

JONES & BEACH ENGINEERS INC.

100 Domain Drive, Suite 201, Exeter, NH 03833
603.772.4746 – JonesandBeach.com

September 23, 2026

City of Portsmouth Planning and Sustainability Department
Attn: Peter Britz, Director
1 Junkins Avenue, Suite 3rd Floor
Portsmouth, NH 03801

RE: Response Letter
0 Ledgewood Drive, Portsmouth, NH
Tax Map 222, Lot 6A
JBE Project No. 25071.1

Dear Mr. Britz,

We are in receipt of comments from the Technical Advisory Committee dated August 31, 2026. Review comments are listed below with our responses in bold.

1. *Dumpster needs to comply with Section 10.575*

Response: As noted on Sheet C2, the dumpster has been relocated to conform with the setbacks per Section 10.575 of the Zoning Ordinance.

2. *Please show the drainage in the rear of the property does not leave site.*

Response: Drainage from onsite and offsite areas reaches the rear of the property in the existing condition, and sits in the low area created by the existing bermed trail that is being taken down before eventually cresting over a break in the berm. The stormwater management system has been designed to mimic this slow stormwater discharge that happens in the existing condition post-construction. In effect, there will be a decrease in the peak flow rate and volume leaving the site to the east during the 2-, 10-, 25-, and 50-year 24-hour storm events in accordance with Section 7 of the site plan review regulations.

3. *Please consider the use of solar on roof.*

Response: The roof will have a south-facing shed exposure for an effective solar-ready roof.

4. *Please provide a green building statement.*

Response: A green building statement is included with this resubmission.

5. *Removal of any city trees will need to go to Trees and Greenery.*

Response: Noted, we will coordinate with Tree and Greenery for this work.

6. *Bike racks are required per section 10.1116.11. Please consider putting them outside.*

Response: An external bike rack has been added to the plan.

7. *Straighten sidewalk alignment along building.*

Response: The sidewalk alignment has been straightened along the front of the building.

8. *Remove “pocket pond” from City property. In addition, it is placed over the sewer main.*

Response: As discussed at the TAC work session on September 8th, the purpose of this “pocket pond” is to provide a shallow depression to detain and infiltrate runoff from offsite that reaches this area. The full extent of the offsite contributing watershed area that drains on to the subject parcel and the wide right of way in front of it is depicted on the existing and proposed watershed plans within the drainage report for the proposed development. It should not be construed from the terminology that this is a stormwater treatment feature; it is a grassed depression that will blend into the surroundings and look like a mowed lawn.

In the existing condition, drainage from offsite areas sits in the low area created by the existing bermed trail before eventually cresting over a break in the berm. This existing berm is being taken out so that the proposed building can be constructed. The intent of the pocket pond in front of the property is to replicate post-construction the existing detention of offsite runoff that is occurring due to the presence of the existing berm. Without the pocket pond, there would be an increase in the peak flow rate and runoff volume post-construction, and this is not possible to replicate on-site where on-site drainage features are already being used to treat and infiltrate runoff from the impervious surface associated with the proposed development.

After this was explained at the September 8th TAC work session, it was amenable to the pocket pond being provided in the right of way. We have adjusted the pocket pond to not be placed directly over the sewer main.

9. *Confirm internal drop connection for sewer service into SMH. Add note to plan sheet stating internal drop connection.*

Response: We have revised the sewer service to the proposed building to tie into the sewer main directly and not into the SMH.

10. *Fire and domestic water services must have their own connections to the water main.*

Response: Fire and domestic services are now shown with separate connections to the extended water main on Sheet C4.

11. *Extend DI water main beyond proposed driveway.*

Response: There is already a privately owned 6” cast iron water main beyond the existing reducer. We are now extending the existing 8” D.I. water main to a convenient tapping location for the building and stubbing the water main just past that point.

12. *Coordinate with off site improvements (retaining wall along edge of property, sidewalk, etc.)*

Response: The offsite sidewalk and retaining wall being designed by others is shown on the plan set, and our proposed sidewalk ties into it.

13. *Confirm location of existing sewer, upstream manhole to the east does not have invert info and location may not be accurate.*

Response: The location, rim, and inverts of the upstream manhole have been confirmed and are shown on the revised existing conditions plan.

14. *Confirm 1" water service is adequate for 15 unit building. May be undersized.*

Response: We have upgraded to a 2" domestic water service.

15. *Confirm 4" fire service is adequate.*

Response: Our initial assessment is a 4" fire service will be sufficient for a building of this size. This must be confirmed with water pressure data before finalizing. Once pressure data is acquired the hydraulic design can be completed and fire service size confirmed.

16. *Coordinate with assessing regarding the address of the property.*

Response: The assessing department has been made aware of the issue and we are awaiting the updating information.

Included with this response letter are the following:

1. One (1) Full Size Revised Plan Set.
2. One (1) Revised Drainage Analysis.
3. Revised Architectural Plans and Elevations.
4. Green Building Statement.
5. Site Review Checklist.
6. Trip Generation Memo.

If you have any questions or need any additional information, please feel free to contact our office. Thank you very much for your time.

Very truly yours,

JONES & BEACH ENGINEERS, INC.



Erik Poulin
Associate Principal

cc: Stefanie Casella, Portsmouth Planning Department (via email)
Ben Middleton, Martini Northern LLC (via email)
Peter Middleton, Martini Northern LLC (via email)
Glen Lambert, Winter Holben (via email)
Brandon Holben, Winter Holben (via email)



City of Portsmouth, New Hampshire

Site Plan Application Checklist

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

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

Name of Applicant: Martini Northern LLC Date Submitted: 9-23-26

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

Site Address: 0 Lafayette Road (Ledgewood Drive) Map: 229 Lot: 6A

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

Site Plan Review Application Required Information			
☒	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☐	Statement that lists and describes "green" building components and systems. (2.5.3.1B)	Pending	
☒	Existing and proposed gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. (2.5.3.1C)	Architecturals	N/A
☒	Tax map and lot number, and current zoning of all parcels under Site Plan Review. (2.5.3.1D)	Cover Sheet & Sheet C2	N/A

Site Plan Review Application Required Information			
☒	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☐	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. (2.5.3.1E)	Cover and Application	N/A
☒	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. (2.5.3.1F)	Sheet C1	N/A
☒	Names, addresses and telephone numbers of all professionals involved in the site plan design. (2.5.3.1G)	Cover Sheet	N/A
☒	List of reference plans. (2.5.3.1H)	Sheet C1	N/A
☒	List of names and contact information of all public or private utilities servicing the site. (2.5.3.1I)	Cover Sheet	N/A

Site Plan Specifications			
☒	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☒	Full size plans shall not be larger than 22 inches by 34 inches with match lines as required, unless approved by the Planning Director.. (2.5.4.1A)	Required on all plan sheets	N/A
☒	Scale: Not less than 1 inch = 60 feet and a graphic bar scale shall be included on all plans. (2.5.4.1B)	Required on all plan sheets	N/A
☒	GIS data should be referenced to the coordinate system New Hampshire State Plane, NAD83 (1996), with units in feet. (2.5.4.1C)	Sheet C1	N/A
☒	Plans shall be drawn to scale and stamped by a NH licensed civil engineer. (2.5.4.1D)	Required on all plan sheets	N/A
☐	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. (2.5.4.1E)	Sheet C1	N/A
☒	Title (name of development project), north point, scale, legend. (2.5.4.2A)	Cover Sheet and Sheet C2	N/A
☒	Date plans first submitted, date and explanation of revisions. (2.5.4.2B)	All Sheets	N/A
☒	Individual plan sheet title that clearly describes the information that is displayed. (2.5.4.2C)	Required on all plan sheets	N/A
☒	Source and date of data displayed on the plan. (2.5.4.2D)	Sheet C1	N/A

Site Plan Specifications – Required Exhibits and Data			
☒	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☒	1. Existing Conditions: (2.5.4.3A) • Surveyed plan of site showing existing natural and built features; • Existing building footprints and gross floor area; • Existing parking areas and number of parking spaces provided; • Zoning district boundaries; • Existing, required, and proposed dimensional zoning requirements including building and open space coverage, yards and/or setbacks, and dwelling units per acre; • Existing impervious and disturbed areas; • Limits and type of existing vegetation; • Wetland delineation, wetland function and value assessment (including vernal pools); • SFHA, 100-year flood elevation line and BFE data, as required.	Sheet C1	
☒	2. Buildings and Structures: (2.5.4.3B) • Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation; • Elevations: Height, massing, placement, materials, lighting, façade treatments; • Total Floor Area; • Number of Usable Floors; • Gross floor area by floor and use.	Architecturals	
☒	3. Access and Circulation: (2.5.4.3C) • Location/width of access ways within site; • Location of curbing, right of ways, edge of pavement and sidewalks; • Location, type, size and design of traffic signing (pavement markings); • Names/layout of existing abutting streets; • Driveway curb cuts for abutting prop. and public roads; • If subdivision; Names of all roads, right of way lines and easements noted; • AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	Sheet C2 & T1	
☒	4. Parking and Loading: (2.5.4.3D) • Location of off street parking/loading areas, landscaped areas/buffers; • Parking Calculations (# required and the # provided).	Sheet C2	
☒	5. Water Infrastructure: (2.5.4.3E) • Size, type and location of water mains, shut-offs, hydrants & Engineering data; • Location of wells and monitoring wells (include protective radii).	Sheet C4	
☒	6. Sewer Infrastructure: (2.5.4.3F) • Size, type and location of sanitary sewage facilities & Engineering data, including any onsite temporary facilities during construction period.	Sheet C4	

☒	7. Utilities: (2.5.4.3G) - The size, type and location of all above & below ground utilities; - Size type and location of generator pads, transformers and other fixtures.	Sheet C4	
☒	8. Solid Waste Facilities: (2.5.4.3H) The size, type and location of solid waste facilities.	Sheet C2	
☒	9. Storm water Management: (2.5.4.3I) - The location, elevation and layout of all storm-water drainage. - The location of onsite snow storage areas and/or proposed off-site snow removal provisions. - Location and containment measures for any salt storage facilities - Location of proposed temporary and permanent material storage locations and distance from wetlands, water bodies, and stormwater structures.	Sheet C3	
☒	10. Outdoor Lighting: (2.5.4.3J) Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and photometric plan.	Sheet L1	
☒	11. Indicate where dark sky friendly lighting measures have been implemented. (10.1)	Sheet L1 Note 7	
☒	12. Landscaping: (2.5.4.3K) - Identify all undisturbed area, existing vegetation and that which is to be retained; - Location of any irrigation system and water source.	Sheet L2	
☒	13. Contours and Elevation: (2.5.4.3L) Existing/Proposed contours (2 foot minimum) and finished grade elevations.	Sheet C3	
☐	14. Open Space: (2.5.4.3M) Type, extent and location of all existing/proposed open space.	NA	
☐	15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)	NA	
☐	16. Character/Civic District (All following information shall be included): (2.5.4.3P) - Applicable Building Height (10.5A21.20 & 10.5A43.30); - Applicable Special Requirements (10.5A21.30); - Proposed building form/type (10.5A43); - Proposed community space (10.5A46).	NA	
☐	17. Special Flood Hazard Areas (2.5.4.3Q) - The proposed development is consistent with the need to minimize flood damage; - All public utilities and facilities are located and construction to minimize or eliminate flood damage; - Adequate drainage is provided so as to reduce exposure to flood hazards.	NA	

Other Required Information			
☒	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☒	Traffic Impact Study or Trip Generation Report, as required. (3.2.1-2)	Attached	
☒	Indicate where Low Impact Development Design practices have been incorporated. (7.1)	Sheet C3 & Report	
☒	Indicate whether the proposed development is located in a wellhead protection or aquifer protection area. Such determination shall be approved by the Director of the Dept. of Public Works. (7.3.1)	Sheet C2 Note 20	
☒	Stormwater Management and Erosion Control Plan. (7.4)	Sheet C3, E1, E2	
☒	Inspection and Maintenance Plan (7.6.5)	Drainage Report	

Final Site Plan Approval Required Information			
☒	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☐	All local approvals, permits, easements and licenses required, including but not limited to: • Waivers; • Driveway permits; • Special exceptions; • Variances granted; • Easements; • Licenses. (2.5.3.2A)	Pending	
☒	Exhibits, data, reports or studies that may have been required as part of the approval process, including but not limited to: • Calculations relating to stormwater runoff; • Information on composition and quantity of water demand and wastewater generated; • Information on air, water or land pollutants to be discharged, including standards, quantity, treatment and/or controls; • Estimates of traffic generation and counts pre- and post- construction; • Estimates of noise generation; • A Stormwater Management and Erosion Control Plan; • Endangered species and archaeological / historical studies; • Wetland and water body (coastal and inland) delineations; • Environmental impact studies. (2.5.3.2B)	Drainage Report	
☐	A document from each of the required private utility service providers indicating approval of the proposed site plan and indicating an ability to provide all required private utilities to the site. (2.5.3.2D)	Pending	

Final Site Plan Approval Required Information

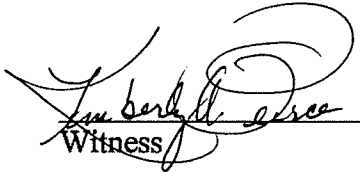
☒	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☐	A list of any required state and federal permit applications required for the project and the status of same. (2.5.3.2E)	NA	
☒	A note shall be provided on the Site Plan stating: "All conditions on this Plan shall remain in effect in perpetuity pursuant to the requirements of the Site Plan Review Regulations." (2.5.4.2E)	Sheet C2 Note 19	N/A
☐	For site plans that involve land designated as "Special Flood Hazard Areas" (SFHA) by the National Flood Insurance Program (NFIP) confirmation that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law, including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334. (2.5.4.2F)	NA	
☒	Plan sheets submitted for recording shall include the following notes: a. "This Site Plan shall be recorded in the Rockingham County Registry of Deeds." b. "All improvements shown on this Site Plan shall be constructed and maintained in accordance with the Plan by the property owner and all future property owners. No changes shall be made to this Site Plan without the express approval of the Portsmouth Planning Director." (2.13.3)	Sheet C2 Note 18	N/A

Applicant's Signature:  Date: 9-23-26

Letter of Authorization

I, Ben Middleton, Martini Northern, LLC, 10 Main Street, Newfields, NH 03856, developer of property located in Portsmouth, NH, known as Tax Map 229, Lot 6A, do hereby authorize Jones & Beach Engineers, Inc., PO Box 219, Stratham, NH, to act on my behalf concerning the previously-mentioned property. The parcel is located on Lafayette Road in Portsmouth, NH.

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


Witness


Ben Middleton
Martini Northern, LLC

6/24/2026
Date

Letter of Authorization

St. Nicholas Greek Orthodox Church, 40 Andrew Jarvis Drive, Portsmouth, NH 03801, owner of property located in Portsmouth, NH, known as Tax Map 229, Lot 6A, do hereby authorize Jones & Beach Engineers, Inc., PO Box 219, Stratham, NH, to act on my behalf concerning the previously-mentioned property. The parcel is located on Lafayette Road in Portsmouth, NH.

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

DocuSigned by:
Caitlin Burke
729E64F0CBEA4AE...

Witness

Signed by:
Gregory Kantner
146C9A8C67A8C451...

St. Nicholas Greek Orthodox Church

6/24/2026

Date

By signing this Letter of Authorization, the undersigned grants permission for the project to proceed. This authorization does not constitute an agreement to pay for any portion of the project and does not create any financial obligation for the undersigned.

KNOW ALL MEN BY THESE PRESENTS, That I, Thomas B. Kremp, being single,
of 545 Lafayette Road, Portsmouth, County of Rockingham and State
of New Hampshire

BK2410 P0505

for consideration paid, grant to St. Nicholas Greek Orthodox Church of
Portsmouth, Inc., a corporation located in Portsmouth, County
of Rockingham and State of New Hampshire,

with warranty covenants

A certain tract or parcel of land situated on the
northerly side of Ledgewood Drive in the City of Portsmouth,
County of Rockingham and State of New Hampshire, more particularly
bounded and described as follows:

Beginning at an iron pin on the northerly side of a
100' right-of-way owned by the City of Portsmouth and being
the division line between the premises herein conveyed and
other land of Thomas B. Kremp known as Lot #1, thence:

1. North 00° 00' one hundred eighty-one (181) feet,
more or less, to an iron pin at land now or formerly of
Roger and Mildred Chapdelaine.
2. South 82° 00' East two hundred thirty-eight and
fifty hundredths (238.50) feet, more or less, by land now or
formerly of Chapdelaine to an iron pin at land of the St.
Nicholas Greek Orthodox Church and land of the City of
Portsmouth.
3. South 00° 05' 25" West one hundred eighty-seven
and ninety hundredths (187.90) feet, more or less, by land
of the City of Portsmouth to an iron pin at the City of
Portsmouth's 100' right-of-way.
4. North 79° 58' 56" West two hundred forty (240)
feet, more or less, by the City of Portsmouth 100' right-of-
way to an iron pin at the point of beginning.

Being Lot #2 containing 1.01 acres as more particularly
described on "Plan of Land in Portsmouth, N.H., County of
Rockingham, as Surveyed for Thomas B. Kremp, Lafayette Road,
Portsmouth, N.H." by Town Planning and Engineering Associates,
Inc. dated January, 1982, to be recorded herewith.

Being a portion of the premises conveyed to Thomas B.
Kremp by deed of Jennie A. D'Errico dated March 17, 1978,
and recorded in Rockingham County Registry of Deeds at Book
2306, Page 1055.

husband wife of said grantor, release to
said grantor all rights of homestead and other interests therein.

Witness, my hand ~~xxxxxx~~ this day of 19 82

Witness

Jay H. Remin

Thomas B. Kremp
Thomas B. Kremp

L.S.

L.S.

State of New Hampshire

Rockingham ss.

A.D. 19 82

Personally appeared Thomas B. Kremp

known to me, or satisfactorily proven, to be the person whose name

subscribed to the foregoing instrument and acknowledged that he executed the same

for the purposes therein contained.

Before me,

Gerald F. Silva
Justice of the Peace - Notary Public



SUSTAINABLE DESIGN FEATURES

Date: September 21, 2026

Project: Ledgewood Dr

ARCHITECTURE

- South-facing shed roof exposure for an effective solar-ready roof
- Energy efficient extruded fiberglass windows to reduce heat loss and provide a highly durable interior and exterior with easy operation
- Exterior walls insulated with wood fiber batt insulation for a low carbon footprint and increased R-value
- High quality composite cladding materials and siding with a long lifespan will help to reduce maintenance and life-cycle costs.
- Energy-efficient LED lighting throughout the interior will lower energy consumption.
- Low-VOC emitting interior materials provide a healthier indoor environment for the occupants.

TRAFFIC IMPACT STATEMENT

ITE TRIP GENERATION ESTIMATES

**“Martini Apartments”
Ledgewood Drive
Portsmouth, NH 03801
Tax Map 229, Lot 6A**

Prepared for:

**Martini Northern LLC
Attn. Ben Middleton
10 Main Street
Newfields, NH 03856**

**Prepared by:
Jones & Beach Engineers, Inc.
100 Domain Drive
Suite 201
Exeter, NH 03833
(603) 772-4746
August 17, 2026
JBE Project No. 25071.2**

EXECUTIVE SUMMARY

Martini Northern LLC proposes to construct a 15-unit apartment building on a 0.99-acre parcel of land located on Ledgewood Drive in Portsmouth, NH. The subject parcel is vacant in the existing condition.

The proposed use for the lot was assumed to be “Multifamily Housing (Low Rise)” (Land Use Code 220, defined by the ITE Manual as “A residential building with two or three floors (levels) of residences.” The ITE Manual provides different estimates for such uses that are and aren’t close to rail transit. There is not rail transit available within walking distance of the proposed unit.

Trip generation estimates for the full day on a typical weekday, Saturday, and Sunday were calculated for the existing and proposed scenarios, as were trip generation estimates for the Peak Hour of Generator on a weekday, Saturday, and Sunday. For weekdays, the peak hour data was further broken down into peak hour AM and peak hour PM, corresponding with typical morning and evening commutes, and data for the Peak Hour on an Adjacent Street was also available.

Per-dwelling unit trip generation estimates for each of the aforementioned scenarios are included in the appendix, with a range of data presented. The Average Rate value for each scenario for the proposed use was used for this analysis. In the following table, the multifamily housing average rate estimates have been multiplied by fifteen (15) to arrive at the trip generation estimate for the proposed use.

Average Estimate			
	Full Day (Trips/Day)	Peak Hour Generator (Trips/Hour)	Peak Hour Adjacent Street (Trips/Hour)
Weekday	93.2		
Saturday	68.3	7.4	
Sunday	58.0	5.4	
Weekday AM		7.1	6.2
Weekday PM		9.3	7.8

CONCLUSION

Based on the above table, under normal circumstances this development would generate **93** additional trips on a weekday, **68** additional trips on a Saturday, and **58** additional trips on a Sunday. Peak hour estimates vary but in general they all show an increase of **5-9** additional trips during the peak hour of the generator and the same number of additional trips during the peak hour of adjacent street under normal circumstances. Ledgewood Drive directly feeds into Route 1, which receives moderate traffic in the existing condition. The existing Winchester Place Apartments further down along Ledgewood also dwarf the intended use of the subject parcel. It is unlikely that this development alone will substantially impact the existing traffic on Route 1 or 1A, or on Ledgewood Drive.

Respectfully submitted,
JONES & BEACH ENGINEERS, INC.

A handwritten signature in blue ink that reads "Daniel Meditz". The signature is written in a cursive, flowing style.

Daniel Meditz, P.E.
Lead Design Engineer

Trip generation estimates used for this analysis were taken from the Trip Generation Manual, 12th Edition, published by the Institute of Traffic Engineers in August 2025.

Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

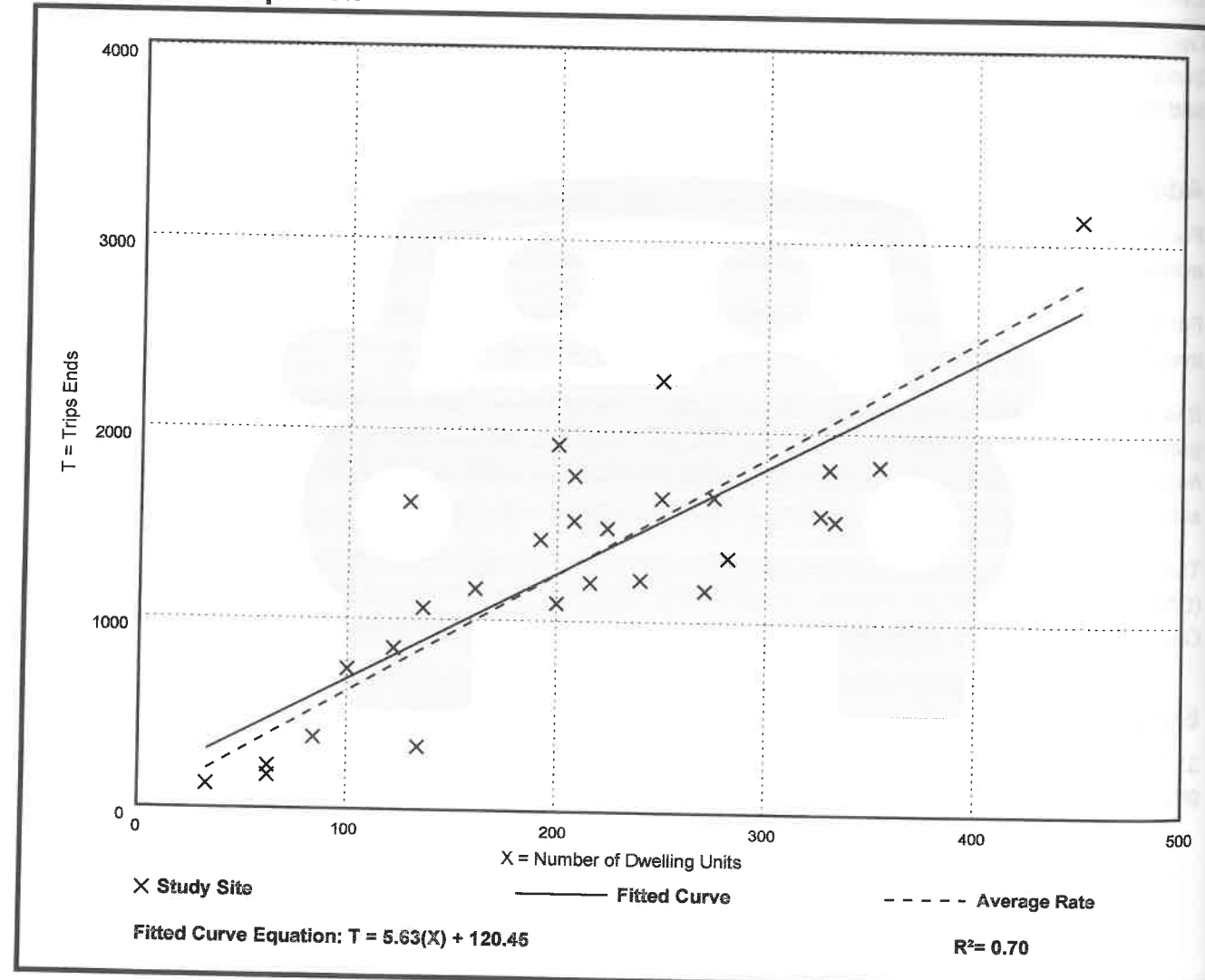
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 28
Avg. Num. of Dwelling Units: 208
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
6.21	2.46 - 12.50	1.87

Data Plot and Equation



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

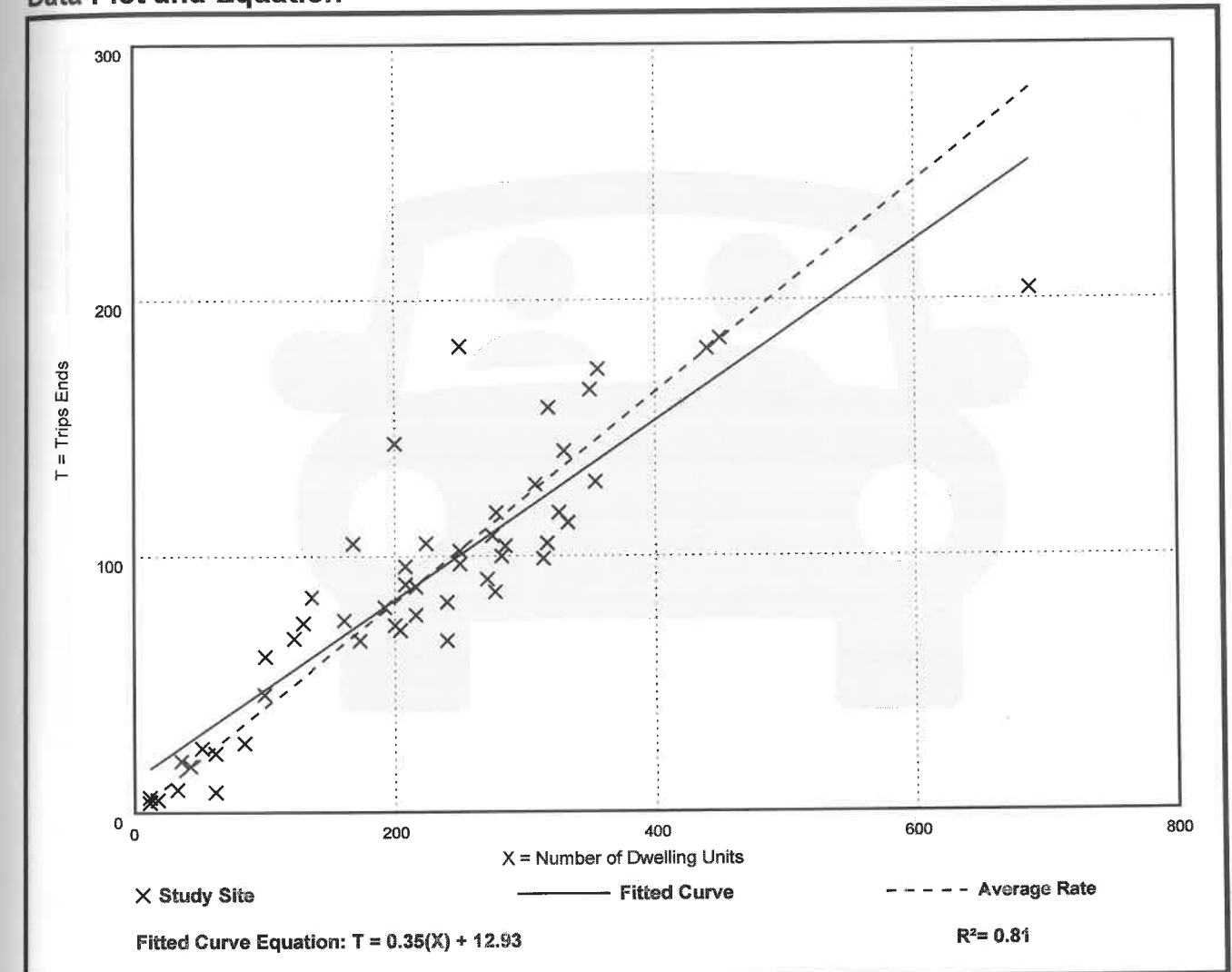
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban
Number of Studies: 51
Avg. Num. of Dwelling Units: 219
Directional Distribution: 24% entering, 76% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.41	0.13 - 0.73	0.10

Data Plot and Equation



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 61

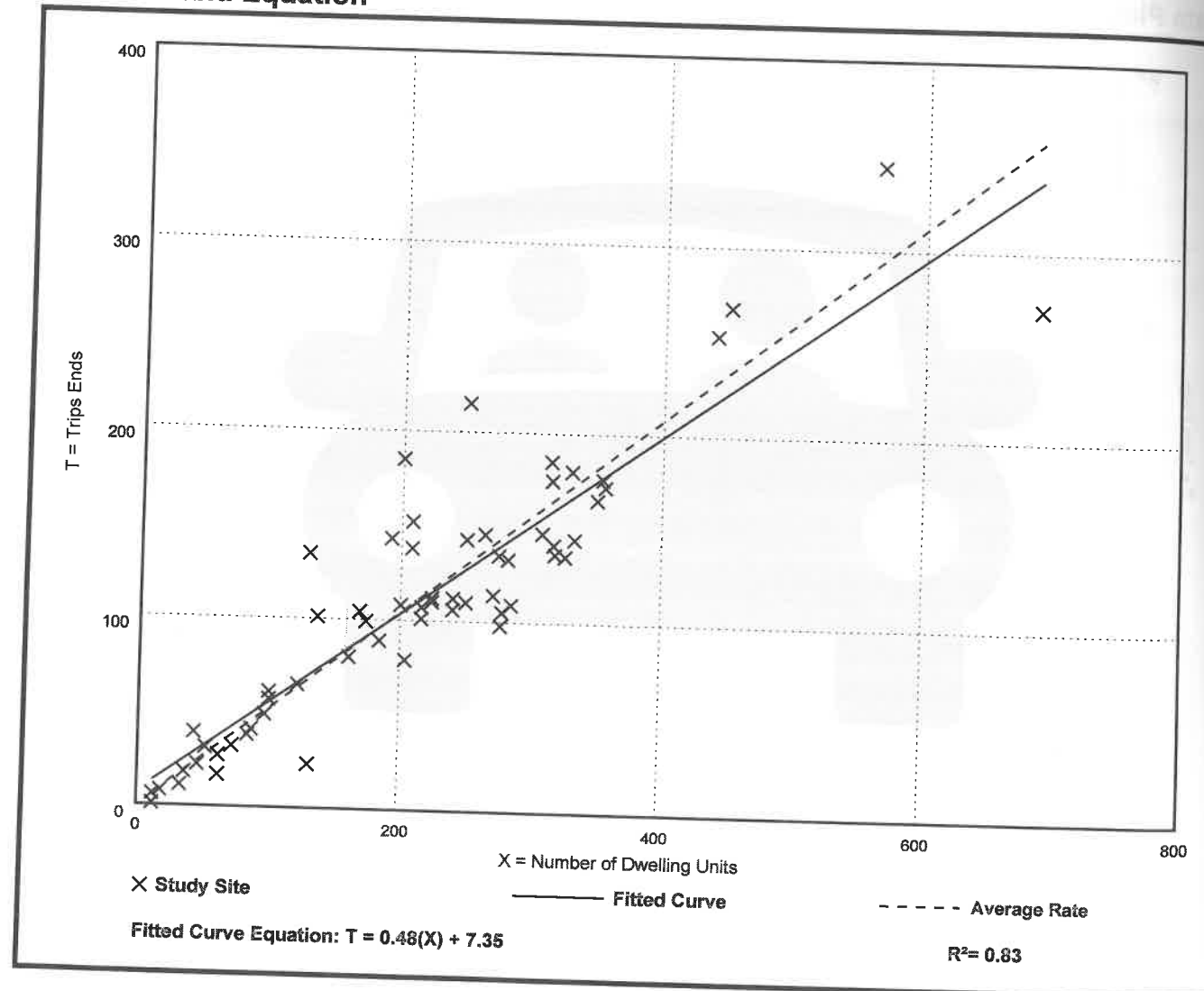
Avg. Num. of Dwelling Units: 215

Directional Distribution: 62% entering, 38% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.52	0.08 - 1.04	0.13

Data Plot and Equation



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

AM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 25

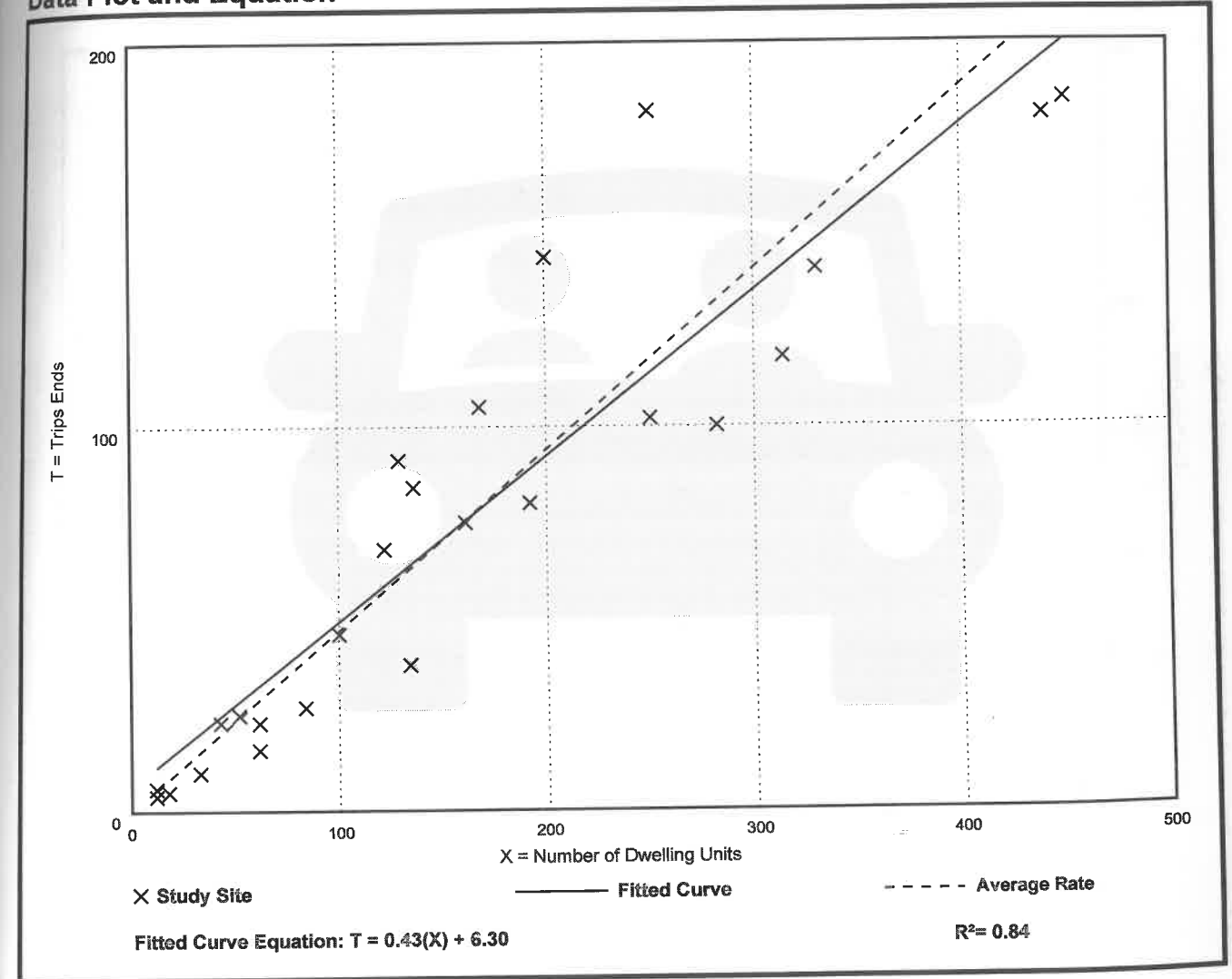
Avg. Num. of Dwelling Units: 161

Directional Distribution: 27% entering, 73% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.47	0.26 - 0.73	0.13

Data Plot and Equation



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

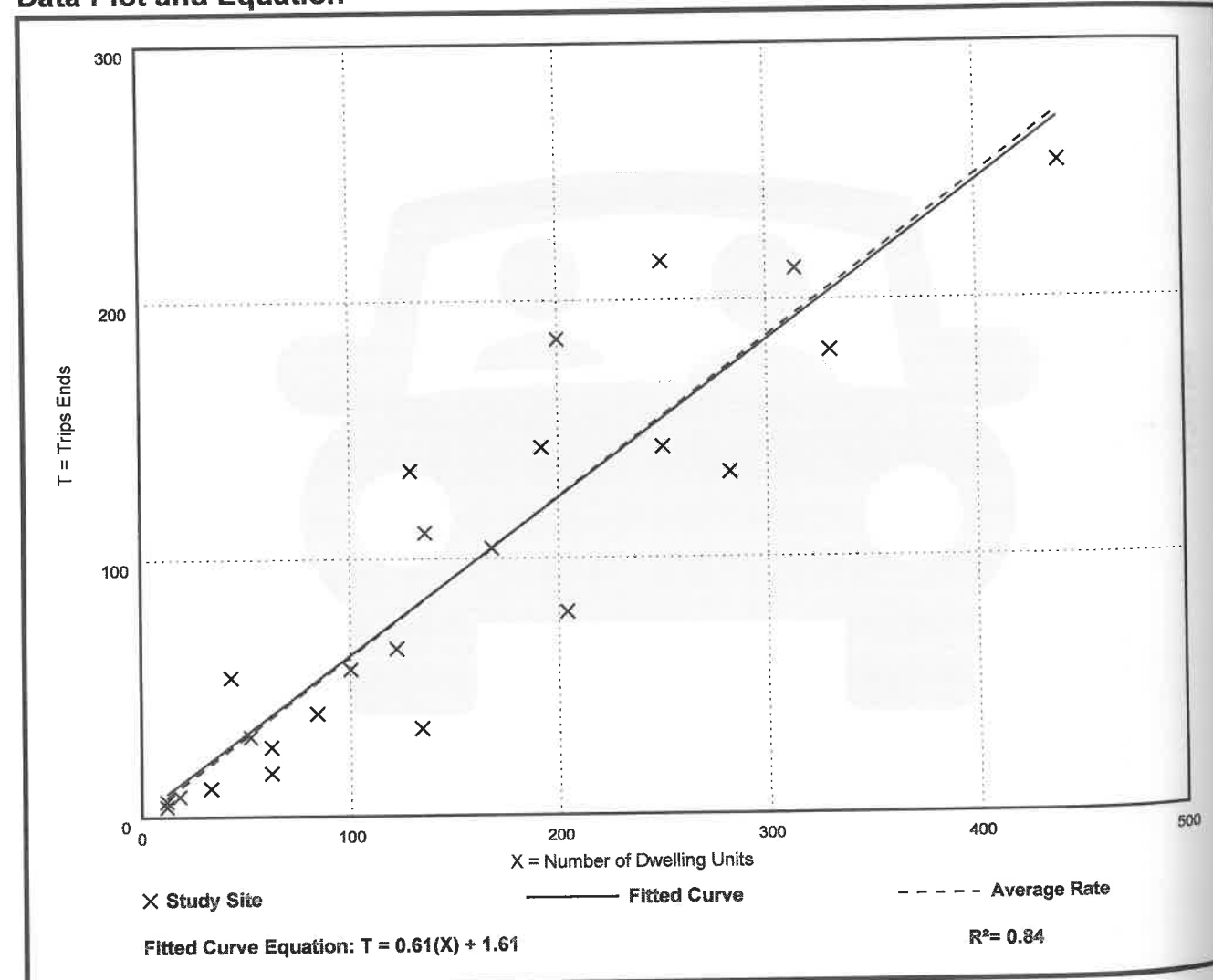
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 24
Avg. Num. of Dwelling Units: 151
Directional Distribution: 60% entering, 40% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.62	0.25 - 1.26	0.20

Data Plot and Equation



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units
On a: Saturday

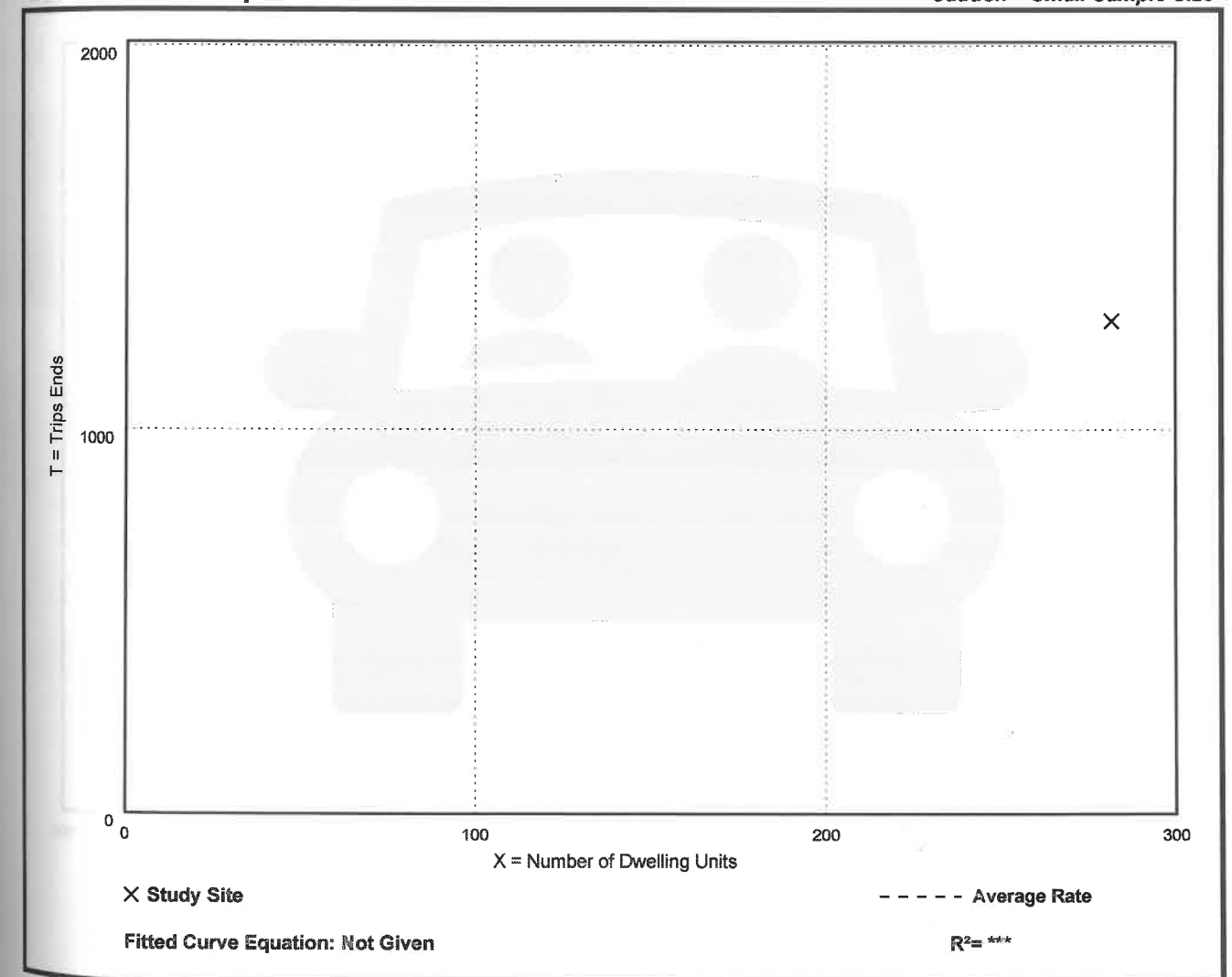
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Dwelling Units: 282
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
4.55	4.55 - 4.55	***

Data Plot and Equation

Caution – Small Sample Size



Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units
On a: Saturday, Peak Hour of Generator

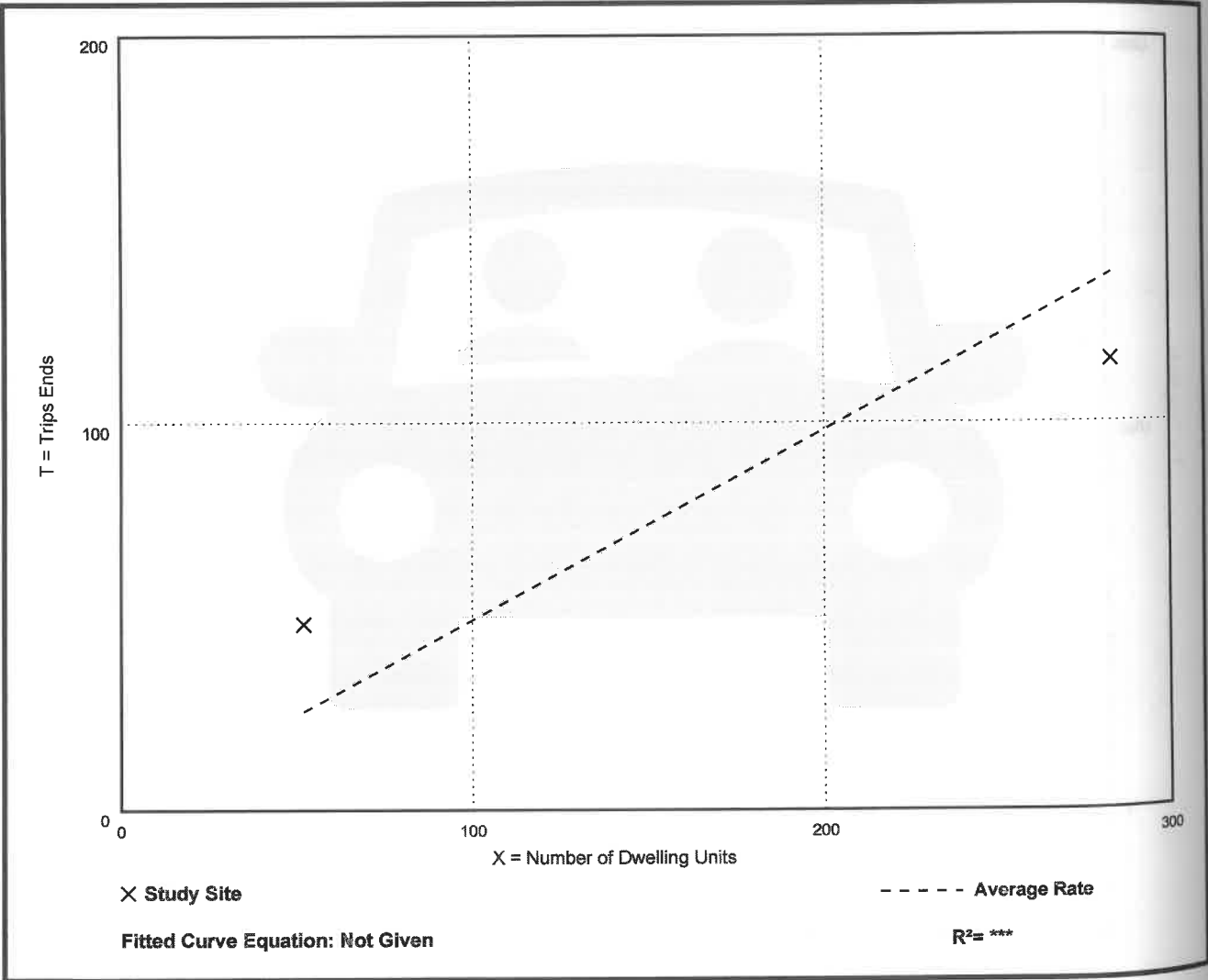
Setting/Location: General Urban/Suburban
Number of Studies: 2
Avg. Num. of Dwelling Units: 167
Directional Distribution: 38% entering, 62% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.49	0.41 - 0.92	***

Data Plot and Equation

Caution – Small Sample Size



Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units
On a: Sunday

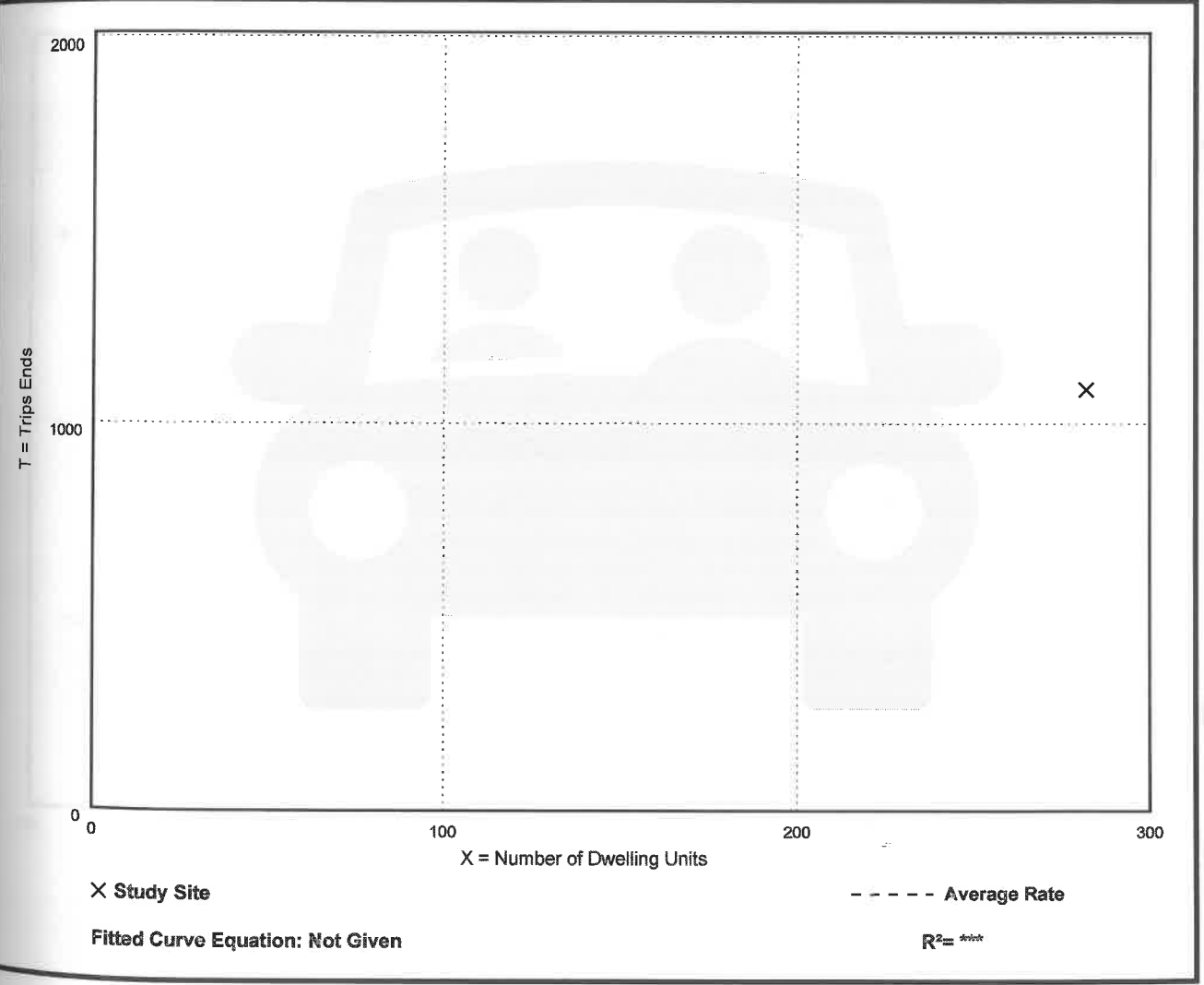
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Dwelling Units: 282
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
3.86	3.86 - 3.86	***

Data Plot and Equation

Caution – Small Sample Size



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units
On a: Sunday, Peak Hour of Generator

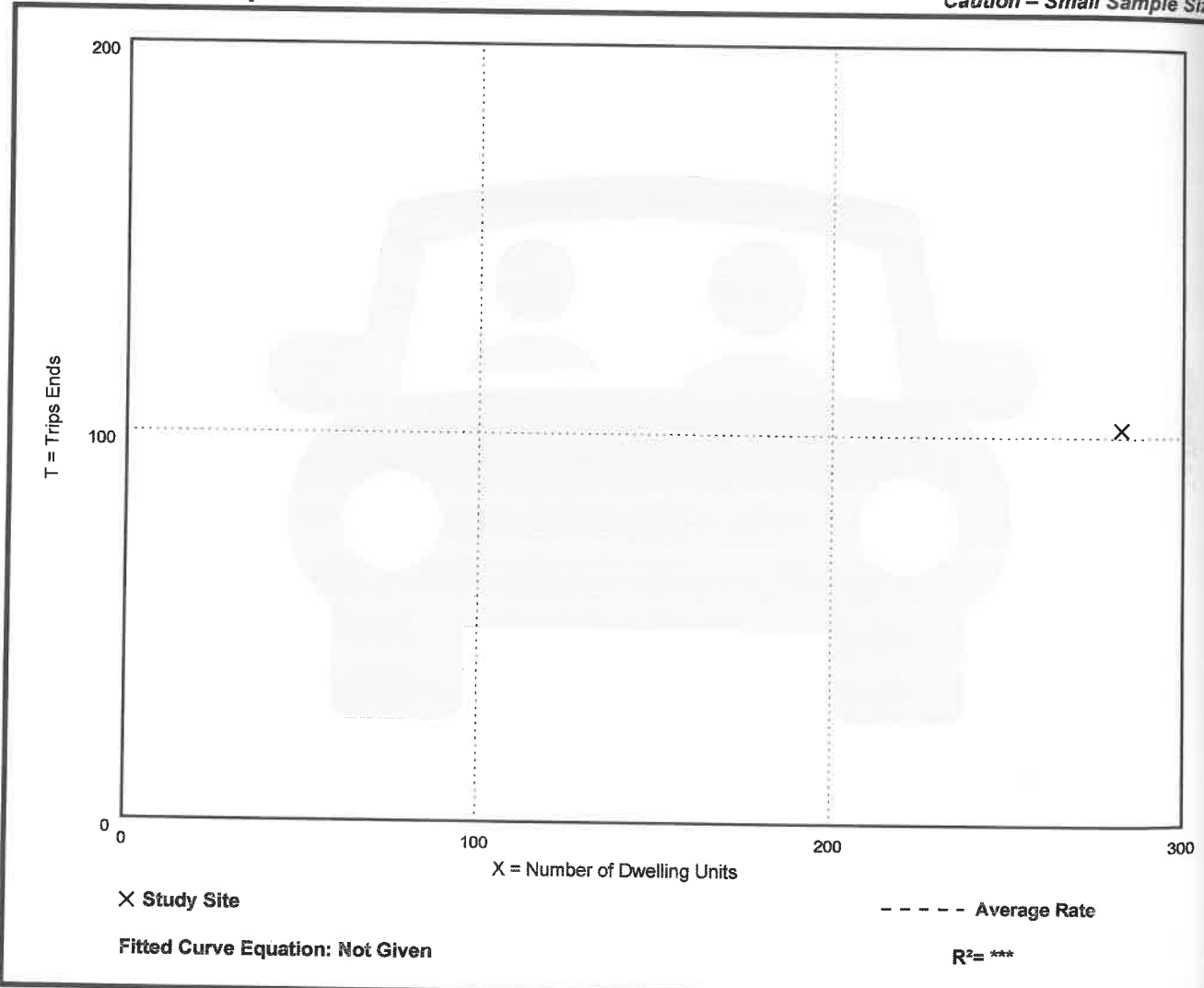
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Dwelling Units: 282
Directional Distribution: Not Available

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.36	0.36 - 0.36	***

Data Plot and Equation

Caution – Small Sample Size



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Residents
On a: Weekday

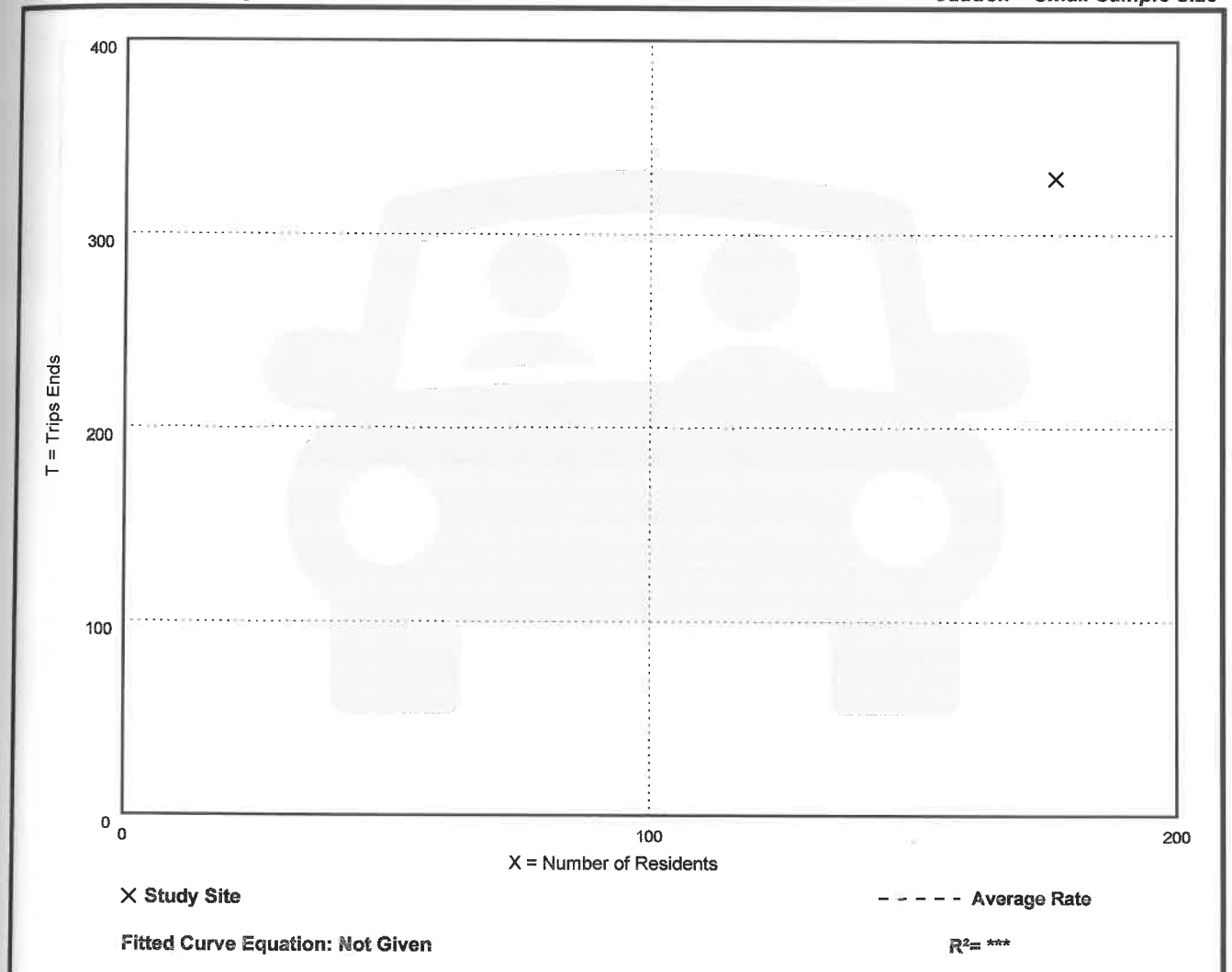
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Residents: 177
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
1.86	1.86 - 1.86	***

Data Plot and Equation

Caution – Small Sample Size





100 Domain Drive, Suite 201, Exeter, NH 03833
603.772.4746 – JonesandBeach.com

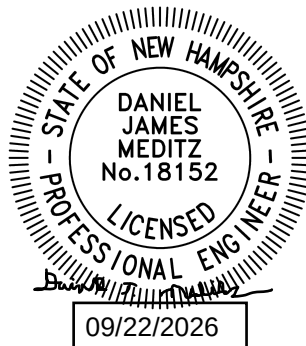
DRAINAGE ANALYSIS

SEDIMENT AND EROSION CONTROL PLAN

**“Ledgewood Drive LLC”
Ledgewood Drive
Portsmouth, NH 03801
Tax Map 229, Lot 6A**

Prepared for:

**Ledgewood Drive LLC
Attn. Ben Middleton
10 Main Street
Newfields, NH 03856**



**Prepared by:
Jones & Beach Engineers, Inc.
100 Domain Drive
Suite 201
Exeter, NH 03833
(603) 772-4746
August 6, 2026
Last Revised September 22, 2026
JBE Project No. 25071.2**

EXECUTIVE SUMMARY

Ledgewood Drive LLC proposes to construct an apartment building with associated indoor and outdoor parking, drainage, and utilities on the subject parcel with access from Ledgewood Drive in Portsmouth, NH. In the existing condition, the subject parcel is vacant and wooded, but surrounded by existing developed sites including a dentist's office to the west on abutting Tax Map 229, Lot 6, a residential subdivision immediately to the north, and the Portsmouth High School athletic field immediately to the east. This is important because the site receives significant offsite contributing watershed runoff from the north and west, and ultimately drains toward the east.

The intent of this analysis is to meet the requirements of Section 7 of the Portsmouth Site Plan Review Regulations, specifically as they relate to on-site stormwater management, and to mitigate the potential for adverse impacts to the subject parcel and downstream properties and water features resulting from the quality, quantity, and peak rate of runoff resulting from the proposed development as well as from upstream contributing watershed areas.

A drainage analysis of the subject parcel as well as offsite contributing watershed area was conducted for the purpose of estimating the peak rate and volume of stormwater runoff in the pre- and post-construction conditions, and to subsequently design adequate drainage structures so that the above-mentioned requirements could be met. Two models were compiled, one for this area in its existing (pre-construction) condition, and a second for the area in its proposed (post-construction) condition. A summary of the pre- and post-construction conditions peak rates of runoff toward the single analysis point, representing a wooded area just downstream of the subject parcel and adjacent to the Portsmouth High School ball field, in units of cubic feet per second (cfs) is as follows:

Analysis Point	2 Year		10 Year		25 Year		50 Year	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Analysis Point #1	2.01	1.99	4.75	4.72	9.48	9.41	15.16	14.97
Analysis Point #2	0.31	0.35	0.51	0.56	0.67	0.72	0.81	0.88

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

Analysis Point	2 Year		10 Year		25 Year		50 Year	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Analysis Point #1	0.188	0.178	0.571	0.540	0.989	0.934	1.424	1.347
Analysis Point #2	0.023	0.026	0.039	0.043	0.052	0.057	0.064	0.070

Per the above tables, the post-construction peak rate and volume of runoff is maintained or reduced toward Analysis Point 1 during the 2-, 10-, 25-, and 50-year 24-hour storms. The slight flow and volume increases toward Analysis Point 2 are due to the concurrent offsite sidewalk project by others and the 5' wide proposed paved apron in the right of way that is pitched toward Ledgewood Drive to keep road runoff off the site. The runoff resulting from the paved apron alone is negligible, and the increase toward Analysis Point 2 resulting from the offsite sidewalk project is outside of our control. Furthermore, runoff from all proposed impervious surfaces except for the aforementioned paved apron is treated post-construction, and the required pollutant removal thresholds have been met. The stormwater management system as designed meets all requirements of the City of Portsmouth stormwater regulations per Section 7 of the Site Plan Review Regulations.

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1.0 RAINFALL CHARACTERISTICS

This drainage report includes an existing conditions analysis of the area involved in the proposed development, as well as a proposed condition, or post-construction analysis, of the same area. These analyses were accomplished using the USDA SCS TR-20 Method within the HydroCAD 10.20-6a Stormwater Modeling System. The curve numbers were developed using the SCS TR-55 Runoff Curve numbers for Urban Areas. A Type III SCS 24-hour rainfall distribution was utilized in analyzing the data for the 2 Year – 24 Hour (3.71"), 10 Year – 24 Hour (5.63"), 25 Year – 24 Hour (7.13"), and 50 Year – 24 Hour (8.54") storm events. This data was taken from the Extreme Precipitation Tables developed by the Northeast Regional Climate Center (NRCC), and the values have been increased by 15% due to the project being within the Coastal/Great Bay Region.

Post-construction peak rates and volumes of runoff will be equal to or less than pre-construction peak rates and volumes of runoff toward Analysis Point 1, stormwater runoff from proposed impervious surfaces will be treated as practicable, and required pollutant removal thresholds will be met, thereby minimizing any potential for a negative impact on abutting properties.

2.0 EXISTING CONDITIONS ANALYSIS

In the existing condition, the subject parcel is vacant and wooded, but surrounded by existing developed sites including a dentist's office to the west on abutting Tax Map 229, Lot 6, a residential subdivision immediately to the north, and the Portsmouth High School athletic field immediately to the east. This is important because the site receives significant offsite contributing watershed runoff from the north and west, which ultimately drains toward the east.

There are ultimately two analysis points toward which all runoff from the subject parcel and offsite contributing watershed areas as well as a stretch of Ledgewood Drive that was considered for the analysis, together referred to from this point forward as simply the "study area", drain.

Analysis point 1 (AP1) represents a small wetland pocket in the southeast corner of the subject parcel. Downstream of analysis point 1, runoff from the site flows on to the Portsmouth High School athletic field immediately to the east of the site. Therefore, it is very important that stormwater is not discharged from the site at a higher peak rate or volume post-construction as compared with the pre-construction condition so as to avoid discharging excessive water into the athletic field. Runoff from the entire subject parcel as well as offsite contributing watershed areas ultimately drains toward Analysis Point 1.

Analysis Point 2 (AP2) represents the outfall from the existing closed drainage system in Ledgewood Drive. Although runoff from the subject parcel itself does not drain toward Analysis Point 2, Analysis Point 2 has been analyzed as the proposed site driveway comes from a curb cut on Ledgewood Drive and therefore results in a slight modification to the watershed of Analysis Point 2 post-construction.

