



CITY OF DOVER

PLANNING TECHNICAL REVIEW COMMITTEE –AGENDA

Meeting Type: Regular Meeting
Meeting Location: Council Conference Room – City Hall, Dover NH
Meeting Date: **Thursday, February 03, 2022**
Meeting Time: **10:30 AM**

1. 10:30 AM – 11:15 AM: Site Review for Diamond Capital, LLC., Assessor's Map 14, Lots 17 & 17A, zoned Gateway, located at 71 & 73 Rutland Street. (Proposal is to retain the two current structures as well as new construction of 8 townhouses in a single building). (P21-64)

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City of Dover Planning Board
288 Central Ave.
Dover, NH 03820-4169

January 7, 2022

Attn: Ms. Donna Benton
AICP City Planner

RE: Proposed Townhome Project
71-73 Rutland Street and Abbey Lane
Planning File No. P21-64
Technical Review Committee Meeting – Responses

Dear Ms. Benton:

In response to the comments received from the City of Dover Technical Review Committee meeting on October 14, 2021 regarding the above referenced project, please find:

- Site Plan Application and Checklist
- Site Plan prepared by Hancock Associates, containing 11 sheets. (rev. 01-07-22)
- Architectural Plans prepared by Koal Architecture, PLLC (rev. 12-17-21)
- Streetscape Rendering prepared by Koal Architecture, PLLC (rev. 12-17-21)
- Traffic Assessment prepared by Hancock Associates
- Parking Memo prepared by Hancock Associates
- Stormwater Management Report prepared by Hancock Associates (rev. 12-17-21)
- Stormwater Operation & Maintenance Plan (rev. 12-17-21)
- Landscape Operation & Maintenance Plan
- Photometric Report prepared by Hurry Associates
- Soils Report prepared by Gove Environmental
- Impact, sewer and water, and passive and active recreation fees (sent under separate cover by Applicant)
- Condominium documents (sent under separate cover by Applicant)

In addition, we offer the following responses to your comments below (responses in **red**):

PLAN REVIEW:

Planning:

- Impact fees
Applicant is handling all fee payments direct.
- Sewer and water fees
Applicant is handling all fee payments direct.
- Treat as one project including existing two homes

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Boston, Brockton, Chelmsford, Danvers, Marlborough, Newburyport, Palmer and Princeton, MA | Concord, NH

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Noted.

- Passive and active recreation fees per Chapter 170-15
We believe the nature of the development as a townhouse condominium development affords the residents private rear decks and patios as well as greenspace within the lot to meet these requirements. Should the Board decide otherwise the Applicant will handle any fee in lieu payments direct.
- Trash? –Toters? Where placed on garbage day?
Trash and recycling will be stored in 24 gallon tote(s) within each townhouse's garage and placed curbside in front of units on garbage pickup day, in correspondence to the City of Dover Recycling Center rules and regulations.
- Tandem parking counts as 1 space. Provide justification for providing only one space per unit and no visitor spaces or add parking.
Revised accordingly – four visitor parking spaces now provided and the spaces in front of each garage are not being counted (although available) toward the twelve (12) spaces provided. Note that the 1.9 spaces required per unit is a maximum.
- Provide lot merger
A lot merger form will be submitted by the Project Attorney under separate cover.
- Postmaster about mail kiosk?
The Applicant has coordinated with the Post Master and a kiosk has been added to plans.
- Provide condo docs as COA
Draft condominium documents will be submitted by the Project Attorney under separate cover.
- Revise Plans to:
 - o Add Planning File number P21-64
Revised accordingly.
 - o Add Common Plan notes: # 1, 6, 7, 9, 10, 12, 13, 18, 19, 20, 24, 25, 26, 30, 31, 34, 35
Added. Notes 12 and 19 reference wetland areas, which there are none within the project site. Note 18 references a treatment swale, which was not proposed.
 - o Revise site work hours to no Saturday, no Sunday, and no federal holidays
Revised accordingly.
 - o Add Signature and stamps on each submission
Revised accordingly.
 - o Add Owners signatures on final plans
Owners will sign off on final plans once planning board approval is obtained.
 - o Add Neighborhood Plan/abutters info
Revised accordingly.
 - o Add Lighting Plan that meets regulations
Revised accordingly. Lighting information provided on site plan and in photometric report. In accordance with lighting regulations, a 3.5:1 uniformity ratio is provided within the parking area.
 - o Snow storage location
Revised accordingly.

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- o Indicate bike rack on floor plans or in note on site plan as indicated in narrative
Bike storage will be contained within each garage unit, as noted on sheet C-2 of the plans.
- o Add “No Parking” signs to Rutland and Abbey
We were informed at TRC meeting parking is allowed on Abbey and that as a public road a private land owner does not have the authority to post no parking signs.
- o At least 5% of the parking needs to be EV ready
We have noted on the plan that one unit (10%) will be equipped with the ability to charge a vehicle. This will be offered as an option to perspective buyers so more than one may be so equipped.
- o Have MA RLA still sign/stamp landscape plan
Revised accordingly.
- o Add stop bars and signs per traffic analysis
Revised accordingly.
- o Replant grass strip along Rutland
Revised accordingly.
- o Wet pond shown on streetscapes
Revised accordingly. Per City Engineer’s comments, wet pond has been converted into a rain garden.
- o Add materials and colors to architectural drawings
Revised architectural plans herein.
- o Combine into one set. Reduce size of civil plans and staple together
Revised accordingly. Civil plans reduced to 24” x 36” sheets.
- o Indicate width of Abbey’s pavement
Revised accordingly.
- o Add sidewalk to Abbey
Revised. Added bituminous concrete sidewalk.
- o Add fence or screening along retaining wall?
Revised accordingly with 6’ white vinyl fence.
- o Add tree next to new building along Abbey
Revised accordingly.
- o Screen transformer
Revised accordingly.
- o Note about unit count and not able to convert single family dwellings into duplexes in future
Note added to plans.
- Provide:
 - o Letters to serve
We have requested letters to serve from the public and private utility companies. They will be forwarded to the Board as they become available.
 - o HOA documents
Draft condominium documents will be submitted by the Project Attorney under separate cover.

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Engineering Comments:

- There seems to be a lack of cover over the sewer main
Sewer has been revised to run through property and tie into the existing sewer manhole on Rutland Street. Adequate cover is now provided. See plans for revised layout.
- You will need a manhole on Rutland for the sewer tie in
See previous comment regarding revised sewer layout.
- Can you tie into the existing sewer that serve the existing buildings below?
See revised sewer layout.
- I believe there is an existing water main on Abbey
Existing water main added to plans and tapped from for proposed water services.
- There will be a 2 inch tap off the main not a tee and a road box will be needed over the curb box in the roadway
Water services revised to call out tapping sleeves and road boxes.
- You will need curb boxes for the 1 inch services
Revised accordingly.
- A yard hydrant may be needed to flush the main.
Revised accordingly.
- Have you considered just running the 4 inch in and tapping off that for the services?
Water services revised to have 1-inch services from townhouses tapping off 2-inch line for both domestic and fire protection services. Each unit will need an NFPA 13D system per NFPA 101. Only a single water connection is required per discussion with a mechanical engineer. A separate backflow preventer will be located inside each unit where the fire suppression line ties into the domestic supply from the street. Final design will be required by a licensed plumber prior to building permit application. The domestic supply will have its own backflow preventer and standard meter horn.
- Can you convert the wet pond to a rain garden to reduce possible insect breeding area?
Revised accordingly. Rain garden now proposed.
- Why do you run the roof drainage thru the ponds?
Revised accordingly. Overflow from roof drainage brought to existing system in Abbey Lane.
- Explain the maintenance drainline out of the pond?
Revised accordingly. Wet pond has been converted into rain garden. Underdrain proposed in rain garden to assist with infiltration.
- Will the pool be removed as part of this project?
Pool will be removed. See Site Preparation and Demolition Plan (sheet C-1).

Police Department Comments:

- Lack of proximate overflow/guest parking is a significant concern for this project. This plan not only provides none, but it further reduces or eliminates public overflow parking for abutting properties on Abbey Lane (per TAM recommendations). Evaluate how to preserve/maximize available overflow parking.
Revised accordingly. Overflow/guest parking now provided.

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- Widen site driveway off Abbey Lane to provide visitor parking
See previous response. Visitor parking now provided.
- Will existing buildings – particularly at 73 Rutland – be rehabilitated? The proposal makes no reference.
Both existing dwellings on the project site will be retained and rehabilitated. See Site Preparation and Demolition Plan (sheet C-1).
- How is refuse proposed to be stored and collected?
Refuse will be stored in 24-gallon trash totes within the garage of each townhouse and will be brought out curbside on trash pickup day.

Fire/Inspections Comments:

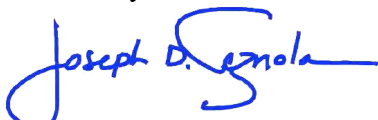
- Indicate if these will be constructed as townhouses or Apt. building.
Eight-unit townhouses are proposed. See plans.
- Indicate the location of the FDC on the site plan.
Revised accordingly. Each townhouse will have a fire protection serviced tapped off the 1" domestic services. See further discussion above.
- Clarify site compliance with City of Dover Ordinance and NH Fire code for access roads greater than 150' in length.
Revised accordingly - emergency vehicle/truck turnaround provided.
- Indicate the distance from the rear boundary line and the types of material used.
Revised accordingly. Driveway will be bituminous concrete pavement, emergency vehicle turnaround will be grass pavers with bearing capacity to handle Fire Department equipment.
- Provide a rear elevation of the proposed structures.
Rear elevation provided in the original submission.

Additionally, we have made the other following revisions to the plans:

- Added downspouts to the rear of the townhouses.
- Conducted test pits on site and revised stormwater – including adding watersheds for the Rutland Manor areas offsite.
- Proposed electrical conduit running up Abbey Lane and tying into the pole at the corner of Rutland Street and Abbey Lane.

We hope this demonstrates we have addressed all comments made by the Technical Review Committee and comply with the applicable sections of the Zoning Ordinance and Site Plan Regulations. We look forward to receiving approval from the committee and continuing with the review process with the Planning Board.

Sincerely,



Hancock Associates
Acting on Behalf of Diamond Capital, LLC

10 Ferry Street, Suite 406 | Concord, NH 03301 | V: 603-223-1950 | HancockAssociates.com

Boston, Brockton, Chelmsford, Danvers, Marlborough, Newburyport, Palmer and Princeton, MA | Concord, NH

STORMWATER REPORT

FOR

71-73 Rutland Street

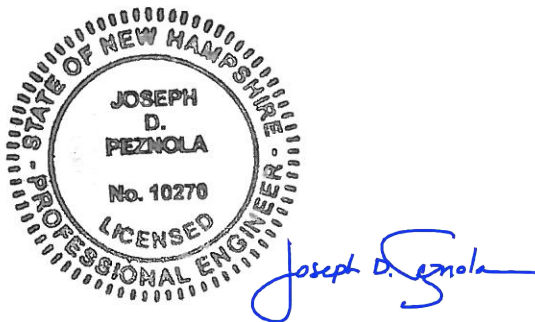
DOVER, NEW HAMPSHIRE

September 10, 2021

Rev. December 17, 2021

Prepared for: Diamond Capital, LLC
170 Commerce Way, Suite 200
Portsmouth, NH 03801

Prepared by: Hancock Associates, Inc.
Civil Engineers | Land Planners | Wetland Scientists
10 Ferry Street, Suite 406
Concord, NH 03301
Tel. 603-223-1950



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ASSOCIATES, INC.

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STORMWATER REPORT
71-73 RUTLAND STREET
DOVER, NH

1.0 PROJECT DESCRIPTION

Diamond Capital, LLC proposes to merge 71 and 73 Rutland Street parcels to construct eight-unit three-story townhouses. The project will include a new drive, utility services, and site alterations which will disturb 27,500± sq. ft. (0.63± acres). In accordance with the New Hampshire Department of Environmental Services (NHDES) requirements for land development, an Alteration of Terrain (AoT) permit will not be required for this project.

1.1 Existing Site Description

The project site includes both 71 and 73 Rutland Street parcels, which are adjacent, rectangular lots with a total area of 43,550± sq. ft. (1.0± acres). 71 Rutland Street (Lot B) has 118± ft. of frontage on Rutland Street. 73 Rutland Street (Lot A) has 100± ft. of frontage on Rutland Street and 200± ft. of frontage on Abbey Lane. The lots will be merged for the proposed project.

The existing 2-½ story wood frame dwelling on Lot B is located on the northern portion of the property, facing Rutland Street. Attached to the dwelling is a 1-½ story garage, with a bituminous concrete driveway and walk providing access to Rutland Street. The dwelling and attached garage will be retained and rehabilitated. A wood deck is attached to the rear of the dwelling, which leads to an inground pool surrounded by a concrete patio. The pool and patio will be removed prior to construction of the townhouses. A garden, fence, and 1-foot-tall stone retaining wall are located to the rear of the garage, adjacent to the pool area, and will also be removed. The back of the lot is grass covered with some areas of thick vegetation.

The existing 1-story wood frame dwelling on Lot A is located on the northeastern portion of the property, facing Rutland Street. Attached to the dwelling is a 1-story garage, with a bituminous concrete driveway and walk providing access to Rutland Street. An enclosed porch is attached to the rear of the dwelling. The dwelling, attached garage, and porch will be retained and rehabilitated. A 1-story wood frame garage is located on the southwest corner of the existing lot, with a concrete apron along the eastern side of the building. Both the garage and the concrete apron will be removed prior to construction of the townhouses. The back of the lot is grass covered with some areas of thick vegetation.

Topography of the overall site consists mostly of flat to moderate slopes. Generally, the site slopes south. The high point onsite is at the northern corner of the parcel at elevation 74.2, and the low elevation onsite is 59.5 located at the southern corner of the parcel. The average slope between the high and low point is roughly 5 percent.

Stormwater from the dwellings discharges via downspouts to grade without any stormwater controls. Two catch basins located south of the site on Abbey Lane collect the sheet flow and carry the runoff to an existing brook which flows through a 30 in. x 30 in. stone culvert.

The project site is not within a federally designated flood hazard area and there are no wetlands on or near the project site.

1.2 Proposed Site Description

The proposed project includes three-story eight-unit townhouses with a new drive entrance from Abbey Lane, parking, retaining walls, transformer, utility connections and an associated stormwater management system. The proposed building is located on the rear of the two adjacent lots. Facing the front of the townhouses is a 22 ft.-wide bituminous concrete drive, which provides access to Abbey Lane. Each townhouse will be provided one garage parking spot. Four visitor parking spots will be located on the property.

The proposed stormwater management system will utilize a subsurface infiltration system and a bioretention system (rain garden). Both BMPs will comply with the City of Dover and NHDES stormwater management design standards.

1.3 Soil conditions

A review of Web Soil Survey (Appendix G) operated by the Natural Resource Conservation Service (NRCS) indicates Scantic silt loam, 3 to 8 percent slopes (Map Unit ScB) and Suffield silt loam, 8 to 15 percent slopes (Map Unit SfC) to be the primary soil groups onsite. Both soil groups predominantly consist of silty loam, with silty clay in the deeper layers. Scantic is classified into hydraulic soil group “C/D” and Suffield is classified into hydraulic soil group “C”.

A site-specific soil survey report was prepared by certified soil scientist Luke Hurley of GES, Inc. on August 16, 2021, for Hancock Associates. Utilizing *Society of Soil Scientists of Northern New England (SSSNE)* standards, GES, Inc. determined the project site to contain Scio Variant soils, which are dominated by silt and very fine sand and is classified into hydraulic soil group “C”.

Additionally, Hancock Associates conducted soil testing on October 22, 2021. Results from the testing confirmed “C/D” soils were present on site and that the seasonal mean high-water table was below elevation 54.0 (NAVD 88).

The compiled results of Web Soil Survey, the site-specific soil survey report, and the test pit data concluded soils on site were within hydrological soil group “C”. An approximated Rawls’ Rate of 0.27 in/hr would be used in the stormwater mitigation and recharge calculations.

2.0 STORMWATER MANAGEMENT STANDARDS

The City of Dover follows the *New Hampshire Stormwater Manual Volume 2*, issued by NHDES, for all proposed stormwater practices and measures. The chapter 2 of the manual states, “Land development projects should employ site design and Best Management Practices (BMPs) to control peak runoff rates, provide stormwater quality treatment, use stormwater for groundwater recharge, and provide for stream channel protection”. The proposed project has been designed in compliance with these standards as follows:

2.1 Peak Control

Post-development peak discharge rates can not exceed pre-development peak discharge rates for the 10- & 50-year, 24-hour storm events.

Stormwater runoff calculations contained herein for site related runoff have been computed in accordance with methods developed by the NRCS, as described in the “NRCS National Engineering Handbook, Section 5, and Hydrology for Small Watersheds.” Storm hydrographs were generated and routed using the NRCS TR-20/TR-55 methodologies (incorporated into the hydraulic modeling software HydroCAD) with a Type III Storm Distribution.

The methodologies provide for hydraulic analyses of a watershed under various combinations of land cover/use. Surface runoff hydrographs were developed from storm rainfall data using a dimensionless unit hydrograph, drainage areas, times of concentration (Tc), and NRCS runoff curve numbers. These computer simulated hydrographs have been flood-routed, when appropriate, to account for effects of surface storage and hydraulic constraints provided by the designed mitigative measures.

For this analysis, hydrographs were developed to simulate peak storm runoff flows under existing and proposed conditions for the 2, 10, 25, and 50-year storm events. 24-hour values of 3.0, 4.3, 5.2, and 5.7 inches of rainfall were utilized for the respective storm events, as interpolated from *Technical Paper No. 40 (TP40) Rainfall Frequency Atlas of the Eastern United States*, by NHDES. These calculations indicate the order-of-magnitude of existing and proposed peak runoff rates anticipated from the project site. The following section provides a brief description of the existing and proposed watershed areas and associated downstream facilities.

2.1.1 Existing Watersheds

Existing Watershed E1 – includes the roofs on the existing dwellings of each lot, the roof on the existing garages, the bituminous concrete drives, the bituminous and cement concrete walkways, patios, decks, lawn, vegetation and wooded areas. Stormwater runoff in this watershed primarily drains towards the existing sub-catchment system on Abbey Lane before being brought to the stone culvert.

Area = 43,550 sq. ft.

Existing Watershed E2 – includes the area from Abbey Lane and Rutland Manor that is collected and drains towards the stone culvert. This watershed does not change between existing and proposed and will not have an increase in impervious area but was modeled to confirm that the stone culvert will not be overwhelmed with the construction of the proposed townhouses.

Area = 130,680 sq. ft.

2.1.2 Proposed Watersheds

Proposed Watershed P1 – includes the proposed bituminous concrete driveway, parking, the rain garden area, the grass paver turnaround, and the surrounding area that will sheet flow into the BMP. Stormwater is collected and treated in this BMP, which overflows into the existing system on Abbey Lane and brought to the stone culvert. Approximately 500 sq. ft. of the proposed driveway will miss the catch basin at the end of the driveway and flow into the existing Abbey Lane system. The rain garden was sized to account for this additional impervious area.

Area = 16,718 sq. ft.

Proposed Watershed P2 – consists of the roof area of the proposed townhouses. Stormwater is collected and treated in the proposed infiltration system (*48 Stormtank Module 25 Series chambers – 24" height double stacked*). Overflow from the proposed system will be carried to the existing sub-catchment system on Abbey Lane and brought to the stone culvert.

Area = 7,040 sq. ft.

Proposed Watershed P3 – consists of the remaining area on the site, including the roofs on the existing dwellings of each lot, the roof on the existing garage, the existing bituminous concrete drives, the existing bituminous and cement concrete walkways, and the proposed grading around the new townhouses which does not flow into watersheds P1 or P2. This sheet flow drains into the existing system on Abbey Lane before being carried to the stone culvert.

Area = 19,792 sq. ft.

Proposed Watershed P4 – includes the area from Abbey Lane and Rutland Manor that is collected and drains towards the stone culvert. This watershed does not change between existing and proposed and will not have an increase in impervious area but was modeled to confirm that the stone culvert will not be overwhelmed with the construction of the proposed townhouses.

Area = 130,680 sq. ft.

2.1.3 Pre-Development vs. Post-Development

Attenuation of peak runoff rates and stormwater volumes from the project site has been provided through construction of a subsurface infiltration system and a wet pond. Under the existing conditions, all stormwater sheet flows offsite to catch basins in Abbey Lane before being carried to a 30" x 30" stone culvert. Under the proposed conditions, all new impervious area is captured and treated within the proposed subsurface infiltration system and rain garden. This in turn will provide adequate mitigation and reduction of runoff to the existing stone culvert.

As noted in the following sections, the proposed project will result in significant decrease in both peak flow and volume of stormwater runoff. Additionally, the project includes stormwater recharge and best management practices (BMPs) to improve stormwater quality.

The peak flow calculations indicate the "order-of magnitude" of runoff rates under existing and proposed conditions for the 2, 10, 25, and 50-year storm event recurrence intervals. Refer to **Table 1** for a summary of the peak runoff rates. As shown in the table, there is no increase in the peak rate of runoff for the 10-year and 50-year storm events.

Table 1 – Peak Flow Reduction

Storm Event	Watershed	Existing Peak Rate	Proposed Peak Rate	% Change
		cfs	cfs	
50-yr	Stone Culvert (R3/R4)	18.92	17.86	-5.6%
25-yr	Stone Culvert (R3/R4)	16.93	16.01	-5.4%
10-yr	Stone Culvert (R3/R4)	13.35	12.76	-4.4%
2-yr	Stone Culvert (R3/R4)	8.23	8.09	-1.7%

2.2 Water Quality Volume

The amount of stormwater runoff from a rainfall event that should be captured and treated to remove the majority of stormwater pollutants on an average annual basis.

Water Quality Volume (WQV) in New Hampshire is associated with the first inch of rainfall, and is calculated using the following equation:

$$\text{WQV} = (P)(R_v)(A)$$

Where:

P = 1 inch

R_v = the unitless runoff coefficient, $R_v = 0.05 + 0.9(I)$

I = the percent impervious cover draining to the structure, in decimal form

A = total site area draining to the structure

When calculating the WQV of the area draining into the proposed rain garden:

$$I = 0.19 \text{ Ac.} / 0.38 \text{ Ac.} = 0.48$$

$$R_v = 0.05 + 0.9(0.48) = 0.49$$

$$\text{WQV} = (1 \text{ in.}) * (0.49) * 0.38 \text{ Ac.}$$

$$\text{WQV} = 676 \text{ cubic ft.}$$

A bioretention system (rain garden) was proposed to meet this water quality volume requirement due to the size and nature of this project. Rain gardens are typically used when treating a watershed of less than five acres. A 3-inch layer of mulch will cover an 18-inch soil filter bed to treat and infiltrate stormwater. Underneath the soil filter bed will be a 14-inch coarse gravel layer with 6-inch perforated PVC underdrains capturing and discharging the treated stormwater. The entire system will be underlaid with a 3" layer of pea gravel. The rain garden will be planted with native

shrub and perennial plantings which will assist with pollutant uptake. A drain basin with dome grate will be installed in the middle of the garden to capture stormwater overflow and direct it to the existing sub-catchment system in Abbey Lane.

Since the project site located in an MS4 area, pretreatment is required prior to the bioretention system. A deep sump catch basin will be used to capture sediments and debris from runoff. A hood will be fitted over the outlet pipe to prevent floating materials from exiting the structure.

The rain garden was sized to capture and treat the stormwater runoff from watershed P1 using the NHDES BMP worksheet (Appendix C), which follows the NH Stormwater Manual design criteria. A portion of stormwater runoff in the driveway (500± sq. ft.) will miss the catch basin and sheet flow out to Abbey Lane. However, considering the existing pool and patio area on the lot is greater than 500 sq. ft. and will be removed, there will be no net increase in impervious runoff leaving the site.

2.3 Groundwater Recharge Volume

The purpose of the groundwater recharge volume criterion is to protect groundwater resources by minimizing the loss of annual pre-development recharge as a result of the proposed development.

Groundwater recharge is heavily dependent on the existing soil conditions of the project site. The equation to calculate groundwater recharge volume (GRV) is as follows:

$$\text{GRV} = (A_I)(R_d)$$

Where:

A_I = the total effective area of impervious surfaces that exist on the site after development

R_d = the groundwater recharge depth based on the USDA/NRCS hydrologic soil group

When calculating the GRV for the project site:

$A_I = 21,640$ sq. ft.

$R_d = 0.10$ in.

$$\text{GRV} = 21,640 \text{ sq. ft.} * 0.10 \text{ in.} = 180.3 \text{ cubic ft.}$$

To reach the recharge requirement, a subsurface infiltration system will be utilized. Roof water from the proposed townhouses will be captured using a gutter system and brought to 48 *Stormtank Module 25 Series chambers – 24" height double stacked*, surrounded by crushed stone, to be infiltrated.

Table 3 summarizes the on-site recharge requirements and the proposed recharge volumes provided by the proposed stormwater infiltration system. The “Static” Method was used to calculate the volume required for the project.

Table 3 – Recharge Compliance Summary

Impervious Area		Recharge Required	Recharge Vol. Required	BMP	Recharge Vol. Provided
(sf)		(in)	(CF)		(CF)
Exist. Imp Area	7,650	0.10	63.8	N/A	0
Prop. Imp Area	21,640	0.10	180.3	Infiltration System	438.3

2.4 Effective Impervious Cover and Undisturbed Cover

NHDES has proposed a target 10% effective impervious cover (%EIC) maximum and 65% undisturbed cover (%UDC) minimum for development sites, referred to as “the 1065 Rule”.

The proposed project does not need to meet these antidegradation requirements. Chapter 5 of the *NH Stormwater Manual Volume 1* states that a NHDES Antidegradation Review is only required for projects that trigger one of the following state or federal permits:

- NHDES Shoreland
- NHDES Wetland
- NHDES AoT
- NHDES Individual 401 Certification
- NPDES CGP
- USACOE404 Individual Permit

2.5 Channel Protection

The purpose of this design criterion is to protect stream channels, downstream receiving waters, and wetlands from erosion and associated sedimentation resulting from the urbanization within a watershed.

The existing collection point on Abbey Lane drains to a brook. To protect the channel, the following NHDES design criteria was followed:

- If the 2-year, 24-hour post-development storm volume **has not increased** over the pre-development volume, then control the 2-year, 24-hour post-development peak flow rate to the 2-year, 24-hour pre-development flow rate.
- If the 2-year, 24-hour post-development storm volume **has increased** over the pre-development volume, then control the 2-year, 24-hour post-development peak flow rate to 50 percent of the 2-year.

The storm runoff volume calculations indicate the “order-of magnitude” of volumes under existing and proposed conditions for the 2, 10, 25, and 50-year storm event recurrence intervals. Refer to **Table 4** for a summary of the runoff volumes. As shown in the table, there is no increase in volume for the 2-yr storm. Thus, the 2-year, 24-hour post-development peak flow rate must be equal to or below the pre-development peak flow rate. The City of Dover also requires that the runoff volumes decrease in the 10, 25, and 50-year storms. As shown in **Table 4**, these requirements are met.

Table 4 – Runoff Volume Reduction

Storm Event	Watershed	Existing Volume	Proposed Volume	% Change
		cf	cf	
50-yr	Stone Culvert (R3/R4)	59221	59208	0.0%
25-yr	Stone Culvert (R3/R4)	52725	52609	-0.2%
10-yr	Stone Culvert (R3/R4)	41162	40818	-0.8%
2-yr	Stone Culvert (R3/R4)	11242	10862	-3.4%

3.0 EROSION AND SEDIMENT CONTROL

Downslope areas will be protected through the installation of a combination of erosion control tubes and filter fabric fence to be located along the perimeter and/or elsewhere as required to protect and stabilize earthwork. All embankment slopes will be fine graded and stabilized by the means of wood chip mulch, shrubs, sod and/or seed and mulch as is appropriate. All pipe drains and catch basins will be installed early in the construction period in order to provide early control of site runoff. Crushed stone will be judiciously applied to stabilize select areas, as required during the course of construction. The erosions controls are further described in the Operation and Maintenance Plan located in the appendix.

4.0 SUMMARY AND CONCLUSIONS

Significant attention and consideration has been given to proper management of stormwater runoff from the project site. The unique site-specific characteristics and hydrologic setting has been carefully studied to develop a comprehensive plan that fully utilizes and recognizes these attributes. Disposition of stormwater has been considered, with respect to its peak rate, total volume, groundwater recharge, and water quality aspects, to ensure appropriate mitigation upon project completion.

- There will be no adverse impact to any surrounding areas.
- The drainage systems have been properly designed to handle the design flow rates.
- A significant decrease in stormwater rate and volume will be realized.
- The project will provide groundwater recharge and increase stormwater quality off the site.

A

LOCUS MAP



DOVER, NEW HAMPSHIRE

Source: NH GraniteView web mapping application.

HANCOCK
ASSOCIATES

Project Title **71-73 Rutland Street**
Location **Dover, NH**
Plan Title **Locus Map**

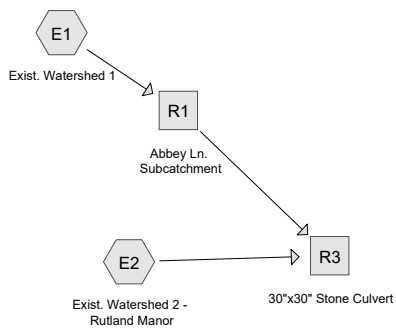
Project #: **23800**
Date: **9/8/2021**
Scale: **1" = 500'**

FIGURE: **1**

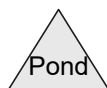
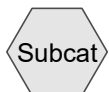
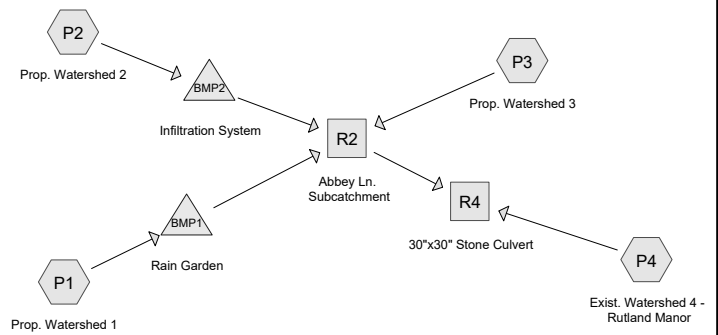
B

HYDROCAD CALCULATIONS

Pre-Development



Post-Development



23800-Dover-NH-Stormwater*Type III 24-hr 2-Year Storm Rainfall=3.00"*

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentE1: Exist. Watershed 1 Runoff Area=43,550 sf 17.53% Impervious Runoff Depth>1.04"
Tc=6.0 min CN=78 Runoff=1.26 cfs 3,760 cf

SubcatchmentE2: Exist. Watershed 2 - Runoff Area=130,680 sf 70.00% Impervious Runoff Depth>1.95"
Tc=6.0 min CN=91 Runoff=7.03 cfs 21,223 cf

SubcatchmentP1: Prop. Watershed 1 Runoff Area=16,718 sf 48.37% Impervious Runoff Depth>1.55"
Tc=6.0 min CN=86 Runoff=0.73 cfs 2,160 cf

SubcatchmentP2: Prop. Watershed 2 Runoff Area=7,040 sf 100.00% Impervious Runoff Depth>2.59"
Tc=6.0 min CN=98 Runoff=0.46 cfs 1,520 cf

SubcatchmentP3: Prop. Watershed 3 Runoff Area=19,792 sf 32.91% Impervious Runoff Depth>1.28"
Tc=6.0 min CN=82 Runoff=0.72 cfs 2,105 cf

SubcatchmentP4: Exist. Watershed 4 - Runoff Area=130,680 sf 70.00% Impervious Runoff Depth>1.95"
Tc=6.0 min CN=91 Runoff=7.03 cfs 21,223 cf

Reach R1: Abbey Ln. Subcatchment Inflow=1.26 cfs 3,760 cf
Outflow=1.26 cfs 3,760 cf

Reach R2: Abbey Ln. Subcatchment Inflow=1.12 cfs 3,128 cf
Outflow=1.12 cfs 3,128 cf

Reach R3: 30"x30" Stone Culvert Avg. Flow Depth=0.59' Max Vel=5.63 fps Inflow=8.29 cfs 24,983 cf
30.0" x 30.0" Box Pipe n=0.018 L=70.0' S=0.0157 '/' Capacity=47.28 cfs Outflow=8.23 cfs 24,973 cf

Reach R4: 30"x30" Stone Culvert Avg. Flow Depth=0.58' Max Vel=5.59 fps Inflow=8.15 cfs 24,350 cf
30.0" x 30.0" Box Pipe n=0.018 L=70.0' S=0.0157 '/' Capacity=47.28 cfs Outflow=8.09 cfs 24,341 cf

Pond BMP1: Rain Garden Peak Elev=58.88' Storage=1,887 cf Inflow=0.73 cfs 2,160 cf
Discarded=0.01 cfs 272 cf Primary=0.00 cfs 0 cf Outflow=0.01 cfs 272 cf

Pond BMP2: Infiltration System Peak Elev=60.31' Storage=507 cf Inflow=0.46 cfs 1,520 cf
Discarded=0.00 cfs 54 cf Primary=0.42 cfs 1,023 cf Outflow=0.42 cfs 1,077 cf

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Type III 24-hr 2-Year Storm Rainfall=3.00"

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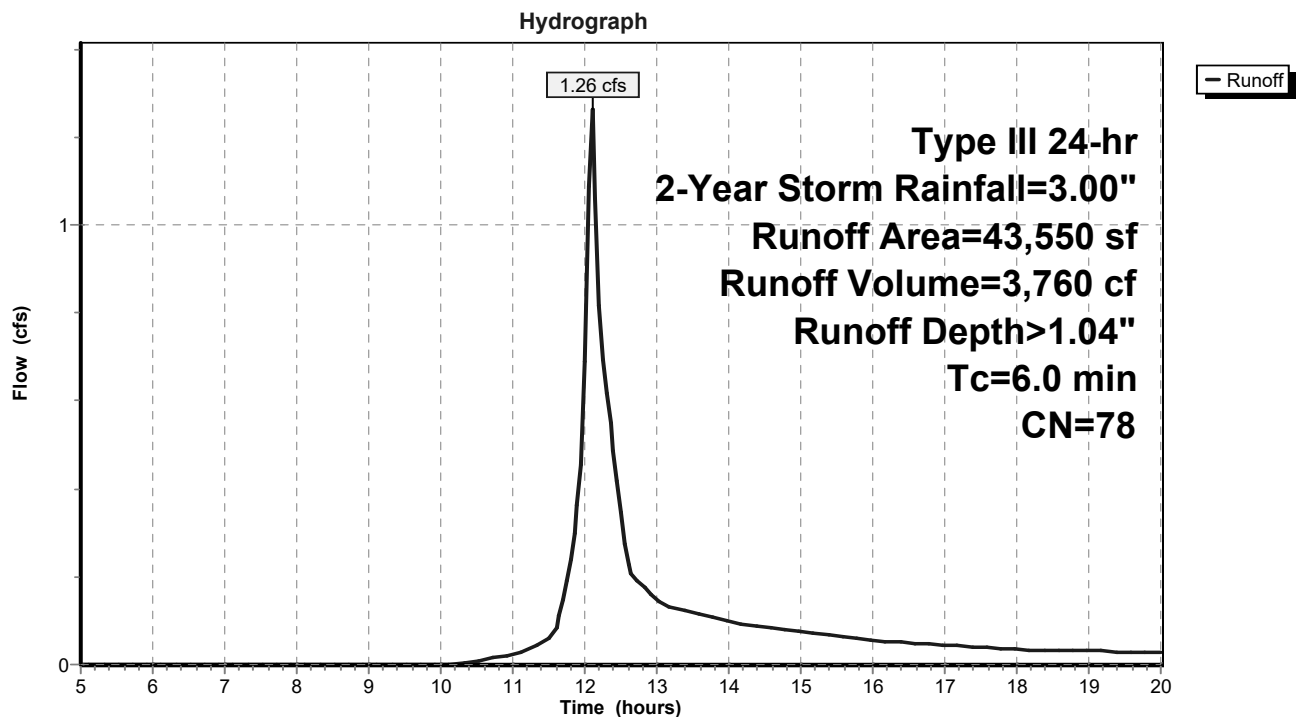
Summary for Subcatchment E1: Exist. Watershed 1

Runoff = 1.26 cfs @ 12.10 hrs, Volume= 3,760 cf, Depth> 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Rainfall=3.00"

	Area (sf)	CN	Description
*	7,635	98	Paved parking, roofs, walks
	35,915	74	>75% Grass cover, Good, HSG C
	43,550	78	Weighted Average
	35,915		82.47% Pervious Area
	7,635		17.53% Impervious Area

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

Subcatchment E1: Exist. Watershed 1

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Type III 24-hr 2-Year Storm Rainfall=3.00"

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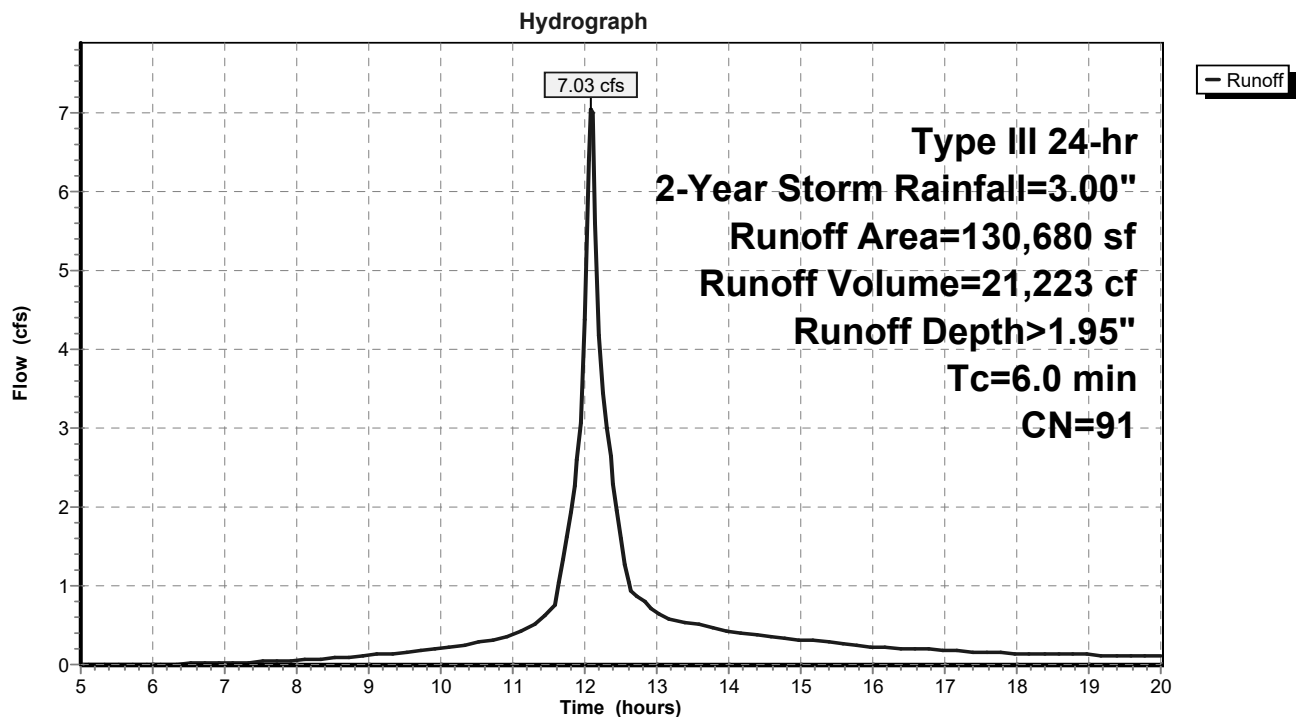
Summary for Subcatchment E2: Exist. Watershed 2 - Rutland Manor

Runoff = 7.03 cfs @ 12.09 hrs, Volume= 21,223 cf, Depth> 1.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Rainfall=3.00"

Area (sf)	CN	Description
91,476	98	Paved parking, HSG A
39,204	74	>75% Grass cover, Good, HSG C
130,680	91	Weighted Average
39,204		30.00% Pervious Area
91,476		70.00% Impervious Area

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

Subcatchment E2: Exist. Watershed 2 - Rutland Manor

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Type III 24-hr 2-Year Storm Rainfall=3.00"

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Summary for Subcatchment P1: Prop. Watershed 1

Runoff = 0.73 cfs @ 12.09 hrs, Volume= 2,160 cf, Depth> 1.55"

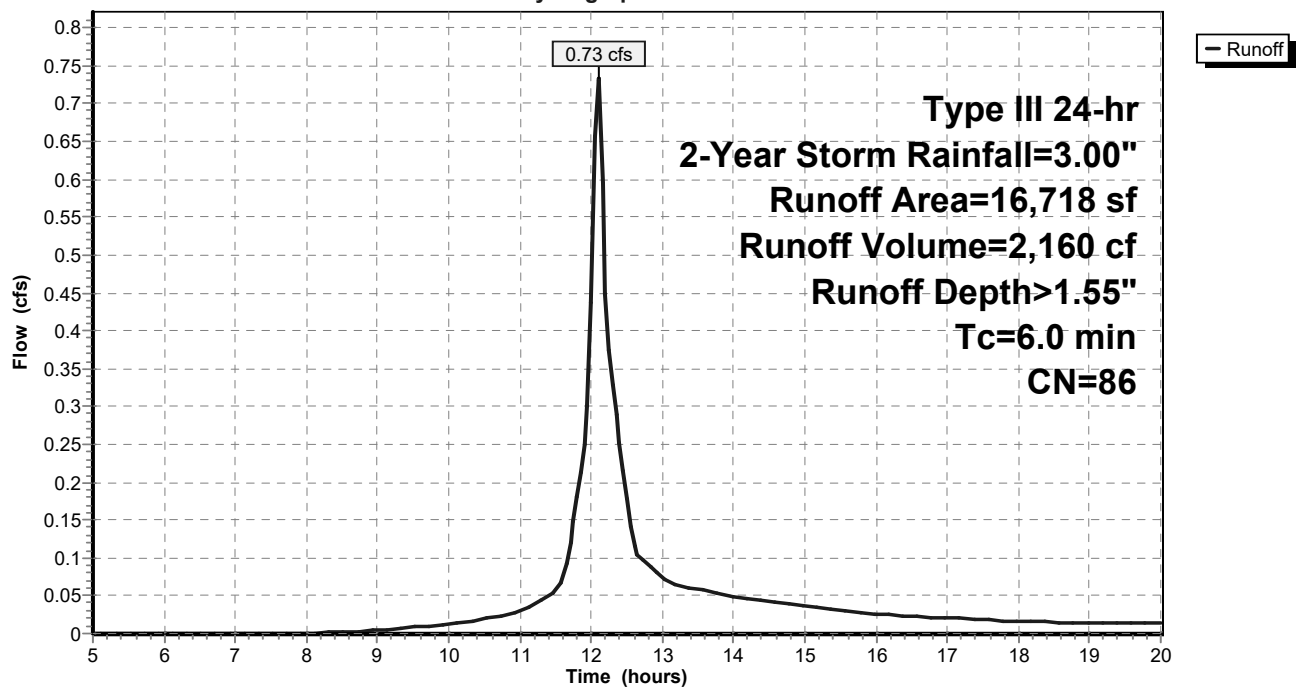
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Rainfall=3.00"

Area (sf)	CN	Description
8,086	98	Paved parking, HSG A
* 8,632	74	>75% Grass cover, Good, HSG C
16,718	86	Weighted Average
8,632		51.63% Pervious Area
8,086		48.37% Impervious Area

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

Subcatchment P1: Prop. Watershed 1

Hydrograph



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Type III 24-hr 2-Year Storm Rainfall=3.00"

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Summary for Subcatchment P2: Prop. Watershed 2

Runoff = 0.46 cfs @ 12.09 hrs, Volume= 1,520 cf, Depth> 2.59"

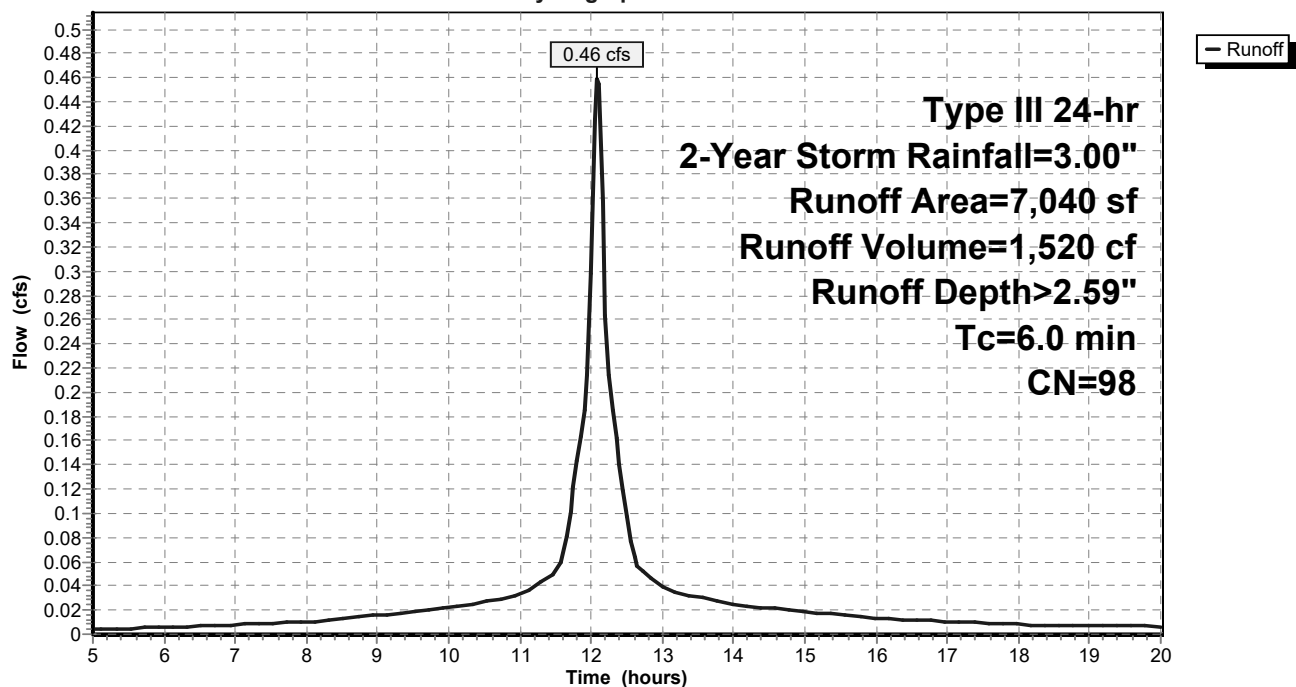
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Rainfall=3.00"

Area (sf)	CN	Description
7,040	98	Roofs, HSG C
7,040		100.00% Impervious Area

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

Subcatchment P2: Prop. Watershed 2

Hydrograph



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Type III 24-hr 2-Year Storm Rainfall=3.00"

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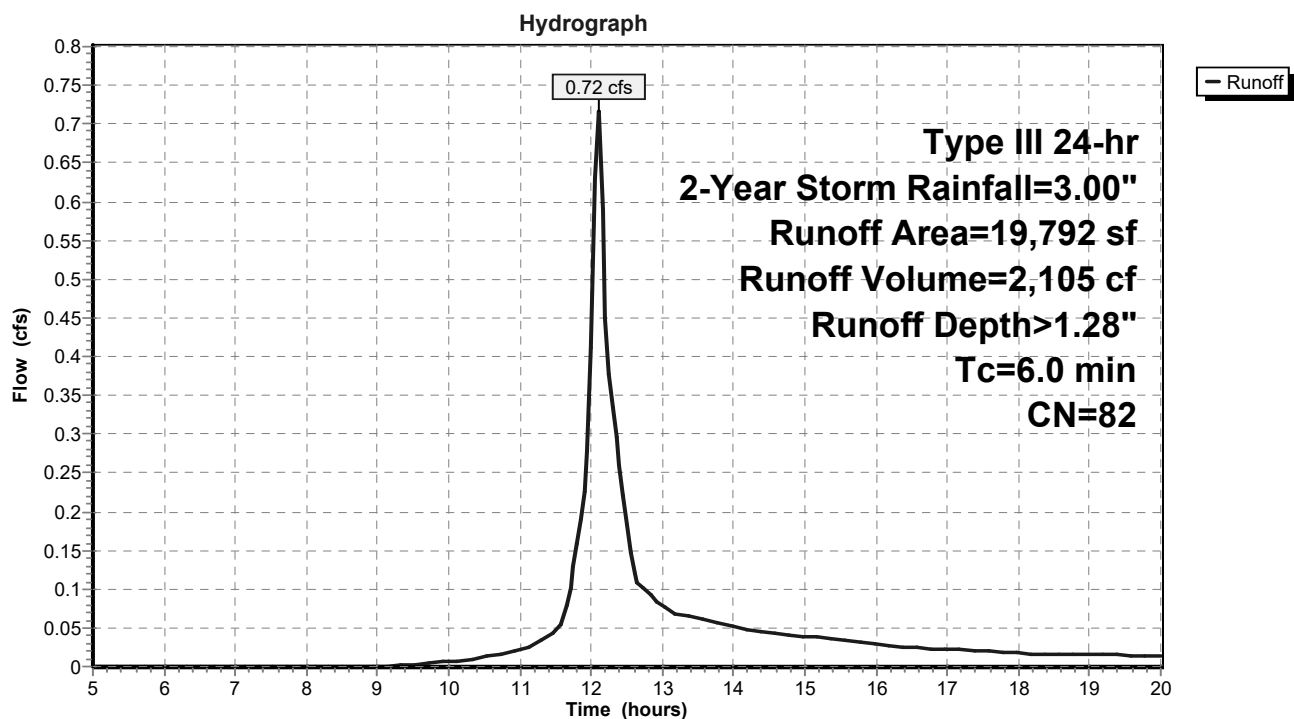
Summary for Subcatchment P3: Prop. Watershed 3

Runoff = 0.72 cfs @ 12.10 hrs, Volume= 2,105 cf, Depth> 1.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Rainfall=3.00"

	Area (sf)	CN	Description
*	6,514	98	Paved parking, exist houses HSG C
	13,278	74	>75% Grass cover, Good, HSG C
	19,792	82	Weighted Average
	13,278		67.09% Pervious Area
	6,514		32.91% Impervious Area

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

Subcatchment P3: Prop. Watershed 3

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Type III 24-hr 2-Year Storm Rainfall=3.00"

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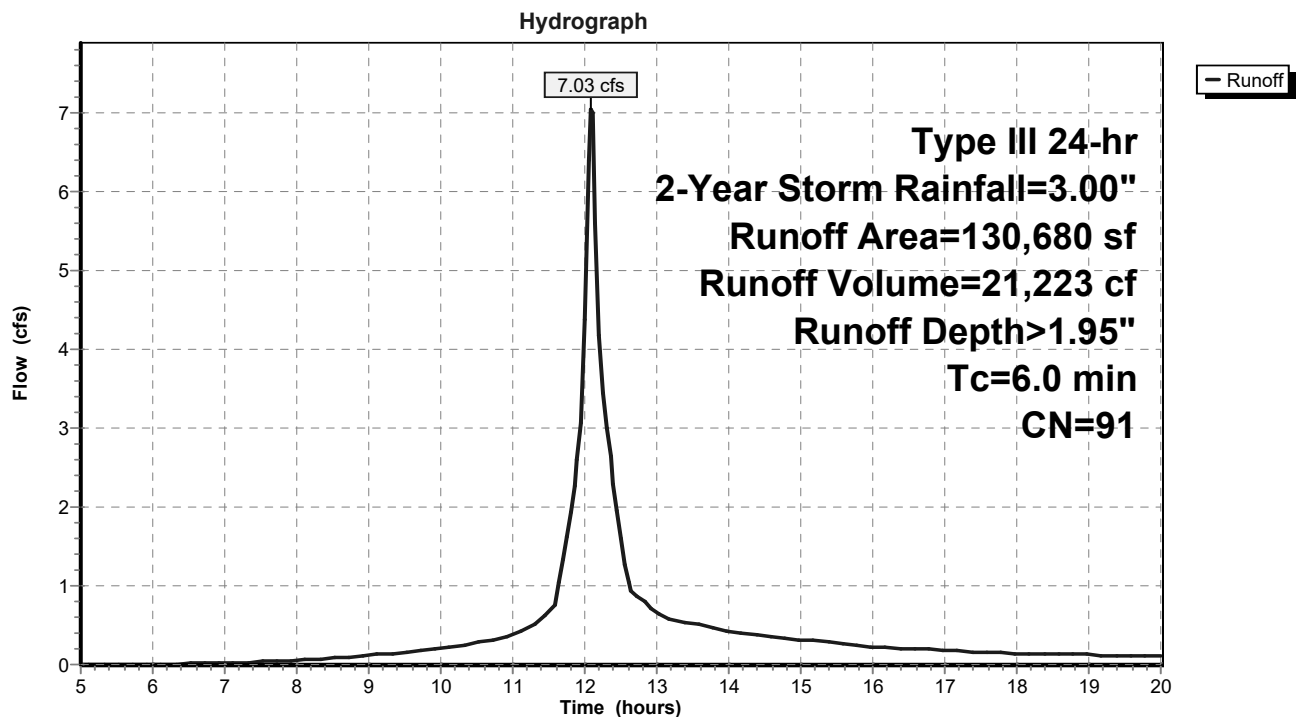
Summary for Subcatchment P4: Exist. Watershed 4 - Rutland Manor

Runoff = 7.03 cfs @ 12.09 hrs, Volume= 21,223 cf, Depth> 1.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Storm Rainfall=3.00"

Area (sf)	CN	Description
91,476	98	Paved parking, HSG A
39,204	74	>75% Grass cover, Good, HSG C
130,680	91	Weighted Average
39,204		30.00% Pervious Area
91,476		70.00% Impervious Area

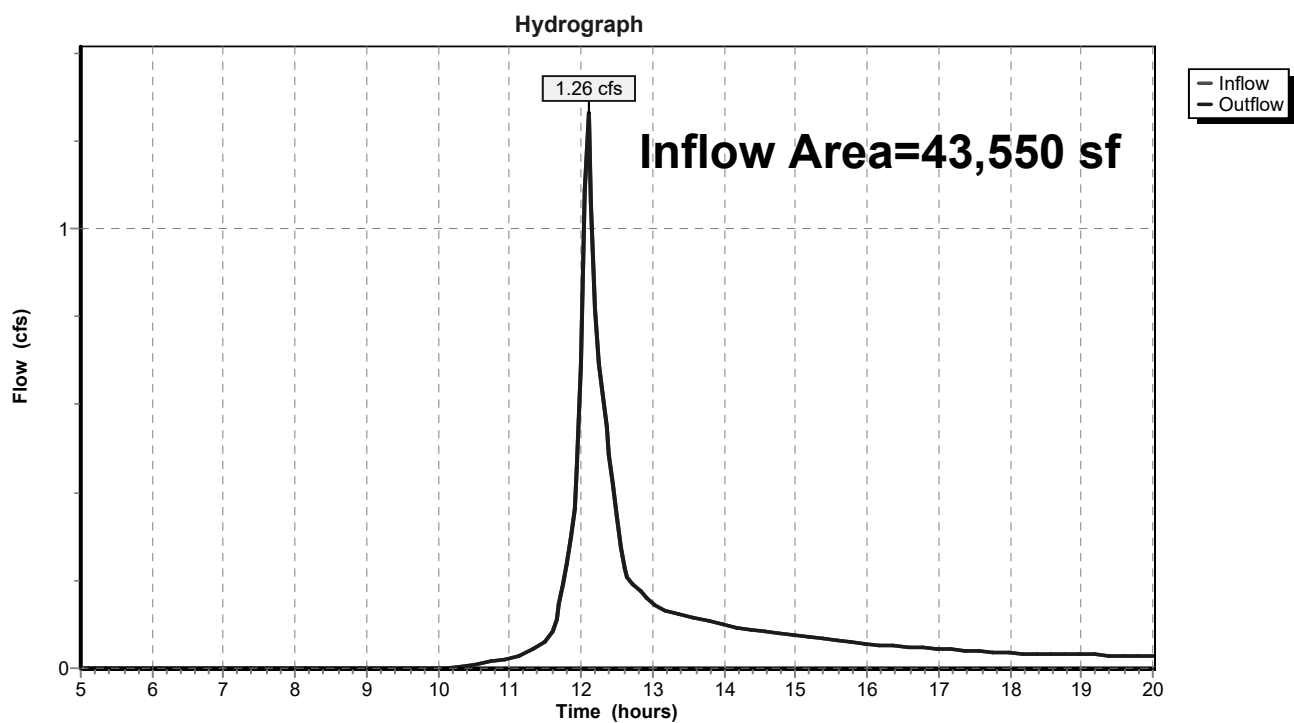
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment P4: Exist. Watershed 4 - Rutland Manor

