS 4, 5 & 9
4 AMIGOS LLC
321 LAFAYETTE ROAD, UNIT D
HAMPTON, NH 03842

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

LANDSCAPE PLAN

ASSESSORS MAP 252 – LOTS 4,5 & 9
1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
PREPARED FOR:
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321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

STATE OF NEW HAMPSHIRE – FRANK C MONTEIRO No. 7152 LICENSED PROFESSIONAL ENGINEER – 1/26/20

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811 DigSafe MA-ME-NH-RI-VT

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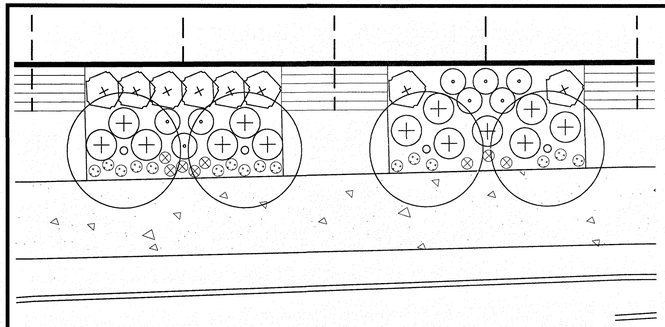

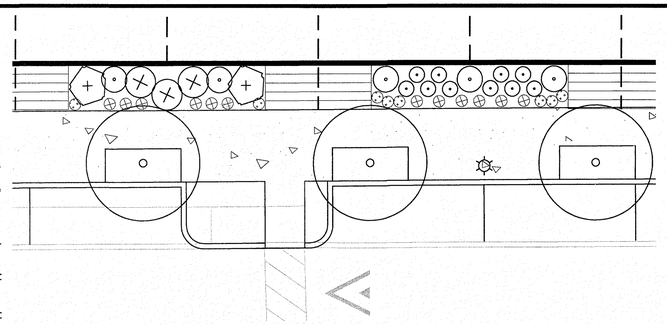

COMPLEX 'E' TYPICAL PLANTING SCHEDULE					
PLANT	QNTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
SHRUBS					
IG	–	ILEX GLABRA 'SHAMROCK'	SHAMROCK INKBERRY	#7 CONTAINER	MIN. SIZE 30" HT.
RK	–	ROSA 'KNOCK OUT'	KNOCK OUT ROSE	#7 CONTAINER	MIN. SIZE 30" HT.
PERENNIALS & GRASSES					
AM	–	ALCHEMILLA MOLLIS	LADY'S MANTLE	#1 CONTAINER	
RG	–	RUDBECKIA 'GOLDSTURM'	GOLDSTURM BLACK–EYED SUSAN	#1 CONTAINER	
PH	–	PENNISETUM ALOPERCURIOIDES 'HAMELN'	DWARF FOUNTAIN GRASS	#1 CONTAINER	

1 / XX — PLANT QUANTITY / PLANT DESIGNATION

COMPLEX 'A' TYPICAL PLANTING

SCALE: 1"=10'

COMPLEX 'B, D & F' TYPICAL PLANTING SCHEDULE					
PLANT	QNTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
SHRUBS					
CS	–	CORNUS SERICEA 'ALLEMAN'S COMPACTA'	COMPACT REDTWIG DOGWOOD	#3 CONTAINER	MIN. SIZE 30" HT.
CAH	–	CLETHRA ALNIFOLIA 'HUMMINGBIRD'	HUMMINGBIRD SUMMERSWEET	#3 CONTAINER	MIN. SIZE 30" HT.
PERENNIALS & GRASSES					
CKF	–	CALAMAGROSTIS A. 'KARL FOERSTER'	K. F. FEATHER REED GRASS	#1 CONTAINER	
PH	–	PENNISETUM ALOPERCURIOIDES 'HAMELN'	DWARF FOUNTAIN GRASS	#1 CONTAINER	
RG	–	RUDBECKIA 'GOLDSTURM'	GOLDSTURM BLACK–EYED SUSAN	#1 CONTAINER	
IS	–	IRIS SIBERICA 'CAESAR'S BROTHER'	CAESAR'S BROTHER SIBERIAN IRIS	#1 CONTAINER	

1 / XX — PLANT QUANTITY / PLANT DESIGNATION

COMPLEX 'B, D & F' TYPICAL PLANTING

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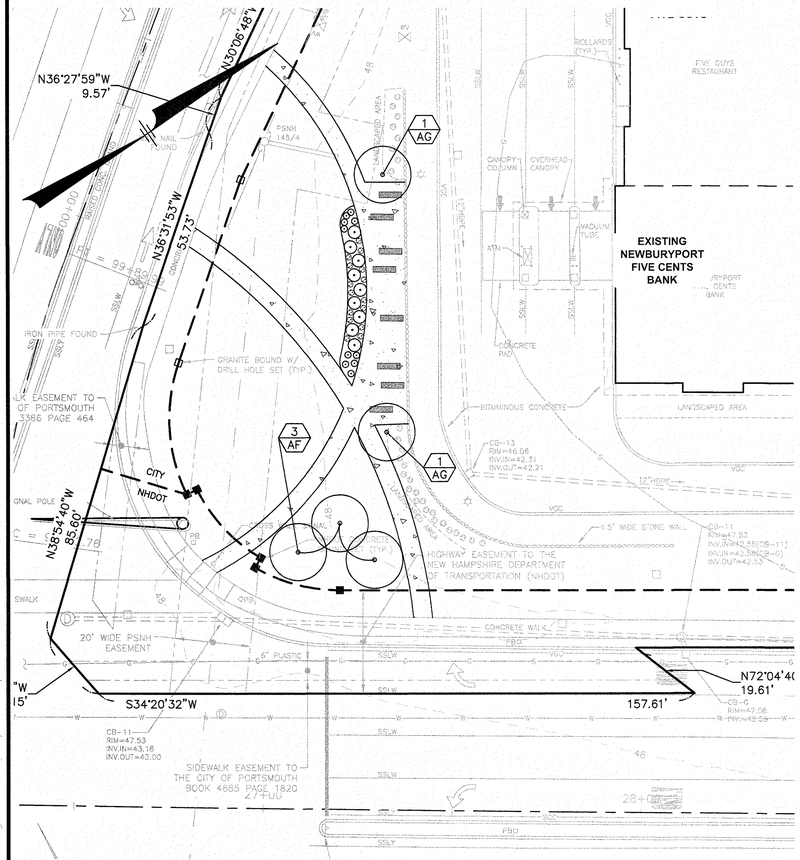
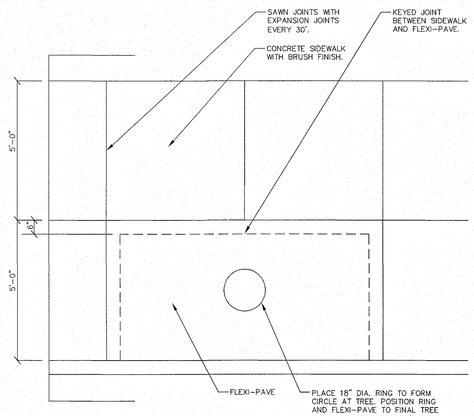


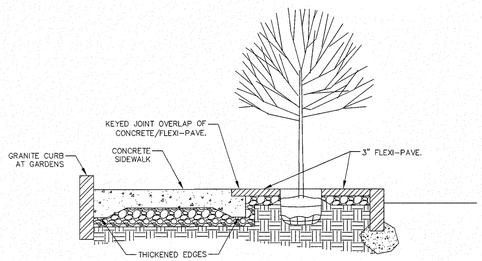
PLANTING SCHEDULE					
PLANT	QNTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
TREES					
AG	2	AMELANCHIER GRANDIFLORA 'AUTUMN BRILLIANCE'	AUTUMN BRILLIANCE SERVICEBERRY	6' – 7' HT.	MULTI–STEM
AF	3	ACER FREEMANII 'AUTUMN BLAZE'	AUTUMN BLAZE MAPLE	3" CAL.	
PERENNIALS & GRASSES					
HD	–	HEMEROCALLIS 'STELLA DE ORO'	DWARF YELLOW DAYLILY	#1 CONTAINER	
ES	–	ERAGROSTIS SPECTABILIS	PURPLE LOVE GRASS	#1 CONTAINER	
SS	–	SCHIZACHYRIUM S. "PRAIRIE BLUES"	LITTLE BLUESTEM 'PRAIRIE BLUES'	#1 CONTAINER	

1 / XX — PLANT QUANTITY / PLANT DESIGNATION

PEVERLY HILL RD & LAFAYETTE RD LANDSCAPE DETAIL

1"=20'

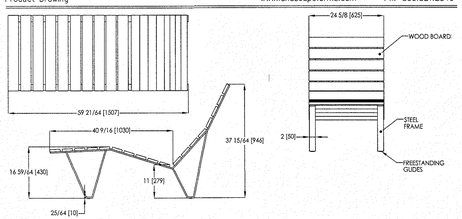




FLEXI–PAVE DETAIL

NOT TO SCALE

Harpo Chaise lounge, freestanding/surface mount — Product Drawing — www.landscapeforms.com — Date: 6/6/2018 — Ph: 800.521.2546



LandscapeForms — Drawing: AX301–01 — Dimensions are in inches [mm]

LOUNGE DETAIL

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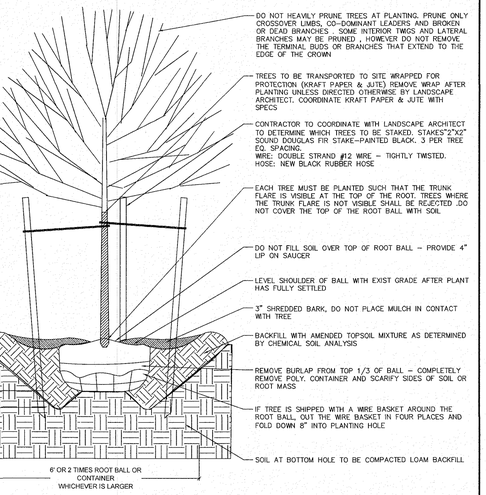
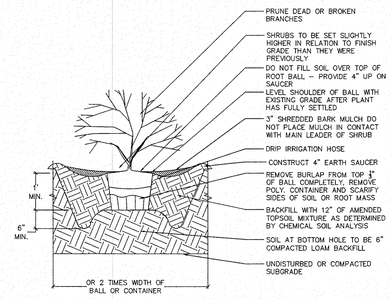


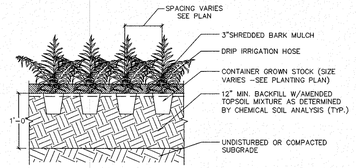
TYPICAL DECIDUOUS TREE PLANTING

NOT TO SCALE



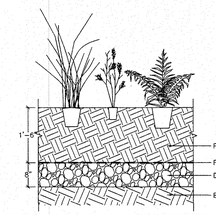
TYPICAL SHRUB PLANTING

NOT TO SCALE



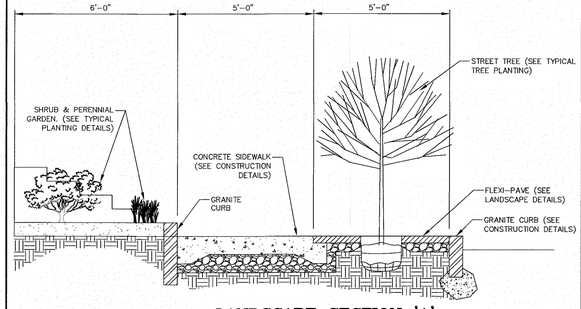
TYPICAL SHRUB PLANTING

NOT TO SCALE



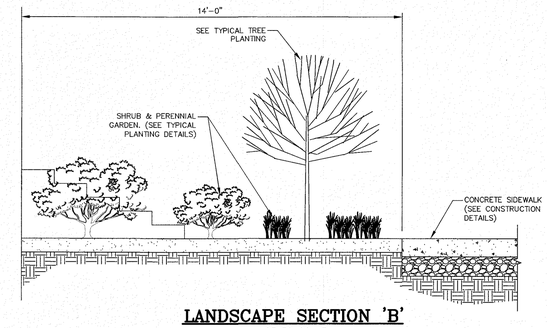
TYPICAL RAIN GARDEN PLANTING

NOT TO SCALE



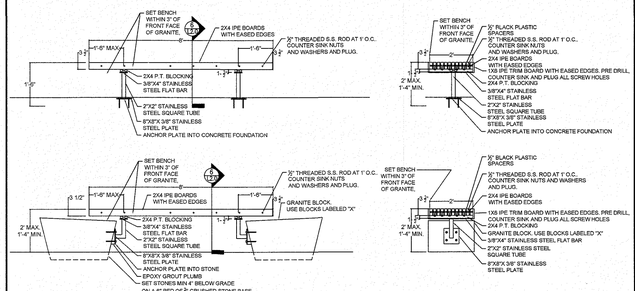
LANDSCAPE SECTION 'A'

NOT TO SCALE



LANDSCAPE SECTION 'B'

NOT TO SCALE



TYPICAL BENCH DETAIL

NOT TO SCALE

NO.	DESCRIPTION	BY	DATE

REVISIONS

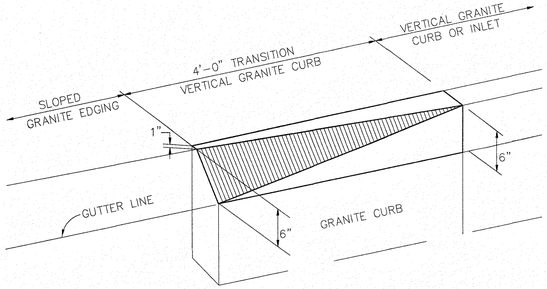
LANDSCAPE DETAILS

ASSESSORS MAP 252 – LOTS 4,5 & 9
1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

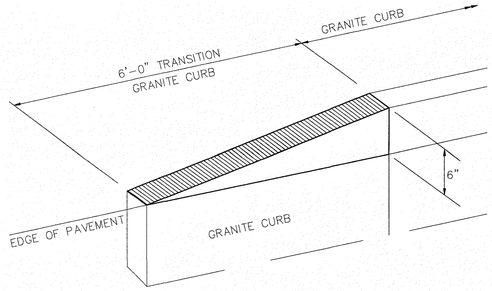
STATE OF NEW HAMPSHIRE – FRANK C. MONTEIRO No. 7452 LICENSED PROFESSIONAL ENGINEER – 1/21/20

GPI — Engineering, Design, Planning, Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: AS SHOWN	DATE: JANUARY 20, 2020		DRAWING NO. 4582SP.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CCC	CMT	458219	10 OF 15

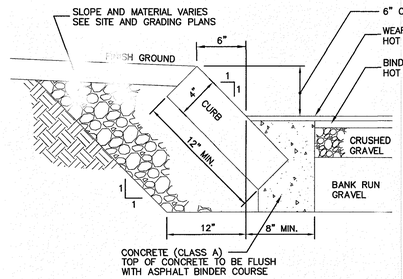


CURB TRANSITION DETAIL
NOT TO SCALE



CURB TRANSITION DETAIL
NOT TO SCALE

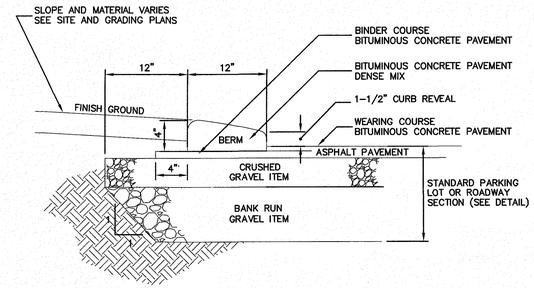
TO BE USED FOR TRANSITION FROM GRANITE CURB TO EDGE OF PAVEMENT



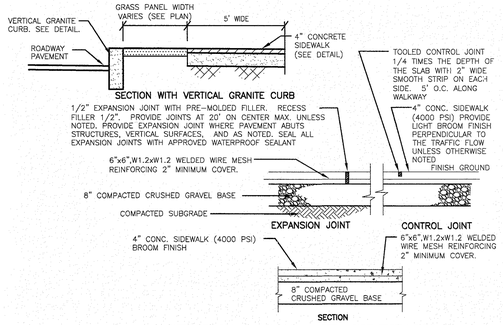
RADIUS FOR STONES WITH SQUARE JOINTS	RADIUS FOR STONES WITH RADIAL JOINTS	MAXIMUM LENGTH
16'–28'	SEE CURB SECTIONS ON RADII DETAIL	1'–6"
29'–41'		2'
42'–55'		3'
56'–68'		4'
69'–82'		5'
83'–96'		6'
97'–110'		7'
OVER 110'		8'

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

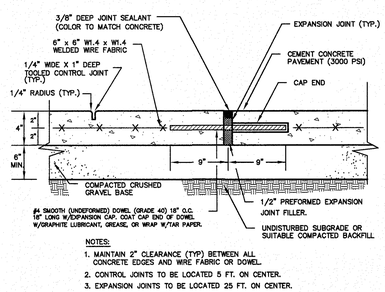
SLOPED GRANITE CURB ON–SITE
NOT TO SCALE



BITUMINOUS CONCRETE BERM DETAIL
NOT TO SCALE

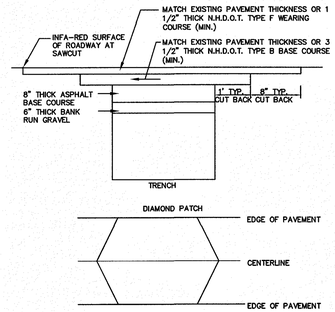


CEMENT CONCRETE SIDEWALK DETAIL IN ROW
NOT TO SCALE

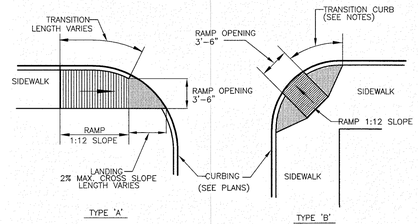


NOTES:
1. MAINTAIN 2" CLEARANCE (TYP) BETWEEN ALL CONCRETE EDGES AND WIRE FABRIC OR DOWEL.
2. CONTROL JOINTS TO BE LOCATED 5 FT. ON CENTER.
3. EXPANSION JOINTS TO BE LOCATED 25 FT. ON CENTER.

CEMENT CONCRETE SIDEWALK
NOT TO SCALE

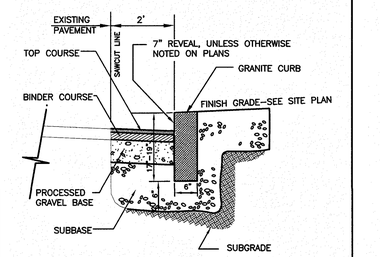


TYPICAL PAVEMENT REPAIR DETAIL IN ROW
NOT TO SCALE

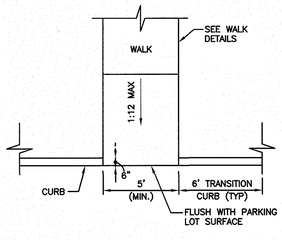


NOTES:
1. 6' MINIMUM TRANSITION CURB ALONG SIDEWALK.
2. 2' MINIMUM TRANSITION CURB ALONG LANDSCAPED AREA.
3. 1/2" REVEAL + AT BOTTOM OF RAMP.

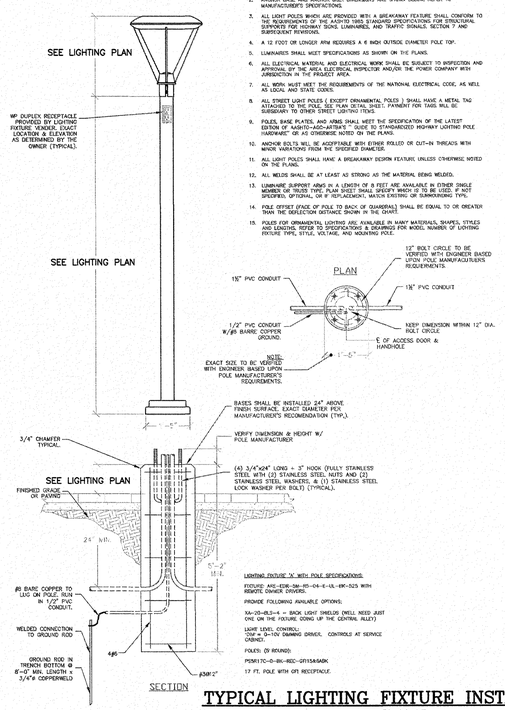
HANDICAP RAMP DETAILS AT SIDEWALK IN R.O.W.
NOT TO SCALE



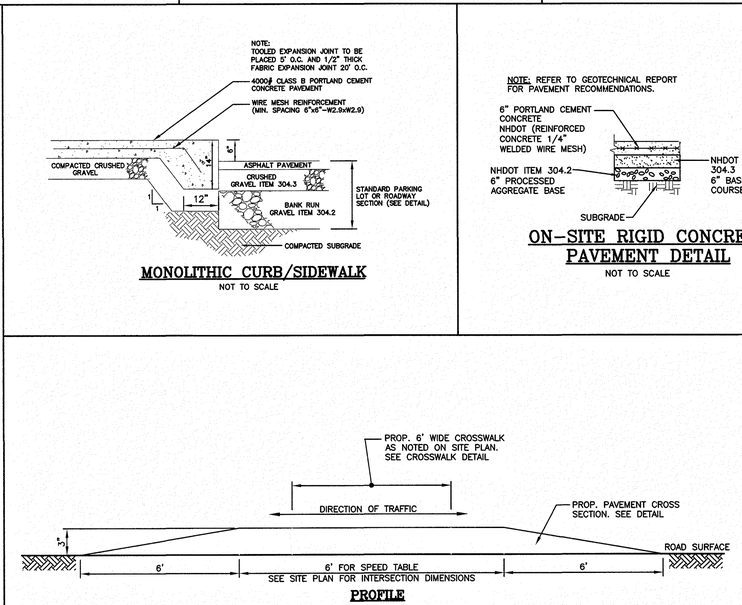
VERTICAL GRANITE CURB–IN ROW
NOT TO SCALE



ON–SITE ACCESSIBLE RAMP
NOT TO SCALE

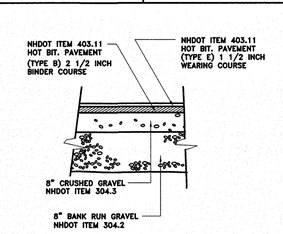


TYPICAL LIGHTING FIXTURE INSTALLATION
NOT TO SCALE

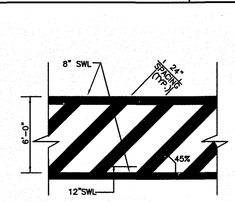


MONOLITHIC CURB/SIDEWALK
NOT TO SCALE

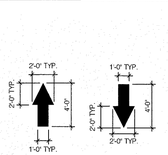
ON–SITE RIGID CONCRETE PAVEMENT DETAIL
NOT TO SCALE



ON–SITE PAVEMENT SECTION FOR PARKING AREAS
NOT TO SCALE



ON–SITE CROSSWALK STRIPING DETAIL
NOT TO SCALE

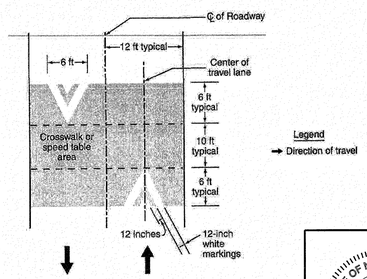


ALL PAVEMENT MARKINGS TO BE WHITE PAVEMENT PAINT, UNLESS STATED OTHERWISE.

ON–SITE PAVEMENT MARKING DETAILS
NOT TO SCALE

PROFILE

TYPICAL STRAIGHT APPROACH SPEED TABLE AND RAISED INTERSECTION DETAIL
NOT TO SCALE



PAVEMENT MARKINGS

NO.	DESCRIPTION	BY	DATE

REVISIONS

DETAIL SHEET

ASSESSORS MAP 252 – LOTS 4,5 & 9
1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

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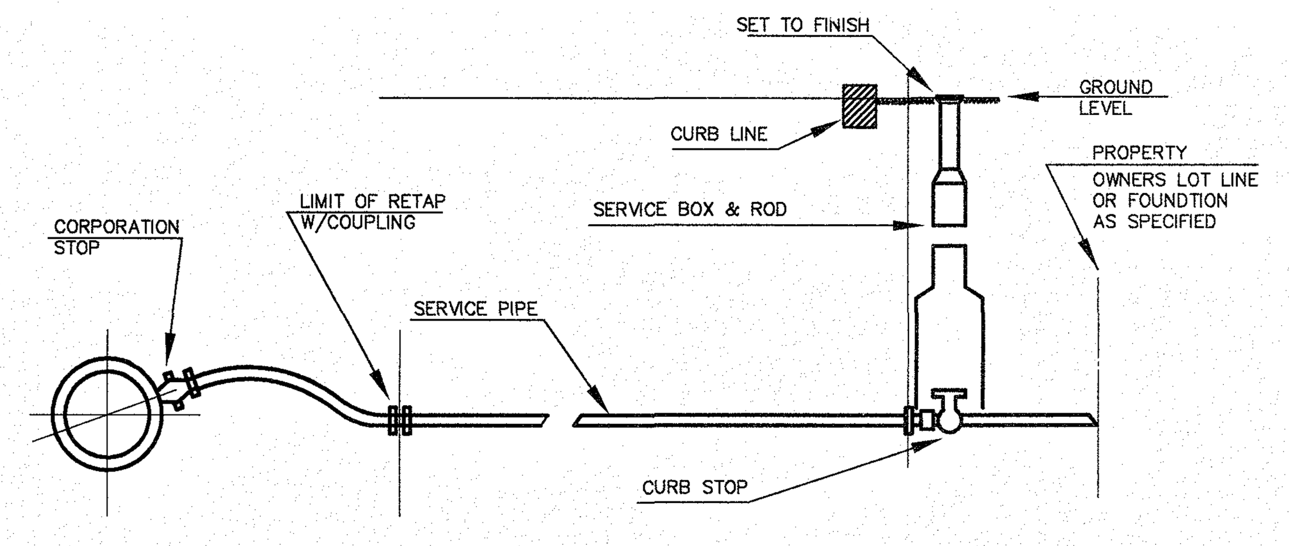
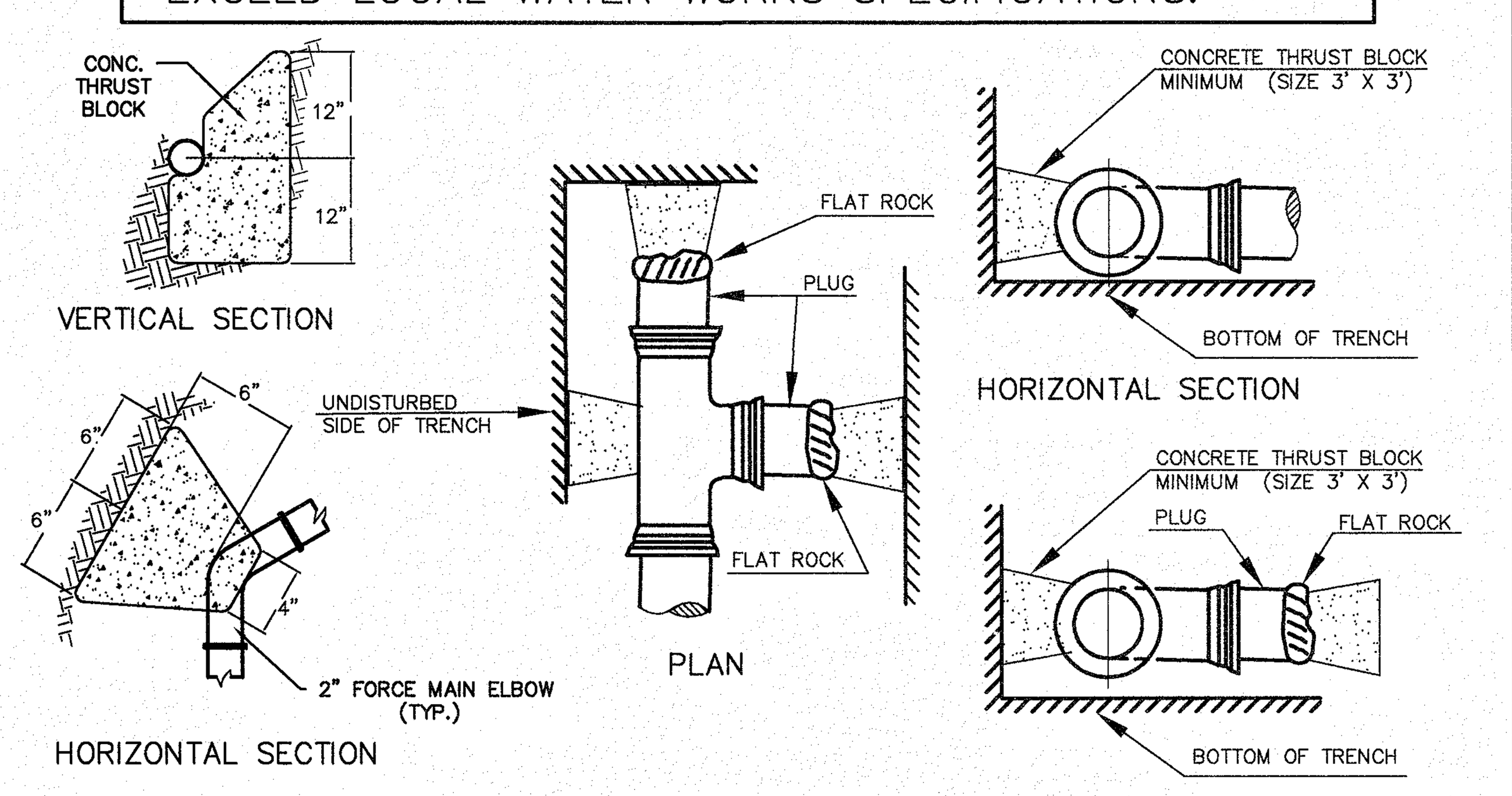


TYPICAL WATER SERVICE CONNECTION

NOT TO SCALE

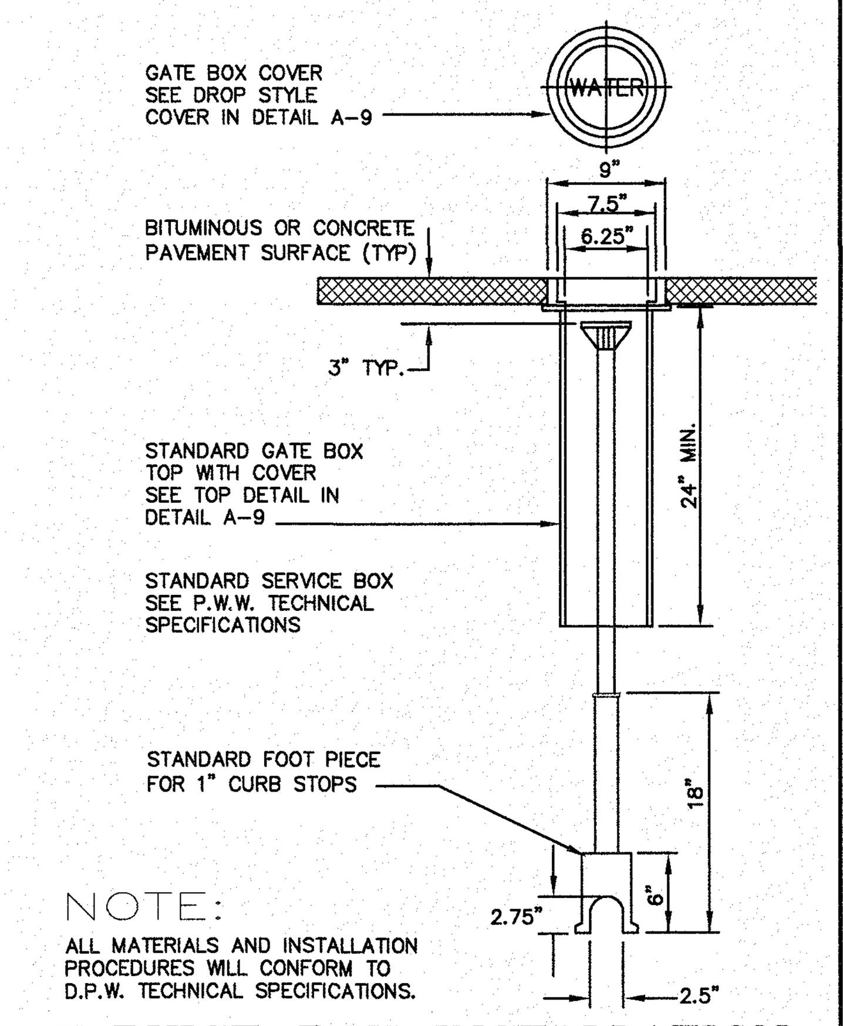
NOTE: ALL WATER SUPPLY MATERIALS TO MEET OR EXCEED LOCAL WATER WORKS SPECIFICATIONS.



CONC. THRUST BLOCK
12"
12"
VERTICAL SECTION
6"
6"
6"
UNDISTURBED SIDE OF TRENCH
2" FORCE MAIN ELBOW (TYP.)
HORIZONTAL SECTION
FLAT ROCK
PLUG
FLAT ROCK
PLAN
CONCRETE THRUST BLOCK MINIMUM (SIZE 3' X 3')
BOTTOM OF TRENCH
HORIZONTAL SECTION
CONCRETE THRUST BLOCK MINIMUM (SIZE 3' X 3')
PLUG
FLAT ROCK
BOTTOM OF TRENCH
HORIZONTAL SECTION

THRUST BLOCK DETAILS

NOT TO SCALE

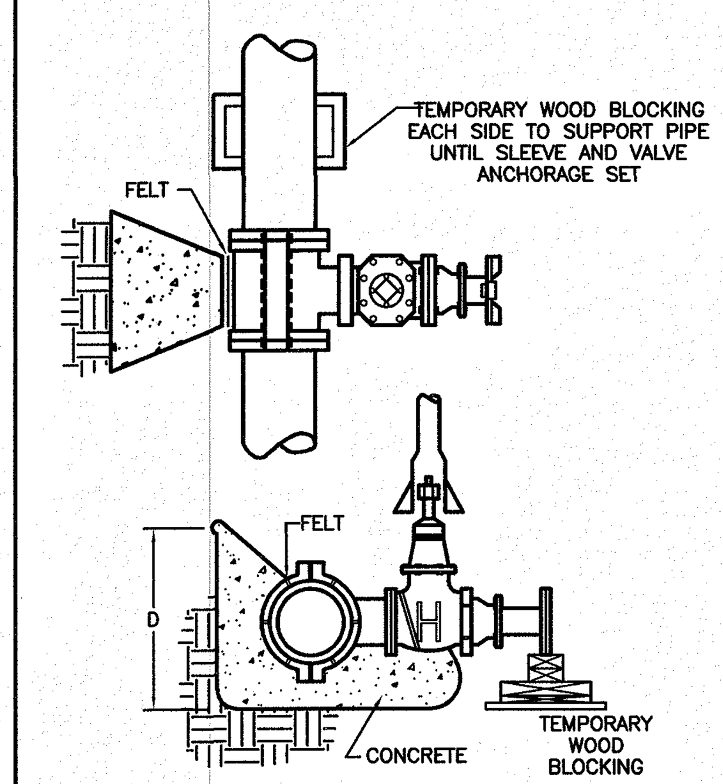


GATE BOX COVER
SEE DROP STYLE
COVER IN DETAIL A-9
WATER
9"
7.5"
6.25"
BITUMINOUS OR CONCRETE PAVEMENT SURFACE (TYP.)
3" TYP.
24" MIN.
STANDARD GATE BOX TOP WITH COVER SEE TOP DETAIL IN DETAIL A-9
STANDARD SERVICE BOX SEE P.W.W. TECHNICAL SPECIFICATIONS
STANDARD FOOT PIECE FOR 1" CURB STOPS
18"
2.75"
6"
2.5"

NOTE:
ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO D.P.W. TECHNICAL SPECIFICATIONS.

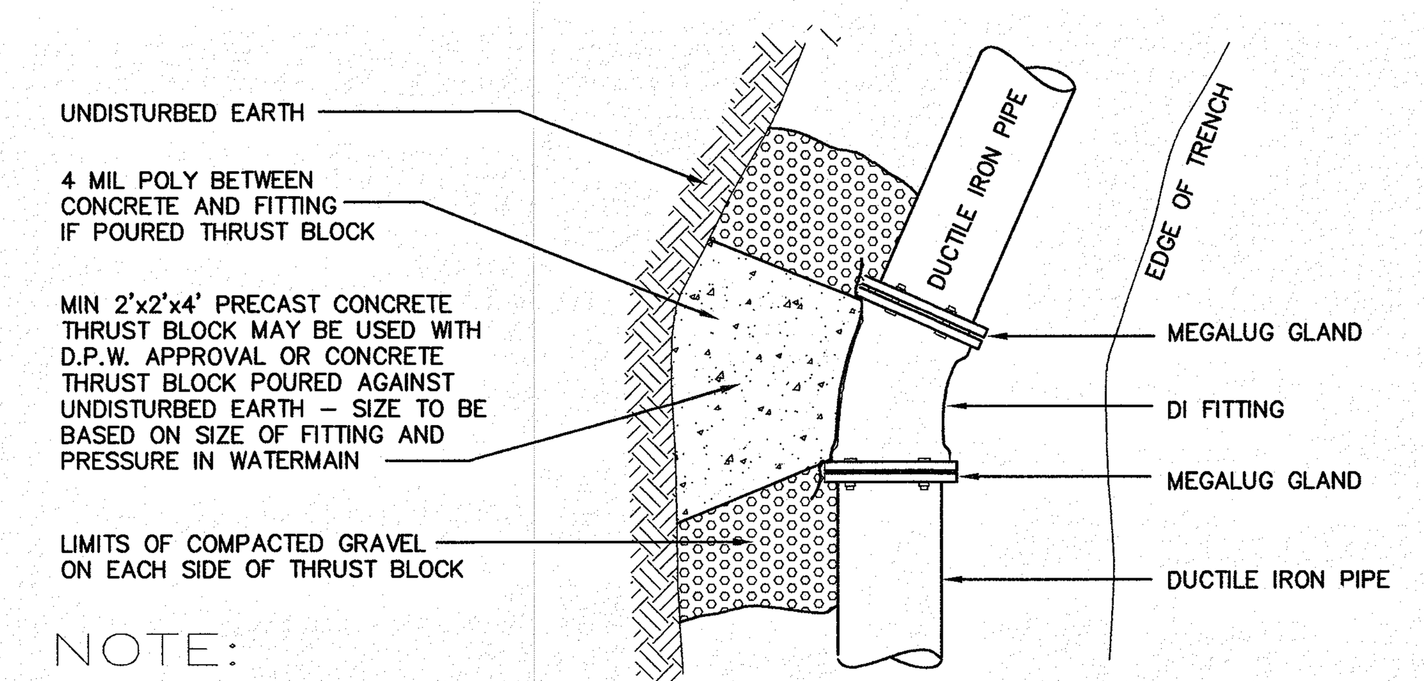
SERVICE BOX INSTALLATION IN PAVEMENT

NOT TO SCALE



TAPPING VALVE AND SLEEVE DETAIL

NOT TO SCALE



UNDISTURBED EARTH
4 MIL POLY BETWEEN CONCRETE AND FITTING IF POURED THRUST BLOCK
MIN 2'x2'x4' PRECAST CONCRETE THRUST BLOCK MAY BE USED WITH D.P.W. APPROVAL OR CONCRETE THRUST BLOCK POURED AGAINST UNDISTURBED EARTH - SIZE TO BE BASED ON SIZE OF FITTING AND PRESSURE IN WATERMAIN
LIMITS OF COMPACTED GRAVEL ON EACH SIDE OF THRUST BLOCK
DUCTILE IRON PIPE
EDGE OF TRENCH
MEGALUG GLAND
DI FITTING
MEGALUG GLAND
DUCTILE IRON PIPE

NOTE:

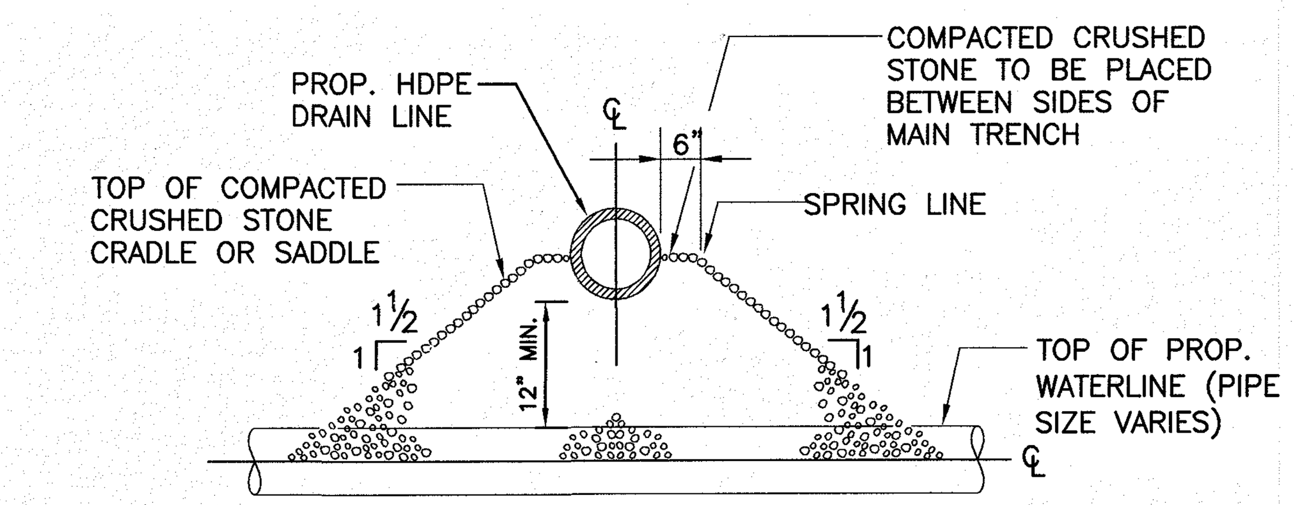
1. ALL MATERIAL AND INSTALLATION PROCEDURES WILL CONFORM TO D.P.W. TECHNICAL SPECIFICATIONS.
2. ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.

TABLE OF DIMENSIONS

PIPE SIZE	90° BEND		45° BEND		22½° BEND		11¼° BEND		TEE&PLUG	
	WIDTH	HGT.	WIDTH	HGT.	WIDTH	HGT.	WIDTH	HGT.	WIDTH	HGT.
6"	33"	21"	18"	21"	12"	18"	9"	12"	21"	24"
8"	45"	27"	24"	27"	18"	21"	12"	15"	27"	33"
10"	60"	36"	36"	36"	24"	30"	18"	21"	36"	42"
12"	66"	39"	36"	42"	24"	30"	18"	21"	39"	45"
14"	72"	45"	42"	48"	27"	36"	18"	27"	45"	54"

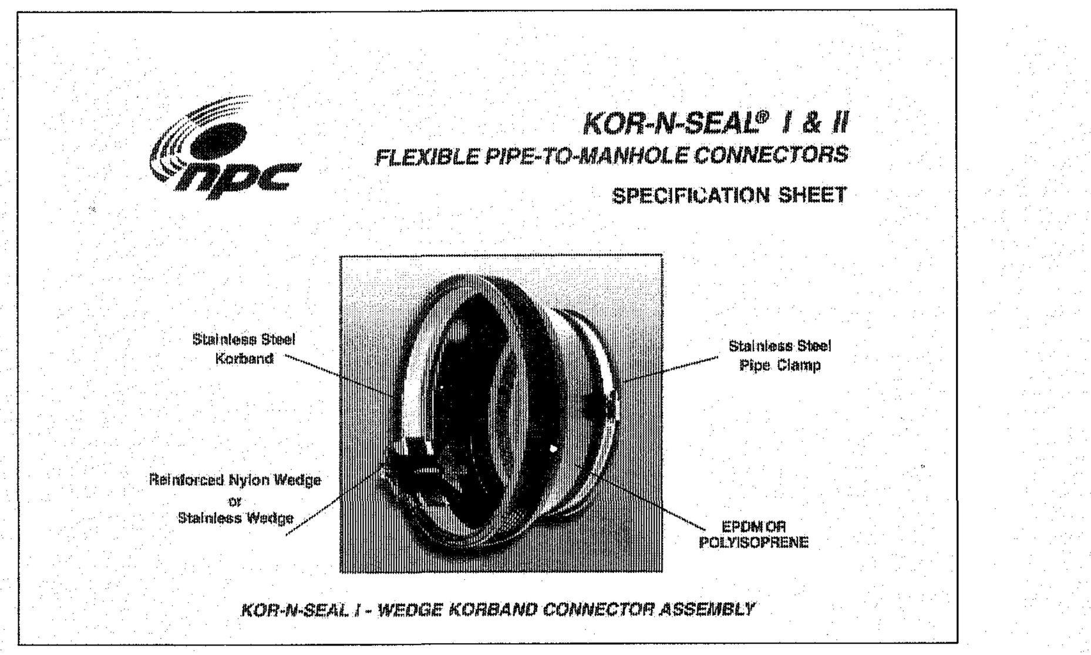
THRUST BLOCKING BEHIND FITTINGS INSTALLATION

NOT TO SCALE



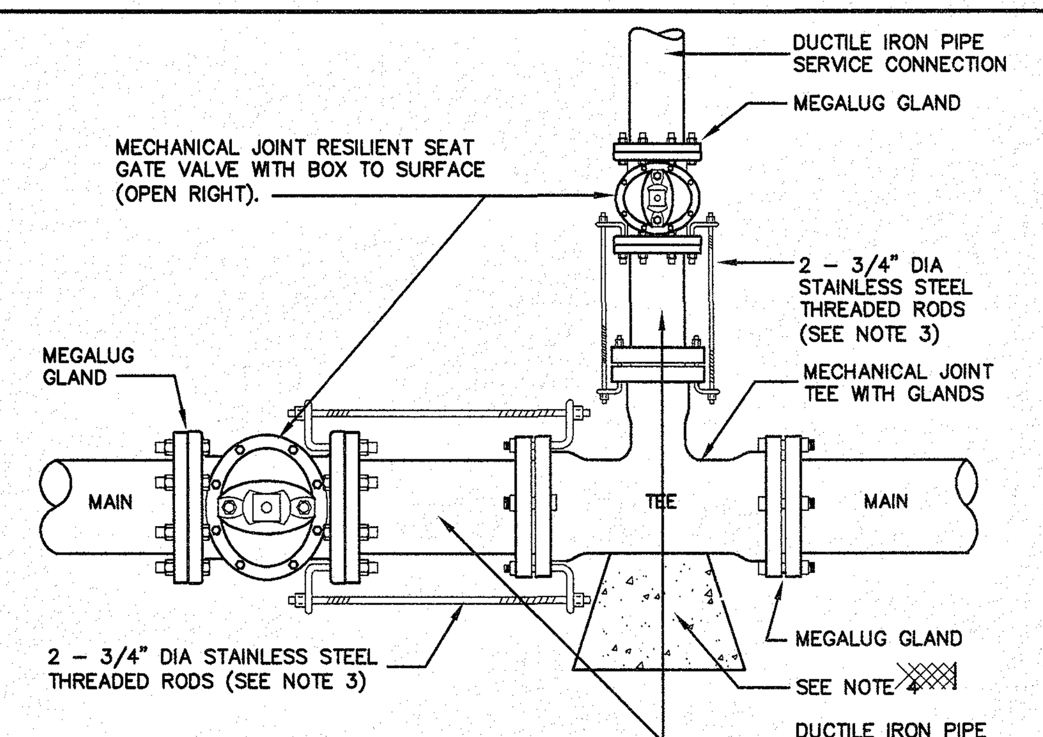
PIPE CROSSING DETAIL

NOT TO SCALE



KOR-N-SEAL DETAIL

NOT TO SCALE



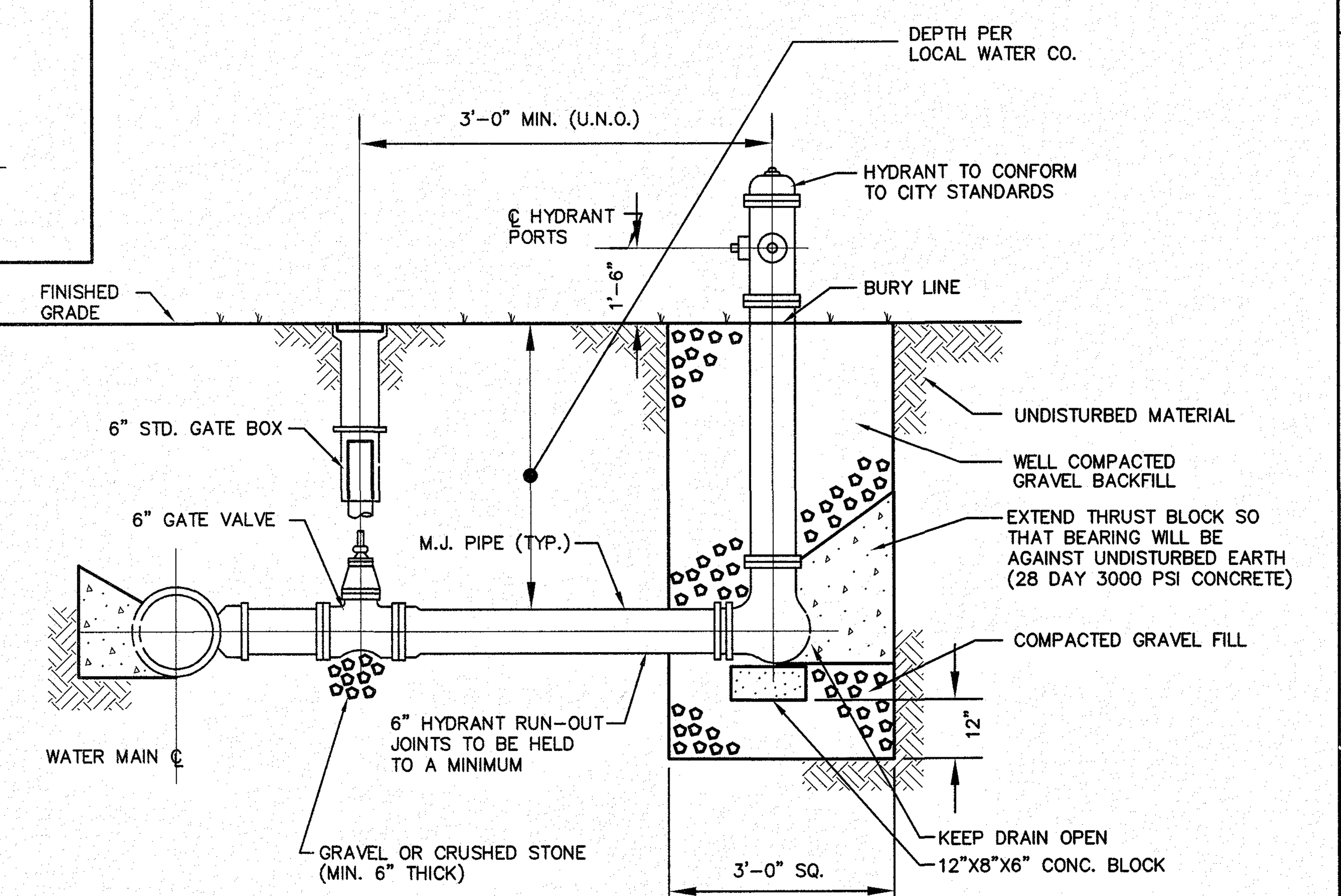
DUCTILE IRON PIPE SERVICE CONNECTION
MEGALUG GLAND
MECHANICAL JOINT RESILIENT SEAT GATE VALVE WITH BOX TO SURFACE (OPEN RIGHT).
2 - 3/4" DIA STAINLESS STEEL THREADED RODS (SEE NOTE 3)
MECHANICAL JOINT TEE WITH GLANDS
MEGALUG GLAND
MAIN
TEE
MAIN
2 - 3/4" DIA STAINLESS STEEL THREADED RODS (SEE NOTE 3)
MEGALUG GLAND
SEE NOTE 4
DUCTILE IRON PIPE NIPPLE - 18" LENGTH

NOTE:

1) ALL MATERIAL AND INSTALLATION PROCEDURES WILL CONFORM TO D.P.W. TECHNICAL SPECIFICATIONS.
2) ALL PIPE SHOULD HAVE A MINIMUM DEPTHS OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3) ALL THREADED RODS AND NUTS MUST BE STAINLESS STEEL.
4) MIN 2'x2'x4' PRECAST CONCRETE THRUST BLOCK MAY BE USED WITH D.P.W. APPROVAL OR CONCRETE THRUST BLOCK POURED AGAINST UNDISTURBED EARTH - SIZE TO BE BASED ON SIZE OF FITTING AND PRESSURE IN WATERMAIN.

TEE INSTALLATION

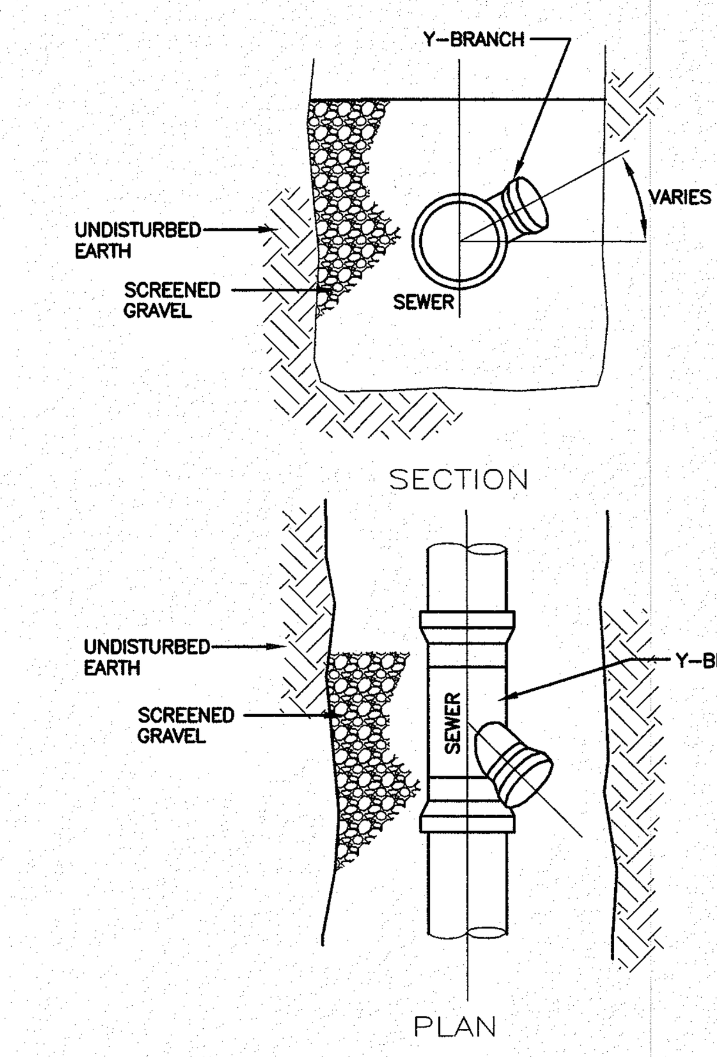
NOT TO SCALE



DEPTH PER LOCAL WATER CO.
3'-0" MIN. (U.N.O.)
HYDRANT TO CONFORM TO CITY STANDARDS
℄ HYDRANT PORTS
1'-6"
FINISHED GRADE
BURY LINE
UNDISTURBED MATERIAL
6" STD. GATE BOX
WELL COMPACTED GRAVEL BACKFILL
6" GATE VALVE
M.J. PIPE (TYP.)
EXTEND THRUST BLOCK SO THAT BEARING WILL BE AGAINST UNDISTURBED EARTH (28 DAY 3000 PSI CONCRETE)
COMPACTED GRAVEL FILL
6" HYDRANT RUN-OUT JOINTS TO BE HELD TO A MINIMUM
WATER MAIN ℄
12"
GRAVEL OR CRUSHED STONE (MIN. 6" THICK)
3'-0" SQ.
KEEP DRAIN OPEN
12"X8"X6" CONC. BLOCK

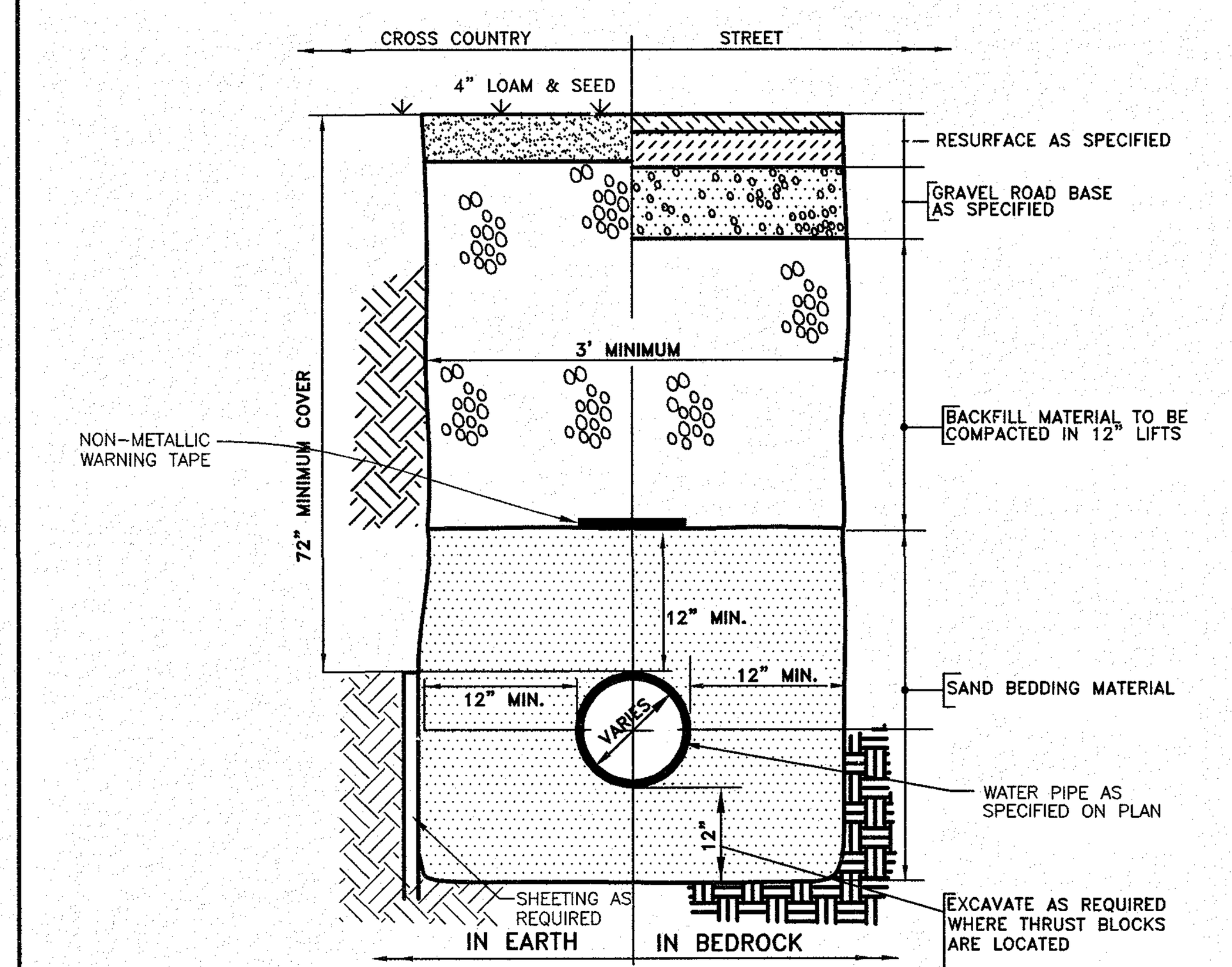
HYDRANT WITH GATE BOX DETAIL

NOT TO SCALE



PVC WYE BRANCH

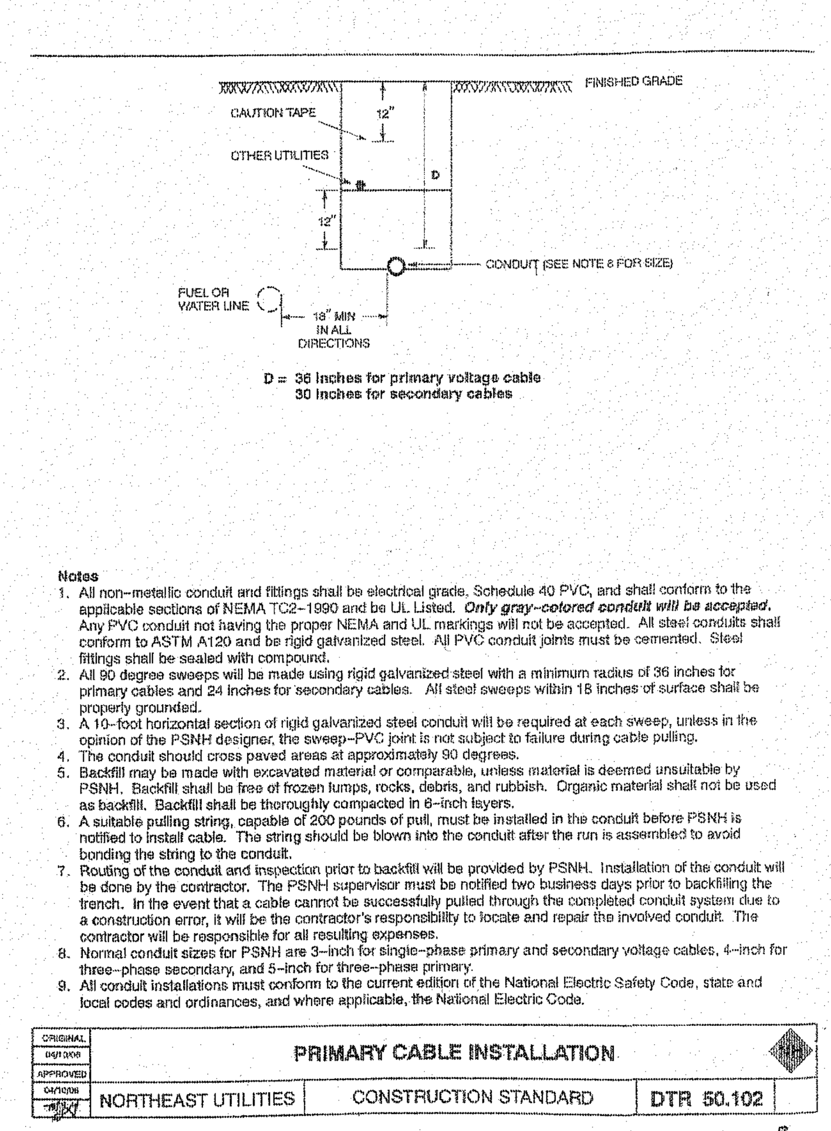
NOT TO SCALE



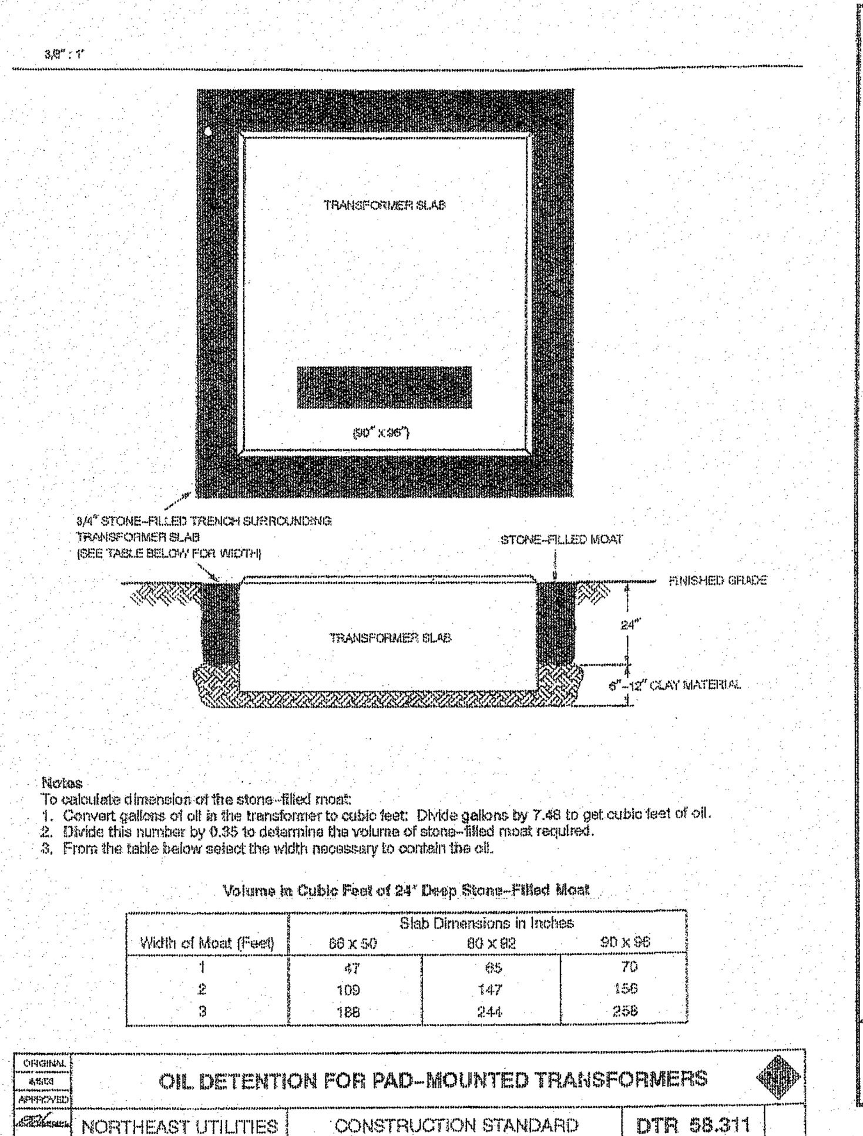
CROSS COUNTRY
STREET
4" LOAM & SEED
RESURFACE AS SPECIFIED
GRAVEL ROAD BASE AS SPECIFIED
3' MINIMUM
NON-METALLIC WARNING TAPE
72" MINIMUM COVER
BACKFILL MATERIAL TO BE COMPACTED IN 12" LIFTS
12" MIN.
12" MIN.
12" MIN.
VARIES
SAND BEDDING MATERIAL
WATER PIPE AS SPECIFIED ON PLAN
12"
SHEETING AS REQUIRED
IN EARTH
IN BEDROCK
EXCAVATE AS REQUIRED WHERE THRUST BLOCKS ARE LOCATED

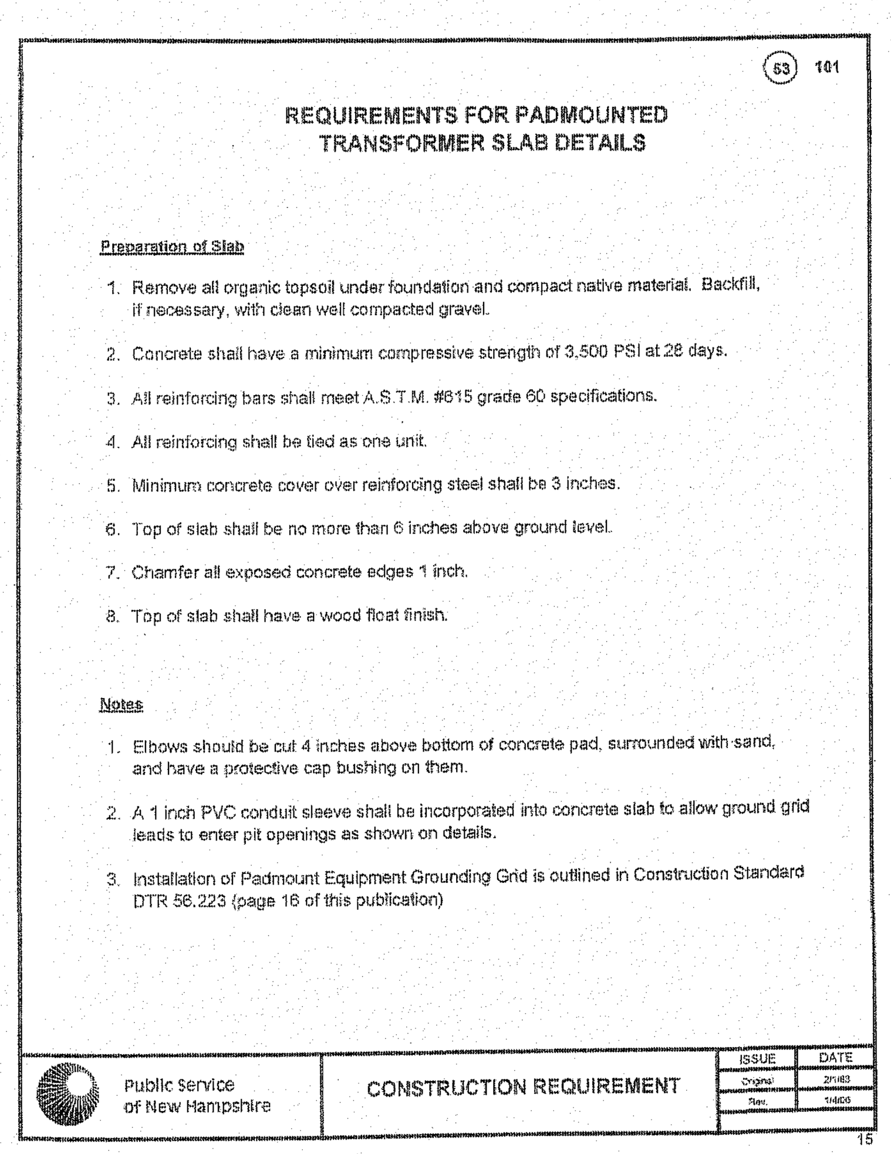
TYPICAL TRENCH SECTION FOR WATER SERVICE

NOT TO SCALE



FINISHED GRADE
CAUTION TAPE
OTHER UTILITIES
FUEL OR WATER LINE
CONDUIT (SEE NOTE 6 FOR SIZE)
D = 36 inches for primary voltage cable
30 inches for secondary cables
PRIMARY CABLE INSTALLATION
NORTHEAST UTILITIES
CONSTRUCTION STANDARD
DTR 50.102





REQUIREMENTS FOR PADMOUNTED TRANSFORMER SLAB DETAILS

Preparation of Slab

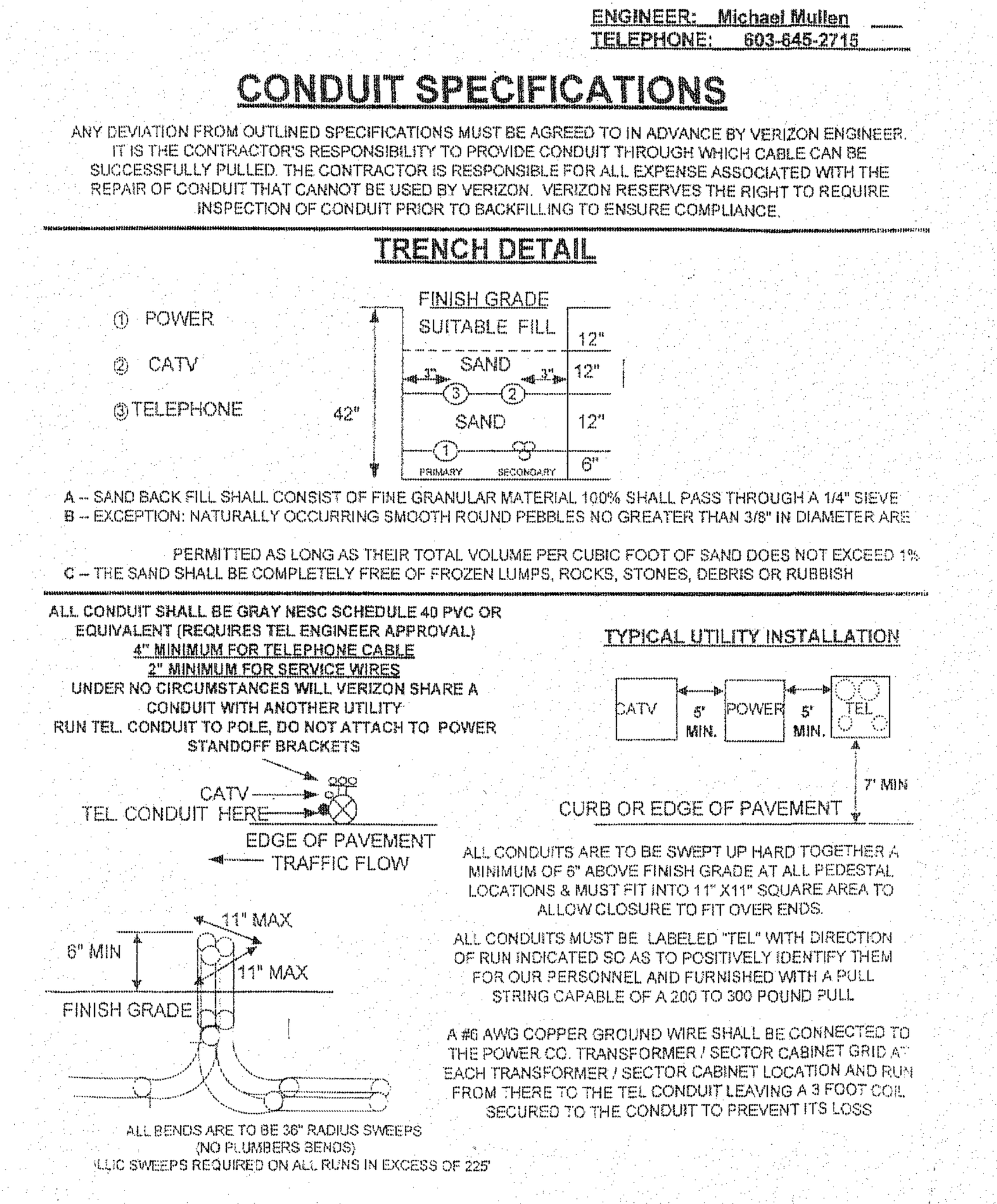
1. Remove all organic topsoil under foundation and compact native material. Backfill, if necessary, with clean well compacted gravel.
2. Concrete shall have a minimum compressive strength of 3,500 PSI at 28 days.
3. All reinforcing bars shall meet A.S.T.M. #615 grade 60 specifications.
4. All reinforcing shall be tied as one unit.
5. Minimum concrete cover over reinforcing steel shall be 3 inches.
6. Top of slab shall be no more than 6 inches above ground level.
7. Chamfer all exposed concrete edges 1 inch.
8. Top of slab shall have a wood float finish.

