

E5071-001
May 29, 2024

Ms. Samantha Collins, Chair
City of Portsmouth Conservation Commission
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: **Request for Wetland Conditional Use Permit Review
100 Durgin Lane – Proposed Redevelopment**

Dear Chair Collins:

On behalf of 100 Durgin Lane Owner, LLC (applicant) we are pleased to submit one (1) set of hard copies and one electronic file (.pdf) of the following information to support a request for a Wetland Conditional Use Permit for the above referenced project:

- One (1) 22x34 & one (1) 11x17 copy of the Site Plan Set, dated April 22, 2024;
- Drainage Analysis, dated April 22, 2024;
- Long-Term Operation & Maintenance Plan, dated April 22, 2024;
- Wetland Delineation Report, last revised May 8, 2024;
- Community Space Exhibit, dated April 19, 2024;
- Impervious Surface Exhibit; dated April 22, 2024;
- Wetland Buffer Exhibit, dated April 22, 2024;
- Wetland Buffer Comparison Exhibit, dated April 22, 2024;
- Authorization Form

PROJECT SUMMARY

Existing Conditions

The proposed project is located at 100 Durgin Lane and includes lots identified as Map 239 Lots 13-2, 16 & 18 on the City of Portsmouth Tax Maps. The site was previously home to Christmas Tree Shops and Bed, Bath and Beyond locations which are no longer in operation. The properties are a combined 26.2 acres of land and are located in the Gateway District (G1) and also lies within the Highway Noise Overlay District. The property is bound to the west by Route 16, to the north by the Motel 6 property and Gosling Road, to the south by the Hampton Inn and Home Depot properties, and to the east by an Eversource easement, Pep Boys and Durgin Plaza.

Proposed Redevelopment

The proposed project consists of the demolition of the existing Christmas Tree Shops and Bed, Bath and Beyond building and the construction of approximately 360 rental housing units in a mix of 3-story and 4-story buildings. The proposed project will include a community building and associated site improvements such as parking, pedestrian access, community spaces, utilities, stormwater management, lighting, and landscaping. The proposed project also includes a reduction in overall impervious surface on the development lot.

The proposed project will be providing 10% community space as required under the Development Site Conditional Use Permit for having more than one principal building on a



single lot. Based on the lot area the required community spaces will exceed 2 acres and includes a public dog park, recreation areas, community walking trails, and open/green space.

Open Space & Buffer Enhancement

The proposed project results in work within the 100-foot wetland buffer and therefore is a Conditional Use Permit is required for demolition and construction activities. The 100-foot wetland buffer within the development area includes impervious parking surfaces, drive aisles, and roadways. The project will provide an overall improvement by reducing impervious cover within the 100-foot wetland buffer. The impervious surface impacts from the proposed project are shown in Table 1. In addition to the summary in Table 1 below, detailed calculations of the impervious surfaces within the buffer for the existing and proposed condition are depicted in the enclosed Wetland Buffer Impervious Surface Exhibit.

The project’s landscape design proposes to replace existing impervious areas removed from the wetland buffer with a native grass mix and native trees in an effort to enhance the previously disturbed wetlands buffer.

Table 1. 100 Durgin Lane, Wetland Buffer Impervious Surfaces

Buffer Segment	Existing Impervious (SF)	Final Impervious (SF)
0-25 feet	3,114	2,467
25-50 feet	12,156	9,010
50-100 feet	45,975	41,506
Total	61,245	52,983
Net Impervious Surface		-8,262

Section 10.1017.24 of the Zoning Ordinance which indicates “Where feasible, the application shall include removal of impervious surfaces at least equal in area to the area of impervious surface impact. The intent of this provision is that the project will not result in a net loss of pervious surface within a jurisdictional wetland buffer.” As shown in Table 1, the proposed project exceeds this requirement by providing an 8,262 SF reduction in impervious surface.

WETLAND CONDITIONAL USE PERMIT

Jurisdictional wetland areas, including forest, dense early successional shrub growth, and emergent wetland are present on site. A Conditional Use Permit for Wetland Buffer Impact will be required for the project for work within the 100 ft wetland buffer.

Wetland Conditional Use Permit Criteria

Based on the above described and enclosed materials, the following addresses how the proposed project warrants the granting of a Wetland Conditional Use Permit by satisfying the following six (6) criteria for approval in Section 10.1017.50 of the Zoning Ordinance:

(1) The land is reasonably suited to the use, activity or alteration.

The land is currently a previously disturbed site that was previously home to Christmas Tree Shops and Bed, Bath and Beyond building. The proposed project design is an allowed use within the Gateway Neighborhood Mixed Use District. Additionally, the proposed project site consists of a previously disturbed wetland



buffer area which has historically been used as a commercial area. The proposed project will result in impervious surface reduction in the buffer, buffer enhancement, and will provide public access to the site.

(2) There is no alternative location outside the wetland buffer that is feasible and reasonable for the proposed use, activity or alteration.

The placement of the proposed buildings and parking areas were sited in a way to reduce the areas of impervious surface within the 25-, 50-, and 100-foot wetland buffers. The proposed project design reduces the impervious surface within the 25-, 50-, and 100' buffers and proposes to replace existing impacted areas with native plants including trees, shrubs, and grasses.

(3) There will be no adverse impact on the wetland functional values of the site or surrounding properties;

There will be no adverse impact on the wetland functional values of the site as the existing condition is previously disturbed and consisting of parking areas, drive aisles, and accessways. There is no real functional wetland buffer area on the project site. The proposed project intends to reduce impervious surfaces from the wetland buffer area. The buffer will be enhanced by the removal of invasive species and enhance the existing vegetation with native vegetation. The proposed site and landscape designs site enhance the previously disturbed wetland buffer area from its existing condition and provide added value by creating public open space for recreation on the site and along the buffer.

(4) Alteration of the natural vegetative state or managed woodland will occur only to the extent necessary to achieve construction goals; and

The proposed project design proposes minimal alteration to the natural woodland to the greatest extent practical. The areas impacted consist primarily of impervious surfaces and previously disturbed areas. Any temporary disturbances of the wetland buffer will be restored following construction.

(5) The proposal is the alternative with the least adverse impact to areas and environments under the jurisdiction of this Section.

The proposed project design is not an adverse impact to the site as it would enhance the buffer by reducing overall impervious surface on the site, improve water quality through stormwater treatment and provide public access to the site. In addition, the proposed project will reduce the impervious surface within the 25, 50, and 100-foot wetland buffers.

(6) Any area within the vegetated buffer strip will be returned to a natural state to the extent feasible.

The proposed work within the vegetated buffer strip is limited to the removal of impervious areas and repaving of the existing access road to the north. The proposed project will collect and treat the onsite impervious surfaces prior to discharging to the onsite wetlands. Implementing these treatment measures will help improve the water quality discharged from the property. Areas temporarily disturbed for the removal of paved areas within the vegetated buffer strip will be restored following construction. The landscape plan proposes replacing the existing disturbed areas within the 25-foot wetland buffer with a native grass mix, mown as required to avoid incursions of invasive species, and the addition of several native trees and shrubs within the previously disturb buffer area.

CONCLUSION

As shown in the enclosed information, the proposed project is expected to create a vibrant, authentic, diverse, and connected development that provides high quality housing to a variety of income ranges and meaningful community spaces.

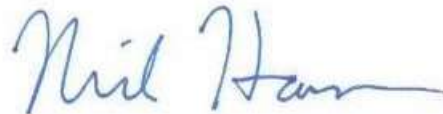
We respectfully request to be placed on the Conservation Commission agenda for June 12, 2024. If you have any questions or need any additional information, please contact me by phone at (603) 294-9213 or by email at NAHansen@tighebond.com.

Sincerely,

TIGHE & BOND, INC.



Patrick M. Crimmins, PE
Vice President



Neil A. Hansen, PE
Project Manager

Enclosures

- Copy: 100 Durgin Lane Owner, LLC
- John K. Bosen, Bosen & Associates
- Utile, Inc Architects
- Aceto Landscape Architecture



PROPOSED MULTI-FAMILY DEVELOPMENT

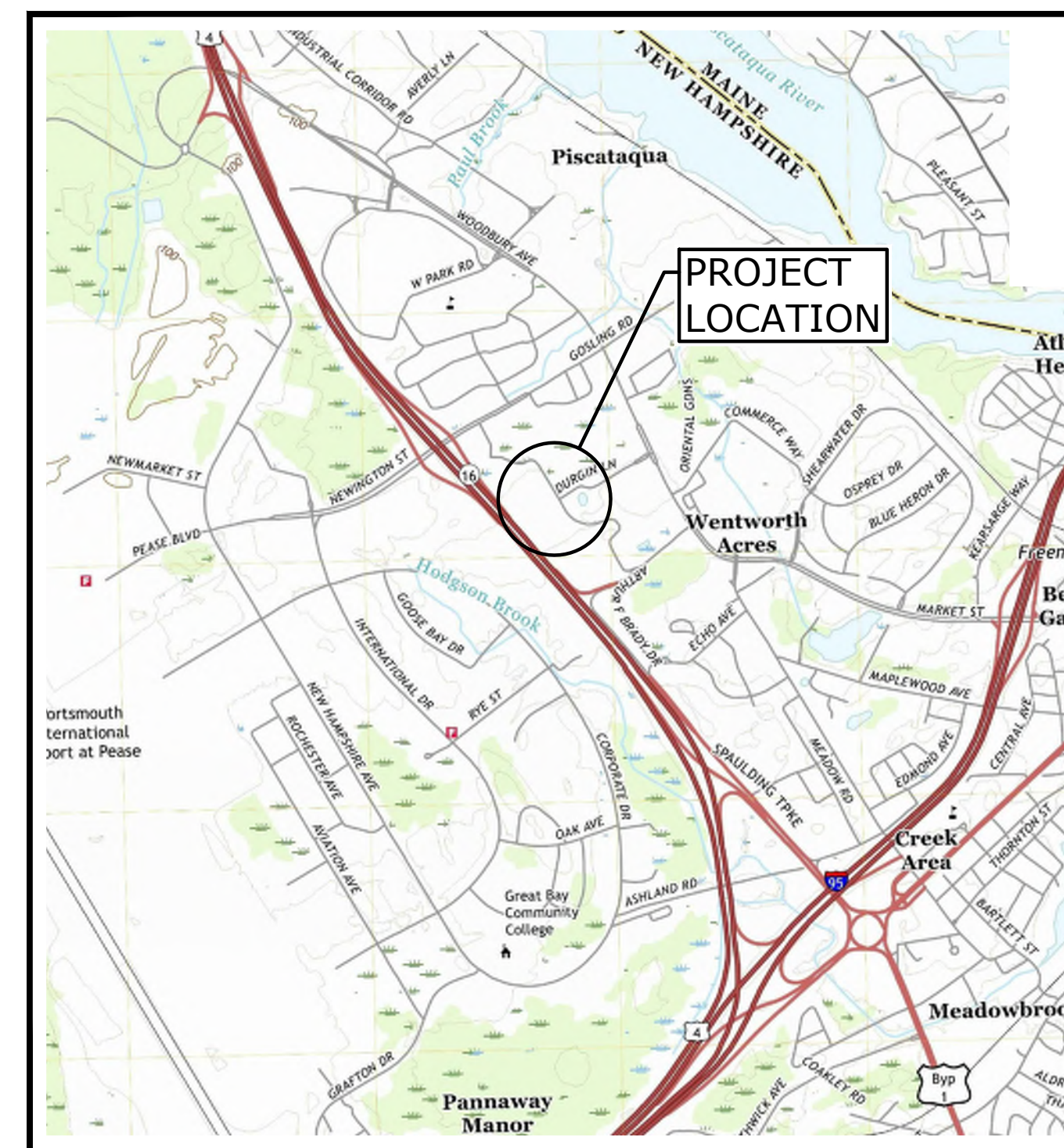
100 DURGIN LANE

PORTSMOUTH, NEW HAMPSHIRE

APRIL 22, 2024

LIST OF DRAWINGS		
SHEET NO.	SHEET TITLE	LAST REVISED
-	COVER SHEET	4/22/2024
1 OF 4	TOPOGRAPHIC SURVEY NOTES	2/29/2024
2 OF 4	TOPOGRAPHIC SURVEY	2/29/2024
3 OF 4	TOPOGRAPHIC SURVEY	2/29/2024
4 OF 4	TOPOGRAPHIC SURVEY	2/29/2024
C-101	GENERAL NOTES AND LEGEND	4/22/2024
C-201	DEMOLITION PLAN	4/22/2024
C-202	DEMOLITION PLAN	4/22/2024
C-300	OVERALL SITE PLAN	4/22/2024
C-301	SITE PLAN	4/22/2024
C-302	SITE PLAN	4/22/2024
C-401	GRADING, DRAINAGE, AND EROSION CONTROL PLAN	4/22/2024
C-402	GRADING, DRAINAGE, AND EROSION CONTROL PLAN	4/22/2024
C-403	DRAINAGE STRUCTURE TABLES	4/22/2024
C-501	UTILITIES PLAN	4/22/2024
C-502	UTILITIES PLAN	4/22/2024
C-600	ACCESS EASEMENT PLAN	4/22/2024
C-601	UTILITY, DRAINAGE, AND GRADING EASEMENT PLAN	4/22/2024
C-602	COMMUNITY SPACE EASEMENT PLAN	4/22/2024
C-801	EROSION CONTROL NOTES AND DETAILS SHEET	4/22/2024
C-802	DETAILS SHEET	4/22/2024
C-803	DETAILS SHEET	4/22/2024
C-804	DETAILS SHEET	4/22/2024
C-805	DETAILS SHEET	4/22/2024
C-806	DETAILS SHEET	4/22/2024
C-807	DETAILS SHEET	4/22/2024
C-808	DETAILS SHEET	4/22/2024
C-809	DETAILS SHEET	4/22/2024
L0-01	LANDSCAPE NOTES	4/22/2024
L1-00	LAYOUT AND MATERIALS PLAN	4/22/2024
L2-00	PLANTING PLAN	4/22/2024
L3-00	PHOTOMETRIC PLAN	4/22/2024
L5-00	SITE DETAILS	4/22/2024
L5-01	SITE DETAILS	4/22/2024
L5-02	SITE DETAILS	4/22/2024
L5-03	PLANTING DETAILS	4/22/2024
1 OF 9	3-STORY BUILDING ELEVATIONS	4/22/2024
2 OF 9	3-STORY BUILDING ELEVATIONS	4/22/2024
3 OF 9	3-STORY BUILDING (SMALL) ELEVATIONS	4/22/2024
4 OF 9	4-STORY BUILDING ELEVATIONS	4/22/2024
5 OF 9	COMMUNITY BUILDING ELEVATIONS	4/22/2024
6 OF 9	3-STORY BUILDING PLANS	4/22/2024
7 OF 9	3-STORY BUILDING (SMALL) FLOOR PLANS	4/22/2024
8 OF 9	4-STORY BUILDING FLOOR PLANS	4/22/2024
9 OF 9	COMMUNITY BUILDING FLOOR PLANS	4/22/2024

LIST OF PERMITS		
LOCAL	STATUS	DATE
SITE PLAN REVIEW PERMIT	PENDING	
LOT LINE REVISION PERMIT	PENDING	
CONDITIONAL USE PERMIT - DEVELOPMENT SITE	PENDING	
CONDITIONAL USE PERMIT - WETLAND BUFFER	PENDING	
CONDITIONAL USE PERMIT - HIGHWAY NOISE OVERLAY DISTRICT	PENDING	
STATE		
NHDES - SEWER CONNECTION PERMIT	NOT SUBMITTED	
NHDES - ALTERATION OF TERRAIN PERMIT	NOT SUBMITTED	
FEDERAL		
NPDES - CONSTRUCTION GENERAL PERMIT	NOT SUBMITTED	

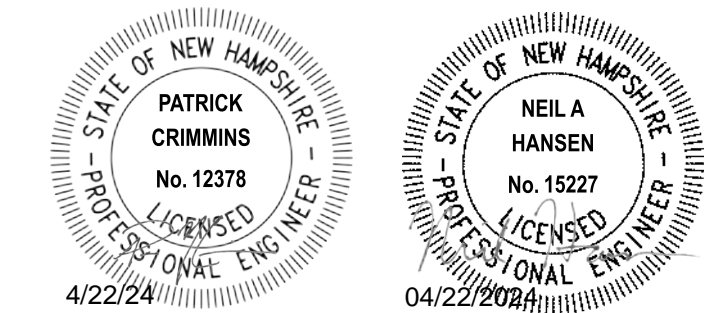


LOCATION MAP
SCALE: 1" = 2000'

CONSTRUCTION NOTES:

1. THE CONTRACTOR SHALL NOT RELY ON SCALED DIMENSIONS AND SHALL CONTACT THE ENGINEER FOR CLARIFICATION IF A REQUIRED DIMENSION IS NOT PROVIDED ON THE PLANS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS AND METHODS, AND FOR SITE CONDITIONS THROUGHOUT CONSTRUCTION. NEITHER THE PLANS NOR THE SEAL OF THE ENGINEER AFFIXED HEREON EXTEND TO OR INCLUDE SYSTEMS REQUIRED FOR THE SAFETY OF THE CONTRACTOR, THEIR EMPLOYEES, AGENTS OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING AND IMPLEMENTING SAFETY PROCEDURES AND SYSTEMS AS REQUIRED BY THE UNITED STATES OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), AND ANY STATE OR LOCAL SAFETY REGULATIONS.
3. TIGHE & BOND ASSUMES NO RESPONSIBILITY FOR ANY ISSUES LEGAL OR OTHERWISE, RESULTING FROM CHANGES MADE TO THESE DRAWINGS WITHOUT WRITTEN AUTHORIZATION OF TIGHE & BOND.

PREPARED BY:
Tighe & Bond
 177 CORPORATE DRIVE
 PORTSMOUTH, NEW HAMPSHIRE 03801
 603-433-8818



OWNER/APPLICANT:
 100 Durgin Lane Owner LLC
 ONE MARINA PARK DRIVE, SUITE 1500
 BOSTON, MA 02210

SURVEYOR:
 HOLDEN ENGINEERING & SURVEYING, INC.
 56 OLD SUNCOOK ROAD, PO BOX 480
 CONCORD, NH 03302

ARCHITECT:
 UTILE
 115 KINGSTON STREET
 BOSTON, MA 02111

LANDSCAPE ARCHITECT:
 ACETO LANDSCAPE ARCHITECTS
 424 FORE STREET #3B
 PORTLAND, ME 04101

**TAC SUBMISSION
 COMPLETE SET (45) SHEETS**

ITEMS CORRESPONDING TO SCHEDULE B:

- 9 Rights and easements in favor of the United States of America relating to electric power transmission lines as described in the Judgment on Declaration of Taking dated October 20, 1952 and recorded at Book 1283, Page 201; Order Amending Judgment on Declaration of Taking recorded November 26, 1954, at Book 1337, Page 277; Order of Court Amending Judgment on the Declaration of Taking, as Amended dated June 29, 1954, and recorded at Book 1340, Page 437 on December 29, 1954; Final Judgment of Condemnation for Tracts dated February 29, 1955, at Book 1370, Page 335; and Certification dated December 9, 1955, and recorded at Book 1379, Page 216. DOES AFFECT THE SUBJECT PROPERTY - SHOWN ON PLAN.
- 10 Rights and easements granted to Public Service Company of New Hampshire by instrument recorded at Book 1350, Page 186; agreement and consent to joint use between Public Service Company of New Hampshire and Costco Wholesale Corporation dated October 21, 1992, and recorded at Book 2965, Page 2892; rights and easements granted by Costco Wholesale Corporation to Public Service Company of New Hampshire and New England Telephone and Telegraph Company (NET&T) dated February 10, 1993, and recorded at Book 2972, Page 1422; and as shown on the 2019 ALTA Survey described herein. DOES AFFECT THE SUBJECT PROPERTY - SHOWN ON PLAN.
- 11 Right of way granted by Shaw's Realty Co. to Gilbert E. and Dorothy Soucy dated July 30, 1992, and recorded at Book 2965, Page 548. DOES AFFECT THE SUBJECT PROPERTY - SHOWN ON PLAN.
- 12 Rights and easements granted to New England Telephone and Telegraph Company dated April 12, 1987, and recorded at Book 1430, Page 375. MAY AFFECT THE SUBJECT PROPERTY - VAGUE DESCRIPTION - NOT PLOTTABLE.
- 13 Rights, easements, terms and obligations set forth in the Agreement between Gilbert E. Soucy and Dorothy Soucy and Costco Wholesale Corporation dated November 3, 1992, and recorded at Book 2956, Page 2200. DOES AFFECT THE SUBJECT PROPERTY - SHOWN ON PLAN.
- 14 Rights and easements granted to Gilbert E. and Dorothy Soucy for vehicular and pedestrian ingress and egress and for electric, telephone and cable television transmission lines as more fully described in the Grant of Right-of-Way from Costco Wholesale Corporation recorded at Book 2966, Page 754. MAY AFFECT THE SUBJECT PROPERTY - DOCUMENT DOES NOT DESCRIBE LOCATION - NOT PLOTTABLE.
- 15 Rights and easements to lay, construct, operate, inspect, repair, maintain, renew, replace and remove underground sanitary sewer mains through a trip of land 20 feet in width as more fully described in the Sewer Easement from Costco Wholesale Corporation to Robert D. Haverly and Kathleen M. Haverly, Trustees of SFL Realty Trust, and Saturn Realty LLC dated June 9, 1994, and recorded at Book 3102, Page 379 and as shown on the 2019 ALTA Survey described herein. DOES AFFECT THE SUBJECT PROPERTY (LOT 239-18) - SHOWN ON PLAN.
- 16 Rights and easements granted by Costco Wholesale Corporation to Saturn Realty LLC by Access Easement dated June 9, 1994, and recorded at Book 3102, Page 381, and as shown on the 2019 ALTA Survey described herein. DOES AFFECT THE SUBJECT PROPERTY - SHOWN ON PLAN.
- 17 Rights and easements for ingress and egress as more fully described in the Access Easement from Costco Wholesale Corporation to Robert D. Haverly and Kathleen M. Haverly, Trustees of SFL Realty Trust, dated June 9, 1994, and recorded at Book 3102, Page 391. DOES AFFECT THE SUBJECT PROPERTY - SHOWN ON PLAN.
- 18 Use limitations and general maintenance obligations as more fully set forth in the Real Estate Operation Agreement between the Trustees of SFL Realty Trust and Costco Wholesale Corporation dated as of June 9, 1994, and recorded at Book 3114, Page 601. DOES AFFECT THE SUBJECT PROPERTY - SHOWN ON PLAN.
- 19 Rights and easements for access and utilities as described in the Easement Deed from Costco Wholesale Corporation to Gilbert E. Soucy and Dorothy Soucy dated November 11, 1992, and recorded at Book 2956, Page 2205; and Access Easement Deed dated June 12, 1996, from Costco Wholesale Corporation to Gilbert E. Soucy and Dorothy Soucy recorded at Book 3150, Page 2035, as affected by Amended Access Easement Deed between MIC PNH, LLC and Bed Bath & Beyond, Inc. dated November 21, 2013, and recorded at Book 5505, Page 683. See also Plan of Supplemental Access Easement as Plan D-35346 and Amended Access Easement dated November 19, 2013, and recorded at Book 5498, Page 2502; and as shown on the 2019 ALTA Survey described herein. DOES AFFECT THE SUBJECT PROPERTY - SHOWN ON PLAN.
- 20 Rights and easement for utilities in the Utility Easement Deed from Costco Wholesale Corporation to Gilbert E. Soucy and Dorothy Soucy dated June 12, 1996, and recorded at Book 3160, Page 2039; and as shown on the 2019 ALTA Survey described herein. DOES AFFECT THE SUBJECT PROPERTY - SHOWN ON PLAN.
- 21 Rights and easements in favor of the City of Portsmouth as described in the Access Easement Deed from Costco Wholesale Corporation dated June 12, 1996 and recorded at Book 3160, Page 2042. DOES AFFECT THE SUBJECT PROPERTY - SHOWN ON PLAN.
- 22 Rights and easements granted by Costco Wholesale Corporation to Gilbert E. Soucy and Dorothy Soucy as more fully described in the Slope and Landscape Easement Deed dated June 12, 1996, and recorded at Book 3160, Page 2045. DOES AFFECT THE SUBJECT PROPERTY - SHOWN ON PLAN.
- 23 Rights and easements in favor of Gilbert E. Soucy and Dorothy Soucy as set forth in the Drainage Easement Deed from Costco Wholesale Corporation dated June 12, 1996, and recorded at Book 3160, Page 2051; and as shown on the 2019 ALTA Survey described herein. DOES AFFECT THE SUBJECT PROPERTY - SHOWN ON PLAN.
- 24 Rights and easements for ingress and egress as more fully described in the Access Easement granted by SFL, LLC to Gilbert Soucy and Dorothy Soucy dated June 13, 1996, and recorded at Book 3160, Page 2033. DOES AFFECT THE SUBJECT PROPERTY - SHOWN ON PLAN.