Summary for Reach R1: Abbey Ln. Subcatchment

Inflow Area = 43,550 sf, 17.53% Impervious, Inflow Depth > 1.04" for 2-Year Storm event
Inflow = 1.26 cfs @ 12.10 hrs, Volume= 3,760 cf
Outflow = 1.26 cfs @ 12.10 hrs, Volume= 3,760 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

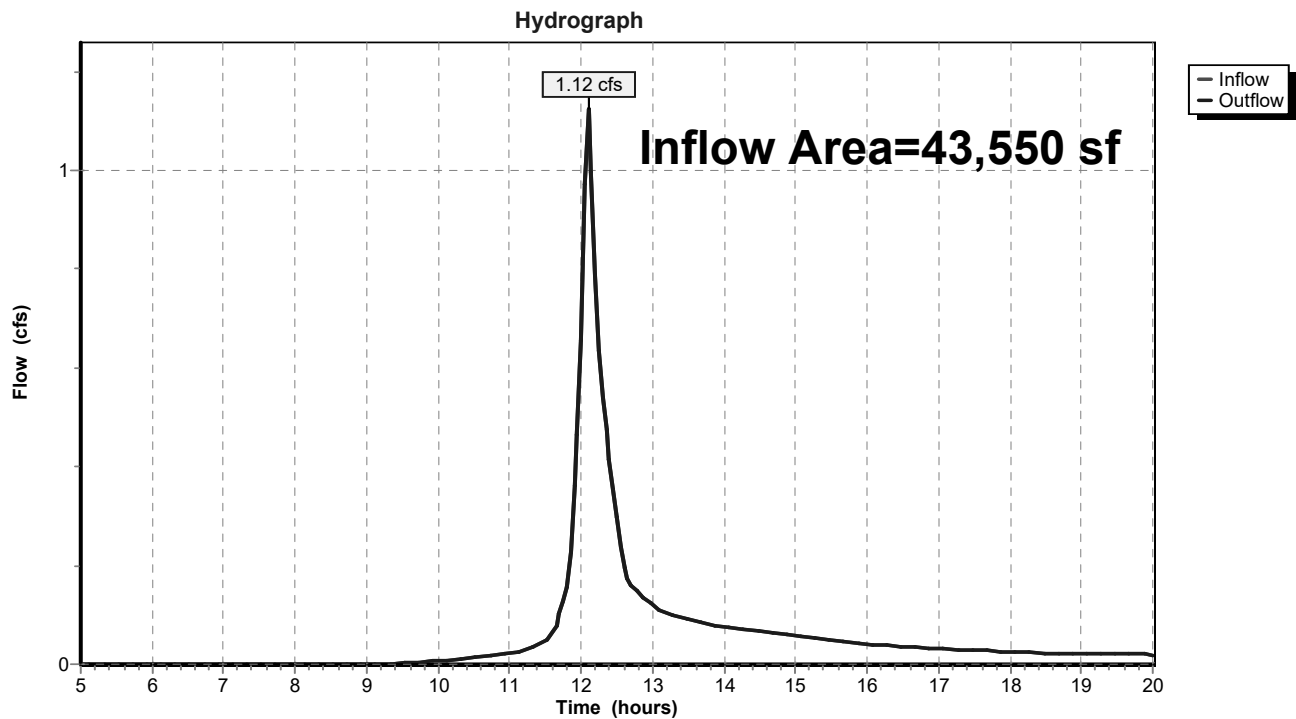
Reach R1: Abbey Ln. Subcatchment

Summary for Reach R2: Abbey Ln. Subcatchment

Inflow Area = 43,550 sf, 49.69% Impervious, Inflow Depth > 0.86" for 2-Year Storm event
 Inflow = 1.12 cfs @ 12.10 hrs, Volume= 3,128 cf
 Outflow = 1.12 cfs @ 12.10 hrs, Volume= 3,128 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach R2: Abbey Ln. Subcatchment



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Type III 24-hr 2-Year Storm Rainfall=3.00"

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Summary for Reach R3: 30"x30" Stone Culvert

Inflow Area = 174,230 sf, 56.89% Impervious, Inflow Depth > 1.72" for 2-Year Storm event
Inflow = 8.29 cfs @ 12.09 hrs, Volume= 24,983 cf
Outflow = 8.23 cfs @ 12.10 hrs, Volume= 24,973 cf, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 5.63 fps, Min. Travel Time= 0.2 min

Avg. Velocity= 1.69 fps, Avg. Travel Time= 0.7 min

Peak Storage= 103 cf @ 12.09 hrs

Average Depth at Peak Storage= 0.59'

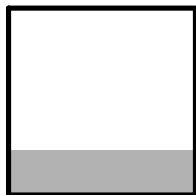
Bank-Full Depth= 2.50' Flow Area= 6.3 sf, Capacity= 47.28 cfs

30.0" W x 30.0" H Box Pipe

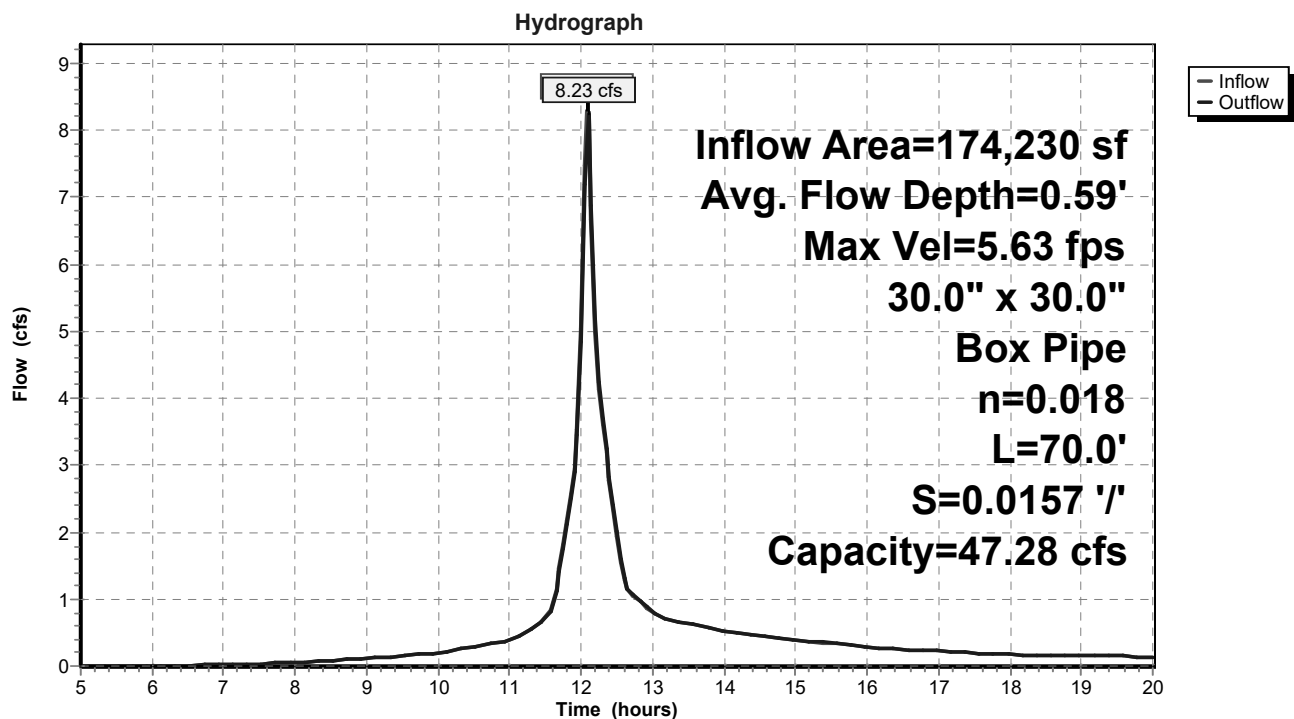
n= 0.018 Rubble masonry, cemented

Length= 70.0' Slope= 0.0157 '/

Inlet Invert= 43.80', Outlet Invert= 42.70'



Reach R3: 30"x30" Stone Culvert



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Type III 24-hr 2-Year Storm Rainfall=3.00"

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Summary for Reach R4: 30"x30" Stone Culvert

Inflow Area = 174,230 sf, 64.92% Impervious, Inflow Depth > 1.68" for 2-Year Storm event
Inflow = 8.15 cfs @ 12.09 hrs, Volume= 24,350 cf
Outflow = 8.09 cfs @ 12.10 hrs, Volume= 24,341 cf, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 5.59 fps, Min. Travel Time= 0.2 min

Avg. Velocity= 1.68 fps, Avg. Travel Time= 0.7 min

Peak Storage= 102 cf @ 12.09 hrs

Average Depth at Peak Storage= 0.58'

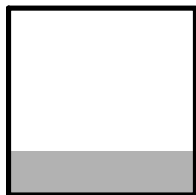
Bank-Full Depth= 2.50' Flow Area= 6.3 sf, Capacity= 47.28 cfs

30.0" W x 30.0" H Box Pipe

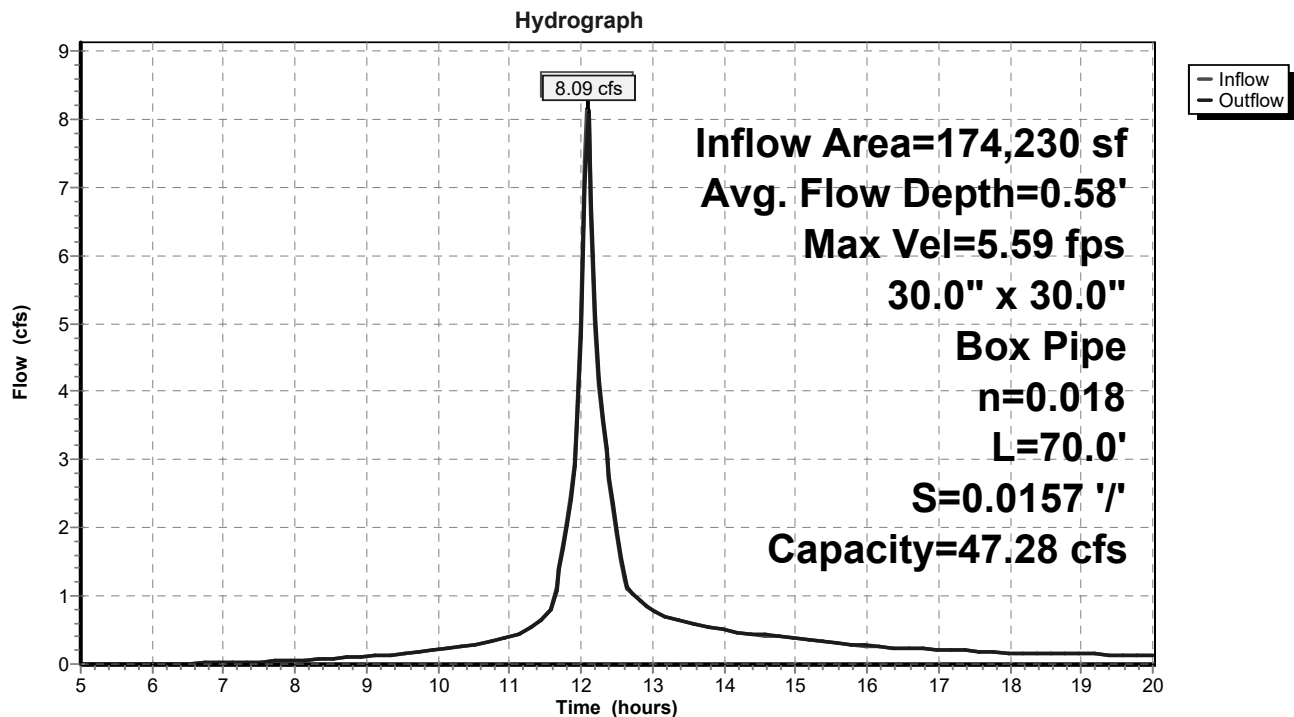
n= 0.018 Rubble masonry, cemented

Length= 70.0' Slope= 0.0157 '/

Inlet Invert= 43.80', Outlet Invert= 42.70'



Reach R4: 30"x30" Stone Culvert



Summary for Pond BMP1: Rain Garden

Inflow Area = 16,718 sf, 48.37% Impervious, Inflow Depth > 1.55" for 2-Year Storm event
 Inflow = 0.73 cfs @ 12.09 hrs, Volume= 2,160 cf
 Outflow = 0.01 cfs @ 20.00 hrs, Volume= 272 cf, Atten= 99%, Lag= 474.4 min
 Discarded = 0.01 cfs @ 20.00 hrs, Volume= 272 cf
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 58.88' @ 20.00 hrs Surf.Area= 1,312 sf Storage= 1,887 cf

Plug-Flow detention time= 254.6 min calculated for 272 cf (13% of inflow)
 Center-of-Mass det. time= 120.9 min (910.8 - 789.9)

Volume	Invert	Avail.Storage	Storage Description
#1	57.00'	3,580 cf	Rain Garden - Ponding Area (Prismatic) , listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
57.00	707	0	0
58.00	1,016	862	862
59.00	1,352	1,184	2,046
60.00	1,716	1,534	3,580

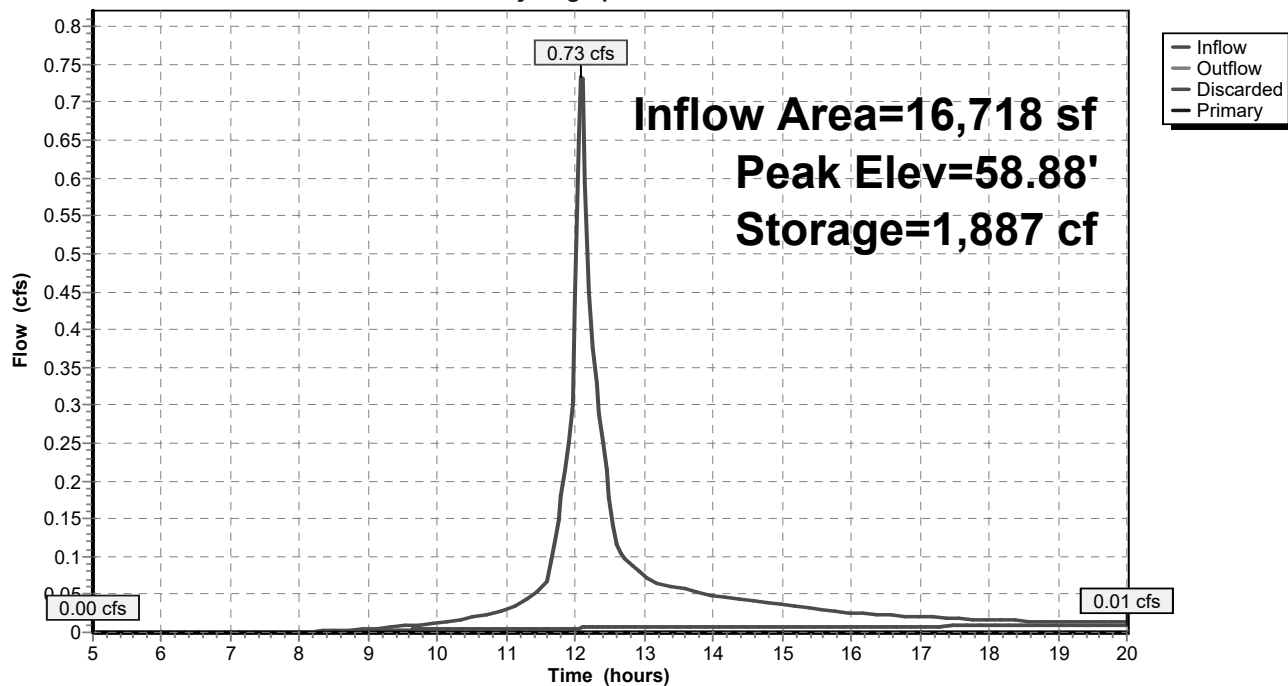
Device	Routing	Invert	Outlet Devices
#1	Primary	53.50'	12.0" Round Culvert L= 89.0' Ke= 0.200 Inlet / Outlet Invert= 53.50' / 52.60' S= 0.0101 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	59.00'	24.0" Horiz. Dome Grate C= 0.600 Limited to weir flow at low heads
#3	Discarded	57.00'	0.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.01 cfs @ 20.00 hrs HW=58.88' (Free Discharge)
 ↑ **3=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=57.00' (Free Discharge)
 ↑ **1=Culvert** (Passes 0.00 cfs of 6.88 cfs potential flow)
 ↑ **2=Dome Grate** (Controls 0.00 cfs)

Pond BMP1: Rain Garden

Hydrograph



Summary for Pond BMP2: Infiltration System

Inflow Area = 7,040 sf, 100.00% Impervious, Inflow Depth > 2.59" for 2-Year Storm event
 Inflow = 0.46 cfs @ 12.09 hrs, Volume= 1,520 cf
 Outflow = 0.42 cfs @ 12.12 hrs, Volume= 1,077 cf, Atten= 9%, Lag= 2.2 min
 Discarded = 0.00 cfs @ 5.25 hrs, Volume= 54 cf
 Primary = 0.42 cfs @ 12.12 hrs, Volume= 1,023 cf

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 60.31' @ 12.12 hrs Surf.Area= 160 sf Storage= 507 cf

Plug-Flow detention time= 124.9 min calculated for 1,073 cf (71% of inflow)
 Center-of-Mass det. time= 58.9 min (798.1 - 739.2)

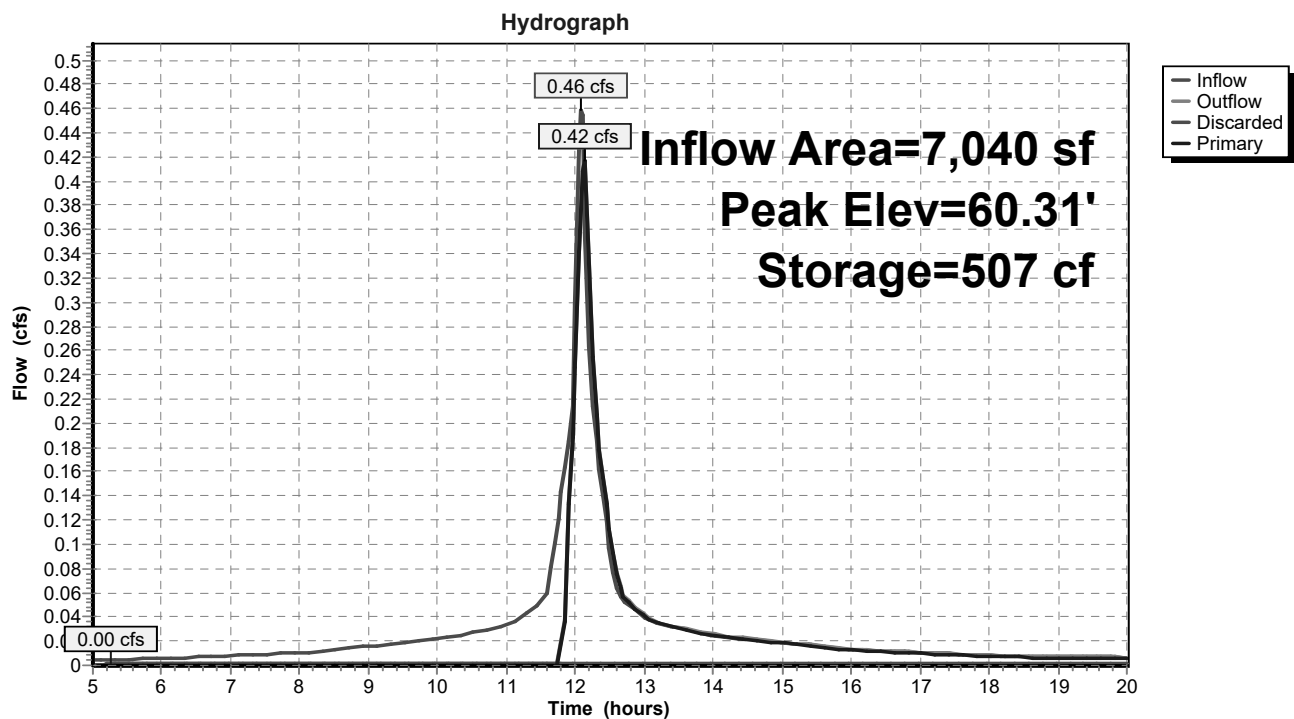
Volume	Invert	Avail.Storage	Storage Description
#1A	56.00'	179 cf	8.00'W x 20.00'L x 5.50'H Field A 880 cf Overall - 432 cf Embedded = 448 cf x 40.0% Voids
#2A	56.50'	415 cf	Brentwood StormTank 48" x 24 Inside #1 Inside= 18.0"W x 48.0"H => 5.77 sf x 3.00'L = 17.3 cf Outside= 18.0"W x 48.0"H => 6.00 sf x 3.00'L = 18.0 cf 4 Rows of 6 Chambers
		595 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	59.75'	6.0" Round 6" PVC out L= 19.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 59.75' / 56.70' S= 0.1605 ' / Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.20 sf
#2	Discarded	56.00'	0.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.00 cfs @ 5.25 hrs HW=56.06' (Free Discharge)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.41 cfs @ 12.12 hrs HW=60.30' (Free Discharge)
 ↑ **1=6" PVC out** (Inlet Controls 0.41 cfs @ 2.08 fps)

Pond BMP2: Infiltration System

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentE1: Exist. Watershed 1 Runoff Area=43,550 sf 17.53% Impervious Runoff Depth>1.98"
Tc=6.0 min CN=78 Runoff=2.44 cfs 7,171 cf

SubcatchmentE2: Exist. Watershed 2 - Runoff Area=130,680 sf 70.00% Impervious Runoff Depth>3.12"
Tc=6.0 min CN=91 Runoff=10.99 cfs 34,004 cf

SubcatchmentP1: Prop. Watershed 1 Runoff Area=16,718 sf 48.37% Impervious Runoff Depth>2.65"
Tc=6.0 min CN=86 Runoff=1.23 cfs 3,688 cf

SubcatchmentP2: Prop. Watershed 2 Runoff Area=7,040 sf 100.00% Impervious Runoff Depth>3.78"
Tc=6.0 min CN=98 Runoff=0.66 cfs 2,218 cf

SubcatchmentP3: Prop. Watershed 3 Runoff Area=19,792 sf 32.91% Impervious Runoff Depth>2.30"
Tc=6.0 min CN=82 Runoff=1.28 cfs 3,791 cf

SubcatchmentP4: Exist. Watershed 4 - Runoff Area=130,680 sf 70.00% Impervious Runoff Depth>3.12"
Tc=6.0 min CN=91 Runoff=10.99 cfs 34,004 cf

Reach R1: Abbey Ln. Subcatchment Inflow=2.44 cfs 7,171 cf
Outflow=2.44 cfs 7,171 cf

Reach R2: Abbey Ln. Subcatchment Inflow=1.86 cfs 6,827 cf
Outflow=1.86 cfs 6,827 cf

Reach R3: 30"x30" Stone Culvert Avg. Flow Depth=0.83' Max Vel=6.50 fps Inflow=13.43 cfs 41,175 cf
30.0" x 30.0" Box Pipe n=0.018 L=70.0' S=0.0157 '/' Capacity=47.28 cfs Outflow=13.35 cfs 41,162 cf

Reach R4: 30"x30" Stone Culvert Avg. Flow Depth=0.80' Max Vel=6.41 fps Inflow=12.83 cfs 40,832 cf
30.0" x 30.0" Box Pipe n=0.018 L=70.0' S=0.0157 '/' Capacity=47.28 cfs Outflow=12.76 cfs 40,818 cf

Pond BMP1: Rain Garden Peak Elev=59.05' Storage=2,119 cf Inflow=1.23 cfs 3,688 cf
Discarded=0.01 cfs 318 cf Primary=0.26 cfs 1,317 cf Outflow=0.27 cfs 1,635 cf

Pond BMP2: Infiltration System Peak Elev=60.63' Storage=539 cf Inflow=0.66 cfs 2,218 cf
Discarded=0.00 cfs 54 cf Primary=0.59 cfs 1,720 cf Outflow=0.59 cfs 1,774 cf

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Type III 24-hr 10-Year Storm Rainfall=4.30"

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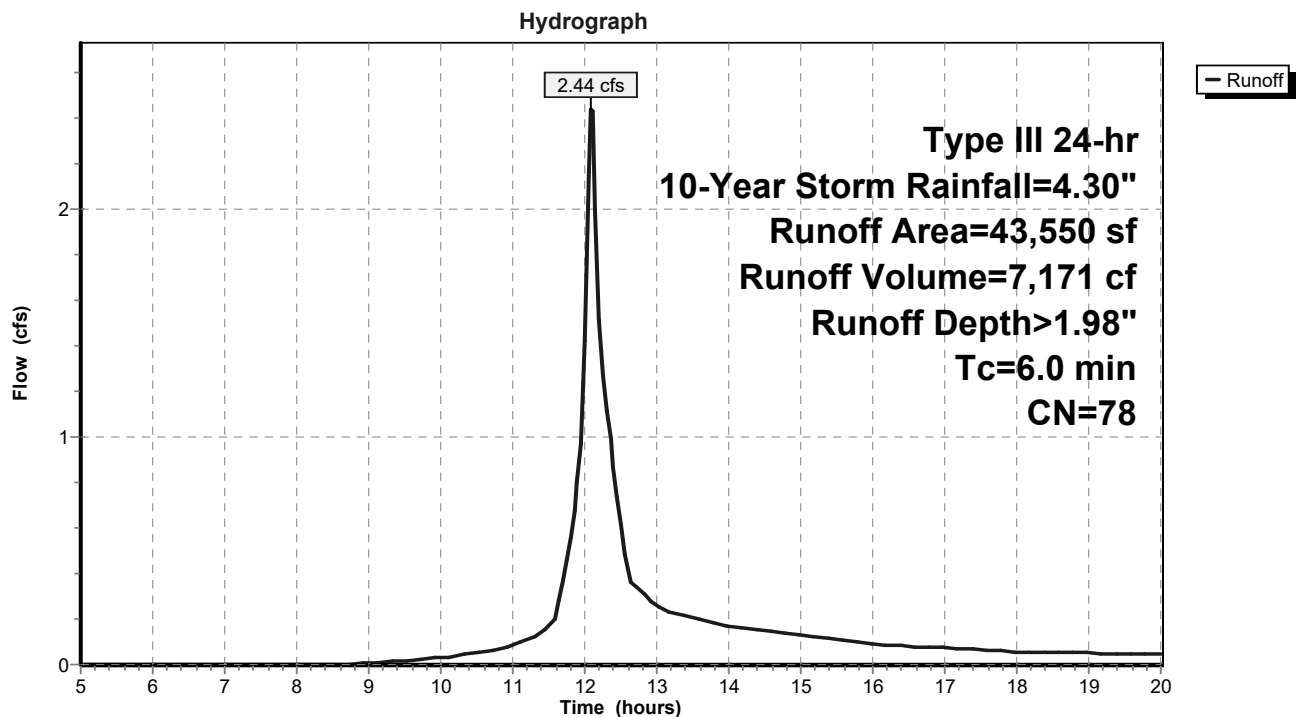
Summary for Subcatchment E1: Exist. Watershed 1

Runoff = 2.44 cfs @ 12.09 hrs, Volume= 7,171 cf, Depth> 1.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=4.30"

	Area (sf)	CN	Description
*	7,635	98	Paved parking, roofs, walks
	35,915	74	>75% Grass cover, Good, HSG C
	43,550	78	Weighted Average
	35,915		82.47% Pervious Area
	7,635		17.53% Impervious Area

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

Subcatchment E1: Exist. Watershed 1

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Type III 24-hr 10-Year Storm Rainfall=4.30"

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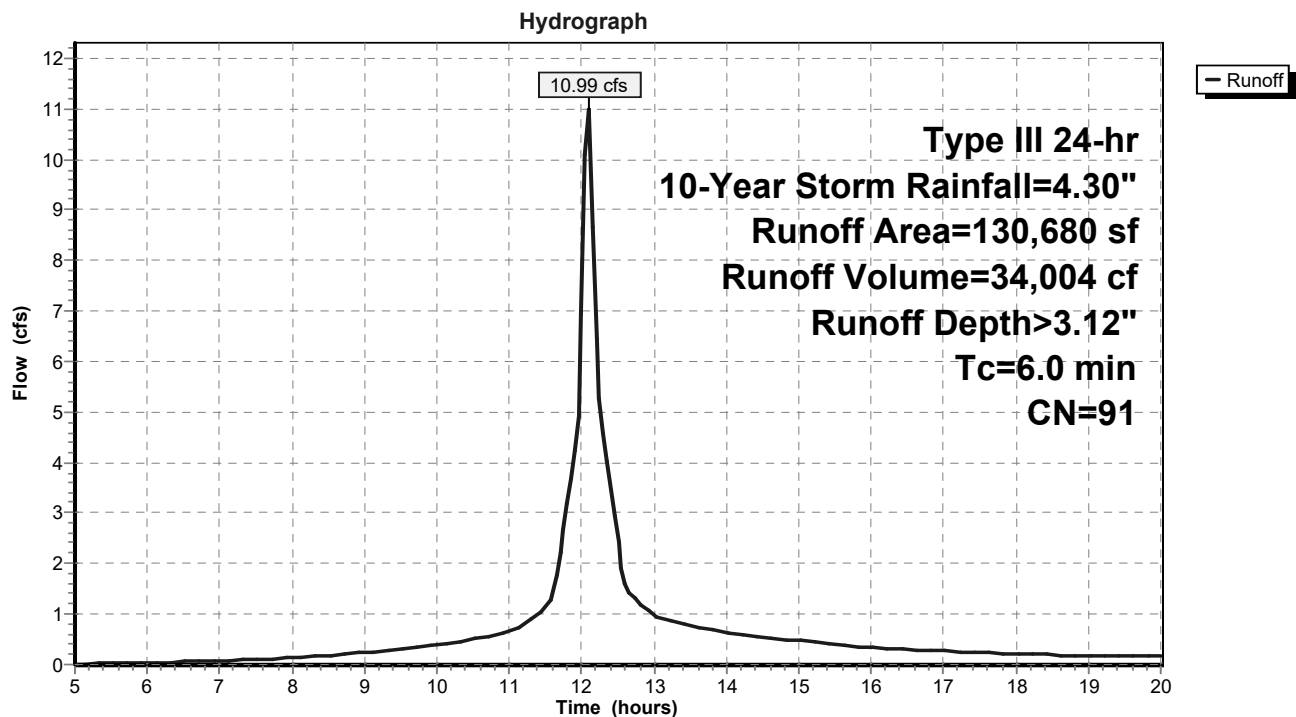
Summary for Subcatchment E2: Exist. Watershed 2 - Rutland Manor

Runoff = 10.99 cfs @ 12.09 hrs, Volume= 34,004 cf, Depth> 3.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=4.30"

Area (sf)	CN	Description
91,476	98	Paved parking, HSG A
39,204	74	>75% Grass cover, Good, HSG C
130,680	91	Weighted Average
39,204		30.00% Pervious Area
91,476		70.00% Impervious Area

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

Subcatchment E2: Exist. Watershed 2 - Rutland Manor

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Type III 24-hr 10-Year Storm Rainfall=4.30"

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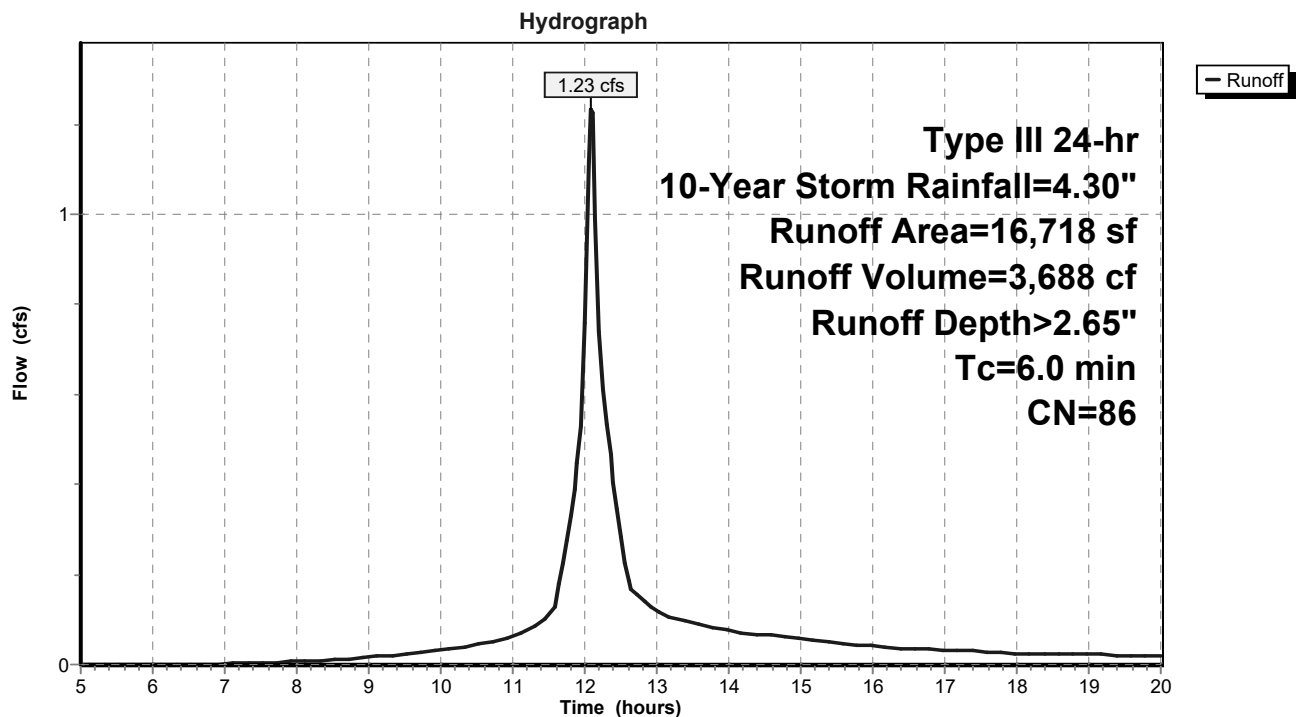
Summary for Subcatchment P1: Prop. Watershed 1

Runoff = 1.23 cfs @ 12.09 hrs, Volume= 3,688 cf, Depth> 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=4.30"

Area (sf)	CN	Description
8,086	98	Paved parking, HSG A
* 8,632	74	>75% Grass cover, Good, HSG C
16,718	86	Weighted Average
8,632		51.63% Pervious Area
8,086		48.37% Impervious Area

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

Subcatchment P1: Prop. Watershed 1

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Type III 24-hr 10-Year Storm Rainfall=4.30"

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Summary for Subcatchment P2: Prop. Watershed 2

Runoff = 0.66 cfs @ 12.09 hrs, Volume= 2,218 cf, Depth> 3.78"

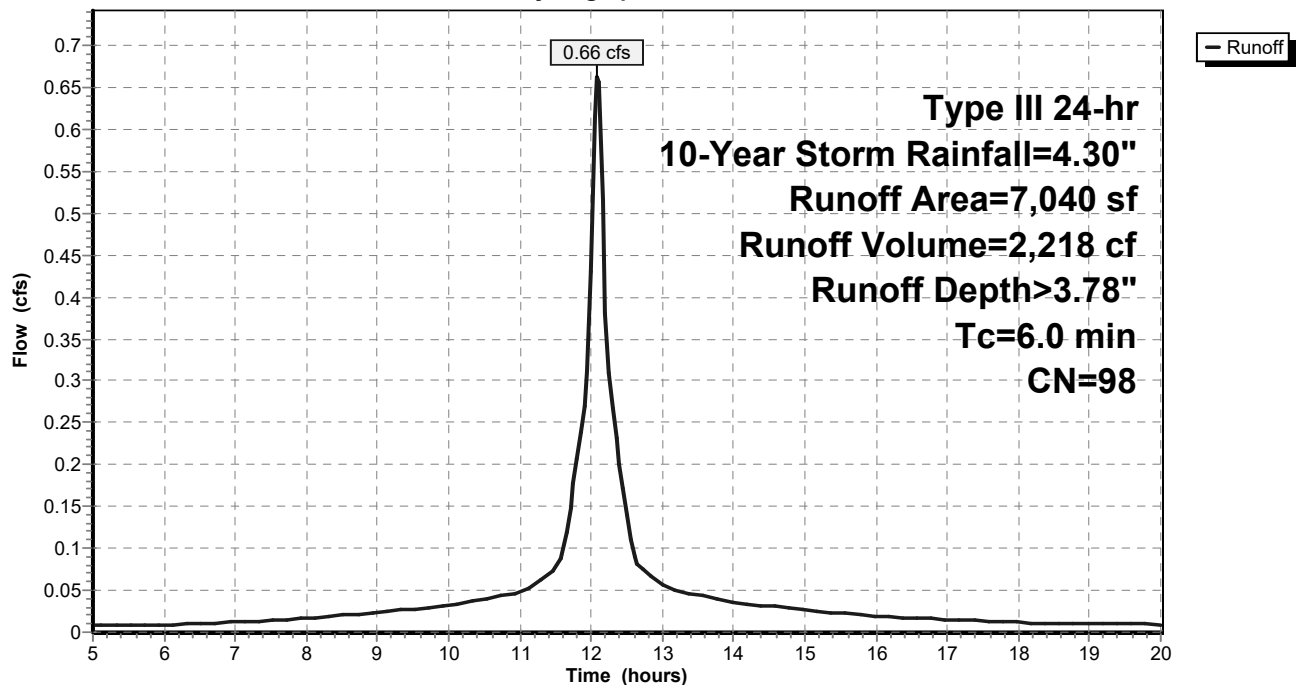
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=4.30"

Area (sf)	CN	Description
7,040	98	Roofs, HSG C
7,040		100.00% Impervious Area

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

Subcatchment P2: Prop. Watershed 2

Hydrograph



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Type III 24-hr 10-Year Storm Rainfall=4.30"

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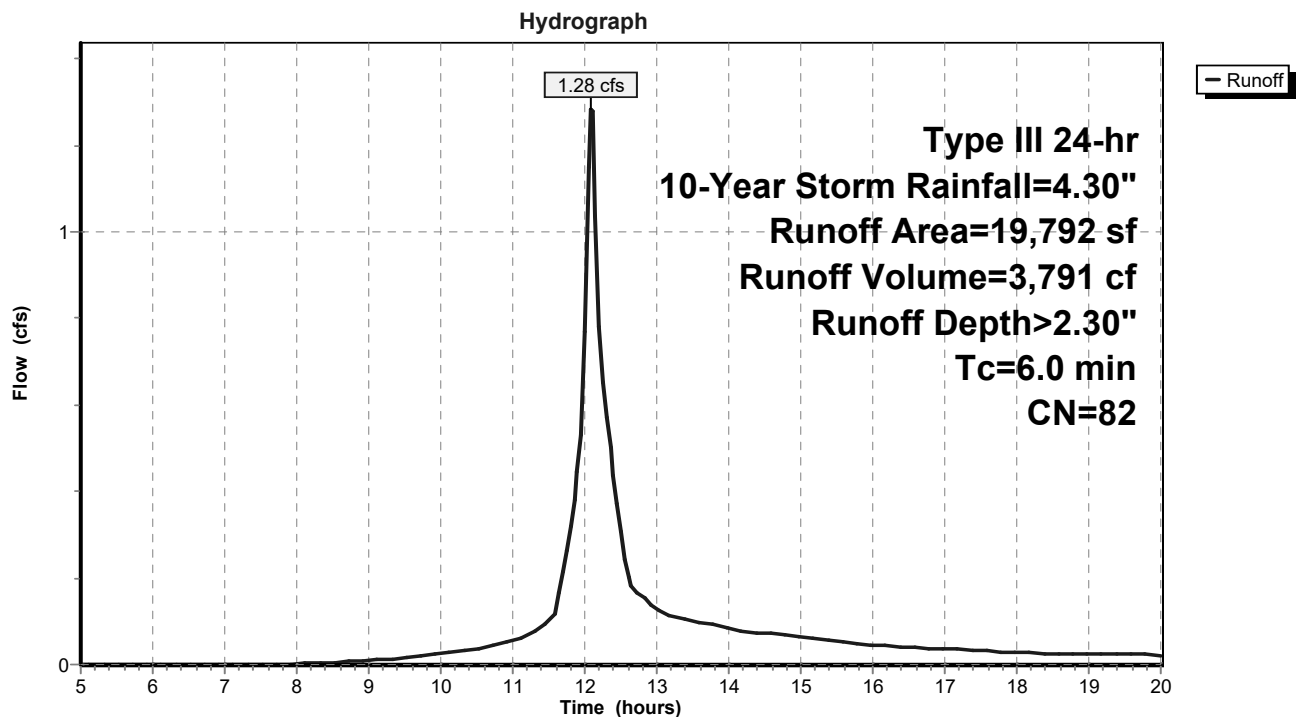
Summary for Subcatchment P3: Prop. Watershed 3

Runoff = 1.28 cfs @ 12.09 hrs, Volume= 3,791 cf, Depth> 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=4.30"

	Area (sf)	CN	Description
*	6,514	98	Paved parking, exist houses HSG C
	13,278	74	>75% Grass cover, Good, HSG C
	19,792	82	Weighted Average
	13,278		67.09% Pervious Area
	6,514		32.91% Impervious Area

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

Subcatchment P3: Prop. Watershed 3

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Type III 24-hr 10-Year Storm Rainfall=4.30"

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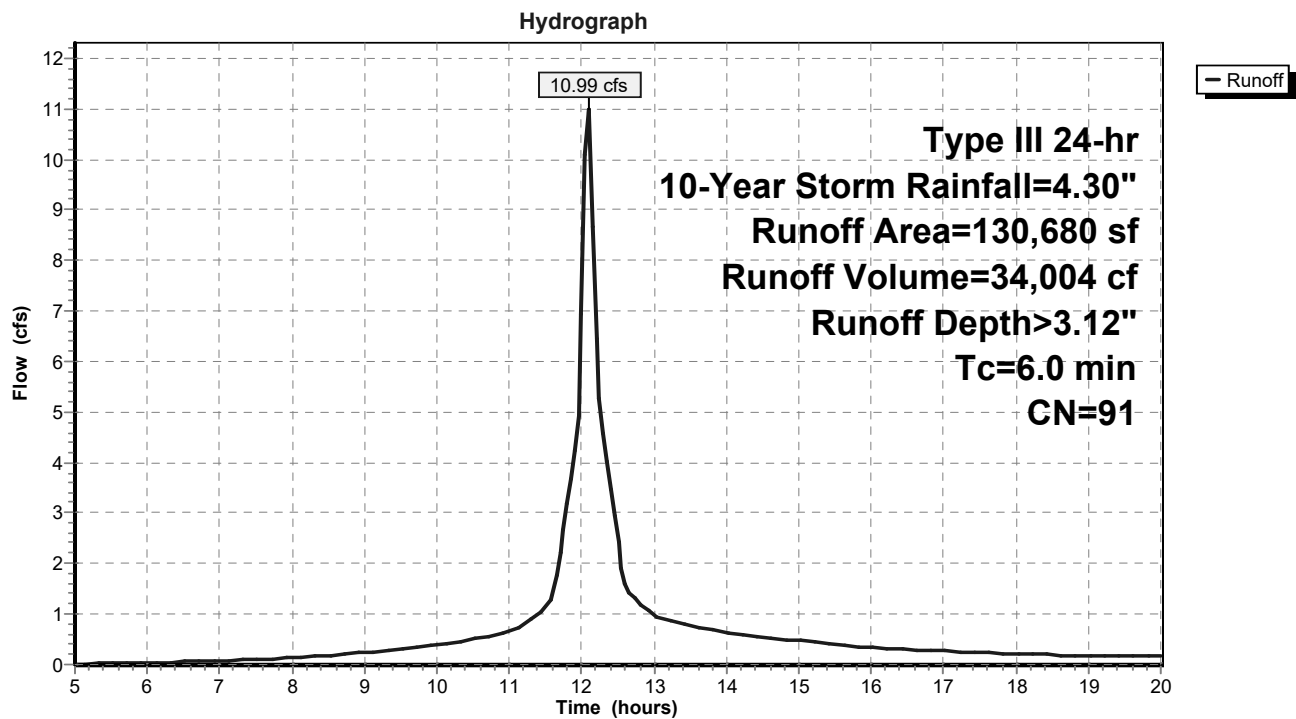
Summary for Subcatchment P4: Exist. Watershed 4 - Rutland Manor

Runoff = 10.99 cfs @ 12.09 hrs, Volume= 34,004 cf, Depth> 3.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=4.30"

Area (sf)	CN	Description
91,476	98	Paved parking, HSG A
39,204	74	>75% Grass cover, Good, HSG C
130,680	91	Weighted Average
39,204		30.00% Pervious Area
91,476		70.00% Impervious Area

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

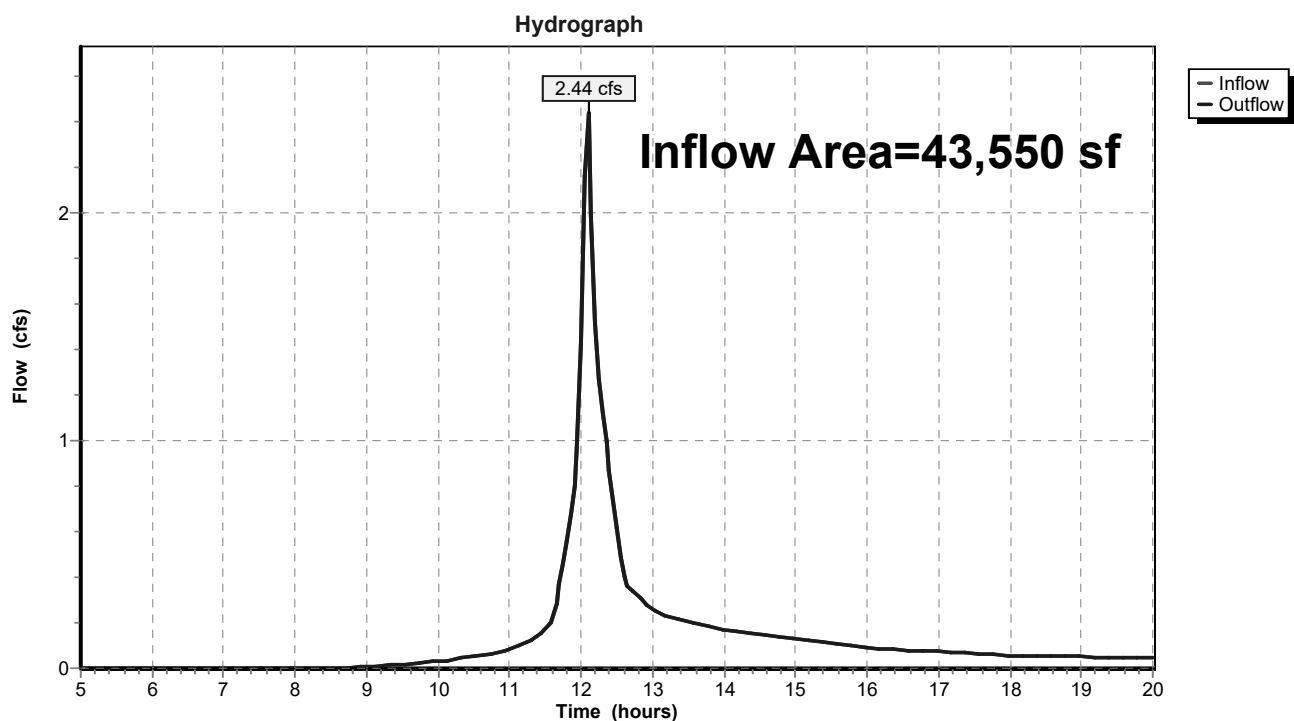
Subcatchment P4: Exist. Watershed 4 - Rutland Manor

Summary for Reach R1: Abbey Ln. Subcatchment

Inflow Area = 43,550 sf, 17.53% Impervious, Inflow Depth > 1.98" for 10-Year Storm event
 Inflow = 2.44 cfs @ 12.09 hrs, Volume= 7,171 cf
 Outflow = 2.44 cfs @ 12.09 hrs, Volume= 7,171 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

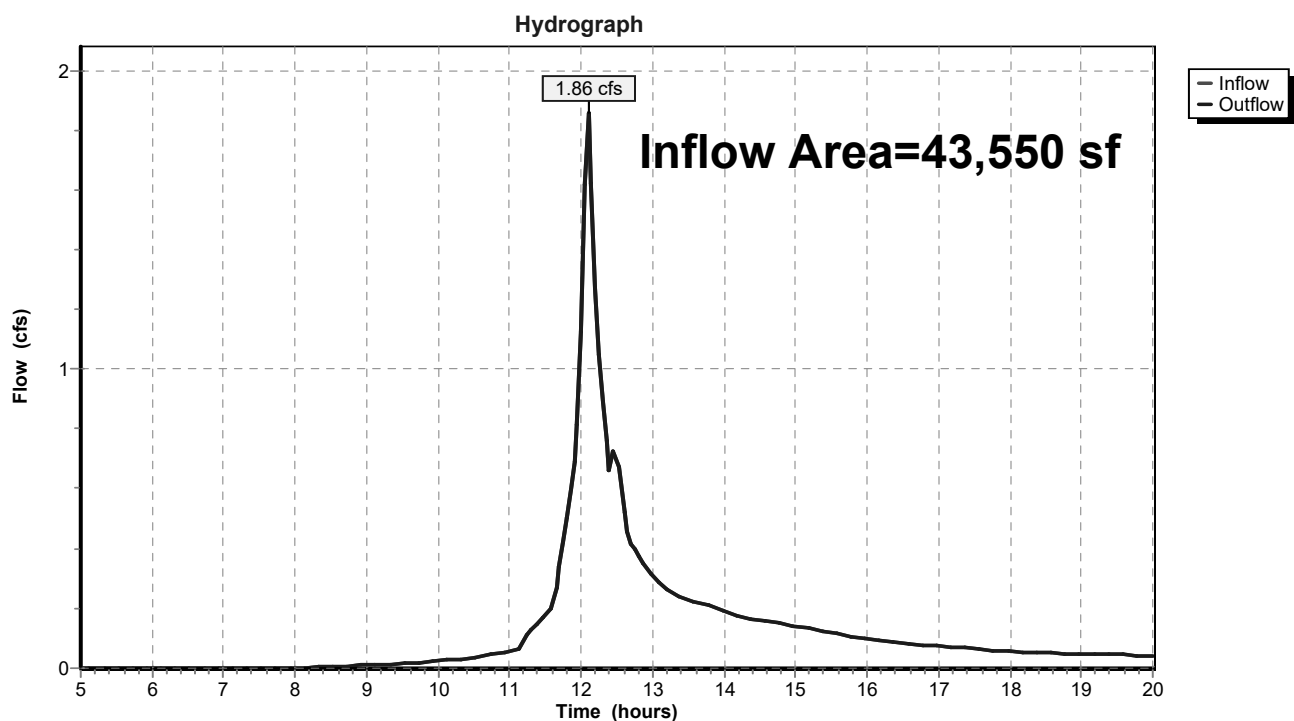
Reach R1: Abbey Ln. Subcatchment



Summary for Reach R2: Abbey Ln. Subcatchment

Inflow Area = 43,550 sf, 49.69% Impervious, Inflow Depth > 1.88" for 10-Year Storm event
Inflow = 1.86 cfs @ 12.10 hrs, Volume= 6,827 cf
Outflow = 1.86 cfs @ 12.10 hrs, Volume= 6,827 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach R2: Abbey Ln. Subcatchment

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Type III 24-hr 10-Year Storm Rainfall=4.30"

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Summary for Reach R3: 30"x30" Stone Culvert

Inflow Area = 174,230 sf, 56.89% Impervious, Inflow Depth > 2.84" for 10-Year Storm event
Inflow = 13.43 cfs @ 12.09 hrs, Volume= 41,175 cf
Outflow = 13.35 cfs @ 12.09 hrs, Volume= 41,162 cf, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 6.50 fps, Min. Travel Time= 0.2 min

Avg. Velocity= 1.99 fps, Avg. Travel Time= 0.6 min

Peak Storage= 145 cf @ 12.09 hrs

Average Depth at Peak Storage= 0.83'

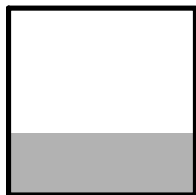
Bank-Full Depth= 2.50' Flow Area= 6.3 sf, Capacity= 47.28 cfs

30.0" W x 30.0" H Box Pipe

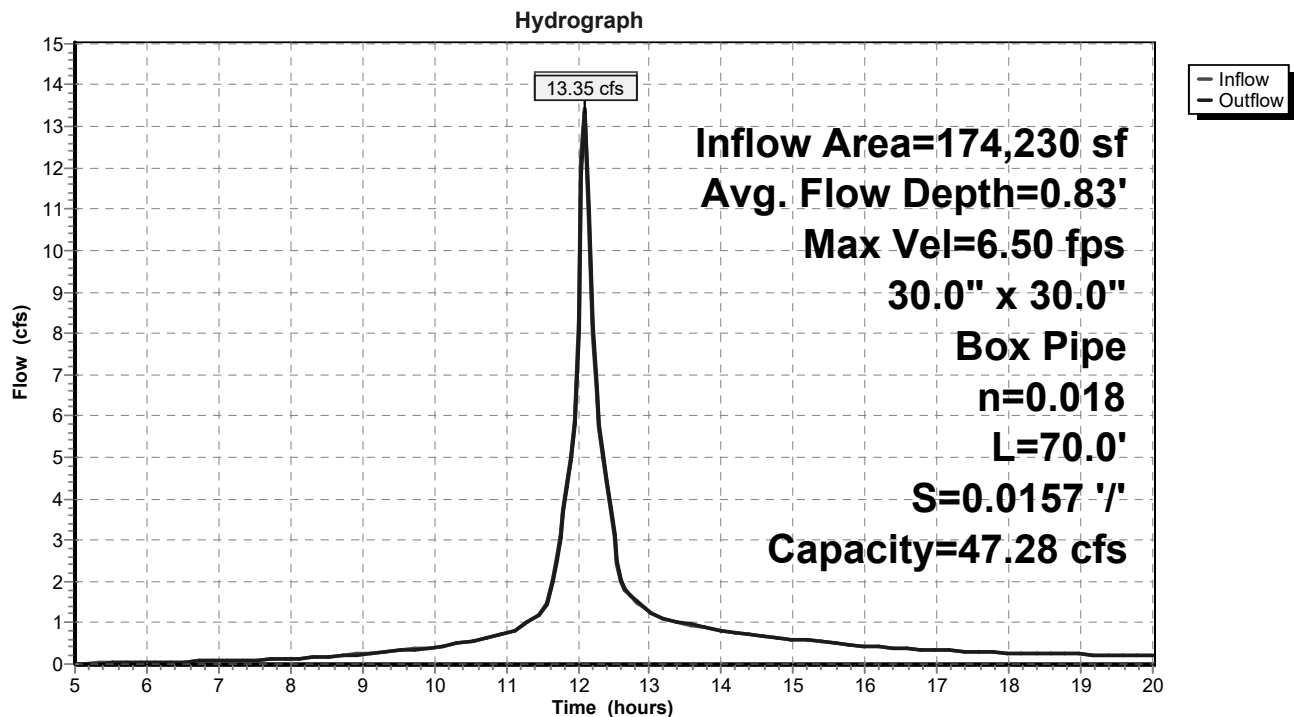
n= 0.018 Rubble masonry, cemented

Length= 70.0' Slope= 0.0157 '/'

Inlet Invert= 43.80', Outlet Invert= 42.70'



Reach R3: 30"x30" Stone Culvert



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Type III 24-hr 10-Year Storm Rainfall=4.30"

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Summary for Reach R4: 30"x30" Stone Culvert

Inflow Area = 174,230 sf, 64.92% Impervious, Inflow Depth > 2.81" for 10-Year Storm event
Inflow = 12.83 cfs @ 12.09 hrs, Volume= 40,832 cf
Outflow = 12.76 cfs @ 12.10 hrs, Volume= 40,818 cf, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 6.41 fps, Min. Travel Time= 0.2 min

Avg. Velocity= 1.99 fps, Avg. Travel Time= 0.6 min

Peak Storage= 140 cf @ 12.09 hrs

Average Depth at Peak Storage= 0.80'