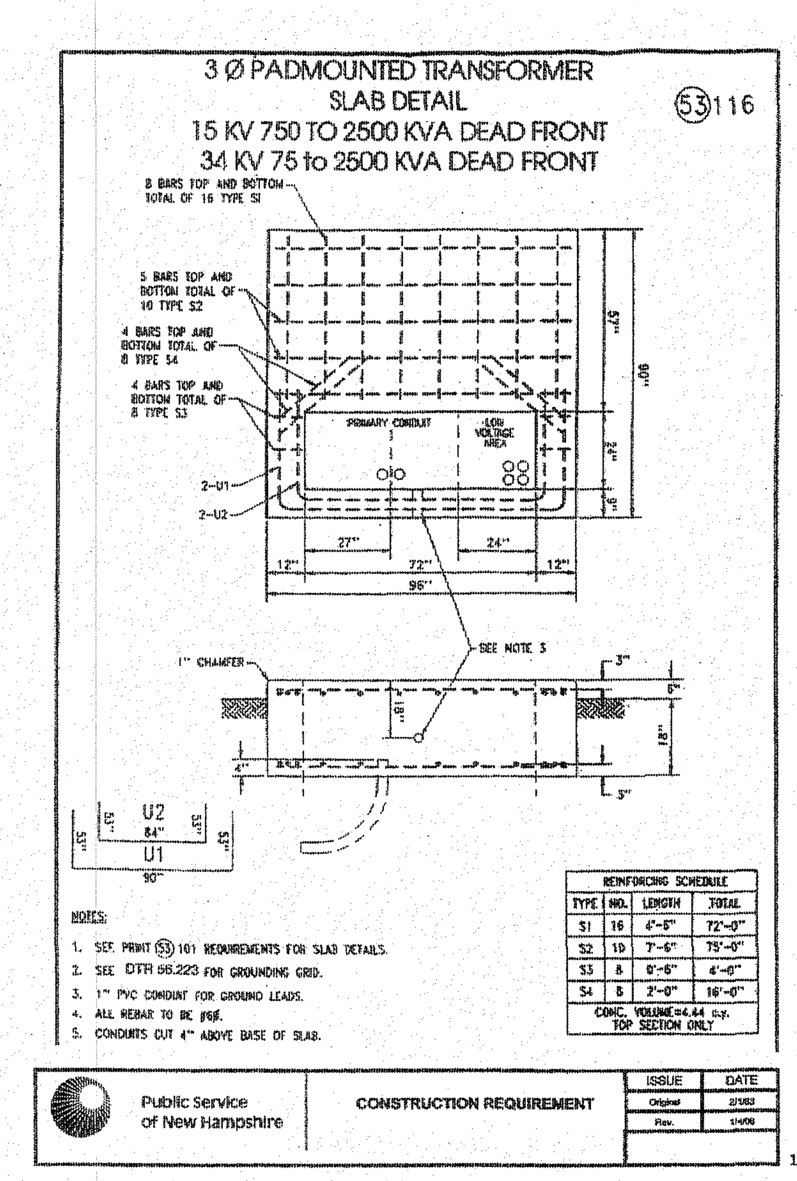
Notes

1. Elbows should be cut 4 inches above bottom of concrete pad, surrounded with sand, and have a protective cap bushing on them.
2. A 1 inch PVC conduit sleeve shall be incorporated into concrete slab to allow ground grid leads to enter pit openings as shown on details.
3. Installation of Padmount Equipment Grounding Grid is outlined in Construction Standard DTR 58.223 (page 16 of this publication)

Public Service of New Hampshire — CONSTRUCTION REQUIREMENT

ENGINEER: Michael Mullen
TELEPHONE: 603-645-2710





NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DETAIL SHEET

ASSESSORS MAP 252 - LOTS 4,5 & 9
1400 LAFAYETTE ROAD
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PREPARED FOR:
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STATE OF NEW HAMPSHIRE — FRANK C. MONTEIRO No. 7152 — LICENSED PROFESSIONAL ENGINEER — 1/21/20

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CPS	CMT	458219	12 OF 15

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NOTES

1. MINIMUM SIZE PIPE FOR HOUSE SERVICE SHALL BE 4 INCHES.
2. PIPE AND JOINT MATERIALS

A. VITRIFIED CLAY PIPE
   1. PIPE AND FITTINGS SHALL BE EXTRA STRENGTH CLAY PIPE CONFORMING TO THE REQUIREMENTS OF ASTM C-700.
   2. JOINTS SHALL BE MADE WITH OIL RESISTANT GASKETS IN ACCORDANCE WITH ASTM C-425 TYPE III MANUFACTURERS INSTRUCTIONS FOR INSTALLATION SHALL BE FOLLOWED.

B. ASBESTOS-CEMENT-NON-PRESSURE SEWER PIPE
   1. PIPE AND FITTINGS SHALL CONFORM TO ASTM TENTATIVE SPECIFICATIONS C644 TYPE II.
   2. JOINTS SHALL BE OF THE SLEEVE-COUPLING TYPE CONFORMING TO ASTM SPECIFICATIONS C644 TYPE II. COMPRESSION RINGS SHALL BE OF OIL RESISTANT RUBBER TYPE OR ELASTOMERIC MATERIAL AND SHALL CONFORM TO ASTM SPECIFICATION D1869. MANUFACTURERS INSTRUCTIONS SHALL BE FOLLOWED FOR INSTALLATIONS.

C. CAST IRON PIPE FITTINGS AND JOINTS
   1. CAST IRON PIPE AND FITTINGS SHALL CONFORM TO THE FOLLOWING STANDARDS OF THE AMERICAN NATIONAL STANDARDS INSTITUTE:
      A21.1 THICKNESS DESIGN OF CAST IRON PIPE
      A21.4 CEMENT MORTAR LINING FOR CAST IRON PIPE AND FITTINGS
      A21.6 CAST IRON PIPE CENTRIFUGALLY CAST IN METAL MOLDS FOR WATER OR OTHER LIQUIDS.
      A21.8 CAST IRON PIPE CENTRIFUGALLY CAST IN SAND LINED MOLDS FOR WATER OR OTHER LIQUIDS.
      A21.10 CAST IRON FITTINGS, 2 INCHES THROUGH 48 INCHES FOR WATER AND OTHER LIQUIDS.
   2. JOINTS SHALL BE OF THE MECHANICAL OR PUSH ON TYPE JOINTS AND GASKETS SHALL CONFORM TO:
      A21.11 RUBBER GASKET JOINTS FOR CAST IRON PRESSURE PIPE AND FITTINGS.

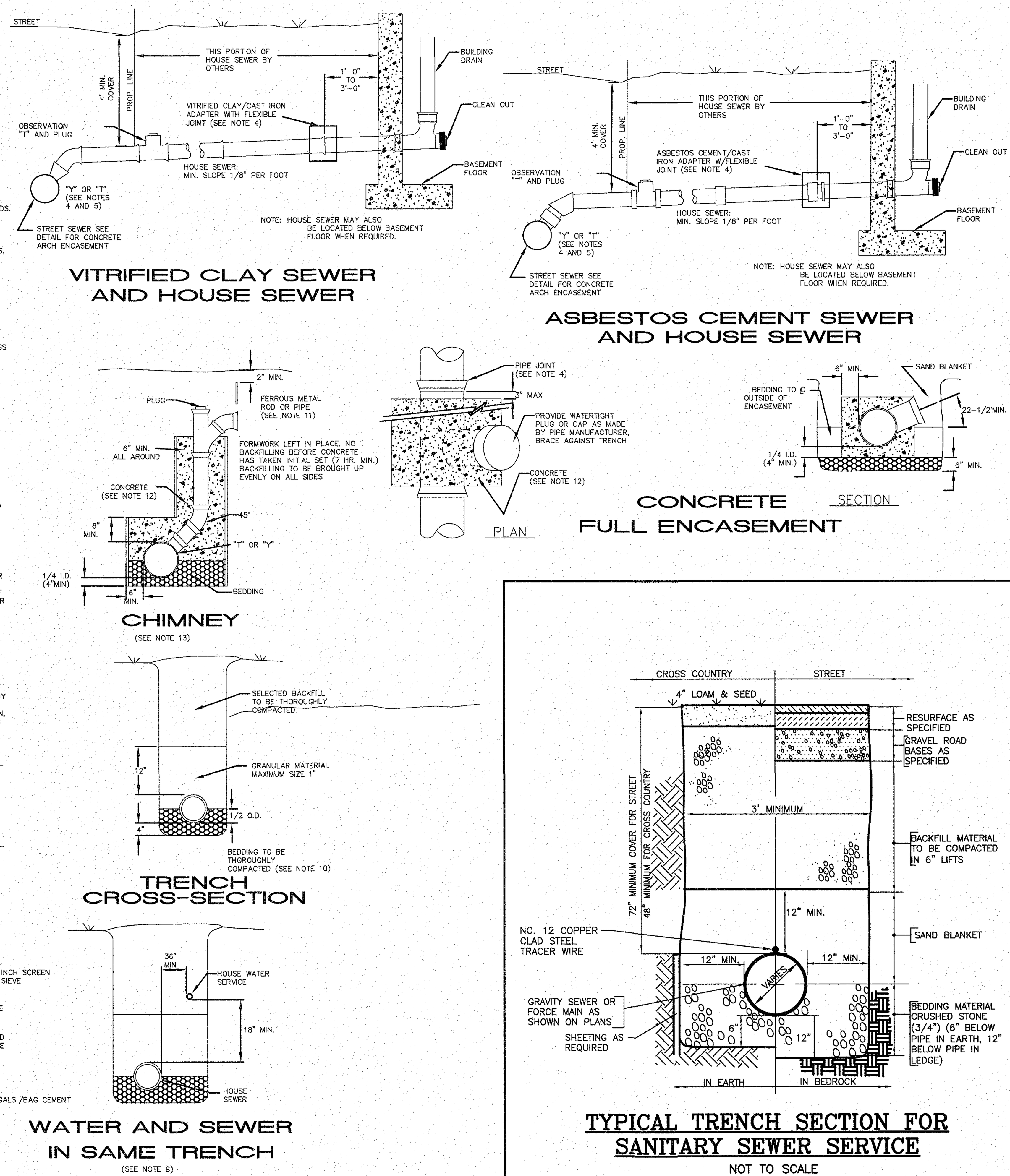
D. DUCTILE IRON PIPE, FITTINGS AND JOINTS
   1. DUCTILE IRON PIPE AND FITTINGS SHALL CONFORM TO THE STANDARDS OF THE UNITED STATES OF AMERICA STANDARDS INSTITUTE:
      A21.50 THICKNESS DESIGN OF DUCTILE IRON PIPE AND WITH ASTM A536 DUCTILE IRON CASTINGS
      A21.51 DUCTILE IRON PIPE CENTRIFUGALLY CAST IN METAL MOLDS OR SAND LINED MOLDS FOR WATER OR OTHER LIQUIDS.
   2. JOINTS SHALL BE AS SPECIFIED IN C2 ABOVE, CAST IRON PIPE JOINTS.

3. DAMAGED PIPE SHALL BE REJECTED AND REMOVED FROM THE JOB SITE.
4. JOINTS SHALL BE BE DEPENDENT UPON A NEOPRENE OR ELASTOMERIC GASKET FOR WATERTIGHTNESS. ALL JOINTS SHALL BE PROPERLY MATCHED WITH THE PIPE MATERIALS USED. WHERE DIFFERING MATERIALS ARE TO BE CONNECTED, AS AT THE STREET SEWER "Y" OR AT THE FOUNDATION WALL, APPROPRIATE ADAPTERS SHALL BE USED.
5. "T" AND "Y" WHERE A "T" OR "Y" IS NOT AVAILABLE IN THE EXISTING STREET SEWER, AN APPROPRIATE CONNECTION SHALL BE MADE IN THE SEWER, FOLLOWING MANUFACTURERS INSTRUCTIONS (USING A BOLTED, CLAMPED OR EPOXY CEMENTED SADDLE TAPPED INTO A SMOOTHLY DRILLED OR SAWN OPENING. THE PRACTICE OF BREAKING AN OPENING WITH A SLEDGE HAMMER, STUFFING CLOTH (OR OTHER SUCH MATERIAL) AROUND THE JOINT, OR APPLYING MORTAR TO HOLD THE CONNECTION AND ANY OTHER SIMILAR CRUDE PRACTICES OR INEPT OR HASTY IMPROVISATIONS WILL NOT BE PERMITTED. THE CONNECTION SHALL BE CONCRETE ENCASED, AS* SHOWN IN THE DETAIL, UP TO AND INCLUDING 15" DIAMETER.
6. PIPE INSTALLATION THE PIPE SHALL BE HANDLED, PLACED AND JOINTED IN ACCORDANCE WITH INSTALLATION GUIDES OF THE APPROPRIATE MANUFACTURER. IT SHALL BE CAREFULLY BEDDED ON A 4 INCH LAYER OF CRUSHED STONE AND/OR GRAVEL, AS SPECIFIED IN NOTE 10, BEDDING AND RE-FILL FOR A DEPTH OF 12 INCHES ABOVE THE TOP OF THE PIPE SHALL BE CAREFULLY AND THOROUGHLY TAMPED BY HAND OR WITH APPROPRIATE MECHANICAL DEVICES.

   THE PIPE SHALL BE LAID AT A CONTINUOUS AND CONSTANT GRADE FROM THE STREET SEWER CONNECTION TO THE HOUSE FOUNDATION AT A GRADE OF NOT LESS THAN 1/8 INCH PER FOOT. PIPE JOINTS MUST BE MADE UNDER DRY CONDITIONS. IF WATER IS PRESENT, ALL NECESSARY STEPS SHALL BE TAKEN TO DEWATER THE TRENCH.
7. TESTING THE COMPLETED HOUSE SEWER SHALL BE SUBJECTED TO A LEAKAGE TEST IN ANY OF THE FOLLOWING MANNERS (PRIOR TO BACKFILLING):
   A. AN OBSERVATION "T" SHALL BE INSTALLED AS SHOWN. WHEN READY TESTING , AN INFLATABLE BLADDER OR PLUG SHALL BE INSERTED JUST UPSTREAM FROM THE OPENING IN THE "T". AFTER INFLATION, WATER SHALL BE INTRODUCED INTO THE SYSTEM ABOVE THE PLUG TO A HEIGHT OF 5 FEET ABOVE THE LEVEL OF THE PLUG.
   B. THE PIPE SHALL BE LEFT EXPOSED AND LIBERALLY HOSED WITH WATER TO SIMULATE, AS NEARLY AS POSSIBLE, WET TRENCH CONDITIONS. IF THE TRENCH IS WET, THE GROUND WATER SHALL BE PERMITTED TO RISE IN THE TRENCH OVER THE PIPE. INSPECTIONS FOR LEAKS SHALL BE MADE THROUGH THE CLEANOUT WITH A FLASHLIGHT.

   * DOES NOT APPLY TO INSTALLATIONS WHERE "T's" AND "Y's" ARE USED

   C. FLUORESCENT DYE SHALL BE SPRINKLED INTO THE TRENCH OVER THE PIPE. IF THE TRENCH IS DRY, THE PIPE SHALL BE LIBERALLY HOSED WITH WATER. IF THE TRENCH IS WET, GROUND WATER SHALL BE PERMITTED TO RISE IN THE TRENCH OVER THE PIPE. OBSERVATION FOR LEAKS SHALL BE MADE IN THE FIRST MANHOLE DOWNSTREAM. LEAKAGE OBSERVED IN ANY OF THE ABOVE, ALTERNATE TESTS SHALL BE CAUSE FOR NON-ACCEPTANCE AND THE PIPE SHALL BE DUG UP, IF NECESSARY, AND RELAID SO AS TO ASSURE WATERTIGHTNESS.
8. ILLEGAL CONNECTION NOTHING BUT SANITARY WASTE FLOW FROM THE HOUSE TOILETS, SINKS, LAUNDRY ETC. SHALL BE PERMITTED. ROOF LEADERS, FOOTING DRAINS, SUMP PUMPS OR ANY OTHER SIMILAR CONNECTION CARRYING RAIN WATER, DRAINAGE OR GROUND WATER SHALL NOT BE PERMITTED.
9. HOUSE WATER SERVICE SHOULD NOT BE LAID IN THE SAME TRENCH AS THE SEWER SERVICE, BUT WHEN NECESSARY, SHALL BE PLACED ABOVE AND TO ONE SIDE OF THE HOUSE SEWER AS SHOWN.
10. BEDDING: SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATERIAL AND MEETING ASTM C33-67.
    100%-PASSING 1 INCH SCREEN; 90-100%-PASSING 3/4 INCH SCREEN
    20-55%-PASSING 3/8 INCH SCREEN; 0-10%-PASSING #4 SIEVE
    0-5%-PASSING #8 SIEVE
    WHERE ORDERED BY THE ENGINEER TO STABILIZE THE TRENCH BASE, SCREENED GRAVEL OR CRUSHED STONE (1-1/2 TO 1/2 INCH) SHALL BE USED.
11. LOCATION THE LOCATION OF THE "T" OR "Y" SHALL BE RECORDED AND FILED IN THE MUNICIPAL RECORDS. IN ADDITION, A FERROUS METAL ROD OR PIPE SHALL BE PLACED OVER THE "T" OR "Y", AS DESCRIBED IN THE TYPICAL "CHIMNEY" DETAIL, TO AID IN LOCATING THE BURIED PIPE WITH A DIP NEEDLE OR PIPEFINDER.
12. CONCRETE CONCRETE SHALL CONFORM TO THE REQUIREMENTS FOR CLASS A (3000 PSI) CONCRETE OF THE N.H. DEPT. OF PUBLIC WORKS AND HIGHWAYS STANDARD SPECIFICATIONS AS FOLLOWS:
    CEMENT: 6.0 BAGS/C.Y.; WATER: 5.75 GALS./BAG CEMENT
    AGGREGATE: 1-1/2 INCH MAX.
13. CHIMNEYS IF VERTICAL DROP INTO THE SEWER IS GREATER THAN 4 FEET, A CHIMNEY SHALL BE CONSTRUCTED FOR THE HOUSE CONNECTION.



VITRIFIED CLAY SEWER AND HOUSE SEWER

ASBESTOS CEMENT SEWER AND HOUSE SEWER

CHIMNEY (SEE NOTE 13)

CONCRETE FULL ENCASEMENT

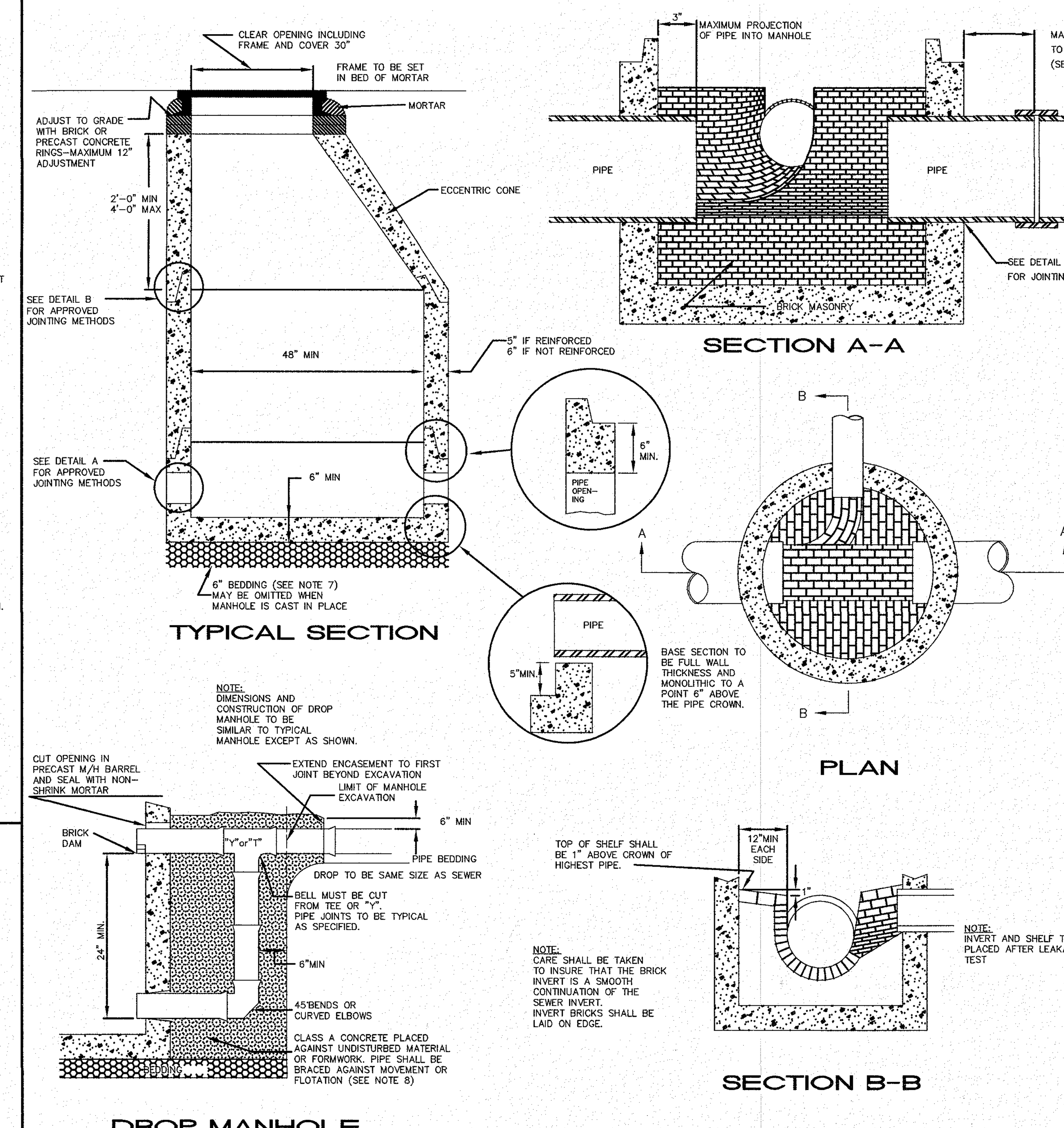
TRENCH CROSS-SECTION

WATER AND SEWER IN SAME TRENCH (SEE NOTE 9)

TYPICAL TRENCH SECTION FOR SANITARY SEWER SERVICE

NOT TO SCALE

HOUSE SEWER DETAILS



TYPICAL SECTION

DROP MANHOLE

SECTION A-A

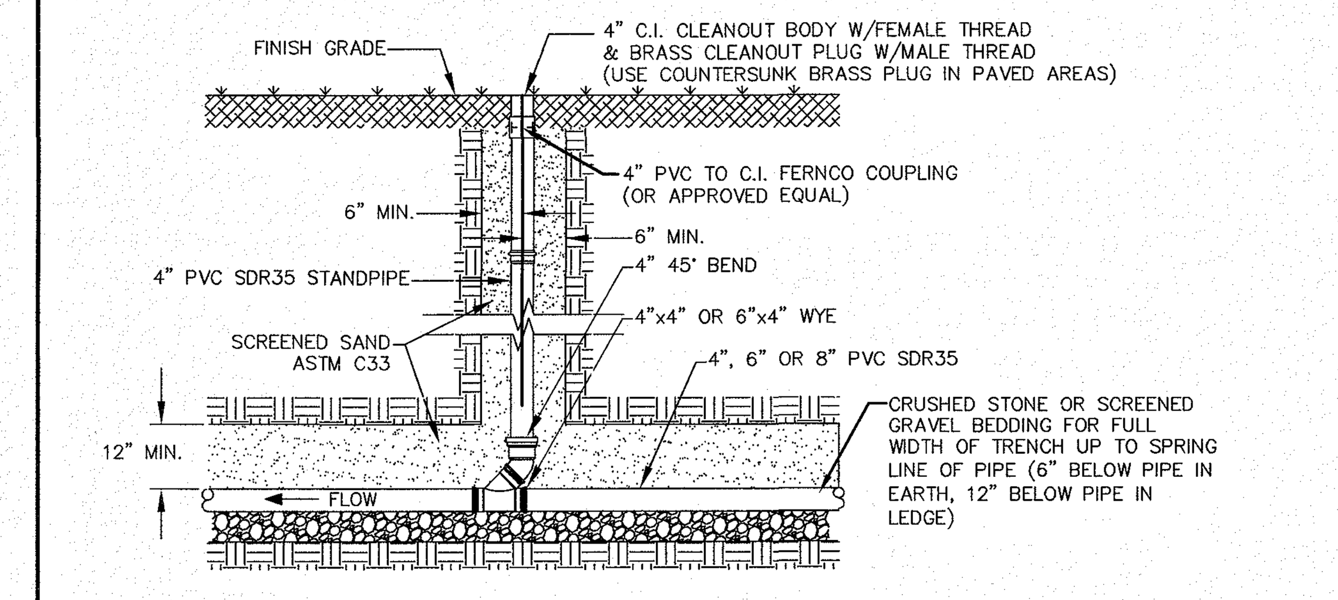
PLAN

SECTION B-B

NOTES

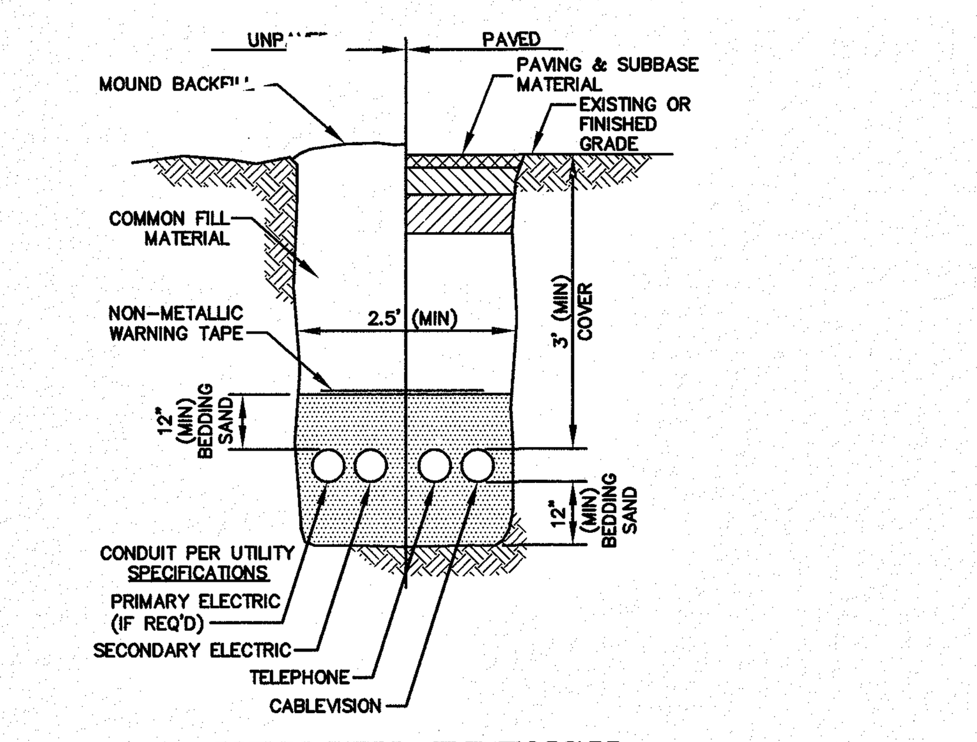
1. IT IS THE INTENTION OF THE ENGINEER THAT THE MANHOLE, INCLUDING ALL COMPONENT PARTS, HAVE ADEQUATE SPACE, STRENGTH AND LEAKPROOF QUALITIES CONSIDERED NECESSARY BY THE ENGINEER FOR THE INTENDED SERVICE. SPACE REQUIREMENTS AND CONFIGURATIONS, SHALL BE AS SHOWN ON THE DRAWING. MANHOLES MAY BE AN ASSEMBLY OF PRECAST SECTIONS, WITH OR WITHOUT STEEL REINFORCEMENT, WITH ADEQUATE JOINTING, OR CONCRETE CAST MONOLITHICALLY IN PLACE WITH OR WITHOUT REINFORCEMENT. IN ANY APPROVED MANHOLE, THE COMPLETE STRUCTURE SHALL BE OF SUCH MATERIAL AND QUALITY AS TO WITHSTAND LOADS OF 8 TONS (H-20 LOADING) WITHOUT FAILURE AND PREVENT LEAKAGE IN EXCESS OF ONE GALLON PER DAY PER VERTICAL FOOT OF MANHOLE, CONTINUOUSLY FOR THE LIFE OF THE STRUCTURE A PERIOD GENERALLY IN EXCESS OF 25 YEARS IS TO BE UNDERSTOOD IN BOTH CASES.
2. BARRELS AND CONE SECTIONS SHALL BE PRECAST REINFORCED OR NON-REINFORCED CONCRETE, OR POURED IN PLACE REINFORCED OR NON-REINFORCED CONCRETE.
3. PRECAST CONCRETE BARREL SECTIONS, CONES AND BASES SHALL CONFORM TO ASTM C 478.
4. LEAKAGE TEST SHALL BE PERFORMED IN ACCORDANCE WITH THE SPECIFICATIONS.
5. INVERTS AND SHELVES MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT, CONSTRUCTED TO CONFORM TO THE SIZE OF THE PIPE AND FLOW. AT CHANGES IN DIRECTION. THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE. CROWN AND SLOPE TO DRAIN TOWARD THE FLOW THROUGH CHANNEL. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY.
6. FRAMES AND COVERS MANHOLE FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30 INCH CLEAR OPENING. A 3 INCH (MINIMUM HEIGHT) LETTER "S" FOR SEWER OR "D" FOR DRAINS SHALL BE PLAINLY CAST INTO THE CENTER OF EACH COVER.
7. BEDDING SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C33
   100% PASSING 1 INCH SCREEN
   90-100% PASSING 3/4 INCH SCREEN
   20-55% PASSING 3/8 INCH SCREEN
   0-10% PASSING #4 SIEVE
   0-5% PASSING #8 SIEVE
   WHERE ORDERED BY THE ENGINEER TO STABILIZE THE BASE. SCREENED GRAVEL OR CRUSHED STONE 1-1/2 TO 1/2 INCH SHALL BE USED.
8. CONCRETE FOR DROP SUPPORT SHALL CONFORM TO THE REQUIREMENT FOR CLASS A (3,000 LB.) CONCRETE OF N.H. DEPT. OF PUBLIC WORKS AND HIGHWAYS STANDARD SPECIFICATIONS AS FOLLOWS:
   CEMENT: 6.0 BAGS PER CUBIC YARD
   WATER: 5.75 GALLONS PER BAG OF CEMENT
   MAX. SIZE OF AGGREGATE: 1 INCH
9. FLEXIBLE JOINT A FLEXIBLE JOINT SHALL BE PROVIDED WITHIN THE FOLLOWING DISTANCES:
   RCP & CI PIPE (ALL SIZES): 48"
   AC & VC PIPE (UP THROUGH 12" DIA.): 18"
   AC & VC PIPE (LARGER THAN 12" DIA.): 36"
10. SHALLOW MANHOLE IN LIEU OF A CONE SECTION, WHEN MANHOLE DEPTH IS LESS THAN 6 FEET, A REINFORCED CONCRETE SLAB COVER MAY BE USED. IT MUST HAVE AN ECCENTRIC ENTRANCE OPENING AND BE CAPABLE OF SUPPORTING H-20 LOADS.

STANDARD MANHOLE - PART A



TYPICAL SEWER SERVICE CLEANOUT

NOT TO SCALE



UTILITY TRENCH

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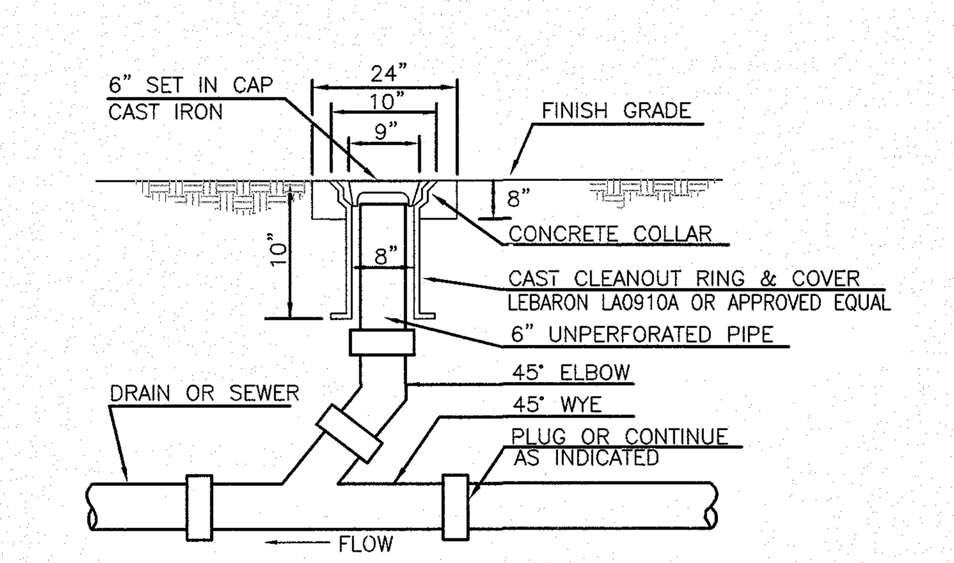
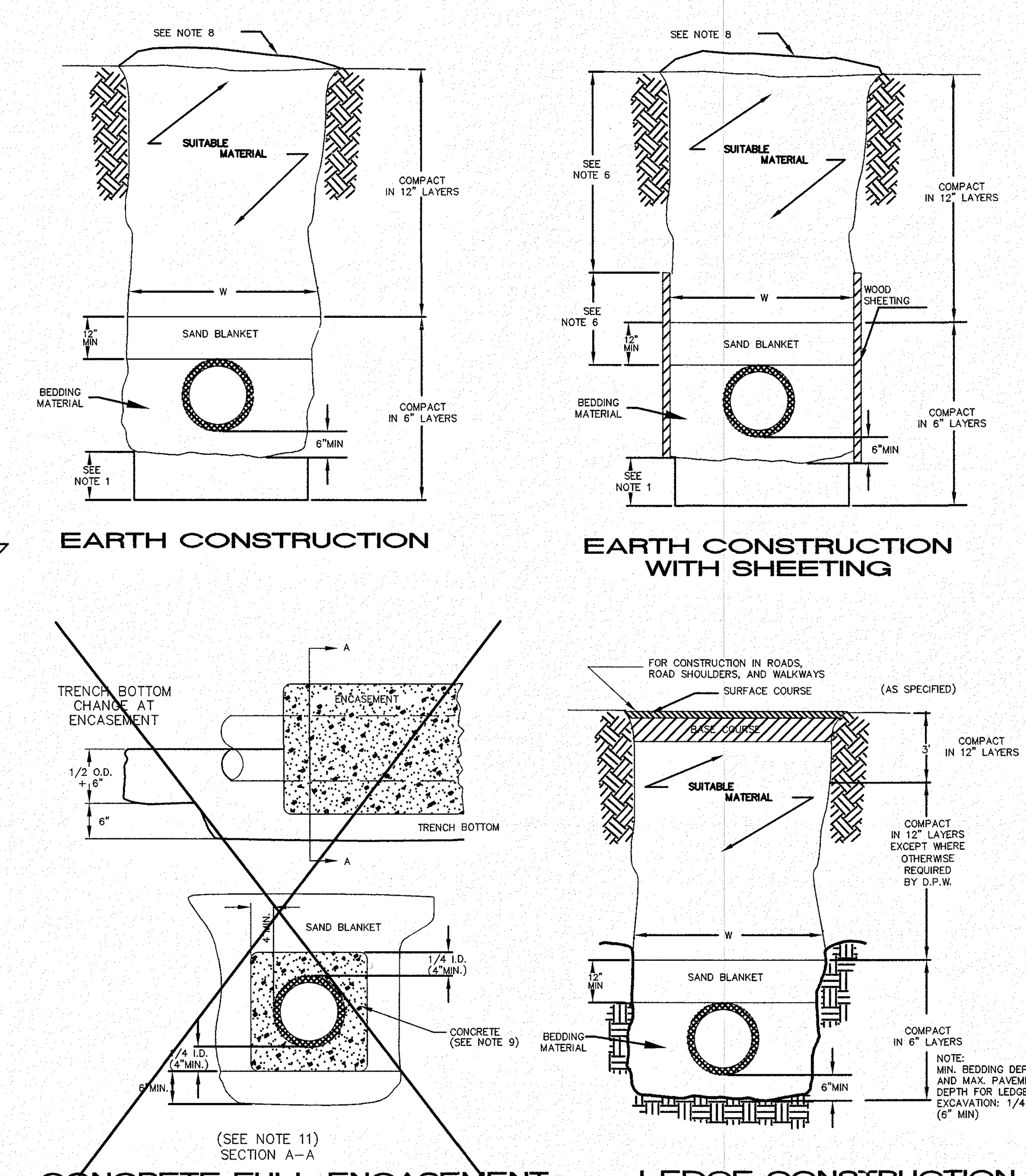


TYPICAL CLEANOUT

NOT TO SCALE



EARTH CONSTRUCTION

EARTH CONSTRUCTION WITH SHEETING

CONCRETE FULL ENCASEMENT

LEDGE CONSTRUCTION

NOTES:

1. ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE, REFILL WITH BEDDING MATERIAL. (SEE ALSO NOTE 7)
2. BEDDING CRUSHED STONE (FINE) FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C33. STONE SIZE #67
   100% PASSING 1 INCH SCREEN
   90-100% PASSING 3/4 INCH SCREEN
   20-50% PASSING 3/8 INCH SCREEN
   0-10% PASSING #4 SIEVE
   0-5% PASSING #8 SIEVE
   WHERE ORDERED BY THE ENGINEER TO STABILIZE THE TRENCH BASE. GRADED SCREENED GRAVEL OR CRUSHED STONE 1/2 TO 1-1/2 INCH SHALL BE USED.
3. SAND BLANKET CLEAN SAND, FREE FROM ORGANIC MATTER, SO GRADED THAT 90-100% PASSES A 1/2 INCH SIEVE AND NOT MORE THAN 15% WILL PASS A #200 SIEVE. BLANKET MAY BE OMITTED FOR CAST IRON, DUCTILE IRON AND REINFORCED CONCRETE PIPE PROVIDED THAT NO STONE LARGER THAN 2" IS IN CONTACT WITH THE PIPE.
4. SUITABLE MATERIAL IN ROADS, ROAD SHOULDERS, WALK WAYS AND TRAVELLED WAYS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS, PIECES OF PAVEMENT, ORGANIC MATTER, TOPSOIL, ALL WET OR SOFT MUCK, PEAT OR CLAY, ALL EXCAVATED LEDGE MATERIAL, AND ALL ROCKS OVER SIX INCHES, OR ANY MATERIAL WHICH AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION.

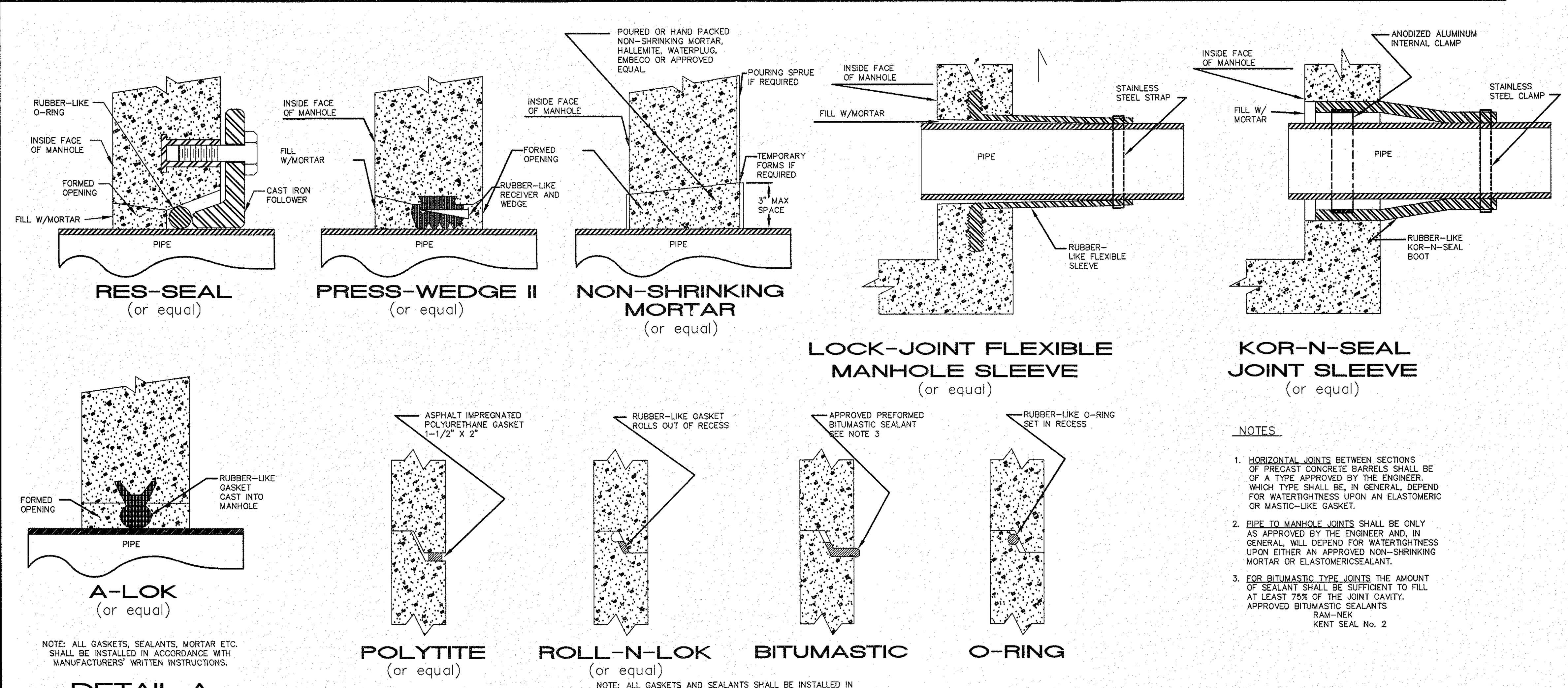
   IN CROSS COUNTRY CONSTRUCTION, SUITABLE MATERIAL SHALL BE AS DESCRIBED ABOVE, EXCEPT THAT THE ENGINEER MAY PERMIT THE USE OF TOPSOIL, LOAM, MUCK OR PEAT, IF HE IS SATISFIED THAT THE COMPLETED CONSTRUCTION WILL BE ENTIRELY STABLE AND PROVIDED THAT EASY ACCESS TO THE SEWER FOR MAINTENANCE (AND POSSIBLY RECONSTRUCTION, WHEN NECESSARY) WILL BE PRESERVED.
5. BASE COURSE, IF ORDERED BY THE ENGINEER SHALL MEET THE REQUIREMENTS OF DIVISION 300 OF THE LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION OF THE STATE OF N.H. DEPT. OF PUBLIC WORKS AND HIGHWAYS.
6. WOOD SHEETING, IF REQUIRED, IS PLACED ALONGSIDE THE PIPE AND EXTENDS BELOW MID-DIAMETER. IT SHALL BE CUT OFF AND LEFT IN PLACE TO AN ELEVATION NOT LESS THAN 1 FOOT ABOVE THE TOP OF THE PIPE. WHERE THE SHEETING IS ORDERED BY THE ENGINEER TO BE LEFT IN PLACE, IT SHALL BE CUT OFF AT LEAST 3 FEET BELOW FINISH GRADE, BUT NOT LESS THAN 1 FOOT ABOVE THE TOP OF THE PIPE.

   W = MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12 INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, W SHALL BE NO MORE THAN 36 INCHES, FOR PIPES GREATER THAN 15 INCHES NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS PIPE O.D.. W SHALL ALSO BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE.
8. FOR CROSS COUNTRY CONSTRUCTION, BACKFILL OR FILL SHALL BE MOUNDED TO A HEIGHT OF 6
7. INCHES ABOVE THE ORIGINAL GROUND SURFACE.
9. CONCRETE FOR ENCASEMENT SHALL CONFORM TO THE REQUIREMENTS FOR CLASS A (3000#) CONCRETE OF THE N.H. DEPT. OF PUBLIC WORKS AND HIGHWAYS STANDARD SPECIFICATIONS AS FOLLOWS:
   CEMENT: 6.0 BAGS PER CUBIC YARD
   WATER: 5.75 GALLONS PER BAG OF CEMENT
   MAXIMUM AGGREGATE SIZE: 1 INCH
10. THERE SHALL BE TEN FEET HORIZONTAL SEPARATION BETWEEN SEWER LINE AND WATER MAIN AND 18 INCHES VERTICAL SEPARATION AT CROSSINGS.
    (see also NOTE 12 below)

    WHERE THE ABOVE SEPARATION CANNOT BE MADE, A WAIVER OF THE STANDARD OF DESIGN MUST BE REQUESTED FROM THE STANDARD OF DESIGN MUST SEWER COMMISSION.
11. IF FULL ENCASEMENT IS UTILIZED, DEPTH OF CONCRETE BELOW PIPE SHALL BE 1/4 I.D. (4" MIN). BLOCK SUPPORT SHALL BE SOLID CONCRETE BLOCKS.
12. WHENEVER SEWERS MUST CROSS WATER MAINS, THE SEWER SHALL BE CONSTRUCTED AS FOLLOWS:

    SEWER PIPE SHALL BE CLASS 52 DUCTILE IRON FOR A MINIMUM DISTANCE OF 9 FEET EACH SIDE OF CROSSING.

STANDARD TRENCH SECTION



RES-SEAL (or equal)

PRESS-WEDGE II (or equal)

NON-SHRINKING MORTAR (or equal)

LOCK-JOINT FLEXIBLE MANHOLE SLEEVE (or equal)

KOR-N-SEAL JOINT SLEEVE (or equal)

A-LOK (or equal)

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

DETAIL A

POLYTITE (or equal)

ROLL-N-LOK

BITUMASTIC

O-RING

NOTE: ALL GASKETS AND SEALANTS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS.

DETAIL B

NOTES

1. HORIZONTAL JOINTS BETWEEN SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE OF A TYPE APPROVED BY THE ENGINEER. WHICH TYPE SHALL BE, IN GENERAL, DEPEND FOR WATERTIGHTNESS UPON AN ELASTOMERIC OR MASTIC-LIKE GASKET.
2. PIPE TO MANHOLE JOINTS SHALL BE ONLY AS APPROVED BY THE ENGINEER AND, IN GENERAL, WILL DEPEND FOR WATERTIGHTNESS UPON EITHER AN APPROVED NON-SHRINKING MORTAR OR ELASTOMERICSEALANT.
3. FOR BITUMASTIC TYPE JOINTS THE AMOUNT OF SEALANT SHALL BE SUFFICIENT TO FILL AT LEAST 75% OF THE JOINT CAVITY. APPROVED BITUMASTIC SEALANTS
   RAM-NEK
   KENT SEAL No. 2

STANDARD MANHOLE - PART B

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DETAIL SHEET

ASSESSORS MAP 252 - LOTS 4,5 & 9
1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

STATE OF NEW HAMPSHIRE — FRANK C. MONTEIRO — No. 7152 — LICENSED — PROFESSIONAL ENGINEER

GPI Engineering Design Planning Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

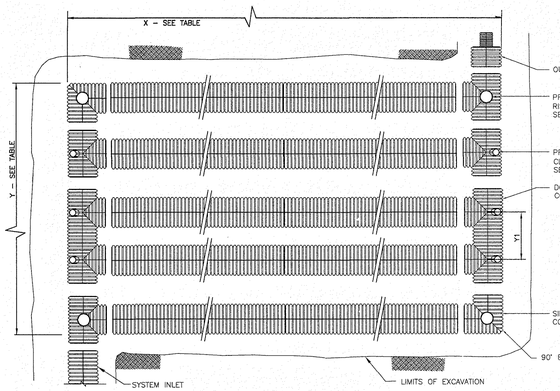
SCALE: 1"=20'		DATE:	DRAWING NO. 4582DET.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CPS	CMT	458219	13 OF 15

UNDERGROUND SYSTEM NOTES:

1) ALL SITE DRAINAGE PIPE SHALL BE CORRUGATED HIGH-DENSITY POLYETHYLENE PIPE, DUAL WALL, SMOOTH INTERIOR AS MANUFACTURED BY ADS, INC., OR APPROVED EQUAL, UNLESS OTHERWISE NOTED ON PLAN.

2) CONTRACTOR SHOULD CONFIRM SYSTEM PARTS AND PROVIDE SHOP DRAWINGS FROM MANUFACTURER. SUBSTITUTIONS AND SHOP DRAWINGS SHOULD BE APPROVED BY THE ENGINEER.

3) PARTS SPECIFICATIONS SHOWN ARE AS PROVIDED BY ADS, INC., OR APPROVED EQUAL. ANY CHANGES TO THESE SPECIFICATIONS SHOULD BE APPROVED BY DESIGN ENGINEER FOR PERFORMANCE.



NOTE: FOR ADDITIONAL DETAILS, SEE ADS STD-702 & STD-703.

UNDERGROUND STORMWATER INFILTRATION SYSTEM TABLE

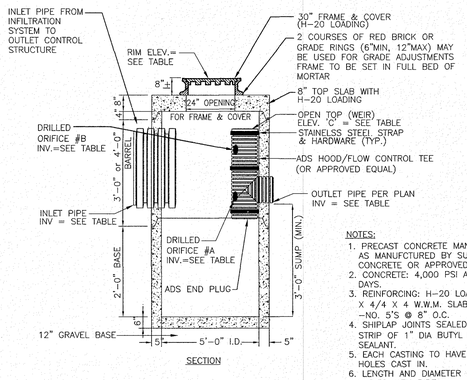
UG INFILTRATION SYSTEM	LENGTH (X)	WIDTH (Y)	SPACING (Y1) (O.C. TYP.) *	PIPE SIZE (INCHES) PERF	INV. PIPE ELEV. (A)	# PIPE ROWS	STONE BED
INFILTRATION SYS#1	57'	24.5'	63"	36"	41.75	5	27.5'x60'
INFILTRATION SYS#2	92'	19.25'	63"	36"	40.50	4	22.25'x95'
INFILTRATION SYS#3	57'	24.5'	63"	36"	40.00	5	27.5'x60'
INFILTRATION SYS#4	32'	19.25'	63"	36"	40.50	4	22.25'x35'

*SEE TYPICAL CROSS SECTION BELOW.

Table 5-2
Classes of Embedment and Backfill Materials

ASTM D3321[1] Class	Description	Notation	ASTM D2487 Description	AASHTO M43 Notation	Min. Compaction Required (Std Proctor Density %)[2]	ASTM D2321[3] Percentage Passing Sieve Sizes 1 ½ in. (40mm)	No. 4 (4.75mm)	No. 200 (0.075mm)	Atterberg Limits LL	PI	Coefficients Uniformity Cu	Curvature Cc
IA[4]	Open-graded, clean manufactured aggregates	N/A	Angular crushed stone or rock, crushed gravel, crushed slag; large voids with little or no fines	5 56	Dumped to Slight	100%	≤10%	<5%	Non Plastic		N/A	
IB	Dense-graded clean manufactured, processed aggregates	N/A	Angular crushed stone or other Class IA material and stone-sand mixtures with gradations selected to minimize migration of adjacent soils. little or no fines			100%	≤50%	<5%	Non Plastic			
II	Clean, coarse-grained soils	GW	Well-graded gravel, gravel-sand mixtures: little or no fines	57 6 67	Moderate (85%	100%	<50% of "Coarse Fraction"	<5%	Non Plastic		>4	1 to 3
		GP	Poorly-graded gravel, gravel-sand mixtures; little or no fines								<4	<1 or >3
		SW	Well-graded sands, gravelly sands; little or no fines				>50% of "Coarse Fraction"				>6	1 to 3
		SP	Poorly-graded sands, gravelly sands; little or no fines								<6	<1 or >3
	Coarse-Grained Soils, bordering clean to w/fines	GW-GC, GP-GM	Sands and gravels which are borderline between clean and with fines	N/A		100%	Varies	5% to 12%	Non Plastic		Same as for GW, GP, SW and SP	
III	Coarse-grained soils with fines	GM	Silty gravels, gravel-sand-silt mixtures	Gravel & sand with >10% fines	Moderate to High (90%)	100%	<50% of "Coarse Fraction"	12% to 50%	N/A	<4 or "A" Line	N/A	
		GC	Clayey gravels, gravel-sand-clay mixtures							>7 & >"A" Line		
		SM	Silty sands, sand-silt mixtures				>50% of "Coarse Fraction"			<4 or "A" Line		
		SC	Clayey sands, sand-clay mixtures							>7 & >"A" Line		
IVA[5]	Inorganic fine-grained soils	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, silts with slight plasticity	N/A	N/R	100%	100%	>50%	<50	<4 or "A" Line	N/A	
		CL	Inorganic clays of low to medium plasticity; gravelly, sandy, or silty clays; lean clays	N/A						>7 & >"A" Line		
IVB	Inorganic fine-grained soils	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts	N/A	N/R	100%	100%	>50%	>50	<"A" Line	N/A	
		CH	Inorganic clays of high plasticity, fat clays	N/A						>"A" Line		
V	Organic soils or Highly organic soils	OL	Organic silts and organic silty clays of low plasticity	N/A	N/R	100%	100%	>50%	<50	<4 or "A" Line	N/A	
		OH	Organic clays of medium to high plasticity; organic silts	N/A					>50	<"A" Line		
		PT	Peat and other high organic soils	N/A								

Notes:
1) Refer to ASTM D2321 for more complete soil descriptions.
2) Class IVA material has limited applications and can be difficult to place and compact; use ONLY with the approval of a soil expert. Contact ADS for additional information regarding suitability of this backfill material.
3) N/R indicates that use of this material and/or compaction level is not recommended by ASTM D2321 for the backfill envelope.
4) When using open-graded material, additional precaution must be taken to reduce or eliminate the risk of migration of fines from adjacent material. Refer to ASTM D2321 for more complete information.



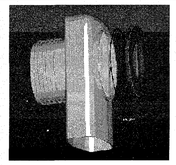
SECTION

NOTES:
1. PRECAST CONCRETE MAN HOLE AS MANUFCTURED BY SUPERIOR CONCRETE OR APPROVED EQUAL.
2. CONCRETE: 4,000 PSI AFTER 28 DAYS.
3. REINFORCING: H-20 LOADING, 4 X 4/4 X 4 W.W.M. SLAB TOP -NO. 5'S @ 8" O.C.
4. SHIPLAP JOINTS SEALED WITH 1 STRIP OF 1" DIA BUTYL RUBBER SEALANT.
5. EACH CASTING TO HAVE LIFTING HOLES CAST IN.
6. LENGTH AND DIAMETER OF TEE VARIES WITH PIPE.

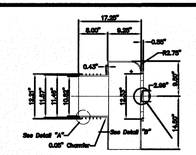
OUTLET CONTROL STRUCTURE TABLE

OCS	RIM	ORIFICE	SIZE (IN.)	ELEV.	INV.IN (SIZE)	INV.IN (ELEV)	INV.OUT (SIZE)	INV.OUT (ELEV)
#1	48.00	A	9" DIA.	42.90	24"	41.75	12"	41.75
		–	–	–				
		C	12" DIA.	45.40				
#2	48.50	A	6" DIA.	41.25	24"	40.50	15"	40.30
		–	–	–				
		C	15" DIA.	44.15				
#3	45.90	A	6" DIA.	41.10	24"	40.00	12"	40.00
		–	–	–				
		C	12" DIA.	43.65				

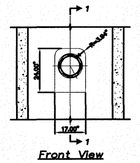
PRECAST CONCRETE OUTLET CONTROL STRUCTURE (OCS) FOR UNDERGROUND INFILTRATION SYSTEM
NOT TO SCALE



Enlarged Section 2–2

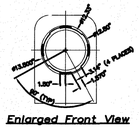


Enlarged Section 1–1

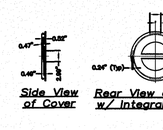


Front View

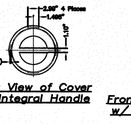
THE ELIMINATOR CATCH BASIN OIL & DEBRIS TRAP



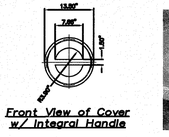
Enlarged Front View



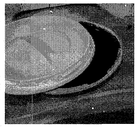
Side View of Cover

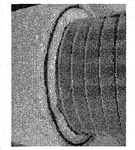


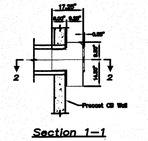
Rear View of Cover w/ Integral Handle



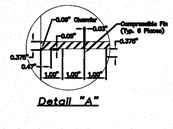
Front View of Cover w/ Integral Handle

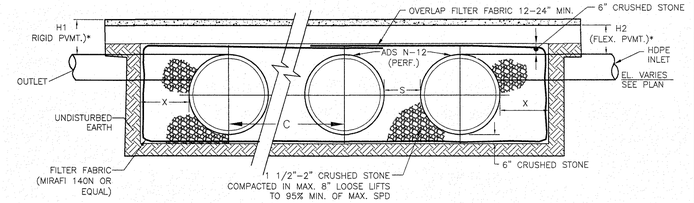






Section 1–1





* H1, H2 = 12" FOR UP TO AND INCLUDING 48" N-12
* H1, H2 = 24" FOR 60" N-12
* FOR TRAFFIC LOAD INSTALLATIONS PROVIDE 24" COVER FOR 42"–60" N-12

NOMINAL DIAMETER	NOMINAL O.D.	TYPICAL SPACING "S"	TYPICAL SPACING "C"	TYPICAL SIDE WALL "X"
12"	14.5"	11"	25.4"	8"
15"	18"	12"	28.9"	8"
18"	21"	13"	33.9"	9"
24"	28"	13"	40.7"	10"
30"	36"	16"	53.1"	18"
36"	42"	22"	63"	18"
42"	48"	24"	71.9"	18"

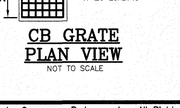
U.G. INF

NOTES
1. ALL UNDERGROUND SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST EDITION.
2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.
3. SEE GRADING & DRAINAGE PLAN FOR INVERT DATA.
4. EXISTING TOPSOIL, BRUSH, TREES, BOULDERS, FILL AND DEBRIS TO BE REMOVED FOR 5' ALL AROUND UNDERGROUND SYSTEMS DOWN TO NATIVE MATERIAL. BACKFILL WITH STONE BEDDING MATERIAL (CLASS 1A OR 1B).

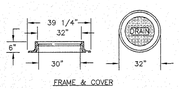
GENERAL NOTES:

1. ALL REFERENCES TO SAND, STONE, OR GRAVEL MATERIAL ARE PER ASTM D2321 "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST EDITION.
2. ALL RETENTION AND DETENTION SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, LATEST EDITION AND THE MANUFACTURER'S PUBLISHED INSTALLATION GUIDELINES.
3. MEASURES SHOULD BE TAKEN TO PREVENT THE MIGRATION OF NATIVE FINES INTO THE BACKFILL MATERIAL, WHEN REQUIRED. SEE ASTM D2321.
4. NO STORMWATER FLOWS ARE TO BE DIRECTED TO THE INFILTRATION SYSTEMS UNTIL ALL CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
5. FILTER FABRIC: GEOTEXTILE FABRIC SHALL BE MIRAFI 140N (OR APPROVED EQ.) TO PREVENT THE MIGRATION OF FINES FROM THE NATIVE SOIL INTO THE SELECT BACKFILL MATERIAL.
6. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE OR UNSUITABLE FOR INFILTRATION, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE GEOTECHNICAL ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE GEOTECHNICAL ENGINEER, AS AN ALTERNATIVE AND AT THE DISCRETION OF THE GEOTECHNICAL ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL. ALL DELETERIOUS OR UNSUITABLE FILL MATERIAL SHALL BE REMOVED BELOW THE TRENCH BOTTOM UNTIL NATIVE MATERIAL IS ENCOUNTERED.
7. BEDDING: SUITABLE MATERIAL SHALL BE CLEAN COMPACT SAND. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER.
8. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE PLACED IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.
9. MINIMUM COVER: MINIMUM COVER OVER ALL RETENTION/DETENTION SYSTEMS IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" FROM TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOATATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER IS 12" UP TO 36" DIAMETER PIPE AND 24" OF COVER FOR 42" – 60" DIAMETER PIPES, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT.

TYPICAL UNDERGROUND INFILTRATION SYSTEM CROSS SECTION
NOT TO SCALE



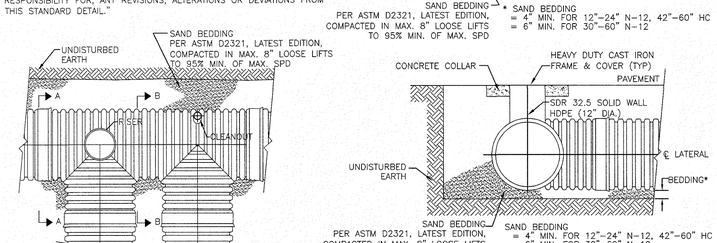
CB GRATE PLAN VIEW
NOT TO SCALE



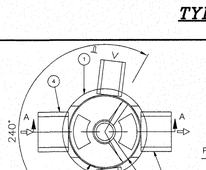
DMH PLAN VIEW
NOT TO SCALE

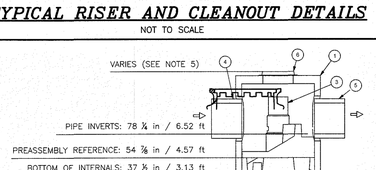
ADS STANDARD DETAILS DISCLAIMER

ADVANCED DRAINAGE SYSTEMS, INC. ("ADS") HAS PREPARED THIS STANDARD DETAIL TO DEMONSTRATE ADS' RECOMMENDED INSTALLATION OF ITS PRODUCTS FOR THE DEPICTED APPLICATION. IN ADDITION TO ADS' RECOMMENDATIONS, THERE MAY BE OTHER NATIONAL, STATE OR LOCAL SPECIFICATIONS THAT ARE PERTINENT TO THIS APPLICATION. ADS' STANDARD DETAIL IS NOT INTENDED TO SUPERSEDE ANY NATIONAL, STATE OR LOCAL SPECIFICATIONS, AND ADS RECOMMENDS THAT THOSE REQUIREMENTS BE REVIEWED AND CONSULTED PRIOR TO THE INSTALLATION OF ADS' PRODUCTS. ADS HAS NOT AUTHORIZED, AND IT BEARS NO RESPONSIBILITY FOR, ANY REVISIONS, ALTERATIONS OR DEVIATIONS FROM THIS STANDARD DETAIL."



TYPICAL RISER AND CLEANOUT DETAILS
NOT TO SCALE





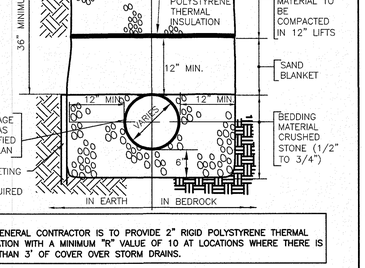
GENERAL NOTES:
1. GENERAL ARRANGEMENT DRAWINGS ONLY. CONTACT HYDRO INTERNATIONAL FOR SITE SPECIFIC FABRICATION DRAWINGS.
2. THE DIAMETER OF THE INLET & OUTLET PIPES MAY BE NO MORE THAN 24".
3. MULTIPLE INLET PIPES POSSIBLE (REFER TO PROJECT PLANS).
4. INLET/OUTLET PIPE ANGLE CAN VARY TO ALIGN WITH DRAINAGE NETWORK (REFER TO PROJECT PLANS).
5. PEAK FLOW RATE AND MINIMUM HEIGHT LIMITED BY AVAILABLE COVER AND PIPE DIAMETER.
6. LARGER SEDIMENT STORAGE CAPACITY MAY BE PROVIDED WITH A DEEPER SUMP DEPTH.

Parts List		
ITEM	SIZE (in)	DESCRIPTION
1	72	I.D. PRECAST MANHOLE
2		LEDGER SUPPORT
3		SEPARATION MODULE
4	30	INLET PIPE (BY OTHERS)
5	30	OUTLET PIPE (BY OTHERS)
6	30	FRAME AND COVER (OR GRATE) (ROUND)

PRODUCT SPECIFICATIONS:
A. THE TREATMENT SYSTEM SHALL USE AN INDUCED VORTEX TO SEPARATE POLLUTANTS FROM STORMWATER RUNOFF.
B. THE TREATMENT SYSTEM SHALL FIT WITHIN THE LIMITS OF EXCAVATION (AREA AND DEPTH) AS SHOWN IN THE PROJECT PLANS AND WILL NOT EXCEED THE DIMENSIONS FOR THE DESIGN FLOW RATES SPECIFIED HEREIN.
C. THE TREATMENT SYSTEM SHALL REMOVE GREATER THAN OR EQUAL TO 95% OF TSS BASED ON THE TARGET PARTICLE SIZE (TPS) OF 106 MICRONS AND/OR 80% OF TSS BASED ON THE TPS OF 230 MICRONS AT 0.7 TIMES THE DESIGN FLOW RATE.
D. THE TREATMENT SYSTEM SHALL CONVEY THE PEAK ON-LINE FLOW RATES OF UP TO 18 CFS WITHOUT CAUSING UPSTREAM SURCHARGE CONDITIONS. FULL-SCALE INDEPENDENT LABORATORY SCOUR TESTING SHALL DEMONSTRATE EFFLUENT CONTROL OF LESS THAN OR EQUAL TO 5 MG/L FOR ALL FLOWS UP TO 200% OF MTFR-10s.
E. THE TREATMENT SYSTEM SHALL BE CAPABLE OF CAPTURING AND RETAINING FINE SILT AND SAND SIZE PARTICLES. ANALYSIS OF CAPTURED SEDIMENT FROM FULL-SCALE FIELD INSTALLATIONS SHALL DEMONSTRATE PARTICLE SIZES PREDOMINATELY IN THE 20–MICRON RANGE

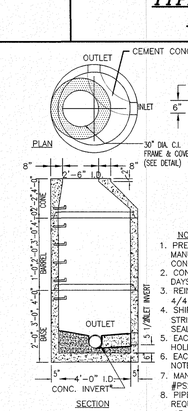
"FIRST DEFENSE" UNIT DETAIL – FD-6HC
(OR APPROVED EQUAL)
NOT TO SCALE

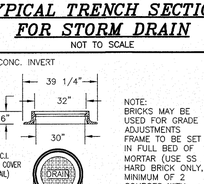
NOTE: CONTRACTOR SHOULD CONFIRM SYSTEM PARTS AND OBTAIN SHOP DRAWINGS FROM MANUFACTURER PRIOR TO CONSTRUCTION.



NOTE:
THE GENERAL CONTRACTOR IS TO PROVIDE 2" RIGID POLYSTYRENE THERMAL INSULATION WITH A MINIMUM "R" VALUE OF 10 AT LOCATIONS WHERE THERE IS LESS THAN 3' OF COVER OVER STORM DRAINS.

TYPICAL TRENCH SECTION FOR STORM DRAIN
NOT TO SCALE

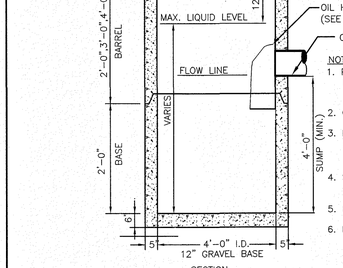




NOTE: BRICKS MAY BE USED FOR GRADE ADJUSTMENTS FRAME TO BE SET IN FULL BED OF MORTAR (USE SS HARD BRICK ONLY, MINIMUM OF 2 COURSES WITH MAXIMUM 12" ADJUSTMENT)

NOTES:
1. PRECAST CONCRETE MANHOLE AS MANUFACTURED BY SUPERIOR CONCRETE OR APPROVED EQUAL.
2. CONCRETE: 4,000 PSI AFTER 28 DAYS.
3. REINFORCING: H-20 LOADING 4 X 4/4 X 4 W.W.M.
4. SHIPLAP JOINTS SEALED WITH 1 STRIP OF 1" DIA. BUTYL RUBBER SEALANT.
5. EACH CASTING TO HAVE LIFTING HOLESCAST IN.
6. EACH SECTION TO BE LABELED AS NOTED.
7. MANHOLE STEPS @ 12" O.C. #F52-PF-SL.
8. PIPE OPENINGS CAST IN AS REQUIRED.
9. 8" SLAB TOP AVAILABLE.

PRECAST CONCRETE DRAIN MANHOLE
NOT TO SCALE



NOTES:
1. PRECAST CONCRETE CATCH BASIN AS MANUFCTURED BY SUPERIOR CONCRETE OR APPROVED EQUAL.
2. CONCRETE: 4,000 PSI AFTER 28 DAYS.
3. REINFORCING: H-20 LOADING, 4 X 4/4 X 4 W.W.M. SLAB TOP -NO. 5'S @ 8" O.C.
4. SHIPLAP JOINTS SEALED WITH 1 STRIP OF1" DIA BUTYL RUBBER SEALANT.
5. EACH CASTING TO HAVE LIFTING HOLES CAST IN.
6. EACH SECTION TO BE LABELED AS NOTED.

SECTION

PRECAST CONCRETE CATCH BASIN WITH HOOD
NOT TO SCALE

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

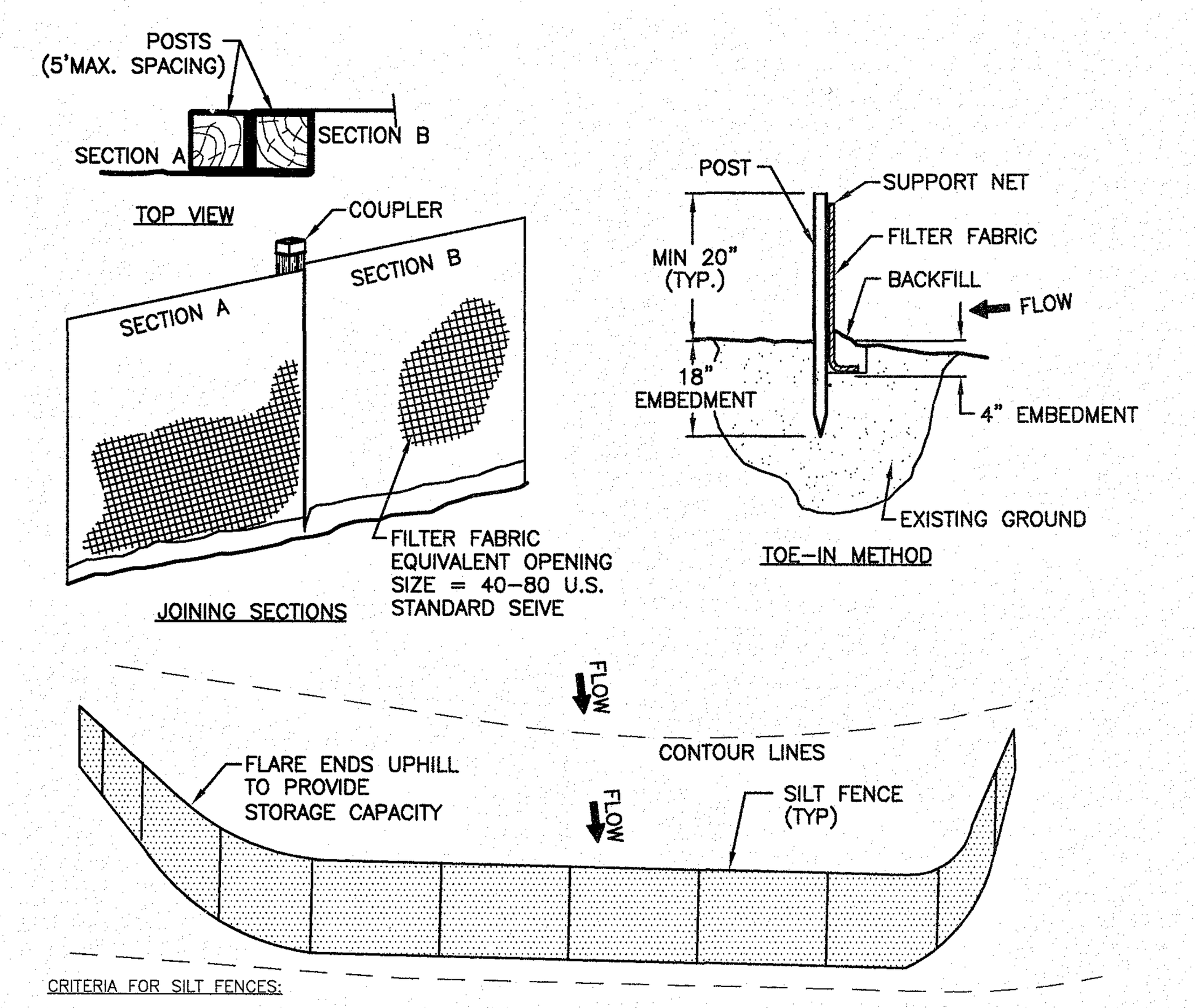
DETAIL SHEET

ASSESSORS MAP 252 – LOTS 4,5 & 9
1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

GPI
Engineering
Design
Planning
Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: 1"=20'	DATE:		DRAWING NO. 4582DET.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CPS	CMT	458219	14 OF 15

F:\Projects\CAD\458219\4582DET.dwg DET 4 1/20/20 5:27pm sbenfanti



CRITERIA FOR SILT FENCES:

1) SILT FENCE FILTER CLOTH: THE FABRIC FOR THE SILT FENCE SHALL MEET THE FOLLOWIING SPECIFICATIONS:

FABRIC PROPERTIES:	MINIMUM ACCEPTABLE VALUES	TEST METHOD
GRAB TENSILE STRENGTH (lbs)	90	ASTM D1682
ELONGATION AT FAILURE (%)	50	ASTM D1682
MULLEN BURST STRENGTH (PSI)	190	ASTM D3786
PUNCTURE STRENGTH (lbs)	40	ASTM D751
EQUIVELANT OPENING SIZE	40–80	US STD SIEVE

2) FENCE POSTS (FOR FABRICATED UNITS) – THE POSTS SHALL BE A MINIMUM OF 36 INCHES LONG. WOOD POSTS WILL BE OF SOUND QUALITY HARDWOOD WITH A MINIMUM CROSS SECTIONAL AREA OF 3.0 SQUARE INCHES. STEEL POSTS WILL BE STANDARD T OR U SECTIONS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT. MAXIMUM SPACING SHALL BE 6 LINEAR FEET.

3) WIRE FENCE (FOR FABRICATED UNITS) – WIRE FENCING SHALL BE A MINIMUM 14.5 GUAGE WITH A MAXIMUM 6 INCH MESH OPENING.

4) PREFABRICATED UNITS – PREFABRICATED UNITS MAY BE USED IN LIEU OF THE ABOVE METHOD PROVIDING: (1) THE FILTER CLOTH AND FENCE POSTS MEET THE ABOVE CRITERIA; AND (2) THE UNIT IS INTALLED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.

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 MADE 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 APPROXIMTELY 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.

CONSTRUCTION SPECIFICATIONS:

1) THE GEOTEXTILE FABRIC SHALL MEET THE DESIGN CRITERIA FOR SILT FENCES.

2) THE FABRIC SHALL BE EMBEDDED A MINIMUM OF 8 INCHES INTO THE GROUND (4" DEEP & 4" WIDE) AND THE SOIL COMPACTED OVER THE EMBEDDED FABRIC.

3) WOVEN WIRE FENCE SHALL BE FASTENED SECURELY TO THE FENCE POSTS WITH WIRE TIES OR STAPLES.

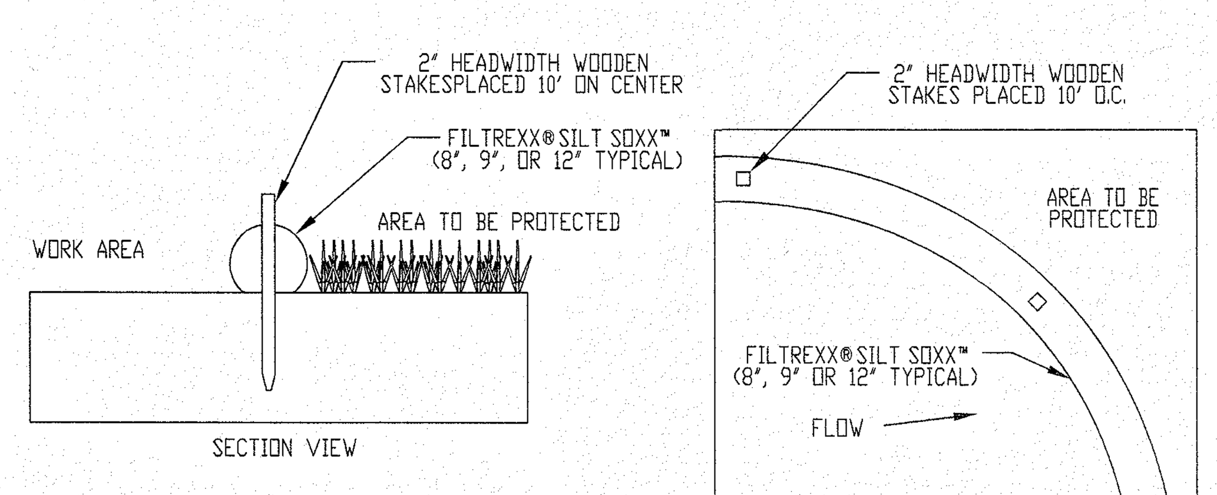
4) FILTER CLOTH SHALL BE FASTENED SECURELY TO THE WOVEN WIRE FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP, MID-SECTION AND BOTTOM.

5) WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EAC OTHER, THEY SHALL BE OVERLAPPED BY 6 INCHES (24" IS PREFERRED), FOLDED, AND STAPLED.

6) POSTS TO BE SPACED AT A MAXIMUM OF 6' ON CENTER.