Existing on-site and offsite topography and drainage features in the area that drains through the site toward analysis point 1 divide the study area into three subcatchments. Subcatchment 3S represents the portion of the study area that drains directly toward AP1 without first passing through some sort of drainage feature.

Two existing drainage features were identified within the watershed of Analysis Point 1. The first, Pond 1P, is a shallow low area just to the east of the center of the subject parcel. Although this is only

a shallow area, there is a variable height berm with an existing trail on top just to the east of Pond 1P that stops water from overflowing directly toward Analysis Point 1. Near the northeast corner of the subject parcel there is a small opening in the berm that acts as an overflow and is modelled in the drainage calculations as a broad-crested rectangular weir outlet. Ponded water below this weir is modelled to directly infiltrate into the soil. Analysis Point 1 is modelled directly downstream of the broad crested rectangular weir outlet of Pond 1P in the existing conditions analysis.

The land within the study area from which runoff drains toward Pond 1P is modelled as Subcatchment 1S, which includes the bulk of the subject parcel as well as significant offsite contributing watershed area.

The second drainage feature, Pond 2P, appears to exist on the privately owned parcel that Legewood Drive passes through, right at the corner of Lafayette Road and Ledgewood Drive in front of the dentist office that is located on abutting Tax Map 229 Lot 6. Pond 2P has a culvert outlet, through which any water that overflows from the pond is discharged toward previously described Pond 1P, where it is further detained before ultimately infiltrating to groundwater or cresting over the existing berm break toward Analysis Point 1.

The land within the study area from which runoff drains toward Pond 2P is modelled as Subcatchment 2S, which includes the bulk of the existing dentist office site located at the corner of Lafayette Road and Ledgewood Drive and some of the Lafayette Road right of way and the privately-owned parcel that Ledgewood Drive passes through.

Two existing catch basins in Ledgewood Drive separate the watershed draining toward Analysis Point 2 into two subcatchments. The areas from which runoff drains toward catch basins 1 and 2, modelled as CB1 and CB2, respectively, are modelled as Subcatchments 4S and 5S.

NRCS Web Soil Survey was used to determine existing soil types on both the subject parcel itself and offsite contributing watershed areas within the study area. Through the use of this tool, it was determined that existing soil type that comprises the predominant majority of both the onsite and offsite components of the study area consists of the "Urban land – Canton complex" (SSSM symbol 799). While urban land complexes are typically not assigned a hydrologic soil group, one had to be assumed for the purposes of stormwater modelling. Due to the presence of Canton soils in the complex, it was assumed that the complex would behave similarly to Canton soils, which are classified as Hydrologic Soil Group B (HSG B) according to "Ksat Values for New Hampshire Soils," Special Publication No. 5 sponsored by the Society of Soil Scientists of Northern New England (SSSNNE). According to the same publication, Canton soils have a saturated hydraulic conductivity (Ksat) range of 2.0-6.0 inches per hour in the B horizon and a Ksat range of 6.0-20.0 inches per hour in the C horizon. The decision to model these study area as HSG B is further justified by the test pits that were performed on the subject parcel in 2025, indicating the presence of well-draining sandy loam and loamy sand components in the soil profile along with some sporadic silt loam or sandy clay loam inclusions in the periphery of the subject parcel, moderately deep seasonal high water tables, and no refusal observed to a depth of at least 50-70 inches.

A small part of the study area was shown by NRCS Web Soil Survey to consist of smoothed Udorthents and Urban land (SSSM symbols 299 and 699, respectively). While it is not possible to assign hydrologic soil groupings or saturated hydraulic conductivity ratings for these human-made soil descriptions, these areas were also modelled as HSG B as the great majority of the study area, which consists of the Urban land-Canton complex is modelled as HSG B due to the presence of Canton soils,

and the soil profile is assumed to be relatively consistent throughout the study area. Furthermore, infiltrating practices that are proposed are in the SSSM symbol 799 area, and the 299 and 699 areas are relatively small by comparison.

In accordance with standard engineering practice, the lowest published Ksat value provided for Canton soils (2.0 inches per hour) was divided by a factor of safety of two to determine the infiltration rate of 1.0 inches per hour to use for design due to the potential for sporadic inconsistencies in the soil profile.

3.0 PROPOSED CONDITIONS ANALYSIS

The construction of infrastructure associated with the proposed conservation subdivision as described in the executive summary divides the subject parcel into 11 subcatchments, all draining toward the same two analysis points as previously described. A stormwater management system consisting of two proprietary biofiltration systems with downstream chambers, as well as a filtration drip edge designed for roof runoff and a pocket pond in the right of way, has been designed to mimic pre-development hydrologic patterns in the post-construction condition, to ensure that there is no net increase in the peak flow or volume of runoff directed toward Analysis Point 1 resultant to the 2-, 10-, 25- or 50-year 24-hour storm events, and to meet the other stormwater design requirements for new developments per Section 7 of the Portsmouth Site Plan Review Regulations.

The existing berm that defines the low area modelled as Pond 1P in the existing conditions analysis is being removed for the proposed development. Due to this unique situation, a detention pond is proposed offsite in the private Ledgewood Drive parcel that has been designed to mimic the stormwater attenuation caused by the low area and berm that are being removed and built over. This detention pond is modelled as 1P in the post-construction analysis as it is intended to replicate pre-construction pond 1P, with the subcatchment from which runoff drains directly toward the proposed modelled as Subcatchment 1S.

Other than this, Subcatchments 2S-5S as well as Pond 2P and the two catch basins in Ledgewood Drive modelled as CB1 and CB2 are functionally the same as in the existing conditions analysis in terms of their hydrologic routing, but their outlines, areas, and surface covers have been altered due to the proposed development.

Subcatchment 6S represents the area from which runoff drains toward Focal Point 1, modelled as Pond 3P, in the post-construction condition. This subcatchment consists of the section of the proposed site driveway to the south of the high point, as well as the part the roof of the proposed building that is pitched such that runoff from it will drain via downspouts toward the Focal Point modelled as Pond 3P.

The “Focal Point” is a proprietary biofiltration system manufactured by Ferguson Waterworks that features a high-flow filter media so that it can be sized significantly smaller than a traditional bioretention system while still providing the same level of treatment. The proposed Focal Point modelled as Pond 3P will be lined and underdrained, and the runoff discharged from the underdrain and overflow structure of the Focal Point will drain through an outlet pipe toward a downstream subsurface chamber system modelled as Pond 4P.

Pond 4P is designed to infiltrate stormwater directed toward it to the extent practicable, and has been designed with an overflow pipe to gradually release any stormwater that cannot be infiltrated directly to groundwater. The overflow pipe from Pond 4P is connected to a closed drainage system consisting

of three drain manholes (DMH 1-3) through which the outflow is routed toward Analysis Point 1 in the northeast corner of the site.

Subcatchment 7S represents the area from which runoff drains toward Focal Point 2, modelled as Pond 5P. The part of the proposed development site to the north of the high point of the proposed driveway as well as the proposed outdoor parking lot and adjacent landscaped area is graded to drain directly toward Focal Point 2 and is therefore represented in Subcatchment 7S. Additionally, a large part of the roof of the proposed apartment building is pitched toward downspouts that drain into land area that is graded such that runoff drains toward Focal Point 2, so this roof sector is additionally included within Subcatchment 7S.

Focal Point 2 (Pond 5P) is lined and underdrain, and includes an overflow mechanism, similarly to the design of Focal Point 1 (Pond 3P). The outflow from the Pond 5P, including any overflow as well as treated runoff from the underdrain, is routed via a drain pipe toward an underground chamber system modelled as Pond 6P. This chamber system is unlined and is intended to infiltrate runoff directed toward it to the extent practicable. All outflow from Pond 6P that is not infiltrated to groundwater is routed via the same closed drainage system as the outflow from Pond 4P is routed into toward Analysis Point 1 at a lower rate and volume than in the existing condition. The intent is to combine the outflows from the two chamber systems and have one point of discharge for the stormwater management system.

Subcatchment 8S represents the easternmost part of the roof of the proposed building, to the east of the ridge of the section of the structure that is perpendicular to Ledgewood Drive. Runoff from Subcatchment 8S drains toward a filtration drip edge modelled as Pond 8P. The filtration drip edge is proposed adjacent to only part of the east face of the building roof so that wetland impacts can be avoided. However, several proposed downspouts along the east face of the proposed building will be connected to a roof leader that is proposed to drain into the filtration drip edge modelled as Pond 8P.

A “filtration drip edge” combines the filtration function of a bioretention pond with the infiltration function of a stone drip edge for improved water quality treatment, and so that the device can be designed closer to the water table due to site constraints. Filtration practices can be designed with a filter course as little as 1’ above the seasonal high water table, while infiltration practices that rely on infiltration alone for water quality treatment require 3’ separation from the bottom of stone to the seasonal high water table (or 4’ in groundwater protection areas). Therefore, this device will have the dual benefit of providing enhanced treatment of runoff from the section of the roof directed to it as compared with a standard stone drip edge, and can be constructed in line with the existing grades and seasonal high water table elevations on site without causing a wetland impact.

Because the subject parcel happens to be situated at a point where it directly receives significant runoff from offsite watershed areas, diversion swales and culverts are proposed along the north and west edges of the subject parcel to keep runoff from offsite out of the stormwater management system for the proposed development itself.

Subcatchment 9S represents the contributing watershed area to a proposed diversion swale on the west end of the subject parcel to the north of the high point of the proposed driveway. This diversion swale is graded toward a low point, and a yard drain modelled as Pond YD is proposed at this low point. Subcatchment 9S is a sector of the same area from Subcatchment 1S in the pre-development model that is rerouted due to the proposed development.

Subcatchment 10S represents the contributing watershed area to a proposed diversion swale on the north end of the site that is graded to drain toward the east and ultimately into a proposed diversion culvert that is modelled as Pond 9P. Subcatchment 10S is a sector of the same area from Subcatchment 1S in the pre-development model that is rerouted due to the proposed development.

The outlet pipe from the yard drain modelled as Pond YD and the diversion culvert modelled as Pond 9P both daylight into proposed drain manhole 4, modelled as DMH4. Downstream of the outlet pipe from DMH 4, runoff flows through another diversion swale modelled as Reach 2R toward a proposed culvert, modelled as Pond 10P, pitched toward the east and running underneath the beginning of the proposed site driveway.

The land area from which runoff drains directly toward the proposed driveway culvert modelled as Pond 10P is represented as Subcatchment 11S. Subcatchment 11S is a sector of the same area from Subcatchment 1S in the pre-development model that is rerouted due to the proposed development.

As a result of the implementation of this stormwater management system, peak flows and runoff volumes are reduced toward Analysis Point 1 during all analyzed storm events in the proposed condition as compared with the existing condition. The NHDES Alteration of Terrain Bureau allows an increase in runoff volume of up to 0.1 acre-feet during the 2-year 24-hour storm event. We are decreasing runoff volumes and therefore this would be approvable by the AOT Bureau if the project needed an AOT permit (which it does not as the area of disturbance is below 100,000 SF).

Furthermore, the project as designed exceeds the AOT Bureau's groundwater recharge volume requirement. A GRV worksheet is contained within the appendix of this report in order to illustrate this. Therefore, we have designed the drainage system to avoid adverse impacts to abutting infrastructure and the requirement per Section 7.1 of the Site Plan Review Regulations to "design practices to the maximum extent practical (MEP) to reduce stormwater runoff volumes, maintain predevelopment site hydrology, and protect water quality in receiving waters" is met, and low impact development (LID) devices such as biofiltration practices, subsurface detention systems, and a filtration drip edge are used.

EPA Region 1 credits the same pollutant removal efficiencies for the Focal Point biofiltration system as for an enhanced biofiltration system with an internal storage reservoir. Specifically, this a 76% phosphorous load reduction and a 75% nitrogen load reduction are credited if the Focal Point biofiltration system has been designed for a 1" runoff from impervious areas, which has been done in accordance with the enclosed Focal Point design worksheet which includes the Focal Point design procedure that has been approved by NHDES. Direct infiltration practices that are designed per NHDES standards, such as but not limited to stone drip edges, feature a removal efficiency of nearly 100% for total suspended solids, total nitrogen, and total phosphorous according to the EPA performance curves included with the pollutant removal calculations in the appendix of this report. According to this document, filtration practices that are not underdrained and directly infiltrate treated runoff to groundwater can be counted as infiltration practices for the purpose of pollutant removal calculation, so the filtration drip edge is counted as an infiltration practice. Runoff from all proposed impervious surfaces is proposed to drain toward either a Focal Point or a filtration drip edge post-construction, with the exception of a small paved apron at the beginning of the proposed driveway that is pitched toward Ledgewood Drive. In effect, the required 80% TSS and 50% TN and TP pollutant removal thresholds will be met and exceeded. Pollutant removal calculations demonstrating this are included in the appendix of this report.

5.0 CONCLUSION

This proposed site development will have minimal adverse effect on abutting infrastructures, properties, and downstream wetlands by way of stormwater runoff or siltation. Appropriate steps will be taken to eliminate erosion and sedimentation; this will be accomplished through the of the above-described stormwater management system as well as temporary erosion control measures including but not limited to silt fence, a stabilized construction entrance, storm drain inlet protection, and temporary sediment traps during construction. Best Management Practices developed by the State of New Hampshire have been utilized in the design of this system and their application will be enforced throughout the construction process. Peak rates and volumes of runoff from the site will be reduced toward all analysis points during all analyzed storm events.

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

Respectfully Submitted,
JONES & BEACH ENGINEERS, INC.

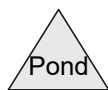
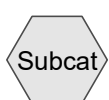
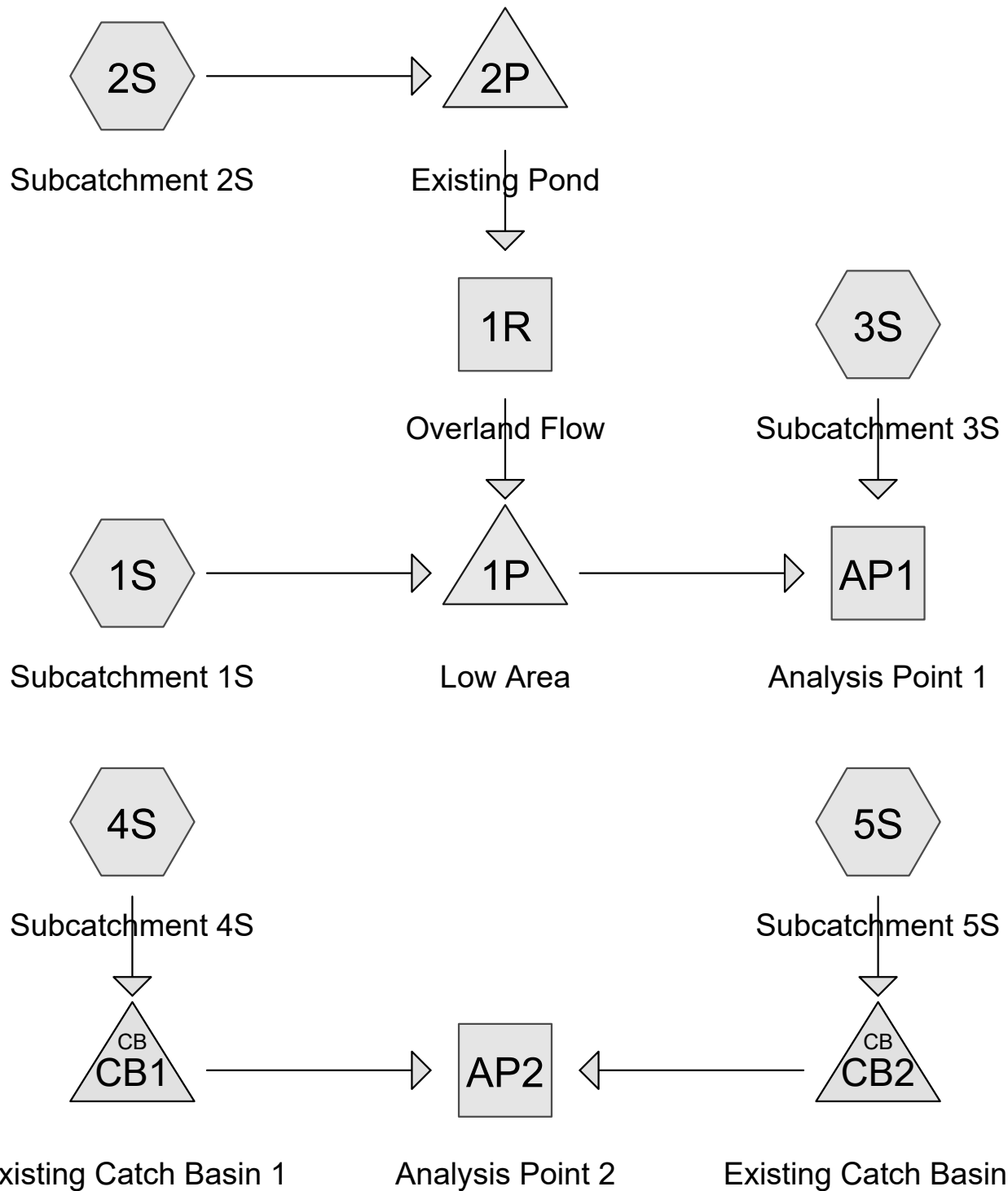


Daniel Meditz, P.E.
Lead Design Engineer

APPENDIX I

EXISTING CONDITIONS DRAINAGE ANALYSIS

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



25071.2-EXISTING

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Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.228	70	1/2 acre lots, 25% imp, HSG B (1S, 3S)
0.566	61	>75% Grass cover, Good, HSG B (1S, 2S, 4S, 5S)
0.086	48	Brush, Good, HSG B (2S)
0.177	98	Paved parking, HSG B (2S)
0.277	98	Paved roads w/curbs & sewers, HSG B (3S, 4S, 5S)
0.045	98	Roofs, HSG B (1S, 2S)
1.806	55	Woods, Good, HSG B (1S, 2S, 3S)
5.186	66	TOTAL AREA

25071.2-EXISTING

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
5.186	HSG B	1S, 2S, 3S, 4S, 5S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
5.186		TOTAL AREA

25071.2-EXISTING*Type III 24-hr 2-YR STORM Rainfall=3.71"*

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Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=112,469 sf 9.32% Impervious Runoff Depth=0.67"
Flow Length=421' Tc=15.9 min CN=61 Runoff=1.13 cfs 0.144 af

Subcatchment2S: Subcatchment2S Runoff Area=22,794 sf 37.44% Impervious Runoff Depth=1.26"
Tc=6.0 min CN=72 Runoff=0.73 cfs 0.055 af

Subcatchment3S: Subcatchment3S Runoff Area=86,121 sf 27.21% Impervious Runoff Depth=1.14"
Flow Length=612' Tc=11.7 min CN=70 Runoff=2.01 cfs 0.188 af

Subcatchment4S: Subcatchment4S Runoff Area=1,897 sf 76.96% Impervious Runoff Depth=2.55"
Tc=6.0 min CN=89 Runoff=0.13 cfs 0.009 af

Subcatchment5S: Subcatchment5S Runoff Area=2,633 sf 80.71% Impervious Runoff Depth=2.74"
Tc=6.0 min CN=91 Runoff=0.19 cfs 0.014 af

Reach 1R: Overland Flow Avg. Flow Depth=0.10' Max Vel=0.24 fps Inflow=0.36 cfs 0.034 af
n=0.070 L=80.0' S=0.0050 '/' Capacity=12.03 cfs Outflow=0.34 cfs 0.034 af

Reach AP1: Analysis Point 1 Inflow=2.01 cfs 0.188 af
Outflow=2.01 cfs 0.188 af

Reach AP2: Analysis Point 2 Inflow=0.31 cfs 0.023 af
Outflow=0.31 cfs 0.023 af

Pond 1P: Low Area Peak Elev=20.28' Storage=3,058 cf Inflow=1.45 cfs 0.178 af
Discarded=0.23 cfs 0.178 af Primary=0.00 cfs 0.000 af Outflow=0.23 cfs 0.178 af

Pond 2P: Existing Pond Peak Elev=21.31' Storage=436 cf Inflow=0.73 cfs 0.055 af
Discarded=0.05 cfs 0.021 af Primary=0.36 cfs 0.034 af Outflow=0.41 cfs 0.055 af

Pond CB1: Existing Catch Basin 1 Peak Elev=23.59' Inflow=0.13 cfs 0.009 af
12.0" Round Culvert n=0.012 L=28.0' S=0.0075 '/' Outflow=0.13 cfs 0.009 af

Pond CB2: Existing Catch Basin 2 Peak Elev=19.30' Inflow=0.19 cfs 0.014 af
12.0" Round Culvert n=0.012 L=36.0' S=0.0078 '/' Outflow=0.19 cfs 0.014 af

Total Runoff Area = 5.186 ac Runoff Volume = 0.410 af Average Runoff Depth = 0.95"
79.62% Pervious = 4.129 ac 20.38% Impervious = 1.057 ac

25071.2-EXISTING*Type III 24-hr 10-YR STORM Rainfall=5.63"*

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Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 points x 3
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=112,469 sf 9.32% Impervious Runoff Depth=1.76"
 Flow Length=421' Tc=15.9 min CN=61 Runoff=3.66 cfs 0.379 af

Subcatchment2S: Subcatchment2S Runoff Area=22,794 sf 37.44% Impervious Runoff Depth=2.69"
 Tc=6.0 min CN=72 Runoff=1.62 cfs 0.117 af

Subcatchment3S: Subcatchment3S Runoff Area=86,121 sf 27.21% Impervious Runoff Depth=2.51"
 Flow Length=612' Tc=11.7 min CN=70 Runoff=4.75 cfs 0.414 af

Subcatchment4S: Subcatchment4S Runoff Area=1,897 sf 76.96% Impervious Runoff Depth=4.38"
 Tc=6.0 min CN=89 Runoff=0.21 cfs 0.016 af

Subcatchment5S: Subcatchment5S Runoff Area=2,633 sf 80.71% Impervious Runoff Depth=4.60"
 Tc=6.0 min CN=91 Runoff=0.30 cfs 0.023 af

Reach 1R: Overland Flow Avg. Flow Depth=0.16' Max Vel=0.33 fps Inflow=0.99 cfs 0.086 af
 n=0.070 L=80.0' S=0.0050 '/' Capacity=12.03 cfs Outflow=0.96 cfs 0.086 af

Reach AP1: Analysis Point 1 Inflow=4.75 cfs 0.571 af
 Outflow=4.75 cfs 0.571 af

Reach AP2: Analysis Point 2 Inflow=0.51 cfs 0.039 af
 Outflow=0.51 cfs 0.039 af

Pond 1P: Low Area Peak Elev=20.53' Storage=5,928 cf Inflow=4.61 cfs 0.465 af
 Discarded=0.37 cfs 0.308 af Primary=2.20 cfs 0.157 af Outflow=2.57 cfs 0.465 af

Pond 2P: Existing Pond Peak Elev=21.54' Storage=831 cf Inflow=1.62 cfs 0.117 af
 Discarded=0.06 cfs 0.031 af Primary=0.99 cfs 0.086 af Outflow=1.06 cfs 0.117 af

Pond CB1: Existing Catch Basin 1 Peak Elev=23.65' Inflow=0.21 cfs 0.016 af
 12.0" Round Culvert n=0.012 L=28.0' S=0.0075 '/' Outflow=0.21 cfs 0.016 af

Pond CB2: Existing Catch Basin 2 Peak Elev=19.36' Inflow=0.30 cfs 0.023 af
 12.0" Round Culvert n=0.012 L=36.0' S=0.0078 '/' Outflow=0.30 cfs 0.023 af

Total Runoff Area = 5.186 ac Runoff Volume = 0.950 af Average Runoff Depth = 2.20"
79.62% Pervious = 4.129 ac 20.38% Impervious = 1.057 ac

25071.2-EXISTING

Type III 24-hr 10-YR STORM Rainfall=5.63"

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Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 3.66 cfs @ 12.24 hrs, Volume= 0.379 af, Depth= 1.76"
 Routed to Pond 1P : Low Area

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-YR STORM Rainfall=5.63"

Area (sf)	CN	Description
37,341	70	1/2 acre lots, 25% imp, HSG B
1,147	98	Roofs, HSG B
14,520	61	>75% Grass cover, Good, HSG B
59,461	55	Woods, Good, HSG B
112,469	61	Weighted Average
101,987		90.68% Pervious Area
10,482		9.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	15	0.1000	0.24		Sheet Flow, Grass: Short n= 0.150 P2= 3.71"
7.2	35	0.0308	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.71"
0.6	30	0.0308	0.88		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	25	0.0800	1.41		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.1	92	0.0217	0.74		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	51	0.0392	0.99		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.5	74	0.0270	0.82		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.3	99	0.0202	0.71		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
15.9	421	Total			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 1.62 cfs @ 12.09 hrs, Volume= 0.117 af, Depth= 2.69"
 Routed to Pond 2P : Existing Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-YR STORM Rainfall=5.63"

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Type III 24-hr 10-YR STORM Rainfall=5.63"

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Area (sf)	CN	Description
7,719	98	Paved parking, HSG B
815	98	Roofs, HSG B
9,211	61	>75% Grass cover, Good, HSG B
1,310	55	Woods, Good, HSG B
3,739	48	Brush, Good, HSG B
22,794	72	Weighted Average
14,260		62.56% Pervious Area
8,534		37.44% Impervious Area

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

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 4.75 cfs @ 12.17 hrs, Volume= 0.414 af, Depth= 2.51"
 Routed to Reach AP1 : Analysis Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-YR STORM Rainfall=5.63"

Area (sf)	CN	Description
17,892	55	Woods, Good, HSG B
8,500	98	Paved roads w/curbs & sewers, HSG B
59,729	70	1/2 acre lots, 25% imp, HSG B
86,121	70	Weighted Average
62,689		72.79% Pervious Area
23,432		27.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0200	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.71"
0.7	55	0.0364	1.34		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.6	59	0.0476	1.53		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.1	208	0.0260	3.27		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.5	33	0.0303	1.22		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.3	86	0.0233	1.07		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.9	52	0.0385	0.98		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.4	69	0.0290	0.85		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.7	612	Total			

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Type III 24-hr 10-YR STORM Rainfall=5.63"

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Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 0.21 cfs @ 12.09 hrs, Volume= 0.016 af, Depth= 4.38"

Routed to Pond CB1 : Existing Catch Basin 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR STORM Rainfall=5.63"

Area (sf)	CN	Description
1,460	98	Paved roads w/curbs & sewers, HSG B
437	61	>75% Grass cover, Good, HSG B
1,897	89	Weighted Average
437		23.04% Pervious Area
1,460		76.96% Impervious Area

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

Summary for Subcatchment 5S: Subcatchment 5S

Runoff = 0.30 cfs @ 12.09 hrs, Volume= 0.023 af, Depth= 4.60"

Routed to Pond CB2 : Existing Catch Basin 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR STORM Rainfall=5.63"

Area (sf)	CN	Description
2,125	98	Paved roads w/curbs & sewers, HSG B
508	61	>75% Grass cover, Good, HSG B
2,633	91	Weighted Average
508		19.29% Pervious Area
2,125		80.71% Impervious Area

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

Summary for Reach 1R: Overland Flow

Inflow Area = 0.523 ac, 37.44% Impervious, Inflow Depth = 1.98" for 10-YR STORM event

Inflow = 0.99 cfs @ 12.20 hrs, Volume= 0.086 af

Outflow = 0.96 cfs @ 12.26 hrs, Volume= 0.086 af, Atten= 4%, Lag= 3.6 min

Routed to Pond 1P : Low Area

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Max. Velocity= 0.33 fps, Min. Travel Time= 4.0 min

Avg. Velocity = 0.10 fps, Avg. Travel Time= 14.0 min

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Type III 24-hr 10-YR STORM Rainfall=5.63"

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Peak Storage= 231 cf @ 12.26 hrs

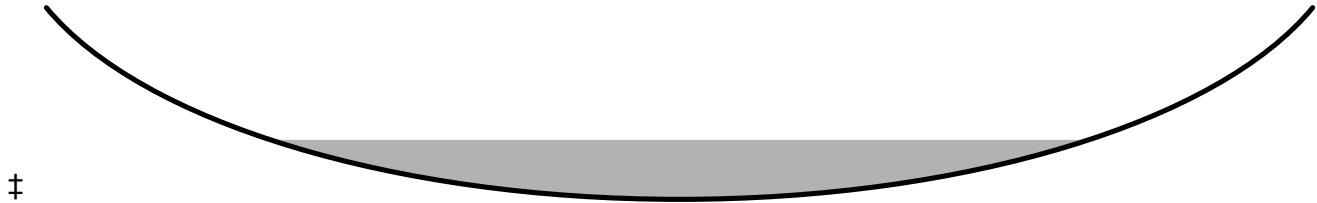
Average Depth at Peak Storage= 0.16' , Surface Width= 27.87'

Bank-Full Depth= 0.50' Flow Area= 16.7 sf, Capacity= 12.03 cfs

50.00' x 0.50' deep Parabolic Channel, n= 0.070 Medium-dense brush, winter

Length= 80.0' Slope= 0.0050 '/'

Inlet Invert= 20.50', Outlet Invert= 20.10'



Summary for Reach AP1: Analysis Point 1

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

Inflow Area = 5.082 ac, 19.17% Impervious, Inflow Depth = 1.35" for 10-YR STORM event

Inflow = 4.75 cfs @ 12.17 hrs, Volume= 0.571 af

Outflow = 4.75 cfs @ 12.17 hrs, Volume= 0.571 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP2: Analysis Point 2

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

Inflow Area = 0.104 ac, 79.14% Impervious, Inflow Depth = 4.50" for 10-YR STORM event

Inflow = 0.51 cfs @ 12.09 hrs, Volume= 0.039 af

Outflow = 0.51 cfs @ 12.09 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Summary for Pond 1P: Low Area

[62] Hint: Exceeded Reach 1R OUTLET depth by 0.31' @ 12.65 hrs

Inflow Area = 3.105 ac, 14.06% Impervious, Inflow Depth = 1.80" for 10-YR STORM event

Inflow = 4.61 cfs @ 12.24 hrs, Volume= 0.465 af

Outflow = 2.57 cfs @ 12.56 hrs, Volume= 0.465 af, Atten= 44%, Lag= 19.2 min

Discarded = 0.37 cfs @ 12.56 hrs, Volume= 0.308 af

Primary = 2.20 cfs @ 12.56 hrs, Volume= 0.157 af

Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 20.53' @ 12.56 hrs Surf.Area= 14,054 sf Storage= 5,928 cf

Plug-Flow detention time= 147.0 min calculated for 0.465 af (100% of inflow)

Center-of-Mass det. time= 146.8 min (1,011.4 - 864.5)

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Type III 24-hr 10-YR STORM Rainfall=5.63"

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Volume	Invert	Avail.Storage	Storage Description									
#1	19.50'	26,604 cf	Custom Stage Data (Irregular) Listed below (Recalc)									
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)			Cum.Store (cubic-feet)			Wet.Area (sq-ft)			
19.50	1,371	213.0	0			0			1,371			
20.00	3,961	394.0	1,277			1,277			10,115			
20.50	14,054	688.0	4,246			5,523			35,431			
22.00	14,054	688.0	21,081			26,604			36,463			
Device	Routing	Invert	Outlet Devices									
#1	Primary	20.40'	20.0' long x 4.0' breadth Broad-Crested Rectangular Weir									
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00									
			2.50 3.00 3.50 4.00 4.50 5.00 5.50									
			Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66									
			2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32									
#2	Discarded	19.50'	1.000 in/hr Exfiltration over Surface area									
			Conductivity to Groundwater Elevation = 16.67' Phase-In= 0.10'									

Discarded OutFlow Max=0.37 cfs @ 12.56 hrs HW=20.53' (Free Discharge)↑**2=Exfiltration** (Controls 0.37 cfs)**Primary OutFlow** Max=2.19 cfs @ 12.56 hrs HW=20.53' TW=0.00' (Dynamic Tailwater)↑**1=Broad-Crested Rectangular Weir**(Weir Controls 2.19 cfs @ 0.85 fps)**Summary for Pond 2P: Existing Pond**

Pond areas, elevations, and culvert parameters are assumed.

Inflow Area = 0.523 ac, 37.44% Impervious, Inflow Depth = 2.69" for 10-YR STORM event
 Inflow = 1.62 cfs @ 12.09 hrs, Volume= 0.117 af
 Outflow = 1.06 cfs @ 12.20 hrs, Volume= 0.117 af, Atten= 35%, Lag= 6.5 min
 Discarded = 0.06 cfs @ 12.20 hrs, Volume= 0.031 af
 Primary = 0.99 cfs @ 12.20 hrs, Volume= 0.086 af
 Routed to Reach 1R : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 21.54' @ 12.20 hrs Surf.Area= 1,912 sf Storage= 831 cf

Plug-Flow detention time= 24.3 min calculated for 0.117 af (100% of inflow)

Center-of-Mass det. time= 23.9 min (860.4 - 836.6)

Volume	Invert	Avail.Storage	Storage Description			
#1	21.00'	1,882 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
21.00	1,209	140.0	0	0	1,209	
22.00	2,647	210.0	1,882	1,882	3,166	

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Type III 24-hr 10-YR STORM Rainfall=5.63"

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Device	Routing	Invert	Outlet Devices
#1	Discarded	21.00'	1.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 20.00' Phase-In= 0.10'
#2	Primary	21.00'	15.0" Round Culvert L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 21.00' / 20.50' S= 0.0167 ' S= 0.0167 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=0.06 cfs @ 12.20 hrs HW=21.54' (Free Discharge)↑**1=Exfiltration** (Controls 0.06 cfs)**Primary OutFlow** Max=0.99 cfs @ 12.20 hrs HW=21.54' TW=20.65' (Dynamic Tailwater)↑**2=Culvert** (Inlet Controls 0.99 cfs @ 1.97 fps)**Summary for Pond CB1: Existing Catch Basin 1**

End invert of pipe is assumed as inverts have not been measured on downstream structure

[58] Hint: Peaked 0.24' above defined flood level

Inflow Area = 0.044 ac, 76.96% Impervious, Inflow Depth = 4.38" for 10-YR STORM event
 Inflow = 0.21 cfs @ 12.09 hrs, Volume= 0.016 af
 Outflow = 0.21 cfs @ 12.09 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.21 cfs @ 12.09 hrs, Volume= 0.016 af
 Routed to Reach AP2 : Analysis Point 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 23.65' @ 12.09 hrs

Flood Elev= 23.41'

Device	Routing	Invert	Outlet Devices
#1	Primary	23.41'	12.0" Round Culvert L= 28.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 23.41' / 23.20' S= 0.0075 ' S= 0.0075 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.21 cfs @ 12.09 hrs HW=23.64' TW=0.00' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 0.21 cfs @ 2.22 fps)**Summary for Pond CB2: Existing Catch Basin 2**

End invert of pipe is assumed as inverts have not been measured on downstream structure

Inflow Area = 0.060 ac, 80.71% Impervious, Inflow Depth = 4.60" for 10-YR STORM event
 Inflow = 0.30 cfs @ 12.09 hrs, Volume= 0.023 af
 Outflow = 0.30 cfs @ 12.09 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.30 cfs @ 12.09 hrs, Volume= 0.023 af
 Routed to Reach AP2 : Analysis Point 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

25071.2-EXISTING*Type III 24-hr 10-YR STORM Rainfall=5.63"*

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Peak Elev= 19.36' @ 12.09 hrs

Flood Elev= 22.23'

Device	Routing	Invert	Outlet Devices
#1	Primary	19.08'	12.0" Round Culvert L= 36.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 19.08' / 18.80' S= 0.0078 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.29 cfs @ 12.09 hrs HW=19.36' TW=0.00' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 0.29 cfs @ 2.49 fps)

25071.2-EXISTING*Type III 24-hr 25-YR STORM Rainfall=7.13"*

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Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 points x 3
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=112,469 sf 9.32% Impervious Runoff Depth=2.80"
 Flow Length=421' Tc=15.9 min CN=61 Runoff=6.04 cfs 0.602 af

Subcatchment2S: Subcatchment2S Runoff Area=22,794 sf 37.44% Impervious Runoff Depth=3.94"
 Tc=6.0 min CN=72 Runoff=2.37 cfs 0.172 af

Subcatchment3S: Subcatchment3S Runoff Area=86,121 sf 27.21% Impervious Runoff Depth=3.73"
 Flow Length=612' Tc=11.7 min CN=70 Runoff=7.11 cfs 0.614 af

Subcatchment4S: Subcatchment4S Runoff Area=1,897 sf 76.96% Impervious Runoff Depth=5.84"
 Tc=6.0 min CN=89 Runoff=0.28 cfs 0.021 af

Subcatchment5S: Subcatchment5S Runoff Area=2,633 sf 80.71% Impervious Runoff Depth=6.07"
 Tc=6.0 min CN=91 Runoff=0.39 cfs 0.031 af

Reach 1R: Overland Flow Avg. Flow Depth=0.19' Max Vel=0.38 fps Inflow=1.54 cfs 0.134 af
 n=0.070 L=80.0' S=0.0050 '/ Capacity=12.03 cfs Outflow=1.49 cfs 0.134 af

Reach AP1: Analysis Point 1 Inflow=9.48 cfs 0.989 af
 Outflow=9.48 cfs 0.989 af

Reach AP2: Analysis Point 2 Inflow=0.67 cfs 0.052 af
 Outflow=0.67 cfs 0.052 af

Pond 1P: Low Area Peak Elev=20.63' Storage=7,348 cf Inflow=7.53 cfs 0.735 af
 Discarded=0.38 cfs 0.360 af Primary=5.30 cfs 0.375 af Outflow=5.67 cfs 0.735 af

Pond 2P: Existing Pond Peak Elev=21.69' Storage=1,133 cf Inflow=2.37 cfs 0.172 af
 Discarded=0.07 cfs 0.038 af Primary=1.54 cfs 0.134 af Outflow=1.61 cfs 0.172 af

Pond CB1: Existing Catch Basin 1 Peak Elev=23.68' Inflow=0.28 cfs 0.021 af
 12.0" Round Culvert n=0.012 L=28.0' S=0.0075 '/ Outflow=0.28 cfs 0.021 af

Pond CB2: Existing Catch Basin 2 Peak Elev=19.40' Inflow=0.39 cfs 0.031 af
 12.0" Round Culvert n=0.012 L=36.0' S=0.0078 '/ Outflow=0.39 cfs 0.031 af

Total Runoff Area = 5.186 ac Runoff Volume = 1.439 af Average Runoff Depth = 3.33"
79.62% Pervious = 4.129 ac 20.38% Impervious = 1.057 ac

25071.2-EXISTING*Type III 24-hr 50-YR STORM Rainfall=8.54"*

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Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=112,469 sf 9.32% Impervious Runoff Depth=3.86"
Flow Length=421' Tc=15.9 min CN=61 Runoff=8.48 cfs 0.831 af

Subcatchment2S: Subcatchment2S Runoff Area=22,794 sf 37.44% Impervious Runoff Depth=5.17"
Tc=6.0 min CN=72 Runoff=3.10 cfs 0.226 af

Subcatchment3S: Subcatchment3S Runoff Area=86,121 sf 27.21% Impervious Runoff Depth=4.93"
Flow Length=612' Tc=11.7 min CN=70 Runoff=9.42 cfs 0.813 af

Subcatchment4S: Subcatchment4S Runoff Area=1,897 sf 76.96% Impervious Runoff Depth=7.22"
Tc=6.0 min CN=89 Runoff=0.34 cfs 0.026 af

Subcatchment5S: Subcatchment5S Runoff Area=2,633 sf 80.71% Impervious Runoff Depth=7.46"
Tc=6.0 min CN=91 Runoff=0.48 cfs 0.038 af

Reach 1R: Overland Flow Avg. Flow Depth=0.22' Max Vel=0.41 fps Inflow=2.05 cfs 0.182 af
n=0.070 L=80.0' S=0.0050 '/ Capacity=12.03 cfs Outflow=2.00 cfs 0.182 af

Reach AP1: Analysis Point 1 Inflow=15.16 cfs 1.424 af
Outflow=15.16 cfs 1.424 af

Reach AP2: Analysis Point 2 Inflow=0.81 cfs 0.064 af
Outflow=0.81 cfs 0.064 af

Pond 1P: Low Area Peak Elev=20.71' Storage=8,481 cf Inflow=10.48 cfs 1.013 af
Discarded=0.38 cfs 0.401 af Primary=8.54 cfs 0.612 af Outflow=8.93 cfs 1.013 af

Pond 2P: Existing Pond Peak Elev=21.81' Storage=1,418 cf Inflow=3.10 cfs 0.226 af
Discarded=0.08 cfs 0.044 af Primary=2.05 cfs 0.182 af Outflow=2.14 cfs 0.226 af

Pond CB1: Existing Catch Basin 1 Peak Elev=23.71' Inflow=0.34 cfs 0.026 af
12.0" Round Culvert n=0.012 L=28.0' S=0.0075 '/ Outflow=0.34 cfs 0.026 af

Pond CB2: Existing Catch Basin 2 Peak Elev=19.44' Inflow=0.48 cfs 0.038 af
12.0" Round Culvert n=0.012 L=36.0' S=0.0078 '/ Outflow=0.48 cfs 0.038 af

Total Runoff Area = 5.186 ac Runoff Volume = 1.933 af Average Runoff Depth = 4.47"
79.62% Pervious = 4.129 ac 20.38% Impervious = 1.057 ac

25071.2-EXISTING

Type III 24-hr 50-YR STORM Rainfall=8.54"

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Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 8.48 cfs @ 12.23 hrs, Volume= 0.831 af, Depth= 3.86"
 Routed to Pond 1P : Low Area

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-YR STORM Rainfall=8.54"

Area (sf)	CN	Description
37,341	70	1/2 acre lots, 25% imp, HSG B
1,147	98	Roofs, HSG B
14,520	61	>75% Grass cover, Good, HSG B
59,461	55	Woods, Good, HSG B
112,469	61	Weighted Average
101,987		90.68% Pervious Area
10,482		9.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	15	0.1000	0.24		Sheet Flow, Grass: Short n= 0.150 P2= 3.71"
7.2	35	0.0308	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.71"
0.6	30	0.0308	0.88		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	25	0.0800	1.41		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.1	92	0.0217	0.74		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	51	0.0392	0.99		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.5	74	0.0270	0.82		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.3	99	0.0202	0.71		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
15.9	421	Total			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 3.10 cfs @ 12.09 hrs, Volume= 0.226 af, Depth= 5.17"
 Routed to Pond 2P : Existing Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-YR STORM Rainfall=8.54"

25071.2-EXISTING

Type III 24-hr 50-YR STORM Rainfall=8.54"

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Area (sf)	CN	Description
7,719	98	Paved parking, HSG B
815	98	Roofs, HSG B
9,211	61	>75% Grass cover, Good, HSG B
1,310	55	Woods, Good, HSG B
3,739	48	Brush, Good, HSG B
22,794	72	Weighted Average
14,260		62.56% Pervious Area
8,534		37.44% Impervious Area

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

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 9.42 cfs @ 12.16 hrs, Volume= 0.813 af, Depth= 4.93"
 Routed to Reach AP1 : Analysis Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-YR STORM Rainfall=8.54"

Area (sf)	CN	Description
17,892	55	Woods, Good, HSG B
8,500	98	Paved roads w/curbs & sewers, HSG B
59,729	70	1/2 acre lots, 25% imp, HSG B
86,121	70	Weighted Average
62,689		72.79% Pervious Area
23,432		27.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0200	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.71"
0.7	55	0.0364	1.34		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.6	59	0.0476	1.53		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.1	208	0.0260	3.27		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.5	33	0.0303	1.22		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.3	86	0.0233	1.07		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.9	52	0.0385	0.98		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.4	69	0.0290	0.85		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.7	612	Total			

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Type III 24-hr 50-YR STORM Rainfall=8.54"

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Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 0.34 cfs @ 12.09 hrs, Volume= 0.026 af, Depth= 7.22"

Routed to Pond CB1 : Existing Catch Basin 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-YR STORM Rainfall=8.54"

Area (sf)	CN	Description
1,460	98	Paved roads w/curbs & sewers, HSG B
437	61	>75% Grass cover, Good, HSG B
1,897	89	Weighted Average
437		23.04% Pervious Area
1,460		76.96% Impervious Area

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

Summary for Subcatchment 5S: Subcatchment 5S

Runoff = 0.48 cfs @ 12.09 hrs, Volume= 0.038 af, Depth= 7.46"

Routed to Pond CB2 : Existing Catch Basin 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-YR STORM Rainfall=8.54"

Area (sf)	CN	Description
2,125	98	Paved roads w/curbs & sewers, HSG B
508	61	>75% Grass cover, Good, HSG B
2,633	91	Weighted Average
508		19.29% Pervious Area
2,125		80.71% Impervious Area

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

Summary for Reach 1R: Overland Flow

Inflow Area = 0.523 ac, 37.44% Impervious, Inflow Depth = 4.17" for 50-YR STORM event

Inflow = 2.05 cfs @ 12.18 hrs, Volume= 0.182 af

Outflow = 2.00 cfs @ 12.23 hrs, Volume= 0.182 af, Atten= 3%, Lag= 2.6 min

Routed to Pond 1P : Low Area

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Max. Velocity= 0.41 fps, Min. Travel Time= 3.2 min

Avg. Velocity = 0.11 fps, Avg. Travel Time= 11.6 min

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Type III 24-hr 50-YR STORM Rainfall=8.54"

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Peak Storage= 385 cf @ 12.23 hrs

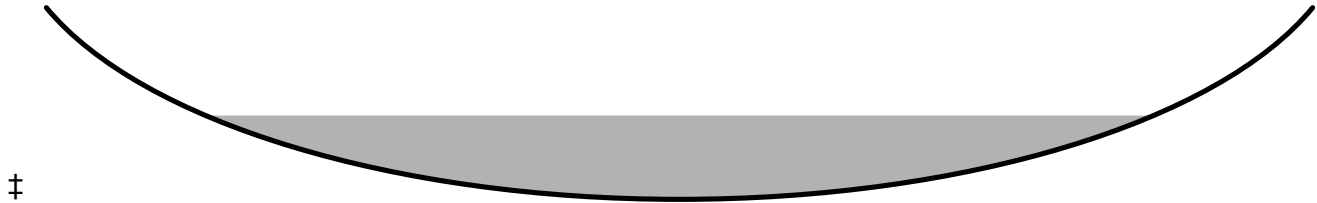
Average Depth at Peak Storage= 0.22' , Surface Width= 33.04'

Bank-Full Depth= 0.50' Flow Area= 16.7 sf, Capacity= 12.03 cfs

50.00' x 0.50' deep Parabolic Channel, n= 0.070 Medium-dense brush, winter

Length= 80.0' Slope= 0.0050 '/'

Inlet Invert= 20.50', Outlet Invert= 20.10'



Summary for Reach AP1: Analysis Point 1

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

Inflow Area = 5.082 ac, 19.17% Impervious, Inflow Depth = 3.36" for 50-YR STORM event

Inflow = 15.16 cfs @ 12.26 hrs, Volume= 1.424 af

Outflow = 15.16 cfs @ 12.26 hrs, Volume= 1.424 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP2: Analysis Point 2

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

Inflow Area = 0.104 ac, 79.14% Impervious, Inflow Depth = 7.36" for 50-YR STORM event

Inflow = 0.81 cfs @ 12.09 hrs, Volume= 0.064 af

Outflow = 0.81 cfs @ 12.09 hrs, Volume= 0.064 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Summary for Pond 1P: Low Area

[63] Warning: Exceeded Reach 1R INLET depth by 0.01' @ 12.40 hrs

[64] Warning: Exceeded Reach 1R outlet bank by 0.11' @ 12.34 hrs

Inflow Area = 3.105 ac, 14.06% Impervious, Inflow Depth = 3.91" for 50-YR STORM event

Inflow = 10.48 cfs @ 12.23 hrs, Volume= 1.013 af

Outflow = 8.93 cfs @ 12.34 hrs, Volume= 1.013 af, Atten= 15%, Lag= 7.1 min

Discarded = 0.38 cfs @ 12.34 hrs, Volume= 0.401 af

Primary = 8.54 cfs @ 12.34 hrs, Volume= 0.612 af

Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 20.71' @ 12.34 hrs Surf.Area= 14,054 sf Storage= 8,481 cf

Plug-Flow detention time= 92.1 min calculated for 1.013 af (100% of inflow)

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Type III 24-hr 50-YR STORM Rainfall=8.54"

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Center-of-Mass det. time= 92.0 min (935.3 - 843.4)

Volume	Invert	Avail.Storage	Storage Description		
#1	19.50'	26,604 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
19.50	1,371	213.0	0	0	1,371
20.00	3,961	394.0	1,277	1,277	10,115
20.50	14,054	688.0	4,246	5,523	35,431
22.00	14,054	688.0	21,081	26,604	36,463

Device	Routing	Invert	Outlet Devices											
#1	Primary	20.40'	20.0' long x 4.0' breadth Broad-Crested Rectangular Weir											
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00											
			2.50 3.00 3.50 4.00 4.50 5.00 5.50											
			Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66											
			2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32											
#2	Discarded	19.50'	1.000 in/hr Exfiltration over Surface area											
			Conductivity to Groundwater Elevation = 16.67' Phase-In= 0.10'											

Discarded OutFlow Max=0.38 cfs @ 12.34 hrs HW=20.71' (Free Discharge)↑**2=Exfiltration** (Controls 0.38 cfs)**Primary OutFlow** Max=8.51 cfs @ 12.34 hrs HW=20.71' TW=0.00' (Dynamic Tailwater)↑**1=Broad-Crested Rectangular Weir**(Weir Controls 8.51 cfs @ 1.37 fps)**Summary for Pond 2P: Existing Pond**

Pond areas, elevations, and culvert parameters are assumed.

Inflow Area = 0.523 ac, 37.44% Impervious, Inflow Depth = 5.17" for 50-YR STORM event
 Inflow = 3.10 cfs @ 12.09 hrs, Volume= 0.226 af
 Outflow = 2.14 cfs @ 12.18 hrs, Volume= 0.226 af, Atten= 31%, Lag= 5.5 min
 Discarded = 0.08 cfs @ 12.18 hrs, Volume= 0.044 af
 Primary = 2.05 cfs @ 12.18 hrs, Volume= 0.182 af
 Routed to Reach 1R : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 21.81' @ 12.18 hrs Surf.Area= 2,337 sf Storage= 1,418 cf

Plug-Flow detention time= 19.8 min calculated for 0.225 af (100% of inflow)

Center-of-Mass det. time= 19.9 min (837.8 - 817.8)

Volume	Invert	Avail.Storage	Storage Description		
#1	21.00'	1,882 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
21.00	1,209	140.0	0	0	1,209
22.00	2,647	210.0	1,882	1,882	3,166

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Type III 24-hr 50-YR STORM Rainfall=8.54"

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Device	Routing	Invert	Outlet Devices
#1	Discarded	21.00'	1.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 20.00' Phase-In= 0.10'
#2	Primary	21.00'	15.0" Round Culvert L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 21.00' / 20.50' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=0.08 cfs @ 12.18 hrs HW=21.81' (Free Discharge)↑**1=Exfiltration** (Controls 0.08 cfs)**Primary OutFlow** Max=2.04 cfs @ 12.18 hrs HW=21.81' TW=20.71' (Dynamic Tailwater)↑**2=Culvert** (Inlet Controls 2.04 cfs @ 2.42 fps)**Summary for Pond CB1: Existing Catch Basin 1**

End invert of pipe is assumed as inverts have not been measured on downstream structure

[58] Hint: Peaked 0.30' above defined flood level

Inflow Area = 0.044 ac, 76.96% Impervious, Inflow Depth = 7.22" for 50-YR STORM event
 Inflow = 0.34 cfs @ 12.09 hrs, Volume= 0.026 af
 Outflow = 0.34 cfs @ 12.09 hrs, Volume= 0.026 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.34 cfs @ 12.09 hrs, Volume= 0.026 af
 Routed to Reach AP2 : Analysis Point 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 23.71' @ 12.09 hrs

Flood Elev= 23.41'

Device	Routing	Invert	Outlet Devices
#1	Primary	23.41'	12.0" Round Culvert L= 28.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 23.41' / 23.20' S= 0.0075 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.33 cfs @ 12.09 hrs HW=23.71' TW=0.00' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 0.33 cfs @ 2.50 fps)**Summary for Pond CB2: Existing Catch Basin 2**

End invert of pipe is assumed as inverts have not been measured on downstream structure

Inflow Area = 0.060 ac, 80.71% Impervious, Inflow Depth = 7.46" for 50-YR STORM event
 Inflow = 0.48 cfs @ 12.09 hrs, Volume= 0.038 af
 Outflow = 0.48 cfs @ 12.09 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.48 cfs @ 12.09 hrs, Volume= 0.038 af
 Routed to Reach AP2 : Analysis Point 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

25071.2-EXISTING*Type III 24-hr 50-YR STORM Rainfall=8.54"*

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Peak Elev= 19.44' @ 12.09 hrs

Flood Elev= 22.23'

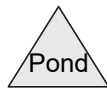
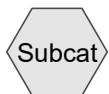
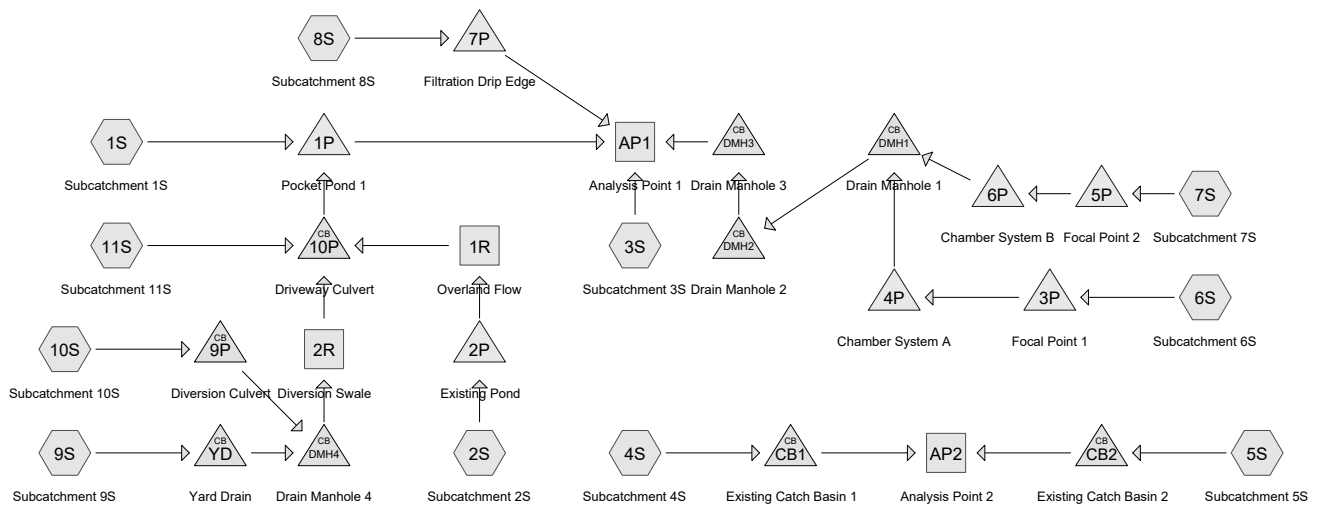
Device	Routing	Invert	Outlet Devices
#1	Primary	19.08'	12.0" Round Culvert L= 36.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 19.08' / 18.80' S= 0.0078 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.46 cfs @ 12.09 hrs HW=19.43' TW=0.00' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 0.46 cfs @ 2.79 fps)

APPENDIX II

PROPOSED CONDITIONS DRAINAGE ANALYSIS

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



Routing Diagram for 25071.2-PROPOSED

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25071.2-PROPOSED

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.228	70	1/2 acre lots, 25% imp, HSG B (3S, 10S)
0.908	61	>75% Grass cover, Good, HSG B (1S, 2S, 3S, 4S, 5S, 6S, 7S, 9S, 10S, 11S)
0.086	48	Brush, Good, HSG B (2S)
0.421	98	Paved parking, HSG B (2S, 6S, 7S)
0.299	98	Paved roads w/curbs & sewers, HSG B (1S, 3S, 4S, 5S)
0.336	98	Roofs, HSG B (2S, 6S, 8S, 10S)
0.034	98	Water Surface, 0% imp, HSG B (8S)
0.874	55	Woods, Good, HSG B (2S, 3S, 9S, 10S, 11S)
5.186	71	TOTAL AREA

25071.2-PROPOSED

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
5.186	HSG B	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
5.186		TOTAL AREA

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Type III 24-hr 2-YR STORM Rainfall=3.71"

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Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 points x 3
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S	Runoff Area=6,934 sf 5.97% Impervious Runoff Depth=0.76" Tc=6.0 min CN=63 Runoff=0.12 cfs 0.010 af
Subcatchment2S: Subcatchment2S	Runoff Area=22,794 sf 37.44% Impervious Runoff Depth=1.26" Tc=6.0 min CN=72 Runoff=0.73 cfs 0.055 af
Subcatchment3S: Subcatchment3S	Runoff Area=81,653 sf 28.56% Impervious Runoff Depth=1.14" Flow Length=599' Tc=10.5 min CN=70 Runoff=1.99 cfs 0.178 af
Subcatchment4S: Subcatchment4S	Runoff Area=1,897 sf 80.02% Impervious Runoff Depth=2.74" Tc=6.0 min CN=91 Runoff=0.13 cfs 0.010 af
Subcatchment5S: Subcatchment5S	Runoff Area=2,929 sf 83.27% Impervious Runoff Depth=2.84" Tc=6.0 min CN=92 Runoff=0.21 cfs 0.016 af
Subcatchment6S: Subcatchment6S	Runoff Area=10,789 sf 86.15% Impervious Runoff Depth=2.94" Tc=6.0 min CN=93 Runoff=0.80 cfs 0.061 af
Subcatchment7S: Subcatchment7S	Runoff Area=7,556 sf 82.50% Impervious Runoff Depth=2.84" Tc=6.0 min CN=92 Runoff=0.55 cfs 0.041 af
Subcatchment8S: Subcatchment8S	Runoff Area=9,264 sf 83.81% Impervious Runoff Depth=3.48" Tc=6.0 min CN=98 Runoff=0.75 cfs 0.062 af
Subcatchment9S: Subcatchment9S	Runoff Area=3,563 sf 0.00% Impervious Runoff Depth=0.50" Flow Length=79' Tc=8.0 min CN=57 Runoff=0.03 cfs 0.003 af
Subcatchment10S: Subcatchment10S	Runoff Area=66,877 sf 16.06% Impervious Runoff Depth=0.92" Flow Length=284' Tc=12.5 min CN=66 Runoff=1.16 cfs 0.117 af
Subcatchment11S: Subcatchment11S	Runoff Area=11,665 sf 0.00% Impervious Runoff Depth=0.50" Flow Length=120' Tc=8.0 min CN=57 Runoff=0.09 cfs 0.011 af
Reach 1R: Overland Flow	Avg. Flow Depth=0.09' Max Vel=0.26 fps Inflow=0.36 cfs 0.034 af n=0.070 L=66.0' S=0.0061 '/' Capacity=13.24 cfs Outflow=0.35 cfs 0.034 af
Reach 2R: Diversion Swale	Avg. Flow Depth=0.31' Max Vel=1.31 fps Inflow=1.18 cfs 0.121 af n=0.030 L=60.0' S=0.0050 '/' Capacity=12.47 cfs Outflow=1.18 cfs 0.121 af
Reach AP1: Analysis Point 1	Inflow=1.99 cfs 0.178 af Outflow=1.99 cfs 0.178 af
Reach AP2: Analysis Point 2	Inflow=0.35 cfs 0.026 af Outflow=0.35 cfs 0.026 af
Pond 1P: Pocket Pond 1	Peak Elev=19.80' Storage=3,054 cf Inflow=1.64 cfs 0.176 af Discarded=0.25 cfs 0.176 af Primary=0.00 cfs 0.000 af Outflow=0.25 cfs 0.176 af

25071.2-PROPOSED*Type III 24-hr 2-YR STORM Rainfall=3.71"*

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Pond 2P: Existing Pond Peak Elev=21.31' Storage=436 cf Inflow=0.73 cfs 0.055 af
Discarded=0.05 cfs 0.021 af Primary=0.36 cfs 0.034 af Outflow=0.41 cfs 0.055 af

Pond 3P: Focal Point 1 Peak Elev=22.58' Storage=59 cf Inflow=0.80 cfs 0.061 af
Outflow=0.80 cfs 0.061 af

Pond 4P: Chamber System A Peak Elev=19.76' Storage=968 cf Inflow=0.80 cfs 0.061 af
Discarded=0.15 cfs 0.061 af Primary=0.00 cfs 0.000 af Outflow=0.15 cfs 0.061 af

Pond 5P: Focal Point 2 Peak Elev=23.02' Storage=23 cf Inflow=0.55 cfs 0.041 af
Outflow=0.55 cfs 0.041 af

Pond 6P: Chamber System B Peak Elev=19.75' Storage=614 cf Inflow=0.55 cfs 0.041 af
Discarded=0.11 cfs 0.041 af Primary=0.00 cfs 0.000 af Outflow=0.11 cfs 0.041 af

Pond 7P: Filtration Drip Edge Peak Elev=20.82' Storage=960 cf Inflow=0.75 cfs 0.062 af
Discarded=0.27 cfs 0.051 af Primary=0.00 cfs 0.000 af Outflow=0.27 cfs 0.051 af

Pond 9P: Diversion Culvert Peak Elev=21.75' Inflow=1.16 cfs 0.117 af
18.0" Round Culvert n=0.013 L=20.0' S=0.0100 '/ Outflow=1.16 cfs 0.117 af

Pond 10P: Driveway Culvert Peak Elev=20.76' Inflow=1.56 cfs 0.166 af
18.0" Round Culvert n=0.013 L=36.0' S=0.0056 '/ Outflow=1.56 cfs 0.166 af

Pond CB1: Existing Catch Basin 1 Peak Elev=23.60' Inflow=0.13 cfs 0.010 af
12.0" Round Culvert n=0.012 L=28.0' S=0.0075 '/ Outflow=0.13 cfs 0.010 af

Pond CB2: Existing Catch Basin 2 Peak Elev=19.31' Inflow=0.21 cfs 0.016 af
12.0" Round Culvert n=0.012 L=36.0' S=0.0078 '/ Outflow=0.21 cfs 0.016 af

Pond DMH1: Drain Manhole 1 Peak Elev=20.15' Inflow=0.00 cfs 0.000 af
12.0" Round Culvert n=0.013 L=58.0' S=0.0052 '/ Outflow=0.00 cfs 0.000 af

Pond DMH2: Drain Manhole 2 Peak Elev=19.75' Inflow=0.00 cfs 0.000 af
12.0" Round Culvert n=0.013 L=140.0' S=0.0050 '/ Outflow=0.00 cfs 0.000 af

Pond DMH3: Drain Manhole 3 Peak Elev=18.95' Inflow=0.00 cfs 0.000 af
12.0" Round Culvert n=0.013 L=24.0' S=0.0062 '/ Outflow=0.00 cfs 0.000 af

Pond DMH4: Drain Manhole 4 Peak Elev=21.46' Inflow=1.18 cfs 0.121 af
18.0" Round Culvert n=0.013 L=92.0' S=0.0054 '/ Outflow=1.18 cfs 0.121 af

Pond YD: Yard Drain Peak Elev=21.78' Inflow=0.03 cfs 0.003 af
12.0" Round Culvert n=0.013 L=28.0' S=0.0107 '/ Outflow=0.03 cfs 0.003 af

Total Runoff Area = 5.186 ac Runoff Volume = 0.564 af Average Runoff Depth = 1.31"
68.90% Pervious = 3.574 ac 31.10% Impervious = 1.613 ac

25071.2-PROPOSED*Type III 24-hr 10-YR STORM Rainfall=5.63"*

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Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 points x 3
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S	Runoff Area=6,934 sf 5.97% Impervious Runoff Depth=1.92" Tc=6.0 min CN=63 Runoff=0.34 cfs 0.025 af
Subcatchment2S: Subcatchment2S	Runoff Area=22,794 sf 37.44% Impervious Runoff Depth=2.69" Tc=6.0 min CN=72 Runoff=1.62 cfs 0.117 af
Subcatchment3S: Subcatchment3S	Runoff Area=81,653 sf 28.56% Impervious Runoff Depth=2.51" Flow Length=599' Tc=10.5 min CN=70 Runoff=4.66 cfs 0.393 af
Subcatchment4S: Subcatchment4S	Runoff Area=1,897 sf 80.02% Impervious Runoff Depth=4.60" Tc=6.0 min CN=91 Runoff=0.22 cfs 0.017 af
Subcatchment5S: Subcatchment5S	Runoff Area=2,929 sf 83.27% Impervious Runoff Depth=4.71" Tc=6.0 min CN=92 Runoff=0.34 cfs 0.026 af
Subcatchment6S: Subcatchment6S	Runoff Area=10,789 sf 86.15% Impervious Runoff Depth=4.82" Tc=6.0 min CN=93 Runoff=1.27 cfs 0.099 af
Subcatchment7S: Subcatchment7S	Runoff Area=7,556 sf 82.50% Impervious Runoff Depth=4.71" Tc=6.0 min CN=92 Runoff=0.88 cfs 0.068 af
Subcatchment8S: Subcatchment8S	Runoff Area=9,264 sf 83.81% Impervious Runoff Depth=5.39" Tc=6.0 min CN=98 Runoff=1.15 cfs 0.096 af
Subcatchment9S: Subcatchment9S	Runoff Area=3,563 sf 0.00% Impervious Runoff Depth=1.46" Flow Length=79' Tc=8.0 min CN=57 Runoff=0.11 cfs 0.010 af
Subcatchment10S: Subcatchment10S	Runoff Area=66,877 sf 16.06% Impervious Runoff Depth=2.17" Flow Length=284' Tc=12.5 min CN=66 Runoff=3.03 cfs 0.278 af
Subcatchment11S: Subcatchment11S	Runoff Area=11,665 sf 0.00% Impervious Runoff Depth=1.46" Flow Length=120' Tc=8.0 min CN=57 Runoff=0.37 cfs 0.032 af
Reach 1R: Overland Flow	Avg. Flow Depth=0.15' Max Vel=0.36 fps Inflow=0.99 cfs 0.086 af n=0.070 L=66.0' S=0.0061 '/' Capacity=13.24 cfs Outflow=0.97 cfs 0.086 af
Reach 2R: Diversion Swale	Avg. Flow Depth=0.51' Max Vel=1.73 fps Inflow=3.13 cfs 0.288 af n=0.030 L=60.0' S=0.0050 '/' Capacity=12.47 cfs Outflow=3.14 cfs 0.288 af
Reach AP1: Analysis Point 1	Inflow=4.72 cfs 0.540 af Outflow=4.72 cfs 0.540 af
Reach AP2: Analysis Point 2	Inflow=0.56 cfs 0.043 af Outflow=0.56 cfs 0.043 af
Pond 1P: Pocket Pond 1	Peak Elev=20.71' Storage=6,020 cf Inflow=4.62 cfs 0.432 af Discarded=0.40 cfs 0.291 af Primary=1.73 cfs 0.141 af Outflow=2.14 cfs 0.432 af

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Pond 2P: Existing Pond Peak Elev=21.54' Storage=831 cf Inflow=1.62 cfs 0.117 af
Discarded=0.06 cfs 0.031 af Primary=0.99 cfs 0.086 af Outflow=1.06 cfs 0.117 af

Pond 3P: Focal Point 1 Peak Elev=22.63' Storage=64 cf Inflow=1.27 cfs 0.099 af
Outflow=1.27 cfs 0.099 af

Pond 4P: Chamber System A Peak Elev=20.59' Storage=1,629 cf Inflow=1.27 cfs 0.099 af
Discarded=0.20 cfs 0.097 af Primary=0.08 cfs 0.003 af Outflow=0.28 cfs 0.099 af

Pond 5P: Focal Point 2 Peak Elev=23.05' Storage=24 cf Inflow=0.88 cfs 0.068 af
Outflow=0.88 cfs 0.068 af

Pond 6P: Chamber System B Peak Elev=20.36' Storage=1,103 cf Inflow=0.88 cfs 0.068 af
Discarded=0.15 cfs 0.068 af Primary=0.00 cfs 0.000 af Outflow=0.15 cfs 0.068 af

Pond 7P: Filtration Drip Edge Peak Elev=21.25' Storage=1,219 cf Inflow=1.15 cfs 0.096 af
Discarded=0.31 cfs 0.081 af Primary=0.38 cfs 0.004 af Outflow=0.69 cfs 0.085 af

Pond 9P: Diversion Culvert Peak Elev=22.21' Inflow=3.03 cfs 0.278 af
18.0" Round Culvert n=0.013 L=20.0' S=0.0100 '/' Outflow=3.03 cfs 0.278 af

Pond 10P: Driveway Culvert Peak Elev=21.30' Inflow=4.39 cfs 0.406 af
18.0" Round Culvert n=0.013 L=36.0' S=0.0056 '/' Outflow=4.39 cfs 0.406 af

Pond CB1: Existing Catch Basin 1 Peak Elev=23.65' Inflow=0.22 cfs 0.017 af
12.0" Round Culvert n=0.012 L=28.0' S=0.0075 '/' Outflow=0.22 cfs 0.017 af

Pond CB2: Existing Catch Basin 2 Peak Elev=19.38' Inflow=0.34 cfs 0.026 af
12.0" Round Culvert n=0.012 L=36.0' S=0.0078 '/' Outflow=0.34 cfs 0.026 af

Pond DMH1: Drain Manhole 1 Peak Elev=20.31' Inflow=0.08 cfs 0.003 af
12.0" Round Culvert n=0.013 L=58.0' S=0.0052 '/' Outflow=0.08 cfs 0.003 af

Pond DMH2: Drain Manhole 2 Peak Elev=19.91' Inflow=0.08 cfs 0.003 af
12.0" Round Culvert n=0.013 L=140.0' S=0.0050 '/' Outflow=0.08 cfs 0.003 af

Pond DMH3: Drain Manhole 3 Peak Elev=19.11' Inflow=0.08 cfs 0.003 af
12.0" Round Culvert n=0.013 L=24.0' S=0.0062 '/' Outflow=0.08 cfs 0.003 af

Pond DMH4: Drain Manhole 4 Peak Elev=21.88' Inflow=3.13 cfs 0.288 af
18.0" Round Culvert n=0.013 L=92.0' S=0.0054 '/' Outflow=3.13 cfs 0.288 af

Pond YD: Yard Drain Peak Elev=21.95' Inflow=0.11 cfs 0.010 af
12.0" Round Culvert n=0.013 L=28.0' S=0.0107 '/' Outflow=0.11 cfs 0.010 af

Total Runoff Area = 5.186 ac Runoff Volume = 1.162 af Average Runoff Depth = 2.69"
68.90% Pervious = 3.574 ac 31.10% Impervious = 1.613 ac

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Type III 24-hr 10-YR STORM Rainfall=5.63"

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Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 0.34 cfs @ 12.10 hrs, Volume= 0.025 af, Depth= 1.92"
 Routed to Pond 1P : Pocket Pond 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-YR STORM Rainfall=5.63"

Area (sf)	CN	Description
6,520	61	>75% Grass cover, Good, HSG B
414	98	Paved roads w/curbs & sewers, HSG B
6,934	63	Weighted Average
6,520		94.03% Pervious Area
414		5.97% Impervious Area

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

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 1.62 cfs @ 12.09 hrs, Volume= 0.117 af, Depth= 2.69"
 Routed to Pond 2P : Existing Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-YR STORM Rainfall=5.63"

Area (sf)	CN	Description
7,719	98	Paved parking, HSG B
815	98	Roofs, HSG B
9,211	61	>75% Grass cover, Good, HSG B
1,310	55	Woods, Good, HSG B
3,739	48	Brush, Good, HSG B
22,794	72	Weighted Average
14,260		62.56% Pervious Area
8,534		37.44% Impervious Area

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

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 4.66 cfs @ 12.15 hrs, Volume= 0.393 af, Depth= 2.51"
 Routed to Reach AP1 : Analysis Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-YR STORM Rainfall=5.63"

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Type III 24-hr 10-YR STORM Rainfall=5.63"

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Area (sf)	CN	Description
12,438	55	Woods, Good, HSG B
8,649	98	Paved roads w/curbs & sewers, HSG B
58,674	70	1/2 acre lots, 25% imp, HSG B
1,892	61	>75% Grass cover, Good, HSG B
81,653	70	Weighted Average
58,336		71.44% Pervious Area
23,318		28.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0200	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.71"
0.7	55	0.0364	1.34		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.6	59	0.0476	1.53		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.1	208	0.0260	3.27		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.5	33	0.0303	1.22		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.3	86	0.0233	1.07		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.8	50	0.0385	0.98		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	58	0.0090	3.35	16.73	Trap/Vee/Rect Channel Flow, Diversion Swale Bot.W=2.00' D=1.00' Z= 3.0 ' / Top.W=8.00' n= 0.030 Earth, grassed & winding
10.5	599	Total			

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af, Depth= 4.60"
Routed to Pond CB1 : Existing Catch Basin 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR STORM Rainfall=5.63"

Area (sf)	CN	Description
1,518	98	Paved roads w/curbs & sewers, HSG B
379	61	>75% Grass cover, Good, HSG B
1,897	91	Weighted Average
379		19.98% Pervious Area
1,518		80.02% Impervious Area

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

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Type III 24-hr 10-YR STORM Rainfall=5.63"

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Summary for Subcatchment 5S: Subcatchment 5S

Runoff = 0.34 cfs @ 12.09 hrs, Volume= 0.026 af, Depth= 4.71"
 Routed to Pond CB2 : Existing Catch Basin 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-YR STORM Rainfall=5.63"

Area (sf)	CN	Description
2,439	98	Paved roads w/curbs & sewers, HSG B
490	61	>75% Grass cover, Good, HSG B
2,929	92	Weighted Average
490		16.73% Pervious Area
2,439		83.27% Impervious Area

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

Summary for Subcatchment 6S: Subcatchment 6S

Runoff = 1.27 cfs @ 12.09 hrs, Volume= 0.099 af, Depth= 4.82"
 Routed to Pond 3P : Focal Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-YR STORM Rainfall=5.63"

Area (sf)	CN	Description
4,405	98	Paved parking, HSG B
1,494	61	>75% Grass cover, Good, HSG B
4,890	98	Roofs, HSG B
10,789	93	Weighted Average
1,494		13.85% Pervious Area
9,295		86.15% Impervious Area

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

Summary for Subcatchment 7S: Subcatchment 7S

Runoff = 0.88 cfs @ 12.09 hrs, Volume= 0.068 af, Depth= 4.71"
 Routed to Pond 5P : Focal Point 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-YR STORM Rainfall=5.63"

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Type III 24-hr 10-YR STORM Rainfall=5.63"

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Area (sf)	CN	Description
6,234	98	Paved parking, HSG B
1,322	61	>75% Grass cover, Good, HSG B
7,556	92	Weighted Average
1,322		17.50% Pervious Area
6,234		82.50% Impervious Area

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

Summary for Subcatchment 8S: Subcatchment 8S

Runoff = 1.15 cfs @ 12.09 hrs, Volume= 0.096 af, Depth= 5.39"
 Routed to Pond 7P : Filtration Drip Edge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-YR STORM Rainfall=5.63"

Area (sf)	CN	Description
7,764	98	Roofs, HSG B
1,500	98	Water Surface, 0% imp, HSG B
9,264	98	Weighted Average
1,500		16.19% Pervious Area
7,764		83.81% Impervious Area

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

Summary for Subcatchment 9S: Subcatchment 9S

Runoff = 0.11 cfs @ 12.13 hrs, Volume= 0.010 af, Depth= 1.46"
 Routed to Pond YD : Yard Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-YR STORM Rainfall=5.63"

Area (sf)	CN	Description
2,652	55	Woods, Good, HSG B
911	61	>75% Grass cover, Good, HSG B
3,563	57	Weighted Average
3,563		100.00% Pervious Area

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Type III 24-hr 10-YR STORM Rainfall=5.63"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	14	0.0500	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.71"
3.3	28	0.1429	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.71"
1.6	8	0.0714	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.71"
0.1	6	0.0714	1.87		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.1	23	0.0100	3.53	17.63	Trap/Vee/Rect Channel Flow, Bot.W=2.00' D=1.00' Z= 3.0 '/' Top.W=8.00' n= 0.030 Earth, grassed & winding
8.0	79	Total			

Summary for Subcatchment 10S: Subcatchment 10S

Intent of final Tc segment is to demonstrate adequacy of provided diversion swale dimensions.