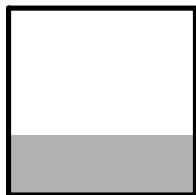
Bank-Full Depth= 2.50' Flow Area= 6.3 sf, Capacity= 47.28 cfs

30.0" W x 30.0" H Box Pipe

n= 0.018 Rubble masonry, cemented

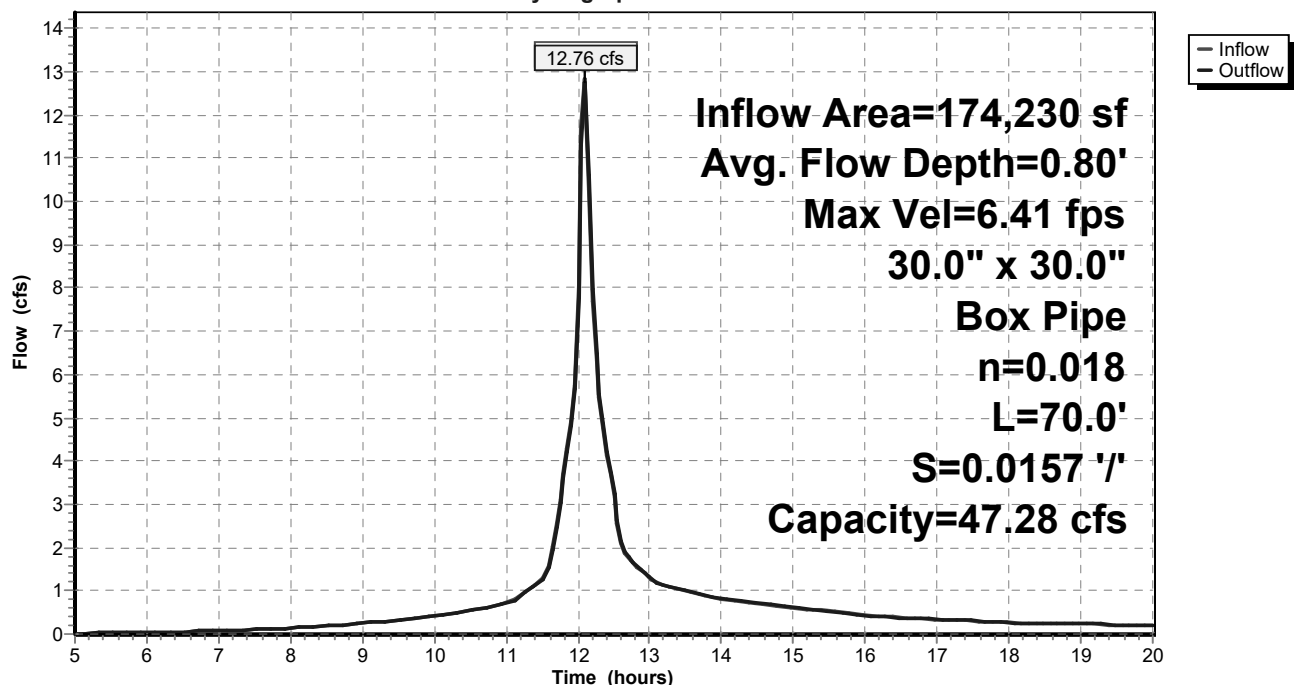
Length= 70.0' Slope= 0.0157 '/'

Inlet Invert= 43.80', Outlet Invert= 42.70'



Reach R4: 30"x30" Stone Culvert

Hydrograph



Summary for Pond BMP1: Rain Garden

Inflow Area = 16,718 sf, 48.37% Impervious, Inflow Depth > 2.65" for 10-Year Storm event
 Inflow = 1.23 cfs @ 12.09 hrs, Volume= 3,688 cf
 Outflow = 0.27 cfs @ 12.52 hrs, Volume= 1,635 cf, Atten= 78%, Lag= 26.0 min
 Discarded = 0.01 cfs @ 12.52 hrs, Volume= 318 cf
 Primary = 0.26 cfs @ 12.52 hrs, Volume= 1,317 cf

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 59.05' @ 12.52 hrs Surf.Area= 1,372 sf Storage= 2,119 cf

Plug-Flow detention time= 181.8 min calculated for 1,629 cf (44% of inflow)
 Center-of-Mass det. time= 95.3 min (872.8 - 777.4)

Volume	Invert	Avail.Storage	Storage Description
#1	57.00'	3,580 cf	Rain Garden - Ponding Area (Prismatic) , listed below (Recalc)

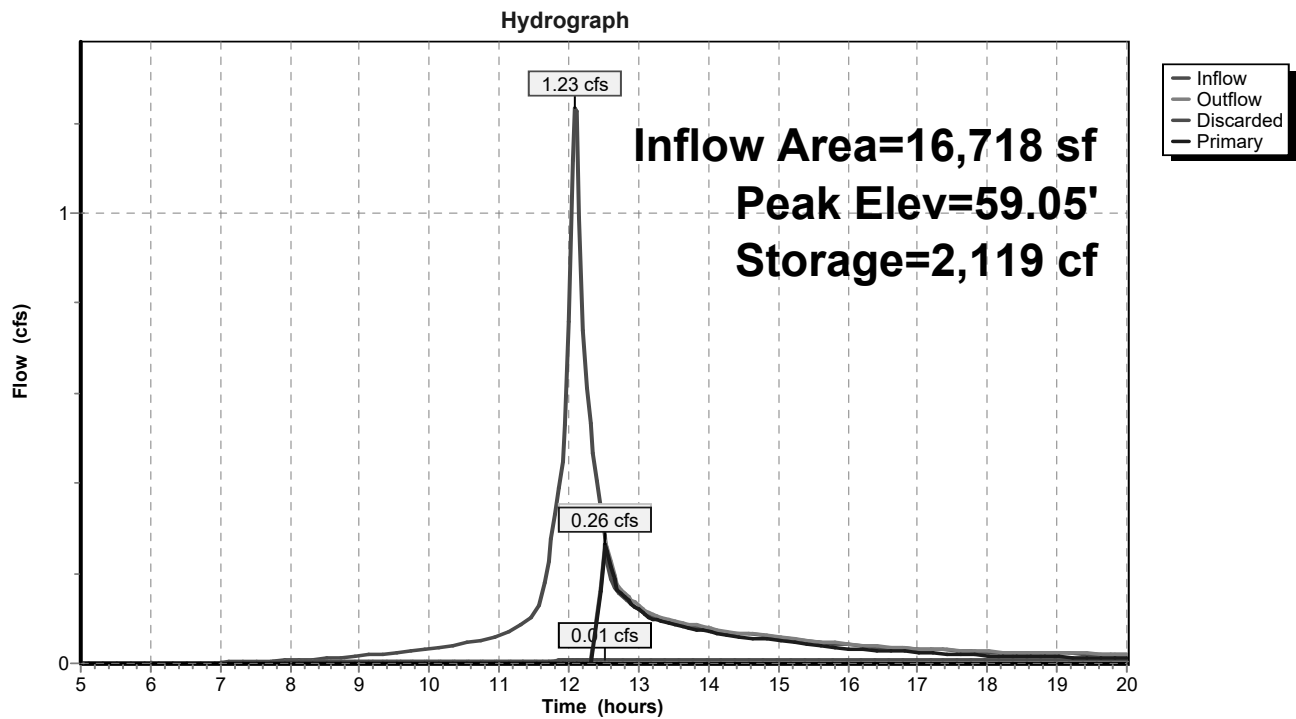
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
57.00	707	0	0
58.00	1,016	862	862
59.00	1,352	1,184	2,046
60.00	1,716	1,534	3,580

Device	Routing	Invert	Outlet Devices
#1	Primary	53.50'	12.0" Round Culvert L= 89.0' Ke= 0.200 Inlet / Outlet Invert= 53.50' / 52.60' S= 0.0101 ' /' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	59.00'	24.0" Horiz. Dome Grate C= 0.600 Limited to weir flow at low heads
#3	Discarded	57.00'	0.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.01 cfs @ 12.52 hrs HW=59.05' (Free Discharge)
 ↑ **3=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.24 cfs @ 12.52 hrs HW=59.05' (Free Discharge)
 ↑ **1=Culvert** (Passes 0.24 cfs of 8.71 cfs potential flow)
 ↑ **2=Dome Grate** (Weir Controls 0.24 cfs @ 0.75 fps)

Pond BMP1: Rain Garden



Summary for Pond BMP2: Infiltration System

Inflow Area = 7,040 sf, 100.00% Impervious, Inflow Depth > 3.78" for 10-Year Storm event
 Inflow = 0.66 cfs @ 12.09 hrs, Volume= 2,218 cf
 Outflow = 0.59 cfs @ 12.13 hrs, Volume= 1,774 cf, Atten= 10%, Lag= 2.5 min
 Discarded = 0.00 cfs @ 5.15 hrs, Volume= 54 cf
 Primary = 0.59 cfs @ 12.13 hrs, Volume= 1,720 cf

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 60.63' @ 12.13 hrs Surf.Area= 160 sf Storage= 539 cf

Plug-Flow detention time= 105.0 min calculated for 1,773 cf (80% of inflow)
 Center-of-Mass det. time= 50.2 min (786.3 - 736.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.00'	179 cf	8.00'W x 20.00'L x 5.50'H Field A 880 cf Overall - 432 cf Embedded = 448 cf x 40.0% Voids
#2A	56.50'	415 cf	Brentwood StormTank 48" x 24 Inside #1 Inside= 18.0"W x 48.0"H => 5.77 sf x 3.00'L = 17.3 cf Outside= 18.0"W x 48.0"H => 6.00 sf x 3.00'L = 18.0 cf 4 Rows of 6 Chambers
		595 cf	Total Available Storage

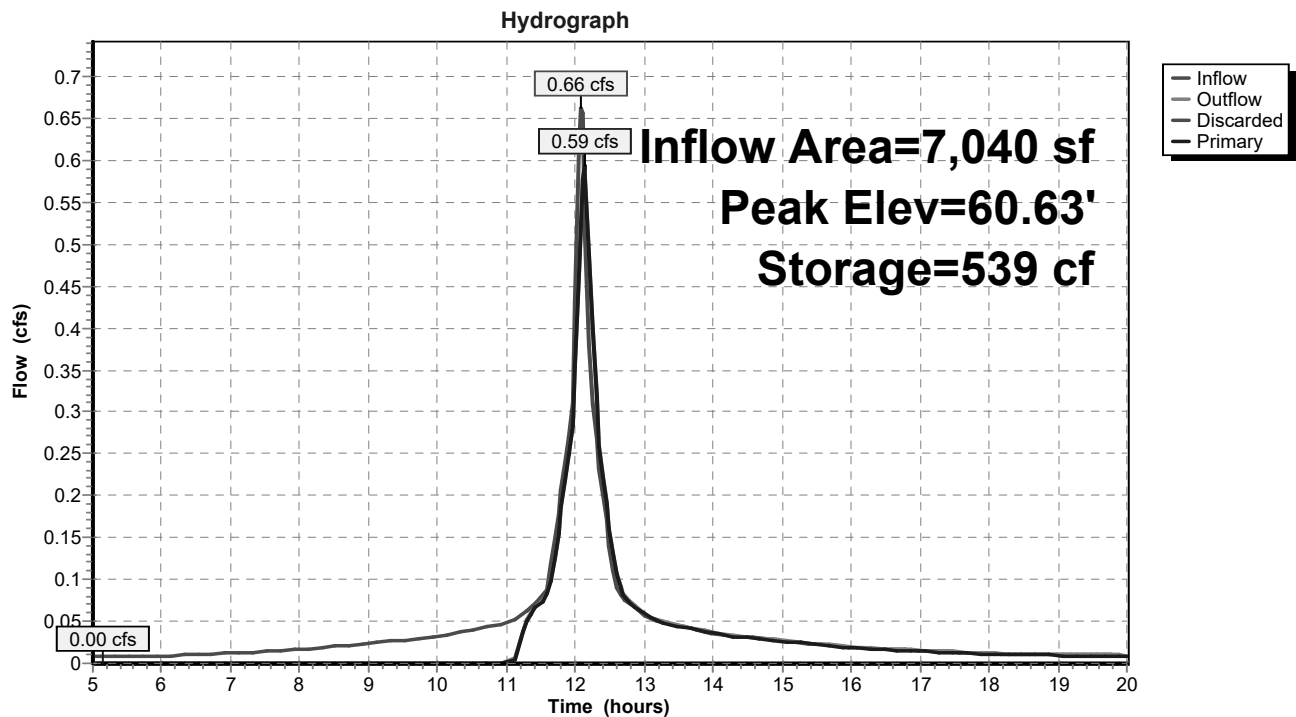
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	59.75'	6.0" Round 6" PVC out L= 19.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 59.75' / 56.70' S= 0.1605 ' / Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.20 sf
#2	Discarded	56.00'	0.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.00 cfs @ 5.15 hrs HW=56.07' (Free Discharge)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.58 cfs @ 12.13 hrs HW=60.61' (Free Discharge)
 ↑ **1=6" PVC out** (Inlet Controls 0.58 cfs @ 2.96 fps)

Pond BMP2: Infiltration System



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Type III 24-hr 25-Year Storm Rainfall=5.20"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentE1: Exist. Watershed 1 Runoff Area=43,550 sf 17.53% Impervious Runoff Depth>2.69"
Tc=6.0 min CN=78 Runoff=3.31 cfs 9,754 cf

SubcatchmentE2: Exist. Watershed 2 - Runoff Area=130,680 sf 70.00% Impervious Runoff Depth>3.95"
Tc=6.0 min CN=91 Runoff=13.71 cfs 42,988 cf

SubcatchmentP1: Prop. Watershed 1 Runoff Area=16,718 sf 48.37% Impervious Runoff Depth>3.44"
Tc=6.0 min CN=86 Runoff=1.58 cfs 4,793 cf

SubcatchmentP2: Prop. Watershed 2 Runoff Area=7,040 sf 100.00% Impervious Runoff Depth>4.60"
Tc=6.0 min CN=98 Runoff=0.80 cfs 2,699 cf

SubcatchmentP3: Prop. Watershed 3 Runoff Area=19,792 sf 32.91% Impervious Runoff Depth>3.05"
Tc=6.0 min CN=82 Runoff=1.69 cfs 5,037 cf

SubcatchmentP4: Exist. Watershed 4 - Runoff Area=130,680 sf 70.00% Impervious Runoff Depth>3.95"
Tc=6.0 min CN=91 Runoff=13.71 cfs 42,988 cf

Reach R1: Abbey Ln. Subcatchment Inflow=3.31 cfs 9,754 cf
Outflow=3.31 cfs 9,754 cf

Reach R2: Abbey Ln. Subcatchment Inflow=2.40 cfs 9,638 cf
Outflow=2.40 cfs 9,638 cf

Reach R3: 30"x30" Stone Culvert Avg. Flow Depth=0.98' Max Vel=6.94 fps Inflow=17.02 cfs 52,742 cf
30.0" x 30.0" Box Pipe n=0.018 L=70.0' S=0.0157 '/' Capacity=47.28 cfs Outflow=16.93 cfs 52,725 cf

Reach R4: 30"x30" Stone Culvert Avg. Flow Depth=0.94' Max Vel=6.83 fps Inflow=16.10 cfs 52,626 cf
30.0" x 30.0" Box Pipe n=0.018 L=70.0' S=0.0157 '/' Capacity=47.28 cfs Outflow=16.01 cfs 52,609 cf

Pond BMP1: Rain Garden Peak Elev=59.12' Storage=2,205 cf Inflow=1.58 cfs 4,793 cf
Discarded=0.01 cfs 336 cf Primary=0.82 cfs 2,401 cf Outflow=0.83 cfs 2,737 cf

Pond BMP2: Infiltration System Peak Elev=60.97' Storage=561 cf Inflow=0.80 cfs 2,699 cf
Discarded=0.00 cfs 54 cf Primary=0.74 cfs 2,201 cf Outflow=0.74 cfs 2,255 cf

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Type III 24-hr 25-Year Storm Rainfall=5.20"

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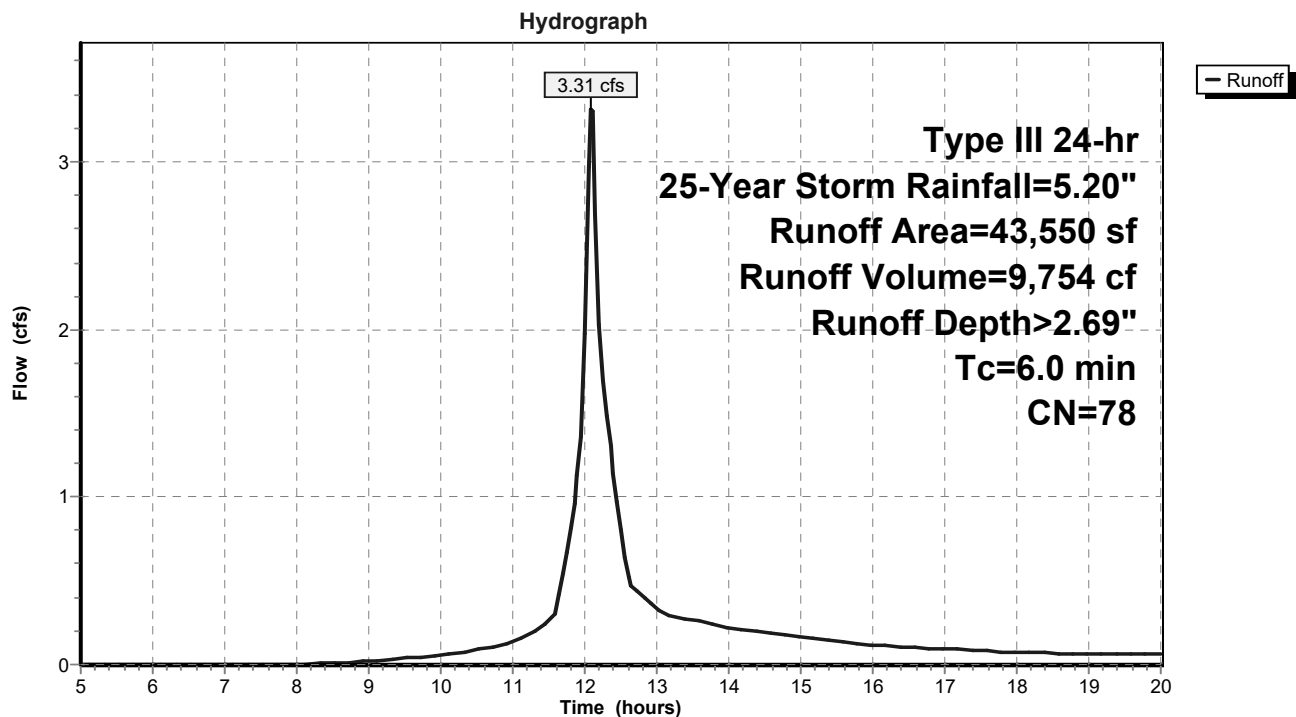
Summary for Subcatchment E1: Exist. Watershed 1

Runoff = 3.31 cfs @ 12.09 hrs, Volume= 9,754 cf, Depth> 2.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=5.20"

	Area (sf)	CN	Description
*	7,635	98	Paved parking, roofs, walks
	35,915	74	>75% Grass cover, Good, HSG C
	43,550	78	Weighted Average
	35,915		82.47% Pervious Area
	7,635		17.53% Impervious Area

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

Subcatchment E1: Exist. Watershed 1

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Type III 24-hr 25-Year Storm Rainfall=5.20"

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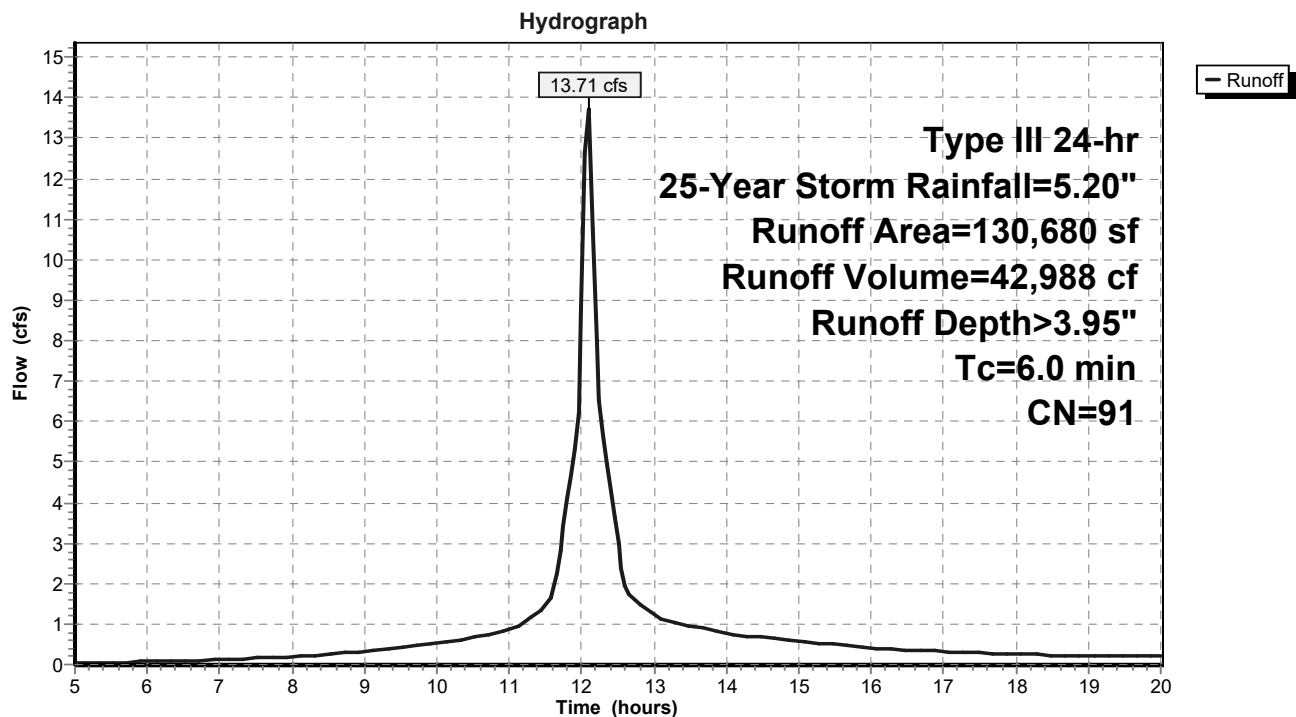
Summary for Subcatchment E2: Exist. Watershed 2 - Rutland Manor

Runoff = 13.71 cfs @ 12.09 hrs, Volume= 42,988 cf, Depth> 3.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=5.20"

Area (sf)	CN	Description
91,476	98	Paved parking, HSG A
39,204	74	>75% Grass cover, Good, HSG C
130,680	91	Weighted Average
39,204		30.00% Pervious Area
91,476		70.00% Impervious Area

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

Subcatchment E2: Exist. Watershed 2 - Rutland Manor

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Type III 24-hr 25-Year Storm Rainfall=5.20"

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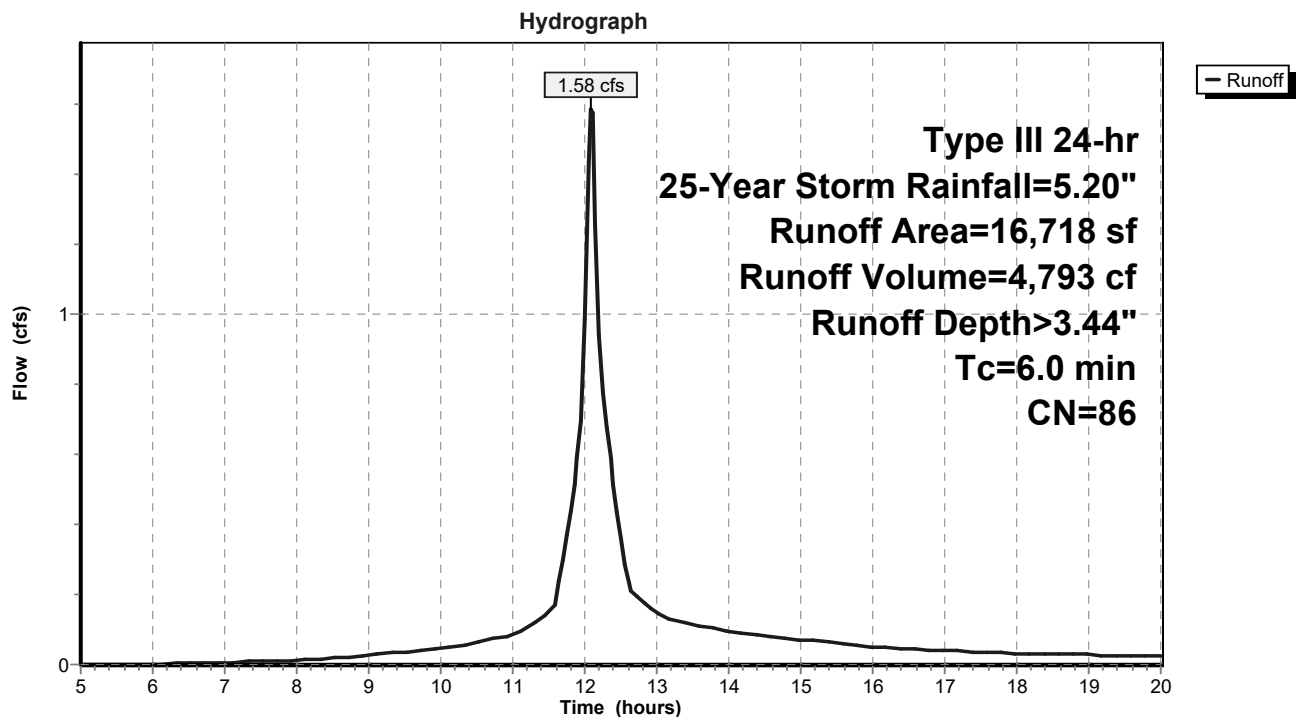
Summary for Subcatchment P1: Prop. Watershed 1

Runoff = 1.58 cfs @ 12.09 hrs, Volume= 4,793 cf, Depth> 3.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=5.20"

Area (sf)	CN	Description
8,086	98	Paved parking, HSG A
* 8,632	74	>75% Grass cover, Good, HSG C
16,718	86	Weighted Average
8,632		51.63% Pervious Area
8,086		48.37% Impervious Area

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

Subcatchment P1: Prop. Watershed 1

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Type III 24-hr 25-Year Storm Rainfall=5.20"

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Summary for Subcatchment P2: Prop. Watershed 2

Runoff = 0.80 cfs @ 12.09 hrs, Volume= 2,699 cf, Depth> 4.60"

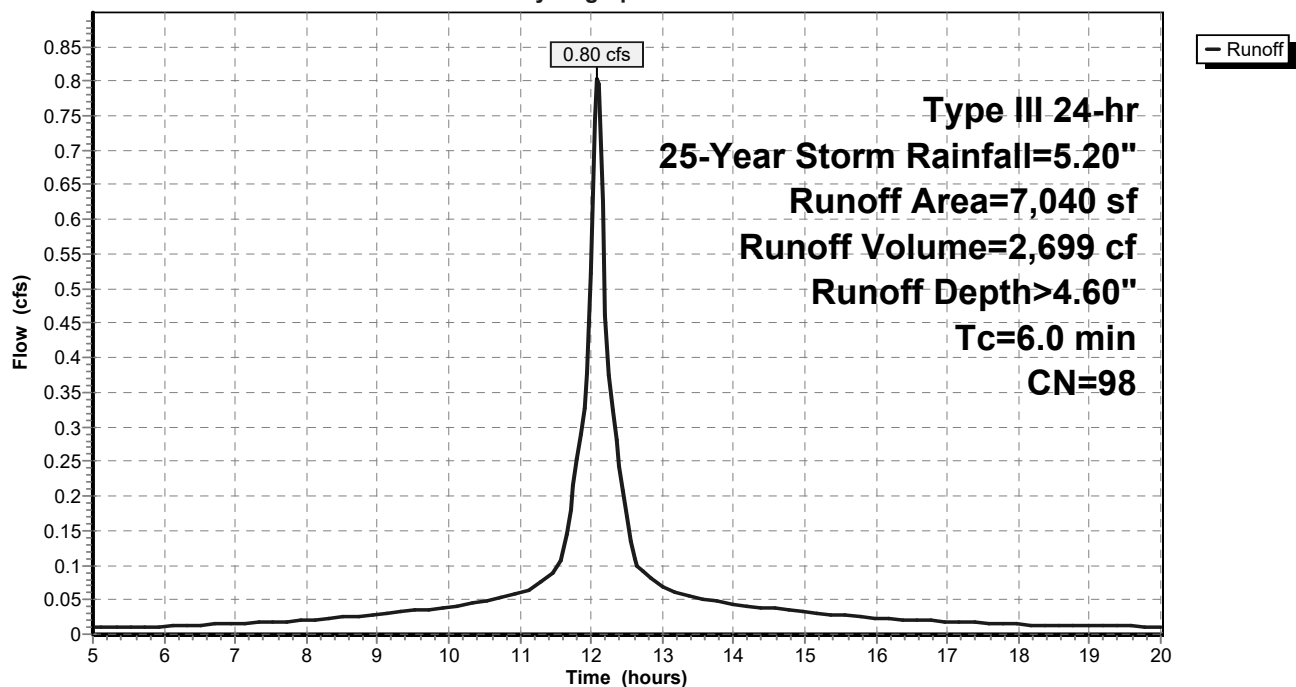
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=5.20"

Area (sf)	CN	Description
7,040	98	Roofs, HSG C
7,040		100.00% Impervious Area

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

Subcatchment P2: Prop. Watershed 2

Hydrograph



23800-Dover-NH-Stormwater

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Type III 24-hr 25-Year Storm Rainfall=5.20"

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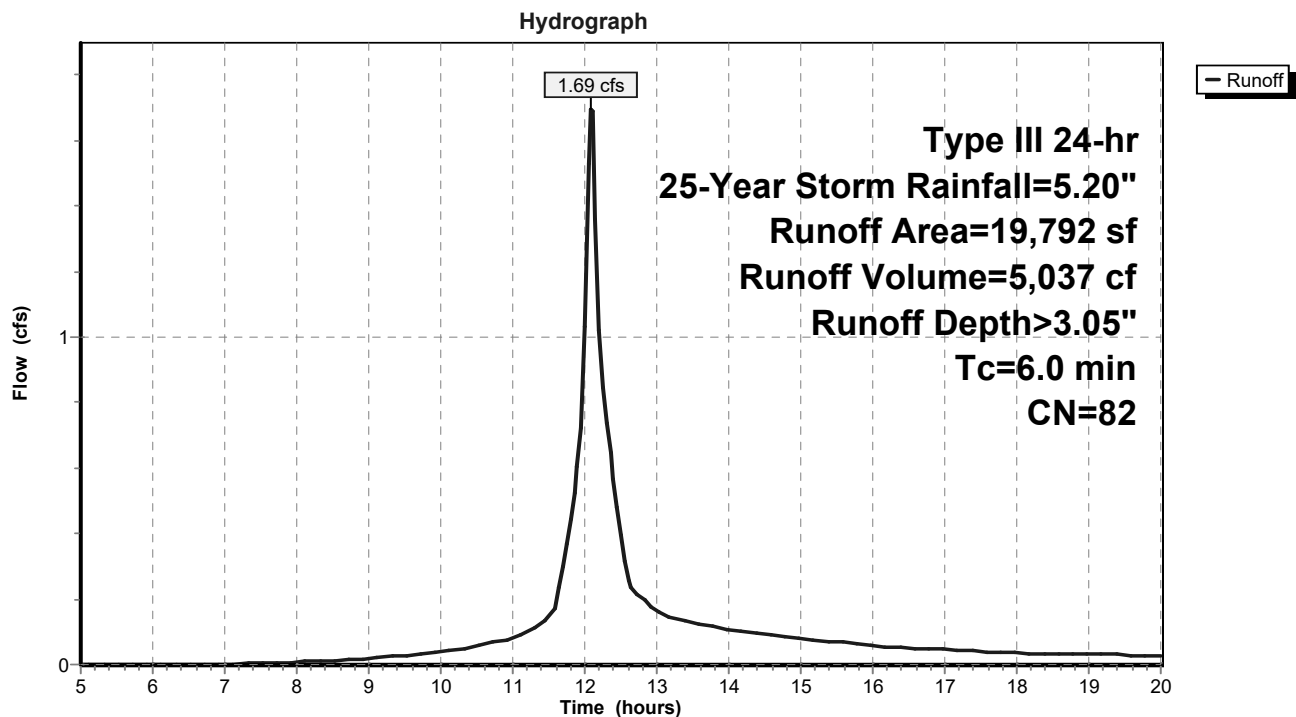
Summary for Subcatchment P3: Prop. Watershed 3

Runoff = 1.69 cfs @ 12.09 hrs, Volume= 5,037 cf, Depth> 3.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=5.20"

	Area (sf)	CN	Description
*	6,514	98	Paved parking, exist houses HSG C
	13,278	74	>75% Grass cover, Good, HSG C
	19,792	82	Weighted Average
	13,278		67.09% Pervious Area
	6,514		32.91% Impervious Area

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

Subcatchment P3: Prop. Watershed 3

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Type III 24-hr 25-Year Storm Rainfall=5.20"

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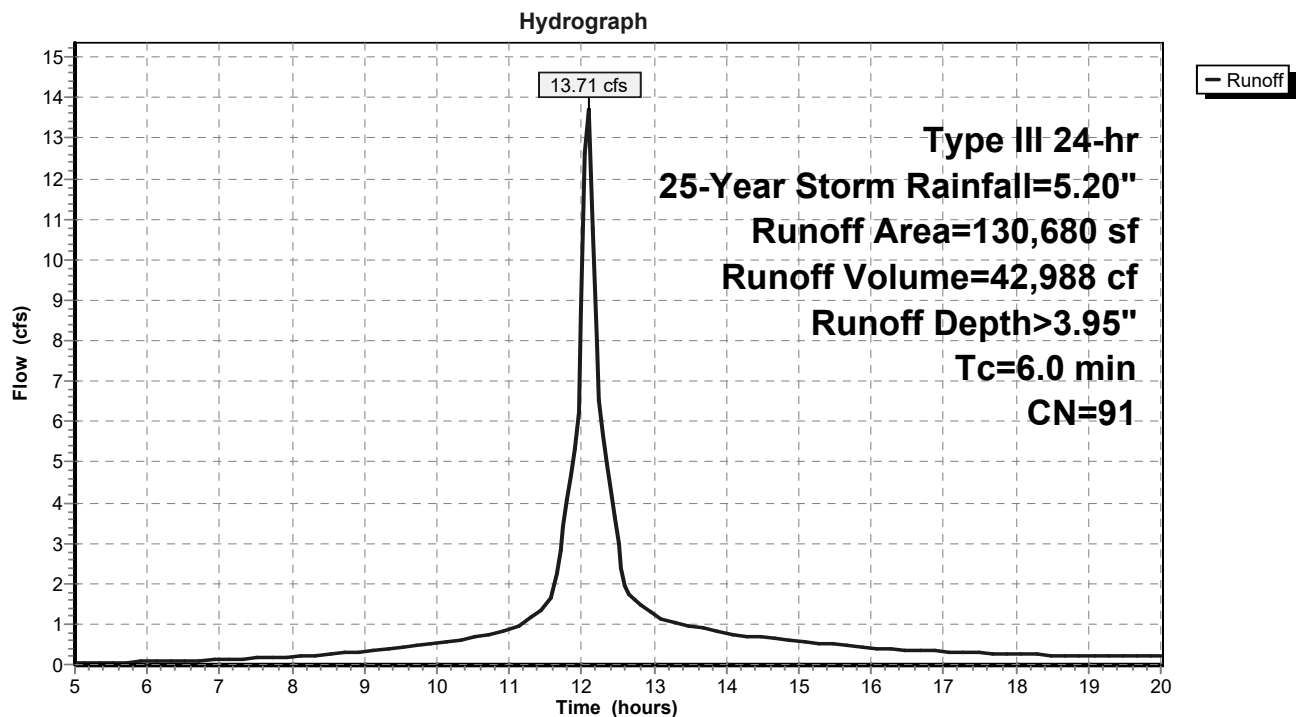
Summary for Subcatchment P4: Exist. Watershed 4 - Rutland Manor

Runoff = 13.71 cfs @ 12.09 hrs, Volume= 42,988 cf, Depth> 3.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=5.20"

Area (sf)	CN	Description
91,476	98	Paved parking, HSG A
39,204	74	>75% Grass cover, Good, HSG C
130,680	91	Weighted Average
39,204		30.00% Pervious Area
91,476		70.00% Impervious Area

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

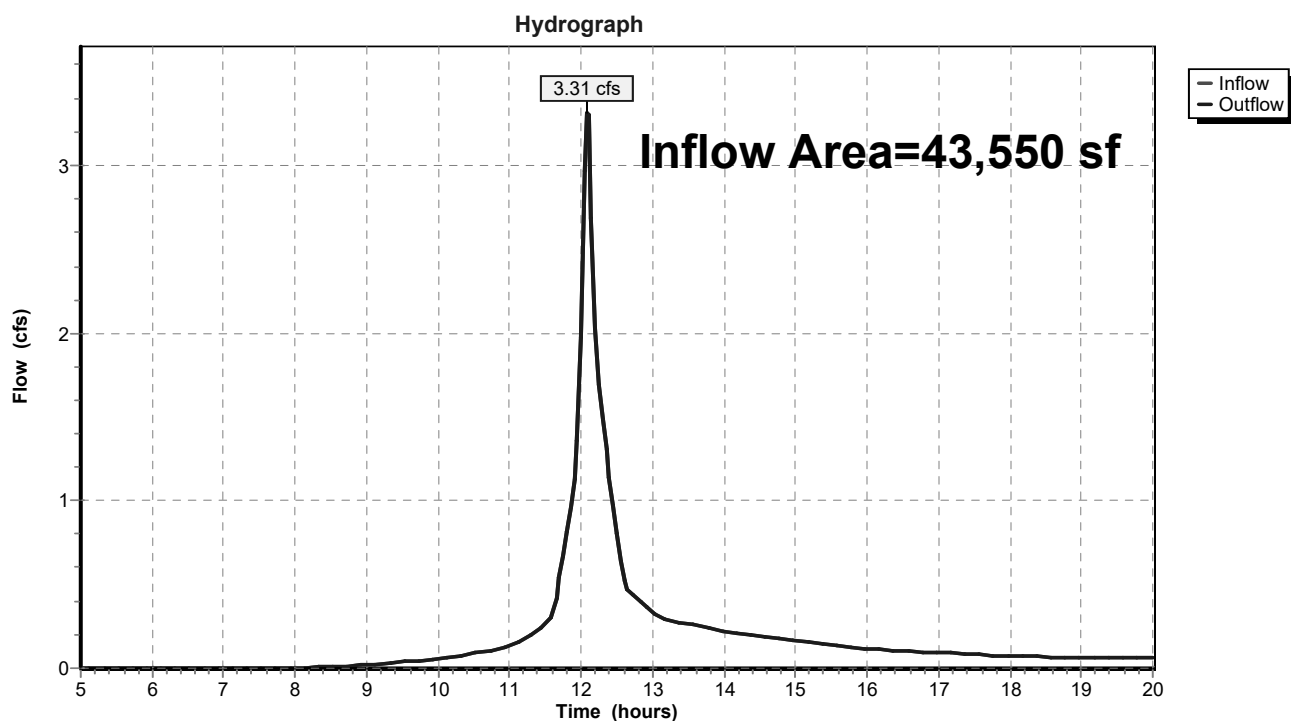
Subcatchment P4: Exist. Watershed 4 - Rutland Manor

Summary for Reach R1: Abbey Ln. Subcatchment

Inflow Area = 43,550 sf, 17.53% Impervious, Inflow Depth > 2.69" for 25-Year Storm event
 Inflow = 3.31 cfs @ 12.09 hrs, Volume= 9,754 cf
 Outflow = 3.31 cfs @ 12.09 hrs, Volume= 9,754 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

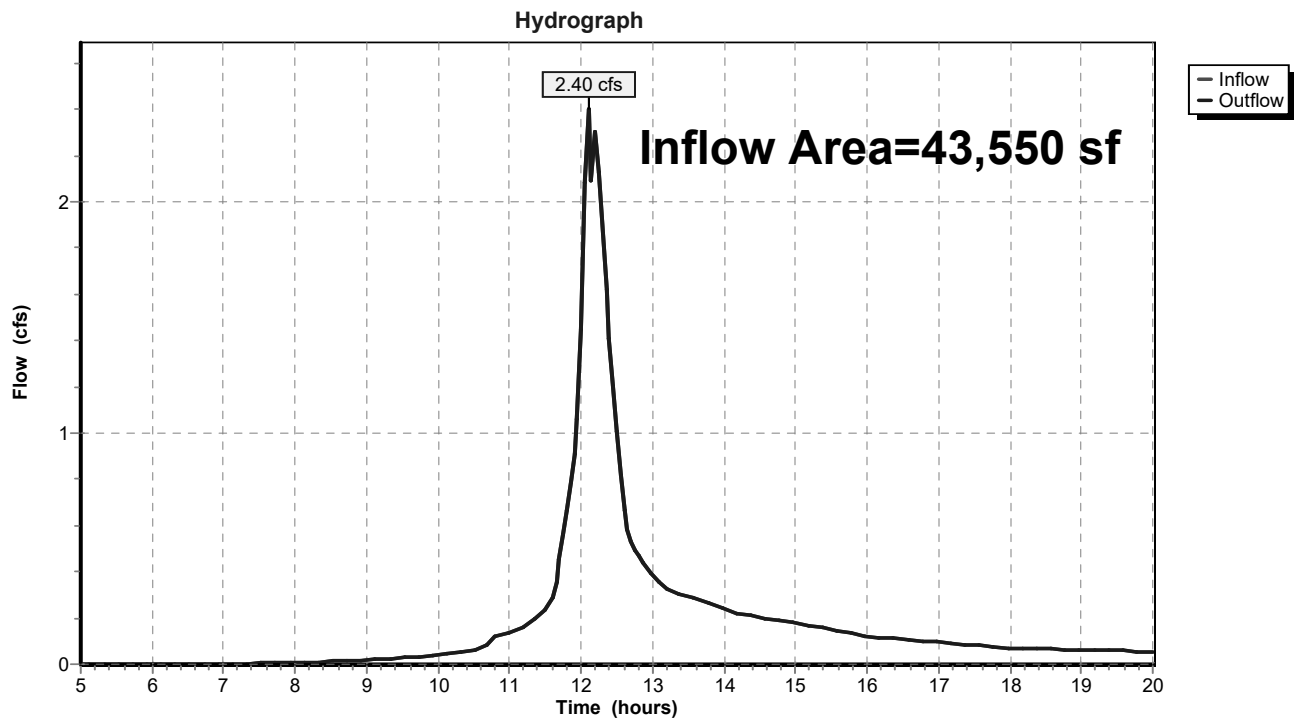
Reach R1: Abbey Ln. Subcatchment



Summary for Reach R2: Abbey Ln. Subcatchment

Inflow Area = 43,550 sf, 49.69% Impervious, Inflow Depth > 2.66" for 25-Year Storm event
Inflow = 2.40 cfs @ 12.10 hrs, Volume= 9,638 cf
Outflow = 2.40 cfs @ 12.10 hrs, Volume= 9,638 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach R2: Abbey Ln. Subcatchment

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Type III 24-hr 25-Year Storm Rainfall=5.20"

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Summary for Reach R3: 30"x30" Stone Culvert

Inflow Area = 174,230 sf, 56.89% Impervious, Inflow Depth > 3.63" for 25-Year Storm event
Inflow = 17.02 cfs @ 12.09 hrs, Volume= 52,742 cf
Outflow = 16.93 cfs @ 12.09 hrs, Volume= 52,725 cf, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 6.94 fps, Min. Travel Time= 0.2 min

Avg. Velocity = 2.18 fps, Avg. Travel Time= 0.5 min

Peak Storage= 172 cf @ 12.09 hrs

Average Depth at Peak Storage= 0.98'

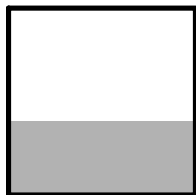
Bank-Full Depth= 2.50' Flow Area= 6.3 sf, Capacity= 47.28 cfs

30.0" W x 30.0" H Box Pipe

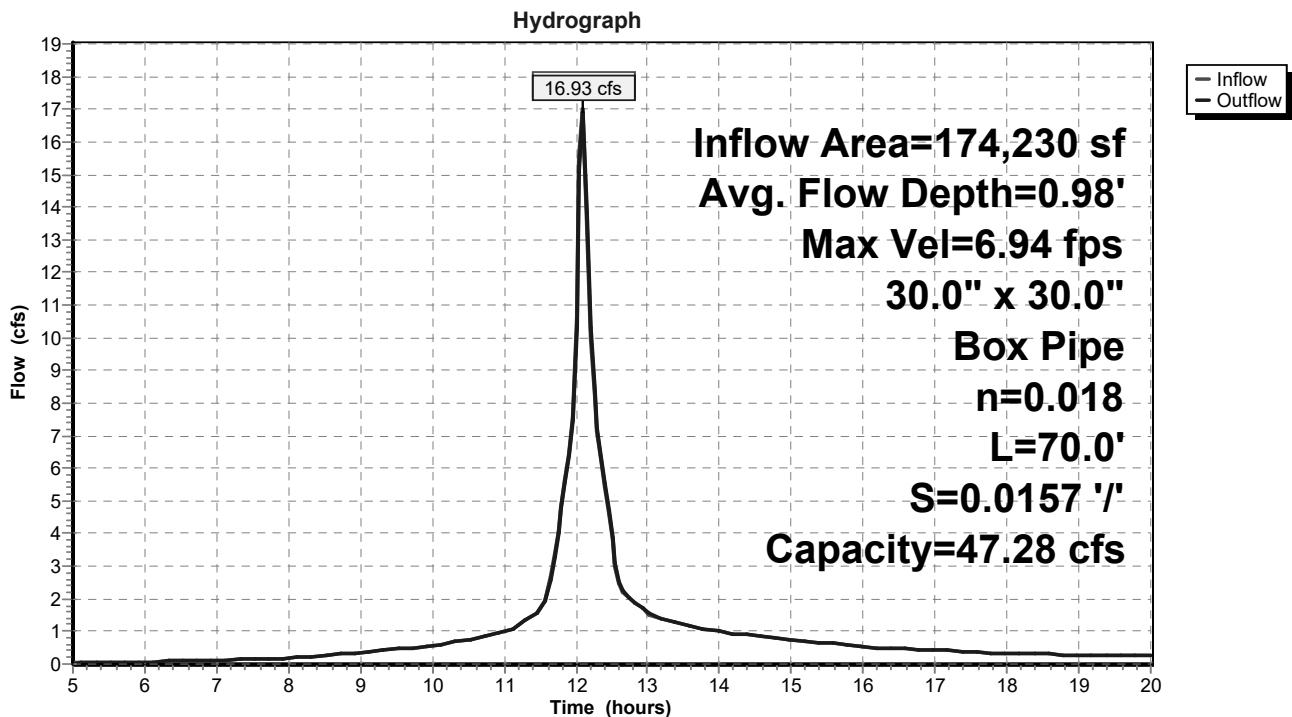
n= 0.018 Rubble masonry, cemented

Length= 70.0' Slope= 0.0157 '/'

Inlet Invert= 43.80', Outlet Invert= 42.70'



Reach R3: 30"x30" Stone Culvert



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Type III 24-hr 25-Year Storm Rainfall=5.20"

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Summary for Reach R4: 30"x30" Stone Culvert

Inflow Area = 174,230 sf, 64.92% Impervious, Inflow Depth > 3.62" for 25-Year Storm event
Inflow = 16.10 cfs @ 12.09 hrs, Volume= 52,626 cf
Outflow = 16.01 cfs @ 12.09 hrs, Volume= 52,609 cf, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 6.83 fps, Min. Travel Time= 0.2 min

Avg. Velocity = 2.19 fps, Avg. Travel Time= 0.5 min

Peak Storage= 165 cf @ 12.09 hrs

Average Depth at Peak Storage= 0.94'

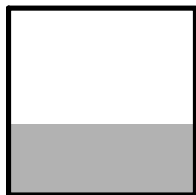
Bank-Full Depth= 2.50' Flow Area= 6.3 sf, Capacity= 47.28 cfs

30.0" W x 30.0" H Box Pipe

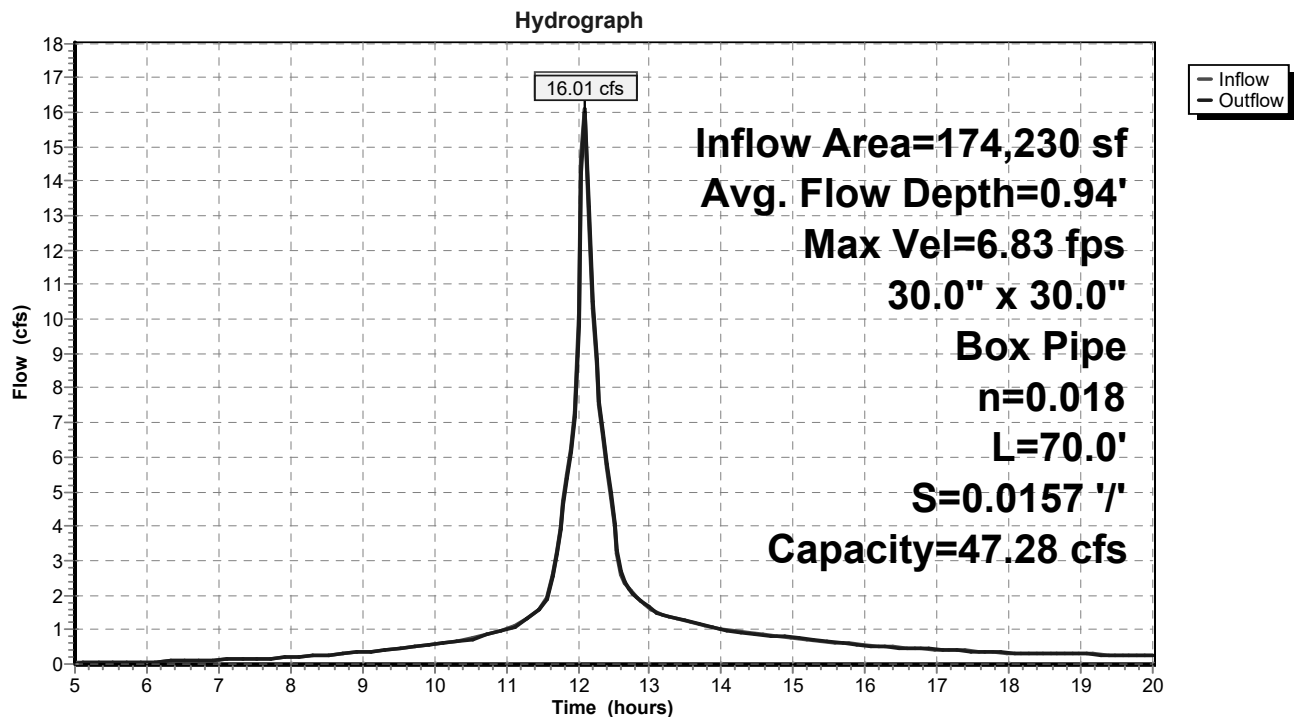
n= 0.018 Rubble masonry, cemented

Length= 70.0' Slope= 0.0157 '/'

Inlet Invert= 43.80', Outlet Invert= 42.70'



Reach R4: 30"x30" Stone Culvert



Summary for Pond BMP1: Rain Garden

Inflow Area = 16,718 sf, 48.37% Impervious, Inflow Depth > 3.44" for 25-Year Storm event
 Inflow = 1.58 cfs @ 12.09 hrs, Volume= 4,793 cf
 Outflow = 0.83 cfs @ 12.25 hrs, Volume= 2,737 cf, Atten= 48%, Lag= 9.9 min
 Discarded = 0.01 cfs @ 12.25 hrs, Volume= 336 cf
 Primary = 0.82 cfs @ 12.25 hrs, Volume= 2,401 cf

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 59.12' @ 12.25 hrs Surf.Area= 1,394 sf Storage= 2,205 cf

Plug-Flow detention time= 143.7 min calculated for 2,737 cf (57% of inflow)
 Center-of-Mass det. time= 66.2 min (837.4 - 771.2)

Volume	Invert	Avail.Storage	Storage Description
#1	57.00'	3,580 cf	Rain Garden - Ponding Area (Prismatic) , listed below (Recalc)

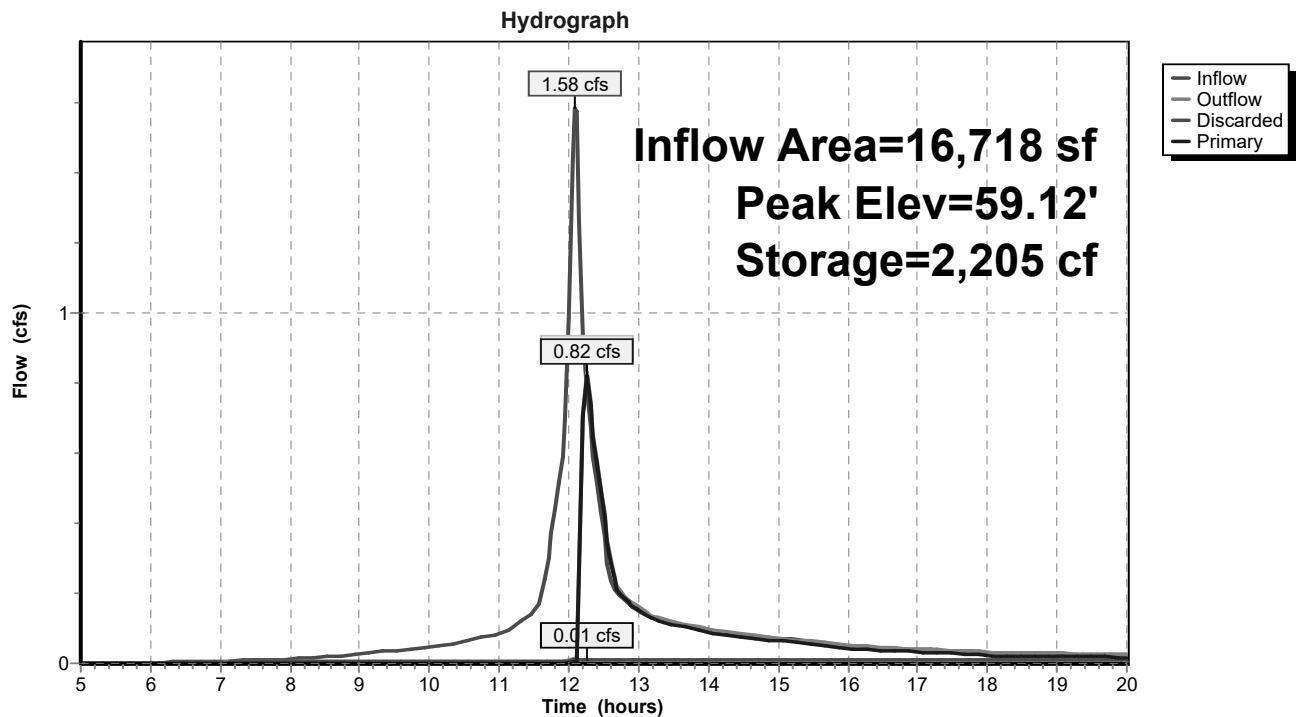
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
57.00	707	0	0
58.00	1,016	862	862
59.00	1,352	1,184	2,046
60.00	1,716	1,534	3,580

Device	Routing	Invert	Outlet Devices
#1	Primary	53.50'	12.0" Round Culvert L= 89.0' Ke= 0.200 Inlet / Outlet Invert= 53.50' / 52.60' S= 0.0101 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	59.00'	24.0" Horiz. Dome Grate C= 0.600 Limited to weir flow at low heads
#3	Discarded	57.00'	0.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.01 cfs @ 12.25 hrs HW=59.12' (Free Discharge)
 ↑ **3=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.81 cfs @ 12.25 hrs HW=59.12' (Free Discharge)
 ↑ **1=Culvert** (Passes 0.81 cfs of 8.76 cfs potential flow)
 ↑ **2=Dome Grate** (Weir Controls 0.81 cfs @ 1.11 fps)

Pond BMP1: Rain Garden



Summary for Pond BMP2: Infiltration System

Inflow Area = 7,040 sf, 100.00% Impervious, Inflow Depth > 4.60" for 25-Year Storm event
 Inflow = 0.80 cfs @ 12.09 hrs, Volume= 2,699 cf
 Outflow = 0.74 cfs @ 12.12 hrs, Volume= 2,255 cf, Atten= 8%, Lag= 2.2 min
 Discarded = 0.00 cfs @ 5.10 hrs, Volume= 54 cf
 Primary = 0.74 cfs @ 12.12 hrs, Volume= 2,201 cf