SEDIMENT CONTROL FENCE

NOT TO SCALE



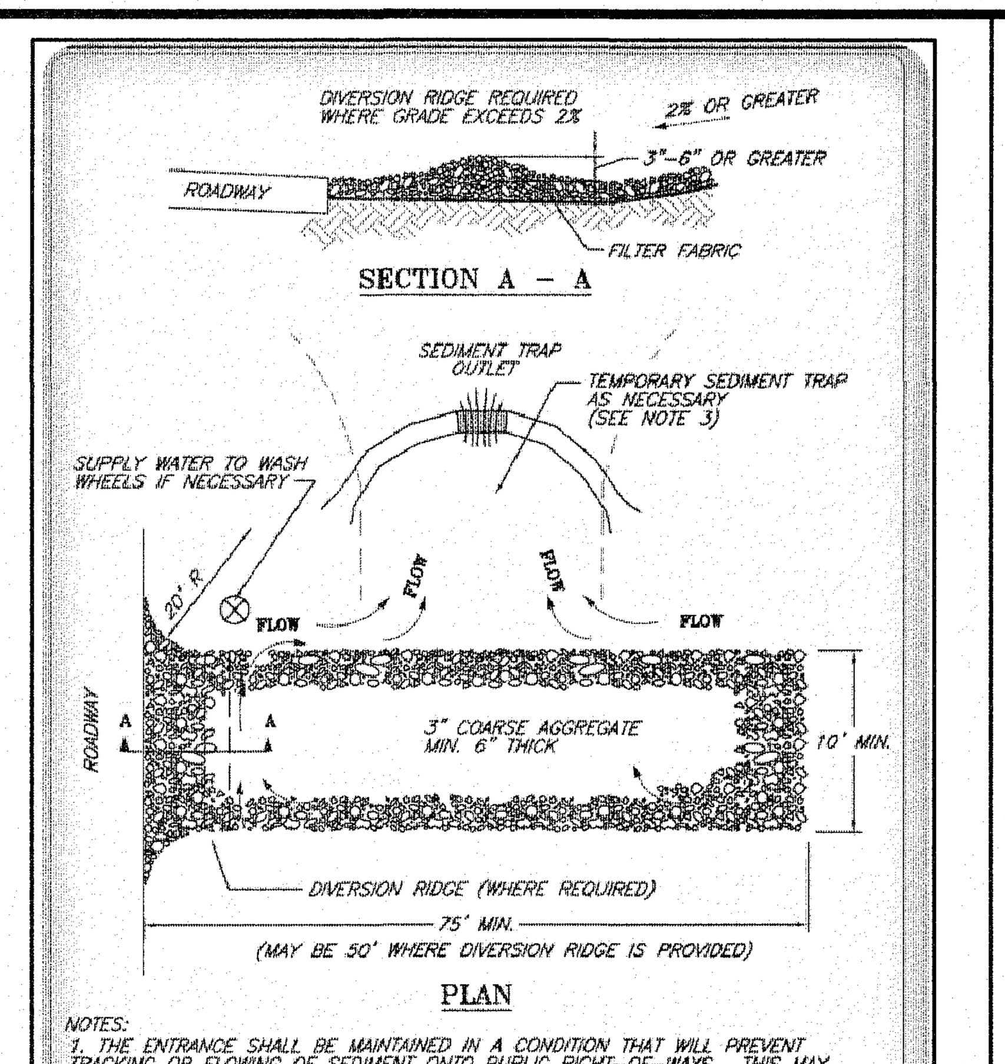
NOTES:
1. ALL MATERIAL TO MEET FILTREXX® SPECIFICATIONS.
2. SILT SOXX™ FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

INSPECTION AND MAINTENANCE

Routine inspection should be conducted within 24 hrs of a runoff event or as designated by the regulating authority. Sediment control should be regularly inspected to make sure they maintain their shape and are producing adequate hydraulic flow-through. If ponding becomes excessive, additional Sediment control may be required to reduce effective slope length or sediment removal may be necessary. Sediment control shall be inspected until area above has been permanently stabilized and construction activity has ceased

1. The Contractor shall maintain the Sediment control in a functional condition at all times and it shall be routinely inspected.
2. If the Sediment control has been damaged, it shall be repaired, or replaced if beyond repair.
3. The Contractor shall remove sediment at the base of the upslope side of the Sediment control when accumulation has reached 1/2 of the effective height of the Sediment control, or as directed by the Engineer. Alternatively, a new Sediment control can be placed on top of and slightly behind the original one creating more sediment storage capacity without soil disturbance.
4. Sediment control shall be maintained until disturbed area above the device has been permanently stabilized and construction activity has ceased.
5. The FilterMedia™ will be dispersed on site once disturbed area has been permanently stabilized, construction activity has ceased, or as determined by the Engineer.
6. For long-term sediment and pollution control applications, Sediment control can be seeded at the time of installation to create a vegetative filtering system for prolonged and increased filtration of sediment and soluble pollutants (contained vegetative filter strip). The appropriate seed mix shall be determined by the Engineer.

FILTREXX® SILT SOXX™



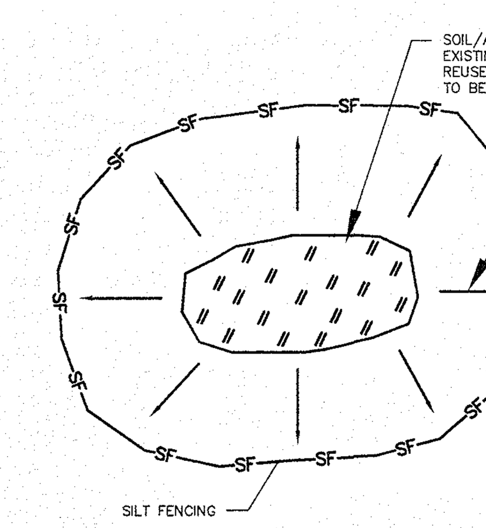
NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.

TEMPORARY GRAVEL CONSTRUCTION EXIT

ADAPTED FROM J. McCULLAH 1994

GRAVEL CONSTRUCTION EXIT

NOT TO SCALE



NOTES:
1. ALL EXISTING EXCAVATED MATERIAL THAT IS NOT TO BE REUSED IN THE WORK IS TO BE IMMEDIATELY REMOVED FROM THE SITE AND PROPERLY DISPOSED OF.
2. SOIL/AGGREGATE STOCKPILE SITES TO BE WHERE SHOWN ON THE DRAWINGS.
3. RESTORE STOCKPILE SITES TO PRE-EXISTING PROJECT CONDITION AND RESEED AS REQUIRED.
4. STOCKPILE HEIGHTS MUST NOT EXCEED 35'. STOCKPILE SLOPES MUST BE 2:1 OR FLATTER.

MATERIALS STOCKPILE DETAIL

NOT TO SCALE

GPI — Formerly MHF Design Consultants, Inc.

Engineering | Design | Planning | Construction Management

TEST PIT DATA

Client: 4 Amigos LLC
Project Address: 1400 Lafayette Road
Town, State: Portsmouth, NH
Job Number: 458219
Date: December 16, 2019
Performed by: Diane Pantermoller

Test Pit No. 12-1 — SCS Soil: Chatfield-Hollis-Canton
ESHWT: >54" — Standing Water: None
Refusal: 54" — Roots: None

Depth	Horizon	Soil Texture	Color	Consistence	Mottles; Quantity/Contrast
0-48"	A	Loamy Sand	10yr 3/2	FR	
48-54"	B	Loamy Sand	10yr 5/6	FR	None visible

Test Pit No. 12-2 — SCS Soil: Chatfield-Hollis-Canton
ESHWT: >120" — Standing Water: None
Refusal: >120" — Roots: 54"

Depth	Horizon	Soil Texture	Color	Consistence	Mottles; Quantity/Contrast
0-9"	A	Loamy Sand	10yr 3/2	FR	
9-18"	B	Loamy Sand	10yr 5/6	FR	
18-120"	C	Loamy Sand	7.5yr 4/3	FR	20% Gravel

Test Pit No. 12-3 — SCS Soil: Chatfield-Hollis-Canton
ESHWT: >122" — Standing Water: None
Refusal: >122" — Roots: None

Depth	Horizon	Soil Texture	Color	Consistence	Mottles; Quantity/Contrast
0-30"	Fill	Mixed Soils/pavement			Mixed Soils/Urban Fill/Pavement Gravel
30-122"	C	Loamy Sand	7.5yr 4/3	FR	20% Gravel

Test Pit No. 12-4 — SCS Soil: Chatfield-Hollis-Canton
ESHWT: >120" — Standing Water: None
Refusal: >120" — Roots: None

Depth	Horizon	Soil Texture	Color	Consistence	Mottles; Quantity/Contrast
0-120"	Fill	Mixed Soils			Bricks, Urban Fill

Test Pit No. 12-5 — SCS Soil: Chatfield-Hollis-Canton
ESHWT: >120" — Standing Water: None
Refusal: >120" — Roots: None

Depth	Horizon	Soil Texture	Color	Consistence	Mottles; Quantity/Contrast
0-36"	Fill	Mixed Soils			Bricks, Urban Fill
36-120"	C	Loamy Sand	7.5yr 4/3	FR	20% Gravel

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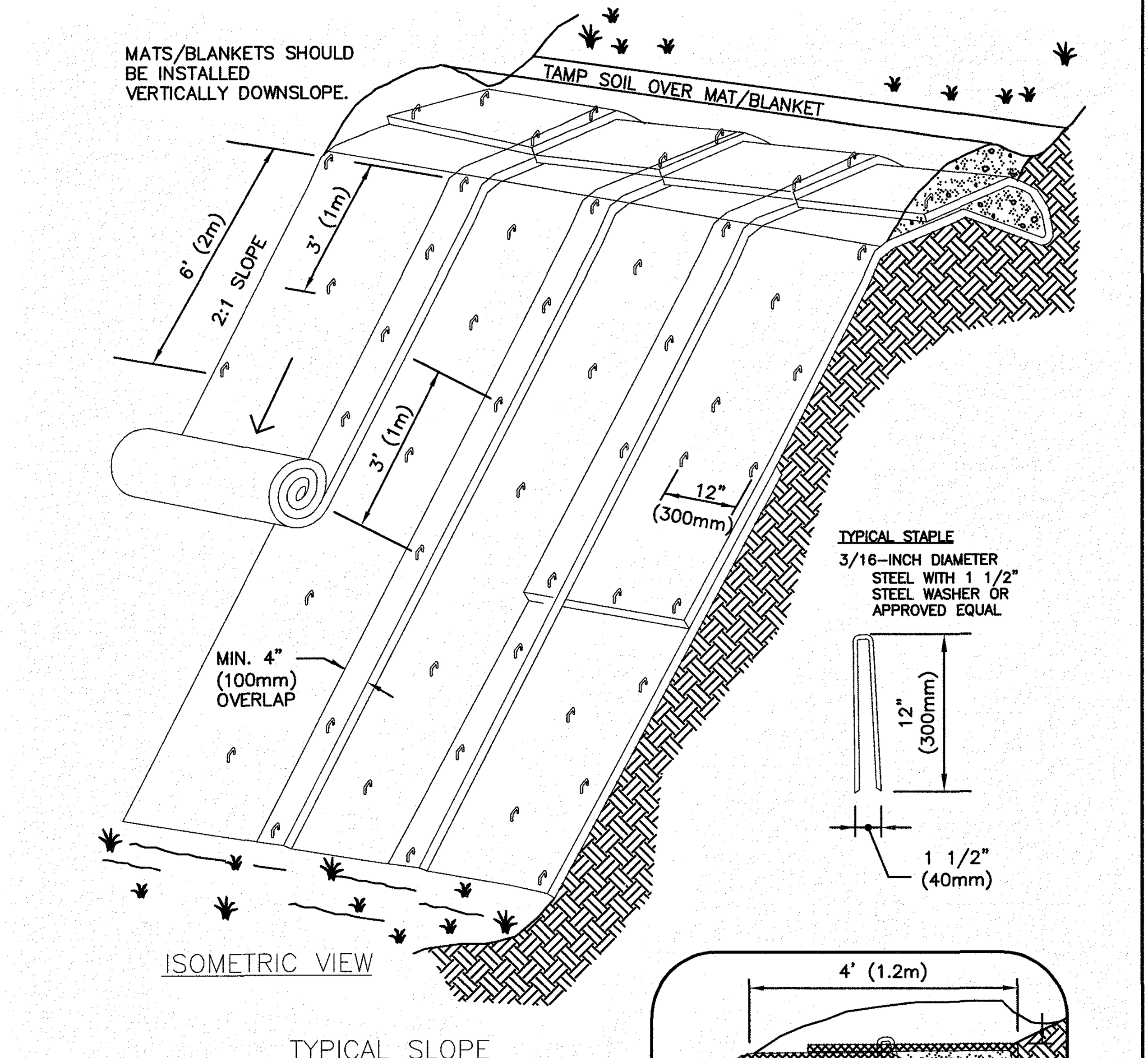
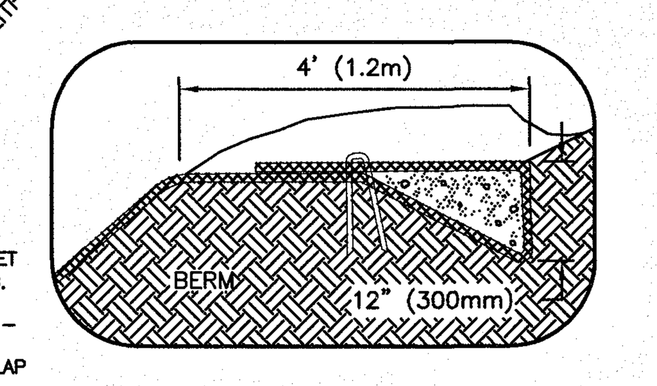
An Equal Opportunity Employer



TYPICAL SLOPE SOIL STABILIZATION



TYPICAL INSTALLATION OF EROSION CONTROL BLANKETS FOR SLOPES

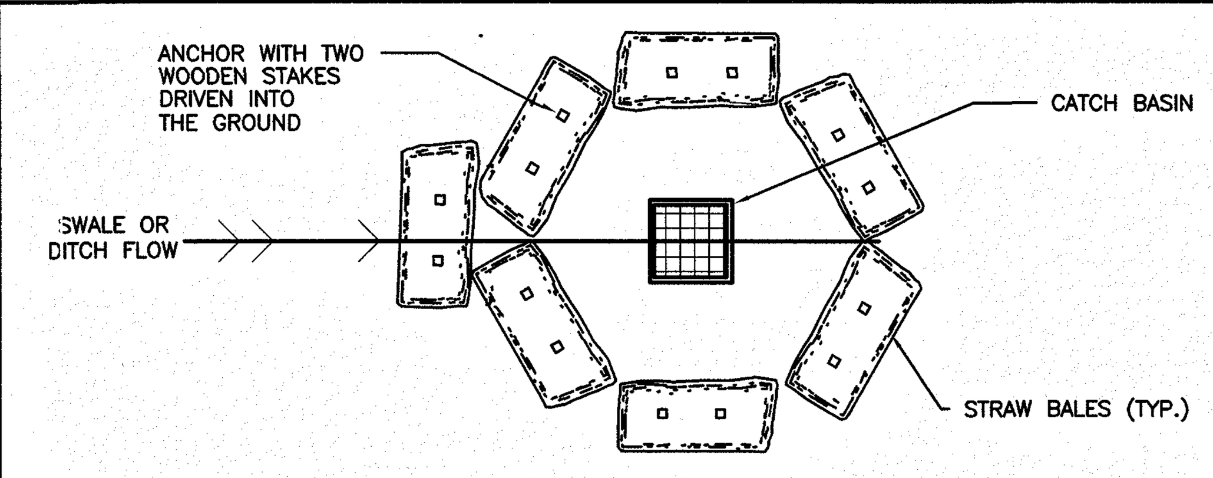
NOT TO SCALE

NOTES:
1. BEGIN AT THE TOP OF BLANKET INSTALLATION AREA BY ANCHORING BLANKET IN A 6" DEEP TRENCH. BACKFILL AND COMPACT TRENCH AFTER STAPLING.
2. ROLL THE BLANKET DOWN THE SWALE IN THE DIRECTION OF THE WATER FLOW. LAY BLANKETS LOOSELY & MAINTAIN DIRECT CONTACT WITH SOIL – DO NOT STRETCH.
3. THE EDGES OF BLANKETS MUST BE STAPLED WITH APPROX. 4 INCH OVERLAP WHERE 2 OR MORE STRIP WIDTHS ARE REQUIRED.
4. WHEN BLANKETS MUST BE SPLICED DOWN THE SWALE, PLACE BLANKET END OVER END WITH 6 INCH (MIN.) OVERLAP AND ANCHOR DOWN SLOPE BLANKET IN A 6 INCH DEEP TRENCH.
5. BLANKETS SHALL BE STAPLED ENOUGH TO ANCHOR BLANKET WHILE MAINTAINING CONTACT WITH SOIL. STAPLES SHALL BE PLACED DOWN THE CENTER & STAGGERED WITH THE STAPLES PLACED ALONG EDGES. PATTERN & AMOUNT OF STAPLES VARIES BY MANUFACTURER, SO FOLLOW MANUFACTURERS RECOMMENDATIONS.
6. BLANKET SHALL BE NORTH AMERICAN GREEN SC-150 OR APPROVED EQUAL.

MAINTENANCE & MATS
1. BLANKETS SHALL BE INSPECTED WEEKLY DURING CONSTRUCTION & AFTER A RAINFALL IN EXCESS OF 1/2" IN A 24-HOUR PERIOD.
2. FAILURES SHALL BE REPAIRED IMMEDIATELY. IF ANY OF THE FOLLOWING OCCUR; SLOPE WASHOUT, MAT DISPLACEMENT, DAMAGE TO MAT, THE AFFECTED AREA SHALL BE REPAIRED & RESEEDED & MAT SHALL BE REPLACED OR RE-INSTALLED.

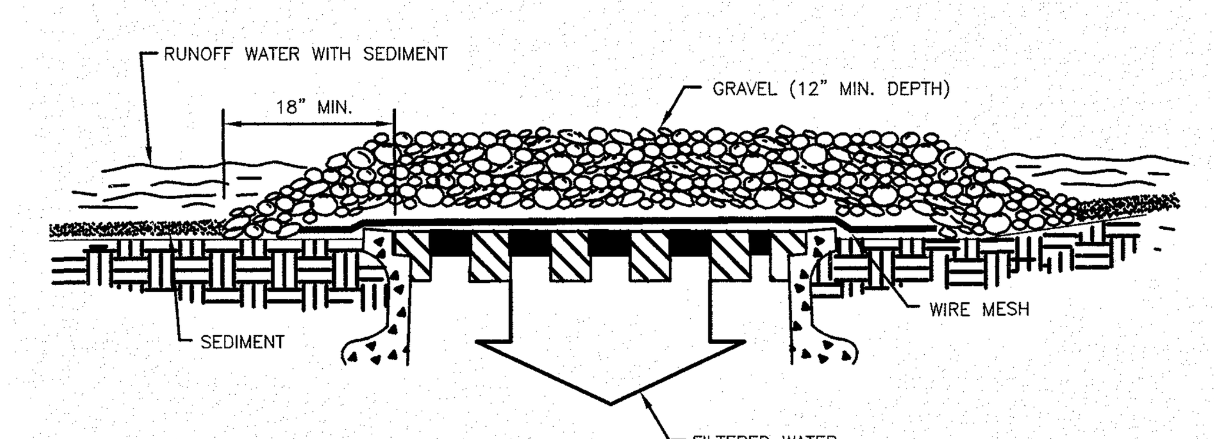
BLANKET SLOPE PROTECTION FOR EROSION CONTROL

NOT TO SCALE



LOW POINT SEDIMENTATION CONTROL BARRIER

NOT TO SCALE



CONSTRUCTION SEQUENCE:

1) A WIRE MESH SHOULD BE PLACED OVER THE DROP INLET OR CURB OPENING SO THAT THE ENTIRE OPENING AND A MINIMUM OF 12 INCHES AROUND THE OPENING ARE COVERED BY THE MESH. THE MESH MAY BE ORDINARY HARDWARE CLOTH OR WIRE MESH WITH OPENINGS UP TO 1/2 INCH.

2) THE WIRE MESH SHOULD BE COVERED WITH CLEAN COARSE AGGREGATE SUCH AS SEWER STONE FOR A MINIMUM DEPTH OF 12 INCHES.

3) THE COARSE AGGREGATE SHOULD EXTEND AT LEAST 18 INCHES ON ALL SIDES OF THE DRAIN OPENING.

MAINTENANCE: ALL STRUCTURES SHOULD BE INSPECTED AFTER EVERY RAIN STORM AND REPAIRS MADE AS NECESSARY. SEDIMENT SHOULD BE REMOVED FROM THE TRAPPING DEVICES AFTER THE SEDIMENT HAS REACHED A MAXIMUM OF ONE HALF THE DEPTH OF THE TRAP. THE SEDIMENT SHOULD BE DISPOSED OF IN A SUITABLE AREA AND PROTECTED FROM EROSION BY EITHER STRUCTURAL 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.

ON-SITE INLET PROTECTION DETAIL

NOT TO SCALE

WINTER STABILIZATION NOTES:

MAINTENANCE REQUIREMENTS:
MAINTENANCE MEASURES SHOULD CONTINUE AS NEEDED THROUGHOUT CONSTRUCTION, INCLUDING THE OVER-WINTER PERIOD. AFTER EACH RAINFALL, SNOWSTORM, OR PERIOD OF THAWING AND RUNOFF, THE SITE CONTRACTOR SHOULD CONDUCT AN INSPECTION OF ALL INSTALLED EROSION CONTROL MEASURES AND PERFORM REPAIRS AS NEEDED TO INSURE THEIR CONTINUING FUNCTION.
FOR ANY AREA STABILIZED BY TEMPORARY OR PERMANENT SEEDING PRIOR TO THE ONSET OF THE WINTER SEASON, THE CONTRACTOR SHOULD CONDUCT AN INSPECTION IN THE SPRING TO ASCERTAIN THE CONDITION OF VEGETATION COVER, AND REPAIR ANY DAMAGE AREAS OR BARE SPOTS AND RESEED AS REQUIRED TO ACHIEVE AN ESTABLISHED VEGETATIVE COVER (AT LEAST 85% OF AREA VEGETATED WITH HEALTHY, VIGOROUS GROWTH).
SPECIFICATIONS:
TO ADEQUATELY PROTECT WATER QUALITY DURING COLD WEATHER AND DURING SPRING RUNOFF, THE FOLLOWING STABILIZATION TECHNIQUES SHOULD BE EMPLOYED DURING THE PERIOD FROM OCTOBER 15TH THROUGH MAY 15TH.

1. THE AREA OF EXPOSED, UNSTABILIZED SOIL SHOULD BE LIMITED TO ONE ACRE AND SHOULD BE PROTECTED AGAINST EROSION BY THE METHODS DESCRIBED IN THIS SECTION PRIOR TO ANY THAW OR SPRING MELT EVENT. SUBJECT TO APPLICABLE REGULATIONS, THE ALLOWABLE AREA OF EXPOSED SOIL MAY BE INCREASED IF ACTIVITIES ARE CONDUCTED ACCORDING TO A WINTER CONSTRUCTION PLAN, DEVELOPED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE STATE OF NEW HAMPSHIRE OR A CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL AS CERTIFIED BY THE CSPESC COUNCIL OF ENVIROCERT INTERNATIONAL, INC.
2. STABILIZATION AS FOLLOWS SHOULD BE COMPLETED WITHIN A DAY OF ESTABLISHING THE GRADE THAT IS FINAL OR THAT OTHERWISE WILL EXIST FOR MORE THAN 5 DAYS:
   A. ALL PROPOSED VEGETATED AREAS HAVING A SLOPE OF LESS THAN 15% WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHOULD BE SEEDED AND COVERED WITH 3 TO 4 TONS OF HAY OR STRAW MULCH PER ACRE SECURED WITH ANCHORED NETTING, OR 2 INCHES OF EROSION CONTROL MIX (SEE DESCRIPTION OF EROSION CONTROL MIX BERMS FOR MATERIAL SPECIFICATION).
   B. ALL PROPOSED VEGETATED AREAS HAVING A SLOPE OF GREATER THAN 15% WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHOULD BE SEEDED AND COVERED WITH A PROPERLY INSTALLED AND ANCHORED EROSION CONTROL BLANKET OR WITH A MINIMUM 4 INCH THICKNESS OF EROSION CONTROL MIX, UNLESS OTHERWISE SPECIFIED BY THE MANUFACTURER. NOTE THAT COMPOST BLANKETS SHOULD NOT EXCEED 2 INCHES IN THICKNESS OR THEY MAY OVERHEAT.
3. ALL STONE-COVERED SLOPES MUST BE CONSTRUCTED AND STABILIZED BY OCTOBER 15.
4. INSTALLATION OF ANCHORED HAY MULCH OR EROSION CONTROL MIX SHOULD NOT OCCUR OVER SNOW OF GREATER THAN ONE INCH IN DEPTH.
5. ALL MULCH APPLIED DURING WINTER SHOULD BE ANCHORED (E.G., BY NETTING, TRACKING, WOOD CELLULOSE FIBER).
6. STOCKPILES OF SOIL MATERIALS SHOULD BE MULCHED FOR OVER WINTER PROTECTION WITH HAY OR STRAW AT TWICE THE NORMAL RATE OR WITH A FOUR-INCH LAYER OF EROSION CONTROL MIX. MULCHING SHOULD BE DONE WITHIN 24 HOURS OF STOCKING, AND RE-ESTABLISHED PRIOR TO ANY RAINFALL OR SNOWFALL. NO SOIL STOCKPILE SHOULD BE PLACED (EVEN COVERED WITH MULCH) WITHIN 100 FEET FROM ANY WETLAND OR OTHER WATER RESOURCE AREA.
7. FROZEN MATERIALS, (E.G., FROST LAYER THAT IS REMOVED DURING WINTER CONSTRUCTION), SHOULD BE STOCKPILED SEPARATELY AND IN A LOCATION THAT IS AWAY FROM ANY AREA NEEDING TO BE PROTECTED. STOCKPILES OF FROZEN MATERIAL CAN MELT IN THE SPRING AND BECOME UNWORKABLE AND DIFFICULT TO TRANSPORT DUE TO THE HIGH MOISTURE CONTENT IN THE SOIL.
8. INSTALLATION OF EROSION CONTROL BLANKETS SHOULD NOT OCCUR OVER SNOW OF GREATER THAN ONE INCH IN DEPTH OR ON FROZEN GROUND.
9. ALL GRASS-LINED DITCHES AND CHANNELS SHOULD BE CONSTRUCTED AND STABILIZED BY SEPTEMBER 1. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHOULD BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS, AS DETERMINED BY A QUALIFIED PROFESSIONAL ENGINEER OR A CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL AS CERTIFIED BY THE CSPESC COUNCIL OF ENVIROCERT INTERNATIONAL, INC. IF A STONE LINING IS NECESSARY, THE CONTRACTOR MAY NEED TO RE-GRADE THE DITCH AS REQUIRED TO PROVIDE ADEQUATE CROSS-SECTION AFTER ALLOWING FOR PLACEMENT OF THE STONE.
10. ALL STONE-LINED DITCHES AND CHANNELS MUST BE CONSTRUCTED AND STABILIZED BY OCTOBER 15.
11. AFTER NOVEMBER 15, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3.
12. SEDIMENT BARRIERS THAT ARE INSTALLED DURING FROZEN CONDITIONS SHOULD CONSIST OF EROSION CONTROL MIX BERMS, OR CONTINUOUS CONTAINED BERMS. SILT FENCES AND HAY BALES SHOULD NOT BE INSTALLED WHEN FROZEN CONDITIONS PREVENT PROPER EMBEDMENT OF THESE BARRIERS.

CONSTRUCTION SEQUENCE NOTES:

1. SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO ANY ON-SITE CONSTRUCTION AS SHOWN. ADDITIONAL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSTALLED AS SOON AS PRACTICAL.
2. CONSTRUCT TEMPORARY STABILIZED CONSTRUCTION ENTRANCE AS SHOWN ON THIS SHEET.
3. CUT AND STUMP AREAS OF PROPOSED CONSTRUCTION.
4. REMOVE AND STOCKPILE TOPSOIL. STOCKPILE SHALL BE SEEDED TO PREVENT EROSION.
5. CONSTRUCT PONDS, SWALES & LEVEL SPREADERS & STABILIZE PRIOR TO DIRECTING ANY RUNOFF TO THEM.
6. CONSTRUCT ROADWAYS AND PERFORM SITE GRADING, PLACING HAY BALES AND SILTATION FENCES AS REQUIRED TO CONTROL SOIL EROSION. STABILIZE ROADS, PARKING LOTS AND CUT/FILL SLOPES WITHIN 72-HOURS OF ACHIEVING FINISH GRADES.
7. CONSTRUCT RELOCATED DRAINAGE LINE PRIOR TO REMOVING THE EXISTING DRAINAGE LINE AS SHOWN ON DEMOLITION PLAN AND CONNECT RELOCATED DRAINAGE LINE.
8. INSTALL UNDERGROUND UTILITIES AND DRAINAGE SYSTEM.
9. BEGIN TEMPORARY AND PERMANENT SEEDING AND MULCHING. ALL CUT AND FILL SLOPES SHALL BE SEEDED OR MULCHED WITHIN 72-HOURS OF ACHIEVING FINISHED GRADES.
10. DAILY, OR AS REQUIRED, CONSTRUCT, INSPECT, AND IF NECESSARY, RECONSTRUCT TEMPORARY BERMS, DRAINS, DITCHES, SILT FENCES AND SEDIMENT TRAPS INCLUDING MULCHING AND SEEDING. AT A MINIMUM, INSPECT EROSION CONTROLS WEEKLY AND AFTER EVERY 1/2" OF RAINFALL.
11. BEGIN EXCAVATION FOR CONSTRUCTION OF BUILDINGS.
12. FINISH PAVING ALL ROADWAYS AND DRIVEWAYS.
13. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
14. AFTER GRASS HAS BEEN FULLY GERMINATED IN ALL SEEDED AREAS, REMOVE ALL TEMPORARY EROSION CONTROL MEASURES.
15. APPLICATION OF GRASS SEED, FERTILIZERS AND MULCH SHALL BE ACCOMPLISHED BY BROADCAST SEEDING OR HYDROSEEDING AT THE RATES OUTLINED BELOW:

Limestone: 138 lbs./1,000 square feet.
Fertilizer: 13.8 lbs./1,000 SF
Mulch: straw mulch approximately 3 tons/acre unless erosion control matting is used.

Permanent Seed Mix	lbs./acre
Creeping Red Fescue	20
Tall Fescue	20
Redtop	2
TOTAL	42

Temporary Seed Mix:	lbs./acre
Winter Rye (Aug. 15–Sept. 15)	112
Oats (No later than May 15)	80

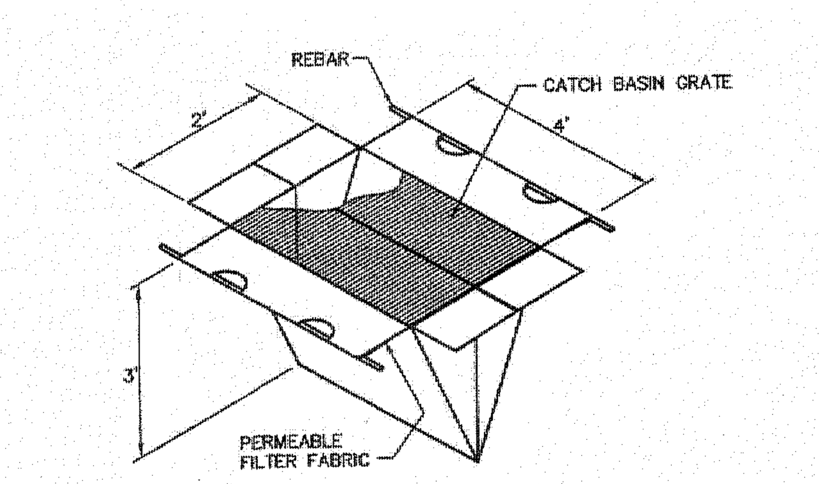
16. NEWLY GRADED AREAS REQUIRING SLOPE PROTECTION OUTSIDE OF NORMAL SEEDING SEASON SHALL RECEIVE HAY MULCH AT THE APPROXIMATE RATE OF NO MORE THAN 2 TONS PER ACRE.
17. THE CONTRACTOR AND DEVELOPER MUST MANAGE THE PROJECT TO MEET THE REQUIREMENTS AND INTENT OF RSA 430:53 AND AGR 3800 RELATIVE TO INVASIVE SPECIES.
18. FUGITIVE DUST MUST BE CONTROLLED IN ACCORDANCE WITH ENV-A 1000.

EROSION CONTROL NOTES:

1. THE EROSION CONTROL PROCEDURES SHALL CONFORM TO THE NH STORMWATER MANUAL, VOLUME 3, EROSION & SEDIMENT CONTROLS DURING CONSTRUCTION, DECEMBER 2008.
2. DURING CONSTRUCTION AND THEREAFTER, EROSION CONTROL MEASURES ARE TO BE IMPLEMENTED AS NOTED: THE SMALLEST PRACTICAL AREA OF LAND SHOULD BE EXPOSED AT ANY ONE TIME DURING DEVELOPMENT. WHEN LAND IS EXPOSED DURING DEVELOPMENT, THE EXPOSURE SHOULD BE KEPT TO THE SHORTEST PRACTICAL PERIOD OF TIME AS APPROVED BY THE ENGINEER. LAND SHOULD NOT BE LEFT EXPOSED DURING THE WINTER MONTHS.
3. LIMIT OF MAXIMUM AREA OF EXPOSED SOIL AT ANY ONE TIME TO LESS THAN 5 ACRES. THE EXPOSED AREA THAT IS BEING ACTIVELY WORKED DURING WINTER IS TO BE LESS THAN 3 ACRES DURING THE WINTER SEASON.
4. ALL PERMANENT STORM WATER STRUCTURES SHALL BE STABILIZED PRIOR TO DIRECTING FLOW INTO THEM. 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 PERCENT VEGETATED GROWTH HAS BEEN ESTABLISHED.
   C) A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP-RAP HAS BEEN INSTALLED.
   D) OR, EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
5. SILT FENCE SHALL BE INSTALLED AND MAINTAINED DURING AND AFTER DEVELOPMENT TO REMOVE SEDIMENT FROM RUNOFF WATER AND FROM LAND UNDERGOING DEVELOPMENT. WHERE POSSIBLE, NATURAL DRAINAGE WAYS SHOULD BE UTILIZED AND LEFT OPEN TO REMOVE EXCESS SURFACE WATER. SILT FENCE TO BE MAINTAINED AND CLEANED UNTIL ALL SLOPES HAVE A HEALTHY STAND OF GRASS.
6. ALL DISTURBED AREAS AND SIDE SLOPES WHICH ARE FINISHED GRADED, WITH NO FURTHER CONSTRUCTION TO TAKE PLACE, SHALL BE LOAMED AND SEEDED WITHIN 72 HOURS AFTER FINAL GRADING. A MINIMUM OF 4" OF LOAM SHALL BE INSTALLED WITH NOT LESS THAN ONE POUND OF SEED PER 50 SQUARE YARDS OF AREA. THE SEED MIX SHALL BE AS DESIGNATED BELOW.
7. ANY DISTURBED AREAS WHICH ARE TO BE LEFT TEMPORARILY, AND WHICH WILL BE REGRADED LATER DURING CONSTRUCTION SHALL BE MACHINE HAY MULCHED AND SEEDED WITH RYE GRASS TO PREVENT EROSION. THE MAXIMUM LENGTH OF TIME FOR THE EXPOSURE OF DISTURBED SOILS SHALL BE 45 DAYS. HAY OR STRAW MULCH SHALL BE APPLIED TO ALL FRESHLY SEEDED AREAS AT THE RATE OF 2 TONS PER ACRE. BALES SHALL BE UNSPOILED, AIR DRIED, AND FREE FROM WEED, SEEDS AND ANY COARSE MATERIAL.
8. DURING GRADING OPERATIONS INSTALL HAY BALE BARRIERS ALONG TOE OF SLOPE OF FILL AREAS WHERE SHOWN. BARRIERS ARE TO BE MAINTAINED UNTIL DISTURBED AREAS ARE PAVED OR GRASSED.
9. THE FILL MATERIAL SHALL BE OF APPROVED SOIL TYPE FREE FROM STUMPS, ROOTS, WOOD, ETC. TO BE PLACED IN 12" LIFTS OR AS SPECIFIED. BULLDOZERS, TRUCKS, TRACTORS, OR ROLLERS MAY BE USED FOR COMPACTION BY ROUTING THE EQUIPMENT TO ALL AREAS OR EACH LAYER.
10. AVOID THE USE OF FUTURE OPEN SPACES (LOAM & SEED) WHEREVER POSSIBLE DURING CONSTRUCTION. CONSTRUCTION TRAFFIC SHALL USE THE ROADBEDS OF FUTURE ROADS.

TEMPORARY EROSION CONTROL MEASURES:

1. THE SMALLEST PRACTICAL AREA OF LAND SHALL BE EXPOSED AT ANY ONE TIME. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
2. HAY BALE BARRIERS AND SEDIMENT TRAPS SHALL BE INSTALLED AS REQUIRED. BARRIERS AND TRAPS ARE TO BE MAINTAINED AND CLEANED UNTIL ALL SLOPES HAVE A HEALTHY STAND OF GRASS.
3. BALED HAY AND MULCH SHALL BE MOWINGS OF ACCEPTABLE HERBACEOUS GROWTH, FREE FROM NOXIOUS WEEDS OR WOODY STEMS, AND SHALL BE DRY. NO SALT HAY SHALL BE USED.
4. FILL MATERIAL SHALL BE FREE FROM STUMPS, WOOD, ROOTS, ETC.
5. STOCKPILED MATERIALS SHALL BE PLACED ONLY IN AREAS SHOWN ON THE PLANS. STOCKPILES SHALL BE PROTECTED BY SILTATION FENCE AND SEEDED TO PREVENT EROSION. THESE MEASURES SHALL REMAIN UNTIL ALL MATERIAL HAS BEEN PLACED OR DISPOSED OFF SITE.
6. ALL DISTURBED AREAS SHALL BE LOAMED AND SEEDED. A MINIMUM OF 4 INCHES OF LOAM SHALL BE INSTALLED AND SEEDING AS SPECIFIED.
7. AFTER ALL DISTURBED AREAS HAVE BEEN STABILIZED THE TEMPORARY EROSION CONTROL MEASURES ARE TO BE REMOVED.
8. PAVED ROADWAYS MUST BE KEPT CLEAN AT ALL TIMES.
9. ALL CATCH BASIN INLETS WILL BE PROTECTED WITH LOW POINT SEDIMENTATION BARRIER.
10. ALL STORM DRAINAGE OUTLETS WILL BE STABILIZED AND CLEANED AS REQUIRED, BEFORE THE DISCHARGE POINTS BECOME OPERATIONAL.
11. ALL DEWATERING OPERATIONS MUST DISCHARGE DIRECTLY INTO A SEDIMENT FILTER AREA.
12. JUTE MATTING OR APPROVED EQUIVALENT SHALL BE PROVIDED ON ALL SLOPES GREATER THAN 3:1.



SILTATION BAG

NOT TO SCALE

USE "SILTSACK" AS MANUFACTURED BY ATLANTIC CONSTRUCTION FABRICS, INC. OR EQUIVALENT

INLET PROTECTION DETAIL

NOT TO SCALE

NO.	DESCRIPTION	BY	DATE

REVISIONS

DETAIL SHEET

ASSESSORS MAP 252 – LOTS 4,5 & 9
1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

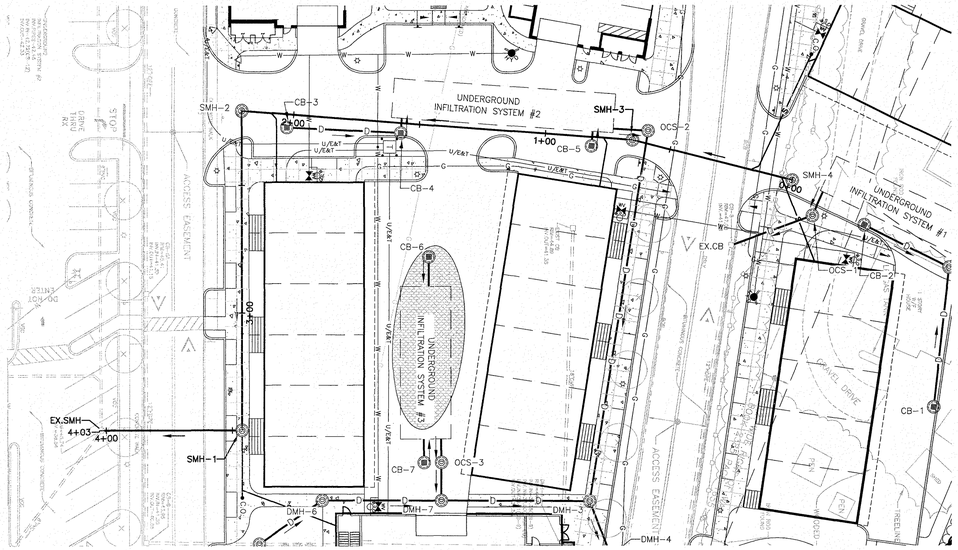
STATE OF NEW HAMPSHIRE — FRANK C. MONTEIRO No. 7152 — LICENSED PROFESSIONAL ENGINEER — 1/21/20

GPI Engineering Design Planning Construction Management
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079
603.893.0720 GPINET.COM

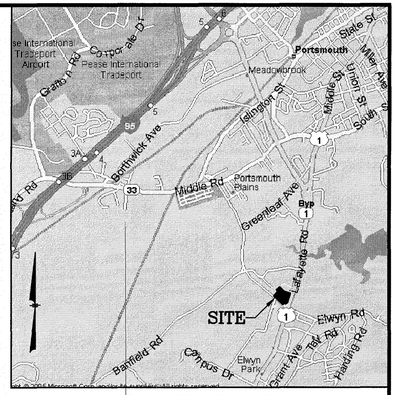
SCALE: 1"=20'	DATE:		DRAWING NO. 4582DET.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CPS	CMT	458219	15 OF 15

LEGEND

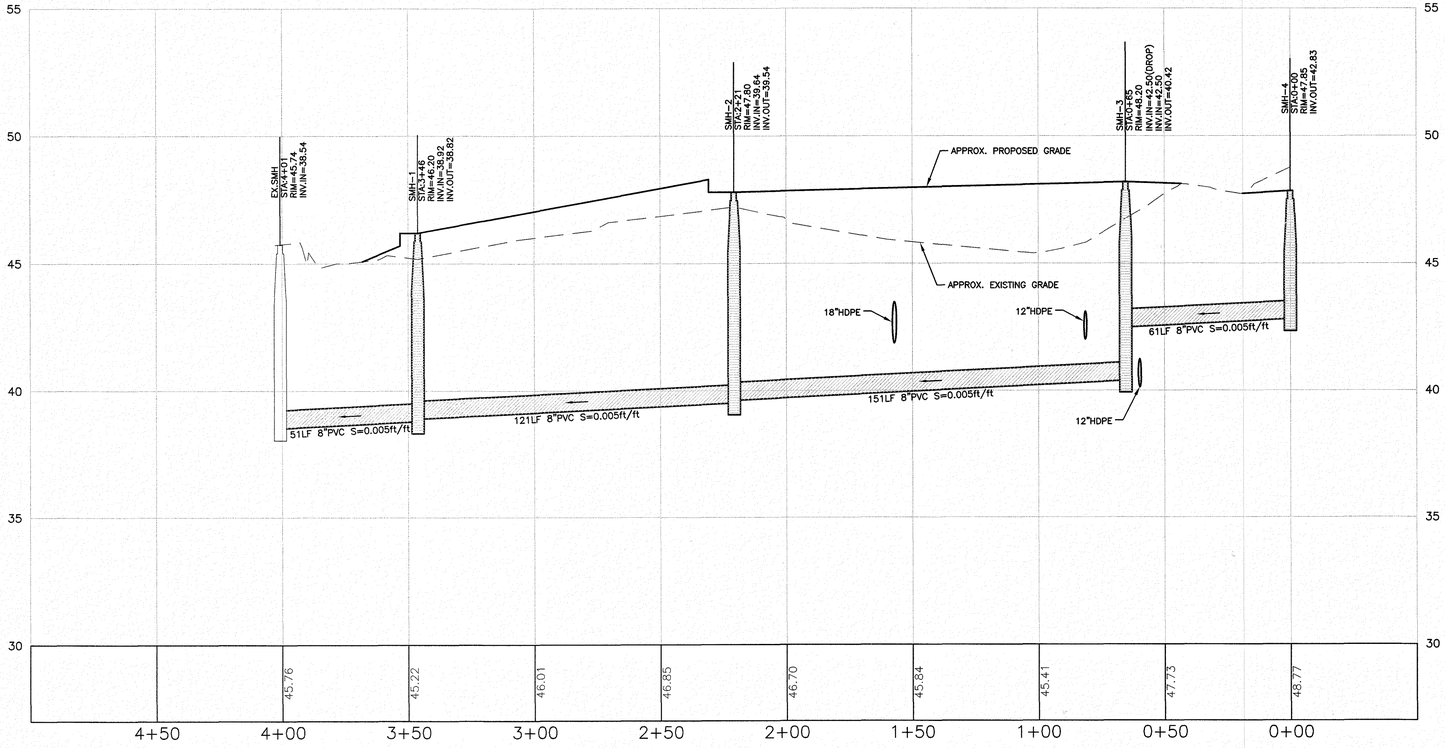
O	IRON PIN FOUND		UTILITY POLE
□	CONCRETE BOUND FOUND	Ⓓ	DRAIN MANHOLE
△	RAILROAD SPIKE FOUND	Ⓢ	SEWER MANHOLE
⊙	DRILL HOLE FOUND	Ⓣ	TELEPHONE MANHOLE
SGC	EXIST. SLOPED GRANITE CURB	□	CATCH BASIN
VGC	EXIST. VERTICAL GRANITE CURB	W	WATER LINE
BCC	EXIST. BITUMINOUS CONC. LIP CURBING		WATER VALVE
VCC	EXIST. VERTICAL CONCRETE CURB		FIRE HYDRANT
OHW	OVERHEAD SERVICE WIRES		GAS VALVE
DSYL	DOUBLE SOLID YELLOW LINE	G	GAS LINE
SSWL	SINGLE SOLID WHITE LINE	T	UNDERGROUND TELEPHONE LINE
BWL	BROKEN WHITE LINE	UGE	UNDERGROUND ELECTRIC AND TELEPHONE
	SIGN		WETLAND LINE
C.O.	PROP. CLEANOUT		TREELINE
CB–1	PROP. CATCH BASIN		
DMH–1	PROP. DRAIN MANHOLE		
SMH–1	PROP. SEWER MANHOLE		
	PROP. GATE VALVE		



PLAN
SCALE: 1"=30'



LOCATION MAP
(NOT TO SCALE)



PROFILE
SCALE: 1"=30'H/3'V

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

OWNER OF RECORD:
MAP 252 LOTS 4, 5 & 9
4 AMIGOS LLC
321 LAFAYETTE ROAD, UNIT D
HAMPTON, NH 03842

FRANK C. MONTEIRO No. 7152 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE
1/21/20

NO.	DESCRIPTION	BY	DATE

REVISIONS

SEWER PLAN/PROFILE

ASSESSORS MAP 252 – LOTS 4,5 & 9
1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

GPI Engineering Design Planning Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: 1"=30'	DATE: JANUARY 20, 2020		DRAWING NO. 4582SP.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CCC	CMT	458219	1 OF 1

F:\Projects\CAD\458219\4582SP.dwg SEWER PROF 1/17/20 3:46pm ccall

NO.	DESCRIPTION	BY	DATE

REVISIONS

COMMUNITY SPACE OVERVIEW PLAN

ASSESSORS MAP 252 – LOTS 4,5 & 9
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PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

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603.893.0720 GPINET.COM
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Suite One
Salem, NH 03079

SCALE: NTS	DATE: JANUARY 20, 2020		DRAWING NO. 4582COM-SPACE.DWG
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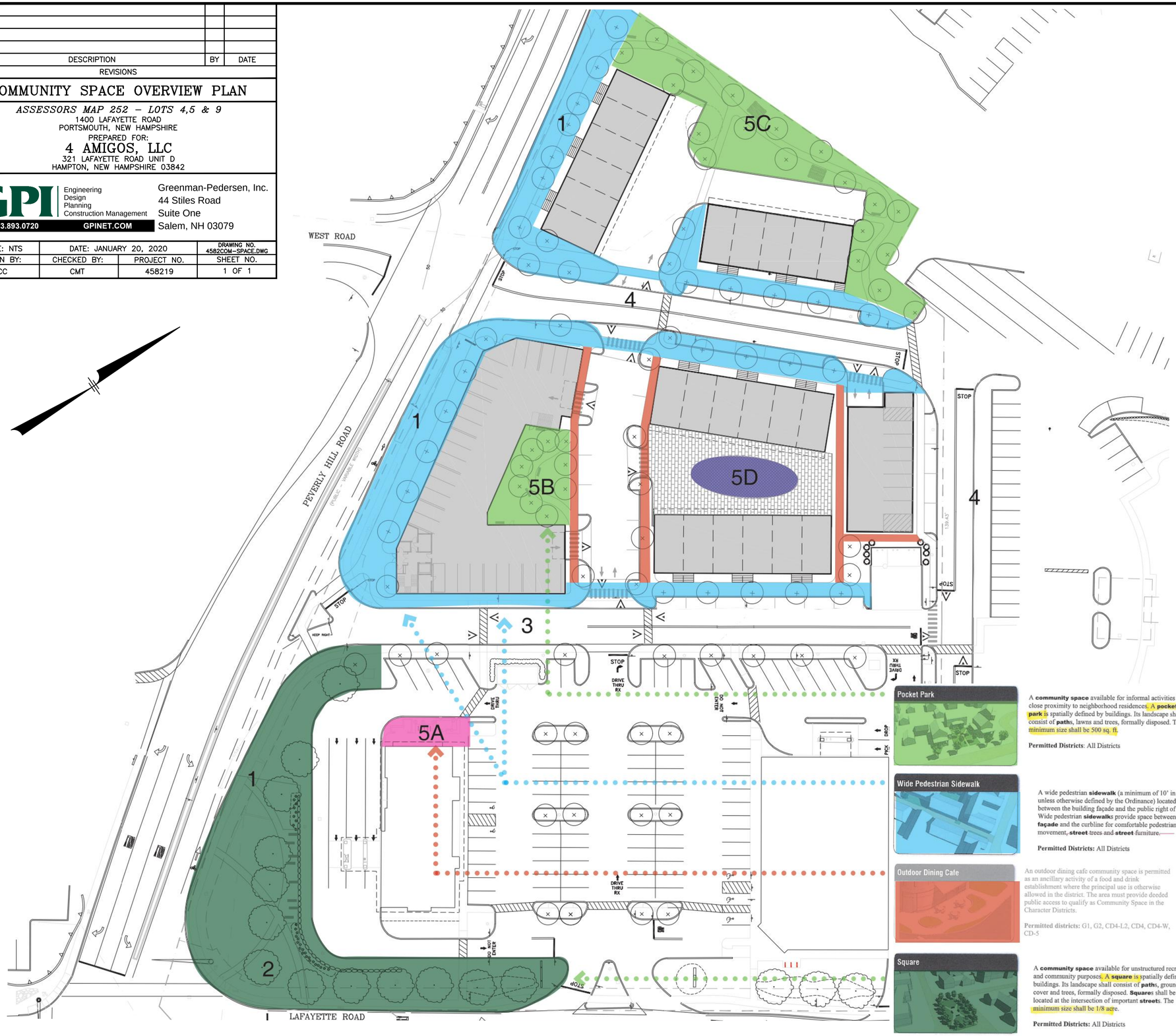
CCC	CMT	458219	1 OF 1



Defining Community Space:

The gateway zoning district requires a clear definition of community space area as well as the typology of community space, based upon defined types in the Gateway Zoning District in the project's design. There is an overall requirement of 20% open space - which the project complies with a recent calculation at 21.3% of the total site is proposed as non-paved and non-building space, but there is not an actual numerical value required for community space. At the same time, the community space requirements mandates an acceptable percentage of open space must have a viable function for the aesthetic and social life of the project. The Planning process will make a determination on the appropriateness of the community space, but the objective of the projects design is to maximize that opportunity in balance with the projects density and development pattern.

The approach for community space in the project design is first to make all public street frontages community space in the form of Widened Sidewalks with street trees and sidewalk amenities and street furniture. Additional landscaped areas can have added Community Space values in smaller discrete locales.

1. Frontage on Peverly Hill Road:
We initially considered that we could use this frontage as a Greenway designation, but we perceived that the Greenway typology in the community space assumed something greater in width. Therefore we have used the **Wide Pedestrian Sidewalk**. The current plan shows 25 feet from the right of way to the face of the building, so the 10 foot sidewalk and landscaping along the building more than adequately fits. Entrances to the building doorways are shown on each of the corners. Wide Pedestrian Sidewalks can have parallel garden spaces as linear rain gardens to capture, detain, and treat roof runoff from the buildings and the sidewalks. Street tree plantings in the 10 foot sidewalk can use Flexi pave, a pervious surfacing material that also functions to protect the tree roots.

The city has planned a sidewalk and striped bicycle lanes along this whole frontage. It's assumed that the city will basically require the project to build this sidewalk and it is proposed to be done at 10'. There are questions if the widened sidewalk should be within or outside of the city right of way.

2. Frontage on Lafayette Road to Rite Aid / Five Guys and Newburyport Bank property:
We are not anxious to make major changes to the parking areas because of lease requirements for Rite Aid. The percentage of building and parking is at somewhat a disadvantage except for the frontage along Lafayette Road because of the high percentage of building and parking coverage and the layout. Nevertheless, the project must integrate the entire property area for open space and community space.

The landscape frontage on Lafayette Road around the corner onto Peverly Hill Road has opportunities for landscaping to activate the space for social uses. The plan shows the corner area incorporating the attractive stone wall with a patio and walkway for seating areas. Designated as a **Square** the prominent street frontage location - although it is not square shaped is a landmark public space location.

3. Frontage Road facing Rite Aid and Five Guys:
This is the project's principal view from Lafayette Road and represents the transition from the commercial frontage to the residential neighborhood development as proposed. The previous project layout had 10 feet from the curb to the face of the buildings. In recognition that the entrance stairs for each of the townhouse unit pairs are not public space - the plan has been revised to set the bottom stair at the 10' edge, and to position the frontage gardens as 6' of additional streetscape space. Parallel on - street parking has also been located along this frontage for visitor parking.

The most appropriate community space for this street frontage is the **Wide Pedestrian Sidewalk**. That requires a minimum 10 foot space for widened paved sidewalk with street trees and street furniture. It's kind of a downtown street like experience and there are plenty of examples of this scale and character throughout the city in attractive neighborhoods. Wide Pedestrian Sidewalks can have parallel garden spaces as linear rain gardens to capture, detain, and treat roof runoff from the buildings and the sidewalks. Street tree plantings in the 10 foot sidewalk can use Flexi pave, a pervious surfacing material that also functions to protect the tree roots.

4. Side connecting streets:
The street frontage connecting to the estate lot and the frontage to the hotel have a similar condition of being a pre - existing condition to which we must adapt the neighborhood design. On the Estate frontage the use of the **Wide Pedestrian Sidewalk** is the best and most efficient community space because it is the front door to all the new housing and a public streetscape. The hotel facing directional only has room for a 5' widewalk but it is a lesser perspective.

5. Within the project itself there are also some additional community spaces:
A. Outdoor dining patio for Five Guys fits into a community space category of **Outdoor Dining cafe.**

B. The interior space of the larger condominium building is a **Pocket Park** due to its building enclosure

C. The western corner and boundary area of Peverly Hill Road is a natural woodland area of native trees and ground covers - is also best designated as a **Pocket Park.**

D. Some of the parking areas can have pervious pavements so that they look more like a plaza and function to detain stormwater.

A **community space** available for informal activities in close proximity to neighborhood residences. A **pocket park** is spatially defined by buildings. Its landscape shall consist of **paths**, lawns and trees, formally disposed. The minimum size shall be 500 sq. ft.

Permitted Districts: All Districts

A wide pedestrian **sidewalk** (a minimum of 10' in width unless otherwise defined by the Ordinance) located between the building façade and the public right of way. Wide pedestrian **sidewalks** provide space between the **façade** and the curbline for comfortable pedestrian movement, **street** trees and **street** furniture.

Permitted Districts: All Districts

An outdoor dining cafe community space is permitted as an ancillary activity of a food and drink establishment where the principal use is otherwise allowed in the district. The area must provide deeded public access to qualify as Community Space in the Character Districts.

Permitted districts: G1, G2, CD4-L2, CD4, CD4-W, CD-5

A **community space** available for unstructured recreation and community purposes. A **square** is spatially defined by buildings. Its landscape shall consist of **paths**, ground cover and trees, formally disposed. **Squares** shall be located at the intersection of important **streets**. The minimum size shall be 1/8 acre.

Permitted Districts: All Districts

A Portsmouth street scene that is comparable to the **Wide Sidewalk** community space - 10' wide sidewalk with street trees, the front gardens are set back 6' more.

Cross - block walkways offer pedestrian connectivity and can have attractive gardens.

Portsmouth **Pocket Park**

Outdoor cafe space in Portsmouth.

Luminaire Schedule							
Symbol	Qty	Label	Arrangement	LMF	Lum. Lumens	Lum. Watts	Part Number
	20	2MB	SINGLE	0.990	5348	70	ARE-EDR-2MB-R3-04-E-UL-xx-525-40K

Calculation Summary (Footcandles calculated using predicted lumen values @ 50K hrs of operation)						
Label	Units	Avg	Max	Min	Avg/Min	Max/Min
All Calc Points	Fc	0.60	3.9	0.0	N.A.	N.A.
Building A Walkway	Fc	0.63	2.2	0.0	N.A.	N.A.
Buildings B, C, & D Walkway	Fc	0.97	2.2	0.2	4.85	11.00
Buildings E & F Walkway	Fc	0.60	3.0	0.0	N.A.	N.A.

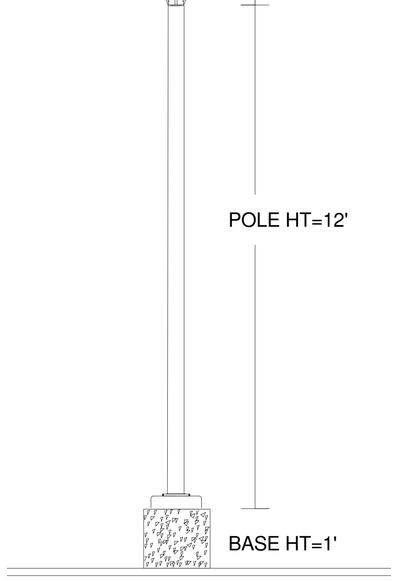
Pole Schedule
(20) SRS-5-11-12-SW-BS-OT-N-xx (12' X 5" X 11ga STEEL ROUND POLE)
Proposed poles meet 140 MPH sustained winds.

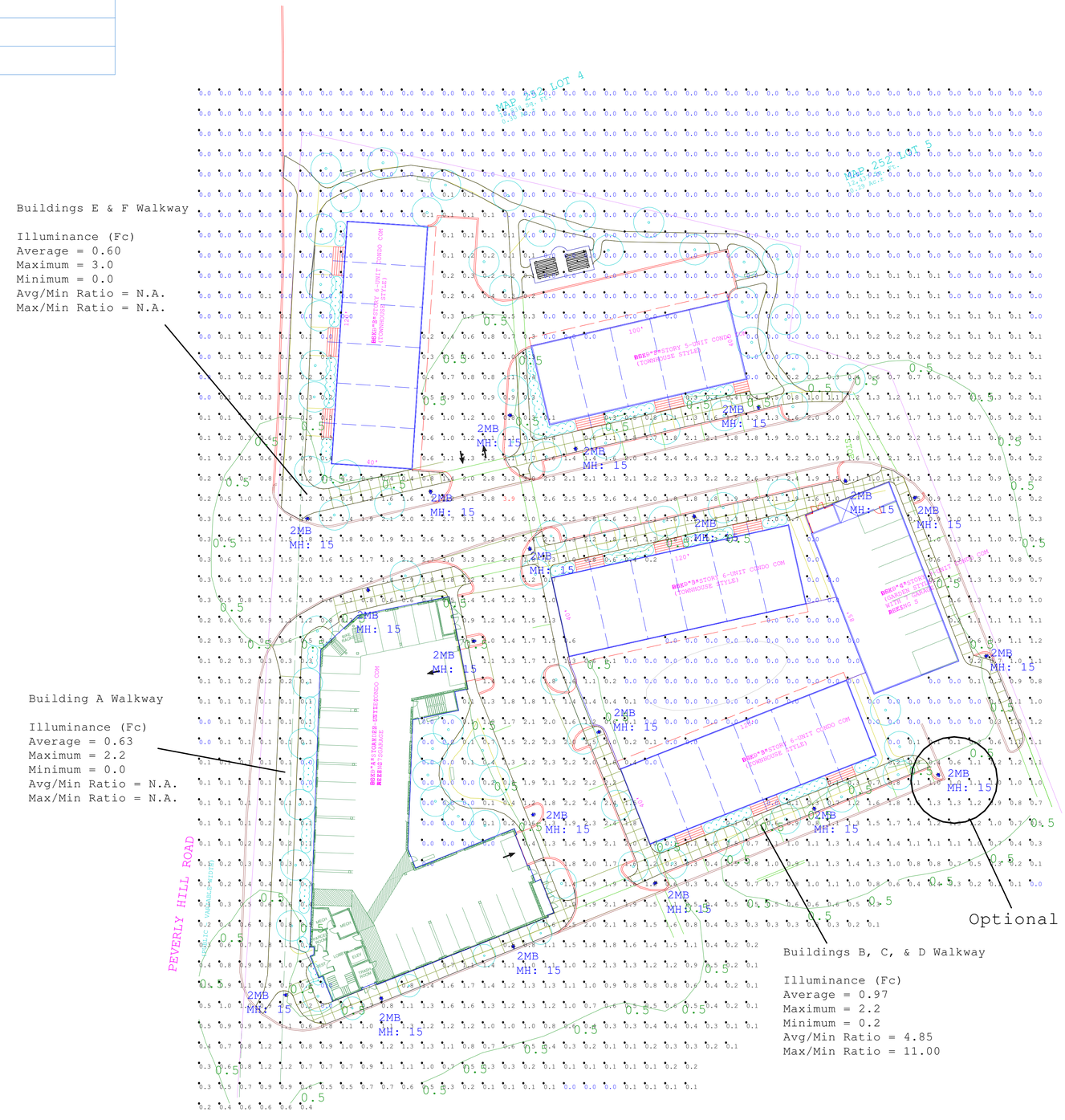
Additional Equipment:

(20) PB-1R5.00 - Single (Adapter Tenon connector)

*** CUSTOMER TO VERIFY ORDERING INFORMATION AND CATALOGUE NUMBER PRIOR TO PLACING ORDER ***

edge post top - round





CREE LIGHTING
A COMPANY OF IDEAL INDUSTRIES, INC.
9201 Washington Ave, Racine, WI 53406 https://creelighting.com - (800) 236-6800

Illumination results shown on this lighting design are based on project parameters provided to Cree Lighting used incorjunction with luminaire test procedures conducted under laboratory conditions. Actual project conditions differing from these design parameters may affect field results. The customer is responsible for verifying dimensional accuracy along with compliance with any applicable electrical, lighting,or energy code.

Project Name: 1400 Lafayette Rd Portsmouth, NH

SR-40291 | Footcandles calculated at grade | Filename: 200113RW1BAF.AGI

Layout By:
Ben Foster

Date:1/16/2020

Scale 1" = 30'

0 60 120

WEST ELEVATION
SCALE: 1" = 10'-0"

NORTH ELEVATION
SCALE: 1" = 10'-0"

EAST ELEVATION
SCALE: 1" = 10'-0"

EAST ELEVATION DIMENSIONED
SCALE: 1" = 10'-0"

FACADE MODULATION WHERE REQUIRED IS
PROPOSED TO BE ACHIEVED BY MATERIAL CHANGES
ROOF, DORMERS AND FENESTRATION VARIATIONS

SOUTH SIDE FIRST FLOOR FACADE OPENINGS			
SOUTH SIDE FIRST FLOOR 1	273.13 S.F.	149.00 S.F.	50.4 %
SOUTH SIDE FIRST FLOOR 2	1,657.50 S.F.	433.0 S.F.	26.0 %
	273.13 S.F.	0 S.F.	0 %
GROSS SOUTH SIDE FIRST FLOOR FACADE OPENINGS	1,930.62 S.F.	582 S.F.	30.1 %

SOUTH ELEVATION
SCALE: 1" = 10'-0"

mjk
Michael J. Keane Architects, PLLC
ARCHITECTURE
PLANNING
DESIGN
101 Kent Place
Newmarket, NH
03857
603-292-1400
mjkarchitects.com

CONSULTANTS

REVISIONS

APPROVALS

CONCEPT NOT FOR CONSTRUCTION
1/19/2020

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PROJECT

MAP 252-LOTS 4, 5 &9
140 LAFAYETTE ROAD
PORTSMOUTH NH

FOR

4 AMIGOS,LLC
321 LAFAYETTE ROAD
HAMPTON, NH 03842,

TITLE

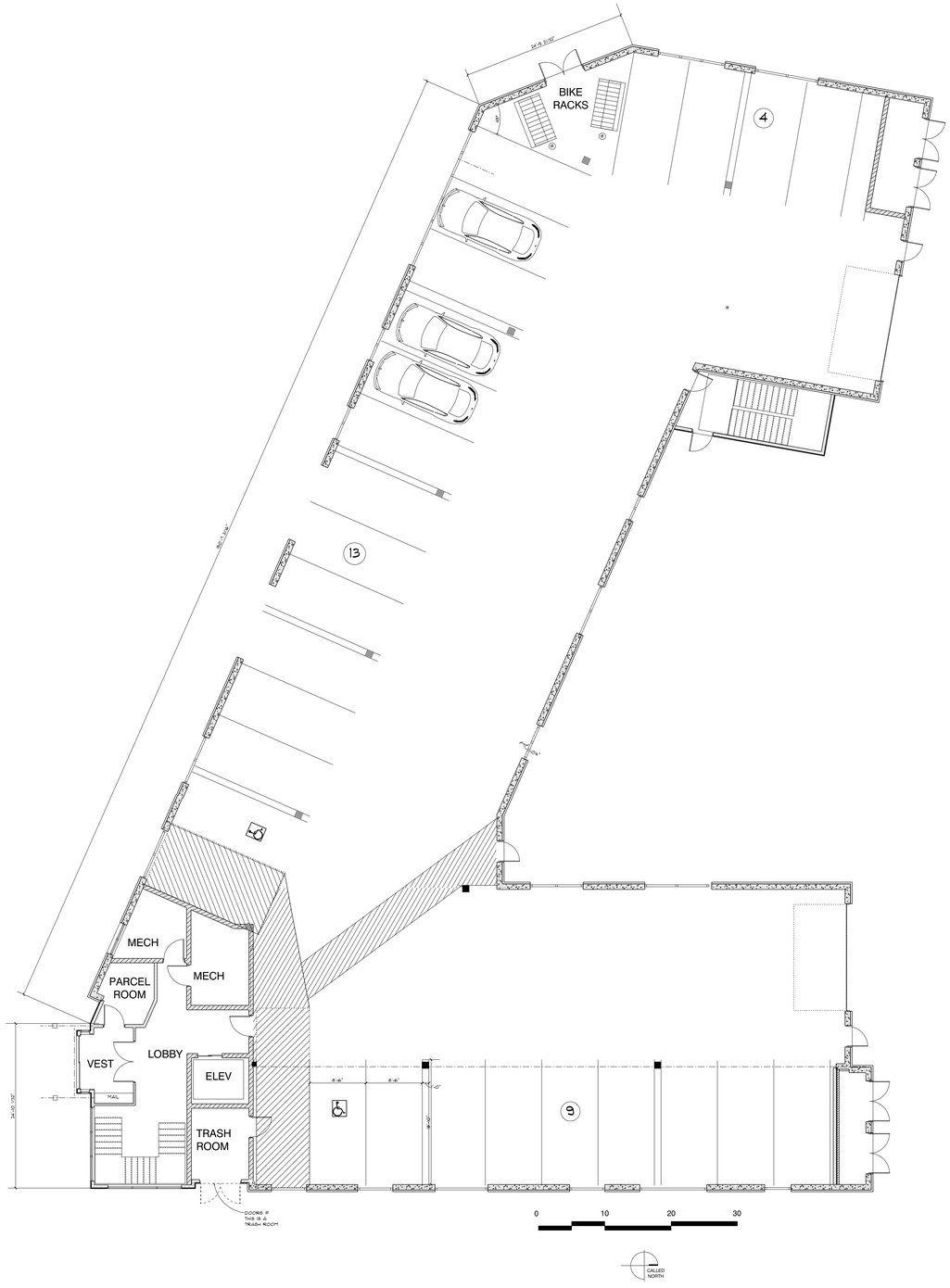
BUILDING A ELEVATIONS

DRAWN BY:
CHECKED BY:
DATE:
SCALE: AS NOTED

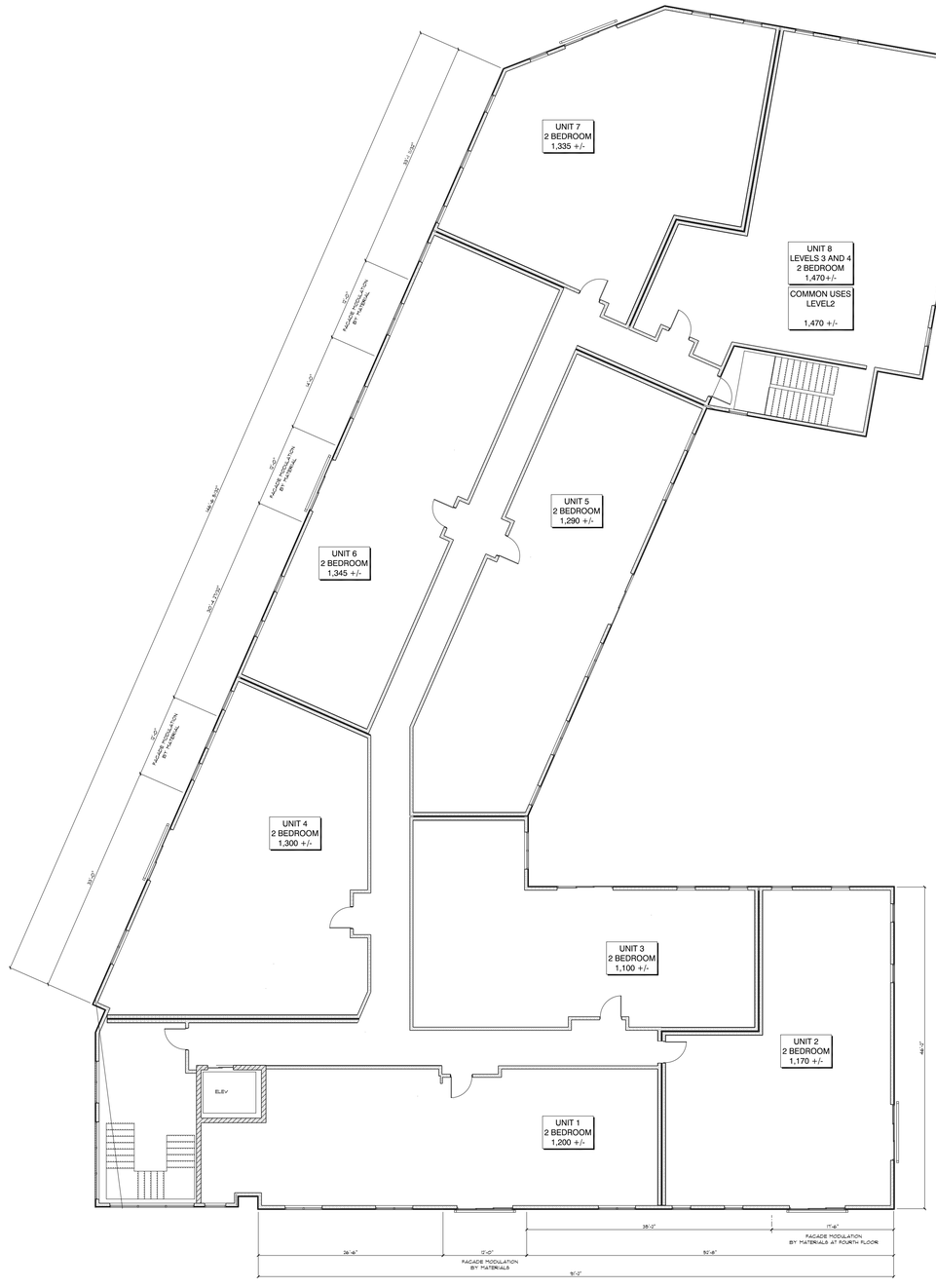
DRAWING NO.

A-1.A

DO NOT SCALE PRINTS



PARKING LEVEL PLAN
SCALE: 1" = 10'-0"



TYPICAL FLOOR PLAN 2-4
SCALE: 1" = 10'-0"

mjk
Michael J. Keane Architects, PLLC
ARCHITECTURE
PLANNING
DESIGN
101 Kent Place
Newmarket, NH
03857
603-292-1400
mjkarchitects.com

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MAP 252-LOTS 4, 5 &9
140 LAFAYETTE ROAD
PORTSMOUTH NH

FOR

4 AMIGOS,LLC
321 LAFAYETTE ROAD
HAMPTON, NH 03842,

TITLE

BUILDING A PLANS

DRAWN BY:

CHECKED BY:

DATE:

SCALE: AS NOTED

DRAWING NO.

A- 2.A

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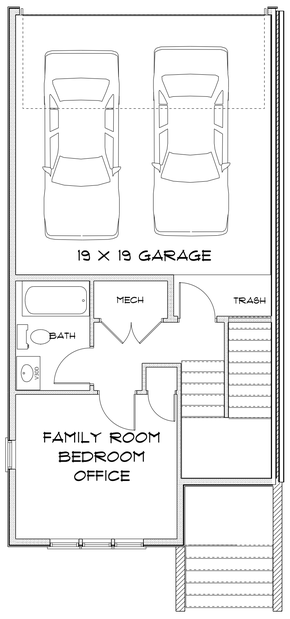
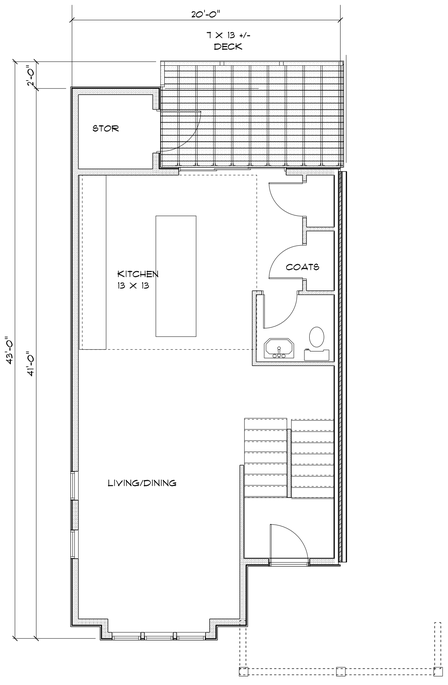
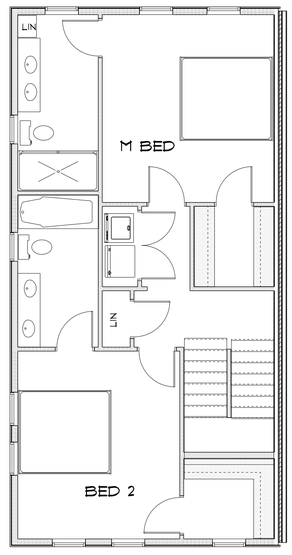


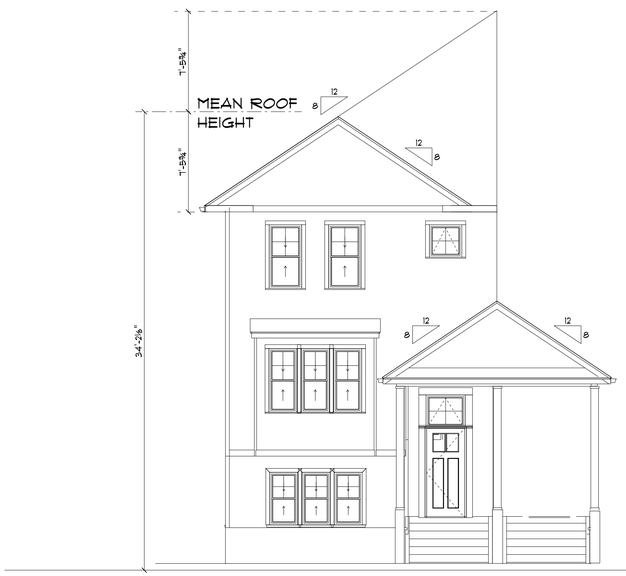
TYPICAL GARAGE LEVEL PLAN
SCALE: 3/16" = 1'-0"



TYPICAL SECOND FLOOR PLAN
SCALE: 3/16" = 1'-0"



TYPICAL THIRD FLOOR PLAN
SCALE: 3/16" = 1'-0"



ASSUMED AVERAGE GRADE TO BE VERIFIED
FACADE MODULATION WHERE REQUIRED IS
PROPOSED TO BE ACHIEVED BY MATERIAL CHANGES
ROOF, DORMERS AND FENESTRATION VARIATIONS

FRONT ELEVATION DIMENSION
SCALE: 3/16" = 1'-0"

mjk
Michael J. Keane
Architects, PLLC
ARCHITECTURE
PLANNING
DESIGN
101 Kent Place
Newmarket, NH
03857
603-292-1400
mjkarchitects.com

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PROJECT

MAP 252- LOTS 4,5 &9
1400 LAFAYETTE ROAD
PORTSMOUTH NH

FOR

4 AMIGOS, LLC
321 LAFAYETTE ROAD
HAMPTON NH 03842,

TITLE

BUILDING B TYPICAL UNIT

DRAWN BY:

CHECKED BY:

DATE:

SCALE: AS NOTED

DRAWING NO.