Runoff = 3.03 cfs @ 12.18 hrs, Volume= 0.278 af, Depth= 2.17"
 Routed to Pond 9P : Diversion Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-YR STORM Rainfall=5.63"

Area (sf)	CN	Description
14,284	55	Woods, Good, HSG B
1,147	98	Roofs, HSG B
38,372	70	1/2 acre lots, 25% imp, HSG B
13,074	61	>75% Grass cover, Good, HSG B
66,877	66	Weighted Average
56,137		83.94% Pervious Area
10,740		16.06% Impervious Area

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Type III 24-hr 10-YR STORM Rainfall=5.63"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	15	0.1000	0.24		Sheet Flow, Grass: Short n= 0.150 P2= 3.71"
7.2	35	0.0308	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.71"
0.6	30	0.0308	0.88		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	25	0.0800	1.41		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.1	92	0.0217	0.74		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	51	0.0392	0.99		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.2	11	0.0270	0.82		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.2	16	0.0270	1.15		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.0	9	0.0160	4.46	22.30	Trap/Vee/Rect Channel Flow, Diversion Swale Segment Bot.W=2.00' D=1.00' Z= 3.0 '/' Top.W=8.00' n= 0.030 Earth, grassed & winding
12.5	284	Total			

Summary for Subcatchment 11S: Subcatchment 11S

Runoff = 0.37 cfs @ 12.13 hrs, Volume= 0.032 af, Depth= 1.46"
Routed to Pond 10P : Driveway Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR STORM Rainfall=5.63"

Area (sf)	CN	Description
7,405	55	Woods, Good, HSG B
4,260	61	>75% Grass cover, Good, HSG B
11,665	57	Weighted Average
11,665		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	15	0.0667	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.71"
2.5	22	0.1818	0.15		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.71"
1.9	13	0.1176	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.71"
0.4	38	0.1176	1.71		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.5	32	0.0469	1.08		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
8.0	120	Total			

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Type III 24-hr 10-YR STORM Rainfall=5.63"

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Summary for Reach 1R: Overland Flow

Inflow Area = 0.523 ac, 37.44% Impervious, Inflow Depth = 1.98" for 10-YR STORM event
Inflow = 0.99 cfs @ 12.20 hrs, Volume= 0.086 af
Outflow = 0.97 cfs @ 12.25 hrs, Volume= 0.086 af, Atten= 2%, Lag= 2.7 min
Routed to Pond 10P : Driveway Culvert

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.36 fps, Min. Travel Time= 3.1 min
Avg. Velocity = 0.10 fps, Avg. Travel Time= 10.6 min

Peak Storage= 180 cf @ 12.25 hrs
Average Depth at Peak Storage= 0.15' , Surface Width= 27.35'
Bank-Full Depth= 0.50' Flow Area= 16.7 sf, Capacity= 13.24 cfs

50.00' x 0.50' deep Parabolic Channel, n= 0.070 Medium-dense brush, winter
Length= 66.0' Slope= 0.0061 '/
Inlet Invert= 20.50', Outlet Invert= 20.10'



Summary for Reach 2R: Diversion Swale

[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 1.617 ac, 15.25% Impervious, Inflow Depth = 2.13" for 10-YR STORM event
Inflow = 3.13 cfs @ 12.18 hrs, Volume= 0.288 af
Outflow = 3.14 cfs @ 12.19 hrs, Volume= 0.288 af, Atten= 0%, Lag= 0.5 min
Routed to Pond 10P : Driveway Culvert

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.73 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 0.65 fps, Avg. Travel Time= 1.5 min

Peak Storage= 109 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.51' , Surface Width= 5.08'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 12.47 cfs

2.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/ Top Width= 8.00'
Length= 60.0' Slope= 0.0050 '/
Inlet Invert= 20.40', Outlet Invert= 20.10'

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**Summary for Reach AP1: Analysis Point 1**

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

Inflow Area = 5.076 ac, 29.99% Impervious, Inflow Depth = 1.28" for 10-YR STORM event
 Inflow = 4.72 cfs @ 12.17 hrs, Volume= 0.540 af
 Outflow = 4.72 cfs @ 12.17 hrs, Volume= 0.540 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP2: Analysis Point 2

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

Inflow Area = 0.111 ac, 81.99% Impervious, Inflow Depth = 4.66" for 10-YR STORM event
 Inflow = 0.56 cfs @ 12.09 hrs, Volume= 0.043 af
 Outflow = 0.56 cfs @ 12.09 hrs, Volume= 0.043 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Summary for Pond 1P: Pocket Pond 1

Inflow Area = 2.567 ac, 17.60% Impervious, Inflow Depth = 2.02" for 10-YR STORM event
 Inflow = 4.62 cfs @ 12.19 hrs, Volume= 0.432 af
 Outflow = 2.14 cfs @ 12.55 hrs, Volume= 0.432 af, Atten= 54%, Lag= 21.4 min
 Discarded = 0.40 cfs @ 12.55 hrs, Volume= 0.291 af
 Primary = 1.73 cfs @ 12.55 hrs, Volume= 0.141 af

Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 20.71' @ 12.55 hrs Surf.Area= 3,631 sf Storage= 6,020 cf

Plug-Flow detention time= 133.8 min calculated for 0.431 af (100% of inflow)

Center-of-Mass det. time= 134.0 min (987.4 - 853.4)

Volume	Invert	Avail.Storage	Storage Description		
#1	18.50'	11,425 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
18.50	1,412	218.0	0	0	1,412
18.75	2,096	241.0	436	436	2,254
20.00	3,067	273.0	3,208	3,643	3,602
22.00	4,778	312.0	7,782	11,425	5,509

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Device	Routing	Invert	Outlet Devices
#1	Primary	20.00'	18.0" Round Culvert L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 20.00' / 19.90' S= 0.0067 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Discarded	18.50'	1.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 18.17' Phase-In= 0.10'

Discarded OutFlow Max=0.40 cfs @ 12.55 hrs HW=20.71' (Free Discharge)↑**2=Exfiltration** (Controls 0.40 cfs)**Primary OutFlow** Max=1.73 cfs @ 12.55 hrs HW=20.71' TW=0.00' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 1.73 cfs @ 3.08 fps)**Summary for Pond 2P: Existing Pond**

Pond areas, elevations, and culvert parameters are assumed.

Inflow Area = 0.523 ac, 37.44% Impervious, Inflow Depth = 2.69" for 10-YR STORM event
 Inflow = 1.62 cfs @ 12.09 hrs, Volume= 0.117 af
 Outflow = 1.06 cfs @ 12.20 hrs, Volume= 0.117 af, Atten= 35%, Lag= 6.5 min
 Discarded = 0.06 cfs @ 12.20 hrs, Volume= 0.031 af
 Primary = 0.99 cfs @ 12.20 hrs, Volume= 0.086 af
 Routed to Reach 1R : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 21.54' @ 12.20 hrs Surf.Area= 1,912 sf Storage= 831 cf

Plug-Flow detention time= 24.3 min calculated for 0.117 af (100% of inflow)

Center-of-Mass det. time= 23.9 min (860.4 - 836.6)

Volume	Invert	Avail.Storage	Storage Description		
#1	21.00'	1,882 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
21.00	1,209	140.0	0	0	1,209
22.00	2,647	210.0	1,882	1,882	3,166

Device	Routing	Invert	Outlet Devices
#1	Discarded	21.00'	1.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 20.00' Phase-In= 0.10'
#2	Primary	21.00'	15.0" Round Culvert L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 21.00' / 20.50' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

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Discarded OutFlow Max=0.06 cfs @ 12.20 hrs HW=21.54' (Free Discharge)↑ **1=Exfiltration** (Controls 0.06 cfs)**Primary OutFlow** Max=0.99 cfs @ 12.20 hrs HW=21.54' TW=20.65' (Dynamic Tailwater)↑ **2=Culvert** (Inlet Controls 0.99 cfs @ 1.97 fps)**Summary for Pond 3P: Focal Point 1**

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=5)

Inflow Area = 0.248 ac, 86.15% Impervious, Inflow Depth = 4.82" for 10-YR STORM event

Inflow = 1.27 cfs @ 12.09 hrs, Volume= 0.099 af

Outflow = 1.27 cfs @ 12.09 hrs, Volume= 0.099 af, Atten= 0%, Lag= 0.1 min

Primary = 1.27 cfs @ 12.09 hrs, Volume= 0.099 af

Routed to Pond 4P : Chamber System A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 22.63' @ 12.09 hrs Surf.Area= 145 sf Storage= 64 cf

Plug-Flow detention time= 1.1 min calculated for 0.099 af (100% of inflow)

Center-of-Mass det. time= 1.1 min (775.9 - 774.8)

Volume	Invert	Avail.Storage	Storage Description
#1	19.75'	18 cf	4.00'W x 10.00'L x 2.25'H Focal Point Area 1 90 cf Overall x 20.0% Voids
#2	22.00'	59 cf	Surface Bowl (Prismatic) Listed below (Recalc)
		77 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.00	40	0	0
22.75	118	59	59

Device	Routing	Invert	Outlet Devices
#1	Primary	19.25'	12.0" Round Culvert L= 9.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 19.25' / 19.20' S= 0.0056 ' / S= 0.0056 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 3	19.75'	100.000 in/hr Exfiltration over Surface area Phase-In= 0.10'
#3	Device 1	19.25'	6.0" W x 6.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	22.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.24 cfs @ 12.09 hrs HW=22.62' TW=19.82' (Dynamic Tailwater)↑ **1=Culvert** (Passes 1.24 cfs of 5.00 cfs potential flow)↑ **3=Orifice/Grate** (Passes 0.34 cfs of 2.02 cfs potential flow)↑ **2=Exfiltration** (Exfiltration Controls 0.34 cfs)↑ **4=Orifice/Grate** (Weir Controls 0.91 cfs @ 1.16 fps)

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Summary for Pond 4P: Chamber System A

High existing grade = 21.0

SHWT depth = 34" per test pit #2

E(SHWT) = 18.17

Bottom of chambers = 19.2

However, credit is being taken for 12" stone layer underneath chambers down to 18.2. SHWT is modelled 6" lower as a factor of safety. Modelling the SHWT too close to the bottom of modelled storage renders inaccurate results.

Inflow Area = 0.248 ac, 86.15% Impervious, Inflow Depth = 4.82" for 10-YR STORM event
 Inflow = 1.27 cfs @ 12.09 hrs, Volume= 0.099 af
 Outflow = 0.28 cfs @ 12.54 hrs, Volume= 0.099 af, Atten= 78%, Lag= 26.9 min
 Discarded = 0.20 cfs @ 12.54 hrs, Volume= 0.097 af
 Primary = 0.08 cfs @ 12.54 hrs, Volume= 0.003 af
 Routed to Pond DMH1 : Drain Manhole 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 20.59' @ 12.54 hrs Surf.Area= 2,160 sf Storage= 1,629 cf

Plug-Flow detention time= 88.2 min calculated for 0.099 af (100% of inflow)

Center-of-Mass det. time= 88.2 min (864.1 - 775.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	19.20'	0 cf	16.00'W x 56.00'L x 2.67'H Field A 2,392 cf Overall - 2,392 cf Embedded = 0 cf x 0.0% Voids
#2A	19.20'	1,600 cf	Shea Leaching Chamber 8x14x2.7x 8 Inside #1 Inside= 84.0"W x 24.0"H => 15.38 sf x 13.00'L = 200.0 cf Outside= 96.0"W x 32.0"H => 21.36 sf x 14.00'L = 299.0 cf 8 Chambers in 2 Rows
#3	18.19'	518 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		2,118 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
18.19	1,264	0.0	0	0
18.20	1,264	40.0	5	5
19.19	1,264	40.0	501	506
19.20	1,264	100.0	13	518

Device	Routing	Invert	Outlet Devices
#1	Primary	20.40'	8.0" Round Culvert L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 20.40' / 20.25' S= 0.0050 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Discarded	18.19'	1.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 17.67' Phase-In= 0.10'

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Discarded OutFlow Max=0.20 cfs @ 12.54 hrs HW=20.59' (Free Discharge)↑ **2=Exfiltration** (Controls 0.20 cfs)**Primary OutFlow** Max=0.08 cfs @ 12.54 hrs HW=20.59' TW=20.31' (Dynamic Tailwater)↑ **1=Culvert** (Barrel Controls 0.08 cfs @ 1.47 fps)**Summary for Pond 5P: Focal Point 2**

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=8)

Inflow Area = 0.173 ac, 82.50% Impervious, Inflow Depth = 4.71" for 10-YR STORM event

Inflow = 0.88 cfs @ 12.09 hrs, Volume= 0.068 af

Outflow = 0.88 cfs @ 12.09 hrs, Volume= 0.068 af, Atten= 0%, Lag= 0.1 min

Primary = 0.88 cfs @ 12.09 hrs, Volume= 0.068 af

Routed to Pond 6P : Chamber System B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 23.05' @ 12.09 hrs Surf.Area= 80 sf Storage= 24 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 0.8 min (779.9 - 779.1)

Volume	Invert	Avail.Storage	Storage Description
#1	20.50'	12 cf	3.00'W x 9.00'L x 2.25'H Focal Point Area 1 61 cf Overall x 20.0% Voids
#2	22.75'	24 cf	Surface Bowl (Prismatic) Listed below (Recalc)
		36 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.75	27	0	0
23.25	70	24	24

Device	Routing	Invert	Outlet Devices
#1	Primary	20.00'	12.0" Round Culvert L= 32.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 20.00' / 19.80' S= 0.0062 ' / S= 0.0062 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 3	20.50'	100.000 in/hr Exfiltration over Surface area Phase-In= 0.10'
#3	Device 1	20.00'	6.0" W x 6.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	22.95'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.86 cfs @ 12.09 hrs HW=23.05' TW=19.82' (Dynamic Tailwater)↑ **1=Culvert** (Passes 0.86 cfs of 4.77 cfs potential flow)↑ **3=Orifice/Grate** (Passes 0.19 cfs of 2.01 cfs potential flow)↑ **2=Exfiltration** (Exfiltration Controls 0.19 cfs)↑ **4=Orifice/Grate** (Weir Controls 0.67 cfs @ 1.05 fps)

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Summary for Pond 6P: Chamber System B

High existing grade = ~21.4

SHWT depth = 34" per test pit #2

E(SHWT) = 18.57

Bottom of chambers = 19.6

However, credit is being taken for 12" stone layer underneath chambers down to 18.6. SHWT is modelled 6" lower as a factor of safety. Modelling the SHWT too close to the bottom of modelled storage renders inaccurate results.

Inflow Area = 0.173 ac, 82.50% Impervious, Inflow Depth = 4.71" for 10-YR STORM event
 Inflow = 0.88 cfs @ 12.09 hrs, Volume= 0.068 af
 Outflow = 0.15 cfs @ 12.58 hrs, Volume= 0.068 af, Atten= 83%, Lag= 29.3 min
 Discarded = 0.15 cfs @ 12.58 hrs, Volume= 0.068 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond DMH1 : Drain Manhole 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 20.36' @ 12.58 hrs Surf.Area= 2,096 sf Storage= 1,103 cf

Plug-Flow detention time= 79.2 min calculated for 0.068 af (100% of inflow)

Center-of-Mass det. time= 79.2 min (859.1 - 779.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	19.60'	0 cf	16.00'W x 56.00'L x 2.67'H Field A 2,392 cf Overall - 2,392 cf Embedded = 0 cf x 0.0% Voids
#2A	19.60'	1,600 cf	Shea Leaching Chamber 8x14x2.7x 8 Inside #1 Inside= 84.0"W x 24.0"H => 15.38 sf x 13.00'L = 200.0 cf Outside= 96.0"W x 32.0"H => 21.36 sf x 14.00'L = 299.0 cf 8 Chambers in 2 Rows
#3	18.59'	492 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		2,092 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
18.59	1,200	0.0	0	0
18.60	1,200	40.0	5	5
19.59	1,200	40.0	475	480
19.60	1,200	100.0	12	492

Device	Routing	Invert	Outlet Devices
#1	Primary	20.80'	8.0" Round Culvert L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 20.80' / 20.75' S= 0.0063 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Discarded	18.59'	1.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 18.07' Phase-In= 0.10'

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Discarded OutFlow Max=0.15 cfs @ 12.58 hrs HW=20.36' (Free Discharge)↑**2=Exfiltration** (Controls 0.15 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=18.59' TW=20.15' (Dynamic Tailwater)↑**1=Culvert** (Controls 0.00 cfs)**Summary for Pond 7P: Filtration Drip Edge**

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=79)

Inflow Area = 0.213 ac, 83.81% Impervious, Inflow Depth = 5.39" for 10-YR STORM event
 Inflow = 1.15 cfs @ 12.09 hrs, Volume= 0.096 af
 Outflow = 0.69 cfs @ 12.22 hrs, Volume= 0.085 af, Atten= 40%, Lag= 7.8 min
 Discarded = 0.31 cfs @ 12.20 hrs, Volume= 0.081 af
 Primary = 0.38 cfs @ 12.22 hrs, Volume= 0.004 af
 Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3
 Peak Elev= 21.25' @ 12.20 hrs Surf.Area= 4,500 sf Storage= 1,219 cf

Plug-Flow detention time= 118.3 min calculated for 0.085 af (89% of inflow)
 Center-of-Mass det. time= 64.7 min (810.8 - 746.1)

Volume	Invert	Avail.Storage	Storage Description
#1	20.25'	600 cf	12.00'W x 125.00'L x 1.00'H Prismatic 1,500 cf Overall x 40.0% Voids
#2	18.75'	113 cf	12.00'W x 125.00'L x 1.50'H Prismatic 2,250 cf Overall x 5.0% Voids
#3	18.50'	56 cf	12.00'W x 125.00'L x 0.25'H Prismatic 375 cf Overall x 15.0% Voids
#4	17.75'	450 cf	12.00'W x 125.00'L x 0.75'H Prismatic Impervious 1,125 cf Overall x 40.0% Voids
		1,219 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#0	Primary	21.25'	Automatic Storage Overflow (Discharged without head)
#1	Discarded	18.50'	1.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 17.67' Phase-In= 0.10'

Discarded OutFlow Max=0.31 cfs @ 12.20 hrs HW=21.25' (Free Discharge)↑**1=Exfiltration** (Controls 0.31 cfs)**Primary OutFlow** Max=0.00 cfs @ 12.22 hrs HW=21.25' TW=0.00' (Dynamic Tailwater)

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Summary for Pond 9P: Diversion Culvert

Inflow Area = 1.535 ac, 16.06% Impervious, Inflow Depth = 2.17" for 10-YR STORM event
 Inflow = 3.03 cfs @ 12.18 hrs, Volume= 0.278 af
 Outflow = 3.03 cfs @ 12.18 hrs, Volume= 0.278 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.03 cfs @ 12.18 hrs, Volume= 0.278 af
 Routed to Pond DMH4 : Drain Manhole 4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 22.21' @ 12.18 hrs

Flood Elev= 23.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	21.20'	18.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 21.20' / 21.00' S= 0.0100 ' / S= 0.0100 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.00 cfs @ 12.18 hrs HW=22.20' TW=21.87' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 3.00 cfs @ 3.38 fps)**Summary for Pond 10P: Driveway Culvert**

[63] Warning: Exceeded Reach 1R INLET depth by 0.66' @ 12.20 hrs

[64] Warning: Exceeded Reach 1R outlet bank by 0.70' @ 12.20 hrs

[63] Warning: Exceeded Reach 2R INLET depth by 0.39' @ 12.20 hrs

[64] Warning: Exceeded Reach 2R outlet bank by 0.20' @ 12.20 hrs

Inflow Area = 2.408 ac, 18.37% Impervious, Inflow Depth = 2.02" for 10-YR STORM event
 Inflow = 4.39 cfs @ 12.20 hrs, Volume= 0.406 af
 Outflow = 4.39 cfs @ 12.20 hrs, Volume= 0.406 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.39 cfs @ 12.20 hrs, Volume= 0.406 af
 Routed to Pond 1P : Pocket Pond 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 21.30' @ 12.20 hrs

Flood Elev= 22.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	20.10'	18.0" Round Culvert L= 36.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 20.10' / 19.90' S= 0.0056 ' / S= 0.0056 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=4.37 cfs @ 12.20 hrs HW=21.30' TW=19.98' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 4.37 cfs @ 3.94 fps)

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Summary for Pond CB1: Existing Catch Basin 1

End invert of pipe is assumed as inverts have not been measured on downstream structure

[58] Hint: Peaked 0.24' above defined flood level

Inflow Area = 0.044 ac, 80.02% Impervious, Inflow Depth = 4.60" for 10-YR STORM event
Inflow = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af
Outflow = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min
Primary = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af
Routed to Reach AP2 : Analysis Point 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 23.65' @ 12.09 hrs
Flood Elev= 23.41'

Device	Routing	Invert	Outlet Devices
#1	Primary	23.41'	12.0" Round Culvert L= 28.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 23.41' / 23.20' S= 0.0075 ' / S= 0.0075 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.21 cfs @ 12.09 hrs HW=23.65' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 0.21 cfs @ 2.24 fps)

Summary for Pond CB2: Existing Catch Basin 2

End invert of pipe is assumed as inverts have not been measured on downstream structure

Inflow Area = 0.067 ac, 83.27% Impervious, Inflow Depth = 4.71" for 10-YR STORM event
Inflow = 0.34 cfs @ 12.09 hrs, Volume= 0.026 af
Outflow = 0.34 cfs @ 12.09 hrs, Volume= 0.026 af, Atten= 0%, Lag= 0.0 min
Primary = 0.34 cfs @ 12.09 hrs, Volume= 0.026 af
Routed to Reach AP2 : Analysis Point 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 19.38' @ 12.09 hrs
Flood Elev= 22.23'

Device	Routing	Invert	Outlet Devices
#1	Primary	19.08'	12.0" Round Culvert L= 36.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 19.08' / 18.80' S= 0.0078 ' / S= 0.0078 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.33 cfs @ 12.09 hrs HW=19.38' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 0.33 cfs @ 2.57 fps)

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Type III 24-hr 10-YR STORM Rainfall=5.63"

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Summary for Pond DMH1: Drain Manhole 1

Inflow Area = 0.421 ac, 84.65% Impervious, Inflow Depth = 0.07" for 10-YR STORM event
 Inflow = 0.08 cfs @ 12.54 hrs, Volume= 0.003 af
 Outflow = 0.08 cfs @ 12.54 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.08 cfs @ 12.54 hrs, Volume= 0.003 af
 Routed to Pond DMH2 : Drain Manhole 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 20.31' @ 12.54 hrs

Flood Elev= 24.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	20.15'	12.0" Round Culvert L= 58.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 20.15' / 19.85' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.08 cfs @ 12.54 hrs HW=20.31' TW=19.91' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 0.08 cfs @ 1.44 fps)**Summary for Pond DMH2: Drain Manhole 2**

Inflow Area = 0.421 ac, 84.65% Impervious, Inflow Depth = 0.07" for 10-YR STORM event
 Inflow = 0.08 cfs @ 12.54 hrs, Volume= 0.003 af
 Outflow = 0.08 cfs @ 12.54 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.08 cfs @ 12.54 hrs, Volume= 0.003 af
 Routed to Pond DMH3 : Drain Manhole 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 19.91' @ 12.54 hrs

Flood Elev= 23.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	19.75'	12.0" Round Culvert L= 140.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 19.75' / 19.05' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.08 cfs @ 12.54 hrs HW=19.91' TW=19.11' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 0.08 cfs @ 1.44 fps)**Summary for Pond DMH3: Drain Manhole 3**

Inflow Area = 0.421 ac, 84.65% Impervious, Inflow Depth = 0.07" for 10-YR STORM event
 Inflow = 0.08 cfs @ 12.54 hrs, Volume= 0.003 af
 Outflow = 0.08 cfs @ 12.54 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.08 cfs @ 12.54 hrs, Volume= 0.003 af
 Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

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Type III 24-hr 10-YR STORM Rainfall=5.63"

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Peak Elev= 19.11' @ 12.54 hrs

Flood Elev= 21.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	18.95'	12.0" Round Culvert L= 24.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 18.95' / 18.80' S= 0.0062 ' / S= 0.0062 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.08 cfs @ 12.54 hrs HW=19.11' TW=0.00' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 0.08 cfs @ 1.48 fps)**Summary for Pond DMH4: Drain Manhole 4**

Inflow Area = 1.617 ac, 15.25% Impervious, Inflow Depth = 2.13" for 10-YR STORM event
Inflow = 3.13 cfs @ 12.18 hrs, Volume= 0.288 af
Outflow = 3.13 cfs @ 12.18 hrs, Volume= 0.288 af, Atten= 0%, Lag= 0.0 min
Primary = 3.13 cfs @ 12.18 hrs, Volume= 0.288 af
Routed to Reach 2R : Diversion Swale

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 21.88' @ 12.18 hrs

Flood Elev= 24.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	20.90'	18.0" Round Culvert L= 92.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 20.90' / 20.40' S= 0.0054 ' / S= 0.0054 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.09 cfs @ 12.18 hrs HW=21.87' TW=20.91' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 3.09 cfs @ 3.63 fps)**Summary for Pond YD: Yard Drain**

Inflow Area = 0.082 ac, 0.00% Impervious, Inflow Depth = 1.46" for 10-YR STORM event
Inflow = 0.11 cfs @ 12.13 hrs, Volume= 0.010 af
Outflow = 0.11 cfs @ 12.13 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min
Primary = 0.11 cfs @ 12.13 hrs, Volume= 0.010 af
Routed to Pond DMH4 : Drain Manhole 4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 21.95' @ 12.17 hrs

Flood Elev= 23.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	21.70'	12.0" Round Culvert L= 28.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 21.70' / 21.40' S= 0.0107 ' / S= 0.0107 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

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Type III 24-hr 10-YR STORM Rainfall=5.63"

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Primary OutFlow Max=0.11 cfs @ 12.13 hrs HW=21.93' TW=21.83' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 0.11 cfs @ 1.26 fps)

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Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 points x 3
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S	Runoff Area=6,934 sf 5.97% Impervious Runoff Depth=3.00" Tc=6.0 min CN=63 Runoff=0.54 cfs 0.040 af
Subcatchment2S: Subcatchment2S	Runoff Area=22,794 sf 37.44% Impervious Runoff Depth=3.94" Tc=6.0 min CN=72 Runoff=2.37 cfs 0.172 af
Subcatchment3S: Subcatchment3S	Runoff Area=81,653 sf 28.56% Impervious Runoff Depth=3.73" Flow Length=599' Tc=10.5 min CN=70 Runoff=6.97 cfs 0.582 af
Subcatchment4S: Subcatchment4S	Runoff Area=1,897 sf 80.02% Impervious Runoff Depth=6.07" Tc=6.0 min CN=91 Runoff=0.28 cfs 0.022 af
Subcatchment5S: Subcatchment5S	Runoff Area=2,929 sf 83.27% Impervious Runoff Depth=6.18" Tc=6.0 min CN=92 Runoff=0.44 cfs 0.035 af
Subcatchment6S: Subcatchment6S	Runoff Area=10,789 sf 86.15% Impervious Runoff Depth=6.30" Tc=6.0 min CN=93 Runoff=1.64 cfs 0.130 af
Subcatchment7S: Subcatchment7S	Runoff Area=7,556 sf 82.50% Impervious Runoff Depth=6.18" Tc=6.0 min CN=92 Runoff=1.14 cfs 0.089 af
Subcatchment8S: Subcatchment8S	Runoff Area=9,264 sf 83.81% Impervious Runoff Depth=6.89" Tc=6.0 min CN=98 Runoff=1.45 cfs 0.122 af
Subcatchment9S: Subcatchment9S	Runoff Area=3,563 sf 0.00% Impervious Runoff Depth=2.40" Flow Length=79' Tc=8.0 min CN=57 Runoff=0.20 cfs 0.016 af
Subcatchment10S: Subcatchment10S	Runoff Area=66,877 sf 16.06% Impervious Runoff Depth=3.31" Flow Length=284' Tc=12.5 min CN=66 Runoff=4.72 cfs 0.423 af
Subcatchment11S: Subcatchment11S	Runoff Area=11,665 sf 0.00% Impervious Runoff Depth=2.40" Flow Length=120' Tc=8.0 min CN=57 Runoff=0.66 cfs 0.054 af
Reach 1R: Overland Flow	Avg. Flow Depth=0.18' Max Vel=0.41 fps Inflow=1.54 cfs 0.134 af n=0.070 L=66.0' S=0.0061 '/' Capacity=13.24 cfs Outflow=1.52 cfs 0.134 af
Reach 2R: Diversion Swale	Avg. Flow Depth=0.64' Max Vel=1.95 fps Inflow=4.90 cfs 0.439 af n=0.030 L=60.0' S=0.0050 '/' Capacity=12.47 cfs Outflow=4.90 cfs 0.439 af
Reach AP1: Analysis Point 1	Inflow=9.41 cfs 0.934 af Outflow=9.41 cfs 0.934 af
Reach AP2: Analysis Point 2	Inflow=0.72 cfs 0.057 af Outflow=0.72 cfs 0.057 af
Pond 1P: Pocket Pond 1	Peak Elev=21.16' Storage=7,754 cf Inflow=7.30 cfs 0.666 af Discarded=0.49 cfs 0.346 af Primary=4.06 cfs 0.321 af Outflow=4.54 cfs 0.666 af

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Pond 2P: Existing Pond Peak Elev=21.69' Storage=1,133 cf Inflow=2.37 cfs 0.172 af
Discarded=0.07 cfs 0.038 af Primary=1.54 cfs 0.134 af Outflow=1.61 cfs 0.172 af

Pond 3P: Focal Point 1 Peak Elev=22.66' Storage=67 cf Inflow=1.64 cfs 0.130 af
Outflow=1.65 cfs 0.130 af

Pond 4P: Chamber System A Peak Elev=20.88' Storage=1,864 cf Inflow=1.65 cfs 0.130 af
Discarded=0.22 cfs 0.113 af Primary=0.44 cfs 0.017 af Outflow=0.66 cfs 0.130 af

Pond 5P: Focal Point 2 Peak Elev=23.08' Storage=26 cf Inflow=1.14 cfs 0.089 af
Outflow=1.14 cfs 0.089 af

Pond 6P: Chamber System B Peak Elev=20.86' Storage=1,500 cf Inflow=1.14 cfs 0.089 af
Discarded=0.19 cfs 0.089 af Primary=0.01 cfs 0.000 af Outflow=0.19 cfs 0.089 af

Pond 7P: Filtration Drip Edge Peak Elev=21.25' Storage=1,219 cf Inflow=1.45 cfs 0.122 af
Discarded=0.31 cfs 0.098 af Primary=0.98 cfs 0.014 af Outflow=1.29 cfs 0.112 af

Pond 9P: Diversion Culvert Peak Elev=22.57' Inflow=4.72 cfs 0.423 af
18.0" Round Culvert n=0.013 L=20.0' S=0.0100 '/ Outflow=4.72 cfs 0.423 af

Pond 10P: Driveway Culvert Peak Elev=21.75' Inflow=6.93 cfs 0.627 af
18.0" Round Culvert n=0.013 L=36.0' S=0.0056 '/ Outflow=6.93 cfs 0.627 af

Pond CB1: Existing Catch Basin 1 Peak Elev=23.69' Inflow=0.28 cfs 0.022 af
12.0" Round Culvert n=0.012 L=28.0' S=0.0075 '/ Outflow=0.28 cfs 0.022 af

Pond CB2: Existing Catch Basin 2 Peak Elev=19.42' Inflow=0.44 cfs 0.035 af
12.0" Round Culvert n=0.012 L=36.0' S=0.0078 '/ Outflow=0.44 cfs 0.035 af

Pond DMH1: Drain Manhole 1 Peak Elev=20.54' Inflow=0.44 cfs 0.017 af
12.0" Round Culvert n=0.013 L=58.0' S=0.0052 '/ Outflow=0.44 cfs 0.017 af

Pond DMH2: Drain Manhole 2 Peak Elev=20.14' Inflow=0.44 cfs 0.017 af
12.0" Round Culvert n=0.013 L=140.0' S=0.0050 '/ Outflow=0.44 cfs 0.017 af

Pond DMH3: Drain Manhole 3 Peak Elev=19.34' Inflow=0.44 cfs 0.017 af
12.0" Round Culvert n=0.013 L=24.0' S=0.0062 '/ Outflow=0.44 cfs 0.017 af

Pond DMH4: Drain Manhole 4 Peak Elev=22.20' Inflow=4.90 cfs 0.439 af
18.0" Round Culvert n=0.013 L=92.0' S=0.0054 '/ Outflow=4.90 cfs 0.439 af

Pond YD: Yard Drain Peak Elev=22.22' Inflow=0.20 cfs 0.016 af
12.0" Round Culvert n=0.013 L=28.0' S=0.0107 '/ Outflow=0.20 cfs 0.016 af

Total Runoff Area = 5.186 ac Runoff Volume = 1.685 af Average Runoff Depth = 3.90"
68.90% Pervious = 3.574 ac 31.10% Impervious = 1.613 ac

25071.2-PROPOSED*Type III 24-hr 50-YR STORM Rainfall=8.54"*

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Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 points x 3
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S	Runoff Area=6,934 sf 5.97% Impervious Runoff Depth=4.10" Tc=6.0 min CN=63 Runoff=0.75 cfs 0.054 af
Subcatchment2S: Subcatchment2S	Runoff Area=22,794 sf 37.44% Impervious Runoff Depth=5.17" Tc=6.0 min CN=72 Runoff=3.10 cfs 0.226 af
Subcatchment3S: Subcatchment3S	Runoff Area=81,653 sf 28.56% Impervious Runoff Depth=4.93" Flow Length=599' Tc=10.5 min CN=70 Runoff=9.24 cfs 0.770 af
Subcatchment4S: Subcatchment4S	Runoff Area=1,897 sf 80.02% Impervious Runoff Depth=7.46" Tc=6.0 min CN=91 Runoff=0.34 cfs 0.027 af
Subcatchment5S: Subcatchment5S	Runoff Area=2,929 sf 83.27% Impervious Runoff Depth=7.58" Tc=6.0 min CN=92 Runoff=0.53 cfs 0.042 af
Subcatchment6S: Subcatchment6S	Runoff Area=10,789 sf 86.15% Impervious Runoff Depth=7.70" Tc=6.0 min CN=93 Runoff=1.98 cfs 0.159 af
Subcatchment7S: Subcatchment7S	Runoff Area=7,556 sf 82.50% Impervious Runoff Depth=7.58" Tc=6.0 min CN=92 Runoff=1.38 cfs 0.110 af
Subcatchment8S: Subcatchment8S	Runoff Area=9,264 sf 83.81% Impervious Runoff Depth=8.30" Tc=6.0 min CN=98 Runoff=1.74 cfs 0.147 af
Subcatchment9S: Subcatchment9S	Runoff Area=3,563 sf 0.00% Impervious Runoff Depth=3.39" Flow Length=79' Tc=8.0 min CN=57 Runoff=0.29 cfs 0.023 af
Subcatchment10S: Subcatchment10S	Runoff Area=66,877 sf 16.06% Impervious Runoff Depth=4.45" Flow Length=284' Tc=12.5 min CN=66 Runoff=6.40 cfs 0.570 af
Subcatchment11S: Subcatchment11S	Runoff Area=11,665 sf 0.00% Impervious Runoff Depth=3.39" Flow Length=120' Tc=8.0 min CN=57 Runoff=0.96 cfs 0.076 af
Reach 1R: Overland Flow	Avg. Flow Depth=0.21' Max Vel=0.45 fps Inflow=2.05 cfs 0.182 af n=0.070 L=66.0' S=0.0061 '/' Capacity=13.24 cfs Outflow=2.03 cfs 0.182 af
Reach 2R: Diversion Swale	Avg. Flow Depth=0.74' Max Vel=2.11 fps Inflow=6.70 cfs 0.593 af n=0.030 L=60.0' S=0.0050 '/' Capacity=12.47 cfs Outflow=6.66 cfs 0.593 af
Reach AP1: Analysis Point 1	Inflow=14.97 cfs 1.347 af Outflow=14.97 cfs 1.347 af
Reach AP2: Analysis Point 2	Inflow=0.88 cfs 0.070 af Outflow=0.88 cfs 0.070 af
Pond 1P: Pocket Pond 1	Peak Elev=21.56' Storage=9,401 cf Inflow=10.04 cfs 0.905 af Discarded=0.56 cfs 0.391 af Primary=6.33 cfs 0.514 af Outflow=6.89 cfs 0.905 af

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Pond 2P: Existing Pond Peak Elev=21.81' Storage=1,418 cf Inflow=3.10 cfs 0.226 af
Discarded=0.08 cfs 0.044 af Primary=2.05 cfs 0.182 af Outflow=2.14 cfs 0.226 af

Pond 3P: Focal Point 1 Peak Elev=22.68' Storage=70 cf Inflow=1.98 cfs 0.159 af
Outflow=1.98 cfs 0.159 af

Pond 4P: Chamber System A Peak Elev=21.13' Storage=2,064 cf Inflow=1.98 cfs 0.159 af
Discarded=0.24 cfs 0.128 af Primary=0.80 cfs 0.031 af Outflow=1.04 cfs 0.159 af

Pond 5P: Focal Point 2 Peak Elev=23.10' Storage=27 cf Inflow=1.38 cfs 0.110 af
Outflow=1.38 cfs 0.110 af

Pond 6P: Chamber System B Peak Elev=21.13' Storage=1,715 cf Inflow=1.38 cfs 0.110 af
Discarded=0.20 cfs 0.102 af Primary=0.22 cfs 0.008 af Outflow=0.42 cfs 0.110 af

Pond 7P: Filtration Drip Edge Peak Elev=21.25' Storage=1,219 cf Inflow=1.74 cfs 0.147 af
Discarded=0.31 cfs 0.113 af Primary=1.45 cfs 0.024 af Outflow=1.76 cfs 0.137 af

Pond 9P: Diversion Culvert Peak Elev=23.21' Inflow=6.40 cfs 0.570 af
18.0" Round Culvert n=0.013 L=20.0' S=0.0100 '/ Outflow=6.40 cfs 0.570 af

Pond 10P: Driveway Culvert Peak Elev=22.53' Inflow=9.45 cfs 0.851 af
18.0" Round Culvert n=0.013 L=36.0' S=0.0056 '/ Outflow=9.45 cfs 0.851 af

Pond CB1: Existing Catch Basin 1 Peak Elev=23.72' Inflow=0.34 cfs 0.027 af
12.0" Round Culvert n=0.012 L=28.0' S=0.0075 '/ Outflow=0.34 cfs 0.027 af

Pond CB2: Existing Catch Basin 2 Peak Elev=19.46' Inflow=0.53 cfs 0.042 af
12.0" Round Culvert n=0.012 L=36.0' S=0.0078 '/ Outflow=0.53 cfs 0.042 af

Pond DMH1: Drain Manhole 1 Peak Elev=20.76' Inflow=0.93 cfs 0.039 af
12.0" Round Culvert n=0.013 L=58.0' S=0.0052 '/ Outflow=0.93 cfs 0.039 af

Pond DMH2: Drain Manhole 2 Peak Elev=20.35' Inflow=0.93 cfs 0.039 af
12.0" Round Culvert n=0.013 L=140.0' S=0.0050 '/ Outflow=0.93 cfs 0.039 af

Pond DMH3: Drain Manhole 3 Peak Elev=19.56' Inflow=0.93 cfs 0.039 af
12.0" Round Culvert n=0.013 L=24.0' S=0.0062 '/ Outflow=0.93 cfs 0.039 af

Pond DMH4: Drain Manhole 4 Peak Elev=22.64' Inflow=6.70 cfs 0.593 af
18.0" Round Culvert n=0.013 L=92.0' S=0.0054 '/ Outflow=6.70 cfs 0.593 af

Pond YD: Yard Drain Peak Elev=22.65' Inflow=0.29 cfs 0.023 af
12.0" Round Culvert n=0.013 L=28.0' S=0.0107 '/ Outflow=0.29 cfs 0.023 af

Total Runoff Area = 5.186 ac Runoff Volume = 2.204 af Average Runoff Depth = 5.10"
68.90% Pervious = 3.574 ac 31.10% Impervious = 1.613 ac

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Type III 24-hr 50-YR STORM Rainfall=8.54"

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Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 0.75 cfs @ 12.09 hrs, Volume= 0.054 af, Depth= 4.10"
 Routed to Pond 1P : Pocket Pond 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-YR STORM Rainfall=8.54"

Area (sf)	CN	Description
6,520	61	>75% Grass cover, Good, HSG B
414	98	Paved roads w/curbs & sewers, HSG B
6,934	63	Weighted Average
6,520		94.03% Pervious Area
414		5.97% Impervious Area

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

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 3.10 cfs @ 12.09 hrs, Volume= 0.226 af, Depth= 5.17"
 Routed to Pond 2P : Existing Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-YR STORM Rainfall=8.54"

Area (sf)	CN	Description
7,719	98	Paved parking, HSG B
815	98	Roofs, HSG B
9,211	61	>75% Grass cover, Good, HSG B
1,310	55	Woods, Good, HSG B
3,739	48	Brush, Good, HSG B
22,794	72	Weighted Average
14,260		62.56% Pervious Area
8,534		37.44% Impervious Area

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

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 9.24 cfs @ 12.15 hrs, Volume= 0.770 af, Depth= 4.93"
 Routed to Reach AP1 : Analysis Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-YR STORM Rainfall=8.54"

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Type III 24-hr 50-YR STORM Rainfall=8.54"

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Area (sf)	CN	Description
12,438	55	Woods, Good, HSG B
8,649	98	Paved roads w/curbs & sewers, HSG B
58,674	70	1/2 acre lots, 25% imp, HSG B
1,892	61	>75% Grass cover, Good, HSG B
81,653	70	Weighted Average
58,336		71.44% Pervious Area
23,318		28.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0200	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.71"
0.7	55	0.0364	1.34		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.6	59	0.0476	1.53		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.1	208	0.0260	3.27		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.5	33	0.0303	1.22		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.3	86	0.0233	1.07		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.8	50	0.0385	0.98		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	58	0.0090	3.35	16.73	Trap/Vee/Rect Channel Flow, Diversion Swale Bot.W=2.00' D=1.00' Z= 3.0 '/' Top.W=8.00' n= 0.030 Earth, grassed & winding
10.5	599	Total			

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 0.34 cfs @ 12.09 hrs, Volume= 0.027 af, Depth= 7.46"
Routed to Pond CB1 : Existing Catch Basin 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-YR STORM Rainfall=8.54"

Area (sf)	CN	Description
1,518	98	Paved roads w/curbs & sewers, HSG B
379	61	>75% Grass cover, Good, HSG B
1,897	91	Weighted Average
379		19.98% Pervious Area
1,518		80.02% Impervious Area

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

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Summary for Subcatchment 5S: Subcatchment 5S

Runoff = 0.53 cfs @ 12.09 hrs, Volume= 0.042 af, Depth= 7.58"
 Routed to Pond CB2 : Existing Catch Basin 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-YR STORM Rainfall=8.54"

Area (sf)	CN	Description
2,439	98	Paved roads w/curbs & sewers, HSG B
490	61	>75% Grass cover, Good, HSG B
2,929	92	Weighted Average
490		16.73% Pervious Area
2,439		83.27% Impervious Area

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

Summary for Subcatchment 6S: Subcatchment 6S

Runoff = 1.98 cfs @ 12.09 hrs, Volume= 0.159 af, Depth= 7.70"
 Routed to Pond 3P : Focal Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-YR STORM Rainfall=8.54"

Area (sf)	CN	Description
4,405	98	Paved parking, HSG B
1,494	61	>75% Grass cover, Good, HSG B
4,890	98	Roofs, HSG B
10,789	93	Weighted Average
1,494		13.85% Pervious Area
9,295		86.15% Impervious Area

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

Summary for Subcatchment 7S: Subcatchment 7S

Runoff = 1.38 cfs @ 12.09 hrs, Volume= 0.110 af, Depth= 7.58"
 Routed to Pond 5P : Focal Point 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-YR STORM Rainfall=8.54"

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Area (sf)	CN	Description
6,234	98	Paved parking, HSG B
1,322	61	>75% Grass cover, Good, HSG B
7,556	92	Weighted Average
1,322		17.50% Pervious Area
6,234		82.50% Impervious Area

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

Summary for Subcatchment 8S: Subcatchment 8S

Runoff = 1.74 cfs @ 12.09 hrs, Volume= 0.147 af, Depth= 8.30"
 Routed to Pond 7P : Filtration Drip Edge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-YR STORM Rainfall=8.54"

Area (sf)	CN	Description
7,764	98	Roofs, HSG B
1,500	98	Water Surface, 0% imp, HSG B
9,264	98	Weighted Average
1,500		16.19% Pervious Area
7,764		83.81% Impervious Area

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

Summary for Subcatchment 9S: Subcatchment 9S

Runoff = 0.29 cfs @ 12.12 hrs, Volume= 0.023 af, Depth= 3.39"
 Routed to Pond YD : Yard Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-YR STORM Rainfall=8.54"

Area (sf)	CN	Description
2,652	55	Woods, Good, HSG B
911	61	>75% Grass cover, Good, HSG B
3,563	57	Weighted Average
3,563		100.00% Pervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	14	0.0500	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.71"
3.3	28	0.1429	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.71"
1.6	8	0.0714	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.71"
0.1	6	0.0714	1.87		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.1	23	0.0100	3.53	17.63	Trap/Vee/Rect Channel Flow, Bot.W=2.00' D=1.00' Z= 3.0 '/' Top.W=8.00' n= 0.030 Earth, grassed & winding
8.0	79	Total			

Summary for Subcatchment 10S: Subcatchment 10S

Intent of final Tc segment is to demonstrate adequacy of provided diversion swale dimensions.

Runoff = 6.40 cfs @ 12.18 hrs, Volume= 0.570 af, Depth= 4.45"
 Routed to Pond 9P : Diversion Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-YR STORM Rainfall=8.54"

Area (sf)	CN	Description
14,284	55	Woods, Good, HSG B
1,147	98	Roofs, HSG B
38,372	70	1/2 acre lots, 25% imp, HSG B
13,074	61	>75% Grass cover, Good, HSG B
66,877	66	Weighted Average
56,137		83.94% Pervious Area
10,740		16.06% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	15	0.1000	0.24		Sheet Flow, Grass: Short n= 0.150 P2= 3.71"
7.2	35	0.0308	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.71"
0.6	30	0.0308	0.88		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	25	0.0800	1.41		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.1	92	0.0217	0.74		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	51	0.0392	0.99		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.2	11	0.0270	0.82		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.2	16	0.0270	1.15		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.0	9	0.0160	4.46	22.30	Trap/Vee/Rect Channel Flow, Diversion Swale Segment Bot.W=2.00' D=1.00' Z= 3.0 '/' Top.W=8.00' n= 0.030 Earth, grassed & winding
12.5	284	Total			

Summary for Subcatchment 11S: Subcatchment 11S

Runoff = 0.96 cfs @ 12.12 hrs, Volume= 0.076 af, Depth= 3.39"
Routed to Pond 10P : Driveway Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-YR STORM Rainfall=8.54"

Area (sf)	CN	Description
7,405	55	Woods, Good, HSG B
4,260	61	>75% Grass cover, Good, HSG B
11,665	57	Weighted Average
11,665		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	15	0.0667	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.71"
2.5	22	0.1818	0.15		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.71"
1.9	13	0.1176	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.71"
0.4	38	0.1176	1.71		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.5	32	0.0469	1.08		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
8.0	120	Total			

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Summary for Reach 1R: Overland Flow

Inflow Area = 0.523 ac, 37.44% Impervious, Inflow Depth = 4.17" for 50-YR STORM event
Inflow = 2.05 cfs @ 12.18 hrs, Volume= 0.182 af
Outflow = 2.03 cfs @ 12.22 hrs, Volume= 0.182 af, Atten= 1%, Lag= 2.1 min
Routed to Pond 10P : Driveway Culvert

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.45 fps, Min. Travel Time= 2.5 min
Avg. Velocity = 0.13 fps, Avg. Travel Time= 8.8 min

Peak Storage= 301 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.21' , Surface Width= 32.45'
Bank-Full Depth= 0.50' Flow Area= 16.7 sf, Capacity= 13.24 cfs

50.00' x 0.50' deep Parabolic Channel, n= 0.070 Medium-dense brush, winter
Length= 66.0' Slope= 0.0061 '/
Inlet Invert= 20.50', Outlet Invert= 20.10'



Summary for Reach 2R: Diversion Swale

Inflow Area = 1.617 ac, 15.25% Impervious, Inflow Depth = 4.40" for 50-YR STORM event
Inflow = 6.70 cfs @ 12.17 hrs, Volume= 0.593 af
Outflow = 6.66 cfs @ 12.18 hrs, Volume= 0.593 af, Atten= 1%, Lag= 0.5 min
Routed to Pond 10P : Driveway Culvert

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.11 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.78 fps, Avg. Travel Time= 1.3 min

Peak Storage= 189 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.74' , Surface Width= 6.46'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 12.47 cfs

2.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/ Top Width= 8.00'
Length= 60.0' Slope= 0.0050 '/
Inlet Invert= 20.40', Outlet Invert= 20.10'



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Summary for Reach AP1: Analysis Point 1

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

Inflow Area = 5.076 ac, 29.99% Impervious, Inflow Depth = 3.18" for 50-YR STORM event
 Inflow = 14.97 cfs @ 12.19 hrs, Volume= 1.347 af
 Outflow = 14.97 cfs @ 12.19 hrs, Volume= 1.347 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP2: Analysis Point 2

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

Inflow Area = 0.111 ac, 81.99% Impervious, Inflow Depth = 7.53" for 50-YR STORM event
 Inflow = 0.88 cfs @ 12.09 hrs, Volume= 0.070 af
 Outflow = 0.88 cfs @ 12.09 hrs, Volume= 0.070 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Summary for Pond 1P: Pocket Pond 1

Inflow Area = 2.567 ac, 17.60% Impervious, Inflow Depth = 4.23" for 50-YR STORM event
 Inflow = 10.04 cfs @ 12.17 hrs, Volume= 0.905 af
 Outflow = 6.89 cfs @ 12.36 hrs, Volume= 0.905 af, Atten= 31%, Lag= 11.0 min
 Discarded = 0.56 cfs @ 12.36 hrs, Volume= 0.391 af
 Primary = 6.33 cfs @ 12.36 hrs, Volume= 0.514 af

Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 21.56' @ 12.36 hrs Surf.Area= 4,367 sf Storage= 9,401 cf

Plug-Flow detention time= 90.6 min calculated for 0.904 af (100% of inflow)

Center-of-Mass det. time= 90.8 min (924.5 - 833.7)

Volume	Invert	Avail.Storage	Storage Description		
#1	18.50'	11,425 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
18.50	1,412	218.0	0	0	1,412
18.75	2,096	241.0	436	436	2,254
20.00	3,067	273.0	3,208	3,643	3,602
22.00	4,778	312.0	7,782	11,425	5,509
Device	Routing	Invert	Outlet Devices		
#1	Primary	20.00'	18.0" Round Culvert L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 20.00' / 19.90' S= 0.0067 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf		
#2	Discarded	18.50'	1.000 in/hr Exfiltration over Surface area		

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Conductivity to Groundwater Elevation = 18.17' Phase-In= 0.10'

Discarded OutFlow Max=0.56 cfs @ 12.36 hrs HW=21.55' (Free Discharge)↑**2=Exfiltration** (Controls 0.56 cfs)**Primary OutFlow** Max=6.32 cfs @ 12.36 hrs HW=21.55' TW=0.00' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 6.32 cfs @ 4.29 fps)**Summary for Pond 2P: Existing Pond**

Pond areas, elevations, and culvert parameters are assumed.

Inflow Area = 0.523 ac, 37.44% Impervious, Inflow Depth = 5.17" for 50-YR STORM event
 Inflow = 3.10 cfs @ 12.09 hrs, Volume= 0.226 af
 Outflow = 2.14 cfs @ 12.18 hrs, Volume= 0.226 af, Atten= 31%, Lag= 5.5 min
 Discarded = 0.08 cfs @ 12.18 hrs, Volume= 0.044 af
 Primary = 2.05 cfs @ 12.18 hrs, Volume= 0.182 af
 Routed to Reach 1R : Overland Flow

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 21.81' @ 12.18 hrs Surf.Area= 2,337 sf Storage= 1,418 cf

Plug-Flow detention time= 19.8 min calculated for 0.225 af (100% of inflow)

Center-of-Mass det. time= 19.9 min (837.8 - 817.8)

Volume	Invert	Avail.Storage	Storage Description
#1	21.00'	1,882 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
21.00	1,209	140.0	0	0	1,209
22.00	2,647	210.0	1,882	1,882	3,166

Device	Routing	Invert	Outlet Devices
#1	Discarded	21.00'	1.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 20.00' Phase-In= 0.10'
#2	Primary	21.00'	15.0" Round Culvert L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 21.00' / 20.50' S= 0.0167 ' / S= 0.0167 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=0.08 cfs @ 12.18 hrs HW=21.81' (Free Discharge)↑**1=Exfiltration** (Controls 0.08 cfs)**Primary OutFlow** Max=2.04 cfs @ 12.18 hrs HW=21.81' TW=20.71' (Dynamic Tailwater)↑**2=Culvert** (Inlet Controls 2.04 cfs @ 2.42 fps)

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Summary for Pond 3P: Focal Point 1

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 0.248 ac, 86.15% Impervious, Inflow Depth = 7.70" for 50-YR STORM event
 Inflow = 1.98 cfs @ 12.09 hrs, Volume= 0.159 af
 Outflow = 1.98 cfs @ 12.09 hrs, Volume= 0.159 af, Atten= 0%, Lag= 0.1 min
 Primary = 1.98 cfs @ 12.09 hrs, Volume= 0.159 af
 Routed to Pond 4P : Chamber System A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3
 Peak Elev= 22.68' @ 12.09 hrs Surf.Area= 151 sf Storage= 70 cf

Plug-Flow detention time= 1.1 min calculated for 0.159 af (100% of inflow)
 Center-of-Mass det. time= 1.1 min (764.9 - 763.7)

Volume	Invert	Avail.Storage	Storage Description
#1	19.75'	18 cf	4.00'W x 10.00'L x 2.25'H Focal Point Area 1 90 cf Overall x 20.0% Voids
#2	22.00'	59 cf	Surface Bowl (Prismatic) Listed below (Recalc)
		77 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.00	40	0	0
22.75	118	59	59

Device	Routing	Invert	Outlet Devices
#1	Primary	19.25'	12.0" Round Culvert L= 9.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 19.25' / 19.20' S= 0.0056 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 3	19.75'	100.000 in/hr Exfiltration over Surface area Phase-In= 0.10'
#3	Device 1	19.25'	6.0" W x 6.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	22.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.93 cfs @ 12.09 hrs HW=22.68' TW=20.72' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 1.93 cfs of 4.18 cfs potential flow)
 ↑ **3=Orifice/Grate** (Passes 0.35 cfs of 1.68 cfs potential flow)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.35 cfs)
 ↑ **4=Orifice/Grate** (Weir Controls 1.59 cfs @ 1.39 fps)

Summary for Pond 4P: Chamber System A

High existing grade = 21.0
 SHWT depth = 34" per test pit #2
 E(SHWT) = 18.17
 Bottom of chambers = 19.2
 However, credit is being taken for 12" stone layer underneath chambers down to 18.2. SHWT is modelled

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6" lower as a factor of safety. Modelling the SHWT too close to the bottom of modelled storage renders inaccurate results.