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 60.97' @ 12.12 hrs Surf.Area= 160 sf Storage= 561 cf

Plug-Flow detention time= 94.3 min calculated for 2,254 cf (83% of inflow)
 Center-of-Mass det. time= 45.6 min (780.5 - 734.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.00'	179 cf	8.00'W x 20.00'L x 5.50'H Field A 880 cf Overall - 432 cf Embedded = 448 cf x 40.0% Voids
#2A	56.50'	415 cf	Brentwood StormTank 48" x 24 Inside #1 Inside= 18.0"W x 48.0"H => 5.77 sf x 3.00'L = 17.3 cf Outside= 18.0"W x 48.0"H => 6.00 sf x 3.00'L = 18.0 cf 4 Rows of 6 Chambers
		595 cf	Total Available Storage

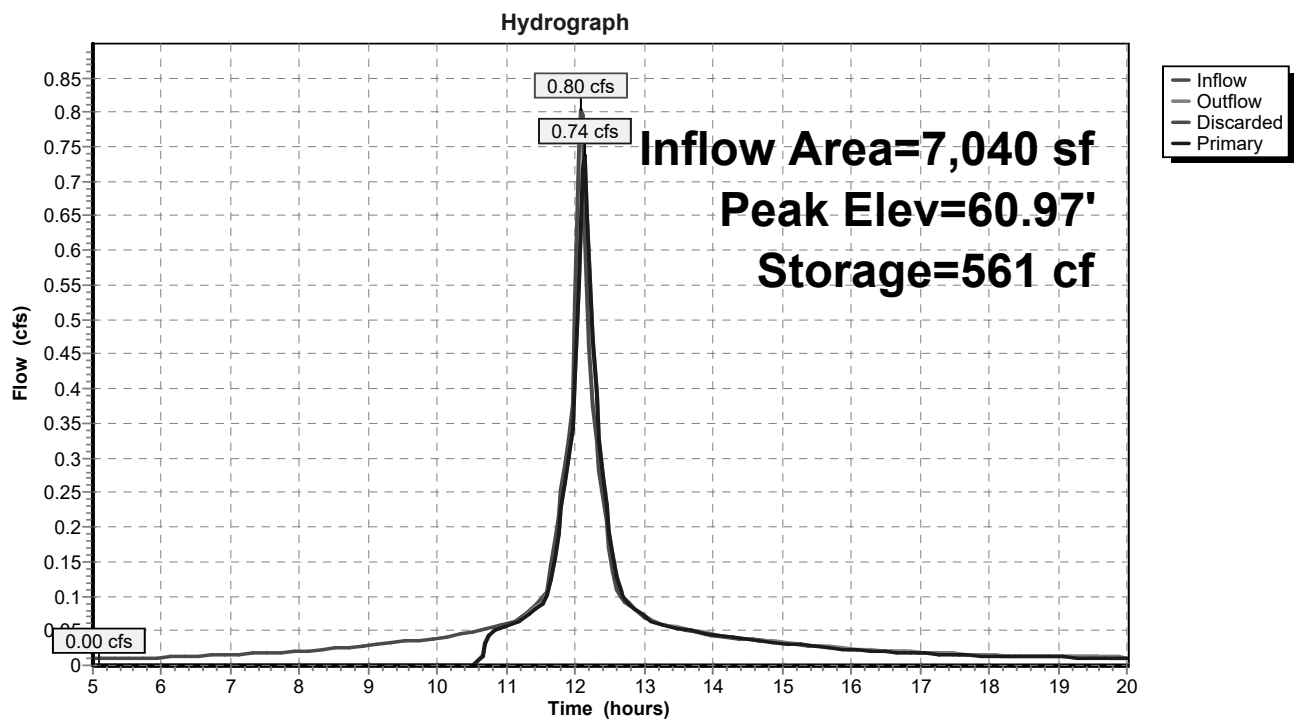
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	59.75'	6.0" Round 6" PVC out L= 19.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 59.75' / 56.70' S= 0.1605 ' / Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.20 sf
#2	Discarded	56.00'	0.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.00 cfs @ 5.10 hrs HW=56.06' (Free Discharge)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.72 cfs @ 12.12 hrs HW=60.92' (Free Discharge)
 ↑ **1=6" PVC out** (Inlet Controls 0.72 cfs @ 3.64 fps)

Pond BMP2: Infiltration System



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Type III 24-hr 50-Year Storm Rainfall=5.70"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

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

SubcatchmentE1: Exist. Watershed 1 Runoff Area=43,550 sf 17.53% Impervious Runoff Depth>3.10"
Tc=6.0 min CN=78 Runoff=3.81 cfs 11,242 cf

SubcatchmentE2: Exist. Watershed2 - Runoff Area=130,680 sf 70.00% Impervious Runoff Depth>4.41"
Tc=6.0 min CN=91 Runoff=15.21 cfs 47,999 cf

SubcatchmentP1: Prop. Watershed 1 Runoff Area=16,718 sf 48.37% Impervious Runoff Depth>3.89"
Tc=6.0 min CN=86 Runoff=1.78 cfs 5,418 cf

SubcatchmentP2: Prop. Watershed2 Runoff Area=7,040 sf 100.00% Impervious Runoff Depth>5.06"
Tc=6.0 min CN=98 Runoff=0.88 cfs 2,966 cf

SubcatchmentP3: Prop. Watershed3 Runoff Area=19,792 sf 32.91% Impervious Runoff Depth>3.48"
Tc=6.0 min CN=82 Runoff=1.92 cfs 5,747 cf

SubcatchmentP4: Exist. Watershed 4 - Runoff Area=130,680 sf 70.00% Impervious Runoff Depth>4.41"
Tc=6.0 min CN=91 Runoff=15.21 cfs 47.999 cf

Reach R1: Abbey Ln. Subcatchment Inflow=3.81 cfs 11,242 cf
Outflow=3.81 cfs 11,242 cf

Reach R2: Abbey Ln. Subcatchment

Inflow=3.52 cfs	11,228 cf
Outflow=3.52 cfs	11,228 cf

Reach R3: 30"x30" Stone Culvert Avg. Flow Depth=1.07' Max Vel=7.15 fps Inflow=19.01 cfs 59,240 cf
30.0" x 30.0" Box Pipe n=0.018 L=70.0' S=0.0157 ' ' Capacity=47.28 cfs Outflow=18.92 cfs 59,221 cf

Reach R4: 30"x30" Stone Culvert Avg. Flow Depth=1.02' Max Vel=7.04 fps Inflow=17.92 cfs 59,227 cf
30.0" x 30.0" Box Pipe n=0.018 L=70.0' S=0.0157 ' ' Capacity=47.28 cfs Outflow=17.86 cfs 59,208 cf

Pond BMP1: Rain Garden Peak Elev=59.15' Storage=2,257 cf Inflow=1.78 cfs 5,418 cf
Discarded=0.01 cfs 345 cf Primary=1.24 cfs 3,014 cf Outflow=1.25 cfs 3,360 cf

Pond BMP2: Infiltration System Peak Elev=61.14' Storage=572 cf Inflow=0.88 cfs 2,966 cf
Discarded=0.00 cfs 54 cf Primary=0.80 cfs 2,467 cf Outflow=0.80 cfs 2,521 cf

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Type III 24-hr 50-Year Storm Rainfall=5.70"

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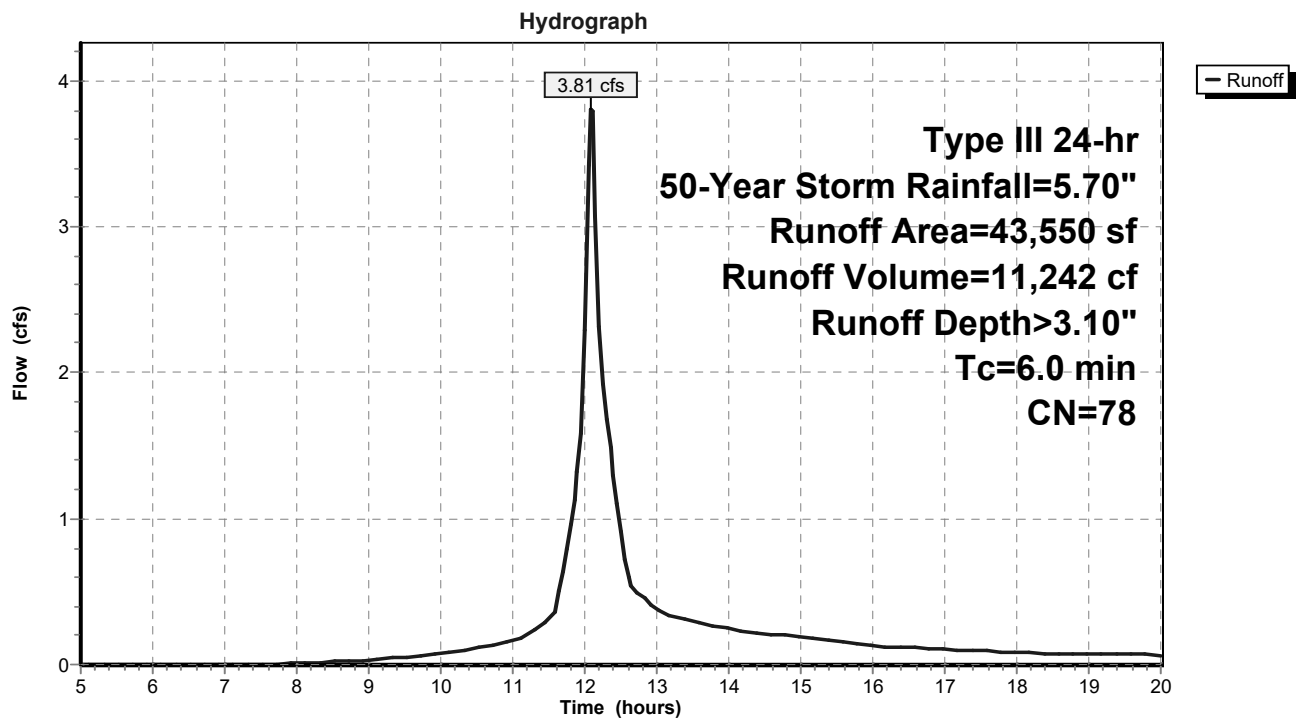
Summary for Subcatchment E1: Exist. Watershed 1

Runoff = 3.81 cfs @ 12.09 hrs, Volume= 11,242 cf, Depth> 3.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Storm Rainfall=5.70"

	Area (sf)	CN	Description
*	7,635	98	Paved parking, roofs, walks
	35,915	74	>75% Grass cover, Good, HSG C
	43,550	78	Weighted Average
	35,915		82.47% Pervious Area
	7,635		17.53% Impervious Area

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

Subcatchment E1: Exist. Watershed 1

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Type III 24-hr 50-Year Storm Rainfall=5.70"

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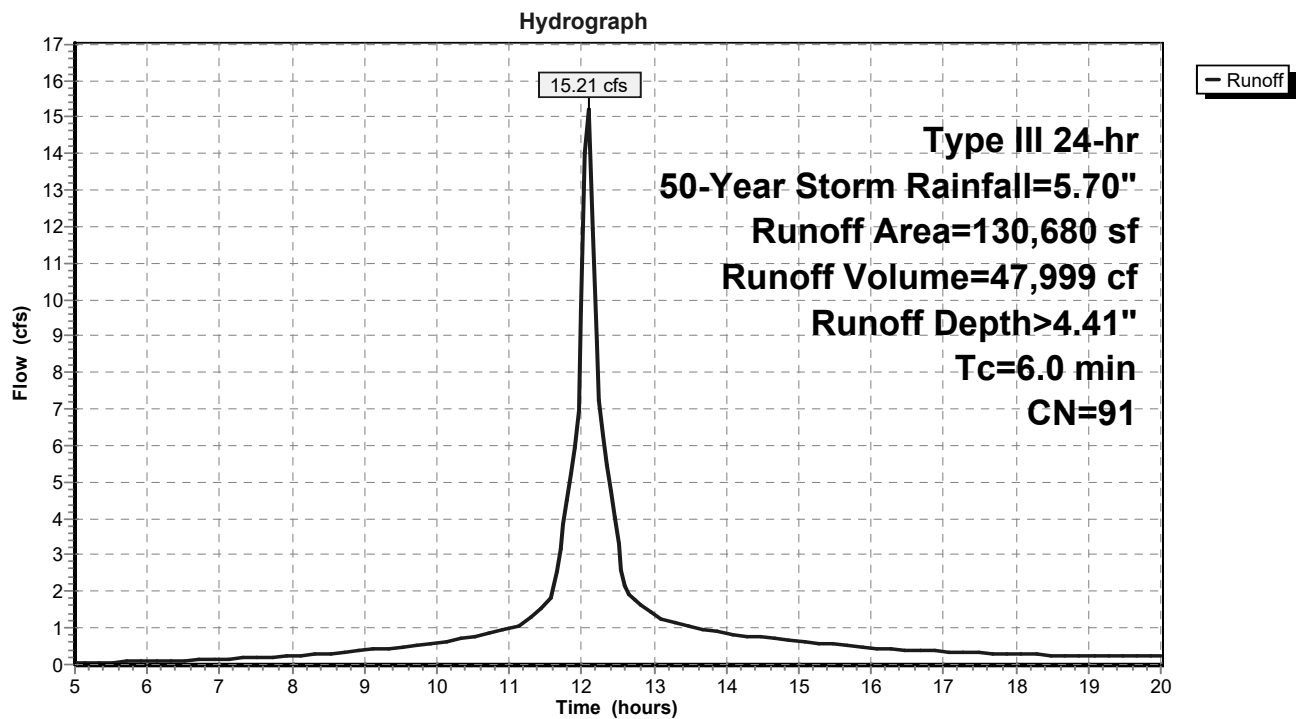
Summary for Subcatchment E2: Exist. Watershed 2 - Rutland Manor

Runoff = 15.21 cfs @ 12.09 hrs, Volume= 47,999 cf, Depth> 4.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Storm Rainfall=5.70"

Area (sf)	CN	Description
91,476	98	Paved parking, HSG A
39,204	74	>75% Grass cover, Good, HSG C
130,680	91	Weighted Average
39,204		30.00% Pervious Area
91,476		70.00% Impervious Area

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

Subcatchment E2: Exist. Watershed 2 - Rutland Manor

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Type III 24-hr 50-Year Storm Rainfall=5.70"

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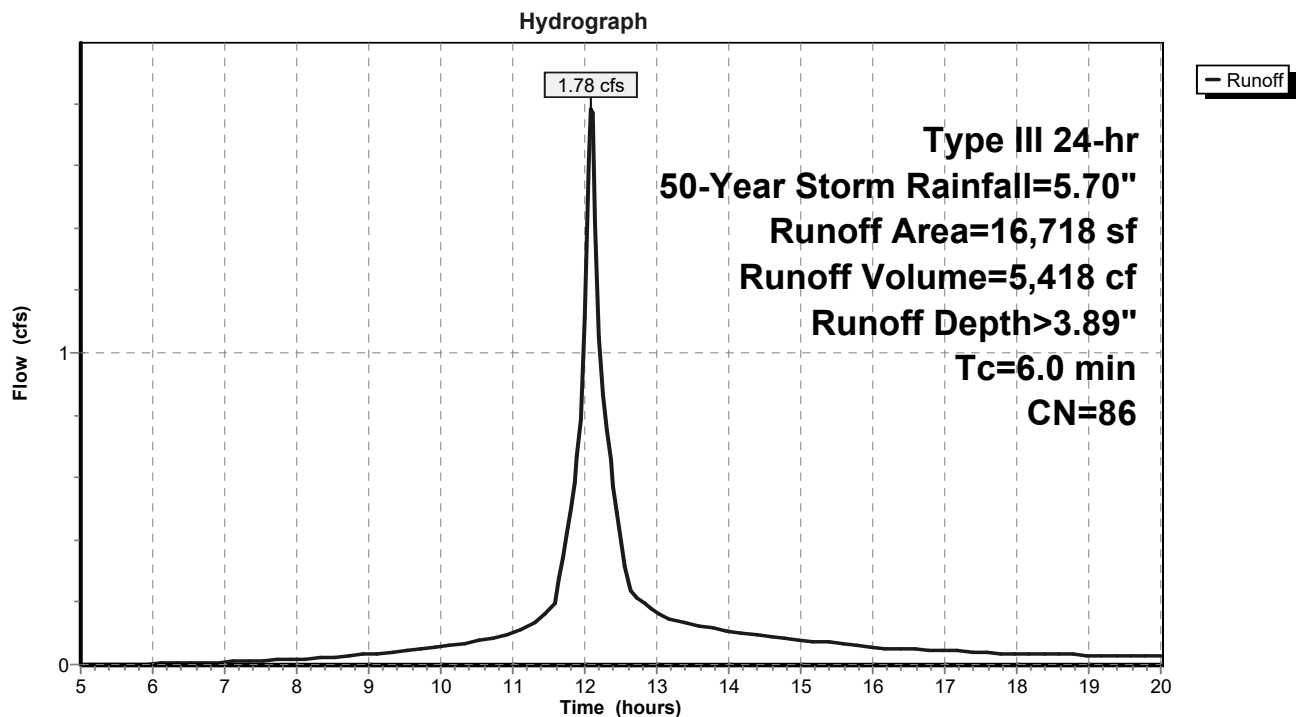
Summary for Subcatchment P1: Prop. Watershed 1

Runoff = 1.78 cfs @ 12.09 hrs, Volume= 5,418 cf, Depth> 3.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Storm Rainfall=5.70"

Area (sf)	CN	Description
8,086	98	Paved parking, HSG A
* 8,632	74	>75% Grass cover, Good, HSG C
16,718	86	Weighted Average
8,632		51.63% Pervious Area
8,086		48.37% Impervious Area

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

Subcatchment P1: Prop. Watershed 1

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Type III 24-hr 50-Year Storm Rainfall=5.70"

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Summary for Subcatchment P2: Prop. Watershed 2

Runoff = 0.88 cfs @ 12.09 hrs, Volume= 2,966 cf, Depth> 5.06"

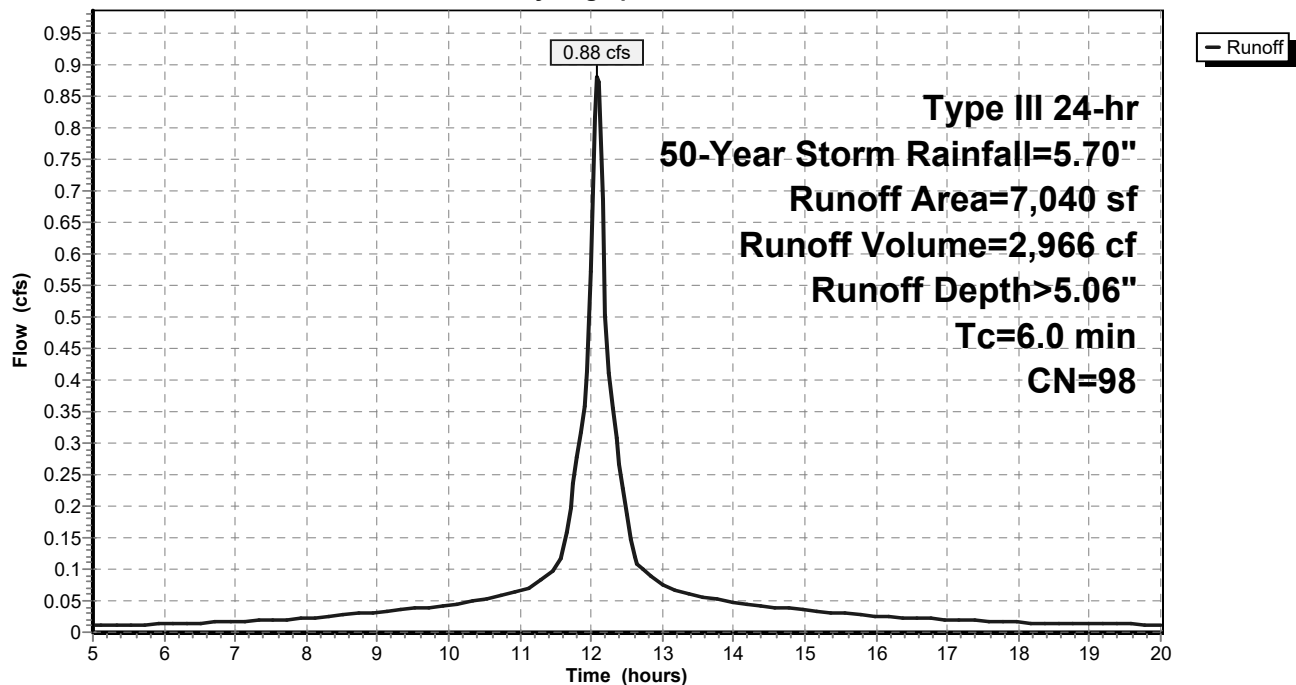
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Storm Rainfall=5.70"

Area (sf)	CN	Description
7,040	98	Roofs, HSG C
7,040		100.00% Impervious Area

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

Subcatchment P2: Prop. Watershed 2

Hydrograph



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Type III 24-hr 50-Year Storm Rainfall=5.70"

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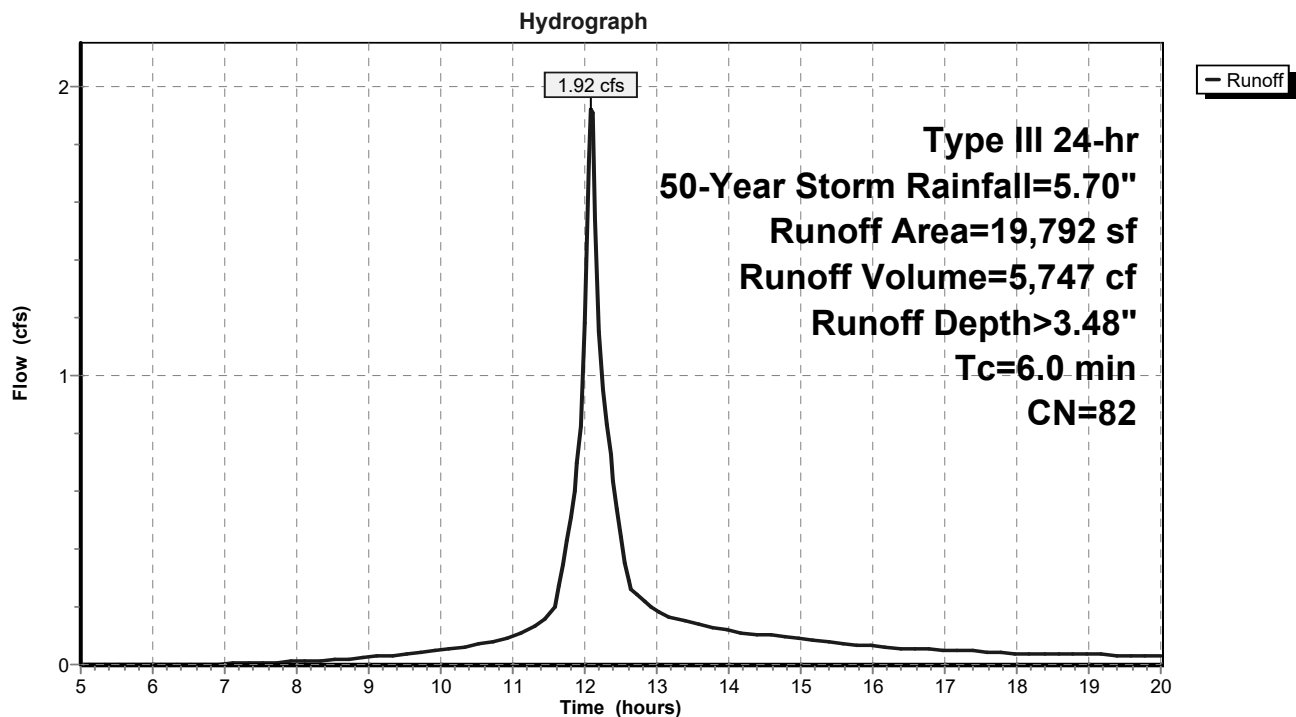
Summary for Subcatchment P3: Prop. Watershed 3

Runoff = 1.92 cfs @ 12.09 hrs, Volume= 5,747 cf, Depth> 3.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Storm Rainfall=5.70"

	Area (sf)	CN	Description
*	6,514	98	Paved parking, exist houses HSG C
	13,278	74	>75% Grass cover, Good, HSG C
	19,792	82	Weighted Average
	13,278		67.09% Pervious Area
	6,514		32.91% Impervious Area

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

Subcatchment P3: Prop. Watershed 3

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Type III 24-hr 50-Year Storm Rainfall=5.70"

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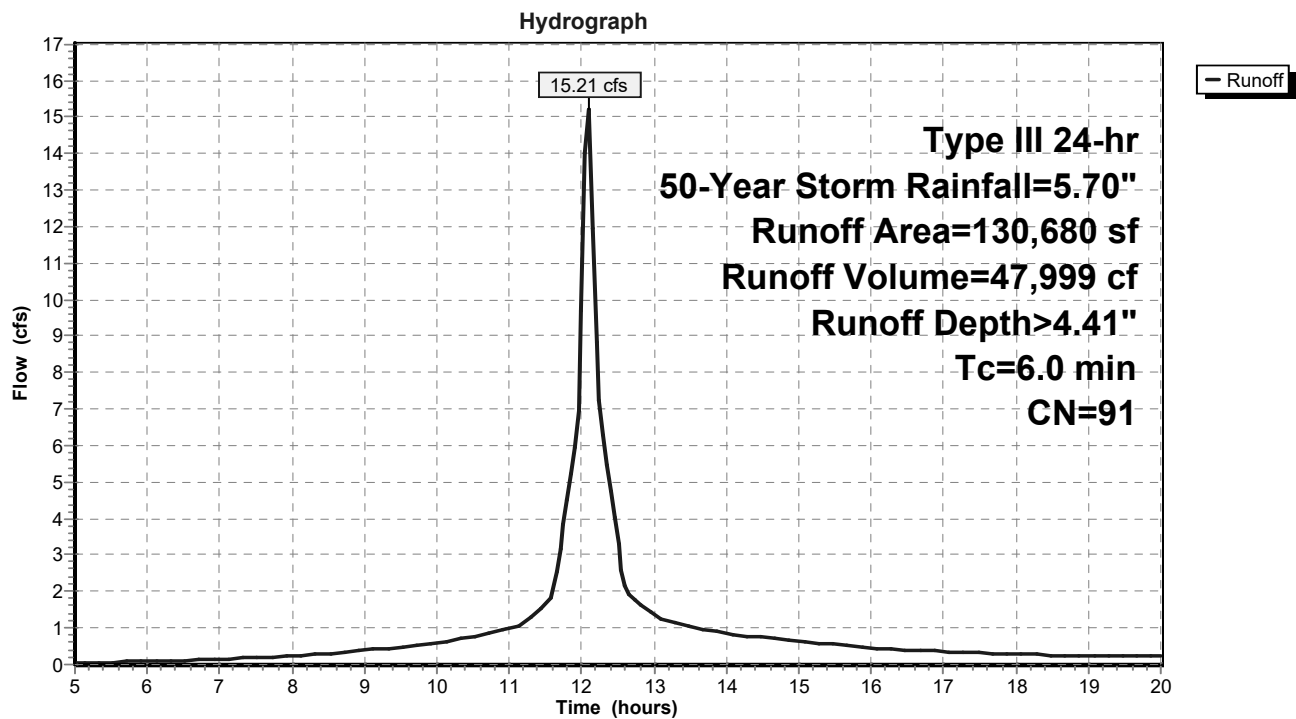
Summary for Subcatchment P4: Exist. Watershed 4 - Rutland Manor

Runoff = 15.21 cfs @ 12.09 hrs, Volume= 47,999 cf, Depth> 4.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Storm Rainfall=5.70"

Area (sf)	CN	Description
91,476	98	Paved parking, HSG A
39,204	74	>75% Grass cover, Good, HSG C
130,680	91	Weighted Average
39,204		30.00% Pervious Area
91,476		70.00% Impervious Area

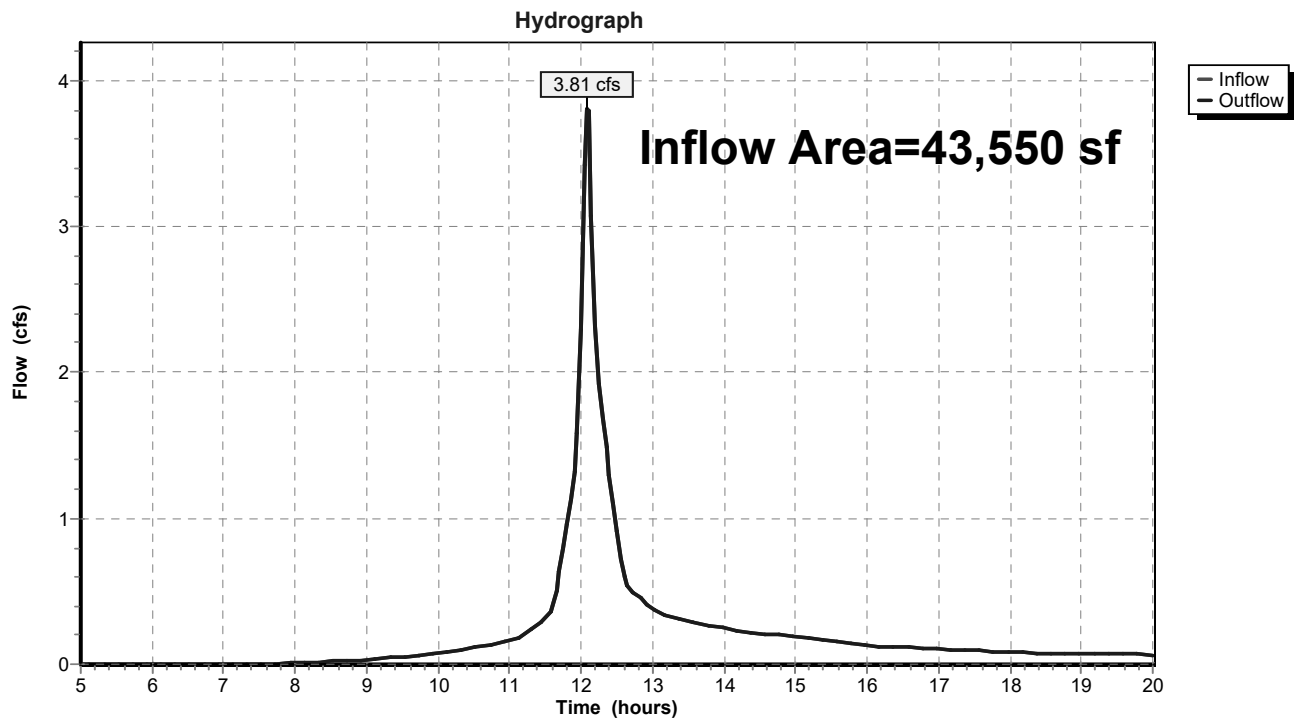
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment P4: Exist. Watershed 4 - Rutland Manor

Summary for Reach R1: Abbey Ln. Subcatchment

Inflow Area = 43,550 sf, 17.53% Impervious, Inflow Depth > 3.10" for 50-Year Storm event
Inflow = 3.81 cfs @ 12.09 hrs, Volume= 11,242 cf
Outflow = 3.81 cfs @ 12.09 hrs, Volume= 11,242 cf, Atten= 0%, Lag= 0.0 min

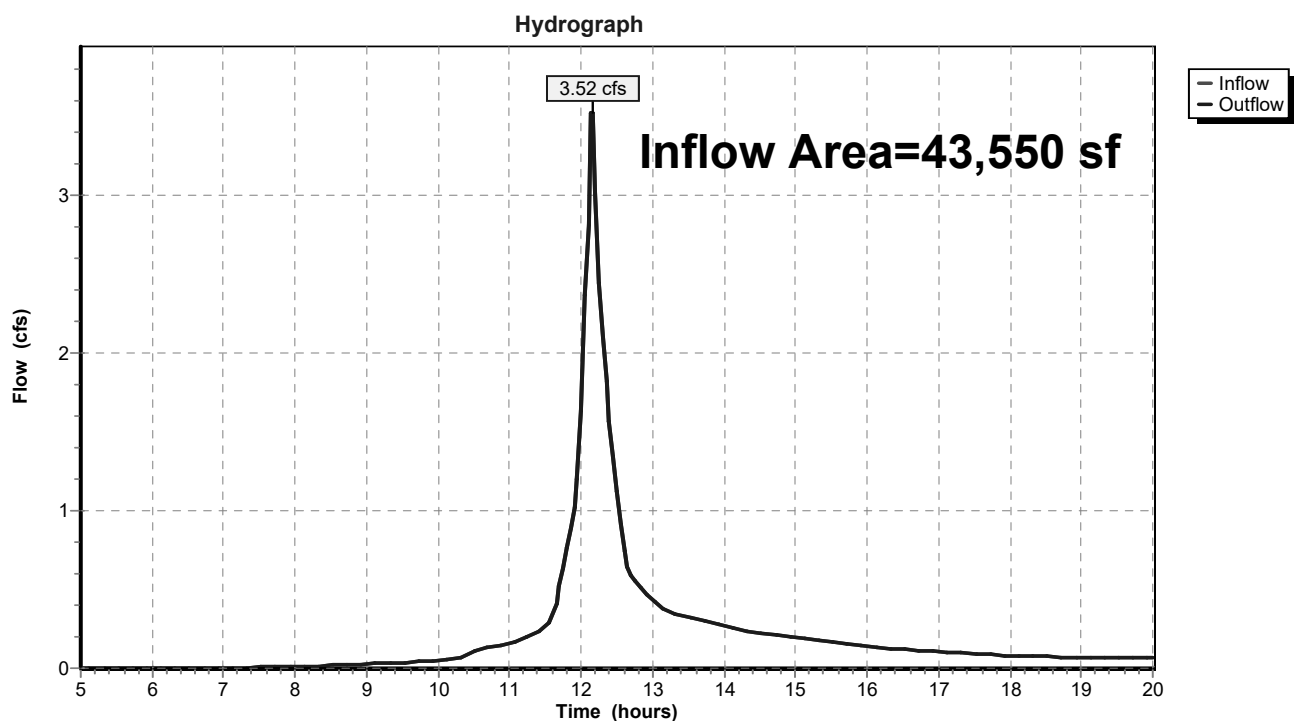
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach R1: Abbey Ln. Subcatchment

Summary for Reach R2: Abbey Ln. Subcatchment

Inflow Area = 43,550 sf, 49.69% Impervious, Inflow Depth > 3.09" for 50-Year Storm event
Inflow = 3.52 cfs @ 12.15 hrs, Volume= 11,228 cf
Outflow = 3.52 cfs @ 12.15 hrs, Volume= 11,228 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach R2: Abbey Ln. Subcatchment

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Type III 24-hr 50-Year Storm Rainfall=5.70"

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Summary for Reach R3: 30"x30" Stone Culvert

Inflow Area = 174,230 sf, 56.89% Impervious, Inflow Depth > 4.08" for 50-Year Storm event
Inflow = 19.01 cfs @ 12.09 hrs, Volume= 59,240 cf
Outflow = 18.92 cfs @ 12.09 hrs, Volume= 59,221 cf, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 7.15 fps, Min. Travel Time= 0.2 min

Avg. Velocity = 2.29 fps, Avg. Travel Time= 0.5 min

Peak Storage= 186 cf @ 12.09 hrs

Average Depth at Peak Storage= 1.07'

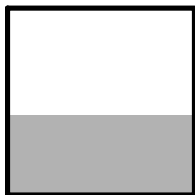
Bank-Full Depth= 2.50' Flow Area= 6.3 sf, Capacity= 47.28 cfs

30.0" W x 30.0" H Box Pipe

n= 0.018 Rubble masonry, cemented

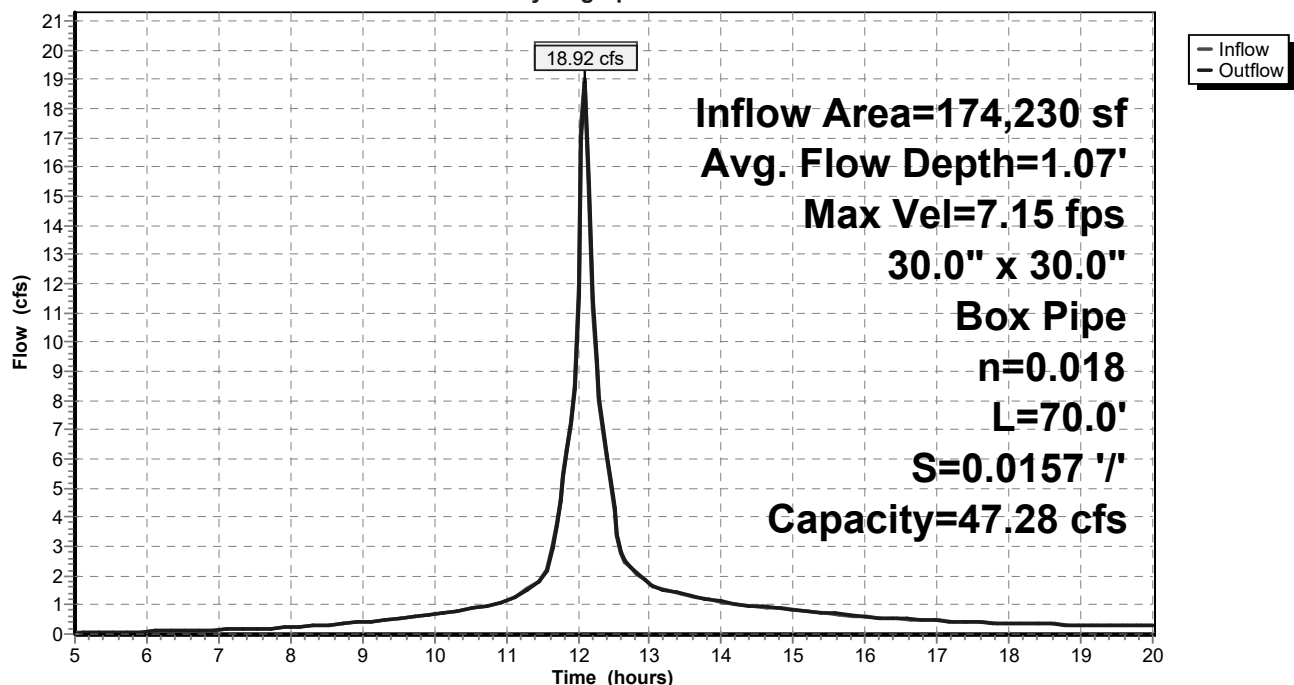
Length= 70.0' Slope= 0.0157 '/'

Inlet Invert= 43.80', Outlet Invert= 42.70'



Reach R3: 30"x30" Stone Culvert

Hydrograph



23800-Dover-NH-Stormwater

Prepared by Hancock Associates

HydroCAD® 10.00-22 s/n 08528 © 2018 HydroCAD Software Solutions LLC

Type III 24-hr 50-Year Storm Rainfall=5.70"

Printed 11/18/2021

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Summary for Reach R4: 30"x30" Stone Culvert

Inflow Area = 174,230 sf, 64.92% Impervious, Inflow Depth > 4.08" for 50-Year Storm event
Inflow = 17.92 cfs @ 12.09 hrs, Volume= 59,227 cf
Outflow = 17.86 cfs @ 12.10 hrs, Volume= 59,208 cf, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 7.04 fps, Min. Travel Time= 0.2 min

Avg. Velocity = 2.29 fps, Avg. Travel Time= 0.5 min

Peak Storage= 179 cf @ 12.10 hrs

Average Depth at Peak Storage= 1.02'

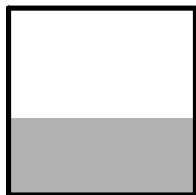
Bank-Full Depth= 2.50' Flow Area= 6.3 sf, Capacity= 47.28 cfs

30.0" W x 30.0" H Box Pipe

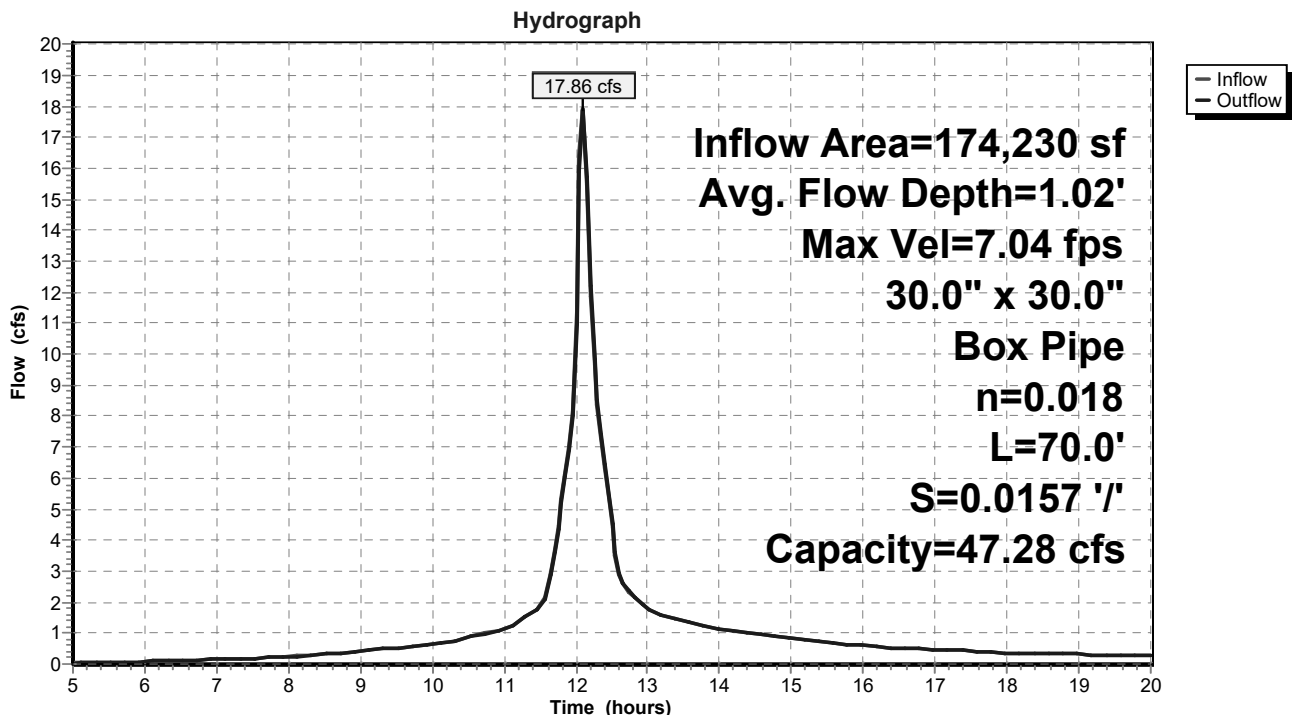
n= 0.018 Rubble masonry, cemented

Length= 70.0' Slope= 0.0157 '/'

Inlet Invert= 43.80', Outlet Invert= 42.70'



Reach R4: 30"x30" Stone Culvert



Summary for Pond BMP1: Rain Garden

Inflow Area = 16,718 sf, 48.37% Impervious, Inflow Depth > 3.89" for 50-Year Storm event
 Inflow = 1.78 cfs @ 12.09 hrs, Volume= 5,418 cf
 Outflow = 1.25 cfs @ 12.18 hrs, Volume= 3,360 cf, Atten= 30%, Lag= 5.4 min
 Discarded = 0.01 cfs @ 12.18 hrs, Volume= 345 cf
 Primary = 1.24 cfs @ 12.18 hrs, Volume= 3,014 cf

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 59.15' @ 12.18 hrs Surf.Area= 1,408 sf Storage= 2,257 cf

Plug-Flow detention time= 130.8 min calculated for 3,348 cf (62% of inflow)
 Center-of-Mass det. time= 58.3 min (826.5 - 768.3)

Volume	Invert	Avail.Storage	Storage Description
#1	57.00'	3,580 cf	Rain Garden - Ponding Area (Prismatic) , listed below (Recalc)

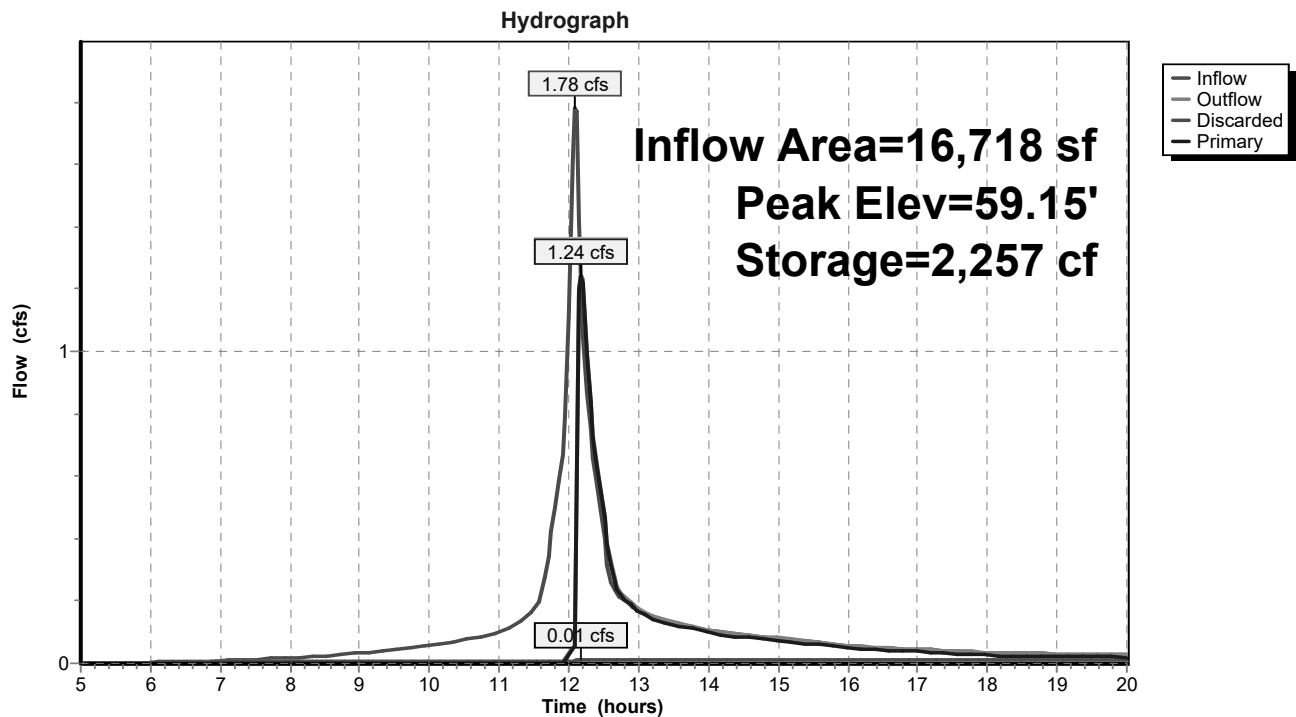
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
57.00	707	0	0
58.00	1,016	862	862
59.00	1,352	1,184	2,046
60.00	1,716	1,534	3,580

Device	Routing	Invert	Outlet Devices
#1	Primary	53.50'	12.0" Round Culvert L= 89.0' Ke= 0.200 Inlet / Outlet Invert= 53.50' / 52.60' S= 0.0101 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	59.00'	24.0" Horiz. Dome Grate C= 0.600 Limited to weir flow at low heads
#3	Discarded	57.00'	0.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.01 cfs @ 12.18 hrs HW=59.15' (Free Discharge)
 ↑ **3=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=1.20 cfs @ 12.18 hrs HW=59.15' (Free Discharge)
 ↑ **1=Culvert** (Passes 1.20 cfs of 8.79 cfs potential flow)
 ↑ **2=Dome Grate** (Weir Controls 1.20 cfs @ 1.27 fps)

Pond BMP1: Rain Garden



Summary for Pond BMP2: Infiltration System

Inflow Area = 7,040 sf, 100.00% Impervious, Inflow Depth > 5.06" for 50-Year Storm event
 Inflow = 0.88 cfs @ 12.09 hrs, Volume= 2,966 cf
 Outflow = 0.80 cfs @ 12.12 hrs, Volume= 2,521 cf, Atten= 9%, Lag= 2.3 min
 Discarded = 0.00 cfs @ 5.10 hrs, Volume= 54 cf
 Primary = 0.80 cfs @ 12.12 hrs, Volume= 2,467 cf

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 61.14' @ 12.12 hrs Surf.Area= 160 sf Storage= 572 cf

Plug-Flow detention time= 88.4 min calculated for 2,512 cf (85% of inflow)
 Center-of-Mass det. time= 43.4 min (777.8 - 734.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.00'	179 cf	8.00'W x 20.00'L x 5.50'H Field A 880 cf Overall - 432 cf Embedded = 448 cf x 40.0% Voids
#2A	56.50'	415 cf	Brentwood StormTank 48" x 24 Inside #1 Inside= 18.0"W x 48.0"H => 5.77 sf x 3.00'L = 17.3 cf Outside= 18.0"W x 48.0"H => 6.00 sf x 3.00'L = 18.0 cf 4 Rows of 6 Chambers
		595 cf	Total Available Storage

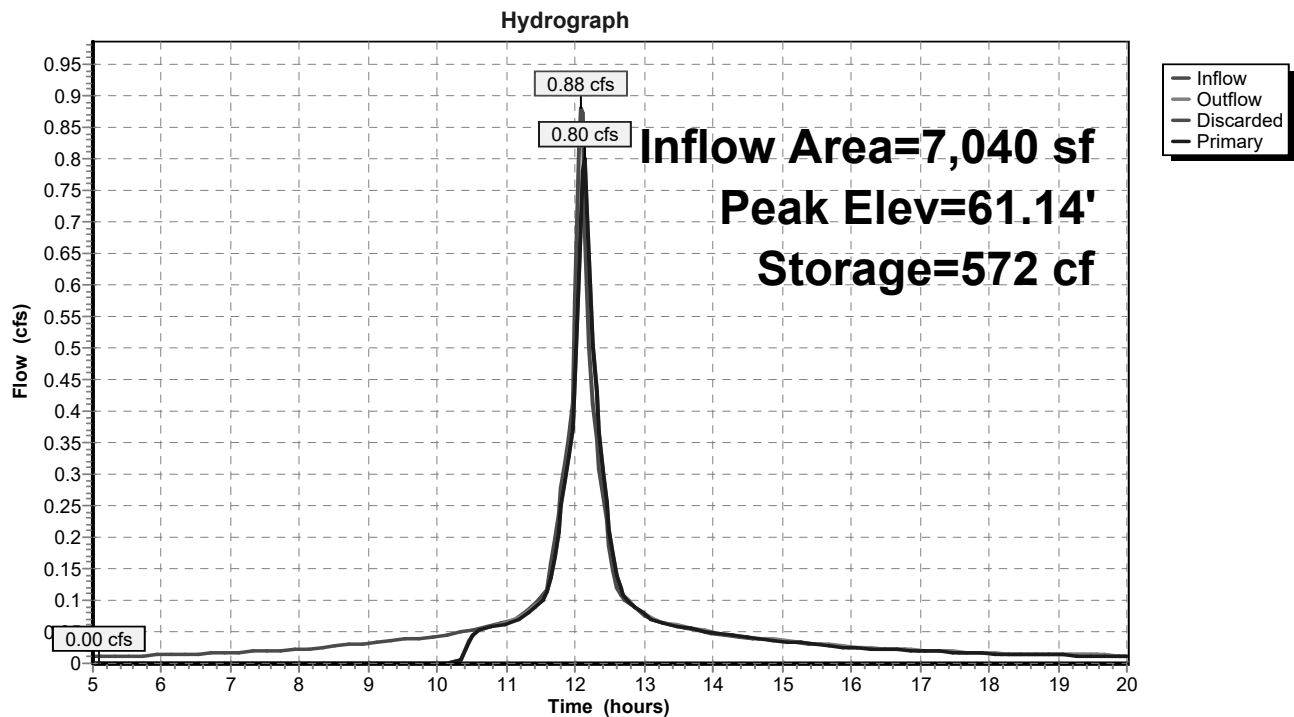
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	59.75'	6.0" Round 6" PVC out L= 19.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 59.75' / 56.70' S= 0.1605 ' / Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.20 sf
#2	Discarded	56.00'	0.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.00 cfs @ 5.10 hrs HW=56.07' (Free Discharge)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.78 cfs @ 12.12 hrs HW=61.09' (Free Discharge)
 ↑ **1=6" PVC out** (Inlet Controls 0.78 cfs @ 3.97 fps)

Pond BMP2: Infiltration System



C

NHDES BMP WORKSHEET



BIORETENTION SYSTEM WITH INTERNAL STORAGE RESERVOIR (UNH Stormwater Center Specification)

Type/Node Name: **Rain Garden (P1)**

Enter the node name in the drainage analysis if applicable.

0.38	ac	A = Area draining to the practice	
0.19	ac	A _i = Impervious area draining to the practice	
0.48	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.49	unitless	R _v = Runoff coefficient = 0.05 + (0.9 x I)	
0.19	ac-in	WQV = 1" x R _v x A	
676	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
68	cf	10% x WQV (check calc for sediment forebay)	
169	cf	25% x WQV (check calc for water stored in saturated zone)	
Deep Sump CB		Method of Pretreatment	
-	cf	If pretrt is sed forebay: V _{SED} (sediment forebay volume)	≥ 10%WQV
2,046	cf	Volume below lowest orifice ¹	≥ 100%WQV
-	cf	Water stored in voids of saturated zone	≥ 26%WQV
0.02	cfs	2Q _{avg} = 2* WQV / 24 hrs * (1hr / 3600 sec) ²	
57.81	ft	E _{WQV} = Elevation of WQV (attach stage-storage table)	
0.01	cfs	Q _{WQV} = Discharge at the E _{WQV} (attach stage-discharge table)	< 2Q _{WQV}
37.56	hours	T _{ED} = Drawdown time of extended detention = 2WQV/Q _{WQV}	≥ 24-hrs
18.00	in	Depth of Filter Media	≥ 18"
3.00	:1	Pond side slopes	≥ 3:1
Orifices > 6"		What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of ≤ 6")?	
59.15	ft	Peak elevation of the 50-year storm event (E ₅₀)	
60.00	ft	Berm elevation of the pond	
YES		E ₅₀ ≤ the berm elevation?	← yes

1. Volume stored above the wetland soil and below the high flow by-pass.

Designer's Notes:

- Water stored in voids of saturated zone of filter media not included in WQV storage calc.

D

GROUNDWATER RECHARGE CALCULATIONS

GROUNDWATER RECHARGE CALCULATION

PROPOSED INFILTRATION SYSTEM

INFILTRATION SYSTEM STORAGE VOLUME

STORMTANK MODULE 25 - 48" HEIGHT

OUTLET ORIFICE INVERT	I_W	=	59.75	ft.
BOTTOM INVERT CHAMBERS	I_C	=	56.50	ft.
STORMWATER DEPTH	D_C	=	3.25	ft.
VOLUME PER CHAMBER	V_C	=	14.11	cf.
NUMBER OF ROWS	R_C	=	4	
CHAMBERS PER ROW	C_C	=	6	
NUMBER OF CHAMBERS	N_C	=	24	

$$N_C = (R_C * C_C)$$

$$V_{CHAMBERS} = (V_C * N_C)$$

$$\text{TOTAL VOLUME OF CHAMBERS BELOW OUTLET } V_{CHAMBERS} = 338.7 \text{ cf.}$$

STONE VOLUME

$$D_S = I_W - I_S$$

STONE BOTTOM INVERT	I_S	=	56.00	ft.
STONE STORMWATER DEPTH	D_S	=	3.75	ft.
STONE WIDTH	W_S	=	8.0	ft.
STONE LENGTH	L_S	=	20.0	ft.
% VOIDS	VOIDS	=	40%	

$$V_{STONE} = [(W_S * L_S * (I_W - I_S)) - V_{CHAMBERS}] * \text{VOIDS}$$

$$\text{STONE VOLUME } V_{stone} = 99.6 \text{ cf.}$$

TOTAL VOLUME BELOW INVERT

$$V_{TOTAL} = V_{CHAMBERS} + V_{STONE}$$

$$\text{TOTAL STORAGE VOLUME } V_{TOTAL} = 438.3 \text{ cf.}$$

BOTTOM AREA

$$A_{bottom} = W_S * L_S$$

$$\text{BOTTOM SURFACE AREA } A_{bottom} = 160.0 \text{ sf.}$$

REQUIRED RECHARGE VOLUME

STATIC METHOD

SOIL TYPE		=	C	
RECHARGE DEPTH	F	=	0.1	in.
IMPERVIOUS AREA	A_{IMP}	=	21,624	sf
% IMPERVIOUS AREA CAPTURED		=	100%	
RECHARGE STORAGE VOLUME	R_v	=	180.2	cf.

$$R_v = (F * A_{imp})$$

438.3 cf.