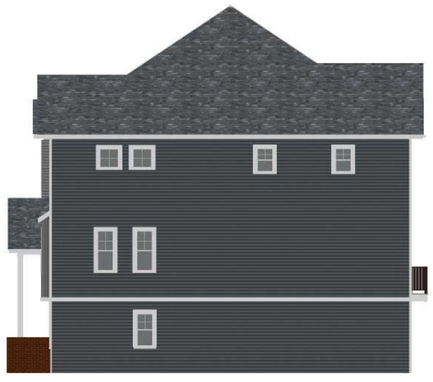
A-1.B

DO NOT SCALE PRINTS

REAR ELEVATION
SCALE: 1/8" = 1'-0"

LEFT ELEVATION
SCALE: 1/8" = 1'-0"

FRONT ELEVATION
SCALE: 1/8" = 1'-0"



RIGHT ELEVATION
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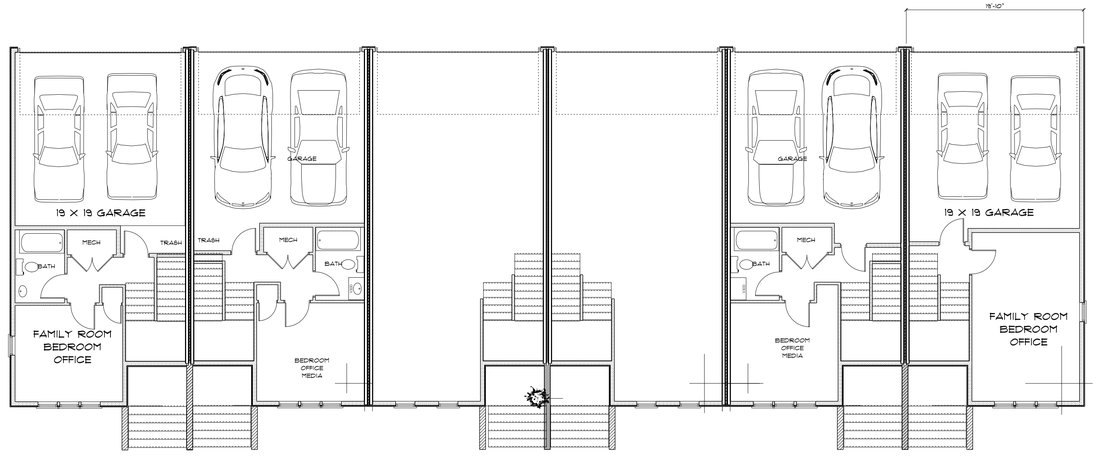

GARAGE LEVEL PLAN
SCALE: 1/8" = 1'-0"

mjk
Michael J. Keane
Architects, PLLC
ARCHITECTURE
PLANNING
DESIGN
101 Kent Place
Newmarket, NH
03857
603-292-1400
mjkarchitects.com

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MAP 252- LOTS 4,5 &9
1400 LAFAYETTE ROAD
PORTSMOUTH NH

FOR

4 AMIGOS, LLC
321 LAFAYETTE ROAD
HAMPTON NH 03842,

TITLE

BUILDING B PLANS AND ELEV

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SCALE: AS NOTED

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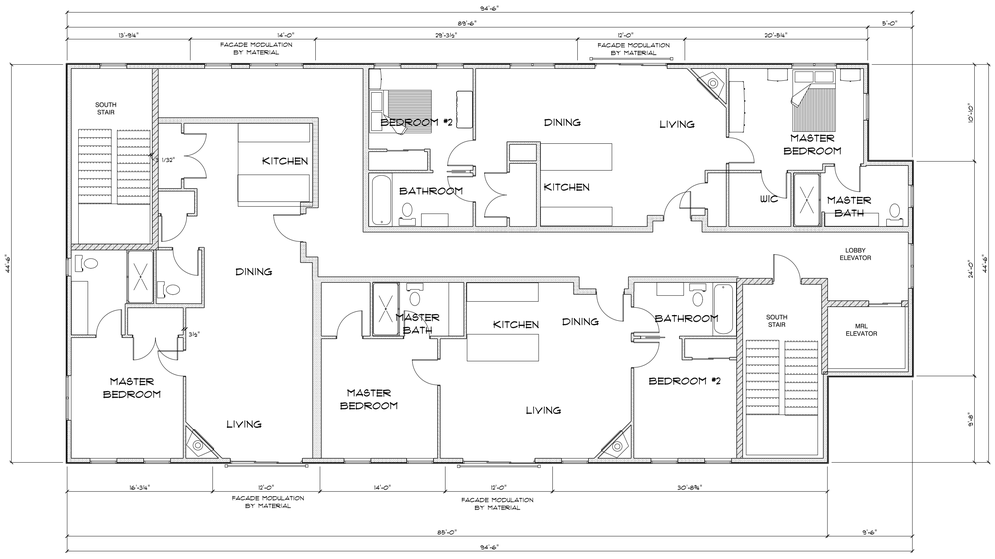
DRAWING NO.

A-2.B

NORTH ELEVATION
SCALE: 1/8" = 1'-0"

WEST ELEVATION
SCALE: 1/8" = 1'-0"



TYPICAL SECOND AND THIRD FLOOR PLAN
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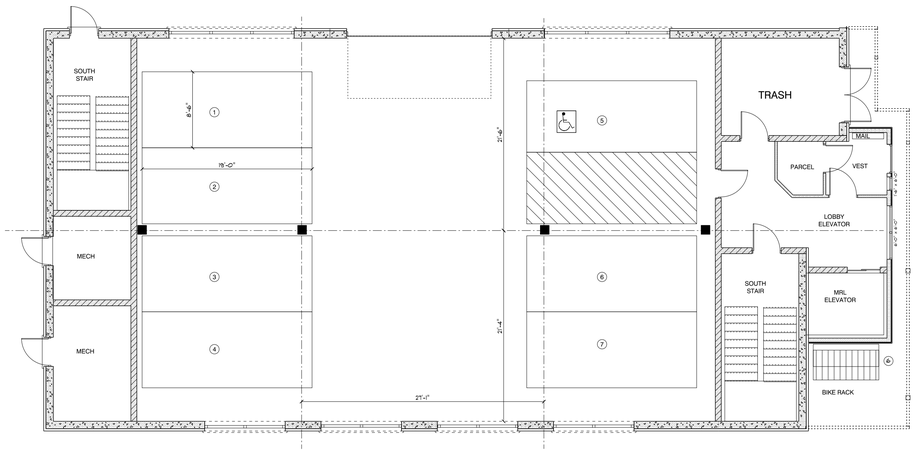
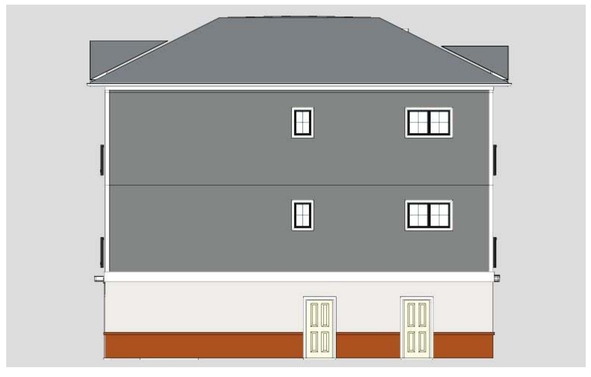


CONCEPT PARKING LEVEL PLAN
SCALE: 1/8" = 1'-0"

SOUTH ELEVATION
SCALE: 1/8" = 1'-0"

FACADE MODULATION WHERE REQUIRED IS PROPOSED TO BE ACHIEVED BY MATERIAL CHANGES ROOF, DORMERS AND FENESTRATION VARIATIONS



EAST ELEVATION
SCALE: 1/8" = 1'-0"

CONCEPT SECTION
SCALE: 1/8" = 1'-0"

mjk
Michael J. Keane Architects, PLLC
ARCHITECTURE
PLANNING
DESIGN
101 Kent Place
Newmarket, NH
03857
603-292-1400
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TITLE

BUILDING C
CONCEPT PLANS

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Michael J. Keane
Architects, PLLC

ARCHITECTURE
PLANNING
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101 Kent Place
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03857

603-292-1400
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BUILDING C
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A-2.C

STORMWATER MANAGEMENT REPORT

SITE DEVELOPMENT PLANS
1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

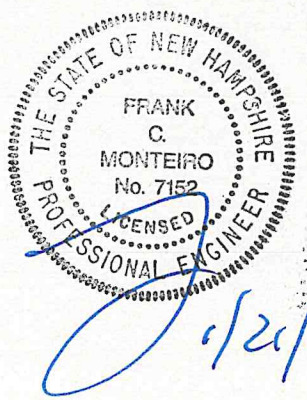
GPI

44 Stiles Road, Suite One
Salem, NH 03079
(603) 893-0720

Prepared For:

4 Amigos, LLC
321D Lafayette Road
Hampton, NH 03842

January 21, 2020



1/21/20

4 Amigos, LLC
Site Development Plans
Stormwater Management Report
January 21, 2020

TABLE OF CONTENTS

Stormwater Management Report

Proposed Site Development Plans

1400 Lafayette Road, Portsmouth, NH 03801

January 21, 2020

SECTION 1 EXECUTIVE SUMMARY

This report contains the stormwater management analysis for the proposed site development at 1400 Lafayette Road in Portsmouth, New Hampshire. The analysis includes both pre- and post-drain calculations of stormwater runoff rates from the project site. This analysis has been prepared in accordance with both the City of Portsmouth requirements and the New Hampshire Department of Environmental Services (NHDES) Stormwater Manual, Volume 2.

The project site consists of three parcels of land identified as Tax Map 252 Lots 4, 5 & 9 with a combined size of 5.71 acres located north of the intersection of Lafayette Road & Peverly Hill Road.

This vacant pad site is part of the former Yoken's Restaurant and Function Facility which was partially redeveloped in 2013 to include the adjacent pharmacy, bank & restaurant development. Lots 4 & 5 are residential lots which are now proposed to be combined with the surrounding commercial development.

The applicant is proposing a multi-unit residential condo development which includes four 3-story Townhouse Style buildings and two 4-story Garden Style buildings. Access is provided from both Lafayette Road & Peverly Hill Road. Onsite parking includes a combination of street parking, individual townhouse garages and parking garage facilities for the garden style buildings.

A new stormwater management system has been designed as part of the proposed development to collect and treat the runoff from the new impervious surface areas. Several stormwater best management practices will be implemented as part of this project. This includes new closed drainage systems with deep-sump, hooded catch basins throughout the site, First Defense hydrodynamic separators, and underground infiltration systems. The proposed closed drainage system within the site will discharge treated water to the existing closed drainage system that discharges to the north which ultimately flows to Sagamore Creek.

The study watershed area is approximately 6.0-acres that primarily drains northerly across the site towards an existing onsite drainage system. For analysis purposes, the site was modeled with multiple design points as described in the Drainage Summary (Table 1) of this report.

As outlined by NHDES AoT there is a 10-year window for phased developments. Since this current phase of the overall development is within the 10-year window the stormwater analysis will compare proposed conditions to existing conditions prior to the 2013 redevelopment phase, with some adjustments made to current storm/rainfall intensities. Refer to Table 1 and associated notes.

TABLE 1: PEAK RATE ANALYSIS SUMMARY

Design Storm	Pre circa 2013[1] (cfs)	Adjusted pre circa 2013[2] (cfs)	Post circa 2013[1] (cfs)	Adjusted Post circa 2013[2] (cfs)	Proposed[3] (cfs)	Change (cfs)
DESIGN POINT #1 (Existing Catch Basin 3A)[4]						
2-year	-	-	1.1	1.4	1.4	0.0
10-year	-	-	1.7	2.2	2.2	0.0
25-year	-	-	2.0	2.8	2.8	0.0
50-year	-	-	2.2	3.4	3.4	0.0
DESIGN POINT #3 (Existing Catch Basin)						
2-year	7.0	8.8	2.7	3.9	5.0	-3.8
10-year	10.3	13.7	5.0	9.8	8.5	-5.2
25-year	12.6	17.6	7.2	13.1	12.2	-5.4
50-year	13.9	21.1	8.7	16.3	15.8	-5.3
DESIGN POINT #4 (Hotel Property)						
2-year	2.4	2.9	1.3	1.6	1.6	-1.3
10-year	3.4	4.5	1.8	2.4	2.5	-2.0
25-year	4.2	5.8	2.2	3.1	3.3	-2.5
50-year	4.6	6.9	2.5	3.7	4.0	-2.9

(All values shown are peak rates in CFS)

Lots 4 & 5 which drain towards Design Point #2 were not part of the original study area; therefore, the pre-development for this design point is based on current site conditions.

Design Storm	Pre-development (cfs)	Post-development (cfs)	Change (cfs)
DESIGN POINT #2 (Lot 3)			
2-year	0.8	0.4	-0.4
10-year	2.1	0.9	-1.2
25-year	3.3	1.3	-2.0
50-year	4.5	1.8	-2.7

(All values shown are peak rates in CFS)

[1] Previous analysis used the SCS Soil Distribution Map rainfall data in accordance with 2013 regulations.

[2] Previous analysis adjusted to use current "Extreme Precipitation" data plus 15% coastal increase per current NHDES requirements.

[3] Uses current "Extreme Precipitation" plus 15% coastal increase per current NHDES requirements.

[4] Existing catch basin 3A was a proposed catch basin in the 2013 post-development and was therefore not present for the 2013 pre-development.

In conclusion, by incorporating a new on-site drainage system that includes provisions for stormwater treatment and infiltration, there will be a decrease in the peak rate of runoff as a result of this project.

SECTION 2 EXISTING CONDITIONS

As previously stated, the existing conditions used for this stormwater analysis date back to the condition prior to the 2013 redevelopment project. Accordingly, the below description is consistent with the description provided in the previous stormwater report submitted at that time with the exception of Lots 4 & 5 which were not part of the original analysis. These two residential lots contain a small house, some grass areas, a few sheds and about 50 wooded coverage, all of which drains overland towards the rear of the property onto adjacent Lot 3.

Portsmouth Tax Map 252 Lot 9 is a 5.1-acre parcel of land located in the Gateway District (GW) in Portsmouth, NH. The parcel of land is the location of the former Yoken's Restaurant and Function Facility. The site is bounded by Lafayette Road to the east, Peverly Road to the south, residential property to the west and the Comfort Inn to the north. Onsite topography ranges from 1-5% and slopes towards the Comfort Inn along the north.

The Yoken's building has been razed, but for analysis purposes the former building and impervious area has been modeled in the existing conditions as if it were still existing. The remainder of the site is mostly paved, occupying approximately 93% of the site, with limited green space.

The existing drainage system consists of a series of catch basins and manholes which ultimately discharge north of the site boundary towards a drainage swale north of the Comfort Inn. This ultimately flows to Sagamore Creek. For analysis purposes, the existing catch basin, labeled CB D and the Hotel Property have been labeled as the design points. These areas represent the runoff discharging from the site as either shallow concentrated flows or flows into the existing drainage system via pipe flow.

The existing onsite catch basins consist of shallow structures with varying pipe sizes and material type. Based on the shallow flat pipes, along the front of the site near Lafayette Road, the existing conditions HydroCAD model indicated several existing catch basins overtopping for even the more frequent less intense design storms. In order to check the runoff results for accuracy due to any modeling limitations in the software, we modeled this portion of the existing site as one subcatchment to compare the results with the individually modeled areas. This "check" is shown in the HydroCAD model as subcatchment "Check". The results of this analysis indicate a level of precision of approximately 10% which indicates predevelopment runoff rates appear to be reasonable for comparison to the post development design points. Ultimately any runoff will drain northerly across the site as overland flow and eventually towards the drainage swale located north of the existing Comfort Inn property.

The existing soils are also classified by the Soil Survey of Rockingham County (NRCS Manual) as 140C "Chatfield-Hollis-Canton Complex", 299 "Udorthents" and 699 "Urban Land" (see soil map), and described by NRCS as follows:

> 140C - Chatfield-Hollis-Canton complex (SCS Classification "B") consists of 8 to 15 percent slopes and are very stony. These gently sloping soils occur as areas so intermingled that mapping them separately was not practical. They are on low, knobby hills and ridges that in most places have a northeast orientation. Areas are irregularly shaped and are 4 to 400 acres in size. They are about 35 percent Chatfield soil, 20 percent Hollis soil, 20 percent Canton soil, and 25 percent other soils. Stones cover 0.01 to 3 percent of the surface.
>
> 299 - Udorthents (SCS Classification "Unknown") consists of areas of soils formed by cutting or filling for construction projects. Udorthents are near or adjacent to most of the soils of the survey area. Because of the extreme variability of Udorthents, a reference pedon is not given.
>
> 699 - Urban Land (SCS Classification "Unknown") consists of land that is covered by streets, parking lots and buildings. Areas are rectangular or irregularly shaped and are 4 to 250 acres in size. Inclusions make up 15 percent or less of the map unit. They consist of scattered areas of soil throughout the map unit.

Based on the majority of the site consisting of Udorthents and Urban land having no known hydrologic soil classification, the analysis used the hydrologic soil group classification B consistent with Chatfield-Hollis-Canton complex present onsite. Additionally test pits were performed onsite indicating loamy sand and sands consistent with a "B" soil.

SECTION 3 PROPOSED CONDITIONS

The applicant is proposing a multi-unit residential condo development which includes four 3-story Townhouse Style buildings and two 4-story Garden Style buildings. Access is provided from both Lafayette Road & Peverly Hill Road. Onsite parking includes a combination of street parking, individual townhouse garages and parking garage facilities for the garden style buildings.

A new stormwater management system has been designed as part of the proposed development to collect and treat the runoff from the new impervious surface areas. Several stormwater best management practices will be implemented as part of this project. This includes new closed drainage systems with deep-sump, hooded catch basins throughout the site, First Defense hydrodynamic separators, and underground infiltration systems. The proposed closed drainage system within the site will discharge treated water to the existing closed drainage system that discharges to the north which ultimately flows to Sagamore Creek.

In order to safeguard against oil or gas introduction into the drainage system, stormwater runoff from parking areas and driveways would be collected into hooded catch basins with deep sumps and routed to one of the First Defense hydrodynamic separators. Such pretreatment of stormwater reduces both suspended solids and oils in the drainage system and is recommended by NHDES.

Another safeguard against future intrusion of contaminants into the groundwater is the implementation of an Operation & Maintenance Plan (O&M), which would assure proper function of drainage components and reduce sediment entering the system. To prevent erosion and sedimentation during construction, Best Management Practices including stabilized construction exits, silt fence, catch basin inserts, and temporary and permanent seeding have been incorporated into the construction sequence.

The total area of disturbance related to the proposed construction on this property is approximately 115,000 square feet; therefore the project is subject to US EPA Construction General Permit requirements.

SECTION 4 STORMWATER MODELING METHODOLOGY

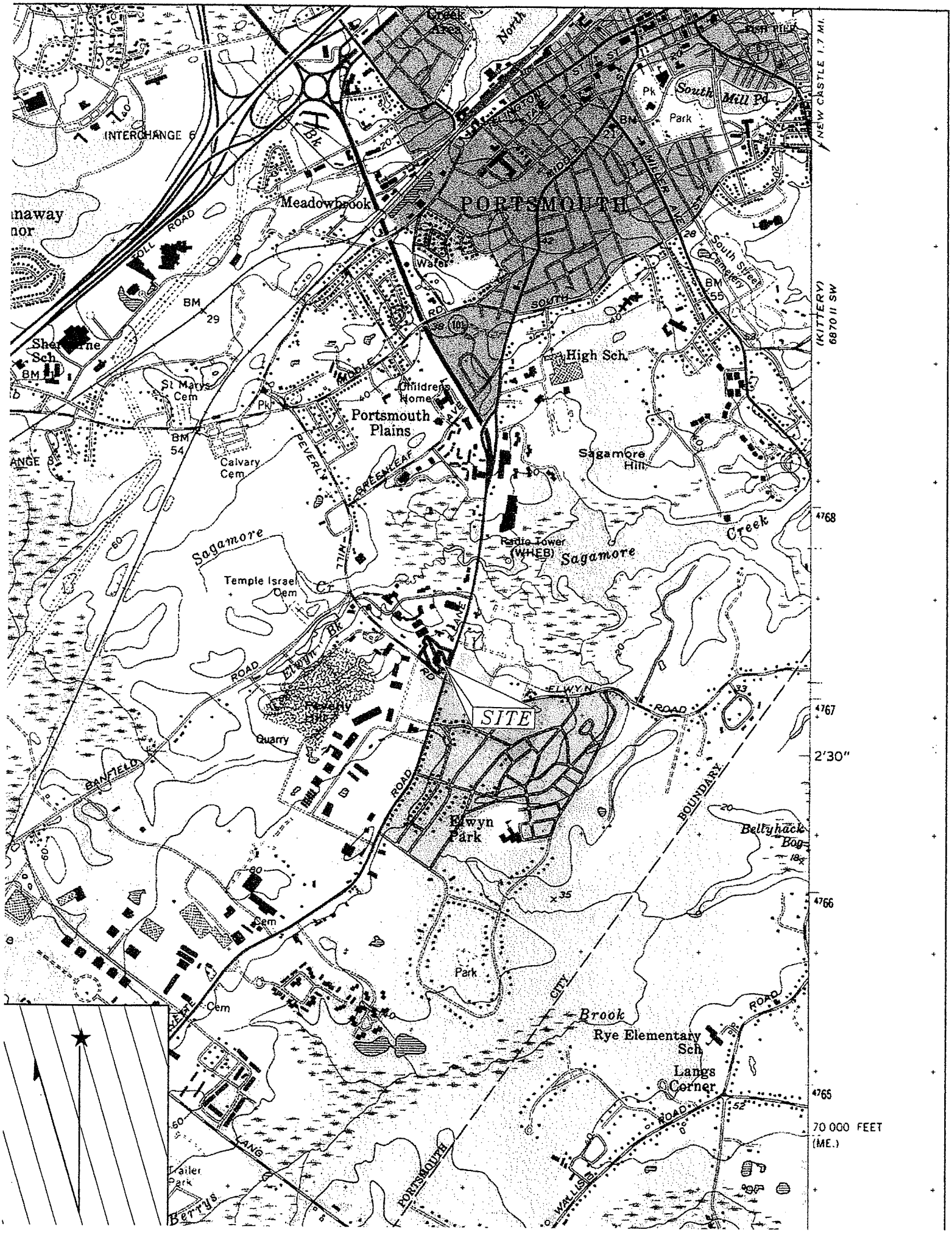
The drainage system for this project was modeled using HydroCAD, a stormwater modeling computer program that analyzes the hydrology, and hydraulics of stormwater runoff. HydroCAD is based largely on the hydrology techniques developed by the Soil Conservation Service (SCS/NRCS), combined with other hydrology and hydraulics calculations. For a given rainfall event, these techniques are used to generate hydrographs throughout a watershed. This provides verification that a given drainage system is adequate for the area under consideration, or to predict where flooding or erosion is likely to occur.

In HydroCAD, each watershed is modeled as a Subcatchment, streams and culverts as a Reach (or Pond, depending on available storage capacity), and large wetlands and other natural or artificial storage areas as a Pond. SCS hydrograph generation and routing procedures were used to model both Pre-development and Post-development runoff conditions.

The Pre-development and Post-development watershed limits and the subcatchment characteristics were determined using both USGS and on-the-ground topographic survey information and through visual, on-site inspection. Conservative estimates were used at all times in estimating the hydrologic characteristics of each watershed or subcatchment.

APPENDIX A

USGS Map


INTERCHANGE 6
Meadowbrook
PORTSMOUTH
Water
High Sch.
Children's Home
Portsmouth Plains
St Mary's Cem
Calvary Cem
Sagamore Hill
Radio Tower (WHEB)
Sagamore Creek
Temple Israel Cem
Elwyn Park
Quarry
SITE
Elwyn Park
Rye Elementary Sch
Langs Corner
Brook
Bellyhack Bog
Park
Trailer Park
Betty's
BM 29
BM 54
BM 55
Pk
Cem
NEW CASTLE 1.7 MI.
(KITTERY) 6870 II SW
4768
4767
4766
4765
2'30"
70 000 FEET (ME.)

APPENDIX B

NRCS Soil Information

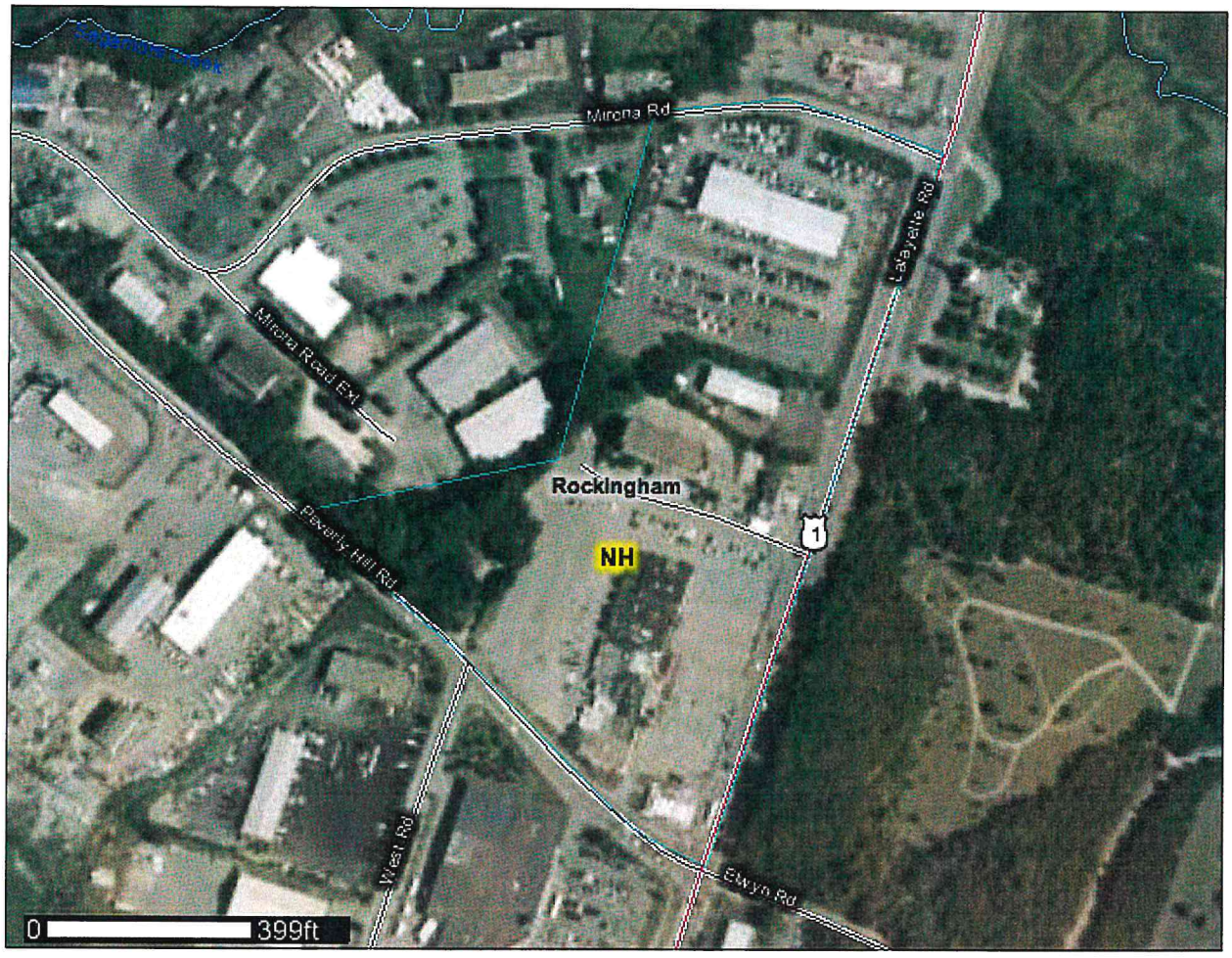
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for Rockingham County, New Hampshire



September 30, 2011

Preface

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

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

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

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

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

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means

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Contents

How Soil Surveys Are Made

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

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

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

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

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

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

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

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

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

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

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

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

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

Custom Soil Resource Report
Soil Map

MAP LEGEND

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

Soils
- Soil Map Units

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
- Gully
- Short Steep Slope
- Other

Political Features
- Cities

Water Features
- Streams and Canals

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

MAP INFORMATION

Map Scale: 1:2,940 if printed on A size (8.5" × 11") sheet.

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 accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 19N NAD83

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 11, Oct 27, 2009

Date(s) aerial images were photographed: 8/23/2003

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

Rockingham County, New Hampshire (NH015)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
140C	Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, very stony	3.8	20.2%
299	Udorthents, smoothed	4.1	22.1%
699	Urban land	10.7	57.7%
Totals for Area of Interest		**18.6**	**100.0%**

Map Unit Descriptions

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

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

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

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

intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

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

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

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

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

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

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

Rockingham County, New Hampshire

140C—Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, very stony

Map Unit Setting

Elevation: 0 to 2,100 feet
Mean annual precipitation: 28 to 46 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 60 to 195 days

Map Unit Composition

Chatfield and similar soils: 35 percent
Canton and similar soils: 20 percent
Hollis and similar soils: 20 percent
Minor components: 25 percent

Description of Chatfield

Setting

Parent material: Till

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to high (0.01 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.5 inches)

Interpretive groups

Land capability (nonirrigated): 6s

Typical profile

0 to 20 inches: Fine sandy loam
20 to 31 inches: Cobbly fine sandy loam
31 to 35 inches: Unweathered bedrock

Description of Hollis

Setting

Parent material: Till

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to high (0.01 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Available water capacity: Very low (about 1.6 inches)

Interpretive groups
Land capability (nonirrigated): 6s

Typical profile
0 to 2 inches: Fine sandy loam
2 to 13 inches: Cobbly fine sandy loam
13 to 17 inches: Unweathered bedrock

Description of Canton

Setting
Parent material: Till

Properties and qualities
Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 5.3 inches)

Interpretive groups
Land capability (nonirrigated): 6s

Typical profile
0 to 5 inches: Gravelly fine sandy loam
5 to 21 inches: Gravelly fine sandy loam
21 to 60 inches: Loamy sand

Minor Components

Not named
Percent of map unit: 7 percent

Newfields
Percent of map unit: 5 percent

Ossipee and greenwood
Percent of map unit: 5 percent
Landform: Bogs

Scarboro
Percent of map unit: 3 percent
Landform: Depressions

Walpole
Percent of map unit: 3 percent
Landform: Depressions

Rock outcrop
Percent of map unit: 2 percent

299—Udorthents, smoothed

Map Unit Composition

Udorthents and similar soils: 100 percent

Description of Udorthents

Properties and qualities

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

699—Urban land

Map Unit Composition

Urban land: 85 percent
Minor components: 15 percent

Minor Components

Not named

Percent of map unit: 15 percent

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

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

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

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

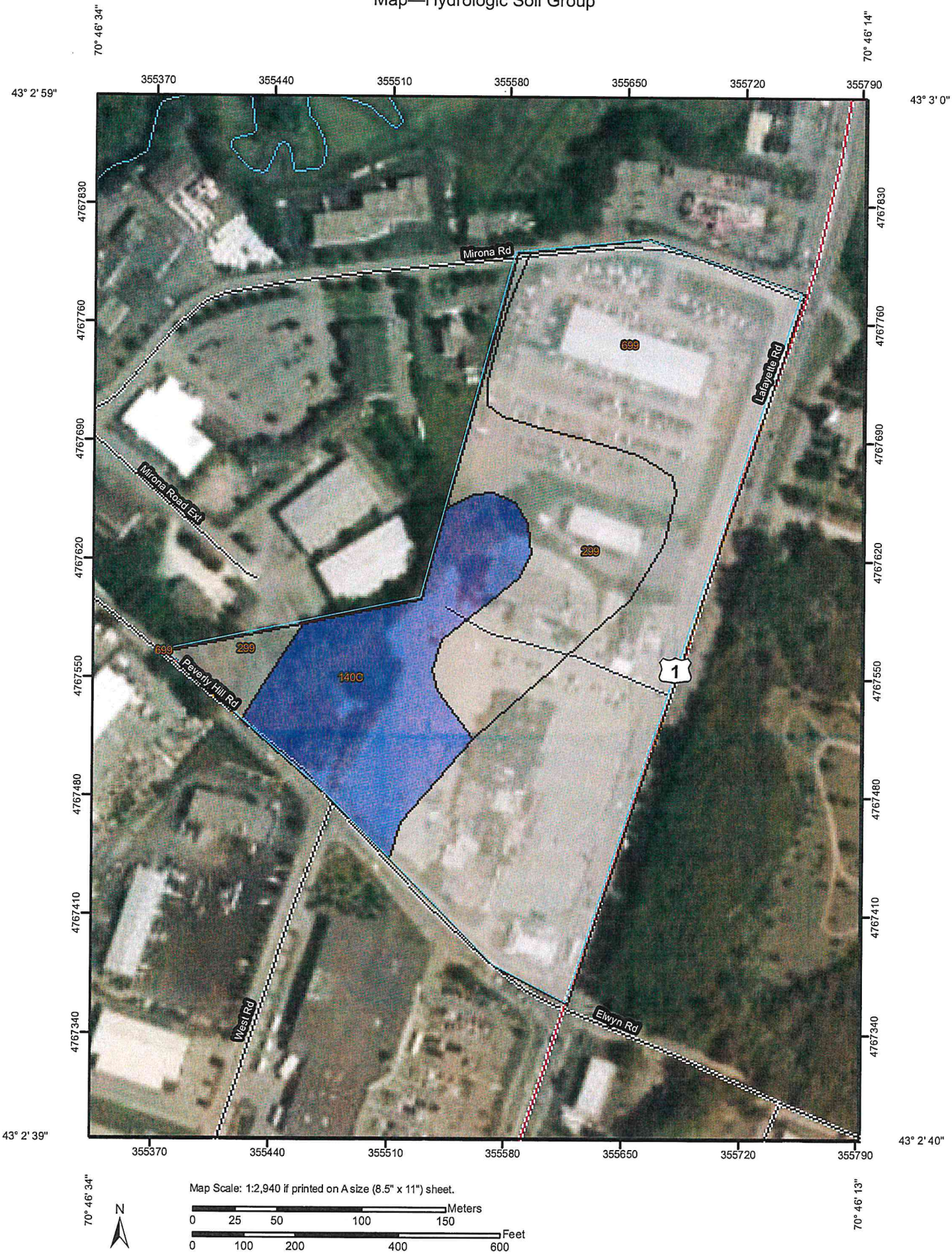
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

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

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

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

Custom Soil Resource Report
Map—Hydrologic Soil Group



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Soil Ratings

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Political Features

- Cities

Water Features

- Streams and Canals

Transportation

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

MAP INFORMATION

Map Scale: 1:2,940 if printed on A size (8.5" × 11") sheet.

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 accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 19N NAD83

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 11, Oct 27, 2009

Date(s) aerial images were photographed: 8/23/2003

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.

Table—Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Rockingham County, New Hampshire (NH015)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
140C	Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, very stony	B	3.8	20.2%
299	Udorthents, smoothed		4.1	22.1%
699	Urban land		10.7	57.7%
Totals for Area of Interest			**18.6**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://soils.usda.gov/

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://soils.usda.gov/

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://soils.usda.gov/

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://soils.usda.gov/

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.glti.nrcs.usda.gov/

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://soils.usda.gov/

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://soils.usda.gov/

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210.

APPENDIX C

72-hr Drawdown Calculations

Drawdown within 72 hours Analysis for Static Method

Proposed Underground Infiltration System #1

Infiltration Rate:	3.00	inches/hour (Ksat conversion from NHDES, see Hydrocad node for additional information)
Design Infiltration Rate:	3.00	inches/hour
Volume Provided for Recharge:	1,323	cf
Basin bottom area:	1,650	sf

Time $_{drawdown}$ = (Required Recharge Volume in cubic feet as determined by the Static Method)(1/Design Infiltration Rate in inches per hour)(conversion for inches to feet)(1/bottom area in feet)

Time $_{drawdown}$ = (1,323 cf) (1 / 3.00 in/hr) (1ft/12 in.) (1 / 1,650 sf)

= 3.21 hours

Drawdown within 72 hours Analysis for Static Method

Proposed Underground Infiltration System #2

Infiltration Rate:	3.00	inches/hour (Ksat conversion from NHDES, see Hydrocad node for additional information)
Design Infiltration Rate:	3.00	inches/hour
Volume Provided for Recharge:	1,142	cf
Basin bottom area:	2,114	sf

Time $_{drawdown}$ = (Required Recharge Volume in cubic feet as determined by the Static Method)(1/Design Infiltration Rate in inches per hour)(conversion for inches to feet)(1/bottom area in feet)

Time $_{drawdown}$ = (1,142 cf) (1 / 3.00 in/hr) (1ft/12 in.) (1 / 2,114 sf)

= 2.16 hours

Drawdown within 72 hours Analysis for Static Method

Proposed Underground Infiltration System #3

Infiltration Rate:	3.00	inches/hour (Ksat conversion from NHDES, see Hydrocad node for additional information)
Design Infiltration Rate:	3.00	inches/hour
Volume Provided for Recharge:	1,267	cf
Basin bottom area:	1,650	sf

Time $_{drawdown}$ = (Required Recharge Volume in cubic feet as determined by the Static Method)(1/Design Infiltration Rate in inches per hour)(conversion for inches to feet)(1/bottom area in feet)

Time $_{drawdown}$ = (1,267 cf) (1 / 3.00 in/hr) (1ft/12 in.) (1 / 1,650 sf)

= 3.07 hours

Drawdown within 72 hours Analysis for Static Method

Proposed Underground Infiltration System #4

Infiltration Rate:	3.00	inches/hour (Ksat conversion from NHDES, see Hydrocad node for additional information)
Design Infiltration Rate:	3.00	inches/hour
Volume Provided for Recharge:	1,002	cf
Basin bottom area:	779	sf

$Time_{drawdown}$ = (Required Recharge Volume in cubic feet as determined by the Static Method)(1/Design Infiltration Rate in inches per hour)(conversion for inches to feet)(1/bottom area in feet)

$Time_{drawdown}$ = (1,002 cf) (1 / 3.00 in/hr) (1ft/12 in.) (1 / 779 sf)

= 5.15 hours

APPENDIX D

Pre-Development HydroCAD Printouts

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: RUNOFF TO EXIST CB Runoff Area=51,345 sf 0.00% Impervious Runoff Depth=0.67"
Flow Length=415' Tc=6.7 min CN=61 Runoff=0.68 cfs 2,846 cf

Subcatchment 2S: RUNOFF TO EXIST CB Runoff Area=12,454 sf 0.00% Impervious Runoff Depth=0.67"
Flow Length=180' Tc=5.4 min CN=61 Runoff=0.17 cfs 690 cf

Subcatchment 100S: RUNOFF TO CB3 Runoff Area=15,623 sf 92.95% Impervious Runoff Depth=3.14"
Flow Length=100' Tc=2.2 min CN=95 Runoff=1.42 cfs 4,082 cf

Subcatchment 200S: RUNOFF TO LOT 3 Runoff Area=34,976 sf 20.22% Impervious Runoff Depth=0.86"
Flow Length=183' Tc=3.2 min CN=65 Runoff=0.77 cfs 2,504 cf

Subcatchment 300S: RUNOFF TO CB8 Runoff Area=10,218 sf 64.84% Impervious Runoff Depth=2.19"
Flow Length=160' Tc=3.2 min CN=85 Runoff=0.67 cfs 1,866 cf

Subcatchment 301S: RUNOFF TO CB9 Runoff Area=3,956 sf 67.62% Impervious Runoff Depth=2.19"
Flow Length=126' Tc=1.8 min CN=85 Runoff=0.27 cfs 722 cf

Subcatchment 302S: RUNOFF TO CB6 Runoff Area=11,791 sf 86.68% Impervious Runoff Depth=2.93"
Flow Length=122' Slope=0.0100 '/' Tc=2.6 min CN=93 Runoff=1.01 cfs 2,877 cf

Subcatchment 303S: RUNOFF TO CB 5A Runoff Area=3,507 sf 92.02% Impervious Runoff Depth=3.14"
Flow Length=105' Tc=0.8 min CN=95 Runoff=0.33 cfs 916 cf

Subcatchment 304S: RUNOFF TO CB5 Runoff Area=12,564 sf 93.01% Impervious Runoff Depth=3.14"
Flow Length=336' Tc=3.2 min CN=95 Runoff=1.10 cfs 3,283 cf

Subcatchment 305S: RUNOFF TO CB12 Runoff Area=8,890 sf 80.99% Impervious Runoff Depth=2.73"
Flow Length=109' Tc=1.0 min CN=91 Runoff=0.76 cfs 2,023 cf

Subcatchment 400S: RUNOFF TO HOTEL Runoff Area=17,525 sf 96.44% Impervious Runoff Depth=3.35"
Flow Length=168' Tc=3.4 min CN=97 Runoff=1.57 cfs 4,897 cf

Pond 12: EXIST. CB12 (STORMCEPTOR) Peak Elev=44.14' Inflow=0.76 cfs 2,023 cf
12.0" Round Culvert n=0.013 L=16.0' S=0.0231 '/' Outflow=0.76 cfs 2,023 cf

Pond DP3: EXIST CB-D (DESIGN POINT #3) Inflow=3.86 cfs 13,456 cf
Primary=3.86 cfs 13,456 cf

Pond EX. CB3A: EX. CB-3A - DESIGN POINT #1 Peak Elev=42.56' Inflow=1.42 cfs 4,082 cf
12.0" Round Culvert n=0.013 L=46.0' S=0.0057 '/' Outflow=1.42 cfs 4,082 cf

Pond EX. CB5: EX. CB-5 Peak Elev=42.71' Inflow=1.10 cfs 3,538 cf
12.0" Round Culvert n=0.013 L=170.0' S=0.0025 '/' Outflow=1.10 cfs 3,538 cf

Pond EX. CB5A: EX. CB-5A Peak Elev=42.20' Inflow=1.38 cfs 4,454 cf
12.0" Round Culvert n=0.013 L=98.0' S=-0.0015 '/' Outflow=1.38 cfs 4,454 cf

Pond EX. CB6: EX. CB-6 (STORMCEPTOR) Peak Elev=41.64' Inflow=2.39 cfs 7,331 cf
12.0" Round Culvert n=0.013 L=165.0' S=0.0053 '/' Outflow=2.39 cfs 7,331 cf

Pond EX. CB8: EX. CB-8 Peak Elev=41.84' Inflow=0.67 cfs 1,866 cf
12.0" Round Culvert n=0.013 L=128.0' S=0.0058 '/' Outflow=0.67 cfs 1,866 cf

Pond EX. CB9: EX. CB-9 Peak Elev=40.80' Inflow=0.93 cfs 2,589 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0230 '/' Outflow=0.93 cfs 2,589 cf

Pond EX. DMH4: EXIST. DMH4 Peak Elev=40.63' Inflow=3.43 cfs 10,610 cf
18.0" Round Culvert n=0.013 L=36.0' S=0.0050 '/' Outflow=3.43 cfs 10,610 cf

Pond EX.CB: EXISTING CB Peak Elev=41.64' Inflow=0.17 cfs 690 cf
18.0" Round Culvert n=0.025 L=132.0' S=0.0135 '/' Outflow=0.17 cfs 690 cf

Pond EX.INF2: EXIST. INFILTRATION SYSTEM Peak Elev=44.13' Storage=684 cf Inflow=0.76 cfs 2,023 cf
Discarded=0.04 cfs 1,769 cf Primary=0.15 cfs 255 cf Outflow=0.19 cfs 2,024 cf

Total Runoff Area = 182,849 sf Runoff Volume = 26,708 cf Average Runoff Depth = 1.75"
56.18% Pervious = 102,721 sf 43.82% Impervious = 80,128 sf

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: RUNOFF TO EXIST CB Runoff Area=51,345 sf 0.00% Impervious Runoff Depth=1.75"
Flow Length=415' Tc=6.7 min CN=61 Runoff=2.22 cfs 7,485 cf

Subcatchment 2S: RUNOFF TO EXIST CB Runoff Area=12,454 sf 0.00% Impervious Runoff Depth=1.75"
Flow Length=180' Tc=5.4 min CN=61 Runoff=0.56 cfs 1,815 cf

Subcatchment 100S: RUNOFF TO CB3 Runoff Area=15,623 sf 92.95% Impervious Runoff Depth=5.02"
Flow Length=100' Tc=2.2 min CN=95 Runoff=2.21 cfs 6,541 cf

Subcatchment 200S: RUNOFF TO LOT 3 Runoff Area=34,976 sf 20.22% Impervious Runoff Depth=2.07"
Flow Length=183' Tc=3.2 min CN=65 Runoff=2.10 cfs 6,039 cf

Subcatchment 300S: RUNOFF TO CB8 Runoff Area=10,218 sf 64.84% Impervious Runoff Depth=3.94"
Flow Length=160' Tc=3.2 min CN=85 Runoff=1.18 cfs 3,351 cf

Subcatchment 301S: RUNOFF TO CB9 Runoff Area=3,956 sf 67.62% Impervious Runoff Depth=3.94"
Flow Length=126' Tc=1.8 min CN=85 Runoff=0.48 cfs 1,298 cf

Subcatchment 302S: RUNOFF TO CB6 Runoff Area=11,791 sf 86.68% Impervious Runoff Depth=4.80"
Flow Length=122' Slope=0.0100 '/' Tc=2.6 min CN=93 Runoff=1.60 cfs 4,714 cf

Subcatchment 303S: RUNOFF TO CB 5A Runoff Area=3,507 sf 92.02% Impervious Runoff Depth=5.02"
Flow Length=105' Tc=0.8 min CN=95 Runoff=0.52 cfs 1,468 cf

Subcatchment 304S: RUNOFF TO CB5 Runoff Area=12,564 sf 93.01% Impervious Runoff Depth=5.02"
Flow Length=336' Tc=3.2 min CN=95 Runoff=1.71 cfs 5,260 cf

Subcatchment 305S: RUNOFF TO CB12 Runoff Area=8,890 sf 80.99% Impervious Runoff Depth=4.58"
Flow Length=109' Tc=1.0 min CN=91 Runoff=1.24 cfs 3,390 cf

Subcatchment 400S: RUNOFF TO HOTEL Runoff Area=17,525 sf 96.44% Impervious Runoff Depth=5.26"
Flow Length=168' Tc=3.4 min CN=97 Runoff=2.41 cfs 7,675 cf

Pond 12: EXIST. CB12 (STORMCEPTOR) Peak Elev=45.06' Inflow=1.24 cfs 3,390 cf
12.0" Round Culvert n=0.013 L=16.0' S=0.0231 '/' Outflow=1.24 cfs 3,390 cf

Pond DP3: EXIST CB-D (DESIGN POINT #3) Inflow=9.80 cfs 26,537 cf
Primary=9.80 cfs 26,537 cf

Pond EX. CB3A: EX. CB-3A - DESIGN POINT #1 Peak Elev=42.81' Inflow=2.21 cfs 6,541 cf
12.0" Round Culvert n=0.013 L=46.0' S=0.0057 '/' Outflow=2.21 cfs 6,541 cf

Pond EX. CB5: EX. CB-5 Peak Elev=47.39' Inflow=4.34 cfs 6,406 cf
12.0" Round Culvert n=0.013 L=170.0' S=0.0025 '/' Outflow=4.34 cfs 6,406 cf

Pond EX. CB5A: EX. CB-5A Peak Elev=47.03' Inflow=4.56 cfs 7,874 cf
12.0" Round Culvert n=0.013 L=98.0' S=-0.0015 '/' Outflow=4.56 cfs 7,874 cf

Pond EX. CB6: EX. CB-6 (STORMCEPTOR) Peak Elev=46.56' Inflow=5.74 cfs 12,588 cf
12.0" Round Culvert n=0.013 L=165.0' S=0.0053 '/' Outflow=5.74 cfs 12,588 cf

Pond EX. CB8: EX. CB-8 Peak Elev=42.08' Inflow=1.18 cfs 3,351 cf
12.0" Round Culvert n=0.013 L=128.0' S=0.0058 '/' Outflow=1.18 cfs 3,351 cf

Pond EX. CB9: EX. CB-9 Peak Elev=41.60' Inflow=1.64 cfs 4,649 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0230 '/' Outflow=1.64 cfs 4,649 cf

Pond EX. DMH4: EXIST. DMH4 Peak Elev=41.46' Inflow=7.80 cfs 19,053 cf
18.0" Round Culvert n=0.013 L=36.0' S=0.0050 '/' Outflow=7.80 cfs 19,053 cf

Pond EX.CB: EXISTING CB Peak Elev=41.95' Inflow=0.56 cfs 1,815 cf
18.0" Round Culvert n=0.025 L=132.0' S=0.0135 '/' Outflow=0.56 cfs 1,815 cf

Pond EX.INF2: EXIST. INFILTRATION SYSTEM Peak Elev=45.04' Storage=931 cf Inflow=1.24 cfs 3,390 cf
Discarded=0.04 cfs 2,245 cf Primary=3.13 cfs 1,145 cf Outflow=3.18 cfs 3,390 cf

Total Runoff Area = 182,849 sf Runoff Volume = 49,037 cf Average Runoff Depth = 3.22"
56.18% Pervious = 102,721 sf 43.82% Impervious = 80,128 sf

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: RUNOFF TO EXIST CB Runoff Area=51,345 sf 0.00% Impervious Runoff Depth=2.79"
Flow Length=415' Tc=6.7 min CN=61 Runoff=3.68 cfs 11,933 cf

Subcatchment 2S: RUNOFF TO EXIST CB Runoff Area=12,454 sf 0.00% Impervious Runoff Depth=2.79"
Flow Length=180' Tc=5.4 min CN=61 Runoff=0.93 cfs 2,894 cf

Subcatchment 100S: RUNOFF TO CB3 Runoff Area=15,623 sf 92.95% Impervious Runoff Depth=6.53"
Flow Length=100' Tc=2.2 min CN=95 Runoff=2.83 cfs 8,495 cf

Subcatchment 200S: RUNOFF TO LOT 3 Runoff Area=34,976 sf 20.22% Impervious Runoff Depth=3.20"
Flow Length=183' Tc=3.2 min CN=65 Runoff=3.30 cfs 9,314 cf

Subcatchment 300S: RUNOFF TO CB8 Runoff Area=10,218 sf 64.84% Impervious Runoff Depth=5.37"
Flow Length=160' Tc=3.2 min CN=85 Runoff=1.59 cfs 4,570 cf

Subcatchment 301S: RUNOFF TO CB9 Runoff Area=3,956 sf 67.62% Impervious Runoff Depth=5.37"
Flow Length=126' Tc=1.8 min CN=85 Runoff=0.65 cfs 1,769 cf

Subcatchment 302S: RUNOFF TO CB6 Runoff Area=11,791 sf 86.68% Impervious Runoff Depth=6.29"
Flow Length=122' Slope=0.0100 '/' Tc=2.6 min CN=93 Runoff=2.07 cfs 6,181 cf

Subcatchment 303S: RUNOFF TO CB 5A Runoff Area=3,507 sf 92.02% Impervious Runoff Depth=6.53"
Flow Length=105' Tc=0.8 min CN=95 Runoff=0.67 cfs 1,907 cf

Subcatchment 304S: RUNOFF TO CB5 Runoff Area=12,564 sf 93.01% Impervious Runoff Depth=6.53"
Flow Length=336' Tc=3.2 min CN=95 Runoff=2.19 cfs 6,832 cf

Subcatchment 305S: RUNOFF TO CB12 Runoff Area=8,890 sf 80.99% Impervious Runoff Depth=6.06"
Flow Length=109' Tc=1.0 min CN=91 Runoff=1.62 cfs 4,487 cf

Subcatchment 400S: RUNOFF TO HOTEL Runoff Area=17,525 sf 96.44% Impervious Runoff Depth=6.76"
Flow Length=168' Tc=3.4 min CN=97 Runoff=3.07 cfs 9,875 cf

Pond 12: EXIST. CB12 (STORMCEPTOR) Peak Elev=54.99' Inflow=1.62 cfs 4,487 cf
12.0" Round Culvert n=0.013 L=16.0' S=0.0231 '/' Outflow=1.62 cfs 4,487 cf

Pond DP3: EXIST CB-D (DESIGN POINT #3) Inflow=13.05 cfs 38,038 cf
Primary=13.05 cfs 38,038 cf

Pond EX. CB3A: EX. CB-3A - DESIGN POINT #1 Peak Elev=43.07' Inflow=2.83 cfs 8,495 cf
12.0" Round Culvert n=0.013 L=46.0' S=0.0057 '/' Outflow=2.83 cfs 8,495 cf

Pond EX. CB5: EX. CB-5 Peak Elev=54.90' Inflow=4.81 cfs 8,784 cf
12.0" Round Culvert n=0.013 L=170.0' S=0.0025 '/' Outflow=4.81 cfs 8,784 cf

Pond EX. CB5A: EX. CB-5A Peak Elev=51.46' Inflow=5.24 cfs 10,691 cf
12.0" Round Culvert n=0.013 L=98.0' S=-0.0015 '/' Outflow=5.24 cfs 10,691 cf

Pond EX. CB6: EX. CB-6 (STORMCEPTOR) Peak Elev=50.32' Inflow=7.30 cfs 16,871 cf
12.0" Round Culvert n=0.013 L=165.0' S=0.0053 '/' Outflow=7.30 cfs 16,871 cf

Pond EX. CB8: EX. CB-8 Peak Elev=42.67' Inflow=1.59 cfs 4,570 cf
12.0" Round Culvert n=0.013 L=128.0' S=0.0058 '/' Outflow=1.59 cfs 4,570 cf

Pond EX. CB9: EX. CB-9 Peak Elev=42.36' Inflow=2.20 cfs 6,340 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0230 '/' Outflow=2.20 cfs 6,340 cf

Pond EX. DMH4: EXIST. DMH4 Peak Elev=42.01' Inflow=10.18 cfs 26,105 cf
18.0" Round Culvert n=0.013 L=36.0' S=0.0050 '/' Outflow=10.18 cfs 26,105 cf

Pond EX.CB: EXISTING CB Peak Elev=42.25' Inflow=0.93 cfs 2,894 cf
18.0" Round Culvert n=0.025 L=132.0' S=0.0135 '/' Outflow=0.93 cfs 2,894 cf

Pond EX.INF2: EXIST. INFILTRATION Peak Elev=54.90' Storage=1,000 cf Inflow=1.62 cfs 4,487 cf
Discarded=0.05 cfs 2,535 cf Primary=3.73 cfs 1,952 cf Outflow=3.78 cfs 4,487 cf

Total Runoff Area = 182,849 sf Runoff Volume = 68,258 cf Average Runoff Depth = 4.48"
56.18% Pervious = 102,721 sf 43.82% Impervious = 80,128 sf

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: RUNOFF TO EXIST CB Runoff Area=51,345 sf 0.00% Impervious Runoff Depth=3.85"
Flow Length=415' Tc=6.7 min CN=61 Runoff=5.15 cfs 16,455 cf

Subcatchment 2S: RUNOFF TO EXIST CB Runoff Area=12,454 sf 0.00% Impervious Runoff Depth=3.85"
Flow Length=180' Tc=5.4 min CN=61 Runoff=1.31 cfs 3,991 cf

Subcatchment 100S: RUNOFF TO CB3 Runoff Area=15,623 sf 92.95% Impervious Runoff Depth=7.92"
Flow Length=100' Tc=2.2 min CN=95 Runoff=3.40 cfs 10,310 cf

Subcatchment 200S: RUNOFF TO LOT 3 Runoff Area=34,976 sf 20.22% Impervious Runoff Depth=4.32"
Flow Length=183' Tc=3.2 min CN=65 Runoff=4.50 cfs 12,588 cf

Subcatchment 300S: RUNOFF TO CB8 Runoff Area=10,218 sf 64.84% Impervious Runoff Depth=6.72"
Flow Length=160' Tc=3.2 min CN=85 Runoff=1.96 cfs 5,719 cf

Subcatchment 301S: RUNOFF TO CB9 Runoff Area=3,956 sf 67.62% Impervious Runoff Depth=6.72"
Flow Length=126' Tc=1.8 min CN=85 Runoff=0.80 cfs 2,214 cf

Subcatchment 302S: RUNOFF TO CB6 Runoff Area=11,791 sf 86.68% Impervious Runoff Depth=7.68"
Flow Length=122' Slope=0.0100 '/' Tc=2.6 min CN=93 Runoff=2.50 cfs 7,545 cf

Subcatchment 303S: RUNOFF TO CB 5A Runoff Area=3,507 sf 92.02% Impervious Runoff Depth=7.92"
Flow Length=105' Tc=0.8 min CN=95 Runoff=0.80 cfs 2,314 cf

Subcatchment 304S: RUNOFF TO CB5 Runoff Area=12,564 sf 93.01% Impervious Runoff Depth=7.92"
Flow Length=336' Tc=3.2 min CN=95 Runoff=2.64 cfs 8,292 cf

Subcatchment 305S: RUNOFF TO CB12 Runoff Area=8,890 sf 80.99% Impervious Runoff Depth=7.44"
Flow Length=109' Tc=1.0 min CN=91 Runoff=1.96 cfs 5,510 cf

Subcatchment 400S: RUNOFF TO HOTEL Runoff Area=17,525 sf 96.44% Impervious Runoff Depth=8.16"
Flow Length=168' Tc=3.4 min CN=97 Runoff=3.68 cfs 11,917 cf

Pond 12: EXIST. CB12 (STORMCEPTOR) Peak Elev=60.70' Inflow=1.96 cfs 5,510 cf
12.0" Round Culvert n=0.013 L=16.0' S=0.0231 '/' Outflow=1.96 cfs 5,510 cf

Pond DP3: EXIST CB-D (DESIGN POINT #3) Inflow=16.28 cfs 49,277 cf
Primary=16.28 cfs 49,277 cf

Pond EX. CB3A: EX. CB-3A - DESIGN POINT #1 Peak Elev=43.42' Inflow=3.40 cfs 10,310 cf
12.0" Round Culvert n=0.013 L=46.0' S=0.0057 '/' Outflow=3.40 cfs 10,310 cf

Pond EX. CB5: EX. CB-5 Peak Elev=60.52' Inflow=5.25 cfs 11,038 cf
12.0" Round Culvert n=0.013 L=170.0' S=0.0025 '/' Outflow=5.25 cfs 11,038 cf

Pond EX. CB5A: EX. CB-5A Peak Elev=55.76' Inflow=6.03 cfs 13,353 cf
12.0" Round Culvert n=0.013 L=98.0' S=-0.0015 '/' Outflow=6.03 cfs 13,353 cf

Pond EX. CB6: EX. CB-6 (STORMCEPTOR) Peak Elev=54.03' Inflow=8.44 cfs 20,898 cf
12.0" Round Culvert n=0.013 L=165.0' S=0.0053 '/' Outflow=8.44 cfs 20,898 cf

Pond EX. CB8: EX. CB-8 Peak Elev=43.54' Inflow=1.96 cfs 5,719 cf
12.0" Round Culvert n=0.013 L=128.0' S=0.0058 '/' Outflow=1.96 cfs 5,719 cf

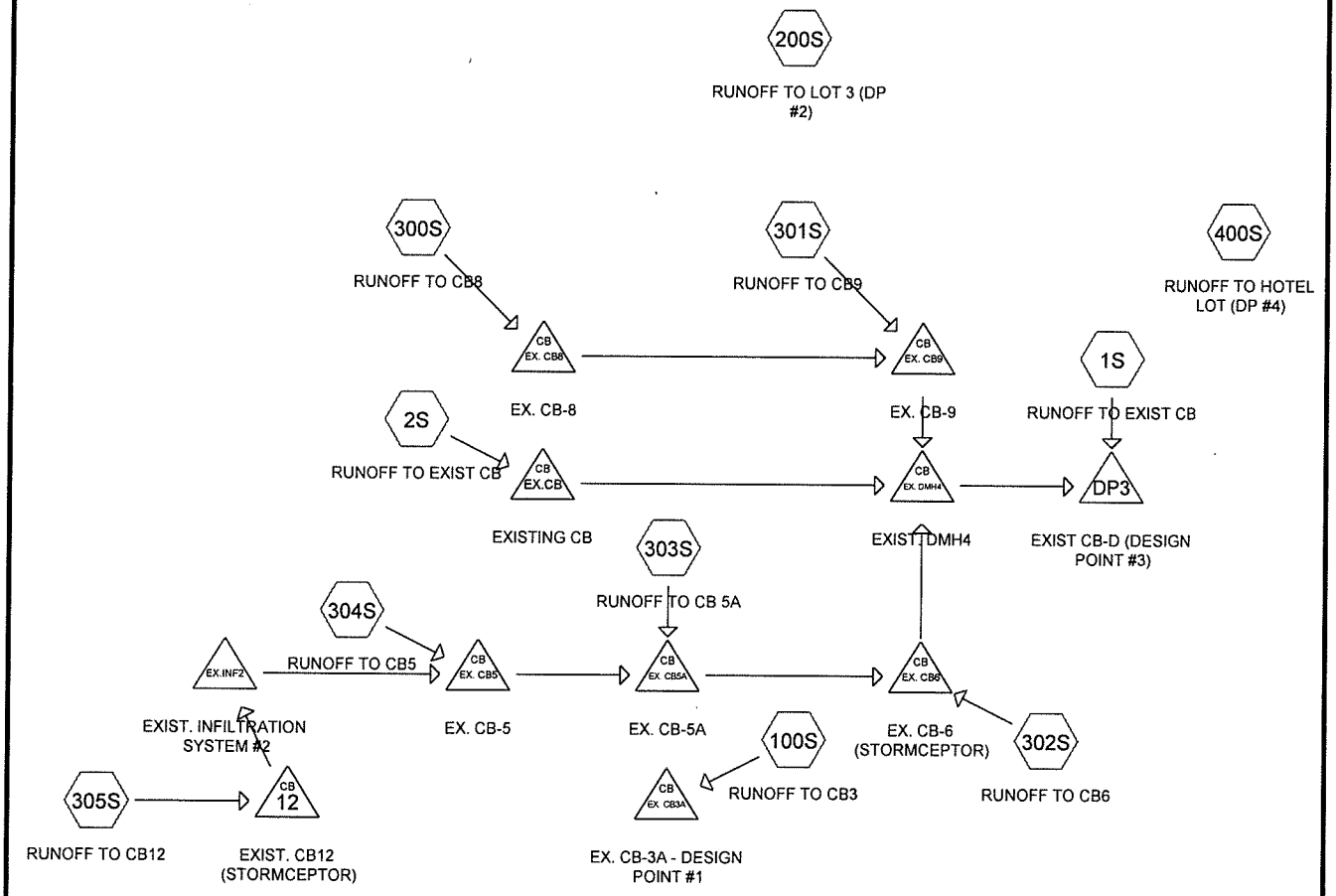
Pond EX. CB9: EX. CB-9 Peak Elev=43.02' Inflow=2.72 cfs 7,933 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0230 '/' Outflow=2.72 cfs 7,933 cf

Pond EX. DMH4: EXIST. DMH4 Peak Elev=42.52' Inflow=12.27 cfs 32,822 cf
18.0" Round Culvert n=0.013 L=36.0' S=0.0050 '/' Outflow=12.27 cfs 32,822 cf

Pond EX.CB: EXISTING CB Peak Elev=42.66' Inflow=1.31 cfs 3,991 cf
18.0" Round Culvert n=0.025 L=132.0' S=0.0135 '/' Outflow=1.31 cfs 3,991 cf

Pond EX.INF2: EXIST. INFILTRATION Peak Elev=60.55' Storage=1,000 cf Inflow=1.96 cfs 5,510 cf
Discarded=0.06 cfs 2,764 cf Primary=3.72 cfs 2,747 cf Outflow=3.76 cfs 5,511 cf

Total Runoff Area = 182,849 sf Runoff Volume = 86,856 cf Average Runoff Depth = 5.70"
56.18% Pervious = 102,721 sf 43.82% Impervious = 80,128 sf



Subcat Reach Pond Link

Routing Diagram for 4582-Predrain

Prepared by Greenman-Pedersen, Inc., Printed 1/21/2020

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
80,830	61	>75% Grass cover, Good, HSG B (1S, 2S, 100S, 200S, 300S, 301S, 302S, 303S, 304S, 305S, 400S)
77,698	98	Paved parking, HSG B (100S, 200S, 300S, 301S, 302S, 303S, 304S, 305S, 400S)
2,430	98	Roofs, HSG B (200S)
21,891	55	Woods, Good, HSG B (200S, 300S, 301S, 400S)
182,849	**76**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
182,849	HSG B	1S, 2S, 100S, 200S, 300S, 301S, 302S, 303S, 304S, 305S, 400S
0	HSG C	
0	HSG D	
0	Other	
182,849		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
0	80,830	0	0	0	80,830	>75% Grass cover, Good
0	77,698	0	0	0	77,698	Paved parking
0	2,430	0	0	0	2,430	Roofs
0	21,891	0	0	0	21,891	Woods, Good
0	**182,849**	**0**	**0**	**0**	**182,849**	**TOTAL AREA**

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	12	43.09	42.72	16.0	0.0231	0.013	12.0	0.0	0.0
2	EX. CB3A	41.82	41.56	46.0	0.0057	0.013	12.0	0.0	0.0
3	EX. CB5	41.93	41.50	170.0	0.0025	0.013	12.0	0.0	0.0
4	EX. CB5A	41.15	41.30	98.0	-0.0015	0.013	12.0	0.0	0.0
5	EX. CB6	40.55	39.68	165.0	0.0053	0.013	12.0	0.0	0.0
6	EX. CB8	41.38	40.64	128.0	0.0058	0.013	12.0	0.0	0.0
7	EX. CB9	40.09	39.40	30.0	0.0230	0.013	12.0	0.0	0.0
8	EX. DMH4	39.58	39.40	36.0	0.0050	0.013	18.0	0.0	0.0
9	EX.CB	41.38	39.60	132.0	0.0135	0.025	18.0	0.0	0.0
10	EX.INF2	42.50	42.34	32.0	0.0050	0.013	12.0	0.0	0.0

Notes Listing (all nodes)

Line#	Node Number	Notes
1	Project	Rainfall events imported from "4582-Postdrain.hcp"
2	EX.INF2	The soils present in the area of the infiltration system consist of Urban Land (NRCS classification 699). Due to the limited information provided for this soil type, 140C Chatfield-Hollis-Canton Complex was used as the closest soil present within the site.
3		The bottom of the stone in the infiltration system is approximately 6' below existing grade. Per USDA Soil Data Mart, the lowest value for the Saturated Ksat Value for this soil at a depth of 21-60"' +/- is 42.33 micrometers/second.
4		Per NHDES Stormwater Manual: Vol. 2, pages 16-17 using a factor of safety of 2, the infiltration rate for this system is as follows:
5		42.33/2 (FS) = 21.17 micro/sec.
6		Converting to inches/hr with a conversion factor of 0.1417 = (21.17 * 0.1417 = 3.00 in/hr)

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: RUNOFF TO EXIST CB Runoff Area=51,345 sf 0.00% Impervious Runoff Depth=2.79"
Flow Length=415' Tc=6.7 min CN=61 Runoff=3.68 cfs 11,933 cf

Subcatchment 2S: RUNOFF TO EXIST CB Runoff Area=12,454 sf 0.00% Impervious Runoff Depth=2.79"
Flow Length=180' Tc=5.4 min CN=61 Runoff=0.93 cfs 2,894 cf

Subcatchment 100S: RUNOFF TO CB3 Runoff Area=15,623 sf 92.95% Impervious Runoff Depth=6.53"
Flow Length=100' Tc=2.2 min CN=95 Runoff=2.83 cfs 8,495 cf

Subcatchment 200S: RUNOFF TO LOT 3 Runoff Area=34,976 sf 20.22% Impervious Runoff Depth=3.20"
Flow Length=183' Tc=3.2 min CN=65 Runoff=3.30 cfs 9,314 cf

Subcatchment 300S: RUNOFF TO CB8 Runoff Area=10,218 sf 64.84% Impervious Runoff Depth=5.37"
Flow Length=160' Tc=3.2 min CN=85 Runoff=1.59 cfs 4,570 cf

Subcatchment 301S: RUNOFF TO CB9 Runoff Area=3,956 sf 67.62% Impervious Runoff Depth=5.37"
Flow Length=126' Tc=1.8 min CN=85 Runoff=0.65 cfs 1,769 cf

Subcatchment 302S: RUNOFF TO CB6 Runoff Area=11,791 sf 86.68% Impervious Runoff Depth=6.29"
Flow Length=122' Slope=0.0100 '/' Tc=2.6 min CN=93 Runoff=2.07 cfs 6,181 cf

Subcatchment 303S: RUNOFF TO CB 5A Runoff Area=3,507 sf 92.02% Impervious Runoff Depth=6.53"
Flow Length=105' Tc=0.8 min CN=95 Runoff=0.67 cfs 1,907 cf

Subcatchment 304S: RUNOFF TO CB5 Runoff Area=12,564 sf 93.01% Impervious Runoff Depth=6.53"
Flow Length=336' Tc=3.2 min CN=95 Runoff=2.19 cfs 6,832 cf

Subcatchment 305S: RUNOFF TO CB12 Runoff Area=8,890 sf 80.99% Impervious Runoff Depth=6.06"
Flow Length=109' Tc=1.0 min CN=91 Runoff=1.62 cfs 4,487 cf

Subcatchment 400S: RUNOFF TO HOTEL Runoff Area=17,525 sf 96.44% Impervious Runoff Depth=6.76"
Flow Length=168' Tc=3.4 min CN=97 Runoff=3.07 cfs 9,875 cf

Pond 12: EXIST. CB12 (STORMCEPTOR) Peak Elev=54.99' Inflow=1.62 cfs 4,487 cf
12.0" Round Culvert n=0.013 L=16.0' S=0.0231 '/' Outflow=1.62 cfs 4,487 cf

Pond DP3: EXIST CB-D (DESIGN POINT #3) Inflow=13.05 cfs 38,038 cf
Primary=13.05 cfs 38,038 cf

Pond EX. CB3A: EX. CB-3A - DESIGN POINT #1 Peak Elev=43.07' Inflow=2.83 cfs 8,495 cf
12.0" Round Culvert n=0.013 L=46.0' S=0.0057 '/' Outflow=2.83 cfs 8,495 cf

Pond EX. CB5: EX. CB-5 Peak Elev=54.90' Inflow=4.81 cfs 8,784 cf
12.0" Round Culvert n=0.013 L=170.0' S=0.0025 '/' Outflow=4.81 cfs 8,784 cf

Pond EX. CB5A: EX. CB-5A Peak Elev=51.46' Inflow=5.24 cfs 10,691 cf
12.0" Round Culvert n=0.013 L=98.0' S=-0.0015 '/' Outflow=5.24 cfs 10,691 cf

Pond EX. CB6: EX. CB-6 (STORMCEPTOR) Peak Elev=50.32' Inflow=7.30 cfs 16,871 cf
12.0" Round Culvert n=0.013 L=165.0' S=0.0053 '/' Outflow=7.30 cfs 16,871 cf

Pond EX. CB8: EX. CB-8 Peak Elev=42.67' Inflow=1.59 cfs 4,570 cf
12.0" Round Culvert n=0.013 L=128.0' S=0.0058 '/' Outflow=1.59 cfs 4,570 cf

Pond EX. CB9: EX. CB-9 Peak Elev=42.36' Inflow=2.20 cfs 6,340 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0230 '/' Outflow=2.20 cfs 6,340 cf

Pond EX. DMH4: EXIST. DMH4 Peak Elev=42.01' Inflow=10.18 cfs 26,105 cf
18.0" Round Culvert n=0.013 L=36.0' S=0.0050 '/' Outflow=10.18 cfs 26,105 cf

Pond EX.CB: EXISTING CB Peak Elev=42.25' Inflow=0.93 cfs 2,894 cf
18.0" Round Culvert n=0.025 L=132.0' S=0.0135 '/' Outflow=0.93 cfs 2,894 cf

Pond EX.INF2: EXIST. INFILTRATION Peak Elev=54.90' Storage=1,000 cf Inflow=1.62 cfs 4,487 cf
Discarded=0.05 cfs 2,535 cf Primary=3.73 cfs 1,952 cf Outflow=3.78 cfs 4,487 cf

Total Runoff Area = 182,849 sf Runoff Volume = 68,258 cf Average Runoff Depth = 4.48"
56.18% Pervious = 102,721 sf 43.82% Impervious = 80,128 sf

Summary for Subcatchment 1S: RUNOFF TO EXIST CB

Runoff = 3.68 cfs @ 12.10 hrs, Volume= 11,933 cf, Depth= 2.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
51,345	61	>75% Grass cover, Good, HSG B
51,345		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	25	0.0400	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
4.3	390	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.7	415	Total			

Summary for Subcatchment 2S: RUNOFF TO EXIST CB

Runoff = 0.93 cfs @ 12.08 hrs, Volume= 2,894 cf, Depth= 2.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
12,454	61	>75% Grass cover, Good, HSG B
12,454		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	25	0.0100	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
1.1	155	0.0250	2.37		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
5.4	180	Total			

Summary for Subcatchment 100S: RUNOFF TO CB3

Runoff = 2.83 cfs @ 12.03 hrs, Volume= 8,495 cf, Depth= 6.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
1,102	61	>75% Grass cover, Good, HSG B
14,521	98	Paved parking, HSG B
15,623	95	Weighted Average
1,102		7.05% Pervious Area
14,521		92.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	10	0.0200	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
0.7	90	0.0120	2.22		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.2	100	Total			

Summary for Subcatchment 200S: RUNOFF TO LOT 3 (DP #2)

Runoff = 3.30 cfs @ 12.05 hrs, Volume= 9,314 cf, Depth= 3.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
20,275	55	Woods, Good, HSG B
4,643	98	Paved parking, HSG B
7,628	61	>75% Grass cover, Good, HSG B
2,430	98	Roofs, HSG B
34,976	65	Weighted Average
27,903		79.78% Pervious Area
7,073		20.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	25	0.0500	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
0.3	30	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.7	128	0.0250	3.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.2	183	Total			

Summary for Subcatchment 300S: RUNOFF TO CB8

Runoff = 1.59 cfs @ 12.05 hrs, Volume= 4,570 cf, Depth= 5.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
2,960	61	>75% Grass cover, Good, HSG B
633	55	Woods, Good, HSG B
6,625	98	Paved parking, HSG B
10,218	85	Weighted Average
3,593		35.16% Pervious Area
6,625		64.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	35	0.1000	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
1.0	125	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.2	160	Total			

Summary for Subcatchment 301S: RUNOFF TO CB9

Runoff = 0.65 cfs @ 12.03 hrs, Volume= 1,769 cf, Depth= 5.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
492	61	>75% Grass cover, Good, HSG B
789	55	Woods, Good, HSG B
2,675	98	Paved parking, HSG B
3,956	85	Weighted Average
1,281		32.38% Pervious Area
2,675		67.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	10	0.0500	0.17		**Sheet Flow,** Range n= 0.130 P2= 3.22"
0.1	6	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.7	110	0.0170	2.65		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.8	126	Total			

Summary for Subcatchment 302S: RUNOFF TO CB6

Runoff = 2.07 cfs @ 12.04 hrs, Volume= 6,181 cf, Depth= 6.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
1,571	61	>75% Grass cover, Good, HSG B
10,220	98	Paved parking, HSG B
11,791	93	Weighted Average
1,571		13.32% Pervious Area
10,220		86.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	8	0.0100	0.08		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
0.9	114	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.6	122	Total			

Summary for Subcatchment 303S: RUNOFF TO CB 5A

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.67 cfs @ 12.01 hrs, Volume= 1,907 cf, Depth= 6.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
280	61	>75% Grass cover, Good, HSG B
3,227	98	Paved parking, HSG B
3,507	95	Weighted Average
280		7.98% Pervious Area
3,227		92.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0200	0.87		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
0.6	95	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	105	Total			

Summary for Subcatchment 304S: RUNOFF TO CB5

Runoff = 2.19 cfs @ 12.05 hrs, Volume= 6,832 cf, Depth= 6.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
878	61	>75% Grass cover, Good, HSG B
11,686	98	Paved parking, HSG B
12,564	95	Weighted Average
878		6.99% Pervious Area
11,686		93.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	16	0.0200	0.96		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
2.9	320	0.0080	1.82		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.2	336	Total			

Summary for Subcatchment 305S: RUNOFF TO CB12

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.62 cfs @ 12.01 hrs, Volume= 4,487 cf, Depth= 6.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
1,690	61	>75% Grass cover, Good, HSG B
7,200	98	Paved parking, HSG B
8,890	91	Weighted Average
1,690		19.01% Pervious Area
7,200		80.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0200	0.87		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
0.1	11	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.7	88	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.0	109	Total			

Summary for Subcatchment 400S: RUNOFF TO HOTEL LOT (DP #4)

Runoff = 3.07 cfs @ 12.05 hrs, Volume= 9,875 cf, Depth= 6.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
194	55	Woods, Good, HSG B
16,901	98	Paved parking, HSG B
430	61	>75% Grass cover, Good, HSG B
17,525	97	Weighted Average
624		3.56% Pervious Area
16,901		96.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	10	0.0500	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.22"
0.3	30	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.7	128	0.0250	3.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.4	168	Total			

Summary for Pond 12: EXIST. CB12 (STORMCEPTOR)

[58] Hint: Peaked 9.05' above defined flood level

Inflow Area = 8,890 sf, 80.99% Impervious, Inflow Depth = 6.06" for 25-Year event
Inflow = 1.62 cfs @ 12.01 hrs, Volume= 4,487 cf
Outflow = 1.62 cfs @ 12.01 hrs, Volume= 4,487 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.62 cfs @ 12.01 hrs, Volume= 4,487 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 54.99' @ 12.07 hrs
Flood Elev= 45.94'

Device	Routing	Invert	Outlet Devices
#1	Primary	43.09'	**12.0" Round Culvert** L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 43.09' / 42.72' S= 0.0231 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.01 hrs HW=45.11' TW=45.16' (Dynamic Tailwater)
↑—**1=Culvert** (Controls 0.00 cfs)

Summary for Pond DP3: EXIST CB-D (DESIGN POINT #3)

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

Inflow Area = 114,725 sf, 36.29% Impervious, Inflow Depth = 3.98" for 25-Year event
Inflow = 13.05 cfs @ 12.05 hrs, Volume= 38,038 cf
Primary = 13.05 cfs @ 12.05 hrs, Volume= 38,038 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Pond EX. CB3A: EX. CB-3A - DESIGN POINT #1

Inflow Area = 15,623 sf, 92.95% Impervious, Inflow Depth = 6.53" for 25-Year event
Inflow = 2.83 cfs @ 12.03 hrs, Volume= 8,495 cf
Outflow = 2.83 cfs @ 12.03 hrs, Volume= 8,495 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.83 cfs @ 12.03 hrs, Volume= 8,495 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 43.07' @ 12.03 hrs
Flood Elev= 44.62'

Device	Routing	Invert	Outlet Devices
#1	Primary	41.82'	**12.0" Round Culvert** L= 46.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 41.82' / 41.56' S= 0.0057 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.82 cfs @ 12.03 hrs HW=43.06' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 2.82 cfs @ 3.71 fps)

Summary for Pond EX. CB5: EX. CB-5

[58] Hint: Peaked 7.22' above defined flood level
[80] Warning: Exceeded Pond EX.INF2 by 5.37' @ 12.05 hrs (8.77 cfs 3,014 cf)

Inflow Area = 21,454 sf, 88.03% Impervious, Inflow Depth = 4.91" for 25-Year event
Inflow = 4.81 cfs @ 12.15 hrs, Volume= 8,784 cf
Outflow = 4.81 cfs @ 12.15 hrs, Volume= 8,784 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.81 cfs @ 12.15 hrs, Volume= 8,784 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 54.90' @ 12.05 hrs
Flood Elev= 47.68'

Device	Routing	Invert	Outlet Devices
#1	Primary	41.93'	**12.0" Round Culvert** L= 170.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 41.93' / 41.50' S= 0.0025 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=4.23 cfs @ 12.15 hrs HW=48.17' TW=45.09' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 4.23 cfs @ 5.39 fps)

Summary for Pond EX. CB5A: EX. CB-5A

[58] Hint: Peaked 6.05' above defined flood level
[80] Warning: Exceeded Pond EX. CB5 by 2.27' @ 12.04 hrs (3.63 cfs 469 cf)

Inflow Area = 24,961 sf, 88.59% Impervious, Inflow Depth = 5.14" for 25-Year event
Inflow = 5.24 cfs @ 12.03 hrs, Volume= 10,691 cf
Outflow = 5.24 cfs @ 12.03 hrs, Volume= 10,691 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.24 cfs @ 12.03 hrs, Volume= 10,691 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 51.46' @ 12.04 hrs
Flood Elev= 45.41'

Device	Routing	Invert	Outlet Devices
#1	Primary	41.30'	**12.0" Round Culvert** L= 98.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 41.15' / 41.30' S= -0.0015 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.03 hrs HW=48.19' TW=50.10' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond EX. CB6: EX. CB-6 (STORMCEPTOR)

[58] Hint: Peaked 6.42' above defined flood level
[80] Warning: Exceeded Pond EX. CB5A by 2.27' @ 12.03 hrs (4.44 cfs 583 cf)

Inflow Area = 36,752 sf, 87.98% Impervious, Inflow Depth = 5.51" for 25-Year event
Inflow = 7.30 cfs @ 12.03 hrs, Volume= 16,871 cf
Outflow = 7.30 cfs @ 12.03 hrs, Volume= 16,871 cf, Atten= 0%, Lag= 0.0 min
Primary = 7.30 cfs @ 12.03 hrs, Volume= 16,871 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 50.32' @ 12.03 hrs
Flood Elev= 43.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	40.55'	**12.0" Round Culvert** L= 165.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.55' / 39.68' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=6.93 cfs @ 12.03 hrs HW=50.06' TW=41.99' (Dynamic Tailwater)
1=Culvert (Outlet Controls 6.93 cfs @ 8.82 fps)

Summary for Pond EX. CB8: EX. CB-8

Inflow Area = 10,218 sf, 64.84% Impervious, Inflow Depth = 5.37" for 25-Year event
Inflow = 1.59 cfs @ 12.05 hrs, Volume= 4,570 cf
Outflow = 1.59 cfs @ 12.05 hrs, Volume= 4,570 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.59 cfs @ 12.05 hrs, Volume= 4,570 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Peak Elev= 42.67' @ 12.05 hrs
Flood Elev= 47.08'

Device	Routing	Invert	Outlet Devices
#1	Primary	41.38'	**12.0" Round Culvert** L= 128.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 41.38' / 40.64' S= 0.0058 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.85 cfs @ 12.05 hrs HW=42.54' TW=42.08' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 1.85 cfs @ 2.55 fps)

Summary for Pond EX. CB9: EX. CB-9

[80] Warning: Exceeded Pond EX. CB8 by 0.08' @ 12.04 hrs (0.65 cfs 23 cf)

Inflow Area =	14,174 sf,	65.61% Impervious,	Inflow Depth =	5.37"	for 25-Year event
Inflow =	2.20 cfs @	12.04 hrs, Volume=	6,340 cf		
Outflow =	2.20 cfs @	12.04 hrs, Volume=	6,340 cf,	Atten= 0%,	Lag= 0.0 min
Primary =	2.20 cfs @	12.04 hrs, Volume=	6,340 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 42.36' @ 12.04 hrs
Flood Elev= 45.09'

Device	Routing	Invert	Outlet Devices
#1	Primary	40.09'	**12.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.09' / 39.40' S= 0.0230 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.11 cfs @ 12.04 hrs HW=42.32' TW=41.65' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 3.11 cfs @ 3.96 fps)

Summary for Pond EX. DMH4: EXIST. DMH4

[80] Warning: Exceeded Pond EX. CB9 by 0.52' @ 12.15 hrs (2.72 cfs 452 cf)
[80] Warning: Exceeded Pond EX.CB by 0.03' @ 12.03 hrs (0.16 cfs 6 cf)

Inflow Area =	63,380 sf,	65.69% Impervious,	Inflow Depth =	4.94"	for 25-Year event
Inflow =	10.18 cfs @	12.03 hrs, Volume=	26,105 cf		
Outflow =	10.18 cfs @	12.03 hrs, Volume=	26,105 cf,	Atten= 0%,	Lag= 0.0 min
Primary =	10.18 cfs @	12.03 hrs, Volume=	26,105 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 42.01' @ 12.03 hrs
Flood Elev= 44.76'

Device	Routing	Invert	Outlet Devices
#1	Primary	39.58'	**18.0" Round Culvert** L= 36.0' RCP, sq.cut end projecting, Ke= 0.500

Inlet / Outlet Invert= 39.58' / 39.40' S= 0.0050 '/' Cc= 0.900
n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf

Primary OutFlow Max=10.18 cfs @ 12.03 hrs HW=42.01' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 10.18 cfs @ 5.76 fps)

Summary for Pond EX.CB: EXISTING CB

Inflow Area =	12,454 sf,	0.00% Impervious,	Inflow Depth =	2.79"	for 25-Year event
Inflow =	0.93 cfs @	12.08 hrs, Volume=	2,894 cf		
Outflow =	0.93 cfs @	12.08 hrs, Volume=	2,894 cf,	Atten= 0%,	Lag= 0.0 min
Primary =	0.93 cfs @	12.08 hrs, Volume=	2,894 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 42.25' @ 12.06 hrs
Flood Elev= 44.89'

Device	Routing	Invert	Outlet Devices
#1	Primary	41.38'	**18.0" Round Culvert**
			L= 132.0' CMP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 41.38' / 39.60' S= 0.0135 '/' Cc= 0.900
			n= 0.025 Corrugated metal, Flow Area= 1.77 sf

Primary OutFlow Max=1.10 cfs @ 12.08 hrs HW=42.12' TW=41.43' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 1.10 cfs @ 1.83 fps)

Summary for Pond EX.INF2: EXIST. INFILTRATION SYSTEM #2

The soils present in the area of the infiltration system consist of Urban Land (NRCS classification 699). Due to the limited information provided for this soil type, 140C Chatfield-Hollis-Canton Complex was used as the closest soil present within the site.