Inflow Area = 0.248 ac, 86.15% Impervious, Inflow Depth = 7.70" for 50-YR STORM event
 Inflow = 1.98 cfs @ 12.09 hrs, Volume= 0.159 af
 Outflow = 1.04 cfs @ 12.23 hrs, Volume= 0.159 af, Atten= 47%, Lag= 8.3 min
 Discarded = 0.24 cfs @ 12.23 hrs, Volume= 0.128 af
 Primary = 0.80 cfs @ 12.23 hrs, Volume= 0.031 af
 Routed to Pond DMH1 : Drain Manhole 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3
 Peak Elev= 21.13' @ 12.23 hrs Surf.Area= 2,160 sf Storage= 2,064 cf

Plug-Flow detention time= 77.0 min calculated for 0.159 af (100% of inflow)
 Center-of-Mass det. time= 77.0 min (841.9 - 764.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	19.20'	0 cf	16.00'W x 56.00'L x 2.67'H Field A 2,392 cf Overall - 2,392 cf Embedded = 0 cf x 0.0% Voids
#2A	19.20'	1,600 cf	Shea Leaching Chamber 8x14x2.7x 8 Inside #1 Inside= 84.0"W x 24.0"H => 15.38 sf x 13.00'L = 200.0 cf Outside= 96.0"W x 32.0"H => 21.36 sf x 14.00'L = 299.0 cf 8 Chambers in 2 Rows
#3	18.19'	518 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		2,118 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
18.19	1,264	0.0	0	0
18.20	1,264	40.0	5	5
19.19	1,264	40.0	501	506
19.20	1,264	100.0	13	518

Device	Routing	Invert	Outlet Devices
#1	Primary	20.40'	8.0" Round Culvert L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 20.40' / 20.25' S= 0.0050 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Discarded	18.19'	1.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 17.67' Phase-In= 0.10'

Discarded OutFlow Max=0.24 cfs @ 12.23 hrs HW=21.13' (Free Discharge)
 ↑ **2=Exfiltration** (Controls 0.24 cfs)

Primary OutFlow Max=0.80 cfs @ 12.23 hrs HW=21.13' TW=20.74' (Dynamic Tailwater)
 ↑ **1=Culvert** (Barrel Controls 0.80 cfs @ 2.61 fps)

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Type III 24-hr 50-YR STORM Rainfall=8.54"

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Summary for Pond 5P: Focal Point 2

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=17)

Inflow Area = 0.173 ac, 82.50% Impervious, Inflow Depth = 7.58" for 50-YR STORM event
 Inflow = 1.38 cfs @ 12.09 hrs, Volume= 0.110 af
 Outflow = 1.38 cfs @ 12.09 hrs, Volume= 0.110 af, Atten= 0%, Lag= 0.1 min
 Primary = 1.38 cfs @ 12.09 hrs, Volume= 0.110 af
 Routed to Pond 6P : Chamber System B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3
 Peak Elev= 23.10' @ 12.09 hrs Surf.Area= 84 sf Storage= 27 cf

Plug-Flow detention time= 0.9 min calculated for 0.109 af (100% of inflow)
 Center-of-Mass det. time= 0.9 min (768.3 - 767.4)

Volume	Invert	Avail.Storage	Storage Description
#1	20.50'	12 cf	3.00'W x 9.00'L x 2.25'H Focal Point Area 1 61 cf Overall x 20.0% Voids
#2	22.75'	24 cf	Surface Bowl (Prismatic) Listed below (Recalc)
		36 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.75	27	0	0
23.25	70	24	24

Device	Routing	Invert	Outlet Devices
#1	Primary	20.00'	12.0" Round Culvert L= 32.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 20.00' / 19.80' S= 0.0062 ' S= 0.0062 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 3	20.50'	100.000 in/hr Exfiltration over Surface area Phase-In= 0.10'
#3	Device 1	20.00'	6.0" W x 6.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	22.95'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.34 cfs @ 12.09 hrs HW=23.10' TW=20.46' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 1.34 cfs of 4.81 cfs potential flow)
 ↑ **3=Orifice/Grate** (Passes 0.19 cfs of 1.95 cfs potential flow)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.19 cfs)
 ↑ **4=Orifice/Grate** (Weir Controls 1.15 cfs @ 1.25 fps)

Summary for Pond 6P: Chamber System B

High existing grade = ~21.4

SHWT depth = 34" per test pit #2

E(SHWT) = 18.57

Bottom of chambers = 19.6

However, credit is being taken for 12" stone layer underneath chambers down to 18.6. SHWT is modelled

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6" lower as a factor of safety. Modelling the SHWT too close to the bottom of modelled storage renders inaccurate results.

Inflow Area = 0.173 ac, 82.50% Impervious, Inflow Depth = 7.58" for 50-YR STORM event
 Inflow = 1.38 cfs @ 12.09 hrs, Volume= 0.110 af
 Outflow = 0.42 cfs @ 12.41 hrs, Volume= 0.110 af, Atten= 69%, Lag= 19.1 min
 Discarded = 0.20 cfs @ 12.41 hrs, Volume= 0.102 af
 Primary = 0.22 cfs @ 12.41 hrs, Volume= 0.008 af
 Routed to Pond DMH1 : Drain Manhole 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3
 Peak Elev= 21.13' @ 12.41 hrs Surf.Area= 2,096 sf Storage= 1,715 cf

Plug-Flow detention time= 86.7 min calculated for 0.109 af (100% of inflow)
 Center-of-Mass det. time= 86.8 min (855.0 - 768.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	19.60'	0 cf	16.00'W x 56.00'L x 2.67'H Field A 2,392 cf Overall - 2,392 cf Embedded = 0 cf x 0.0% Voids
#2A	19.60'	1,600 cf	Shea Leaching Chamber 8x14x2.7x 8 Inside #1 Inside= 84.0"W x 24.0"H => 15.38 sf x 13.00'L = 200.0 cf Outside= 96.0"W x 32.0"H => 21.36 sf x 14.00'L = 299.0 cf 8 Chambers in 2 Rows
#3	18.59'	492 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		2,092 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
18.59	1,200	0.0	0	0
18.60	1,200	40.0	5	5
19.59	1,200	40.0	475	480
19.60	1,200	100.0	12	492

Device	Routing	Invert	Outlet Devices
#1	Primary	20.80'	8.0" Round Culvert L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 20.80' / 20.75' S= 0.0063 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Discarded	18.59'	1.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 18.07' Phase-In= 0.10'

Discarded OutFlow Max=0.20 cfs @ 12.41 hrs HW=21.13' (Free Discharge)
 ↑ **2=Exfiltration** (Controls 0.20 cfs)

Primary OutFlow Max=0.22 cfs @ 12.41 hrs HW=21.13' TW=20.71' (Dynamic Tailwater)
 ↑ **1=Culvert** (Barrel Controls 0.22 cfs @ 1.85 fps)

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Summary for Pond 7P: Filtration Drip Edge

[90] Warning: Qout>Qin may require smaller dt or Finer Routing

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=50)

Inflow Area = 0.213 ac, 83.81% Impervious, Inflow Depth = 8.30" for 50-YR STORM event
 Inflow = 1.74 cfs @ 12.09 hrs, Volume= 0.147 af
 Outflow = 1.76 cfs @ 12.12 hrs, Volume= 0.137 af, Atten= 0%, Lag= 2.0 min
 Discarded = 0.31 cfs @ 12.05 hrs, Volume= 0.113 af
 Primary = 1.45 cfs @ 12.12 hrs, Volume= 0.024 af

Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 21.25' @ 12.05 hrs Surf.Area= 4,500 sf Storage= 1,219 cf

Plug-Flow detention time= 91.8 min calculated for 0.137 af (93% of inflow)

Center-of-Mass det. time= 52.1 min (792.5 - 740.4)

Volume	Invert	Avail.Storage	Storage Description
#1	20.25'	600 cf	12.00'W x 125.00'L x 1.00'H Prisma 1,500 cf Overall x 40.0% Voids
#2	18.75'	113 cf	12.00'W x 125.00'L x 1.50'H Prisma 2,250 cf Overall x 5.0% Voids
#3	18.50'	56 cf	12.00'W x 125.00'L x 0.25'H Prisma 375 cf Overall x 15.0% Voids
#4	17.75'	450 cf	12.00'W x 125.00'L x 0.75'H Prisma 1,125 cf Overall x 40.0% Voids
			1,219 cf Total Available Storage

Device	Routing	Invert	Outlet Devices
#0	Primary	21.25'	Automatic Storage Overflow (Discharged without head)
#1	Discarded	18.50'	1.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 17.67' Phase-In= 0.10'

Discarded OutFlow Max=0.31 cfs @ 12.05 hrs HW=21.25' (Free Discharge)↑1=**Exfiltration** (Controls 0.31 cfs)**Primary OutFlow** Max=0.00 cfs @ 12.12 hrs HW=21.25' TW=0.00' (Dynamic Tailwater)**Summary for Pond 9P: Diversion Culvert**

[58] Hint: Peaked 0.01' above defined flood level

Inflow Area = 1.535 ac, 16.06% Impervious, Inflow Depth = 4.45" for 50-YR STORM event
 Inflow = 6.40 cfs @ 12.18 hrs, Volume= 0.570 af
 Outflow = 6.40 cfs @ 12.18 hrs, Volume= 0.570 af, Atten= 0%, Lag= 0.0 min
 Primary = 6.40 cfs @ 12.18 hrs, Volume= 0.570 af

Routed to Pond DMH4 : Drain Manhole 4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

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Peak Elev= 23.21' @ 12.17 hrs

Flood Elev= 23.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	21.20'	18.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 21.20' / 21.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=6.31 cfs @ 12.18 hrs HW=23.16' TW=22.61' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 6.31 cfs @ 3.57 fps)**Summary for Pond 10P: Driveway Culvert**

[63] Warning: Exceeded Reach 1R INLET depth by 1.81' @ 12.20 hrs

[64] Warning: Exceeded Reach 1R outlet bank by 1.93' @ 12.21 hrs

[63] Warning: Exceeded Reach 2R INLET depth by 1.38' @ 12.20 hrs

[64] Warning: Exceeded Reach 2R outlet bank by 1.43' @ 12.21 hrs

Inflow Area = 2.408 ac, 18.37% Impervious, Inflow Depth = 4.24" for 50-YR STORM event

Inflow = 9.45 cfs @ 12.18 hrs, Volume= 0.851 af

Outflow = 9.45 cfs @ 12.18 hrs, Volume= 0.851 af, Atten= 0%, Lag= 0.0 min

Primary = 9.45 cfs @ 12.18 hrs, Volume= 0.851 af

Routed to Pond 1P : Pocket Pond 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 22.53' @ 12.21 hrs

Flood Elev= 22.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	20.10'	18.0" Round Culvert L= 36.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 20.10' / 19.90' S= 0.0056 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=9.43 cfs @ 12.18 hrs HW=22.44' TW=21.21' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 9.43 cfs @ 5.33 fps)**Summary for Pond CB1: Existing Catch Basin 1**

End invert of pipe is assumed as inverts have not been measured on downstream structure

[58] Hint: Peaked 0.31' above defined flood level

Inflow Area = 0.044 ac, 80.02% Impervious, Inflow Depth = 7.46" for 50-YR STORM event

Inflow = 0.34 cfs @ 12.09 hrs, Volume= 0.027 af

Outflow = 0.34 cfs @ 12.09 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min

Primary = 0.34 cfs @ 12.09 hrs, Volume= 0.027 af

Routed to Reach AP2 : Analysis Point 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

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Peak Elev= 23.72' @ 12.09 hrs

Flood Elev= 23.41'

Device	Routing	Invert	Outlet Devices
#1	Primary	23.41'	12.0" Round Culvert L= 28.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 23.41' / 23.20' S= 0.0075 ' S= 0.0075 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.33 cfs @ 12.09 hrs HW=23.71' TW=0.00' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 0.33 cfs @ 2.51 fps)**Summary for Pond CB2: Existing Catch Basin 2**

End invert of pipe is assumed as inverts have not been measured on downstream structure

Inflow Area = 0.067 ac, 83.27% Impervious, Inflow Depth = 7.58" for 50-YR STORM event
 Inflow = 0.53 cfs @ 12.09 hrs, Volume= 0.042 af
 Outflow = 0.53 cfs @ 12.09 hrs, Volume= 0.042 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.53 cfs @ 12.09 hrs, Volume= 0.042 af
 Routed to Reach AP2 : Analysis Point 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 19.46' @ 12.09 hrs

Flood Elev= 22.23'

Device	Routing	Invert	Outlet Devices
#1	Primary	19.08'	12.0" Round Culvert L= 36.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 19.08' / 18.80' S= 0.0078 ' S= 0.0078 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.52 cfs @ 12.09 hrs HW=19.46' TW=0.00' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 0.52 cfs @ 2.87 fps)**Summary for Pond DMH1: Drain Manhole 1**

Inflow Area = 0.421 ac, 84.65% Impervious, Inflow Depth = 1.11" for 50-YR STORM event
 Inflow = 0.93 cfs @ 12.29 hrs, Volume= 0.039 af
 Outflow = 0.93 cfs @ 12.29 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.93 cfs @ 12.29 hrs, Volume= 0.039 af
 Routed to Pond DMH2 : Drain Manhole 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 20.76' @ 12.29 hrs

Flood Elev= 24.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	20.15'	12.0" Round Culvert L= 58.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 20.15' / 19.85' S= 0.0052 ' S= 0.0052 ' Cc= 0.900

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n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.93 cfs @ 12.29 hrs HW=20.76' TW=20.34' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 0.93 cfs @ 2.64 fps)**Summary for Pond DMH2: Drain Manhole 2**

Inflow Area = 0.421 ac, 84.65% Impervious, Inflow Depth = 1.11" for 50-YR STORM event

Inflow = 0.93 cfs @ 12.29 hrs, Volume= 0.039 af

Outflow = 0.93 cfs @ 12.29 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min

Primary = 0.93 cfs @ 12.29 hrs, Volume= 0.039 af

Routed to Pond DMH3 : Drain Manhole 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 20.35' @ 12.29 hrs

Flood Elev= 23.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	19.75'	12.0" Round Culvert L= 140.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 19.75' / 19.05' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.93 cfs @ 12.29 hrs HW=20.34' TW=19.56' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 0.93 cfs @ 2.74 fps)**Summary for Pond DMH3: Drain Manhole 3**

Inflow Area = 0.421 ac, 84.65% Impervious, Inflow Depth = 1.11" for 50-YR STORM event

Inflow = 0.93 cfs @ 12.29 hrs, Volume= 0.039 af

Outflow = 0.93 cfs @ 12.29 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min

Primary = 0.93 cfs @ 12.29 hrs, Volume= 0.039 af

Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 19.56' @ 12.29 hrs

Flood Elev= 21.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	18.95'	12.0" Round Culvert L= 24.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 18.95' / 18.80' S= 0.0062 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.93 cfs @ 12.29 hrs HW=19.56' TW=0.00' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 0.93 cfs @ 2.67 fps)

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Summary for Pond DMH4: Drain Manhole 4

Inflow Area = 1.617 ac, 15.25% Impervious, Inflow Depth = 4.40" for 50-YR STORM event
 Inflow = 6.70 cfs @ 12.17 hrs, Volume= 0.593 af
 Outflow = 6.70 cfs @ 12.17 hrs, Volume= 0.593 af, Atten= 0%, Lag= 0.0 min
 Primary = 6.70 cfs @ 12.17 hrs, Volume= 0.593 af
 Routed to Reach 2R : Diversion Swale

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 22.64' @ 12.17 hrs

Flood Elev= 24.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	20.90'	18.0" Round Culvert L= 92.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 20.90' / 20.40' S= 0.0054 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=6.57 cfs @ 12.17 hrs HW=22.61' TW=21.14' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 6.57 cfs @ 3.72 fps)**Summary for Pond YD: Yard Drain**

Inflow Area = 0.082 ac, 0.00% Impervious, Inflow Depth = 3.39" for 50-YR STORM event
 Inflow = 0.29 cfs @ 12.12 hrs, Volume= 0.023 af
 Outflow = 0.29 cfs @ 12.12 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.29 cfs @ 12.12 hrs, Volume= 0.023 af
 Routed to Pond DMH4 : Drain Manhole 4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 22.65' @ 12.17 hrs

Flood Elev= 23.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	21.70'	12.0" Round Culvert L= 28.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 21.70' / 21.40' S= 0.0107 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.31 cfs @ 12.12 hrs HW=22.46' TW=22.44' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 0.31 cfs @ 0.67 fps)

APPENDIX III

Test Pit Logs

**TEST PITS
FOR
LEDGEWOOD DRIVE
PORTSMOUTH, NEW HAMPSHIRE
JULY 31, 2025
JBE Project No. 25071**

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

Test Pit #1

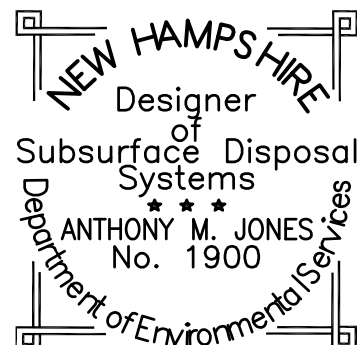
0"- 28"	10YR 3/3	dark brown fine sandy loam granular, friable many roots
28" – 38"	2.5Y 5/4	light olive brown fine sandy loam granular, friable common roots
38" – 58"	10YR 4/6	dark yellowish brown loamy sand massive, friable Many, distinct redox

SHWT = 38"

Roots: 38"

No H₂O observed

No Refusal observed



Test Pit #2

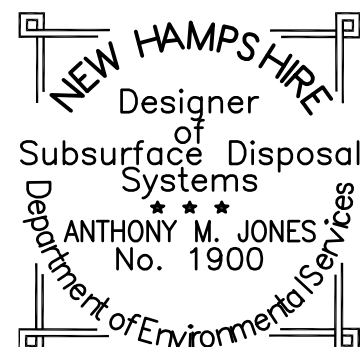
0"- 18"	10YR 4/2	dark grayish brown fine sandy loam granular, friable common roots
18" - 34"	10YR 3/6	dark yellowish brown loamy sand massive, friable common roots
34" - 62"	2.5Y 5/2	grayish brown loamy sand massive, friable Common, distinct redox

SHWT = 34"
Roots: 34"
No H₂O observed
No Refusal observed

Test Pit #3

0"- 6"	10YR 4/2	dark grayish brown fine sandy loam granular, friable common roots
6" - 20"	2.5Y 6/4	light yellowish brown fine sandy loam angular blocky, friable few roots
20" - 50"	2.5Y 6/3	light yellowish brown sandy clay loam angular blocky, very firm Many, distinct redox

SHWT = 20"
Roots: 26"
No H₂O observed
Refusal observed at: 50"



Test Pit #4

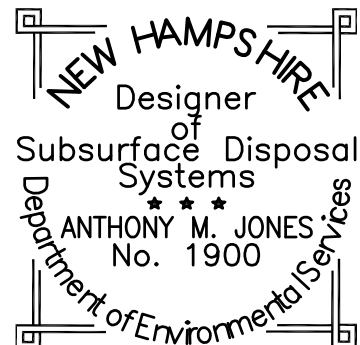
0"- 48"	10YR 4/3	brown fine sandy loam granular, friable common roots
48" – 56"	2.5Y 6/3	light yellowish brown silt loam blocky, friable common roots
56" – 70"	2.5Y 6/4	light yellowish brown silt loam blocky, friable Many, distinct redox

SHWT = 56"

Roots: 58"

No H₂O observed

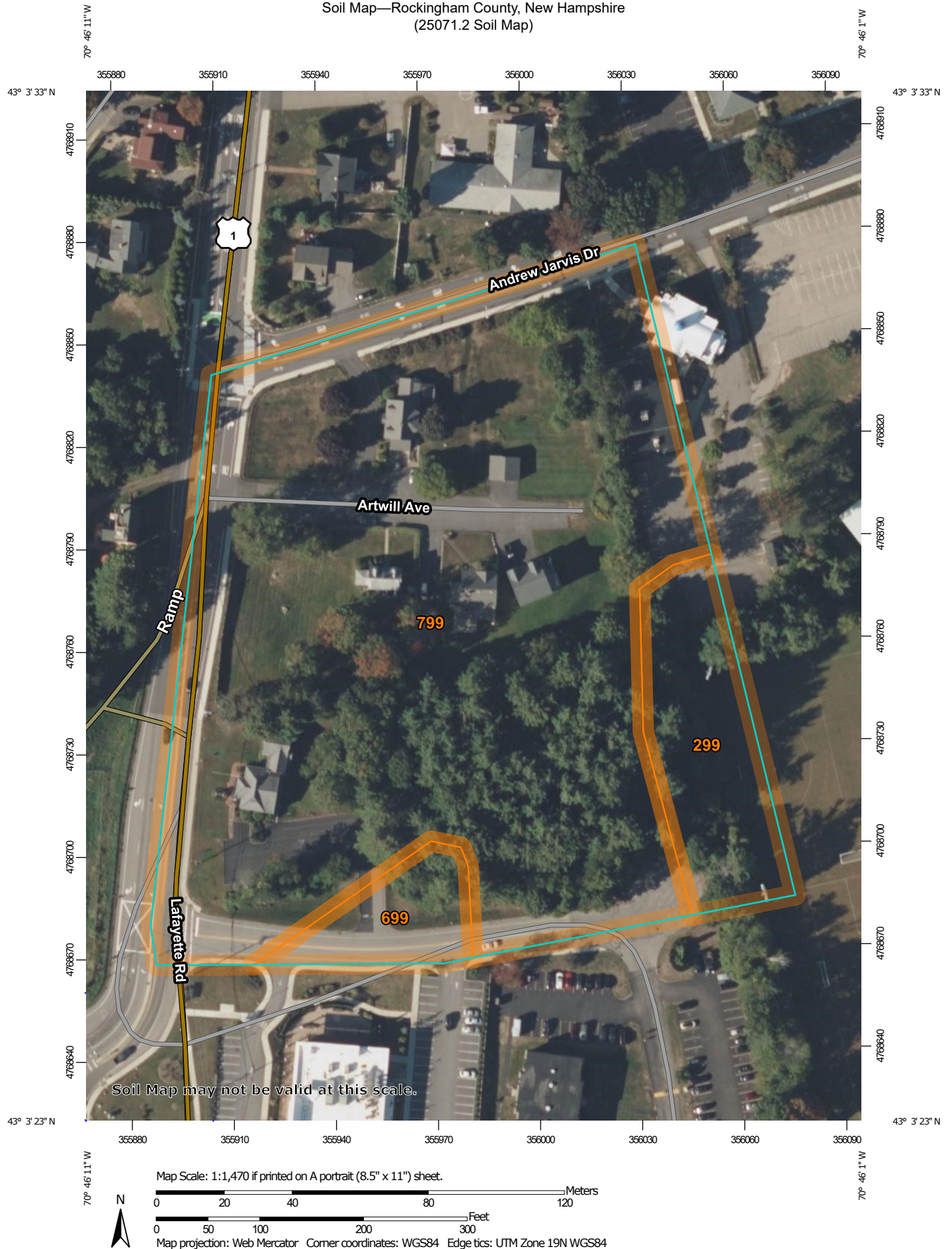
No Refusal observed



APPENDIX IV

NRCS Soil Map

Soil Map—Rockingham County, New Hampshire
(25071.2 Soil Map)



Soil Map—Rockingham County, New Hampshire
(25071.2 Soil Map)

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Rockingham County, New Hampshire

Survey Area Data: Version 28, Sep 9, 2025

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

Date(s) aerial images were photographed: Jun 19, 2020—Sep 20, 2020

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
299	Udorthents, smoothed	0.7	9.9%
699	Urban land	0.3	4.4%
799	Urban land-Canton complex, 3 to 15 percent slopes	6.3	85.7%
Totals for Area of Interest		7.4	100.0%

APPENDIX V

Extreme Precipitation Estimates

Extreme Precipitation in New York & New England

An Interactive Web Tool for Extreme Precipitation Analysis

About this Project

Data & Products

Daily Monitoring

Documentation

Select Product ?

Extreme Precipitation
Tables - HTML ?

Extreme Precipitation
Tables - Text/CSV ?

Partial Duration Series -
by Point ?

Partial Duration Series -
by Station ?

Distribution Curves -
Graphical ?

Distribution Curves -
Text/TBL ?

Intensity Frequency
Duration Graphs ?

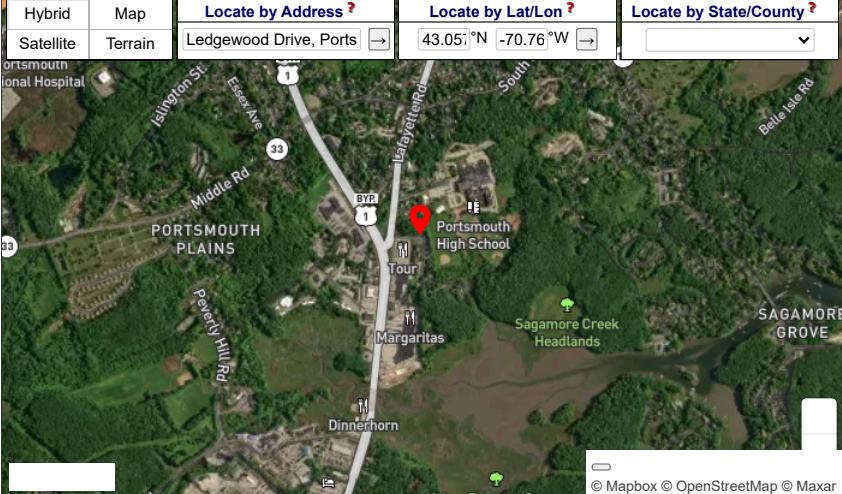
Precipitation Frequency
Duration Graphs ?

GIS Data Files ?

Regional/State Maps ?

Select Location ? Double-click map to place a marker, or enter address or latitude/longitude.

Hybrid	Map	Locate by Address ?	Locate by Lat/Lon ?	Locate by State/County ?
Satellite	Terrain	Ledgewood Drive, Ports	43.051°N -70.76°W	



Map showing the Portsmouth Plains area. A red location marker is placed near the intersection of Middle Rd and the Sagamore River. The map includes labels for various roads (e.g., Middle Rd, Peverly Hill Rd, Sagamore River) and landmarks (e.g., Portsmouth High School, Sagamore Creek Headlands). The map is credited to Mapbox, OpenStreetMap, and Maxar.

Select Options ?

Smoothing ?

Yes

Delivery ?

Popup

Submit ?

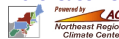
Version 2.0

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This project is a joint collaboration between:

Northeast Regional Climate Center (NRCC)

Natural Resources Conservation Service (NRCS)



Cornell University



Contact: precip@cornell.edu

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Metadata for Point	
Smoothing State	Yes
Location	
Latitude	43.057 degrees North
Longitude	70.768 degrees West
Elevation	0 feet
Date/Time	Fri Jun 26 2026 14:28:08 GMT-0400 (Eastern Daylight Time)

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.82	1.04	1yr	0.70	0.98	1.21	1.57	2.04	2.67	2.93	1yr	2.36	2.82	3.23	3.96	4.57	1yr
2yr	0.32	0.50	0.62	0.82	1.02	1.30	2yr	0.88	1.18	1.52	1.94	2.50	3.22	3.58	2yr	2.85	3.45	3.95	4.70	5.35	2yr
5yr	0.37	0.58	0.73	0.98	1.25	1.61	5yr	1.08	1.47	1.89	2.44	3.15	4.08	4.60	5yr	3.61	4.42	5.06	5.96	6.73	5yr
10yr	0.41	0.65	0.82	1.12	1.45	1.89	10yr	1.25	1.73	2.24	2.90	3.76	4.89	5.55	10yr	4.33	5.34	6.11	7.14	8.01	10yr
25yr	0.48	0.76	0.97	1.34	1.78	2.34	25yr	1.53	2.15	2.78	3.64	4.76	6.20	7.13	25yr	5.49	6.86	7.85	9.07	10.10	25yr
50yr	0.54	0.86	1.10	1.54	2.08	2.76	50yr	1.79	2.53	3.30	4.34	5.68	7.42	8.62	50yr	6.57	8.29	9.48	10.87	12.03	50yr
100yr	0.60	0.97	1.25	1.78	2.42	3.27	100yr	2.09	2.99	3.92	5.18	6.80	8.90	10.43	100yr	7.87	10.03	11.46	13.04	14.35	100yr
200yr	0.68	1.10	1.43	2.05	2.83	3.85	200yr	2.45	3.53	4.63	6.15	8.12	10.66	12.61	200yr	9.44	12.13	13.85	15.64	17.11	200yr
500yr	0.80	1.32	1.72	2.49	3.49	4.78	500yr	3.01	4.39	5.79	7.74	10.27	13.55	16.22	500yr	11.99	15.60	17.81	19.91	21.61	500yr

x 1.15
3.71
5.63
7.13
8.54

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.72	0.88	1yr	0.63	0.87	0.92	1.33	1.68	2.25	2.53	1yr	1.99	2.43	2.88	3.18	3.91	1yr
2yr	0.32	0.49	0.60	0.81	1.00	1.19	2yr	0.86	1.16	1.37	1.82	2.34	3.07	3.47	2yr	2.72	3.34	3.84	4.57	5.10	2yr
5yr	0.35	0.54	0.67	0.92	1.17	1.40	5yr	1.01	1.37	1.61	2.12	2.73	3.81	4.22	5yr	3.37	4.06	4.74	5.57	6.28	5yr
10yr	0.39	0.59	0.74	1.03	1.33	1.60	10yr	1.15	1.57	1.81	2.39	3.06	4.40	4.90	10yr	3.89	4.71	5.49	6.46	7.24	10yr
25yr	0.44	0.67	0.83	1.19	1.57	1.90	25yr	1.35	1.86	2.10	2.75	3.53	4.75	5.95	25yr	4.20	5.72	6.72	7.87	8.75	25yr
50yr	0.48	0.74	0.92	1.32	1.77	2.17	50yr	1.53	2.12	2.35	3.07	3.93	5.37	6.88	50yr	4.75	6.61	7.83	9.14	10.11	50yr
100yr	0.54	0.81	1.02	1.47	2.02	2.47	100yr	1.74	2.42	2.63	3.41	4.35	6.04	7.95	100yr	5.35	7.65	9.12	10.64	11.68	100yr
200yr	0.60	0.90	1.14	1.64	2.29	2.82	200yr	1.98	2.76	2.94	3.77	4.79	6.78	9.19	200yr	6.00	8.84	10.63	12.40	13.51	200yr
500yr	0.69	1.03	1.32	1.92	2.73	3.37	500yr	2.36	3.30	3.42	4.30	5.45	7.90	11.13	500yr	7.00	10.70	13.00	15.20	16.37	500yr

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.29	0.44	0.54	0.72	0.89	1.09	1yr	0.77	1.06	1.26	1.74	2.20	2.99	3.17	1yr	2.65	3.05	3.60	4.39	5.06	1yr
2yr	0.34	0.52	0.64	0.87	1.07	1.27	2yr	0.92	1.24	1.48	1.96	2.51	3.44	3.71	2yr	3.04	3.57	4.10	4.85	5.65	2yr
5yr	0.40	0.62	0.77	1.05	1.34	1.62	5yr	1.15	1.59	1.88	2.53	3.25	4.36	4.97	5yr	3.85	4.78	5.40	6.39	7.17	5yr
10yr	0.47	0.72	0.89	1.25	1.61	1.98	10yr	1.39	1.93	2.28	3.11	3.95	5.36	6.21	10yr	4.74	5.97	6.82	7.85	8.77	10yr
25yr	0.58	0.88	1.09	1.56	2.05	2.57	25yr	1.77	2.52	2.95	4.07	5.15	7.80	8.34	25yr	6.90	8.02	9.13	10.35	11.42	25yr
50yr	0.67	1.02	1.27	1.83	2.47	3.13	50yr	2.13	3.06	3.60	5.00	6.31	9.76	10.44	50yr	8.64	10.04	11.41	12.73	13.97	50yr
100yr	0.79	1.20	1.50	2.16	2.97	3.82	100yr	2.56	3.73	4.37	6.15	7.75	12.21	13.07	100yr	10.81	12.57	14.24	15.70	17.09	100yr
200yr	0.93	1.39	1.76	2.55	3.56	4.66	200yr	3.07	4.56	5.34	7.58	9.52	15.32	16.38	200yr	13.56	15.75	17.81	19.34	20.91	200yr
500yr	1.15	1.71	2.20	3.20	4.54	6.05	500yr	3.92	5.92	6.93	10.02	12.53	20.69	22.08	500yr	18.31	21.23	23.93	25.48	27.32	500yr

APPENDIX VI

Rip Rap Calculations

RIP RAP CALCULATIONS

"Ledgewood Drive LLC"

Ledgewood Drive

Portsmouth, NH 03801

Jones & Beach Engineers, Inc.

100 Domain Drive, Suite 201

Exeter, NH 03833

8/17/2026 Revised 9/22/2026

Rip Rap equations were obtained from the *Stormwater Management and Erosion Control Handbook for Urban and Developing Areas in New Hampshire*.

Aprons are sized for the 25-Year storm event.

TAILWATER < HALF THE D_o

$$L_a = (1.8 \times Q) / D_o^{3/2} + (7 \times D_o)$$

$$W = L_a + (3 \times D_o) \text{ or defined channel width}$$

$$d_{50} = (0.02 \times Q^{4/3}) / (T_w \times D_o)$$

Culvert or Catch Basin (Sta. No.)	Tailwater (Feet) T _w	Discharge (C.F.S.) Q	Diameter of Pipe D _o	Length of Rip Rap L _a (feet)	Width of Rip Rap W (feet)	d ₅₀ -Median Stone Rip Rap d50 (feet)
DMH 3 (12" HDPE)	0.26	0.44	1	7.8	11	0.03
1P (18" HDPE)	0.73	4.06	1.5	14.5	19	0.12

TAILWATER > HALF THE D_o

$$L_a = (3.0 \times Q) / D_o^{3/2} + (7 \times D_o)$$

$$W = (0.4 \times L_a) + (3 \times D_o) \text{ or defined channel width}$$

$$d_{50} = (0.02 \times Q^{4/3}) / (T_w \times D_o)$$

Culvert or Catch Basin (Sta. No.)	Tailwater (Feet) T _w	Discharge (C.F.S.) Q	Diameter of Pipe D _o	Length of Rip Rap L _a (feet)	Width of Rip Rap W (feet)	d ₅₀ -Median Stone Rip Rap d50 (feet)
10P (18" HDPE)	1.1	6.93	1.5	21.8	13	0.16
DMH 4 (18" HDPE)	0.86	4.9	1.5	18.5	12	0.13

Table 7-24 -- Recommended Rip Rap Gradation Ranges				
d ₅₀ Size =	0.25	Feet	3	Inches
% of Weight Smaller	Size of Stone (Inches)			
Than the Given d ₅₀ Size		From		To
100%		5		6
85%		4		5
50%		3		5
15%		1		2

Table 7-24 -- Recommended Rip Rap Gradation Ranges				
d ₅₀ Size =	0.5	Feet	6	Inches
% of Weight Smaller	Size of Stone (Inches)			
Than the Given d ₅₀ Size		From		To
100%		9		12
85%		8		11
50%		6		9
15%		2		3

APPENDIX VII

BMP Worksheets

GROUNDWATER RECHARGE VOLUME (GRV)
(Env-Wq 1504.12)

	ac	Area of HSG A soil that was replaced by impervious cover	0.40"
0.56	ac	Area of HSG B soil that was replaced by impervious cover	0.25"
	ac	Area of HSG C soil that was replaced by impervious cover	0.10"
	ac	Area of HSG D soil or impervious cover that was replaced by impervious cover	0.0"
0.25 inches		Rd = Weighted groundwater recharge depth	
0.1393	ac-in	GRV = AI * Rd	
505	cf	GRV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
	← Y/N	Is a stage-storage table attached showing that the GRV can be stored below the lowest invert of the outlet structure (if applicable)? Multiple stormwater control measures may be used to meet the GRV requirements.	

Provide calculations/discussion below showing that the project meets the groundwater recharge requirements (Env-Wq 1507.04):

1,075 cf stored below outlet invert in chamber system A

1,075 cf stored below outlet invert in chamber system B

713 cf stored in filtration drip edge

1075+1075+713 = 2,863 cf total GRV provided >> 505 cf GRV required

[illegible]

GENERAL CALCULATIONS - WQV and WQF (optional worksheet)

This worksheet may be useful when designing a BMP that does not fit into one of the specific worksheets already provided (such as for a technology which is not a stormwater wetland, infiltration practice, etc.)

Water Quality Volume (WQV)

0.25	ac	A = Area draining to the practice
0.21	ac	A _i = Impervious area draining to the practice
0.86	decimal	I = Percent impervious area draining to the practice, in decimal form
0.83	unitless	R _v = Runoff coefficient = 0.05 + (0.9 x I)
0.20	ac-in	WQV = 1" x R _v x A
743	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1	inches	P = Amount of rainfall. For WQF in NH, P = 1".
0.83	inches	Q = Water quality depth. $Q = WQV/A$
98	unitless	CN = Unit peak discharge curve number. $CN = 1000 / (10 + 5P + 10Q - 10 * [Q^2 + 1.25 * Q * P]^{0.5})$
0.2	inches	S = Potential maximum retention. $S = (1000 / CN) - 10$
0.033	inches	Ia = Initial abstraction. Ia = 0.2S
6.0	minutes	T _c = Time of Concentration
700.0	cfs/mi ² /in	q _u is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III.
0.224	cfs	WQF = q _u x WQV. Conversion: to convert "cfs/mi ² /in * ac-in" to "cfs" multiply by 1mi ² /640ac.

Designer's Notes:

For design of Focal Point 1 (Pond 3P) in conjunction with Focal Point design worksheet.

This image shows a blank sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

FOCALPOINT

NEW HAMPSHIRE AOT PROJECTS

1. Determine FocalPoint bed area (minimum 174 sf/acre of impervious area - ex: 0.2 acres = 35 sf)

See step 2 to determine if minimum size is appropriate.

- Tributary impervious area:
- Tributary pervious area:
- Minimum FocalPoint bed area required: $= ((A \times 1.0) + (B \times 0.4)) \times 174$
- FocalPoint bed area provided:
- Dimensions of proposed FocalPoint:

$$\begin{aligned}
 &= \underline{\hspace{2cm}} 0.214 \text{ ac (A)} \\
 &= \underline{\hspace{2cm}} 0.034 \text{ ac (B)} \\
 &= \underline{\hspace{2cm}} 39.6 \text{ sf} \\
 &= \underline{\hspace{2cm}} 40 \text{ sf} \\
 &= \underline{\hspace{2cm}} 10 \text{ ft} \times \underline{\hspace{2cm}} 4 \text{ ft}
 \end{aligned}$$

2. Model a Type II & III 24-hr rainfall event that generates the water quality volume to demonstrate that the entire storm volume is treated prior to activation of the overflow (typically set at 6 - 12 in above the mulch). Note: a 1.2 - 1.3 in rainfall event usually generates 1.0 in of runoff.

Contact ACF for a sample HydroCAD node.

- Water quality volume (WQv) goal:
- Type II & III 24-hr rainfall depth to generate WQv:
- Temporary storage depth provided:
- Temporary storage volume provided at above depth:
- Peak ponding depth from Type III 24-hr storm event:

$$\begin{aligned}
 &= \underline{\hspace{2cm}} 743 \text{ ft}^3 \\
 &= \underline{\hspace{2cm}} 1.49 \text{ in} \\
 &= \underline{\hspace{2cm}} 6.0 \text{ in} \\
 &\quad \text{(typically 6 - 12 in)} \\
 &= \underline{\hspace{2cm}} 51 \text{ ft}^3 \\
 &= \underline{\hspace{2cm}} 2.1 \text{ in}
 \end{aligned}$$

3. Size the Harco PVC domed overflow riser.

Note: ACF recommends installation of a Fabco domed overflow filter kit for overflow protection.

- Domed overflow riser diameter:
- Rim elevation of overflow riser:
- 6 in invert in elevation from FocalPoint:
- 12 in invert out elevation:

$$\begin{aligned}
 &= \underline{\hspace{2cm}} 24 \text{ in} \\
 &= \underline{\hspace{2cm}} 22.50 \\
 &\quad \text{(typically 6 - 12 in above mulch surface)} \\
 &= \underline{\hspace{2cm}} 19.25 \\
 &\quad \text{(typically 3 ft below mulch surface)} \\
 &= \underline{\hspace{2cm}} 19.25
 \end{aligned}$$

4. Flood control - peak flow attenuation of major storms

The treated flow and bypass flow can be routed to a detention system such as an open pond or a subsurface solution like an expanded R-Tank system. (contact ACF for additional information on designing expanded R-Tank systems)

5. Prepare a landscape plan for the FocalPoint bed area



6. Design review and installation oversight by manufacturer's representative

- The design has been reviewed by ACF Environmental
- Engineer will coordinate installation inspection with ACF Environmental



DESIGNING WITH FOCALPOINT IN NEW HAMPSHIRE

The New Hampshire Department of Environmental Services has approved the FocalPoint (High Performance Modular Biofiltration System) for use on AoT site development projects in the State of New Hampshire.

SIZING CRITERIA SUMMARY

- The surface area of the media within FocalPoint must be a minimum of 174 sf per 1.0 acre of impervious area (26 sf per 0.15 acres). The thickness of the media is to be no less than 1.5 ft (18 in).
- The system must be modelled in HydroCAD (or similar TR-55 modeling software) to demonstrate that the entire volume of a 1.22 in Type II or III 24-hr storm is treated prior to activation of the bypass/overflow (typically set at 6 - 12 in above the mulch surface). Note: A 1.22 in rainfall event typically generates 1.0 in of runoff.
- The R-Tank modular underdrain can be expanded beyond the footprint of the FocalPoint media bed for expanded infiltration and peak flow attenuation/detention post treatment.

FOCALPOINT SYSTEMS:



FOCALPOINT ACCESSORIES:



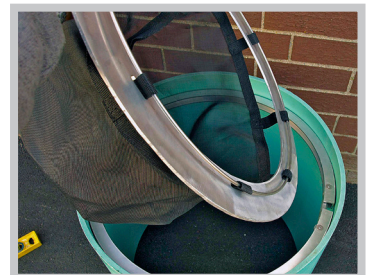
Pretreatment - Rain Guardian
Turret



Pretreatment - Rain Guardian
Foxhole



Pretreatment - PreTx



Bypass protection - Domed
overflow with filter insert

For additional information please visit: www.acfenvironmental.com

Contact Rob Woodman - Senior Stormwater Engineer
Cell: 207.272.4431 | Email: rwoodman@acfenv.com

25071.2-PROPOSED

Type III 24-hr Focal Point 1 WQF Rainfall=1.49"

Prepared by Jones & Beach Engineers Inc

Printed 9/22/2026

HydroCAD® 10.20-6a s/n 00762 © 2024 HydroCAD Software Solutions LLC

Page 1

Summary for Pond 3P: Focal Point 1

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=9)

Inflow Area = 0.248 ac, 86.15% Impervious, Inflow Depth = 0.86" for Focal Point 1 WQF event
 Inflow = 0.24 cfs @ 12.09 hrs, Volume= 0.018 af
 Outflow = 0.23 cfs @ 12.12 hrs, Volume= 0.018 af, Atten= 5%, Lag= 1.9 min
 Primary = 0.23 cfs @ 12.12 hrs, Volume= 0.018 af
 Routed to Pond 4P : Chamber System A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3
 Peak Elev= 22.18' @ 12.12 hrs Surf.Area= 98 sf Storage= 27 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.8 min (823.0 - 822.2)

Volume	Invert	Avail.Storage	Storage Description
#1	19.75'	18 cf	4.00'W x 10.00'L x 2.25'H Focal Point Area 1 90 cf Overall x 20.0% Voids
#2	22.00'	59 cf	Surface Bowl (Prismatic) Listed below (Recalc)
		77 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.00	40	0	0
22.75	118	59	59

Device	Routing	Invert	Outlet Devices
#1	Primary	19.25'	12.0" Round Culvert L= 9.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 19.25' / 19.20' S= 0.0056 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 3	19.75'	100.000 in/hr Exfiltration over Surface area Phase-In= 0.10'
#3	Device 1	19.25'	6.0" W x 6.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	22.50'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.22 cfs @ 12.12 hrs HW=22.16' TW=18.45' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 0.22 cfs of 4.63 cfs potential flow)
 ↑ **3=Orifice/Grate** (Passes 0.22 cfs of 1.96 cfs potential flow)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.22 cfs)
 ↑ **4=Orifice/Grate** (Controls 0.00 cfs)

25071.2-PROPOSED

Type III 24-hr Focal Point 1 WQF Rainfall=1.49"

Prepared by Jones & Beach Engineers Inc

Printed 9/22/2026

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Page 2

Stage-Discharge for Pond 3P: Focal Point 1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
19.75	0.00	20.79	0.09	21.83	0.09
19.77	0.02	20.81	0.09	21.85	0.09
19.79	0.04	20.83	0.09	21.87	0.09
19.81	0.06	20.85	0.09	21.89	0.09
19.83	0.07	20.87	0.09	21.91	0.09
19.85	0.09	20.89	0.09	21.93	0.09
19.87	0.09	20.91	0.09	21.95	0.09
19.89	0.09	20.93	0.09	21.97	0.09
19.91	0.09	20.95	0.09	21.99	0.09
19.93	0.09	20.97	0.09	22.01	0.19
19.95	0.09	20.99	0.09	22.03	0.19
19.97	0.09	21.01	0.09	22.05	0.20
19.99	0.09	21.03	0.09	22.07	0.20
20.01	0.09	21.05	0.09	22.09	0.21
20.03	0.09	21.07	0.09	22.11	0.21
20.05	0.09	21.09	0.09	22.13	0.22
20.07	0.09	21.11	0.09	22.15	0.22
20.09	0.09	21.13	0.09	22.17	0.23
20.11	0.09	21.15	0.09	22.19	0.23
20.13	0.09	21.17	0.09	22.21	0.24
20.15	0.09	21.19	0.09	22.23	0.24
20.17	0.09	21.21	0.09	22.25	0.25
20.19	0.09	21.23	0.09	22.27	0.25
20.21	0.09	21.25	0.09	22.29	0.25
20.23	0.09	21.27	0.09	22.31	0.26
20.25	0.09	21.29	0.09	22.33	0.26
20.27	0.09	21.31	0.09	22.35	0.27
20.29	0.09	21.33	0.09	22.37	0.27
20.31	0.09	21.35	0.09	22.39	0.28
20.33	0.09	21.37	0.09	22.41	0.28
20.35	0.09	21.39	0.09	22.43	0.29
20.37	0.09	21.41	0.09	22.45	0.29
20.39	0.09	21.43	0.09	22.47	0.30
20.41	0.09	21.45	0.09	22.49	0.30
20.43	0.09	21.47	0.09	22.51	0.33
20.45	0.09	21.49	0.09	22.53	0.42
20.47	0.09	21.51	0.09	22.55	0.55
20.49	0.09	21.53	0.09	22.57	0.70
20.51	0.09	21.55	0.09	22.59	0.88
20.53	0.09	21.57	0.09	22.61	1.08
20.55	0.09	21.59	0.09	22.63	1.30
20.57	0.09	21.61	0.09	22.65	1.54
20.59	0.09	21.63	0.09	22.67	1.79
20.61	0.09	21.65	0.09	22.69	2.05
20.63	0.09	21.67	0.09	22.71	2.33
20.65	0.09	21.69	0.09	22.73	2.63
20.67	0.09	21.71	0.09	22.75	2.93
20.69	0.09	21.73	0.09		
20.71	0.09	21.75	0.09		
20.73	0.09	21.77	0.09		
20.75	0.09	21.79	0.09		
20.77	0.09	21.81	0.09		

WQF = 0.224 cfs
E(WQF) = 22.16
Overflow el. = 22.5

25071.2-PROPOSED

Type III 24-hr Focal Point 1 WQF Rainfall=1.49"

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Stage-Area-Storage for Pond 3P: Focal Point 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
19.75	40	0	22.35	116	38
19.80	40	0	22.40	122	42
19.85	40	1	22.45	127	47
19.90	40	1	22.50	132	51
19.95	40	2	22.55	137	56
20.00	40	2	22.60	142	61
20.05	40	2	22.65	148	66
20.10	40	3	22.70	153	71
20.15	40	3	22.75	158	77
20.20	40	4			
20.25	40	4			
20.30	40	4			
20.35	40	5			
20.40	40	5			
20.45	40	6			
20.50	40	6			
20.55	40	6			
20.60	40	7			
20.65	40	7			
20.70	40	8			
20.75	40	8			
20.80	40	8			
20.85	40	9			
20.90	40	9			
20.95	40	10			
21.00	40	10			
21.05	40	10			
21.10	40	11			
21.15	40	11			
21.20	40	12			
21.25	40	12			
21.30	40	12			
21.35	40	13			
21.40	40	13			
21.45	40	14			
21.50	40	14			
21.55	40	14			
21.60	40	15			
21.65	40	15			
21.70	40	16			
21.75	40	16			
21.80	40	16			
21.85	40	17			
21.90	40	17			
21.95	40	18			
22.00	80	18			
22.05	85	20			
22.10	90	23			
22.15	96	25			
22.20	101	28			
22.25	106	31			
22.30	111	35			

Overflow el. = 22.5
Temporary storage
volume provided = 51 cf

INFILTRATION PRACTICE CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Chamber System A (Pond 4P)**

Enter the type of infiltration practice (such as basin, trench) and the node name in the drainage analysis, if applicable.

Yes		Have you reviewed Env-Wq 1508.07(a) to ensure that infiltration is allowed?	← yes
0.25	ac	A = Area draining to the practice	
0.22	ac	A _i = Impervious area draining to the practice	
0.86	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.83	unitless	R _v = Runoff coefficient = 0.05 + (0.9 x I)	
0.21	ac-in	WQV = 1" x R _v x A	
755	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
189	cf	25% x WQV (check calc for sediment forebay volume)	
N/A		Method of pretreatment? (not required for clean or roof runoff)	
	cf	V _{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
1,075	cf	V = Volume ¹ (attach a stage-storage table)	≥ WQV
896	sf	A _{SA} = Surface area of the bottom of the pond	
1.00	iph	K _{sat} _{DESIGN} = Design infiltration rate ²	
10.1	hours	T _{DRAIN} = Drain time = V / (A _{SA} * I _{DESIGN})	≤ 72-hrs
19.20	feet	E _{BTM} = Elevation of the bottom of the basin	
18.17	feet	E _{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
16.17	feet	E _{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.03	feet	D _{SHWT} = Separation from SHWT	≥ * ³
3.0	feet	D _{ROCK} = Separation from bedrock	≥ * ³
	ft	D _{amend} = Depth of amended soil, if applicable due high infiltration rate	≥ 24"
	ft	D _T = Depth of trench, if trench proposed	4 - 10 ft
	Yes/No	If a trench or underground system is proposed, has observation well been provided?	← yes
		If a trench is proposed, does material meet Env-Wq 1508.07(k)(2) requirements. ⁴	← yes
	Yes/No	If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?	← yes
	:1	If a basin is proposed, pond side slopes.	≥ 3:1
20.59	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
21.13	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
21.20	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench? ⁵	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

- Volume below the lowest invert of the outlet structure and excludes forebay volume
- K_{sat}_{DESIGN} includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
- 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
- Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
- If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

Runoff is already treated through focal point. WQV calculation is irrelevant & only 1' SHWT separation necessary

No stage storage table is attached. 8*14'*8' = 896 sf

Outlet 1.2' above pond bottom, so 896 sf * 1.2 ft = 1,075 cf

GENERAL CALCULATIONS - WQV and WQF (optional worksheet)

This worksheet may be useful when designing a BMP that does not fit into one of the specific worksheets already provided (such as for a technology which is not a stormwater wetland, infiltration practice, etc.)

Water Quality Volume (WQV)

0.17	ac	A = Area draining to the practice
0.14	ac	A _i = Impervious area draining to the practice
0.83	decimal	I = Percent impervious area draining to the practice, in decimal form
0.79	unitless	R _v = Runoff coefficient = 0.05 + (0.9 x I)
0.14	ac-in	WQV = 1" x R _v x A
498	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1	inches	P = Amount of rainfall. For WQF in NH, P = 1".
0.79	inches	Q = Water quality depth. $Q = WQV/A$
98	unitless	CN = Unit peak discharge curve number. $CN = 1000 / (10 + 5P + 10Q - 10 * [Q^2 + 1.25 * Q * P]^{0.5})$
0.2	inches	S = Potential maximum retention. $S = (1000/CN) - 10$
0.040	inches	Ia = Initial abstraction. Ia = 0.2S
6.0	minutes	T _c = Time of Concentration
700.0	cfs/mi ² /in	q _u is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III.
0.150	cfs	WQF = q _u x WQV. Conversion: to convert "cfs/mi ² /in * ac-in" to "cfs" multiply by 1mi ² /640ac.

Designer's Notes:

For design of Focal Point 2 (Pond 5P) in conjunction with Focal Point design worksheet.

[illegible]

FOCALPOINT

NEW HAMPSHIRE AOT PROJECTS

1. Determine FocalPoint bed area (minimum 174 sf/acre of impervious area - ex: 0.2 acres = 35 sf)

See step 2 to determine if minimum size is appropriate.

- Tributary impervious area: = 0.143 ac (A)
- Tributary pervious area: = 0.030 ac (B)
- Minimum FocalPoint bed area required: = $((A \times 1.0) + (B \times 0.4)) \times 174$ = 27.0 sf
- FocalPoint bed area provided: = 28 sf
- Dimensions of proposed FocalPoint: = 3 ft x 7 ft

2. Model a Type II & III 24-hr rainfall event that generates the water quality volume to demonstrate that the entire storm volume is treated prior to activation of the overflow (typically set at 6 - 12 in above the mulch). Note: a 1.2 - 1.3 in rainfall event usually generates 1.0 in of runoff.

Contact ACF for a sample HydroCAD node.

- Water quality volume (WQv) goal: = 498 ft³
- Type II & III 24-hr rainfall depth to generate WQv: = 1.40 in
- Temporary storage depth provided: = 2.4 in
(typically 6 - 12 in)
- Temporary storage volume provided at above depth: = 19 ft³
- Peak ponding depth from Type III 24-hr storm event: = 1.8 in

3. Size the Harco PVC domed overflow riser.

Note: ACF recommends installation of a Fabco domed overflow filter kit for overflow protection.

- Domed overflow riser diameter: = 24 in
- Rim elevation of overflow riser: = 22.95
(typically 6 - 12 in above mulch surface)
- 6 in invert in elevation from FocalPoint: = 20.00
(typically 3 ft below mulch surface)
- 12 in invert out elevation: = 20.00

4. Flood control - peak flow attenuation of major storms

The treated flow and bypass flow can be routed to a detention system such as an open pond or a subsurface solution like an expanded R-Tank system. (contact ACF for additional information on designing expanded R-Tank systems)

5. Prepare a landscape plan for the FocalPoint bed area



6. Design review and installation oversight by manufacturer's representative

- The design has been reviewed by ACF Environmental ☒
- Engineer will coordinate installation inspection with ACF Environmental ☒

DESIGNING WITH FOCALPOINT IN NEW HAMPSHIRE

The New Hampshire Department of Environmental Services has approved the FocalPoint (High Performance Modular Biofiltration System) for use on AoT site development projects in the State of New Hampshire.

SIZING CRITERIA SUMMARY

- The surface area of the media within FocalPoint must be a minimum of 174 sf per 1.0 acre of impervious area (26 sf per 0.15 acres). The thickness of the media is to be no less than 1.5 ft (18 in).
- The system must be modelled in HydroCAD (or similar TR-55 modeling software) to demonstrate that the entire volume of a 1.22 in Type II or III 24-hr storm is treated prior to activation of the bypass/overflow (typically set at 6 - 12 in above the mulch surface). Note: A 1.22 in rainfall event typically generates 1.0 in of runoff.
- The R-Tank modular underdrain can be expanded beyond the footprint of the FocalPoint media bed for expanded infiltration and peak flow attenuation/detention post treatment.

FOCALPOINT SYSTEMS:



FOCALPOINT ACCESSORIES:



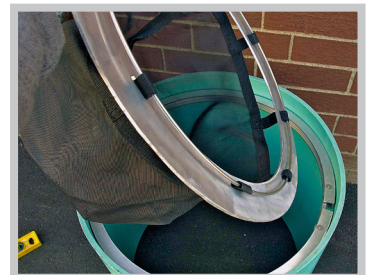
Pretreatment - Rain Guardian Turret



Pretreatment - Rain Guardian Foxhole



Pretreatment - PreTx



Bypass protection - Domed overflow with filter insert

For additional information please visit: www.acfenvironmental.com

Contact Rob Woodman - Senior Stormwater Engineer
Cell: 207.272.4431 | Email: rwoodman@acfenv.com

25071.2-PROPOSED

Type III 24-hr Focal Point 2 WQF Rainfall=1.40"

Prepared by Jones & Beach Engineers Inc

Printed 9/22/2026

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Page 1

Summary for Pond 5P: Focal Point 2

[90] Warning: Qout>Qin may require smaller dt or Finer Routing

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=3)

Inflow Area = 0.173 ac, 82.50% Impervious, Inflow Depth = 0.72" for Focal Point 2 WQF event
 Inflow = 0.14 cfs @ 12.09 hrs, Volume= 0.010 af
 Outflow = 0.15 cfs @ 12.12 hrs, Volume= 0.010 af, Atten= 0%, Lag= 1.5 min
 Primary = 0.15 cfs @ 12.12 hrs, Volume= 0.010 af
 Routed to Pond 6P : Chamber System B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs / 3
 Peak Elev= 22.90' @ 12.12 hrs Surf.Area= 67 sf Storage= 17 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.8 min (832.4 - 831.5)

Volume	Invert	Avail.Storage	Storage Description
#1	20.50'	12 cf	3.00'W x 9.00'L x 2.25'H Focal Point Area 1 61 cf Overall x 20.0% Voids
#2	22.75'	24 cf	Surface Bowl (Prismatic) Listed below (Recalc)
		36 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.75	27	0	0
23.25	70	24	24

Device	Routing	Invert	Outlet Devices
#1	Primary	20.00'	12.0" Round Culvert L= 32.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 20.00' / 19.80' S= 0.0062 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 3	20.50'	100.000 in/hr Exfiltration over Surface area Phase-In= 0.10'
#3	Device 1	20.00'	6.0" W x 6.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	22.95'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.14 cfs @ 12.12 hrs HW=22.84' TW=18.73' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 0.14 cfs of 4.56 cfs potential flow)
 ↑ **3=Orifice/Grate** (Passes 0.14 cfs of 1.94 cfs potential flow)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.14 cfs)
 ↑ **4=Orifice/Grate** (Controls 0.00 cfs)

25071.2-PROPOSED

Type III 24-hr Focal Point 2 WQF Rainfall=1.40"

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Stage-Discharge for Pond 5P: Focal Point 2

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
20.50	0.00	21.54	0.06	22.58	0.06
20.52	0.01	21.56	0.06	22.60	0.06
20.54	0.02	21.58	0.06	22.62	0.06
20.56	0.04	21.60	0.06	22.64	0.06
20.58	0.05	21.62	0.06	22.66	0.06
20.60	0.06	21.64	0.06	22.68	0.06
20.62	0.06	21.66	0.06	22.70	0.06
20.64	0.06	21.68	0.06	22.72	0.06
20.66	0.06	21.70	0.06	22.74	0.06
20.68	0.06	21.72	0.06	22.76	0.13
20.70	0.06	21.74	0.06	22.78	0.13
20.72	0.06	21.76	0.06	22.80	0.13
20.74	0.06	21.78	0.06	22.82	0.14
20.76	0.06	21.80	0.06	22.84	0.14
20.78	0.06	21.82	0.06	22.86	0.15
20.80	0.06	21.84	0.06	22.88	0.15
20.82	0.06	21.86	0.06	22.90	0.15
20.84	0.06	21.88	0.06	22.92	0.16
20.86	0.06	21.90	0.06	22.94	0.16
20.88	0.06	21.92	0.06	22.96	0.19
20.90	0.06	21.94	0.06	22.98	0.28
20.92	0.06	21.96	0.06	23.00	0.40
20.94	0.06	21.98	0.06	23.02	0.56
20.96	0.06	22.00	0.06	23.04	0.74
20.98	0.06	22.02	0.06	23.06	0.94
21.00	0.06	22.04	0.06	23.08	1.15
21.02	0.06	22.06	0.06	23.10	1.39
21.04	0.06	22.08	0.06	23.12	1.64
21.06	0.06	22.10	0.06	23.14	1.90
21.08	0.06	22.12	0.06	23.16	2.18
21.10	0.06	22.14	0.06	23.18	2.48
21.12	0.06	22.16	0.06	23.20	2.78
21.14	0.06	22.18	0.06	23.22	3.10
21.16	0.06	22.20	0.06	23.24	3.43
21.18	0.06	22.22	0.06		
21.20	0.06	22.24	0.06		
21.22	0.06	22.26	0.06		
21.24	0.06	22.28	0.06		
21.26	0.06	22.30	0.06		
21.28	0.06	22.32	0.06		
21.30	0.06	22.34	0.06		
21.32	0.06	22.36	0.06		
21.34	0.06	22.38	0.06		
21.36	0.06	22.40	0.06		
21.38	0.06	22.42	0.06		
21.40	0.06	22.44	0.06		
21.42	0.06	22.46	0.06		
21.44	0.06	22.48	0.06		
21.46	0.06	22.50	0.06		
21.48	0.06	22.52	0.06		
21.50	0.06	22.54	0.06		
21.52	0.06	22.56	0.06		

WQF = 0.15 cfs
E(WQF) = 22.9
Overflow el. = 22.95

25071.2-PROPOSED*Type III 24-hr Focal Point 2 WQF Rainfall=1.40"*

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Stage-Area-Storage for Pond 5P: Focal Point 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
20.50	27	0	23.10	84	27
20.55	27	0	23.15	88	30
20.60	27	1	23.20	93	33
20.65	27	1	23.25	97	36
20.70	27	1			
20.75	27	1			
20.80	27	2			
20.85	27	2			
20.90	27	2			
20.95	27	2			
21.00	27	3			
21.05	27	3			
21.10	27	3			
21.15	27	4			
21.20	27	4			
21.25	27	4			
21.30	27	4			
21.35	27	5			
21.40	27	5			
21.45	27	5			
21.50	27	5			
21.55	27	6			
21.60	27	6			
21.65	27	6			
21.70	27	6			
21.75	27	7			
21.80	27	7			
21.85	27	7			
21.90	27	8			
21.95	27	8			
22.00	27	8			
22.05	27	8			
22.10	27	9			
22.15	27	9			
22.20	27	9			
22.25	27	9			
22.30	27	10			
22.35	27	10			
22.40	27	10			
22.45	27	11			
22.50	27	11			
22.55	27	11			
22.60	27	11			
22.65	27	12			
22.70	27	12			
22.75	54	12			
22.80	58	14			
22.85	63	15			
22.90	67	17			
22.95	71	19			
23.00	76	22			
23.05	80	24			

Overflow el. = 22.95
Temporary storage volume
provided = 19 cf

INFILTRATION PRACTICE CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Chamber System B (Pond 6P)**

Enter the type of infiltration practice (such as basin, trench) and the node name in the drainage analysis, if applicable.

Yes		Have you reviewed Env-Wq 1508.07(a) to ensure that infiltration is allowed?	← yes
0.17	ac	A = Area draining to the practice	
0.14	ac	A _i = Impervious area draining to the practice	
0.83	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.79	unitless	R _v = Runoff coefficient = 0.05 + (0.9 x I)	
0.14	ac-in	WQV = 1" x R _v x A	
498	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
124	cf	25% x WQV (check calc for sediment forebay volume)	
N/A		Method of pretreatment? (not required for clean or roof runoff)	
	cf	V _{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
1,075	cf	V = Volume ¹ (attach a stage-storage table)	≥ WQV
896	sf	A _{SA} = Surface area of the bottom of the pond	
1.00	iph	K _{sat} _{DESIGN} = Design infiltration rate ²	
6.7	hours	T _{DRAIN} = Drain time = V / (A _{SA} * I _{DESIGN})	≤ 72-hrs
19.60	feet	E _{BTM} = Elevation of the bottom of the basin	
18.57	feet	E _{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
16.90	feet	E _{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.03	feet	D _{SHWT} = Separation from SHWT	≥ * ³
2.7	feet	D _{ROCK} = Separation from bedrock	≥ * ³
	ft	D _{amend} = Depth of amended soil, if applicable due high infiltration rate	≥ 24"
	ft	D _T = Depth of trench, if trench proposed	4 - 10 ft
	Yes/No	If a trench or underground system is proposed, has observation well been provided?	← yes
		If a trench is proposed, does material meet Env-Wq 1508.07(k)(2) requirements. ⁴	← yes
	Yes/No	If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?	← yes
	:1	If a basin is proposed, pond side slopes.	≥ 3:1
20.36	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
21.13	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
21.60	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench? ⁵	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

- Volume below the lowest invert of the outlet structure and excludes forebay volume
- K_{sat}_{DESIGN} includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
- 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
- Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
- If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

Runoff is already treated through focal point. WQV calculation is irrelevant & only 1' SHWT separation necessary

No stage storage table is attached. 8*14'*8' = 896 sf

Outlet 1.2' above pond bottom, so 896 sf * 1.2 ft = 1,075 cf

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.08)

Type/Node Name: _____

Filtration Drip Edge / Pond 8P

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

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.08(a).	
0.21	ac	A = Area draining to the practice	
0.18	ac	A _i = Impervious area draining to the practice	
0.84	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.80	unitless	R _v = Runoff coefficient = 0.05 + (0.9 x I)	
0.17	ac-in	WQV = 1" x R _v x A	
622	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
155	cf	25% x WQV (check calc for sediment forebay volume)	
466	cf	75% x WQV (check calc for surface sand filter volume)	
N/A		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V _{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
Calculate time to drain if system IS NOT underdrained:			
1,500	sf	A _{SA} = Surface area of the practice	
1.00	iph	K _{sat} _{DESIGN} = Design infiltration rate ¹	
		If K _{sat} (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
N/A	Yes/No	(Use the calculations below)	
5.0	hours	T _{DRAIN} = Drain time = V / (A _{SA} * I _{DESIGN})	≤ 72-hrs
Calculate time to drain if system IS underdrained:			
	ft	E _{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q _{WQV} = Discharge at the E _{WQV} (attach stage-discharge table)	
-	hours	T _{DRAIN} = Drain time = 2WQV/Q _{WQV}	≤ 72-hrs
18.75	feet	E _{FC} = Elevation of the bottom of the filter course material ²	
	feet	E _{UD} = Invert elevation of the underdrain (UD), if applicable	
17.67	feet	E _{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
15.67	feet	E _{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
18.75	feet	D _{FC to UD} = Depth to UD from the bottom of the filter course	≥ 1'
3.08	feet	D _{FC to ROCK} = Depth to bedrock from the bottom of the filter course	≥ 1'
1.08	feet	D _{FC to SHWT} = Depth to SHWT from the bottom of the filter course	≥ 1'
21.25	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
21.25	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	← yes
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	< 10 ac
	cf	V = Volume of storage ³ (attach a stage-storage table)	≥ 75%WQV
	inches	D _{FC} = Filter course thickness	18", or 24" if within GPA
Sheet		Note what sheet in the plan set contains the filter course specification.	
Yes/No		Access grate provided?	← yes

APPENDIX VIII

Pollutant Removal Calculations

POLLUTANT REMOVAL CALCULATIONS

BMP	Focal Point 1 (3P)	Focal Point 2 (5P)	Filter Drip Edge (7P)	Nothing	Total	Required
Acres Impervious	0.214	0.143	0.179	0.022	0.557	
TSS Removal (%)	90%	90%	99%	0%	89%	80%
TN Removal (%)	75%	75%	99%	0%	80%	50%
TP Removal (%)	76%	76%	99%	0%	80%	50%

Existing offsite impervious within watersheds is excluded from calculation.