>>>

180.2 cf.

REQUIREMENT SATISFIED

E

OPERATION AND MAINTENANCE PLAN

- OPERATION AND MAINTENANCE PLAN -

Owner & Responsible Party:

Diamond Capital, LLC
170 Commerce Way, Suite 200
Portsmouth, NH 03801

Date: 12/17/2021

I. Short Term Maintenance Program During Construction – Responsible Party: Site Contractor

- Contractor shall refer to Site Plans dated 12/17/21, prepared by Hancock Associates for additional information.
- Site contractor shall provide Dover Engineering Department a 24 hour emergency contact (name and number) prior to start of construction.
- Care shall be taken at all times to control erosion and sediment movement by the use of compaction of disturbed areas and the use of straw wattles as shown on the plan. Other than erosion, no pollutant discharges are expected during construction.
- The contractor shall ensure that all runoff is collected in the appropriate structures as they are constructed and that uncontrolled runoff is kept to a minimum
- During construction the straw wattles, must be inspected every week and rain events greater than 1". Repair and replace as necessary, and remove any sediment buildup behind the devices.
- After installation of the drainage control devices and temporary erosion protection, weekly inspections are required to ensure they are operating as designed and to determine maintenance/cleaning requirements. Structures are to be cleaned either by hand, or mechanical means. Refer to following schedule.
- Sweeping of tracked soils on public way to be performed weekly, or as necessary. Additional crushed stone to be placed within the filter berm as required to prevent tracking of soils offsite.
- If storm events occur after the side slopes and other areas that are to be stabilized have been planted, but prior to seed germination, then re-grading and replanting of those areas may be required.
- Contractor shall take all measures to protect trees marked on site plans.
- Contractor shall maintain a weekly log of inspections using template below. Logs shall be made available to municipal representatives at request.
- In the event of a fuel spill immediately contact the Dover Fire Department (603-516-6153).
- Contractor shall clean all drainage and stormwater control structures at completion of construction

Maintenance Schedule during Construction

Sediment Control	Inspection	Maintenance Thresholds	Maintenance Action
Erosion control silt sacks, straw wattles, soil stockpiles	Weekly and after large storm events (more than 0.5-inch of rainfall in 24-hour period)	If integrity of the system is compromised	Restore the integrity of the system and/or clean sediment out
Drainage Structures	Weekly and after large storm events (more than 1.0-inches of rainfall in 24-hour period)	If the sump is 1/3 full with sediment	Clean sediment out
Infiltration Chambers	Weekly and after large storm events (more than 1.0-inches of rainfall in 24-hour period)	When sediment is observed in infiltration units	Remove sediment by jetting system. Replace system if infiltration component is compromised.
Loamed and seeded areas	Weekly and after large storm events (more than 1.0-inches of rainfall in 24-hour period)	When sediment is greater than 2-inches in depth, vegetation is not taking	Remove sediment by non-intrusive means (non-mechanical), repair vegetation
Adjacent Roadways and Parking Areas	Weekly and after large storm events (more than 1.0 -inches of rainfall in 24-hour period)	If sediment is greater than 1/2 inch in any area of the paved surfaces	Sweep/clean sediment from street

71-73 Rutland Street, Dover, New Hampshire
Short Term – Operation and Maintenance
To be performed by site contractor

WEEKLY INSPECTION SCHEDULE AND EVALUATION CHECKLIST

Best Management practice	Current Conditions and Minimum Maintenance / Repairs, If Necessary	Completed Maintenance / Repair (i.e. date, contractor, tasks complete, etc.)
<i>Catch Basins</i>		
<i>Erosion control/compost filter tube</i>		
<i>Soil Stockpiles</i>		
<i>Subsurface Infiltration Systems</i>		
<i>Crushed Stone Filter Berm</i>		
<i>Slope Stabilization Condition</i>		
<i>Soils tracked offsite</i>		
<i>Overall Site Condition</i>		

Inspected by: _____ Date: _____

II. Long Term Maintenance Program After Construction – Responsible Party: Owner

After construction and issuance of Occupancy Permit, the owner, shall be the responsible party for maintenance as outlined below:

**Diamond Capital, LLC
170 Commerce Way, Suite 200
Portsmouth, NH 03801**

Long Term Maintenance Schedule after Construction

Task	Inspection	Maintenance Thresholds	Maintenance Action
Drainage Structures	Twice a year – spring and fall	If the sump is 1/3 full with sediment	Clean sediment out
Infiltration Chambers	Twice a year – spring and fall	When sediment is observed in infiltration units, or standing water	Remove sediment by jetting system. Replace system if infiltration component is compromised. Contact a registered engineer if standing water is observed.
Bioretention System	Twice a year – spring and fall	When sediment is accumulating, debris is observed in outlet structures, and vegetation is overgrowing	Remove woody vegetation, remove debris from outlet structures, remove sediment, inspect and repair embankments, inlet and outlet structures, and appurtenances.

Title:

F

SITE-SPECIFIC SOIL SURVEY REPORT

SITE-SPECIFIC SOIL SURVEY REPORT

For
Rutland Street, Dover

1. MAPPING STANDARDS

Site-Specific Soil Mapping Standards for New Hampshire and Vermont. SSSNNE Special Publication No. 3, Version 5.0, December 2017. This map product is within the technical standards of the National Cooperative Soil Survey. It is a special product, intended for the submission to NH DES Alteration of Terrain. It was produced by a professional soil scientist and is not a product of the USDA Natural Resource Conservation Service.

Hydrologic Soil Group was determined using SSSNNE Special Publication No. 5.

Scale of soil map:

Approximately 1" equals

Contours:

Intervals of 2 feet

2. DATE SOIL MAP PRODUCED

Date(s) of on-site field work: 8/16/21

Date(s) of test pits: None Performed for Soil Map by GES, Inc.

Test pits recorded by:

3. GEOGRAPHIC LOCATION AND SIZE OF SITE

City or town where soil mapping was conducted: Dover

Location: Rutland Street

Size of area: approximately 0.5 acre

Was the map for the entire lot? no

If no, where was the mapping conducted on the parcel: rear of lot

4. PURPOSE OF THE SOIL MAP

Was the map prepared to meet the requirement of Alteration of Terrain? No

If no, what was the purpose of the map? City of Dover

Who was the map prepared for? Hancock Associates

5. SOIL IDENTIFICATION LEGEND

SSSM SYM.	SSS MAP NAME	HISS SYM.	HYDROLOGIC SOIL GRP.
933	Scio Variant	431	C

SLOPE PHASE:

0-8% B 8-15% C 15-25% D 25%+ E

6. SOIL MAP UNIT DESCRIPTIONS

933 The Scio Variant series consists of very deep, somewhat poorly drained soils formed in eolian, lacustrine, or alluvial sediments dominated by silt and very fine sand. They are on terraces, old alluvial fans, lake plains, outwash plains and lakebeds. Saturated

hydraulic conductivity is moderately high or high to a depth of 100 centimeters and ranges from moderately low through very high below 100 centimeters. Slope ranges from 0 through 25 percent. ESHWT ranges between 0-15"

7. RESPONSIBLE SOIL SCIENTIST

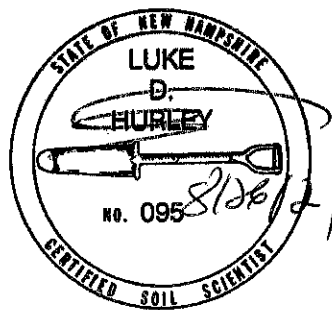
Name: Luke Hurley

Certified Soil Scientist Number: 095

8. OTHER DISTINGUISHING FEATURES OF SITE

Is the site in a natural condition? Yes

If no, what is the nature of the disturbance? Residential backyard.



G

TEST PIT LOG

HANCOCK ASSOCIATES

Surveyors | Engineers | Scientists

Test Pits

71 and 73 Rutland Street, Dover, NH

November 2, 2021

9:30 AM

Soil Evaluator: Joe Peznola, PE

Test Pit#1

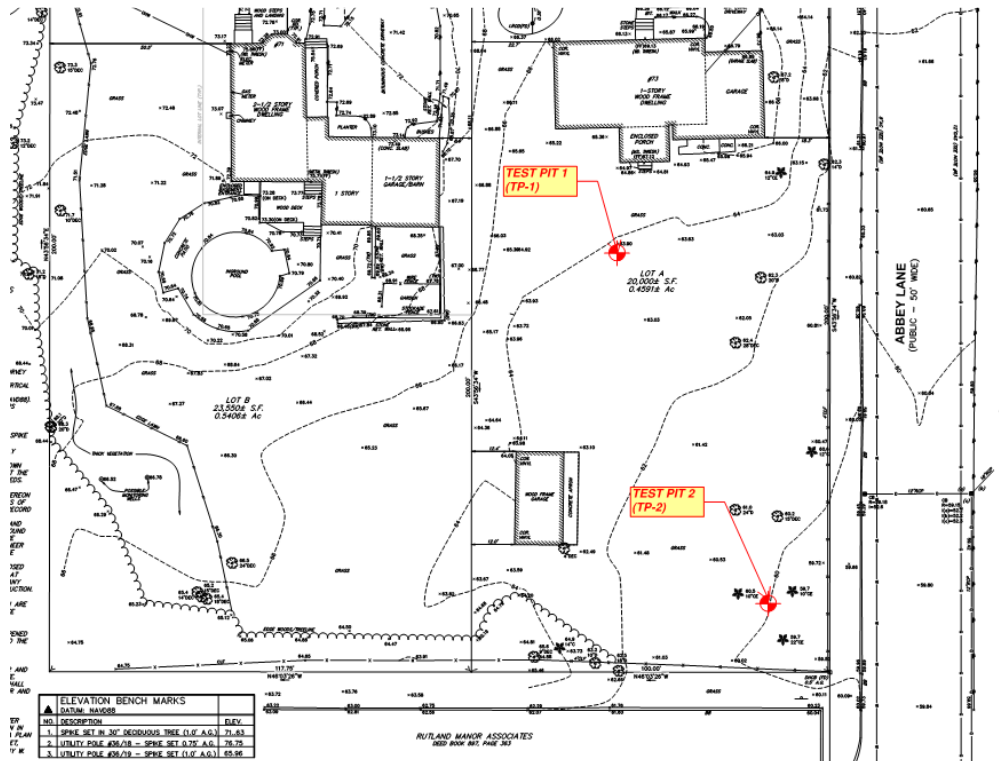
Elevation: 64.0 ±
0-3" Loam
3-24" Loam
24"-84" Silty Clay Loam
ESHWT: N/A
(No GW observed)

Test Pit#2

Elevation: 60.0 ±
0-3" Loam
3-12" Loam
12"-96" Silty Clay Loam
ESHWT: N/A
(No GW Observed)

ESHWT below 96" (below 52.0 ±)

Figure 1: Test pit locations



H

NRCS SOILS MAP

Custom Soil Resource Report
Soil Map



Map Scale: 1:669 if printed on A portrait (8.5" x 11") sheet.

0 5 10 20 30 Meters

0 30 60 120 180 Feet

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
ScB	Scantic silt loam, 3 to 8 percent slopes	0.7	68.4%
SfC	Suffield silt loam, 8 to 15 percent slopes	0.3	31.6%
Totals for Area of Interest		1.0	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,

Strafford County, New Hampshire

ScB—Scantic silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9d8t
Elevation: 0 to 260 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of local importance

Map Unit Composition

Scantic and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scantic

Setting

Landform: Marine terraces

Typical profile

H1 - 0 to 13 inches: silt loam
H2 - 13 to 23 inches: silty clay loam
H3 - 23 to 40 inches: silty clay

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Minor Components

Swanton

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Not named wet

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Custom Soil Resource Report

Buxton

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

SfC—Suffield silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9d8v
Elevation: 0 to 250 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Suffield and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Suffield

Typical profile

H1 - 0 to 19 inches: silt loam
H2 - 19 to 28 inches: silt loam
H3 - 28 to 41 inches: silty clay

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F144AY017NH - Well Drained Lake Plain
Hydric soil rating: No

Minor Components

Not named

Percent of map unit: 9 percent
Hydric soil rating: No

Custom Soil Resource Report

Buxton

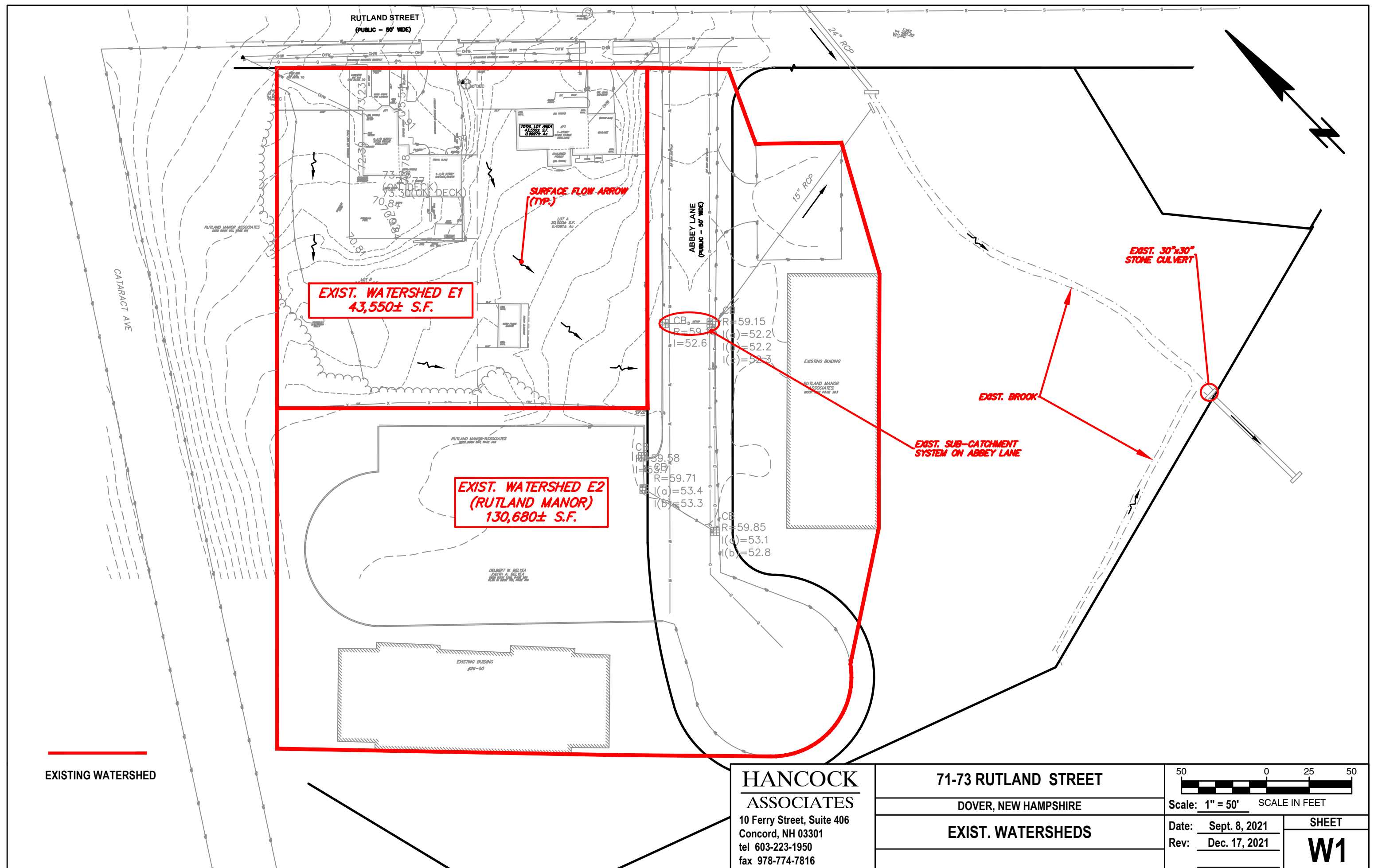
Percent of map unit: 5 percent
Hydric soil rating: No

Rock outcrop

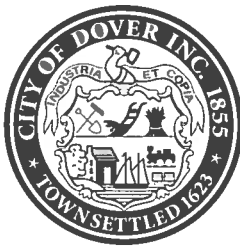
Percent of map unit: 1 percent
Hydric soil rating: No

I

WATERSHED PLANS



CHRISTOPHER G. PARKER, AICP
Assistant City Manager
Planning & Strategic Initiatives
c.parker@dover.nh.gov



288 Central Avenue
Dover, New Hampshire 03820-4169
(603) 516-6008
Fax: (603) 516-6049
www.dover.nh.gov

City of Dover, New Hampshire

DEPARTMENT OF PLANNING AND COMMUNITY DEVELOPMENT

INSTRUCTIONS TO APPLICANTS TO THE DOVER PLANNING BOARD

**IMPORTANT: PLEASE READ ALL INSTRUCTIONS CAREFULLY BEFORE
FILLING OUT ATTACHED APPLICATION.
INCOMPLETE APPLICATIONS WILL NOT BE ACCEPTED FOR REVIEW.**

Dear Applicant:

This will serve to briefly inform you regarding the process to have the Dover Planning Board (the Board) review a land use application. Please refer to the NH Statutes on Land Use and Regulation the Dover Code, and our Developer's Handbook for more specific information.

The Board primarily reviews 5 types of applications:

1. **Site Plans** - A site plan is a professionally rendered drawing which delineates the proposed development of a site. This plan is required for non-residential development, creation of multi-family residential structures, and for extensions of parking lots and alteration of an acre or more of land. These plans require meeting with the Technical Review Committee before Planning Board review.
2. **Subdivisions** - A subdivision is the division of the lot, tract, or parcel of land into two (2) or more lots, plats, sites or other divisions of land for the purpose, whether immediate or future, of sale, rent, lease or building development. It includes re-subdivision and, when appropriate to the context, relates to the process of subdividing or to the land or territory subdivided. Major subdivision plans (4+) require meeting with the Technical Review Committee before Planning Board review.
3. **Lot Line Adjustments** - A lot line adjustment alters the size of two (2) or more lots, but does not create a new buildable lot.
4. **Conditional Use Permits** - A conditional use permit is required for any alteration of wetlands, wetland buffers or work within the City's conservation district. Additionally, a conditional use permit could be issued as to offer relief in the Central Business District, for plans in the Residential Mixed Use Overlay District, or parking relief. Environmental Conditional Use Permits are acted on after Conservation Commission review.
5. **Excavation Permits** - NH RSA Chapter 155-E grants municipalities the authority to regulate earth excavations within their borders. This authority rests with the Planning Board.

The Board cannot and will not review applications that do not meet zoning requirements. **Please review the need to apply to the Zoning Board of Adjustment prior to applying to the Board.**

Professional agents will prepare your application; however, you may represent yourself or authorize, in writing, someone else to represent you before the Planning Board.

In most cases, the first step would be to appear before the Technical Review Committee, to apply, eight (8) folded copies of the site plan with scale of not less than 1"=50' or 1"=100' for larger site plans, and a PDF, need to be provided, along with payment of plan review fees. These meetings occur on Thursday, and materials and payment must be submitted three (3) weeks prior to meeting. Meetings are scheduled, upon receipt of completed applications with the full checklist and payment.

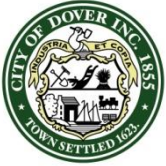
The next step would be to provide, two weeks prior to Planning Board, the final plan sets (three (3) full size and twelve (12) half size (11x 17), folded, copies of the plan), and 15 copies, and a PDF, of all supporting materials, including response to TRC comments. Please print all materials on both sides of paper.

For projects not appearing before the Technical Review Committee, Plan Review Fees are due along with three (3) full size and twelve (12) half size (11x17), folded, copies of the plan set and 15 copies, plus a PDF, of plans and materials, 3 weeks prior to the Planning Board meeting. Please print all materials on both sides of paper.

Staff will generate an abutter list, and Abutter/Notice Fees will be invoiced. They are due 28 hours prior to Planning Board. If they are not paid, the application will not be heard.

Once an item is placed upon an agenda the following process is used:

- The Board will hold a public hearing on your application at a regularly scheduled meeting
 - Typically the second or fourth Tuesday of the Month.
- Public notice of the hearing will be posted at the City Clerk's office and the Planning Department office and printed in the newspaper.
- Certified letters will be mailed to you and to all abutters at least ten days before the date of the hearing.
- 28 hours prior to the meeting, abutter/notice fees must be paid
- At the meeting
 - Staff will introduce your project
 - You and all other parties will be invited to appear in person or by agent or counsel to present your application.
 - Your project will be pre-loaded onto a laptop for review by the Board and public
 - The Board may ask clarifying questions
 - The Board will vote to accept jurisdiction on the application
 - If accepted:
 - The Board will hold a public hearing
 - The Board may ask additional questions
 - The Board will deliberate on your application
 - Typically decisions are made the night of the presentation, but an application may be tabled
 - After deliberation, a decision will be made.
 - You will be sent a notice of the decision.



City of Dover, New Hampshire SITE REVIEW APPLICATION

[Revision Date: July 1, 2021]

Office Use Only

Project #: _____

Date Received: _____

Amount Paid: _____

Time Received: _____

APPLICANT AND OWNER INFORMATION

Name of Applicant: Diamond Capital, LLC Telephone # 978-255-2410

Address of Applicant: 170 Commerce Way Suite 200 Portsmouth, NH 03801

E-Mail Address: Sarah@SavageBuilders.com

Name of Property Owner (if different from applicant): Same Telephone # _____

Address of Property Owner: _____

PROPERTY INFORMATION

Address of Property: 71 and 73 Rutland Street

Assessor's Map # 14 Lot(s) # 17 and 17A

Zoning District(s) Gateway Overlay District(s) _____

Size of Parcel: 43560 sq. ft. 1.0 ac. Property Deed: Book _____ Page: _____

Existing Use of Property: Residential

SITE PLAN INFORMATION

Describe Proposed Use: Multi-family

Area of Parcel to be Developed: 43,560 sq. ft.

If Multi-family Residential: Number of Units 10 & Buildings Proposed 3 (2 exist/1 proposed)

If lodging: Number of Units _____ & number of Buildings _____

Number of Parking Spaces: Existing 4 Proposed 16

Highway Access (check where applicable): _____ City Street X State Highway

Number of Employees Total: n/a In Maximum Shift: _____

Disposition of Parcel:

Building Setbacks:

Building Footprint 7,040 sq. ft.

Front Yard 20 ft.

Total Building Area 14,340 sq. ft.

Rear Yard 15 ft.

Paved Area 8,650 sq. ft.

Side Yard: n/a Right _____ ft. Left _____ ft.

City Water? ☒ Yes ☐ No How far is city water from the property? In street in front

City Sewer? ☒ Yes ☐ No How far is city sewer from the property? In street in front

TRANSFER OF DEVELOPMENT RIGHTS INFORMATION

Type of TRANSFER OF DEVELOPMENT RIGHT REQUEST (Check All That Apply):

☐ Residential ☐ Residential (reduced size) ☐ Industrial | ☐ Purchase ☐ Land Preservation

Relief sought (Check All That Apply):

☐ Lot Size ☐ Frontage ☐ Setback ☐ 30' Buffer ☐ Increase by _____ units

Describe Proposed Use or Activity that requires TDR; describe any impacts and document mitigation:

BUILDING INFORMATION

Type of Building to be Built: 2-story wood framed townhouse (standard construction)

Height of Building: 32 feet to peak of roof Finished Floor Elevation: Stepped slabs, see plan

Number of Seats (where applicable) n/a

Estimated value of construction: \$1.736M Refuse removal: Public/Private (circle one)

WAIVER REQUESTS

Site Review Regulations section(s) to be waived: 153-13(12) partial

Justification for waiver request(s) (*attach additional sheets as needed*):

Waiver requested from requirement to have landscape plan prepared by a N.H. Landscape Architect. Applicant unable to secure a NH RLA. Plan completed by James Emmanuel who is a Registered Landscape Architect in Massachusetts with extensive experience.

SURVEYOR INFORMATION

Name of Surveyor and Company (Licensed in N.H.) Wayne C. Jalbert, PLS, Hancock Survey Assoc., Inc.

Address 10 Ferry Street Suite 406 Concord, NH 03301 Telephone #: 603-223-1950

Professional License #: 0861 E-mail address: wjalbert@hancockassociates.com

ENGINEER INFORMATION

Name of Engineer and Company (Licensed in N.H.) Joseph D. Peznola, PE, Hancock Survey Assoc., Inc.

Address 10 Ferry Street Suite 406 Concord, NH 03301 Telephone #: 603-223-1950

Professional License #: 10270 E-mail address: jpeznola@hancockasscoaites.com

ARCHITECT INFORMATION

Name of Architect and Company (Licensed in N.H.) Donald W. Bladjda, AIA Koal, PLLC

Address 42 Gilford East Dr. , Gilford, NH 03249 Telephone #: 603-215-7055

Professional License #: 0260 E-mail address: donald@koalpllc.com

LANDSCAPE ARCHITECT INFORMATION

Name of Landscape Architect and Company (Licensed in N.H.) Waiver requested

Address _____ Telephone #: _____

Professional License #: _____ E-mail address: _____

SOIL SCIENTIST INFORMATION

Name of Soil Scientist and Company (Licensed in N.H.) Luke Hurley Gove Environmental Services, Inc.

Address 8 Continental Drive Bldg 2 Unit H Exeter, NH 03883 Telephone #: 603-418-7260

Professional License #: 0095 E-mail address: lhurley@gesinc.biz

CONSERVATION EASEMENT HOLDER

Name of Easement Holder: n/a Telephone # _____

Address Easement Holder: _____

SIGNATURES

I/We hereby submit this application to the City of Dover Planning Board and attest that to the best of my knowledge all of the information on this application form and in the accompanying application materials and documentation is true and accurate. Furthermore, I/we submit that the existing conditions sheet of the plan represents the lot in question, and that no alteration of the site shall take place during Planning Board review up to and including the pre-construction meeting. As applicant or as agent, I attest that I am duly authorized to act in this capacity.

Signature of Property Owner: Mark Lee Date: 9-8-21

Signature of Applicant (if different from owner): _____ Date: _____

Signature of Agent: Jason S. Sargent Date: 9-8-21

AUTHORIZATION TO ENTER SUBJECT PROPERTY

I, and my successors, hereby authorize members of the Dover Planning Board, Planning Department and other pertinent City Departments and boards to enter my property for the purpose of evaluating this application, including performing inspections during the application phase, post-approval phase, construction phase and occupancy phase. It is understood that these individuals must use all reasonable care, courtesy, and diligence when on the property.

Signature of Property Owner: Mark Lee Date: 9-8-21

AUTHORIZATION TO COMPLETE THE PROJECT ON SUBJECT PROPERTY

I, and my successors, hereby the City of Dover or its assigns to enter my property for the purpose of completing the site work as required by the approved plan should the letter or credit or other surety be called. It is understood that these individuals must use all reasonable care, courtesy, and diligence when on the property.

Signature of Property Owner: Mark Lee Date: 9-8-21

Signature of Applicant (if different from owner): _____ Date: _____

CERTIFICATION OF FEES

I, and my successors, hereby certify that I understand that the City of Dover collects impact fees, utility investment fees and inspection fees for projects developed in Dover. Said fees must be paid before a Certificate of Occupancy can be obtained for a structure, unless a different payment schedule is agreed to by the applicant and the City prior to approvals being issued by the Dover Planning Board. Additionally, should the property be in "Current Use" it will be subject to the Land Use Change Tax.

Signature of Property Owner: Mark Lee Date: 9-8-21

Signature of Applicant (if different from owner): _____ Date: _____

***CITY OF DOVER SITE REVIEW
LIST OF ABUTTERS***

Pursuant to RSA 676:4, the State Law of New Hampshire, the City of Dover is required to notify the applicant, abutters (including holders of conservation easements), and any professional whose seal is on the plan, of the public hearing by certified mail, return receipt requested. Staff will provide the abutter information, while the applicant must provide accurate contact information for the owner, applicant and professional agents representing the project.

Owner:

TAX MAP	LOT #	PROPERTY OWNER	MAILING ADDRESS
14	17&17A	Diamond Capital, LLC	170 Commerce Way Portsmouth NH

Applicant (if different from owner):

APPLICANT NAME	APPLICANT COMPANY	MAILING ADDRESS
Same		

Surveyor and/or Engineer/Professional Agent:

NAME	COMPANY	MAILING ADDRESS
Joseph Peznola, PE	Hancock Associates	10 Ferry St Suite 406 Concord, NH

Conservation Easement Holder:

TAX MAP	LOT #	NAME OF EASEMENT HOLDER	MAILING ADDRESS
n/a			

PLANNING BOARD FEE SCHEDULE/INVOICE

(Revised July 1, 2021)

Below are the fees associated with plan review and are subject to a nonrefundable application fee to cover administrative expenses. Please complete the information below and provide payment with your application submittal. **Plan Review Fees shall be paid prior to technical review committee (TRC) being scheduled.** For plans not requiring TRC review, **fees are due 21 days prior** to the Planning Board meeting. Staff will coordinate abutter/notice fees, which will be invoiced and must be paid 28 hours before the Planning Board meeting for an application to be heard. Fees shall be paid by cash or check made payable to "City of Dover".

A. Plan Review Fees

1. Application fee for the following (SELECT ALL THAT APPLY):

- ☐ SUBDIVISION Application fee \$200.00 + \$150.00 x # _____ new lots created = \$ _____
- ☐ LOT LINE ADJUSTMENT Application fee \$200.00 + \$100.00 X # _____ of lots involved = \$ _____
- ☐ TRANSFER OF DEVELOPMENT RIGHTS Application fee \$200.00 = \$ _____
- ☐ SITE REVIEW – RESIDENTIAL Application fee \$200.00+ \$100.00 x # _____ per dwelling unit = \$ _____
- ☒ SITE REVIEW – NON-RESIDENTIAL Application fee \$200.00 + (not to exceed \$10,000)
 - New construction \$.15 sq. ft. x # 14,340 sq. ft.= \$ 2,151.00
 - Additions (new floor space) \$.10 per sq. ft. x # _____ sq. ft.= \$ _____
- ☐ MOTEL/HOTEL \$35.00 x # _____ per lodging unit= \$ _____
- ☐ CHANGE OF USE Application fee \$200.00 + (not to exceed \$5,000)
 - Existing floor spaces \$.10 per sq. ft. x # _____ sq. ft. = \$ _____
- ☐ CONDITIONAL USE PERMIT Application fee \$200.00 x # _____ per Application = \$ _____
- ☐ GRAVEL PIT/ EXCAVATIONS
 - Application fee \$50.00= \$ _____
 - Permit fee \$75.00= \$ _____
- ☐ EXTENSIONS/AMENDMENTS/WAIVERS FOR AN APPROVED PLAN Application fee \$200.00 = \$ _____
- ☐ REQUEST FOR REZONING Application fee \$200.00 = \$ _____
- ☐ DRIVEWAY WAIVER Application fee \$200.00 = \$ _____

2. TOTAL IMPERVIOUS PAVED AREA (for new development, roadways or additions to

existing parking lots, (not to exceed \$10,000)) Application fee of \$200.00 is N/A if it is part

of a Site Review or Subdivision Plan. \$200.00 + \$.07 per sq. ft. x # 8,650 sq. ft. = \$ 605.50

SUBTOTAL PLAN REVIEW FEE (A) = \$ 2,756.50

AND

B. Abutter Notification/Mailing Labels - this office will create and print the abutter list and provide labels in triplicate for each abutter. The applicant/owner will review the list for accuracy and provide to us the engineer, architect, licensed land surveyor (LLS), licensed landscape architect (LLA) and/or soil scientist whose professional seal appears on the plan with names and addresses for notices.

- ☒ Applicant & Owner, engineer, architect, LLS, LLA and/or soil scientist
 - Certified letters fee # 5 of x \$8.00= \$ 40.00
- ☒ Certified letters fee: # of abutters _____ X \$8.00= \$?
- ☐ First Class Mail fee (for individual owner of units within a condominium or other collective form of ownership): # of abutters _____ X \$1.00= \$ _____
- ☒ Creating/Printing Abutter Labels in triplicate per sheet _____ x \$10.00= \$?

C. Foster's newspaper public notice fee \$100.00 x # 1 applications = \$ 100.00

SUBTOTAL NOTICE FEE (B & C) = \$ 140.00

TOTAL INVOICE AMOUNT (A, B & C) = \$ 2,896.50

PLAN REVIEW FEE COLLECTED/PAID = \$ _____

BALANCE DUE = \$ _____

The balance due must be paid 28 hours prior to the Planning Board Meeting, to be heard.



City of Dover, New Hampshire SITE PLAN REVIEW SUBMISSION CHECKLIST

[Revision Date: June 4, 2019]

This site plan review checklist, as required by Chapter 153-6-B(2), should be completed by the applicant. It is intended to assist the applicant in the planning process of preparing a Site Plan Review application for Planning Board action. The size of the project will determine the types of information required for review, therefore, a **pre-application conference** with the Planning Department to determine the list of items that must be completed is strongly encouraged.

The first step would be to appear before the Technical Review Committee, to apply, eight (8) folded copies of the site plan with scale of not less than 1"=50' or 1"=100' for larger site plans, need to be provided, along with payment of plan review fees.

Two weeks prior to Planning Board, three (3) full size and twelve (12) half size (11x17), folded, copies of the plan set and materials, including response to TRC comments, will be due. Abutter/Notice Fees will be invoiced and need to be paid 28 hours prior to the Planning Board meeting.

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: Diamond Capitol, LLC File Number: _____

PROJECT TITLE: TBD

PROPERTY LOCATION: 71 & 73 Rutland St Tax Map: 14 Lot: 17 & 17A

	Where/How Provided	Reviewed
1. Completed and signed Application form	x	
2. Plan Review Fees are provided	pending abutter number	
3. Electronic copy of the engineered/surveyed plan layout	x	
4. Electronic copy of supplementary materials and application	x	
5. Traffic Impact Assessment and Analysis (Standard or Advanced)	waiver requested	
6. Waiver requests to the Site Plan Review Regulations, with written justification	x	
7. Conditional Use Permit applications	n/a	
8. A colored rendering of the streetscape that will be created along the existing public right-of-way	x	
9. A colored architectural plan showing all sides of buildings	x	
10. Folded copies of site plan w/scale of not less than 1"=50' or 1"=100' for larger site plans, for TRC. Plans shall contain the following items as appropriate:	x	
Location map at appropriate scale	x	
Proposed Project name and title and Planning File #	Planning File # pending	
Date, north arrow and scale	x	
Names of all abutting property owners	x	
Name and address of owners and/or applicants	x	
Signature & stamp of NH licensed land surveyor and/or engineer	x	
Zoning District boundaries, including any special or overlay districts	x	
Location of Conservation District areas	x	
Location, names and widths of existing and proposed streets, including pavement widths, grades, curbs and crosswalks	x	
Location and widths of existing & proposed easements & right of ways	x	
Location and width of existing and proposed access/egress ways	x	

	Explain How Provided	Reviewed
Depict pedestrian walkways and accessible access	x	
Existing and proposed property lines with dimensions and bearings tied into Dover's Geographic Information System coordinate system	x	
Existing and proposed topographic information at two foot intervals	x	
Existing and proposed buildings and structure locations	x	
Minimum building setbacks or build to lines on all lots	x	
Location and size of existing and proposed electric, telephone, gas cable and other underground utilities	x	
Existing and proposed water lines and fire hydrants, including materials and capacity needed	3,600 GPD	
Location and materials of sanitary sewage facilities within project site and projected additional peak hour sewer load	3,600 GPD	
Existing and proposed stormwater lines and facilities	x	
Lighting plan depicting all existing and proposed exterior light fixtures and a lighting level analysis for parking lots	x	
Location of Flood Hazard Zone	n/a	
Location of all bodies of water and watercourses	none	
Location of wetlands and buffers	none	
Neighborhood plan with aerial underlay showing how project relates to abutting uses within the plan set	x	
Existing natural features and/or significant vegetation on property	x	
Depict existing contours up to 100 ft. beyond project limits	x	
Landscape plan depicting existing and proposed landscaping, prepared by a licensed Professional Landscape Architect	x	
Location of parking layout delineating spaces and arrangement; note addressing maximum required spaces	x	
Location, material and size of existing and proposed pavement area	x	
Location of proposed fire lanes		
Specify finished floor elevations of buildings	x	
Location of solid waste disposal facilities (dumpster, pad and screening, etc.), including required screening	x	
Depict all service, storage, loading bays and utility areas	x	
All applicable Dover Common Site Plan notes	x	
11. Additional Information if appropriate		
Stormwater Management Plan depicting the existing & proposed storm drainage system and engineered drainage analysis	x	
Stormwater Management System Operation and Maintenance Plan	x	
Letter to Serve from Public and Private Utilities	pending	
Erosion and Sedimentation Control Plan	x	
Landscape Operation and Maintenance Plan	x	
Proposed restrictive covenants or homeowners association documents	pending	
Dates and permit numbers of all required state and federal permits	none	
If wetland buffer, indicate placards locations, as applicable	n/a	
Depict test boring locations, groundwater elevations and soil profiles and/or soils types call-outs	see soils report by Gove	
Location of proposed drive-in facilities	none	
Provide additional exhibits/technical data determined appropriate by the Planning Board or its staff as required		

REVIEWED BY: _____ DATE _____ TRC DATE _____

CITY OF DOVER PLANNING DEPARTMENT
Revised August 10, 2020

APPLICANT: Diamond Capital, LLC FILE NUMBER: _____

List of Common Site Plan Notes

The following list of commonly required notes is intended to be used as a guide to applicants and should not be construed as a comprehensive note requirement list for all projects. A preapplication conference with the Planning Department is suggested to help determine the actual notes that may be required.

1. The intent of this plan is to *(describe the purpose of the plan)*.
2. Owners of Record are: Name
Street address
Municipality, State, Zip Code

Authorized Signature
3. The parcel(s) is *(are)* shown as Lot No. 17/17A, Map 14 of the City of Dover Tax Assessor's Maps.
4. The subject parcel(s) contains 1.0 acres or 43,560 sq. ft. area of land.
5. Title reference for the project parcel(s) is the Strafford County Registry of Deeds, Book No. ____, Page No. ____.
6. Reference Plans: *(List all reference plans and their SCRD #)*
7. All applicable right-of-way, conservation, slope, construction, power line, cross travel, or other easements shall be referenced in a note.
8. Zoning dimensional and density requirements are as follows:

Required:

Provided:

- a. Zoning district G sub-district _____
- b. Minimum lot size: _____ acres (sq. ft.)
- c. Minimum lot frontage: _____ ft.
- d. Minimum yard setbacks/build-to-lines:
Front _____ ft.
Side _____ ft.
Rear _____ ft.
Abut-a-street _____ ft.
- e. Maximum/minimum lot coverage _____ %
- f. Minimum/maximum bldg. height _____ ft./stories

This property falls within the following zoning overlay districts: *(List districts)*

9. List any variances or special exceptions granted by the Zoning Board of Adjustment or Conditional Use Permits granted by the Planning Board for the proposed use or structure, including the case number and date of decision and any conditions.
10. Property line information has been obtained from a survey performed by *(surveyor)* on *(date)* with an error not greater than 1 in 10,000 *(or has been obtained from _____ Plan, prepared by (surveyor))*.
11. Subject parcel is *(is not)* located within a Federally designated flood hazard area (Community panel number 33017C0xxxD, Effective Date: September 30, 2015).
12. Wetlands were delineated by _____, Certified Wetlands Scientist, Certification Number _____, in accordance with Chapter 170-27.1 of the Zoning Ordinance, on _____, 20____.
13. As-built plans of the subdivision shall be submitted on paper and in digital format AutoCAD DWG, AutoCAD DXF or ESRI format to the City of Dover Engineer's Office upon completion of project if a street is proposed for City acceptance. As-built plans shall be prepared and certified correct by a L.L.S. or P.E. Digital files shall be geo-referenced to New Hampshire State Plane Coordinates NAD83 and shall be expressed in feet.
14. The installation of electric power, cable television and telephone lines shall be underground throughout the site for which development is proposed.
15. The subject parcel(s) is (are) served by municipal water and sewer *(or is served by on-site well and septic system)*.
16. All construction shall conform with the State of New Hampshire Department of Transportation (NHDOT) "Standard Specifications for Road and Bridge Construction" and with the City of Dover Community Services Regulations and standard specification for construction. The more stringent specification shall apply.
17. All erosion control notes shall include provisions for construction sequencing, temporary erosion control measures, and permanent standards such as loam spread rate for disturbed areas, rates of lime, type and rates for fertilizer, and seed and mulch mixture with rates of application.
18. The limits of construction disturbance that are located in or within the 50 ft. of Conservation and Wetland Districts shall be staked, flagged and clearly identified prior any earth disturbing activity occurs.
19. All treatment swales to be constructed shall have sod bottoms.
20. A letter of credit for the cost of revegetating all disturbed areas on the site shall be submitted, and the approved construction sign installed prior to any earth disturbing activity occurs.
21. A pre-construction conference with the developer, the design engineer, the earthwork contractor and the City Engineer shall occur prior to any earth disturbing activity.
22. Site Construction hours shall be limited to Monday-Friday 7 AM-6 PM, Saturday and Sunday 9 AM-4 PM. Hours of construction must be documented on a site construction sign along with the contact information for the general contractor. Said signage must be located and approved by the City Engineer or Assistant City Manager.

23. Building addresses (including apt/unit numbers if applicable) shall be assigned by the Building Official at the time of issuance of a building permit.
24. The proposed use for the site (structure) is _____. (More specific uses are encouraged, such as single family, duplex, multi-family, restaurant, hotel, doctor's office, etc. Should more than one use be proposed, an indication of the percentage of each use is suggested.)
25. The following federal and state permits have been issued for the subject property: (*List permit type, number and date of issuance.*)
26. Commercial vehicle route during construction shall conform to Dover City Code or be coordinated with the Community Services Director.
27. Any retaining wall taller than four feet (4') requires issuance of a building permit from Inspection Services.
28. Any fence taller than seven feet (7') requires the issuance of a building permit from Inspection Services.
29. Applicant shall complete Land Use Development Tracking Form, most recently revised version, utilizing the online Pollution Tracking and Accounting Pilot Project (PTAPP) portal.
<https://www.unh.edu/unhsc/ptapp>
30. The owner of record shall record at the Registry of Deeds documentation sufficient to provide notice to all persons/entities that may acquire any property subject to the requirements and responsibilities described in the approved STORMWATER Management Plan. The notice shall comply with the applicable requirements for recording contained in RSA 477 and 478. The notice need not set forth the requirements at length, so long as it is sufficient to provide notice to prospective purchasers to the requirements for maintenance and reporting.
31. Fire department access road(s) shall be installed and maintained to support the imposed loads of fire apparatus in all weather conditions at all times.
32. The maximum parking space calculation is _____ (broken down) and _____ spaces are provided.
33. Exterior lighting shall be cut-off type fixtures per Chapter 153-14-E and shall provide lighting directed on-site only.
34. Topographic survey performed by _____ on (*dates*).
35. Elevations are based on U.S.G.S. NVD 1988 datum. (**or** Elevations depicted are based on information obtained from the City Engineer's Office and was derived from coordinates for control stations _____ and _____. These coordinates have not been adjusted to 1983 datum).
36. A security system shall be installed as required by Chapter 45, Article I, section 45-2 of the Code of the City of Dover. (*If a business establishment or multi-family dwelling contained in a new, altered or repaired structure*)
37. Approved backflow preventers shall be provided for both fire and domestic water lines.

- 38. The (*existing or proposed*) structure shall be served by a sprinkler system as required by Chapter 81- 30 of the Code of the City of Dover and the adopted State of NH Building and Fire Codes.
- 39. Sprinkler connections must be flushed in accordance with NFPA 24 and a Contractor’s Material and Test Certificate for Underground Piping form must be completed and approved by Inspection Services prior to connection of the backflow device.
- 40. Fire department connection(s) shall be located on the street side of the building per NFPA 13. Access to the FDC shall maintain a clear and unobstructed path at all times.
- 41. The site layout is designed in compliance with applicable accessibility regulations. The proposed structure will be also be designed in accordance with applicable accessibility regulations. (i.e. IBC, ANSI-117.1) and NH RSA 155-A:5.

REMARKS:

HANCOCK ASSOCIATES

Surveyors | Engineers | Scientists

September 8, 2021

City of Dover Planning Board
288 Central Avenue
Dover, NH 03820
Donna Benton, AICP, City Planner

Subject: Traffic Assessment 71/73 Rutland Street and Abbey Lane

Dear Ms. Benton:

Hancock Associates has reviewed the requirements of Chapter 157, Land Subdivision Regulations, Subsection 157-10D regarding the proposed project.

This assessment considers the safety of the proposal along with a general assessment of the potential impact of the project. This is not a full Traffic Impact Analysis considering the project is proposing only eight townhomes.

Existing Conditions

The project site is comprised of two properties at 71 and 73 Rutland Street containing a combined one acre (43,550 square feet). The site is bounded by Rutland Street to the north, Abbey Lane (a public way) to the east and property of Rutland Manor to the south and west. Rutland Manor is a 50-unit apartment complex containing two buildings built in the 1970s. Directly across Rutland Street are two single family homes at 70 and 72 Rutland and the Assembly of God Restoration Church. Single-family homes currently exist on each of the lots at 71 and 73 Rutland with individual driveways onto Rutland. Rutland Street is a city street with a 50 foot right of way, 30 feet of pavement and a sidewalk on the south (locus) side. Abbey Lane is a city street with a 50 foot right of way, 30 feet of pavement and no sidewalk. Neither street is stiped. Rutland Street connects Central Ave (NH Route 108) at the interchange with eth Spaulding Turnpike to the east and Cataract Avenue to the west. The area including the subject parcel is in Dover's Gateway Zoning District. Existing traffic volumes were not obtained.

Proposed Conditions

The proposal calls for the merger of the two lots, retaining the two structures and the construction of eight three-bedroom townhomes in a single building at the back of the lot. Access to the townhomes will be via a new driveway on Abbey Lane. The two existing homes and the eight new townhomes will be sold under a condominium form of ownership. The two existing homes will continue to utilize their driveways onto Rutland with the townhomes using the new drive from Abbey Lane

Project Generated Traffic

The anticipated vehicle trips generated by the proposed eight (8) townhouse condominiums are as follows in accordance with the Institute of Transportation Engineers (ITE) Trip Generation, 10th Edition; Institute of Transportation Engineers; Washington, DC; 2017:

HANCOCK ASSOCIATES

Surveyors | Engineers | Scientists

Vehicle Trips

Average Weekday	90 (50% entering/50% exiting)
AM peak hour (7:00 a.m. to 9:00 a.m.)	7 (24% entering/76% exiting)
PM peak hour (4:00 p.m. to 6:00 p.m.)	9 (62% entering/38% exiting)

Based on ITE LUC 210, Single-Family Detached Housing; 8 dwelling units.

Pedestrian and Bike Facilities

A sidewalk exists on the south side of Rutland Street out to Central Street where Central Street has sidewalks on both sides and is striped with a double yellow center and 1–2-foot fog lines. There are no designated bicycle lanes in the area.

Public Transportation

The nearest bus stop on the Cooperative Alliance for Seacoast Transportation (COAST) system is on the Regional Route 13 at the Dover Transportation Center 1.3 miles away.

Sight Distance Assessment

At the intersection of Abbey Lane and Rutland Street sight distances are unobstructed to the west to Cataract Ave., 370 feet away and to the east over 1,200 feet to Central Ave. There is no posted speed limit on Rutland Street. We did not perform a speed study. The sight distances would support a required minimum stopping sight distance (SSD), per AASHTO 2018 standards of 45 miles per hour at 360 feet. Intersection sight distance (ISD) at 45 miles per hour is 500 feet, available to the east and outside the distance to the intersection to the west.

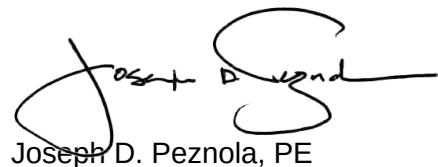
Summary

Hancock Associates does not believe the proposed project poses any safety concerns given the use of existing roadways, available sight distance and the relative low trip generation.

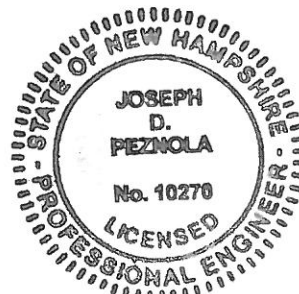
Recommendations

- The project site driveway should be a minimum of 20 feet wide.
- On street parking on Abbey Lane and Rutland Street should be prohibited by residents and guests.
- Vehicles existing the site should be placed under stop sign control with a stop line provided.
- All signs and pavement markings to be installed should conform to the applicable standards of the Manual on Uniform Traffic Control Devices (MUTCD).
- Signs and landscaping at the site drive intersection with Abbey Lane should be installed so as not to impede line of sight.
- Snow accumulation within the project site should not impede parking or sight lines.

Hancock Associates
Acting on Behalf of Diamond Capital, LLC



Joseph D. Peznola, PE



10 Ferry Street, Suite 406 | Concord, NH 03301 | V: 603-223-1950 | HancockAssociates.com

er and Princeton, MA | Concord, NH

HANCOCK ASSOCIATES

Surveyors | Engineers | Scientists

City of Dover Planning Board
288 Central Ave.
Dover, NH 03820-4169

January 7, 2021

Attn: Ms. Donna Benton
AICP City Planner

RE: *Eagle Heights* – Proposed Townhome Project – Parking Regulations
71-73 Rutland Street and Abbey Lane
Planning File No. P21-64
Technical Review Committee Meeting – Responses

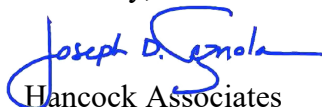
Dear Ms. Benton:

Following the City of Dover parking requirements in the Gateway district (G), the maximum number of spaces per dwelling unit is 1.9 (1.4 spaces per unit plus 0.5 per visitor). The proposed project referenced above will include 8 dwelling units, making the **required number of parking spaces to be 16**. After previous discussion at the initial TRC meeting, **we have proposed 12 parking spaces: 8 garage spaces and 4 visitor spaces**.

Each townhouse has a 10' wide by 23' long bituminous drive-in front of each garage. Although this area cannot be considered an official parking space, it can be utilized as one. With these additional 8 spaces, the realistic total number of parking spaces on the project site will be 20. Further, the condominium by-laws shall contain a provision, not subject to amendment, that no parking shall be permitted within the common area of the condominium and that all parking shall be located only within the unit itself (garage) and/or the limited common area for each unit (driveway).

We strongly believe sufficient parking is being provided for the project and complies with the intent of the ordinance in minimizing impervious surfaces.

Sincerely,



Hancock Associates
Acting on Behalf of Diamond Capital, LLC



LANDSCAPE MAINTENANCE PLAN

General

The Owner of each lot shall be responsible for the maintenance of all landscaped open space, natural screens, and constructed screens within the lot. Landscaping shall be maintained in good condition such that planting shall be vigorous and in good health at all times and that the parcel shall present a healthy, neat, and orderly appearance, free from refuse and debris.

Integrated Turf Management Plan

Maintenance of lawn areas shall generally consist of watering, weeding, mowing and edging, replacement of dead sod, disease and insect control, repair of erosion, and any and all procedures consistent with good horticultural practice, as necessary to insure normal, vigorous and healthy growth of grass,

The lot Owner shall provide the following maintenance activities as specified:

1. Mowing: Once a week or more often as conditions warrant.
2. Watering: by natural rainfall after establishment period. Seed to be kept moist during establishment period.
3. Fertilizing: Early spring and fall.
4. Weeding: Once or twice a year.
5. Pest and Disease Control: Only as needed
6. De-thatching: spring and fall.
7. Liming: Once a year, in the fall and as soil tests indicate need.
8. Raking, edging, debris removal, sod replacement, erosion repair: As needed.
9. Soil testing shall be performed once every 3 years or more frequent if conditions warrant. Soil shall be amended as indicated by test for turf grass.
10. Lawns shall be aerated annually during late summer or early fall. Thinning lawns shall be over-seeded with a certified general turf blended seed mix and top-dressed with a compost/sand mixture ¼-1/2" in the late summer and early fall.

11. Soil and seed shall be kept moist during seed establishment period. Late summer/early fall application of seed is preferable.
12. Turf fertilizer (slow release) shall be applied mid to late fall according to manufacturers recommended rates.
13. Weeds shall be mechanically removed from the site as feasible and disposed of in a legal manner.
14. Grass clippings shall be left on turf areas using mulching mowers. Mowing patterns shall be alternated to avoid ruts and compaction. Care shall be taken to avoid damage to lawn areas.

Shrub and Groundcover Management

The lot Owner shall provide the following shrub and maintenance activities as specified:

1. Mulching: Once each year in spring. Mulch shall be 2"-3" maximum depth and shall always be kept pulled 2"-3" away from tree trunk. Mulch shall be shredded bark, 100% organic and be free of any disease, pests, and insects. Mulch may be applied by manual or mechanical methods where appropriate.
2. Weeding: Once or twice a year as needed. Weeds shall be removed and disposed of off site in a legal manner.
3. Watering: weekly minimum during the establishment period. Long term watering typically only warranted by severe weather conditions.
4. Pruning: To include cleaning, raising and reduction, spring to fall, dependent on accepted practice for each particular species.
5. Preventative pest/disease management: Avoid shrubs and groundcover known to be susceptible to various pests. Establish pest thresholds prior to treatment with acceptable pesticides. Pesticide application to be performed by certified applicator. See tree pest management below.
6. Fertilizer shall be granular 16-16-16 formulation or similar in the spring prior to anticipated rainfall.
7. Once established, plantings shall be watered by natural rainfall. During excessive drought periods watering by hand or drip irrigation bags may be required.
8. Shrubs shall be pruned in accordance with generally accepted standards for proper pruning. Shrubs shall be pruned to remove branches that are dead, broken, extending beyond the face of curbs (where applicable). Shrubs shall not be sheared into topiary shapes.

9. Known invasive plants shall be identified, removed from site as practicable, and disposed of in a legal manner.

Tree Management

The lot Owner shall provide the following tree maintenance activities as specified:

1. Risk Management: this includes management of existing trees to minimize risk of tree failure and possible damage or injury. This includes:
 - Removal of trees that show significant decline or serious defects in their structure.
 - Hazard pruning to remove a dead or broken portion of the tree.
2. Pruning: These include three different types of pruning as defined by the American National Standard for Tree Operations: Tree, Shrub and Other Woody Plant Maintenance - Standard Practices.
 - Crown Cleaning - selective pruning to remove one or more of the following parts: dead, diseased, and/or broken branches
 - Crown Raising - selective pruning to provide vertical clearance
 - Crown Reduction - selective pruning to decrease height and/or spread
3. Mulching: Once each year In spring. Mulch shall be 2"-3" maximum depth and shall always be kept pulled 2"-3" away form tree trunk. Mulch shall be shredded bark, 100% organic and be free of any disease, pests, and insects. Mulch may be applied by manual or mechanical methods where appropriate.
4. Pest and Disease Control: Only as needed. Dead or diseased branches shall be removed and disposed of off site in a legal manner.
5. Watering: weekly minimum during the establishment period. Long term shall be by natural rainfall. During excessive drought periods watering by hand or drip irrigation bags may be required.
6. Fertilization: early spring or fall. Formulation shall depend on soil test recommendations and plant variety. Granular type fertilizer to be used and watered in.
7. Soil additives: Only as needed.
8. Root crown excavation: This is required where excessive soil or mulch has been placed over the base of the tree.
9. Only trees on slopes 2:1 or greater shall be staked. Stakes shall be removed after first growing season.
10. Preventative pest/disease management: Avoid trees known to be susceptible to various pests. Establish acceptable pest thresholds. Once monitoring, identification, and action thresholds indicate that pest control is required, and preventive methods are no longer effective or available, evaluate the proper control method both for effectiveness and risk. Effective, less risky pest controls are chosen first, including highly targeted chemicals, such as pheromones

to disrupt pest mating, or mechanical control, such as trapping or weeding. If further monitoring, identifications and action thresholds indicate that less risky controls are not working, then additional pest control methods would be employed, such as targeted spraying of pesticides. Broadcast spraying of non-specific pesticides is a last resort. Pesticides, if required, to be applied by a certified applicator.