ITEMS CORRESPONDING TO SCHEDULE B:

- 25 Terms and provisions set forth in the Conservation Easement from SFL L.L.C. to the City of Portsmouth dated November 21, 1996 and recorded at Book 3192, Page 282. DOES AFFECT THE SUBJECT PROPERTY - SHOWN ON PLAN.
- 26 Terms and conditions of the Operation and Maintenance Agreement between SFL, LLC and During [sic.] Lane Hotel Corp. dated as of June 21, 1996 and recorded at Book 3165, Page 1545. DOES AFFECT THE SUBJECT PROPERTY - SHOWN ON PLAN.
- 27 Rights and easements for access, parking, utilities and signage as more fully described in the Access, Parking Signage and Utility Easement granted by Robert D. Haverly and Kathleen M. Haverly, Trustees of SFL Realty Trust, to Saturn Realty LLC dated June 9, 1994, and recorded at Book 3102, Page 397, as affected by the Quitclaim Deed and Release to Home Depot USA, Inc. from Saturn Realty LLC dated March 6, 1997 recorded in the Registry at Book 3202, Page 2465. DOES AFFECT THE SUBJECT PROPERTY (LOT 239-13-2) - SHOWN ON PLAN.
- 28 Rights and easements for access, parking, utilities and signage as more fully described in the instrument granted by Saturn Realty LLC to Robert D. Haverly and Kathleen M. Haverly, Trustees of SFL Realty Trust, dated June 9, 1994, and recorded at Book 3102, Page 400, as affected by deed from Home Depot U.S.A., Inc. to Saturn Realty, LLC recorded March 10, 1997, at Book 3202, Page 2462. DOES AFFECT THE SUBJECT PROPERTY (LOT 239-13-1) - SHOWN ON PLAN.
- 29 Terms and conditions set forth in the Mutual Access Easement between Home Depot U.S.A., Inc. and Thomas J. Flaherty recorded September 14, 2006, at Book 4707, Page 1682, as may be affected by that certain Site Plan prepared by Applodere Engineering, Inc. recorded as Plan No. D-34142 on September 14, 2006. DOES AFFECT THE SUBJECT PROPERTY - SHOWN ON PLAN.
- 30 Rights and easements set forth in the Grant of Right-of-Way from Durgin Square Limited Partnership Louis L. Dow, Sr. et al. dated July 28, 1992, and recorded at Book 2839, Page 504; and as shown on the 2019 ALTA Survey described herein. DOES AFFECT THE SUBJECT PROPERTY - SHOWN ON PLAN.
- 31 Such state of facts and matters as shown on ALTA/NSPS Land Title Survey prepared by CDS Commercial Due Diligence Services bearing Field Date November 18, 2019, Project Address 100 Durgin Lane, Portsmouth NH; Project Name: BBBY Portfolio; CDS Project Number: 19-09-0671-011, Approved CDS Surveyor, Holden Engineering & Surveying, Inc. (the "2019 ALTA Survey") including the following: REFERENCES PRIOR VERSION OF CURRENT PLAN - NO ADDITIONAL MATTERS TO PLOT.
 - (a) encroachment of headwall extending 9.9+/- feet onto the Land;
 - (b) parking spaces and pavement located within easements described herein, to the extent the easement is in full force and effect;
 - (c) overhead and underground utility lines;
 - (d) utility poles and guy wires;
 - (e) landscaping, berms and medians traversing the boundary lines of the Land;
 - (f) City of Portsmouth site restrictions, building setbacks, and parking requirements;
 - (g) catch basins and drain manholes;
 - (h) water shut-offs and hydrants;
 - (i) sewer manholes;
 - (j) electric and gas meters; and
 - (k) signage.
- 32 Rights, easements and obligations pertaining to ingress and egress as more fully described in the Access Easement Agreement between Home Depot U.S.A., Inc. and OCV Retail-Portsmouth, LLC dated as of December 27, 2007, and recorded on January 3, 2008, at Book 4875, Page 1438. DOES AFFECT THE SUBJECT PROPERTY - SHOWN ON PLAN.
- 33 Covenants and restrictions set forth in the Declaration of Use Restriction between Bed Bath & Beyond, Inc. and Home Depot U.S.A., Inc. dated as of December 27, 2007, and recorded on January 3, 2008, at Book 4875, Page 1464. DOES AFFECT THE SUBJECT PROPERTY - NOT SURVEY RELATED - NOT PLOTTABLE.
- 34 Rights and easements relating to signage as more fully described in the Directional Signage Easement between Home Depot U.S.A., Inc., OCV Retail-Portsmouth, LLC and Bed Bath & Beyond, Inc. dated as of December 27, 2007, and recorded at Book 4875, Page 1477 on January 3, 2008. DOES AFFECT THE SUBJECT PROPERTY - BLANKET DESCRIPTION - NOT PLOTTABLE.
- 35 Such state of facts and matters as shown on the plan entitled "Easement Plan Hampton Inn, Tax Map 239 Lots 15 & 18, Property of MIC PNH, LLC & Bed Bath & Beyond, Inc., 99 & 100 Durgin Lane, County of Rockingham, Portsmouth, New Hampshire", prepared by MSC Civil Engineers & Land Surveyors, Inc., dated February 20, 2013, revised through April 2, 2013, and recorded December 2, 2013, as Plan No. D-38033. DOES AFFECT THE SUBJECT PROPERTY - SHOWN ON PLAN.
- 36 INTENTIONALLY DELETED.
- 37 INTENTIONALLY DELETED.
- 38 Subject to Subordination, Non-Disturbance and Attornment Agreement, recorded on January 6, 2022, in Book 6372, Page 839. DOES AFFECT THE SUBJECT PROPERTY - NOT SURVEY RELATED - NOT PLOTTABLE.
- 39 Subject to Conditions, Etc. contained in Quitclaim Deed, recorded on December 27, 2021, in Book 6369, Page 422 and re-recorded on December 30, 2021, in Book 6370, Page 340. NO DOCUMENT PROVIDED.
- 40 Subject to Easements contained in Quitclaim Deed, recorded on December 27, 2021, in Book 6369, Page 422 and re-recorded on December 30, 2021, in Book 6370, Page 340. NO DOCUMENT PROVIDED.

TITLE INFORMATION:

THE TITLE DESCRIPTION AND SCHEDULE B ITEMS HEREON ARE FROM FIRST AMERICAN TITLE INSURANCE COMPANY COMMITMENT NO. OAK ST INVEST DURGIN LANE WITH AN EFFECTIVE DATE OF NOVEMBER 9, 2023 AT 12:00 PM.

BASIS OF BEARINGS:

BEARINGS BASED ON PLAN D-35346 AND SHOWN ON PLAN AS N 59° 39' 24" E.

FLOOD NOTE:

Said described property is located within an area having a Zone Designation X by the Federal Emergency Management Agency (FEMA), on Flood Insurance Rate Map No. 33015C0260E, with a date of identification of May 17, 2005, for Community Panel No. 0260, in Rockingham County, State of New Hampshire, which is the current Flood Insurance Rate Map for the community in which said property is situated.

Zone "X" Denotes Areas of minimal flood hazard (No Shading)

The subject property is NOT in a Special Flood Hazard Area

PARKING INFORMATION:

618 REGULAR SPACES
18 HANDICAPPED ACCESSIBLE SPACES
632 TOTAL PARKING SPACES

NOTES:

1. THE OWNER OF RECORD IS OAK STREET INVESTMENT GRADE NET LEASE FUND SERIES 2021-2 LLC, 30 N. LA SALLE ST. SUITE 4140, CHICAGO, IL 60602.
2. REFERENCE THE SUBJECT PROPERTIES AS TAX MAP 239 LOTS 16, 18, AND 13-2, PER THE CITY OF PORTSMOUTH, NH ASSESSORS MAPS.
3. DEED REFERENCE FOR THE SUBJECT PARCEL IS BOOK 6370, PAGE 340, AS RECORDED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
4. TOTAL AREA OF SUBJECT PARCEL IS 1,138,161 SQUARE FEET, OR 25.15 ACRES.
5. TABLE A ITEM 16- THERE IS NO OBSERVABLE EVIDENCE OF EARTH MOVING WORK, BUILDING CONSTRUCTION OR BUILDING ADDITIONS WITHIN RECENT MONTHS.
6. THE ACCOMPANYING SURVEY WAS MADE ON THE GROUND AND CORRECTLY SHOWS THE LOCATION OF ALL BUILDINGS, STRUCTURES AND OTHER IMPROVEMENTS SITUATED ON THE ABOVE PREMISES; THERE ARE NO VISIBLE ENCROACHMENTS ON THE SUBJECT PROPERTY OR UPON ADJACENT LAND ABUTTING SAID PROPERTY EXCEPT AS SHOWN HEREON AND WAS MADE IN ACCORDANCE WITH LAWS AND/ OR MINIMUM STANDARDS OF THE STATE OF NEW HAMPSHIRE.
7. THE PROPERTY HAS DIRECT ACCESS TO DURGIN LANE A PUBLIC WAY AND INDIRECT ACCESS TO GOSLING ROAD A PUBLIC WAY.
8. THE INTERNAL CONTIGUITY OF THE SUBJECT PROPERTY HAS NO OVERLAPS, GAPS, OR GORES.
9. THE PROPERTY DESCRIBED HEREON HAS THE STREET ADDRESS AS FOLLOWS: 100 DURGIN LANE, PORTSMOUTH, NH
10. SAID PREMISES IS A SEPARATELY SUBDIVIDED TRACT.
11. ANY OFFSITE EASEMENTS OR SERVIDUTES BENEFITTING THE SURVEYED PROPERTY AND DISCLOSED IN RECORD DOCUMENTS ARE DEPICTED HEREON.
12. "ALL STATEMENTS WITHIN THE CERTIFICATION, AND OTHER REFERENCES LOCATED ELSEWHERE HEREON, RELATED TO: UTILITIES, IMPROVEMENTS, STRUCTURES, BUILDINGS, PARTY WALLS, PARKING, EASEMENTS SERVIDUTES, AND ENCROACHMENTS ARE BASED SOLELY ON ABOVE GROUND, VISIBLE EVIDENCE, UNLESS ANOTHER SOURCE OF INFORMATION IS SPECIFICALLY REFERENCED HEREON" IS NOT NOTED.
13. THE SUBJECT PROPERTY DOES NOT FALL WITHIN A WETLANDS AREA.
14. THERE WERE NO PARTY WALLS OBSERVED AT THE TIME OF SURVEY.
15. THERE IS NO VISIBLE EVIDENCE OF A CEMETERY ON THE SUBJECT PROPERTY AT THE TIME OF THE SURVEY.
16. HORIZONTAL DIMENSIONS ARE BASED ON THE 1983 NORTH AMERICAN DATUM (NAD 83) AND ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).

STATEMENT OF ENCROACHMENTS

(A) HEADWALL EXTENDS ONTO SUBJECT PROPERTY 9.9' +/-

SURVEYOR'S CERTIFICATE:

To: Shabins, Lazos & Van Der Beken PLLC; First American Title Insurance Company; and 100 Durgin Lane Owner LLC.

This is to certify that this map or plat and the survey on which it is based were made in accordance with the 2021 Minimum Standard Detail Requirements for ALTA/NSPS Land Title Surveys, jointly established and adopted by ALTA and NSPS, and includes Items 1, 2, 3, 4, 6(a), 6(b), 7(c), 7(b)(1), 7(c), 8, 9, 13, 14, 16, and 21(a). (Graphically depict in relation to the subject tract or property any offsite easements or servitudes benefitting the surveyed property and disclosed in Record Documents provided to the surveyor as part of the Schedule "A") of Table A thereof.

The field work was completed on August, 22, 2023



ZONING INFORMATION:

ZONING INFORMATION TAKEN FROM THE REPORT PREPARED BY THE PLANNING & ZONING RESOURCE COMPANY, PZR SITE NUMBER 167869-1, DATED SEPTEMBER 12, 2023.

ZONE IS "G1" GATEWAY NEIGHBORHOOD MIXED USE CORRIDOR

SITE RESTRICTIONS:
MINIMUM LOT SIZE = NOT SPECIFIED
MINIMUM LOT FRONTAGE = 100 FEET
MINIMUM LOT WIDTH = NOT SPECIFIED
MINIMUM LOT DEPTH = NOT SPECIFIED
MAXIMUM BUILDING HEIGHT = 4 STORES/50 FEET
MAXIMUM LOT COVERAGE = 70%

SETBACKS:
FRONT = 0 FEET MINIMUM/ 50 FEET MAXIMUM
SIDE = 15 FEET
REAR = 15 FEET

PARKING:
ALL RETAIL TRADE USES: 1 SPACE PER 300 SQ. FT. OF GROSS FLOOR AREA (78,317 / 300 = 261) 261 TOTAL PARKING SPACES REQUIRED.

THE CURRENT USE IS PERMITTED IN THIS DISTRICT.

THE ABOVE RESTRICTIONS WERE OBTAINED FROM THE TOWN OF PORTSMOUTH, NH ZONING CODE

WETLAND NOTES:

The delineation work was performed on November 11, 2023 by Brendan Quigley, CWS #249 utilizing the following standards:

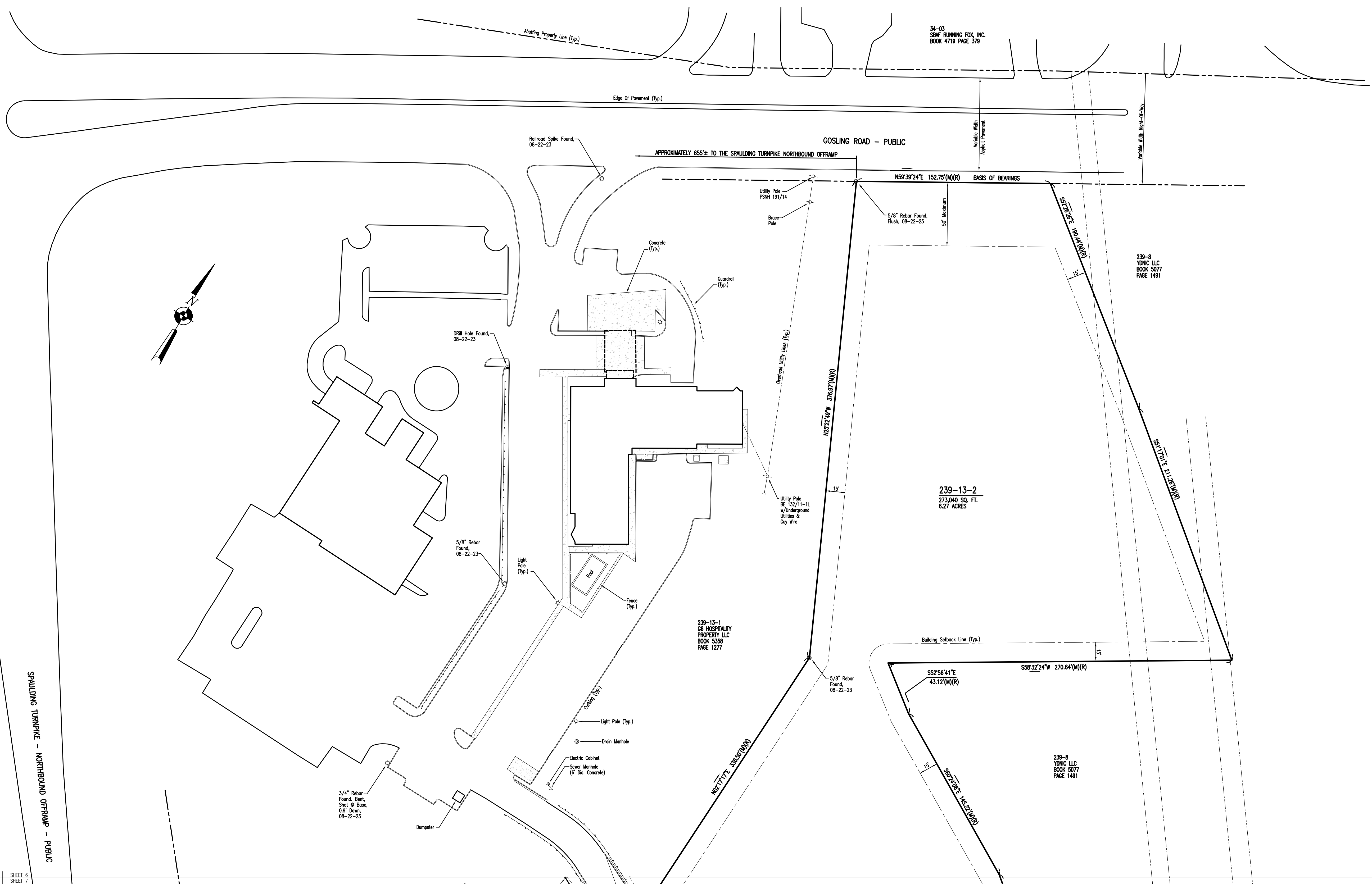
1. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, (Version 2.0) January 2012, U.S. Army Corps of Engineers.
2. Field Indicators of Hydric Soils in the United States, A Guide for Identifying and Delineating Hydric Soils, Version 8.2. United States Department of Agriculture (2018).
3. New England Hydric Soils Technical Committee, 2019 Version 4, Field Indicators for Identifying Hydric Soils in New England. New England Interstate Water Pollution Control Commission, Lowell, MA.
4. U.S. Army Corps of Engineers National Wetland Plant List, version 3.5. (2020)

HOLDEN ENGINEERING & SURVEYING, inc.
 56 Old Suncook Road
 PO Box 480 Concord, NH 03302
 (603) 225-6449
 9 Constitution Drive
 Bedford, NH 03110
 (603) 472-2078

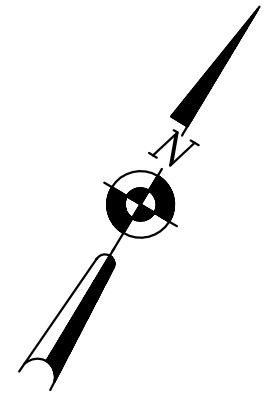
ALTA / NSPS LAND TITLE SURVEY PREPARED FOR
 100 DURGIN LANE OWNER LLC
 100 DURGIN LANE, PORTSMOUTH, ROCKINGHAM COUNTY, NEW HAMPSHIRE

Date:	Revisions Description	Dr. By	Chk. By	Book	Page	Date:
11-10-23	REVISED PER CLIENT COMMENTS	DS	LR			08-10-23
02-13-24	MINOR UTILITY EDITS	DS	PH			Scale: NONE
02-29-24	UPDATE TITLE COMMITMENT	DS	LR			Dr. By: DS Ck By: LR
						Job No. 2320547
						Sheet no 1 of 8

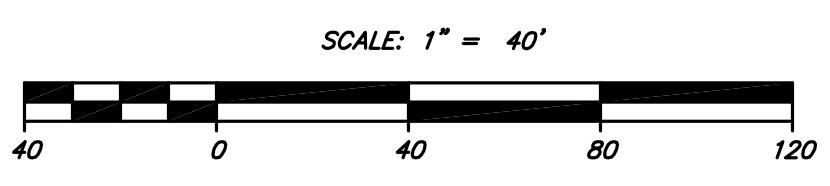
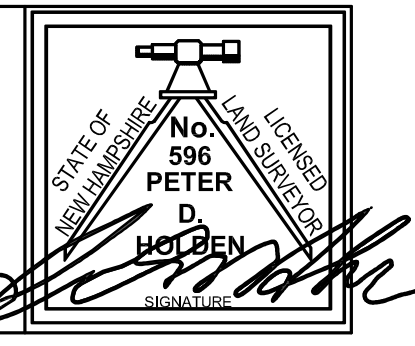
H:\CONC-2320547\CADD\SHEETS-1-2.dwg Mar 14, 2024 dsoucy



- LEGEND:**
- ABUTTING PROPERTY LINE
 - TREELINE
 - UNDERGROUND ELECTRIC (Point)
 - SEWER LINE (Point)
 - 10 FOOT CONTOUR
 - 2 FOOT CONTOUR
 - CURBING
 - EDGE OF PAVEMENT
 - FENCE
 - GUARDRAIL
 - PROPERTY LINE
 - FORMER LOT LINE
 - BUILDING SETBACK LINE
 - OVERHEAD UTILITY LINES
 - EASEMENT
 - STONEMALL
 - FLAGGED WETLAND
 - SWALE
 - GAS LINE (Point)
 - CONCRETE
 - CATCH BASIN
 - DRAIN MANHOLE
 - ELECTRIC BOX
 - LIGHT POLE
 - REBAR OR RAILROAD SPIKE
 - DRILL HOLE
 - POST
 - SIGN
 - SEWER MANHOLE
 - UTILITY POLE OR BRACE POLE
 - WATER SHUT-OFF
 - HYDRANT
 - ELECTRIC METER
 - GAS METER
 - FLAG POLE
 - GAS SHUT-OFF
 - BORING
 - WETLAND FLAG LOCATION
 - BOLLARD
 - TREE



I HEREBY CERTIFY THAT THIS PLAN IS BASED ON AN ACTUAL FIELD SURVEY AND HAS A MAX. ERROR OF CLOSURE OF 1:10,000 ON ALL PROPERTY LINES WITHIN AND BORDERING THE SUBJECT PROPERTY.



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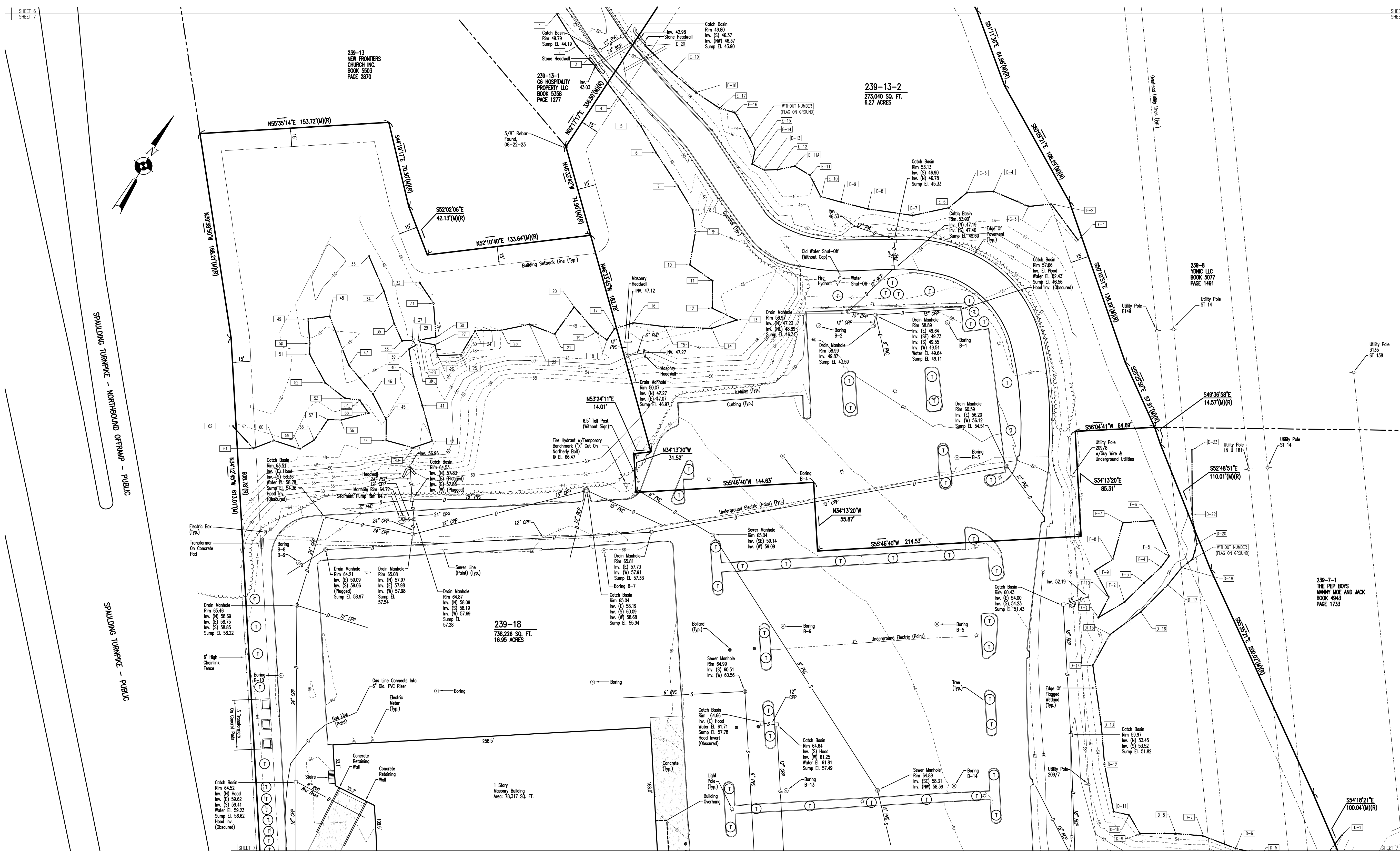
56 Old Suncook Road
PO Box 480 Concord, NH 03302
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9 Constitution Drive
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(603) 472-2078

TOPOGRAPHIC SURVEY PREPARED FOR
100 DURGIN LANE OWNER LLC
100 DURGIN LANE, PORTSMOUTH, ROCKINGHAM COUNTY, NEW HAMPSHIRE

Date:	Revisions Description	Dr. By	Chk. By	Book	Page	Date:
11-10-23	REVISED PER CLIENT COMMENTS	DS	LR			08-10-23
02-13-24	MINOR UTILITY EDITS	DS	PH			Scale: 1"=40'
02-29-24	REVISE UTILITIES	DS	LR			Dr. By: DS Ck By: LR
						Job No. 2320547
						Sheet no 6 of 8

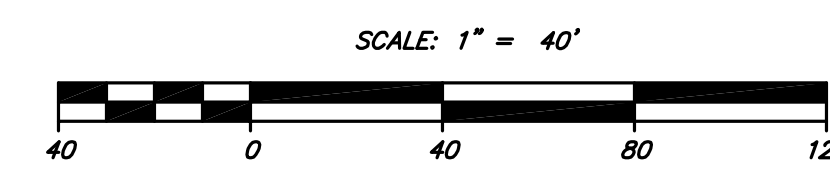
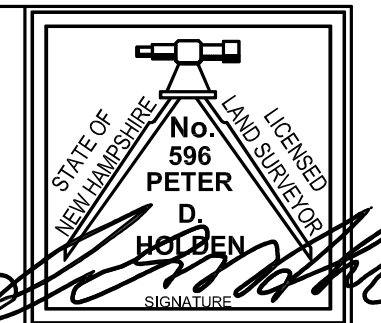
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LEGEND:

- ABUTTING PROPERTY LINE
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- - - WETLAND FLAG LOCATION
- - - BOLLARD
- - - TREE

I HEREBY CERTIFY THAT THIS PLAN IS BASED ON AN ACTUAL FIELD SURVEY AND HAS A MAX. ERROR OF CLOSURE OF 1:10,000 ON ALL PROPERTY LINES WITHIN AND BORDERING THE SUBJECT PROPERTY.