Pollutant removal efficiencies are per annotated EPA Performance curves enclosed with these calculations

TSS removal of 89% provided exceeds 80% requirement

TN removal of 80% provided exceeds 50% requirement

TP removal of 80% provided exceeds 50% requirement



REGION 1

BOSTON, MA 02109

Dated by Signature

MEMORANDUM

SUBJECT: FocalPoint Crediting Direction

FROM: Damien Houlihan, Stormwater Permits Section
Water Division

TO: Robert J. Woodman
Director - Engineering and Green Stormwater Infrastructure
Ferguson Waterworks

On June 7, 2021, Ferguson Waterworks (Ferguson) submitted a request to EPA Region 1 regarding the use of the FocalPoint biofiltration system (also known also as the High Performance Modular Biofiltration System, hereinafter "FocalPoint biofiltration system"). Based on the review of documents submitted by Ferguson, EPA Region 1 finds that entities wishing to deploy the FocalPoint biofiltration system may calculate phosphorus and nitrogen reductions under the 2016 Massachusetts Municipal Separate Storm Sewer Permit (MA MS4 Permit) and the 2017 New Hampshire Municipal Separate Storm Sewer Permit (NH MS4 Permit) using the performance quantification for Enhanced Biofiltration found on Table 3-20 and Figure 3-15 of Attachment 3 to Appendix F of the MA MS4 permit and Table 3-20 and Figure 3-15 of Attachment 3 to Appendix F of the NH MS4 permit (also attached to this document for reference) provided the following standard FocalPoint design requirements and other conditions are met:

1. Ferguson's FocalPoint biofiltration systems are to be designed with pretreatment to remove coarse sediment and debris before they reach and prematurely close the filter bed. Pretreatment measures must be designed to dissipate velocities and spread water out over a 2 to 4 ft width.
2. Ferguson's FocalPoint biofiltration systems are to be designed with a minimum and maximum surface ponding depths of 3 inches and 18 inches, respectively.
3. Ferguson's FocalPoint biofiltration systems are to be separated or otherwise isolated from the groundwater table to ensure that groundwater does not inundate the filter bed either using an impermeable liner or physical separation.
4. Ferguson's FocalPoint biofiltration systems are to be designed such that the system bed area is sized to be a minimum of 174 square feet per acre of tributary area. Stormwater modelling software shall be used to demonstrate that the runoff volume goal is treated prior to bypass.
5. System maintenance of Ferguson's FocalPoint biofiltration systems should occur once every 6 months, at a minimum, and filter media and pretreatment measures shall be replaced such that the performance of the systems are maintained as originally designed.

6. Stormwater quality monitoring must be used to ensure system performance has not declined over time. EPA recommends this monitoring commence once the filter bed media reaches two (2) years in age to ensure system performance has not declined. All monitoring data must be submitted to EPA by the entity claiming pollution reduction credit for the FocalPoint biofiltration system and filter media shall be replaced if monitoring data shows a decline in performance from original design.

This pollution reduction crediting of the FocalPoint biofiltration system is consistent with the Alternative Methods request process contained in Attachment 3 to Appendix F in the MA MS4 Permit and Attachment 3 to Appendix F of the NH MS4 Permit and may be used unless EPA Region 1 requires an alternative pollution reduction crediting methodology based on new or additional modeling of high-flow-rate filtering systems in a future NPDES permit. All stormwater quality monitoring data shall be submitted to EPA consistent with the requirements of the MA MS4 Permit or the NH MS4 Permit.

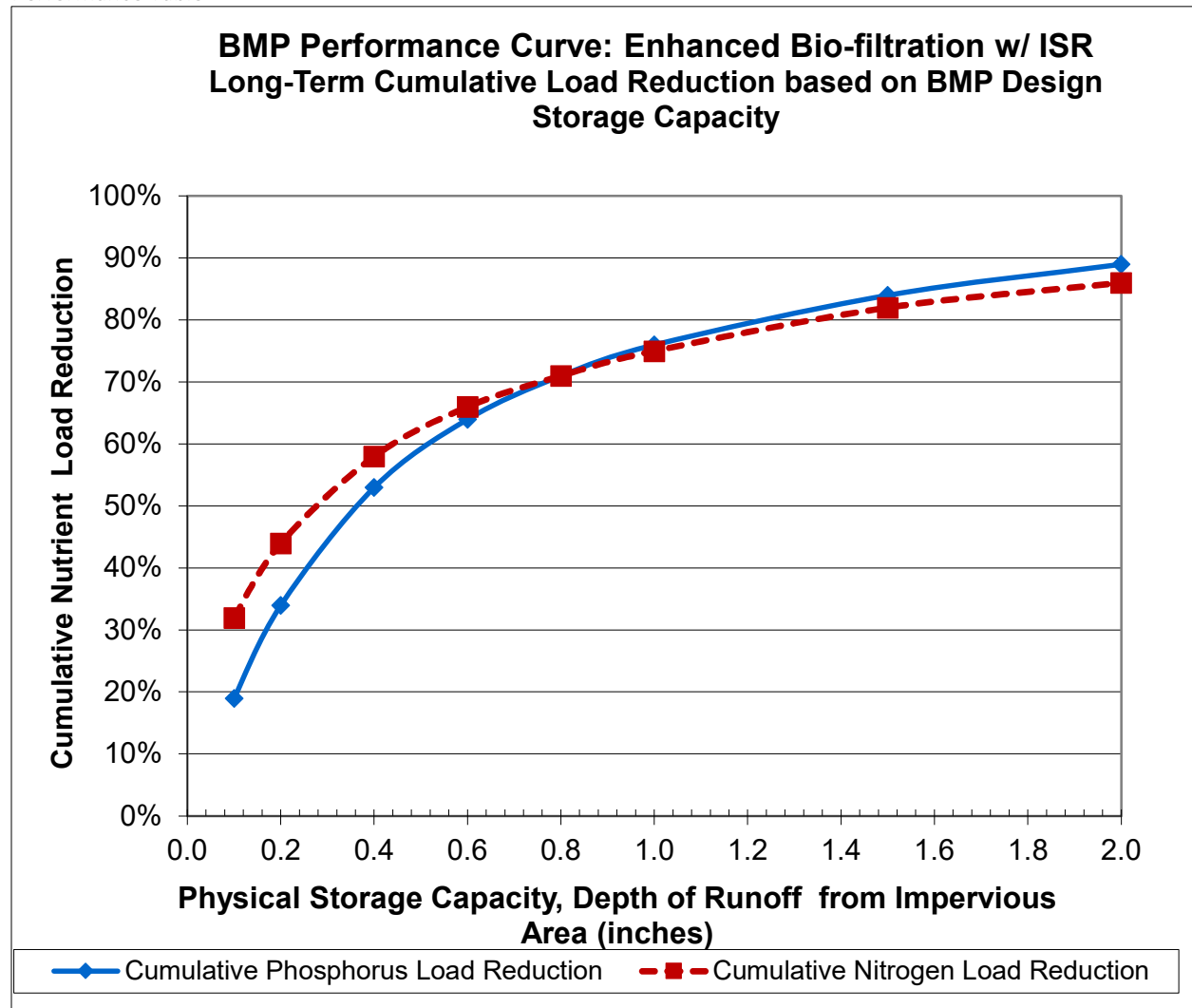
Table 3- 20: Enhanced Bio-filtration* with Internal Storage Reservoir (ISR) BMP Performance Table

Enhanced Bio-filtration* w/ ISR BMP Performance Table: Long-Term Phosphorus & Nitrogen Load Reduction								
BMP Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Cumulative Phosphorus Load Reduction	19%	34%	53%	64%	71%	76%	84%	89%
Cumulative Nitrogen Load Reduction	32%	44%	58%	66%	71%	75%	82%	86%

***Filter media augmented with phosphorus sorbing materials to enhance phosphorus removal.**

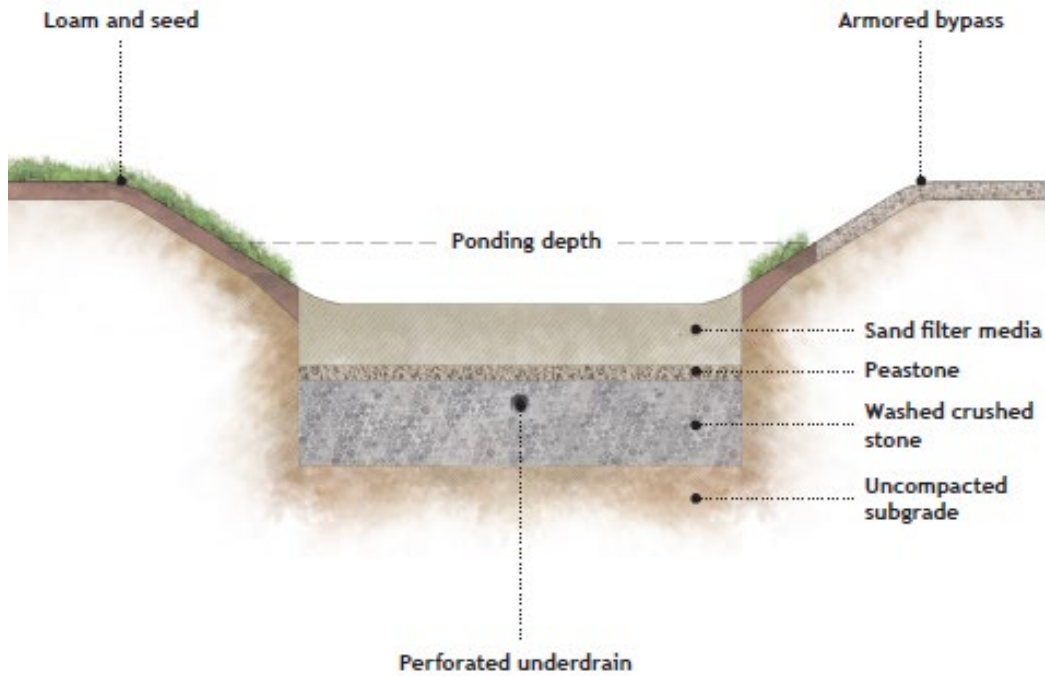
JBE added note: 90% TSS removal assumed due to infiltration system directly downstream

Figure 3-15: BMP Performance Curve: Enhanced Bio-filtration with Internal Storage Reservoir (ISR) BMP Performance Table



Infiltration Basin is an impoundment designed to temporarily retain stormwater runoff, allowing all or a portion of the water to infiltrate into the soil and is designed to completely drain between storm events. Surface infiltration basins should be designed with an outlet structure to pass peak flows during a range of storm events and an emergency spillway to pass peak flows around the embankment during extreme storm events. Water quality treatment is provided by stormwater runoff pollutants binding to soil particles beneath the basin as water infiltrates. Biological and chemical processes occurring in the soil also contribute to the breakdown of pollutants.

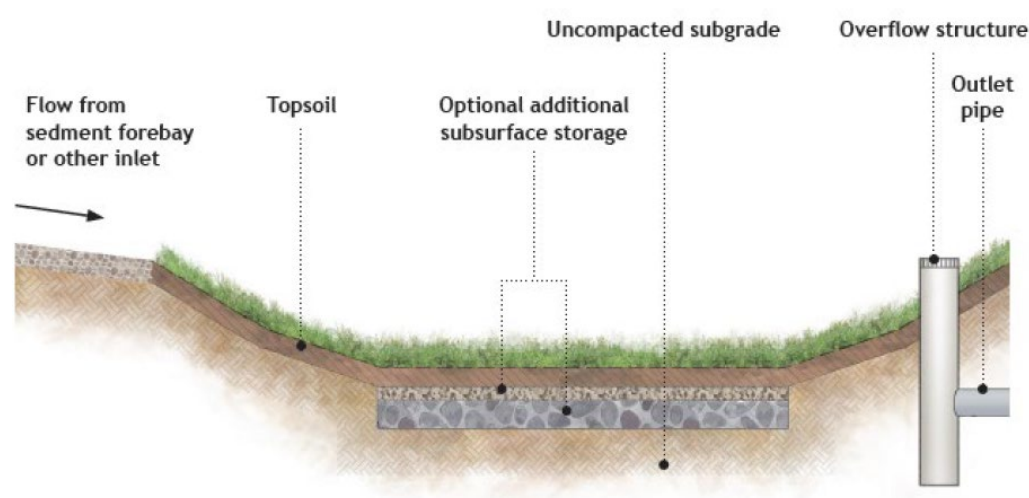
Sample Design



New England Stormwater Retrofit Manual (2022)

Infiltration Basin

Profile



graphic not to scale

New England Stormwater Retrofit Manual (2022)

Pollutant Export Rate by Land Use¹

Source Category by Land Use	Land Surface Cover	P Load Export Rate (lbs/acre/year)	N Load Export Rate (lbs/acre/year)
Commercial (COM) and Industrial (IND)	Directly connected impervious	1.78	15.0
Multi-Family (MFR) and High-Density Residential (HDR)	Directly connected impervious	2.32	14.1
Medium-Density Residential (MDR)	Directly connected impervious	1.96	14.1
Low-Density Residential (LDR) - "Rural"	Directly connected impervious	1.52	14.1

General Equations

Parameter	Equation
Physical Storage Capacity	Depth of Runoff x Drainage Area
Cost	Design Storage Volume x Unit Cost x Adjustment Factor ²
Yearly Pollutant Removal	Pollutant Load Export Rate x Drainage Area x Efficiency

Cost (2026)^{2,3}

Unit Cost (\$/ft ³) ⁴	Annual Maintenance Hours (hrs)
8.11	Not Assessed

¹ 2016 Massachusetts MS4 General Permit, Appendix F, Attachment 3, Table 3-1 (for phosphorus) and Table 3-2 (for nitrogen)

² EPA Memorandum "Methodology for developing cost estimates for Opti-Tool." February 20, 2016. scholars.unh.edu

³ Converted from 2010 to January 2026 dollars using U.S. Department of Labor Bureau of Labor Statistics' Consumer Price Index Inflation Calculator. bls.gov/data/inflation_calculator.htm

⁴ The unit cost provided, design storage volume of the SCM, and a user-determined multiplier (adjustment factor) that accounts for SCM-specific factors can be used to appropriately calibrate the total SCM cost. See further discussion on page 4 of this document.

12

SCM Performance Tables for Soil Infiltration Rate: Infiltration Basin

Infiltration Rate (in/hr)	Depth of Runoff from Impervious Area (inches)	Load Reduction (%)					
		Volume	Phosphorus	Nitrogen	TSS	Zinc	Bacteria
0.52	0.1	20	37	57	60	59	29
	0.2	36	56	75	78	77	48
	0.4	58	79	90	92	91	75
	0.6	73	90	96	96	96	88
	0.8	83	95	98	98	98	94
	1.0	89	97	99	99	99	97
	1.5	96	99	100	100	100	100
	2.0	98	100	100	100	100	100
For filtration drip edge (Pond 8P) 1.02	0.1	25	42	60	59	58	33
	0.2	42	62	77	78	77	54
	0.4	66	85	92	92	91	81
	0.6	80	94	97	97	96	92
	0.8	88	97	99	99	98	97
	1.0	93	99	99	99	99	99
	1.5	97	100	100	100	100	100
	2.0	99	100	100	100	100	100
2.41	0.1	33	51	64	59	58	40
	0.2	54	73	82	79	78	65
	0.4	79	92	95	93	93	91
	0.6	90	97	98	98	97	98
	0.8	95	99	99	99	99	100
	1.0	97	100	100	100	100	100
	1.5	100	100	100	100	100	100
	2.0	100	100	100	100	100	100
8.27	0.1	55	71	76	61	60	59
	0.2	78	90	92	82	81	88
	0.4	94	99	99	95	95	99
	0.6	98	100	100	99	99	100
	0.8	99	100	100	100	100	100
	1.0	100	100	100	100	100	100
	1.5	100	100	100	100	100	100
	2.0	100	100	100	100	100	100

APPENDIX IX

Stormwater Operations and Maintenance Manual

STORMWATER MANAGEMENT OPERATIONS AND MAINTENANCE MANUAL

**“Ledgewood Drive LLC”
Ledgewood Drive
Portsmouth, NH 03801
Tax Map 229, Lot 6A**

Prepared for:

**Ledgewood Drive LLC
Attn. Ben Middleton
10 Main Street
Newfields, NH 03856**

Prepared by:

**Jones & Beach Engineers, Inc.
100 Domain Drive
Suite 201
Exeter, NH 03833
(603) 772-4746
August 17, 2026
Revised September 22, 2026
JBE Project No. 25071.2**



Inspection and Maintenance of Facilities and Property

A. Maintenance of Common Facilities or Property

1. The Landowner, future owners and assigns are responsible to perform the maintenance obligations themselves or hire a qualified professional to review the site on an annual basis for maintenance and certification of the stormwater system. The Landowner, future owners and assigns shall keep receipts and records of all maintenance companies hired throughout the year to submit along with the following form and shall submit an Operations and Maintenance report on a yearly basis to the Portsmouth Planning Department.

B. General Inspection and Maintenance Requirements

1. Permanent stormwater and sediment and erosion control facilities to be maintained on the site include, but are not limited to, the following:
 - a. Driveway and Parking Lot
 - b. Vegetation and landscaping
 - c. Focal Points
 - d. Rain Guardian
 - e. Yard Drain
 - f. Chamber Systems
 - g. Drain Manhole
 - h. Filtration Drip Edge
 - i. Culverts and Roof Drains
 - j. Rip-Rap Outlet Protection Aprons
2. Maintenance of permanent measures shall follow the following schedule:
 - a. Normal winter driveway & parking lot maintenance including plowing and snow removal. Road sweeping at the end of every winter, preferably before the start of the spring rain season.
 - b. **Annual inspection** of the site for erosion, destabilization, settling, and sloughing. Any needed repairs are to be conducted immediately. **Annual inspection** of site's vegetation and landscaping. Any areas that are bare shall be reseeded and mulched with hay or, if the case is extreme, loamed and seeded or sodded to ensure adequate vegetative cover. Landscape specimens shall be replaced in kind, if they are found to be dead or dying.
 - c. Focal Points: See enclosed inspection and maintenance guidance document.
 - d. Rain Guardians: See enclosed inspection and maintenance guidance document.
 - e. **Annual inspection** of yard drains to determine if they need to be cleaned. Yard drains are to be cleaned if the depth of deposits is greater than one-half the depth from the basin bottom to the invert of the lowest pipe or opening into or out of the basin. If a yard drain significantly exceeds the one-half depth standard during the inspection, then it shall be cleaned more frequently. If woody debris or trash accumulates in the yard drain, then it shall be cleaned on a weekly basis. The yard drain can be cleaned either manually or by specially designed equipment including, but not limited to, bucket loaders and vacuum

pumps. Before any materials can be disposed, it is necessary to perform a detailed chemical analysis to determine if the materials meet the EPA criteria for hazardous waste. This will help determine how the materials shall be stored, treated, and disposed. Grease hoods are to be wiped clean and the rags disposed of properly. Debris obscuring the grate inlet shall also be removed.

- f. Chamber system: Once annually, open the inspection ports and visually inspect the condition of the stone base. If more than 6" of sediment is observed, plug the outlet and flush the system thoroughly. Pump water into system until at least 1" of standing water covers the system bottom. Repeat at both inspection ports and pump out back-flush water. Capture sediment-laden water for proper disposal according to local state, and EPA regulation. Additionally, vacuum all adjacent manhole structures.

- g. **Annual inspection** of drain manholes to determine if they need to be cleaned. Manholes shall be cleaned of any material upon inspection. Manholes can be cleaned either manually or by specially designed equipment including, but not limited to, bucket loaders and vacuum pumps. Before any materials can be disposed, it is necessary to perform a detailed chemical analysis to determine if the materials meet the EPA criteria for hazardous waste. This will help determine how the materials shall be stored, treated, and disposed.

- h. Filtration drip edge:

The following course of action will help assure that the filtration drip edge is maintained to preserve its effectiveness.

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

- i. **Inspection** of culvert inlets and outlets **including any roof drain outfalls** at least **once every three months** during the rainy season (March to November). Any debris is to be removed and disposed of properly.
- j. Rock riprap shall be **inspected annually** in order to ensure that it has not been displaced, undermined, or otherwise damaged. Displaced rock shall be replaced, or additional rock added in order to maintain the structure(s) in their undamaged state. Woody vegetation must not be allowed to become established in riprap areas, and/or any debris removed from the void spaces between the rocks. Remove any excessive vegetation that grows in the voids of the stone. If the riprap is adjacent to a stream or other waterbody, the water shall be kept clear of obstructions, debris, and sediment deposits.

See attached sample forms as a guideline.

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

Jones & Beach Engineers, Inc.
100 Domain Drive, Suite 201
Exeter, NH 03833
T#: (603) 772-4746



Commitment to maintenance requirements

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

Signature

Print Name

Title

Date



Annual Operations and Maintenance Report

The Landowner, future owners and assigns are responsible to perform the maintenance obligations themselves or hire a qualified professional to review the site on an annual basis for maintenance and certification of the stormwater system. The Landowner, future owners and assigns shall keep receipts and records of all maintenance companies hired throughout the year to submit along with the following form and shall submit an Operations and Maintenance report on a yearly basis to the Portsmouth Planning Department.

- a. Driveway and Parking Lot
- b. Vegetation and landscaping
- c. Focal Points
- d. Rain Guardian
- e. Yard Drain
- f. Chamber Systems
- g. Drain Manhole
- h. Filtration Drip Edge
- i. Culverts and Roof Drains
- j. Rip-Rap Outlet Protection Aprons

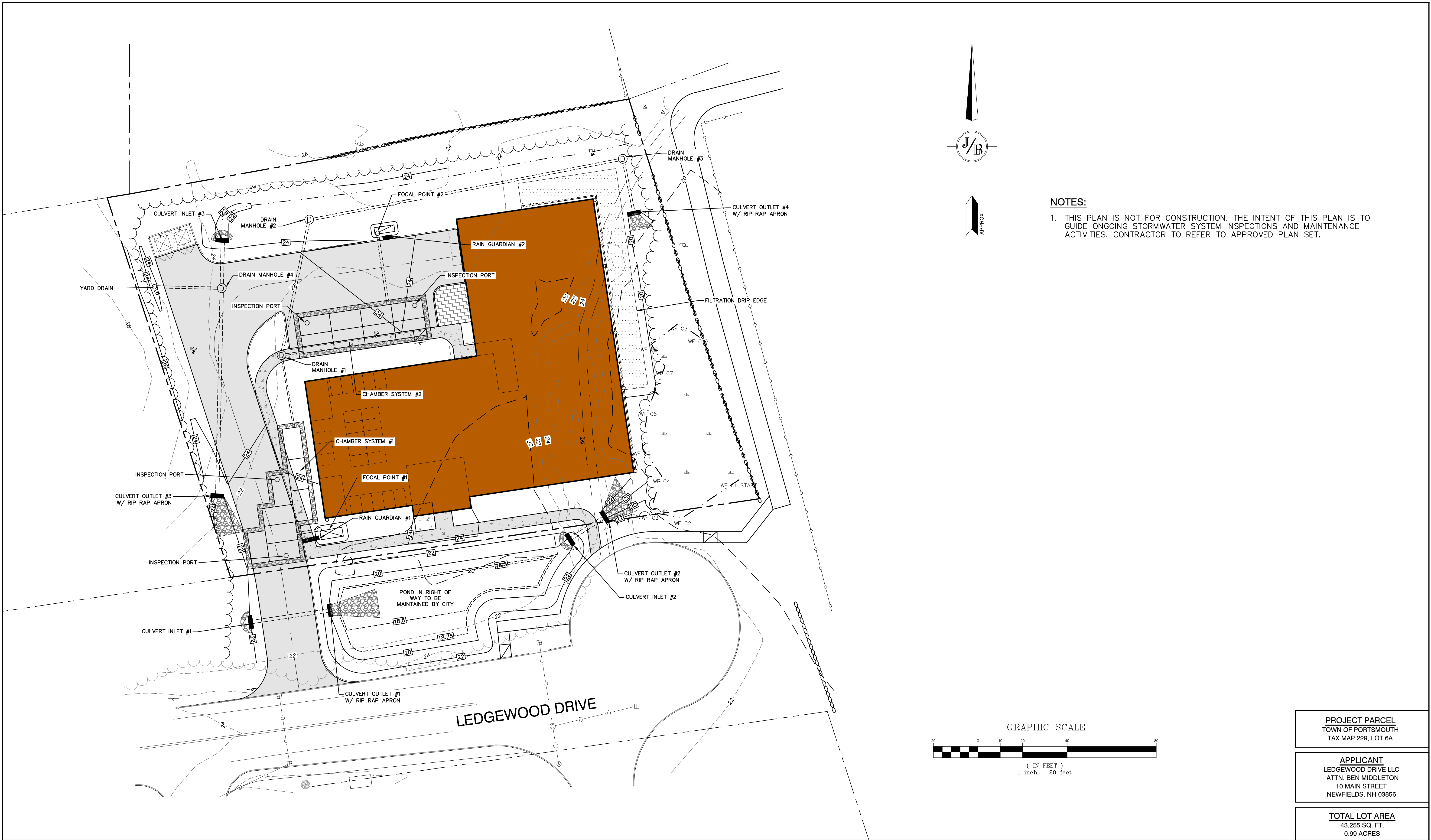
Area	Date of Inspection	Who Inspected	Findings of Inspector
Driveway and Parking Lot			
Vegetation and Landscaping			
Focal Point #1			
Focal Point #2			



Rain Guardian #1			
Rain Guardian #2			
Yard Drain			
Chamber System #1			
Chamber System #2			
Drain Manhole #1			
Drain Manhole #2			
Drain Manhole #3			

Drain Manhole #4			
Filtration Drip Edge			
Culvert Inlet #1			
Culvert Inlet #2			
Culvert Inlet #3			
Culvert Outlet #1 w/ rip rap outlet protection apron			
Culvert Outlet #2 w/ rip rap outlet protection apron			

Culvert Outlet #3 w/ rip rap outlet protection apron			
Culvert Outlet #4 w/ rip rap outlet protection apron			
Roof Drains			
Other (please note):			
Other (please note):			



NOTES:

1. THIS PLAN IS NOT FOR CONSTRUCTION. THE INTENT OF THIS PLAN IS TO GUIDE ONGOING STORMWATER SYSTEM INSPECTIONS AND MAINTENANCE ACTIVITIES. CONTRACTOR TO REFER TO APPROVED PLAN SET.

Design: DJM	Draft: TCR	Date: 01/08/26
Checked: EMP	Scale: AS NOTED	Project No.: 25071.2
Drawing Name: 25071.2-PLAN.dwg		
THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.		

2	09/22/26	REVISED PER TAC COMMENTS	DJM
1	09/01/26	UPDATED TITLE BLOCK	DJM
0	08/17/26	ISSUED FOR REVIEW	DJM
REV.	DATE	REVISION	BY

J/B

Designed and Produced in NH

Jones & Beach Engineers, Inc.

100 Domain Dr.
Suite 201
Exeter, NH 03833

Civil Engineering Services

603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	OPERATIONS AND MAINTENANCE PLAN
Project:	LEDGEWOOD DRIVE LLC LEDGEWOOD DRIVE, PORTSMOUTH, NH 03801
Owner of Record:	ST NICHOLAS GREEK ORTHODOX CHURCH 40 ANDREW JARVIS DRIVE, PORTSMOUTH, NH 03801

DRAWING No.

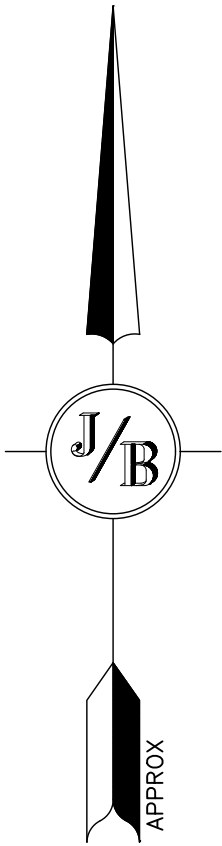
O&M

SHEET 1 OF 1
JBE PROJECT NO. 25071.2

PROJECT PARCEL TOWN OF PORTSMOUTH TAX MAP 229, LOT 6A
APPLICANT LEDGEWOOD DRIVE LLC ATTN. BEN MIDDLETON 10 MAIN STREET NEWFIELDS, NH 03856
TOTAL LOT AREA 43,255 SQ. FT. 0.99 ACRES

APPENDIX X

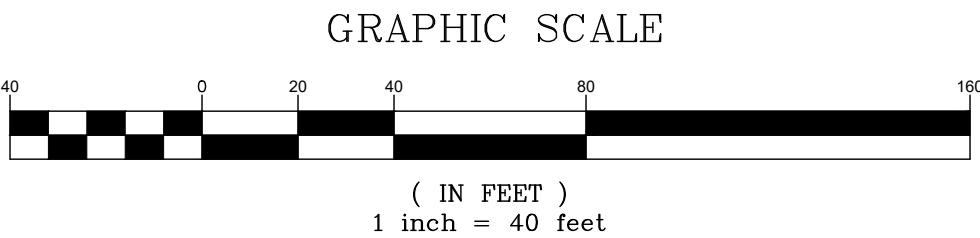
Pre- and Post-Construction Watershed Plans



OFFSITE TOPOGRAPHY SHOWN HEREON IS FROM NH GRANIT LIDAR EXCEPT FOR STRETCH OF LEDGEWOOD DRIVE IN FRONT OF SUBJECT PARCEL. NH GRANIT LIDAR TOPOGRAPHY WAS USED LOOSELY TO GENERATE EXISTING WATERSHED BOUNDARIES AND FLOW PATHS IN CONJUNCTION WITH FIELD EVIDENCE THAT IN SOME CASES CONTRADICTS LIDAR TOPOGRAPHY WHICH MAY NOT TAKE INTO ACCOUNT FINE GRADING OF DEVELOPED AREAS, RETAINING WALLS, AND CURB LINES.

LEGEND

- SUBCATCHMENT BOUNDARY
- SUBCATCHMENT
- REACH
- POND
- TC PATH
- WETLANDS
- NRCS SOILS
- FLOW ARROW

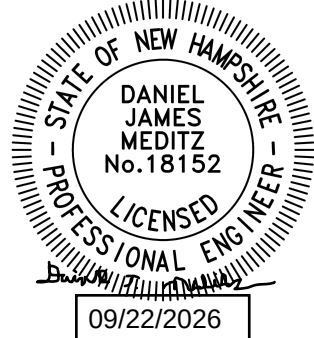


PROJECT PARCEL
TOWN OF PORTSMOUTH
TAX MAP 229, LOT 6A

APPLICANT
LEDGEWOOD DRIVE LLC
ATTN. BEN MIDDLETON
10 MAIN STREET
NEWFIELDS, NH 03856

TOTAL LOT AREA
43,255 SQ. FT.
0.99 ACRES

Design: DJM	Draft: TCR	Date: 07/28/26
Checked: EMP	Scale: AS NOTED	Project No.: 25071.2
Drawing Name: 25071.2-WATERSHED.dwg		
THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.		



0	08/17/26	ISSUED FOR REVIEW	DJM
REV.	DATE	REVISION	BY

J/B Jones & Beach Engineers, Inc.
Civil Engineering Services
100 Domain Dr. Suite 201 Exeter, NH 03833
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	EXISTING WATERSHED PLAN
Project:	LEDGEWOOD DRIVE LLC LEDGEWOOD DRIVE, PORTSMOUTH, NH
Owner of Record:	ST NICHOLAS GREEK ORTHODOX CHURCH 40 ANDREW JARVIS DRIVE, PORTSMOUTH, NH 03801

DRAWING No.
W1
SHEET 1 OF 2
JBE PROJECT NO. 25071.2



Know what's below
811 before you dig

MULTI-FAMILY RESIDENTIAL DEVELOPMENT

"LEDGEWOOD DRIVE LLC"

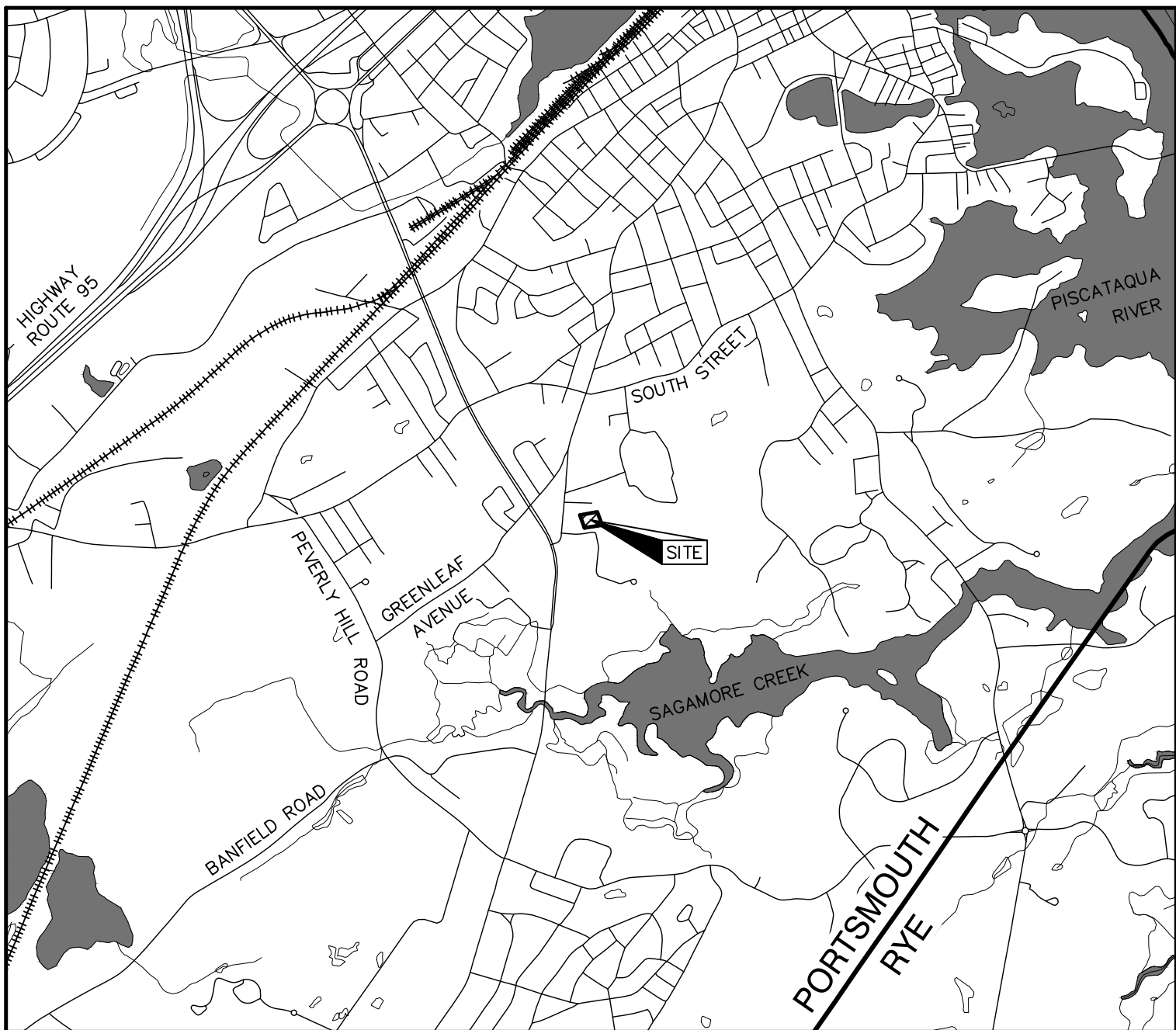
TAX MAP 229, LOT 6A

LEDGEWOOD DRIVE, PORTSMOUTH, NH 03801

GENERAL LEGEND

EXISTING	PROPOSED

DESCRIPTION
PROPERTY LINES
SETBACK LINES
CENTERLINE
FRESHWATER WETLANDS LINE
TIDAL WETLANDS LINE
STREAM CHANNEL
TREE LINE
STONEWALL
BARBED WIRE
FENCE
STOCKADE FENCE
SOIL BOUNDARY
AQUIFER PROTECTION LINE
FLOOD PLAIN LINE
ZONELINE
EASEMENT
MAJOR CONTOUR
MINOR CONTOUR
EDGE OF PAVEMENT
VERTICAL GRANITE CURB
SLOPE GRANITE CURB
CAPE COD BERM
POURED CONCRETE CURB
SILT FENCE
DRAINAGE LINE
SEWER LINE
SEWER FORCE MAIN
GAS LINE
WATER LINE
WATER SERVICE
OVERHEAD ELECTRIC
UNDERGROUND ELECTRIC
GUARDRAIL
UNDERDRAIN
FIRE PROTECTION LINE
THRUST BLOCK
IRON PIPE/IRON ROD
DRILL HOLE
IRON ROD/DRILL HOLE
STONE/GRANITE BOUND
SPOT GRADE
PAVEMENT SPOT GRADE
CURB SPOT GRADE
BENCHMARK (TBM)
DOUBLE POST SIGN
SINGLE POST SIGN
WELL
TEST PIT
FAILED TEST PIT
MONITORING WELL
PERC TEST
PHOTO LOCATION
TREES AND BUSHES
UTILITY POLE
LIGHT POLES
DRAIN MANHOLE
SEWER MANHOLE
HYDRANT
WATER GATE
WATER SHUT OFF
REDUCER
SINGLE GRATE CATCH BASIN
DOUBLE GRATE CATCH BASIN
TRANSFORMER
CULVERT W/WINGWALLS
CULVERT W/FLARED END SECTION
CULVERT W/STRAIGHT HEADWALL
STONE CHECK DAM
DRAINAGE FLOW DIRECTION
4K SEPTIC AREA
WETLAND IMPACT
VEGETATED FILTER STRIP
RIPRAP
PAVEMENT HATCH
OPEN WATER
FRESHWATER WETLANDS
TIDAL WETLANDS
STABILIZED CONSTRUCTION ENTRANCE
CONCRETE
GRAVEL
SNOW STORAGE
RETAINING WALL



LOCUS MAP

SCALE 1" = 2000'

SHEET INDEX

CS	COVER SHEET
C1	EXISTING CONDITIONS PLAN
C2	SITE PLAN
C3	GRADING AND DRAINAGE PLAN
C4	UTILITY PLAN
L1	LIGHTING PLAN
L2	LANDSCAPING PLAN
T1	TRUCK TURNING PLAN
D1-D5	DETAIL SHEETS
E1-E2	EROSION AND SEDIMENT CONTROL DETAILS

CIVIL ENGINEER / SURVEYOR

JONES & BEACH ENGINEERS, INC.
100 DOMAIN DRIVE, SUITE 201
EXETER, NH 03833
(603) 772-4746
CONTACT: ERIK POULIN, P.E.
E-MAIL: EPOULIN@JONESANDBEACH.COM

WETLAND CONSULTANT

GOVE ENVIRONMENTAL SERVICES
8 CONTINENTAL DRIVE, UNIT H
EXETER, NH 03833-7507
(603) 778-0644
CONTACT: BRENDEN WALDEN

LANDSCAPE DESIGNER

LM LAND DESIGN, LLC
11 SOUTH ROAD
BRENTWOOD, NH 03833
(603) 770-7728
CONTACT: LISE MCNAUGHTON

WATER

CITY OF PORTSMOUTH
DEPARTMENT OF PUBLIC WORKS
WATER DIVISION
680 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
(603) 427-1530

SEWER

CITY OF PORTSMOUTH
DEPARTMENT OF PUBLIC WORKS
SEWER DIVISION
680 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
(603) 766-1421

LIGHTING DESIGN

EXPOSURE LIGHTING
501 ISLINGTON STREET, UNIT 1A
PORTSMOUTH, NH 03801
CONTACT: KEN SWEENEY

ELECTRIC

EVERSOURCE
1700 LAFAYETTE ROAD
PORTSMOUTH, NH 03801
(800) 662-7764

TELEPHONE

CONSOLIDATED COMMUNICATIONS
1575 GREENLAND ROAD
GREENLAND, NH 03840
(800) 427-5525

CABLE TV

COMCAST COMMUNICATION CORPORATION
334-B CALEF HIGHWAY
EPPING, NH 03042-2325
(603) 679-5695

PROJECT PARCEL
TOWN OF PORTSMOUTH
TAX MAP 229, LOT 6A

APPLICANT
LEDGEWOOD DRIVE LLC
ATTN. BEN MIDDLETON
10 MAIN STREET
NEWFIELDS, NH 03856

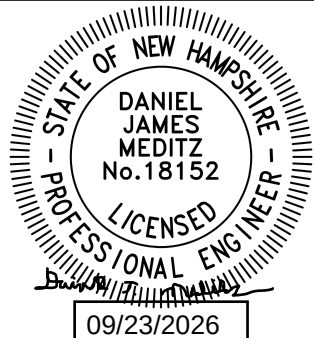
TOTAL LOT AREA
43,255 SQ. FT.
0.99 ACRES

CITY OF PORTSMOUTH PLANNING BOARD

CHAIRPERSON

DATE

Design: DJM	Draft: TCR	Date: 01/08/26
Checked: EMP	Scale: AS NOTED	Project No.: 25071.2
Drawing Name: 25071.2-PLAN.dwg		
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2	09/22/26	REVISED PER TAC COMMENTS	DJM
1	09/01/26	UPDATED TITLE BLOCK	DJM
0	08/17/26	ISSUED FOR REVIEW	DJM

J/B

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Jones & Beach Engineers, Inc.

100 Domain Dr.
Suite 201
Exeter, NH 03833

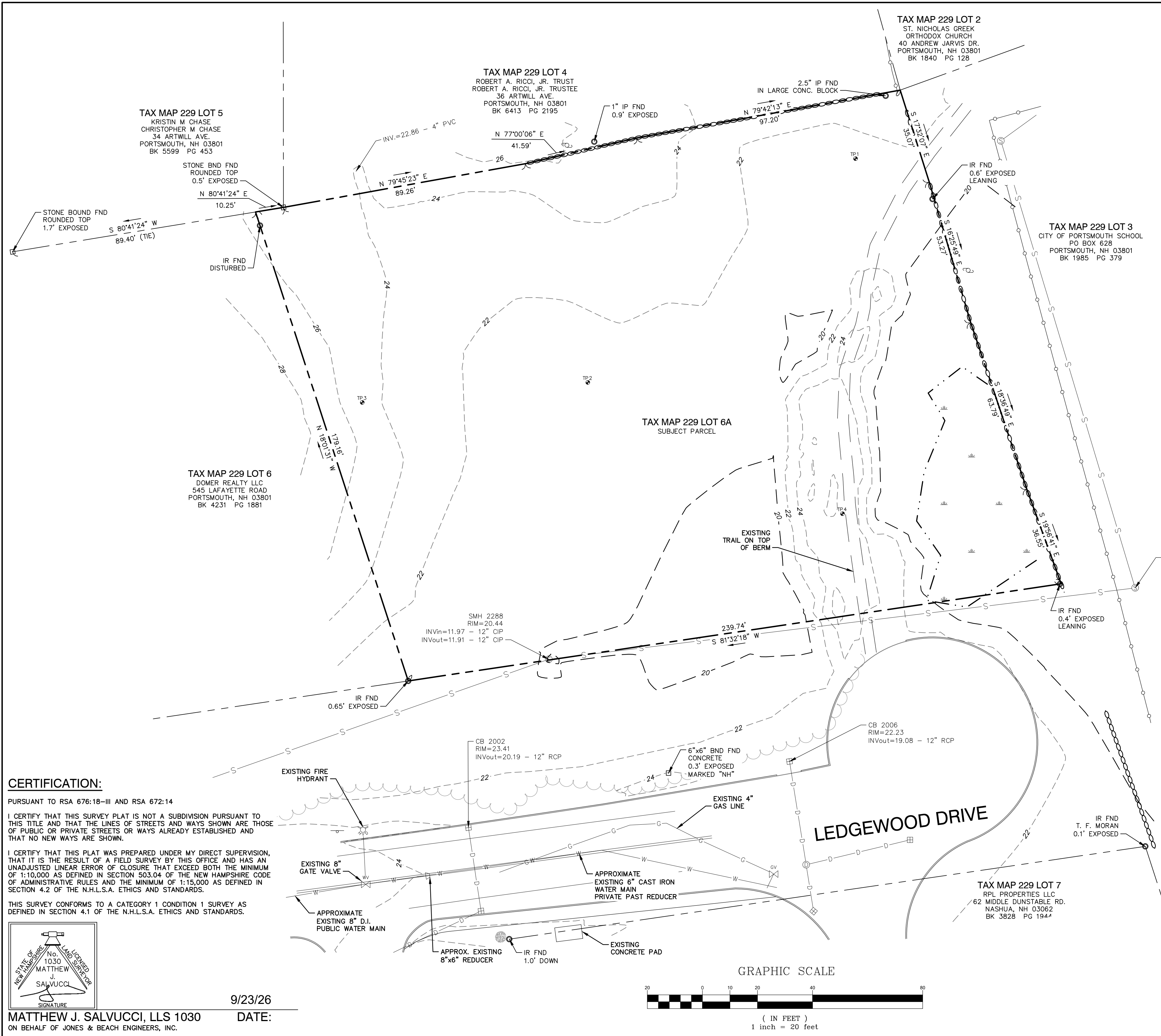
Civil Engineering Services

603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	COVER SHEET
Project:	LEDGEWOOD DRIVE LLC LEDGEWOOD DRIVE, PORTSMOUTH, NH 03801
Owner of Record:	ST NICHOLAS GREEK ORTHODOX CHURCH 40 ANDREW JARVIS DRIVE, PORTSMOUTH, NH 03801

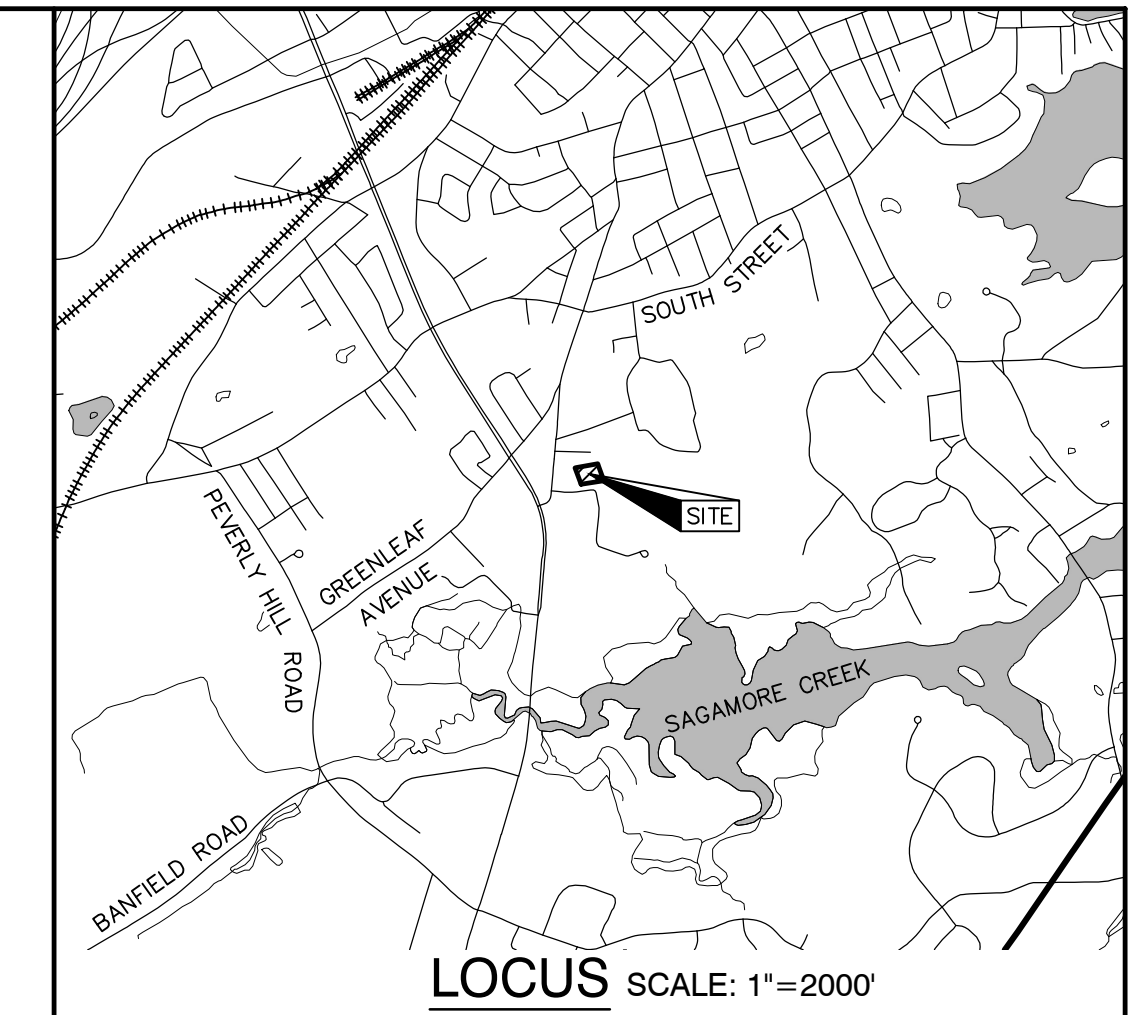
DRAWING No.
CS
SHEET 1 OF 15 JBE PROJECT NO. 25071.2

LEDGEWOOD DRIVE, PORTSMOUTH, NH 03801
JBE # 25071.2 REVISION 0, 09/18/26



PLAN REFERENCES:

- "PLAN OF THE HOMESTEAD FARM OF THE LATE SAMUEL LANGDON, PORTSMOUTH, NH" DRAWN BY A.C. HOYT, DATED MAY 23, 1882, COPIED BY JOHN W. DURGIN, NOVEMBER 7, 1927. R.C.R.D. 0364.
- "EXISTING CONDITIONS PLAN, COMMERCIAL DEVELOPMENT, 581 LAFAYETTE ROAD, PORTSMOUTH, NH" BY AMBIT ENGINEERING, INC., DATED JANUARY 3, 2025.
- "LAND IN PORTSMOUTH, NH, SAMUEL S. LANGDON TO T.J. DOWNS" BY JOHN W. DURGIN, DATED DECEMBER 1937. R.C.R.D. 0998.
- "LAND IN PORTSMOUTH, NH, SAMUEL S. LANGDON TO JOHN L. PHELPS" BY JOHN W. DURGIN, DATED SEPTEMBER 1935. R.C.R.D. 01017.
- "PLAN OF LOTS OWNED BY BEATRICE L. HOPLEY, LAFAYETTE ROAD, PORTSMOUTH, NH" BY JOHN W. DURGIN, DATED DECEMBER 1, 1957. R.C.R.D. 02632.
- "PLAN OF LOTS OWNED BY BEATRICE L. HOPLEY, LAFAYETTE ROAD, PORTSMOUTH, NH" BY JOHN W. DURGIN, DATED NOVEMBER 12, 1958. R.C.R.D. 02637.
- "PLAN OF LAND IN PORTSMOUTH, NH" SURVEYED FORY THOMAS B. KREMP," PREPARED BY TPE ASSOCIATES. DATED FEBRUARY 19, 1982. R.C.R.D. 10640.
- "EASEMENT PLAN, TAX MAP 229 - LOT 5, KRISTEN M. CHASE TO THE CITY OF PORTSMOUTH" BY GREENMAN-PEDERSON, INC., DATED JANUARY 24, 2018. R.C.R.D. 40627.
- "CORRECTIVE SEWER EASEMENT PLAN OVER LAND OF KARONA, LLC, 36 ARTWILL AVENUE, PORTSMOUTH, NH, ASSESSOR'S PARCEL 229-4, FOR KARONA, LLC" BY JAMES VERRA AND ASSOCIATES, INC., DATED FEBRUARY 9, 2021. R.C.R.D. 42611.



NOTES:

- THE INTENT OF THIS PLAN IS TO SHOW THE BOUNDARY AND EXISTING CONDITIONS OF PORTSMOUTH TAX MAP 229 LOT 6A.
- UNDERGROUND FACILITIES, UTILITIES AND STRUCTURES HAVE BEEN SKETCHED IN PER UTILITY LAYOUT PROVIDED BY PORTSMOUTH DEPARTMENT OF PUBLIC WORKS AND THEIR LOCATION MUST BE CONSIDERED APPROXIMATE ONLY. NEITHER JONES & BEACH ENGINEERS, INC., ANY OF THEIR EMPLOYEES, NOR PORTSMOUTH DEPARTMENT OF PUBLIC WORKS TAKE RESPONSIBILITY FOR THE LOCATION OF ANY UNDERGROUND STRUCTURES OR UTILITIES NOT SHOWN THAT MAY EXIST. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL UNDERGROUND STRUCTURES AND/OR UTILITIES LOCATED PRIOR TO EXCAVATION WORK BY CALLING 1-888-DIG-SAFE (1-888-344-7233).
- BASIS OF BEARING: HORIZONTAL - NH STATE PLANE. VERTICAL - NAVD88.
- CERTAIN DATA HEREON MAY VARY FROM RECORDED DATA DUE TO DIFFERENCES IN DECLINATION, ORIENTATION, AND METHODS OF MEASUREMENT.
- ALL BOOK AND PAGE NUMBERS REFER TO THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
- THE TAX MAP AND LOT NUMBERS ARE BASED ON THE TOWN OF PORTSMOUTH TAX RECORDS AND ARE SUBJECT TO CHANGE.
- THIS SURVEY IS NOT A CERTIFICATION TO OWNERSHIP OR TITLE OF LANDS SHOWN. OWNERSHIP AND ENCUMBRANCES ARE MATTERS OF TITLE EXAMINATION NOT OF A BOUNDARY SURVEY. THE INTENT OF THIS PLAN IS TO RETRACE THE BOUNDARY LINES OF DEEDS REFERENCED HEREON. OWNERSHIP OF ADJOINING PROPERTIES IS ACCORDING TO ASSESSOR'S RECORDS. THIS PLAN MAY OR MAY NOT INDICATE ALL ENCUMBRANCES EXPRESSED, IMPLIED OR PRESCRIPTIVE.
- ANY USE OF THIS PLAN AND OR ACCOMPANYING DESCRIPTIONS SHOULD BE DONE WITH LEGAL COUNSEL, TO BE CERTAIN THAT TITLES ARE CLEAR, THAT INFORMATION IS CURRENT, AND THAT ANY NECESSARY CERTIFICATES ARE IN PLACE FOR A PARTICULAR CONVEYANCE, OR OTHER USES.
- SUBJECT PROPERTY IS NOT LOCATED WITHIN FEDERALLY DESIGNATED FLOOD HAZARD ZONE. REFERENCE FEMA COMMUNITY PANEL NO. 33015C0270F, DATED JANUARY 29, 2021.
- THE LIMITS OF JURISDICTIONAL WETLANDS WERE DELINEATED BY BRENDEN WALDEN DURING SUMMER, 2025 IN ACCORDANCE WITH THE FOLLOWING GUIDANCE DOCUMENTS:
 - THE CORPS OF ENGINEERS FEDERAL MANUAL FOR IDENTIFYING AND DELINEATING JURISDICTIONAL WETLANDS.
 - THE NORTH CENTRAL & NORTHEAST REGIONAL SUPPLEMENT TO THE FEDERAL MANUAL
 - THE CURRENT VERSION OF THE FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, AS PUBLISHED BY THE NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION AND/OR THE CURRENT VERSION OF THE FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, AS PUBLISHED BY THE USDA, NRCS, AS APPROPRIATE.
 - THE CURRENT NATIONAL LIST OF PLANT SPECIES THAT OCCUR IN WETLANDS, AS PUBLISHED BY THE US FISH AND WILDLIFE SERVICE.
- SURVEY TIE LINES SHOWN HEREON ARE NOT BOUNDARY LINES. THEY SHOULD ONLY BE USED TO LOCATE THE PARCEL SURVEYED FROM THE FOUND MONUMENTS SHOWN AND LOCATED BY THIS SURVEY.

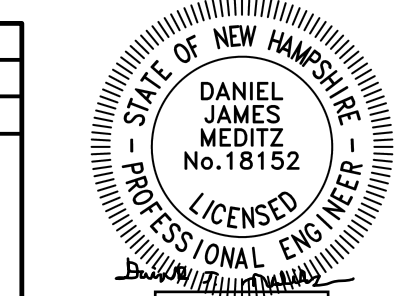
LEGEND

---	PROPERTY LINE
---	ABUTTER PROPERTY LINE
---	SURVEY TIE LINES
---	WETLANDS
---	TREE LINE
---	EDGE OF PAVEMENT
---	STONE WALL
---	REMNANT STONE WALL
---	MAJOR CONTOUR
---	MINOR CONTOUR
---	DRAIN LINE
---	CATCH BASIN
---	DRAIN MANHOLE
---	WATER LINE
---	HYDRANT
---	WATER GATE VALVE
---	WATER SHUTOFF
---	SEWER LINE
---	SEWER MANHOLE
---	UTILITY POLE
---	GAS LINE
---	GAS GATE VALVE

ZONING SUMMARY		
ZONE	GATEWAY CORRIDOR (G1)	
	REQUIRED	PROPOSED
FRONT SETBACK	10' MIN., 30' MAX	15'
MINIMUM SIDE SETBACK	15'	28.7'
MINIMUM REAR SETBACK	20'	41.3'
MINIMUM WETLAND BUFFER	0 (WETLAND < 10,000 S.F.)	
MINIMUM OPEN SPACE	20% OF LOT	47.8%
MAXIMUM BUILDING COVERAGE	50%	29.3%
MINIMUM STREET FRONTAGE	50'	239.74'
MAXIMUM BUILDING HEIGHT	4 STORIES OR 50'	36'

PROJECT PARCEL TOWN OF PORTSMOUTH TAX MAP 229, LOT 6A
APPLICANT LEDGEWOOD DRIVE LLC ATTN. BEN MIDDLETON 10 MAIN STREET NEWFIELDS, NH 03856
TOTAL LOT AREA 43,255 SQ. FT. 0.99 ACRES

Design: DJM	Draft: TCR	Date: 01/08/26
Checked: EMP	Scale: AS NOTED	Project No.: 25071.2
Drawing Name: 25071.2-PLAN.dwg		
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REV.	DATE	REVISION	BY

Designed and Produced in NH

J/B Jones & Beach Engineers, Inc.

100 Domain Dr.
Suite 201
Exeter, NH 03833

Civil Engineering Services

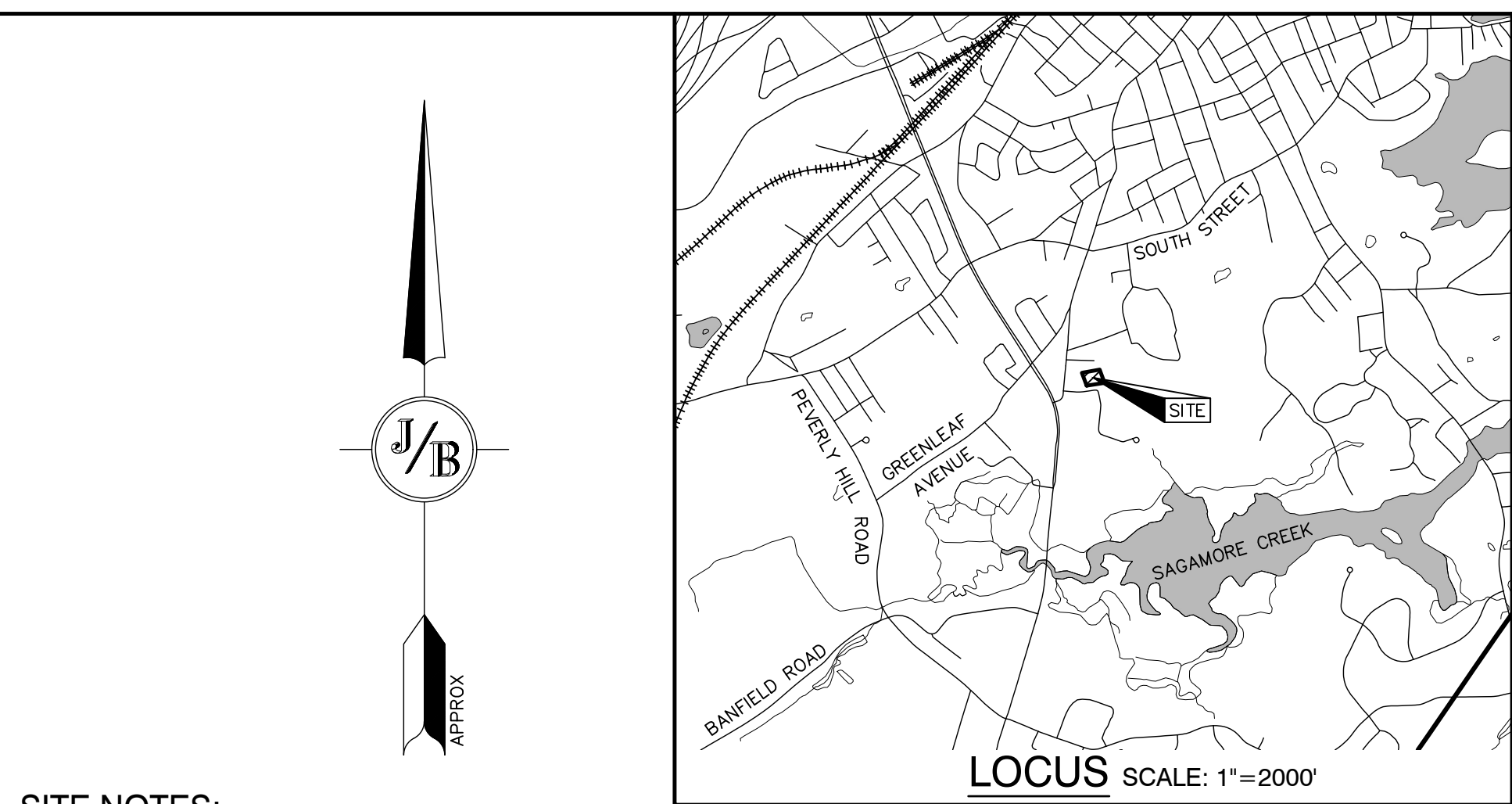
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	EXISTING CONDITIONS PLAN
Project:	LEDGEWOOD DRIVE LLC LEDGEWOOD DRIVE, PORTSMOUTH, NH 03801
Owner of Record:	ST NICHOLAS GREEK ORTHODOX CHURCH 40 ANDREW JARVIS DRIVE, PORTSMOUTH, NH 03801

DRAWING No.