11. Replacement Trees: Owner shall replace dead or missing trees according to the following:

- Lost, dead or diseased trees shall be replaced with the same or similar species.
- New trees shall be 3" in caliper for shade trees and to 2" in caliper for ornamental trees.

Watering during establishment period

Water source shall consist of local water supply systems. At a minimum trees and shrubs shall be watered by flooding as follows:

Month 0-3: Once per week

Month 3-6: Twice per month

Month 6-12: Once per month.

Watering frequency may be increased or decreased depending upon excessive rainfall or drought conditions.

Seasonal Maintenance

Each lot Owner shall maintain a plan for seasonal activities including raking, de thatching, removal of dead brush and flowers, fertilizing, watering, pruning, mowing, weeding, etc. for each of the following:

1. Spring Clean-up Plan
2. Fall Clean-up Plan
3. Leaf & Plant Debris Disposal
4. Winter Plowing: Prior to the start of each winter season, curb lines and planting beds should be stacked out with brightly colored wooden stakes to demarcate edges. Snow storage will be in designated open areas adjacent to parking and walks. During periods of extreme snowfall, portions of the common area may be utilized for storage of snow. Springtime cleanup will typically include repair of any turf damage related to plowing operations.
5. Winter Deicing Plan: Only calcium based products will be utilized for deicing on an as-needed basis to control ice build-up.

Wet Pond Area - First Year Maintenance Guidelines

Successful establishment of wet ponds requires that the following tasks be undertaken during the first year following construction.

- Initial inspections. For the first six months following construction, the site should be inspected at least twice after storm events that exceed a 1/2-inch of rainfall.
- Remove and replace dead or dying plants.
- Spot Reseeding. Inspect for eroding areas in the contributing drainage area or around the pond buffer, and make sure they are immediately stabilized with grass cover.
- Watering. Trees planted in the pond buffer need to be watered during the first growing season. In general, consider watering every 3 days for first month, and then weekly during the remainder of the first growing season (April - October), depending on rainfall.

Routine Maintenance Guidelines

Wet Ponds must be inspected to ensure that they operate in good working condition. Items in need of repair must be immediately addressed.

Routine Maintenance Tasks

Remove trash and debris As needed Check and repair eroded areas - Annually

Check for and remove nuisance animals and burrows - Annually

Forebay inspection and cleanout Annually-remove sediment when forebay reaches 50% capacity or every 7 years

Inspect plant composition for consistency with approved plans and correct any deficiencies Annually

Inspect and repair any clogging or damage to the orifice - Annually

Inspect and exercise all mechanical devices - Annually

Inspect for and repair structural damage and leaks - Annually

Inspect and repair any damaged or clogged inlets and outlets - Annually

Remove woody vegetation on or near, forebays, spillways, and outlets - Annually

Check sediment accumulation in the permanent pool - Annually, dredge if necessary

Replace dead or damaged plant material As needed Repair broken pipes - As needed

Luminaire Schedule

Symbol	Qty	Label	Description	Arrangement	Luminaire Lumens	Luminaire Watts
	4	CLS25-12W-4K-III	CLASSIC I -12W-4K-III	Single	1060	13.1
	8	LTN WALL MOUNT 5W 4K	LTN 5W 4K SMT-V-OA	Single	659	5.5

RUTLAND STREET DOVER NH

CLASSIC I-12W 4K III
LTN-WM 5W-4K-V

ECHO LIGHTING INC

5618 EAST WASHINGTON BLVD
COMMERCE, CA 90040



Luminaire Location Summary						
SeqNo	Label	X	Y	Z	Orient	Tilt
1	LTN WALL MOUNT 5W 4K	1193860. 518	250197.2 59	6	46.105	0
2	LTN WALL MOUNT 5W 4K	1193844. 894	250212.5 55	6	43.62	0
3	LTN WALL MOUNT 5W 4K	1193828. 865	250227.7 46	6	48.463	0
4	LTN WALL MOUNT 5W 4K	1193813. 099	250243.0 48	6	42.565	0
5	LTN WALL MOUNT 5W 4K	1193797. 211	250258.3 07	6	38.004	0
6	LTN WALL MOUNT 5W 4K	1193781. 389	250273.6 09	6	47.226	0
7	LTN WALL MOUNT 5W 4K	1193765. 558	250288.8 42	6	49.973	0
8	LTN WALL MOUNT 5W 4K	1193749. 713	250304.0 3	6	44.672	0
9	CLS25-12W- 4K-III	1193819. 017	250308.7 47	8	225.031	0
10	CLS25-12W- 4K-III	1193850. 549	250277.1 01	8	223.901	0
11	CLS25-12W- 4K-III	1193899. 162	250228.4 84	8	227.436	0
12	CLS25-12W- 4K-III	1193777. 578	250350.4 45	8	314.237	0

RUTLAND STREET DOVER NH

CLASSIC I-12W 4K III
LTN-WM 5W-4K-V

ECHO LIGHTING INC

5618 EAST WASHINGTON BLVD
COMMERCE, CA 90040

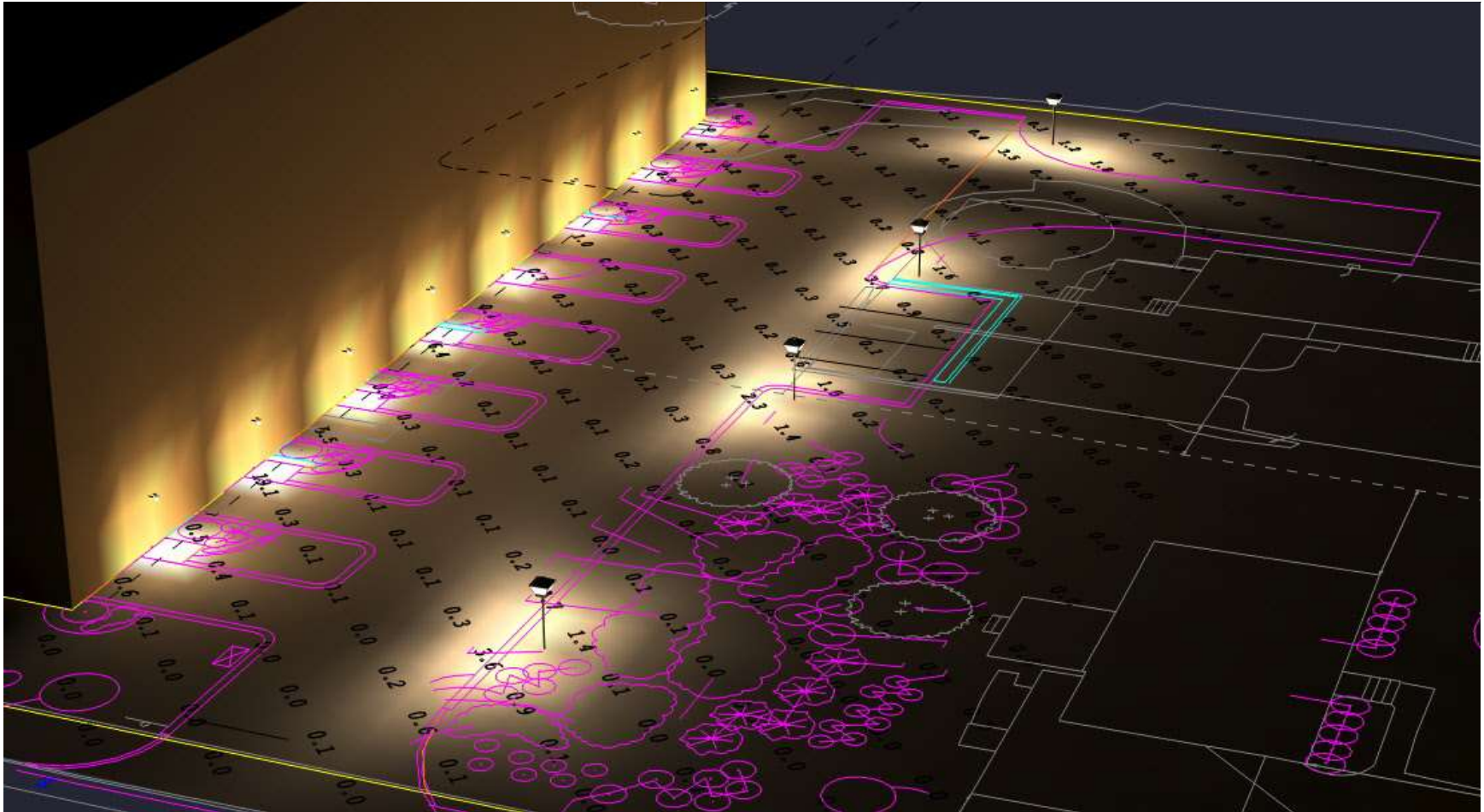




RUTLAND STREET DOVER NH
 CLASSIC I-12W 4K III
 LTN-WM 5W-4K-V

ECHO LIGHTING INC
 5618 EAST WASHINGTON BLVD
 COMMERCE, CA 90040





RUTLAND STREET DOVER NH

CLASSIC I-12W 4K III
LTN-WM 5W-4K-V

ECHO LIGHTING INC

5618 EAST WASHINGTON BLVD
COMMERCE, CA 90040



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COMMERCE, CA 90040



RUTLAND STREET DOVER NH

CLASSIC I-12W 4K III
LTN-WM 5W-4K-V

ECHO LIGHTING INC

5618 EAST WASHINGTON BLVD
COMMERCE, CA 90040



ECHO LIGHTING, INC.
COMMERCE, CA 90040

Eagle Heights
71 & 73 Rutland Street
Dover, New Hampshire 03820

ASSESSORS: PARCEL ID:
#14017 (LOT B)
#14017-A (LOT A)

PREPARED FOR

Diamond
Capital, LLC

170 Commerce Way, Suite 200
Portsmouth, New Hampshire 03801

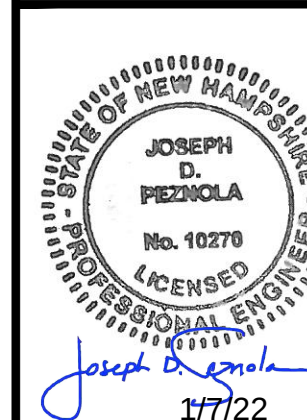
HANCOCK
ASSOCIATES

Civil Engineers

Land Surveyors

Wetland Scientists

10 FERRY STREET, SUITE 406, CONCORD, NH 03301
VOICE (603) 223-1950, FAX (978) 774-7816
WWW.HANCOCKASSOCIATES.COM



SITE PREPARATION & DEMOLITION PLAN

PLOT DATE: Jan 10, 2022 10:41 am

DWG: 23800sp4.dwg

LAYOUT: *Site*

SHEET: 2 OF 10

PROJECT NO.

23800

1. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE DONE AS SET FORTH IN THE MOST CURRENT STATE SEDIMENT AND EROSION CONTROL MANUAL.
2. THOSE AREAS UNDERGOING ACTUAL CONSTRUCTION WILL BE LEFT IN AN UNTREATED OR UNVEGETATED CONDITION FOR A MINIMUM TIME. AREAS SHALL BE PERMANENTLY STABILIZED WITHIN 15 DAYS OF FINAL GRADING AND TEMPORARILY STABILIZED WITHIN 30 DAYS OF INITIAL DISBURSEMENT OF THE SOIL. IF THE DISTURBANCE IS WITHIN 100 FEET OF A STREAM OR WATERWAY, THE AREA SHALL BE STABILIZED WITHIN 7 DAYS OR PRIOR TO ANY STORM EVENT (THIS WOULD INCLUDE WETLANDS).
3. SEDIMENT BARRIERS (SILT FENCE, STRAW BARRIERS, ETC.) SHOULD BE INSTALLED PRIOR TO ANY SOIL DISBURSEMENT OF THE CONTRIBUTING DRAINAGE AREA ABOVE THEM. MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL AREAS WITH SLOPES GREATER THAN 15% AFTER OCTOBER 1ST THE SAME APPLIES FOR ALL SLOPES GREATER THAN 8%.
4. INSTALL SILTATION BARRIER AT TOE OF SLOPE TO FILTER SILT FROM RUNOFF. SEE SILTATION BARRIER DETAILS FOR PROPER INSTALLATION. SILTATION BARRIER WILL REMAIN IN PLACE PER NOTE #5.
5. ALL EROSION CONTROL STRUCTURES WILL BE INSPECTED, REPLACED AND/OR REPAIRED EVERY 7 DAYS AND IMMEDIATELY FOLLOWING ANY SIGNIFICANT RAINFALL OR SNOW MELT OR WHEN NO LONGER SERVICABLE DUE TO SEDIMENT ACCUMULATION OR DECOMPOSITION. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH ABOVE THE HEIGHT OF THE BARRIER. SEDIMENT CONTROL DEVICES SHALL REMAIN IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL AREAS UPSLOPE ARE STABILIZED BY TURF.
6. NO SLOPES, EITHER PERMANENT OR TEMPORARY, SHALL BE STEEPER THAN TWO TO ONE (2:1).
7. TEMPORARY SEEDING OF DISTURBED AREAS THAT HAVE NOT BEEN FINAL GRADED SHALL BE COMPLETED 45 DAYS PRIOR TO THE FIRST KILLING FROST TO PROTECT FROM SPRING FLOOD PROBLEMS.
8. DURING THE CONSTRUCTION PHASE, INTERCEPTED SEDIMENT WILL BE RETURNED TO THE SITE AND REGRADED INTO OPEN AREAS.
9. CONTRACTOR TO INSTALL COMPOST FILTER TUBES DOWN SLOPE OF ALL EXCAVATIONS.

- A. SELECTED GENERAL CONTRACTOR (GC) MUST ADVISE ALL SUB-CONTRACTORS OF PROPOSED PARK LOCATIONS, STABILIZED CONSTRUCTION ENTRANCE, AND STAGING LOCATIONS.
- B. CONTRACT DIG-SAFE 72 HOURS PRIOR TO ANY EARTHWORK.
- C. GIVEN THE SEASONAL HIGH-WATER ELEVATIONS DETERMINED FOR THE SITE, DE-WATERING IS ANTICIPATED. SHOULD ANY DE-WATERING BE REQUIRED, SC TO INCORPORATE THE USE OF DE-WATERING BAGS OR OTHER ACCEPTABLE METHOD OF DE-WATER. DIRECT DISCHARGE TO CATCH BASIN STRUCTURES IS FORBIDDEN.
- D. REFUELING OF MACHINERY OVER CATCH BASINS IS FORBIDDEN. GC TO HAVE AN EMERGENCY SPILL KIT ONSITE AT ALL TIMES. IMMEDIATELY REPORT ANY FUEL SPILLS TO THE DOWRY FIRE DEPARTMENT.
- E. CONTRACTOR TO USE WATER AS A MEANS FOR DUST CONTROL AS NECESSARY DURING CONSTRUCTION.
- F. ALL EQUIPMENT MUST BE SECURED OVERNIGHT.

	PROP. CONTOUR
	SPOT GRADE
	PROP. FENCE
	PROP. BITUMINOUS PAVEMENT
	PROP. CONCRETE CEMENT
	PROP. RETAINING WALL
	PROP. CURBING
	PROP. DRAIN
	PROP. ROOF DRAIN
	PROP. WATER LINE
	PROP. GAS LINE
	PROP. SEWER
	PROP. ELECTRIC, CABLE, & TELE.
	PROP. TELEVISION
	PROP. EROSION CONTROL
	PROP. CATCH BASIN
	PROP. OUTLET CONTROL STRUCTURE
	PROP. SEWER MANHOLE
	PROP. FLARED END SECTION W/R/RAP
	TOP OF CURB/BOTTOM OF CURB
	TOP OF WALL/BOTTOM OF WALL
	PROP. CLEANOUT
	HIGH-DENSITY POLYETHYLENE
	POLYVINYL CHLORIDE
	PROP. BITUMINOUS BERM
	PROP. BITUMINOUS CURB
	PROP. FLOW ARROW
	PROP. HYDRANT
	TEST PIT
	ECHO QLS32-36W-4K-III & -IV
	LIGHT POLE

GRAPHIC SCALE" 1 INCH = 20 FEET



PLAN REFERENCE:

1. EXISTING CONDITIONS TAKEN FROM A PLAN TITLED "EXISTING CONDITIONS PLAN OF LAND IN DOVER, NH", DATED MARCH 12, 2020 AND LAST REVISED ON MARCH 24, 2020. PLAN WAS PREPARED BY HANCOCK ASSOCIATES.
2. PROPOSED BUILDING FOOTPRINT DESIGNED BASED ON THE PLAN TITLED "FIRST FLOOR CONCEPT", DATED 03/16/21. PREPARED BY KOAL ARCHITECTURE, PLLC.

Eagle Heights
71 & 73 Rutland Street
Dover, New Hampshire 03820

ASSESSORS:

PARCEL ID:
#14017 (LOT B)
#14017-A (LOT A)

PREPARED FOR:

Diamond
Capital, LLC

170 Commerce Way, Suite 200
Portsmouth, New Hampshire 03801

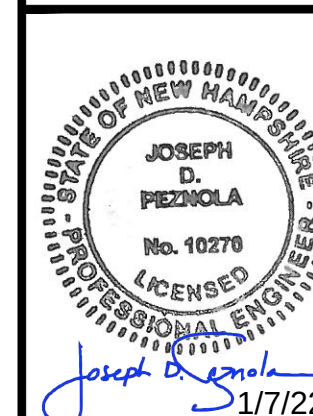
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VOICE (603) 223-1950, FAX (978) 774-7816
WWW.HANCOCKASSOCIATES.COM



1	EJR	JDP	01/07/22	TRC COMMENTS
NO.	BY	APP	DATE	ISSUE/REVISION DESCRIPTION
DATE:	09/10/21		DESIGN BY:	EJR
SCALE:	1" = 20'		DRAWN BY:	EJR
APPRVD. BY:	JDP	CHECK BY:	AD	

LAYOUT & MATERIALS PLAN

PLOT DATE: Jan 10, 2022 10:41 am

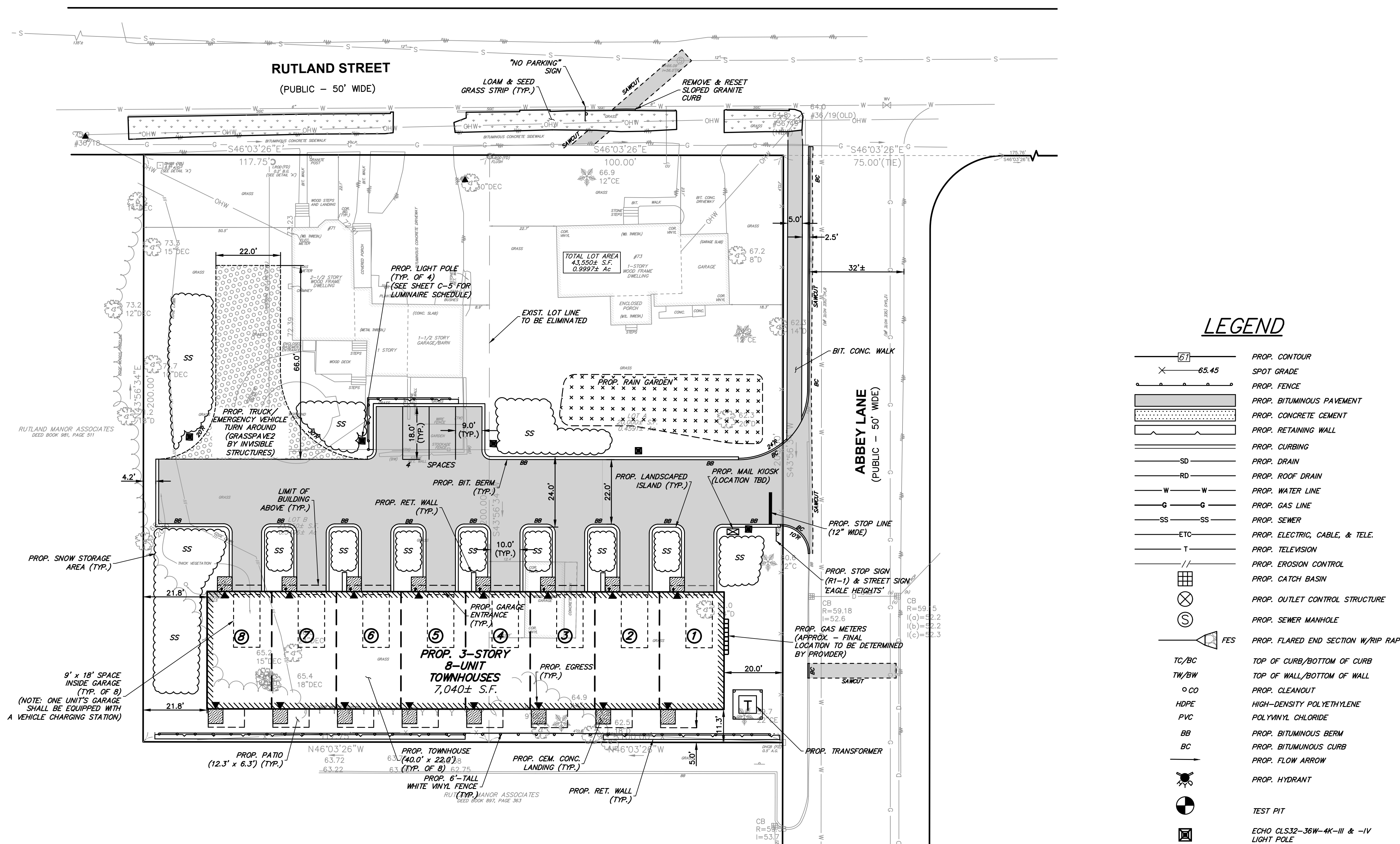
DWG: 23800sp4.dwg

LAYOUT: *Layout*

SHEET: 3 OF 10

PROJECT NO.:

23800



PLAN REFERENCE:

1. EXISTING CONDITIONS TAKEN FROM A PLAN TITLED "EXISTING CONDITIONS PLAN OF LAND IN DOVER, NH", DATED MARCH 12, 2020 AND LAST REVISED ON MARCH 24, 2020. PLAN WAS PREPARED BY HANCOCK ASSOCIATES.
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PARKING SUMMARY:

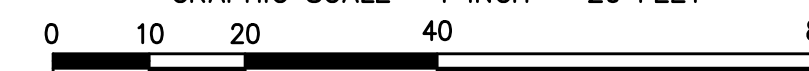
REQUIRED: 1.9 SPACES/UNIT MAX.
(1.4 SPACES/UNIT + 0.5 PER VISITOR)

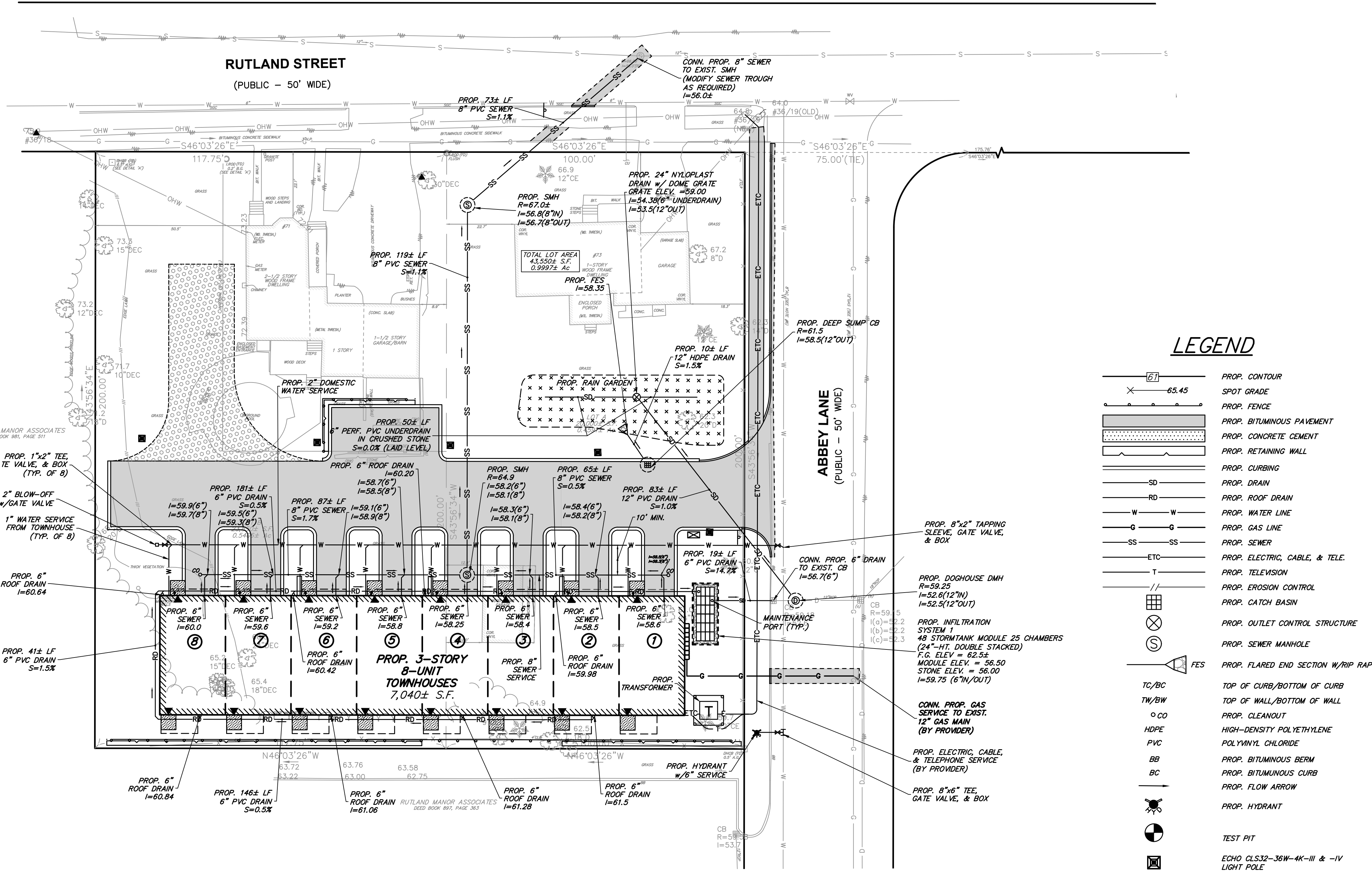
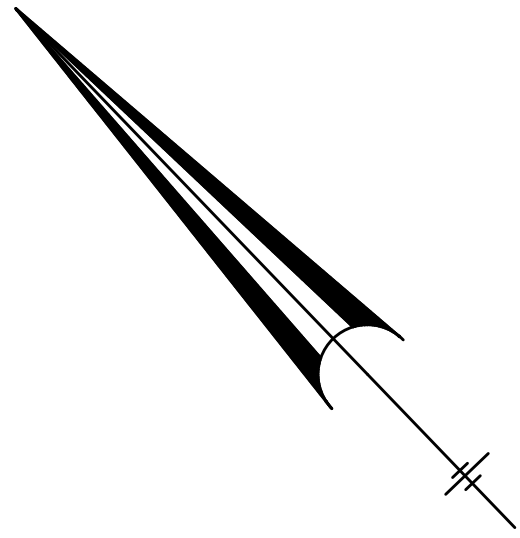
PROPOSED: 4 VISITOR SPACES
+ 8 GARAGE SPACES
12 SPACES

$$12 \text{ SPACES} / 8 \text{ UNITS} = 1.5 \text{ SPACES/UNIT}$$

NOTE: BIKE STORAGE WILL BE CONTAINED WITHIN EACH GARAGE UNIT.

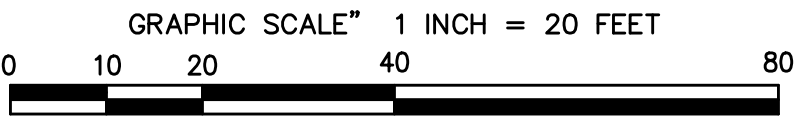
GRAPHIC SCALE" 1 INCH = 20 FEET





- PLAN REFERENCE:**
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- NOTES:**
- FOR MORE UTILITY INFORMATION REGARDING PIPE SIZES, MATERIALS, LENGTHS, INVERTS, ETC., SEE SHEET C-5.
 - TRANSFORMER AND ELECTRICAL CONDUIT LAYOUT TO BE DETERMINED BY PROVIDER.



PERMIT SITE PLAN

Eagle Heights
71 & 73 Rutland Street
Dover, New Hampshire 03820

ASSESSORS:
PARCEL ID:
#14017 (LOT B)
#14017-A (LOT A)

PREPARED FOR:
**Diamond
Capital, LLC**

170 Commerce Way, Suite 200
Portsmouth, New Hampshire 03801

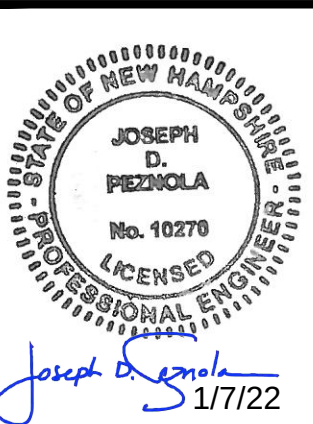
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1	EJR	JDP	01/07/22	TRC	COMMENTS
NO.	BY	APP	DATE	ISSUE/REVISION	DESCRIPTION
DATE:	09/10/21	DESIGN BY:	EJR		
SCALE:	1" = 20'	DRAWN BY:	EJR		
APPROV. BY:	JDP	CHECK BY:	AD		

UTILITY PLAN

PLOT DATE: Jan 10, 2022 10:45 am
PATH: G:\Civil 3D Projects\23800 - Diamond Cap - Dover, NH\Eng\DWG\

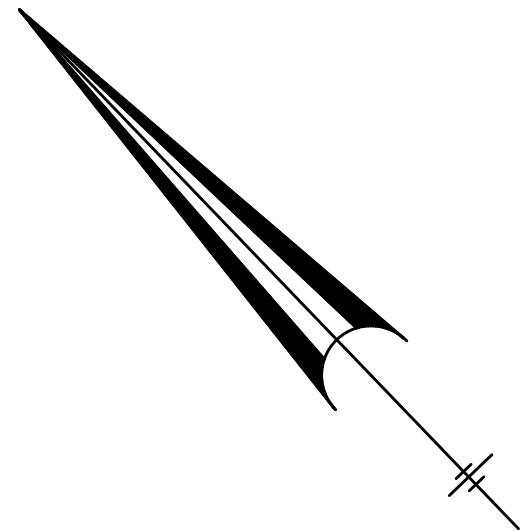
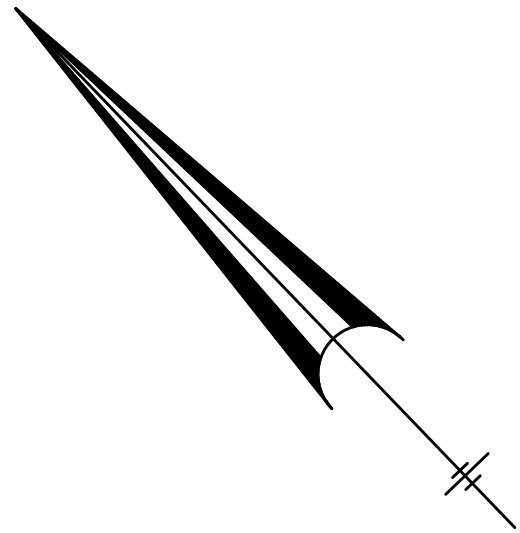
DWG: 23800sp4.dwg

LAYOUT: Utility

SHEET: 4 OF 10

PROJECT NO.: 23800

C-3



BMP SIZING CALCULATIONS:

BIORETENTION SYSTEM (RAIN GARDEN)

TOTAL AREA DRAINING TO PRACTICE (A) = 16,718 S.F. (0.38 Ac)
IMPERVIOUS AREA DRAINING TO PRACTICE (A_i) = 8,086 S.F. (0.19 Ac)
PERCENT IMPERVIOUS AREA DRAINING TO PRACTICE (I) = 0.19 A_i/0.38 Ac = 0.48
RUNOFF COEFFICIENT (R_v) = 0.05 + (0.9 x I) = 0.49
WQV = 1" x R_v x A = 1" x 0.49 x 0.38 Ac = 0.19 Ac-in = 676 C.F.

PER NHDES DESIGN STANDARDS:

VOLUME BELOW LOWEST ORIFICE = 2,046 C.F. > 676 C.F. (WQV)

(FOR MORE RAIN GARDEN INFORMATION SEE STORMWATER REPORT)

INFILTRATION SYSTEM 1 (ROOF DRAINAGE)

EFFECTIVE IMPERVIOUS AREA ON PROJECT SITE (A_i) = 21,640 ± S.F.
GROUNDWATER RECHARGE DEPTH (R_g) = 0.10' (HYDRAULIC SOIL GROUP C)
GROUNDWATER RECHARGE VOLUME (GRV) = A_i x R_g = 21,640 S.F. x 0.10' = 2,164 S.F.-in
GRV = 180.3 C.F.

PROP. INFILTRATION SYSTEM 1:
48 STORMTANK MODULE 25 CHAMBERS (24" - HEIGHT DOUBLE STACKED)

STACKED CHAMBER DIMENSIONS: 1.5' WIDTH x 3.0' LENGTH x (2.0'+2.0') HEIGHT
CHAMBER VOIDS: 96.5%
OUTLET PIPE INVERT: 59.75
CHAMBER INVERT: 56.50
STONE INVERT: 56.00

EXCAVATION AREA = 160.0 S.F.

CHAMBER VOLUME = 24 CHAMBERS * [1.5' x 3.0' x (59.75-56.50)] * 96.5%
CHAMBER VOLUME = 351.0 C.F. * 96.5% = 338.7 C.F.

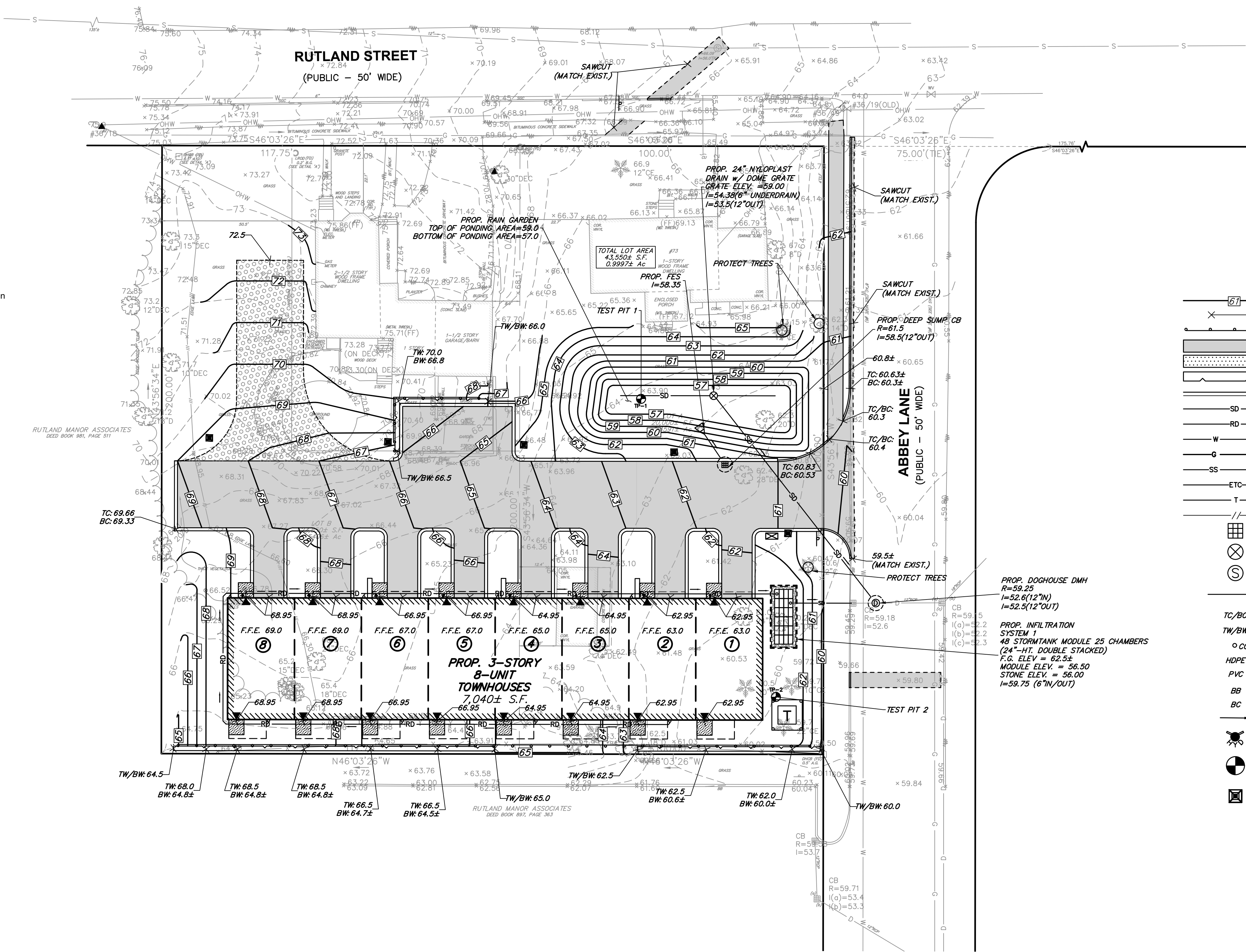
CR. STONE VOLUME = [160.0 S.F. x (59.75-56.00) - 351.0 C.F.] * 40%
CR. STONE VOLUME = 99.6 C.F.

PROP. RECHARGE VOLUME = 338.7 C.F. + 99.6 C.F. = 438.3 C.F. >> 180.3 C.F.

TEST PIT DATA:

SOIL TESTING CONDUCTED ON 10/22/21 AT 9:30 AM BY JOE PEZNOLA, PE OF HANCOCK ASSOCIATES.

TEST PIT 1	TEST PIT 2
A (L) 0"	A (L) 0"
B (L) 3"	B (L) 3"
C/D (SCL) 24"	C/D (SCL) 12"
NO GW OBSERVED	NO GW OBSERVED - SOIL MOIST @ 72"



LEGEND

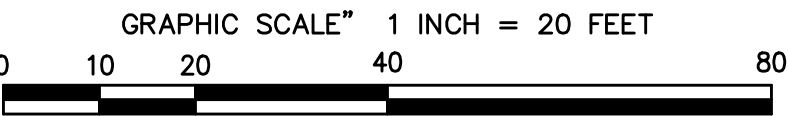
	PROP. CONTOUR
	SPOT GRADE
	PROP. FENCE
	PROP. BITUMINOUS PAVEMENT
	PROP. CONCRETE CEMENT
	PROP. RETAINING WALL
	PROP. CURBING
	PROP. DRAIN
	PROP. ROOF DRAIN
	PROP. WATER LINE
	PROP. GAS LINE
	PROP. SEWER
	PROP. ELECTRIC, CABLE, & TELE.
	PROP. TELEVISION
	PROP. EROSION CONTROL
	PROP. CATCH BASIN
	PROP. OUTLET CONTROL STRUCTURE
	PROP. SEWER MANHOLE
	PROP. FLARED END SECTION W/rip RAP
	TOP OF CURB/BOTTOM OF CURB
	TOP OF WALL/BOTTOM OF WALL
	PROP. CLEANOUT
	HIGH-DENSITY POLYETHYLENE
	POLYVINYL CHLORIDE
	PROP. BITUMINOUS BERM
	PROP. BITUMINOUS CURB
	PROP. FLOW ARROW
	PROP. HYDRANT
	TEST PIT
	ECHO CLS32-36W-4K-III & -IV LIGHT POLE

PLAN REFERENCE:

- EXISTING CONDITIONS TAKEN FROM A PLAN TITLED "EXISTING CONDITIONS PLAN OF LAND IN DOVER, NH", DATED MARCH 12, 2020 AND LAST REVISED ON MARCH 24, 2020. PLAN WAS PREPARED BY HANCOCK ASSOCIATES.
- PROPOSED BUILDING FOOTPRINT DESIGNED BASED ON THE PLAN TITLED "FIRST FLOOR CONCEPT", DATED 03/16/21, PREPARED BY KOAL ARCHITECTURE, PLLC.

NOTE:

FOR MORE UTILITY INFORMATION REGARDING PIPE SIZES, MATERIALS, LENGTHS, INVERTS, ETC., SEE SHEET C-5.



**PERMIT
SITE
PLAN**

Eagle Heights
71 & 73 Rutland Street
Dover, New Hampshire 03820

ASSESSORS:

PARCEL ID:
#14017 (LOT B)
#14017-A (LOT A)

PREPARED FOR:

Diamond
Capital, LLC

170 Commerce Way, Suite 200
Portsmouth, New Hampshire 03801

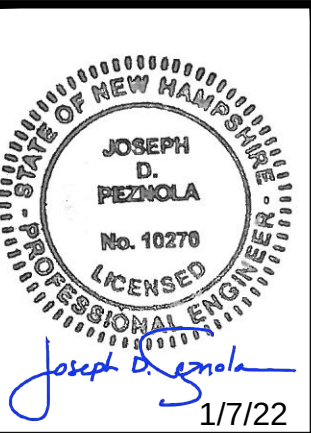
**HANCOCK
ASSOCIATES**

Civil Engineers

Land Surveyors

Wetland Scientists

10 FERRY STREET, SUITE 406, CONCORD, NH 03301
VOICE (603) 223-1950, FAX (978) 774-7816
WWW.HANCOCKASSOCIATES.COM



NO.	BY	APP	DATE	ISSUE/REVISION	DESCRIPTION
1	EJR	JDP	01/07/22	TRC	COMMENTS

**GRADING &
DRAINAGE
PLAN**

PLOT DATE: Jan 10, 2022, 10:45 am
PATH: G:\Cadd\3D Projects\23800 - Diamond Cap - Dover, NH\Eng\DWG\

DWG: 23800sp4.dwg

LAYOUT: Grading

SHEET: 5 OF 10

PROJECT NO.:

23800

C-4

AREALIGHTING | POLEMOUNT
PROJECT: RUTLAND STREET (13135)

CLS32 SERIES
FEATURES + BENEFITS

- Industry leading LED systems
- High efficiency & energy savings
- Environmentally friendly
- Reliable & low-maintenance
- 5-year limited warranty
- UL Listed electrical components
- Suitable for wet conditions

SPECIFICATIONS

LUMINAIRE: All aluminum construction
LIGHT SOURCE: 36W LED 4000K
DRIVER: Electronic LED Driver, 120V-277V, 480V Available, Dimming Leads Optional 0-10V
DIFFUSER: Injection molded lens with open frame
OPTICS: Type III
OPTIONS: N/A
ARM: N/A
POLE: 4"OD straight round aluminum pole with cast decorative base (Washington/DCB4)
ANCHOR BOLTS: (4)1/2" x 18" x 3" galvanized anchor bolts on an 8" diameter bolt circle
FINISH: Powder coat. Standard colors are Black, White, Dark Bronze, and Silver. Custom Colors and RAL Colors Available. Consult Factory. All exposed hardware shall be stainless steel.

CATALOG # CLS32-36W-4K-SMT-III-OF-SRAP4-12-DCB4

APPROVED BY: DATE: _____

ECHO LIGHTING, INC.
Ph: +1-323-890-9008 5618 E. Washington Blvd.
Fax: +1-323-890-1981 Commerce, CA 90040
Email: info@echolighting.com www.echolighting.com

AREALIGHTING | POLEMOUNT
PROJECT: RUTLAND STREET (13135)

CLS32 SERIES
FEATURES + BENEFITS

- Industry leading LED systems
- High efficiency & energy savings
- Environmentally friendly
- Reliable & low-maintenance
- 5-year limited warranty
- UL Listed electrical components
- Suitable for wet conditions

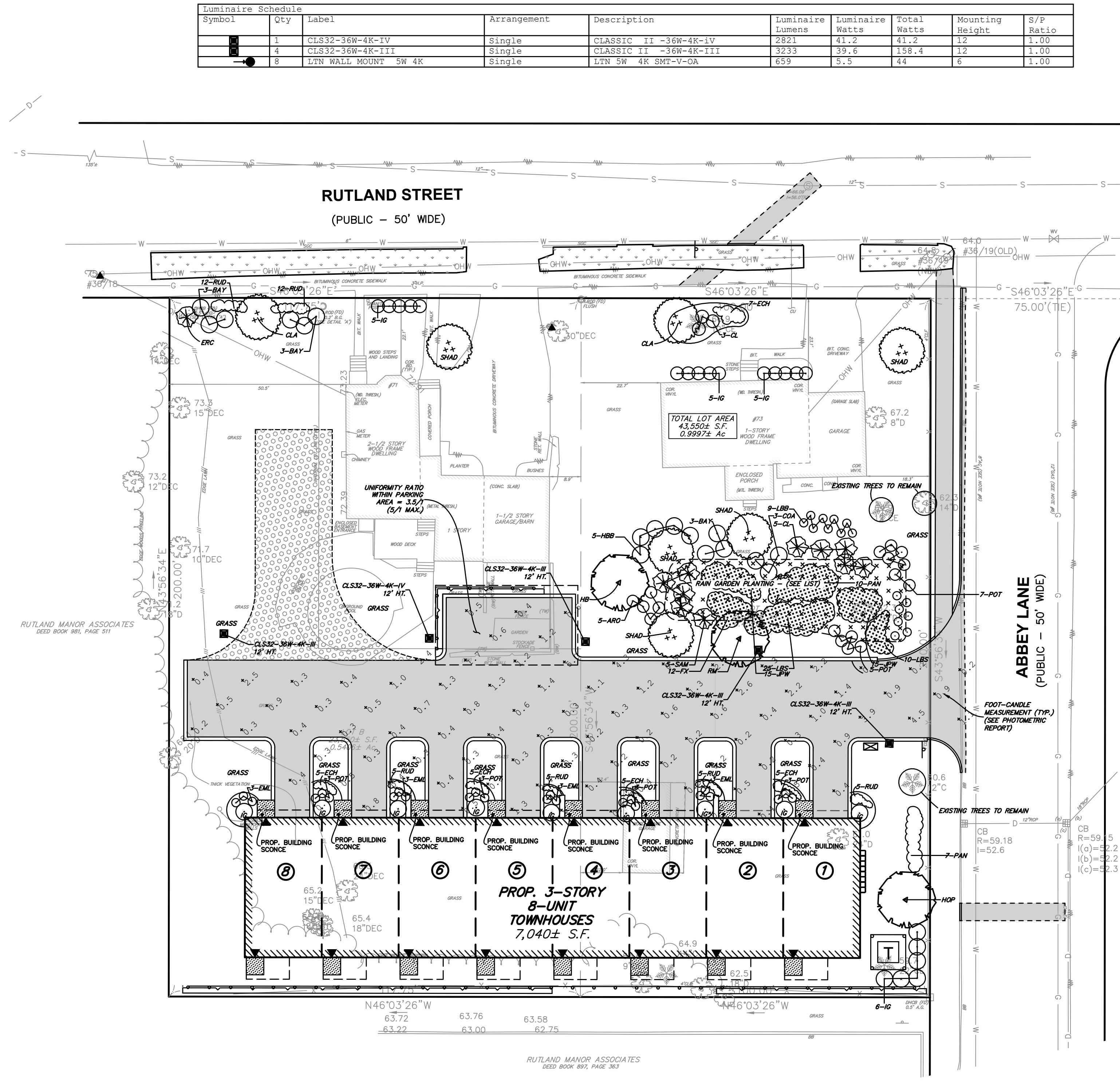
SPECIFICATIONS

LUMINAIRE: All aluminum construction
LIGHT SOURCE: 36W LED 4000K
DRIVER: Electronic LED Driver, 120V-277V, 480V Available, Dimming Leads Optional 0-10V
DIFFUSER: Injection molded lens with open frame
OPTICS: Type IV
OPTIONS: N/A
ARM: N/A
POLE: 4"OD straight round aluminum pole with cast decorative base (Washington/DCB4)
ANCHOR BOLTS: (4)1/2" x 18" x 3" galvanized anchor bolts on an 8" diameter bolt circle
FINISH: Powder coat. Standard colors are Black, White, Dark Bronze, and Silver. Custom Colors and RAL Colors Available. Consult Factory. All exposed hardware shall be stainless steel.

CATALOG # CLS32-36W-4K-SMT-III-OF-SRAP4-12-DCB4

APPROVED BY: DATE: _____

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Fax: +1-323-890-1981 Commerce, CA 90040
Email: info@echolighting.com www.echolighting.com



Plant Schedule

Qty	Key	Botanical Name	Common Name	Size
TREES:				
2	CLA	Cladrastis kentuckea	Yellowwood	2-2.5'
1	HB	Betula nigra	River Birch	10-12'
1	HOP	Ostrya virginiana	American Hophornbeam	2-2.5'
1	RM	Acer rubrum 'Red Sunset'	Red Sunset Maple	2-2.5'
5	SHAD	Amelanchier canadensis	Downy Shadblow	8-10'
SHRUBS:				
5	ARO	Aronia arbutifolia	Chokeberry	#3pot
9	BAY	Myrica pensylvanicum	Northern Bayberry	#3pot
8	CL	Clethra alnifolia	Sweet Pepper	#3pot
3	COA	Cornus amomum	Silky Dogwood	#3pot
12	EML	Kalmia angustifolia	Sheep Laurel	2'h
1	ERC	Juniperus virginiana	Eastern Red Cedar	7-8'
17	HBB	Vaccinium corymbosum	Highbush Blueberry	#3pot
30	IG	Ilex glabra 'Shamrock'	Shamrock Inkberry	#3pot
16	LBB	Vaccinium angustifolium	Low Bush Blueberry	#3pot
24	POT	Potentilla 'Abbottswood'	Abbottswood Potentilla	#3pot
5	SAM	Sambucus canadensis	American Elderberry	#3pot
GRASSES & PERENNIALS:				
27	ECH	Echinacea purpurea	Purple Coneflower	#1pot
12	FX	Carex vulpinoidea	Fox Sedge	#1pot
35	JPV	Eupatorium maculatum	Joe Pye Weed	#1pot
35	LBS	Schizachyrium scoparium	Little Bluestem	#1pot
17	PAN	Panicum virgatum	Switchgrass	#1pot
44	RUD	Rudbeckia fulgida	Black Eyed Susan	#1pot

PERMIT SITE PLAN

Eagle Heights
71 & 73 Rutland Street
Dover, New Hampshire 03820

ASSESSORS: PARCEL ID:
#14017 (LOT B)
#14017-A (LOT A)

PREPARED FOR:

Diamond Capital, LLC

170 Commerce Way, Suite 200
Portsmouth, New Hampshire 03801

HANCOCK ASSOCIATES

Civil Engineers
Land Surveyors
Wetland Scientists

10 FERRY STREET, SUITE 406, CONCORD, NH 03301
VOICE (603) 223-1950, FAX (978) 774-7816
WWW.HANCOCKASSOCIATES.COM

LTN SERIES
AREA LIGHTING | WALL MOUNT

LTNS

SPECIFICATIONS

LUMINAIRE: All aluminum construction.
DRIVER: Electronic LED driver, 120-277V
Options: 480V Driver, Dimming control 0-10V
ELECTRICAL: All components UL recognized. Luminaire shipped complete & ready to install.
FINISH: Powder coat - Standard colors are Black, White, Dark Green & Dark Bronze. Custom colors available, consult factory. All exposed hardware shall be stainless-steel.

ORDER INFORMATION EXAMPLE: LTNS-12W-4K-SMT-V-WM-CC-HSS

SERIES	WATTAGE	COLOR TEMP	VOLTAGE	OPTICS	FINISH	OPTIONS
LTNS	12W	27K	480V	TYPE V	WHIT	MS
		30K			WHIT	
		35K			WHIT	
		40K			WHIT	
		50K			WHIT	
		60K			WHIT	
		70K			WHIT	
		80K			WHIT	
		90K			WHIT	
		100K			WHIT	
		110K			WHIT	
		120K			WHIT	
		130K			WHIT	
		140K			WHIT	
		150K			WHIT	
		160K			WHIT	
		170K			WHIT	
		180K			WHIT	
		190K			WHIT	
		200K			WHIT	
		210K			WHIT	
		220K			WHIT	
		230K			WHIT	
		240K			WHIT	
		250K			WHIT	
		260K			WHIT	
		270K			WHIT	
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		950K			WHIT	
		960K			WHIT	
		970K			WHIT	
		980K			WHIT	
		990K			WHIT	
		1000K			WHIT	

ECHO LIGHTING, INC.
Ph: +1-323-890-9008 5618 E. Washington Blvd.
Fax: +1-323-890-1981 Commerce, CA 90040
Email: info@echolighting.com www.echolighting.com

CLASSIC SERIES
AREA LIGHTING | POST TOP, WALL MOUNT

CLS38

SPECIFICATIONS

LUMINAIRE: All aluminum construction.
DRIVER: Electronic LED driver, 120-277V
Options: 480V Driver, Dimming control 0-10V
ELECTRICAL: All components UL recognized. Luminaire shipped complete & ready to install.
FINISH: Powder coat - Standard colors are Black, White, Dark Green & Dark Bronze. Custom colors available, consult factory. All exposed hardware shall be stainless-steel.

ORDER INFORMATION EXAMPLE: CLS38-85W-4K-SMT-OF-III-PT-BLK-BPC

SERIES	WATTAGE	COLOR TEMP	VOLTAGE	OPTICS	FINISH	OPTIONS
CLS38	85W	27K	480V	TYPE III	WHIT	BPC
		30K			WHIT	
		35K			WHIT	
		40K			WHIT	
		50K			WHIT	
		60K			WHIT	
		70K			WHIT	
		80K			WHIT	
		90K			WHIT	
		100K			WHIT	
		110K			WHIT	
		120K			WHIT	
		130K			WHIT	
		140K			WHIT	
		150K			WHIT	
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		970K			WHIT	
		980K			WHIT	
		990K			WHIT	
		1000K			WHIT	

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Email: info@echolighting.com www.echolighting.com

DECORATIVE BASES
1-PIECE HEAVY WALL CAST ALUMINUM

DCB1

DCB2

DCB3

DCB4

NOTES:

- LANDSCAPE DESIGN BY JAMES K. EMMANUEL ASSOCIATES OF MARBLEHEAD, MA.
- SITE LIGHTING DESIGN BY HURRY ASSOCIATES OF HINGHAM, MA. FOR MORE INFORMATION REGARDING LIGHT FIXTURES AND LIGHTING, PLEASE REFER TO THE PHOTOMETRIC REPORT.

GRAPHIC SCALE 1 INCH = 20 FEET

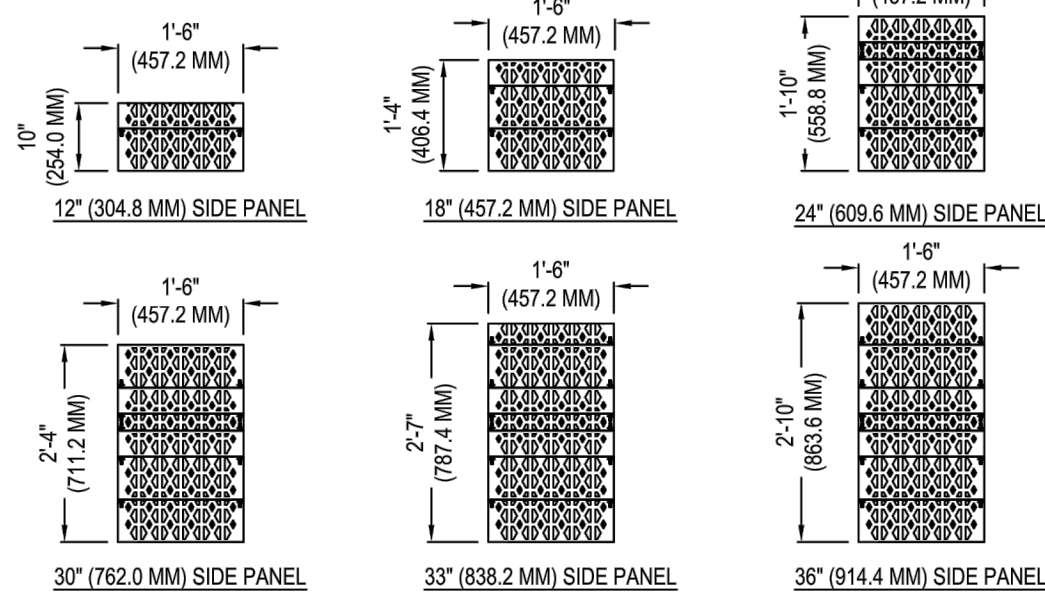
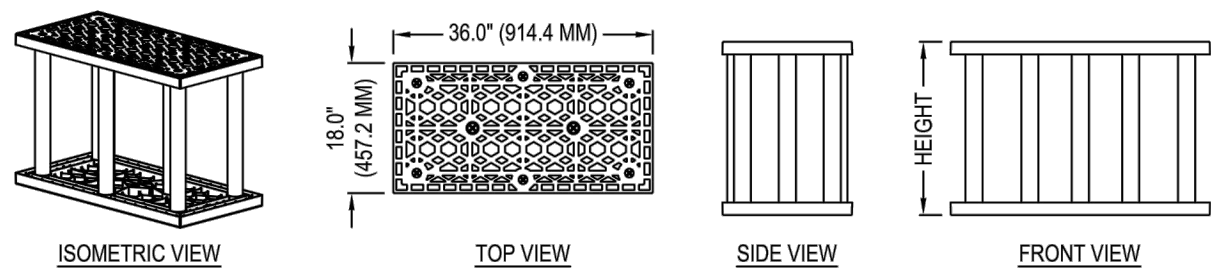
0 10 20 40 80

LEGEND

- PROP. CONTOUR
- SPOT GRADE
- PROP.