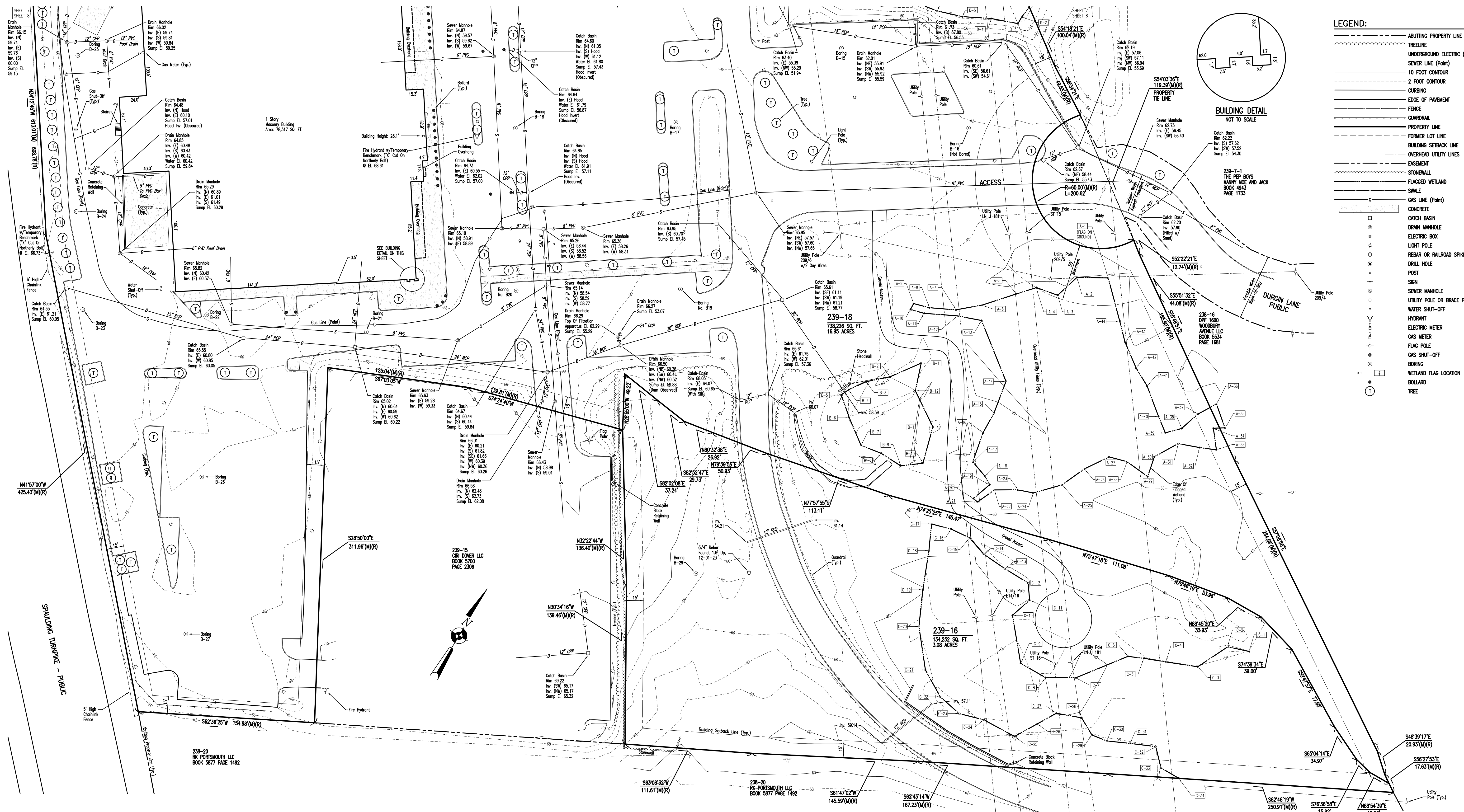
HOLDEN ENGINEERING & SURVEYING, inc.

56 Old Suncook Road
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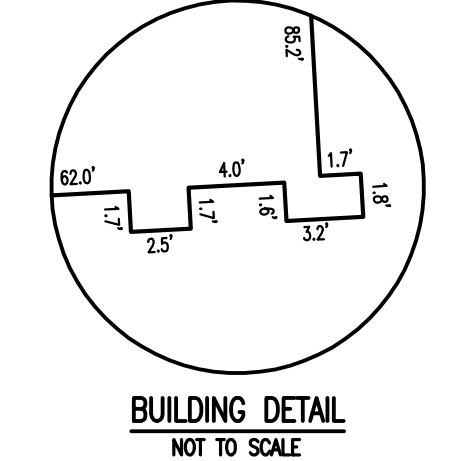
TOPOGRAPHIC SURVEY PREPARED FOR
100 DURGIN LANE OWNER LLC
100 DURGIN LANE, PORTSMOUTH, ROCKINGHAM COUNTY, NEW HAMPSHIRE

Date:	Revisions	Dr.	Chk.	Book	Page	Date:
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02-29-24	REVISE UTILITIES	DS	LR			Dr. By: DS Ck By: LR
						Job No. 2320547
						Sheet no 6 of 8

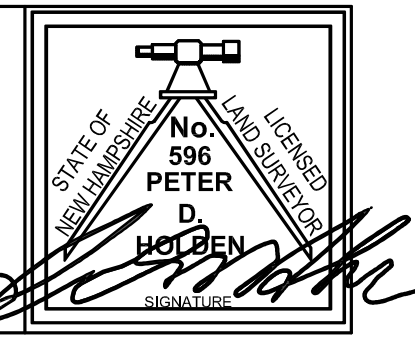


LEGEND:

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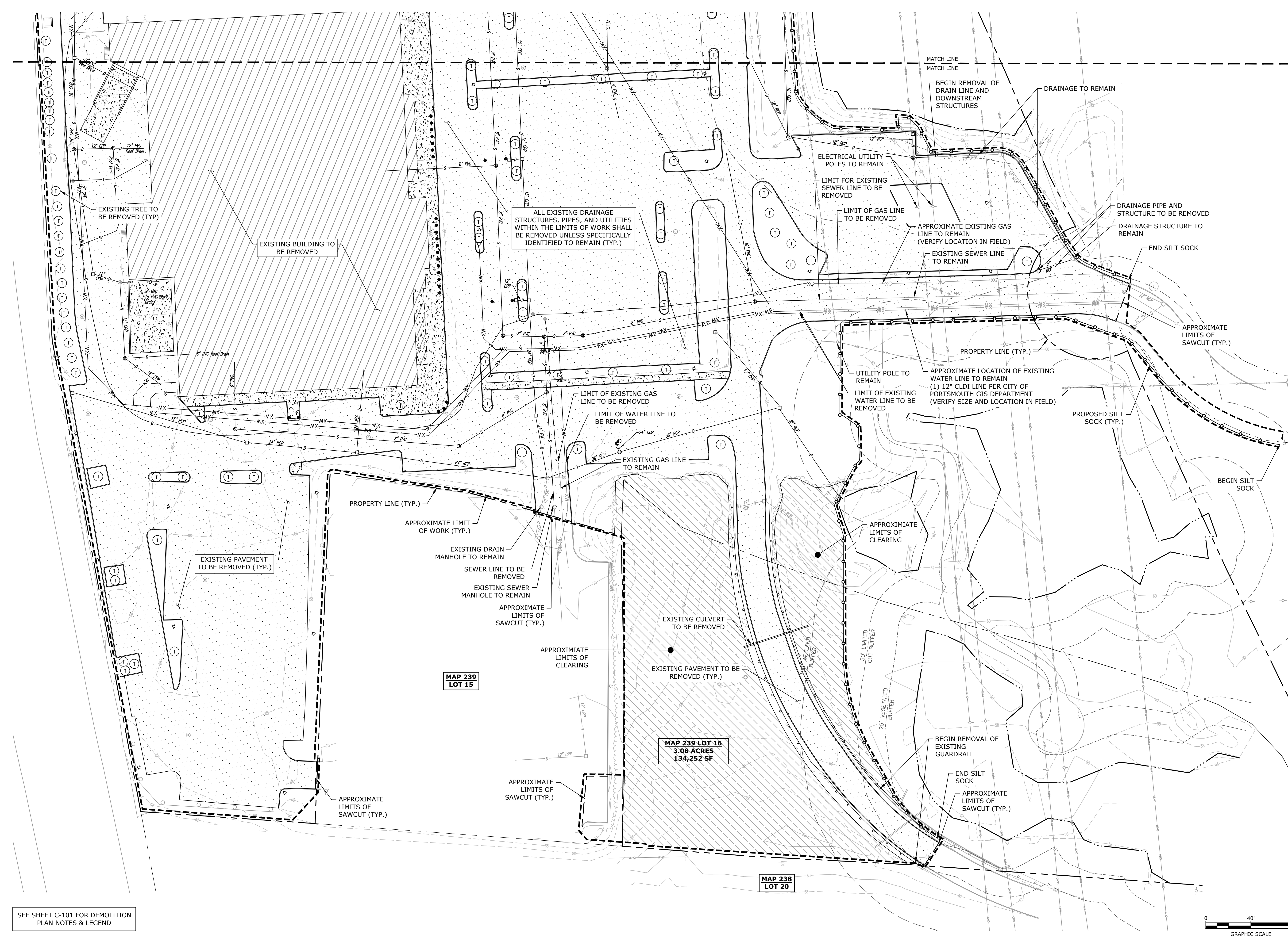
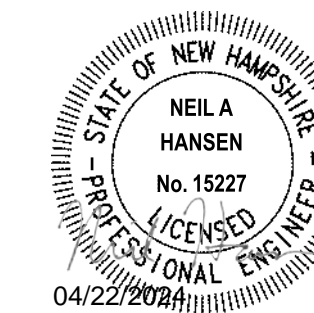
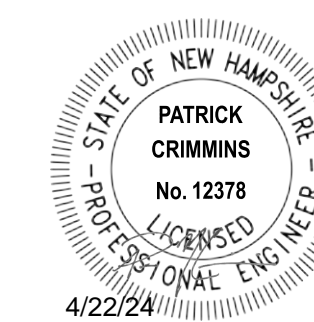
56 Old Suncook Road
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TOPOGRAPHIC SURVEY PREPARED FOR
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100 DURGIN LANE, PORTSMOUTH, ROCKINGHAM COUNTY, NEW HAMPSHIRE

Date:	Revisions	Dr.	Chk.	Book	Page	Date:
	Description	By	By			
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02-13-24	MINOR UTILITY EDITS	DS	PH			Scale: 1"=40'
02-29-24	REVISE UTILITIES	DS	LR			Dr. By: DS Ck. By: LR
						Job No. 2320547
						Sheet no 6 of 8

HOLDEN ENGINEERING & SURVEYING, inc.



PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE PORTSMOUTH, NEW HAMPSHIRE

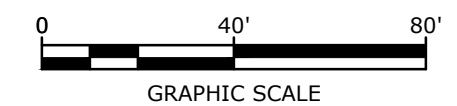
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PROJECT NO: E5071-001		
DATE: 4/22/2024		
FILE: E5071-001-C-DSGN.dwg		
DRAWN BY: BKC/NHW		
DESIGNED/CHECKED BY: NAH		
APPROVED BY: PMC		

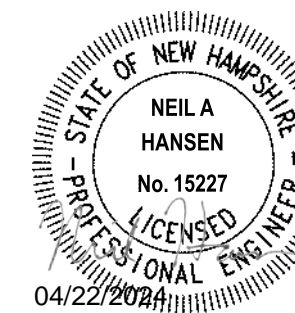
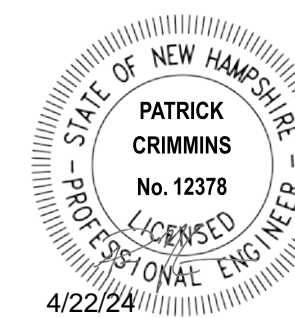
DEMOLITION PLAN

SCALE: AS SHOWN

Last Saved: 4/19/2024 12:02pm By: Bcurcio
 Plotted On: Apr 19, 2024 12:02pm By: Bcurcio
 Tighe & Bond \\\globe.com\data\proj\100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-DSGN.dwg

SEE SHEET C-101 FOR DEMOLITION PLAN NOTES & LEGEND





SITE DATA:
 LOCATION: TAX MAP 239, LOT 13-2, MAP 239 LOT 16, MAP 239 LOT 18
 OWNER: 100 DURGIN LANE OWNER LLC
 ONE MARINA PARK DRIVE, SUITE 1500
 BOSTON, MA 02210

ZONING DISTRICT: GATEWAY NEIGHBORHOOD MIXED USE CORRIDOR (G1)
 HIGHWAY NOISE OVERLAY DISTRICT

PROPOSED USE: MULTI-FAMILY RESIDENTIAL DEVELOPMENT
 EXISTING LOT SIZE: ±1,139,161 SF / 26.15 ACRES (MAP 239 LOT 13-2, LOT 16, LOT 18)

DEVELOPMENT STANDARDS

GENERAL RESIDENTIAL DEVELOPMENT (10.5B42.30)	REQUIRED	PROPOSED
MINIMUM SITE DEVELOPMENT AREA:	10,000 SF	±1,139,161 SF
MINIMUM SITE WIDTH:	75 FT	>75 FT
MINIMUM SITE LENGTH:	100 FT	>100 FT
MINIMUM PERIMETER BUFFER:	N/A	-
MAXIMUM DEVELOPMENT BLOCK DIMS:		
BLOCK LENGTH:	500 FT	<500 FT
BLOCK PERIMETER:	1,500 FT	<1,500 FT
MAXIMUM BUILDING COVERAGE:	50%	8.6%
MINIMUM OPEN SPACE COVERAGE:	20%	62%

APARTMENT BUILDING (10.5B34.40)	REQUIRED	PROPOSED
MINIMUM LOT DEPTH:	NR	-
MINIMUM STREET FRONTAGE:	50 FT	200.6 FT
FRONT YARD SETBACK:	10-30 FT	±225.1 FT ⁽¹⁾
MIN. SIDE YARD SETBACK:	15 FT	15 FT
MIN. REAR YARD SETBACK:	20 FT	85.0 FT
DWELLING UNITS PER BUILDING:	4-24	VARIES (24 MAX.)
MAXIMUM DWELLING UNIT SIZE:	NR	-
MAXIMUM BUILDING HEIGHT:	NR	4 STORIES OR 50 FT
MINIMUM STREET-FACING FACADE HEIGHT:	24 FT	>24 FT
MAX. FINISH FLOOR ABOVE SIDEWALK:	36"	VARIES
MAXIMUM BUILDING COVERAGE:	50%	7.8%
MAXIMUM BUILDING FOOTPRINT:	NR	-
MAXIMUM FACADE MODULATION LENGTH:	50 FT	<50 FT
MINIMUM STREET FACING FACADE GLAZING:	20% GROUND FLOOR	>20%
MAXIMUM STREET FACING ENTRANCE SPACING:	NR	-
ALLOWED ROOF TYPES:	ALL	SHED
ALLOWED FACADE TYPES:		FORECOURT, RECESSED, DOORYARD, RECESSED, ENTRY, DOORYARD, STEP, PORCH

COMMUNITY BUILDING (10.5B34.100)	REQUIRED	PROPOSED
MINIMUM LOT DEPTH:	NR	-
MINIMUM STREET FRONTAGE:	50 FT	200.6 FT
FRONT YARD SETBACK:	10-40 FT	263.1 FT ⁽¹⁾
MIN. SIDE YARD SETBACK:	15 FT	15 FT
MIN. REAR YARD SETBACK:	20 FT	256.4 FT
DWELLING UNITS PER BUILDING:	NR	-
MAXIMUM DWELLING UNIT SIZE:	NR	-
MAXIMUM BUILDING HEIGHT:	NR	3 STORIES OR 45 FT
MINIMUM STREET-FACING FACADE HEIGHT:	18 FT	18 FT
FINISH FLOOR GRADE ABOVE SIDEWALK:	2 FT - 6 FT	VARIES
MAXIMUM BUILDING COVERAGE:	NR	-
MAXIMUM BUILDING FOOTPRINT:	NR	-
MAXIMUM FACADE MODULATION LENGTH:	100 FT	100 FT
MINIMUM STREET FACING FACADE GLAZING:	30% GROUND FLOOR	30%
MAXIMUM STREET FACING ENTRANCE SPACING:	NR	-
ALLOWED ROOF TYPES:	ALL	SHED
ALLOWED FACADE TYPES:		DOORYARD, FORECOURT, STOOP, RECESSED, ENTRY, STEP, PORCH, TERRACE, GALLERY, ARCADE PORCH, FORECOURT, TERRACE

(1) - THE APPLICANT IS REQUESTING THE PLANNING BOARD TO ALLOW AN INCREASE OF BUILDING SETBACK FROM THE FRONT LOT LINE AS ALLOWED BY SECTION 10.5B41.60.

COMMUNITY SPACE:	REQUIRED	PROPOSED
	10%	11.6%
	113,916 SF	131,942 SF

PARKING REQUIREMENTS

RESIDENTIAL UNITS (<750 SF)	227 UNITS X 1.0 SPACES	227 SPACES
RESIDENTIAL UNITS (>750 SF)	133 UNITS X 1.3 SPACES	173 SPACES
VISITOR SPACES	1 SPACE / 5 UNITS	72 SPACES
TOTAL MINIMUM PARKING SPACES REQUIRED =		472 SPACES

PARKING SPACES	REQUIRED	PROPOSED
	472 SPACES	567 SPACES

ADA PARKING SPACES	REQUIRED ⁽²⁾	PROPOSED
	25 SPACES	34 SPACES

(2) - PER THE AMERICANS WITH DISABILITIES ACT (ADA) STANDARDS, LATEST EDITION.

PARKING SPACE DIMENSIONAL REQUIREMENTS:

STANDARD 90° STALL :		
LENGTH	8.5 FT MIN	8.5 FT
WIDTH	19 FT MIN	19 FT
STANDARD 0° STALL :		
LENGTH	8.5 FT MIN	8.5 FT
WIDTH	20 FT MIN	20 FT
DRIVE AISLE WIDTH:		
90° (2-WAY TRAFFIC)	24 FT	24 FT
0° (2-WAY TRAFFIC)	24 FT	24 FT

BICYCLE SPACES	REQUIRED	PROPOSED
1 BICYCLE SPACE / 10 PARKING SPACES:	30 SPACES (MAX.)	>58 SPACES

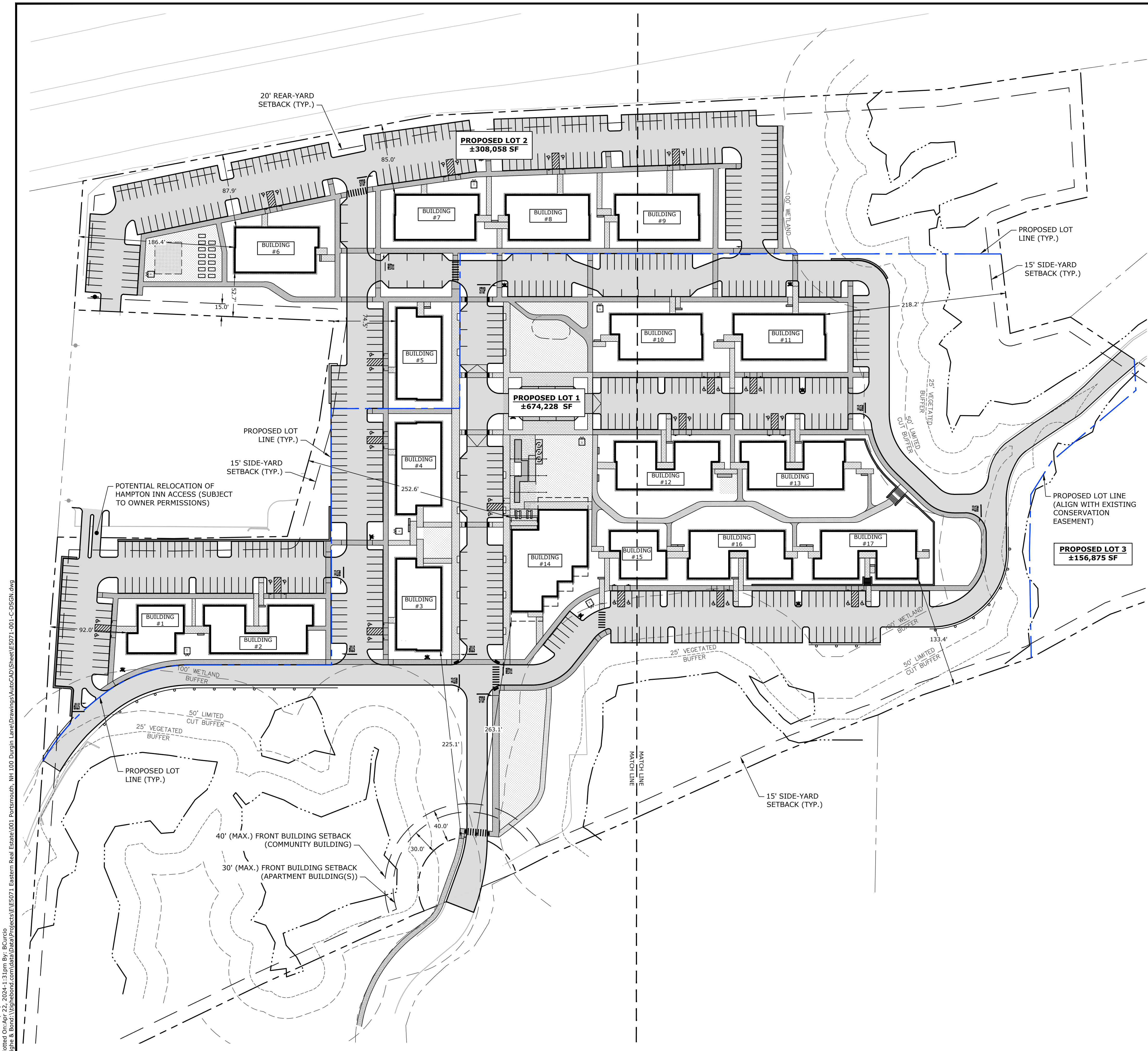
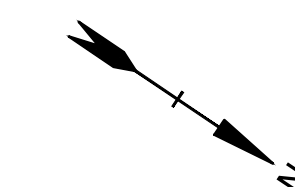
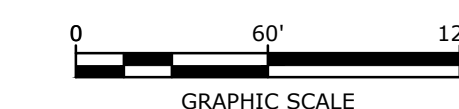
(INDOOR BIKE STORAGE WILL BE PROVIDED THAT MEETS OR EXCEEDS REQUIRED.)

LOT LINE REVISIONS SHOWN HEREIN ARE FOR PERMITTING PURPOSES ONLY. FINAL LOT LINE REVISION PLAN SHALL BE PREPARED BY THE PROJECT SURVEYOR AND RECORDED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS PRIOR TO ISSUING BUILDING PERMITS.

SITE RECORDING NOTES:

- THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
- 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.
- ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
- THIS IS NOT A BOUNDARY SURVEY AND SHALL NOT BE USED AS SUCH.