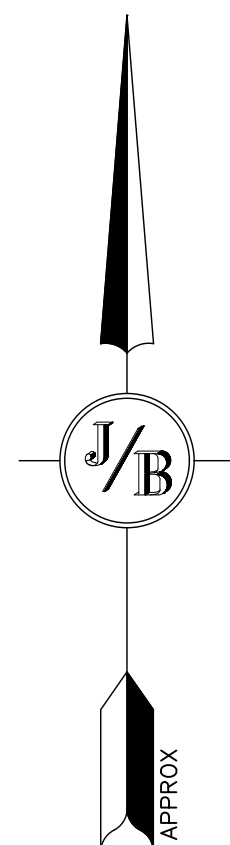
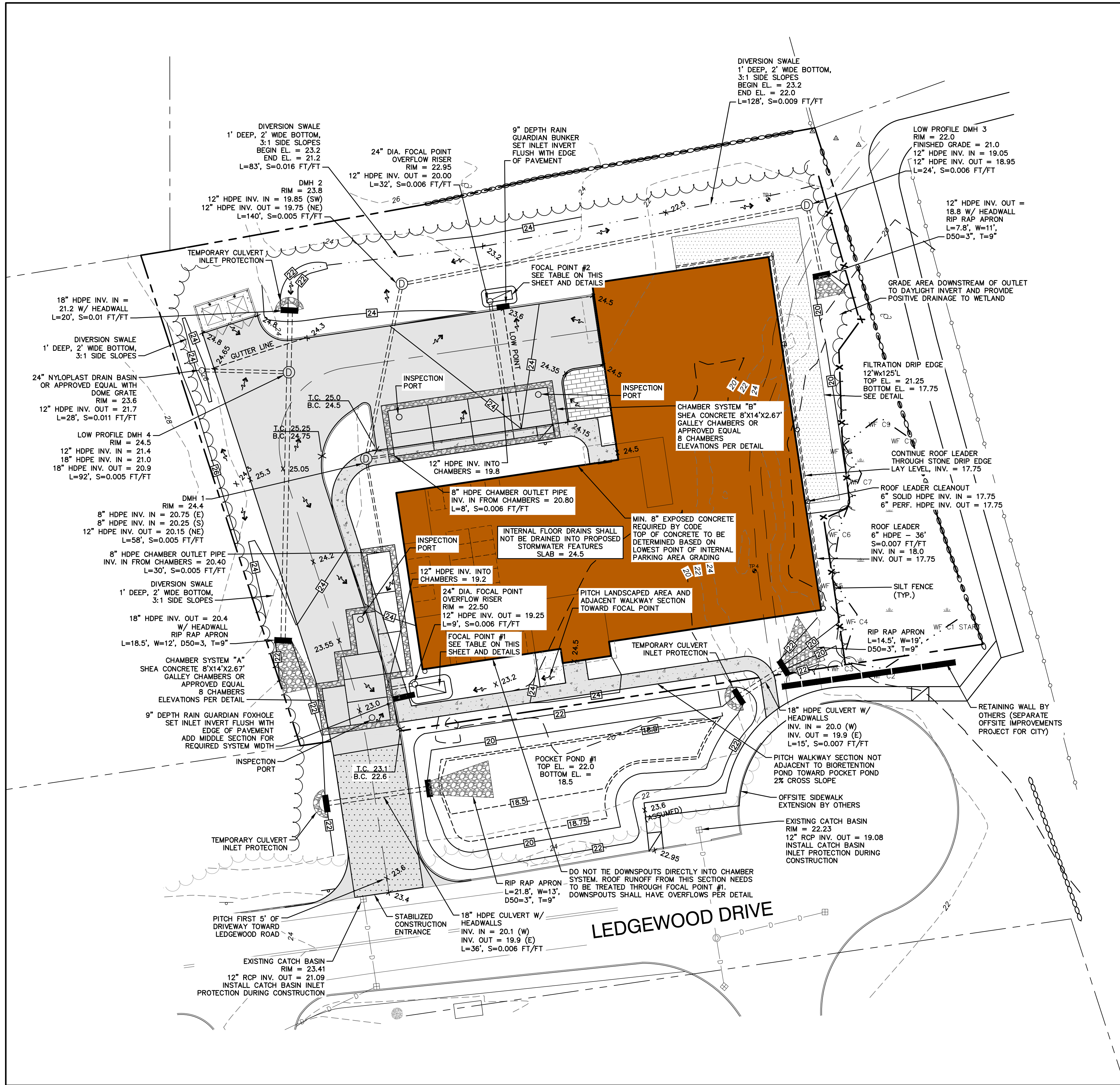
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SHEET 2 OF 15
JBE PROJECT NO. 25071.2



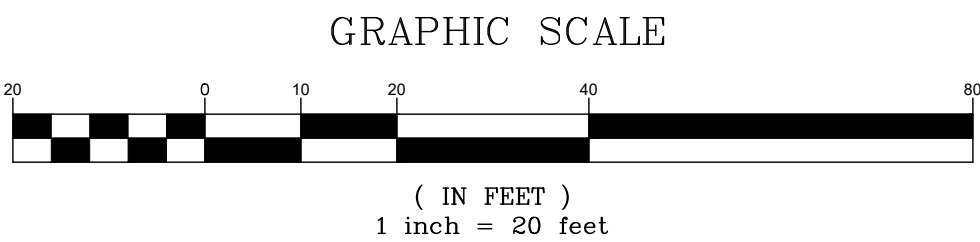
ZONING SUMMARY		
ZONE	GATEWAY CORRIDOR (G1)	
	REQUIRED	PROPOSED
FRONT SETBACK	10' MIN., 30' MAX	14' TO OVERHANG, 15' TO WALL
MINIMUM SIDE SETBACK	15'	28.7'
MINIMUM REAR SETBACK	20'	39.2'
MINIMUM WETLAND BUFFER	0 (WETLAND < 10,000 S.F.)	
MINIMUM OPEN SPACE	20% OF LOT	47.8%
MAXIMUM BUILDING COVERAGE	50%	29.2%
MINIMUM STREET FRONTAGE	50'	239.74'
MAXIMUM BUILDING HEIGHT	4 STORIES OR 50'	36'

Plan Name:	SITE PLAN MAP 229, LOT 6A
Project:	LEDGEWOOD DRIVE LLC LEDGEWOOD DRIVE, PORTSMOUTH, NH 03801
Owner of Record:	ST NICHOLAS GREEK ORTHODOX CHURCH 40 ANDREW JARVIS DRIVE, PORTSMOUTH, NH 03801



GRADING AND DRAINAGE NOTES:

- UNDERGROUND FACILITIES, UTILITIES AND STRUCTURES HAVE BEEN PLOTTED FROM FIELD OBSERVATION AND THEIR LOCATION MUST BE CONSIDERED APPROXIMATE ONLY. NEITHER JONES & BEACH ENGINEERS, INC., NOR ANY OF THEIR EMPLOYEES TAKE RESPONSIBILITY FOR THE LOCATION OF ANY UNDERGROUND STRUCTURES AND/OR UTILITIES NOT SHOWN THAT MAY EXIST. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL UNDERGROUND STRUCTURES AND/OR UTILITIES LOCATED PRIOR TO EXCAVATION WORK BY CALLING 888-DIG-SAFE (888-344-7233).
- ALL BENCHMARKS AND TOPOGRAPHY SHALL BE FIELD VERIFIED BY THE CONTRACTOR.
- SITE GRADING SHALL NOT PROCEED UNTIL EROSION CONTROL MEASURES HAVE BEEN INSTALLED. SEE CONSTRUCTION SEQUENCE ON SHEET E1.
- PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR IS REQUIRED TO HAVE THE PROJECT'S LAND SURVEYOR STAKE OR FLAG CLEARING LIMITS. A MINIMUM OF 48 HOURS NOTICE IS REQUIRED.
- ALL ROOF DRAINS FROM BUILDING SHALL END 5' OUTSIDE THE BUILDING LIMITS AS SHOWN ON PLAN AND SHALL BE PROVIDED WITH A TEMPORARY PLUG AND WITNESS AT THE END. ALL EXTERIOR ROOF DOWNSPOUTS ARE TO BE INSTALLED WITH OVERFLOW DEVICES.
- ALL SWALES AND DETENTION PONDS ARE TO BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
- PROPOSED RIM ELEVATIONS OF DRAINAGE STRUCTURES ARE APPROXIMATE. FINAL ELEVATIONS ARE TO BE SET FLUSH WITH FINISH GRADES.
- ALL SWALES AND ANY SLOPES GREATER THAN 3:1 SHALL BE STABILIZED WITH NORTH AMERICAN GREEN S150 EROSION CONTROL BLANKETS (OR AN EQUIVALENT APPROVED IN WRITING BY THE ENGINEER), UNLESS OTHERWISE SPECIFIED.
- ALL DRAINAGE AND SANITARY STRUCTURE INTERIOR DIAMETERS (4' MIN) SHALL BE DETERMINED BY THE MANUFACTURER BASED ON THE PIPE CONFIGURATIONS SHOWN ON THESE PLANS. CATCH BASINS SHALL HAVE 3' DEEP SUMPS WITH GREASE HOODS, UNLESS OTHERWISE NOTED.
- ALL DRAINAGE STRUCTURES SHALL BE PRECAST, UNLESS OTHERWISE SPECIFIED. SEE DETAIL SHEETS FOR DRAINAGE DETAILS.
- ALL DRAINAGE STRUCTURES AND STORMWATER PIPES SHALL MEET HEAVY DUTY TRAFFIC H20 LOADING AND SHALL BE INSTALLED ACCORDINGLY.
- IMMEDIATELY APPLY AND COMPACT STONE BASE FOR BUILDING PAD TO +/- 1/2" PRIOR TO EXCAVATING INTERIOR AND PERIMETER FOOTINGS.
- IN AREAS WHERE CONSTRUCTION IS PROPOSED ADJACENT TO ABUTTING PROPERTIES, THE CONTRACTOR SHALL INSTALL ORANGE CONSTRUCTION FENCING ALONG PROPERTY LINES IN ALL AREAS WHERE SILT FENCING IS NOT REQUIRED.
- ALL DRAINAGE PIPE SHALL BE NON-PERFORATED ADS N-12 OR APPROVED EQUAL, UNLESS OTHERWISE SPECIFIED.
- STONE INLET PROTECTION SHALL BE PLACED AT EXISTING CATCH BASINS. SEE DETAIL WITHIN THE DETAIL SHEETS.
- LAND DISTURBING ACTIVITIES SHALL NOT COMMENCE UNTIL APPROVAL TO DO SO HAS BEEN RECEIVED BY ALL GOVERNING AUTHORITIES. THE GENERAL CONTRACTOR SHALL STRICTLY ADHERE TO THE EPA SWPPP DURING CONSTRUCTION OPERATIONS.
- ALL EXPOSED AREAS SHALL BE SEEDED AS SPECIFIED WITHIN 3 DAYS OF FINAL GRADING AND ANYTIME CONSTRUCTION STOPS FOR LONGER THAN 3 DAYS.
- MAINTAIN EROSION CONTROL MEASURES AFTER EACH RAIN EVENT OF 0.25" OR GREATER IN A 24 HOUR PERIOD AND AT LEAST ONCE A WEEK.
- THIS PLAN SHALL NOT BE CONSIDERED ALL INCLUSIVE, AS THE GENERAL CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SEDIMENT FROM LEAVING THE SITE.
- CONSTRUCTION VEHICLES SHALL UTILIZE THE STABILIZED CONSTRUCTION ENTRANCE TO THE EXTENT POSSIBLE THROUGHOUT CONSTRUCTION.
- IF INSTALLATION OF STORM DRAINAGE SYSTEM SHOULD BE INTERRUPTED BY WEATHER OR NIGHTFALL, THE PIPE ENDS SHALL BE COVERED WITH FILTER FABRIC.
- THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO TAKE WHATEVER MEANS NECESSARY TO ESTABLISH PERMANENT SOIL STABILIZATION.
- SEDIMENT SHALL BE REMOVED FROM ALL SEDIMENT BASINS BEFORE THEY ARE 25% FULL.
- ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH PROJECT SPECIFICATIONS.
- ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED, IF DEEMED NECESSARY BY ON-SITE INSPECTION BY ENGINEER AND/OR REGULATORY OFFICIALS.
- SEE ALSO EROSION AND SEDIMENT CONTROL SPECIFICATIONS ON SHEETS E1-E2.



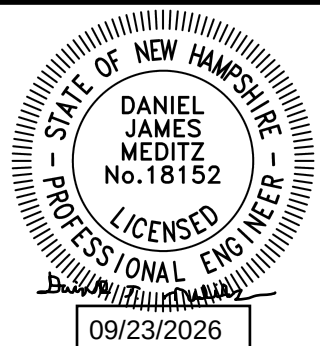
FOCAL POINT SCHEDULE						
FOCAL POINT	BOTTOM SIZE	SIDE SLOPES	BERM EL.	BOTTOM OF SURFACE PONDING	BOTTOM OF FILTER COURSE	R-TANK UNDERDRAIN INVERT
1	4' x 10'	3:1	22.75	22.00	20.25	19.25
2	3' x 9'	3:1	23.25	22.75	21.00	20.00

PROJECT PARCEL
TOWN OF PORTSMOUTH
TAX MAP 229, LOT 6A

APPLICANT
LEDGEWOOD DRIVE LLC
ATTN. BEN MIDDLETON
10 MAIN STREET
NEWFIELDS, NH 03856

TOTAL LOT AREA
43,255 SQ. FT.
0.99 ACRES

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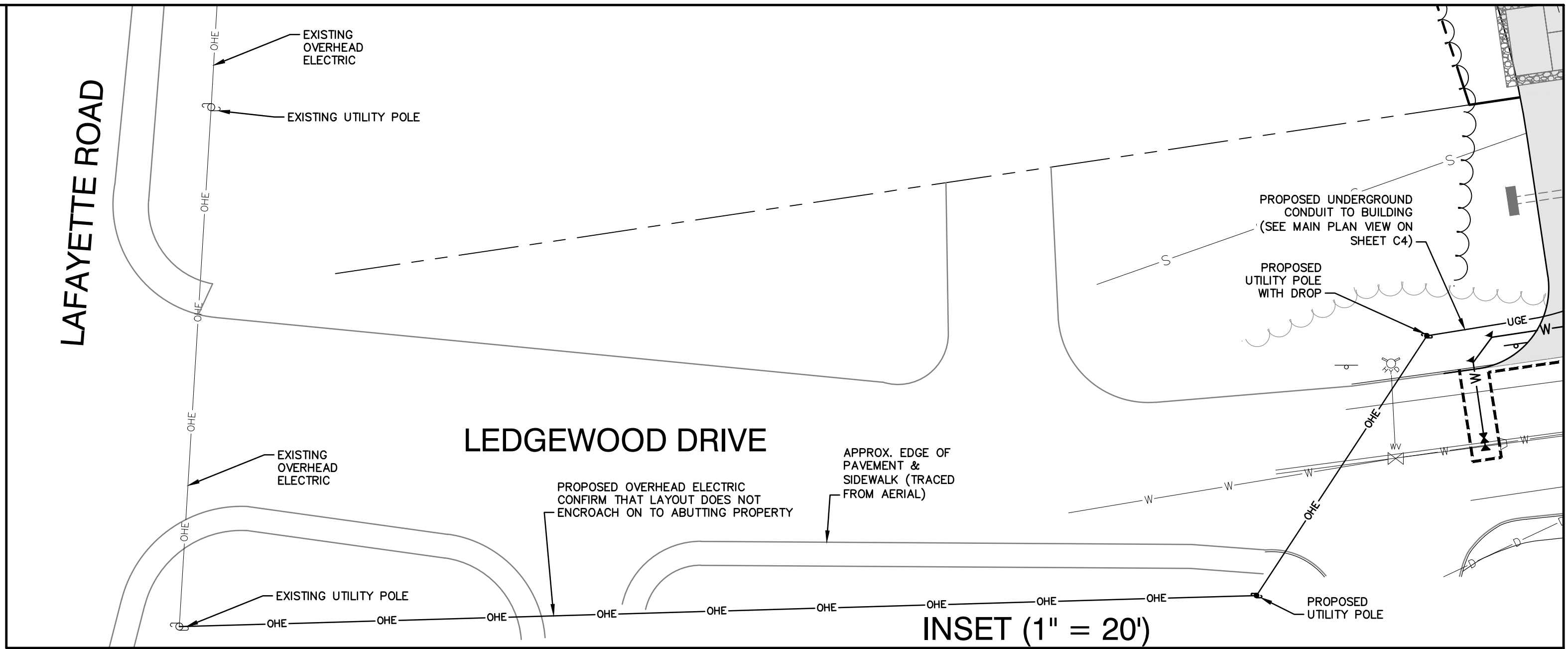
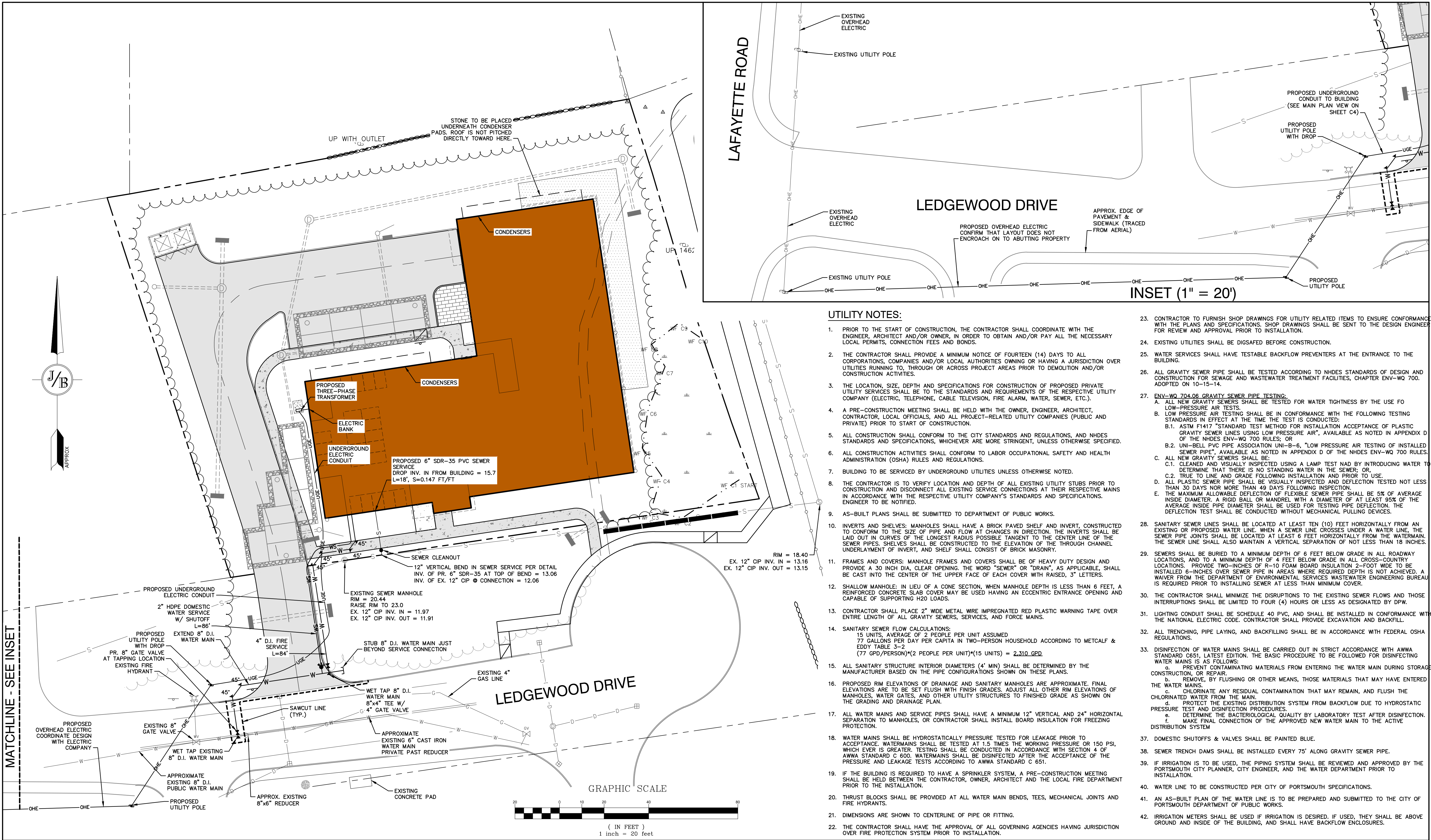
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	GRADING AND DRAINAGE PLAN
Project:	LEDGEWOOD DRIVE LLC LEDGEWOOD DRIVE, PORTSMOUTH, NH 03801
Owner of Record:	ST NICHOLAS GREEK ORTHODOX CHURCH 40 ANDREW JARVIS DRIVE, PORTSMOUTH, NH 03801

DRAWING No.

C3

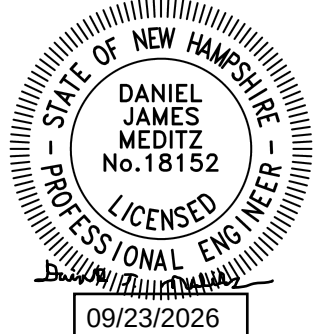
SHEET 4 OF 15
JBE PROJECT NO. 25071.2



UTILITY NOTES:

- PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER, ARCHITECT AND/OR OWNER, IN ORDER TO OBTAIN AND/OR PAY ALL THE NECESSARY LOCAL PERMITS, CONNECTION FEES AND BONDS.
- THE CONTRACTOR SHALL PROVIDE A MINIMUM NOTICE OF FOURTEEN (14) DAYS TO ALL CORPORATIONS, COMPANIES AND/OR LOCAL AUTHORITIES OWNING OR HAVING A JURISDICTION OVER UTILITIES RUNNING TO, THROUGH OR ACROSS PROJECT AREAS PRIOR TO DEMOLITION AND/OR CONSTRUCTION ACTIVITIES.
- THE LOCATION, SIZE, DEPTH AND SPECIFICATIONS FOR CONSTRUCTION OF PROPOSED PRIVATE UTILITY SERVICES SHALL BE TO THE STANDARDS AND REQUIREMENTS OF THE RESPECTIVE UTILITY COMPANY (ELECTRIC, TELEPHONE, CABLE TELEVISION, FIRE ALARM, WATER, SEWER, ETC.).
- A PRE-CONSTRUCTION MEETING SHALL BE HELD WITH THE OWNER, ENGINEER, ARCHITECT, CONTRACTOR, LOCAL OFFICIALS, AND ALL PROJECT-RELATED UTILITY COMPANIES (PUBLIC AND PRIVATE) PRIOR TO START OF CONSTRUCTION.
- ALL CONSTRUCTION SHALL CONFORM TO THE CITY STANDARDS AND REGULATIONS, AND NHDES STANDARDS AND SPECIFICATIONS, WHICHEVER ARE MORE STRINGENT, UNLESS OTHERWISE SPECIFIED.
- ALL CONSTRUCTION ACTIVITIES SHALL CONFORM TO LABOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) RULES AND REGULATIONS.
- BUILDING TO BE SERVED BY UNDERGROUND UTILITIES UNLESS OTHERWISE NOTED.
- THE CONTRACTOR IS TO VERIFY LOCATION AND DEPTH OF ALL EXISTING UTILITY STUBS PRIOR TO CONSTRUCTION AND DISCONNECT ALL EXISTING SERVICE CONNECTIONS AT THEIR RESPECTIVE MAINS IN ACCORDANCE WITH THE RESPECTIVE UTILITY COMPANY'S STANDARDS AND SPECIFICATIONS. ENGINEER TO BE NOTIFIED.
- AS-BUILT PLANS SHALL BE SUBMITTED TO DEPARTMENT OF PUBLIC WORKS.
- INVERTS AND SHELVES: MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT, CONSTRUCTED TO CONFORM TO THE SIZE OF PIPE AND FLOW AT CHANGES IN DIRECTION. THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE THROUGH CHANNEL UNDERLAYMENT OF INVERT, AND SHELF SHALL CONSIST OF BRICK MASONRY.
- FRAMES AND COVERS: MANHOLE FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30 INCH DIA. CLEAR OPENING. THE WORD "SEWER" OR "DRAIN", AS APPLICABLE, SHALL BE CAST INTO THE CENTER OF THE UPPER FACE OF EACH COVER WITH RAISED, 3" LETTERS.
- SHALLOW MANHOLE: IN LIEU OF A CONE SECTION, WHEN MANHOLE DEPTH IS LESS THAN 6 FEET, A REINFORCED CONCRETE SLAB COVER MAY BE USED HAVING AN ECCENTRIC ENTRANCE OPENING AND CAPABLE OF SUPPORTING H2O LOADS.
- CONTRACTOR SHALL PLACE 2" WIDE METAL WIRE IMPREGNATED RED PLASTIC WARNING TAPE OVER ENTIRE LENGTH OF ALL GRAVITY SEWERS, SERVICES, AND FORCE MAINS.
- SANITARY SEWER FLOW CALCULATIONS:
15 UNITS, AVERAGE OF 2 PEOPLE PER UNIT ASSUMED
77 GALLONS PER DAY PER CAPITA IN TWO-PERSON HOUSEHOLD ACCORDING TO METCALF & EDDY TABLE 3-2
 $(77 \text{ GPD/PERSON}) \times (2 \text{ PEOPLE PER UNIT}) \times (15 \text{ UNITS}) = 2,310 \text{ GPD}$
- ALL SANITARY STRUCTURE INTERIOR DIAMETERS (4" MIN) SHALL BE DETERMINED BY THE MANUFACTURER BASED ON THE PIPE CONFIGURATIONS SHOWN ON THESE PLANS.
- PROPOSED RIM ELEVATIONS OF DRAINAGE AND SANITARY MANHOLES ARE APPROXIMATE. FINAL ELEVATIONS ARE TO BE SET FLUSH WITH FINISH GRADES. ADJUST ALL OTHER RIM ELEVATIONS OF MANHOLES, WATER GATES, AND OTHER UTILITY STRUCTURES TO FINISHED GRADE AS SHOWN ON THE GRADING AND DRAINAGE PLAN.
- ALL WATER MAINS AND SERVICE PIPES SHALL HAVE A MINIMUM 12" VERTICAL AND 24" HORIZONTAL SEPARATION TO MANHOLES, OR CONTRACTOR SHALL INSTALL BOARD INSULATION FOR FREEZING PROTECTION.
- WATER MAINS SHALL BE HYDROSTATICALLY PRESSURE TESTED FOR LEAKAGE PRIOR TO ACCEPTANCE. WATERMANS SHALL BE TESTED AT 1.5 TIMES THE WORKING PRESSURE OR 150 PSI, WHICHEVER IS GREATER. TESTING SHALL BE CONDUCTED IN ACCORDANCE WITH SECTION 4 OF AWWA STANDARD C 600. WATERMANS SHALL BE DISINFECTED AFTER THE ACCEPTANCE OF THE PRESSURE AND LEAKAGE TESTS ACCORDING TO AWWA STANDARD C 651.
- IF THE BUILDING IS REQUIRED TO HAVE A SPRINKLER SYSTEM, A PRE-CONSTRUCTION MEETING SHALL BE HELD BETWEEN THE CONTRACTOR, OWNER, ARCHITECT AND THE LOCAL FIRE DEPARTMENT PRIOR TO THE INSTALLATION.
- THRUST BLOCKS SHALL BE PROVIDED AT ALL WATER MAIN BENDS, TEES, MECHANICAL JOINTS AND FIRE HYDRANTS.
- DIMENSIONS ARE SHOWN TO CENTERLINE OF PIPE OR FITTING.
- THE CONTRACTOR SHALL HAVE THE APPROVAL OF ALL GOVERNING AGENCIES HAVING JURISDICTION OVER FIRE PROTECTION SYSTEM PRIOR TO INSTALLATION.
- CONTRACTOR TO FURNISH SHOP DRAWINGS FOR UTILITY RELATED ITEMS TO ENSURE CONFORMANCE WITH THE PLANS AND SPECIFICATIONS. SHOP DRAWINGS SHALL BE SENT TO THE DESIGN ENGINEER FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.
- EXISTING UTILITIES SHALL BE DIGSAFED BEFORE CONSTRUCTION.
- WATER SERVICES SHALL HAVE TESTABLE BACKFLOW PREVENTERS AT THE ENTRANCE TO THE BUILDING.
- ALL GRAVITY SEWER PIPE SHALL BE TESTED ACCORDING TO NHDES STANDARDS OF DESIGN AND CONSTRUCTION FOR SEWAGE AND WASTEWATER TREATMENT FACILITIES, CHAPTER ENV-WQ 700. ADOPTED ON 10-15-14.
- ENV-WQ 704.06 GRAVITY SEWER PIPE TESTING:
A. ALL NEW GRAVITY SEWERS SHALL BE TESTED FOR WATER TIGHTNESS BY THE USE FO LOW-PRESSURE AIR TESTS.
B. LOW PRESSURE AIR TESTING SHALL BE IN CONFORMANCE WITH THE FOLLOWING TESTING STANDARDS IN EFFECT AT THE TIME THE TEST IS CONDUCTED:
B.1. ASTM F1417 "STANDARD TEST METHOD FOR INSTALLATION ACCEPTANCE OF PLASTIC GRAVITY SEWER LINES USING LOW PRESSURE AIR", AVAILABLE AS NOTED IN APPENDIX D OF THE NHDES ENV-WQ 700 RULES; OR
B.2. UNI-BELL PVC PIPE ASSOCIATION UNI-B-6, "LOW PRESSURE AIR TESTING OF INSTALLED SEWER PIPE", AVAILABLE AS NOTED IN APPENDIX D OF THE NHDES ENV-WQ 700 RULES.
C. ALL NEW GRAVITY SEWERS SHALL BE:
C.1. CLEANED AND VISUALLY INSPECTED USING A LAMP TEST NAD BY INTRODUCING WATER TO DETERMINE THAT THERE IS NO STANDING WATER IN THE SEWER; OR,
C.2. TRUE TO LINE AND GRADE FOLLOWING INSTALLATION AND PRIOR TO USE.
D. ALL PLASTIC SEWER PIPE SHALL BE VISUALLY INSPECTED AND DEFLECTION TESTED NOT LESS THAN 30 DAYS NOR MORE THAN 49 DAYS FOLLOWING INSPECTION.
E. THE MAXIMUM ALLOWABLE DEFLECTION OF FLEXIBLE SEWER PIPE SHALL BE 5% OF AVERAGE INSIDE DIAMETER. A RIGID BALL OR MANDREL WITH A DIAMETER OF AT LEAST 95% OF THE AVERAGE INSIDE PIPE DIAMETER SHALL BE USED FOR TESTING PIPE DEFLECTION. THE DEFLECTION TEST SHALL BE CONDUCTED WITHOUT MECHANICAL PULLING DEVICES.
- SANITARY SEWER LINES SHALL BE LOCATED AT LEAST TEN (10) FEET HORIZONTALLY FROM AN EXISTING OR PROPOSED WATER LINE. WHEN A SEWER LINE CROSSES UNDER A WATER LINE, THE SEWER PIPE JOINTS SHALL BE LOCATED AT LEAST 6 FEET HORIZONTALLY FROM THE WATERMAIN. THE SEWER LINE SHALL ALSO MAINTAIN A VERTICAL SEPARATION OF NOT LESS THAN 18 INCHES.
- SEWERS SHALL BE BURIED TO A MINIMUM DEPTH OF 6 FEET BELOW GRADE IN ALL ROADWAY LOCATIONS, AND TO A MINIMUM DEPTH OF 4 FEET BELOW GRADE IN ALL CROSS-COUNTRY LOCATIONS. PROVIDE TWO-INCHES OF R-10 FOAM BOARD INSULATION 2-FOOT WIDE TO BE INSTALLED 6-INCHES OVER SEWER PIPE IN AREAS WHERE REQUIRED DEPTH IS NOT ACHIEVED. A WAIVER FROM THE DEPARTMENT OF ENVIRONMENTAL SERVICES WASTEWATER ENGINEERING BUREAU IS REQUIRED PRIOR TO INSTALLING SEWER AT LESS THAN MINIMUM COVER.
- THE CONTRACTOR SHALL MINIMIZE THE DISRUPTIONS TO THE EXISTING SEWER FLOWS AND THOSE INTERRUPTIONS SHALL BE LIMITED TO FOUR (4) HOURS OR LESS AS DESIGNATED BY DPW.
- LIGHTING CONDUIT SHALL BE SCHEDULE 40 PVC, AND SHALL BE INSTALLED IN CONFORMANCE WITH THE NATIONAL ELECTRIC CODE. CONTRACTOR SHALL PROVIDE EXCAVATION AND BACKFILL.
- ALL TRENCHING, PIPE LAYING, AND BACKFILLING SHALL BE IN ACCORDANCE WITH FEDERAL OSHA REGULATIONS.
- DISINFECTION OF WATER MAINS SHALL BE CARRIED OUT IN STRICT ACCORDANCE WITH AWWA STANDARD C651, LATEST EDITION. THE BASIC PROCEDURE TO BE FOLLOWED FOR DISINFECTING WATER MAINS IS AS FOLLOWS:
a. PREVENT CONTAMINATING MATERIALS FROM ENTERING THE WATER MAIN DURING STORAGE, CONSTRUCTION, OR REPAIR.
b. REMOVE, BY FLUSHING OR OTHER MEANS, THOSE MATERIALS THAT MAY HAVE ENTERED THE WATER MAINS.
c. CHLORINATE ANY RESIDUAL CONTAMINATION THAT MAY REMAIN, AND FLUSH THE CHLORINATED WATER FROM THE MAIN.
d. PROTECT THE EXISTING DISTRIBUTION SYSTEM FROM BACKFLOW DUE TO HYDROSTATIC PRESSURE TEST AND DISINFECTION PROCEDURES.
e. DETERMINE THE BACTERIOLOGICAL QUALITY BY LABORATORY TEST AFTER DISINFECTION.
f. MAKE FINAL CONNECTION OF THE APPROVED NEW WATER MAIN TO THE ACTIVE DISTRIBUTION SYSTEM.
- DOMESTIC SHUTOFFS & VALVES SHALL BE PAINTED BLUE.
- SEWER TRENCH DAMS SHALL BE INSTALLED EVERY 75' ALONG GRAVITY SEWER PIPE.
- IF IRRIGATION IS TO BE USED, THE PIPING SYSTEM SHALL BE REVIEWED AND APPROVED BY THE PORTSMOUTH CITY PLANNER, CITY ENGINEER, AND THE WATER DEPARTMENT PRIOR TO INSTALLATION.
- WATER LINE TO BE CONSTRUCTED PER CITY OF PORTSMOUTH SPECIFICATIONS.
- AN AS-BUILT PLAN OF THE WATER LINE IS TO BE PREPARED AND SUBMITTED TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS.
- IRRIGATION METERS SHALL BE USED IF IRRIGATION IS DESIRED. IF USED, THEY SHALL BE ABOVE GROUND AND INSIDE OF THE BUILDING, AND SHALL HAVE BACKFLOW ENCLOSURES.

Design: DJM	Draft: TCR	Date: 01/08/26
Checked: EMP	Scale: AS NOTED	Project No.: 25071.2
Drawing Name: 25071.2-PLAN.dwg		
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100 Domain Dr.
Suite 201
Exeter, NH 03833

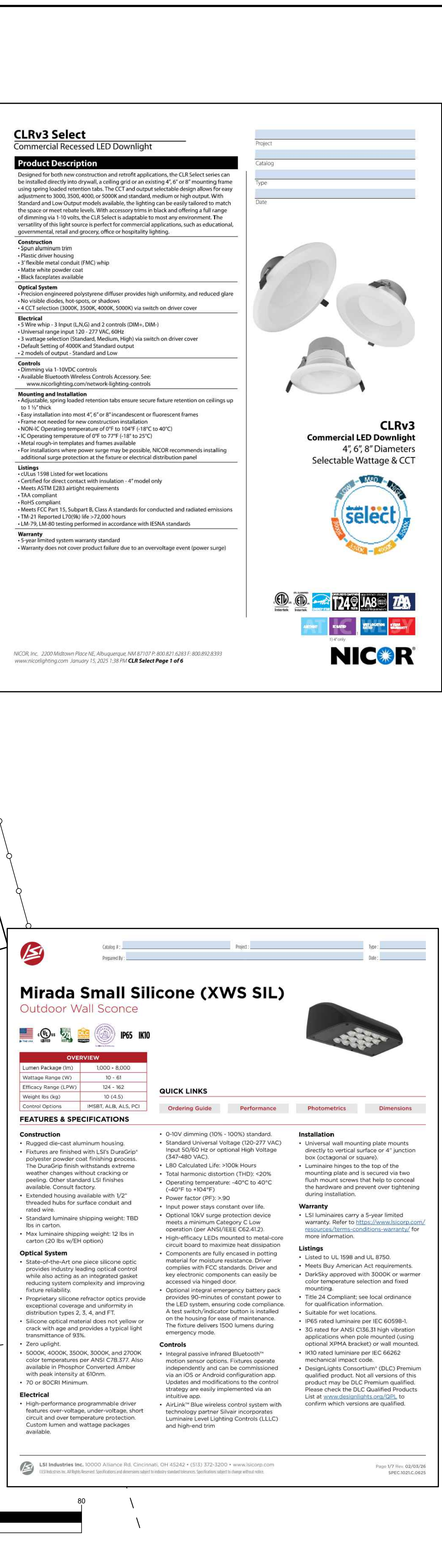
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Civil Engineering Services
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

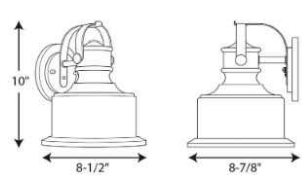
Plan Name:	UTILITY PLAN
Project:	LEDGEWOOD DRIVE LLC LEDGEWOOD DRIVE, PORTSMOUTH, NH 03801
Owner of Record:	ST NICHOLAS GREEK ORTHODOX CHURCH 40 ANDREW JARVIS DRIVE, PORTSMOUTH, NH 03801

DRAWING No.

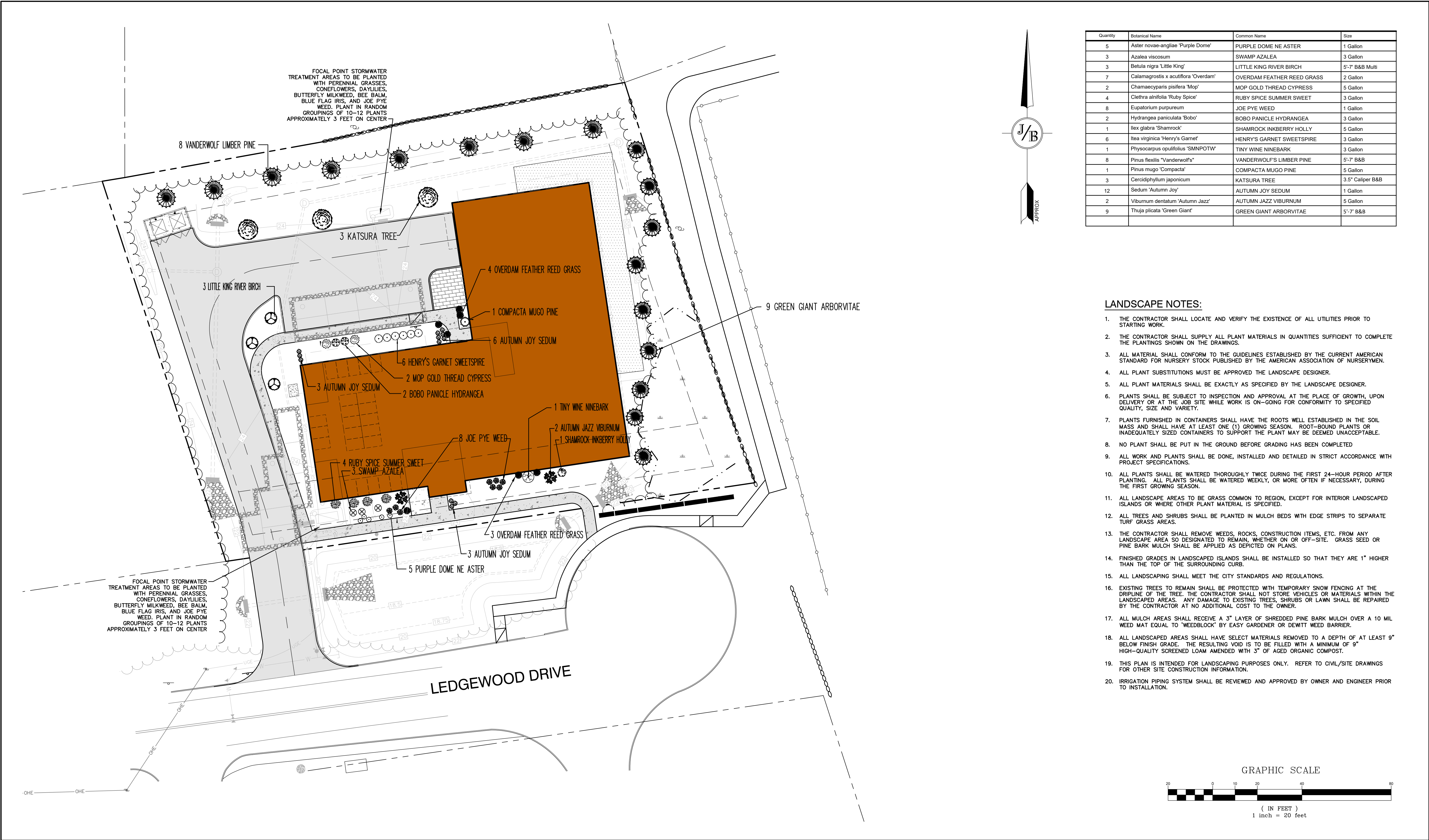
C4

SHEET 5 OF 15
JBE PROJECT NO. 25071.2



Lighting and Electrical Notes: 1. SITE ELECTRICAL CONTRACTOR SHALL COORDINATE LOCATION OF EASEMENTS, UNDERGROUND UTILITIES AND DRAINAGE BEFORE DRILLING POLE BASES. 2. CONTRACTOR SHALL INSTALL PROPOSED LIGHT POLES ACCORDING TO CITY REGULATIONS. 3. ALL OUTDOOR LIGHTING SYSTEMS SHALL BE EQUIPPED WITH TIMERS TO REDUCE ILLUMINATION LEVELS TO NON-OPERATIONAL VALUES PER CITY REGULATIONS. 4. LIGHTING CONDUIT SHALL BE SCHEDULE 40 PVC, AND SHALL BE INSTALLED IN CONFORMANCE WITH THE NATIONAL ELECTRICAL CODE. CONTRACTOR SHALL PROVIDE EXCAVATION AND BACKFILL. 5. ILLUMINATION READINGS SHOWN ARE BASED ON A TOTAL LLF OF 0.75 AT GRADE. ILLUMINATION READINGS SHOWN ARE IN UNITS OF FOOT-CANDELES. 6. LIGHTING CALCULATIONS SHOWN ARE NOT A SUBSTITUTE FOR INDEPENDENT ENGINEERING ANALYSIS OF LIGHTING SYSTEM AND SAFETY. 7. ALL LIGHTING FIXTURES SHALL BE FULL CUT-OFF DARK-SKY COMPLIANT, UNLESS OTHERWISE NOTED. 8. THE PROPOSED LIGHTING CALCULATIONS AND DESIGN WAS PERFORMED BY EXPOSURE LIGHTING LLC, 501 ISLINGTON ST., UNIT 1A, PORTSMOUTH, NH 03801 ATTENTION KEN SWEENEY. AN EQUAL LIGHTING DESIGN SHALL BE SUBMITTED FOR REVIEW IF EQUAL SUBSTITUTIONS ARE PROPOSED BY THE CONTRACTOR OR OWNER.																											
PROGRESS LIGHTING Callahan LED	<table> <tr><td>Project:</td><td></td></tr> <tr><td>Fixture Type:</td><td></td></tr> <tr><td>Quantity:</td><td></td></tr> <tr><td>Order #:</td><td></td></tr> </table> Wall Mounted • Wet Location Listed PROGRESS LED P560052-020-30  Dimensions: Width: 8 3/8 in Depth: 8 3/8 in Height: 9 1/8 in H/CIR: 3 3/4 in Antique Bronze Aluminum Shade Diameter: 8 3/8 in Height: 9 1/8 in 	Project:		Fixture Type:		Quantity:		Order #:																			
Project:																											
Fixture Type:																											
Quantity:																											
Order #:																											
Description: Callahan Collection One-Light LED Small Wall Lantern																											
Specifications: Antique Bronze Aluminum Shade (Removable to 70% Brightness (See Dimming Notes)) Back plate covers a standard 4" recessed outlet box 5 in W, 8.75 in H, 5 in depth Mounting stud for outlet box included 6 in of wire supplied No. and phasing(s) not registered with (UL)																											
Performance: <table> <tr><td>Number of Modules</td><td>1</td></tr> <tr><td>Input Power</td><td>9 W</td></tr> <tr><td>Input Voltage</td><td>120 V</td></tr> <tr><td>Input Frequency</td><td>60 Hz</td></tr> <tr><td>Currents (LPM) (Sound)</td><td>0.046 A (0.482)</td></tr> <tr><td>Currents (LPM) (240-volt)</td><td>133/16.5 (1.44 7%)</td></tr> <tr><td>ETC</td><td>3500 K</td></tr> <tr><td>BE</td><td>90-CRI</td></tr> <tr><td>Life (Hours)</td><td>60000 (L70/2M-31)</td></tr> <tr><td>UL/ETL</td><td>Meets FCC Title 47, Part 15 Class B</td></tr> <tr><td>UL-Listing Temp</td><td>30°C</td></tr> <tr><td>Warranty</td><td>5-year Limited Warranty</td></tr> <tr><td>Notes</td><td>©Callan Wet Location Listed Newen Callahan Inc. 20-JAN-2016</td></tr> </table>	Number of Modules	1	Input Power	9 W	Input Voltage	120 V	Input Frequency	60 Hz	Currents (LPM) (Sound)	0.046 A (0.482)	Currents (LPM) (240-volt)	133/16.5 (1.44 7%)	ETC	3500 K	BE	90-CRI	Life (Hours)	60000 (L70/2M-31)	UL/ETL	Meets FCC Title 47, Part 15 Class B	UL-Listing Temp	30°C	Warranty	5-year Limited Warranty	Notes	©Callan Wet Location Listed Newen Callahan Inc. 20-JAN-2016	
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Notes	©Callan Wet Location Listed Newen Callahan Inc. 20-JAN-2016																										
001 Millennium Blvd, Greenville, South Carolina 29607	www.progresslighting.com Rev. 10/24																										
ACR-A-UNV-DIM-30-HSS	LSI INDUSTRIES, INC.																										
ACR-S-UNV-DIM-30-CXX	LSI INDUSTRIES, INC. NICOR																										
UNV-30K8-CXX-SA-IS G15 S CXX AB 4BC	LSI INDUSTRIES, INC.																										
UNV-30K8-CXX-SA / 5 S CXX AB 4BC	LSI INDUSTRIES, INC.																										
STL-3-UNV-DIM-30-	LSI INDUSTRIES, INC.																										

STATE OF NEW HAMPSHIRE
DANIEL JAMES MEDITZ
No. 18152
LICENSED
PROFESSIONAL ENGINEER



Design: DJM	Draft: TCR	Date: 01/08/26
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Drawing Name: 25071.2-PLAN.dwg		
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85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885

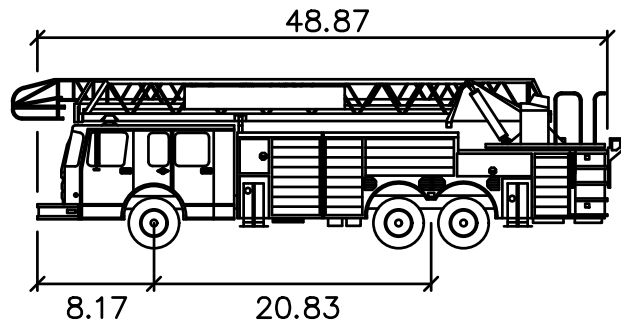
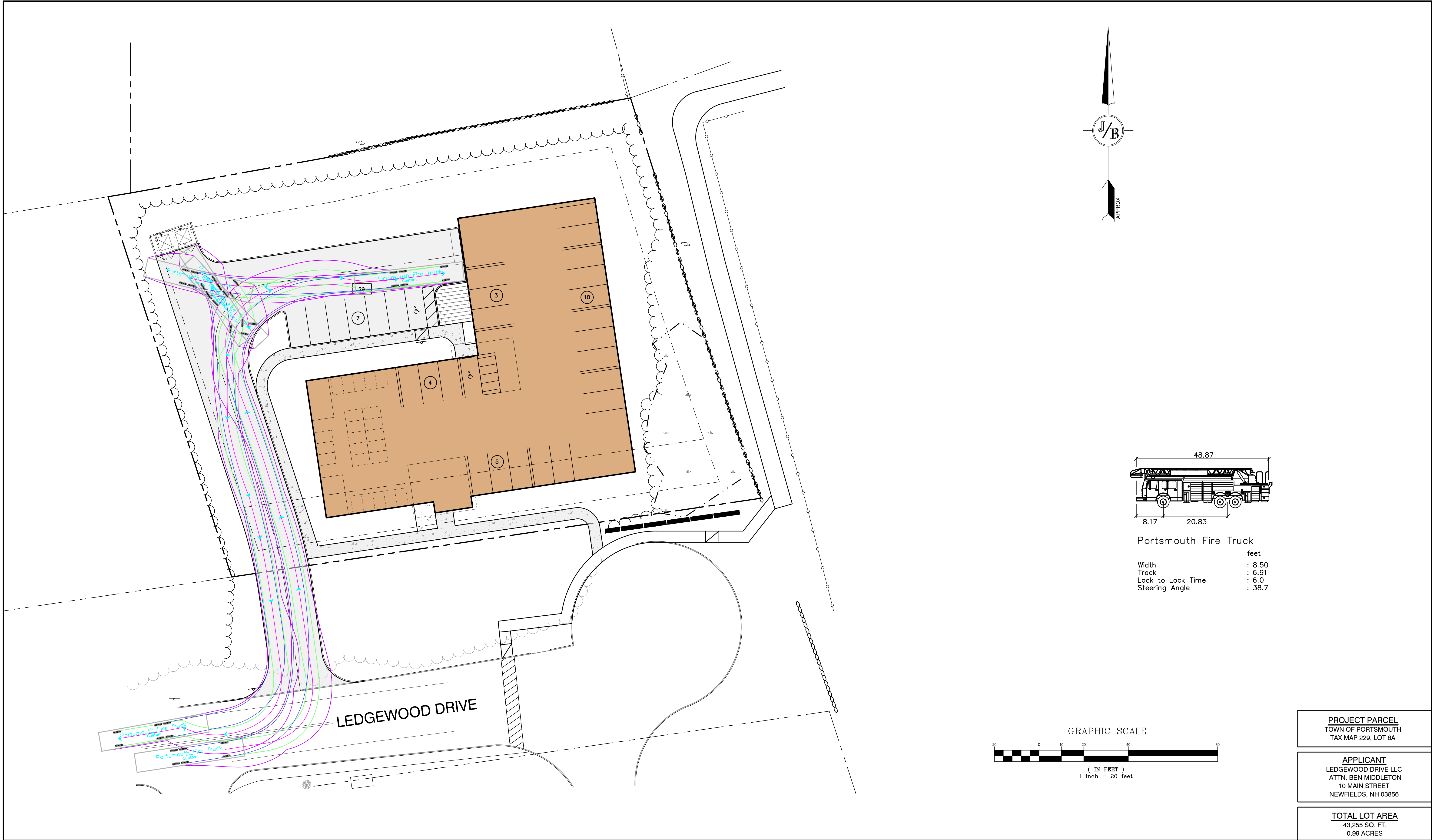
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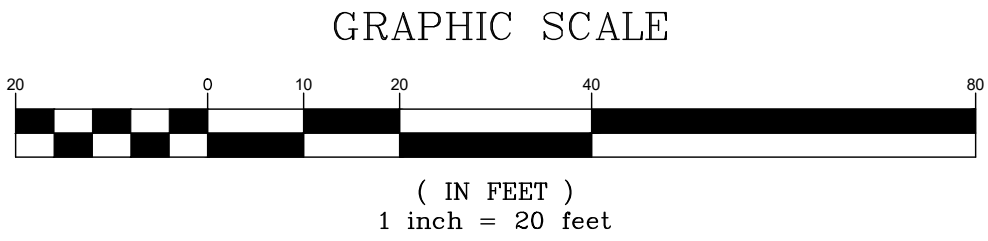
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	LANDSCAPE PLAN
Project:	LEDGEWOOD DRIVE LLC LEDGEWOOD DRIVE, PORTSMOUTH, NH 03801
Owner of Record:	ST NICHOLAS GREEK ORTHODOX CHURCH 40 ANDREW JARVIS DRIVE, PORTSMOUTH, NH 03801

DRAWING No.
L2
SHEET 7 OF 15 JBE PROJECT NO. 25071.2



Portsmouth Fire Truck	
	feet
Width	: 8.50
Track	: 6.91
Lock to Lock Time	: 6.0
Steering Angle	: 38.7



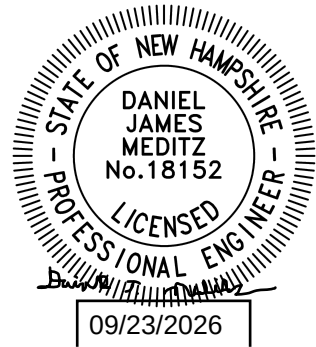
PROJECT PARCEL
TOWN OF PORTSMOUTH
TAX MAP 229, LOT 6A

APPLICANT
LEDGEWOOD DRIVE LLC
ATTN. BEN MIDDLETON
10 MAIN STREET
NEWFIELDS, NH 03856

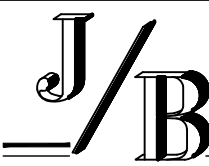
TOTAL LOT AREA
43,255 SQ. FT.
0.99 ACRES

Design: DJM	Draft: TCR	Date: 01/08/26
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Drawing Name: 25071.2-PLAN.dwg		

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Suite 201
Exeter, NH 03833

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603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	TRUCK TURNING PLAN
Project:	LEDGEWOOD DRIVE LLC LEDGEWOOD DRIVE, PORTSMOUTH, NH 03801
Owner of Record:	ST NICHOLAS GREEK ORTHODOX CHURCH 40 ANDREW JARVIS DRIVE, PORTSMOUTH, NH 03801

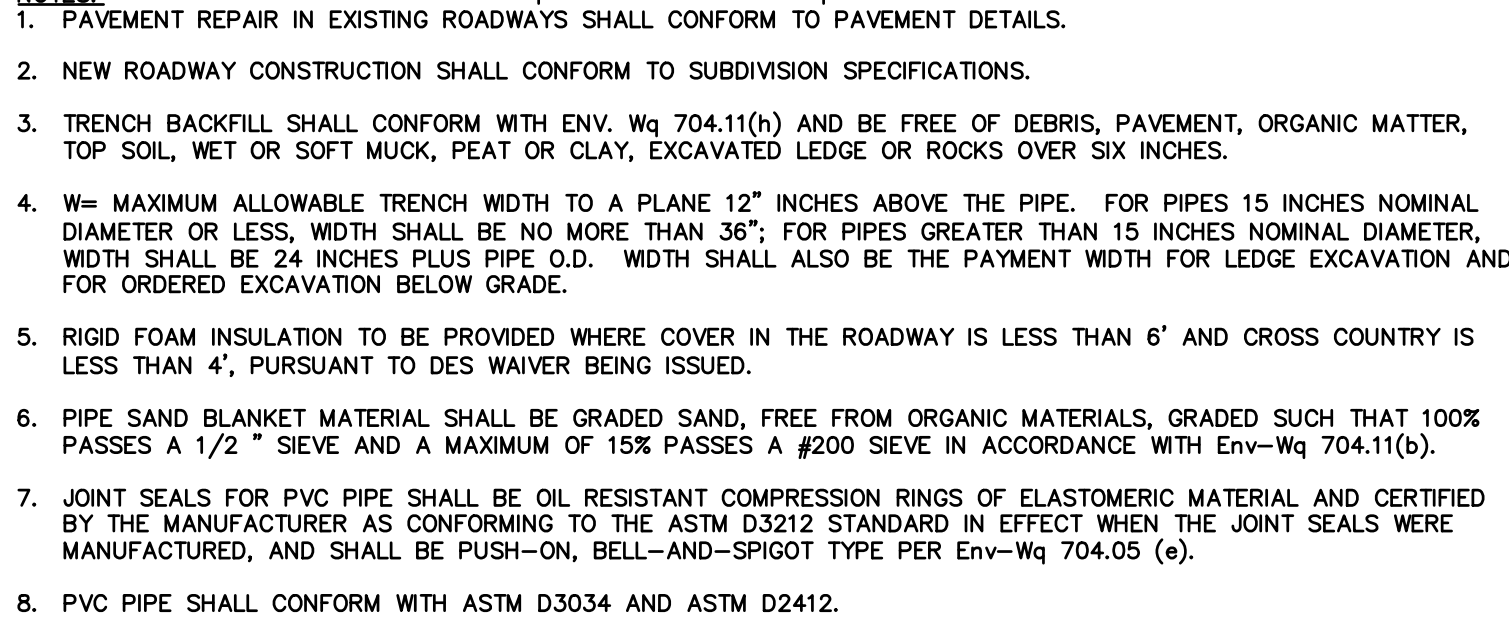
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T1

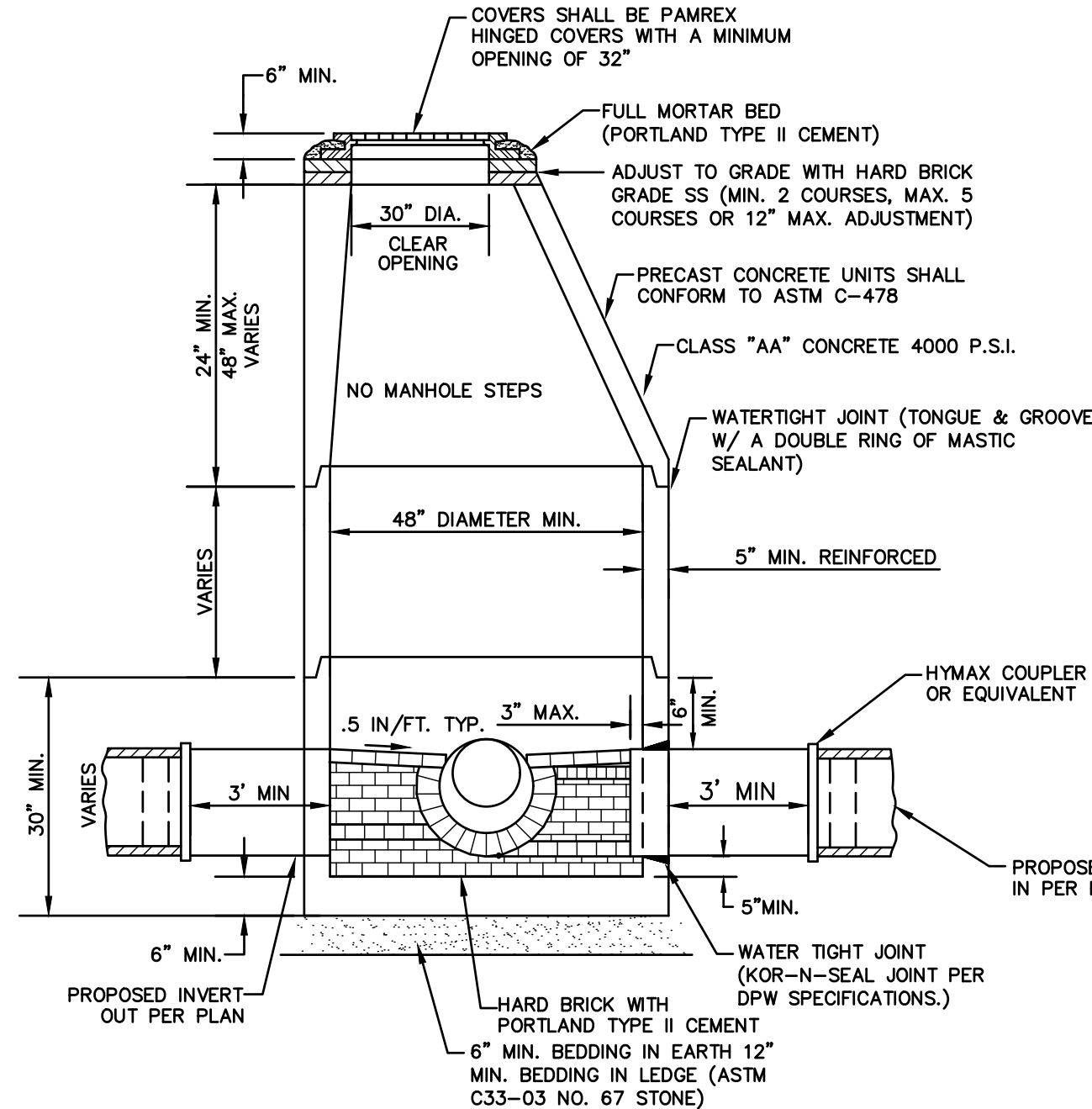
SHEET 8 OF 15
JBE PROJECT NO. 25071.2



NOT TO SCALE



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1. PER NHDES ENV-WQ 704.13(C), THE MORTAR SPECIFICATION SHALL BE AS FOLLOWS:
 1. MORTAR SHALL BE COMPOSED OF PORTLAND CEMENT AND SAND WITH OR WITHOUT HYDRATED LIME ADDITION;
 2. PROPORTIONS IN MORTAR OF PARTS BY VOLUMES SHALL BE:
 - A. 4.5 PARTS SAND AND 1.5 PARTS CEMENT; OR
 - B. 4.5 PARTS SAND, ONE PART CEMENT AND 0.5 PART HYDRATED LIME;
 3. CEMENT SHALL BE TYPE II PORTLAND CEMENT CONFORMING TO ASTM C150-05;
 4. HYDRATED LIME SHALL BE TYPE S CONFORMING TO THE ASTM C207-06 STANDARD SPECIFICATIONS FOR HYDRATED LIME FOR MASONRY PURPOSES;
 5. SAND SHALL CONSIST OF INERT NATURAL SAND CONFORMING TO THE ASTM C33-03 STANDARD SPECIFICATIONS FOR CONCRETE, FINE AGGREGATES;
2. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPED TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL IN ACCORDANCE WITH ENV-WQ 704.12 (K).
3. ALL MANHOLES SHALL BE TESTED FOR LEAKAGE IN ACCORDANCE WITH ENV-WQ 704.17 (a) THROUGH (e).
4. SEWER MANHOLE COVERS SHALL CONFORM TO ASTM A48 WITH A CASTING EQUAL TO CLASS 30 IN ACCORDANCE WITH ENV-WQ 704.13 (a).
5. ALL ASBESTOS CONTAINING WASTE MATERIALS MUST BE PROPERLY IDENTIFIED, PACKAGED AND DELIVERED TO A LANDFILL LICENCED BY THE NHDES SOLID WASTE MANAGEMENT PROGRAM FOR DISPOSAL. CALL (603) 271-2925 FOR MORE INFORMATION.
6. PORTSMOUTH STANDARD SEWER MANHOLE SHALL BE USED.
7. CONTRACTOR TO PURCHASE SEWER MANHOLE COVERS FROM THE CITY OF PORTSMOUTH DIRECTLY.
8. MANHOLE BASE SECTIONS SHALL BE MONOLITHIC TO A POINT AT LEAST 6" ABOVE THE HIGHEST INCOMING SEWER PIPE PER ENV-WQ 704.12 (e).
9. MANHOLE CASTINGS SHALL CONFORM TO ASTM A48 PER ENV-WQ 704.13 (a) (8).

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Plan Name:	DETAIL SHEET
Project:	LEDGEWOOD DRIVE LLC LEDGEWOOD DRIVE, PORTSMOUTH, NH 03801
Owner of Record:	ST NICHOLAS GREEK ORTHODOX CHURCH 40 ANDREW JARVIS DRIVE, PORTSMOUTH, NH 03801

DRAWING No.