STORMTANK (BRENTWOOD INDUSTRIES)
621 BRENTWOOD DRIVE
READING, PA 19611
PHONE: (610) 374-5109
www.stormtank.com



- SIDE PANELS TO BE INSTALLED ALONG SYSTEM PERIMETER, UNLESS OTHERWISE SPECIFIED.
- ALL HEIGHTS TO BE CUT FROM A 36" (914.4 MM) SIDE PANEL AT PRE-Scribed LOCATIONS, EXCEPT 33" (838.2 MM) & 12" (304.8 MM) SIDE PANEL.

MODEL	HEIGHT (MM)	CAPACITY (M ³)	NOMINAL VOID	NOMINAL WEIGHT (KG)
2524	12" (304.8)	1.216 CF (0.1424)	99.70%	17.56 LBS (7.986)
2524	18" (457.2)	1.824 CF (0.2136)	99.60%	26.30 LBS (11.92)
2524	24" (609.6)	2.432 CF (0.2712)	99.50%	35.04 LBS (15.89)
2524	30" (762.0)	3.040 CF (0.3288)	99.40%	43.78 LBS (19.85)
2524	33" (838.2)	3.392 CF (0.3622)	99.30%	48.62 LBS (22.05)
2524	36" (914.4)	3.744 CF (0.3956)	99.20%	53.46 LBS (24.25)

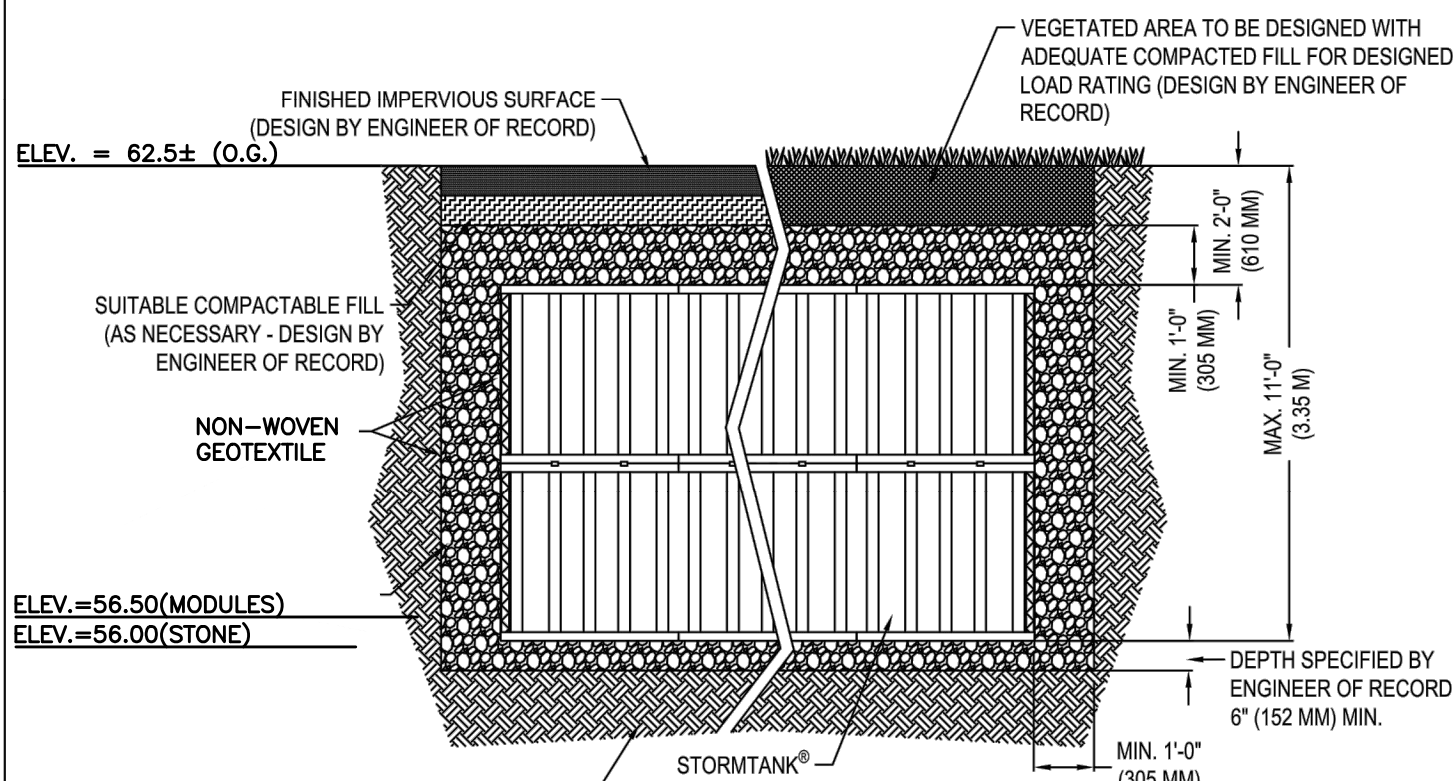
- MANUFACTURER NOTES:
1. REFERENCE CURRENT INSTALLATION INSTRUCTIONS FOR PROPER INSTALLATION PRACTICES.
 2. DO NOT SCALE DRAWING.
 3. THIS DRAWING IS INTENDED FOR USE BY ARCHITECTS, ENGINEERS, CONTRACTORS, CONSULTANTS AND DESIGN PROFESSIONALS FOR PLANNING PURPOSES ONLY. THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION.
 4. ALL INFORMATION CONTAINED HEREIN WAS CURRENT AT THE TIME OF DEVELOPMENT BUT MUST BE REVIEWED AND APPROVED BY THE PRODUCT MANUFACTURER TO BE CONSIDERED ACCURATE.
 5. CONTRACTOR'S NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT www.CADdetails.com/info AND ENTER REFERENCE NUMBER 4907-008



4907-008
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REVISION DATE: 14/05/2020
CADdetails.com



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621 BRENTWOOD DRIVE
READING, PA 19611
PHONE: (610) 374-5109
www.stormtank.com



ENGINEER OF RECORD RESPONSIBLE FOR ENSURING SUBGRADE SOILS MEET BEARING AND SETTLING REQUIREMENTS

CROSS SECTION

INFILTRATION SYSTEM 1

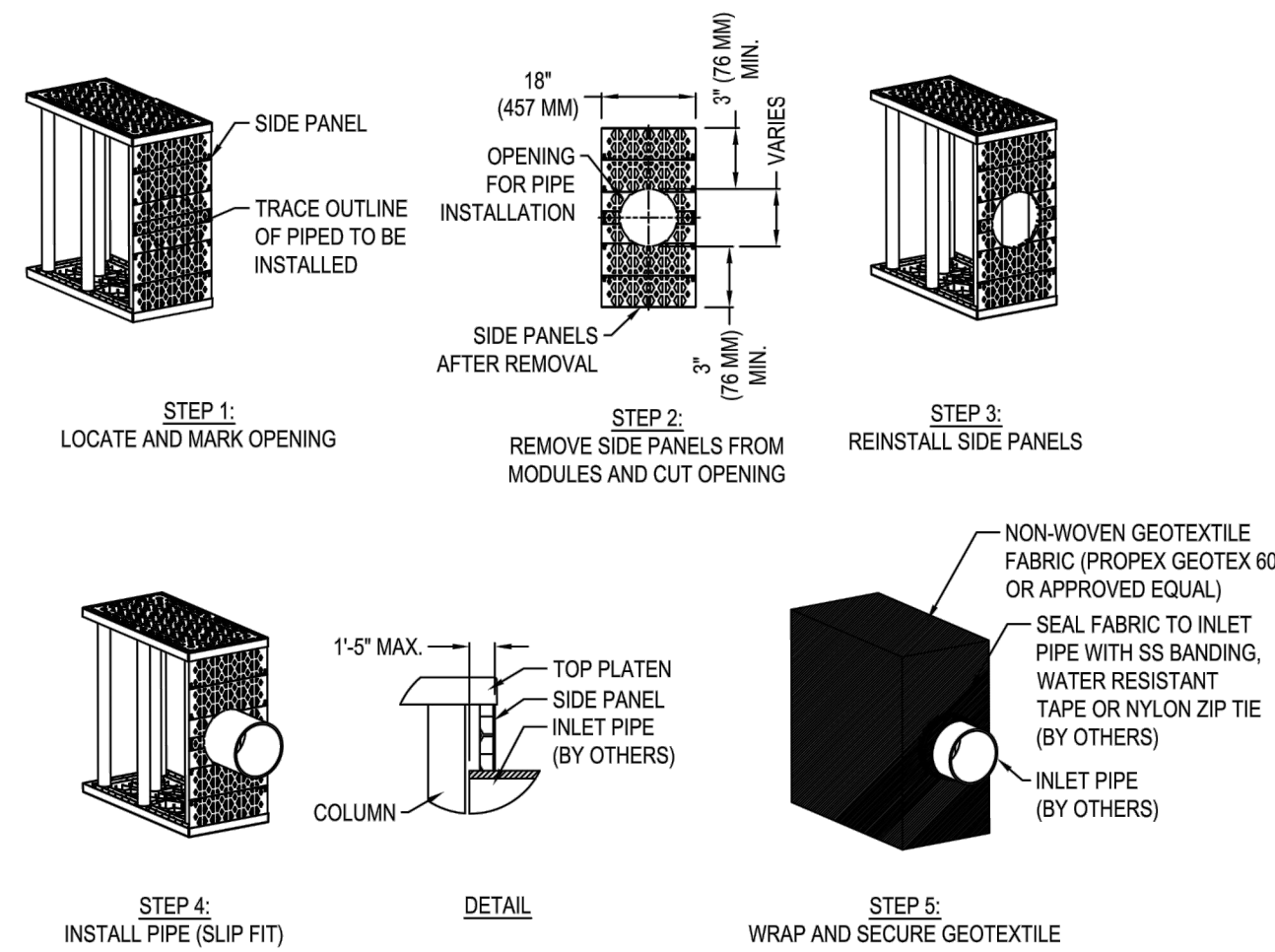
- NOTES:
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
 2. DO NOT SCALE DRAWING.
 3. THIS DRAWING IS INTENDED FOR USE BY ARCHITECTS, ENGINEERS, CONTRACTORS, CONSULTANTS AND DESIGN PROFESSIONALS FOR PLANNING PURPOSES ONLY. THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION.
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 5. CONTRACTOR'S NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT www.CADdetails.com/info AND ENTER REFERENCE NUMBER 4907-022.



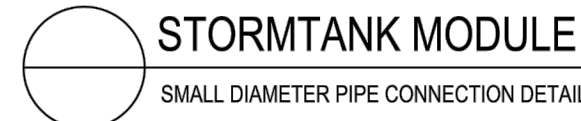
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STORMTANK (BRENTWOOD INDUSTRIES)
621 BRENTWOOD DRIVE
READING, PA 19611
PHONE: (610) 374-5109
www.stormtank.com



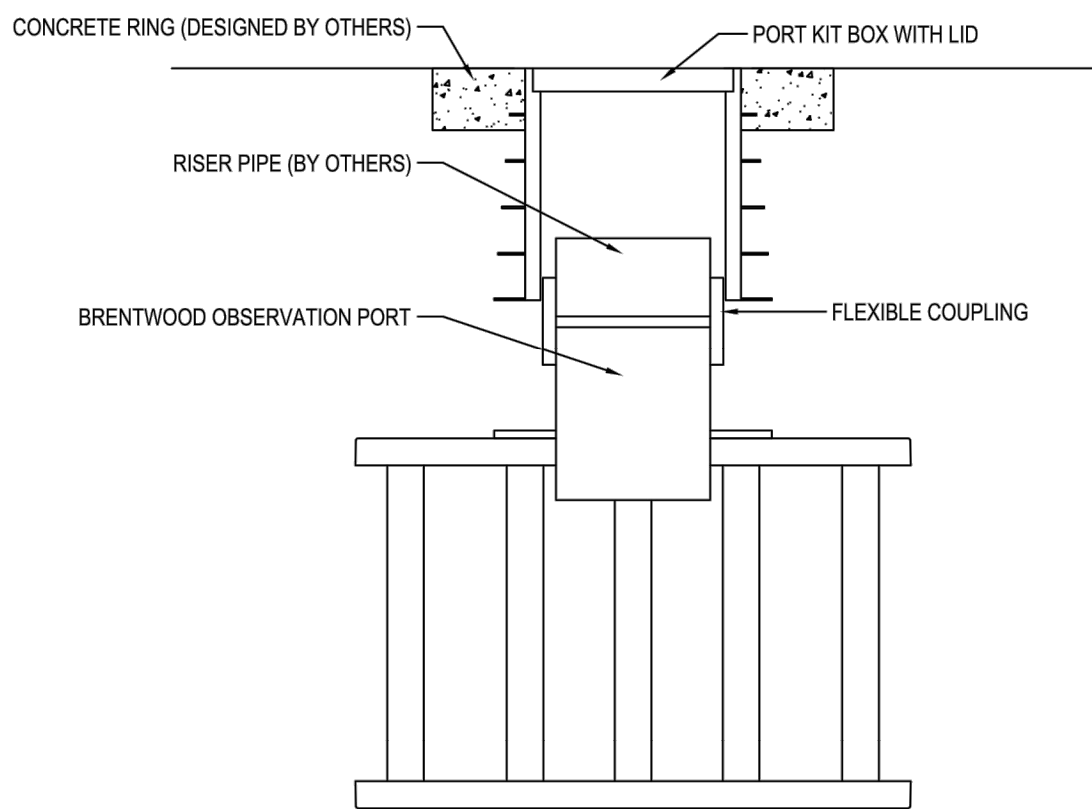
- NOTES:
1. SIDE PANELS TO BE INSTALLED ALONG SYSTEM PERIMETER, UNLESS OTHERWISE SPECIFIED.
 2. ALL HEIGHTS TO BE CUT FROM A 36" (914.4 MM) SIDE PANEL AT PRE-Scribed LOCATIONS.
 3. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
 4. DO NOT SCALE DRAWING.
 5. THIS DRAWING IS INTENDED FOR USE BY ARCHITECTS, ENGINEERS, CONTRACTORS, CONSULTANTS AND DESIGN PROFESSIONALS FOR PLANNING PURPOSES ONLY. THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION.
 6. ALL INFORMATION CONTAINED HEREIN WAS CURRENT AT THE TIME OF DEVELOPMENT BUT MUST BE REVIEWED AND APPROVED BY THE PRODUCT MANUFACTURER TO BE CONSIDERED ACCURATE.
 7. CONTRACTOR'S NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT www.CADdetails.com/info AND ENTER REFERENCE NUMBER 4907-018.



4907-018
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STORMTANK (BRENTWOOD INDUSTRIES)
621 BRENTWOOD DRIVE
READING, PA 19611
PHONE: (610) 374-5109
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SECTION

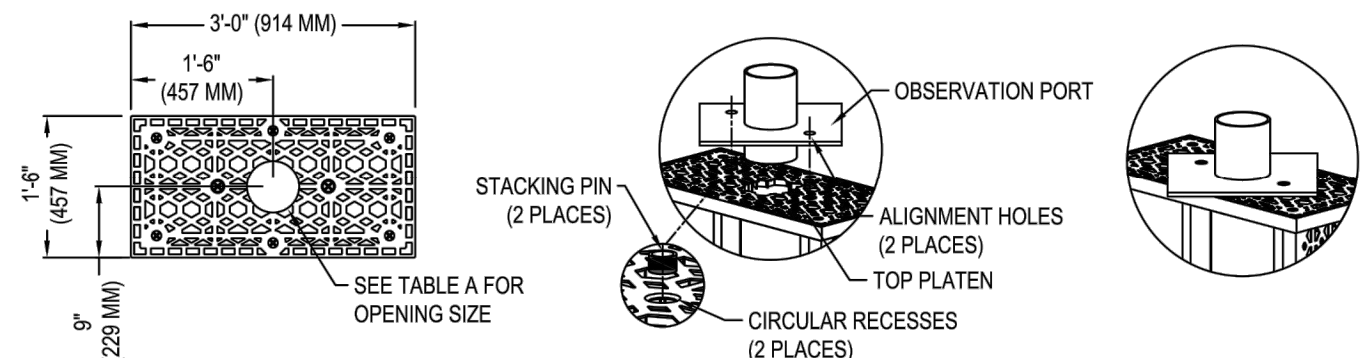
- NOTES:
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
 2. DO NOT SCALE DRAWING.
 3. THIS DRAWING IS INTENDED FOR USE BY ARCHITECTS, ENGINEERS, CONTRACTORS, CONSULTANTS AND DESIGN PROFESSIONALS FOR PLANNING PURPOSES ONLY. THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION.
 4. ALL INFORMATION CONTAINED HEREIN WAS CURRENT AT THE TIME OF DEVELOPMENT BUT MUST BE REVIEWED AND APPROVED BY THE PRODUCT MANUFACTURER TO BE CONSIDERED ACCURATE.
 5. CONTRACTOR'S NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT www.CADdetails.com/info AND ENTER REFERENCE NUMBER 4907-009.



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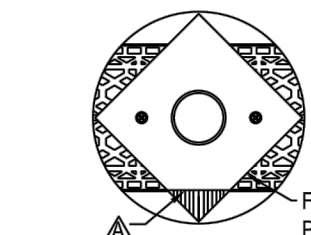


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READING, PA 19611
PHONE: (610) 374-5109
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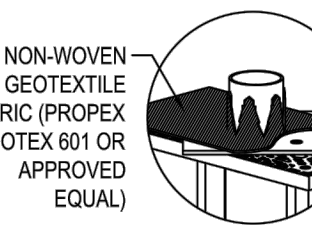


STEP 1
LAYOUT & CUT OPENING INTO THE CENTER OF THE TOP PLATEN FOR BRENTWOOD OBSERVATION PORT.

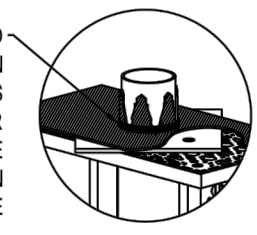
TABLE A: OBSERVATION PORT DIMENSION		
PORT SIZE	OPEN SIZE	RISER PIPE DIA
6" (152 MM)	7" (178 MM)	6" (152 MM)
8" (203 MM)	9" (229 MM)	8" (203 MM)
10" (254 MM)	11" (279 MM)	10" (254 MM)



STEP 4
PLAN VIEW - PORT PLATE IN POSITION
MARK & CUT FLANGE PLATE FLUSH WITH MODULE SIDE WHEN MODULE IS ON THE PERIMETER OF THE SYSTEM.



STEP 5
INSTALL GEOTEXTILE:
WRAP SPECIFIED GEOTEXTILE FABRIC AROUND ENTIRE INSTALLATION OF STORMTANK MODULES. CUT "X" PATTERN INTO GEOTEXTILE FABRIC AT OBSERVATION PORT AND PEEL EDGES OUT.

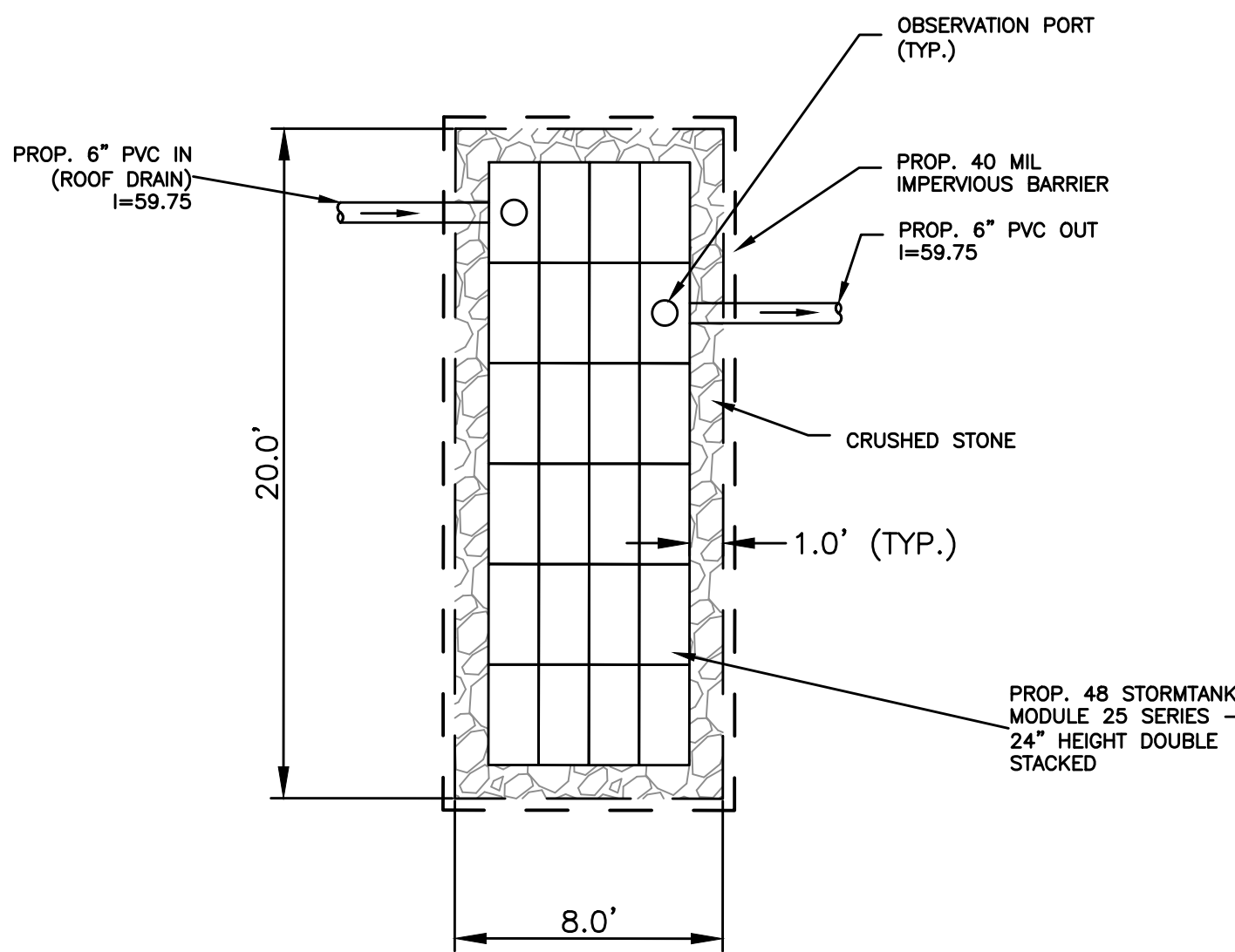


STEP 6
SEAL FABRIC TO OBSERVATION PORT

- NOTES:
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
 2. DO NOT SCALE DRAWING.
 3. THIS DRAWING IS INTENDED FOR USE BY ARCHITECTS, ENGINEERS, CONTRACTORS, CONSULTANTS AND DESIGN PROFESSIONALS FOR PLANNING PURPOSES ONLY. THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION.
 4. ALL INFORMATION CONTAINED HEREIN WAS CURRENT AT THE TIME OF DEVELOPMENT BUT MUST BE REVIEWED AND APPROVED BY THE PRODUCT MANUFACTURER TO BE CONSIDERED ACCURATE.
 5. CONTRACTOR'S NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT www.CADdetails.com/info AND ENTER REFERENCE NUMBER 4907-010.



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PROP. INFILTRATION SYSTEM 1
(NOT TO SCALE)

PERMIT SITE PLAN

Eagle Heights
71 & 73 Rutland Street
Dover, New Hampshire 03820

ASSESSORS:

PARCEL ID:
#14017 (LOT B)
#14017-A (LOT A)

PREPARED FOR:

Diamond
Capital, LLC

170 Commerce Way, Suite 200
Portsmouth, New Hampshire 03801

HANCOCK ASSOCIATES

Civil Engineers

Land Surveyors

Wetland Scientists

10 FERRY STREET, SUITE 406, CONCORD, NH 03301
VOICE (603) 223-1950, FAX (978) 774-7816
WWW.HANCOCKASSOCIATES.COM



NO.	BY	APP	DATE	ISSUE/REVISION	DESCRIPTION
1	EJR	JDP	01/07/22	TRC	COMMENTS
DATE:	09/10/21	DESIGN BY:	EJR		
SCALE:	AS INDICATED	DRAWN BY:	EJR		
APPRVD. BY:	JDP	CHECK BY:	AD		

DETAILS - 1

PLOT DATE: Jan 10, 2022 10:42 am
PATH: G:\Civil 3D Projects\23800 - Diamond Cap - Dover, NH\Eng\DWG\

DWG: 23800sp 4.dwg

LAYOUT: Details - 1

SHEET: 7 OF 10

PROJECT NO.:

23800

C-6

Eagle Heights
71 & 73 Rutland Street
Dover, New Hampshire 03820

PREPARED FOR

170 Commerce Way, Suite 200
Portsmouth, New Hampshire 03801

Civil Engineers

Land Surveyors

Wetland Scientists

SEAL OF NEW HAMPSHIRE -
 PROFESSIONAL ENGINEER -
 JOSEPH D. PEZZOLA
 No. 10270
 1/7/22

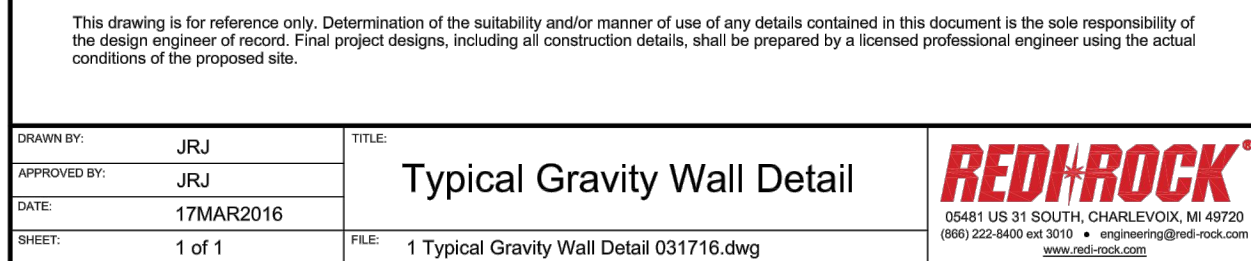
DETAILS - 2

DWG: 23800sp4.dwg

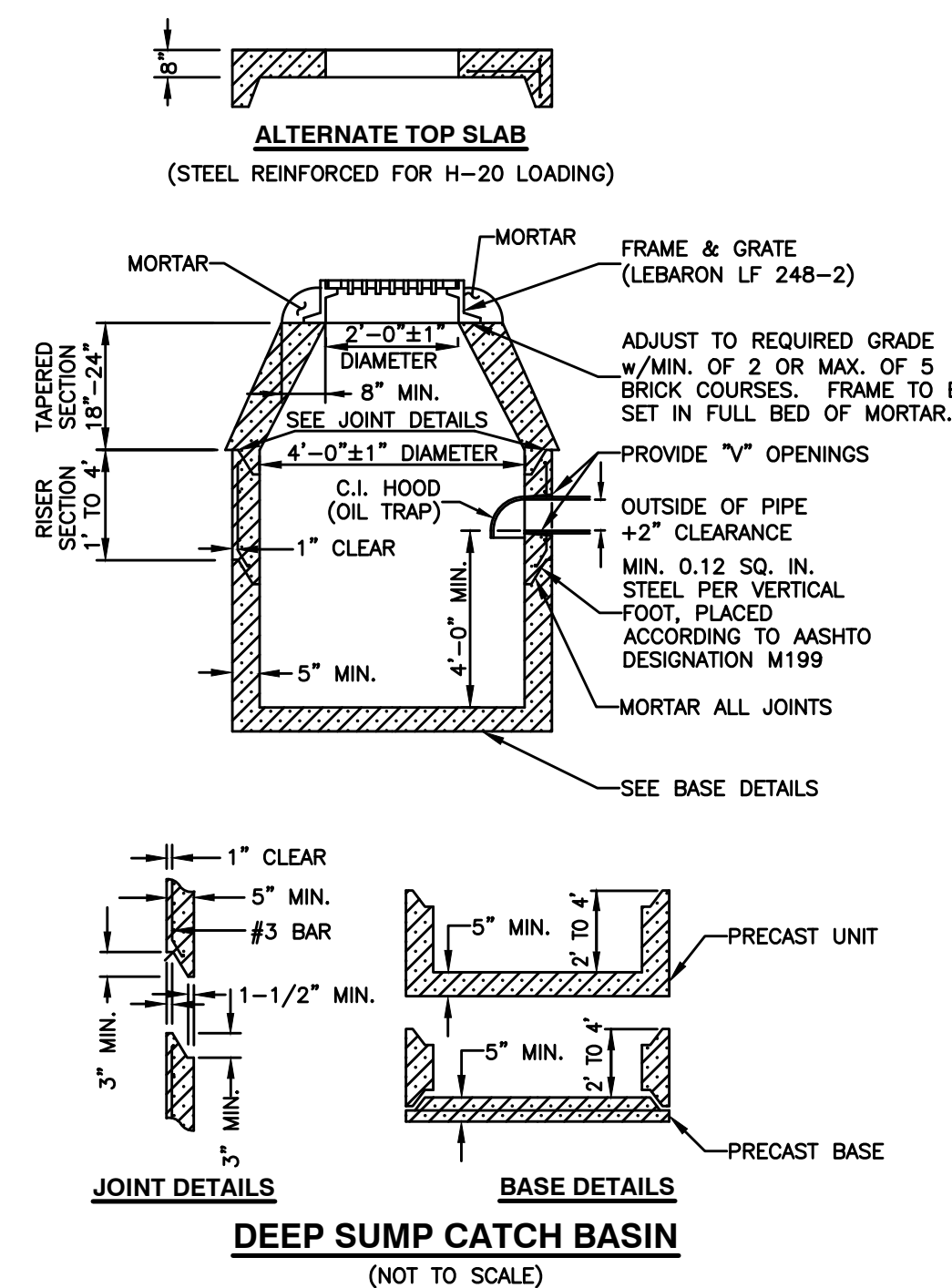
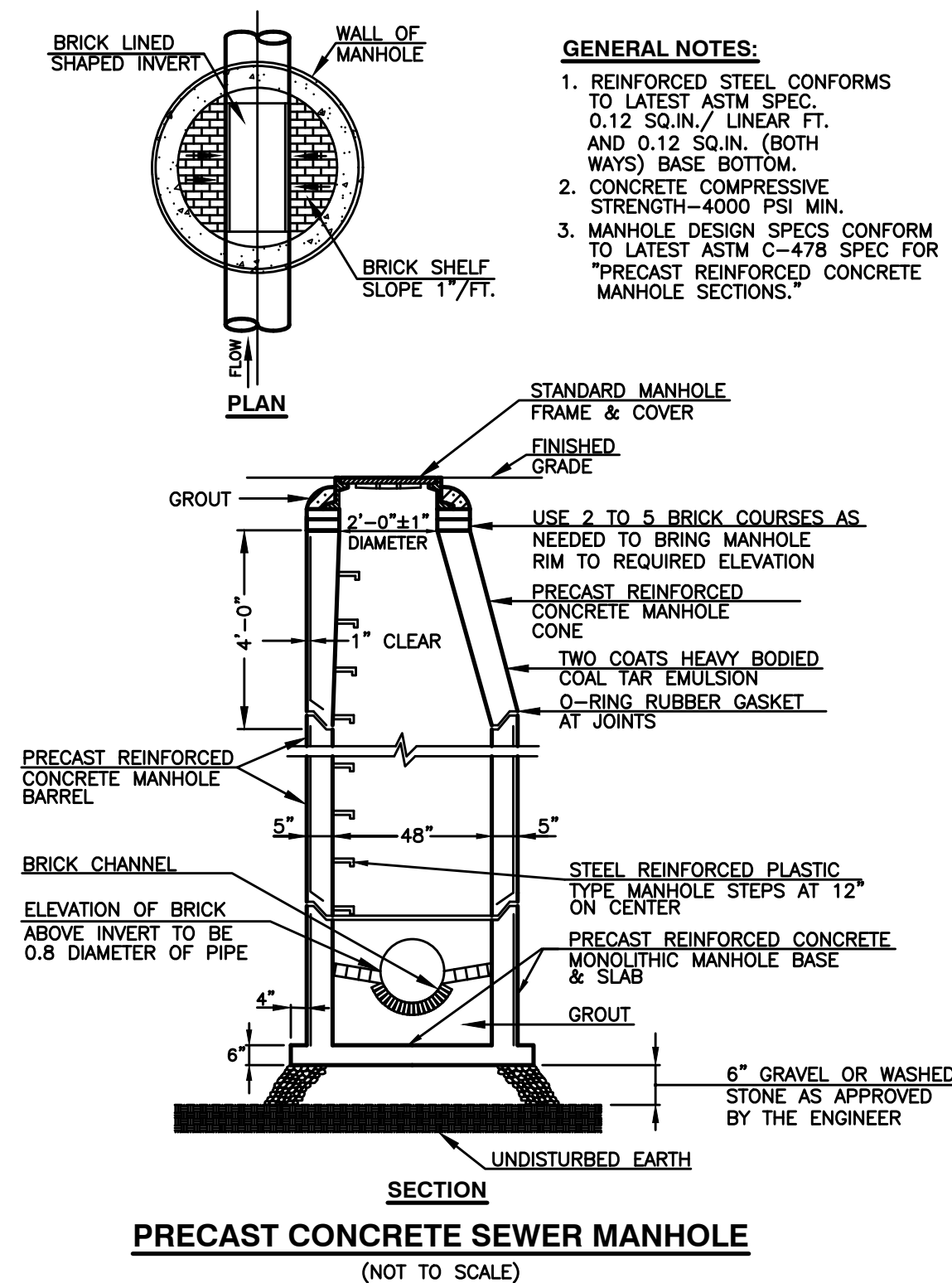
LAYOUT: *Details* – 2

SHEET: 8 OF 10

23800



NOTE: FINAL DESIGN BY MANUFACTURER



PERMIT
SITE
PLAN

Eagle Heights
71 & 73 Rutland Street
Dover, New Hampshire 03820

ASSESSORS:
PARCEL ID:
#14017 (LOT B)
#14017-A (LOT A)

Diamond
Capital, LLC

170 Commerce Way, Suite 200
Portsmouth, New Hampshire 03801

HANCOCK
ASSOCIATES

Civil Engineers

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10 FERRY STREET, SUITE 406, CONCORD, NH 03301
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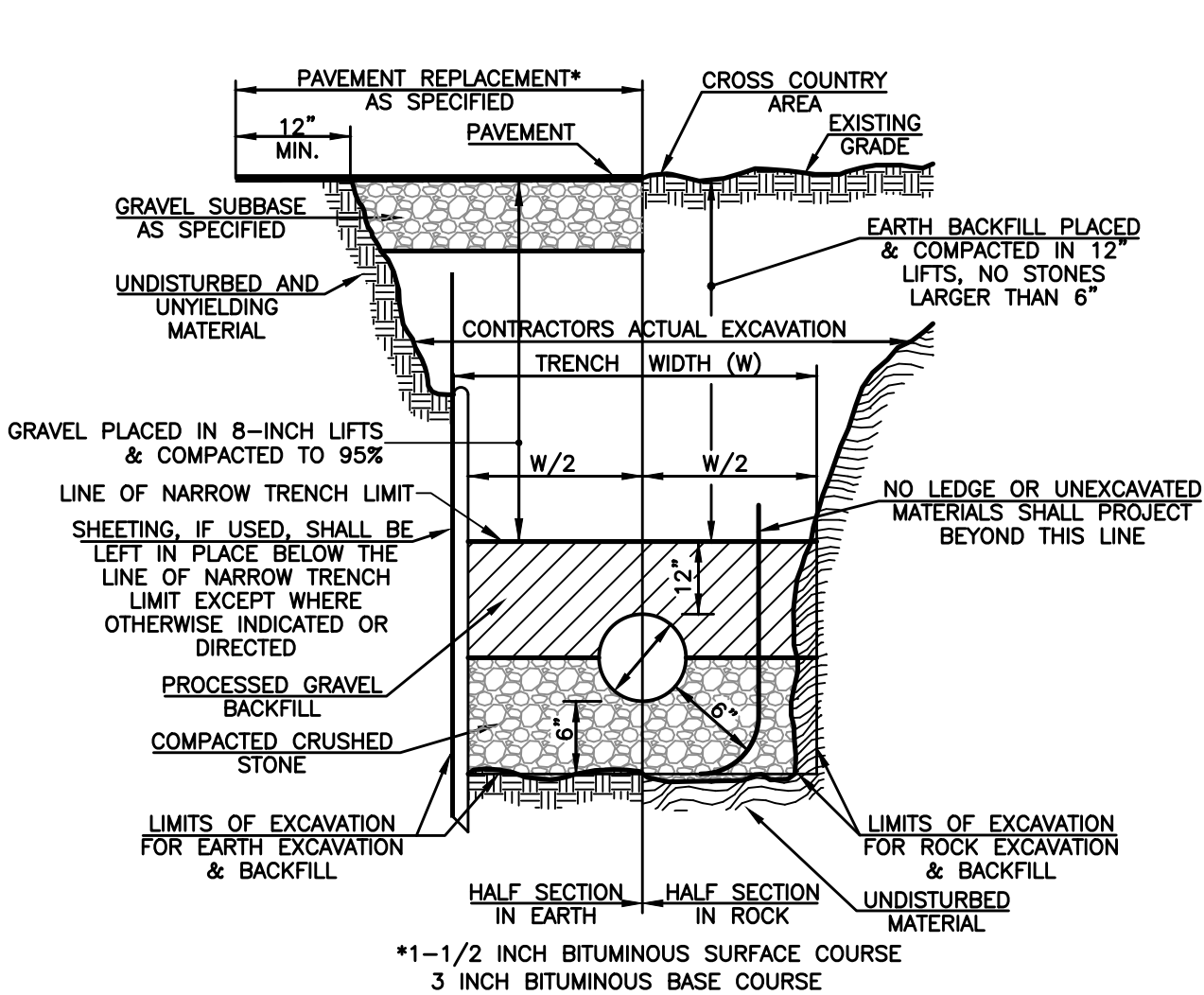
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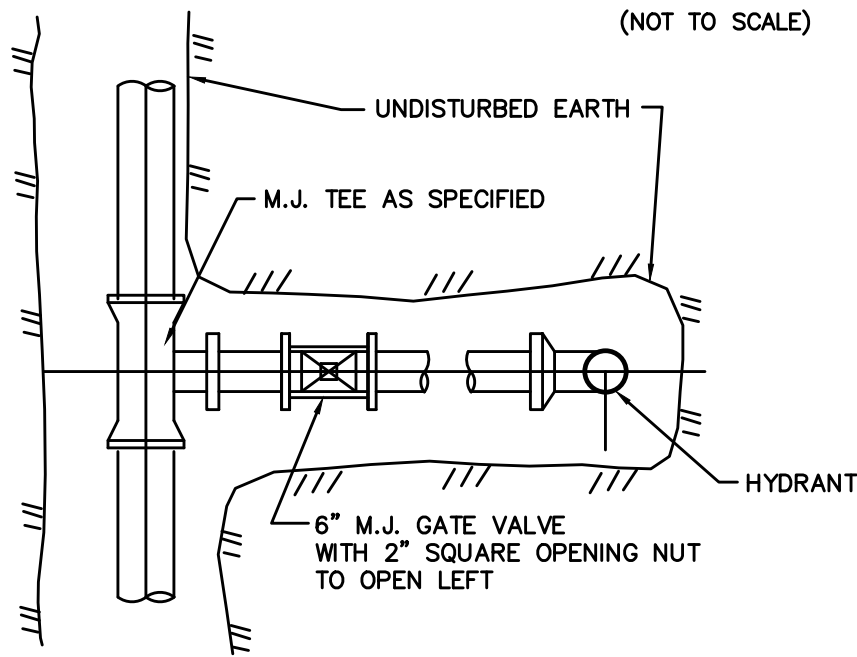
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LAYOUT: Details - 3
SHEET: 9 OF 10
PROJECT NO.: 23800

C-8

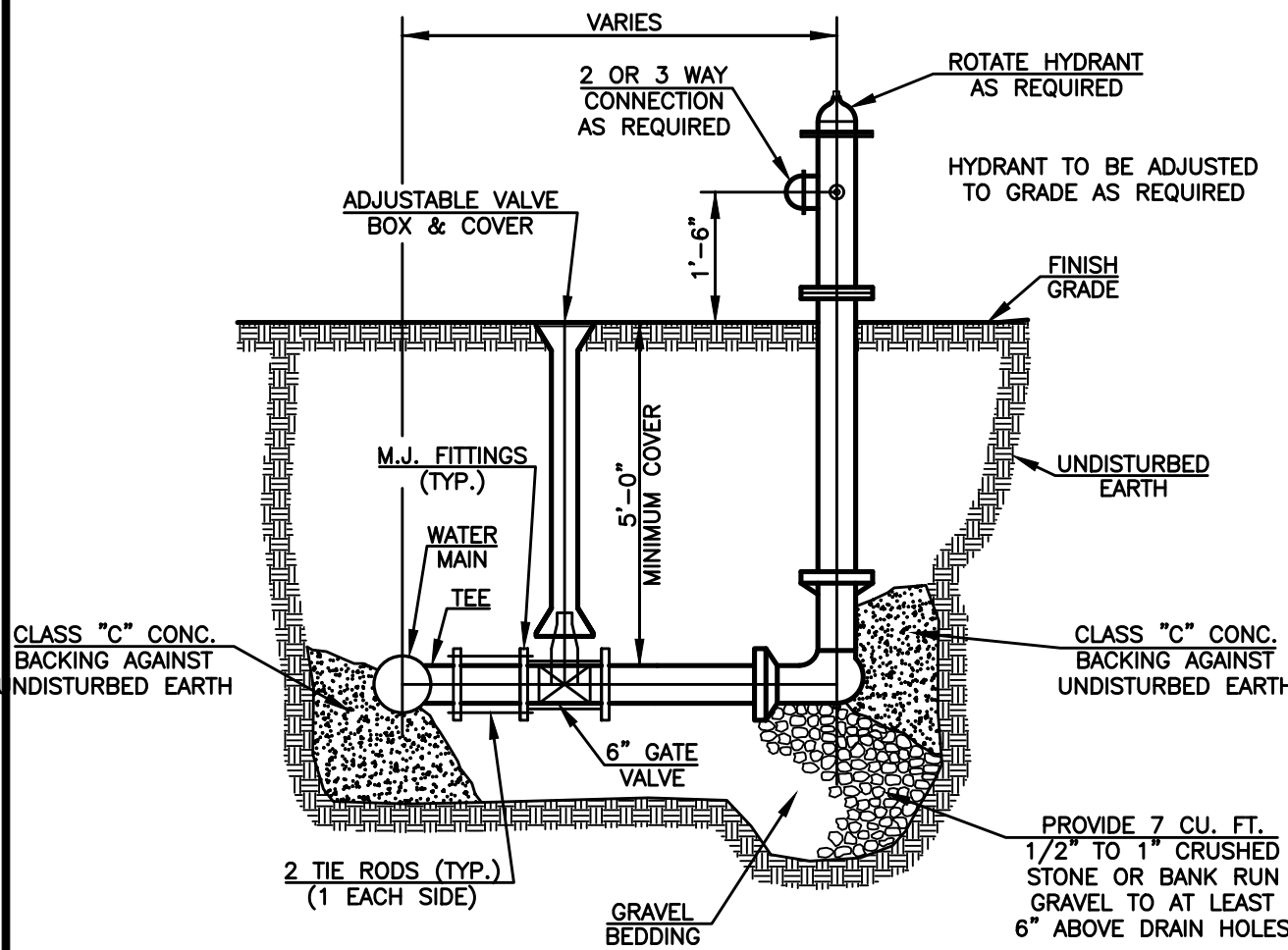


NOTE:
WITH THE EXCEPTION OF NATURAL GAS SERVICE(S), ALL UTILITY TRENCHES WITHIN THE RIGHT OF WAY SHALL BE BACKFILLED WITH CONTROL DENSITY FILL (CDF) EXCAVATABLE TYPE I-E UP TO WITHIN 16 INCHES OF THE ASPHALT BINDER LEVEL, AFTER WHICH DENSE GRADE GRAVEL COMPACTED TO 95% PROCTOR TESTING SHALL BE PLACED OVER THE CDF. DETAILS OF THIS REQUIREMENT IS THE ENGINEERING DIVISION WEBSITE STANDARD CONSTRUCTION DETAILS.

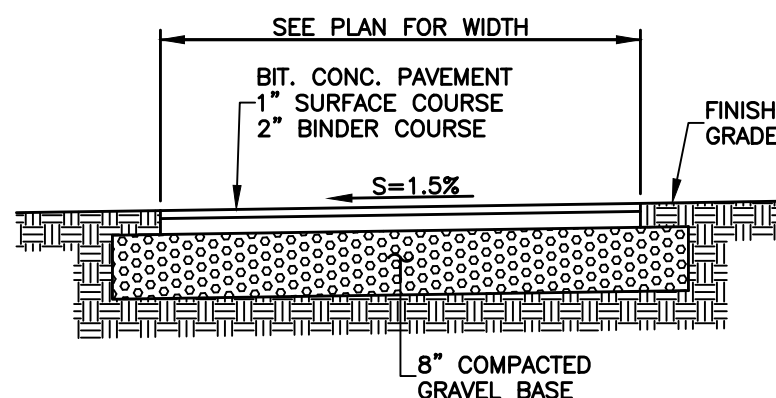
**TYPICAL TRENCH DETAIL
FOR SEWER**
(NOT TO SCALE)



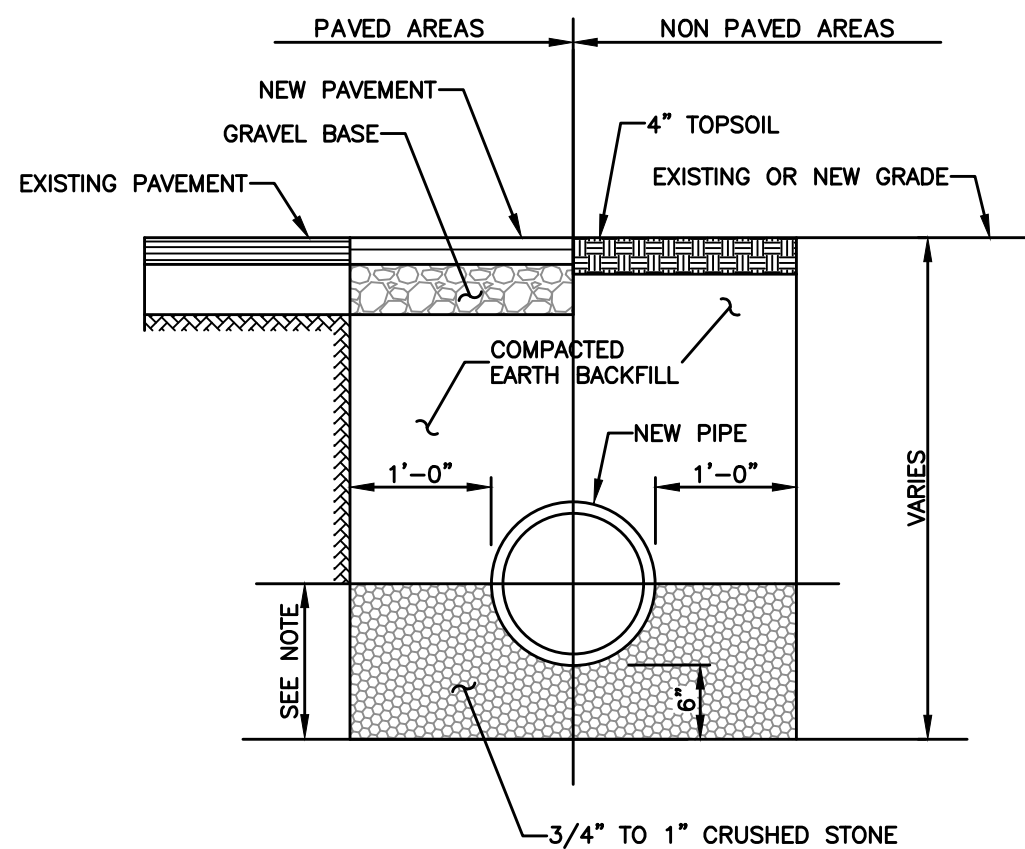
NOTE:
USE MEGA-LUG RESTRAINTS IN LIEU OF THRUST BLOCK & TIE RODS.



TYPICAL HYDRANT & VALVE
(NOT TO SCALE)

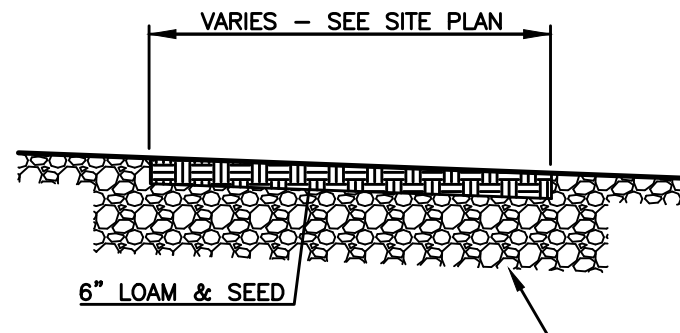


BITUMINOUS CONCRETE WALK
(NOT TO SCALE)



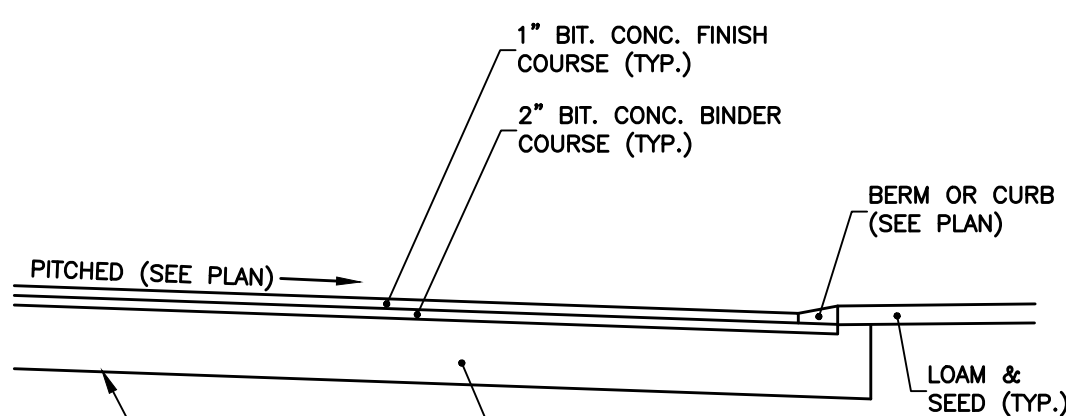
NOTE:
CRUSHED STONE WILL ONLY BE REQUIRED IF UNSUITABLE MATERIALS ARE ENCOUNTERED OR IF PIPE IS BEING LAID WITHIN GROUND WATER TABLE. OTHERWISE, PIPE MAY BE PLACED ON BOTTOM OF TRENCH AND EARTH BACKFILLED.

**EXCAVATION & BACKFILL DETAIL
FOR DRAIN AND WATER PIPES**
(NOT TO SCALE)

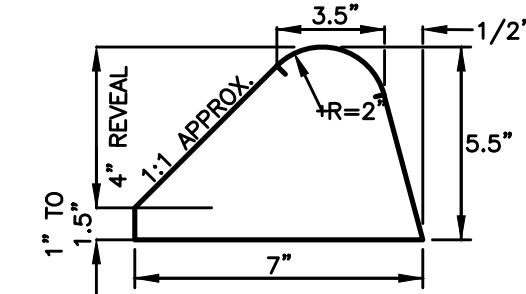


NOTES:
1.) SEED TO BE PREMIUM SUN-SHADE MIX.
2.) LOAM TO COMPLY WITH LANDSCAPE ARCHITECT'S SPECIFICATION.