The bottom of the stone in the infiltration system is approximately 6' below existing grade. Per USDA Soil Data Mart, the lowest value for the Saturated Ksat Value for this soil at a depth of 21-60"' +/- is 42.33 micrometers/second.

Per NHDES Stormwater Manual: Vol. 2, pages 16-17 using a factor of safety of 2, the infiltration rate for this system is as follows:

42.33/2 (FS) = 21.17 micro/sec.
Converting to inches/hr with a conversion factor of 0.1417 = (21.17 * 0.1417 = 3.00 in/hr)

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[93] Warning: Storage range exceeded by 9.57'
[58] Hint: Peaked 9.90' above defined flood level
[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=8)
[80] Warning: Exceeded Pond 12 by 5.27' @ 12.06 hrs (8.68 cfs 1,614 cf)

Inflow Area =	8,890 sf,	80.99% Impervious,	Inflow Depth =	6.06" for 25-Year event
Inflow =	1.62 cfs @	12.01 hrs, Volume=	4,487 cf	
Outflow =	3.78 cfs @	12.15 hrs, Volume=	4,487 cf,	Atten= 0%, Lag= 8.1 min
Discarded =	0.05 cfs @	12.06 hrs, Volume=	2,535 cf	
Primary =	3.73 cfs @	12.15 hrs, Volume=	1,952 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 54.90' @ 12.06 hrs Surf.Area= 582 sf Storage= 1,000 cf
Flood Elev= 45.00' Surf.Area= 582 sf Storage= 922 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 78.7 min (850.0 - 771.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	42.00'	583 cf	**13.23'W x 44.00'L x 3.33'H Field A** 1,941 cf Overall - 484 cf Embedded = 1,457 cf x 40.0% Voids
#2A	42.50'	372 cf	**ADS N-12 24"** x 6 Inside #1 Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf 6 Chambers in 3 Rows
#3	42.50'	14 cf	**24.0" Round Pipe Storage** x 4 Inside #1 L= 1.1'
#4	42.50'	31 cf	**24.0" Round Pipe Storage** -Impervious L= 10.0'
		1,000 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	42.50'	**12.0" Round Culvert** L= 32.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.50' / 42.34' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	43.90'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	44.50'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	42.00'	**3.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'

Discarded OutFlow Max=0.05 cfs @ 12.06 hrs HW=54.63' (Free Discharge)
└**4=Exfiltration** (Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 12.15 hrs HW=45.06' TW=48.21' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

APPENDIX E

Post-Development HydroCAD Printouts

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DRAINS TO CB-1 Runoff Area=2,495 sf 100.00% Impervious Runoff Depth=3.47"
Flow Length=51' Slope=0.0240 '/' Tc=0.5 min CN=98 Runoff=0.25 cfs 721 cf

Subcatchment 2S: DRAINS TO CB-2 Runoff Area=5,690 sf 89.86% Impervious Runoff Depth=3.03"
Flow Length=85' Slope=0.0160 '/' Tc=0.8 min CN=94 Runoff=0.53 cfs 1,437 cf

Subcatchment 3S: DRAINS TO CB-3 Runoff Area=1,896 sf 88.87% Impervious Runoff Depth=3.03"
Flow Length=44' Slope=0.0230 '/' Tc=1.9 min CN=94 Runoff=0.17 cfs 479 cf

Subcatchment 4S: DRAINS TO CB-4 Runoff Area=8,030 sf 65.19% Impervious Runoff Depth=2.19"
Flow Length=93' Slope=0.0490 '/' Tc=2.7 min CN=85 Runoff=0.53 cfs 1,467 cf

Subcatchment 5S: DRAINS TO CB-5 Runoff Area=2,118 sf 93.34% Impervious Runoff Depth=3.24"
Flow Length=39' Slope=0.0410 '/' Tc=0.4 min CN=96 Runoff=0.21 cfs 572 cf

Subcatchment 6S: DRAINS TO CB-6 Runoff Area=3,501 sf 100.00% Impervious Runoff Depth=3.47"
Flow Length=47' Slope=0.0130 '/' Tc=0.7 min CN=98 Runoff=0.35 cfs 1,011 cf

Subcatchment 7S: DRAINS TO CB-7 Runoff Area=3,767 sf 91.16% Impervious Runoff Depth=3.14"
Flow Length=60' Slope=0.0150 '/' Tc=4.0 min CN=95 Runoff=0.32 cfs 984 cf

Subcatchment 10S: ROOF B Runoff Area=4,800 sf 100.00% Impervious Runoff Depth=3.47"
Tc=1.0 min CN=98 Runoff=0.47 cfs 1,386 cf

Subcatchment 16S: ROOF E Runoff Area=4,800 sf 100.00% Impervious Runoff Depth=3.47"
Tc=1.0 min CN=98 Runoff=0.47 cfs 1,386 cf

Subcatchment 17S: ROOF F Runoff Area=4,000 sf 100.00% Impervious Runoff Depth=3.47"
Tc=1.0 min CN=98 Runoff=0.39 cfs 1,155 cf

Subcatchment 18S: ROOF C Runoff Area=4,121 sf 100.00% Impervious Runoff Depth=3.47"
Tc=1.0 min CN=98 Runoff=0.41 cfs 1,190 cf

Subcatchment 19S: ROOF D Runoff Area=4,800 sf 100.00% Impervious Runoff Depth=3.47"
Tc=1.0 min CN=98 Runoff=0.47 cfs 1,386 cf

Subcatchment 21S: ROOF A Runoff Area=12,794 sf 100.00% Impervious Runoff Depth=3.47"
Tc=1.0 min CN=98 Runoff=1.26 cfs 3,695 cf

Subcatchment 100S: RUNOFF TO EX. Runoff Area=15,909 sf 93.10% Impervious Runoff Depth=3.14"
Flow Length=115' Tc=2.5 min CN=95 Runoff=1.43 cfs 4,157 cf

Subcatchment 200S: Drains to Northern Runoff Area=12,293 sf 30.20% Impervious Runoff Depth=1.25"
Flow Length=132' Slope=0.0200 '/' Tc=5.2 min CN=72 Runoff=0.41 cfs 1,284 cf

Subcatchment 300S: DRAINS TO EX. CB-8 Runoff Area=16,660 sf 81.10% Impervious Runoff Depth=2.73"
Flow Length=279' Slope=0.0180 '/' Tc=2.0 min CN=91 Runoff=1.38 cfs 3,792 cf

Subcatchment 301S: DRAINS TO EX. CB-9 Runoff Area=8,754 sf 88.77% Impervious Runoff Depth=3.03"
Flow Length=127' Slope=0.0230 '/' Tc=3.2 min CN=94 Runoff=0.75 cfs 2,211 cf

Subcatchment 302S: RUNOFF TO EX. CB6 Runoff Area=14,456 sf 83.97% Impervious Runoff Depth=2.83"
Flow Length=122' Slope=0.0100 '/' Tc=2.9 min CN=92 Runoff=1.19 cfs 3,407 cf

Subcatchment 303S: RUNOFF TO EX. CB 5A Runoff Area=4,915 sf 89.85% Impervious Runoff Depth=3.03"
Flow Length=106' Tc=0.9 min CN=94 Runoff=0.46 cfs 1,241 cf

Subcatchment 304S: RUNOFF TO EX. CB5 Runoff Area=17,574 sf 78.43% Impervious Runoff Depth=2.64"
Flow Length=336' Tc=3.3 min CN=90 Runoff=1.35 cfs 3,860 cf

Subcatchment 305S: RUNOFF TO CB12 Runoff Area=8,890 sf 80.99% Impervious Runoff Depth=2.73"
Flow Length=109' Tc=1.0 min CN=91 Runoff=0.76 cfs 2,023 cf

Subcatchment 400S: Drains to Hotel Lot - Runoff Area=20,586 sf 82.94% Impervious Runoff Depth=2.83"
Flow Length=255' Slope=0.0200 '/' Tc=4.9 min CN=92 Runoff=1.58 cfs 4,852 cf

Pond CB1: PROP. CB-1 Peak Elev=43.17' Inflow=0.64 cfs 1,876 cf
12.0" Round Culvert n=0.013 L=55.0' S=0.0091 '/' Outflow=0.64 cfs 1,876 cf

Pond CB2: PROP. CB-2 Peak Elev=43.96' Inflow=0.53 cfs 1,437 cf
12.0" Round Culvert n=0.013 L=37.0' S=0.0365 '/' Outflow=0.53 cfs 1,437 cf

Pond CB3: PROP. CB-3 Peak Elev=43.20' Inflow=0.64 cfs 1,865 cf
12.0" Round Culvert n=0.013 L=45.0' S=0.0067 '/' Outflow=0.64 cfs 1,865 cf

Pond CB4: PROP. CB-4 Peak Elev=42.77' Inflow=1.14 cfs 3,332 cf
12.0" Round Culvert n=0.013 L=6.0' S=0.0333 '/' Outflow=1.14 cfs 3,332 cf

Pond CB5: PROP. CB-5 Peak Elev=42.92' Inflow=0.21 cfs 572 cf
12.0" Round Culvert n=0.013 L=6.0' S=0.0333 '/' Outflow=0.21 cfs 572 cf

Pond CB6: PROP. CB-6 Peak Elev=42.49' Inflow=0.35 cfs 1,011 cf
12.0" Round Culvert n=0.013 L=12.0' S=0.0167 '/' Outflow=0.35 cfs 1,011 cf

Pond CB7: PROP. CB-7 Peak Elev=42.48' Inflow=0.32 cfs 984 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0222 '/' Outflow=0.32 cfs 984 cf

Pond DMH1: PROP. DMH-1 Peak Elev=43.01' Inflow=1.17 cfs 3,313 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0500 '/' Outflow=1.17 cfs 3,313 cf

Pond DMH2: PROP. DMH-2 Peak Elev=40.88' Inflow=2.93 cfs 8,836 cf
18.0" Round Culvert n=0.013 L=23.0' S=0.0065 '/' Outflow=2.93 cfs 8,836 cf

Pond DMH3: PROP. DMH-3 Peak Elev=40.73' Inflow=5.03 cfs 14,889 cf
18.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=5.03 cfs 14,889 cf

Pond DMH4: PROP. DMH-4 Peak Elev=41.47' Inflow=2.93 cfs 8,763 cf
18.0" Round Culvert n=0.013 L=30.0' S=0.0050 '/' Outflow=2.93 cfs 8,763 cf

Pond DMH5: PROP. DMH-5 Peak Elev=41.30' Inflow=2.93 cfs 8,763 cf
18.0" Round Culvert n=0.013 L=47.0' S=0.0053 '/' Outflow=2.93 cfs 8,763 cf

Pond DMH6: PROP. DMH-6 Peak Elev=41.09' Inflow=2.93 cfs 8,799 cf
18.0" Round Culvert n=0.013 L=59.0' S=0.0042 '/' Outflow=2.93 cfs 8,799 cf

Pond EX CB12: EXIST. CB12 (STORMCEPTOR) Peak Elev=44.14' Inflow=0.76 cfs 2,023 cf
12.0" Round Culvert n=0.013 L=16.0' S=0.0231 '/' Outflow=0.76 cfs 2,023 cf

Pond EX. CB-D: EX. DMH - DESIGN POINT #3 Peak Elev=40.20' Inflow=5.03 cfs 14,889 cf
18.0" Round Culvert n=0.013 L=164.0' S=0.0399 '/' Outflow=5.03 cfs 14,889 cf

Pond EX. CB3A: EX. CB-3A - DESIGN POINT #1 Peak Elev=42.56' Inflow=1.43 cfs 4,157 cf
12.0" Round Culvert n=0.013 L=46.0' S=0.0057 '/' Outflow=1.43 cfs 4,157 cf

Pond EX. CB5: EX. CB-5 Peak Elev=42.88' Inflow=1.35 cfs 4,114 cf
12.0" Round Culvert n=0.013 L=170.0' S=0.0025 '/' Outflow=1.35 cfs 4,114 cf

Pond EX. CB5A: EX. CB-5A Peak Elev=42.43' Inflow=1.74 cfs 5,356 cf
12.0" Round Culvert n=0.013 L=98.0' S=-0.0015 '/' Outflow=1.74 cfs 5,356 cf

Pond EX. CB6: EX. CB-6 (STORMCEPTOR) Peak Elev=42.05' Inflow=2.93 cfs 8,763 cf
12.0" Round Culvert n=0.013 L=45.0' S=0.0056 '/' Outflow=2.93 cfs 8,763 cf

Pond EX. CB8: EX. CB-8 Peak Elev=42.08' Inflow=1.38 cfs 3,841 cf
12.0" Round Culvert n=0.013 L=128.0' S=0.0058 '/' Outflow=1.38 cfs 3,841 cf

Pond EX. CB9: EX. CB-9 Peak Elev=41.10' Inflow=2.11 cfs 6,052 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0230 '/' Outflow=2.11 cfs 6,052 cf

Pond EX.INF2: EXIST. INFILTRATION SYSTEM Peak Elev=44.13' Storage=684 cf Inflow=0.76 cfs 2,023 cf
Discarded=0.04 cfs 1,769 cf Primary=0.15 cfs 255 cf Outflow=0.19 cfs 2,024 cf

Pond INF-1: U/G INF-1 Peak Elev=43.01' Storage=1,446 cf Inflow=1.64 cfs 4,699 cf
Discarded=0.21 cfs 4,650 cf Primary=0.04 cfs 50 cf Outflow=0.25 cfs 4,699 cf

Pond INF-2: U/G INF-2 Peak Elev=41.36' Storage=1,283 cf Inflow=1.33 cfs 4,185 cf
Discarded=0.24 cfs 4,149 cf Primary=0.03 cfs 37 cf Outflow=0.27 cfs 4,186 cf

Pond INF-3: U/G INF-3 Peak Elev=41.20' Storage=1,383 cf Inflow=1.49 cfs 4,572 cf
Discarded=0.21 cfs 4,536 cf Primary=0.03 cfs 36 cf Outflow=0.24 cfs 4,572 cf

Pond INF-4: U/G INF-4 Peak Elev=42.58' Storage=1,129 cf Inflow=1.26 cfs 3,695 cf
Discarded=0.13 cfs 3,415 cf Primary=0.23 cfs 280 cf Outflow=0.35 cfs 3,695 cf

Total Runoff Area = 182,849 sf Runoff Volume = 43,699 cf Average Runoff Depth = 2.87"
16.23% Pervious = 29,676 sf 83.77% Impervious = 153,173 sf

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DRAINS TO CB-1 Runoff Area=2,495 sf 100.00% Impervious Runoff Depth=5.37"
Flow Length=51' Slope=0.0240 '/' Tc=0.5 min CN=98 Runoff=0.38 cfs 1,117 cf

Subcatchment 2S: DRAINS TO CB-2 Runoff Area=5,690 sf 89.86% Impervious Runoff Depth=4.91"
Flow Length=85' Slope=0.0160 '/' Tc=0.8 min CN=94 Runoff=0.83 cfs 2,328 cf

Subcatchment 3S: DRAINS TO CB-3 Runoff Area=1,896 sf 88.87% Impervious Runoff Depth=4.91"
Flow Length=44' Slope=0.0230 '/' Tc=1.9 min CN=94 Runoff=0.27 cfs 776 cf

Subcatchment 4S: DRAINS TO CB-4 Runoff Area=8,030 sf 65.19% Impervious Runoff Depth=3.94"
Flow Length=93' Slope=0.0490 '/' Tc=2.7 min CN=85 Runoff=0.94 cfs 2,634 cf

Subcatchment 5S: DRAINS TO CB-5 Runoff Area=2,118 sf 93.34% Impervious Runoff Depth=5.14"
Flow Length=39' Slope=0.0410 '/' Tc=0.4 min CN=96 Runoff=0.32 cfs 907 cf

Subcatchment 6S: DRAINS TO CB-6 Runoff Area=3,501 sf 100.00% Impervious Runoff Depth=5.37"
Flow Length=47' Slope=0.0130 '/' Tc=0.7 min CN=98 Runoff=0.53 cfs 1,567 cf

Subcatchment 7S: DRAINS TO CB-7 Runoff Area=3,767 sf 91.16% Impervious Runoff Depth=5.02"
Flow Length=60' Slope=0.0150 '/' Tc=4.0 min CN=95 Runoff=0.50 cfs 1,577 cf

Subcatchment 10S: ROOF B Runoff Area=4,800 sf 100.00% Impervious Runoff Depth=5.37"
Tc=1.0 min CN=98 Runoff=0.72 cfs 2,149 cf

Subcatchment 16S: ROOF E Runoff Area=4,800 sf 100.00% Impervious Runoff Depth=5.37"
Tc=1.0 min CN=98 Runoff=0.72 cfs 2,149 cf

Subcatchment 17S: ROOF F Runoff Area=4,000 sf 100.00% Impervious Runoff Depth=5.37"
Tc=1.0 min CN=98 Runoff=0.60 cfs 1,791 cf

Subcatchment 18S: ROOF C Runoff Area=4,121 sf 100.00% Impervious Runoff Depth=5.37"
Tc=1.0 min CN=98 Runoff=0.62 cfs 1,845 cf

Subcatchment 19S: ROOF D Runoff Area=4,800 sf 100.00% Impervious Runoff Depth=5.37"
Tc=1.0 min CN=98 Runoff=0.72 cfs 2,149 cf

Subcatchment 21S: ROOF A Runoff Area=12,794 sf 100.00% Impervious Runoff Depth=5.37"
Tc=1.0 min CN=98 Runoff=1.92 cfs 5,728 cf

Subcatchment 100S: RUNOFF TO EX. Runoff Area=15,909 sf 93.10% Impervious Runoff Depth=5.02"
Flow Length=115' Tc=2.5 min CN=95 Runoff=2.22 cfs 6,661 cf

Subcatchment 200S: Drains to Northern Runoff Area=12,293 sf 30.20% Impervious Runoff Depth=2.68"
Flow Length=132' Slope=0.0200 '/' Tc=5.2 min CN=72 Runoff=0.91 cfs 2,743 cf

Subcatchment 300S: DRAINS TO EX. CB-8 Runoff Area=16,660 sf 81.10% Impervious Runoff Depth=4.58"
Flow Length=279' Slope=0.0180 '/' Tc=2.0 min CN=91 Runoff=2.25 cfs 6,353 cf

Subcatchment 301S: DRAINS TO EX. CB-9 Runoff Area=8,754 sf 88.77% Impervious Runoff Depth=4.91"
Flow Length=127' Slope=0.0230 '/' Tc=3.2 min CN=94 Runoff=1.18 cfs 3,582 cf

Subcatchment 302S: RUNOFF TO EX. CB6 Runoff Area=14,456 sf 83.97% Impervious Runoff Depth=4.69"
Flow Length=122' Slope=0.0100 '/' Tc=2.9 min CN=92 Runoff=1.92 cfs 5,646 cf

Subcatchment 303S: RUNOFF TO EX. CB 5A Runoff Area=4,915 sf 89.85% Impervious Runoff Depth=4.91"
Flow Length=106' Tc=0.9 min CN=94 Runoff=0.72 cfs 2,011 cf

Subcatchment 304S: RUNOFF TO EX. CB5 Runoff Area=17,574 sf 78.43% Impervious Runoff Depth=4.47"
Flow Length=336' Tc=3.3 min CN=90 Runoff=2.23 cfs 6,541 cf

Subcatchment 305S: RUNOFF TO CB12 Runoff Area=8,890 sf 80.99% Impervious Runoff Depth=4.58"
Flow Length=109' Tc=1.0 min CN=91 Runoff=1.24 cfs 3,390 cf

Subcatchment 400S: Drains to Hotel Lot - Runoff Area=20,586 sf 82.94% Impervious Runoff Depth=4.69"
Flow Length=255' Slope=0.0200 '/' Tc=4.9 min CN=92 Runoff=2.54 cfs 8,040 cf

Pond CB1: PROP. CB-1 Peak Elev=43.50' Inflow=0.98 cfs 2,908 cf
12.0" Round Culvert n=0.013 L=55.0' S=0.0091 '/' Outflow=0.98 cfs 2,908 cf

Pond CB2: PROP. CB-2 Peak Elev=44.07' Inflow=0.83 cfs 2,328 cf
12.0" Round Culvert n=0.013 L=37.0' S=0.0365 '/' Outflow=0.83 cfs 2,328 cf

Pond CB3: PROP. CB-3 Peak Elev=43.35' Inflow=0.98 cfs 2,925 cf
12.0" Round Culvert n=0.013 L=45.0' S=0.0067 '/' Outflow=0.98 cfs 2,925 cf

Pond CB4: PROP. CB-4 Peak Elev=42.98' Inflow=1.88 cfs 5,559 cf
12.0" Round Culvert n=0.013 L=6.0' S=0.0333 '/' Outflow=1.88 cfs 5,559 cf

Pond CB5: PROP. CB-5 Peak Elev=42.98' Inflow=0.32 cfs 907 cf
12.0" Round Culvert n=0.013 L=6.0' S=0.0333 '/' Outflow=0.32 cfs 907 cf

Pond CB6: PROP. CB-6 Peak Elev=42.57' Inflow=0.53 cfs 1,567 cf
12.0" Round Culvert n=0.013 L=12.0' S=0.0167 '/' Outflow=0.53 cfs 1,567 cf

Pond CB7: PROP. CB-7 Peak Elev=42.55' Inflow=0.50 cfs 1,577 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0222 '/' Outflow=0.50 cfs 1,577 cf

Pond DMH1: PROP. DMH-1 Peak Elev=43.44' Inflow=1.81 cfs 5,236 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0500 '/' Outflow=1.81 cfs 5,236 cf

Pond DMH2: PROP. DMH-2 Peak Elev=42.08' Inflow=5.57 cfs 18,352 cf
18.0" Round Culvert n=0.013 L=23.0' S=0.0065 '/' Outflow=5.57 cfs 18,352 cf

Pond DMH3: PROP. DMH-3 Peak Elev=41.77' Inflow=8.45 cfs 29,518 cf
18.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=8.45 cfs 29,518 cf

Pond DMH4: PROP. DMH-4 Peak Elev=42.91' Inflow=4.90 cfs 15,343 cf
18.0" Round Culvert n=0.013 L=30.0' S=0.0050 '/' Outflow=4.90 cfs 15,343 cf

Pond DMH5: PROP. DMH-5 Peak Elev=42.65' Inflow=4.90 cfs 15,343 cf
18.0" Round Culvert n=0.013 L=47.0' S=0.0053 '/' Outflow=4.90 cfs 15,343 cf

Pond DMH6: PROP. DMH-6 Peak Elev=42.38' Inflow=4.90 cfs 16,428 cf
18.0" Round Culvert n=0.013 L=59.0' S=0.0042 '/' Outflow=4.90 cfs 16,428 cf

Pond EX CB12: EXIST. CB12 (STORMCEPTOR) Peak Elev=46.24' Inflow=1.24 cfs 3,390 cf
12.0" Round Culvert n=0.013 L=16.0' S=0.0231 '/' Outflow=1.24 cfs 3,390 cf

Pond EX. CB-D: EX. DMH - DESIGN POINT #3 Peak Elev=40.83' Inflow=8.45 cfs 29,518 cf
18.0" Round Culvert n=0.013 L=164.0' S=0.0399 '/' Outflow=8.45 cfs 29,518 cf

Pond EX. CB3A: EX. CB-3A - DESIGN POINT #1 Peak Elev=42.82' Inflow=2.22 cfs 6,661 cf
12.0" Round Culvert n=0.013 L=46.0' S=0.0057 '/' Outflow=2.22 cfs 6,661 cf

Pond EX. CB5: EX. CB-5 Peak Elev=46.21' Inflow=3.38 cfs 7,686 cf
12.0" Round Culvert n=0.013 L=170.0' S=0.0025 '/' Outflow=3.38 cfs 7,686 cf

Pond EX. CB5A: EX. CB-5A Peak Elev=45.26' Inflow=3.63 cfs 9,697 cf
12.0" Round Culvert n=0.013 L=98.0' S=-0.0015 '/' Outflow=3.63 cfs 9,697 cf

Pond EX. CB6: EX. CB-6 (STORMCEPTOR) Peak Elev=44.43' Inflow=4.90 cfs 15,343 cf
12.0" Round Culvert n=0.013 L=45.0' S=0.0056 '/' Outflow=4.90 cfs 15,343 cf

Pond EX. CB8: EX. CB-8 Peak Elev=43.43' Inflow=2.54 cfs 7,584 cf
12.0" Round Culvert n=0.013 L=128.0' S=0.0058 '/' Outflow=2.54 cfs 7,584 cf

Pond EX. CB9: EX. CB-9 Peak Elev=42.69' Inflow=3.71 cfs 11,166 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0230 '/' Outflow=3.71 cfs 11,166 cf

Pond EX.INF2: EXIST. INFILTRATION Peak Elev=46.22' Storage=1,000 cf Inflow=1.24 cfs 3,390 cf
Discarded=0.04 cfs 2,246 cf Primary=2.39 cfs 1,145 cf Outflow=2.44 cfs 3,390 cf

Pond INF-1: U/G INF-1 Peak Elev=43.41' Storage=1,908 cf Inflow=2.53 cfs 7,385 cf
Discarded=0.23 cfs 6,155 cf Primary=0.77 cfs 1,231 cf Outflow=1.00 cfs 7,386 cf

Pond INF-2: U/G INF-2 Peak Elev=42.14' Storage=2,404 cf Inflow=3.35 cfs 7,809 cf
Discarded=0.30 cfs 5,887 cf Primary=0.75 cfs 1,924 cf Outflow=1.05 cfs 7,811 cf

Pond INF-3: U/G INF-3 Peak Elev=41.78' Storage=2,054 cf Inflow=2.28 cfs 7,138 cf
Discarded=0.24 cfs 6,055 cf Primary=0.62 cfs 1,085 cf Outflow=0.86 cfs 7,139 cf

Pond INF-4: U/G INF-4 Peak Elev=42.96' Storage=1,328 cf Inflow=1.92 cfs 5,728 cf
Discarded=0.14 cfs 4,385 cf Primary=1.32 cfs 1,343 cf Outflow=1.46 cfs 5,728 cf

Total Runoff Area = 182,849 sf Runoff Volume = 71,684 cf Average Runoff Depth = 4.70"
16.23% Pervious = 29,676 sf 83.77% Impervious = 153,173 sf

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DRAINS TO CB-1 Runoff Area=2,495 sf 100.00% Impervious Runoff Depth=6.88"
Flow Length=51' Slope=0.0240 '/' Tc=0.5 min CN=98 Runoff=0.48 cfs 1,431 cf

Subcatchment 2S: DRAINS TO CB-2 Runoff Area=5,690 sf 89.86% Impervious Runoff Depth=6.41"
Flow Length=85' Slope=0.0160 '/' Tc=0.8 min CN=94 Runoff=1.07 cfs 3,038 cf

Subcatchment 3S: DRAINS TO CB-3 Runoff Area=1,896 sf 88.87% Impervious Runoff Depth=6.41"
Flow Length=44' Slope=0.0230 '/' Tc=1.9 min CN=94 Runoff=0.34 cfs 1,012 cf

Subcatchment 4S: DRAINS TO CB-4 Runoff Area=8,030 sf 65.19% Impervious Runoff Depth=5.37"
Flow Length=93' Slope=0.0490 '/' Tc=2.7 min CN=85 Runoff=1.27 cfs 3,592 cf

Subcatchment 5S: DRAINS TO CB-5 Runoff Area=2,118 sf 93.34% Impervious Runoff Depth=6.64"
Flow Length=39' Slope=0.0410 '/' Tc=0.4 min CN=96 Runoff=0.41 cfs 1,173 cf

Subcatchment 6S: DRAINS TO CB-6 Runoff Area=3,501 sf 100.00% Impervious Runoff Depth=6.88"
Flow Length=47' Slope=0.0130 '/' Tc=0.7 min CN=98 Runoff=0.68 cfs 2,007 cf

Subcatchment 7S: DRAINS TO CB-7 Runoff Area=3,767 sf 91.16% Impervious Runoff Depth=6.53"
Flow Length=60' Slope=0.0150 '/' Tc=4.0 min CN=95 Runoff=0.64 cfs 2,048 cf

Subcatchment 10S: ROOF B Runoff Area=4,800 sf 100.00% Impervious Runoff Depth=6.88"
Tc=1.0 min CN=98 Runoff=0.92 cfs 2,752 cf

Subcatchment 16S: ROOF E Runoff Area=4,800 sf 100.00% Impervious Runoff Depth=6.88"
Tc=1.0 min CN=98 Runoff=0.92 cfs 2,752 cf

Subcatchment 17S: ROOF F Runoff Area=4,000 sf 100.00% Impervious Runoff Depth=6.88"
Tc=1.0 min CN=98 Runoff=0.76 cfs 2,294 cf

Subcatchment 18S: ROOF C Runoff Area=4,121 sf 100.00% Impervious Runoff Depth=6.88"
Tc=1.0 min CN=98 Runoff=0.79 cfs 2,363 cf

Subcatchment 19S: ROOF D Runoff Area=4,800 sf 100.00% Impervious Runoff Depth=6.88"
Tc=1.0 min CN=98 Runoff=0.92 cfs 2,752 cf

Subcatchment 21S: ROOF A Runoff Area=12,794 sf 100.00% Impervious Runoff Depth=6.88"
Tc=1.0 min CN=98 Runoff=2.45 cfs 7,336 cf

Subcatchment 100S: RUNOFF TO EX. Runoff Area=15,909 sf 93.10% Impervious Runoff Depth=6.53"
Flow Length=115' Tc=2.5 min CN=95 Runoff=2.85 cfs 8,651 cf

Subcatchment 200S: Drains to Northern Runoff Area=12,293 sf 30.20% Impervious Runoff Depth=3.93"
Flow Length=132' Slope=0.0200 '/' Tc=5.2 min CN=72 Runoff=1.34 cfs 4,028 cf

Subcatchment 300S: DRAINS TO EX. CB-8 Runoff Area=16,660 sf 81.10% Impervious Runoff Depth=6.06"
Flow Length=279' Slope=0.0180 '/' Tc=2.0 min CN=91 Runoff=2.93 cfs 8,409 cf

Subcatchment 301S: DRAINS TO EX. CB-9 Runoff Area=8,754 sf 88.77% Impervious Runoff Depth=6.41"
Flow Length=127' Slope=0.0230 '/' Tc=3.2 min CN=94 Runoff=1.52 cfs 4,674 cf

Subcatchment 302S: RUNOFF TO EX. CB6 Runoff Area=14,456 sf 83.97% Impervious Runoff Depth=6.17"
Flow Length=122' Slope=0.0100 '/' Tc=2.9 min CN=92 Runoff=2.49 cfs 7,437 cf

Subcatchment 303S: RUNOFF TO EX. CB 5A Runoff Area=4,915 sf 89.85% Impervious Runoff Depth=6.41"
Flow Length=106' Tc=0.9 min CN=94 Runoff=0.92 cfs 2,624 cf

Subcatchment 304S: RUNOFF TO EX. CB5 Runoff Area=17,574 sf 78.43% Impervious Runoff Depth=5.94"
Flow Length=336' Tc=3.3 min CN=90 Runoff=2.92 cfs 8,700 cf

Subcatchment 305S: RUNOFF TO CB12 Runoff Area=8,890 sf 80.99% Impervious Runoff Depth=6.06"
Flow Length=109' Tc=1.0 min CN=91 Runoff=1.62 cfs 4,487 cf

Subcatchment 400S: Drains to Hotel Lot - Runoff Area=20,586 sf 82.94% Impervious Runoff Depth=6.17"
Flow Length=255' Slope=0.0200 '/' Tc=4.9 min CN=92 Runoff=3.30 cfs 10,590 cf

Pond CB1: PROP. CB-1 Peak Elev=44.20' Inflow=1.24 cfs 3,724 cf
12.0" Round Culvert n=0.013 L=55.0' S=0.0091 '/' Outflow=1.24 cfs 3,724 cf

Pond CB2: PROP. CB-2 Peak Elev=44.23' Inflow=1.07 cfs 3,038 cf
12.0" Round Culvert n=0.013 L=37.0' S=0.0365 '/' Outflow=1.07 cfs 3,038 cf

Pond CB3: PROP. CB-3 Peak Elev=43.48' Inflow=1.25 cfs 3,765 cf
12.0" Round Culvert n=0.013 L=45.0' S=0.0067 '/' Outflow=1.25 cfs 3,765 cf

Pond CB4: PROP. CB-4 Peak Elev=43.15' Inflow=2.46 cfs 7,356 cf
12.0" Round Culvert n=0.013 L=6.0' S=0.0333 '/' Outflow=2.46 cfs 7,356 cf

Pond CB5: PROP. CB-5 Peak Elev=43.02' Inflow=0.41 cfs 1,173 cf
12.0" Round Culvert n=0.013 L=6.0' S=0.0333 '/' Outflow=0.41 cfs 1,173 cf

Pond CB6: PROP. CB-6 Peak Elev=42.63' Inflow=0.68 cfs 2,007 cf
12.0" Round Culvert n=0.013 L=12.0' S=0.0167 '/' Outflow=0.68 cfs 2,007 cf

Pond CB7: PROP. CB-7 Peak Elev=42.61' Inflow=0.64 cfs 2,048 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0222 '/' Outflow=0.64 cfs 2,048 cf

Pond DMH1: PROP. DMH-1 Peak Elev=44.18' Inflow=2.32 cfs 6,762 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0500 '/' Outflow=2.32 cfs 6,762 cf

Pond DMH2: PROP. DMH-2 Peak Elev=44.63' Inflow=7.78 cfs 26,369 cf
18.0" Round Culvert n=0.013 L=23.0' S=0.0065 '/' Outflow=7.78 cfs 26,369 cf

Pond DMH3: PROP. DMH-3 Peak Elev=43.80' Inflow=12.17 cfs 41,772 cf
18.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=12.17 cfs 41,772 cf

Pond DMH4: PROP. DMH-4 Peak Elev=46.61' Inflow=7.78 cfs 20,711 cf
18.0" Round Culvert n=0.013 L=30.0' S=0.0050 '/' Outflow=7.78 cfs 20,711 cf

Pond DMH5: PROP. DMH-5 Peak Elev=46.04' Inflow=7.78 cfs 20,711 cf
18.0" Round Culvert n=0.013 L=47.0' S=0.0053 '/' Outflow=7.78 cfs 20,711 cf

Pond DMH6: PROP. DMH-6 Peak Elev=45.34' Inflow=7.78 cfs 22,754 cf
18.0" Round Culvert n=0.013 L=59.0' S=0.0042 '/' Outflow=7.78 cfs 22,754 cf

Pond EX CB12: EXIST. CB12 (STORMCEPTOR) Peak Elev=54.55' Inflow=1.62 cfs 4,487 cf
12.0" Round Culvert n=0.013 L=16.0' S=0.0231 '/' Outflow=1.62 cfs 4,487 cf

Pond EX. CB-D: EX. DMH - DESIGN POINT #3 Peak Elev=41.88' Inflow=12.17 cfs 41,772 cf
18.0" Round Culvert n=0.013 L=164.0' S=0.0399 '/' Outflow=12.17 cfs 41,772 cf

Pond EX. CB3A: EX. CB-3A - DESIGN POINT #1 Peak Elev=43.08' Inflow=2.85 cfs 8,651 cf
12.0" Round Culvert n=0.013 L=46.0' S=0.0057 '/' Outflow=2.85 cfs 8,651 cf

Pond EX. CB5: EX. CB-5 Peak Elev=54.42' Inflow=4.60 cfs 10,650 cf
12.0" Round Culvert n=0.013 L=170.0' S=0.0025 '/' Outflow=4.60 cfs 10,650 cf

Pond EX. CB5A: EX. CB-5A Peak Elev=51.44' Inflow=5.31 cfs 13,274 cf
12.0" Round Culvert n=0.013 L=98.0' S=-0.0015 '/' Outflow=5.31 cfs 13,274 cf

Pond EX. CB6: EX. CB-6 (STORMCEPTOR) Peak Elev=49.72' Inflow=7.78 cfs 20,711 cf
12.0" Round Culvert n=0.013 L=45.0' S=0.0056 '/' Outflow=7.78 cfs 20,711 cf

Pond EX. CB8: EX. CB-8 Peak Elev=46.13' Inflow=2.93 cfs 10,728 cf
12.0" Round Culvert n=0.013 L=128.0' S=0.0058 '/' Outflow=2.93 cfs 10,728 cf

Pond EX. CB9: EX. CB-9 Peak Elev=45.08' Inflow=4.41 cfs 15,402 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0230 '/' Outflow=4.41 cfs 15,402 cf

Pond EX.INF2: EXIST. INFILTRATION Peak Elev=54.48' Storage=1,000 cf Inflow=1.62 cfs 4,487 cf
Discarded=0.05 cfs 2,537 cf Primary=3.46 cfs 1,950 cf Outflow=3.50 cfs 4,487 cf

Pond INF-1: U/G INF-1 Peak Elev=44.12' Storage=2,731 cf Inflow=3.23 cfs 9,515 cf
Discarded=0.27 cfs 7,196 cf Primary=1.80 cfs 2,319 cf Outflow=2.06 cfs 9,515 cf

Pond INF-2: U/G INF-2 Peak Elev=42.98' Storage=3,639 cf Inflow=4.76 cfs 10,796 cf
Discarded=0.36 cfs 7,182 cf Primary=1.20 cfs 3,615 cf Outflow=1.55 cfs 10,797 cf

Pond INF-3: U/G INF-3 Peak Elev=42.52' Storage=2,898 cf Inflow=2.90 cfs 9,171 cf
Discarded=0.28 cfs 7,128 cf Primary=0.95 cfs 2,043 cf Outflow=1.22 cfs 9,171 cf

Pond INF-4: U/G INF-4 Peak Elev=43.13' Storage=1,416 cf Inflow=2.45 cfs 7,336 cf
Discarded=0.15 cfs 5,069 cf Primary=1.98 cfs 2,267 cf Outflow=2.13 cfs 7,336 cf

Total Runoff Area = 182,849 sf Runoff Volume = 94,151 cf Average Runoff Depth = 6.18"
16.23% Pervious = 29,676 sf 83.77% Impervious = 153,173 sf

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DRAINS TO CB-1 Runoff Area=2,495 sf 100.00% Impervious Runoff Depth=8.28"
Flow Length=51' Slope=0.0240 '/' Tc=0.5 min CN=98 Runoff=0.58 cfs 1,722 cf

Subcatchment 2S: DRAINS TO CB-2 Runoff Area=5,690 sf 89.86% Impervious Runoff Depth=7.80"
Flow Length=85' Slope=0.0160 '/' Tc=0.8 min CN=94 Runoff=1.29 cfs 3,698 cf

Subcatchment 3S: DRAINS TO CB-3 Runoff Area=1,896 sf 88.87% Impervious Runoff Depth=7.80"
Flow Length=44' Slope=0.0230 '/' Tc=1.9 min CN=94 Runoff=0.41 cfs 1,232 cf

Subcatchment 4S: DRAINS TO CB-4 Runoff Area=8,030 sf 65.19% Impervious Runoff Depth=6.72"
Flow Length=93' Slope=0.0490 '/' Tc=2.7 min CN=85 Runoff=1.57 cfs 4,494 cf

Subcatchment 5S: DRAINS TO CB-5 Runoff Area=2,118 sf 93.34% Impervious Runoff Depth=8.04"
Flow Length=39' Slope=0.0410 '/' Tc=0.4 min CN=96 Runoff=0.49 cfs 1,419 cf

Subcatchment 6S: DRAINS TO CB-6 Runoff Area=3,501 sf 100.00% Impervious Runoff Depth=8.28"
Flow Length=47' Slope=0.0130 '/' Tc=0.7 min CN=98 Runoff=0.81 cfs 2,416 cf

Subcatchment 7S: DRAINS TO CB-7 Runoff Area=3,767 sf 91.16% Impervious Runoff Depth=7.92"
Flow Length=60' Slope=0.0150 '/' Tc=4.0 min CN=95 Runoff=0.77 cfs 2,486 cf

Subcatchment 10S: ROOF B Runoff Area=4,800 sf 100.00% Impervious Runoff Depth=8.28"
Tc=1.0 min CN=98 Runoff=1.10 cfs 3,312 cf

Subcatchment 16S: ROOF E Runoff Area=4,800 sf 100.00% Impervious Runoff Depth=8.28"
Tc=1.0 min CN=98 Runoff=1.10 cfs 3,312 cf

Subcatchment 17S: ROOF F Runoff Area=4,000 sf 100.00% Impervious Runoff Depth=8.28"
Tc=1.0 min CN=98 Runoff=0.92 cfs 2,760 cf

Subcatchment 18S: ROOF C Runoff Area=4,121 sf 100.00% Impervious Runoff Depth=8.28"
Tc=1.0 min CN=98 Runoff=0.94 cfs 2,843 cf

Subcatchment 19S: ROOF D Runoff Area=4,800 sf 100.00% Impervious Runoff Depth=8.28"
Tc=1.0 min CN=98 Runoff=1.10 cfs 3,312 cf

Subcatchment 21S: ROOF A Runoff Area=12,794 sf 100.00% Impervious Runoff Depth=8.28"
Tc=1.0 min CN=98 Runoff=2.93 cfs 8,828 cf

Subcatchment 100S: RUNOFF TO EX. Runoff Area=15,909 sf 93.10% Impervious Runoff Depth=7.92"
Flow Length=115' Tc=2.5 min CN=95 Runoff=3.43 cfs 10,499 cf

Subcatchment 200S: Drains to Northern Runoff Area=12,293 sf 30.20% Impervious Runoff Depth=5.15"
Flow Length=132' Slope=0.0200 '/' Tc=5.2 min CN=72 Runoff=1.75 cfs 5,279 cf

Subcatchment 300S: DRAINS TO EX. CB-8 Runoff Area=16,660 sf 81.10% Impervious Runoff Depth=7.44"
Flow Length=279' Slope=0.0180 '/' Tc=2.0 min CN=91 Runoff=3.56 cfs 10,327 cf

Subcatchment 301S: DRAINS TO EX. CB-9 Runoff Area=8,754 sf 88.77% Impervious Runoff Depth=7.80"
Flow Length=127' Slope=0.0230 '/' Tc=3.2 min CN=94 Runoff=1.83 cfs 5,689 cf

Subcatchment 302S: RUNOFF TO EX. CB6 Runoff Area=14,456 sf 83.97% Impervious Runoff Depth=7.56"
Flow Length=122' Slope=0.0100 '/' Tc=2.9 min CN=92 Runoff=3.01 cfs 9,106 cf

Subcatchment 303S: RUNOFF TO EX. CB 5A Runoff Area=4,915 sf 89.85% Impervious Runoff Depth=7.80"
Flow Length=106' Tc=0.9 min CN=94 Runoff=1.11 cfs 3,194 cf

Subcatchment 304S: RUNOFF TO EX. CB5 Runoff Area=17,574 sf 78.43% Impervious Runoff Depth=7.32"
Flow Length=336' Tc=3.3 min CN=90 Runoff=3.55 cfs 10,717 cf

Subcatchment 305S: RUNOFF TO CB12 Runoff Area=8,890 sf 80.99% Impervious Runoff Depth=7.44"
Flow Length=109' Tc=1.0 min CN=91 Runoff=1.96 cfs 5,510 cf

Subcatchment 400S: Drains to Hotel Lot - Runoff Area=20,586 sf 82.94% Impervious Runoff Depth=7.56"
Flow Length=255' Slope=0.0200 '/' Tc=4.9 min CN=92 Runoff=3.99 cfs 12,967 cf

Pond CB1: PROP. CB-1 Peak Elev=44.93' Inflow=1.49 cfs 4,481 cf
12.0" Round Culvert n=0.013 L=55.0' S=0.0091 '/' Outflow=1.49 cfs 4,481 cf

Pond CB2: PROP. CB-2 Peak Elev=44.93' Inflow=1.29 cfs 3,698 cf
12.0" Round Culvert n=0.013 L=37.0' S=0.0365 '/' Outflow=1.29 cfs 3,698 cf

Pond CB3: PROP. CB-3 Peak Elev=43.92' Inflow=1.50 cfs 4,544 cf
12.0" Round Culvert n=0.013 L=45.0' S=0.0067 '/' Outflow=1.50 cfs 4,544 cf

Pond CB4: PROP. CB-4 Peak Elev=43.91' Inflow=3.00 cfs 9,038 cf
12.0" Round Culvert n=0.013 L=6.0' S=0.0333 '/' Outflow=3.00 cfs 9,038 cf

Pond CB5: PROP. CB-5 Peak Elev=43.86' Inflow=0.49 cfs 1,419 cf
12.0" Round Culvert n=0.013 L=6.0' S=0.0333 '/' Outflow=0.49 cfs 1,419 cf

Pond CB6: PROP. CB-6 Peak Elev=43.30' Inflow=0.81 cfs 2,416 cf
12.0" Round Culvert n=0.013 L=12.0' S=0.0167 '/' Outflow=0.81 cfs 2,416 cf

Pond CB7: PROP. CB-7 Peak Elev=43.30' Inflow=0.77 cfs 2,486 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0222 '/' Outflow=0.77 cfs 2,486 cf

Pond DMH1: PROP. DMH-1 Peak Elev=44.91' Inflow=2.78 cfs 8,180 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0500 '/' Outflow=2.78 cfs 8,180 cf

Pond DMH2: PROP. DMH-2 Peak Elev=47.11' Inflow=10.51 cfs 34,015 cf
18.0" Round Culvert n=0.013 L=23.0' S=0.0065 '/' Outflow=10.51 cfs 34,015 cf

Pond DMH3: PROP. DMH-3 Peak Elev=45.70' Inflow=15.81 cfs 53,412 cf
18.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=15.81 cfs 53,412 cf

Pond DMH4: PROP. DMH-4 Peak Elev=49.93' Inflow=10.51 cfs 25,762 cf
18.0" Round Culvert n=0.013 L=30.0' S=0.0050 '/' Outflow=10.51 cfs 25,762 cf

Pond DMH5: PROP. DMH-5 Peak Elev=49.28' Inflow=10.51 cfs 25,762 cf
18.0" Round Culvert n=0.013 L=47.0' S=0.0053 '/' Outflow=10.51 cfs 25,762 cf

Pond DMH6: PROP. DMH-6 Peak Elev=47.94' Inflow=10.51 cfs 28,753 cf
18.0" Round Culvert n=0.013 L=59.0' S=0.0042 '/' Outflow=10.51 cfs 28,753 cf

Pond EX CB12: EXIST. CB12 (STORMCEPTOR) Peak Elev=63.06' Inflow=1.96 cfs 5,510 cf
12.0" Round Culvert n=0.013 L=16.0' S=0.0231 '/' Outflow=1.96 cfs 5,510 cf

Pond EX. CB-D: EX. DMH - DESIGN POINT #3 Peak Elev=43.29' Inflow=15.81 cfs 53,412 cf
18.0" Round Culvert n=0.013 L=164.0' S=0.0399 '/' Outflow=15.81 cfs 53,412 cf

Pond EX. CB3A: EX. CB-3A - DESIGN POINT #1 Peak Elev=43.43' Inflow=3.43 cfs 10,499 cf
12.0" Round Culvert n=0.013 L=46.0' S=0.0057 '/' Outflow=3.43 cfs 10,499 cf

Pond EX. CB5: EX. CB-5 Peak Elev=63.98' Inflow=6.53 cfs 13,462 cf
12.0" Round Culvert n=0.013 L=170.0' S=0.0025 '/' Outflow=6.53 cfs 13,462 cf

Pond EX. CB5A: EX. CB-5A Peak Elev=58.62' Inflow=7.53 cfs 16,656 cf
12.0" Round Culvert n=0.013 L=98.0' S=-0.0015 '/' Outflow=7.53 cfs 16,656 cf

Pond EX. CB6: EX. CB-6 (STORMCEPTOR) Peak Elev=56.47' Inflow=10.51 cfs 25,762 cf
12.0" Round Culvert n=0.013 L=45.0' S=0.0056 '/' Outflow=10.51 cfs 25,762 cf

Pond EX. CB8: EX. CB-8 Peak Elev=49.07' Inflow=3.56 cfs 13,707 cf
12.0" Round Culvert n=0.013 L=128.0' S=0.0058 '/' Outflow=3.56 cfs 13,707 cf

Pond EX. CB9: EX. CB-9 Peak Elev=47.58' Inflow=5.34 cfs 19,397 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0230 '/' Outflow=5.34 cfs 19,397 cf

Pond EX.INF2: EXIST. INFILTRATION Peak Elev=62.91' Storage=1,000 cf Inflow=1.96 cfs 5,510 cf
Discarded=0.06 cfs 2,766 cf Primary=3.21 cfs 2,745 cf Outflow=3.27 cfs 5,511 cf

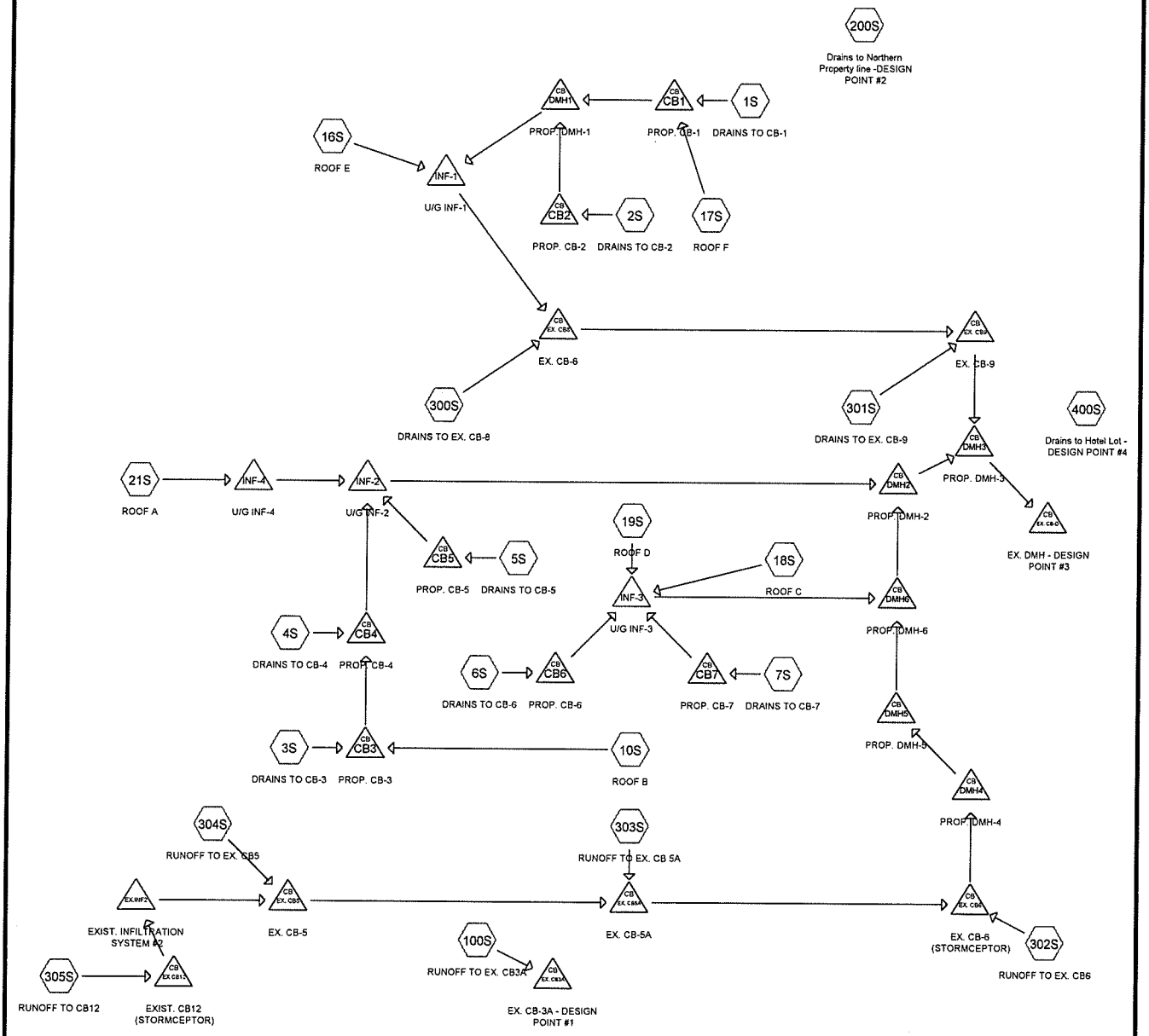
Pond INF-1: U/G INF-1 Peak Elev=44.83' Storage=3,449 cf Inflow=3.88 cfs 11,492 cf
Discarded=0.31 cfs 8,111 cf Primary=2.21 cfs 3,381 cf Outflow=2.50 cfs 11,492 cf

Pond INF-2: U/G INF-2 Peak Elev=43.86' Storage=4,625 cf Inflow=5.81 cfs 13,603 cf
Discarded=0.43 cfs 8,342 cf Primary=1.43 cfs 5,261 cf Outflow=1.87 cfs 13,603 cf

Pond INF-3: U/G INF-3 Peak Elev=43.29' Storage=3,592 cf Inflow=3.48 cfs 11,057 cf
Discarded=0.33 cfs 8,066 cf Primary=1.15 cfs 2,992 cf Outflow=1.47 cfs 11,058 cf

Pond INF-4: U/G INF-4 Peak Elev=43.88' Storage=1,706 cf Inflow=2.93 cfs 8,828 cf
Discarded=0.17 cfs 5,682 cf Primary=2.41 cfs 3,146 cf Outflow=2.56 cfs 8,828 cf

Total Runoff Area = 182,849 sf Runoff Volume = 115,123 cf Average Runoff Depth = 7.56"
16.23% Pervious = 29,676 sf 83.77% Impervious = 153,173 sf



Subcat Reach Pond Link

Routing Diagram for 4582-Postdrain

Prepared by Greenman-Pedersen, Inc., Printed 1/21/2020

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
29,676	61	>75% Grass cover, Good, HSG B (2S, 3S, 4S, 5S, 7S, 100S, 200S, 300S, 301S, 302S, 303S, 304S, 305S, 400S)
117,858	98	Paved parking, HSG B (1S, 2S, 3S, 4S, 5S, 6S, 7S, 100S, 200S, 300S, 301S, 302S, 303S, 304S, 305S, 400S)
35,315	98	Roofs, HSG B (10S, 16S, 17S, 18S, 19S, 21S)
182,849	**92**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
182,849	HSG B	1S, 2S, 3S, 4S, 5S, 6S, 7S, 10S, 16S, 17S, 18S, 19S, 21S, 100S, 200S, 300S, 301S, 302S, 303S, 304S, 305S, 400S
0	HSG C	
0	HSG D	
0	Other	
182,849		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
0	29,676	0	0	0	29,676	>75% Grass cover, Good
0	117,858	0	0	0	117,858	Paved parking
0	35,315	0	0	0	35,315	Roofs
0	**182,849**	**0**	**0**	**0**	**182,849**	**TOTAL AREA**

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	CB1	42.75	42.25	55.0	0.0091	0.013	12.0	0.0	0.0
2	CB2	43.60	42.25	37.0	0.0365	0.013	12.0	0.0	0.0
3	CB3	42.75	42.45	45.0	0.0067	0.013	12.0	0.0	0.0
4	CB4	42.20	42.00	6.0	0.0333	0.013	12.0	0.0	0.0
5	CB5	42.70	42.50	6.0	0.0333	0.013	12.0	0.0	0.0
6	CB6	42.20	42.00	12.0	0.0167	0.013	12.0	0.0	0.0
7	CB7	42.20	42.00	9.0	0.0222	0.013	12.0	0.0	0.0
8	DMH1	42.00	41.75	5.0	0.0500	0.013	12.0	0.0	0.0
9	DMH2	39.55	39.40	23.0	0.0065	0.013	18.0	0.0	0.0
10	DMH3	39.40	39.20	40.0	0.0050	0.013	18.0	0.0	0.0
11	DMH4	40.20	40.05	30.0	0.0050	0.013	18.0	0.0	0.0
12	DMH5	40.05	39.80	47.0	0.0053	0.013	18.0	0.0	0.0
13	DMH6	39.80	39.55	59.0	0.0042	0.013	18.0	0.0	0.0
14	EX CB12	43.09	42.72	16.0	0.0231	0.013	12.0	0.0	0.0
15	EX. CB-D	39.09	32.55	164.0	0.0399	0.013	18.0	0.0	0.0
16	EX. CB3A	41.82	41.56	46.0	0.0057	0.013	12.0	0.0	0.0
17	EX. CB5	41.93	41.50	170.0	0.0025	0.013	12.0	0.0	0.0
18	EX. CB5A	41.15	41.30	98.0	-0.0015	0.013	12.0	0.0	0.0
19	EX. CB6	40.55	40.30	45.0	0.0056	0.013	12.0	0.0	0.0
20	EX. CB8	41.38	40.64	128.0	0.0058	0.013	12.0	0.0	0.0
21	EX. CB9	40.09	39.40	30.0	0.0230	0.013	12.0	0.0	0.0
22	EX.INF2	42.50	42.34	32.0	0.0050	0.013	12.0	0.0	0.0
23	INF-1	41.75	41.50	33.0	0.0076	0.013	12.0	0.0	0.0
24	INF-2	40.30	39.55	147.0	0.0051	0.013	15.0	0.0	0.0
25	INF-3	40.00	39.80	16.0	0.0125	0.013	12.0	0.0	0.0
26	INF-4	42.35	42.00	10.0	0.0350	0.013	12.0	0.0	0.0

Notes Listing (all nodes)

Line#	Node Number	Notes
1	EX.INF2	The soils present in the area of the infiltration system consist of Urban Land (NRCS classification 699). Due to the limited information provided for this soil type, 140C Chatfield-Hollis-Canton Complex was used as the closest soil present within the site.
2		The bottom of the stone in the infiltration system is approximately 6' below existing grade. Per USDA Soil Data Mart, the lowest value for the Saturated Ksat Value for this soil at a depth of 21-60"' +/- is 42.33 micrometers/second.
3		Per NHDES Stormwater Manual: Vol. 2, pages 16-17 using a factor of safety of 2, the infiltration rate for this system is as follows:
4		42.33/2 (FS) = 21.17 micro/sec.
5		Converting to inches/hr with a conversion factor of 0.1417 = (21.17 * 0.1417 = 3.00 in/hr)

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DRAINS TO CB-1 Runoff Area=2,495 sf 100.00% Impervious Runoff Depth=6.88"
Flow Length=51' Slope=0.0240 '/' Tc=0.5 min CN=98 Runoff=0.48 cfs 1,431 cf

Subcatchment 2S: DRAINS TO CB-2 Runoff Area=5,690 sf 89.86% Impervious Runoff Depth=6.41"
Flow Length=85' Slope=0.0160 '/' Tc=0.8 min CN=94 Runoff=1.07 cfs 3,038 cf

Subcatchment 3S: DRAINS TO CB-3 Runoff Area=1,896 sf 88.87% Impervious Runoff Depth=6.41"
Flow Length=44' Slope=0.0230 '/' Tc=1.9 min CN=94 Runoff=0.34 cfs 1,012 cf

Subcatchment 4S: DRAINS TO CB-4 Runoff Area=8,030 sf 65.19% Impervious Runoff Depth=5.37"
Flow Length=93' Slope=0.0490 '/' Tc=2.7 min CN=85 Runoff=1.27 cfs 3,592 cf

Subcatchment 5S: DRAINS TO CB-5 Runoff Area=2,118 sf 93.34% Impervious Runoff Depth=6.64"
Flow Length=39' Slope=0.0410 '/' Tc=0.4 min CN=96 Runoff=0.41 cfs 1,173 cf

Subcatchment 6S: DRAINS TO CB-6 Runoff Area=3,501 sf 100.00% Impervious Runoff Depth=6.88"
Flow Length=47' Slope=0.0130 '/' Tc=0.7 min CN=98 Runoff=0.68 cfs 2,007 cf

Subcatchment 7S: DRAINS TO CB-7 Runoff Area=3,767 sf 91.16% Impervious Runoff Depth=6.53"
Flow Length=60' Slope=0.0150 '/' Tc=4.0 min CN=95 Runoff=0.64 cfs 2,048 cf

Subcatchment 10S: ROOF B Runoff Area=4,800 sf 100.00% Impervious Runoff Depth=6.88"
Tc=1.0 min CN=98 Runoff=0.92 cfs 2,752 cf

Subcatchment 16S: ROOF E Runoff Area=4,800 sf 100.00% Impervious Runoff Depth=6.88"
Tc=1.0 min CN=98 Runoff=0.92 cfs 2,752 cf

Subcatchment 17S: ROOF F Runoff Area=4,000 sf 100.00% Impervious Runoff Depth=6.88"
Tc=1.0 min CN=98 Runoff=0.76 cfs 2,294 cf

Subcatchment 18S: ROOF C Runoff Area=4,121 sf 100.00% Impervious Runoff Depth=6.88"
Tc=1.0 min CN=98 Runoff=0.79 cfs 2,363 cf

Subcatchment 19S: ROOF D Runoff Area=4,800 sf 100.00% Impervious Runoff Depth=6.88"
Tc=1.0 min CN=98 Runoff=0.92 cfs 2,752 cf

Subcatchment 21S: ROOF A Runoff Area=12,794 sf 100.00% Impervious Runoff Depth=6.88"
Tc=1.0 min CN=98 Runoff=2.45 cfs 7,336 cf

Subcatchment 100S: RUNOFF TO EX. Runoff Area=15,909 sf 93.10% Impervious Runoff Depth=6.53"
Flow Length=115' Tc=2.5 min CN=95 Runoff=2.85 cfs 8,651 cf

Subcatchment 200S: Drains to Northern Runoff Area=12,293 sf 30.20% Impervious Runoff Depth=3.93"
Flow Length=132' Slope=0.0200 '/' Tc=5.2 min CN=72 Runoff=1.34 cfs 4,028 cf

Subcatchment 300S: DRAINS TO EX. CB-8 Runoff Area=16,660 sf 81.10% Impervious Runoff Depth=6.06"
Flow Length=279' Slope=0.0180 '/' Tc=2.0 min CN=91 Runoff=2.93 cfs 8,409 cf

Subcatchment 301S: DRAINS TO EX. CB-9 Runoff Area=8,754 sf 88.77% Impervious Runoff Depth=6.41"
Flow Length=127' Slope=0.0230 '/' Tc=3.2 min CN=94 Runoff=1.52 cfs 4,674 cf

Subcatchment 302S: RUNOFF TO EX. CB6 Runoff Area=14,456 sf 83.97% Impervious Runoff Depth=6.17"
Flow Length=122' Slope=0.0100 '/' Tc=2.9 min CN=92 Runoff=2.49 cfs 7,437 cf

Subcatchment 303S: RUNOFF TO EX. CB 5A Runoff Area=4,915 sf 89.85% Impervious Runoff Depth=6.41"
Flow Length=106' Tc=0.9 min CN=94 Runoff=0.92 cfs 2,624 cf

Subcatchment 304S: RUNOFF TO EX. CB5 Runoff Area=17,574 sf 78.43% Impervious Runoff Depth=5.94"
Flow Length=336' Tc=3.3 min CN=90 Runoff=2.92 cfs 8,700 cf

Subcatchment 305S: RUNOFF TO CB12 Runoff Area=8,890 sf 80.99% Impervious Runoff Depth=6.06"
Flow Length=109' Tc=1.0 min CN=91 Runoff=1.62 cfs 4,487 cf

Subcatchment 400S: Drains to Hotel Lot - Runoff Area=20,586 sf 82.94% Impervious Runoff Depth=6.17"
Flow Length=255' Slope=0.0200 '/' Tc=4.9 min CN=92 Runoff=3.30 cfs 10,590 cf

Pond CB1: PROP. CB-1 Peak Elev=44.20' Inflow=1.24 cfs 3,724 cf
12.0" Round Culvert n=0.013 L=55.0' S=0.0091 '/' Outflow=1.24 cfs 3,724 cf

Pond CB2: PROP. CB-2 Peak Elev=44.23' Inflow=1.07 cfs 3,038 cf
12.0" Round Culvert n=0.013 L=37.0' S=0.0365 '/' Outflow=1.07 cfs 3,038 cf

Pond CB3: PROP. CB-3 Peak Elev=43.48' Inflow=1.25 cfs 3,765 cf
12.0" Round Culvert n=0.013 L=45.0' S=0.0067 '/' Outflow=1.25 cfs 3,765 cf

Pond CB4: PROP. CB-4 Peak Elev=43.15' Inflow=2.46 cfs 7,356 cf
12.0" Round Culvert n=0.013 L=6.0' S=0.0333 '/' Outflow=2.46 cfs 7,356 cf

Pond CB5: PROP. CB-5 Peak Elev=43.02' Inflow=0.41 cfs 1,173 cf
12.0" Round Culvert n=0.013 L=6.0' S=0.0333 '/' Outflow=0.41 cfs 1,173 cf

Pond CB6: PROP. CB-6 Peak Elev=42.63' Inflow=0.68 cfs 2,007 cf
12.0" Round Culvert n=0.013 L=12.0' S=0.0167 '/' Outflow=0.68 cfs 2,007 cf

Pond CB7: PROP. CB-7 Peak Elev=42.61' Inflow=0.64 cfs 2,048 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0222 '/' Outflow=0.64 cfs 2,048 cf

Pond DMH1: PROP. DMH-1 Peak Elev=44.18' Inflow=2.32 cfs 6,762 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0500 '/' Outflow=2.32 cfs 6,762 cf

Pond DMH2: PROP. DMH-2 Peak Elev=44.63' Inflow=7.78 cfs 26,369 cf
18.0" Round Culvert n=0.013 L=23.0' S=0.0065 '/' Outflow=7.78 cfs 26,369 cf