D2

SHEET 10 OF 15
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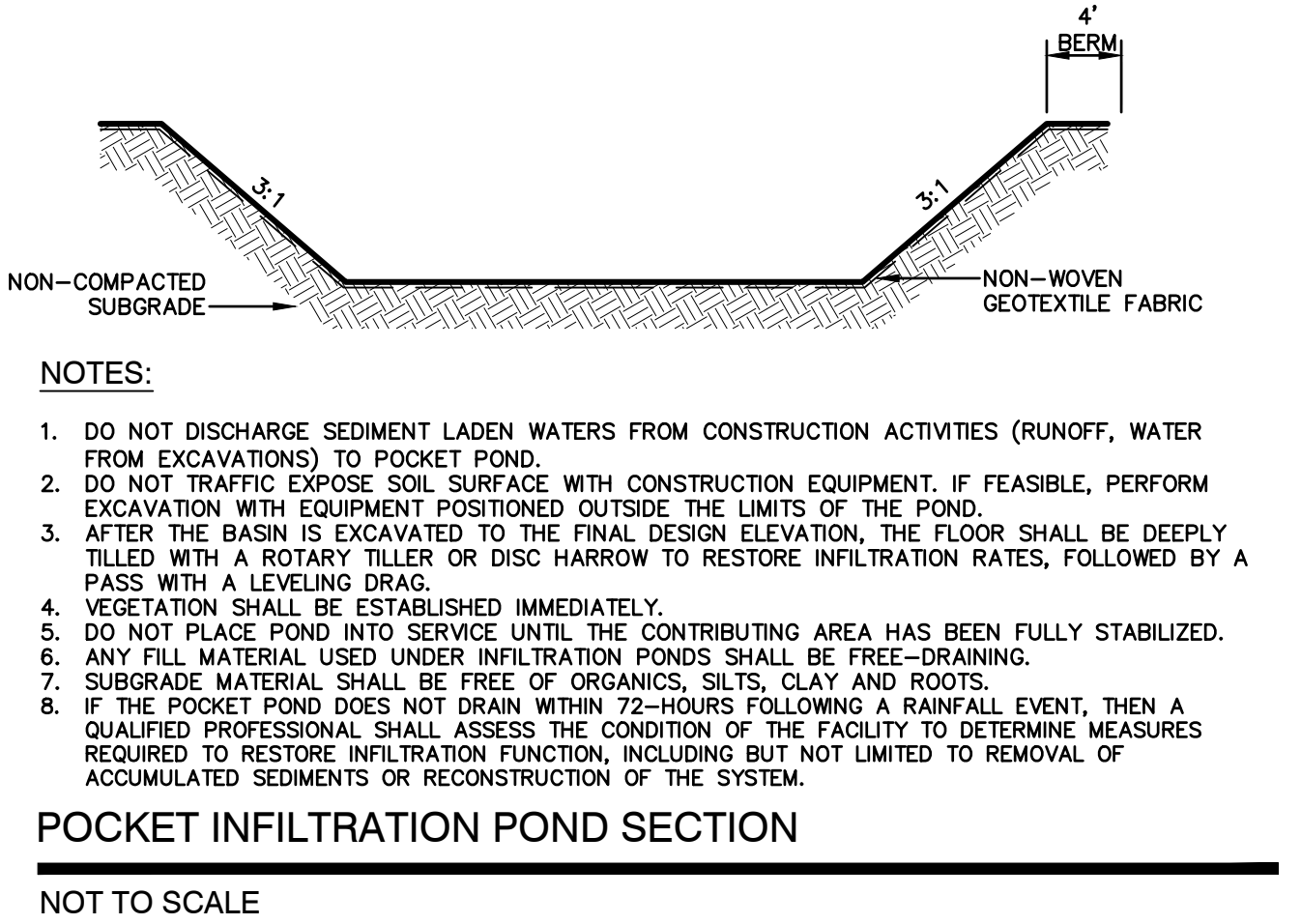
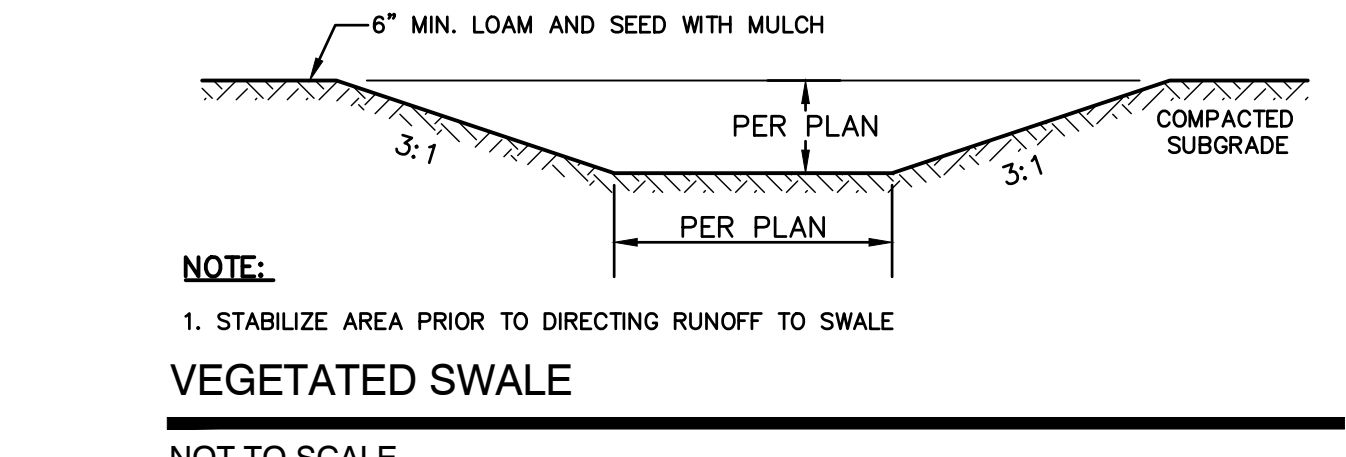
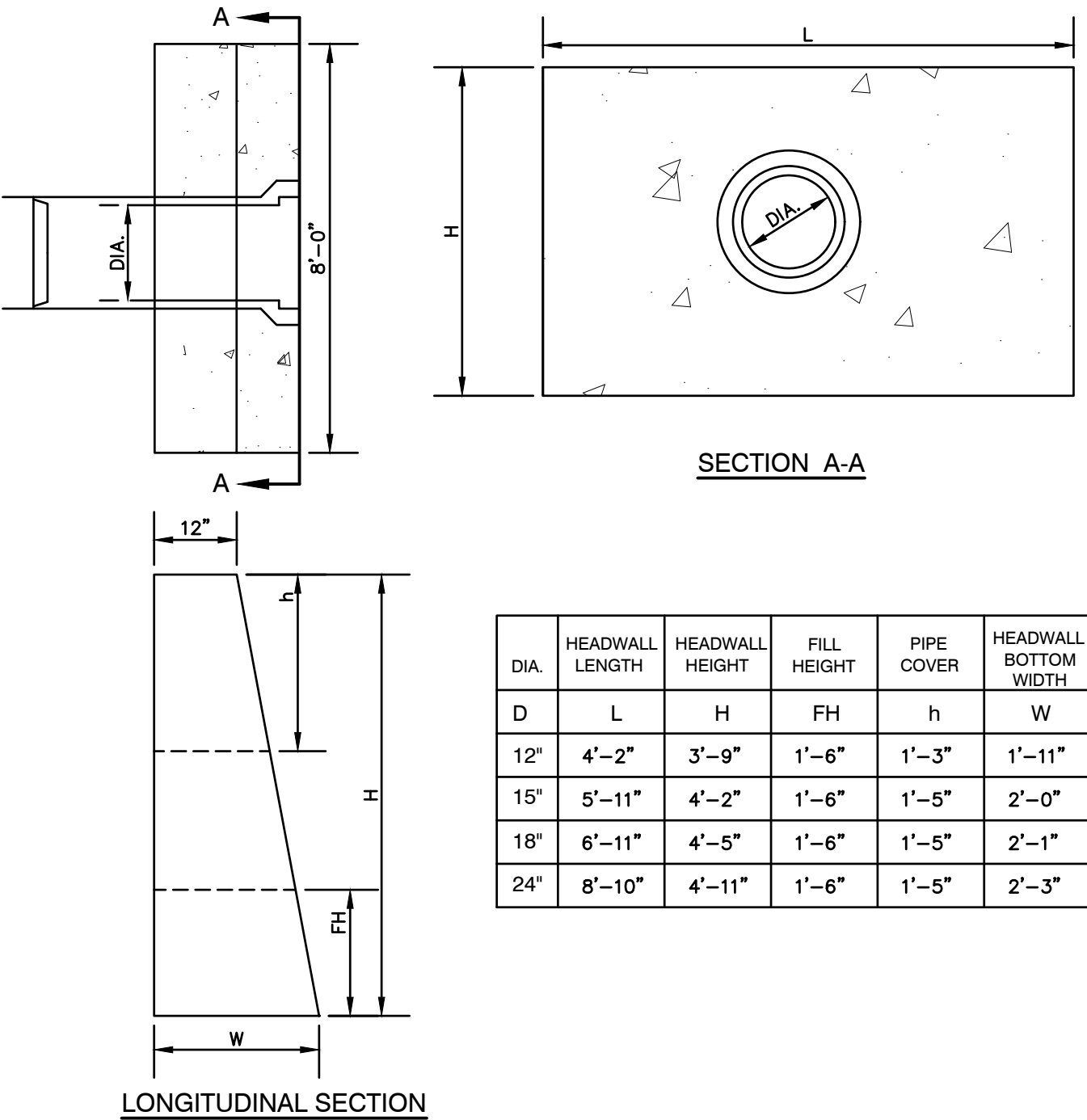
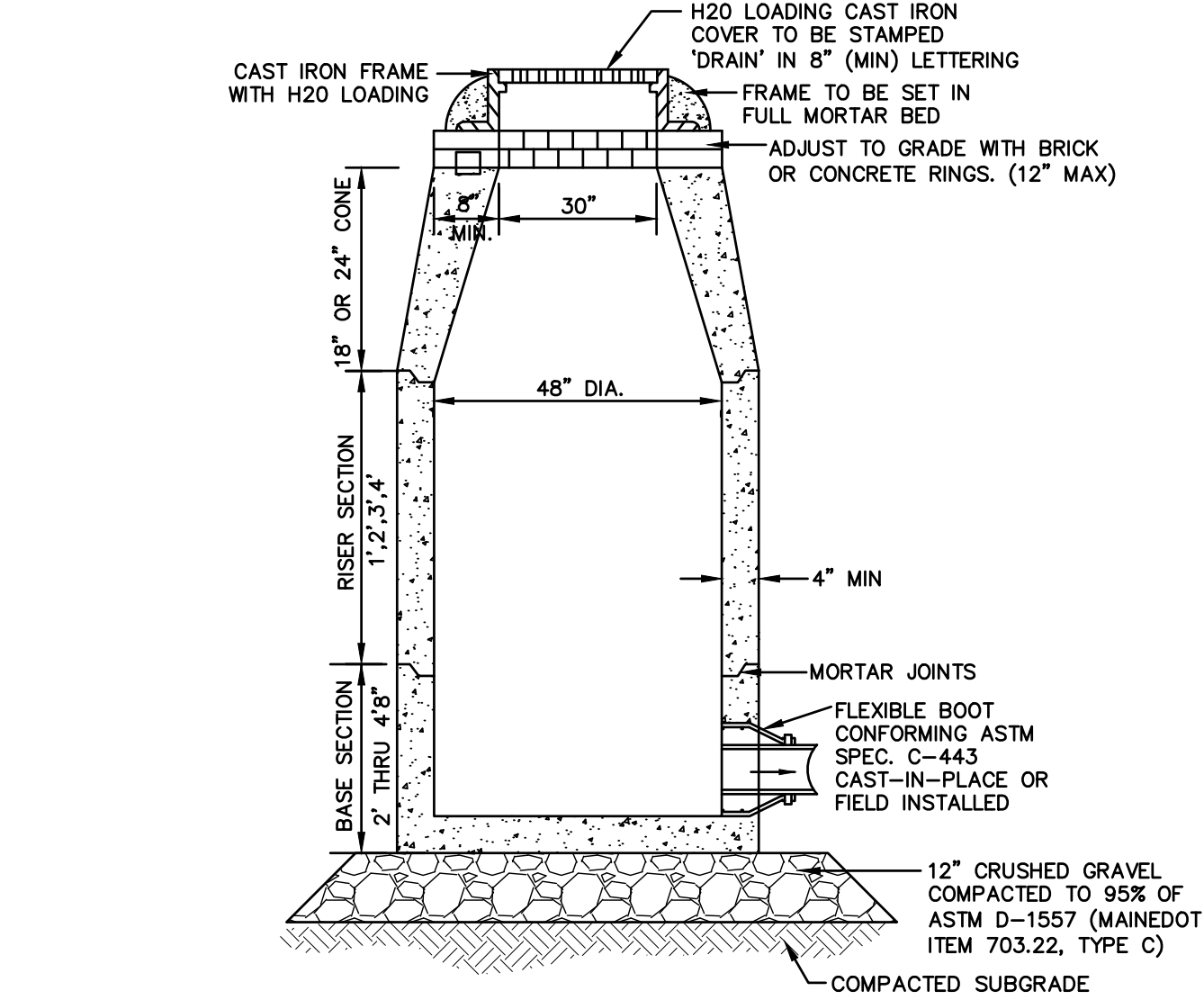
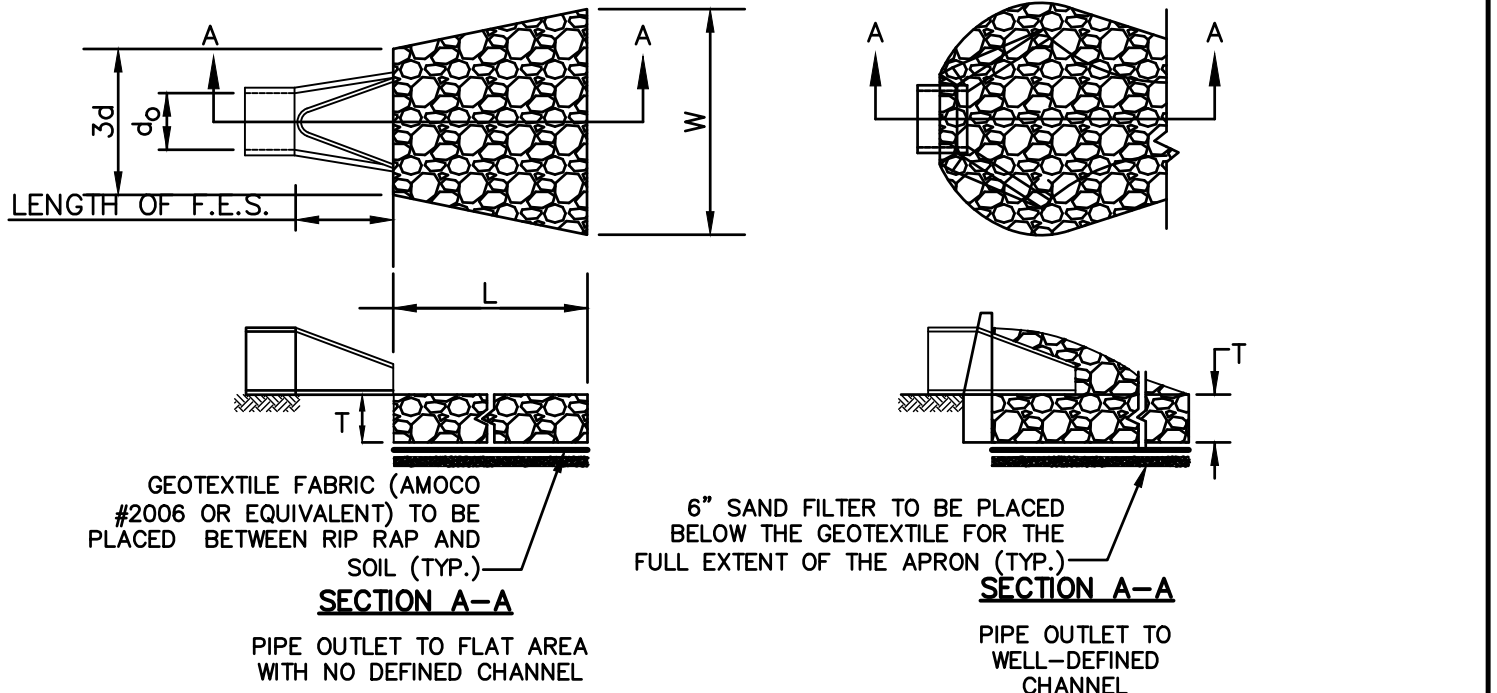
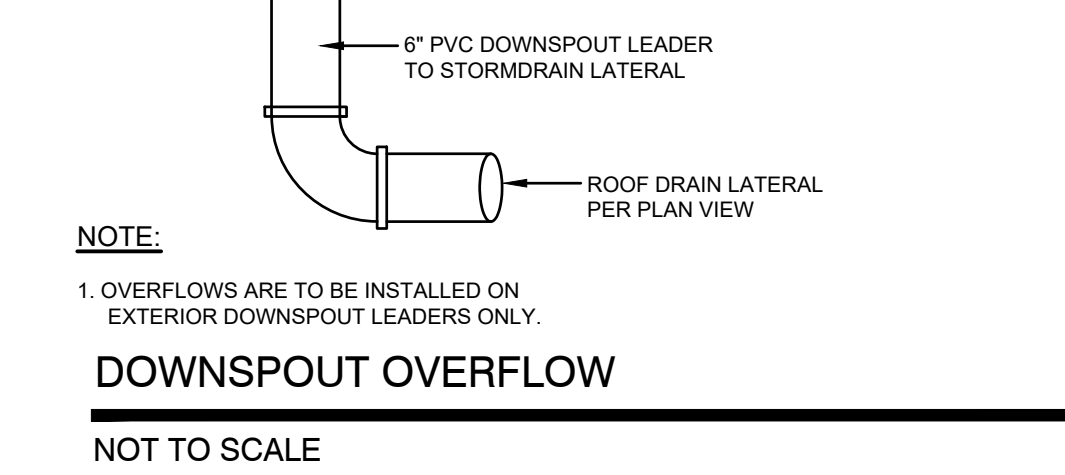
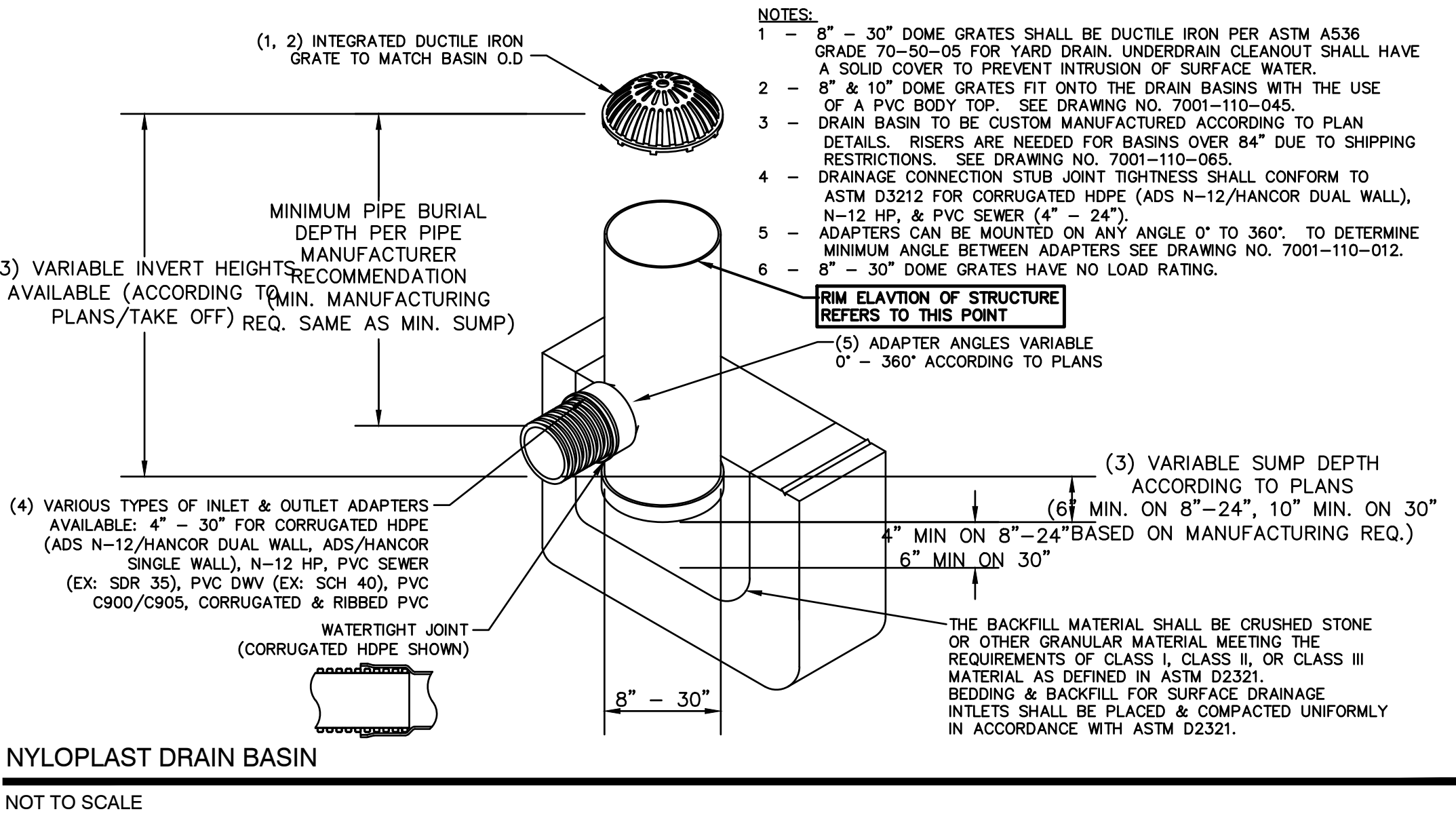
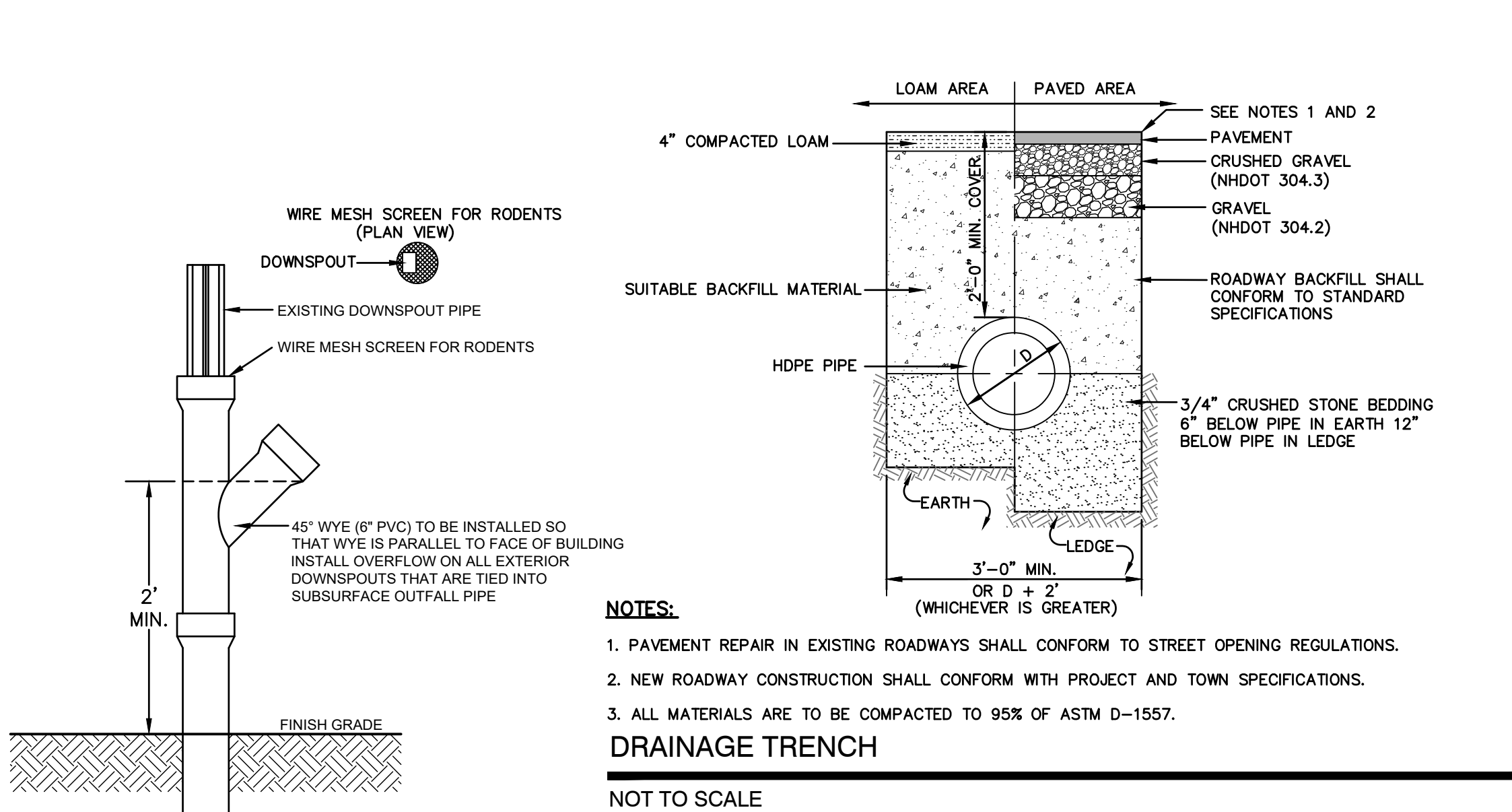


TABLE 7-24--RECOMMENDED RIP RAP GRADATION RANGES			
THICKNESS OF RIP RAP = 0.75 FEET			
d50 SIZE=	0.25	FEET	3 INCHES
% OF WEIGHT SMALLER THAN THE GIVEN d50 SIZE	SIZE OF STONE (INCHES) FROM	TO	
100%	5	6	
85%	4	5	
50%	3	5	
15%	1	2	

TABLE 7-24--RECOMMENDED RIP RAP GRADATION RANGES			
THICKNESS OF RIP RAP = 1.5 FEET			
d50 SIZE=	0.50	FEET	6 INCHES
% OF WEIGHT SMALLER THAN THE GIVEN d50 SIZE	SIZE OF STONE (INCHES) FROM	TO	
100%	9	12	
85%	8	11	
50%	6	9	
15%	2	3	

- NOTES:**
- BASE SECTION SHALL BE MONOLITHIC WITH 48" INSIDE DIAMETER.
 - ALL SECTIONS SHALL BE DESIGNED FOR H2O LOADING.
 - CONCRETE SHALL BE COMPRESSIVE STRENGTH 4000 PSI, TYPE II CEMENT.
 - FRAMES AND GRATES SHALL BE HEAVY DUTY AND DESIGNED FOR H2O LOADING.
 - PROVIDE "V" KNOCKOUTS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS SO AS TO BE WATERTIGHT.
 - JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE BUTYL RUBBER.
 - ALL DRAIN MANHOLE FRAMES AND GRATES SHALL BE NEENAH R-1798 OR APPROVED EQUAL (30" DIA. TYPICAL).
 - STANDARD FRAME(S) AND GRATE(S) SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM, BUT NO MORE THAN 12"), OR PRECAST CONCRETE 'DONUTS'.

- NOTES:**
- ALL DIMENSIONS GIVEN IN FEET & INCHES.
 - PROVIDE BELL END AT INLET HEADWALL, AND SPIGOT END AT OUTLET END HEADWALL.
 - CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS; CEMENT TO BE TYPE III PER ASTM C-150. REINFORCING TO MEET OR EXCEED ASTM A-615 GRADE 60 DEFORMED BARS.
 - 1" THREADED INSERTS PROVED FOR FINAL ATTACHMENT IN FIELD BY OTHERS.

- NOTES:**
- DO NOT DISCHARGE SEDIMENT LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF, WATER FROM EXCAVATIONS) TO POCKET POND.
 - DO NOT TRAFFIC EXPOSE SOIL SURFACE WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATION WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE POND.
 - AFTER THE BASIN IS EXCAVATED TO THE FINAL DESIGN ELEVATION, THE FLOOR SHALL BE DEEPLY TILLED WITH A ROTARY TILLER OR DISC HARROW TO RESTORE INFILTRATION RATES, FOLLOWED BY A PASS WITH A LEVELING DRAG.
 - VEGETATION SHALL BE ESTABLISHED IMMEDIATELY.
 - DO NOT PLACE POND INTO SERVICE UNTIL THE CONTRIBUTING AREA HAS BEEN FULLY STABILIZED.
 - ANY FILL MATERIAL USED UNDER INFILTRATION PONDS SHALL BE FREE-DRAINING.
 - SUBGRADE MATERIAL SHALL BE FREE OF ORGANICS, SILTS, CLAY AND ROOTS.
 - IF THE POCKET POND DOES NOT DRAIN WITHIN 72-HOURS FOLLOWING A RAINFALL EVENT, THEN A QUALIFIED PROFESSIONAL SHALL ASSESS THE CONDITION OF THE FACILITY TO DETERMINE MEASURES REQUIRED TO RESTORE INFILTRATION FUNCTION, INCLUDING BUT NOT LIMITED TO REMOVAL OF ACCUMULATED SEDIMENTS OR RECONSTRUCTION OF THE SYSTEM.

DRAIN MANHOLE (4' DIAM.)

NOT TO SCALE

PRECAST CONCRETE HEADWALL

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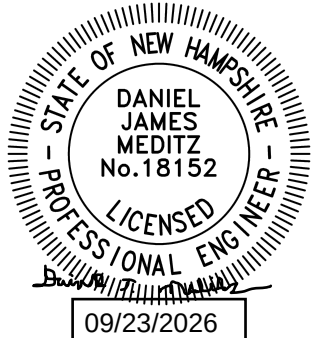
POCKET INFILTRATION POND SECTION

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RIP RAP OUTLET PROTECTION APRON

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Exeter, NH 03833

Civil Engineering Services

603-772-4746

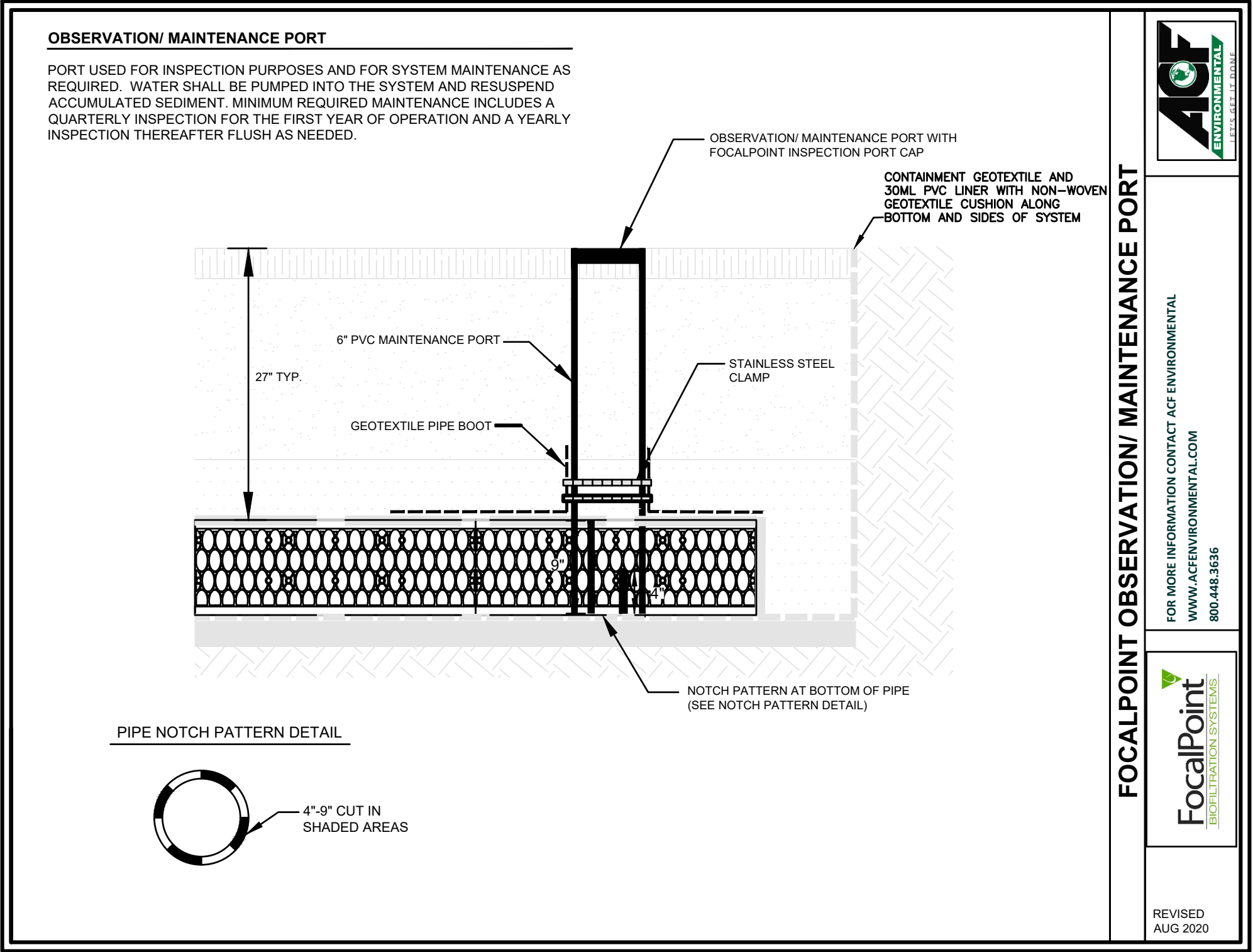
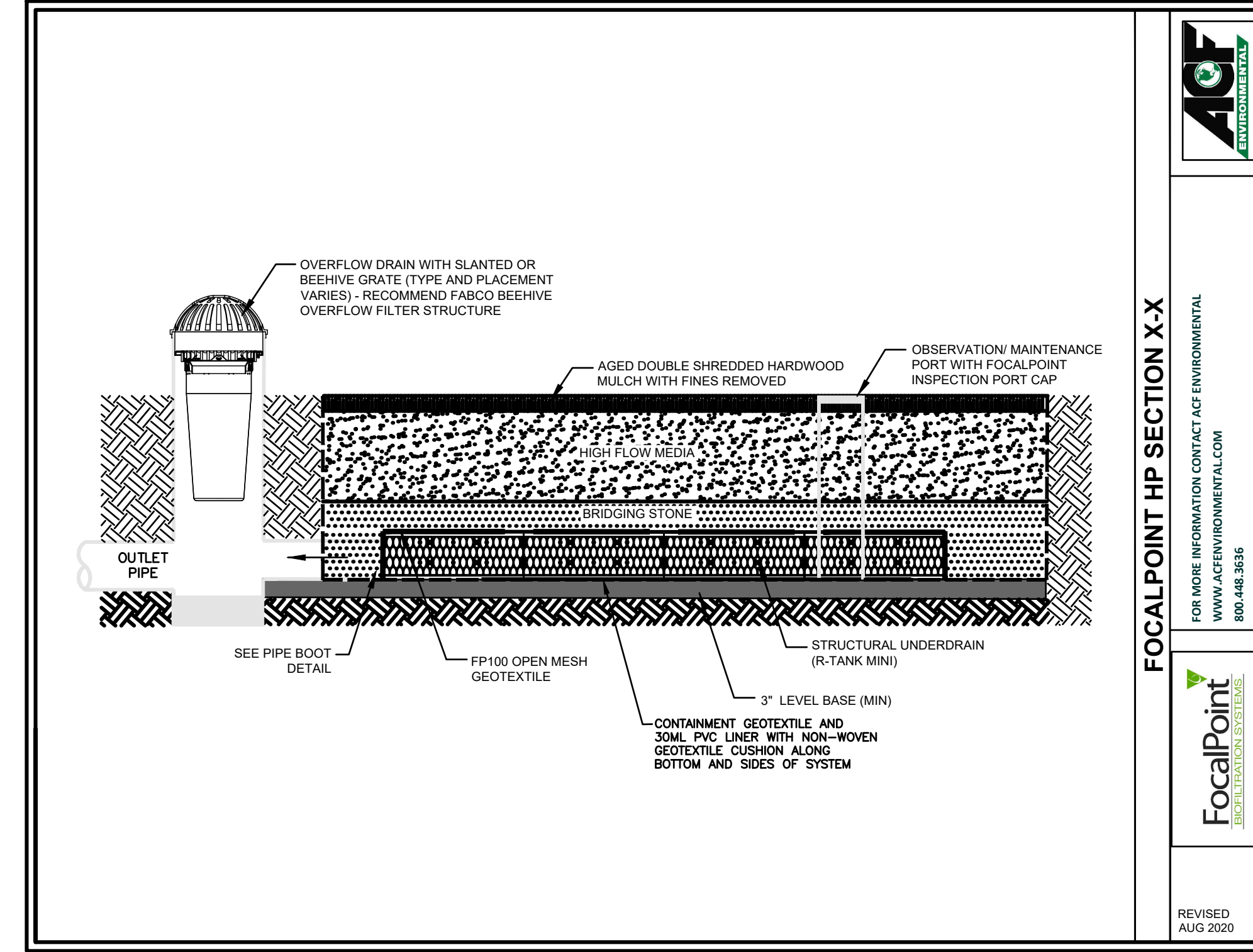
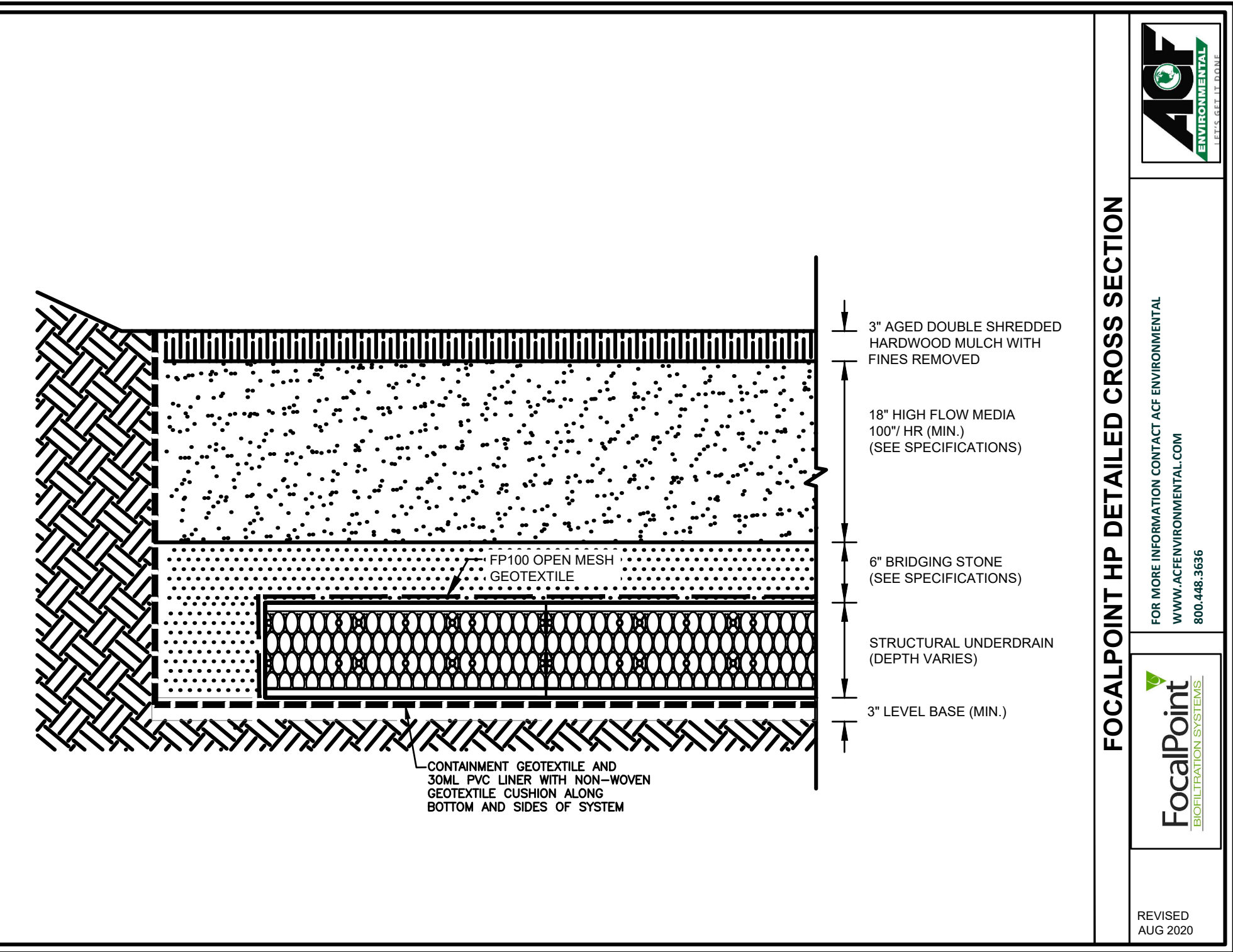
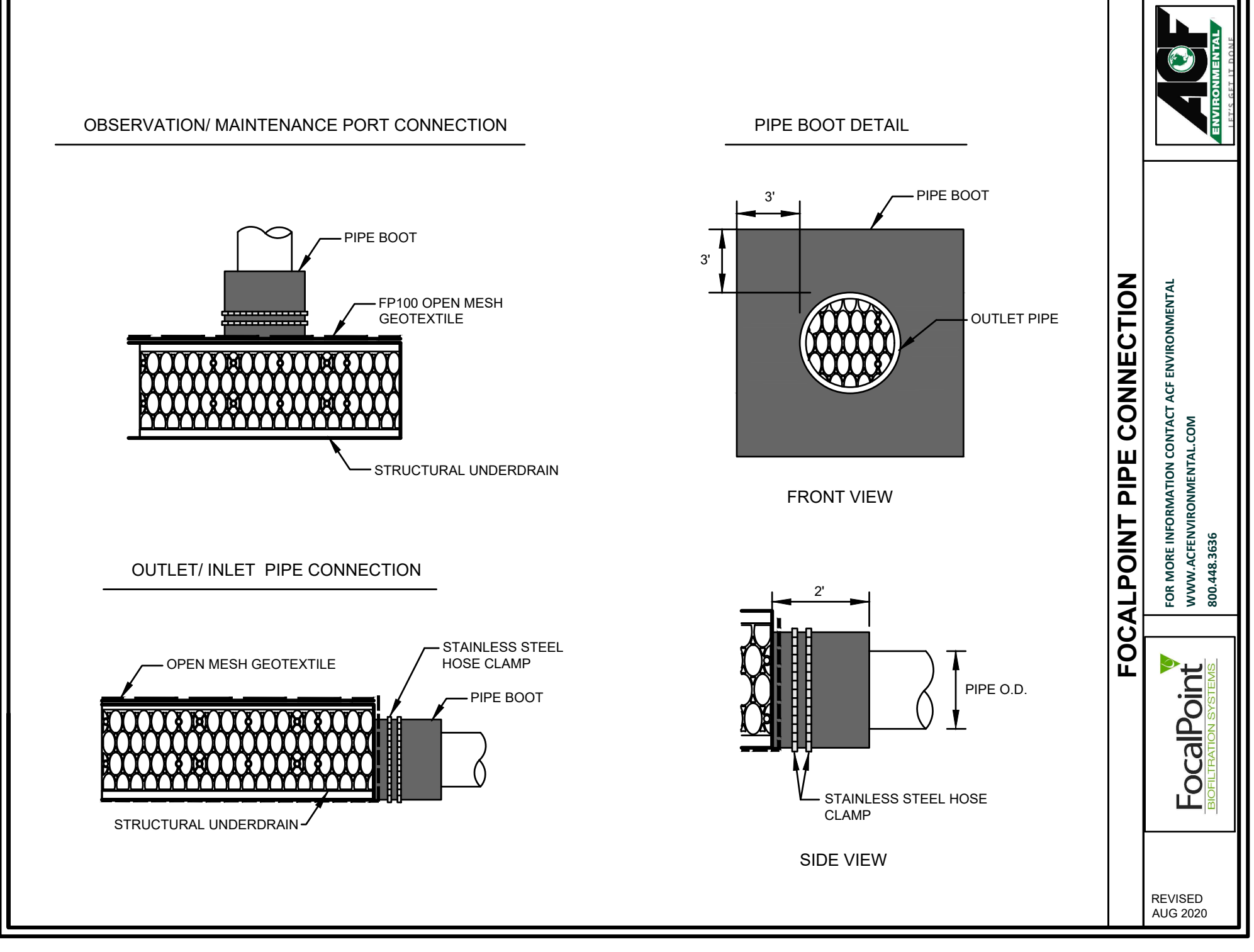
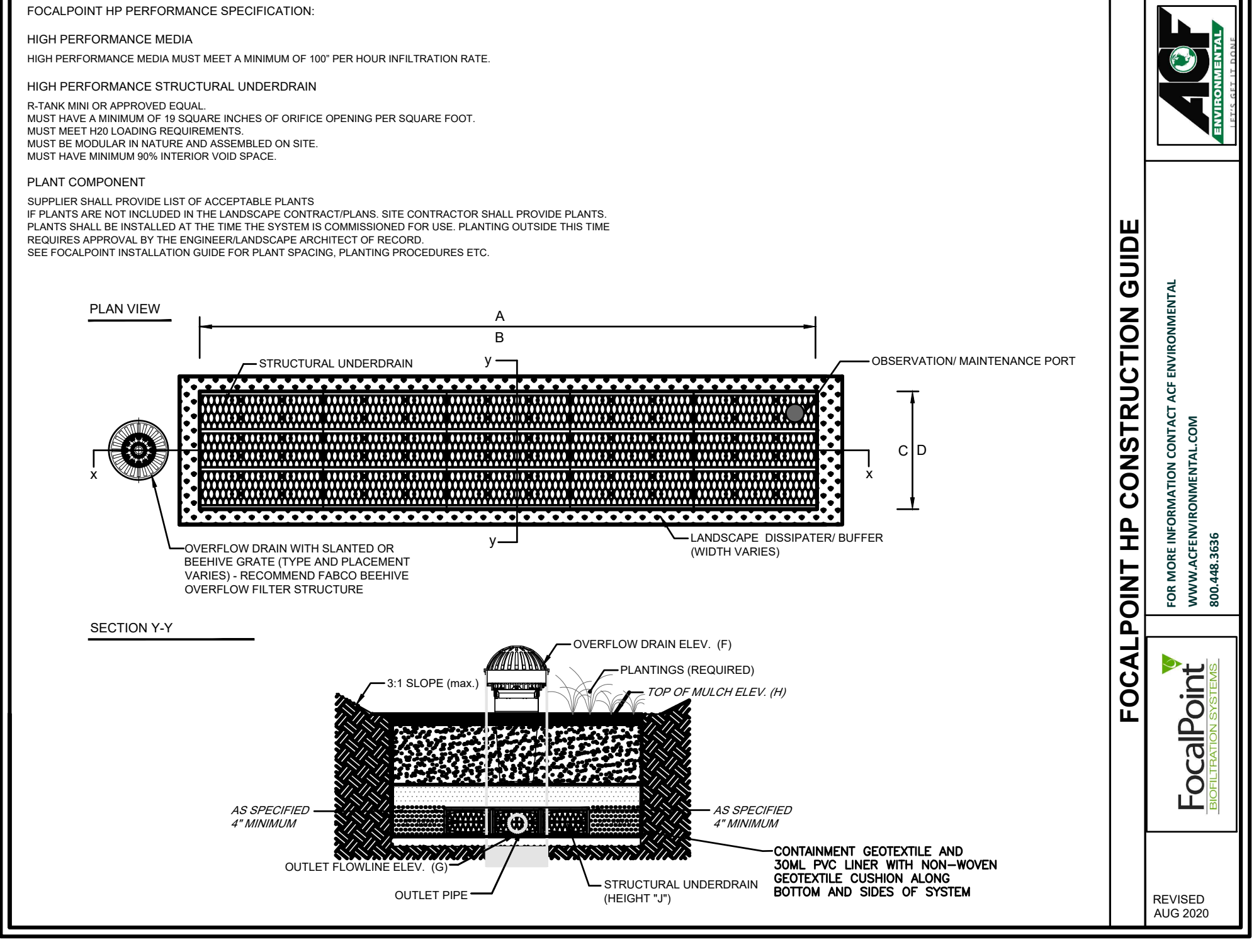
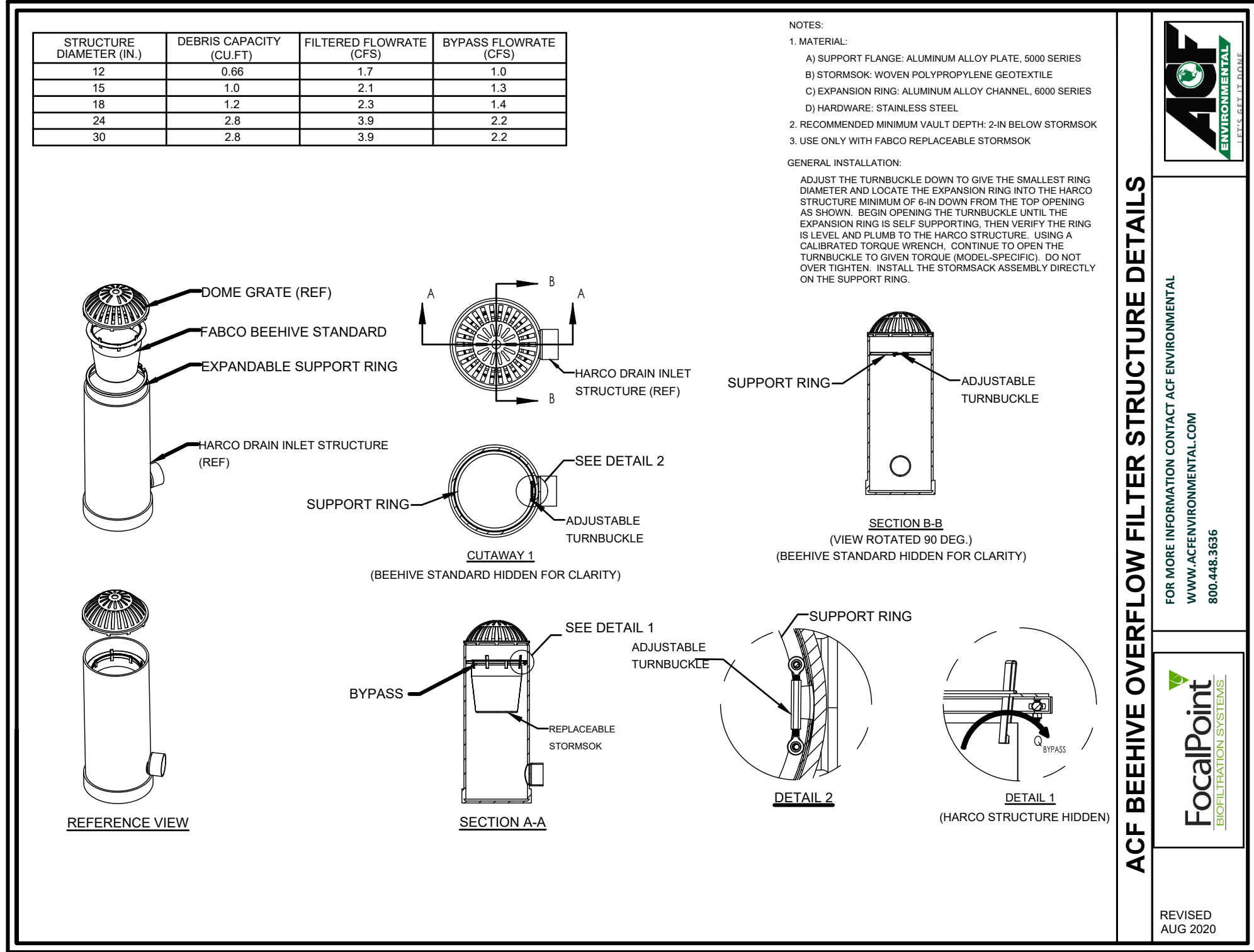
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	DETAIL SHEET
Project:	LEDGEWOOD DRIVE LLC LEDGEWOOD DRIVE, PORTSMOUTH, NH 03801
Owner of Record:	ST NICHOLAS GREEK ORTHODOX CHURCH 40 ANDREW JARVIS DRIVE, PORTSMOUTH, NH 03801

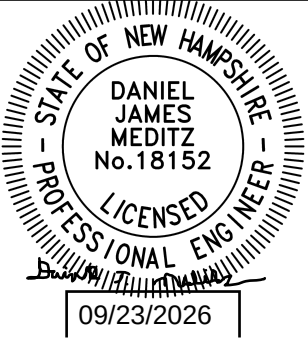
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SHEET 11 OF 15
JBE PROJECT NO. 25071.2



Design: DJM	Draft: TCR	Date: 01/08/26
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REV.	DATE	REVISION	BY
2	09/22/26	REVISED PER TAC COMMENTS	DJM
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Designed and Produced in NH

J/B Jones & Beach Engineers, Inc.

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Civil Engineering Services

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DRAWING No.

D5

SHEET 13 OF 15
JBE PROJECT NO. 25071.2

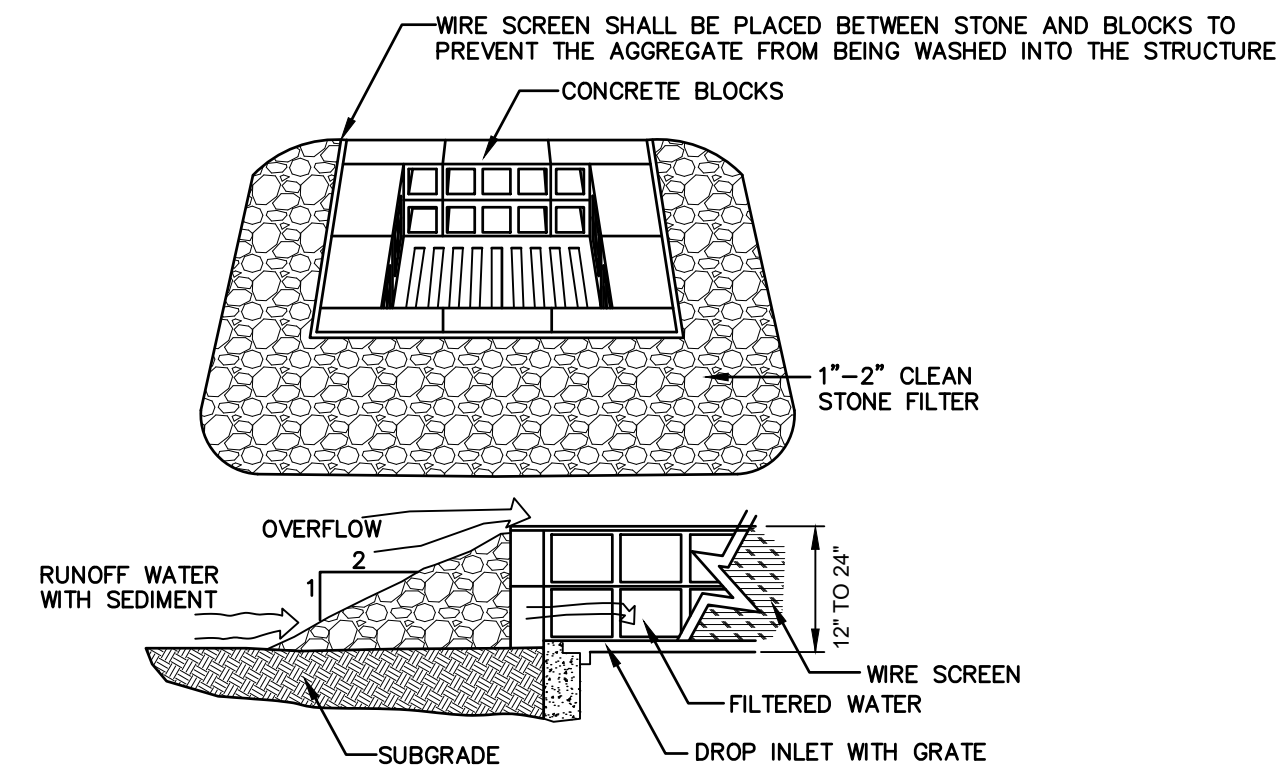
TEMPORARY EROSION CONTROL NOTES

1. THE SMALLEST PRACTICAL AREA OF LAND SHALL BE EXPOSED AT ANY ONE TIME. AT NO TIME SHALL AN AREA IN EXCESS OF 5 ACRES BE EXPOSED AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED.
2. EROSION, SEDIMENT AND DETENTION MEASURES SHALL BE INSTALLED AS SHOWN ON THE PLANS AND AT LOCATIONS AS REQUIRED, DIRECTED BY THE ENGINEER.
3. ALL DISTURBED AREAS (INCLUDING POND AREAS BELOW THE PROPOSED WATERLINE) SHALL BE RETURNED TO PROPOSED GRADES AND ELEVATIONS. DISTURBED AREAS SHALL BE LOAMED WITH A MINIMUM OF 6" OF SCREENED ORGANIC LOAM AND SEEDED WITH SEED MIXTURE 'C' AT A RATE NOT LESS THAN 1.10 POUNDS OF SEED PER 1,000 S.F. OF AREA (48 LBS. / ACRE).
4. SILT FENCES AND OTHER BARRIERS SHALL BE INSPECTED EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS OF A RAINFALL OF 0.5" OR GREATER. ALL DAMAGED AREAS SHALL BE REPAIRED, AND SEDIMENT DEPOSITS SHALL PERIODICALLY BE REMOVED AND DISPOSED OF.
5. AFTER ALL DISTURBED AREAS HAVE BEEN STABILIZED, THE TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED AND THE AREA DISTURBED BY THE REMOVAL SMOOTHED AND RE-VEGETATED.
6. AREAS MUST BE SEEDED AND MULCHED OR OTHERWISE PERMANENTLY STABILIZED WITHIN 3 DAYS OF FINAL GRADING, OR TEMPORARILY STABILIZED WITHIN 14 DAYS OF THE INITIAL DISTURBANCE OF SOIL. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
7. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING NORTH AMERICAN GREEN S150 EROSION CONTROL BLANKETS (OR AN EQUIVALENT APPROVED IN WRITING BY THE ENGINEER) ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
8. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.
9. AFTER OCTOBER 15th, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3" OF CRUSHED GRAVEL PER NHDOT ITEM 304.3.
10. IN AREAS TO BE PAVED, "STABLE" MEANS THAT BASE COURSE GRAVELS MEETING THE REQUIREMENTS OF NHDOT STANDARD FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM 304.2 HAVE BEEN INSTALLED.

IN AREAS THAT WILL NOT BE PAVED, "STABLE MEANS THAT:

- a. A MINIMUM OF 85% VEGETATIVE COVER HAS BEEN ESTABLISHED IN A MANNER THAT IS EVENLY DISTRIBUTED OVER THE SITE, WITH NO LARGE AREAS OF BARE SOIL;
- b. A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED; OR
- c. EROSION CONTROL BLANKETS HAVE BEEN INSTALLED IN ACCORDANCE WITH ENV-WQ 1506.03.

11. FUGITIVE DUST CONTROL IS REQUIRED TO BE CONTROLLED IN ACCORDANCE WITH ENV-A 1000, AND THE PROJECT IS TO MEET THE REQUIREMENTS AND INTENT OF RSA 430:53 AND AGR 3800 RELATIVE TO INVASIVE SPECIES.

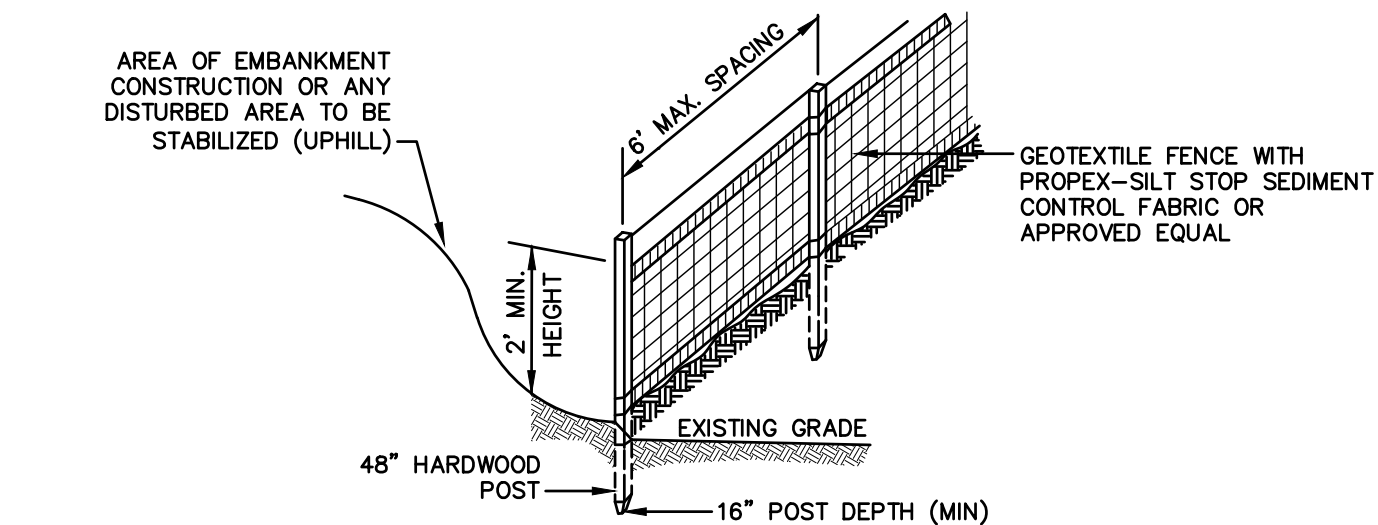


MAINTENANCE NOTE:

1. ALL STRUCTURES SHOULD BE INSPECTED AFTER EVERY RAINFALL AND REPAIRS MADE AS NECESSARY. SEDIMENT SHOULD BE REMOVED FROM TRAPPING DEVICES AFTER THE SEDIMENT HAS REACHED A MAXIMUM OF ONE HALF THE DEPTH OF THE TRAP. THE SEDIMENT SHOULD BE DISPOSED IN A SUITABLE UPLAND AREA AND PROTECTED FROM EROSION BY EITHER STRUCTURE OR VEGETATIVE MEANS. THE TEMPORARY TRAPS SHOULD BE REMOVED AND REPAIRED AS SOON AS THE CONTRIBUTING DRAINAGE AREA TO THE INLET HAS BEEN COMPLETELY STABILIZED.

TEMPORARY CATCH BASIN INLET PROTECTION
(Block and Gravel Drop Inlet Sediment Filter)

NOT TO SCALE

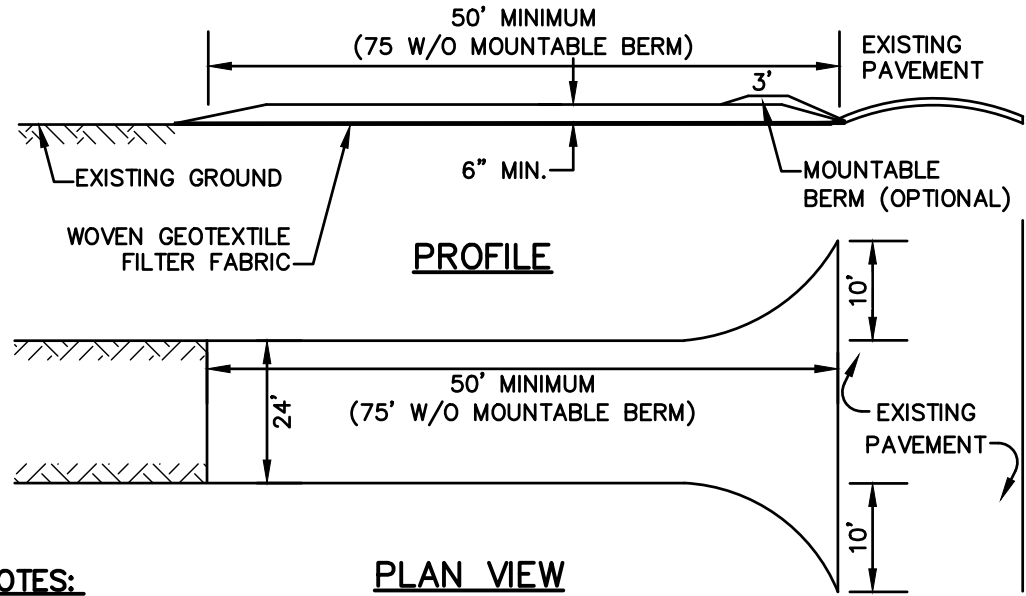


CONSTRUCTION SPECIFICATIONS:

1. WOVEN FABRIC FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. FILTER CLOTH SHALL BE FASTENED TO WOVEN WIRE EVERY 24" AT TOP, MID AND BOTTOM AND EMBEDDED IN THE GROUND A MINIMUM OF 8" AND THEN COVERED WITH SOIL.
2. THE FENCE POSTS SHALL BE A MINIMUM OF 48" LONG, SPACED A MAXIMUM 6' APART, AND DRIVEN A MINIMUM OF 16" INTO THE GROUND.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THE ENDS OF THE FABRIC SHALL BE OVERLAPPED 6", FOLDED AND STAPLED TO PREVENT SEDIMENT FROM BY-PASSING.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND SEDIMENT REMOVED AND PROPERLY DISPOSED OF WHEN IT IS 6" DEEP OR VISIBLE 'BULGES' DEVELOP IN THE SILT FENCE.
5. PLACE THE ENDS OF THE SILT FENCE UP CONTOUR TO PROVIDE FOR SEDIMENT STORAGE.
6. SILT FENCE SHALL REMAIN IN PLACE FOR 24 MONTHS.

SILT FENCE

NOT TO SCALE

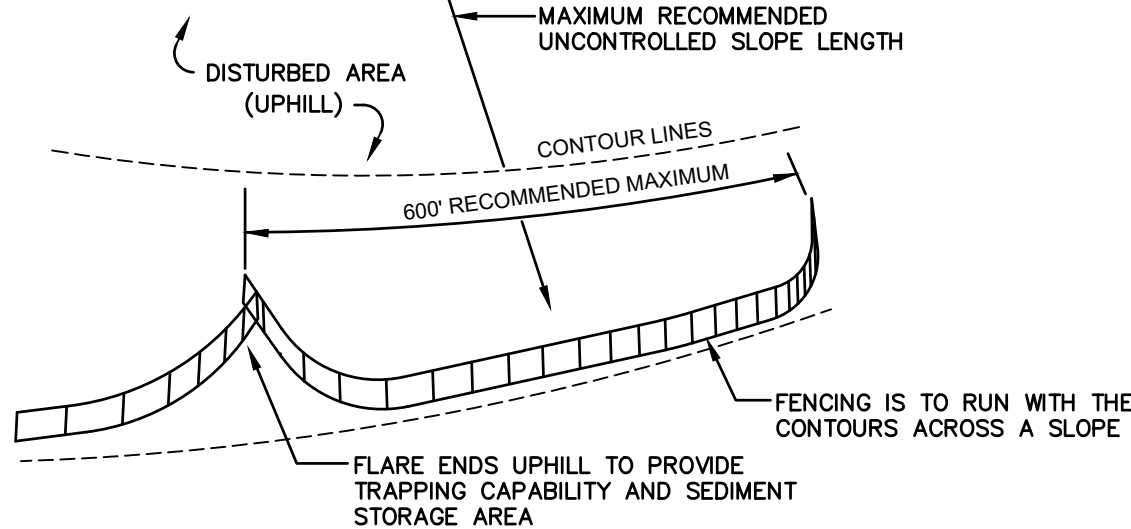


NOTES:

1. STONE FOR STABILIZED CONSTRUCTION ENTRANCE SHALL BE 3 INCH STONE, RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT.
2. THE LENGTH OF THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 50 FEET, 75' WITHOUT A MOUNTABLE BERM, AND EXCEPT FOR A SINGLE RESIDENTIAL LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY.
3. THICKNESS OF THE STONE FOR THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 6 INCHES.
4. THE WIDTH OF THE ENTRANCE SHALL NOT BE LESS THAN THE FULL WIDTH OF THE ENTRANCE WHERE INGRESS OR EGRESS OCCURS, OR 10 FEET, WHICHEVER IS GREATER.
5. GEOTEXTILE FILTER FABRIC SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE. FILTER FABRIC IS NOT REQUIRED FOR A SINGLE FAMILY RESIDENTIAL LOT.
6. ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A STONE BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO THE PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, WASHED, OR TRACKED ONTO THE PUBLIC RIGHT-OF-WAY MUST BE REMOVED PROMPTLY.

STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE



7. SILT FENCES SHALL BE REMOVED WHEN NO LONGER NEEDED AND THE SEDIMENT COLLECTED SHALL BE DISPOSED AS DIRECTED BY THE ENGINEER. THE AREA DISTURBED BY THE REMOVAL SHALL BE SMOOTHED AND REVEGETATED.

MAINTENANCE:

1. SILT FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS THAT ARE REQUIRED SHALL BE DONE IMMEDIATELY.
2. IF THE FABRIC ON A SILT FENCE SHOULD DECOMPOSE OR BECOME INEFFECTIVE DURING THE EXPECTED LIFE OF THE FENCE, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE INSPECTED AFTER EVERY STORM EVENT. THE DEPOSITS SHOULD BE REMOVED WHEN THEY REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER.
4. SEDIMENT DEPOSITS THAT ARE REMOVED, OR LEFT IN PLACE AFTER THE FABRIC HAS BEEN REMOVED, SHALL BE GRADED TO CONFORM WITH THE EXISTING TOPOGRAPHY AND VEGETATED.

SEEDING SPECIFICATIONS

1. **GRADING AND SHAPING**
- A. SLOPES SHALL NOT BE STEEPER THAN 2:1 WITHOUT APPROPRIATE EROSION CONTROL MEASURES AS SPECIFIED ON THE PLANS (3:1 SLOPES OR FLATTER ARE PREFERRED).
- B. WHERE MOWING WILL BE DONE, 3:1 SLOPES OR FLATTER ARE RECOMMENDED.
2. **SEEDBED PREPARATION**
- A. SURFACE AND SEEPAGE WATER SHOULD BE DRAINED OR DIVERTED FROM THE SITE TO PREVENT DROWNING OR WINTER KILLING OF THE PLANTS.
- B. STONES LARGER THAN 4 INCHES AND TRASH SHOULD BE REMOVED BECAUSE THEY INTERFERE WITH SEEDING AND FUTURE MAINTENANCE OF THE AREA. WHERE FEASIBLE, THE SOIL SHOULD BE TILLED TO A DEPTH OF ABOUT 4 INCHES TO PREPARE A SEEDBED AND FERTILIZER AND LIME MIXED INTO THE SOIL. THE SEEDBED SHOULD BE LEFT IN A REASONABLY FIRM AND SMOOTH CONDITION. THE LAST TILLAGE OPERATION SHOULD BE PERFORMED ACROSS THE SLOPE WHEREVER PRACTICAL.
3. **ESTABLISHING A STAND**
- A. LIME AND FERTILIZER SHOULD BE APPLIED PRIOR TO OR AT THE TIME OF SEEDING AND INCORPORATED INTO THE SOIL. TYPES AND AMOUNTS OF LIME AND FERTILIZER SHOULD BE BASED ON AN EVALUATION OF SOIL TESTS. WHEN A SOIL TEST IS NOT AVAILABLE, THE FOLLOWING MINIMUM AMOUNTS SHOULD BE APPLIED:
- AGRICULTURAL LIMESTONE, 2 TONS PER ACRE OR 100 LBS. PER 1,000 SQ.FT.
- NITROGEN(N), 50 LBS. PER ACRE OR 1.1 LBS. PER 1,000 SQ.FT.
- PHOSPHATE(P2O5), 100 LBS. PER ACRE OR 2.2 LBS. PER 1,000 SQ.FT.
- POTASH(K2O), 100 LBS. PER ACRE OR 2.2 LBS. PER 1,000 SQ.FT.
- (NOTE: THIS IS THE EQUIVALENT OF 500 LBS. PER ACRE OF 10-20-20 FERTILIZER OR 1,000 LBS. PER ACRE OF 5-10-10.)
- B. SEED SHOULD BE SPREAD UNIFORMLY BY THE METHOD MOST APPROPRIATE FOR THE SITE. METHODS INCLUDE BROADCASTING, DRILLING AND HYDROSEEDING. WHERE BROADCASTING IS USED, COVER SEED WITH .25 INCH OF SOIL OR LESS, BY CULTIPACKING OR RAKING.
- C. REFER TO THE 'SEEDING GUIDE' AND 'SEEDING RATES' TABLES ON THIS SHEET FOR APPROPRIATE SEED MIXTURES AND RATES OF SEEDING. ALL LEGUMES (CROWNVEATCH, BIRDSFOOT, TREFOLI AND FLATPEA) MUST BE INOCULATED WITH THEIR SPECIFIC INOCULANT PRIOR TO THEIR INTRODUCTION TO THE SITE.
- D. WHEN SEEDED AREAS ARE MULCHED, PLANTINGS MAY BE MADE FROM EARLY SPRING TO EARLY OCTOBER. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20th OR FROM AUGUST 10th TO SEPTEMBER 1st.
4. **MULCH**
- A. HAY, STRAW, OR OTHER MULCH, WHEN NEEDED, SHOULD BE APPLIED IMMEDIATELY AFTER SEEDING.
- B. MULCH WILL BE HELD IN PLACE USING APPROPRIATE TECHNIQUES FROM THE BEST MANAGEMENT PRACTICE FOR MULCHING. HAY OR STRAW MULCH SHALL BE PLACED AT A RATE OF 90 LBS PER 1000 S.F.
5. **MAINTENANCE TO ESTABLISH A STAND**
- A. PLANTED AREAS SHOULD BE PROTECTED FROM DAMAGE BY FIRE, GRAZING, TRAFFIC, AND DENSE WEED GROWTH.
- B. FERTILIZATION NEEDS SHOULD BE DETERMINED BY ONSITE INSPECTIONS. SUPPLEMENTAL FERTILIZER IS USUALLY THE KEY TO FULLY COMPLETE THE ESTABLISHMENT OF THE STAND BECAUSE MOST PERENNIALS TAKE 2 TO 3 YEARS TO BECOME FULLY ESTABLISHED.
- C. IN WATERWAYS, CHANNELS, OR SWALES WHERE UNIFORM FLOW CONDITIONS ARE ANTICIPATED, ANNUAL MOWING MAY BE NECESSARY TO CONTROL GROWTH OF WOODY VEGETATION.