SEE SHEET C-101 FOR SITE PLAN NOTES & LEGEND



Last Saved: 4/22/2024 1:13:33 PM By: EDCurcio
 Plotted On: Apr 22, 2024 1:13:33 PM
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PROPOSED MULTI-FAMILY DEVELOPMENT

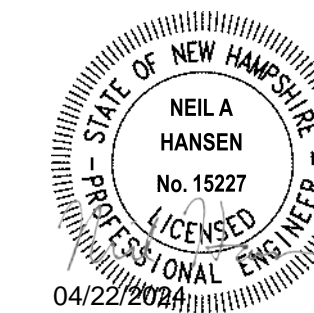
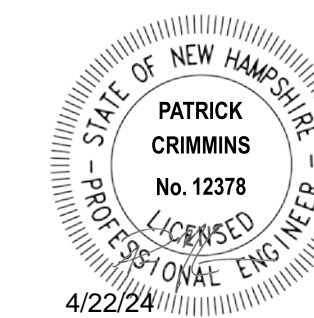
100 DURGIN LANE OWNER, LLC

100 DURGIN LANE PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	4/22/2024	TAC SUBMISSION

PROJECT NO: E5071-001
 DATE: 4/22/2024
 FILE: E5071-001-C-DSGN.dwg
 DRAWN BY: BKC/NHW
 DESIGNED/CHECKED BY: NAH
 APPROVED BY: PMC

OVERALL SITE PLAN
 SCALE: AS SHOWN
C-300



**PROPOSED
MULTI-FAMILY
DEVELOPMENT**

100 DURGIN LANE OWNER,
LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

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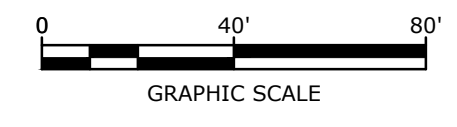
**GRADING, DRAINAGE, AND
EROSION CONTROL PLAN**

SCALE: AS SHOWN

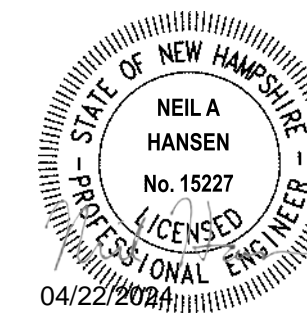
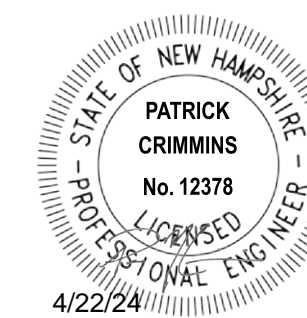
C-401



SEE SHEET C-101 FOR GRADING & DRAINAGE PLAN NOTES & LEGEND



Last Saved: 4/19/2024
 Plotted On: Apr 22, 2024 9:32am By: ECorcio
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**PROPOSED
MULTI-FAMILY
DEVELOPMENT**

100 DURGIN LANE OWNER,
LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

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DRAWN BY:	BKC/NHW		
DESIGNED/CHECKED BY:	NAH		
APPROVED BY:	PMC		

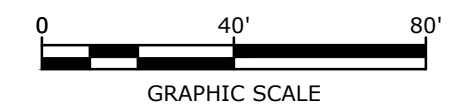
GRADING, DRAINAGE, AND
EROSION CONTROL PLAN

SCALE: AS SHOWN

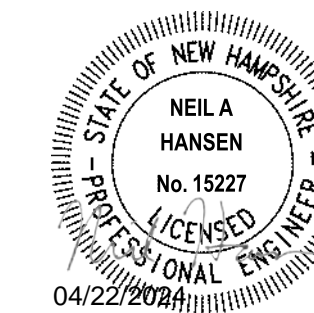
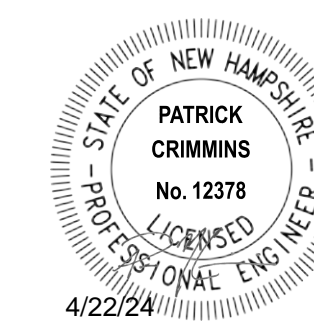
C-402



SEE SHEET C-101 FOR GRADING &
DRAINAGE PLAN NOTES & LEGEND



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**PROPOSED
MULTI-FAMILY
DEVELOPMENT**

**100 DURGIN
LANE OWNER,
LLC**

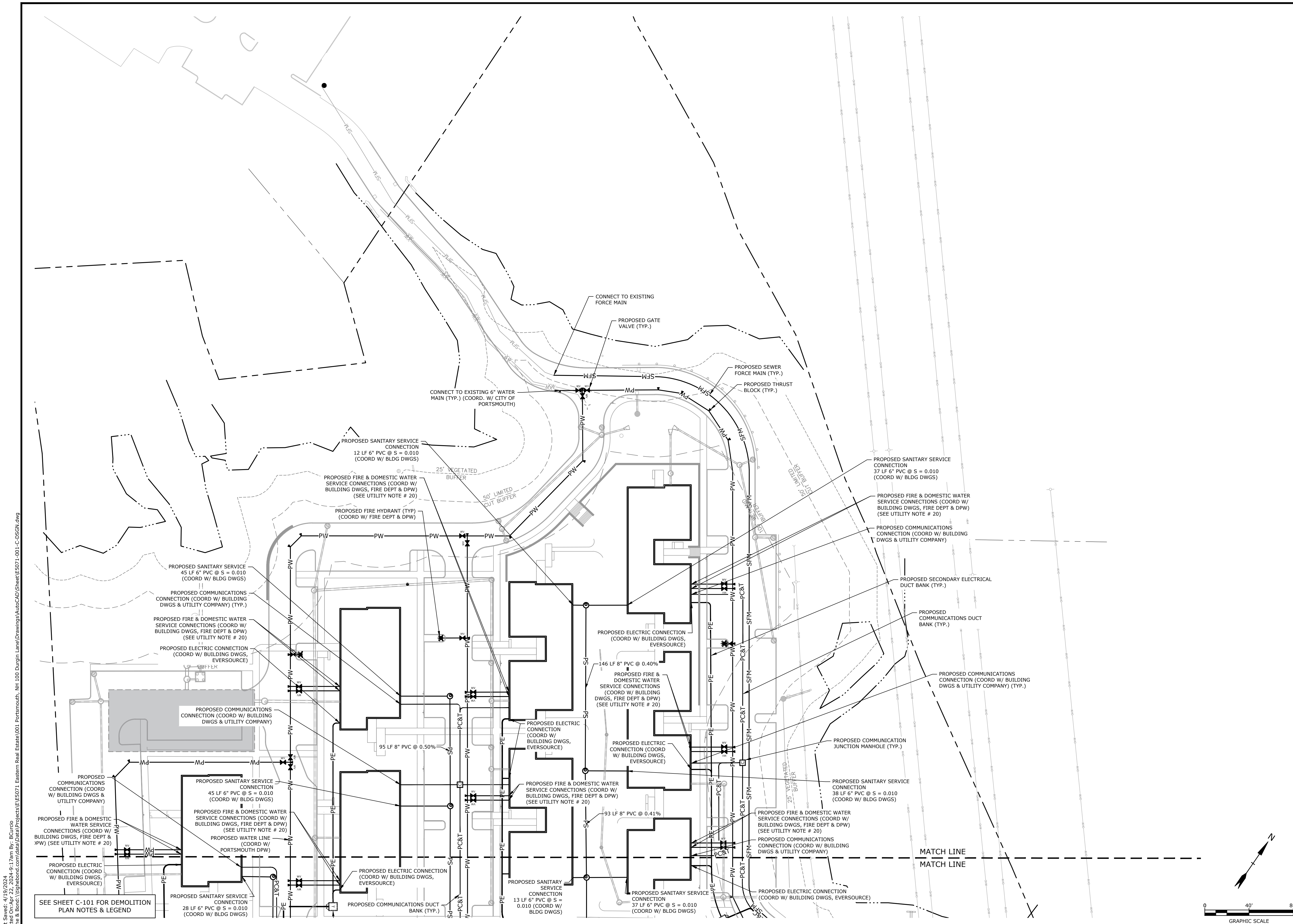
**100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE**

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PROJECT NO: E5071-001		
DATE: 4/22/2024		
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DESIGNED/CHECKED BY: NAH		
APPROVED BY: PMC		

UTILITIES PLAN

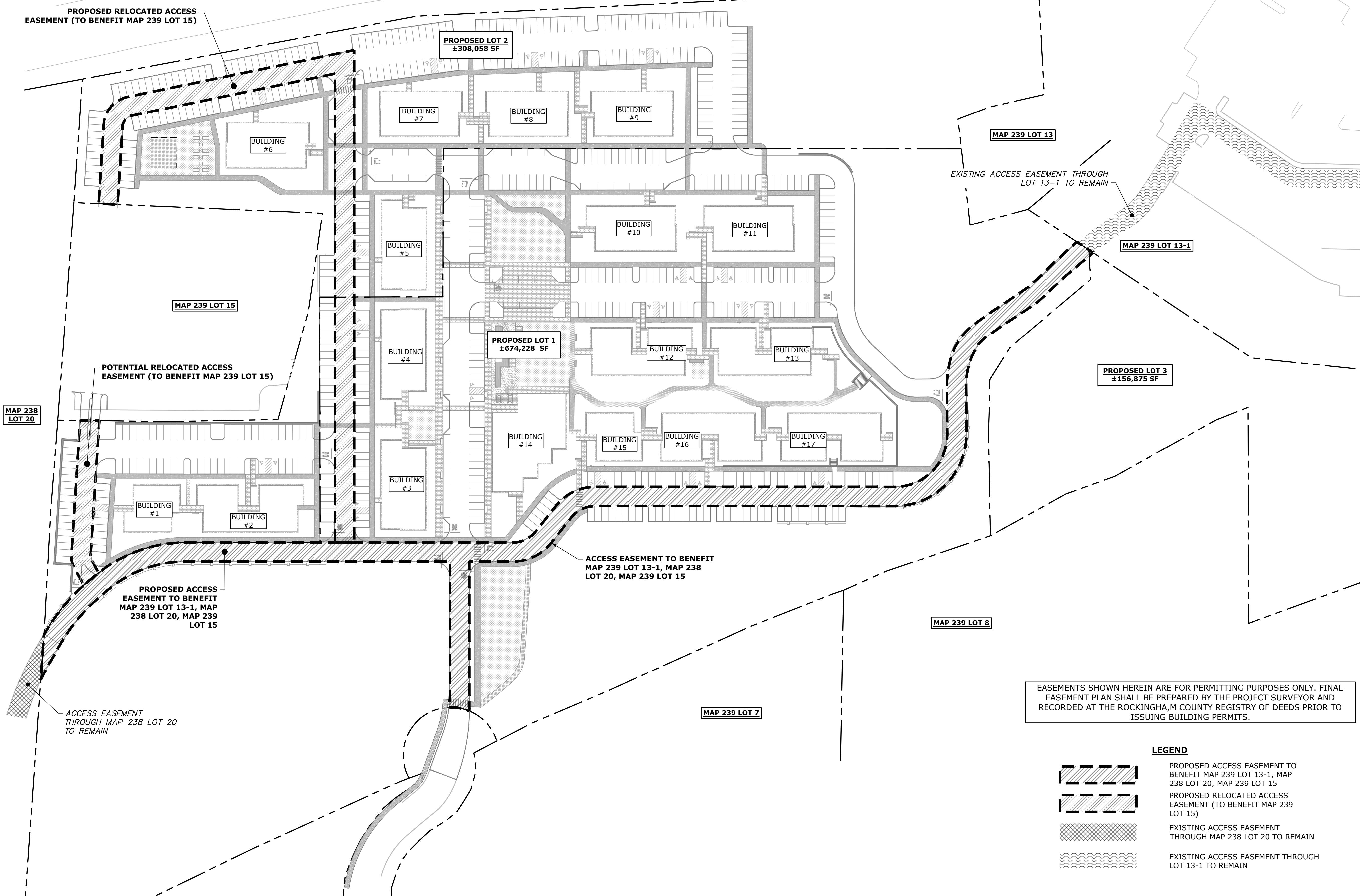
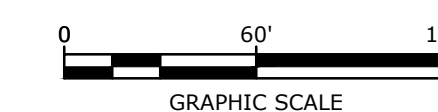
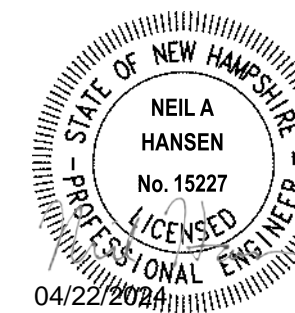
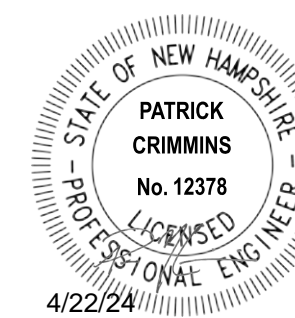
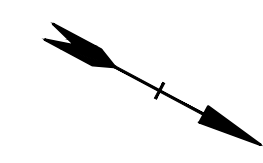
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SEE SHEET C-101 FOR DEMOLITION
PLAN NOTES & LEGEND



EASEMENTS SHOWN HEREIN ARE FOR PERMITTING PURPOSES ONLY. FINAL EASEMENT PLAN SHALL BE PREPARED BY THE PROJECT SURVEYOR AND RECORDED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS PRIOR TO ISSUING BUILDING PERMITS.

LEGEND

	PROPOSED ACCESS EASEMENT TO BENEFIT MAP 239 LOT 13-1, MAP 238 LOT 20, MAP 239 LOT 15
	PROPOSED RELOCATED ACCESS EASEMENT (TO BENEFIT MAP 239 LOT 15)
	EXISTING ACCESS EASEMENT THROUGH MAP 238 LOT 20 TO REMAIN
	EXISTING ACCESS EASEMENT THROUGH LOT 13-1 TO REMAIN

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE PORTSMOUTH, NEW HAMPSHIRE

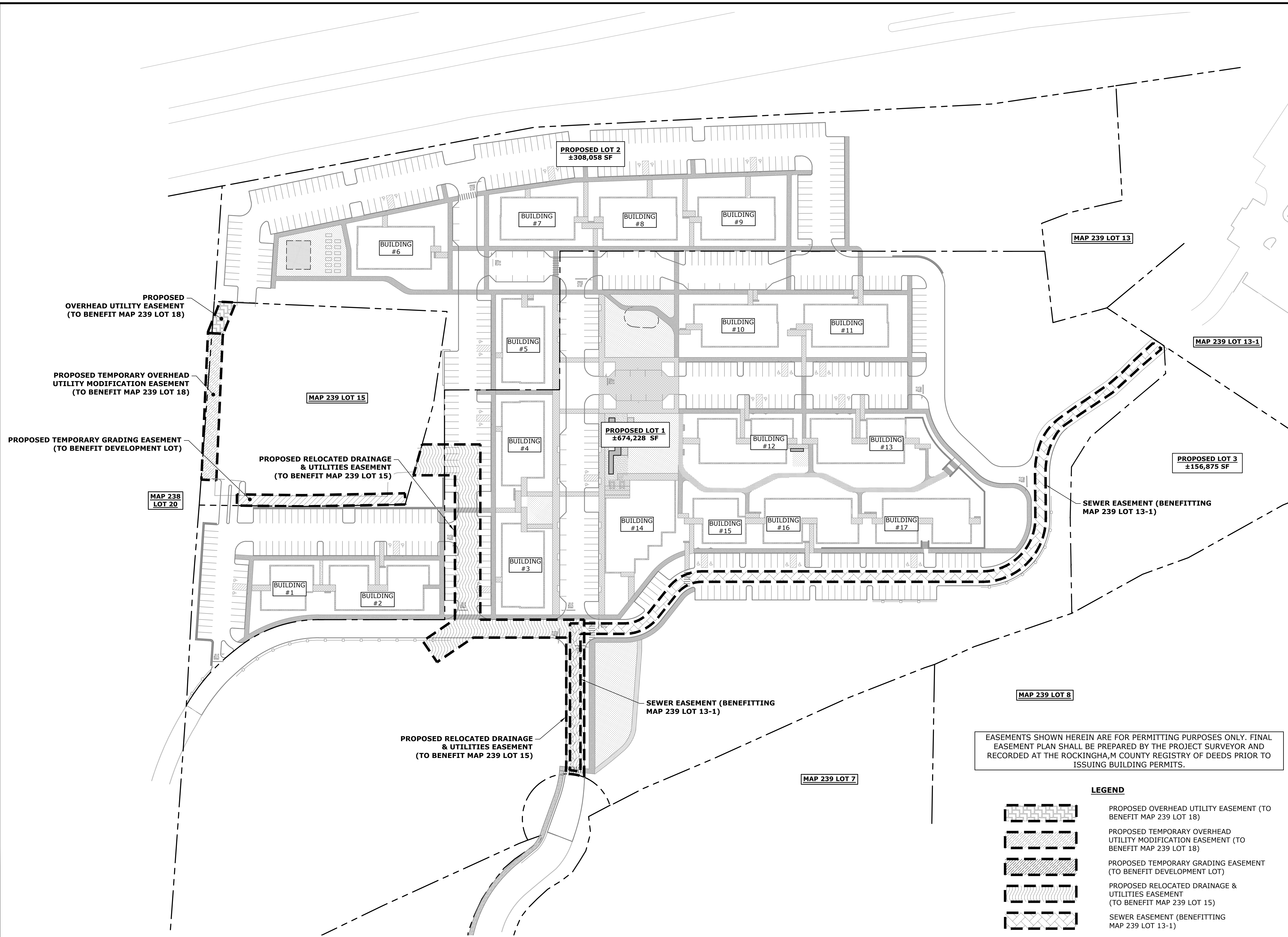
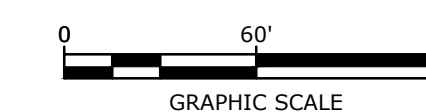
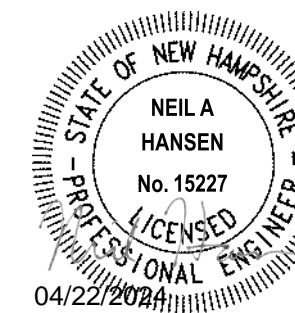
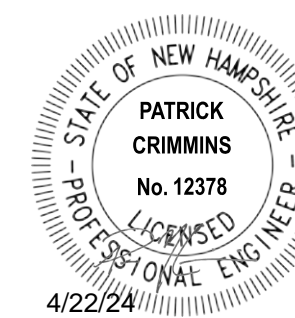
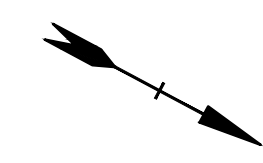
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PROJECT NO: E5071-001		
DATE: 4/22/2024		
FILE: E5071-001-FIGS.dwg		
DRAWN BY: BKC/NHW		
DESIGNED/CHECKED BY: NAH		
APPROVED BY: PMC		

ACCESS EASEMENT PLAN

SCALE: AS SHOWN

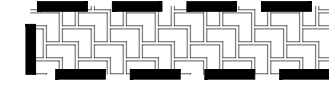




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EASEMENTS SHOWN HEREIN ARE FOR PERMITTING PURPOSES ONLY. FINAL EASEMENT PLAN SHALL BE PREPARED BY THE PROJECT SURVEYOR AND RECORDED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS PRIOR TO ISSUING BUILDING PERMITS.

LEGEND

-  PROPOSED OVERHEAD UTILITY EASEMENT (TO BENEFIT MAP 239 LOT 18)
-  PROPOSED TEMPORARY OVERHEAD UTILITY MODIFICATION EASEMENT (TO BENEFIT MAP 239 LOT 18)
-  PROPOSED TEMPORARY GRADING EASEMENT (TO BENEFIT DEVELOPMENT LOT)
-  PROPOSED RELOCATED DRAINAGE & UTILITIES EASEMENT (TO BENEFIT MAP 239 LOT 15)
-  SEWER EASEMENT (BENEFITTING MAP 239 LOT 13-1)

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	4/22/2024	TAC SUBMISSION
PROJECT NO: E5071-001		
DATE: 4/22/2024		
FILE: E5071-001-FIGS.dwg		
DRAWN BY: BKC/NHW		
DESIGNED/CHECKED BY: NAH		
APPROVED BY: PMC		

UTILITY, DRAINAGE, AND GRADING EASEMENT PLAN

SCALE: AS SHOWN

Last Saved: 4/22/2024 2:09pm By: ECurcio
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GENERAL PROJECT INFORMATION

PROJECT APPLICANT: 100 DURGIN LANE OWNER, LLC

PROJECT NAME: PROPOSED MIXED USE DEVELOPMENT
PROJECT MAP / LOT: MAP 239 / LOT 18
MAP 239 / LOT 16
MAP 239 / LOT 13
PROJECT ADDRESS: DURGIN LANE
PORTSMOUTH, NH 03801

PROJECT LATITUDE: 43°-04'-43" N
PROJECT LONGITUDE: 70°-45'-41" W

PROJECT DESCRIPTION

THE PROJECT CONSISTS OF THE CONSTRUCTION OF AN 360 RESIDENTIAL UNITS IN A MIX OF 3 AND 4 STORY BUILDINGS.

DISTURBED AREA

THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 15.1 ACRES.

SOIL CHARACTERISTICS

BASED ON THE USCS WEB SOIL SURVEY THE SOILS ON SITE PRIMARILY CONSIST OF CHATFIELD-HOLLIS-CANTON COMPLEX SOILS WHICH ARE WELL DRAINED SOILS WITH A HYDROLOGIC SOIL GROUP RATING OF B.

NAME OF RECEIVING WATERS

THE STORMWATER RUNOFF FROM THE SITE WILL BE DISCHARGED VIA A CLOSED DRAINAGE SYSTEM TO AN UNNAMED ON SITE WETLANDS WHICH ULTIMATELY FLOW TO THE PISCATAQUA RIVER.

CONSTRUCTION SEQUENCE OF MAJOR ACTIVITIES:

- 1. CUT AND CLEAR TREES.
- 2. CONSTRUCT TEMPORARY AND PERMANENT SEDIMENT, EROSION AND DETENTION CONTROL FACILITIES. EROSION, SEDIMENT AND DETENTION MEASURES SHALL BE INSTALLED PRIOR TO ANY EARTH MOVING OPERATIONS THAT WILL INFLUENCE STORMWATER RUNOFF SUCH AS:
 - NEW CONSTRUCTION
 - CONTROL OF DUST
 - CONSTRUCTION DURING LATE WINTER AND EARLY SPRING
- 3. ALL PERMANENT DITCHES, SWALES, DETENTION, RETENTION AND SEDIMENTATION BASINS TO BE STABILIZED USING THE VEGETATIVE AND NON-STRUCTURAL BMPs PRIOR TO DIRECTING RUNOFF TO THEM.
- 4. CLEAR AND DISPOSE OF DEBRIS.
- 5. CONSTRUCT TEMPORARY CULVERTS AND DIVERSION CHANNELS AS REQUIRED.
- 6. GRADE AND GRAVEL ROADWAYS AND PARKING AREAS - ALL ROADS AND PARKING AREA SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
- 7. BEGIN PERMANENT AND TEMPORARY SEEDING AND MULCHING. ALL CUT AND FILL SLOPES SHALL BE SEEDED AND MULCHED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
- 8. DAILY, OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINS, DITCHES, PERIMETER EROSION CONTROL MEASURES, SEDIMENT TRAPS, ETC., MULCH AND SEED AS REQUIRED.
- 9. SEDIMENT TRAPS AND/OR BASINS SHALL BE USED AS NECESSARY TO CONTAIN RUNOFF UNTIL SOILS ARE STABILIZED.
- 10. FINISH PAVING ALL ROADWAYS AND PARKING LOTS.
- 11. INSPECT AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES.
- 12. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
- 13. REMOVE TRAPPED SEDIMENTS FROM COLLECTOR DEVICES AS APPROPRIATE AND THEN REMOVE TEMPORARY EROSION CONTROL MEASURES.

SPECIAL CONSTRUCTION NOTES:

- 1. THE CONSTRUCTION SEQUENCE MUST LIMIT THE DURATION AND AREA OF DISTURBANCE.
- 2. THE PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.

EROSION CONTROL NOTES:

- 1. ALL EROSION CONTROL MEASURES AND PRACTICES SHALL CONFORM TO THE "NEW HAMPSHIRE STORMWATER MANUAL VOLUME 3: EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION" PREPARED BY THE NHDES.
- 2. PRIOR TO ANY WORK OR SOIL DISTURBANCE, CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR EROSION CONTROL MEASURES AS REQUIRED IN THE PROJECT MANUAL.
- 3. CONTRACTOR SHALL INSTALL TEMPORARY EROSION CONTROL BARRIERS, INCLUDING HAY BALES, SILT FENCES, MULCH BERMS, SILT SACKS AND SILT SOCKS AS SHOWN IN THESE DRAWINGS AS THE FIRST ORDER OF WORK.
- 4. SILT SACK INLET PROTECTION SHALL BE INSTALLED IN ALL EXISTING AND PROPOSED CATCH BASIN INLETS WITHIN THE WORK LIMITS AND BE MAINTAINED FOR THE DURATION OF THE PROJECT.
- 5. PERIMETER CONTROLS INCLUDING SILT FENCES, MULCH BERM, SILT SOCK, AND/OR HAY BALE BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT UNTIL NON-PAVED AREAS HAVE BEEN STABILIZED.
- 6. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL TEMPORARY EROSION CONTROL DEVICES UPON COMPLETION OF CONSTRUCTION.
- 7. ALL DISTURBED AREAS NOT OTHERWISE BEING TREATED SHALL RECEIVE 6" LOAM, SEED AND FERTILIZER.
- 8. INSPECT ALL INLET PROTECTION AND PERIMETER CONTROLS WEEKLY AND AFTER EACH RAIN STORM OF 0.25 INCH OR GREATER. REPAIR/MODIFY PROTECTION AS NECESSARY TO MAXIMIZE EFFICIENCY OF FILTER. REPLACE ALL FILTERS WHEN SEDIMENT IS 1/3 THE FILTER HEIGHT.
- 9. CONSTRUCT EROSION CONTROL BLANKETS ON ALL SLOPES STEEPER THAN 3:1.