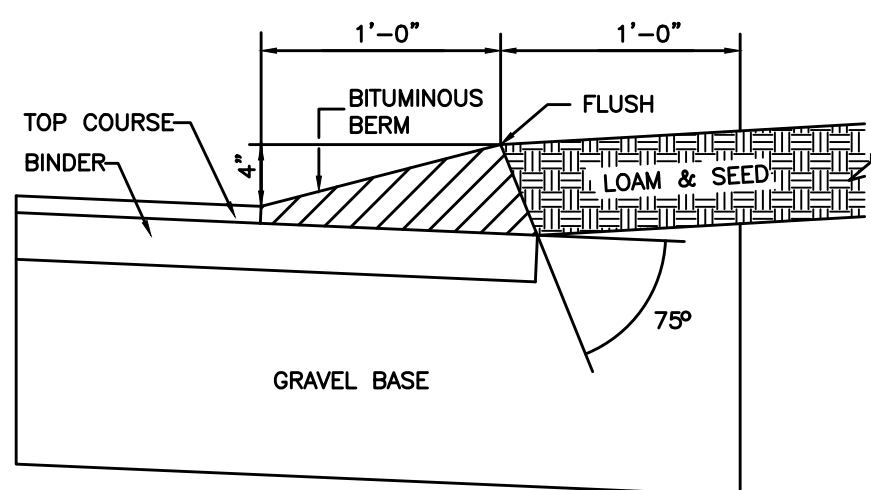
LOAM & SEED
(NOT TO SCALE)



FULL DEPTH DRIVEWAY PAVEMENT SECTION
(NOT TO SCALE)

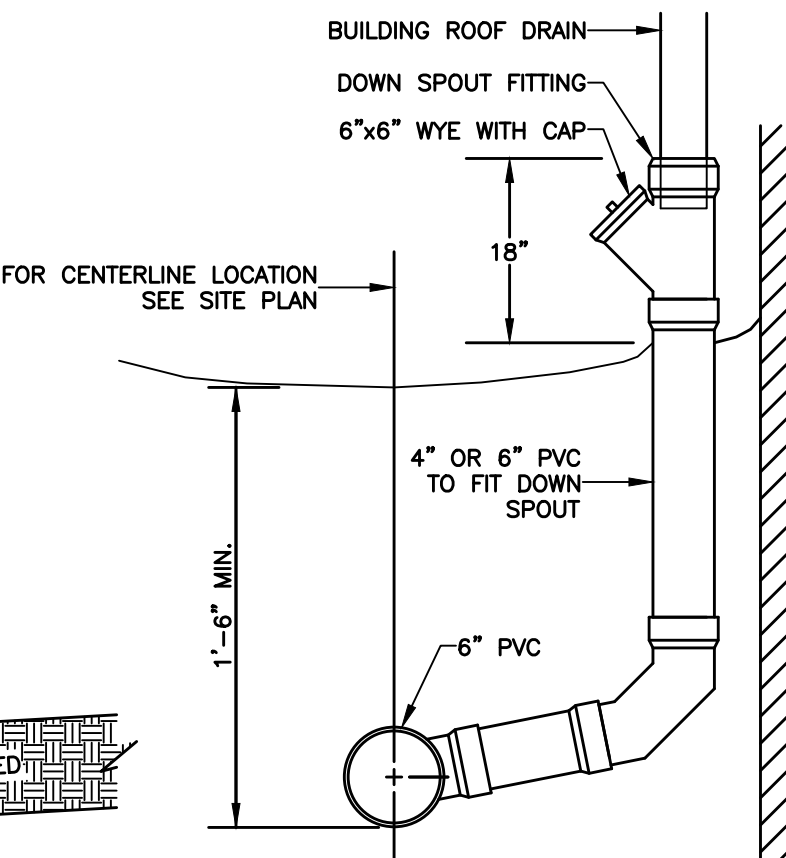
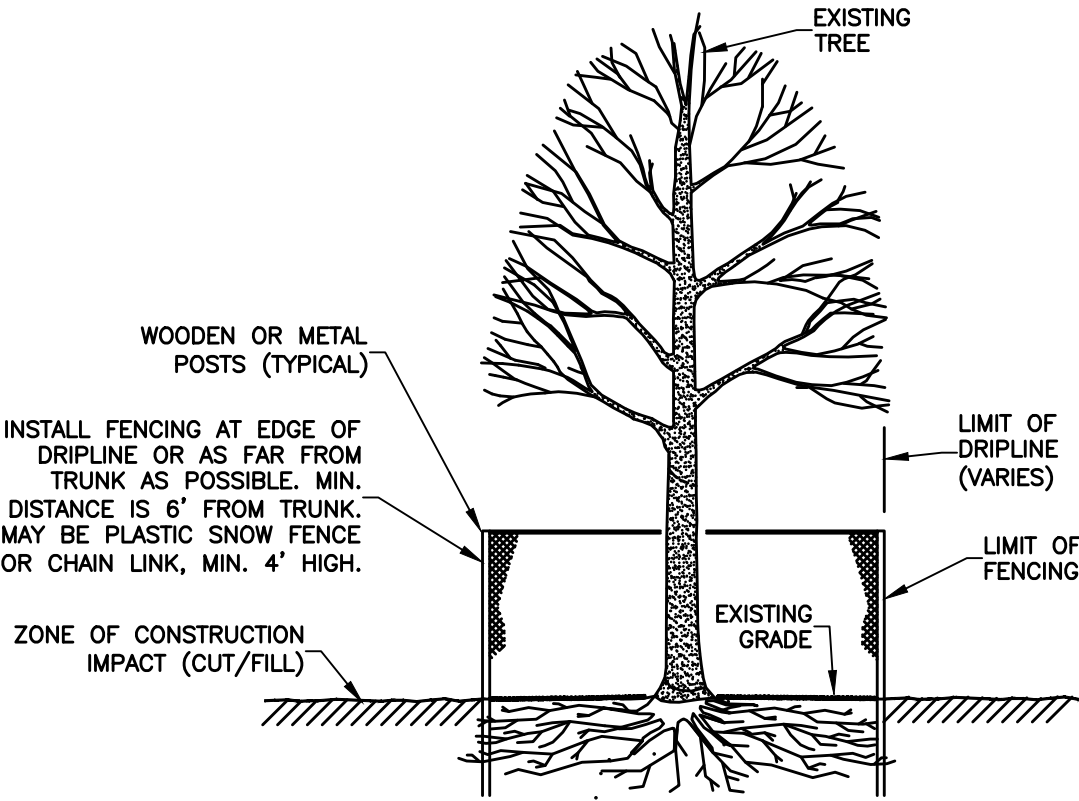


BITUMINOUS CURB
(NOT TO SCALE)

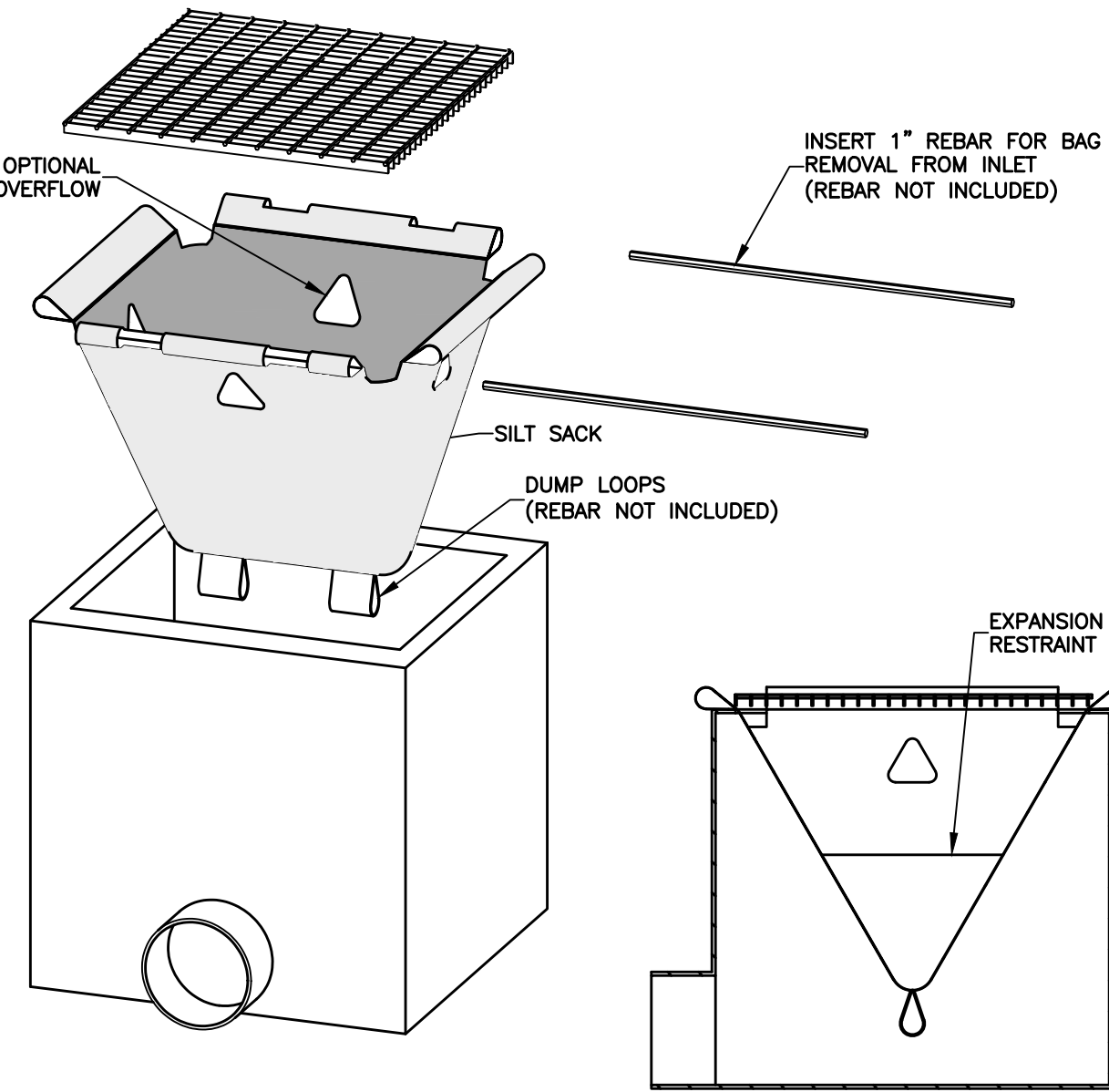


BITUMINOUS BERM
(NOT TO SCALE)

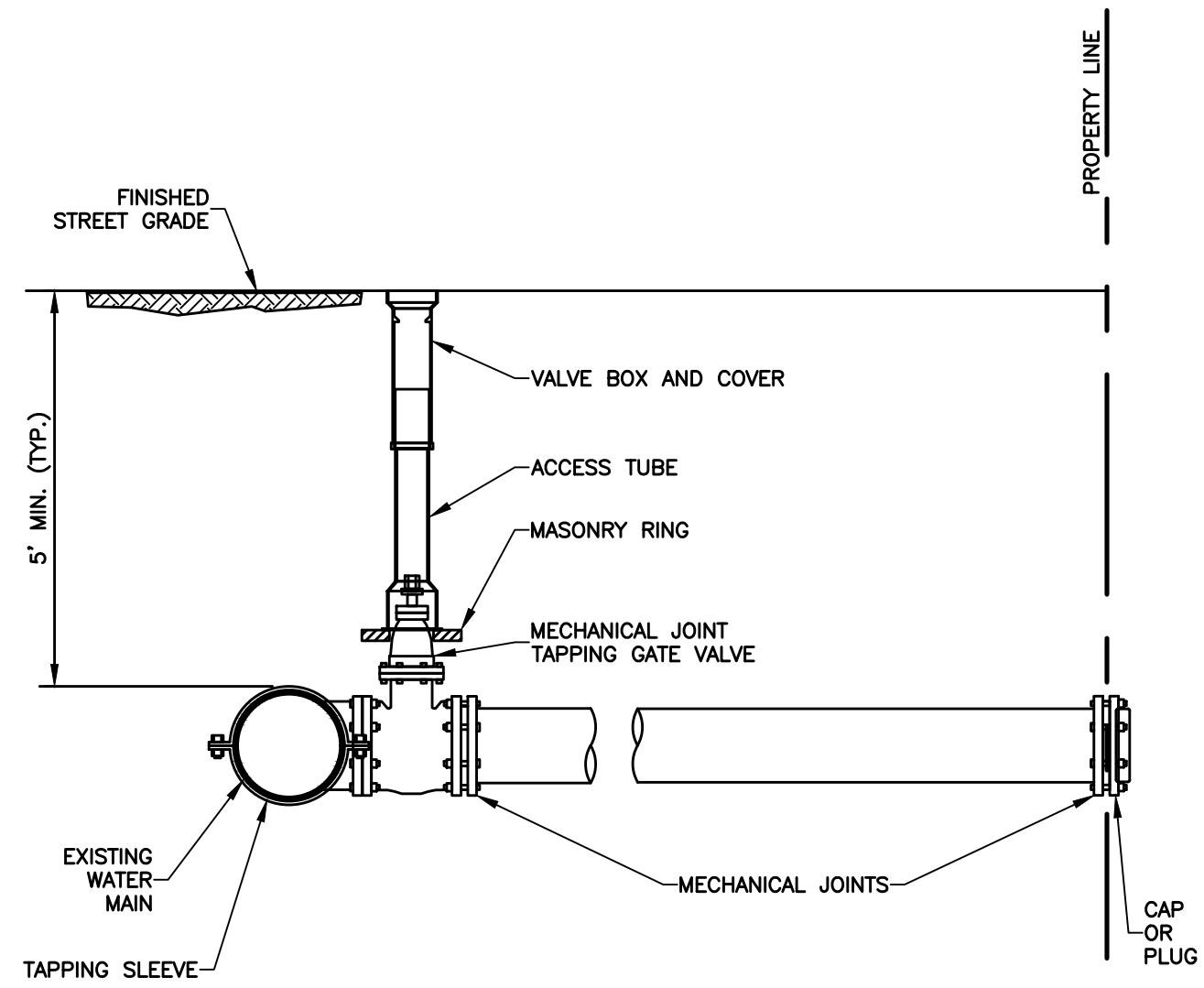
TEMPORARY EXISTING TREE PROTECTION
(NOT TO SCALE)



**ROOF DRAIN
CONNECTION DETAIL
WITH CLEANOUT**
(NOT TO SCALE)

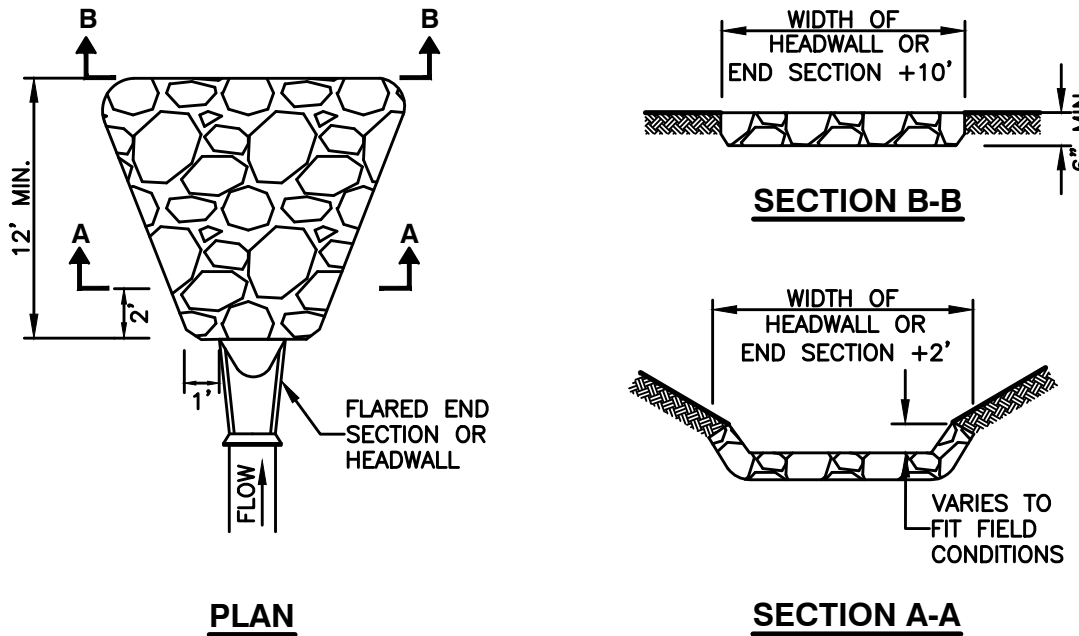


SILT SACK DETAIL
(NOT TO SCALE)

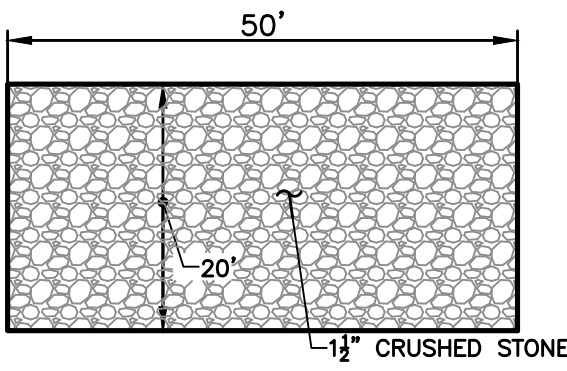


NOTES:
- CONCRETE THRUST BLOCK TO BE USED ONLY WHERE IT WILL BEAR ON UNDISTURBED EARTH.
- USE RESTRAINED JOINT FITTINGS (MEGALUG OR APPROVED EQUAL) WHERE CONCRETE THRUST BLOCK IS UNACCEPTABLE.
- SIZE OF BLOCK OR MEGALUG TO BE DESIGNED FOR SPECIFIC CONDITIONS.

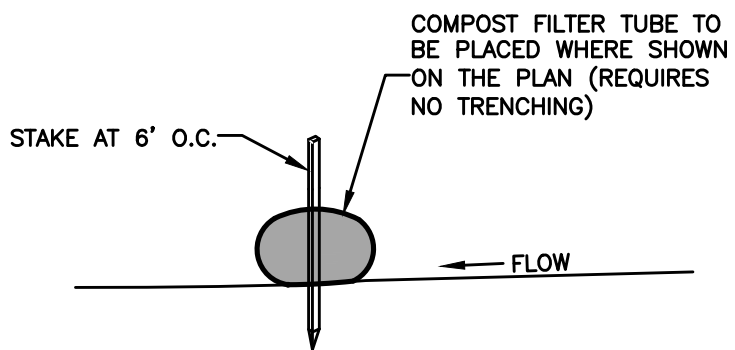
**TYPICAL WATER SERVICE CONNECTION
WITH TAPPING SLEEVE AND GATE VALVE**
(NOT TO SCALE)



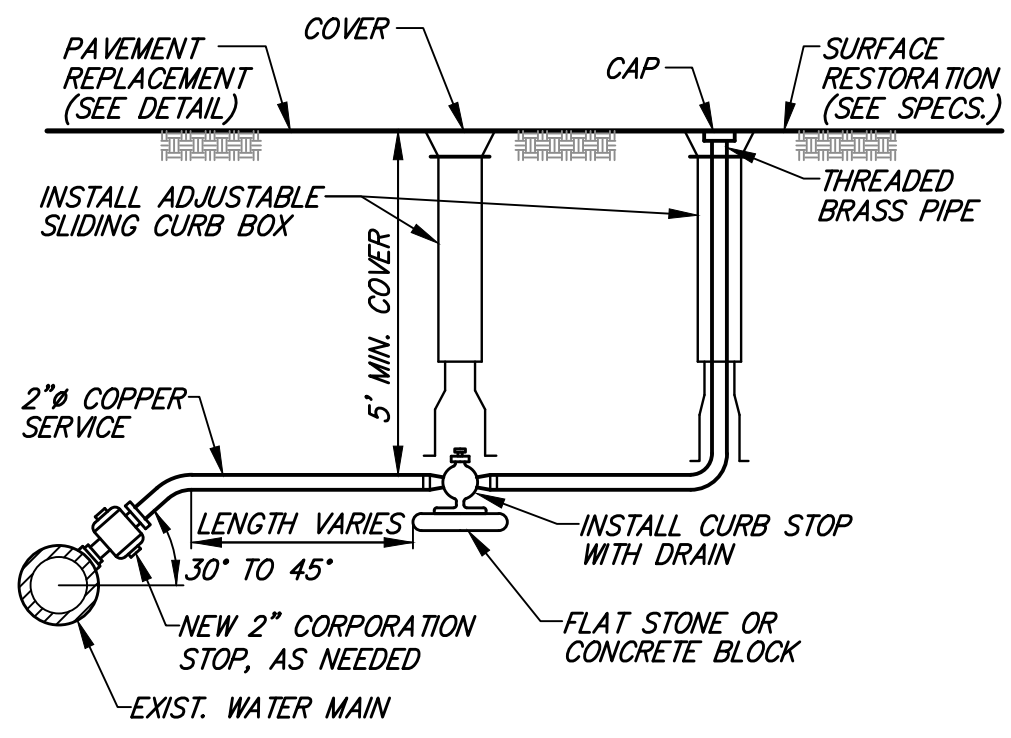
FLARED END SECTION AND RIP-RAP
(NOT TO SCALE)



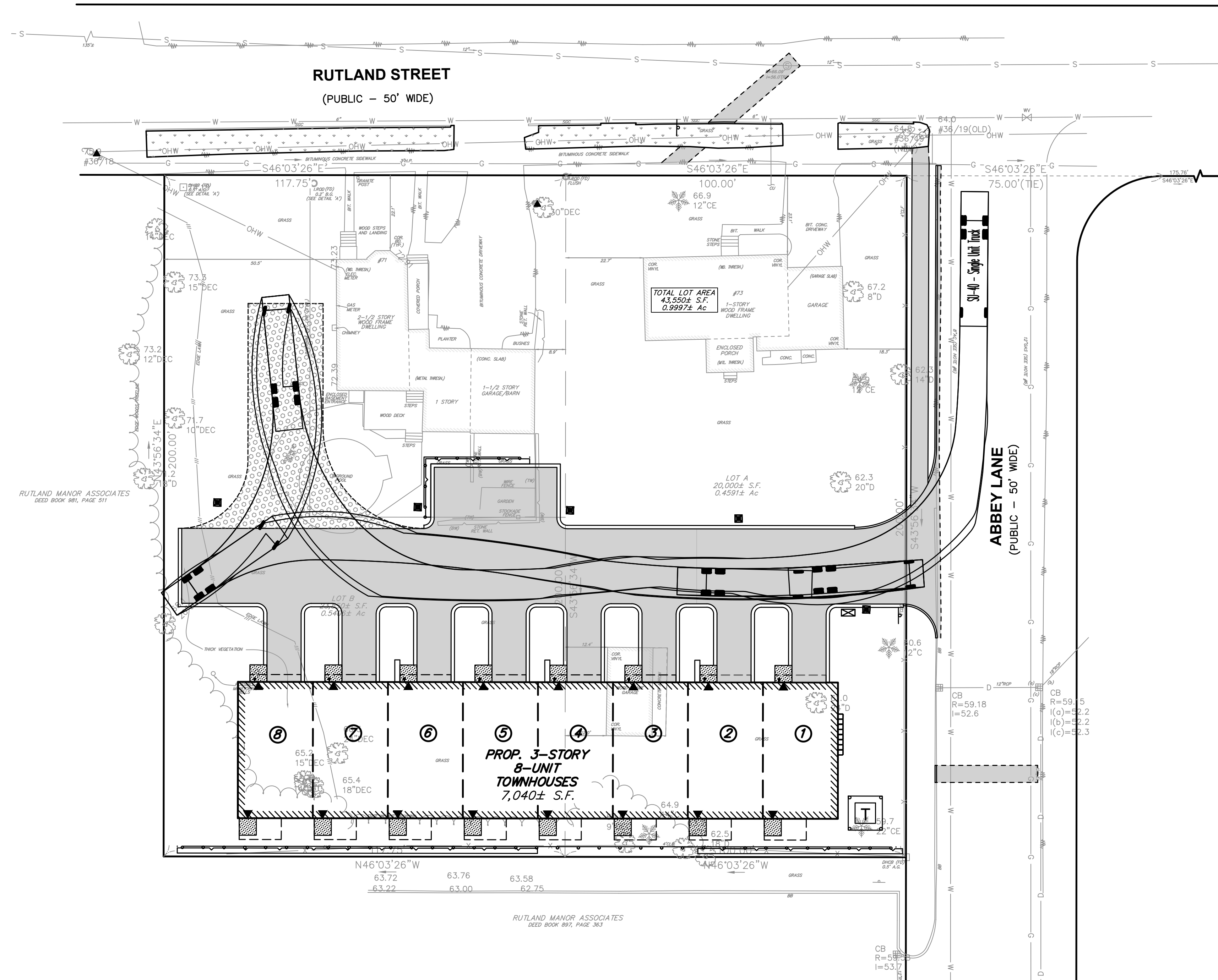
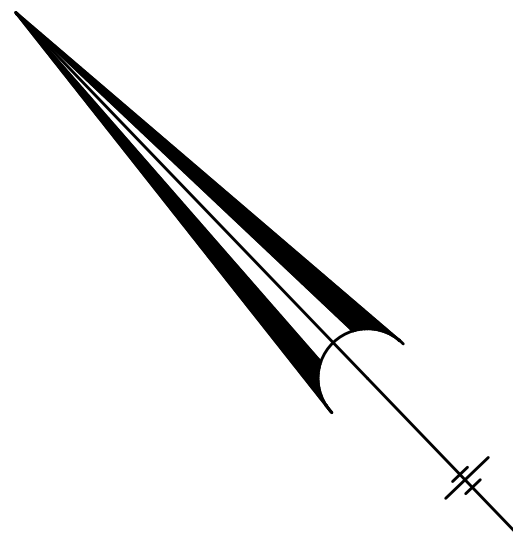
**CONSTRUCTION ACCESS
CRUSHED STONE APRON**
(NOT TO SCALE)



COMPOST FILTER TUBE
(NOT TO SCALE)



CURB STOP BLOW-OFF
(NOT TO SCALE)



LEGEND	
	PROP. CONTOUR
	SPOT GRADE
	PROP. FENCE
	PROP. BITUMINOUS PAVEMENT
	PROP. CONCRETE CEMENT
	PROP. RETAINING WALL
	PROP. CURBING
	PROP. DRAIN
	PROP. ROOF DRAIN
	PROP. WATER LINE
	PROP. GAS LINE
	PROP. SEWER
	PROP. ELECTRIC, CABLE, & TELE.
	PROP. TELEVISION
	PROP. EROSION CONTROL
	PROP. CATCH BASIN
	PROP. OUTLET CONTROL STRUCTURE
	PROP. SEWER MANHOLE
	PROP. FLARED END SECTION W/RIP RAP
	TOP OF CURB/BOTTOM OF CURB
	TOP OF WALL/BOTTOM OF WALL
	PROP. CLEANOUT
	HIGH-DENSITY POLYETHYLENE
	POLYVINYL CHLORIDE
	PROP. BITUMINOUS BERM
	PROP. BITUMINOUS CURB
	PROP. FLOW ARROW
	PROP. HYDRANT
	TEST PIT
	ECHO CLS32-36W-4K-III & -IV LIGHT POLE

PLAN REFERENCE:

- EXISTING CONDITIONS TAKEN FROM A PLAN TITLED "EXISTING CONDITIONS PLAN OF LAND IN DOVER, NH", DATED MARCH 12, 2020 AND LAST REVISED ON MARCH 24, 2020. PLAN WAS PREPARED BY HANCOCK ASSOCIATES.
- PROPOSED BUILDING FOOTPRINT DESIGNED BASED ON THE PLAN TITLED "FIRST FLOOR CONCEPT", DATED 03/16/21, PREPARED BY KOAL ARCHITECTURE, PLLC.

PERMIT
SITE
PLAN

Eagle Heights
71 & 73 Rutland Street
Dover, New Hampshire 03820

ASSESSORS:
PARCEL ID:
#14017 (LOT B)
#14017-A (LOT A)

PREPARED FOR:

Diamond
Capital, LLC

170 Commerce Way, Suite 200
Portsmouth, New Hampshire 03801

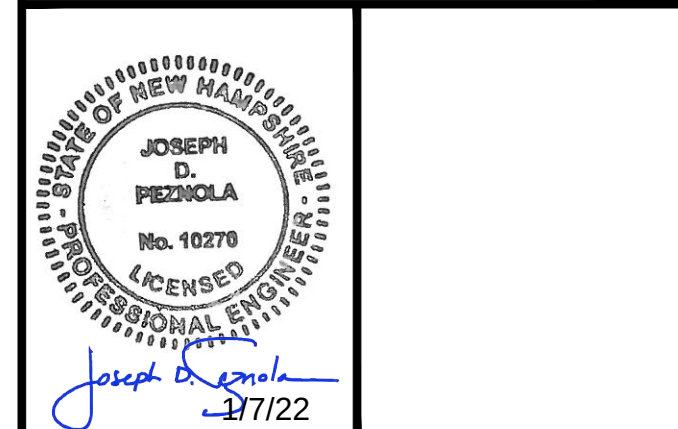
HANCOCK
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10 FERRY STREET, SUITE 406, CONCORD, NH 03301
VOICE (603) 223-1950, FAX (978) 774-7816
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NO.	BY	APP	DATE	ISSUE/REVISION	DESCRIPTION
1	EJR	JDP	01/07/22	TRC	COMMENTS
NO.	BY	APP	DATE	ISSUE/REVISION	DESCRIPTION
DATE:	09/10/21	DESIGN BY:	EJR		
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APPRVD. BY:	JDP	CHECK BY:	AD		

TRUCK
TURNING
MOVEMENTS

PLOT DATE: Jan 10, 2022 10:43 am
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DWG: 23800sp 4.dwg

LAYOUT: 7M

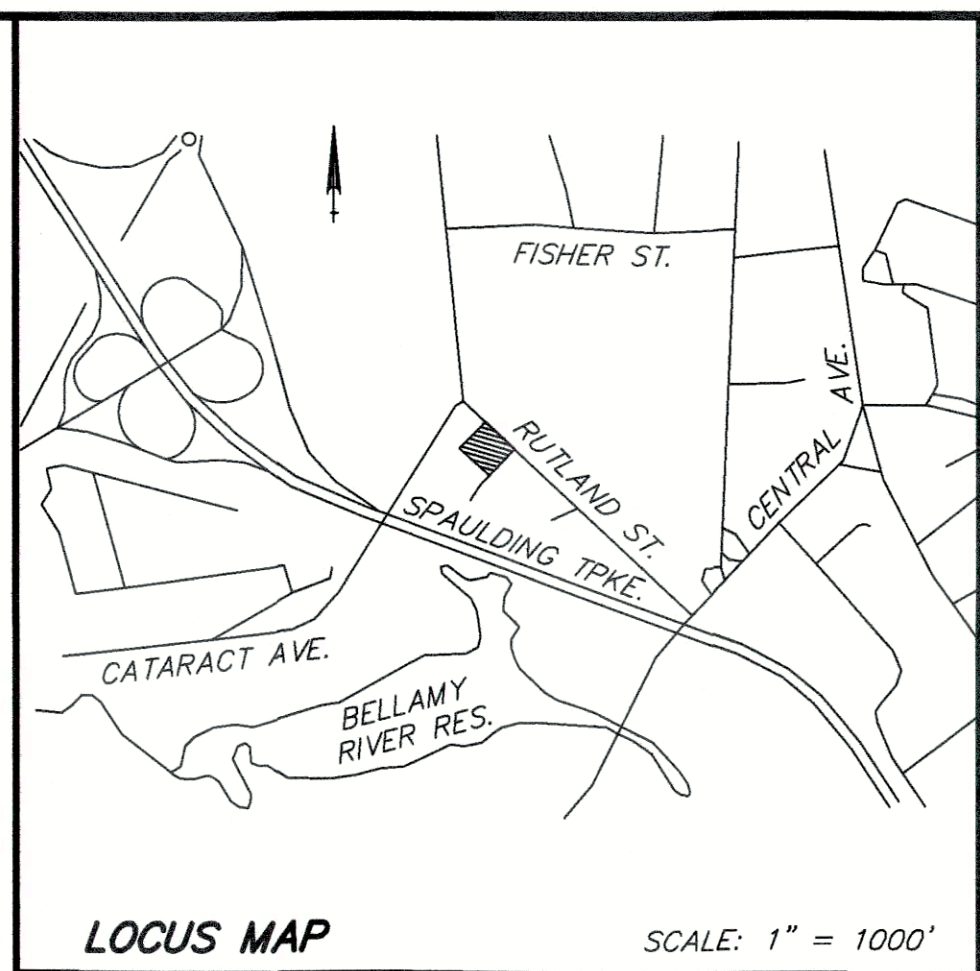
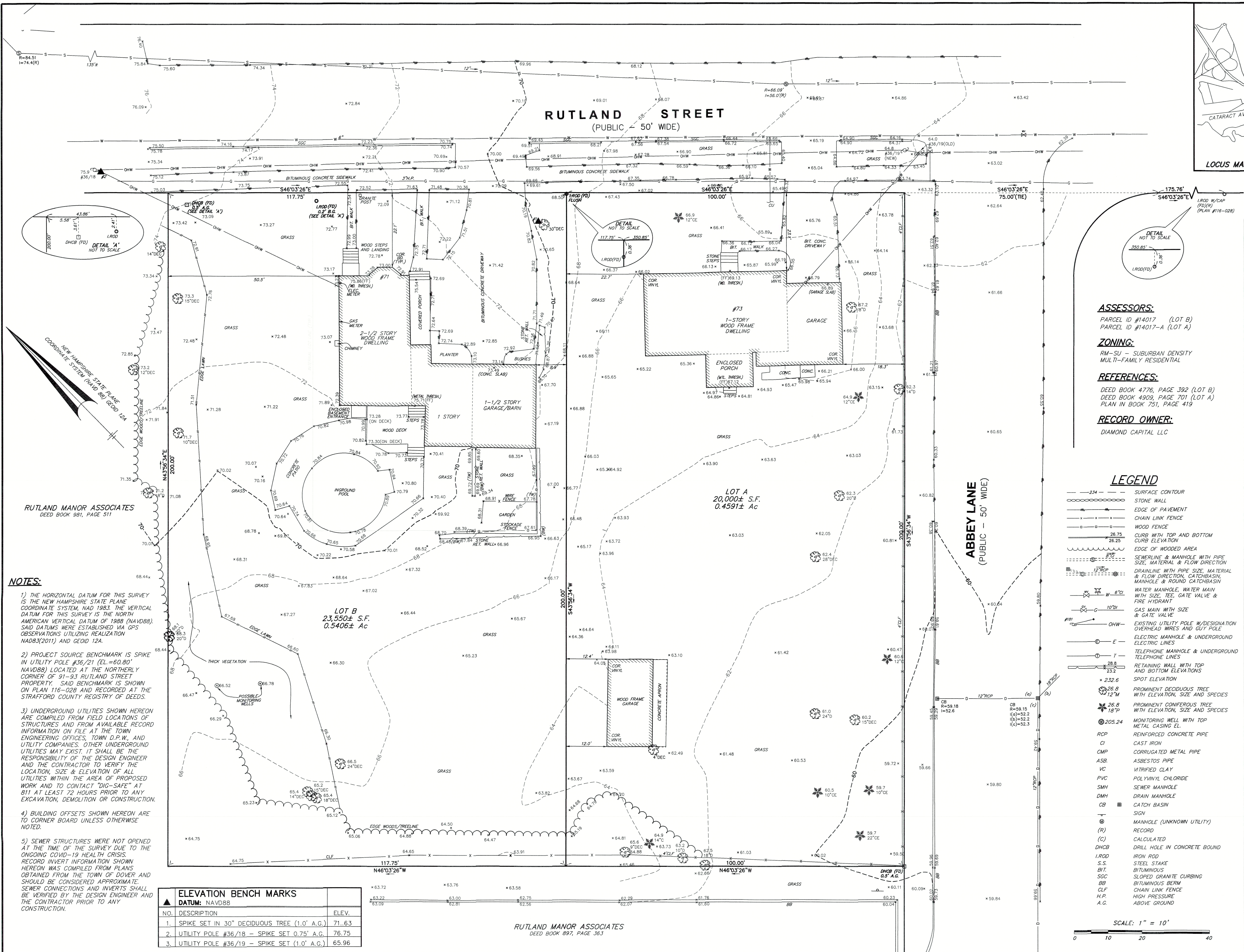
SHEET: 10 OF 10

PROJECT NO.:

23800

GRAPHIC SCALE" 1 INCH = 20 FEET
0 10 20 40 80

C-9



#71 & 73
Rutland
Street

Dover, New Hampshire

ASSESSORS:

PARCEL ID #14017 (LOT B)
PARCEL ID #14017-A (LOT A)

ZONING:

RM-SU - SUBURBAN DENSITY
MULTI-FAMILY RESIDENTIAL

REFERENCES:

DEED BOOK 4776, PAGE 392 (LOT B)
DEED BOOK 4909, PAGE 701 (LOT A)
PLAN IN BOOK 751, PAGE 419

RECORD OWNER:

DIAMOND CAPITAL LLC

PREPARED FOR:

Diamond
Capital LLC

170 Commerce Way, Suite 200
Portsmouth, New Hampshire 03801

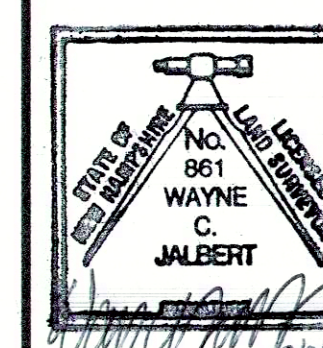
HANCOCK
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185 CENTRE STREET, DANVERS, MA 01923
VOICE (978) 777-3050, FAX (978) 774-7816
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- LEGEND**
- 234 SURFACE CONTOUR
 - STONE WALL
 - EDGE OF PAVEMENT
 - CHAIN LINK FENCE
 - WOOD FENCE
 - CURB WITH TOP AND BOTTOM CURB ELEVATION
 - EDGE OF WOODED AREA
 - SEWERLINE & MANHOLE WITH PIPE SIZE, MATERIAL & FLOW DIRECTION
 - DRAINAGE WITH PIPE SIZE, MATERIAL & FLOW DIRECTION, CATCHBASIN, MANHOLE & ROUND CATCHBASIN
 - WATER MANHOLE, WATER MAIN WITH SIZE, TEE, GATE VALVE & FIRE HYDRANT
 - GAS MAIN WITH SIZE & GATE VALVE
 - EXISTING UTILITY POLE W/DESIGNATION OVERHEAD WIRES AND GUY POLE
 - ELECTRIC MANHOLE & UNDERGROUND ELECTRIC LINES
 - TELEPHONE MANHOLE & UNDERGROUND TELEPHONE LINES
 - RETAINING WALL WITH TOP AND BOTTOM ELEVATIONS
 - SPOT ELEVATION
 - PROMINENT DECIDUOUS TREE WITH ELEVATION, SIZE AND SPECIES
 - PROMINENT CONIFEROUS TREE WITH ELEVATION, SIZE AND SPECIES
 - MONITORING WELL WITH TOP METAL CASING EL.
 - REINFORCED CONCRETE PIPE
 - CAST IRON
 - CORRUGATED METAL PIPE
 - ASBESTOS PIPE
 - VITRIFIED CLAY
 - POLYVINYL CHLORIDE
 - SEWER MANHOLE
 - DRAIN MANHOLE
 - CATCH BASIN
 - SIGN
 - MANHOLE (UNKNOWN UTILITY)
 - RECORD
 - CALCULATED
 - DRILL HOLE IN CONCRETE BOUND
 - IRON ROD
 - STEEL STAKE
 - BITUMINOUS
 - SLOPED GRANITE CURBING
 - BITUMINOUS BERM
 - CHAIN LINK FENCE
 - HIGH PRESSURE ABOVE GROUND

SCALE: 1" = 10'

NOTES:

- 1) THE HORIZONTAL DATUM FOR THIS SURVEY IS THE NEW HAMPSHIRE STATE PLANE COORDINATE SYSTEM, NAD 1983. THE VERTICAL DATUM FOR THIS SURVEY IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). SAID DATUMS WERE ESTABLISHED VIA GPS OBSERVATIONS UTILIZING REALIZATION NAD83(2011) AND GEOID 12A.
- 2) PROJECT SOURCE BENCHMARK IS SPIKE IN UTILITY POLE #36/21 (EL. -60.80') (NAVD88) LOCATED AT THE NORTHERLY CORNER OF 91-93 RUTLAND STREET PROPERTY. SAID BENCHMARK IS SHOWN ON PLAN 116-028 AND RECORDED AT THE STRAFFORD COUNTY REGISTRY OF DEEDS.
- 3) UNDERGROUND UTILITIES SHOWN HEREON ARE COMPILED FROM FIELD LOCATIONS OF STRUCTURES AND FROM AVAILABLE RECORD INFORMATION ON FILE AT THE TOWN ENGINEERING OFFICES, TOWN D.P.W., AND UTILITY COMPANIES. OTHER UNDERGROUND UTILITIES MAY EXIST. IT SHALL BE THE RESPONSIBILITY OF THE DESIGN ENGINEER AND THE CONTRACTOR TO VERIFY THE LOCATION, SIZE & ELEVATION OF ALL UTILITIES WITHIN THE AREA OF PROPOSED WORK AND TO CONTACT "DIG-SAFE" AT 811 AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION, DEMOLITION OR CONSTRUCTION.
- 4) BUILDING OFFSETS SHOWN HEREON ARE TO CORNER BOARD UNLESS OTHERWISE NOTED.
- 5) SEWER STRUCTURES WERE NOT OPENED AT THE TIME OF THE SURVEY DUE TO THE ONGOING COVID-19 HEALTH CRISIS. RECORD INVERT INFORMATION SHOWN HEREON WAS COMPILED FROM PLANS OBTAINED FROM THE TOWN OF DOVER AND SHOULD BE CONSIDERED APPROXIMATE. SEWER CONNECTIONS AND INVERTS SHALL BE VERIFIED BY THE DESIGN ENGINEER AND THE CONTRACTOR PRIOR TO ANY CONSTRUCTION.

ELEVATION BENCH MARKS

DATUM: NAVD88

NO.	DESCRIPTION	ELEV.
1.	SPIKE SET IN 30" DECIDUOUS TREE (1.0' A.G.)	71.63
2.	UTILITY POLE #36/18 - SPIKE SET 0.75' A.G.	76.75
3.	UTILITY POLE #36/19 - SPIKE SET (1.0' A.G.)	65.96

RUTLAND MANOR ASSOCIATES
DEED BOOK 897, PAGE 363

EXISTING CONDITIONS
PLAN OF LAND
IN
DOVER, NH

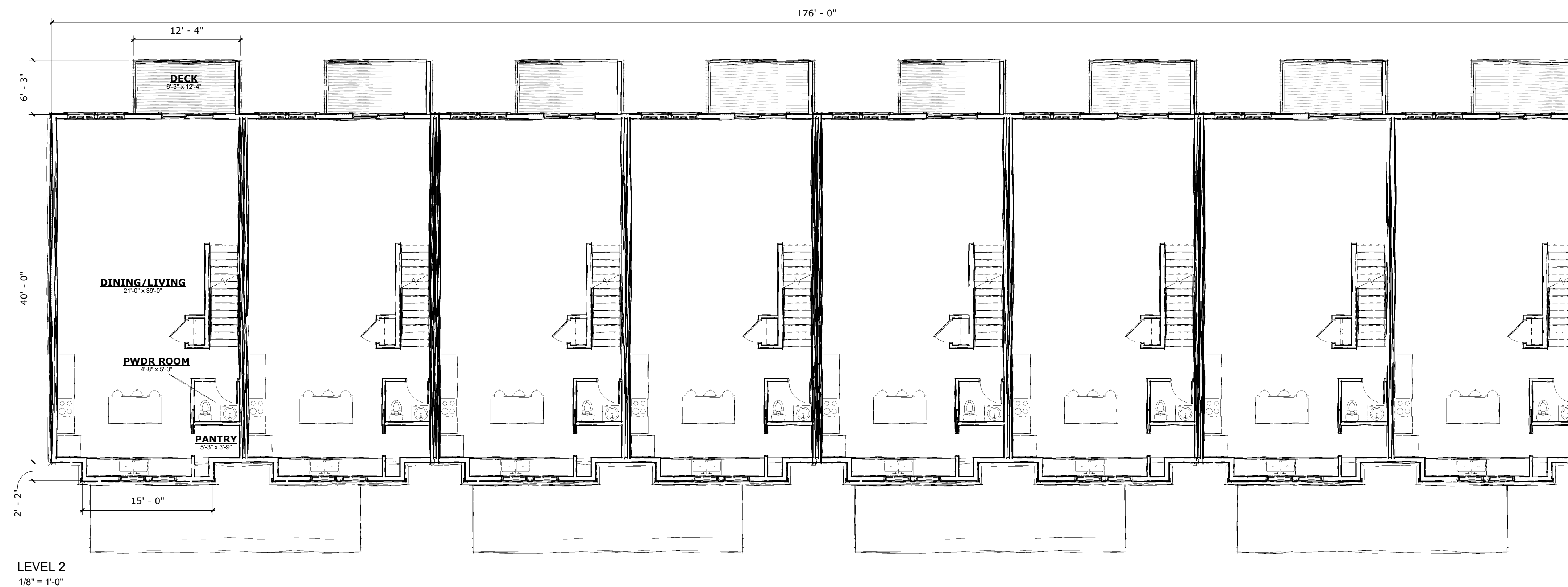
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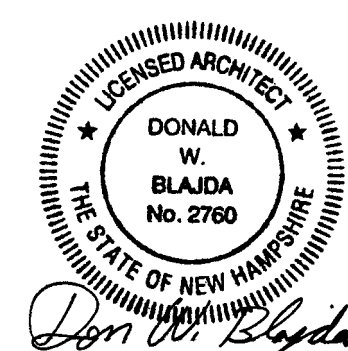
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SHEET: 1 OF 1

PROJECT NO.: 23800



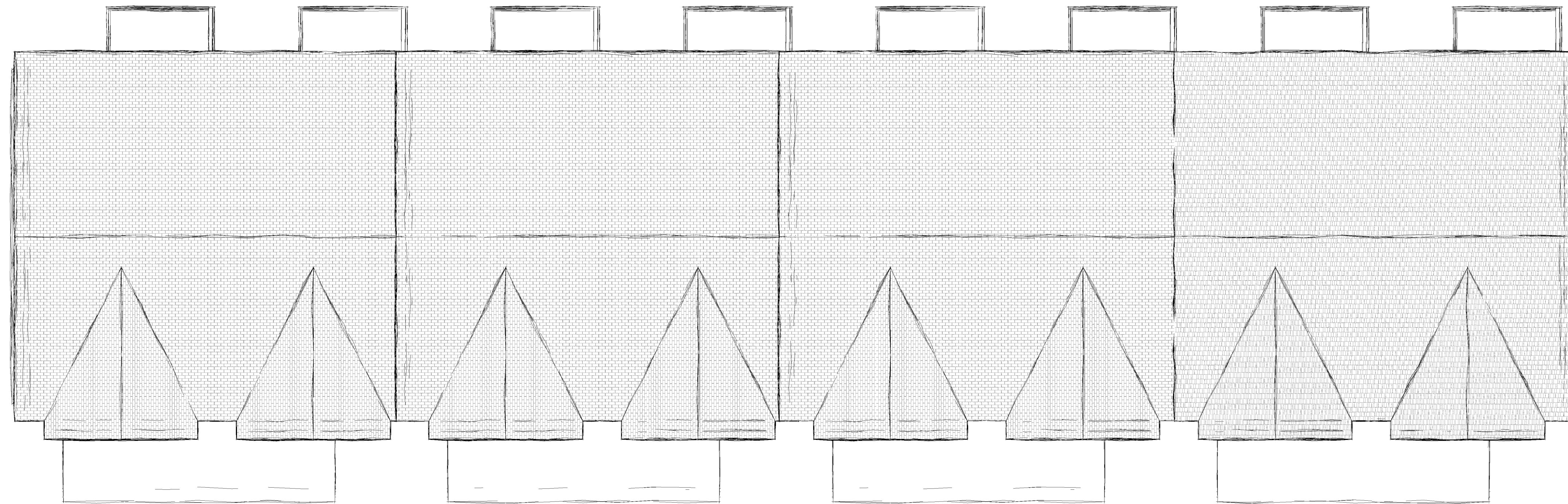
PROGRESS PRINT
NOT FOR
CONSTRUCTION



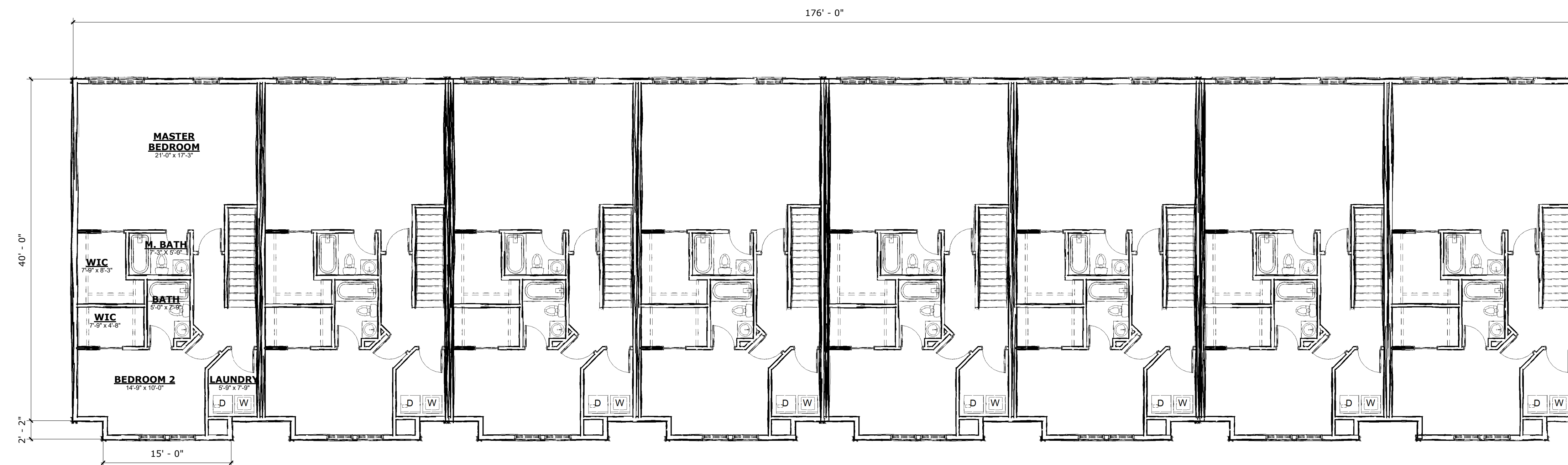
71 & 73 Rutland Street
Dover, New Hampshire 03820

12/28/2021





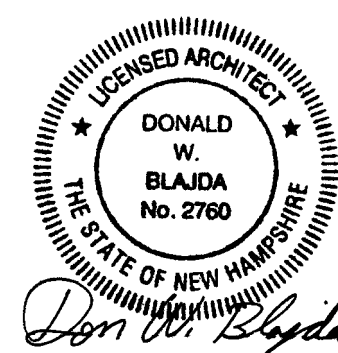
ROOF PLAN
1/8" = 1'-0"



LEVEL 3
1/8" = 1'-0"



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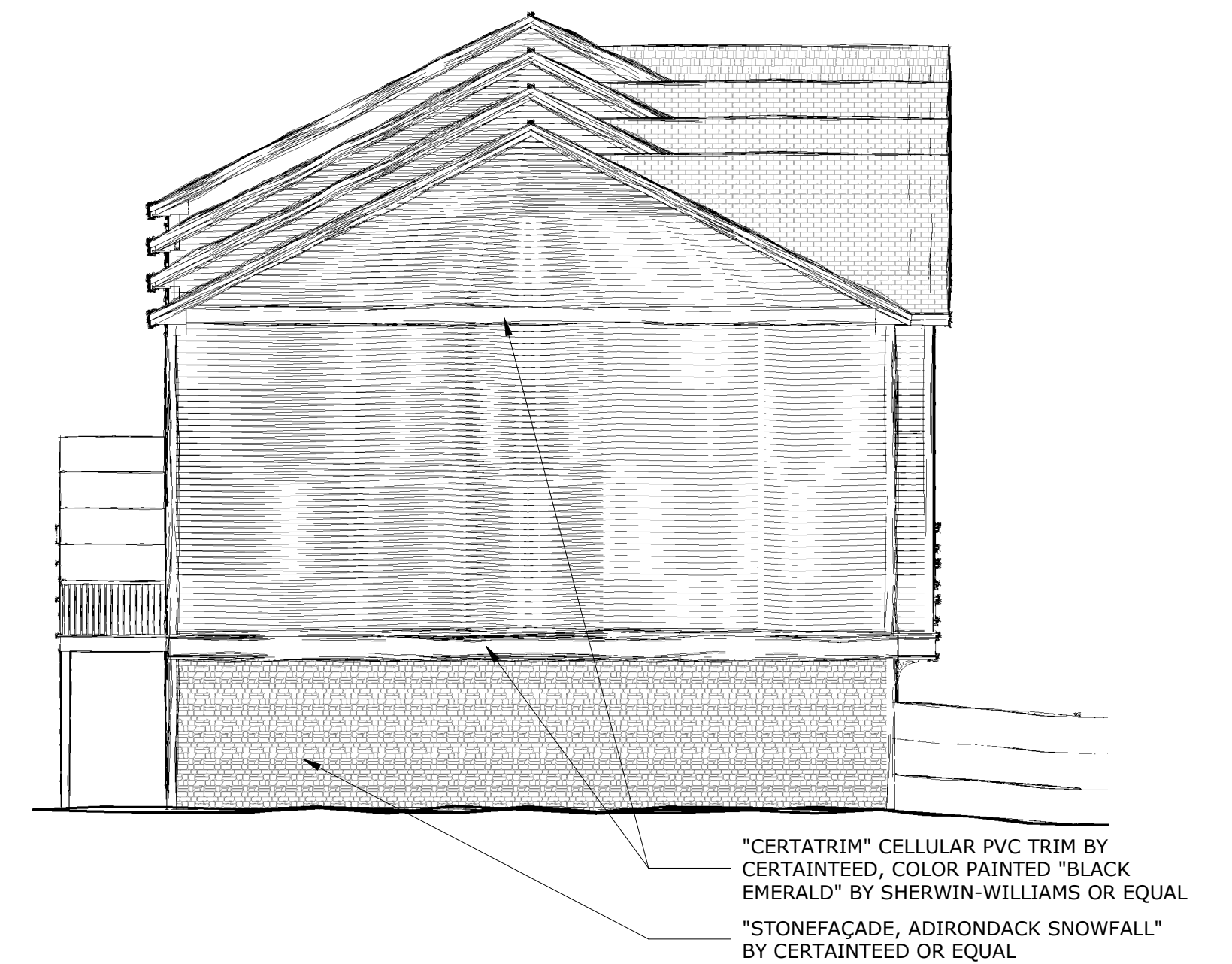
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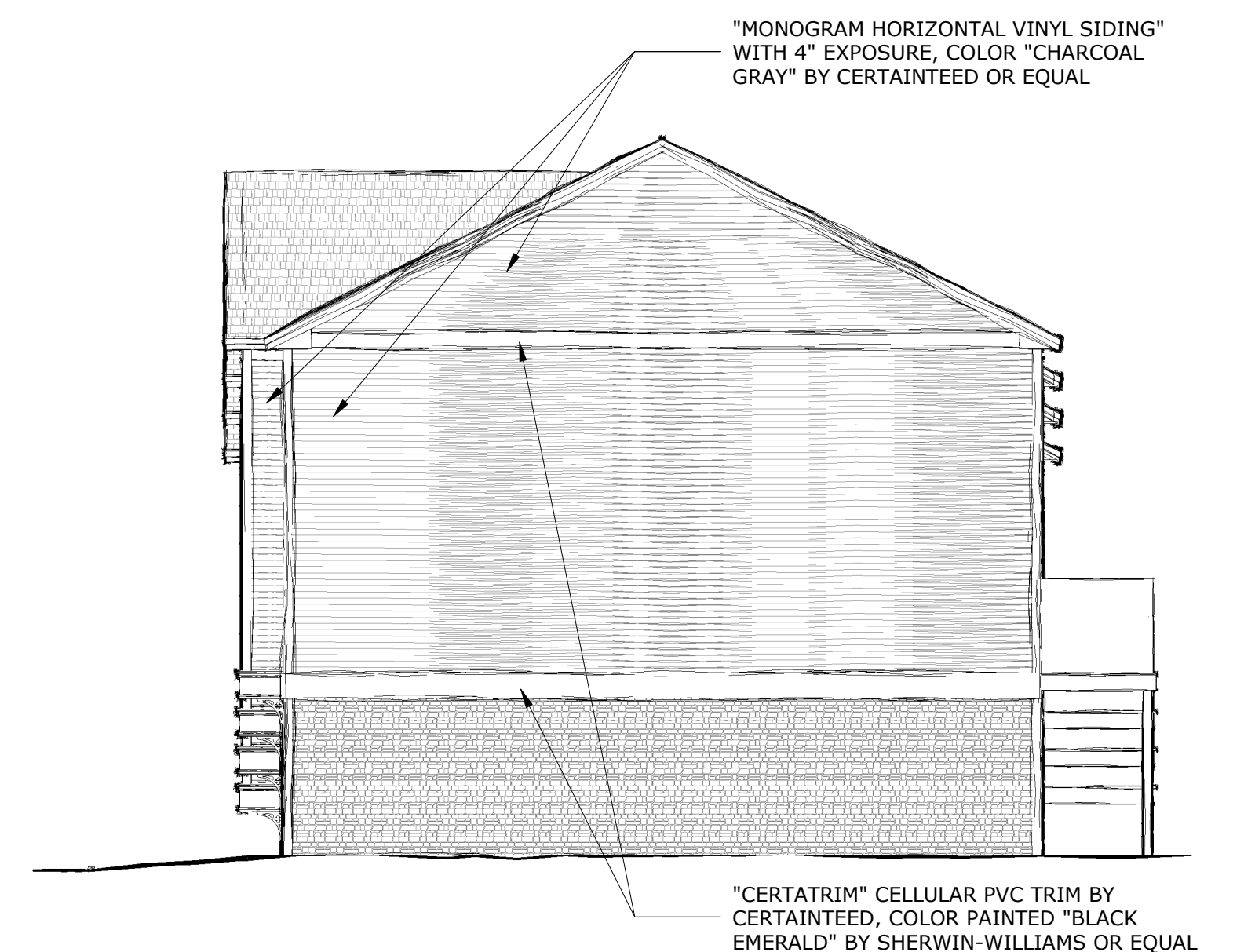
SOUTH ELEVATION
1/8" = 1'-0"



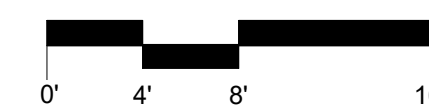
EAST ELEVATION
1/8" = 1'-0"



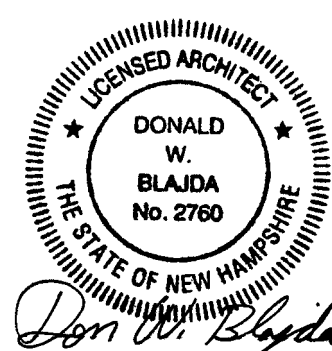
NORTH ELEVATION
1/8" = 1'-0"



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



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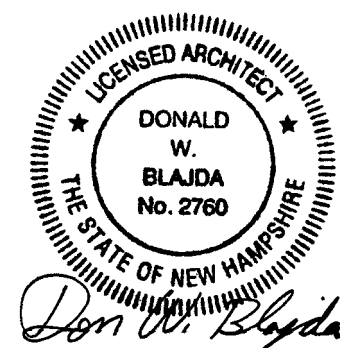
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① FRONT STREET VIEW

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① FRONT DRIVEWAY VIEW

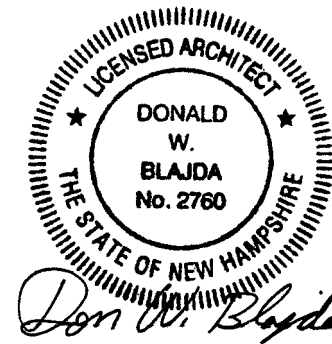


② FRONT YARD VIEW



③ FRONT CLOSE-UP VIEW

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