USE	SEEDING MIXTURE 1/	DROUGHTY	WELL DRAINED	MODERATELY WELL DRAINED	POORLY DRAINED
STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS	A	FAIR	GOOD	GOOD	FAIR
	B	POOR	GOOD	FAIR	FAIR
	C	POOR	GOOD	EXCELLENT	GOOD
	D	FAIR	EXCELLENT	EXCELLENT	POOR
WATERWAYS, EMERGENCY SPILLWAYS, AND OTHER CHANNELS WITH FLOWING WATER.	A	GOOD	GOOD	GOOD	FAIR
	C	GOOD	EXCELLENT	EXCELLENT	FAIR
LIGHTLY USED PARKING LOTS, ODD AREAS, UNUSED LANDS, AND LOW INTENSITY USE RECREATION SITES.	A	GOOD	GOOD	GOOD	FAIR
	B	GOOD	GOOD	FAIR	POOR
	C	GOOD	EXCELLENT	EXCELLENT	FAIR
PLAY AREAS AND ATHLETIC FIELDS. (TOPSOIL IS ESSENTIAL FOR GOOD TURF.)	E	FAIR	EXCELLENT	EXCELLENT	2/
	F	FAIR	EXCELLENT	EXCELLENT	2/
GRAVEL PIT, SEE NH-PM-24 IN APPENDIX FOR RECOMMENDATION REGARDING RECLAMATION OF SAND AND GRAVEL PITS.					
1/ REFER TO SEEDING MIXTURES AND RATES IN TABLE BELOW.					
2/ POORLY DRAINED SOILS ARE NOT DESIRABLE FOR USE AS PLAYING AREA AND ATHLETIC FIELDS.					

NOTE: TEMPORARY SEED MIX FOR STABILIZATION OF TURF SHALL BE WINTER RYE OR OATS AT A RATE OF 2.5 LBS. PER 1000 S.F. AND SHALL BE PLACED PRIOR TO OCTOBER 15th, IF PERMANENT SEEDING NOT YET COMPLETE.

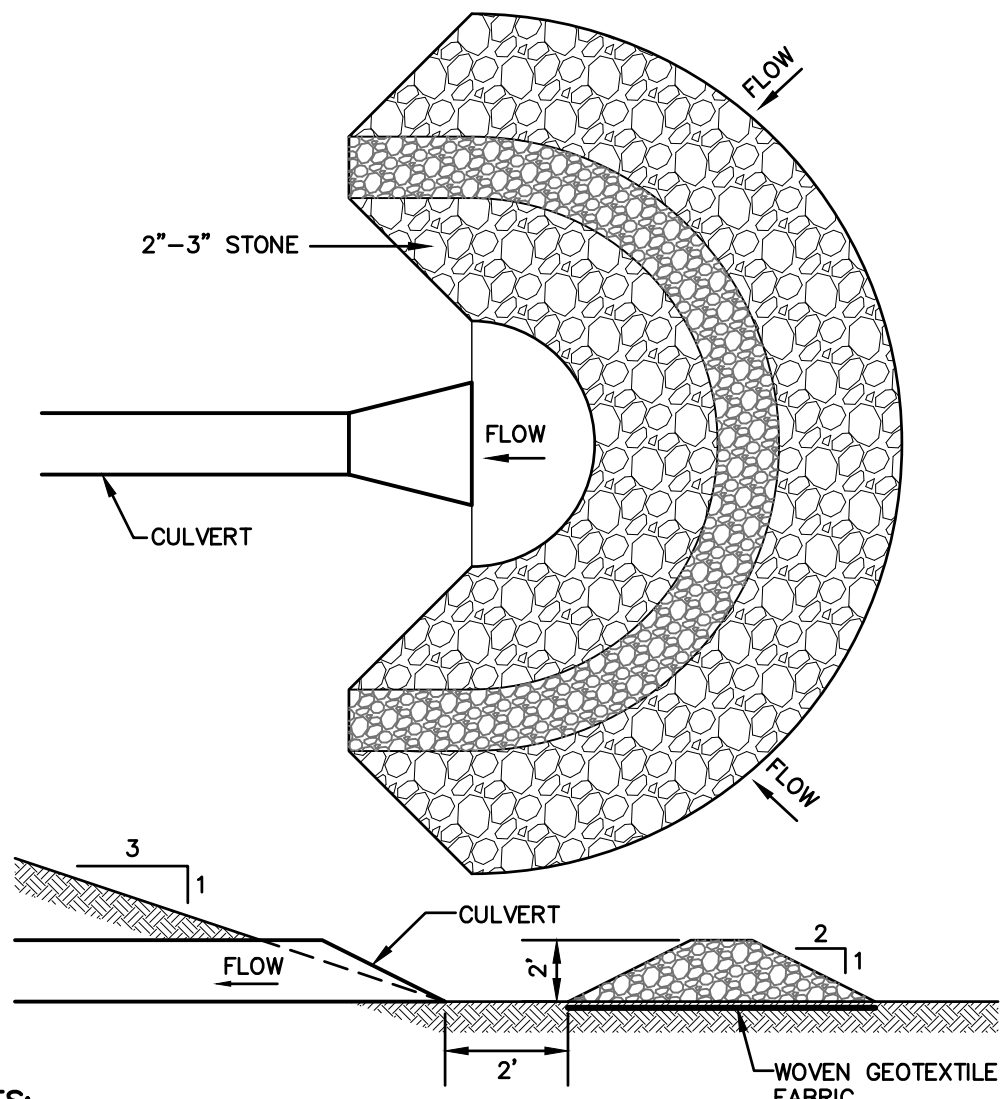
SEEDING GUIDE

MIXTURE	POUNDS PER ACRE	POUNDS PER 1,000 Sq. Ft.
A. TALL FESCUE CREEPING RED FESCUE RED TOP TOTAL	20	0.45
	20	0.45
	2	0.05
	42	0.95
B. TALL FESCUE CREEPING RED FESCUE CROWN VETCH OR FLAT PEA TOTAL	15	0.35
	10	0.25
	15	0.35
	30	0.75
	40 OR 55	0.95 OR 1.35
C. TALL FESCUE CREEPING RED FESCUE BIRDS FOOT TREFOLI TOTAL	20	0.45
	20	0.45
	8	0.20
	48	1.10
D. TALL FESCUE FLAT PEA TOTAL	20	0.45
	30	0.75
	50	1.20
E. CREEPING RED FESCUE 1/ KENTUCKY BLUEGRASS 1/ TOTAL	50	1.15
	50	1.15
	100	2.30
F. TALL FESCUE 1	150	3.60

*

1/ FOR HEAVY USE ATHLETIC FIELDS CONSULT THE UNIVERSITY OF NEW HAMPSHIRE COOPERATIVE EXTENSION TURF SPECIALIST FOR CURRENT VARIETIES AND SEEDING RATES.

SEEDING RATES



NOTES:

1. TEMPORARY CULVERT INLET PROTECTION CHECK DAMS SHALL BE CONSTRUCTED OF 2-3" STONE OVER WOVEN GEOTEXTILE FABRIC.
2. INLET PROTECTION MEASURES SHALL BE INSTALLED AT THE OPENINGS OF ALL EXISTING AND PROPOSED CULVERTS LOCATED BELOW (DOWNSTREAM) FROM AND WITHIN 100' OF THE PROJECT SITE.
3. SEDIMENT SHALL BE REMOVED FROM BEHIND THE STRUCTURE WHEN IT HAS ACCUMULATED TO ONE HALF THE ORIGINAL HEIGHT OF THE STRUCTURE.
4. STRUCTURES SHALL BE REMOVED WHEN THE SITE IS STABILIZED WITH VEGETATION AND THE CHANNEL SHALL BE SMOOTHED AND REVEGETATED.

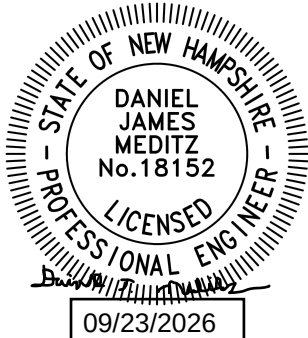
TEMPORARY CULVERT INLET PROTECTION CHECK DAM

NOT TO SCALE

CONSTRUCTION SEQUENCE

1. PRIOR TO THE START OF ANY ACTIVITY, IT IS THE RESPONSIBILITY OF THE SITE'S SITE DEVELOPER (OR OWNER) TO FILE A NOTICE OF INTENT (NOI) FORM WITH THE ENVIRONMENTAL PROTECTION AGENCY (EPA) IN ORDER TO GAIN COVERAGE UNDER THE NPDES GENERAL PERMIT FOR STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITIES. A PRE CONSTRUCTION MEETING IS TO BE HELD WITH ALL DEPARTMENT HEADS PRIOR TO THE START OF CONSTRUCTION.
2. WETLAND BOUNDARIES ARE TO BE CLEARLY MARKED PRIOR TO THE START OF CONSTRUCTION.
3. CUT AND REMOVE TREES IN CONSTRUCTION AREA AS REQUIRED OR DIRECTED.
4. INSTALL SILT FENCING, HAY BALES AND CONSTRUCTION ENTRANCES PRIOR TO THE START OF CONSTRUCTION. THESE ARE TO BE MAINTAINED UNTIL THE FINAL PAVEMENT SURFACING AND LANDSCAPING AREAS ARE ESTABLISHED.
5. CLEAR, CUT, GRUB AND DISPOSE OF DEBRIS IN APPROVED FACILITIES. THIS INCLUDES ANY REQUIRED DEMOLITION OF EXISTING STRUCTURES, UTILITIES, ETC.
6. CONSTRUCT AND/OR INSTALL TEMPORARY OR PERMANENT SEDIMENT AND/OR DETENTION BASIN(S) AS REQUIRED. THESE FACILITIES SHALL BE INSTALLED AND STABILIZED PRIOR TO DIRECTING RUN-OFF TO THEM.
7. STRIP LOAM PER THE RECOMMENDATIONS OF THE PROJECT ENGINEER AND STOCKPILE EXCESS MATERIAL. STABILIZE STOCKPILE AS NECESSARY.
8. PERFORM PRELIMINARY SITE GRADING IN ACCORDANCE WITH THE PLANS, INCLUDING THE CONSTRUCTION OF ANY RETAINING WALLS AND SOUND WALLS.
9. PREPARE BUILDING PAD(S) TO ENABLE BUILDING CONSTRUCTION TO BEGIN.
10. INSTALL THE SEWER AND DRAINAGE SYSTEMS FIRST, THEN ANY OTHER UTILITIES IN ACCORDANCE WITH THE PLAN AND DETAILS. ANY CONFLICTS BETWEEN UTILITIES ARE TO BE RESOLVED WITH THE INVOLVEMENT AND APPROVAL OF THE ENGINEER.
11. ALL SWALES AND DRAINAGE STRUCTURES ARE TO BE CONSTRUCTED AND STABILIZED PRIOR TO HAVING RUN-OFF DIRECTED TO THEM.
12. DAILY, OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINAGE DITCHES, CHECK DAMS, SEDIMENT TRAPS, ETC., TO PREVENT EROSION ON THE SITE AND PREVENT ANY SILTATION OF ABUTTING SUBGRADES AND/OR PROPERTY.
13. PERFORM FINAL FINE GRADING, INCLUDING PLACEMENT OF 'SELECT' SUBGRADE MATERIALS.
14. PAVE ALL PARKING LOT AND DRIVEWAYS WITH INITIAL 'BASE COURSE'.
15. PERFORM ALL REMAINING SITE CONSTRUCTION (I.e. BUILDING, CURBING, UTILITY CONNECTIONS, ETC.).
16. LOAM AND SEED ALL DISTURBED AREAS AND INSTALL ANY REQUIRED SEDIMENT AND EROSION CONTROL FACILITIES (I.e. RIP RAP, EROSION CONTROL BLANKETS, ETC.).
17. FINISH PAVING PARKING LOT AND DRIVEWAYS WITH 'FINISH' COURSE.
18. PARKING LOT AND DRIVEWAYS SHALL BE STABILIZED (PER REQUIREMENTS OF NHDES ENV-WQ 1502.61) WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
19. ALL CUT AND FILL SLOPES SHALL BE SEEDED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
20. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
21. REMOVE TEMPORARY EROSION CONTROL MEASURES AFTER SEEDING AREAS HAVE BEEN 75%-85% ESTABLISHED AND SITE IMPROVEMENTS ARE COMPLETE. SMOOTH AND RE-VEGETATE ALL DISTURBED AREAS.
22. CLEAN SITE AND ALL DRAINAGE STRUCTURES, PIPES AND SUMPS OF ALL SILT AND DEBRIS.
23. INSTALL ALL PAINTED PAVEMENT MARKINGS AND SIGNAGE PER THE PLANS AND DETAILS.
24. ALL EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND AFTER EVERY QUARTER-INCH OF RAINFALL.
25. UPON COMPLETION OF CONSTRUCTION, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY ANY RELEVANT PERMITTING AGENCIES THAT THE CONSTRUCTION HAS BEEN FINISHED IN A SATISFACTORY MANNER.

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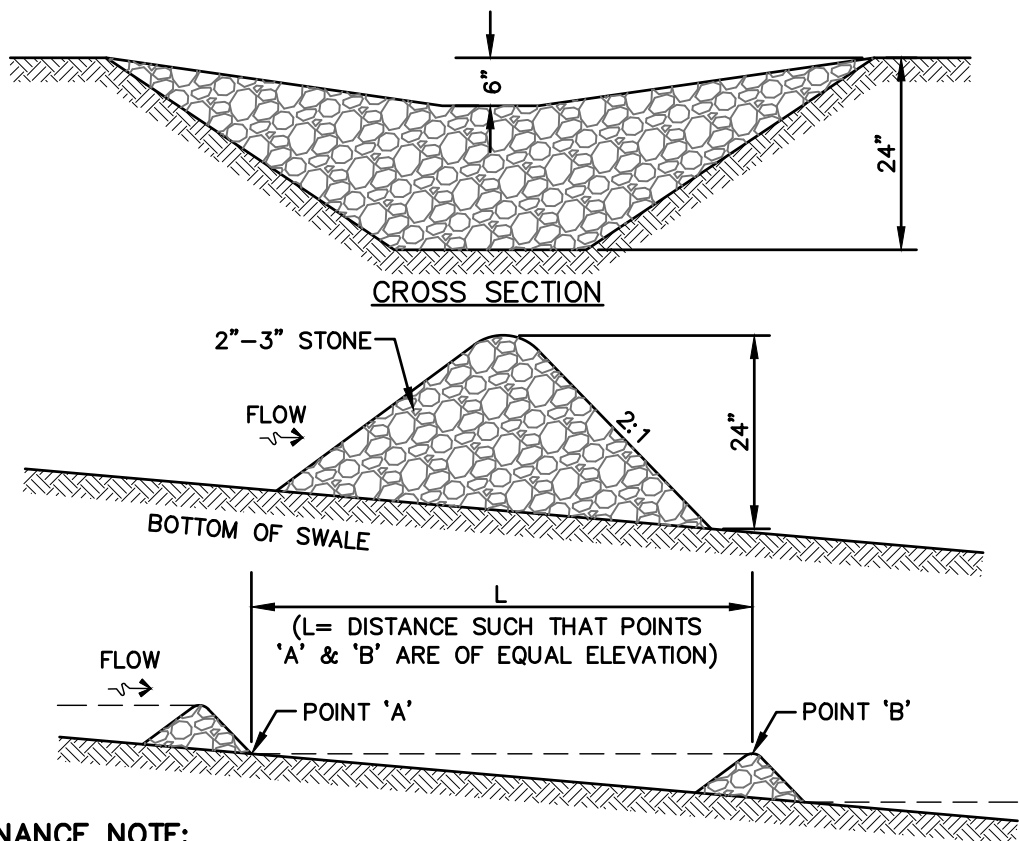


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Plan Name:	EROSION AND SEDIMENT CONTROL DETAILS
Project:	LEDGEWOOD DRIVE LLC LEDGEWOOD DRIVE, PORTSMOUTH, NH 03801
Owner of Record:	ST NICHOLAS GREEK ORTHODOX CHURCH 40 ANDREW JARVIS DRIVE, PORTSMOUTH, NH 03801

DRAWING No.
E1
SHEET 14 OF 15 JBE PROJECT NO. 25071.2

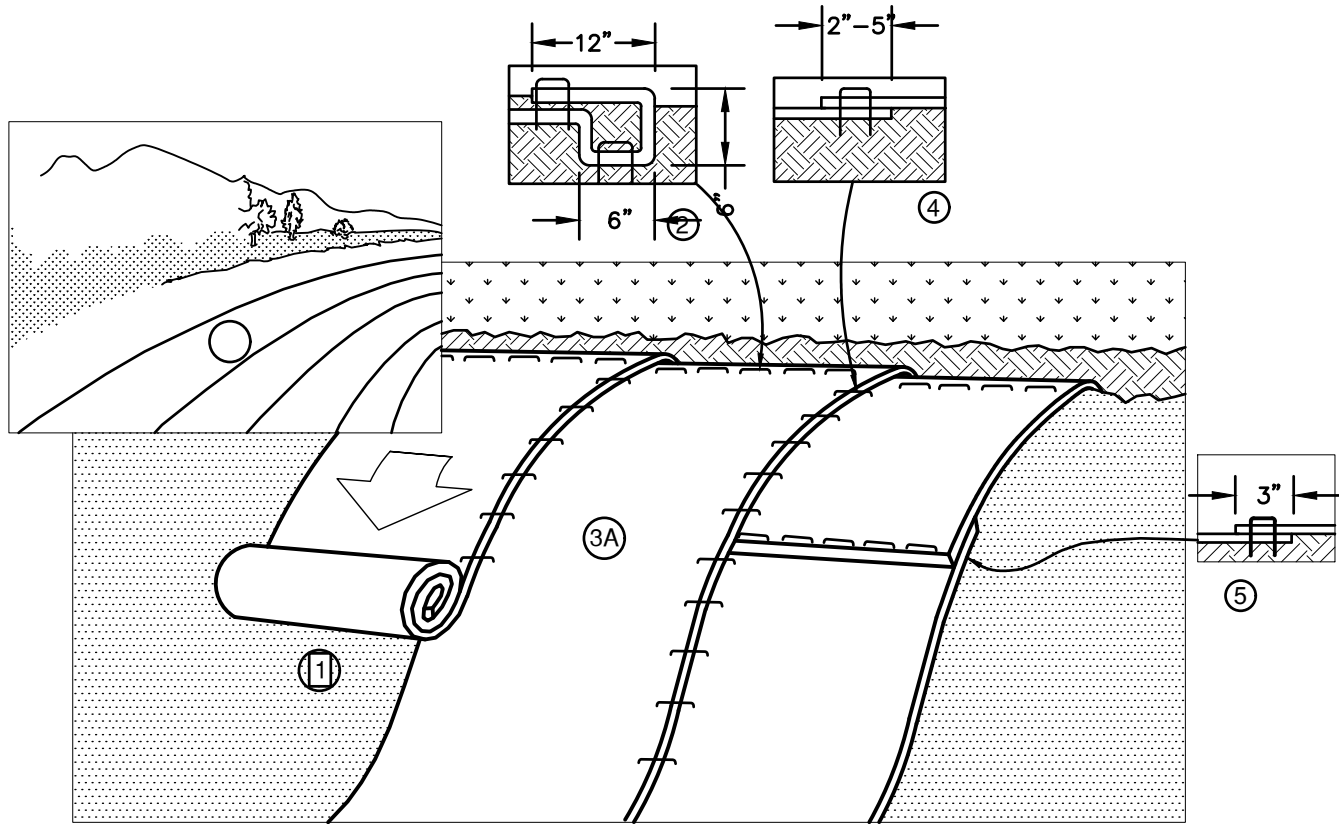


MAINTENANCE NOTE:

1. STONE CHECK DAMS SHOULD BE CHECKED AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY NECESSARY REPAIRS SHOULD BE MADE IMMEDIATELY. PARTICULAR ATTENTION SHOULD BE GIVEN TO END RUN AND EROSION AT THE DOWNSTREAM TOE OF THE STRUCTURE. WHEN THE STRUCTURES ARE REMOVED, THE DISTURBED PORTION SHOULD BE BROUGHT TO THE EXISTING CHANNEL GRADE AND THE AREAS PREPARED, SEEDED AND MULCHED. WHILE THIS PRACTICE IS NOT INTENDED TO BE USED PRIMARILY FOR SEDIMENT TRAPPING, SOME SEDIMENT WILL ACCUMULATE BEHIND THE STRUCTURES. SEDIMENT SHALL BE REMOVED FROM BEHIND THE STRUCTURES WHEN IT HAS ACCUMULATED TO ONE HALF OF THE ORIGINAL HEIGHT OF THE STRUCTURE.

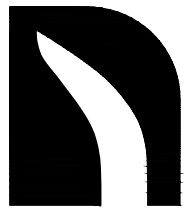
STONE CHECK DAM

NOT TO SCALE



NOTES:

1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING OPTIONAL DOT SYSTEM™, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2"-5" OVERLAP, DEPENDING ON BLANKET TYPE. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH ON THE PREVIOUSLY INSTALLED BLANKET.
5. CONSECUTIVE BLANKETS SPICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH. NOTE: IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

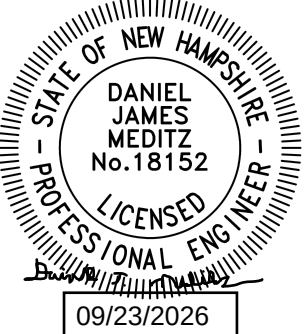


NORTH AMERICAN GREEN
14649 HIGHWAY 41 NORTH
EVANSVILLE, INDIANA 47725
1-800-772-2040

EROSION CONTROL BLANKET SLOPE INSTALLATION
(North American Green SC150BN)

NOT TO SCALE

Design: DJM	Draft: TCR	Date: 01/08/26
Checked: EMP	Scale: AS NOTED	Project No.: 25071.2
Drawing Name: 25071.2-PLAN.dwg		
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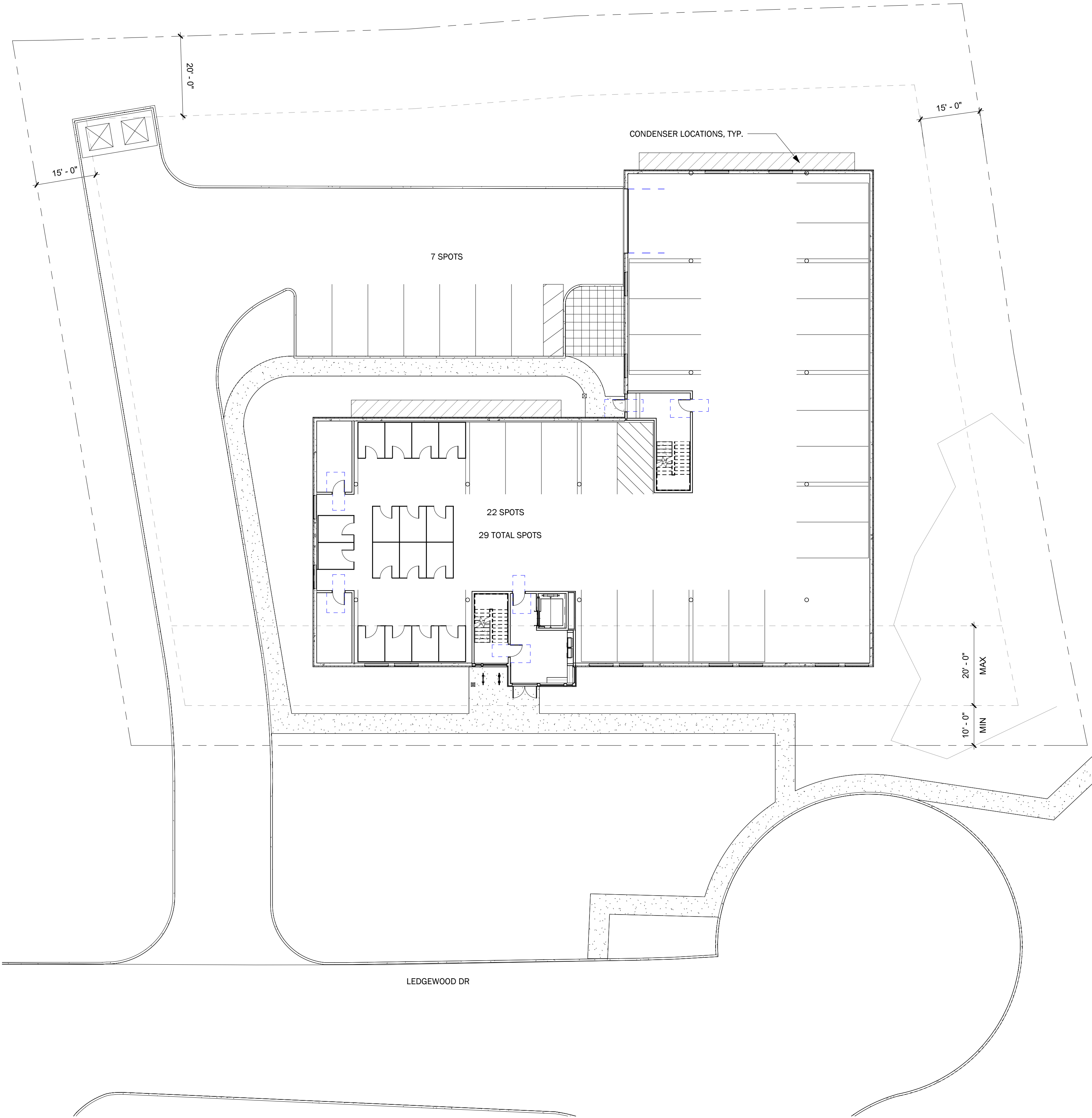


REV.	DATE	REVISION	BY
2	09/22/26	REVISED PER TAC COMMENTS	DJM
1	09/01/26	UPDATED TITLE BLOCK	DJM
0	08/17/26	ISSUED FOR REVIEW	DJM

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100 Domain Dr. Suite 201 Exeter, NH 03833		603-772-4746 E-MAIL: JBE@JONESANDBEACH.COM
Civil Engineering Services		

Plan Name:	EROSION AND SEDIMENT CONTROL DETAILS
Project:	LEDGEWOOD DRIVE LLC LEDGEWOOD DRIVE, PORTSMOUTH, NH 03801
Owner of Record:	ST NICHOLAS GREEK ORTHODOX CHURCH 40 ANDREW JARVIS DRIVE, PORTSMOUTH, NH 03801

DRAWING No.
E2
SHEET 15 OF 15 JBE PROJECT NO. 25071.2



① 01.1 - SITE SKETCH
1/16" = 1'-0"

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DESIGN
DEVELOPMENT

LEDGEWOOD DRIVE
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architecture + design

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KITTERY, MAINE 03904
207.994.3104

Drawn By:	HP/GL
Drawing Checked By:	BH
Drawing Scale:	1/16" = 1'-0"
Drawing Date:	09/21/2026
Project Number:	26061

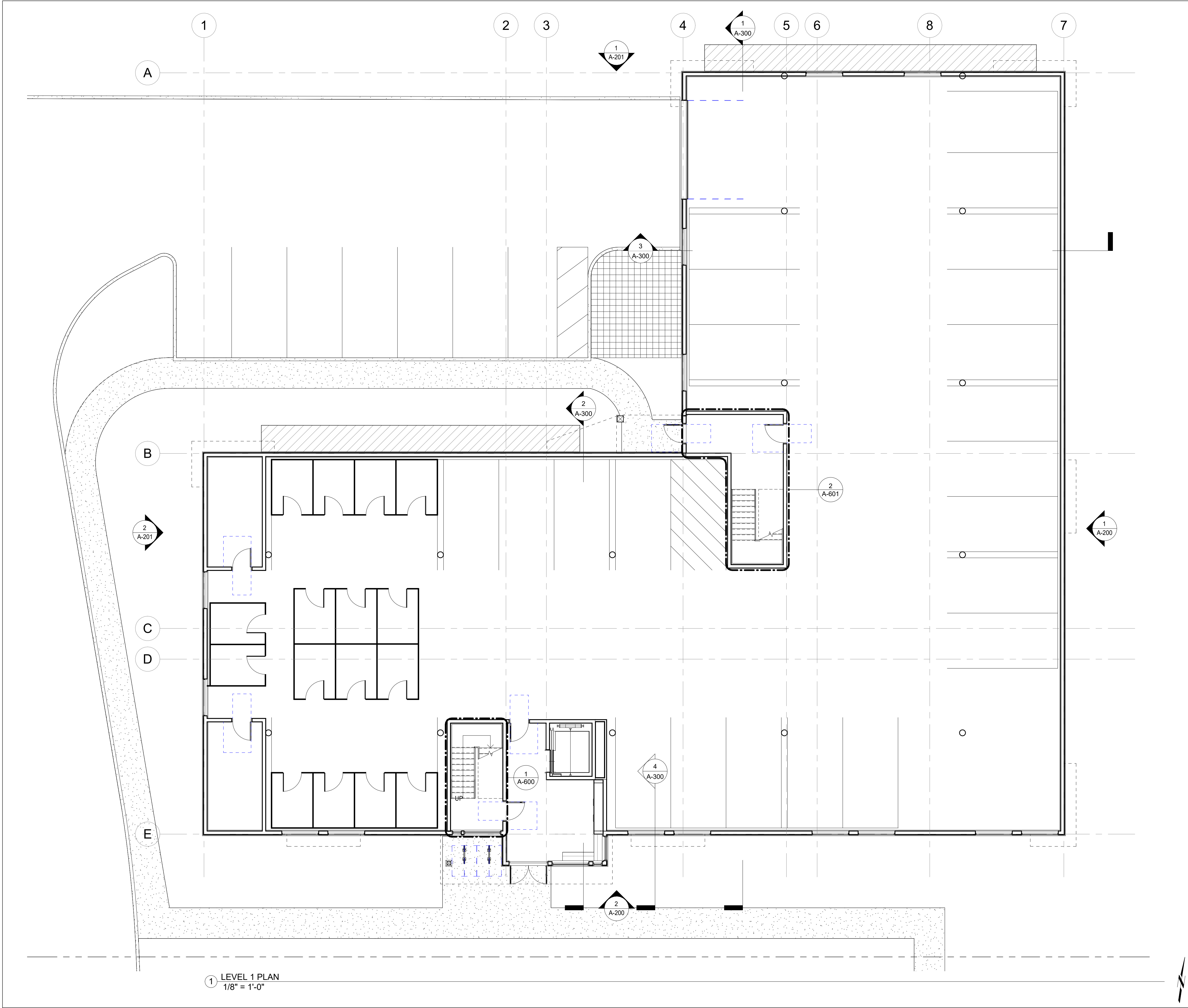
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No.	Description	Date

ARCHITECTURAL
SITE SKETCH

A-001

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

LEGEND - PLAN	
	NEW WALL
	WINDOW TAG
	DOOR TAG
	WALL TAG
	ALIGN
	KEYNOTE

- GENERAL NOTES - PLAN**
- A. ALL DIMENSIONS ARE TO FACE OF STUD U.N.O. DIMENSIONS INDICATED AS "CLEAR" SHALL MAINTAIN A CLEAR OPENING WIDTH FROM FACE OF FINISHES. DIMENSIONS TO EXISTING CONSTRUCTION ARE TO FACE OF FINISH UNLESS NOTED OTHERWISE.
- B. SEE ELEVATIONS, SECTIONS, AND DETAILS FOR ADDITIONAL INFORMATION.
- C. SEE ENLARGED PLANS AND INTERIOR ELEVATIONS FOR ADDITIONAL INFORMATION.
- D. ALL INTERIOR PARTITIONS ARE TYPE NW1 U.N.O. ALL FURRED PARTITIONS ARE TYPE NF1 U.N.O. ALL CORRIDOR AND UNIT DEMISING WALLS ARE TYPE 30W1 U.N.O.
- E. ALL EXTERIOR WALLS ARE TYPE E1 U.N.O.
- F. ANY DISCREPANCIES IN THESE PLANS SHALL BE BROUGHT TO THE ARCHITECT'S ATTENTION IMMEDIATELY.
- G. REFER TO MECHANICAL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION DRAWINGS AND SPECIFICATIONS FOR FULL SCOPE OF WORK.
- H. THE LOCATION OF DOOR OPENINGS NOT DIMENSIONED SHALL BE 6" FROM ADJACENT WALL (FACE OF FRAMING TO ROUGH OPENING).
- I. PROVIDE BLOCKING BEHIND SURFACE APPLIED FIXTURES, TRIM, GRAB BARS, SHELVES, CHAIR RAILS, PICTURE RAILS, WOOD TRIM AND BASE, AND OTHER ACCESSORIES WHEN MOUNTED ON STUD WALLS.
- J. WHERE WALLS OR INFILLS ABUT OR INTERSECT EXISTING WALLS, TAPE AND FINISH JOINTS AT INTERSECTIONS SMOOTH AND CONTINUOUS. USE METAL TRIM WHERE GYPSUM BOARD INTERSECTS OTHER MATERIALS.

KEYNOTES - PLAN	
NO.	DESCRIPTION

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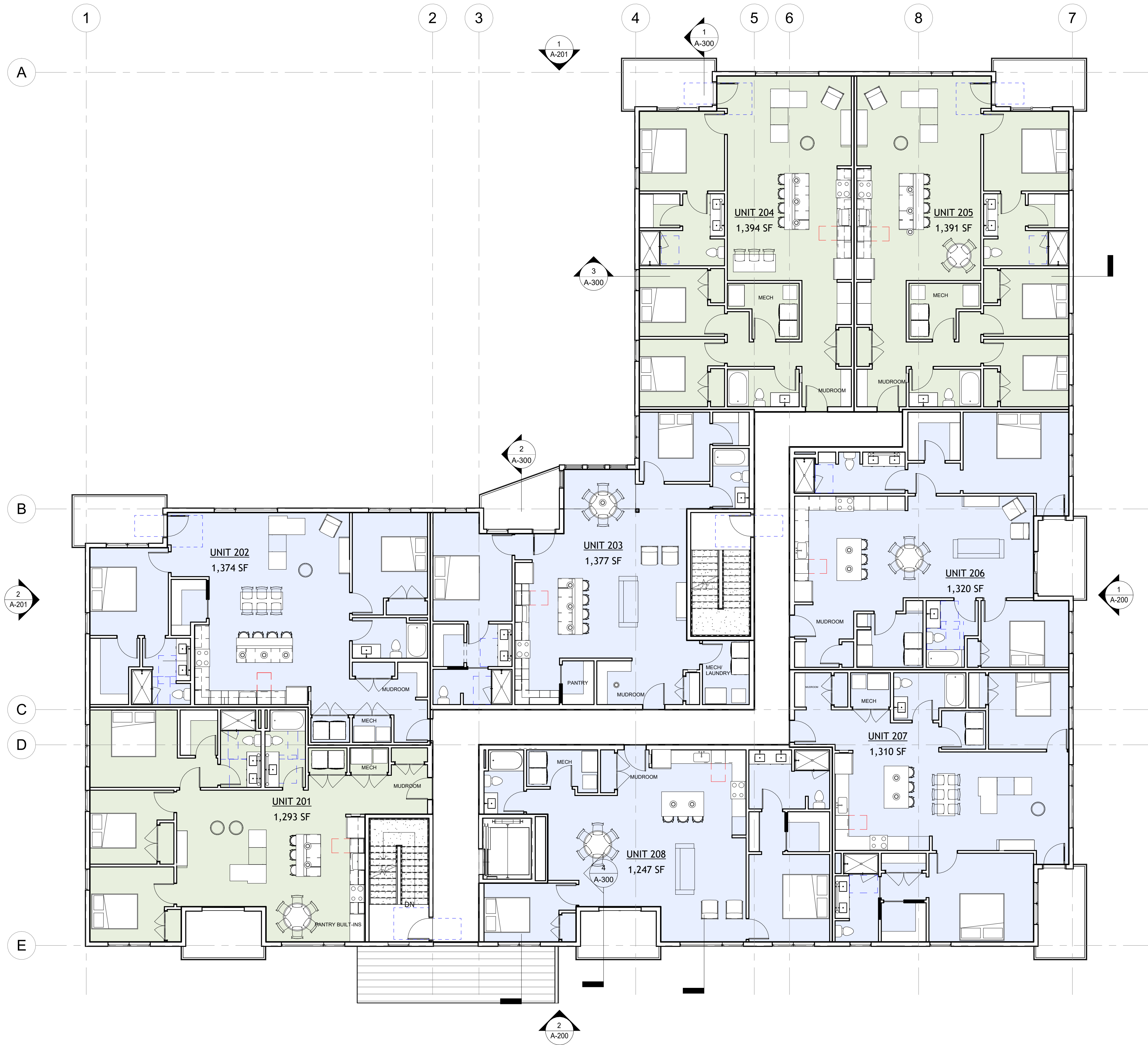
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LEVEL 1 PLAN

A-100

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1 LEVEL 2 UNIT PLANS
1/8" = 1'-0"

UNIT AREAS		
ROOM NAME	ROOM TYPE	AREA
1ST FLOOR		
UNIT 201	3 BED	1,293 SF
UNIT 202	2 BED	1,374 SF
UNIT 203	2 BED	1,377 SF
UNIT 204	3 BED	1,394 SF
UNIT 205	3 BED	1,391 SF
UNIT 206	2 BED	1,320 SF
UNIT 207	2 BED	1,310 SF
UNIT 208	2 BED	1,247 SF
8		10,706 SF
2ND FLOOR		
UNIT 301	3 BED	1,294 SF
UNIT 302	2 BED	1,376 SF
UNIT 303	2 BED	1,375 SF
UNIT 304	3 BED	1,532 SF
UNIT 305	3 BED	1,930 SF
UNIT 306	3 BED	1,861 SF
UNIT 307	2 BED	1,416 SF
7		10,784 SF
		21,489 SF

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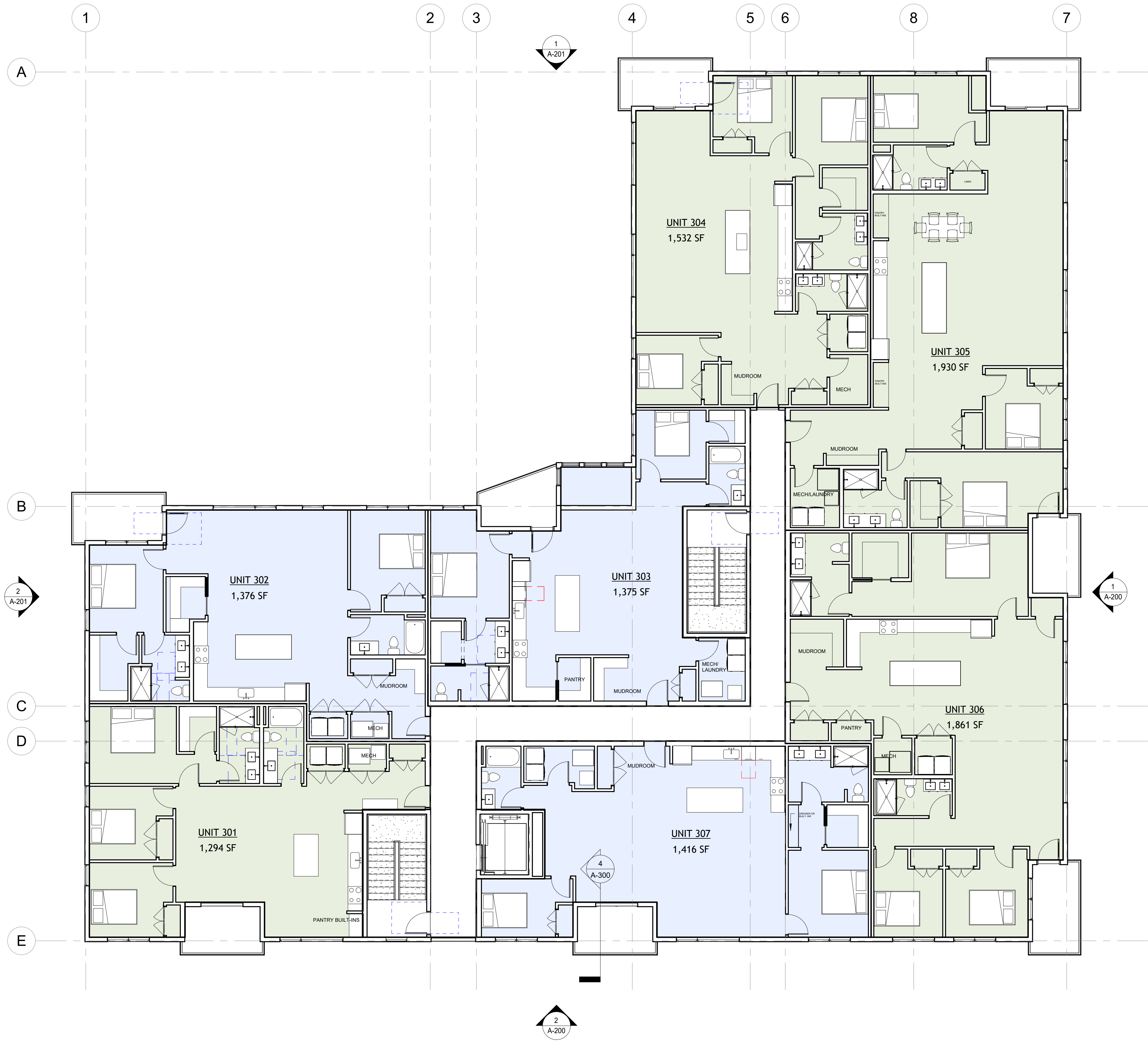
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No. Description Date

LEVEL 2 AREA
PLAN

A-101

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

UNIT AREAS		
ROOM NAME	ROOM TYPE	AREA
1ST FLOOR		
UNIT 201	3 BED	1,293 SF
UNIT 202	2 BED	1,374 SF
UNIT 203	2 BED	1,377 SF
UNIT 204	3 BED	1,394 SF
UNIT 205	3 BED	1,391 SF
UNIT 206	2 BED	1,320 SF
UNIT 207	2 BED	1,310 SF
UNIT 208	2 BED	1,247 SF
8		10,706 SF
2ND FLOOR		
UNIT 301	3 BED	1,294 SF
UNIT 302	2 BED	1,376 SF
UNIT 303	2 BED	1,375 SF
UNIT 304	3 BED	1,532 SF
UNIT 305	3 BED	1,930 SF
UNIT 306	3 BED	1,861 SF
UNIT 307	2 BED	1,416 SF
7		10,784 SF
		21,489 SF

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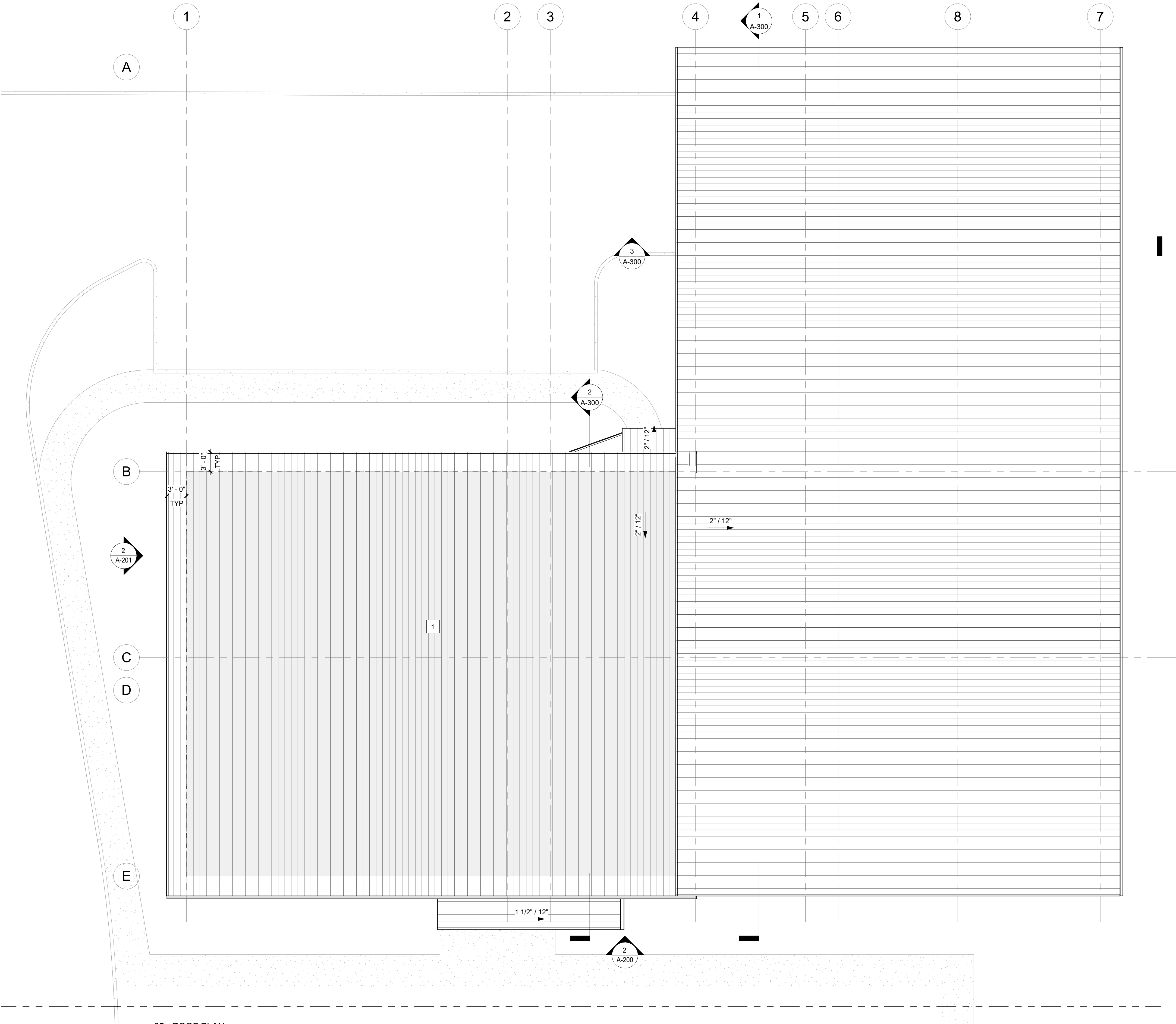
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No. Description Date

LEVEL 3 AREA
PLAN

A-102

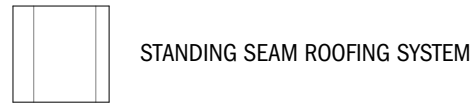
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① 05 - ROOF PLAN
1/8" = 1'-0"

ROOF FINISH LEGEND



ROOF PLAN NOTES

- A. PROVIDE WALKWAY PROTECTION STRIPS 2 FEET WIDE FULLY AROUND ALL ROOF TOP MECHANICAL UNIT(S) AND CREATE A PATHWAY 2 FEET WIDE FROM ROOF ACCESS LOCATION(S)
- B. PROTECT ALL OPENINGS CUT IN THE EXISTING ROOF. PROVIDE TEMPORARY ROOFING IF WORK IS TO BE UNFINISHED DURING ADVERSE WEATHER CONDITIONS.
- C. PROVIDE FLASHING AT ALL ROOF PENETRATIONS, WHETHER SHOWN ON THE ROOF PLAN OR NOT, UNLESS NOTED OTHERWISE. REFER TO STRUCTURAL, MECHANICAL AND ELECTRICAL PLANS FOR NUMBER, LOCATION, AND SIZE OF PENETRATIONS.
- D. SEE ELEVATIONS, SECTIONS, AND DETAILS FOR ADDITIONAL INFORMATION

KEYNOTES - ROOF

NO.	DESCRIPTION
1	HATCH INDICATES AREA OF SOLAR-READY ROOF (APPROX 4600 SF), COORDINATE WITH ROOF TRUSS DESIGN

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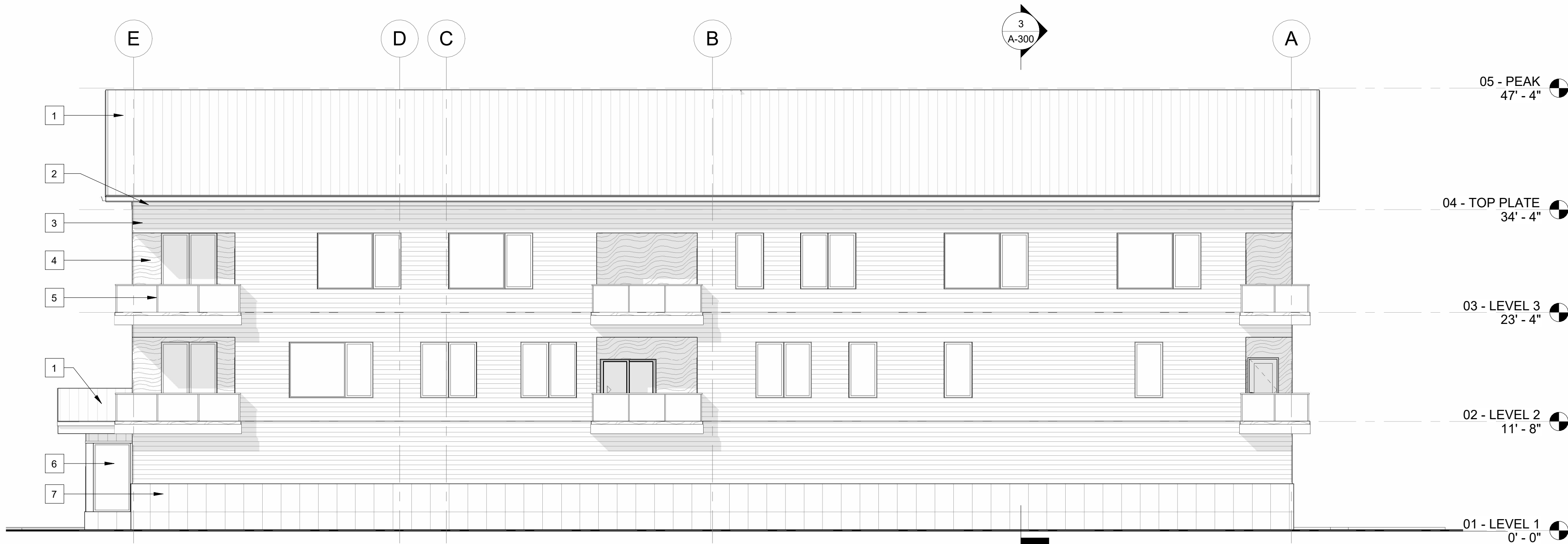
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No.	Description	Date

ROOF PLAN

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① EAST ELEVATION
1/8" = 1'-0"



② SOUTH ELEVATION
1/8" = 1'-0"

KEYNOTES - ELEVATIONS	
NO.	DESCRIPTIONS
1	STANDING SEAM ROOFING SYSTEM
2	1X12 COMPOSITE FRIEZE BOARD
3	6" EXPOSURE NICKEL GAP COMPOSITE SIDING W/ MITERED CORNERS
4	WOOD-LOOK COMPOSITE PANEL
5	GLASS RAILING SYSTEM - VIEWARIL BASIS OF DESIGN
6	CLAD WOOD WINDOWS/DOORS
7	T-CLEAR WALLGUARD CONCRETE-FACED INSULATION PANEL
8	COMPOSITE BOARD & BATTEN SIDING
9	WOOD-LOOK COMPOSITE SOFFIT

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EXTERIOR
ELEVATIONS

A-200

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② WEST ELEVATION
1/8" = 1'-0"



① NORTH ELEVATION
1/8" = 1'-0"

KEYNOTES - ELEVATIONS	
NO.	DESCRIPTIONS
1	STANDING SEAM ROOFING SYSTEM
2	1X12 COMPOSITE FRIEZE BOARD
3	6" EXPOSURE NICKEL GAP COMPOSITE SIDING W/ MITERED CORNERS
4	WOOD-LOOK COMPOSITE PANEL
5	GLASS RAILING SYSTEM - VIEWARIL BASIS OF DESIGN
6	CLAD WOOD WINDOWS/DOORS
7	T-CLEAR WALLGUARD CONCRETE-FACED INSULATION PANEL
8	COMPOSITE BOARD & BATTEN SIDING
9	WOOD-LOOK COMPOSITE SOFFIT

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No.	Description	Date

EXTERIOR
ELEVATIONS

A-201

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① PERSPECTIVE 1



② PERSPECTIVE 2



③ PERSPECTIVE 3



④ PERSPECTIVE 4

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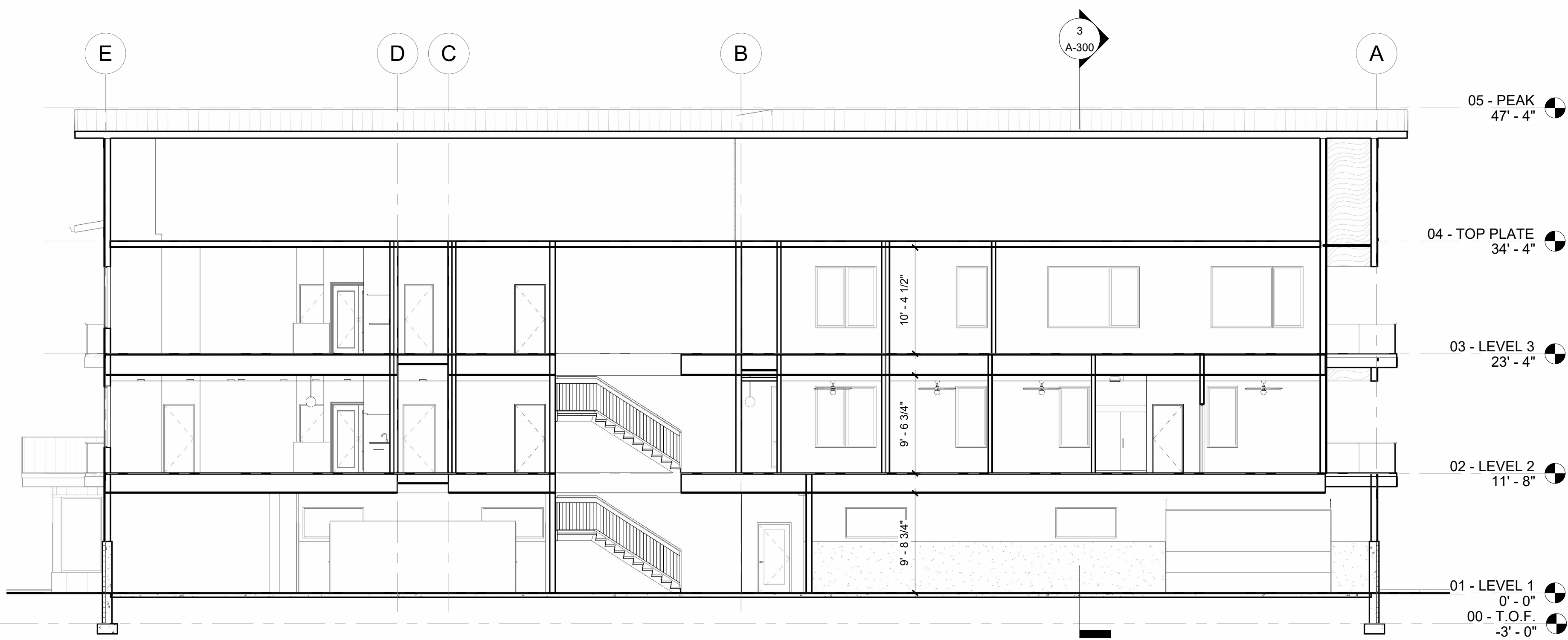
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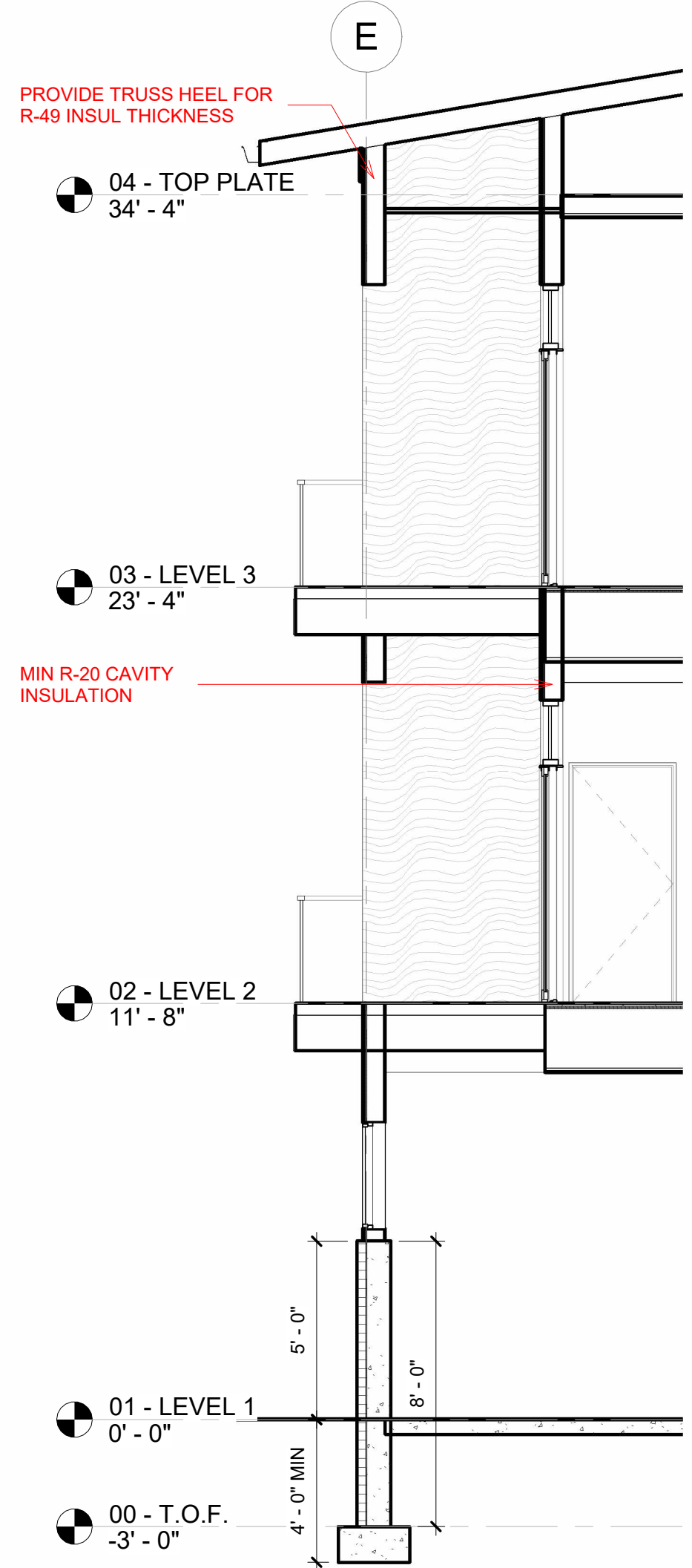
EXTERIOR
PERSPECTIVES

A-202

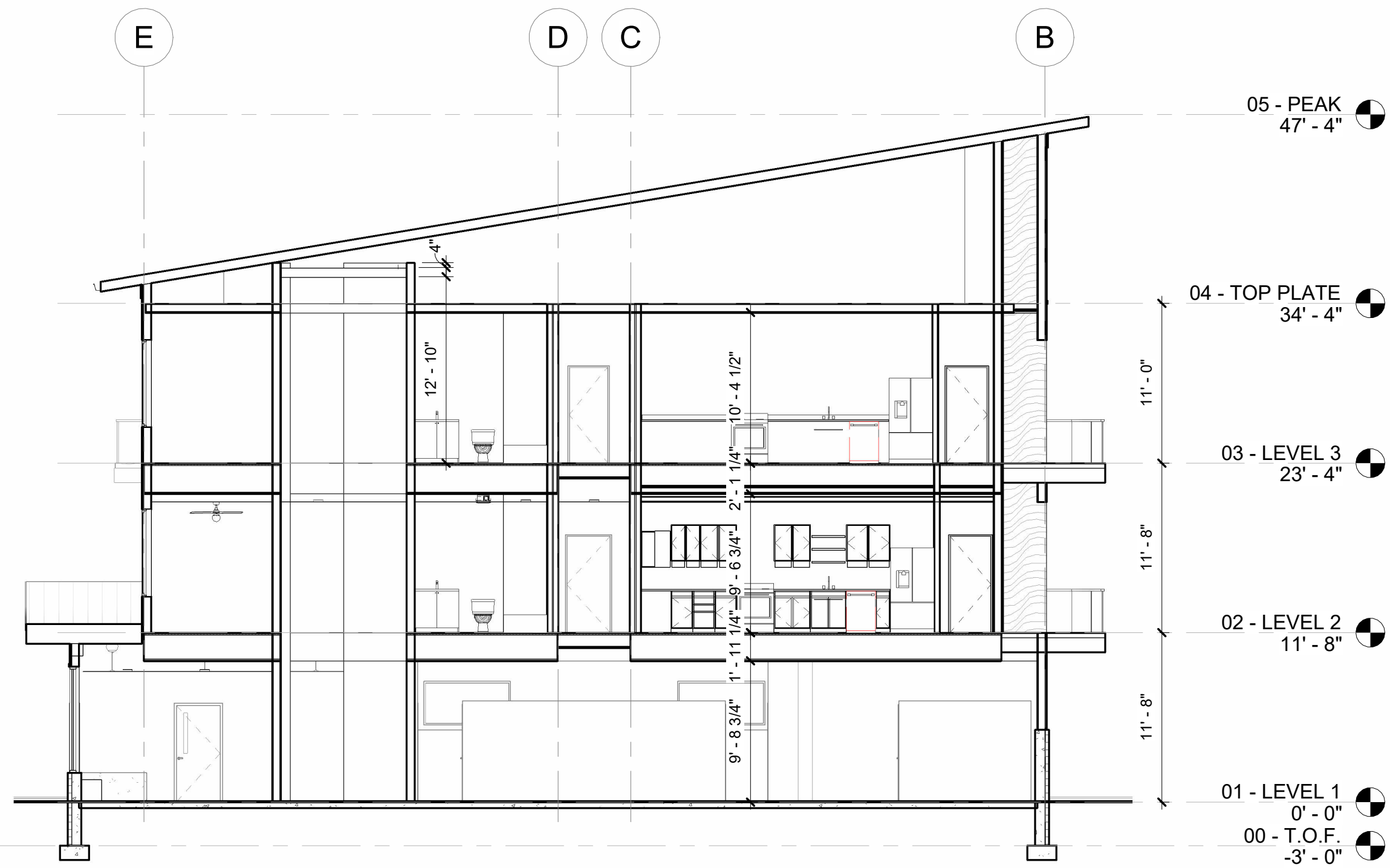
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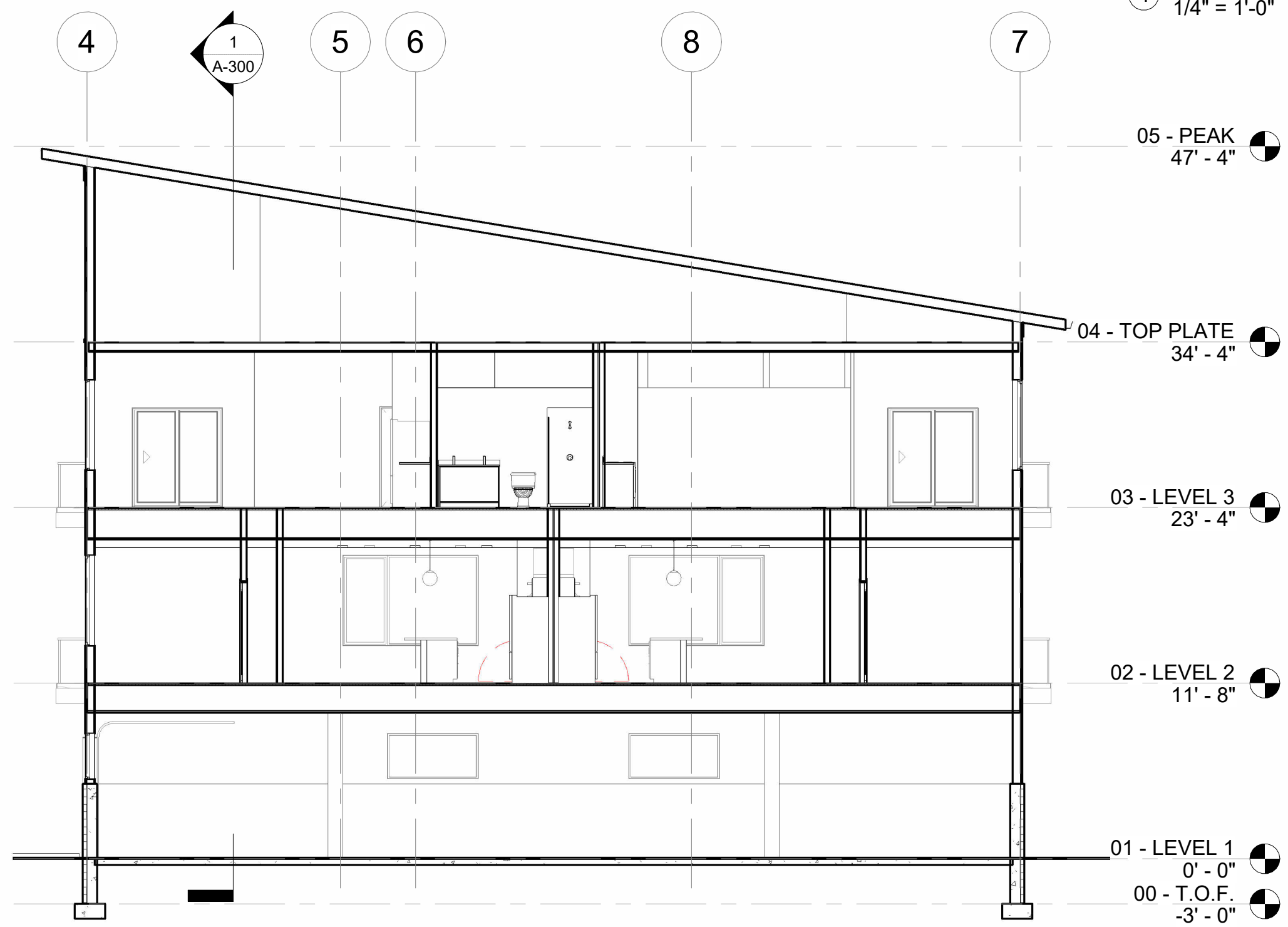
1 BUILDING SECTION 1
1/8" = 1'-0"



4 WALL SECTION 1
1/4" = 1'-0"



2 BUILDING SECTION 2
1/8" = 1'-0"



3 BUILDING SECTION 3
1/8" = 1'-0"

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BUILDING
SECTIONS

A-300

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