Pond DMH3: PROP. DMH-3 Peak Elev=43.80' Inflow=12.17 cfs 41,772 cf
18.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=12.17 cfs 41,772 cf

Pond DMH4: PROP. DMH-4 Peak Elev=46.61' Inflow=7.78 cfs 20,711 cf
18.0" Round Culvert n=0.013 L=30.0' S=0.0050 '/' Outflow=7.78 cfs 20,711 cf

Pond DMH5: PROP. DMH-5 Peak Elev=46.04' Inflow=7.78 cfs 20,711 cf
18.0" Round Culvert n=0.013 L=47.0' S=0.0053 '/' Outflow=7.78 cfs 20,711 cf

Pond DMH6: PROP. DMH-6 Peak Elev=45.34' Inflow=7.78 cfs 22,754 cf
18.0" Round Culvert n=0.013 L=59.0' S=0.0042 '/' Outflow=7.78 cfs 22,754 cf

Pond EX CB12: EXIST. CB12 (STORMCEPTOR) Peak Elev=54.55' Inflow=1.62 cfs 4,487 cf
12.0" Round Culvert n=0.013 L=16.0' S=0.0231 '/' Outflow=1.62 cfs 4,487 cf

Pond EX. CB-D: EX. DMH - DESIGN POINT #3 Peak Elev=41.88' Inflow=12.17 cfs 41,772 cf
18.0" Round Culvert n=0.013 L=164.0' S=0.0399 '/' Outflow=12.17 cfs 41,772 cf

Pond EX. CB3A: EX. CB-3A - DESIGN POINT #1 Peak Elev=43.08' Inflow=2.85 cfs 8,651 cf
12.0" Round Culvert n=0.013 L=46.0' S=0.0057 '/' Outflow=2.85 cfs 8,651 cf

Pond EX. CB5: EX. CB-5 Peak Elev=54.42' Inflow=4.60 cfs 10,650 cf
12.0" Round Culvert n=0.013 L=170.0' S=0.0025 '/' Outflow=4.60 cfs 10,650 cf

Pond EX. CB5A: EX. CB-5A Peak Elev=51.44' Inflow=5.31 cfs 13,274 cf
12.0" Round Culvert n=0.013 L=98.0' S=-0.0015 '/' Outflow=5.31 cfs 13,274 cf

Pond EX. CB6: EX. CB-6 (STORMCEPTOR) Peak Elev=49.72' Inflow=7.78 cfs 20,711 cf
12.0" Round Culvert n=0.013 L=45.0' S=0.0056 '/' Outflow=7.78 cfs 20,711 cf

Pond EX. CB8: EX. CB-8 Peak Elev=46.13' Inflow=2.93 cfs 10,728 cf
12.0" Round Culvert n=0.013 L=128.0' S=0.0058 '/' Outflow=2.93 cfs 10,728 cf

Pond EX. CB9: EX. CB-9 Peak Elev=45.08' Inflow=4.41 cfs 15,402 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0230 '/' Outflow=4.41 cfs 15,402 cf

Pond EX.INF2: EXIST. INFILTRATION Peak Elev=54.48' Storage=1,000 cf Inflow=1.62 cfs 4,487 cf
Discarded=0.05 cfs 2,537 cf Primary=3.46 cfs 1,950 cf Outflow=3.50 cfs 4,487 cf

Pond INF-1: U/G INF-1 Peak Elev=44.12' Storage=2,731 cf Inflow=3.23 cfs 9,515 cf
Discarded=0.27 cfs 7,196 cf Primary=1.80 cfs 2,319 cf Outflow=2.06 cfs 9,515 cf

Pond INF-2: U/G INF-2 Peak Elev=42.98' Storage=3,639 cf Inflow=4.76 cfs 10,796 cf
Discarded=0.36 cfs 7,182 cf Primary=1.20 cfs 3,615 cf Outflow=1.55 cfs 10,797 cf

Pond INF-3: U/G INF-3 Peak Elev=42.52' Storage=2,898 cf Inflow=2.90 cfs 9,171 cf
Discarded=0.28 cfs 7,128 cf Primary=0.95 cfs 2,043 cf Outflow=1.22 cfs 9,171 cf

Pond INF-4: U/G INF-4 Peak Elev=43.13' Storage=1,416 cf Inflow=2.45 cfs 7,336 cf
Discarded=0.15 cfs 5,069 cf Primary=1.98 cfs 2,267 cf Outflow=2.13 cfs 7,336 cf

Total Runoff Area = 182,849 sf Runoff Volume = 94,151 cf Average Runoff Depth = 6.18"
16.23% Pervious = 29,676 sf 83.77% Impervious = 153,173 sf

Summary for Subcatchment 1S: DRAINS TO CB-1

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.48 cfs @ 12.01 hrs, Volume= 1,431 cf, Depth= 6.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
2,495	98	Paved parking, HSG B
2,495		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	25	0.0240	1.12		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
0.1	26	0.0240	3.14		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	51	Total			

Summary for Subcatchment 2S: DRAINS TO CB-2

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.07 cfs @ 12.01 hrs, Volume= 3,038 cf, Depth= 6.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
577	61	>75% Grass cover, Good, HSG B
5,113	98	Paved parking, HSG B
5,690	94	Weighted Average
577		10.14% Pervious Area
5,113		89.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	25	0.0160	0.96		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
0.4	60	0.0160	2.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	85	Total			

Summary for Subcatchment 3S: DRAINS TO CB-3

Runoff = 0.34 cfs @ 12.03 hrs, Volume= 1,012 cf, Depth= 6.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
211	61	>75% Grass cover, Good, HSG B
1,685	98	Paved parking, HSG B
1,896	94	Weighted Average
211		11.13% Pervious Area
1,685		88.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	15	0.0230	1.00		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
1.5	10	0.0230	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
0.1	19	0.0230	3.08		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.9	44	Total			

Summary for Subcatchment 4S: DRAINS TO CB-4

Runoff = 1.27 cfs @ 12.04 hrs, Volume= 3,592 cf, Depth= 5.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
2,795	61	>75% Grass cover, Good, HSG B
5,235	98	Paved parking, HSG B
8,030	85	Weighted Average
2,795		34.81% Pervious Area
5,235		65.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	25	0.0490	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
0.2	20	0.0490	1.55		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	48	0.0490	4.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.7	93	Total			

Summary for Subcatchment 5S: DRAINS TO CB-5

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.41 cfs @ 12.01 hrs, Volume= 1,173 cf, Depth= 6.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
141	61	>75% Grass cover, Good, HSG B
1,977	98	Paved parking, HSG B
2,118	96	Weighted Average
141		6.66% Pervious Area
1,977		93.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	25	0.0410	1.39		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
0.1	14	0.0410	4.11		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.4	39	Total			

Summary for Subcatchment 6S: DRAINS TO CB-6

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.68 cfs @ 12.01 hrs, Volume= 2,007 cf, Depth= 6.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
3,501	98	Paved parking, HSG B
3,501		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	25	0.0130	0.88		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
0.2	22	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	47	Total			

Summary for Subcatchment 7S: DRAINS TO CB-7

Runoff = 0.64 cfs @ 12.06 hrs, Volume= 2,048 cf, Depth= 6.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
333	61	>75% Grass cover, Good, HSG B
3,434	98	Paved parking, HSG B
3,767	95	Weighted Average
333		8.84% Pervious Area
3,434		91.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	25	0.0150	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
0.3	15	0.0150	0.86		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	20	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.0	60	Total			

Summary for Subcatchment 10S: ROOF B

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.92 cfs @ 12.01 hrs, Volume= 2,752 cf, Depth= 6.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
4,800	98	Roofs, HSG B
4,800		100.00% Impervious Area

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

Summary for Subcatchment 16S: ROOF E

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.92 cfs @ 12.01 hrs, Volume= 2,752 cf, Depth= 6.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
4,800	98	Roofs, HSG B
4,800		100.00% Impervious Area

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

Summary for Subcatchment 17S: ROOF F

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.76 cfs @ 12.01 hrs, Volume= 2,294 cf, Depth= 6.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
4,000	98	Roofs, HSG B
4,000		100.00% Impervious Area

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

Summary for Subcatchment 18S: ROOF C

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.79 cfs @ 12.01 hrs, Volume= 2,363 cf, Depth= 6.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
4,121	98	Roofs, HSG B
4,121		100.00% Impervious Area

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

Summary for Subcatchment 19S: ROOF D

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.92 cfs @ 12.01 hrs, Volume= 2,752 cf, Depth= 6.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
4,800	98	Roofs, HSG B
4,800		100.00% Impervious Area

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

Summary for Subcatchment 21S: ROOF A

[49] Hint: Tc<2dt may require smaller dt

Runoff = 2.45 cfs @ 12.01 hrs, Volume= 7,336 cf, Depth= 6.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
12,794	98	Roofs, HSG B
12,794		100.00% Impervious Area

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

Summary for Subcatchment 100S: RUNOFF TO EX. CB3A

Runoff = 2.85 cfs @ 12.04 hrs, Volume= 8,651 cf, Depth= 6.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
1,098	61	>75% Grass cover, Good, HSG B
14,811	98	Paved parking, HSG B
15,909	95	Weighted Average
1,098		6.90% Pervious Area
14,811		93.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	10	0.0200	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
0.3	15	0.0120	0.77		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
0.7	90	0.0120	2.22		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.5	115	Total			

Summary for Subcatchment 200S: Drains to Northern Property line -DESIGN POINT #2

Runoff = 1.34 cfs @ 12.08 hrs, Volume= 4,028 cf, Depth= 3.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
8,580	61	>75% Grass cover, Good, HSG B
3,713	98	Paved parking, HSG B
12,293	72	Weighted Average
8,580		69.80% Pervious Area
3,713		30.20% 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= 3.22"
0.9	5	0.0200	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
0.1	15	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.5	92	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.2	132	Total			

Summary for Subcatchment 300S: DRAINS TO EX. CB-8

Runoff = 2.93 cfs @ 12.03 hrs, Volume= 8,409 cf, Depth= 6.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
3,149	61	>75% Grass cover, Good, HSG B
13,511	98	Paved parking, HSG B
16,660	91	Weighted Average
3,149		18.90% Pervious Area
13,511		81.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	25	0.0180	1.00		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
1.6	254	0.0180	2.72		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.0	279	Total			

Summary for Subcatchment 301S: DRAINS TO EX. CB-9

Runoff = 1.52 cfs @ 12.05 hrs, Volume= 4,674 cf, Depth= 6.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
983	61	>75% Grass cover, Good, HSG B
7,771	98	Paved parking, HSG B
8,754	94	Weighted Average
983		11.23% Pervious Area
7,771		88.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	20	0.0230	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
0.1	5	0.0230	0.80		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
0.6	102	0.0230	3.08		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.2	127	Total			

Summary for Subcatchment 302S: RUNOFF TO EX. CB6

Runoff = 2.49 cfs @ 12.04 hrs, Volume= 7,437 cf, Depth= 6.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
2,317	61	>75% Grass cover, Good, HSG B
12,139	98	Paved parking, HSG B
14,456	92	Weighted Average
2,317		16.03% Pervious Area
12,139		83.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	8	0.0100	0.08		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
0.4	17	0.0100	0.73		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
0.8	97	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.9	122	Total			

Summary for Subcatchment 303S: RUNOFF TO EX. CB 5A

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.92 cfs @ 12.01 hrs, Volume= 2,624 cf, Depth= 6.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
499	61	>75% Grass cover, Good, HSG B
4,416	98	Paved parking, HSG B
4,915	94	Weighted Average
499		10.15% Pervious Area
4,416		89.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	25	0.0200	1.05		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
0.5	81	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	106	Total			

Summary for Subcatchment 304S: RUNOFF TO EX. CB5

Runoff = 2.92 cfs @ 12.05 hrs, Volume= 8,700 cf, Depth= 5.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
3,790	61	>75% Grass cover, Good, HSG B
13,784	98	Paved parking, HSG B
17,574	90	Weighted Average
3,790		21.57% Pervious Area
13,784		78.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	25	0.0200	1.05		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
2.9	311	0.0080	1.82		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.3	336	Total			

Summary for Subcatchment 305S: RUNOFF TO CB12

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.62 cfs @ 12.01 hrs, Volume= 4,487 cf, Depth= 6.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
1,690	61	>75% Grass cover, Good, HSG B
7,200	98	Paved parking, HSG B
8,890	91	Weighted Average
1,690		19.01% Pervious Area
7,200		80.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0200	0.87		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.22"
0.1	11	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.7	88	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.0	109	Total			

Summary for Subcatchment 400S: Drains to Hotel Lot - DESIGN POINT #4

Runoff = 3.30 cfs @ 12.07 hrs, Volume= 10,590 cf, Depth= 6.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=7.12"

Area (sf)	CN	Description
3,513	61	>75% Grass cover, Good, HSG B
17,073	98	Paved parking, HSG B
20,586	92	Weighted Average
3,513		17.06% Pervious Area
17,073		82.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	25	0.0200	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.22"
0.6	35	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.1	195	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.9	255	Total			

Summary for Pond CB1: PROP. CB-1

Inflow Area = 6,495 sf,100.00% Impervious, Inflow Depth = 6.88" for 25-Year event
Inflow = 1.24 cfs @ 12.01 hrs, Volume= 3,724 cf
Outflow = 1.24 cfs @ 12.01 hrs, Volume= 3,724 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.24 cfs @ 12.01 hrs, Volume= 3,724 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 44.20' @ 12.13 hrs
Flood Elev= 46.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	42.75'	**12.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.75' / 42.25' S= 0.0091 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.72 cfs @ 12.01 hrs HW=43.82' TW=43.77' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.72 cfs @ 1.07 fps)

Summary for Pond CB2: PROP. CB-2

Inflow Area = 5,690 sf, 89.86% Impervious, Inflow Depth = 6.41" for 25-Year event
Inflow = 1.07 cfs @ 12.01 hrs, Volume= 3,038 cf
Outflow = 1.07 cfs @ 12.01 hrs, Volume= 3,038 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.07 cfs @ 12.01 hrs, Volume= 3,038 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 44.23' @ 12.13 hrs
Flood Elev= 47.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	43.60'	**12.0" Round Culvert** L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 43.60' / 42.25' S= 0.0365 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.96 cfs @ 12.01 hrs HW=44.17' TW=43.77' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.96 cfs @ 3.01 fps)

Summary for Pond CB3: PROP. CB-3

Inflow Area = 6,696 sf, 96.85% Impervious, Inflow Depth = 6.75" for 25-Year event
Inflow = 1.25 cfs @ 12.02 hrs, Volume= 3,765 cf
Outflow = 1.25 cfs @ 12.02 hrs, Volume= 3,765 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.25 cfs @ 12.02 hrs, Volume= 3,765 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 43.48' @ 12.03 hrs
Flood Elev= 47.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	42.75'	**12.0" Round Culvert** L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.75' / 42.45' S= 0.0067 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.19 cfs @ 12.02 hrs HW=43.47' TW=43.13' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 1.19 cfs @ 2.76 fps)

Summary for Pond CB4: PROP. CB-4

Inflow Area =	14,726 sf,	79.59% Impervious,	Inflow Depth =	5.99"	for 25-Year event
Inflow =	2.46 cfs @	12.03 hrs, Volume=	7,356 cf		
Outflow =	2.46 cfs @	12.03 hrs, Volume=	7,356 cf,	Atten= 0%,	Lag= 0.0 min
Primary =	2.46 cfs @	12.03 hrs, Volume=	7,356 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 43.15' @ 12.03 hrs
Flood Elev= 45.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	42.20'	**12.0" Round Culvert** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.20' / 42.00' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.46 cfs @ 12.03 hrs HW=43.14' TW=41.97' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.46 cfs @ 4.13 fps)

Summary for Pond CB5: PROP. CB-5

Inflow Area =	2,118 sf,	93.34% Impervious,	Inflow Depth =	6.64"	for 25-Year event
Inflow =	0.41 cfs @	12.01 hrs, Volume=	1,173 cf		
Outflow =	0.41 cfs @	12.01 hrs, Volume=	1,173 cf,	Atten= 0%,	Lag= 0.0 min
Primary =	0.41 cfs @	12.01 hrs, Volume=	1,173 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 43.02' @ 12.01 hrs
Flood Elev= 47.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	42.70'	**12.0" Round Culvert** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.70' / 42.50' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.40 cfs @ 12.01 hrs HW=43.01' TW=41.75' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.40 cfs @ 1.91 fps)

Summary for Pond CB6: PROP. CB-6

Inflow Area = 3,501 sf,100.00% Impervious, Inflow Depth = 6.88" for 25-Year event
Inflow = 0.68 cfs @ 12.01 hrs, Volume= 2,007 cf
Outflow = 0.68 cfs @ 12.01 hrs, Volume= 2,007 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.68 cfs @ 12.01 hrs, Volume= 2,007 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 42.63' @ 12.01 hrs
Flood Elev= 45.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	42.20'	**12.0" Round Culvert** L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.20' / 42.00' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.68 cfs @ 12.01 hrs HW=42.63' TW=41.59' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 0.68 cfs @ 3.09 fps)

Summary for Pond CB7: PROP. CB-7

Inflow Area = 3,767 sf, 91.16% Impervious, Inflow Depth = 6.53" for 25-Year event
Inflow = 0.64 cfs @ 12.06 hrs, Volume= 2,048 cf
Outflow = 0.64 cfs @ 12.06 hrs, Volume= 2,048 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.64 cfs @ 12.06 hrs, Volume= 2,048 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 42.61' @ 12.06 hrs
Flood Elev= 45.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	42.20'	**12.0" Round Culvert** L= 9.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.20' / 42.00' S= 0.0222 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.64 cfs @ 12.06 hrs HW=42.61' TW=41.95' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 0.64 cfs @ 3.15 fps)

Summary for Pond DMH1: PROP. DMH-1

Inflow Area = 12,185 sf, 95.26% Impervious, Inflow Depth = 6.66" for 25-Year event
Inflow = 2.32 cfs @ 12.01 hrs, Volume= 6,762 cf
Outflow = 2.32 cfs @ 12.01 hrs, Volume= 6,762 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.32 cfs @ 12.01 hrs, Volume= 6,762 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 44.18' @ 12.12 hrs
Flood Elev= 47.45'

Device	Routing	Invert	Outlet Devices
#1	Primary	42.00'	**12.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.00' / 41.75' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.02 cfs @ 12.01 hrs HW=43.77' TW=43.48' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 2.02 cfs @ 2.57 fps)

Summary for Pond DMH2: PROP. DMH-2

[80] Warning: Exceeded Pond DMH6 by 0.28' @ 12.27 hrs (4.54 cfs 326 cf)
[80] Warning: Exceeded Pond INF-2 by 2.44' @ 12.04 hrs (4.70 cfs 734 cf)

Inflow Area =	91,662 sf,	87.15% Impervious,	Inflow Depth =	3.45"	for 25-Year event
Inflow =	7.78 cfs @	12.04 hrs, Volume=	26,369 cf		
Outflow =	7.78 cfs @	12.04 hrs, Volume=	26,369 cf,	Atten= 0%,	Lag= 0.0 min
Primary =	7.78 cfs @	12.04 hrs, Volume=	26,369 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 44.63' @ 12.04 hrs
Flood Elev= 46.55'

Device	Routing	Invert	Outlet Devices
#1	Primary	39.55'	**18.0" Round Culvert** L= 23.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 39.55' / 39.40' S= 0.0065 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=7.09 cfs @ 12.04 hrs HW=44.48' TW=43.79' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 7.09 cfs @ 4.01 fps)

Summary for Pond DMH3: PROP. DMH-3

[80] Warning: Exceeded Pond DMH2 by 0.17' @ 12.26 hrs (3.53 cfs 226 cf)
[80] Warning: Exceeded Pond EX. CB9 by 0.01' @ 12.26 hrs (0.41 cfs 15 cf)

Inflow Area =	134,061 sf,	87.70% Impervious,	Inflow Depth =	3.74"	for 25-Year event
Inflow =	12.17 cfs @	12.04 hrs, Volume=	41,772 cf		
Outflow =	12.17 cfs @	12.04 hrs, Volume=	41,772 cf,	Atten= 0%,	Lag= 0.0 min
Primary =	12.17 cfs @	12.04 hrs, Volume=	41,772 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 43.80' @ 12.04 hrs
Flood Elev= 45.45'

Device	Routing	Invert	Outlet Devices
#1	Primary	39.40'	**18.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 39.40' / 39.20' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=11.79 cfs @ 12.04 hrs HW=43.78' TW=41.86' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 11.79 cfs @ 6.67 fps)

Summary for Pond DMH4: PROP. DMH-4

[58] Hint: Peaked 1.41' above defined flood level

Inflow Area =	45,835 sf,	81.90% Impervious,	Inflow Depth =	5.42"	for 25-Year event
Inflow =	7.78 cfs @	12.04 hrs, Volume=	20,711 cf		
Outflow =	7.78 cfs @	12.04 hrs, Volume=	20,711 cf,	Atten= 0%,	Lag= 0.0 min
Primary =	7.78 cfs @	12.04 hrs, Volume=	20,711 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 46.61' @ 12.07 hrs
Flood Elev= 45.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	40.20'	**18.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.20' / 40.05' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.89 cfs @ 12.04 hrs HW=44.78' TW=44.57' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 3.89 cfs @ 2.20 fps)

Summary for Pond DMH5: PROP. DMH-5

[80] Warning: Exceeded Pond DMH4 by 0.37' @ 12.29 hrs (5.18 cfs 556 cf)

Inflow Area =	45,835 sf,	81.90% Impervious,	Inflow Depth =	5.42"	for 25-Year event
Inflow =	7.78 cfs @	12.04 hrs, Volume=	20,711 cf		
Outflow =	7.78 cfs @	12.04 hrs, Volume=	20,711 cf,	Atten= 0%,	Lag= 0.0 min
Primary =	7.78 cfs @	12.04 hrs, Volume=	20,711 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 46.04' @ 12.06 hrs
Flood Elev= 46.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	40.05'	**18.0" Round Culvert** L= 47.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.05' / 39.80' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.43 cfs @ 12.04 hrs HW=44.57' TW=44.57' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 0.43 cfs @ 0.24 fps)

Summary for Pond DMH6: PROP. DMH-6

[80] Warning: Exceeded Pond DMH5 by 0.37' @ 12.28 hrs (5.18 cfs 556 cf)
[80] Warning: Exceeded Pond INF-3 by 3.36' @ 12.05 hrs (6.54 cfs 1,555 cf)

Inflow Area =	62,024 sf,	86.09% Impervious,	Inflow Depth =	4.40"	for 25-Year event
Inflow =	7.78 cfs @	12.04 hrs, Volume=	22,754 cf		
Outflow =	7.78 cfs @	12.04 hrs, Volume=	22,754 cf,	Atten= 0%,	Lag= 0.0 min
Primary =	7.78 cfs @	12.04 hrs, Volume=	22,754 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 45.34' @ 12.05 hrs
Flood Elev= 45.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	39.80'	**18.0" Round Culvert** L= 59.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 39.80' / 39.55' S= 0.0042 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=2.52 cfs @ 12.04 hrs HW=44.57' TW=44.48' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 2.52 cfs @ 1.43 fps)

Summary for Pond EX CB12: EXIST. CB12 (STORMCEPTOR)

[58] Hint: Peaked 8.61' above defined flood level

Inflow Area =	8,890 sf,	80.99% Impervious,	Inflow Depth =	6.06"	for 25-Year event
Inflow =	1.62 cfs @	12.01 hrs, Volume=	4,487 cf		
Outflow =	1.62 cfs @	12.01 hrs, Volume=	4,487 cf,	Atten= 0%,	Lag= 0.0 min
Primary =	1.62 cfs @	12.01 hrs, Volume=	4,487 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 54.55' @ 12.08 hrs
Flood Elev= 45.94'

Device	Routing	Invert	Outlet Devices
#1	Primary	43.09'	**12.0" Round Culvert** L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 43.09' / 42.72' S= 0.0231 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.01 hrs HW=45.28' TW=45.59' (Dynamic Tailwater)
↑**1=Culvert** (Controls 0.00 cfs)

Summary for Pond EX. CB-D: EX. DMH - DESIGN POINT #3

Inflow Area = 134,061 sf, 87.70% Impervious, Inflow Depth = 3.74" for 25-Year event
Inflow = 12.17 cfs @ 12.04 hrs, Volume= 41,772 cf
Outflow = 12.17 cfs @ 12.04 hrs, Volume= 41,772 cf, Atten= 0%, Lag= 0.0 min
Primary = 12.17 cfs @ 12.04 hrs, Volume= 41,772 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 41.88' @ 12.04 hrs
Flood Elev= 44.18'

Device	Routing	Invert	Outlet Devices
#1	Primary	39.09'	**18.0" Round Culvert** L= 164.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 39.09' / 32.55' S= 0.0399 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=12.10 cfs @ 12.04 hrs HW=41.86' (Free Discharge)
1=Culvert (Inlet Controls 12.10 cfs @ 6.85 fps)

Summary for Pond EX. CB3A: EX. CB-3A - DESIGN POINT #1

Inflow Area = 15,909 sf, 93.10% Impervious, Inflow Depth = 6.53" for 25-Year event
Inflow = 2.85 cfs @ 12.04 hrs, Volume= 8,651 cf
Outflow = 2.85 cfs @ 12.04 hrs, Volume= 8,651 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.85 cfs @ 12.04 hrs, Volume= 8,651 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 43.08' @ 12.04 hrs
Flood Elev= 44.62'

Device	Routing	Invert	Outlet Devices
#1	Primary	41.82'	**12.0" Round Culvert** L= 46.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 41.82' / 41.56' S= 0.0057 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.84 cfs @ 12.04 hrs HW=43.07' (Free Discharge)
1=Culvert (Barrel Controls 2.84 cfs @ 3.71 fps)

Summary for Pond EX. CB5: EX. CB-5

[58] Hint: Peaked 6.74' above defined flood level
[80] Warning: Exceeded Pond EX.INF2 by 2.72' @ 12.02 hrs (6.23 cfs 2,001 cf)

Inflow Area = 26,464 sf, 79.29% Impervious, Inflow Depth = 4.83" for 25-Year event
Inflow = 4.60 cfs @ 12.22 hrs, Volume= 10,650 cf
Outflow = 4.60 cfs @ 12.22 hrs, Volume= 10,650 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.60 cfs @ 12.22 hrs, Volume= 10,650 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Peak Elev= 54.42' @ 12.06 hrs
Flood Elev= 47.68'

Device	Routing	Invert	Outlet Devices
#1	Primary	41.93'	**12.0" Round Culvert** L= 170.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 41.93' / 41.50' S= 0.0025 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.07 cfs @ 12.22 hrs HW=47.28' TW=45.66' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 3.07 cfs @ 3.91 fps)

Summary for Pond EX. CB5A: EX. CB-5A

[58] Hint: Peaked 6.03' above defined flood level

Inflow Area =	31,379 sf,	80.95% Impervious,	Inflow Depth =	5.08"	for 25-Year event
Inflow =	5.31 cfs @	12.02 hrs, Volume=	13,274 cf		
Outflow =	5.31 cfs @	12.02 hrs, Volume=	13,274 cf,	Atten= 0%,	Lag= 0.0 min
Primary =	5.31 cfs @	12.02 hrs, Volume=	13,274 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 51.44' @ 12.06 hrs
Flood Elev= 45.41'

Device	Routing	Invert	Outlet Devices
#1	Primary	41.30'	**12.0" Round Culvert** L= 98.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 41.15' / 41.30' S= -0.0015 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.66 cfs @ 12.02 hrs HW=47.90' TW=47.08' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 2.66 cfs @ 3.38 fps)

Summary for Pond EX. CB6: EX. CB-6 (STORMCEPTOR)

[58] Hint: Peaked 5.82' above defined flood level

Inflow Area =	45,835 sf,	81.90% Impervious,	Inflow Depth =	5.42"	for 25-Year event
Inflow =	7.78 cfs @	12.04 hrs, Volume=	20,711 cf		
Outflow =	7.78 cfs @	12.04 hrs, Volume=	20,711 cf,	Atten= 0%,	Lag= 0.0 min
Primary =	7.78 cfs @	12.04 hrs, Volume=	20,711 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 49.72' @ 12.08 hrs
Flood Elev= 43.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	40.55'	**12.0" Round Culvert** L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.55' / 40.30' S= 0.0056 '/' Cc= 0.900

n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=7.25 cfs @ 12.04 hrs HW=48.63' TW=44.78' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 7.25 cfs @ 9.23 fps)

Summary for Pond EX. CB8: EX. CB-8

[80] Warning: Exceeded Pond INF-1 by 2.29' @ 12.05 hrs (5.73 cfs 1,085 cf)

Inflow Area =	33,645 sf,	88.93% Impervious,	Inflow Depth =	3.83"	for 25-Year event
Inflow =	2.93 cfs @	12.03 hrs, Volume=	10,728 cf		
Outflow =	2.93 cfs @	12.03 hrs, Volume=	10,728 cf,	Atten= 0%,	Lag= 0.0 min
Primary =	2.93 cfs @	12.03 hrs, Volume=	10,728 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 46.13' @ 12.05 hrs
Flood Elev= 47.08'

Device	Routing	Invert	Outlet Devices
#1	Primary	41.38'	**12.0" Round Culvert** L= 128.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 41.38' / 40.64' S= 0.0058 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.55 cfs @ 12.03 hrs HW=44.68' TW=44.34' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 1.55 cfs @ 1.97 fps)

Summary for Pond EX. CB9: EX. CB-9

Inflow Area =	42,399 sf,	88.89% Impervious,	Inflow Depth =	4.36"	for 25-Year event
Inflow =	4.41 cfs @	12.03 hrs, Volume=	15,402 cf		
Outflow =	4.41 cfs @	12.03 hrs, Volume=	15,402 cf,	Atten= 0%,	Lag= 0.0 min
Primary =	4.41 cfs @	12.03 hrs, Volume=	15,402 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 45.08' @ 12.05 hrs
Flood Elev= 45.09'

Device	Routing	Invert	Outlet Devices
#1	Primary	40.09'	**12.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.09' / 39.40' S= 0.0230 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.60 cfs @ 12.03 hrs HW=44.65' TW=43.74' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 3.60 cfs @ 4.58 fps)

Summary for Pond EX.INF2: EXIST. INFILTRATION SYSTEM #2

The soils present in the area of the infiltration system consist of Urban Land (NRCS classification 699). Due to the limited information provided for this soil type, 140C Chatfield-Hollis-Canton Complex was used as the closest soil present within the site.

The bottom of the stone in the infiltration system is approximately 6' below existing grade. Per USDA Soil Data Mart, the lowest value for the Saturated Ksat Value for this soil at a depth of 21-60"' +/- is 42.33 micrometers/second.

Per NHDES Stormwater Manual: Vol. 2, pages 16-17 using a factor of safety of 2, the infiltration rate for this system is as follows:

42.33/2 (FS) = 21.17 micro/sec.
Converting to inches/hr with a conversion factor of 0.1417 = (21.17 * 0.1417 = 3.00 in/hr)

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[93] Warning: Storage range exceeded by 9.14'
[58] Hint: Peaked 9.48' above defined flood level
[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=13)
[80] Warning: Exceeded Pond EX CB12 by 2.67' @ 12.03 hrs (6.17 cfs 1,217 cf)

Inflow Area =	8,890 sf,	80.99% Impervious,	Inflow Depth =	6.06"	for 25-Year event
Inflow =	1.62 cfs @	12.01 hrs,	Volume=	4,487 cf	
Outflow =	3.50 cfs @	12.22 hrs,	Volume=	4,487 cf,	Atten= 0%, Lag= 12.3 min
Discarded =	0.05 cfs @	12.07 hrs,	Volume=	2,537 cf	
Primary =	3.46 cfs @	12.22 hrs,	Volume=	1,950 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 54.48' @ 12.07 hrs Surf.Area= 582 sf Storage= 1,000 cf
Flood Elev= 45.00' Surf.Area= 582 sf Storage= 922 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 78.9 min (850.2 - 771.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	42.00'	583 cf	**13.23'W x 44.00'L x 3.33'H Field A** 1,941 cf Overall - 484 cf Embedded = 1,457 cf x 40.0% Voids
#2A	42.50'	372 cf	**ADS N-12 24"** x 6 Inside #1 Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf 6 Chambers in 3 Rows
#3	42.50'	14 cf	**24.0" Round Pipe Storage** x 4 Inside #1 L= 1.1'
#4	42.50'	31 cf	**24.0" Round Pipe Storage** -Impervious L= 10.0'
		1,000 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	42.50'	**12.0" Round Culvert** L= 32.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.50' / 42.34' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	43.90'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	44.50'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	42.00'	**3.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'

Discarded OutFlow Max=0.05 cfs @ 12.07 hrs HW=54.46' (Free Discharge)
└**4=Exfiltration** (Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 12.22 hrs HW=44.97' TW=47.29' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond INF-1: U/G INF-1

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=287)

Inflow Area =	16,985 sf, 96.60% Impervious,	Inflow Depth =	6.72"	for 25-Year event
Inflow =	3.23 cfs @ 12.01 hrs, Volume=	9,515 cf		
Outflow =	2.06 cfs @ 12.22 hrs, Volume=	9,515 cf,	Atten= 36%,	Lag= 12.7 min
Discarded =	0.27 cfs @ 12.12 hrs, Volume=	7,196 cf		
Primary =	1.80 cfs @ 12.22 hrs, Volume=	2,319 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 44.12' @ 12.12 hrs Surf.Area= 1,650 sf Storage= 2,731 cf
Flood Elev= 45.50' Surf.Area= 1,650 sf Storage= 3,868 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 42.9 min (787.7 - 744.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	41.25'	1,910 cf	**27.50'W x 60.00'L x 4.50'H Field A** 7,425 cf Overall - 2,649 cf Embedded = 4,776 cf x 40.0% Voids
#2A	41.75'	2,123 cf	**ADS N-12 36"** x 15 Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf Row Length Adjustment= -10.00' x 7.10 sf x 5 rows 24.50' Header x 7.10 sf x 2 = 347.9 cf Inside
		4,033 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	41.75'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 41.75' / 41.50' S= 0.0076 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Discarded	41.25'	**3.000 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 38.25'
#3	Device 1	42.90'	**9.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	45.40'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.27 cfs @ 12.12 hrs HW=44.12' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.27 cfs)

Primary OutFlow Max=1.73 cfs @ 12.22 hrs HW=43.93' TW=43.09' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 1.73 cfs of 3.47 cfs potential flow)
↑—**3=Orifice/Grate** (Orifice Controls 1.73 cfs @ 3.91 fps)
└—**4=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond INF-2: U/G INF-2

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=348)

Inflow Area =	29,638 sf,	89.38% Impervious,	Inflow Depth =	4.37"	for 25-Year event
Inflow =	4.76 cfs @	12.03 hrs, Volume=	10,796 cf		
Outflow =	1.55 cfs @	12.26 hrs, Volume=	10,797 cf,	Atten= 67%,	Lag= 14.0 min
Discarded =	0.36 cfs @	12.30 hrs, Volume=	7,182 cf		
Primary =	1.20 cfs @	12.26 hrs, Volume=	3,615 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 42.98' @ 12.30 hrs Surf.Area= 2,114 sf Storage= 3,639 cf
Flood Elev= 44.25' Surf.Area= 2,114 sf Storage= 4,939 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 36.9 min (795.5 - 758.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	40.00'	2,463 cf	**22.25'W x 95.00'L x 4.50'H Field A** 9,512 cf Overall - 3,354 cf Embedded = 6,158 cf x 40.0% Voids
#2A	40.50'	2,687 cf	**ADS N-12 36"** x 16 Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf Row Length Adjustment= +5.00' x 7.10 sf x 4 rows 19.25' Header x 7.10 sf x 2 = 273.3 cf Inside
		5,151 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	40.30'	**15.0" Round Culvert** L= 147.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.30' / 39.55' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Discarded	40.00'	**3.000 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 37.00'
#3	Device 1	41.25'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	44.15'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.36 cfs @ 12.30 hrs HW=42.98' (Free Discharge)
└**2=Exfiltration** (Controls 0.36 cfs)

Primary OutFlow Max=1.08 cfs @ 12.26 hrs HW=42.97' TW=41.67' (Dynamic Tailwater)
└**1=Culvert** (Passes 1.08 cfs of 5.06 cfs potential flow)
├**3=Orifice/Grate** (Orifice Controls 1.08 cfs @ 5.50 fps)
└**4=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond INF-3: U/G INF-3

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=297)

Inflow Area =	16,189 sf, 97.94% Impervious,	Inflow Depth =	6.80"	for 25-Year event
Inflow =	2.90 cfs @ 12.02 hrs, Volume=	9,171 cf		
Outflow =	1.22 cfs @ 12.40 hrs, Volume=	9,171 cf,	Atten= 58%,	Lag= 23.1 min
Discarded =	0.28 cfs @ 12.27 hrs, Volume=	7,128 cf		
Primary =	0.95 cfs @ 12.40 hrs, Volume=	2,043 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 42.52' @ 12.27 hrs Surf.Area= 1,650 sf Storage= 2,898 cf
Flood Elev= 43.75' Surf.Area= 1,650 sf Storage= 3,868 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 45.1 min (787.5 - 742.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	39.50'	1,910 cf	**27.50'W x 60.00'L x 4.50'H Field A** 7,425 cf Overall - 2,649 cf Embedded = 4,776 cf x 40.0% Voids
#2A	40.00'	2,123 cf	**ADS N-12 36"** x 15 Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf Row Length Adjustment= -10.00' x 7.10 sf x 5 rows 24.50' Header x 7.10 sf x 2 = 347.9 cf Inside
		4,033 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	40.00'	**12.0" Round Culvert** L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.00' / 39.80' S= 0.0125 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Discarded	39.50'	**3.000 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 36.50'
#3	Device 1	41.10'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	43.65'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.28 cfs @ 12.27 hrs HW=42.52' (Free Discharge)
└**2=Exfiltration** (Controls 0.28 cfs)

Primary OutFlow Max=0.95 cfs @ 12.40 hrs HW=42.37' TW=41.32' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.95 cfs of 3.86 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 0.95 cfs @ 4.85 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond INF-4: U/G INF-4

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=166)

Inflow Area =	12,794 sf,100.00% Impervious,	Inflow Depth =	6.88"	for 25-Year event
Inflow =	2.45 cfs @ 12.01 hrs, Volume=	7,336 cf		
Outflow =	2.13 cfs @ 12.04 hrs, Volume=	7,336 cf,	Atten= 13%,	Lag= 1.7 min
Discarded =	0.15 cfs @ 12.04 hrs, Volume=	5,069 cf		
Primary =	1.98 cfs @ 12.04 hrs, Volume=	2,267 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 43.13' @ 12.04 hrs Surf.Area= 779 sf Storage= 1,416 cf
Flood Elev= 44.25' Surf.Area= 779 sf Storage= 1,816 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 54.1 min (792.2 - 738.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	40.00'	911 cf	**22.25'W x 35.00'L x 4.50'H Field A** 3,504 cf Overall - 1,227 cf Embedded = 2,277 cf x 40.0% Voids
#2A	40.50'	983 cf	**ADS N-12 36"** x 4 Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf Row Length Adjustment= +5.00' x 7.10 sf x 4 rows 19.25' Header x 7.10 sf x 2 = 273.3 cf Inside
		1,894 cf	Total Available Storage

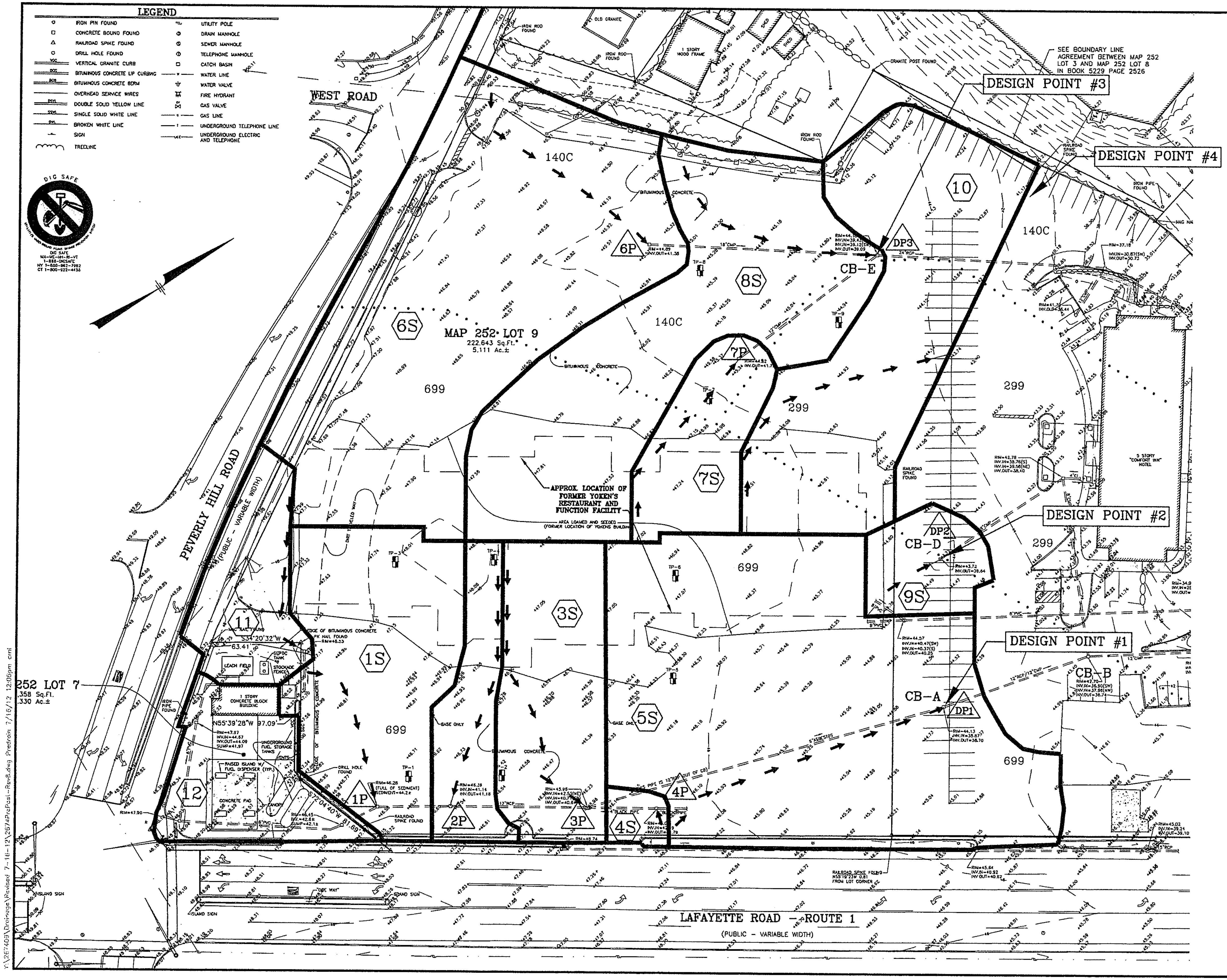
Storage Group A created with Chamber Wizard

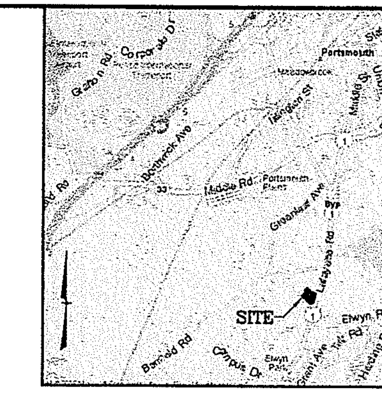
Device	Routing	Invert	Outlet Devices
#1	Primary	42.35'	**12.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500

			Inlet / Outlet Invert= 42.35' / 42.00' S= 0.0350 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Discarded	40.00'	**3.000 in/hr Exfiltration over Wetted area**
			Conductivity to Groundwater Elevation = 37.00'

Discarded OutFlow Max=0.15 cfs @ 12.04 hrs HW=43.13' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.15 cfs)

Primary OutFlow Max=1.98 cfs @ 12.04 hrs HW=43.13' TW=42.13' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 1.98 cfs @ 3.01 fps)


LEGEND
IRON PIN FOUND
CONCRETE BOUND FOUND
RAILROAD SPIKE FOUND
DRILL HOLE FOUND
VERTICAL GRANITE CURB
BITUMINOUS CONCRETE LIP CURBING
BITUMINOUS CONCRETE BERM
OVERHEAD SERVICE WIRES
DOUBLE SOLID YELLOW LINE
SINGLE SOLID WHITE LINE
BROKEN WHITE LINE
SIGN
TREELINE
UTILITY POLE
DRAIN MANHOLE
SEWER MANHOLE
TELEPHONE MANHOLE
CATCH BASIN
WATER LINE
WATER VALVE
FIRE HYDRANT
GAS VALVE
GAS LINE
UNDERGROUND TELEPHONE LINE
UNDERGROUND ELECTRIC AND TELEPHONE
DIG SAFE
WEST ROAD
PEVERLY HILL ROAD
(PUBLIC - VARIABLE WIDTH)
LAFAYETTE ROAD - ROUTE 1
(PUBLIC - VARIABLE WIDTH)
MAP 252 LOT 9
222,643 Sq.Ft.
5.111 Ac.±
252 LOT 7
DESIGN POINT #1
DESIGN POINT #2
DESIGN POINT #3
DESIGN POINT #4
SEE BOUNDARY LINE AGREEMENT BETWEEN MAP 252 LOT 3 AND MAP 252 LOT 8 IN BOOK 5229 PAGE 2526
APPROX. LOCATION OF FORMER YOKEN'S RESTAURANT AND FUNCTION FACILITY
AREA LOAMED AND SEEDED (FORMER LOCATION OF YOKENS BUILDING)
1 STORY CONCRETE BLOCK BUILDING
UNDERGROUND FUEL STORAGE TANKS
RAISED ISLAND W/ FUEL DISPENSER (TYP.)
CONCRETE PAD
CANOPY
LEACH FIELD
SEPTIC TANK
STOCKADE FENCE
N55°39'28"W 97.09'
S34°20'32"W 63.41'
S72°01'40"W 81.69'
5 STORY "COMFORT INN" HOTEL
1 STORY WOOD FRAME
1S
2P
3S
3P
4S
4P
5S
6S
6P
7S
7P
8S
9S
10
11
12
1P
DP1
DP2
DP3
CB-A
CB-B
CB-D
CB-E
140C
299
699



LOCATION MAP
(NOT TO SCALE)

WATERSHED LEGEND:

(1) SUBCATCHMENT: A relatively homogeneous area of land that drains into a single reach or pond. Each subcatchment generates a runoff hydrograph. (A subcatchment may also be used to account for the rain falling directly on the surface of a pond.)

[1] REACH: A uniform stream, channel, or pipe that conveys water from one point to another reach or pond. The outflow of each reach is determined by a hydrograph routing calculation.

△1 POND: A pond, swamp, dam, or other impoundment that fills with water from one or more sources and empties in a manner determined by a weir, culvert, or other device(s) at its outlet. The outflow(s) of each pond is determined by a hydrograph routing calculation. The primary and/or secondary outflow may drain into a reach or into another pond.

— Time of Concentration Path (Tc)

140C NRCS Soil Classification

NRCS SOIL LINE

DRAINAGE DIVIDE LINE

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

NO.	DESCRIPTION	BY	DATE
1	MISC. REVISIONS	CMT	2/24/12

REVISIONS

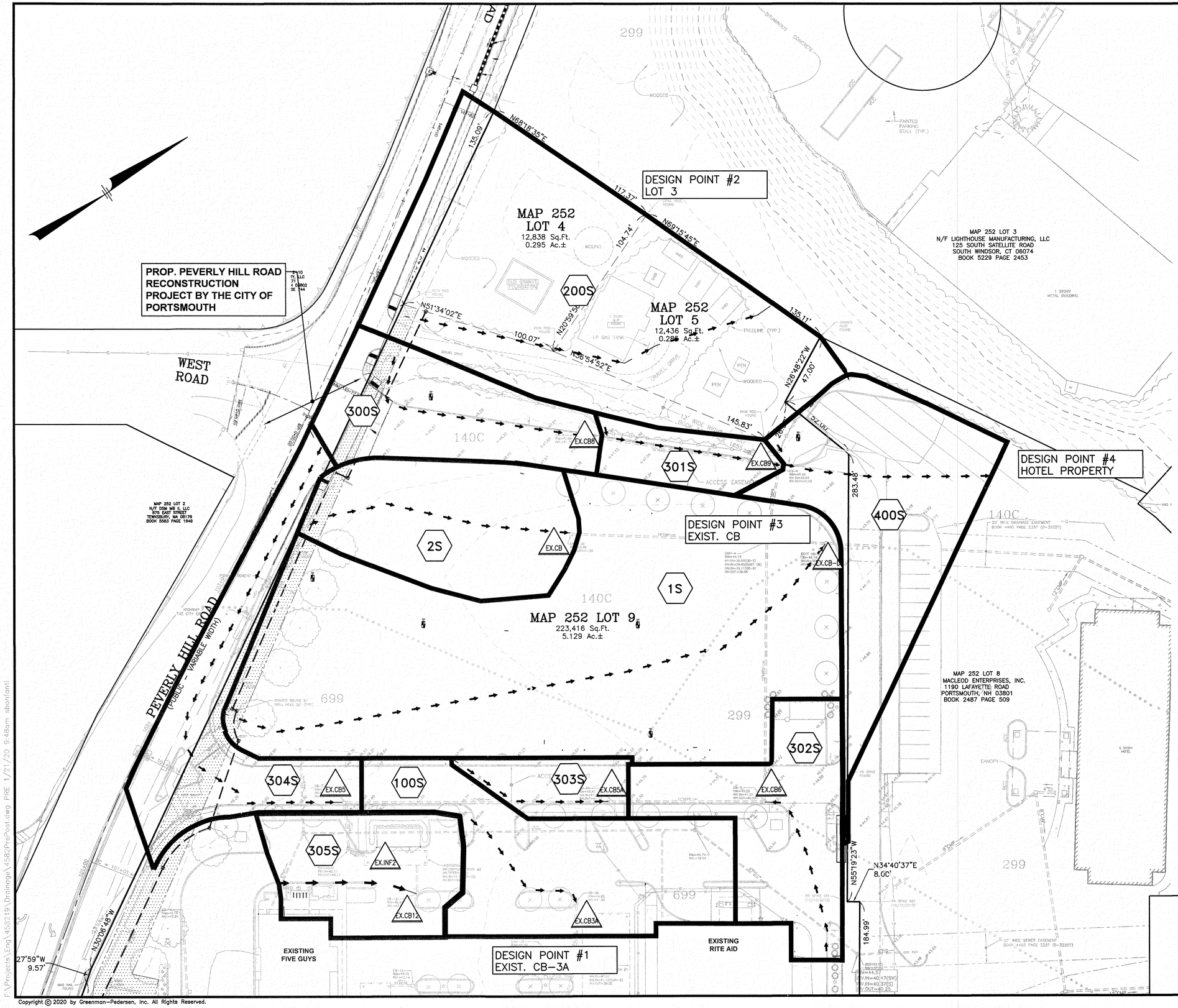
PRE DEVELOPMENT DRAINAGE PLAN

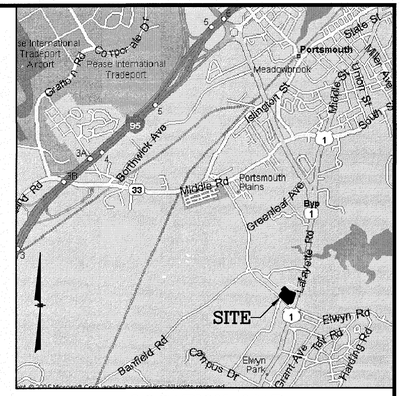
TAX MAP 252 LOTS 7 & 9
1390 & 1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

PREPARED FOR:
4 AMIGOS, LLC
321D LAFAYETTE ROAD
HAMPTON, NH 03842

MHF Design Consultants, Inc.
44 Stiles Road, Suite One
Salem, New Hampshire 03079
(603) 893-0720
ENGINEERS • PLANNERS • SURVEYORS
www.mhfdesign.com

SCALE: 1"= 40'	DATE: FEBRUARY 13, 2012		DRAWING NO. 2674PrePost-Rev2.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
CMT	FCM	267409	1 OF 1





LOCATION MAP
(NOT TO SCALE)

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Time of Concentration Path (Tc)

SOIL LEGEND

602 — SOIL TYPE DESIGNATION

SOIL BOUNDARY

OWNER OF RECORD:

MAP 252 LOT 7
4 AMIGOS LLC
321 LAFAYETTE ROAD, UNIT D
HAMPTON, NH 03842

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

NO.	DESCRIPTION	BY	DATE

REVISIONS

PRE-DEVELOPMENT DRAINAGE PLAN

ASSESSORS MAP 252 - LOTS 4,5 & 9
1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

GPI — Engineering, Design, Planning, Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: 1"=30'	DATE: JANUARY 21, 2020		DRAWING NO. 4582PREPOST.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
SJB	CMT	458219	1 OF 1

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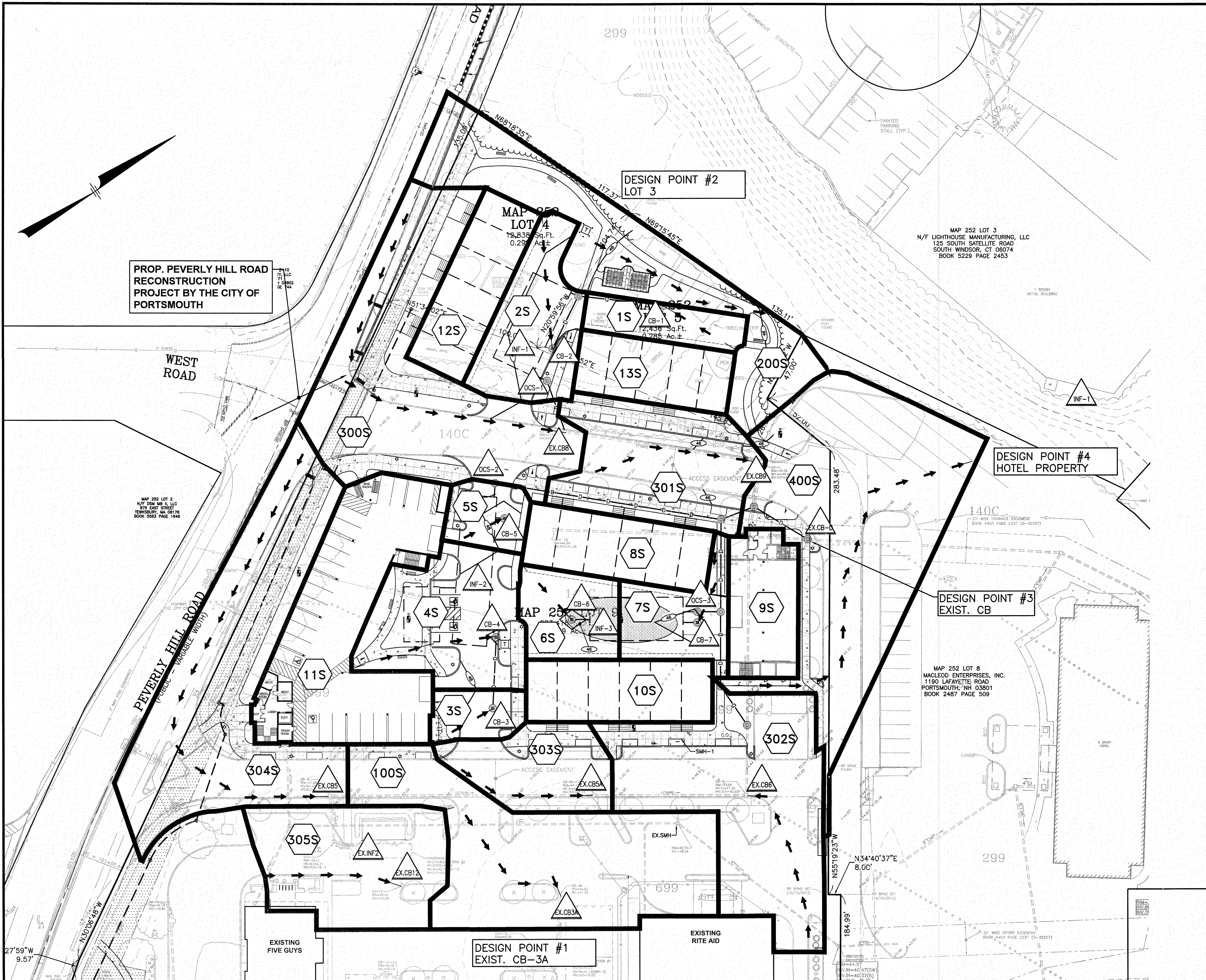

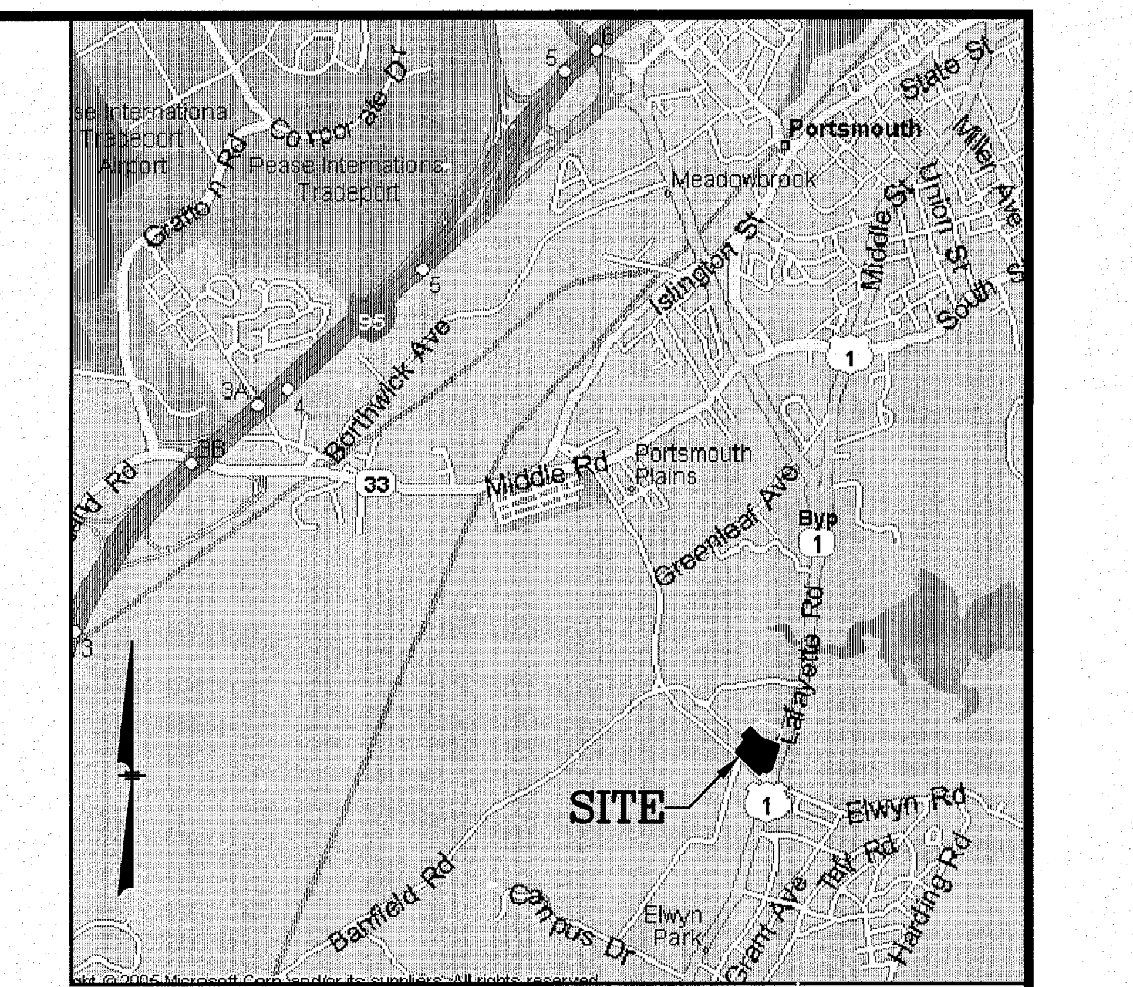

LOCATION MAP
(NOT TO SCALE)

WATERSHED LEGEND:

SUBCATCHMENT: A relatively homogeneous area of land that drains into a single reach or pond. Each subcatchment generates a runoff hydrograph. (A subcatchment may also be used to account for the rain falling directly on the surface of a pond.)

REACH: A uniform stream, channel, or pipe that conveys water from one point to another reach or pond. The outflow of each reach is determined by a hydrograph routing calculation.

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Time of Concentration Path (Tc)

SOIL LEGEND

602 SOIL TYPE DESIGNATION

SOIL BOUNDARY

OWNER OF RECORD:

MAP 252 LOT 7
4 AMIGOS LLC
321 LAFAYETTE ROAD, UNIT D
HAMPTON, NH 03842

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

POST-DEVELOPMENT DRAINAGE PLAN

ASSESSORS MAP 252 - LOTS 4,5 & 9
1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
PREPARED FOR:
4 AMIGOS, LLC
321 LAFAYETTE ROAD UNIT D
HAMPTON, NEW HAMPSHIRE 03842

GPI Engineering Design Planning Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road
Suite One
Salem, NH 03079

SCALE: 1"=30'	DATE: JANUARY 21, 2020		DRAWING NO. 4582PREPOST.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
SJB	CMT	458219	1 OF 1

INSPECTION & MAINTENANCE MANUAL FOR STORMWATER MANAGEMENT SYSTEMS

GPI

SITE DEVELOPMENT PLANS
1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

GPI

44 Stiles Road, Suite One
Salem, NH 03079
(603) 893-0720

Prepared For:

4 Amigos, LLC
321D Lafayette Road
Hampton, NH 03842

January 21, 2020

4 Amigos, LLC
Site Development Plans
Inspection & Maintenance Manual
January 21, 2020

TABLE OF CONTENTS

SECTION 1 I & M DOCUMENTATION REQUIREMENTS

4 Amigos, LLC shall be responsible for the continued operation, and maintenance of all stormwater management systems in accordance with this manual and the requirements of NHDES AOT Env-Wq 1507.07. Logs of inspections and maintenance shall be maintained and filed with the City of Portsmouth as needed. Copies will need to be kept for the most recent three years and made available to the Planning Board, Conservation Commission, and NHDES upon request.

Logs shall include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. If a maintenance task requires the cleanout of any sediments or debris, the location where the sediment and debris was disposed after removal will be indicated. Disposal of the accumulated sediment and hydrocarbons must be in accordance with applicable local, state, and federal guidelines and regulations.

All stormwater facilities associated with this development are identified on Figure 1 contained within Section 3 of this manual and listed individually on the log form included herein, and shall be inspected and maintained in accordance with the procedures outlined in Section 4.

SECTION 2 BMP SPECIFIC I & M PROCEDURES

Driveway/Parking Lot Sweeping

Sweeping shall be done once in the early fall and then immediately following spring snowmelt to remove sand and other debris and when visual buildup of debris is apparent. Pavement surfaces shall be swept at other times such as in the fall after leaves have dropped to remove accumulated debris. Since contaminants typically accumulate within 12 inches of the curbline, street cleaning operations should concentrate in cleaning curb and gutter lines for maximum pollutant removal efficiency. Other areas shall also be swept periodically when visual buildup of debris is apparent. Once removed from paved surfaces, the sweeping must be handled and disposed of properly. Disposal of the accumulated sediment and hydrocarbons must be in accordance with applicable local, state, and federal guidelines and regulations.

Deep Sump Hooded Catch Basins

Inspect and clean as required all catch basins at least four times per year including at the end of the foliage and snow removal seasons. Sediment must be removed whenever the depth of deposits is greater than or equal to one half the depth from the bottom of sump to the invert of the lowest pipe in the basin. If the basin outlet is designed with a hood to trap floatable materials check to ensure watertight seal is working. Damaged hoods should be replaced when noted by inspection. At a minimum, remove floating debris and hydrocarbons at the time of the inspection. Sediment and debris can be removed by a clamshell bucket; however, a vacuum truck is preferred. Disposal of the accumulated sediment and hydrocarbons must be in accordance with applicable local, state, and federal guidelines and regulations.

Hydrodynamic Separator (First Defense Unit)

Initial maintenance to be performed twice a year for the first year after the unit is online and operational. A vacuum truck must be used at a minimum of once per year for sediment removal. Refer to the attached First Defense Owner's manual for operation and maintenance procedures and schedules thereafter.

Subsurface Stormwater Infiltration Systems

All subsurface systems should initially be inspected within the first three months after completion of the site's construction. Preventive maintenance should be performed at least every six months and sediment shall be removed from pretreatment BMP's after every major storm event. The Infiltration System shall be inspected on regular bi-annual scheduled dates. During the first year of operation, the system shall be inspected after at least two large storm events (> 1 inch) to ensure that it is fully drained within 72 hours. If standing water is present more than 72 hours after a rainfall event, the infiltration system shall be cleaned.

Ponded water in the system indicates potential infiltration failure in the bottom of the pipe and/or stone. In this case, accumulated sediment shall be removed from the bottom utilizing water jets and/or truck mounted vacuum equipment. Sediment and debris removal should be through the use of truck mounted vacuum equipment. Outlet pipes should be flushed to point of discharge on the same frequency as mentioned above. Disposal of the accumulated sediment

and hydrocarbons must be in accordance with applicable local, state, and federal guidelines and regulations.

The following is the recommended procedure to inspect the underground system in service:

1. Locate the riser or cleanout section of the system. The riser/cleanout will typically be 6 or 12" in diameter or larger.
2. Remove the lid from the riser/cleanout.
3. Measure the sediment buildup at each riser and cleanout location. Only certified confined space entry personnel having appropriate equipment should be permitted to enter the system.
4. Inspect each manifold, all laterals, and outlet pipes for sediment build up, obstructions, or other problems. Obstructions should be removed at this time.
5. If measured sediment build up is between 2" to 8", cleaning should be considered; if sediment build up exceeds 8", cleaning should be performed at the earliest opportunity. A thorough cleaning of the system (manifolds and laterals) shall be performed by water jets and/or truck mounted vacuum equipment.

Pretreatment BMP's shall be inspected and cleaned during the regular bi-annual inspections.

The inlet and outlet of the subsurface systems should be checked periodically to ensure that flow structures are not blocked by debris. All pipes connecting the structures to the system should be checked for debris that may obstruct flow. Inspections should be conducted monthly during wet weather conditions from March to November.

Vegetated Areas

Inspect slopes and embankments early in the growing season to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows. During the summer months, all landscape features are to be maintained with the minimum possible amount of fertilizers, pesticides or herbicides.

Winter Maintenance

Proposed snow storage is located along the edge of the roadways. Any excess snow is to be trucked offsite. During the winter months all snow is to be stored such that snowmelt is controlled. Avoid disposing of snow on top of storm drain catch basins or in stormwater drainage swales or ditches. The minimum amount of deicing chemicals needed is to be used. It is recommended that winter maintenance contractors be current UNHT2 Green SnowPro Certified applicators or equivalent. In addition, a NHDES Salt Applicator Certification is recommended, but not required. Information on these certifications can be found in the links provided below:

- http://t2.unh.edu/green-snopro-training-and-nhdes-certification
- http://des.nh.gov/organization/divisions/water/wmb/was/salt-reduction-initiative/salt-applicator-certification.htm

Control of Invasive Species

During maintenance activities, check for the presence of invasive species. Invasive species must be managed/removed in accordance with RSA 430:530 and AGR 3800. See Section 4 of this manual for information from the University of New Hampshire Cooperative Extension and the New Hampshire Guide to Upland Invasive Species from the New Hampshire Department of Agriculture Markets and Food, Plant Industry Division or the information provided on their website (http://www.agriculture.nh.gov/divisions/plant-industry/invasive-plants.htm).

SECTION 3 LONG TERM MAINTENANCE PLAN EXHIBITS

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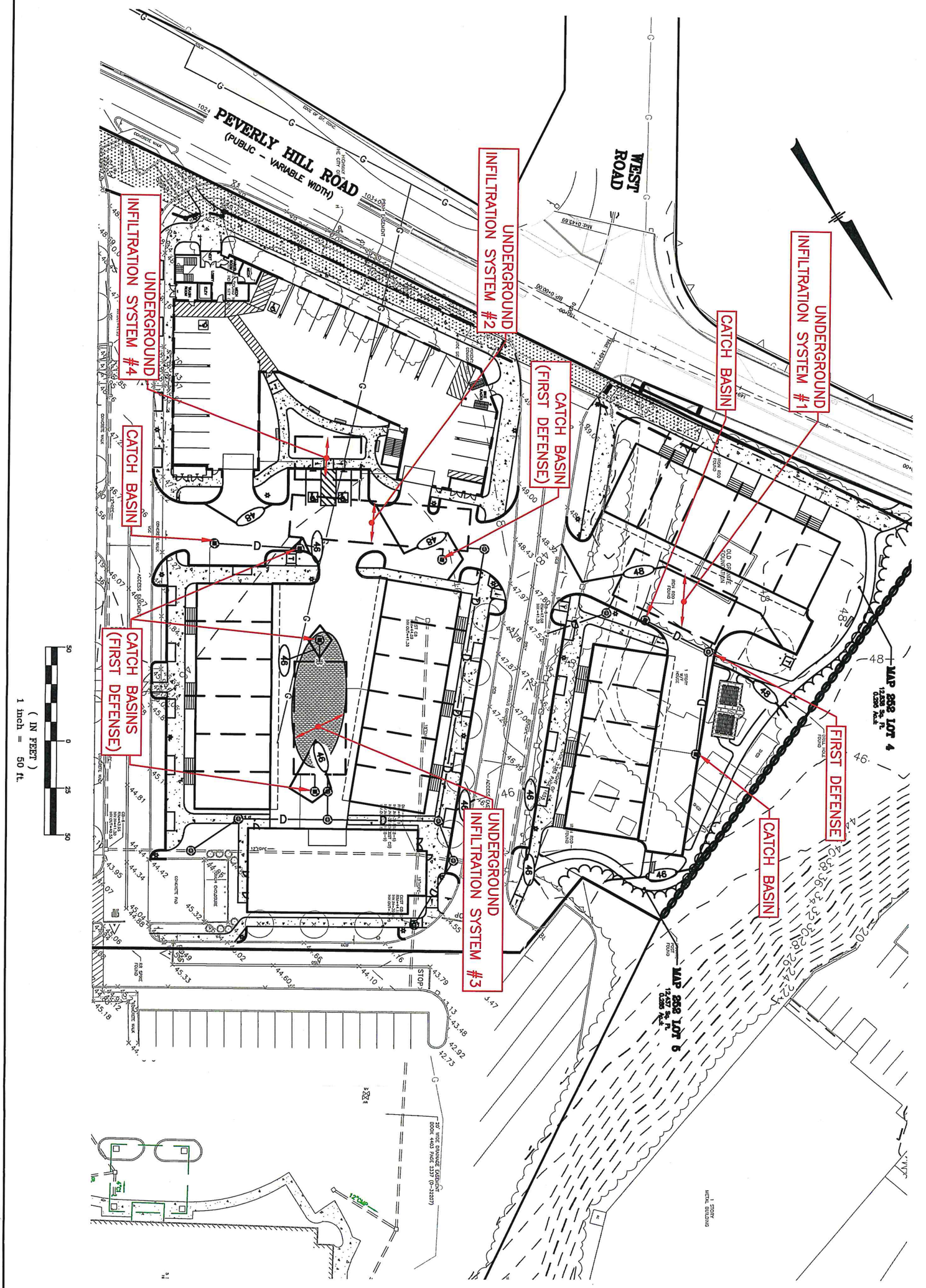

LONG TERM MAINTENANCE PLAN EXHIBIT

1400 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE

GPI Engineering Design Planning Construction Management
603.893.0720 GPINET.COM
Greenman-Pedersen, Inc.
44 Stiles Road, Suite One
Salem, NH 03079

DRAWN BY:	SJB
MHF JOB #:	458219
DATE:	1/21/20
REV.:	–
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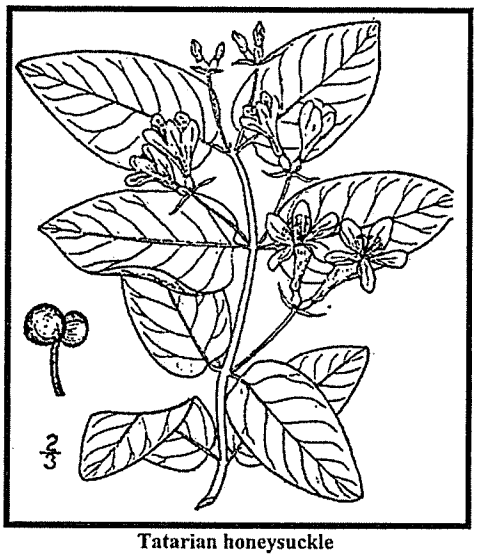
FIGURE	1

SECTION 4 CONTROL OF INVASIVE SPECIES

UNIVERSITY of NEW HAMPSHIRE COOPERATIVE EXTENSION

Methods for Disposing Non-Native Invasive Plants

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



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

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

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

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

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

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

New Hampshire Regulations

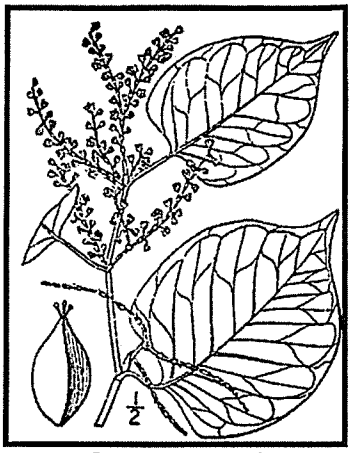
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

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

How and When to Dispose of Invasives?

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

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



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

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

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

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

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

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

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

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

Suggested Disposal Methods for Non-Native Invasive Plants

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

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

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

January 2010

CONTACT INFORMATION

TERRESTRIAL PLANTS

Douglas Cygan, Invasive Species Coordinator, NH Department of Agriculture, Markets & Food, Division of Plant Industry, 29 Hazen Drive, Concord, NH 03301
(603) 271-3488, douglas.cygan@agr.nh.gov
Website: www.agriculture.nh.gov

AQUATIC PLANTS

Amy Smagula, Clean Lakes and Exotic Species Coordinator, NH Department of Environmental Services, 29 Hazen Drive, PO Box 95, Concord, NH 03302
(603) 271-2248, asmagula@des.state.nh.us.