STABILIZATION:

- 1. AN AREA SHALL BE CONSIDERED STABLE WHEN ONE OF THE FOLLOWING HAS OCCURRED:
 - A. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
 - B. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
 - C. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED;
 - D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.;
 - E. 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.
- 2. WINTER STABILIZATION PRACTICES:
 - A. 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 EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE 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;
 - B. 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;
 - C. AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3, OR IF CONSTRUCTION IS TO CONTINUE THROUGH THE WINTER SEASON BE CLEARED OF ANY ACCUMULATED SNOW AFTER EACH STORM EVENT;
- 3. STABILIZATION SHALL BE INITIATED ON ALL LOAM STOCKPILES, AND DISTURBED AREAS, WHERE CONSTRUCTION ACTIVITY SHALL NOT OCCUR FOR MORE THAN TWENTY-ONE (21) CALENDAR DAYS BY THE FOURTEENTH (14TH) DAY AFTER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED IN THAT AREA. STABILIZATION MEASURES TO BE USED INCLUDE:
 - A. TEMPORARY SEEDING;
 - B. MULCHING.
- 4. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
- 5. WHEN CONSTRUCTION ACTIVITY PERMANENTLY OR TEMPORARILY CEASES WITHIN 100 FEET OF NEARBY SURFACE WATERS OR DELINEATED WETLANDS, THE AREA SHALL BE STABILIZED WITHIN SEVEN (7) DAYS OR PRIOR TO A RAIN EVENT. ONCE CONSTRUCTION ACTIVITY CEASES

PERMANENTLY IN AN THESE AREAS, SILT FENCES, MULCH BERMS, HAY BALE BARRIERS AND ANY EARTH/DIKES SHALL BE REMOVED ONCE PERMANENT MEASURES ARE ESTABLISHED. DURING CONSTRUCTION, RUNOFF WILL BE DIVERTED AROUND THE SITE WITH EARTH DIKES, PIPING OR STABILIZED CHANNELS WHERE POSSIBLE. SHEET RUNOFF FROM THE SITE WILL BE FILTERED THROUGH SILT FENCES, MULCH BERMS, HAY BALE BARRIERS, OR SILT SOCKS. ALL STORM DRAIN BASIN INLETS SHALL BE PROVIDED WITH FLARED END SECTIONS AND TRASH RACKS. THE SITE SHALL BE STABILIZED FOR THE WINTER BY OCTOBER 15.

DUST CONTROL:

- 1. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTROL DUST THROUGHOUT THE CONSTRUCTION PERIOD.
- 2. DUST CONTROL METHODS SHALL INCLUDE, BUT BE NOT LIMITED TO SPRINKLING WATER ON EXPOSED AREAS, COVERING LOADED DUMP TRUCKS LEAVING THE SITE, AND TEMPORARY MULCHING.
- 3. DUST CONTROL MEASURES SHALL BE UTILIZED SO AS TO PREVENT THE MIGRATION OF DUST FROM THE SITE TO ABUTTING AREAS.

STOCKPILES:

- 1. LOCATE STOCKPILES A MINIMUM OF 50 FEET AWAY FROM CATCH BASINS, SWALES, AND CULVERTS.
- 2. ALL STOCKPILES SHOULD BE SURROUNDED WITH TEMPORARY EROSION CONTROL MEASURES PRIOR TO THE ONSET OF PRECIPITATION.
- 3. PERIMETER BARRIERS SHOULD BE MAINTAINED AT ALL TIMES, AND ADJUSTED AS NEEDED TO ACCOMMODATE THE DELIVERY AND REMOVAL OF MATERIALS FROM THE STOCKPILE. THE INTEGRITY OF THE BARRIER SHOULD BE INSPECTED AT THE END OF EACH WORKING DAY.
- 4. PROTECT ALL STOCKPILES FROM STORMWATER RUN-OFF USING TEMPORARY EROSION CONTROL MEASURES SUCH AS BERMS, SILT SOCK, OR OTHER APPROVED PRACTICE TO PREVENT MIGRATION OF MATERIAL BEYOND THE IMMEDIATE CONFINES OF THE STOCKPILES.

OFF SITE VEHICLE TRACKING:

- 1. THE CONTRACTOR SHALL CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE(S) PRIOR TO ANY EXCAVATION ACTIVITIES.

VEGETATION:

- 1. TEMPORARY GRASS COVER:
 - A. SEEDBED PREPARATION:
 - a. APPLY FERTILIZER AT THE RATE OF 600 POUNDS PER ACRE OF 10-10-10. APPLY LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF THREE (3) TONS PER ACRE;
 - B. SEEDING:
 - a. UTILIZE ANNUAL RYE GRASS AT A RATE OF 40 LBS/ACRE;
 - b. WHERE THE SOIL HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF TWO (2) INCHES BEFORE APPLYING FERTILIZER, LIME AND SEED;
 - c. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, OR HYDROSEEDER (SLURRY INCLUDING SEED AND FERTILIZER). HYDROSEEDINGS, WHICH INCLUDE MULCH, MAY BE LEFT ON SOIL SURFACE. SEEDING RATES MUST BE INCREASED 10% WHEN HYDROSEEDING;
 - C. MAINTENANCE:
 - a. TEMPORARY SEEDING SHALL BE PERIODICALLY INSPECTED. AT A MINIMUM, 95% OF THE SOIL SURFACE SHOULD BE COVERED BY VEGETATION. IF ANY EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHALL BE MADE AND OTHER TEMPORARY MEASURES USED IN THE INTERIM (MULCH, FILTER BARRIERS, CHECK DAMS, ETC.).
- 2. VEGETATIVE PRACTICE:
 - A. FOR PERMANENT MEASURES AND PLANTINGS:
 - a. LIMESTONE SHALL BE THOROUGHLY INCORPORATED INTO THE LOAM LAYER AT A RATE OF THREE (3) TONS PER ACRE IN ORDER TO PROVIDE A PH VALUE OF 5.5 TO 6.5;
 - b. FERTILIZER SHALL BE SPREAD ON THE TOP LAYER OF LOAM AND WORKED INTO THE SURFACE. FERTILIZER APPLICATION RATE SHALL BE 800 POUNDS PER ACRE OF 10-20-20 FERTILIZER;
 - c. SOIL CONDITIONERS AND FERTILIZER SHALL BE APPLIED AT THE RECOMMENDED RATES AND SHALL BE THOROUGHLY WORKED INTO THE LOAM. LOAM SHALL BE RAKED UNTIL THE SURFACE IS FINELY PULVERIZED, SMOOTH AND EVEN, AND THEN COMPACTED TO AN EVEN SURFACE CONFORMING TO THE REQUIRED LINES AND GRADES WITH APPROVED ROLLERS WEIGHING BETWEEN 4-1/2 POUNDS AND 5-1/2 POUNDS PER INCH OF WIDTH;
 - d. SEED SHALL BE SOWN AT THE RATE SHOWN BELOW. SOWING SHALL BE DONE ON A CALM, DRY DAY, PREFERABLY BY MACHINE, BUT IF BY HAND, ONLY BY EXPERIENCED WORKMEN. IMMEDIATELY BEFORE SEEDING, THE SOIL SHALL BE LIGHTLY RAKED. ONE HALF THE SEED SHALL BE SOWN IN ONE DIRECTION AND THE OTHER HALF AT RIGHT ANGLES TO THE ORIGINAL DIRECTION. IT SHALL BE LIGHTLY RAKED INTO THE SOIL TO A DEPTH NOT OVER 1/4 INCH AND ROLLED WITH A HAND ROLLER WEIGHING NOT OVER 100 POUNDS PER LINEAR FOOT OF WIDTH;
 - e. HAY MULCH SHALL BE APPLIED IMMEDIATELY AFTER SEEDING AS INDICATED ABOVE;
 - f. THE SURFACE SHALL BE WATERED AND KEPT MOIST WITH A FINE SPRAY AS REQUIRED, WITHOUT WASHING AWAY THE SOIL, UNTIL THE GRASS IS WELL ESTABLISHED. ANY AREAS WHICH ARE NOT SATISFACTORILY COVERED WITH GRASS SHALL BE RESEEDED, AND ALL NOXIOUS WEEDS REMOVED;
 - g. THE CONTRACTOR SHALL PROTECT AND MAINTAIN THE SEEDED AREAS UNTIL ACCEPTED;
 - h. A GRASS SEED MIXTURE CONTAINING THE FOLLOWING SEED REQUIREMENTS SHALL BE APPLIED AT THE INDICATED RATE:

SEED MIX	APPLICATION RATE
CREeping RED FESCUE	20 LBS/ACRE
TALL FESCUE	20 LBS/ACRE
REDTOP	2 LBS/ACRE

IN NO CASE SHALL THE WEED CONTENT EXCEED ONE (1) PERCENT BY WEIGHT. ALL SEED SHALL COMPLY WITH STATE AND FEDERAL SEED LAWS. SEEDING SHALL BE DONE NO LATER THAN SEPTEMBER 15. IN NO CASE SHALL SEEDING TAKE PLACE OVER SNOW.
- 3. DORMANT SEEDING (SEPTEMBER 15 TO FIRST SNOWFALL):
 - A. FOLLOW PERMANENT MEASURES SLOPE, LIME, FERTILIZER AND GRADING REQUIREMENTS. APPLY SEED MIXTURE AT TWICE THE INDICATED RATE. APPLY MULCH AS INDICATED FOR PERMANENT MEASURES.

CONCRETE WASHOUT AREA:

- 1. THE FOLLOWING ARE THE ONLY NON-STORMWATER DISCHARGES ALLOWED. ALL OTHER NON-STORMWATER DISCHARGES ARE PROHIBITED ON SITE:
 - A. THE CONCRETE DELIVERY TRUCKS SHALL, WHENEVER POSSIBLE, USE WASHOUT FACILITIES AT THEIR OWN PLANT OR DISPATCH FACILITY;
 - B. IF IT IS NECESSARY, SITE CONTRACTOR SHALL DESIGNATE SPECIFIC WASHOUT AREAS AND DESIGN FACILITIES TO HANDLE ANTICIPATED WASHOUT WATER;
 - C. CONTRACTOR SHALL LOCATE WASHOUT AREAS AT LEAST 150 FEET AWAY FROM STORM DRAINS, SWALES AND SURFACE WATERS OR DELINEATED WETLANDS;
 - D. INSPECT WASHOUT FACILITIES DAILY TO DETECT LEAKS OR TEARS AND TO IDENTIFY WHEN MATERIALS NEED TO BE REMOVED.

ALLOWABLE NON-STORMWATER DISCHARGES:

- 1. FIRE-FIGHTING ACTIVITIES;
- 2. FIRE HYDRANT FLUSHING;
- 3. WATERS USED TO WASH VEHICLES WHERE DETERGENTS ARE NOT USED;
- 4. WATER USED TO CONTROL DUST;
- 5. POTABLE WATER INCLUDING UNCONTAMINATED WATER LINE FLUSHING;
- 6. ROUTINE EXTERNAL BUILDING WASH DOWN WHERE DETERGENTS ARE NOT USED;
- 7. PAVEMENT WASH WATERS WHERE DETERGENTS ARE NOT USED;
- 8. UNCONTAMINATED AIR CONDITIONING/COMPRESSOR CONDENSATION;
- 9. UNCONTAMINATED GROUND WATER OR SPRING WATER;
- 10. FOUNDATION OR FOOTING DRAINS WHICH ARE UNCONTAMINATED;
- 11. UNCONTAMINATED EXCAVATION DEWATERING;
- 12. LANDSCAPE IRRIGATION.

WASTE DISPOSAL:

- 1. WASTE MATERIAL:
 - A. ALL WASTE MATERIALS SHALL BE COLLECTED AND STORED IN SECURELY LIDDED RECEPTACLES. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE SHALL BE

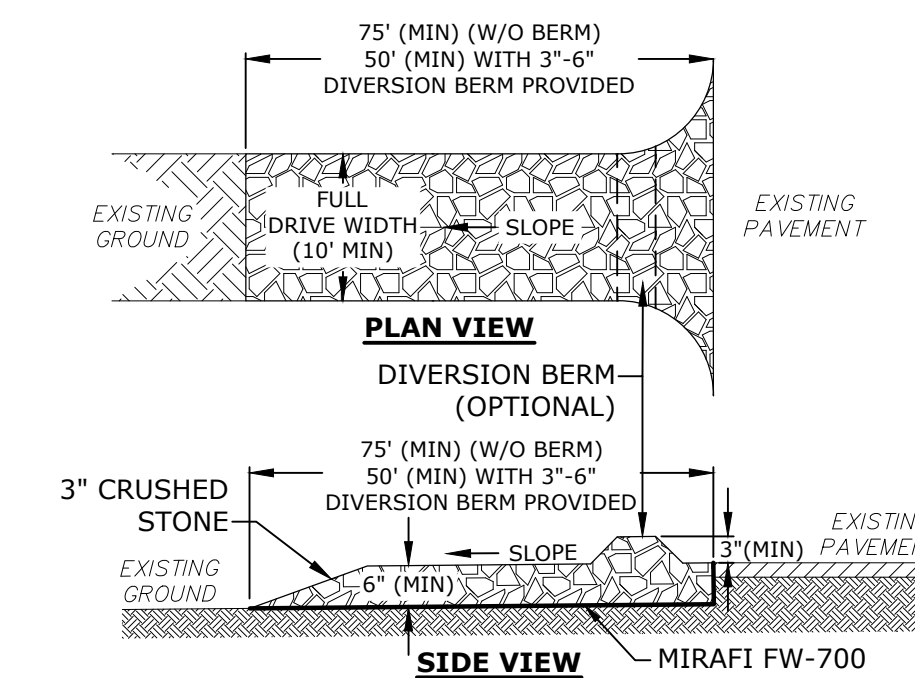
- DEPOSITED IN A DUMPSTER;
 - B. NO CONSTRUCTION WASTE MATERIALS SHALL BE BURIED ON SITE;
 - C. ALL PERSONNEL SHALL BE INSTRUCTED REGARDING THE CORRECT PROCEDURE FOR WASTE DISPOSAL BY THE SUPERINTENDENT.
- 2. HAZARDOUS WASTE:
 - A. ALL HAZARDOUS WASTE MATERIALS SHALL BE DISPOSED OF IN THE MANNER SPECIFIED BY LOCAL OR STATE REGULATION OR BY THE MANUFACTURER;
 - B. SITE PERSONNEL SHALL BE INSTRUCTED IN THESE PRACTICES BY THE SUPERINTENDENT.
 - 3. SANITARY WASTE:
 - A. ALL SANITARY WASTE SHALL BE COLLECTED FROM THE PORTABLE UNITS A MINIMUM OF ONCE PER WEEK BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

SPILL PREVENTION:

- 1. CONTRACTOR SHALL BE FAMILIAR WITH SPILL PREVENTION MEASURES REQUIRED BY LOCAL, STATE AND FEDERAL AGENCIES. AT A MINIMUM, CONTRACTOR SHALL FOLLOW THE BEST MANAGEMENT SPILL PREVENTION PRACTICES OUTLINED BELOW.
- 2. THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT SHALL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES DURING CONSTRUCTION TO STORMWATER RUNOFF:
 - A. GOOD HOUSEKEEPING - THE FOLLOWING GOOD HOUSEKEEPING PRACTICE SHALL BE FOLLOWED ON SITE DURING CONSTRUCTION:
 - a. ONLY SUFFICIENT AMOUNTS OF PRODUCTS TO DO THE JOB SHALL BE STORED ON SITE;
 - b. ALL REGULATED MATERIALS STORED ON SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR PROPER (ORIGINAL IF POSSIBLE) CONTAINERS AND, IF POSSIBLE, UNDER A ROOF OR OTHER ENCLOSURE, ON AN IMPERVIOUS SURFACE;
 - c. MANUFACTURER'S RECOMMENDATIONS FOR PROPER USE AND DISPOSAL SHALL BE FOLLOWED;
 - d. THE SITE SUPERINTENDENT SHALL INSPECT DAILY TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS;
 - e. SUBSTANCES SHALL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER;
 - f. WHENEVER POSSIBLE ALL OF A PRODUCT SHALL BE USED UP BEFORE DISPOSING OF THE CONTAINER.
 - 9. THE TRAINING OF ON-SITE EMPLOYEES AND THE ON-SITE POSTING OF RELEASE RESPONSE INFORMATION DESCRIBING WHAT TO DO IN THE EVENT OF A SPILL OF REGULATED SUBSTANCES.
- B. HAZARDOUS PRODUCTS - THE FOLLOWING PRACTICES SHALL BE USED TO REDUCE THE RISKS ASSOCIATED WITH HAZARDOUS MATERIALS:
 - a. PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE;
 - b. ORIGINAL LABELS AND MATERIAL SAFETY DATA SHALL BE RETAINED FOR IMPORTANT PRODUCT INFORMATION;
 - c. SURPLUS PRODUCT THAT MUST BE DISPOSED OF SHALL BE DISCARDED ACCORDING TO THE MANUFACTURER'S RECOMMENDED METHODS OF DISPOSAL.
- C. PRODUCT SPECIFIC PRACTICES - THE FOLLOWING PRODUCT SPECIFIC PRACTICES SHALL BE FOLLOWED ON SITE:
 - a. PETROLEUM PRODUCTS:
 - i. ALL ON SITE VEHICLES SHALL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE LEAKAGE;
 - ii. PETROLEUM PRODUCTS SHALL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED. ANY ASPHALT BASED SUBSTANCES USED ON SITE SHALL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
 - iii. SECURE FUEL STORAGE AREAS AGAINST UNAUTHORIZED ENTRY;
 - iv. INSPECT FUEL STORAGE AREAS WEEKLY;
 - v. WHEREVER POSSIBLE, KEEP REGULATED CONTAINERS THAT ARE STORED OUTSIDE MORE THAN 50 FEET FROM SURFACE WATER AND STORM DRAINS, 75 FEET FROM PRIVATE WELLS, AND 400 FEET FROM PUBLIC WELLS;
 - vi. COVER REGULATED CONTAINERS IN OUTSIDE STORAGE AREAS;
 - vii. SECONDARY CONTAINMENT IS REQUIRED FOR CONTAINERS CONTAINING REGULATED SUBSTANCES STORED OUTSIDE, EXCEPT FOR ON PREMISE USE HEATING FUEL TANKS, OR ABOVEGROUND OR UNDERGROUND STORAGE TANKS OTHERWISE REGULATED.
 - viii. THE FUEL HANDLING REQUIREMENTS SHALL INCLUDE:
 - (1) EXCEPT WHEN IN USE, KEEP CONTAINERS CONTAINING REGULATED SUBSTANCES CLOSED AND SEALED;
 - (2) PLACE DRIP PANS UNDER SPIGOTS, VALVES, AND PUMPS;
 - (3) HAVE SPILL CONTROL AND CONTAINMENT EQUIPMENT READILY AVAILABLE IN ALL WORK AREAS;
 - (4) USE FUNNELS AND DRIP PANS WHEN TRANSFERRING REGULATED SUBSTANCES;
 - (5) PERFORM TRANSFERS OF REGULATED SUBSTANCES OVER AN IMPERVIOUS SURFACE.
 - ix. FUELING AND MAINTENANCE OF EXCAVATION, EARTHMOVING AND OTHER CONSTRUCTION RELATED EQUIPMENT SHALL COMPLY WITH THE REGULATIONS OF THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES THESE REQUIREMENTS ARE SUMMARIZED IN WD-DWGB-22-6 BEST MANAGEMENT PRACTICES FOR FUELING AND MAINTENANCE OF EXCAVATION AND EARTHMOVING EQUIPMENT, OR ITS SUCCESSOR DOCUMENT.
[HTTPS://WWW.DES.NH.GOV/ORGANIZATION/COMMISSIONER/PIP/FACTSHEETS/DWGB/DOCUMENTS/DWGB-22-6.PDF](https://www.des.nh.gov/organization/commissioner/pip/factsheets/dwgb/documents/dwgb-22-6.pdf)
- b. FERTILIZERS:
 - i. FERTILIZERS USED SHALL BE APPLIED ONLY IN THE MINIMUM AMOUNTS DIRECTED BY THE SPECIFICATIONS;
 - ii. ONCE APPLIED FERTILIZER SHALL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORMWATER;
 - iii. STORAGE SHALL BE IN A COVERED SHED OR ENCLOSED TRAILERS. THE CONTENTS OF ANY PARTIALLY USED BAGS OF FERTILIZER SHALL BE TRANSFERRED TO A SEALABLE PLASTIC BIN TO AVOID SPILLS.
- c. PAINTS:
 - i. ALL CONTAINERS SHALL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE;
 - ii. EXCESS PAINT SHALL NOT BE DISCHARGED TO THE STORM SEWER SYSTEM;
 - iii. EXCESS PAINT SHALL BE DISPOSED OF PROPERLY ACCORDING TO MANUFACTURER'S INSTRUCTIONS OR STATE AND LOCAL REGULATIONS.
- D. SPILL CONTROL PRACTICES - IN ADDITION TO GOOD HOUSEKEEPING AND MATERIAL MANAGEMENT PRACTICES DISCUSSED IN THE PREVIOUS SECTION, THE FOLLOWING PRACTICES SHALL BE FOLLOWED FOR SPILL PREVENTION AND CLEANUP:
 - a. MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP SHALL BE CLEARLY POSTED AND SITE PERSONNEL SHALL BE MADE AWARE OF THE PROCEDURES AND THE LOCATION OF THE INFORMATION AND CLEANUP SUPPLIES;
 - b. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP SHALL BE KEPT IN THE MATERIAL STORAGE AREA ON SITE. EQUIPMENT AND MATERIALS SHALL INCLUDE BUT NOT BE LIMITED TO BROOMS, DUSTPANS, MOPS, RAGS, GLOVES, GOGGLES, KITTY LITTER, SAND, SAWDUST AND PLASTIC OR METAL TRASH CONTAINERS SPECIFICALLY FOR THIS PURPOSE;
 - c. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY;
 - d. THE SPILL AREA SHALL BE KEPT WELL VENTILATED AND PERSONNEL SHALL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE;
 - e. SPILLS OF TOXIC OR HAZARDOUS MATERIAL SHALL BE REPORTED TO THE APPROPRIATE LOCAL, STATE OR FEDERAL AGENCIES AS REQUIRED;
 - f. THE SITE SUPERINTENDENT RESPONSIBLE FOR DAY-TO-DAY SITE OPERATIONS SHALL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR.
- E. VEHICLE FUELING AND MAINTENANCE PRACTICE:
 - a. CONTRACTOR SHALL MAKE AN EFFORT TO PERFORM EQUIPMENT/VEHICLE FUELING AND MAINTENANCE AT AN OFF-SITE FACILITY;
 - b. CONTRACTOR SHALL PROVIDE AN ON-SITE FUELING AND MAINTENANCE AREA THAT IS CLEAN AND DRY;
 - c. IF POSSIBLE THE CONTRACTOR SHALL KEEP AREA COVERED;
 - d. CONTRACTOR SHALL KEEP A SPILL KIT AT THE FUELING AND MAINTENANCE AREA;
 - e. CONTRACTOR SHALL REGULARLY INSPECT VEHICLES FOR LEAKS AND DAMAGE;
 - f. CONTRACTOR SHALL USE DRIP PANS, DRIP CLOTHS, OR ABSORBENT PADS WHEN REPLACING SPENT FLUID.