RESOURCES

NH Coastal Watershed Invasive Plant Partnership (CWIPP)
www.des.nh.gov/organization/divisions/water/wmb/coastal/cwipp/index.htm
Invasive Plant Atlas of New England (IPANE)
http://invasives.eeb.uconn.edu/ipane
Natural Resource Conservation Service (NRCS)
http://plants.usda.gov
New England Wildflower Society (NEWS)
www.newfs.org
New Hampshire Department of Agriculture, Markets & Food (DAMF)
www.agriculture.nh.gov
New Hampshire Department of Resources & Economic Development, Natural Heritage Bureau (DRED)
http://www.naturalheritage.org
New Hampshire Department of Resources & Economic Development, Division of Forests and Lands (DRED)
http://www.nhdfl.org/organization/div_nhnhi.htm
New Hampshire Department of Environmental Services (DES)
www.des.state.nh.us/wmb/exoticspecies
New Hampshire Fish & Game Department
www.wildlife.state.nh.us
The Nature Conservancy (TNC)
www.nature.org
U.S. Department of Agriculture's Animal Plant Health Inspection Service (USDA APHIS)
www.aphis.usda.gov
University of New Hampshire Cooperative Extension (UNHCE)
www.ceinfo.unh.edu

Funding for the printing of this booklet provided by:
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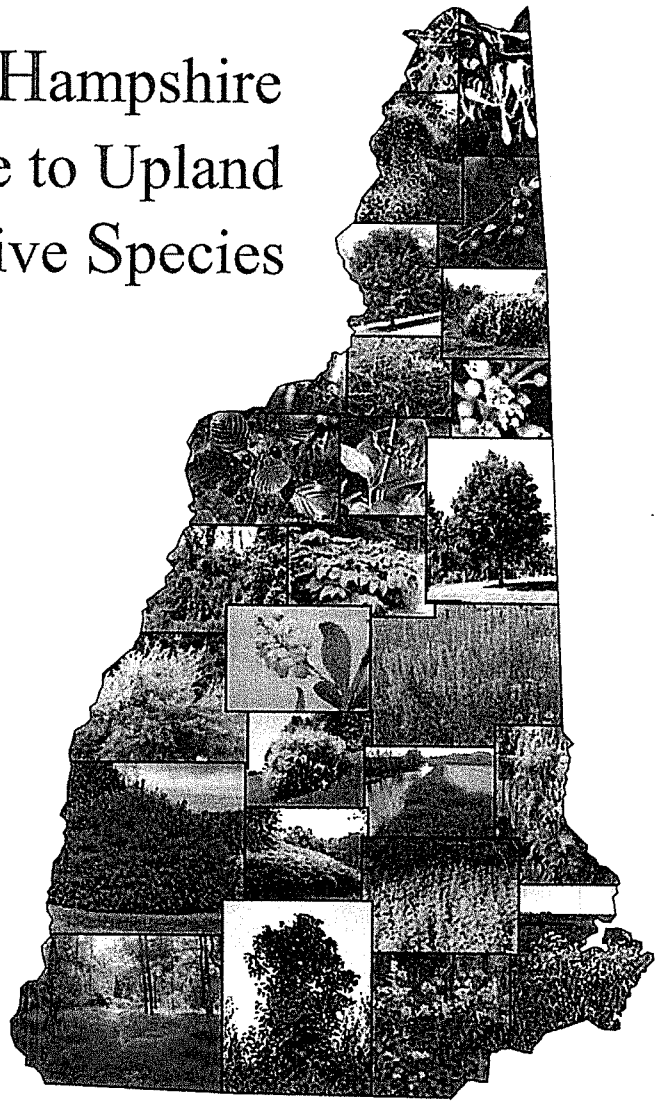
New Hampshire Guide to Upland Invasive Species



New Hampshire
Department of Agriculture
Markets and Food, Plant Industry Division

3rd Edition
2011

Douglas Cygan

Introduction

Throughout the world, non-native invasive species have become an overwhelming problem resulting in impacts to the natural environment and managed landscapes. Invasive species typically possess certain traits that give them an advantage over most native species. The most common traits include the production of many offspring, early and rapid development, and adaptability and high tolerance to many environmental conditions. These traits allow invasive species to be highly competitive and, in many cases, suppress native species. Studies show that invasives can reduce natural diversity, impact endangered or threatened species, reduce wildlife habitat, create water quality impacts, stress and reduce forest and agricultural crop production, damage personal property, and cause health problems.

Invasive species began arriving in North America in the mid-to-late 1700s by various means. Many were brought here for ornamental uses, erosion control, or to provide for wildlife habitat. Others arrived inadvertently through international travel and commerce.

Impacts and Actions

Biologists have found that invasive species cover more than 100 million acres of land in the U.S. and their population numbers continue to spread. The repeated process of spread has become so extreme that invasive species cost the United States billions of dollars per year. This is a result of lost agricultural and forest crops, impacts to natural resources and the environment, and the control efforts required to eradicate them.

On February 3, 1999, President Clinton signed Executive Order 13112, which established the National Invasive Species Council. The Council is responsible for assessing the impacts of invasive species, providing the nation with guidance and leadership on invasive species issues, and seeing that federal programs are coordinated and compatible with state and local initiatives.

Each state is also required to participate by evaluating and responding to their invasive species concerns. In the summer of 2000, the State of New Hampshire passed House Bill 1258-FN, which created the Invasive Species Act (ISA) and the New Hampshire Invasive Species Committee.

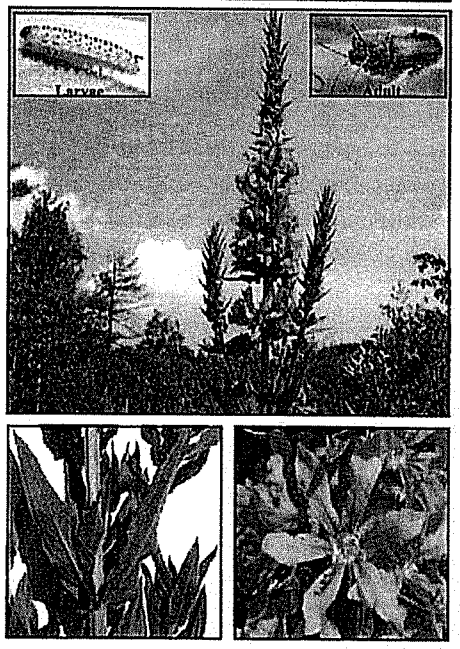
GLOSSARY OF PLANT TERMS

Alternate: Arranged singly at each node, as leaves or buds on different sides of a stem.
Annual: Living or growing for only one year or season.
Aril: A fleshy, usually brightly colored cover of a seed that develops from the ovule stalk and partially or entirely envelops the seed.
Axis: The point at which the leaf is attached to the main stem or branch.
Berry: A small, juicy, fleshy fruit.
Biennial: Having a life cycle that normally takes two growing seasons to complete.
Capsule: A dry dehiscent fruit that develops from two or more united capsules.
Compound: Composed of more than one part.
Deciduous: Shedding or losing foliage at the end of the growing season.
Dehiscent: The spontaneous opening of a fruit at maturity.
Drupe: A fleshy fruit usually having a single hard stone enclosing a seed.
Entire: Referring to a leaf not having an indented margin.
Filiform: Having the form resembling a thread or filament.
Furrowed: A rut groove or narrow depression.
Glabrous: Having no hairs or projections; smooth.
Imbricate: To be arranged with regular overlapping edges.
Inflorescence: A cluster of small flowers arranged on a flower stalk.
Lanceolate: A leaf tapering from a rounded base toward an apex, lance-shaped
Lenticels: The small, corky pores or narrow lines on the surface of the stems of woody plants that allow the interchange of gases between the interior tissue and the surrounding air.
Lustrous: Having a sheen or glow.
Native: A species that originated in a certain place or region; indigenous.
Naturalized: Adapted or acclimated to a new environment without cultivation.
Opposite: Growing in pairs on either side of a stem.
Ovate: Broad or rounded at the base and tapering toward the end.
Panicle: A branched cluster of flowers in which the branches are racemes
Peduncle: The stalk of a solitary flower of an inflorescence.
Peltate: Leaf being round with the stem attached near its center.
Perennial: Living three or more years.
Perfect: Having both stamens and pistals in the same flower.
Pod: A dry, several-sealed, dehiscent fruit.
Pubescent: Covered in fine short hairs.
Raceme: Elongated cluster of flowers along the main stem in which the flowers at the base open first.
Rhizome: A horizontal, usually underground stem that often sends out roots and shoots from its nodes.
Samara: A winged, often one-seed indehiscent fruit as of the ash, elm or maple.
Simple: Having no divisions or branches; not compound.
Umbel: A flat-topped or rounded inflorescence.

Lythrum salicaria - Purple Loosestrife

Family: Lythraceae
Native to: Eurasia

Description: Perennial growing 30-80" tall by $^{2}/_{3}$'s as wide. **Stems:** 4-6 sided, turning woody in summer. **Leaves:** Opposite to whorled, lanceolate, 2-4" long. **Flowers:** Spiked raceme, purple to magenta, June to October. **Fruit:** Capsule. **Habitat:** Mostly found in wetlands and aquatic systems, full to partial sun. **Spread:** Each plant can produce approximately 2.5-4.5 million seeds. Seeds dispersed by water, wildlife and humans. **Comments:** Invades wetlands suppressing native species and destroying wildlife habitat. **Controls:** Hand pull, use a spade to dig larger plants or use biocontrols (*Galerucella Spp.*, top left is a larvae & top right is an adult).

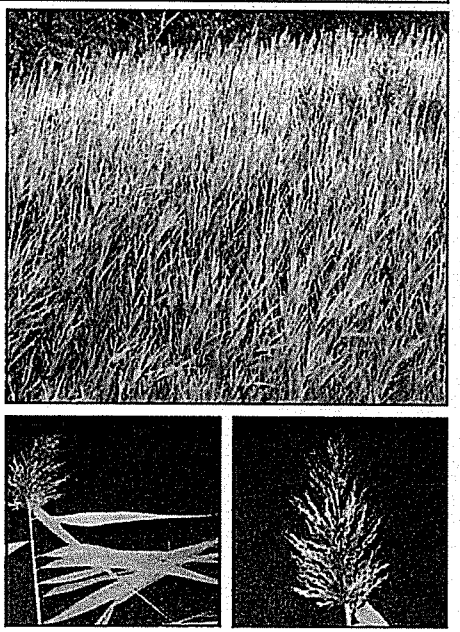


Photos by Douglas Cygan

Phragmites australis - Common Reed

Family: Poaceae
Native to: Eurasia

Description: Perennial rhizomatous grass growing 14' tall. **Stems:** Called 'culms' are large, hollow and grow up to 1" dia. **Leaves:** Lanceolate, up to 24" long, bluish-green in color. **Flowers:** Panicles with many spikelets having seven small reddish flowers. **Habitat:** Mostly found in marshlands, but also grows in freshwater wetlands and aquatic systems, full to partial sun. **Spread:** Spreads primarily by rhizomes. **Comments:** Forms dense colonies that suppress native species and alter wildlife habitat. **Controls:** Hand pull small plants. Use a spade to dig larger plants or apply herbicides.



Photos by Douglas Cygan

New Hampshire Invasive Species Committee

The New Hampshire Invasive Species Committee (ISC) is an advisory group for the Commissioner of the NH Department of Agriculture, Markets & Food (DAMF) on matters concerning invasive species in the state. The ISC consists of 11 appointed members representing the following: the NH Department of Agriculture, the NH Department of Environmental Services, the NH Department of Resources & Economic Development, the NH Department of Transportation, the NH Department of Fish & Game, The College of Life Science & Agriculture of the University of NH, the UNH Cooperative Extension, environmental interests, horticultural interests, general public interests, and livestock owners & feed growers interests. The ISC meets regularly to conduct the following efforts:

- Review information;
- Evaluate and discuss potentially invasive plant, insect and fungi species of concern;
- Host guest presentations on related topics;
- Develop outreach and educational materials;
- Formulate management practices as guidance for the control of invasive species; and
- Prepare lists of proposed prohibited and restricted species.

(*Note: This committee is not charged with the evaluation or listing of aquatic plant species, which is conducted by the Department of Environmental Services under RSA-487:16-a. However, a brief description of the program and four of the aquatic species are described on pages 29 & 30 of this book*).

New Hampshire Rules

In accordance with the Invasive Species Act (ISA), HB 1258-FN, the DAMF is the lead state agency for terrestrial invasive plants, insects and fungi species. The DAMF has the responsibility for the evaluation, publication and development of rules on invasive plant species. This is for the purpose of protecting the health of native species, the environment, commercial agriculture, forest crop production, and human health. Therefore, the rule, Agr 3800, states "**No person shall collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living or viable portion of any listed prohibited invasive plant species, which includes all of their cultivars and varieties, listed"** (see the New Hampshire Department of Agriculture's website at www.agriculture.nh.gov to review the complete set of rules).

Invasive Upland Plant Species (Agr 3800)

Invasive Insect Species

(To see the complete list of all 16 invasive insects refer to rules Agr 3800)

Invasive Aquatic Plant Species

To see the complete list of invasive aquatic plants refer to DES's Env-Wq 1300 rules

New Hampshire Department of Environmental Services Aquatic Invasive Plant Species

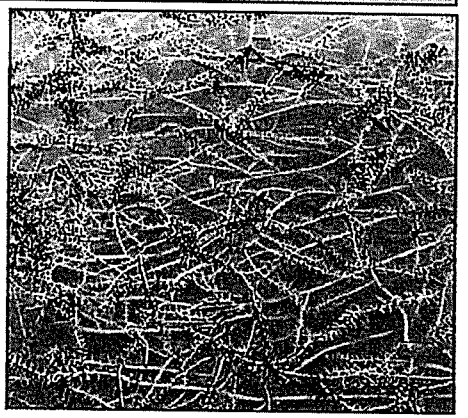
"Exotic aquatic species" are plants or animals that are not part of New Hampshire's native aquatic flora and fauna. Since the first exotic aquatic plant infestation in New Hampshire was discovered in 1965 in Lake Winnipesaukee, exotic aquatic plant infestations have increased to a total of 83 infestations in 72 waterbodies in 2008. Species present include variable milfoil (63 waterbodies), Eurasian milfoil (3 waterbodies), fanwort (9 waterbodies), water chestnut (1 waterbody) and Brazilian elodea (1 waterbody), Curly Leaf Pondweed (3 waterbodies), and European Naiad (3 waterbodies), and Didymo (1 waterbody). Most of these exotic plants can propagate by fragmentation as well as by seed.

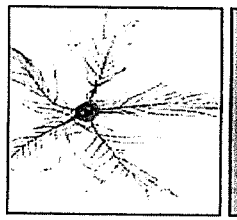
Exotic aquatic plant fragments can easily become attached to aquatic recreational equipment, such as boats, motors, and trailers, and can spread from waterbody to waterbody through transient boating activities. Infestations can have detrimental effects on the ecological, recreational, aesthetic, and economic values of the state's precious surface waters, limiting use of the waterbodies and decreasing shorefront property values by as much as 1020 percent according to a UNH study (Halstead, et al., 2001).

Myriophyllum heterophyllum - Variable Milfoil

Family: Haloragaceae
Native to: Eurasia

Description: Submerged aquatic perennial growing 20' tall. **Stems:** Round, thick and reddish. **Leaves:** Feathery leaflets surrounding the stem. **Flowers:** Stalks that emerge above the water with green leaves, June to August. **Habitat:** Lakes, ponds, calm streams, and other similar aquatic systems with full to partial sun. **Spread:** It reproduces primarily by vegetative propagules when individual plant segments break off, and dispersed by water movement, humans, and boats. **Comments:**Invades water bodies, suppresses native species and destroys fish habitat. **Controls:** Prevention, hand pulling, bottom screening, and aquatic herbicide use.

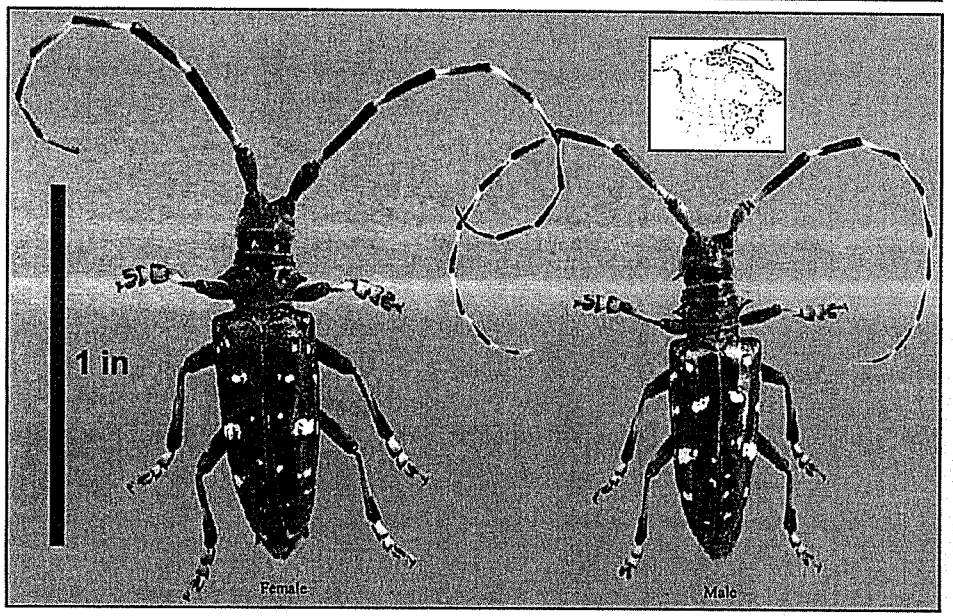




Photos by Amy Smagula

Anoplophora glabripennis - Asian Longhorned Beetle

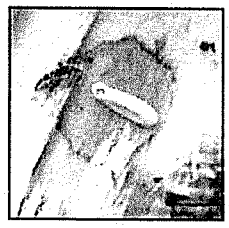
Family: Cerambycidae
Native to: Europe



Asian Longhorned Beetle—*Anoplophora glabripennis* (Photo by Chris Rallis)

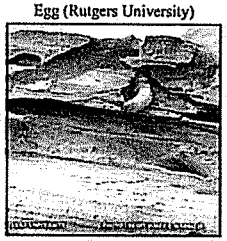
The Asian longhorned beetle (ALB) is a serious threat to a large variety of deciduous hardwoods in North America. ALB is a large glossy black insect with white spots dotting its elytra. Adults grow to 1-1.5" long and have whitish bandings on their antennae. Females are typically bigger than males. Tree injury occurs when larvae tunnel through the xylem (heartwood) of the host, thus weakening the tree. Hosts trees include, but aren't limited to: Maple, Chestnut, Poplar, Willow, Birch, Elm, and Mountain ash. Adult females chew a crater in the bark and lay 1-egg per site. Upon hatching the larvae feed on the wood and emerge as adults in 1-2 years through perfect $^{3}/_{8}$" diameter exit holes. Other signs include coarse wood shavings called frass, oozing sap, oviposition sites, leaf-feeding damage, and mature beetles. **If found, please call the NH Dept. of Agriculture at (603) 271-2561.**

Oviposition Site

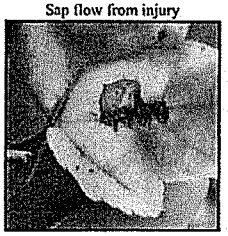


Egg (Rutgers University)

Sap flow from injury



Larval damage (Rutgers Univ.)



Adult feeding damage on leaf

3/8" diameter exit hole

Photos by Douglas Cygan, Chris Rallis & Rutgers University

DO NOT MOVE FIREWOOD

WHAT YOU CAN DO

There are many things that you, as an individual, can do to help control the spread of invasive species and preserve native flora and fauna:

- Minimize impacts to natural vegetation, soils, and drainage.
- Learn how to identify invasive plants and know how to tell them apart from native species.
- Control invasives on your property by following recommended practices.
- When landscaping, ask your local garden center or contact your County Extension Service about alternative plantings.
- Become active in local or regional initiatives to control invasives.
- After working in an area with invasive species remove any soil, or propagules that may have adhered to clothing, shoes, vehicle tires, etc.

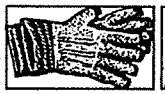
CONTROL METHODS

Mechanical: Mechanical control involves hand pulling, digging, cultivation, mowing, cutting or utilizing some type of physical barrier such as a tarpaulin, mulch, wood chips, etc. This method is most effective when populations of unwanted species are low.

Cultural: Cultural control is the manipulation of a plant community to prevent the introduction or spread of an unwanted species. This can be accomplished by modifying the growing environment such as the soil, available light or moisture, or planting trees or shrubs that can outcompete the invasive species.

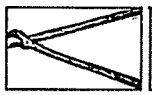
Chemical: Chemical control involves the use of an approved herbicide to manage a targeted species. The application method must be chosen to avoid damage to beneficial or native species. The applicator must adhere to all State and Federal pesticide regulations and in many cases be licensed by the state. For more information, contact the NH Department of Agriculture's Pesticide Control Division at 603-271-3550 or www.agriculture.nh.gov.

Biological: Biological control is the use of native or introduced beneficial organisms to naturally reduce populations of unwanted species. Most biological controls are found to be self-sustaining and host specific.



Pulling

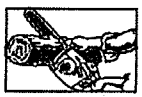
Digging



Cutting-Hand tools

Herbiciding

Mowing

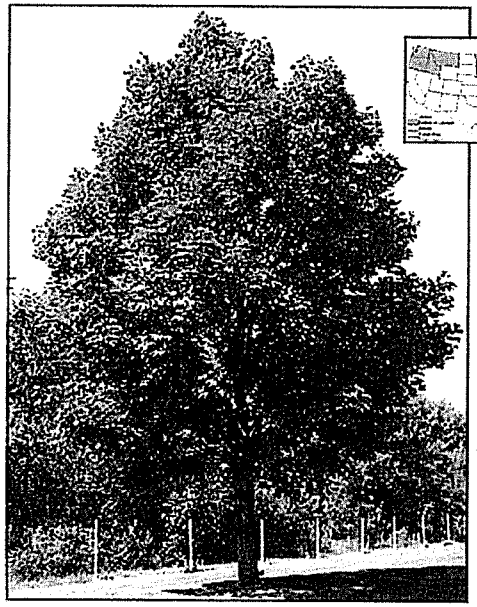


Cutting-Saws

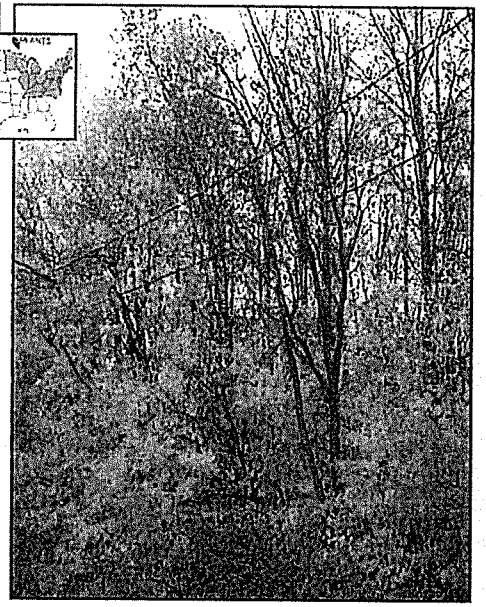
Biocontrols

Acer platanoides - Norway Maple

Family: Aceraceae
Native to: Europe

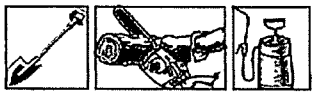


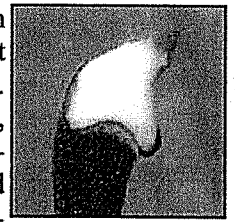
Norway Maple—*Acer platanoides*



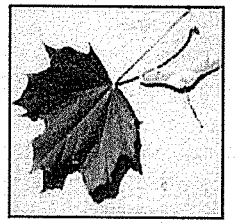
Norway Maple (in yellow) Invasion in Franklin, NH

Description: Large deciduous tree 60' high by 40' wide. **Bark:** Grayish and somewhat furrowed. **Twigs:** Smooth, olive-brown. **Buds:** Terminal, imbricate, rounded, smooth, greenish-red. **Leaves:** Opposite, 4-7" wide, 5-lobed, dark green to dark red above, lustrous below. **Flowers:** Greenish-yellow, April. **Fruit:** Horizontal samara. **Zone:** 3-7. **Habitat:** Moist, well drained soils, full sun to partial shade. **Spread:** Seeds spread by wind and water. **Comments:** Leaf stalks exude milky white sap. Fast growing, buds break earlier than most native species. Naturalizes in woodlands where it can outcompete native species. **Controls:** Pull or dig seedlings/saplings. Cut large trees and prune suckers when they sprout. Herbicide: foliar spray, cut-stem, bark banding, or slash bark with ax and apply to wounds.





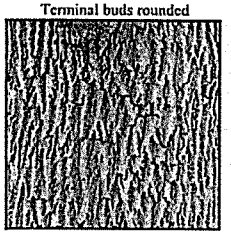
Milky white sap-leaf petiole



Leaf with winged seed

Terminal buds rounded

Flowers greenish-yellow



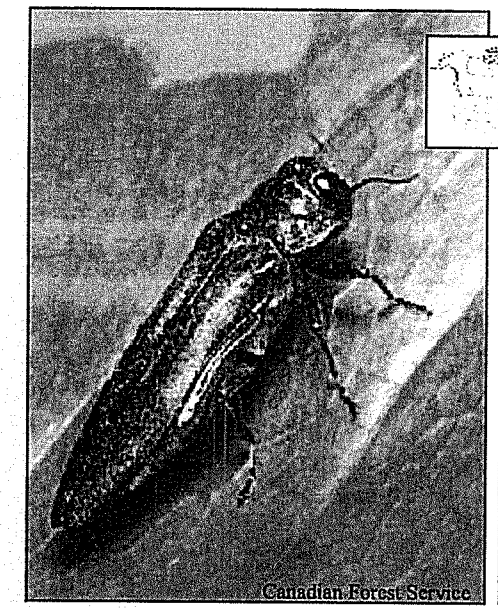
Bark is grayish & furrowed

Leaves turn yellow in Fall

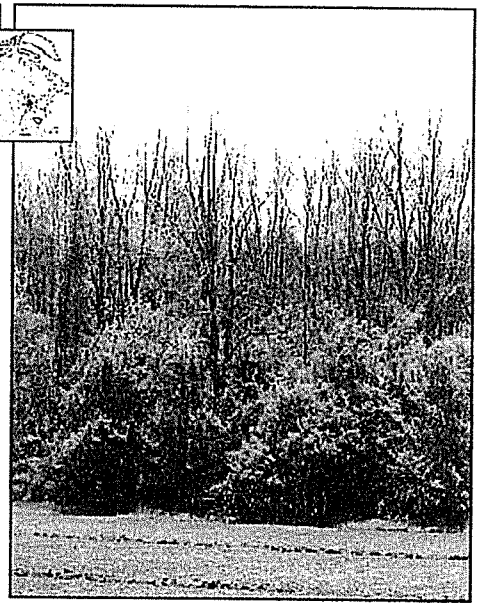
Photos by Douglas Cygan

Agrilus planipennis - Emerald Ash Borer

Family: Buprestidae
Native to: Asia

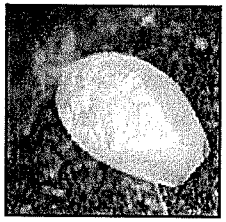


Emerald Ash Borer—*Agrilus planipennis*



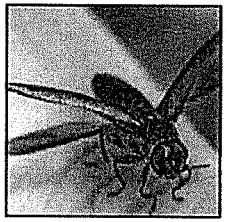
Dead standing Ash trees (Canadian Forest Service)

Emerald Ash Borers (EAB) are small invasive wood boring beetles that attack all species of ash trees (*Fraxinus spp.*). Native to East Asia, it is suspected that they were accidentally introduced to North America in infested wood packing material. The adults are 3/8" to ½" in length by 1/16" in width. Their bodies have a dark metallic green appearance. Adults emerge from a D-shaped exit hole from late May to mid-July and live for 3-6 weeks, during which time they feed on ash foliage, and fly 1-mile or so in search of a mate and to lay eggs. Females will lay 60-90 eggs in the crevices of ash tree bark. Larvae emerging from the eggs create distinctive S-shaped feeding galleries within the cambium which is directly beneath the bark. These feeding galleries can girdle the tree and result in tree death. Movement of EAB into new uninfested areas is principally through transportation of firewood. **If found, please contact the NH Dept. of Agriculture at (603) 271-2561.**



Egg

Larvae in feeding galleries



Adult with wings spread

Feeding galleries in cambium

D-shaped exit hole

EAB Purple prism trap

Photos by Douglas Cygan & Chris Rallis

DO NOT MOVE FIREWOOD

Adelges tsugae - Hemlock Wooly Adelgid

Family: Adelgidae
Native to: Asia

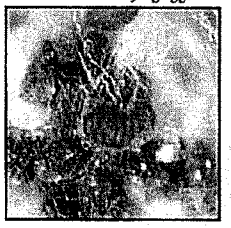
Hemlock Wooly Adelgid—*Adelges tsugae* Nests

Hemlock trees dead from Adelgid (www.earthportal.org)

Hemlock Wooly Adelgid (*Adelges tsugae*) (HWA) is a serious pest to all North American hemlock trees (*Tsuga spp.*). It is native to Japan & China and was first found in the Pacific Northwest in the 1920's. By the 1950's it had reached the east coast and now infects hemlock trees from Georgia to Maine. It spreads by movement of nursery stock, wind and animals. These insects are extremely small averaging about $^{1}/_{8}$" in length with piercing-sucking mouth parts similar in appearance to aphids. All adults are females with each producing 50-300 eggs. To protect themselves & their eggs they produce a white-waxy covering. Adults insert their piercing mouth parts into the stem at the base of the needles. Trees die from needle loss & lack of nutrition. **If found, please call the NH Dept. of Agriculture at (603) 271-2561.**

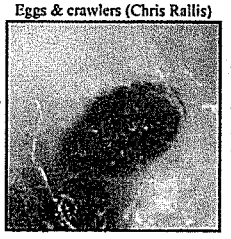
Adult female laying eggs

Egg mass in protective nest

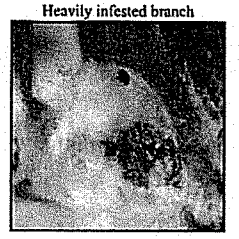


Eggs & crawlers (Chris Rallis)

Heavily infested branch



Crawlers (Chris Rallis)



Crawler leaving nest (Chris Rallis)

Photos by Douglas Cygan & Chris Rallis

DO NOT MOVE FIREWOOD

Ailanthus altissima - Tree of Heaven

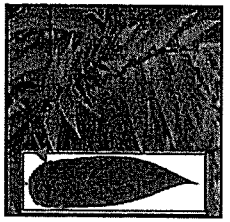
Family: Simaroubaceae
Native to: China

Tree of Heaven—*Ailanthus altissima*

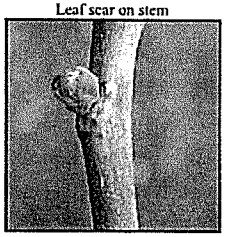
Tree of Heaven invasion

Description: Deciduous tree up to 60' tall by 40' wide. **Bark:** Grayish, slightly furrowed. **Twigs:**Reddish-brown. **Leaves:** Compound, 18-24" long with 13-25 leaflets arranged alternately on stem, lanceolate, 3-5" long with 2-4 teeth near base. **Flowers:** Panicles, 8-16" long, yellowish-green, mid-June. **Fruit:** Samara. **Zone:** 4-8. **Habitat:** Highly adaptable and pollution tolerant, full sun to partial shade. **Spread:** Seeds are wind dispersed. **Comments:** Very fast growing, dense canopy shades out native species. **Controls:** Remove seedlings and saplings by hand. Larger trees can be mechanically removed or cut. To prevent suckering, if trees are cut, apply herbicide to cut portion of stump.

Leaf scar on stem

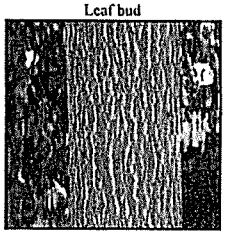


Compound leaves & leaf



Leaf bud

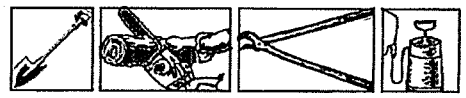
Flowers yellowish-green



Bark grayish & furrowed

Winged seed cluster

Photos by Douglas Cygan



Alliaria petiolata - Garlic Mustard

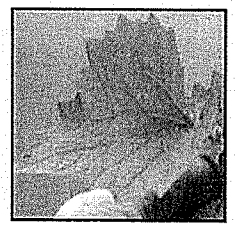
Family: Cruciferae
Native to: Europe

Garlic Mustard—*Alliaria petiolata*

Woodland invasion (photo by Cornell University)

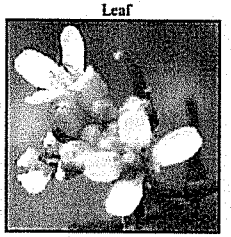
Description: Cool season biennial, 2nd year plants flower and reach 2-3$^1/_2$' tall. **Leaves:** Triangular, coarsely toothed, heart-shaped. **Flowers:** Umbel, small, 4-petals, white, April-May. **Fruit:** Pods, seeds turn black when mature. **Zone:** 4-8. **Habitat:** Prefers moist shaded floodplains, forests and roadsides, adaptable to most soil and light conditions. **Spread:** Seeds spread by water and wildlife. **Comments:** Plants spread quickly into natural areas leading to competition and displacement of native species. **Controls:** Small populations can be hand pulled while large populations can be continuously cut back to prevent flowering and seed production. Herbicide treatments are also effective.

Basal rosette

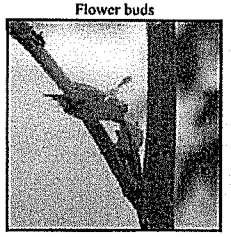


Leaf

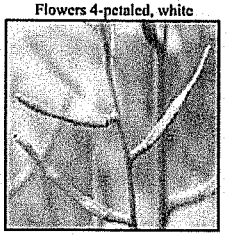
Flower buds



Flowers 4-petaled, white



Stems



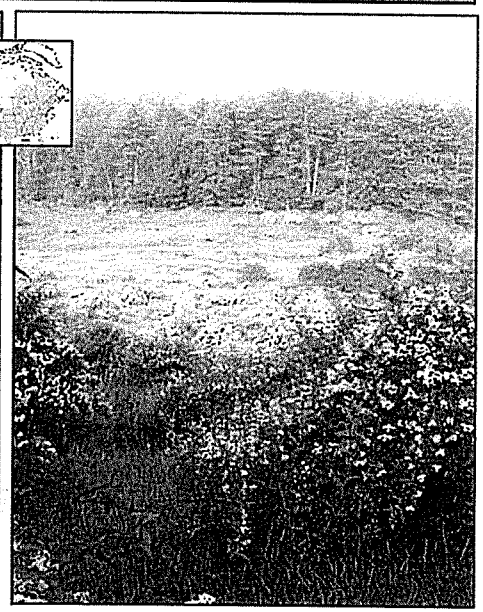
Seed pods

Photos by Douglas Cygan

Rosa multiflora - Multiflora Rose

Family: Rosaceae
Native to: Japan & Korea

Multiflora Rose-*Rosa multiflora*

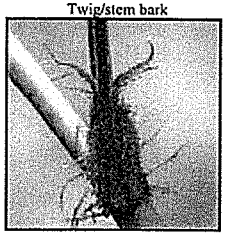


Multiflora Rose invasion, Canterbury, NH

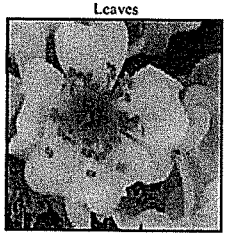
Description: Hardy shrub / climber reaching up to 15' or more in height and 10' in width. **Stems:** Long and arching, forming dense clumps, thorns may or may not be present. **Leaves:** Alternately arranged, compound with 7-9 leaflets and having feather margins at base. **Flowers:** Clusters of white or pink, June to July. **Fruit:** Rose hips turn red in fall. **Zone:** 3-8. **Habitat:** Prefers moist, well drained soils, full sun. **Spread:** Fruits with seeds are dispersed by birds. **Comments:** Very aggressive, leading to competition and displacement of native species. **Controls:** Hand or mechanical removal, cutting, or herbicide application.

Twig/stem bark

Leaves

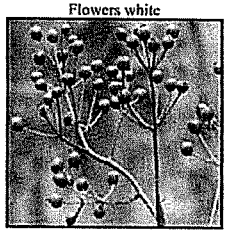


Feathery margin at base of leaf



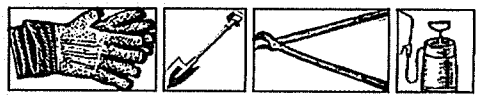
Flowers white

Fall color



Fruit is called a hip

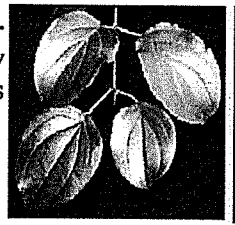
Photos by Douglas Cygan

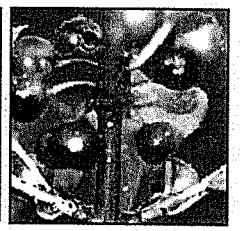


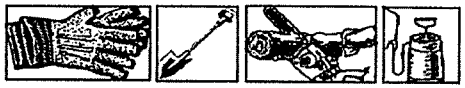
Rhamnus cathartica - Common Buckthorn

Family: Rhamnaceae
Native to: Eurasia

Description: Deciduous shrub or small tree measuring 20' by 15'. **Bark:** Grayish to brown with raised lenticels. **Stems:** Cinnamon colored with terminal spine. **Leaves:** Opposite, simple and broadly ovate with toothed margins. **Flowers:** Inconspicuous, 4-petaled, greenish-yellow, mid-June. **Fruit:** Fleshy, 1/4" diameter turning black in the fall. **Zone:** 3-7. **Habitat:** Adapts to most conditions including pH, heavy shade to full sun. **Spread:** Seeds are bird dispersed. **Comments: Highly:** Aggressive, fast growing, outcompetes native species. **Controls:** Remove seedlings and saplings by hand. Larger trees can be cut or plants can be treated with an herbicide.





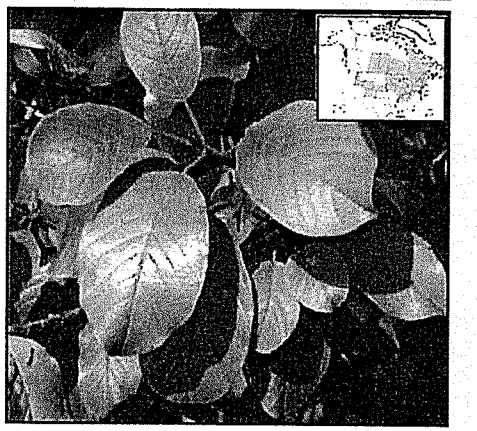


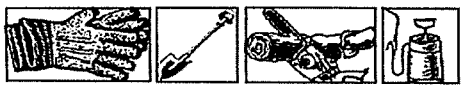
Photos courtesy of John M. Randall/The Nature Conservancy

Rhamnus frangula - Glossy Buckthorn

Family: Rhamnaceae
Native to: Japan

Description: Tall deciduous shrub up to 20' in height by 15' wide, **Bark:** Grayish with whitish lenticels. **Twigs:** Reddish-brown. **Leaves:** Ovate, 4-5" long by 3-4" wide, arranged oppositely or whorled on stem. **Flowers:** Small, greenish-white, mid-June. **Fruit:** Fleshy, turning black in the fall. **Zone:** 2-7. **Habitat:** Highly adaptable and pollution tolerant, full sun to partial shade. **Spread:** Seeds are bird dispersed. **Comments:** Very fast growing, dense canopy shades out native species. **Controls:** Remove seedlings and saplings by hand. Larger trees can be cut or herbicide may be used.



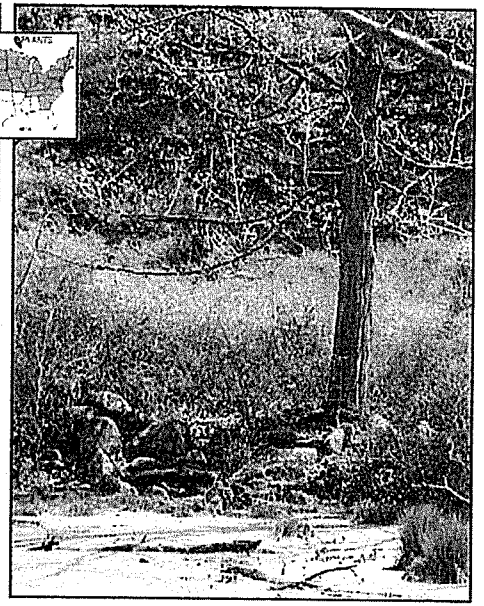


Photos by Douglas Cygan

Berberis thunbergii - Japanese Barberry

Family: Berberidaceae
Native to: Japan

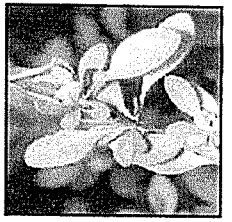
Japanese Barberry-*Berberis thunbergii*



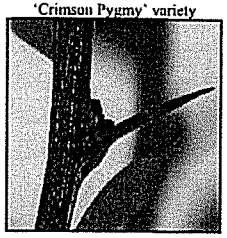
Japanese Barberry invasion, Antrim, NH

Description: Deciduous shrub, 2-4$^1/_2$' tall. **Leaves:** Ovate, simple, entire. Color varies depending on variety. **Flowers:** Small yellowish, bloom in May in clusters of 2-4. **Fruit:** Drupe, turning red in summer. **Zone:** 4-8. **Habitat:** Prefers well drained soils in semi shade and often occurring in forests, roadsides, and open fields. **Spread:** Seeds are dispersed by wildlife. **Comments:** Forms dense thickets in natural environments where it becomes established, resulting in impacts to native flora and fauna. **Controls:** Remove small immature plants by hand. Dig larger plants with a garden spade or remove mechanically. Cut stems at base or control with herbicide treatment.

'Crimson Pygmy' variety

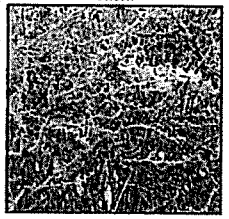


Leaves

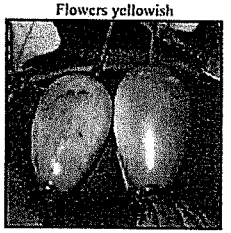


Thorn

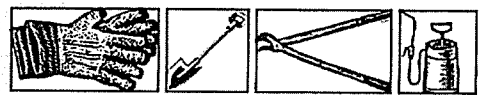
Flowers yellowish



Frost covered Barberry



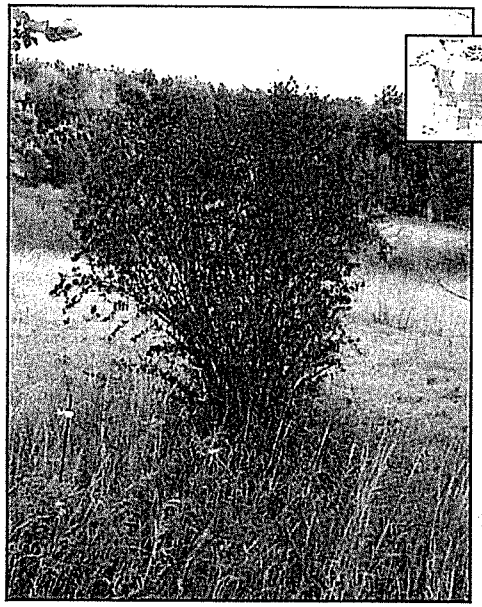
Fruit is a fleshy drupe



Photos by Douglas Cygan

Berberis vulgaris - European Barberry

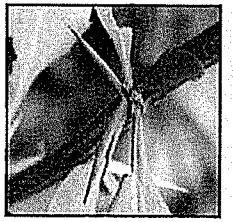
Family: Berberidaceae
Native to: China



European Barberry-*Berberis vulgaris*

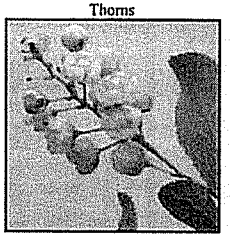
Woodland invasion, Claremont, NH

Description: Shrub 3-8' in height by 3-6' in width. **Stems:** Tan bark with 3 long spines at each leaf axis. **Leaves:** Alternate, simple, $^1/_2$"-1$^1/_2$" long, bright green above, dull below. **Flowers:** Perfect, yellow, $^1/_2$" long, mid-April to May. **Fruit:** Oblong drupe turning pale red in fall. **Zone:** 4-8. **Habitat:** Prefers full sun to partial shade and open spaces to wooded areas. **Spread:** Seeds are dispersed by birds and wildlife. **Comments:** Highly adaptable to most environments and is pollution tolerant. **Controls:** Hand pull young plants. Cut or mechanically remove older larger plants or apply approved herbicides for large populations.

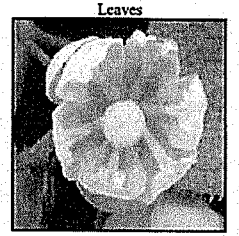


Thorns

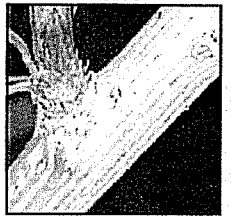
Leaves



Flowers



Flowers whitish-yellow



Stems

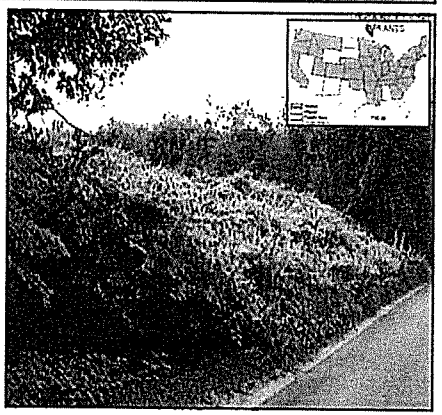
Seed pods

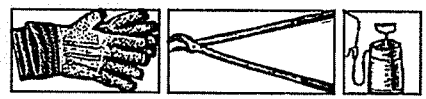
Photos by Douglas Cygan

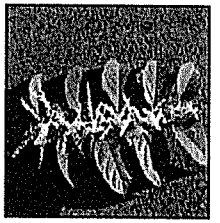
Polygonum cuspidatum - Japanese Knotweed

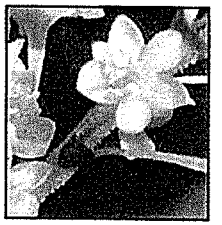
Family: Polygonaceae
Native to: Japan

Description: Perennial reaching 10' in height and width. Bohemian Knotweed (*Reynoutria x bohemica*) is similar. **Stems:** Greenish, hollow and jointed, similar to bamboo. **Leaves:** Alternate, broadly ovate, 3-7" long. **Flowers:** Small, whitish, forming panicles, August-September. **Seeds:** Calyx, brown, triangular. **Habitat:** Found in woodland sites, open spaces, ditches, roadsides, riverbanks. Prefers moist, well-drained soils. **Spread:** Stem & root fragments, and by seed. **Comments:** Aggressive, spreads quickly along surface waters and in right-of-ways. **Controls:** **Do <u>not</u> mow**, cut stems at base then smother by covering area with heavy-duty fabric/plastic, herbicides also recommended.









Photos by Douglas Cygan

Polygonum perfoliatum - Mile-a-Minute Vine

Family: Polygonaceae
Native to: Asia

Description: Very fast growing herbaceous perennial vine growing to 25' in height. **Stems:** Greenish with stiff barbs used for support. **Leaves:** Alternate, triangular in shape with clasping bract at the base, 1-3" long. **Flowers:** Racemes, inconspicuous and white forming at the bract, August - October. **Seeds:** An achene within a greenish, berry-like fruit. **Habitat:** Grows in partial shade to full sun, fields, roadsides & forests. Prefers moist, well-drained soils. **Spread:** Seed spread by birds & wildlife. **Comments:** Fast growing, aggressive. **Controls:** Mowing, hand cutting or herbicide use is recommended.

Photos by Leslie J. Mehrhoff

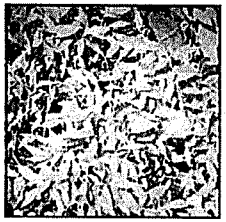
Microstegium vimineum - Japanese Stilt Grass

Family: Poaceae
Native to: Asia

Japanese Stilt Grass—*Microstegium vimineum*

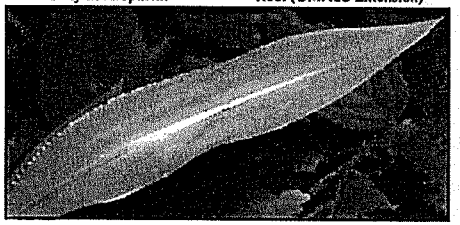
Japanese Stilt Grass woodland invasion

Description: Weak-stemmed annual grass, reaching 2-4' tall. **Leaves:** Lanceolate, tapered at both ends, 2-3" long with silvery stripe of reflective hairs down the midrib. **Flowers:** Racemes occur at the ends of the stalk itself, late August. **Fruit:** Achenes develop in late fall. **Zone:** 5-11. **Habitat:** Occurs along riverbanks, floodplains, forests and roadsides, adaptable to most soil and light conditions. **Spread:** Seeds spread by water, wildlife & humans. **Comments:** Plants spread quickly into natural areas leading to competition and displacement of native species. **Controls:** Small populations can be hand pulled while large populations can be continuously cut back to prevent flowering and seed production. Herbicide treatments are also effective.

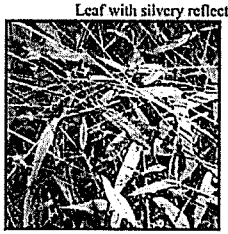


Early development

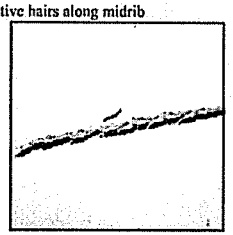
Root (UMASS Extension)



Leaf with silvery reflective hairs along midrib



Fall-leaves turn purplish

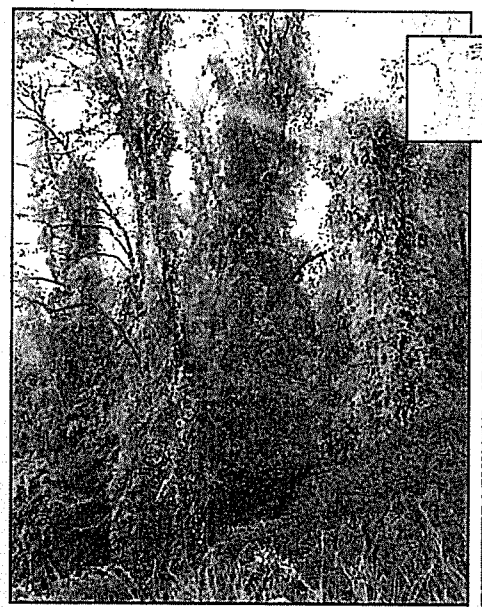


Seed-Achene

Photos courtesy of Leslie J. Mehrhoff/UCONN-IPANE and UMASS Extension

Celastrus orbiculatus - Oriental Bittersweet

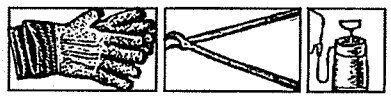
Family: Celastraceae
Native to: Japan, China



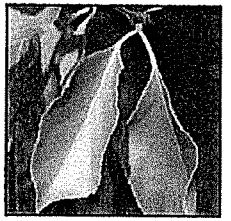
Oriental Bittersweet-*Celastrus orbiculatus*

Oriental Bittersweet invasion, Concord, NH

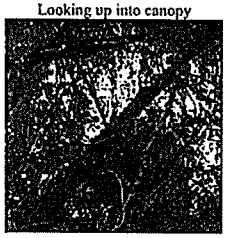
Description: Deciduous vine reaching heights of 40-60'. **Bark:** Tannish, furrowed. **Leaves:** Alternate, ovate, bluntly toothed, 3-4" long by 2/3's as wide, tapered at the base. **Flowers:** Small, greenish, blooming in spring. **Fruit:** Yellow dehiscent capsule surrounding an orange-red aril. *Fruits occur in the axils of the stems whereas native bittersweet (Celastrus scandens) fruits at the ends.* **Zone:** 4-8. **Habitat:** Disturbed edges, roadsides, fields, forests and along rivers and streams. **Spread:** Birds and humans. **Comments:** Very aggressive, climbs up and over trees and smothers them. Do not buy wreaths made of these vines. **Controls:** Difficult to manage. Cutting, pulling, or recommended herbicide use applied to foliage, bark, or cut-stump.



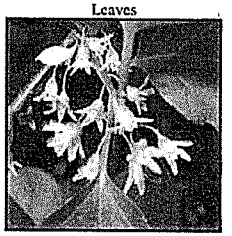
Looking up into canopy



Leaves



Native trees being strangled



Flowers yellowish-white

Mature Orange-yellow fruit

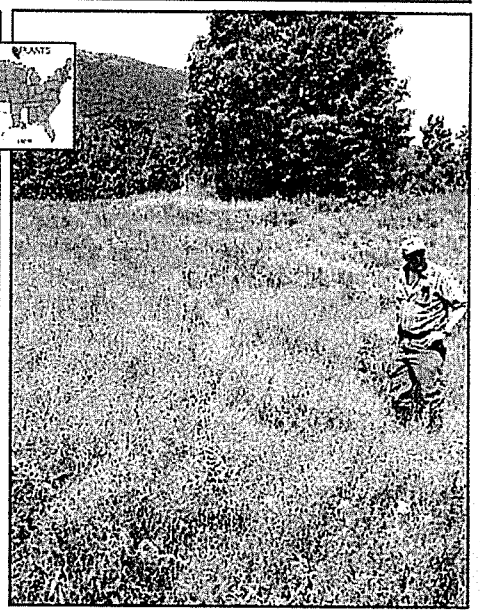
Fruit is a fleshy capsule

Photos by Douglas Cygan

Centaurea maculosa - Spotted Knapweed

Family: Compositae
Native to: Eurasia

Spotted Knapweed—*Centaurea maculosa*

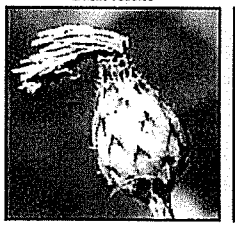


Invasion (photo by Leslie Mehrhoff)

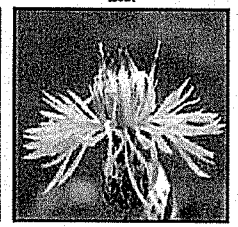
Description: Tall erect herbaceous perennial living 3-5 years. **Leaves:** Alternate, divided, Pale green, 1-3" long. **Flowers:** Aster-like, terminal, purple, July-August. **Fruit:** Each plant produces thousands of brownish seeds per year. **Zone:** 3-10. **Habitat:** Invades dry sunny roadsides, fields and waste places. Its large taproot allows it to survive harsh winters and draught **Spread:** Seeds spread by wind and wildlife. **Comments:** Plants spread quickly into natural meadows and fields leading to competition and displacement of native species. Roots excrete a toxin killing off other plants. **Controls:** Small populations can be hand pulled while large populations can be continuously cut back to prevent flowering and seed production. Herbicide treatments are also effective.

Basal rosette

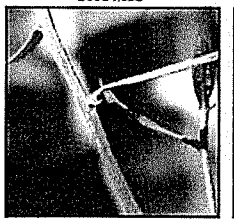
Leaf



Seed head



Flowers—Aster like



Stems

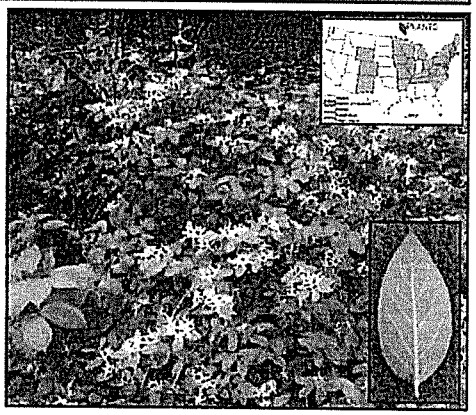
Seeds

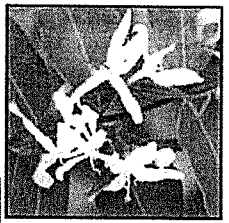
Photos by Leslie Mehrhoff & Douglas Cygan

Lonicera morrowii - Morrow's Honeysuckle

Family: Caprifoliaceae
Native to: Japan

Description: Shrub reaching 6-8' tall. **Stems:** Smooth, glabrous, Tannish, hollow. **Leaves:** Ovate, simple, entire, opposite, pubescent beneath, 1-2½" long. **Flowers:** Tubular, white, turning yellow with age, May to June. **Fruits:** Berry turning red. **Zone:** 3 . **Habitat:** Moist to wet shaded floodplains, forests, roadsides, fields, waste places. **Spread:** Seeds are dispersed by wildlife and humans. **Comments:** Rapidly invades sites, forming a dense vegetative layer that outcompetes native flora and fauna species. **Controls:** Hand control is effective for small plants, while mechanical removal and repetitive cutting also work well. Herbicide treatment is better for areas with greater infestations.



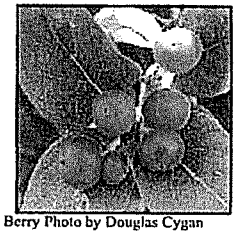


Photos by Douglas Cygan & Leaf Photo by Leslie J. Mehrhoff

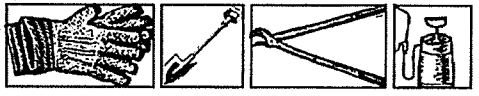
Lonicera tatarica - Tatarian Honeysuckle

Family: Caprifoliaceae
Native to: Eurasia

Description: Upright deciduous shrub reaching 6-15' tall. **Stems:** Smooth, glabrous, tan, hollow. **Leaves:** Ovate, smooth, bluish-green, opposite, 1-2½" long. **Flowers:** Tubular, pink or white, April to May. **Fruit:** Berry with two seeds, turning red in fall. **Zone:** 3. **Habitat:** Under story species in woodland sites, also invades open spaces. Thrives in moist soils. **Spread:** Seeds dispersed by wildlife and humans. **Comments:** Rapidly invades forests, fields, roadsides and floodplains. Outcompetes native species. **Controls:** Hand control is effective for small plants while mechanical removal, cutting and chemical applications are better for larger stands.



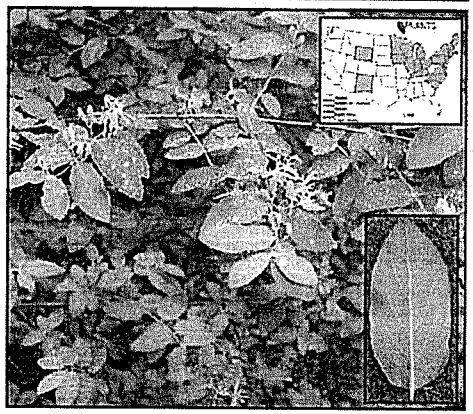
Photos by Leslie J. Mehrhoff & Berry Photo by Douglas Cygan

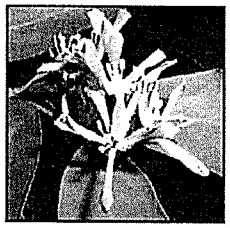


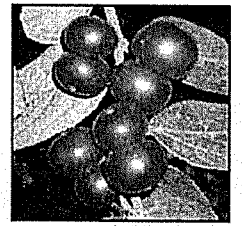
Lonicera x bella - Showy Bush Honeysuckle

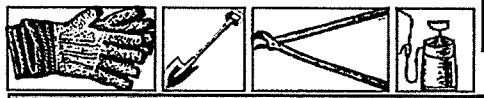
Family: Caprifoliaceae
Native to: Eurasia

Description: Shrub reaching 20' in height and width. **Stems:** Greenish to tan with corky wings. **Leaves:** Oppositely arranged, simple and elliptic, 1-3" long by half as wide, light green. **Flowers:** Yellow, white or pink, May to early June. **Fruit:** Fleshy red, forming in pairs in leaf axis. **Zone:** 4. **Habitat:** Prefers dry upland soils, full sun to heavy shade, pH adaptable. **Spread:** Seeds are dispersed by birds. **Comments:** *L. x bella* is a cross between *L. tatarica* & *L. morrowii*. Spreads into natural areas forming dense stands, which displace native species. **Controls**: Hand or mechanical removal, continuous cutting, girdling, and herbicide treatment.







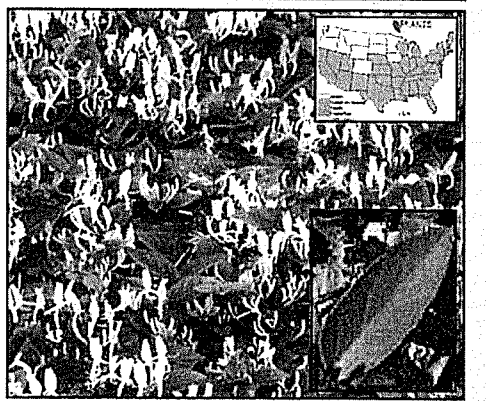


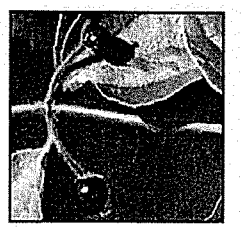
Photos courtesy of Leslie J. Mehrhoff/UCONN-IPANE

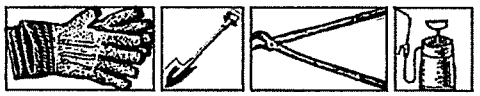
Lonicera japonica - Japanese Honeysuckle

Family: Caprifoliaceae
Native to: Eurasia

Description: Climbing vine. **Stems:** Reddish-brown, pubescent. **Leaves:** Opposite and not clasping the stem as opposed to the three native honeysuckle vines that do clasp the stem, oblong, $1\frac{1}{2}$-2" long, rounded at base. **Flowers:** Tubular, white or yellow, fragrant, May to mid-July. **Fruit:** Berry, smooth, blackish to slightly purplish. **Zone:** 4-8. **Habitat:** Prefers moist soils and full sun to partial shade. **Spread:** Seeds spread by wildlife. **Comments:** Vines grow quickly, covering native vegetation, resulting in loss of habitat. **Controls:** hand or mechanical removal, cutting, girdling, chemical.





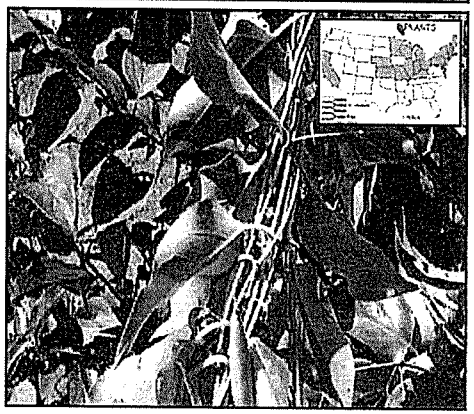


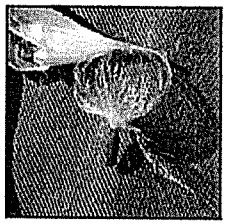
Photos courtesy of John M. Randall/The Nature Conservancy
& Leaf Photo by Leslie J. Mehrhoff

Cynanchum nigrum - Black Swallow-Wort

Family: Asclepiadaceae
Native to: Eurasia

Description: Perennial herbaceous vine that grows to 6'. **Leaves:** Opposite, lanceolate, dark glossy green, simple with a smooth edge, 2-4" long. **Flowers:** Small $\frac{1}{4}$", 5-petaled, purplish, from June to September. **Seed:** Seeds are similar to those of milkweed. **Zone:** 4 to 8. **Habitat:** It prefers full to partial sun. **Spread:** Seeds dispersed by wind. **Comments:** Invades roadsides, fields, disturbed sites, meadows, and woodlands, outcompeting native species. **Controls:** Hand pull young plants. Remove and destroy seed pods before they open. Apply herbicides as a foliar spray during the growing season. If plants are to be dug, use a spade and make sure that all root fragments are removed.



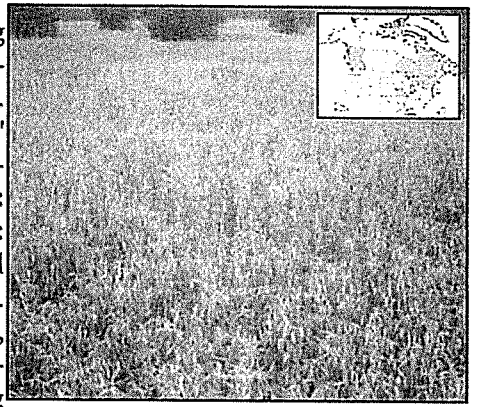


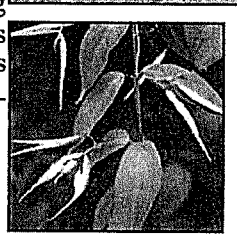
Photos by Douglas Cygan

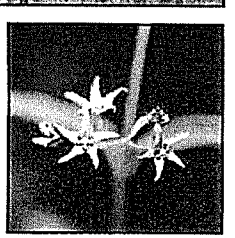
Cynanchum rossicum - Pale Swallow-Wort

Family: Asclepiadaceae
Native to: China

Description: Perennial vine growing to 3-6'. Very similar to black swallow-wort with the exception of the flowers. **Leaves:** Opposite, lanceolate, 2-4" long. **Flowers:** Magenta, $\frac{3}{8}$", flowering from June to September. **Seed:** Seeds are similar to milkweed. **Zone:** 4 to 8. **Habitat:** It prefers full to partial sun. **Spread:** Seeds dispersed by wind. **Comments:** Invades roadsides, fields, disturbed sites, meadows and woodlands. **Controls:** Hand pull young plants. Remove and destroy seed pods before they open. Apply herbicides as a foliar spray. Dig using a spade to ensure all root fragments are removed.





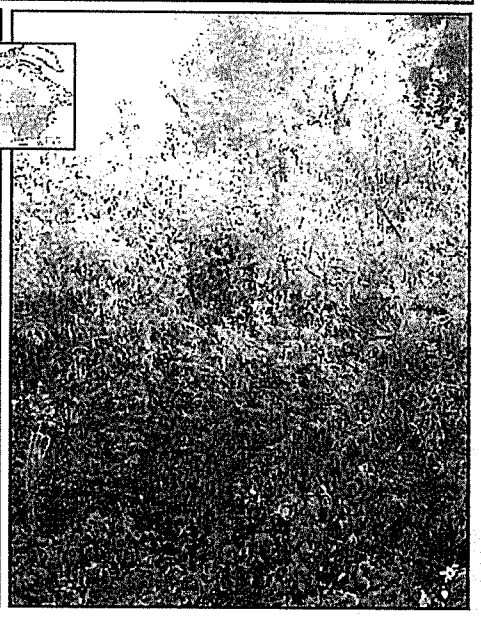


Photos courtesy of John M. Randall/The Nature Conservancy

Elaeagnus umbellata - Autumn Olive

Family: Elaeagnaceae
Native to: Asia

Autumn Olive—Elaeagnus umbellata

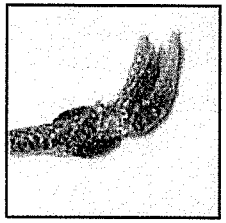


Autumn Olive invasion in Concord, NH

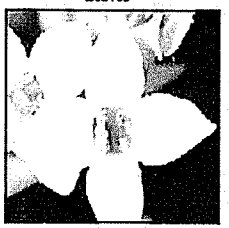
Description: Weedy deciduous shrub measuring 20' by 20'. **Bark:** Silvery-gray and smooth with whitish lenticels. **Stems:** Cinnamon-brown. **Leaves:** Elliptical, 2-3" long, glossy, green above and silverish below. **Flowers:** Solitary, whitish, 4-petaled, mid-June. **Fruit:** Drupe. **Zone:** 3-8. **Habitat:** Naturalizes in open spaces exposed to full sun. **Spread:** Seeds dispersed by birds and wildlife. **Comments:** Very aggressive. Outcompetes and displaces native species. **Controls:** Remove seedlings and saplings by hand. Larger shrubs can be mechanically removed, or cut and apply herbicide to stump.

Silvery-gray Bark

Leaves



Terminal bud

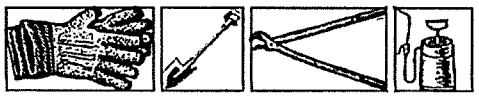


Flowers whitish

Fall Color

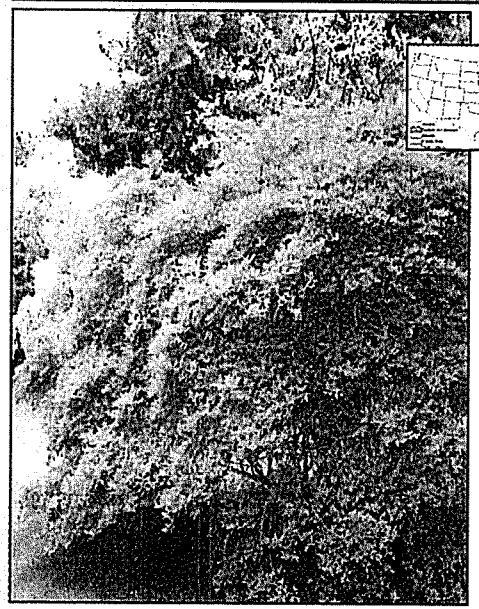
Fruit is a fleshy drupe

Photos by Douglas Cygan



Ligustrum obtusifolium - Blunt-leaved Privet

Family: Oleaceae
Native to: Europe

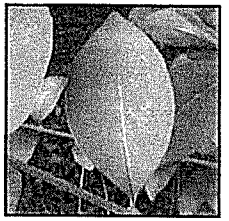


Blunt-leaved Privet-*Ligustrum obtusifolium*

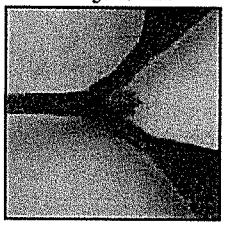
Blunt-leaved Privet (Photo: Leslie J. Mehrhoff)

Description: Shrub reaching 12' tall by 10-12' wide. **Stems:** Greenish, smooth. **Leaves:** Opposite, simple and elliptic, 1-3" long by half as wide, blunt tipped, light green. **Flowers:** Small white panicles, May to early June. **Fruit:** Small blackish drupe. **Zone:** 4-7. **Habitat:** Prefers dry upland soils, full sun to heavy shade, pH adaptable. **Spread:** Seeds dispersed by birds. **Comments**: Becomes established in natural areas leading to competition and displacement of native species. **Controls:** Hand or mechanical removal, cutting, herbicide applications such as foliar or cut-stem.

Twig/stem bark

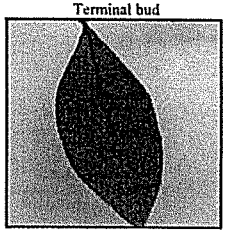


Leaves

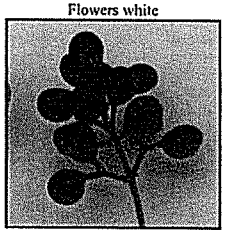


Terminal bud

Flowers white

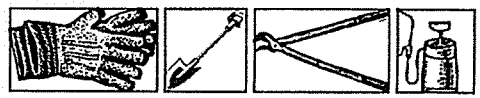


Fall color



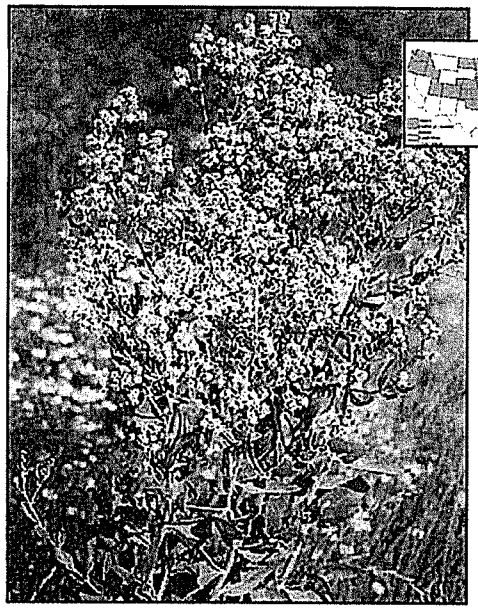
Fruit is a dark drupe

Photos by Douglas Cygan & Leslie Mehrhoff



Lepidium latifolium - Perennial Pepperweed

Family: Cruciferae
Native to: Eurasia

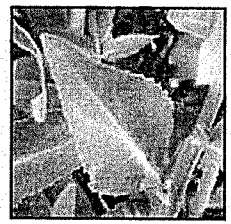


Perennial Pepperweed—*Lepidium latifolium*

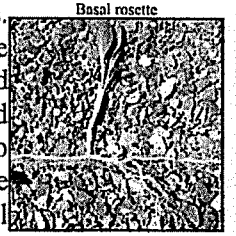
Perennial Pepperweed invasion Seacoast area, NH

Description: Long lived perennial growing 2-4' tall. **Leaves:** Alternate, lanceolate with serrated edge. **Flowers:** Terminal, tightly clustered, white, July. **Fruit:** Silicle, rounded, flattish, hairy $^{1}/_{16}$" long. **Zone:** 4-8. **Habitat:** Prefers wet, brackish soils such as coastal tidal marshes and ditches, wetlands, and floodplains. **Spread:** Seeds and creeping rhizome fragments spread by water, wildlife and humans. **Comments:** Plants spread quickly into natural areas leading to competition and displacement of native coastal wetland species. **Controls:** Small populations can be hand pulled while large populations can be continuously cut back to prevent flowering and seed production. Herbicide treatments are also effective.

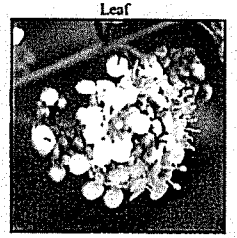
Basal rosette



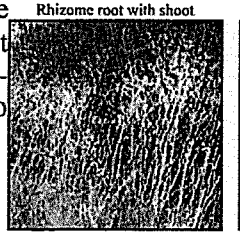
Leaf



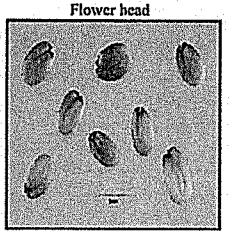
Rhizome root with shoot



Flower head



Persistent stems

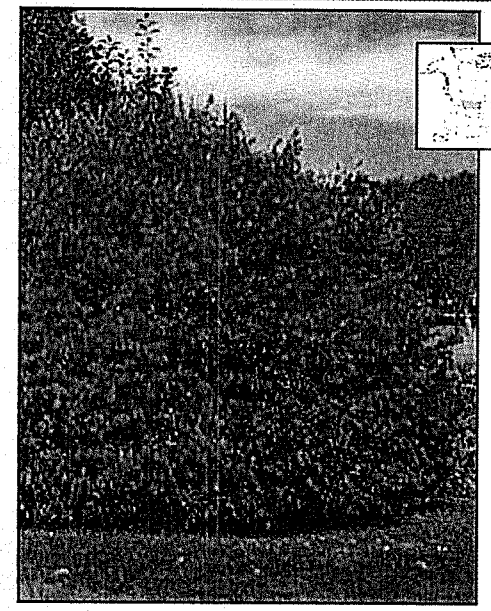


Seeds (photo—USDA)

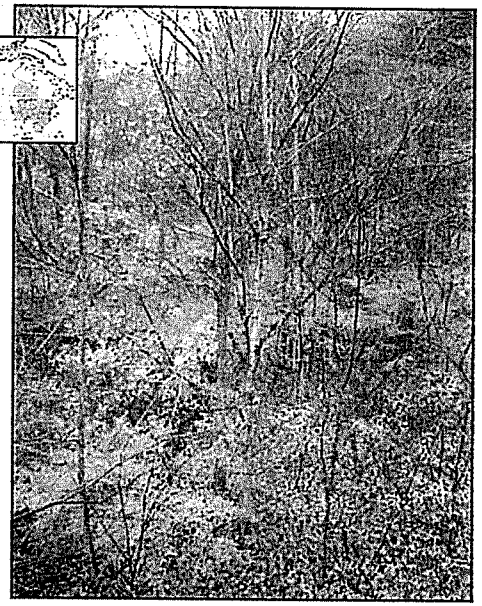
Photos by Kevin Lucey & Jennifer Forman

Euonymus alatus - Burning Bush

Family: Celastraceae
Native to: Asia

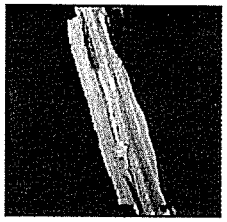


Burning Bush-*Euonymus alatus*

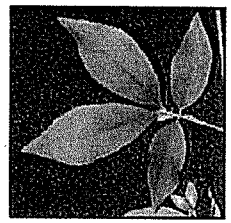


Burning Bush invasion, Boscawen, NH

Description: Deciduous shrub reaching 20' in height and width. **Stems:** Greenish with corky wings. **Leaves:** Oppositely arranged, simple and elliptic, 1-3" long by half as wide, light green. **Flowers:** Inconspicuous greenish-yellow, May to June. **Fruit:** Fleshy green capsule turning red in fall. **Zone:** 3 to 8. **Habitat:** Prefers dry upland soils, full sun to heavy shade, pH adaptable. **Spread**: Seeds are dispersed by birds and wildlife. **Comments:** Outcompetes and displaces native species. **Controls:** Hand remove seedlings and saplings. Use a spade or shovel to dig out larger plants. Large populations may be controlled with herbicide use.

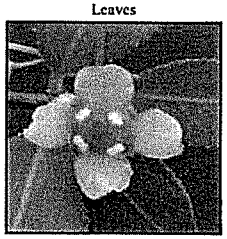


Corky-winged bark

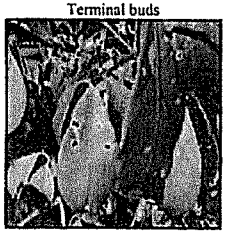


Leaves

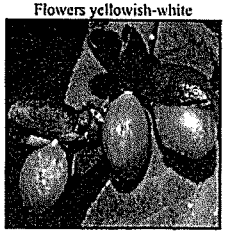
Terminal buds



Flowers yellowish-white

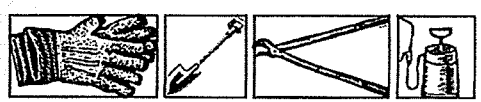


Fall color



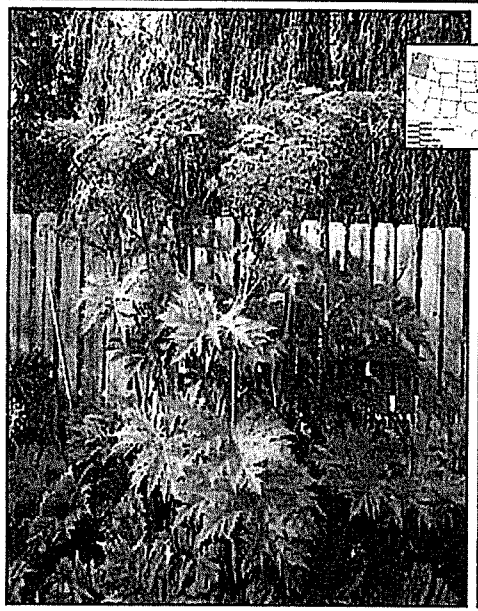
Fruit is a fleshy capsule

Photos by Douglas Cygan



Heracleum mantegazzianum - Giant Hogweed

Family: Apiaceae
Native to: China

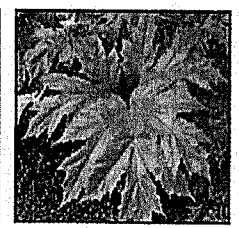


Giant Hogweed-*Heracleum mantegazzianum*

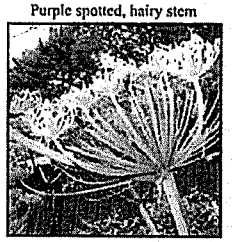
Open field invasion (Photo-Bugwood.org)

Description: Biennial growing to 15' tall. **Stems:** Greenish with purple splotches, 2-4" diameter with coarse hairs, hollow. **Leaves:** Large, compound, deeply incised, 3-5' wide, hairy on underside. **Flowers:** White inflorescence, 1-2' in diameter, May-June. **Seeds:** Flattened, $^3/_8$" long, ovate with 4 brown resin canals. **Zone:** 3-8. **Habitat:** Found in wet areas, roadsides, gardens, open spaces, full sun to partial shade. **Spread:** Seeds dispersed by water, wildlife and humans. **Comments:** The clear, watery sap is phototoxic to human skin, causing severe blistering and burns. Spreads readily and displaces native species. **Controls:** Remove plants by digging up tap root. Herbicide can also be used as a foliar treatment.

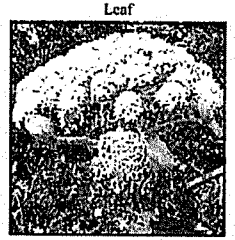
Purple spotted, hairy stem



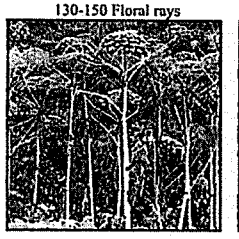
Leaf



130-150 Floral rays



Flowers whitish umbel



Persistent dead stalks

Seeds with resinous veins

Photos by Douglas Cygan

Hesperis matronalis - Dame's Rocket

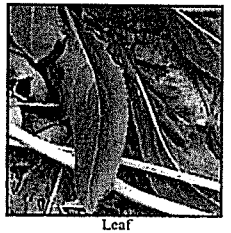
Family: Brassicaceae
Native to: Eurasia

Dame's Rocket—*Hesperis matronalis*

Dame's Rocket invasion

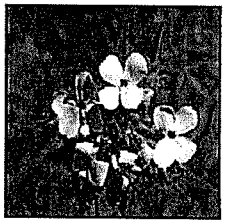
Description: Cool season biennial, 2nd year plants flower and reach 30" tall. **Leaves:** Alternately arranged and lanceolate in shape with toothed margins. **Flowers:** Terminal racemes, 4-petals, purplish, early to mid spring. **Fruit:** Pods, seeds turn brown when mature. **Zone:** 4-8. **Habitat:** Prefers partial sun, moist to mesic conditions such as floodplains, forests and roadsides, adaptable to full sun with adequate moisture. **Spread:** Seeds spread by water and wildlife. **Comments:** Plants spread quickly into natural areas leading to competition and displacement of native species. **Controls:** Small populations can be hand pulled while large populations can be continuously cut back to prevent flowering and seed production. Herbicide treatments are also effective.

Basal rosette

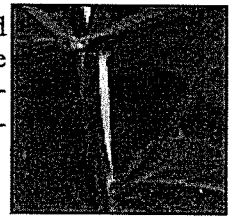


Leaf

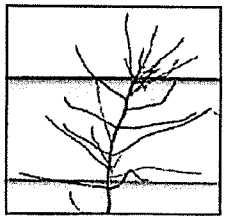
Flower buds



Flowers 4-petaled, white



Stems



Seed pods

Photos by Leslie Mehroff

SECTION 5 STORMWATER INSPECTION & MAINTENANCE LOG

STORMWATER INSPECTION MAINTENANCE LOG

1400 LAFAYETTE ROAD, PORTSMOUTH, NH

General Information			
Project Name	Residential Development Plans	**Location**	Portsmouth, NH
		Start/ End Time	
Date of Inspection			
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Contact Information			

	Site Specific BMP's	Maintenance Interval
1	Street Sweeping	1 year
2	Deep Sump Catch Basins	6 months
3	Underground Infiltration Systems (#1-4)	6 months
4	Hydrodynamic Separator (First Defense Unit)	1 Year (See separate maintenance log for First Defense Unit)

STORMWATER INSPECTION MAINTENANCE LOG

1400 LAFAYETTE ROAD, PORTSMOUTH, NH

BMP Description	Corrective Action Required?	Notes
Street Sweeping		
Evidence of debris accumulation	☐ Yes ☐ No	
Evidence of oil grease	☐ Yes ☐ No	
Other (specify)	☐ Yes ☐ No	
Deep Sump Catch Basins		
Grates clear of debris	☐ Yes ☐ No	
Inlet and outlet clear of debris	☐ Yes ☐ No	
Evidence of oil grease	☐ Yes ☐ No	
Observance of accumulated sediment	☐ Yes ☐ No	Sediment Depth =
Evidence of structural deterioration	☐ Yes ☐ No	
Evidence of flow bypassing facility	☐ Yes ☐ No	
Other (specify)	☐ Yes ☐ No	
Underground Infiltration System #1		
Inlet and outlet clear of debris	☐ Yes ☐ No	
Bottom surface clear of debris	☐ Yes ☐ No	
Evidence of rilling or gullying	☐ Yes ☐ No	
Observance of accumulated sediment	☐ Yes ☐ No	
Bottom dewaters within 72 hrs. of a storm event	☐ Yes ☐ No	
Standing water or wet spots	☐ Yes ☐ No	
Other (specify)	☐ Yes ☐ No	
Underground Infiltration System #2		
Inlet and outlet clear of debris	☐ Yes ☐ No	
Bottom surface clear of debris	☐ Yes ☐ No	
Evidence of rilling or gullying	☐ Yes ☐ No	
Observance of accumulated sediment	☐ Yes ☐ No	
Bottom dewaters within 72 hrs. of a storm event	☐ Yes ☐ No	
Standing water or wet spots	☐ Yes ☐ No	
Other (specify)	☐ Yes ☐ No	

STORMWATER INSPECTION MAINTENANCE LOG

1400 LAFAYETTE ROAD, PORTSMOUTH, NH

BMP Description	Corrective Action Required?	Notes
Underground Infiltration System #3		
Inlet and outlet clear of debris	☐ Yes ☐ No	
Bottom surface clear of debris	☐ Yes ☐ No	
Evidence of rilling or gullying	☐ Yes ☐ No	
Observance of accumulated sediment	☐ Yes ☐ No	
Bottom dewaters within 72 hrs. of a storm event	☐ Yes ☐ No	
Standing water or wet spots	☐ Yes ☐ No	
Other (specify)	☐ Yes ☐ No	
Underground Infiltration System #4		
Inlet and outlet clear of debris	☐ Yes ☐ No	
Bottom surface clear of debris	☐ Yes ☐ No	
Evidence of rilling or gullying	☐ Yes ☐ No	
Observance of accumulated sediment	☐ Yes ☐ No	
Bottom dewaters within 72 hrs. of a storm event	☐ Yes ☐ No	
Standing water or wet spots	☐ Yes ☐ No	
Other (specify)	☐ Yes ☐ No	
Hydrodynamic Separator #1 (First Defense Unit)		
See separate maintenance log for First Defense Unit		
Hydrodynamic Separator #2 (First Defense Unit)		
See separate maintenance log for First Defense Unit		
Hydrodynamic Separator #3 (First Defense Unit)		
See separate maintenance log for First Defense Unit		
Hydrodynamic Separator #4 (First Defense Unit)		
See separate maintenance log for First Defense Unit		
Hydrodynamic Separator #5 (First Defense Unit)		
See separate maintenance log for First Defense Unit		

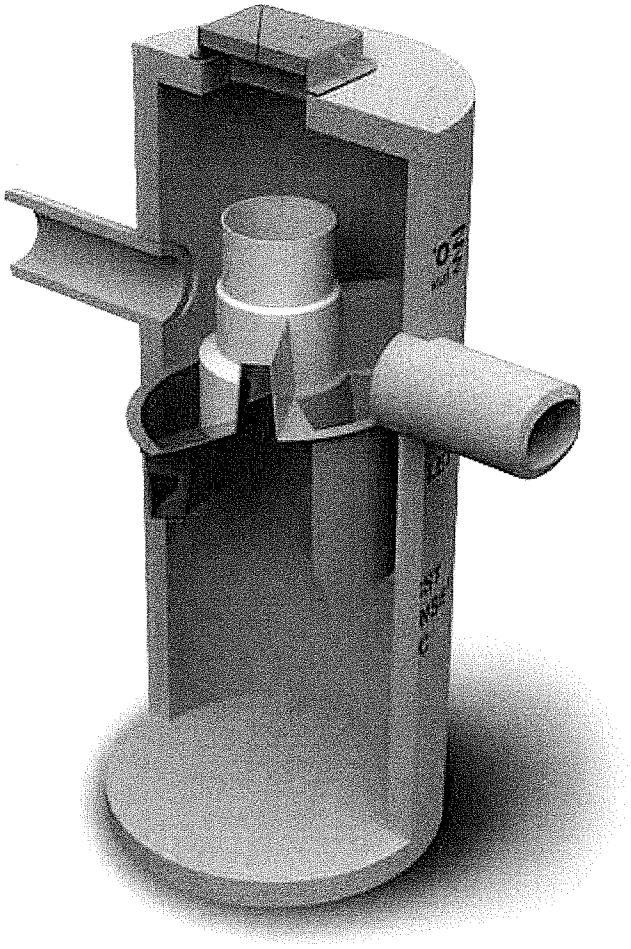
NOTE: Photos shall be provided with each inspection log and shall be sufficiently labeled to identify photo location.

SECTION 6 DE-ICING LOG

Deicing Log

Date Applied	Type of Deicing Material	Amount Applied

Hydro International®



Operation and Maintenance Manual

First Defense® and First Defense®-HC

Vortex Separator for Stormwater Treatment

Stormwater Solutions

Turning Water Around ...®

Table of Contents

Hydro International (Stormwater), 94 Hutchins Drive, Portland ME 04102
Tel: (207) 756-6200 Fax: (207) 756-6212 Web: www.hydro-int.com

I. First Defense® by Hydro International

Introduction

The First Defense® is an enhanced vortex separator that combines an effective and economical stormwater treatment chamber with an integral peak flow bypass. It efficiently removes total suspended solids (TSS), trash and hydrocarbons from stormwater runoff without washing out previously captured pollutants. The First Defense® is available in several model configurations (refer to *Section II. Model Sizes & Configurations*, page 4) to accommodate a wide range of pipe sizes, peak flows and depth constraints.

Operation

The First Defense® operates on simple fluid hydraulics. It is self-activating, has no moving parts, no external power requirement and is fabricated with durable non-corrosive components. No manual procedures are required to operate the unit and maintenance is limited to monitoring accumulations of stored pollutants and periodic clean-outs. The First Defense® has been designed to allow for easy and safe access for inspection, monitoring and clean-out procedures. Neither entry into the unit nor removal of the internal components is necessary for maintenance, thus safety concerns related to confined-space-entry are avoided.

Pollutant Capture and Retention

The internal components of the First Defense® have been designed to optimize pollutant capture. Sediment is captured and retained in the base of the unit, while oil and floatables are stored on the water surface in the inner volume (Fig.1).

The pollutant storage volumes are isolated from the built-in bypass chamber to prevent washout during high-flow storm events. The sump of the First Defense® retains a standing water level between storm events. This ensures a quiescent flow regime at the onset of a storm, preventing resuspension and washout of pollutants captured during previous events.

Accessories such as oil absorbent pads are available for enhanced oil removal and storage. Due to the separation of the oil and floatable storage volume from the outlet, the potential for washout of stored pollutants between clean-outs is minimized.

Applications

- Stormwater treatment at the point of entry into the drainage line
- Sites constrained by space, topography or drainage profiles with limited slope and depth of cover
- Retrofit installations where stormwater treatment is placed on or tied into an existing storm drain line
- Pretreatment for filters, infiltration and storage

Advantages

- Inlet options include surface grate or multiple inlet pipes
- Integral high capacity bypass conveys large peak flows without the need for "offline" arrangements using separate junction manholes
- Proven to prevent pollutant washout at up to 500% of its treatment flow
- Long flow path through the device ensures a long residence time within the treatment chamber, enhancing pollutant settling
- Delivered to site pre-assembled and ready for installation

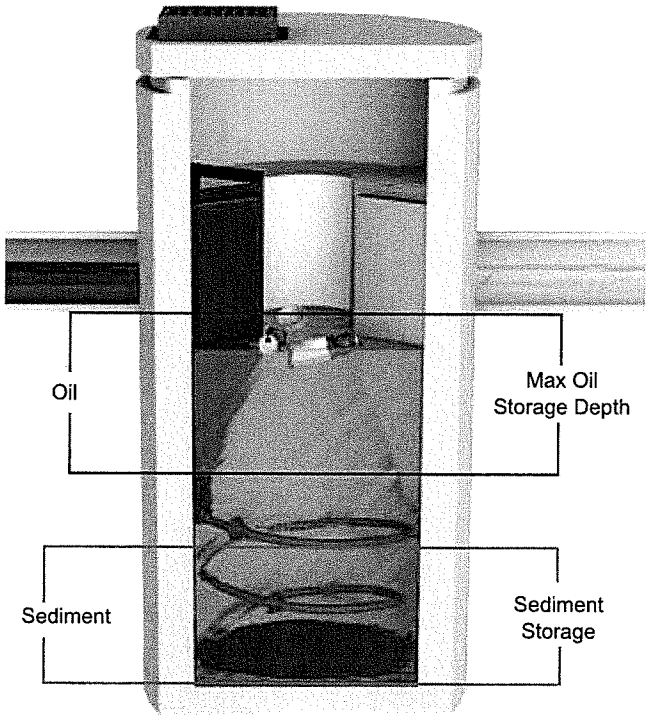


Fig.1 Pollutant storage volumes in the First Defense®.

II. Model Sizes & Configurations

The First Defense® inlet and internal bypass arrangements are available in several model sizes and configurations. The components of the First Defense®-4HC and First Defense®-6HC have modified geometries as to allow greater design flexibility needed to accommodate various site constraints.

All First Defense® models include the internal components that are designed to remove and retain total suspended solids (TSS), gross solids, floatable trash and hydrocarbons (Fig.2a - 2b). First Defense® model parameters and design criteria are shown in Table 1.

First Defense® Components

1. **Built-In Bypass**
2. **Inlet Pipe**
3. **Inlet Chute**
4. **Floatables Draw-off Port**
5. **Outlet Pipe**
6. **Floatables Storage**
7. **Sediment Storage**
8. **Inlet Grate or Cover**

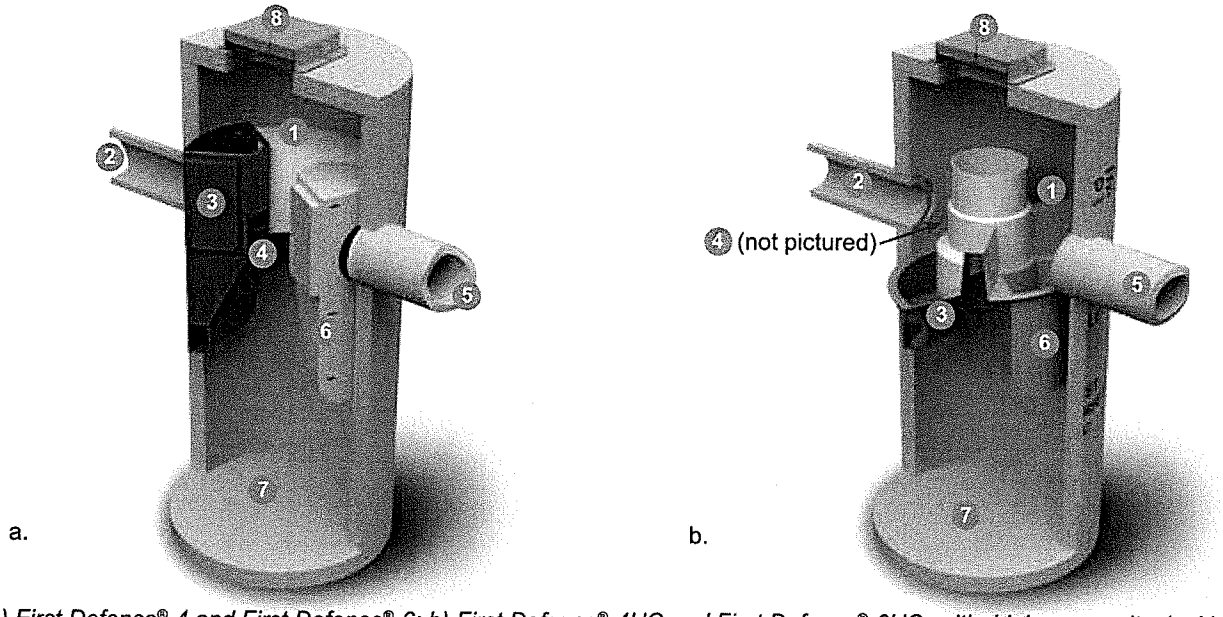


Fig.2a) First Defense®-4 and First Defense®-6; b) First Defense®-4HC and First Defense®-6HC, with higher capacity dual internal bypass and larger maximum pipe diameter.

Table 1. First Defense® Pollutant Storage Capacities and Maximum Clean out Depths

First Defense® Model Number	Diameter	Oil Storage Capacity	Oil Clean Out Depth	Maximum Sediment Storage Capacity[1]		Recommended Sediment Clean-out Capacity	
				Volume	Depth	Volume	Depth
	(ft / m)	(gal / L)	(in / cm)	(yd^3 / m^3)	(in / cm)	(yd^3 / m^3)	(in / cm)
FD-4	4 / 1.2	180 / 681	<23.5 / 60	1.3 / 1.0	33 / 84	0.7 / 0.5	18 / 46
FD-4HC		191 / 723	<24.4 / 62				
FD-6	6 / 1.8	420 / 1,590	<23.5 / 60	3.3 / 2.5	37.5 / 95	1.3 / 1.0	15 / 38
FD-6HC		496 / 1,878	<28.2 / 72				

NOTE

[1] Sediment storage capacity and clean out depth may vary, as larger sediment storage sump volumes are provided when required.

III. Maintenance

Overview

The First Defense® protects the environment by removing a wide range of pollutants from stormwater runoff. Periodic removal of these captured pollutants is essential to the continuous, long-term functioning of the First Defense®. The First Defense® will capture and retain sediment and oil until the sediment and oil storage volumes are full to capacity. When sediment and oil storage capacities are reached, the First Defense® will no longer be able to store removed sediment and oil. Maximum pollutant storage capacities are provided in Table 1.

The First Defense® allows for easy and safe inspection, monitoring and clean-out procedures. A commercially or municipally owned sump-vac is used to remove captured sediment and floatables. Access ports are located in the top of the manhole.

Maintenance events may include Inspection, Oil & Floatables Removal, and Sediment Removal. Maintenance events do not require entry into the First Defense®, nor do they require the internal components of the First Defense® to be removed. In the case of inspection and floatables removal, a vactor truck is not required. However, a vactor truck is required if the maintenance event is to include oil removal and/or sediment removal.

Maintenance Equipment Considerations

The internal components of the First Defense®-HC have a centrally located circular shaft through which the sediment storage sump can be accessed with a sump vac hose. The open diameter of this access shaft is 15 inches in diameter (Fig.3). Therefore, the nozzle fitting of any vactor hose used for maintenance should be less than 15 inches in diameter.

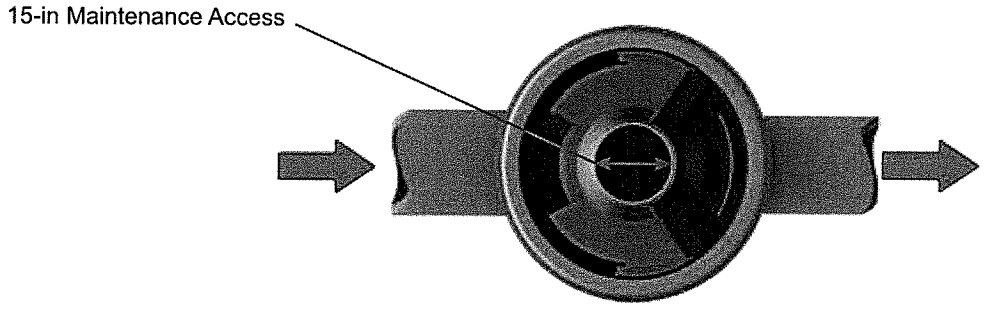


Fig.3 The central opening to the sump of the First Defense®-HC is 15 inches in diameter.

Determining Your Maintenance Schedule

The frequency of clean out is determined in the field after installation. During the first year of operation, the unit should be inspected every six months to determine the rate of sediment and floatables accumulation. A simple probe such as a Sludge-Judge® can be used to determine the level of accumulated solids stored in the sump. This information can be recorded in the maintenance log (see page 9) to establish a routine maintenance schedule.

The vactor procedure, including both sediment and oil / flotables removal, for a 6-ft First Defense® typically takes less than 30 minutes and removes a combined water/oil volume of about 765 gallons.

Inspection Procedures

1. Set up any necessary safety equipment around the access port or grate of the First Defense® as stipulated by local ordinances. Safety equipment should notify passing pedestrian and road traffic that work is being done.

2. Remove the grate or lid to the manhole.

3. Without entering the vessel, look down into the chamber to inspect the inside. Make note of any irregularities. Fig.4 shows the standing water level that should be observed.

4. Without entering the vessel, use the pole with the skimmer net to remove floatables and loose debris from the components and water surface.

5. Using a sediment probe such as a Sludge Judge®, measure the depth of sediment that has collected in the sump of the vessel.

6. On the Maintenance Log (see page 9), record the date, unit location, estimated volume of floatables and gross debris removed, and the depth of sediment measured. Also note any apparent irregularities such as damaged components or blockages.

7. Securely replace the grate or lid.

8. Take down safety equipment.

9. Notify Hydro International of any irregularities noted during inspection.

Floatables and Sediment Clean Out

Floatables clean out is typically done in conjunction with sediment removal. A commercially or municipally owned sump-vac is used to remove captured sediment and floatables (Fig.5).

Floatables and loose debris can also be netted with a skimmer and pole. The access port located at the top of the manhole provides unobstructed access for a vactor hose and skimmer pole to be lowered to the base of the sump.

Scheduling

- Floatables and sump clean out are typically conducted once a year during any season.

- Floatables and sump clean out should occur as soon as possible following a spill in the contributing drainage area.

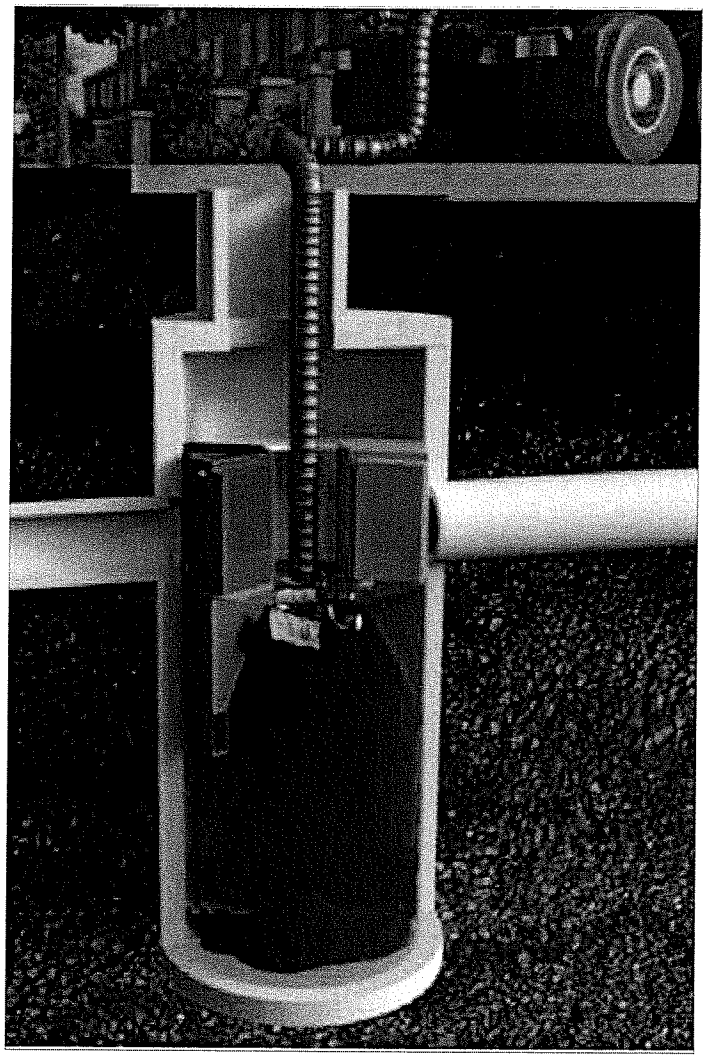


Fig.4 Floatables are removed with a vactor hose (First Defense model FD-4, shown).

Recommended Equipment

- Safety Equipment (traffic cones, etc)
- Crow bar or other tool to remove grate or lid
- Pole with skimmer or net (if only floatables are being removed)
- Sediment probe (such as a Sludge Judge®)
- Vactor truck (flexible hose recommended)
- First Defense® Maintenance Log

Floatables and sediment Clean Out Procedures

1. Set up any necessary safety equipment around the access port or grate of the First Defense® as stipulated by local ordinances. Safety equipment should notify passing pedestrian and road traffic that work is being done.

2. Remove the grate or lid to the manhole.

3. Without entering the vessel, look down into the chamber to inspect the inside. Make note of any irregularities.

4. Remove oil and floatables stored on the surface of the water with the vactor hose (Fig.5) or with the skimmer or net (not pictured).

5. Using a sediment probe such as a Sludge Judge®, measure the depth of sediment that has collected in the sump of the vessel and record it in the Maintenance Log (page 9).

6. Once all floatables have been removed, drop the vactor hose to the base of the sump. Vactor out the sediment and gross debris off the sump floor (Fig.5).

7. Retract the vactor hose from the vessel.

8. On the Maintenance Log provided by Hydro International, record the date, unit location, estimated volume of floatables and gross debris removed, and the depth of sediment measured. Also note any apparent irregularities such as damaged components, blockages, or irregularly high or low water levels.

9. Securely replace the grate or lid.

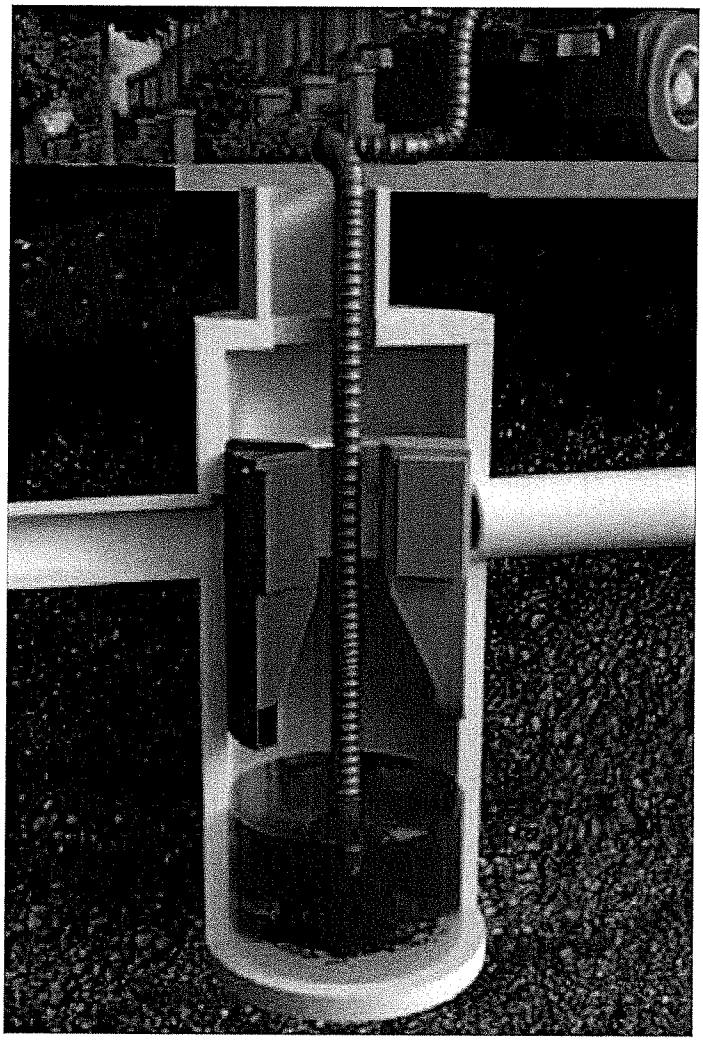


Fig.5 Sediment is removed with a vactor hose (First Defense model FD-4, shown).

Maintenance at a Glance

Activity	Frequency
Inspection	- Regularly during first year of installation - Every 6 months after the first year of installation
Oil and Floatables Removal	- Once per year, with sediment removal - Following a spill in the drainage area
Sediment Removal	- Once per year or as needed - Following a spill in the drainage area
NOTE: For most clean outs the entire volume of liquid does not need to be removed from the manhole. Only remove the first few inches of oils and floatables from the water surface to reduce the total volume of liquid removed during a clean out.	

Hydro International®

First Defense® Installation Log

HYDRO INTERNATIONAL REFERENCE NUMBER:	
SITE NAME:	
SITE LOCATION:	
OWNER:	CONTRACTOR:
CONTACT NAME:	CONTACT NAME:
COMPANY NAME:	COMPANY NAME:
ADDRESS:	ADDRESS:
TELEPHONE:	TELEPHONE:
FAX:	FAX:

INSTALLATION DATE: / /

MODEL SIZE (CIRCLE ONE): FD-4 FD-4HC FD-6 FD-6HC

INLET (CIRCLE ALL THAT APPLY): GRATED INLET (CATCH BASIN) INLET PIPE (FLOW THROUGH)

Hydro International (Stormwater), 94 Hutchins Drive, Portland ME 04102
Tel: (207) 756-6200 Fax: (207) 756-6212 Web: www.hydro-int.com

Hydro International®

First Defense® Inspection and Maintenance Log

Date	Initials	Depth of Floatables and Oils	Sediment Depth Measured	Volume of Sediment Removed	Site Activity and Comments

Hydro International (Stormwater), 94 Hutchins Drive, Portland ME 04102
Tel: (207) 756-6200 Fax: (207) 756-6212 Web: www.hydro-int.com

Hydro International (Stormwater), 94 Hutchins Drive, Portland ME 04102
Tel: (207) 756-6200 Fax: (207) 756-6212 Web: www.hydro-int.com

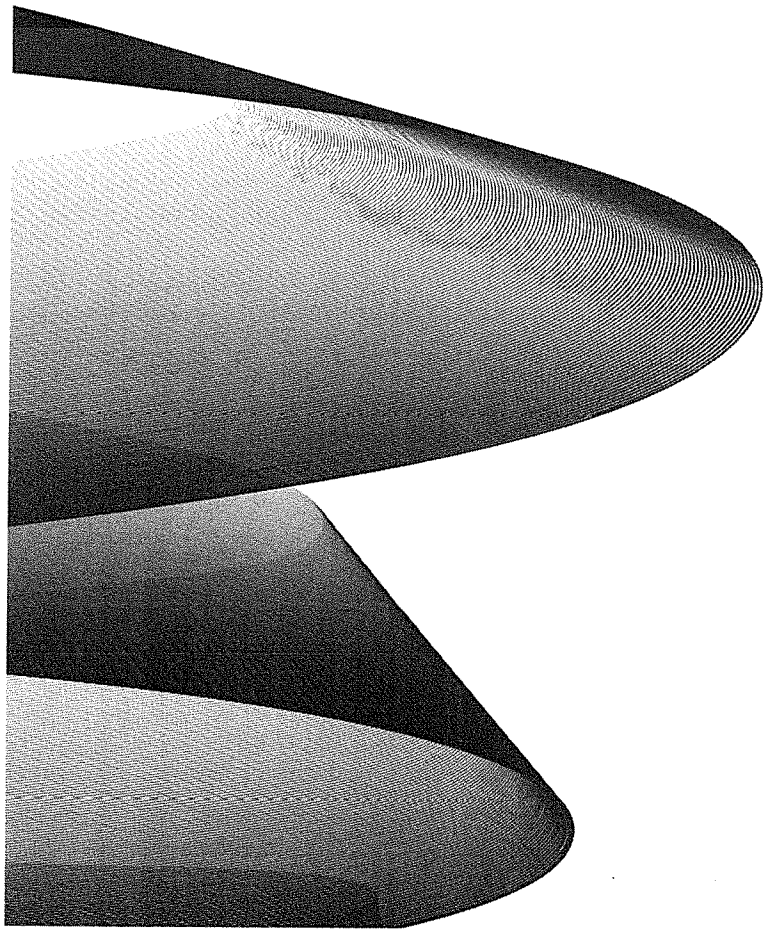
Hydro International®

What is HX?

HX is Hydro Experience, it is the essence of Hydro. It's interwoven into every strand of Hydro's story, from our products to our people, our engineering pedigree to our approach to business and problem-solving.

HX is a stamp of quality and a mark of our commitment to optimum process performance. A Hydro solution is tried, tested and proven.

There is no equivalent to Hydro HX.



Stormwater Solutions

94 Hutchins Drive
Portland, ME 04102

Tel: (207) 756-6200
Fax: (207) 756-6212
stormwaterinquiry@hydro-int.com

www.hydro-int.com

Turning Water Around...®

FD_O+M_D1502

STORMWATER INSPECTION MAINTENANCE LOG

1400 LAFAYETTE ROAD, PORTSMOUTH, NH

General Information			
Project Name	Residential Development Plans	**Location**	Portsmouth, NH
Date of Inspection		**Start/ End Time**	
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Contact Information			

	Site Specific BMP's	Maintenance Interval
1	Street Sweeping	1 year
2	Deep Sump Catch Basins	6 months
3	Underground Infiltration Systems (#1-4)	6 months
4	Hydrodynamic Separator (First Defense Unit)	1 Year (See separate maintenance log for First Defense Unit)

STORMWATER INSPECTION MAINTENANCE LOG

1400 LAFAYETTE ROAD, PORTSMOUTH, NH

BMP Description	Corrective Action Required?	Notes
Street Sweeping		
Evidence of debris accumulation	☐ Yes ☐ No	
Evidence of oil grease	☐ Yes ☐ No	
Other (specify)	☐ Yes ☐ No	
Deep Sump Catch Basins		
Grates clear of debris	☐ Yes ☐ No	
Inlet and outlet clear of debris	☐ Yes ☐ No	
Evidence of oil grease	☐ Yes ☐ No	
Observance of accumulated sediment	☐ Yes ☐ No	Sediment Depth =
Evidence of structural deterioration	☐ Yes ☐ No	
Evidence of flow bypassing facility	☐ Yes ☐ No	
Other (specify)	☐ Yes ☐ No	
Underground Infiltration System #1		
Inlet and outlet clear of debris	☐ Yes ☐ No	
Bottom surface clear of debris	☐ Yes ☐ No	
Evidence of rilling or gullying	☐ Yes ☐ No	
Observance of accumulated sediment	☐ Yes ☐ No	
Bottom dewaters within 72 hrs. of a storm event	☐ Yes ☐ No	
Standing water or wet spots	☐ Yes ☐ No	
Other (specify)	☐ Yes ☐ No	
Underground Infiltration System #2		
Inlet and outlet clear of debris	☐ Yes ☐ No	
Bottom surface clear of debris	☐ Yes ☐ No	
Evidence of rilling or gullying	☐ Yes ☐ No	
Observance of accumulated sediment	☐ Yes ☐ No	
Bottom dewaters within 72 hrs. of a storm event	☐ Yes ☐ No	
Standing water or wet spots	☐ Yes ☐ No	
Other (specify)	☐ Yes ☐ No	

STORMWATER INSPECTION MAINTENANCE LOG

1400 LAFAYETTE ROAD, PORTSMOUTH, NH

BMP Description	Corrective Action Required?	Notes
Underground Infiltration System #3		
Inlet and outlet clear of debris	☐ Yes ☐ No	
Bottom surface clear of debris	☐ Yes ☐ No	
Evidence of rilling or gullying	☐ Yes ☐ No	
Observance of accumulated sediment	☐ Yes ☐ No	
Bottom dewaters within 72 hrs. of a storm event	☐ Yes ☐ No	
Standing water or wet spots	☐ Yes ☐ No	
Other (specify)	☐ Yes ☐ No	
Underground Infiltration System #4		
Inlet and outlet clear of debris	☐ Yes ☐ No	
Bottom surface clear of debris	☐ Yes ☐ No	
Evidence of rilling or gullying	☐ Yes ☐ No	
Observance of accumulated sediment	☐ Yes ☐ No	
Bottom dewaters within 72 hrs. of a storm event	☐ Yes ☐ No	
Standing water or wet spots	☐ Yes ☐ No	
Other (specify)	☐ Yes ☐ No	
Hydrodynamic Separator #1 (First Defense Unit)		
See separate maintenance log for First Defense Unit		
Hydrodynamic Separator #2 (First Defense Unit)		
See separate maintenance log for First Defense Unit		
Hydrodynamic Separator #3 (First Defense Unit)		
See separate maintenance log for First Defense Unit		
Hydrodynamic Separator #4 (First Defense Unit)		
See separate maintenance log for First Defense Unit		
Hydrodynamic Separator #5 (First Defense Unit)		
See separate maintenance log for First Defense Unit		

NOTE: Photos shall be provided with each inspection log and shall be sufficiently labeled to identify photo location.

Deicing Log

Date Applied	Type of Deicing Material	Amount Applied

January 17, 2020

MAX-0458219.00

Mr. Richard Green
4 Amigos, LLC
321 Lafayette Road, Unit D
Hampton, New Hampshire 03842

SUBJECT: Trip-Generation & Site Access Letter
Residential Development
1400 Lafayette Road (US Route 1)
Portsmouth, New Hampshire

Dear Mr. Green:

Greenman-Pedersen Inc. (GPI) has prepared this letter to evaluate the expected trips associated with the proposed residential development to be located at 1400 Lafayette Road (US Route 1) in Portsmouth, New Hampshire. The residential portion of the site is currently vacant. The remainder of the site, however, occupies a Rite Aid, a Five Guys, and a Newburyport Five Cents Bank. In addition, when the pharmacy, restaurant, and bank were permitted and approved, it was assumed that a 20,200 square foot retail building would be built on the portion of the site that is now proposing residential units. The project consists of constructing 54 residential units within five buildings; 31 garden-style units and 23 townhouse-style units. Access to the site is currently provide via two driveways on Peverly Hill Road; a right-in/right-out only driveway and a full access/egress driveway, and two driveways on Lafayette Road (US Route 1); a right-in/right-out only driveway and a full access and right-out only driveway. As part of the development, access and egress to the site will remain the same. The site in relation to the surrounding roadways is shown on Figure A-1 attached to this letter.

Existing Conditions

Geometry

Lafayette Road (US Route 1) is classified as a principal arterial and is under the jurisdiction of the New Hampshire Department of Transportation (NHDOT). In the vicinity of the site, Lafayette Road is a four-lane roadway with two lanes in each direction and exclusive turn lanes at major intersections. Directional flow is separated by a double-yellow centerline. The posted speed limit on Lafayette Road adjacent to the site is 35 miles per hour (mph).

Peverly Hill Road is classified as a major collector and is under the jurisdiction of the City of Portsmouth. In the vicinity of the site, Peverly Hill Road is a two-lane roadway with one lane in each direction. Directional flow is separated by a double-yellow centerline. The posted speed limit on Peverly Hill Road adjacent to the site is 25 mph.

Collisions

Collision data for the study area intersections were obtained from the NHDOT for the most-recent complete three-year period (2014 through 2016). A summary of the collision data is provided in Table 1 and the back-up is attached to this letter. A data request was sent to the Portsmouth Police Department; however, the data was not received before submission of this letter. Once the data is received, it will be evaluated and if there are any major discrepancies compared to the NHDOT data a Supplemental Collision Letter will be prepared.

The signalized intersection of Lafayette Road (US Route 1) at Peverly Hill Road has experienced 24 reported collisions over the three-year study period, averaging 8.00 collisions per year. Three of the 24 reported collisions resulted in personal injury, 21 percent of the collisions occurred in wet/icy conditions, and 29 percent occurred during commuter peaks.

The intersection of Lafayette Road (US Route 1) at the full access/right-out only site driveway experienced one reported collision over the three-year study period, which took place in 2015. The crash did not result in personal injury, did not occur in wet/icy conditions, and did not occur during commuter peaks.

The intersection of Peverly Hill Road at West Road and the site driveway experienced nine reported collisions over the three-year study period, averaging 3.00 collisions per year. Three of the nine reported collisions resulted in personal injury, 22 percent of the collisions occurred in wet/icy conditions, and 22 percent occurred during commuter peaks. Three of the nine crashes were single-vehicle collisions with fixed objects; a tree, an embankment/ditch/curb, and a telephone pole.

The intersections of Lafayette Road (US Route 1) at the right-in/right-out site driveway and Peverly Hill Road at the right-in/right-out site driveway did not experience any collisions over the three-year study period.

Table 1
COLLISION SUMMARY

Location	Number of Collisions		Severity [a]				Percent During [b]	
	Total	Average per Year	PD	PI	F	U	Wet/Icy Conditions	Commuter Peak
US Route 1 at Peverly Hill Road	24	8.00	16	3	--	5	21%	29%
US Route 1 at Full Access/Right-Out Site Driveway	1	0.33	1	--	--	--	0%	0%
US Route 1 at Right-In/Right-Out Site Driveway	0	--	--	--	--	--	--	--
Peverly Hill Road at West Road and Site Driveway	9	3.00	6	3	--	--	22%	22%
Peverly Hill Road at Right-In/Right-Out Site Driveway	0	--	--	--	--	--	--	--

Source: New Hampshire Department of Transportation (2014-2016).
[a] PD = property damage only; PI = personal injury; F = fatality, U = unknown.
[b] Percent of vehicle incidents that occurred during the weekday AM and weekday PM commuter peak periods.

Design Conditions

Pedestrian and Bicycle Access

Currently sidewalks and a bicycle lane exist on the north side of Peverly Hill Road between Lafayette Road (US Route 1) and West Road. The City has a planned Peverly Hill Road Reconstruction project that would continue 5-foot wide sidewalks on the north side of the roadway and 5-foot wide bicycle lanes on the north and south sides of the roadway from West Road further west along the site frontage and beyond. The proposed residential development is further proposing a total sidewalk width of 10-feet for the two blocks of the residential development which are classified as community space and those can function either as sidewalks or they are wide enough to be used as a bicycle shared-used path, if the City desires it to be used that way. In addition, Americans with Disabilities Act (ADA) compliant sidewalks, ramps, and crosswalks are proposed throughout the development and bicycle racks will be provided on-site.

Additionally, Cooperative Alliance For Seacoast Transportation (COAST) provides Bus Route 41 along Lafayette Road (Route 1) that passes by the site. The closest bus stop is located 0.2 miles to the south on Wilson Road within the Market Basket Plaza. The bus route map and schedule is attached to this letter for reference.

Sight Distance

Access to the site is currently provide via two driveways on Peverly Hill Road; a right-in/right-out only driveway and a full access/egress driveway, and two driveways on Lafayette Road (US Route 1); a right-in/right-out only driveway and a full access and right-out only driveway. As part of the development, access and egress to the site will remain the same. To identify potential safety concerns associated with site access and egress, sight distances have been evaluated at the proposed site driveways to determine if the available sight distances for vehicles exiting the site meet or exceed the minimum distances required for approaching vehicles to safely stop. The available sight distances were compared with minimum requirements, as established by the American Association of State Highway and Transportation Officials (AASHTO).[1] AASHTO is the national standard by which vehicle sight distance is calculated, measured, and reported. In addition, the available sight distances were compared with the NHDOT's requirement of 400 feet of All-Season Safe Sight Distance.

Sight distance is the length of roadway ahead that is visible to the driver. Stopping Sight Distance (SSD) is the minimum distance required for a vehicle traveling at a certain speed to safely stop before reaching a stationary object in its path. The values are based on a driver perception and reaction time of 2.5 seconds and a braking distance calculated for wet, level pavements. When the roadway is either on an upgrade or downgrade, grade correction factors are applied. SSD is measured from an eye height of 3.5 feet to an object height of 2 feet above street level, equivalent to the taillight height of a passenger car. The SSD is measured along the centerline of the traveled way of the major road.

Intersection sight distance (ISD) is provided on minor street approaches to allow the drivers of stopped vehicles a sufficient view of the major roadway to decide when to enter the major roadway. By definition, ISD is the minimum distance required for a motorist exiting a minor street to turn onto the major street, without being overtaken by an approaching vehicle reducing its speed from the design speed to 70 percent of the design speed. The ISD is measured from an eye height of 3.5 feet to an object height of 3.5 feet above street level. The use of an object height equal to the driver eye height makes ISDs reciprocal (i.e., if one driver can see another vehicle, then the driver of that vehicle can also see the first vehicle). When the minor street is on an upgrade that exceeds 3 percent, grade correction factors are applied. The ISD design values for right turns from a minor street are less

[1] *A Policy on Geometric Design of Highways and Streets*; American Association of State Highway and Transportation Officials (AASHTO); 2004.

than the design values for left turns because, in making right turns, drivers generally accept gaps that are slightly shorter than those accepted in making left turns.

The SSD is generally more important as it represents the minimum distance required for safe stopping while ISD is based only upon acceptable speed reductions to the approaching traffic stream. The ISD, however, must be equal to or greater than the minimum required SSD in order to provide safe operations at the intersection. In accordance with the AASHTO manual, *"If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, this may require a major-road vehicle to stop or slow to accommodate the maneuver by a minor-road vehicle. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road."* Accordingly, ISD should be at least equal to the distance required to allow a driver approaching the minor road to safely stop.

The available SSD and ISD at the proposed site driveway locations were measured in the field and compared to minimum requirements as established by AASHTO. Since the distance required to stop a vehicle is dependent on the speed of that vehicle, speed studies were conducted. The speed data is attached to this letter. Based on both the posted speed limit and the observed speeds, the SSD and ISD requirements at the site driveway intersections were calculated. The required minimum sight distances for each direction are compared to the available distances, as shown in Table 2.

Table 2
SIGHT DISTANCE SUMMARY

	Stopping Sight Distance (feet)		Intersection Sight Distance (feet)		
Location/Direction	Measured	Minimum Required [a]	Measured	Minimum Required [b]	Desirable [c]
Route 1 at Full Access / Right-Out Only Site Driveway:					
North of Intersection (SB)	500+	350	500+	350	335
Route 1 at Right-In / Right-Out Site Driveway:					
North of Intersection (SB)	500+	350	500+	350	335
Peverly Hill Rd at Right-In / Right-Out Site Driveway:					
East of Intersection (westbound)	500+	250	500+	250	240
Peverly Hill Rd at Site Driveway:					
East of Intersection (westbound)	500+	250	500+	250	240
West of Intersection (eastbound)	500+	240	500+	240	280

[a] Values based on AASHTO requirements for an 85th percentile speed of 44 mph (SB) on Route 1 and 35 mph/34 mph (WB/EB) on Peverly Hill Road.
[b] Values based on AASHTO requirements for SSD.
[c] Values based on AASHTO requirements for a posted speed limit of 35 mph on Route 1 and 25 mph on Peverly Hill Road.

As indicated in Table 2, available sight distances at the site driveway locations exceed the minimum requirements as recommended by AASHTO as well as the 400 feet of All-Season Safe Sight Distance. To ensure the safe and efficient flow of traffic to and from the site, it is recommended that any proposed plantings, vegetation, landscaping, and signing along the site frontage be kept low to the ground (no more than 3.0 feet above street level) or set back sufficiently from the edge of Peverly Hill Road so as not to inhibit the available sight lines.

Trip Generation

The project consists of constructing 54 residential units within five buildings; 31 garden-style units and 23 townhouse-style units. Traffic to be generated by the proposed development project was forecast using the trip-generation information provided in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*[2] for LUC 221 (Multifamily Housing [Mid-Rise]). The trip-generation summary is shown in Table 3, and the back-up data are provided in the attachments.

Table 3
TRIP-GENERATION SUMMARY

Time Period/Direction	Total Trips [a]
Weekday Daily:	290
Weekday AM Peak Hour:	
In	5
Out	14
Total	19
Weekday PM Peak Hour:	
In	15
Out	10
Total	25
Saturday Daily:	270
Saturday Midday Peak Hour:	
In	15
Out	15
Total	30

[a] Based on ITE LUC 221 (Multifamily Housing [Mid-Rise]) for 54 dwelling units.

As shown in Table 3, the proposed residential development is expected to generate 19 total vehicle trips (5 entering and 14 exiting) during the weekday AM peak hour, 25 total vehicle trips (15 entering and 10 exiting) during the weekday PM peak hour, and 29 total vehicle trips (14 entering and 15 exiting) during the Saturday midday peak hour.

[2] *Trip Generation, 10th Edition.* Institute of Transportation Engineers; Washington, DC; 2017.

Trip Generation Comparison

The residential portion of the site is currently vacant. The remainder of the site, however, occupies a Rite Aid, a Five Guys, and a Newburyport Five Cents Bank. In addition, when the pharmacy, restaurant, and bank were permitted and approved, it was assumed that a 20,200 square foot retail building would be built on the portion of the site that is now proposing residential units. The approved trip generation which includes the 20,200 square foot retail building was provided in a letter[3] prepared by Vanasse & Associates, Inc. (VAI) dated July 12, 2012. Accordingly, the proposed residential trip generation estimates have been compared to the previously approved retail trip generation estimates. This comparison is provided in Table 4.

Table 4
TRIP-GENERATION COMPARISON

Time Period/Direction	(1) Currently Proposed Residential Development [a]	(2) Previously Approved General Retail (20,200 sf) [b]	(3) Difference
Weekday Daily:	290	868	578
Weekday PM Peak Hour:			
In	15	37	22
Out	10	38	28
Total	25	75	50
Saturday Daily:	270	1,010	740
Saturday Midday Peak Hour:			
In	15	51	36
Out	15	48	33
Total	30	99	69

[a] Based on ITE LUC 221 (Multifamily Housing [Mid-Rise]) for 54 dwelling units. From Table 3.
[b] Based on ITE LUC 820 (Shopping Center) for 20,200 square feet from *VAI Letter*.
[c] Trips associated with previously approved General Retail (column 2) minus trips associated with currently proposed residential development (column 1).

The currently proposed residential development is expected to generate 50 *fewer* vehicles trips (22 *less* entering and 28 *less* exiting) during the weekday PM peak hour and 69 *fewer* vehicle trips (36 *less* entering and 33 *less* exiting) during the Saturday midday peak hour in comparison to the previously approved retail building.

Trip Distribution

Having estimated project-generated vehicle trips, the next step is to determine the distribution of project traffic and assign these trips to the local roadway network. Using the directional distribution from the VAI letter prepared for the commercial development on the site, approximately 35 percent of the site-generated traffic is expected to travel to and from the north along Lafayette Road (Route 1), 35 percent is expected to and from the south along

[3] Vanasse & Associates, Inc. (VAI); *Proposed Commercial Development, 1390 Lafayette Road, Portsmouth, New Hampshire*; July 12, 2012.

Lafayette Road (Route 1), 15 percent is expected to and from the west along Peverly Hill Road, 10 percent is expected to and from the east along Elwyn Road, and 5 percent is expected to and from the south along West Road.

The proposed residential development will result in increases in traffic on Lafayette Road (Route 1) and Peverly Hill Road beyond the study area to be in the range of 2 to 11 vehicles. These increases represent, on average, one additional vehicle trip approximately every 5.5 to 30 minutes during the peak hours. These small increases in traffic are expected to have a negligible impact on traffic operations along Lafayette Road (US Route 1) and Peverly Hill Road.

Summary

- The proposed residential development is to be located at 1400 Lafayette Road (US Route 1) in Portsmouth, New Hampshire. The residential portion of the site is currently vacant. The remainder of the site, however, occupies a Rite Aid, a Five Guys, and a Newburyport Five Cents Bank. In addition, when the pharmacy, restaurant, and bank were permitted and approved, it was assumed that a 20,200 square foot retail building would be built on the portion of the site that is now proposing residential units. The project consists of constructing 54 residential units within five buildings; 31 garden-style units and 23 townhouse-style units.

- Access to the site is currently provide via two driveways on Peverly Hill Road; a right-in/right-out only driveway and a full access/egress driveway, and two driveways on Lafayette Road (US Route 1); a right-in/right-out only driveway and a full access and right-out only driveway. As part of the development, access and egress to the site will remain the same.

- The signalized intersection of Lafayette Road (Route 1) at Peverly Hill Road has experienced 24 reported collisions over the three-year study period, averaging 8.00 collisions per year. The intersection of Lafayette Road (Route 1) at the full access/right-out only site driveway experienced one reported collision over the three-year study period. The intersection of Peverly Hill Road at West Road and the site driveway experienced nine reported collisions over the three-year study period, averaging 3.00 collisions per year. The intersections of Lafayette Road (Route 1) at the right-in/right-out site driveway and Peverly Hill Road at the right-in/right-out site driveway did not experience any collisions over the three-year study period.

- The City has a planned Peverly Hill Road Reconstruction project that would continue 5-foot wide sidewalks on the north side of the roadway and 5-foot wide bicycle lanes on the north and south sides of the roadway from West Road further west along the site frontage and beyond. The proposed residential development is further proposing a total sidewalk width of 10-feet for the two blocks of the residential development which are classified as community space and those can function either as sidewalks or they are wide enough to be used as a bicycle shared-used path, if the City desires it to be used that way. In addition, Americans with Disabilities Act (ADA) compliant sidewalks, ramps, and crosswalks are proposed throughout the development and bicycle racks will be provided on-site.

- Available sight distances at the site driveway locations exceed the minimum requirements as recommended by AASHTO as well as the 400 feet of All-Season Safe Sight Distance. To ensure the safe and efficient flow of traffic to and from the site, it is recommended that any proposed plantings, vegetation, landscaping, and signing along the site frontage be kept low to the ground (no more than 3.0 feet above street level) or set back sufficiently from the edge of Peverly Hill Road so as not to inhibit the available sight lines.

- The currently proposed residential development is expected to generate 19 total vehicle trips (5 entering and 14 exiting) during the weekday AM peak hour, 25 total vehicle trips (15 entering and 10 exiting) during the weekday PM peak hour, and 29 total vehicle trips (14 entering and 15 exiting) during the Saturday midday

peak hour. These additional trips equate to 50 *fewer* vehicles trips (22 *less* entering and 28 *less* exiting) during the weekday PM peak hour and 69 *fewer* vehicle trips (36 *less* entering and 33 *less* exiting) during the Saturday midday peak hour in comparison to the previously approved retail building.

- The proposed residential development will result in increases in traffic on Lafayette Road (Route 1) and Peverly Hill Road beyond the study area to be in the range of 2 to 11 vehicles. These increases represent, on average, one additional vehicle trip approximately every 5.5 to 30 minutes during the peak hours. These small increases in traffic are expected to have a negligible impact on traffic operations along Lafayette Road (US Route 1) and Peverly Hill Road.

Should you have any questions, or require additional information, please contact me at (978) 570-2968.

Sincerely,

GREENMAN-PEDERSEN, INC.

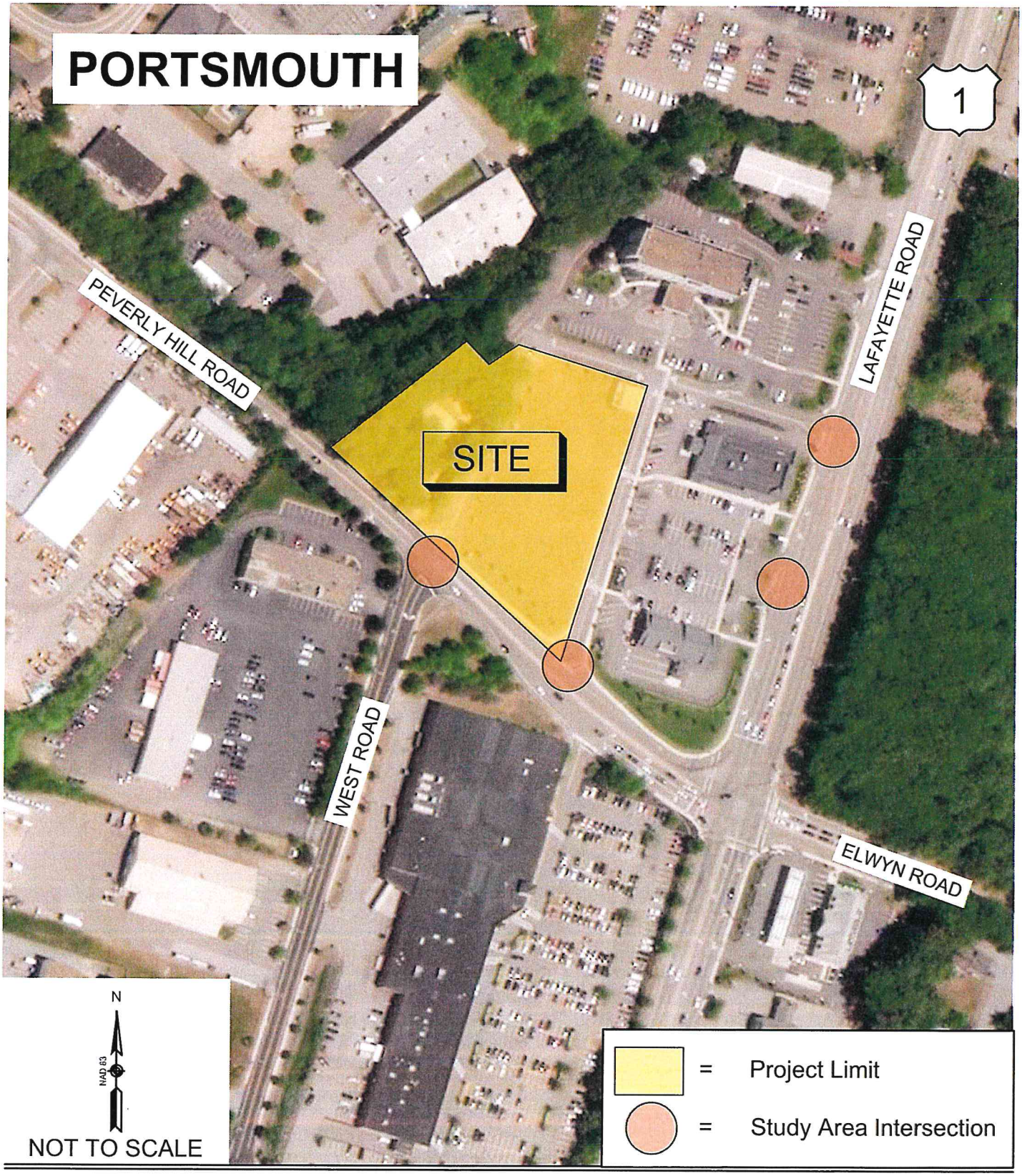
Heather Monticup

Heather L. Monticup, P.E.
Assistant Vice President / Director of Land Development Traffic

enclosure(s)

ATTACHMENTS

SITE LOCATION MAP (FIGURE A-1)
PUBLIC TRANSPORTATION MAP AND SCHEDULE
SPEED DATA
TRIP-GENERATION WORKSHEETS



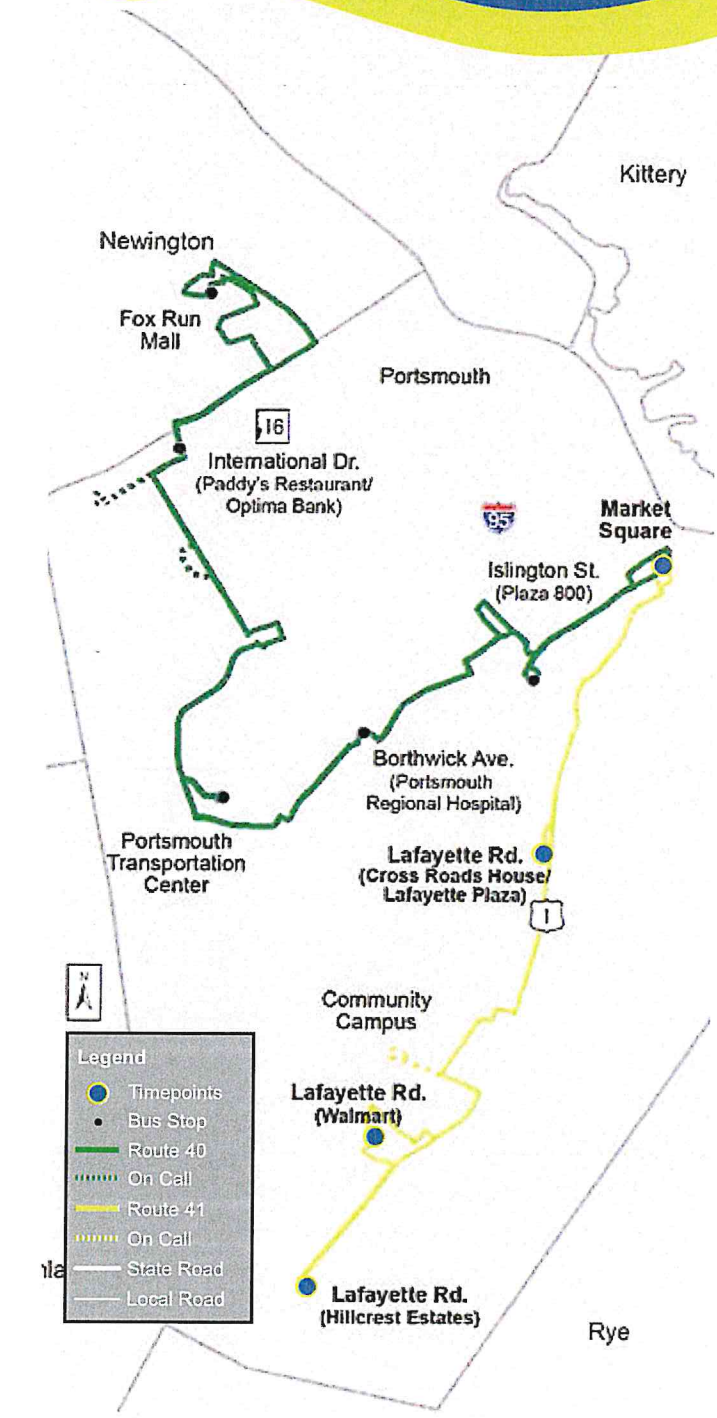
GPI
Engineering
Design
Planning
Construction Management
978.570.2999 GPINET.COM

Greenman-Pedersen, Inc.
181 Ballardvale Street
Suite 202
Wilmington, MA 01887

Figure A-1

Project Locus Map

41 Trolley 41 Map



OUT & INBOUND
Trolley 41 Stops

41

OUTBOUND
PORTSMOUTH

- **Market Square** *(Connect to Routes 2, 4, 40)*
- Court/Chestnut Sts.
- Court/Middle Sts.
- Middle/Summer Sts.
- Middle/Madison Sts.
- Middle/Cass Sts.
- Middle St./Aldrich Rd.
- Middle/Lawrence Sts.
- Lafayette Rd./Willard Ave.
- Lafayette Rd. (Lafayette Professional Park)
- Lafayette Rd. (Portsmouth High School)
- **Lafayette Rd. (Cross Roads House)**
- Wilson Rd. (Market Basket)
- 210 West Rd. (Seacoast Family Food Pantry)
- West Rd./Campus Dr.
- Campus Dr. (Community Campus) *ON CALL*
- West/Lafayette Rds.
- Constitution Ave. (Portsmouth Green)
- **Lafayette Rd. (Walmart)**
- Lafayette Rd. (Patriots Park Apts.)
- Lafayette/Ocean Rds.
- **Lafayette Rd. (Hillcrest Estates)**

INBOUND
PORTSMOUTH

- **Lafayette Rd. (Hillcrest Estates)**
- Lafayette Rd. (Dunkin' Donuts)
- Lafayette Rd./White Cedar Blvd.
- Lafayette Rd./Springbrook Cir. (Taco Bell)
- Lafayette Rd. (VIP Auto Parts)
- West/Lafayette Rds.
- West Rd./Campus Dr.
- 215 West Rd.
- Wilson Rd. (Market Basket)
- **Lafayette Rd. (Lafayette Plaza/Lens Doctors)**
- Lafayette Rd./Ledgewood Dr.
- Lafayette Rd. (Portsmouth High School)
- Lafayette Rd./South St.
- Lafayette Rd./Willard Ave.
- Middle St./Mendum Ave.
- Middle St./Aldrich Rd.
- Middle/Park Sts.
- Middle/Wibird Sts. (Middle St. Market)
- Middle St./Miller Ave. (Margeson Apts.)
- Court/Mark Sts.
- Court St. (Feaster Apts.)
- **Market Square** *(Connect to Routes 2, 4, 40)*

Trolley Note: Customers aboard the Rte. 40 Trolley may stay aboard to ride the Rte. 41 Trolley at no additional charge. Exceptions are noted for specific runs which do not continue as the Rte. 41 Trolley.

41 OUT & INBOUND

Route 41 Weekday • Market Square • Lafayette Rd.

OUTBOUND										
PORTSMOUTH										
• Market Square	5:59am	6:40am	7:33am	8:16am	8:54am	9:30am	10:26am	11:16am	12:33pm	1:21pm
• Lafayette Rd. (Cross Roads House)	6:07am	6:48am	7:41am	8:24am	9:02am	9:38am	10:34am	11:24am	12:41pm	1:29pm
• Lafayette Rd. (Walmart)	--	6:56am	7:49am	8:32am	9:10am	9:46am	10:42am	11:32am	12:49pm	1:37pm
• Lafayette Rd. (Hillcrest Estates)	6:11am	7:07am	8:05am	8:42am	9:14am	9:51am	10:47am	11:37am	12:57pm	1:45pm
INBOUND										
PORTSMOUTH										
• Lafayette Rd. (Hillcrest Estates)	6:12am	7:08am	8:06am	8:43am	9:15am	9:52am	10:48am	11:38am	12:58pm	1:46pm
• Lafayette Rd. (Lafayette Plaza / Lens Doctors)	6:19am	7:17am	8:15am	8:52am	9:24am	10:01am	10:57am	11:47am	1:07pm	1:55pm
• Market Square	6:28am	7:27am	8:27am	9:00am	9:33am	10:09am	11:05am	11:55am	1:17pm	2:05pm

- --: *No Service*
- *The 5:59am run from Market Square does not service Market Basket, Community Campus, Constitution Ave., or Walmart*
- *The 6:12am run from Lafayette Rd. (Hillcrest Estates) does not service West Rd. or Market Basket.*
- *The 6:12am run from Lafayette Rd. (Hillcrest Estates) continues service to the Portsmouth Naval Shipyard Gate 1. Customers wishing to continue on the Pease Trolley must depart and pay full fare on the next departure of the Pease Trolley.*
- *The 8:06am and 9:52am runs from Lafayette Rd. (Hillcrest Estates) end service at Market Square. They do not continue as the Pease Trolley. All customers must depart in Market Square. Those wishing to continue on the next Pease Trolley must pay full fare.*

continued on next page

41 OUT & INBOUND *continued*

Route 41 Weekday • Market Square • Lafayette Rd.

OUTBOUND										
PORTSMOUTH										
• Market Square	2:41pm	3:17pm	3:53pm	4:22pm	4:51pm	5:32pm	6:08pm	6:33pm	7:35pm	8:32pm
• Lafayette Rd. (Cross Roads House)	2:49pm	3:25pm	4:01pm	4:30pm	4:59pm	5:40pm	6:16pm	6:41pm	7:43pm	8:40pm
• Lafayette Rd. (Walmart)	2:57pm	3:33pm	4:09pm	4:38pm	5:07pm	5:48pm	6:24pm	6:49pm	7:51pm	8:48pm
• Lafayette Rd. (Hillcrest Estates)	3:03pm	3:39pm	4:17pm	4:44pm	5:12pm	5:51pm	6:30pm	6:54pm	7:56pm	8:51pm
INBOUND										
PORTSMOUTH										
• Lafayette Rd. (Hillcrest Estates)	3:04pm	3:40pm	4:18pm	4:45pm	5:13pm	5:52pm	6:30pm	6:55pm	7:57pm	8:52pm
• Lafayette Rd. (Lafayette Plaza / Lens Doctors)	3:13pm	3:49pm	4:27pm	4:54pm	5:22pm	6:01pm	6:39pm	7:04pm	8:06pm	9:01pm
• Market Square	3:23pm	3:59pm	4:37pm	5:04pm	5:32pm	6:11pm	6:48pm	7:13pm	8:13pm	9:08pm

- *The 6:30pm run from Lafayette Rd. (Hillcrest Estates) does not continue as the Pease Trolley. Those wishing to continue on the next Pease Trolley must pay full fare.*

40 OUT & INBOUND
Route 40 Saturday • Portsmouth • Pease Tradeport • Newington

OUTBOUND							
PORTSMOUTH							
• Market Square	--	8:11am	10:13am	1:06pm	3:22pm	5:41pm	7:56pm
• Islington St. (Plaza 800)	--	8:17am	10:20am	1:13pm	3:30pm	5:49pm	8:04pm
• Borthwick Ave. (Portsmouth Regional Hospital)	--	8:24am	10:27am	1:20pm	3:37pm	5:56pm	8:11pm
• Portsmouth Transportation Center	--	8:31am	10:38am	1:28pm	3:45pm	6:04pm	8:16pm
• International Dr. (Paddy's Restaurant)	--	8:39am	10:46am	1:36pm	3:53pm	6:12pm	--
NEWINGTON							
• Fox Run Mall	--	8:47am	10:54am	1:46pm	4:04pm	6:22pm	--
INBOUND							
NEWINGTON							
• Fox Run Mall	--	8:51am	10:58am	1:51pm	4:09pm	6:26pm	--
PORTSMOUTH							
• International Dr. (Optima Bank)	--	8:57am	11:04am	1:57pm	4:15pm	6:32pm	--
• Portsmouth Transportation Center	7:05am	9:05am	11:12am	2:05pm	4:23pm	6:40pm	8:16pm
• Borthwick Ave. (Portsmouth Regional Hospital)	7:12am	9:12am	11:19am	2:12pm	4:30pm	6:47pm	8:23pm
• Islington St. (Plaza 800)	7:18am	9:18am	11:30am	2:22pm	4:40pm	6:59pm	8:29pm
• Market Square	7:26am	9:26am	11:39am	2:32pm	4:50pm	7:08pm	8:38pm

- *--: No Service*
- *The 7:56pm run from Market Square only goes as far as the Portsmouth Transportation Center and returns to Market Square.*

41 OUT & INBOUND
Route 41 Saturday • Market Square • Lafayette Rd

OUTBOUND							
PORTSMOUTH							
• Market Square	7:28am	9:28am	12:16pm	2:34pm	4:52pm	7:11pm	8:39pm
• Lafayette Rd. (Cross Roads House)	7:36am	9:36am	12:24pm	2:42pm	5:00pm	7:19pm	8:47pm
• Lafayette Rd. (Walmart)	7:46am	9:44am	12:32pm	2:50pm	5:08pm	7:27pm	8:55pm
• Lafayette Rd. (Hillcrest Estates)	7:51am	9:53am	12:44pm	3:00pm	5:18pm	7:36pm	9:02pm
INBOUND							
PORTSMOUTH							
• Lafayette Rd. (Hillcrest Estates)	7:52am	9:54am	12:45pm	3:01pm	5:19pm	7:37pm	9:03pm
• Lafayette Rd. (Lafayette Plaza / Lens Doctors)	8:01am	10:03am	12:54pm	3:10pm	5:28pm	7:46pm	9:09pm
• Market Square	8:10am	10:12am	1:05pm	3:21pm	5:39pm	7:55pm	--

- *--: No Service*
- *The 7:28am, 9:28am, 12:16pm, and 2:34pm runs from Market Square service community campus on Saturdays.*
- *The 4:52pm, 7:11pm, and 8:39pm runs from Market Square do not service Community Campus.*
- *The 9:03pm run from Lafayette Rd. (Hillcrest Estates) ends service at Lafayette Plaza, and does not return to Market Square. It does not serve West Rd.*

Lafayette Road	
Southbound Speed (mph)	Northbound Speed (mph)
40	43
35	36
43	36
37	37
39	38
41	35
36	37
36	37
33	35
32	37
52	41
46	37
37	38
35	33
42	38
40	39
38	44
37	37
36	39
36	37
44	37
42	40
40	37
38	41
37	44
44	36
48	39
38	35
38	38
34	37
37	45
43	47
38	42
33	38
39	48
39	37
55	39
54	36
46	45
39	46
44	41
40	35
40	47
46	41
40	37
42	37
36	39
44	41
42	43
39	39
40	39 = Average Speeds
44	44 = 85th Percentile Speeds

Peverly Hill Road	
Eastbound Speed (mph)	Westbound Speed (mph)
32	36
32	37
33	31
29	29
31	35
30	25
34	31
30	28
34	33
32	39
28	20
33	37
31	34
37	30
30	33
30	27
31	29
29	34
26	31
27	32
29	28
30	31
35	32
33	32
31	34
27	30
24	31
26	30
30	23
33	29
26	28
27	31
30	33
30	29
29	31
32	34
34	38
34	37
33	30
34	32
30	32
34	25
28	26
32	35
30	28
27	32
30	27
28	31
27	32
38	28
31	31 = Average Speeds
34	35 = 85th Percentile Speeds

Institute of Transportation Engineers (ITE)

Land Use Code (LUC) 221 - Multifamily Housing (Mid-Rise)

General Urban/Suburban

Average Vehicle Trips Ends vs: Dwelling Units
Independent Variable (X): 54

AVERAGE WEEKDAY DAILY

T = 5.45 * (X) - 1.75
T = 5.45 * 54 - 1.75
T = 292.55
T = 292 vehicle trips
with 50% (146 vpd) entering and 50% (146 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

Ln(T) = 0.98 Ln (X) - 0.98
Ln(T) = 0.98 Ln (54) - 0.98
Ln(T) = 2.93
T = 18.71
T = 19 vehicle trips
with 26% (5 vph) entering and 74% (14 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

Ln T = 0.96 Ln (X) - 0.63
Ln T = 0.96 Ln(54) - 0.63
Ln T = 3.20
T = 24.52
T = 25 vehicle trips
with 61% (15 vph) entering and 39% (10 vph) exiting.

SATURDAY DAILY

T = 4.91 * (X)
T = 4.91 * 54
T = 265.14
T = 266 vehicle trips
with 50% (133 vpd) entering and 50% (133 vpd) exiting.

SATURDAY PEAK HOUR OF GENERATOR

T = 0.42 * (X) + 6.73
T = 0.42 * 54 + 6.73
T = 29.41
T = 30 vehicle trips
with 49% (15 vpd) entering and 51% (15 vpd) exiting.