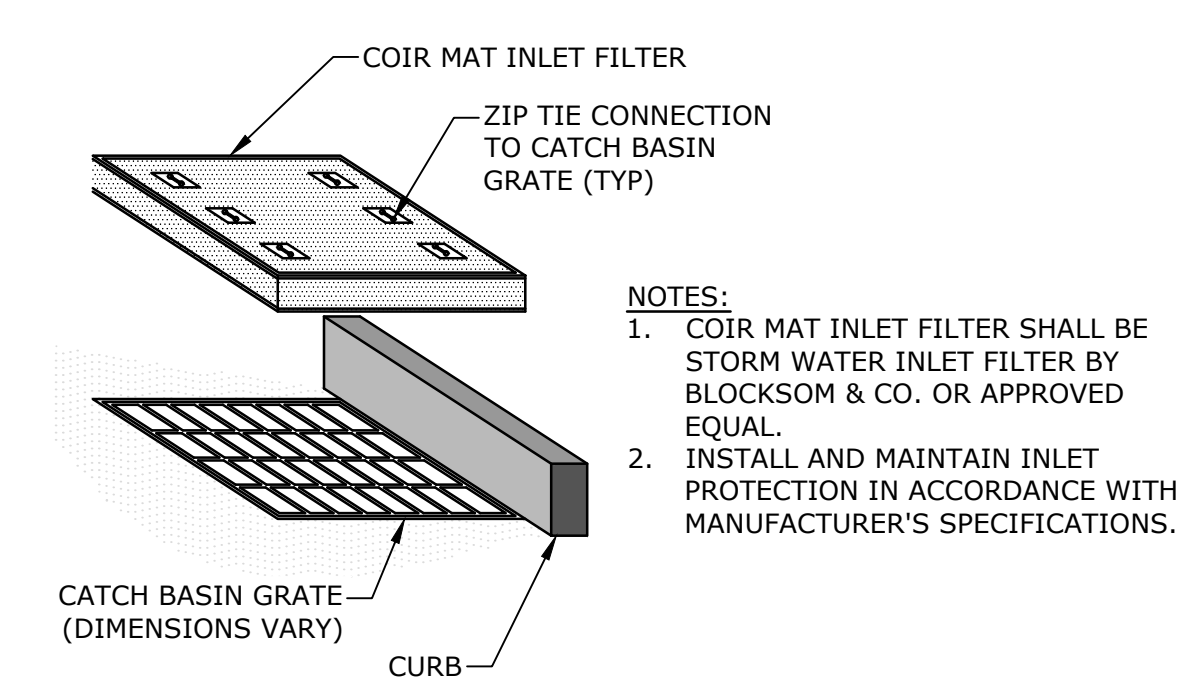
EROSION CONTROL OBSERVATIONS AND MAINTENANCE PRACTICES

- 1. THIS PROJECT EXCEEDS ONE (1) ACRE OF DISTURBANCE AND THUS REQUIRES A SWPPP. THE SWPPP SHALL BE PREPARED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE FAMILIAR WITH THE SWPPP AND KEEP AN UPDATED COPY OF THE SWPPP ONSITE AT ALL TIMES.
- 2. THE FOLLOWING REPRESENTS THE GENERAL OBSERVATION AND REPORTING PRACTICES THAT SHALL BE FOLLOWED AS PART OF THIS PROJECT:
 - A. OBSERVATIONS OF THE PROJECT FOR COMPLIANCE WITH THE SWPPP SHALL BE MADE BY THE CONTRACTOR AT LEAST ONCE A WEEK OR WITHIN 24 HOURS OF A STORM 0.25 INCHES OR GREATER;
 - B. AN OBSERVATION REPORT SHALL BE MADE AFTER EACH OBSERVATION AND DISTRIBUTED TO THE ENGINEER, THE OWNER, AND THE CONTRACTOR;
 - C. A REPRESENTATIVE OF THE SITE CONTRACTOR, SHALL BE RESPONSIBLE FOR MAINTENANCE AND REPAIR ACTIVITIES;
 - D. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED WITHIN 24 HOURS OF REPORT.



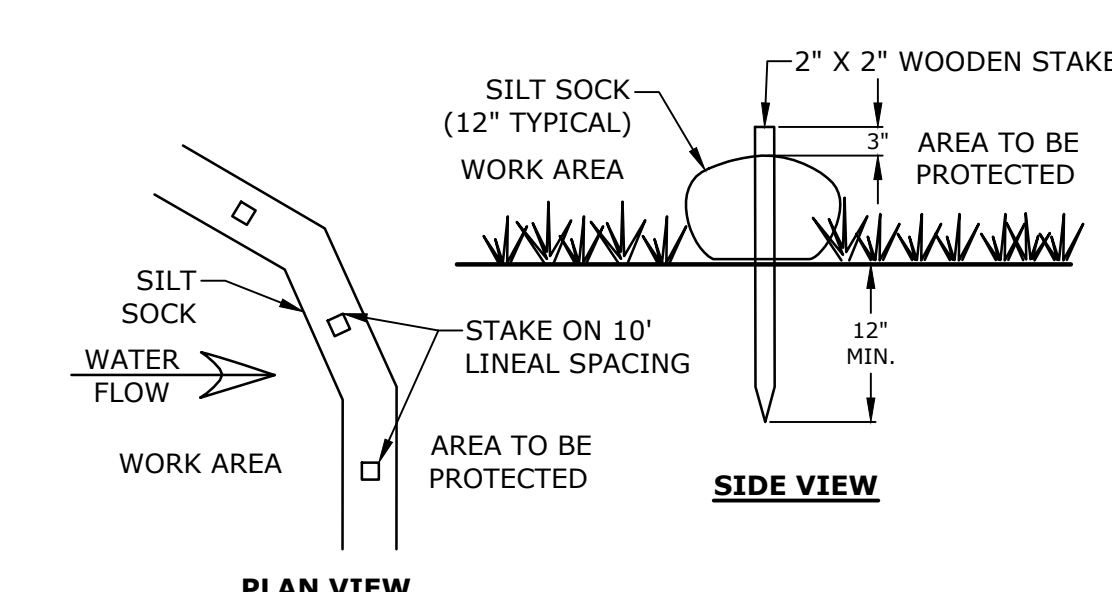
NOTE:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF SEDIMENT FROM THE SITE. WHEN WASHING IS REQUIRED, IT SHALL BE DONE SO RUNOFF DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING STORM DRAINS, DITCHES, OR WATERWAYS

STABILIZED CONSTRUCTION EXIT
NO SCALE



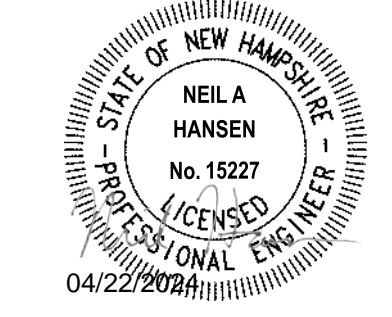
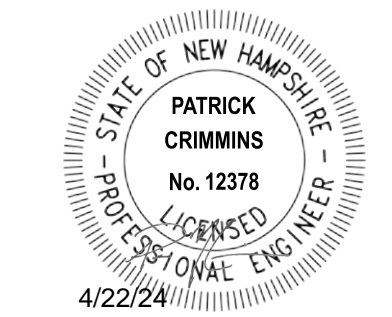
NOTES:
1. COIR MAT INLET FILTER SHALL BE STORM WATER INLET FILTER BY BLOCKSOM & CO. OR APPROVED EQUAL.
2. INSTALL AND MAINTAIN INLET PROTECTION IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

INLET PROTECTION
NO SCALE



PLAN VIEW
NOTES:
1. SILT SOCK SHALL BE SILT SOXX BY FILTREXX OR APPROVED EQUAL.
2. INSTALL SILT SOCK IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

SILT SOCK
NO SCALE



PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	4/22/2024	TAC SUBMISSION

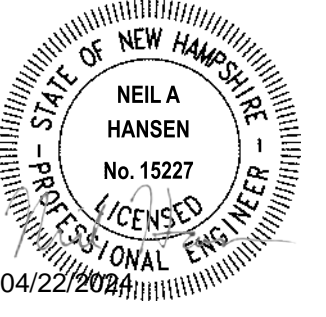
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DATE:	4/22/2024
FILE:	E5071-001-C-DTLS.dwg
DRAWN BY:	BKC/NHW
DESIGNED/CHECKED BY:	NAH
APPROVED BY:	PMC

EROSION CONTROL NOTES AND DETAILS SHEET

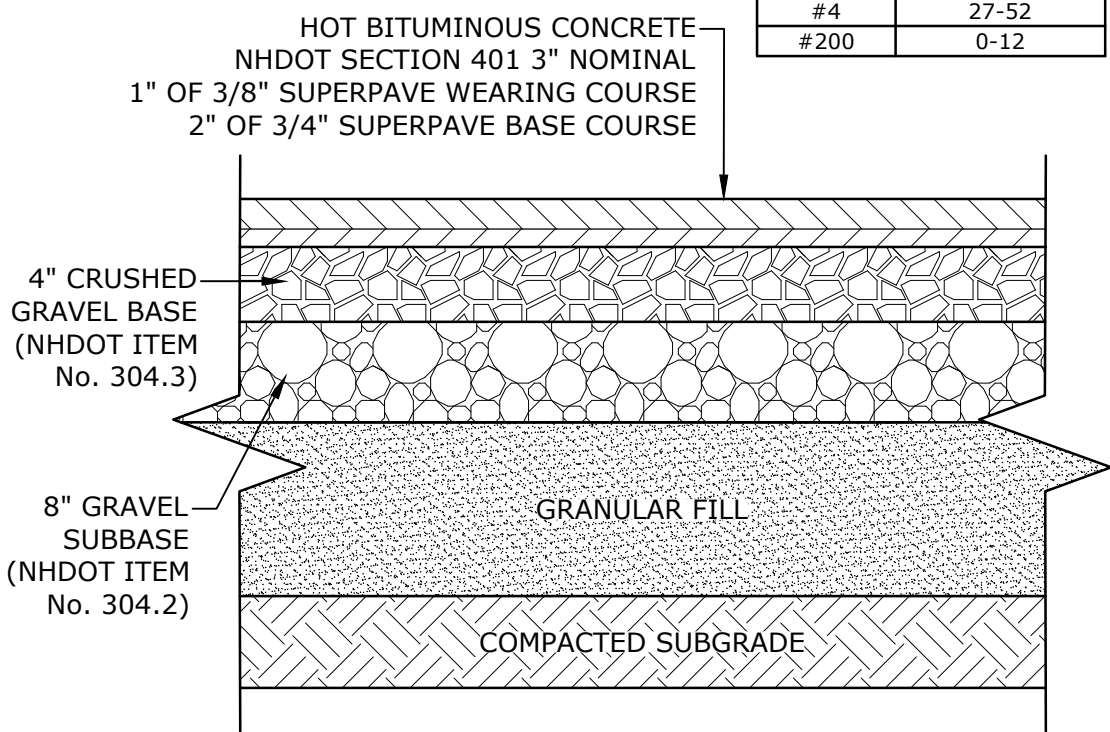
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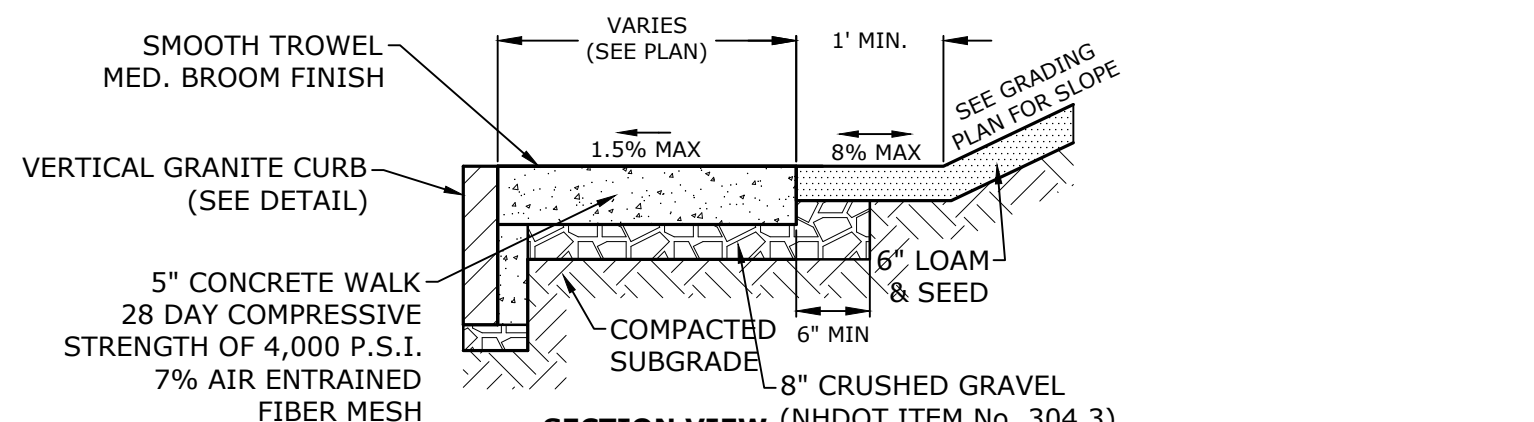
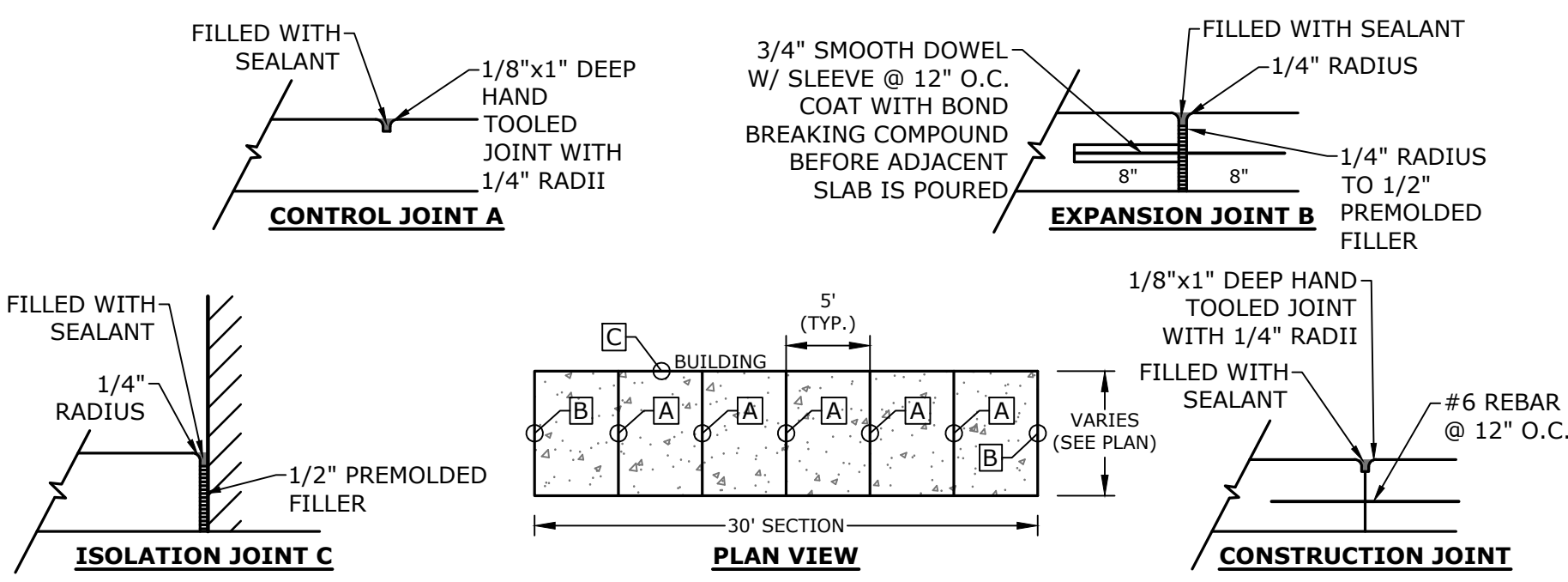


NHDOT ITEM No. 304.2 (GRAVEL)		NHDOT ITEM No. 304.3 (CRUSHED GRAVEL)	
SIEVE SIZE	% PASSING	SIEVE SIZE	% PASSING
6"	100	3"	100
#4	25-70	2"	95-100
#200	0-12	1"	55-85
		#4	27-52
		#200	0-12



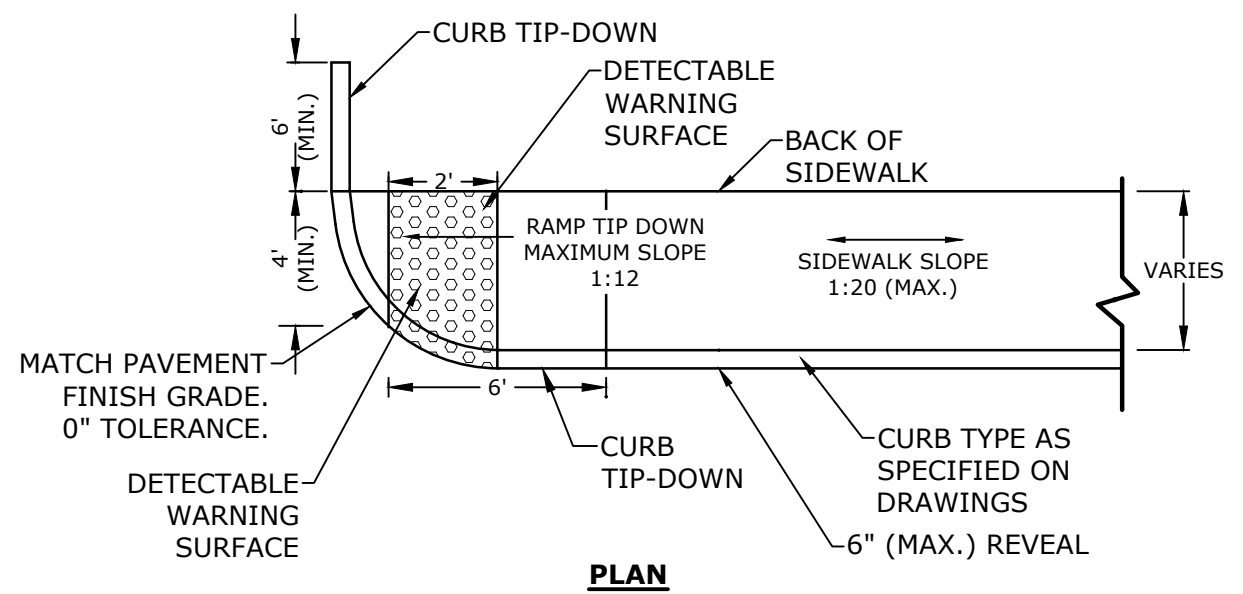
- NOTES:**
- SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
 - SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
 - A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.
 - REFER TO CITY SPECIFICATIONS FOR ASPHALT MIX DESIGN.

ON-SITE PAVEMENT SECTION
NO SCALE

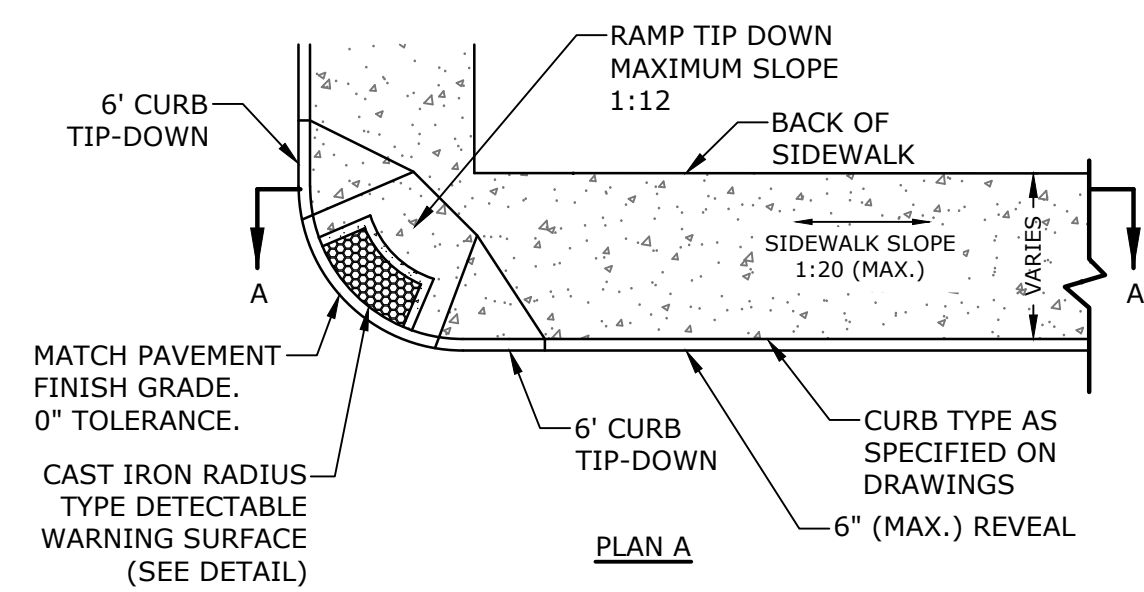
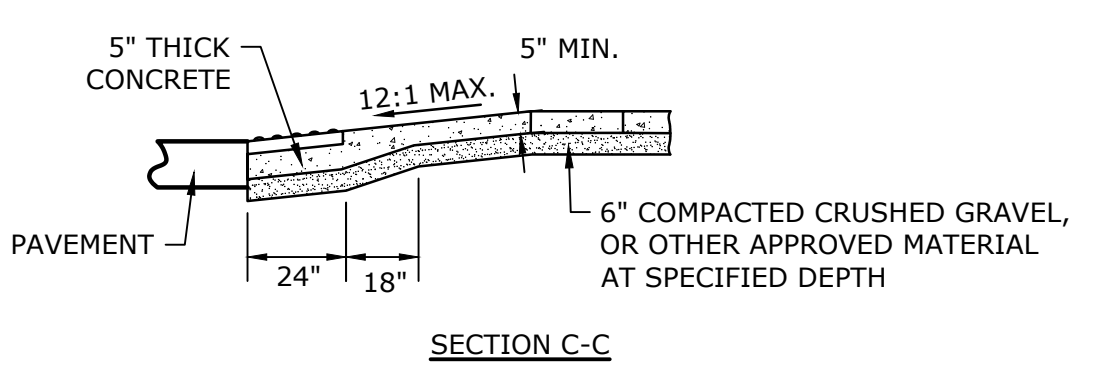
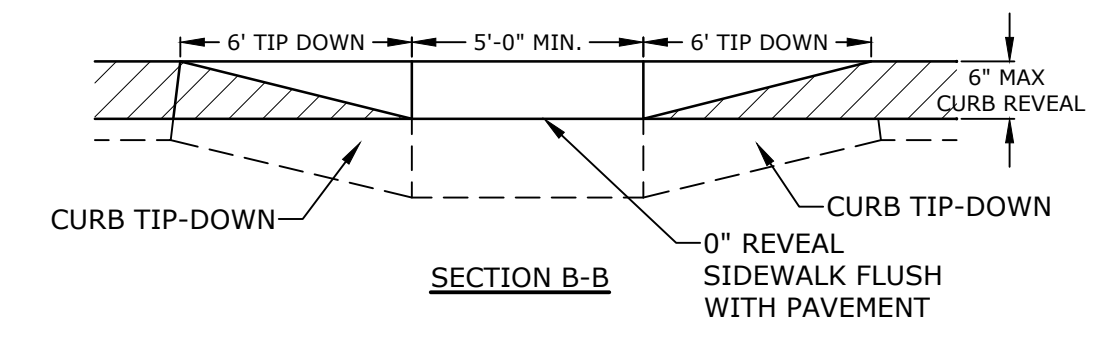
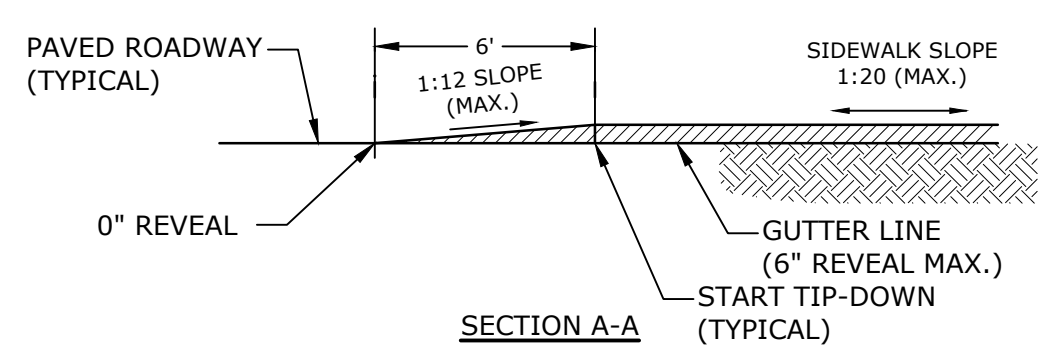


- NOTES:**
- SEE SITE PLAN FOR SIDEWALK WIDTH AND LOCATIONS.
 - SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR WALK AND SIDE SLOPE GRADES.
 - ISOLATION JOINTS ADJACENT TO BUILDING SHALL BE COORDINATED WITH BUILDING DRAWINGS.

CONCRETE SIDEWALK WITH GRANITE CURB
NO SCALE

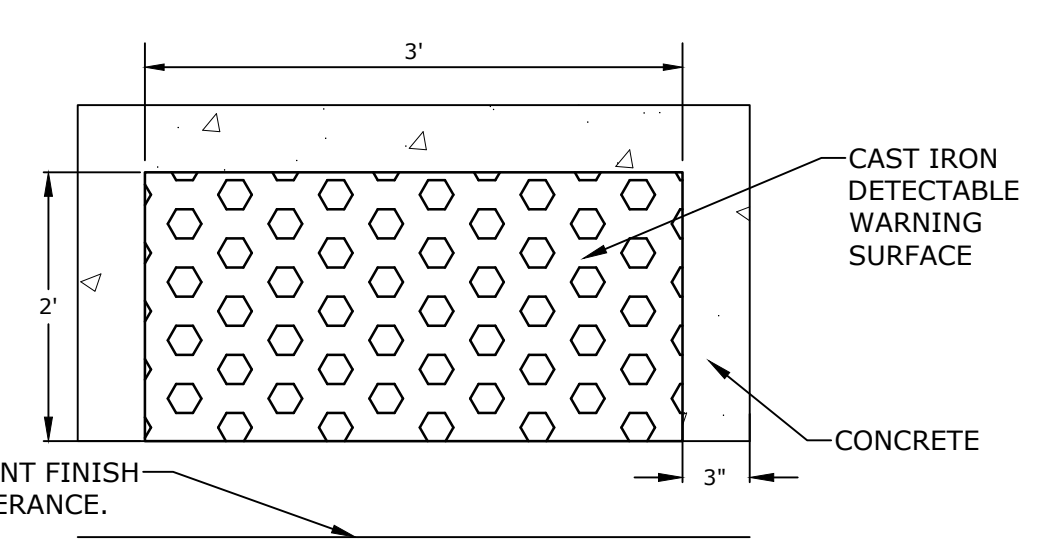
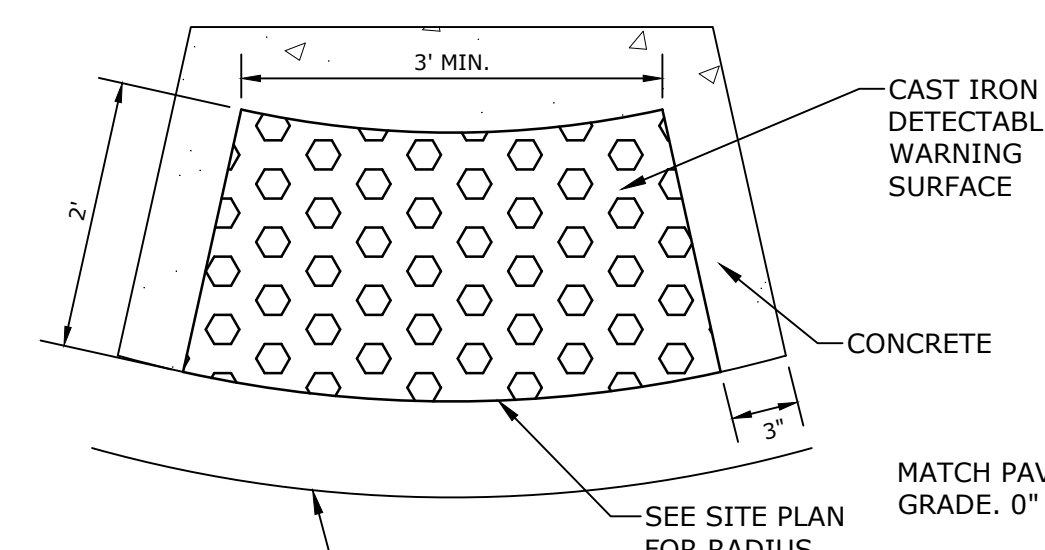


NHDOT ITEM No. 304.3 (CRUSHED GRAVEL)	
SIEVE SIZE	% PASSING
3"	100
2"	95-100
1"	55-85
#4	27-52
#200	0-12



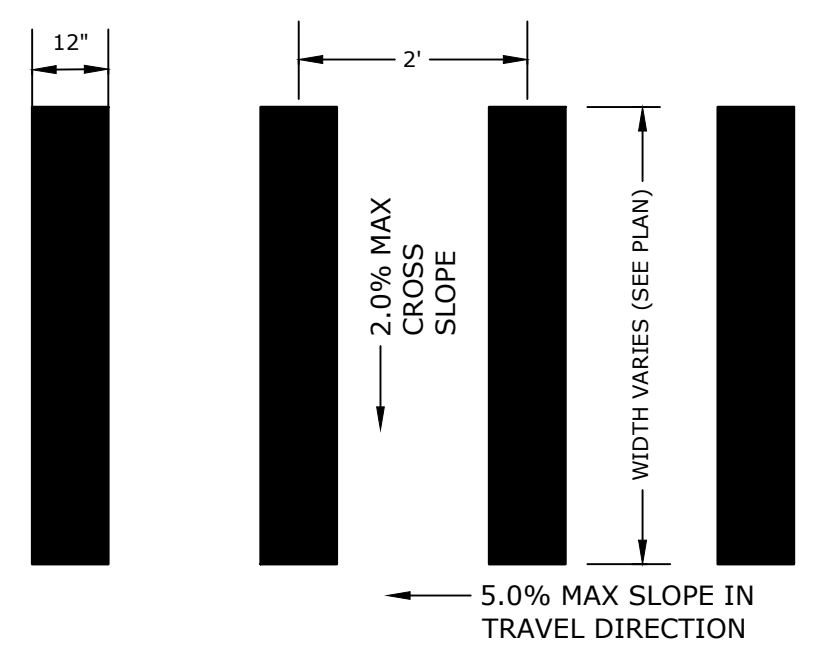
- NOTES:**
- RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
 - A 6" COMPACTED CRUSHED GRAVEL BASE (NHDOT ITEM No. 304.3) SHALL BE PROVIDED BENEATH RAMPS.
 - DETECTABLE WARNING PANEL SHALL BE CAST IRON SET IN CONCRETE (SEE DETAIL.)
 - PROVIDE DETECTABLE WARNING SURFACES ANYTIME THAT A CURB RAMP, BLENDED TRANSITION, OR LANDING CONNECTS TO A STREET.
 - LOCATE THE DETECTABLE WARNING SURFACES AT THE BACK OF THE CURB ALONG THE EDGE OF THE LANDING.
 - THE MAXIMUM RUNNING SLOPE OF ANY SIDEWALK CURB RAMP IS 12:1, THE MAXIMUM CROSS SLOPE IS 2%. THE SLOPE OF THE LANDING SHALL NOT EXCEED 2% IN ANY DIRECTION.
 - TRANSITIONS SHALL BE FLUSH AND FREE OF ABRUPT CHANGES. ROADWAY SHOULDER SLOPES ADJOINING SIDEWALK CURB RAMPS SHALL BE A MAXIMUM OF 5% (FULL WIDTH) FOR A DISTANCE OF 2 FT. FROM THE ROADWAY CURBLINE.
 - THE BOTTOM OF THE SIDEWALK CURB RAMP OR LANDING, EXCLUSIVE OF THE FLARED SIDES, SHALL BE WHOLLY CONTAINED WITHIN THE CROSSWALK MARKINGS.
 - DETECTABLE WARNING PANELS SHALL BE A MINIMUM OF 2 FEET IN DEPTH. THE ROWS OF TRUNCATED DOMES SHALL BE ALIGNED PERPENDICULAR TO THE GRADE BREAK BETWEEN THE RAMP, BLENDED TRANSITION, OR LANDING AND THE STREET.
 - THE TEXTURE OF THE DETECTABLE WARNING FEATURE MUST CONTRAST VISUALLY WITH THE SURROUNDING SURFACES (EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT).

CONCRETE WHEELCHAIR ACCESSIBLE RAMP
NO SCALE



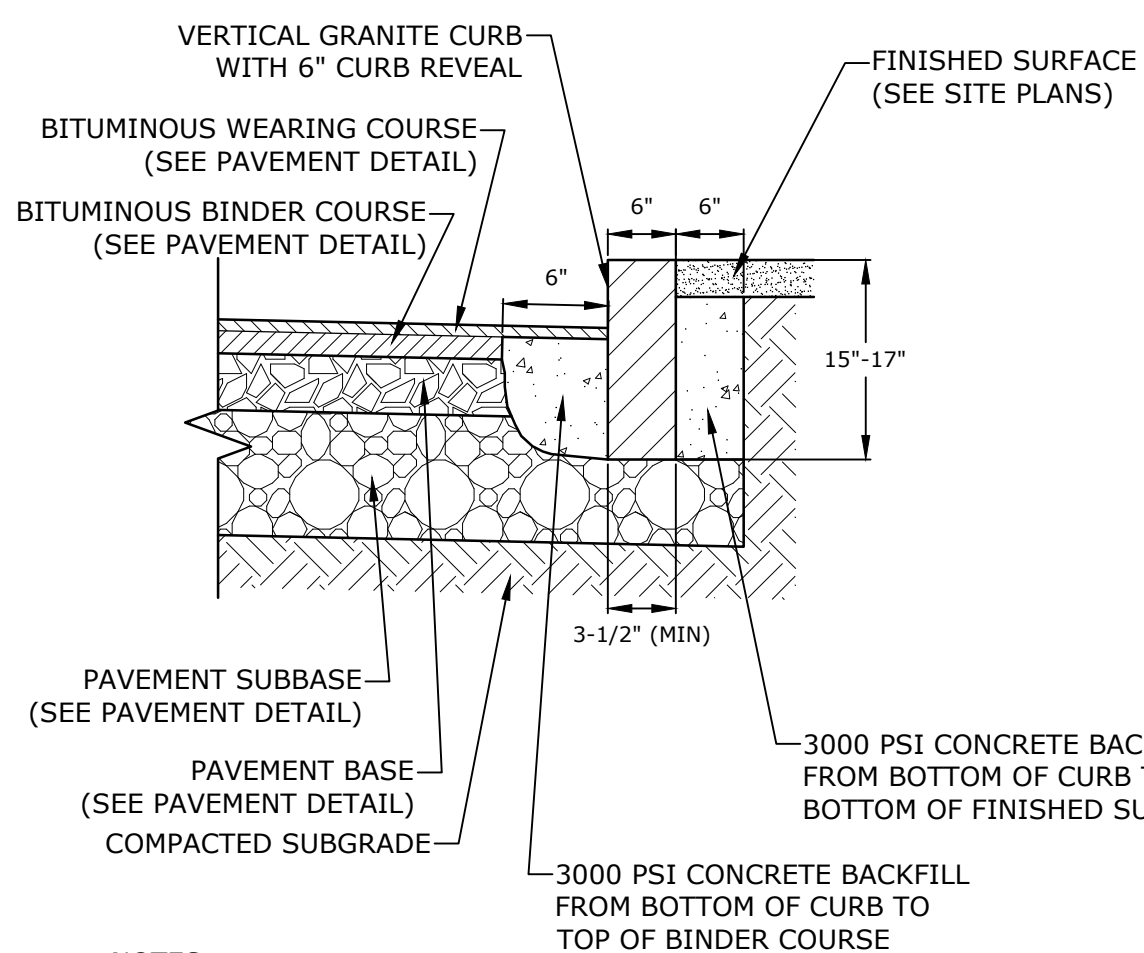
- NOTES:**
- DETECTABLE WARNING SURFACE SHALL BE 2' X 3' CAST IRON PANEL SET IN CONCRETE.
 - DETECTABLE WARNING SURFACE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

CAST IRON DETECTABLE WARNING SURFACE
NO SCALE



- NOTE:**
- STRIPING SHALL BE CONSTRUCTED USING WHITE THERMO PLASTIC, REFLECTORIZED PAVEMENT MARKING MATERIAL MEETING THE REQUIREMENTS OF ASTM D 4505

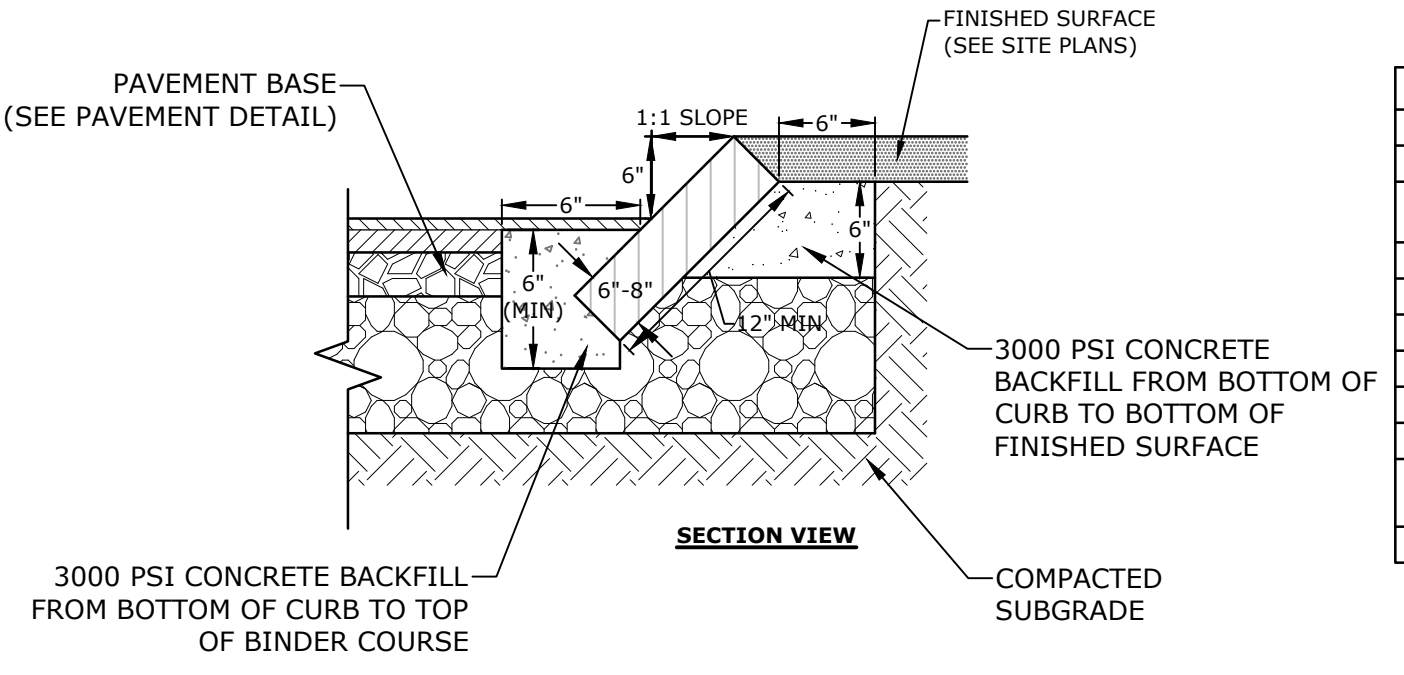
CROSSWALK STRIPING
NO SCALE



CURB RADIUS TABLE	
RADIUS	MAX. LENGTH
<20'	USE CURVED CURB
21'	3'
22'-28'	4'
29'-35'	5'
36'-42'	6'
43'-49'	7'
50'-56'	8'
57'-60'	9'
>60'	10'

- NOTES:**
- SEE SITE PLAN(S) FOR LIMITS OF VERTICAL GRANITE CURB (VGC).
 - ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
 - MINIMUM LENGTH OF STRAIGHT CURB STONES = 3'
 - MAXIMUM LENGTH OF STRAIGHT CURB STONES = 10'
 - MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (SEE TABLE).
 - ALL RADII 20 FEET AND SMALLER SHALL BE CONSTRUCTED USING CURVED SECTIONS.
 - JOINTS BETWEEN STONES SHALL HAVE A MAXIMUM SPACING OF 1/2" AND SHALL BE MORTARED.

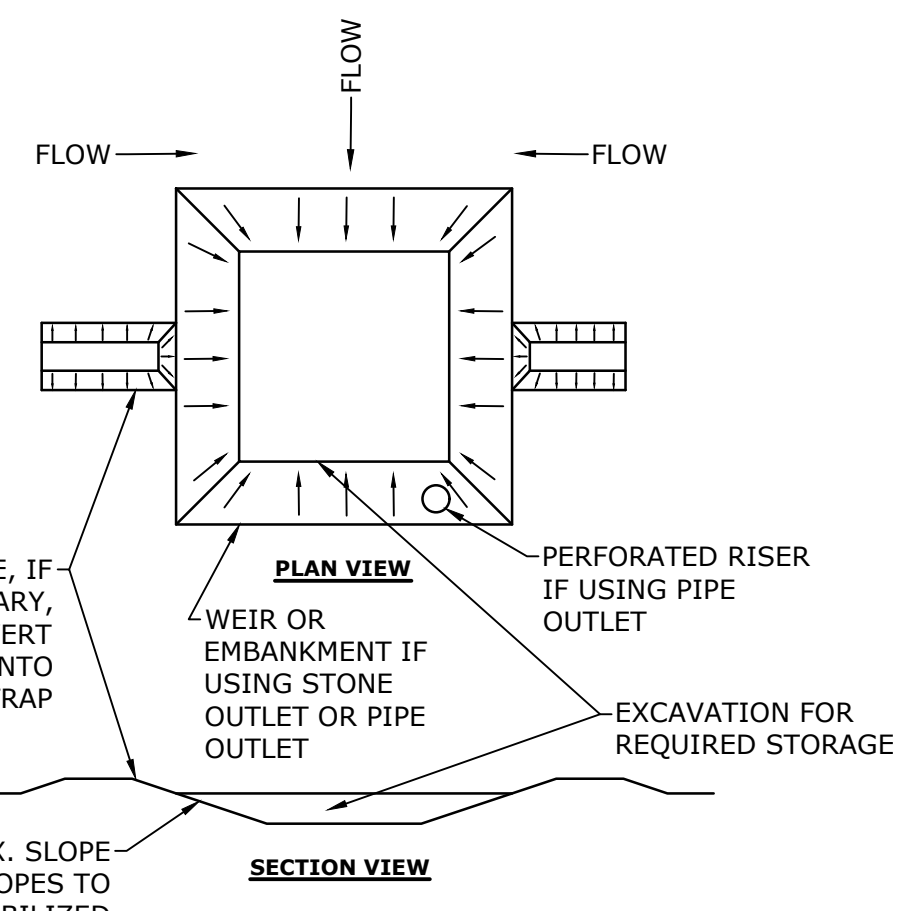
VERTICAL GRANITE CURB
NO SCALE



CURB RADIUS TABLE	
RADIUS	MAX LENGTH
<2'	USE CURVED CURB
2'-15'	USE RADIAL JOINTS
16'-28'	1'-6"
29'-41'	2'
42'-55'	3'
56'-68'	4'
69'-82'	5'
83'-96'	6'
97'-110'	7'
>110'	8'

- NOTES:**
- SEE SITE PLAN(S) FOR LIMITS OF SLOPED GRANITE CURB (SGC).
 - ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
 - MINIMUM LENGTH OF STRAIGHT CURB STONES = 18"
 - MAXIMUM LENGTH OF STRAIGHT CURB STONES = 8'
 - MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (SEE TABLE).
 - JOINTS BETWEEN STONES SHALL HAVE A MAXIMUM SPACING OF 1/2" AND SHALL BE MORTARED.

TYPICAL SECTION



- NOTES:**
- THE TRAP SHALL BE INSTALLED AS CLOSE TO THE DISTURBED AREA AS POSSIBLE.
 - THE MAXIMUM CONTRIBUTING AREA TO A SINGLE TRAP SHALL BE LESS THAN 5 ACRES.
 - THE MINIMUM VOLUME OF THE TRAP SHALL BE 3,600 CUBIC FEET OF STORAGE FOR EACH ACRE OF DRAINAGE AREA.
 - TRAP OUTLET SHALL BE MINIMUM OF ONE FOOT BELOW THE CREST OF THE TRAP.
 - TRAP SHALL DISCHARGE TO A STABILIZED AREA.
 - TRAP SHALL BE CLEANED WHEN 50 PERCENT OF THE ORIGINAL VOLUME IS FILLED.
 - MATERIALS REMOVED FROM THE TRAP SHALL BE PROPERLY DISPOSED OF AND STABILIZED.
 - SEDIMENT TRAPS MUST BE USED AS NEEDED TO CONTAIN RUNOFF UNTIL SOILS ARE STABILIZED.

SEDIMENT TRAP
NO SCALE

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	4/22/2024	TAC SUBMISSION

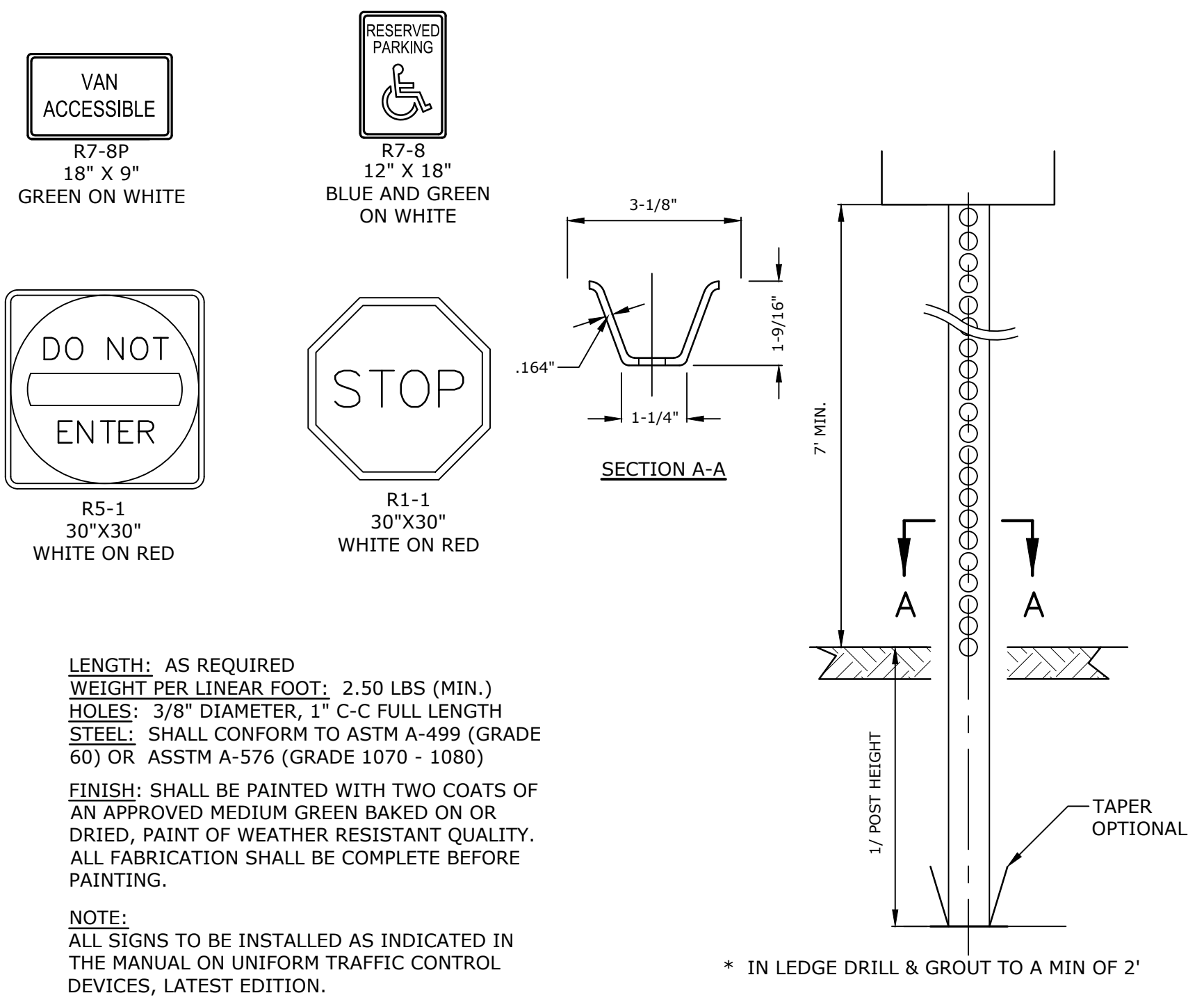
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DATE: 4/22/2024
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DRAWN BY: BKC/NHW
DESIGNED/CHECKED BY: NAH
APPROVED BY: PMC

DETAILS SHEET

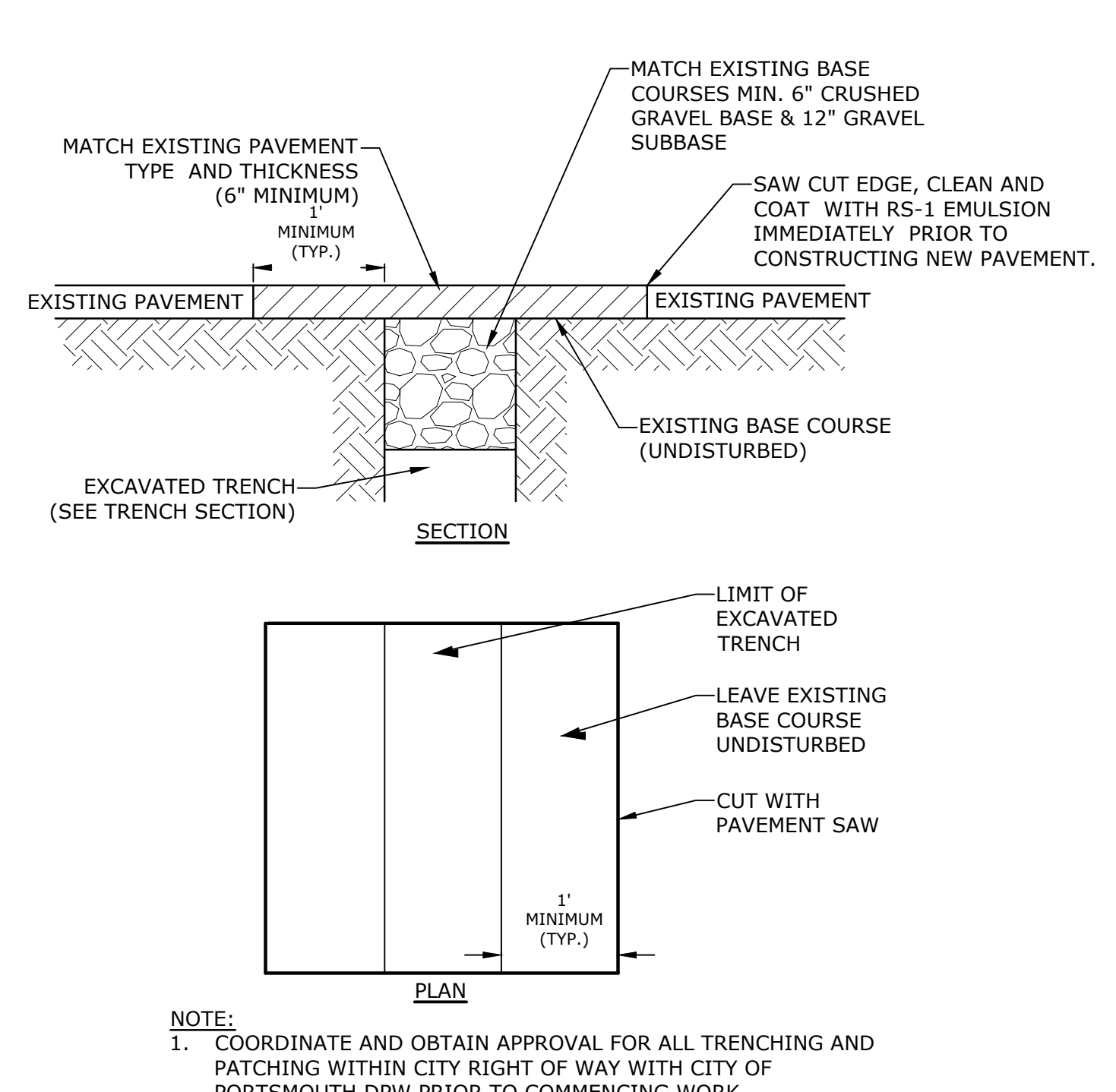
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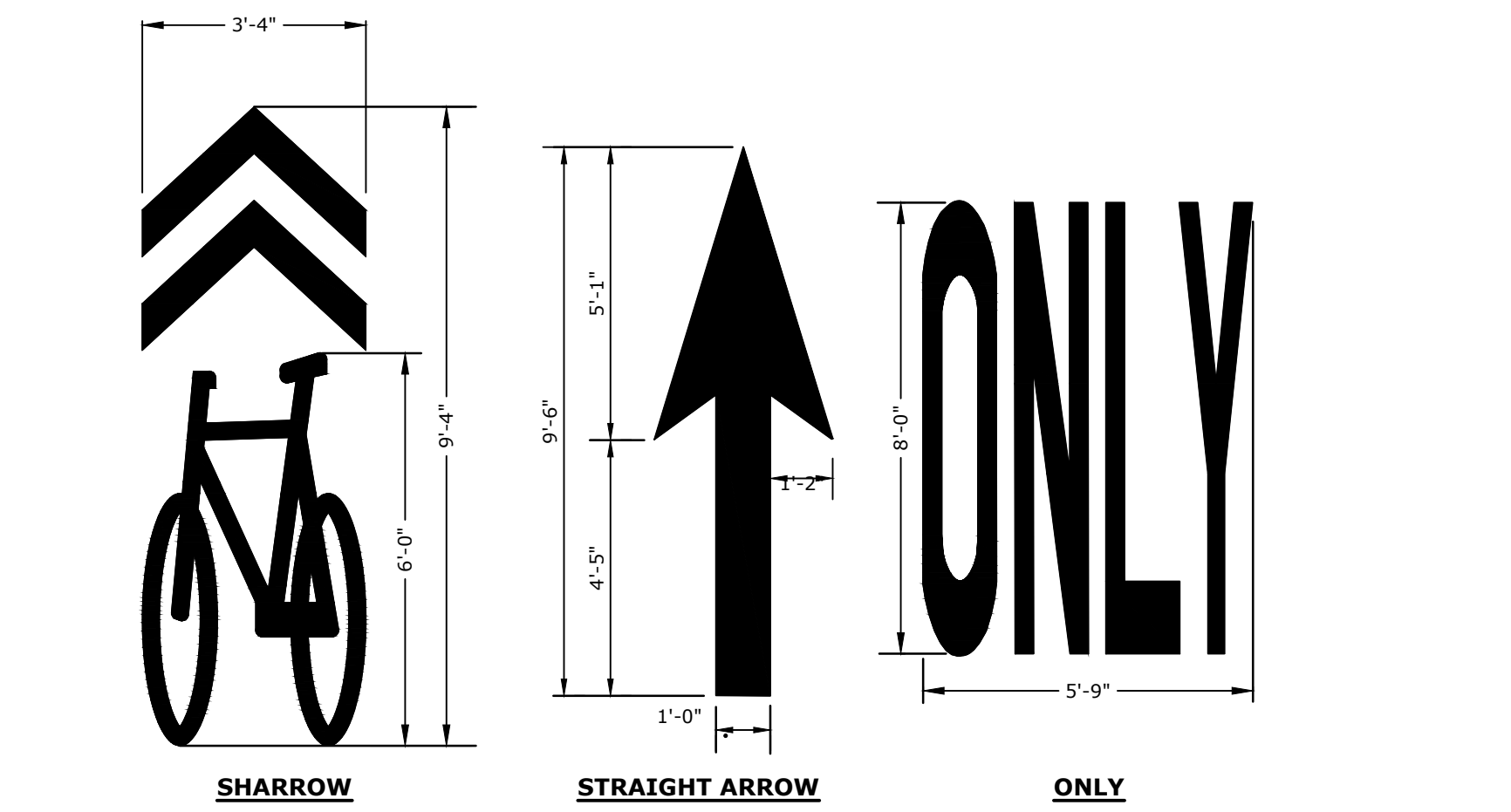
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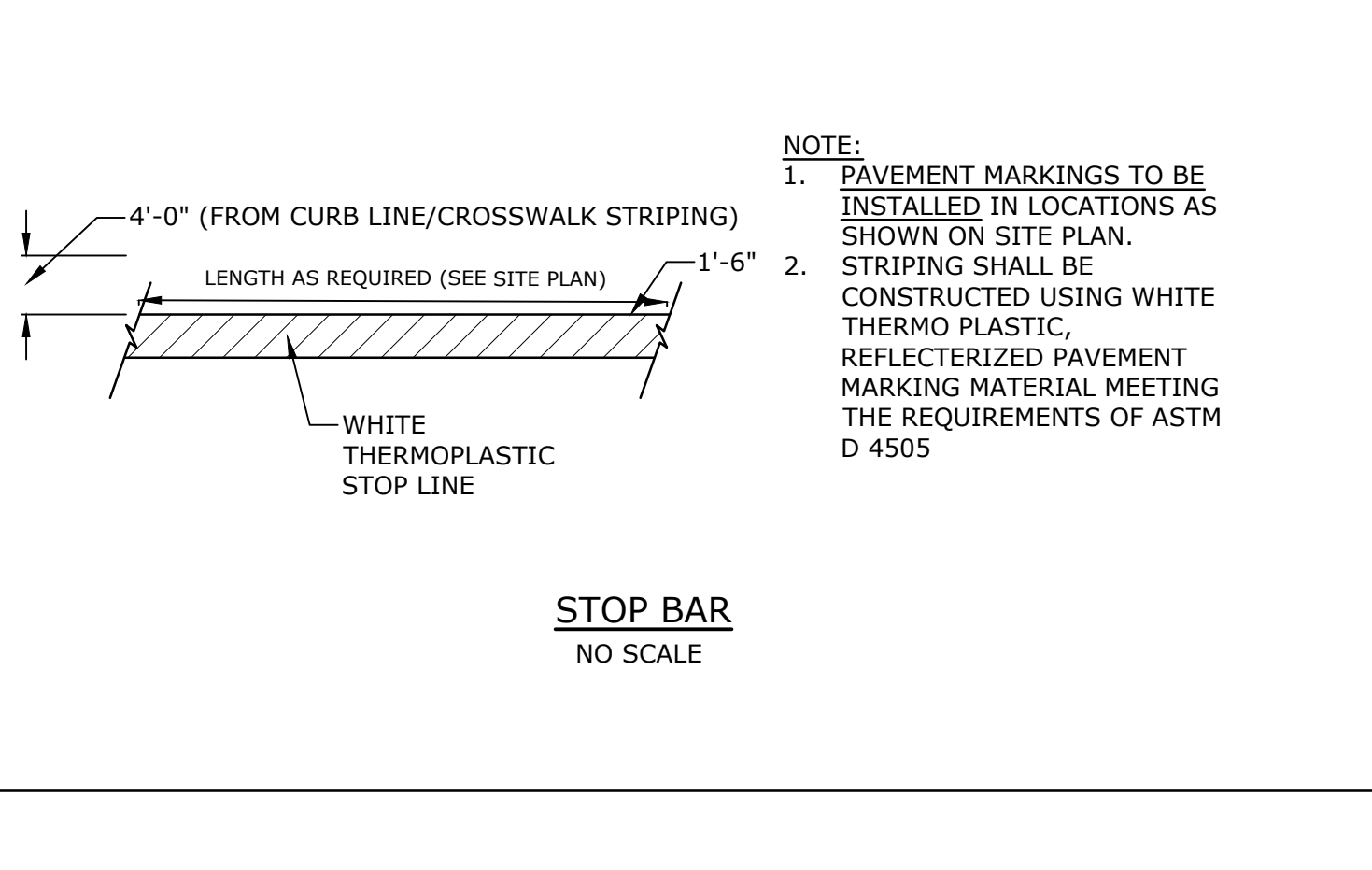
SIGN LEGEND & SIGN POST
NO SCALE



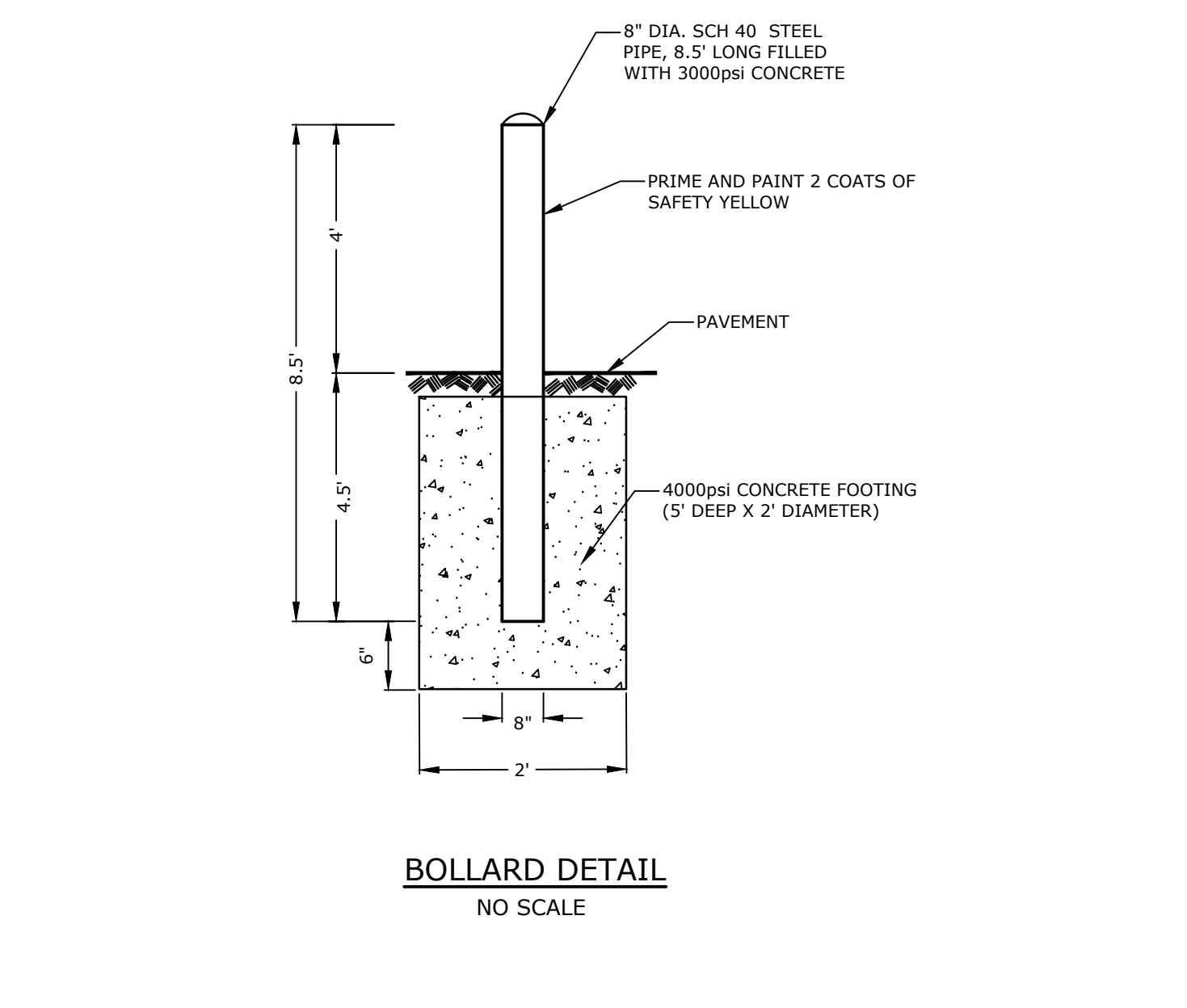
ROADWAY TRENCH PATCH
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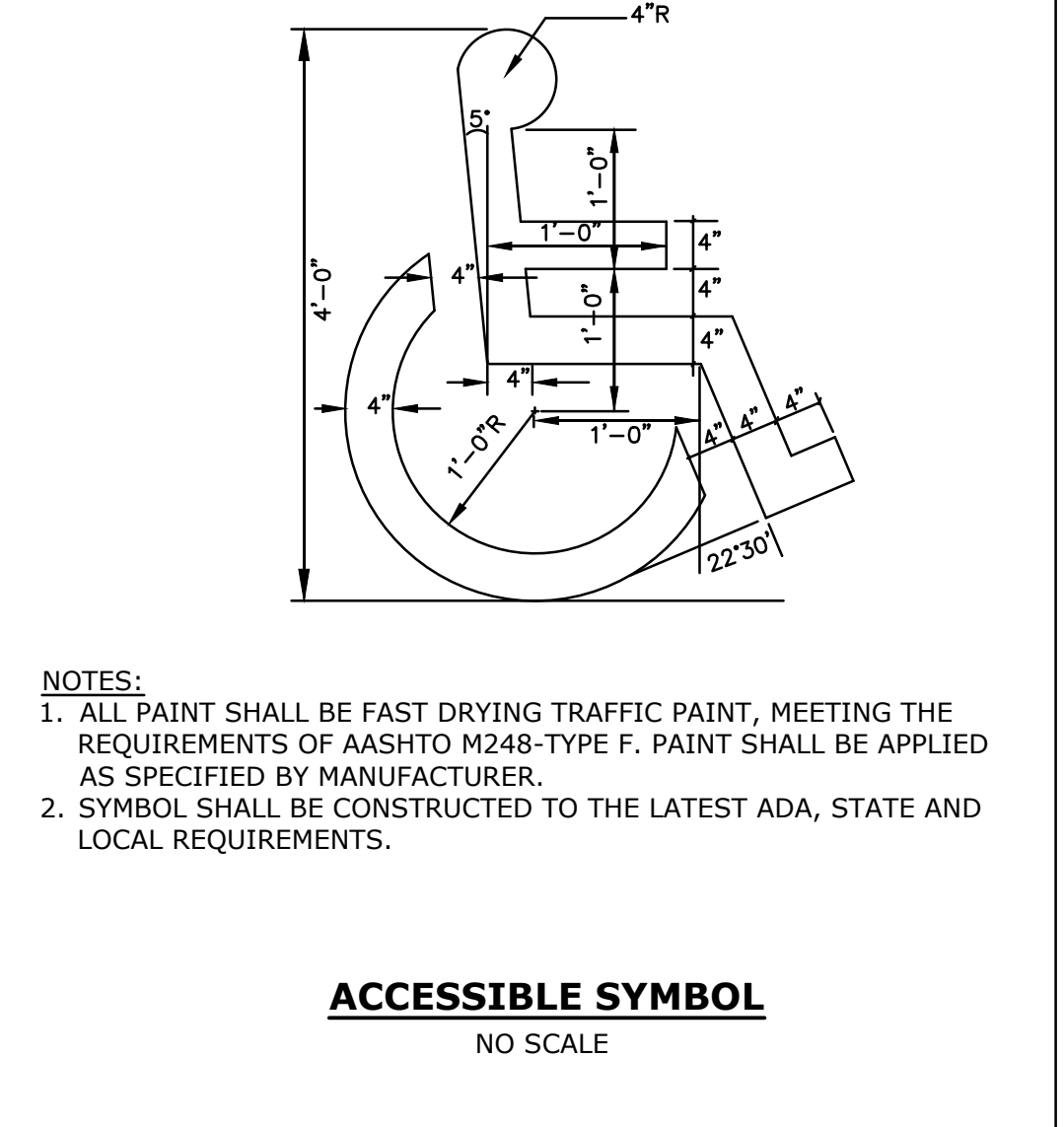
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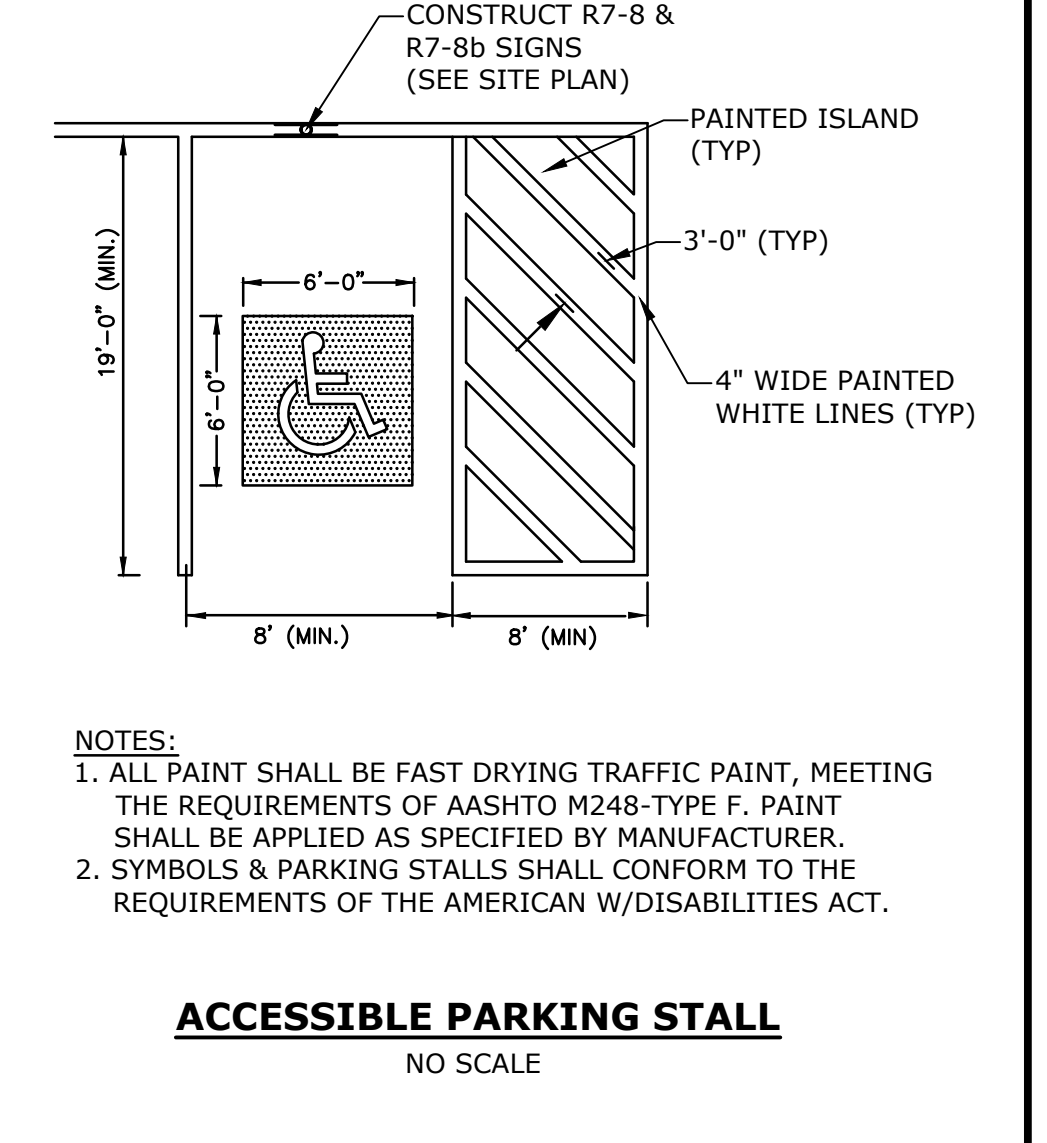
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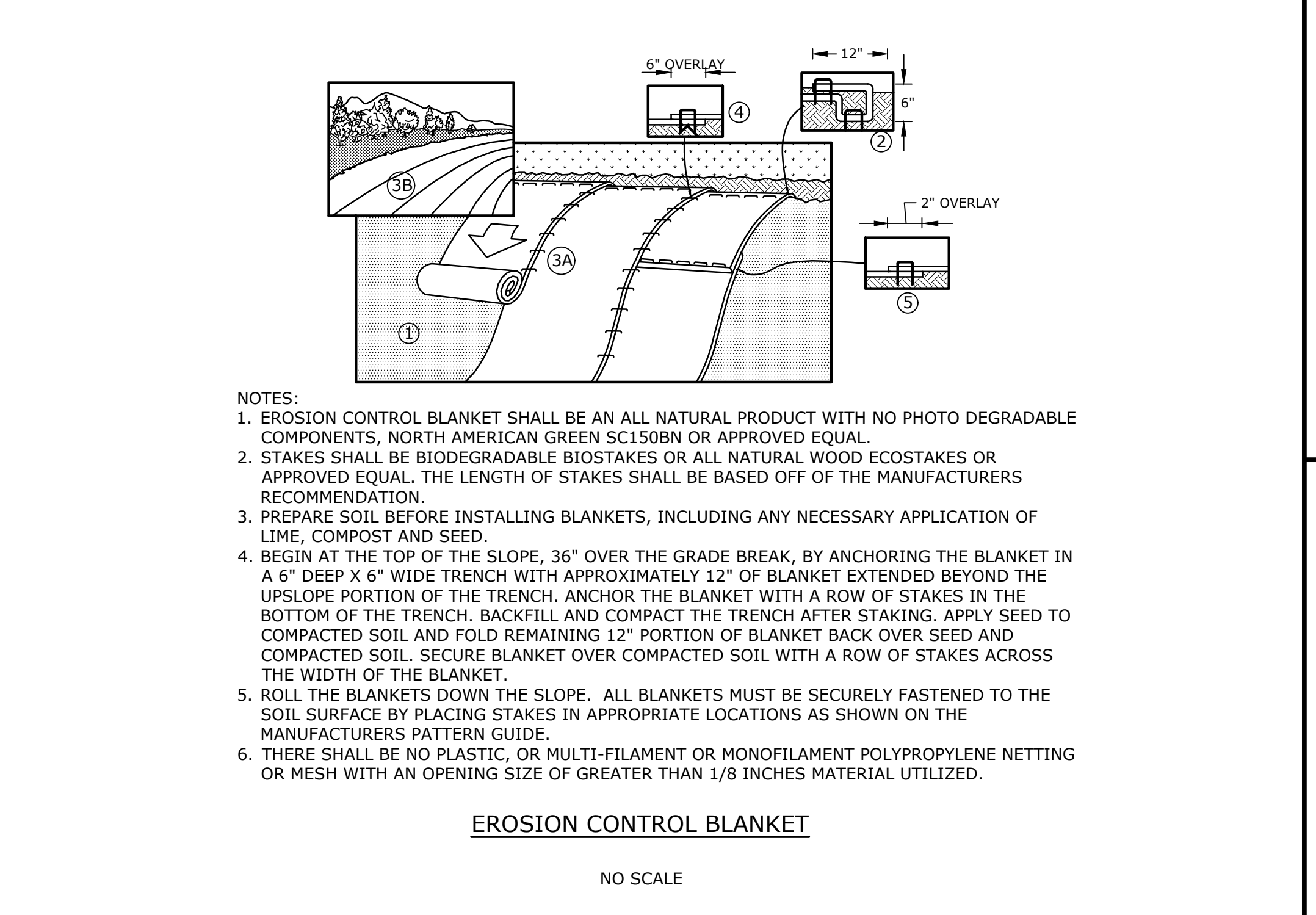
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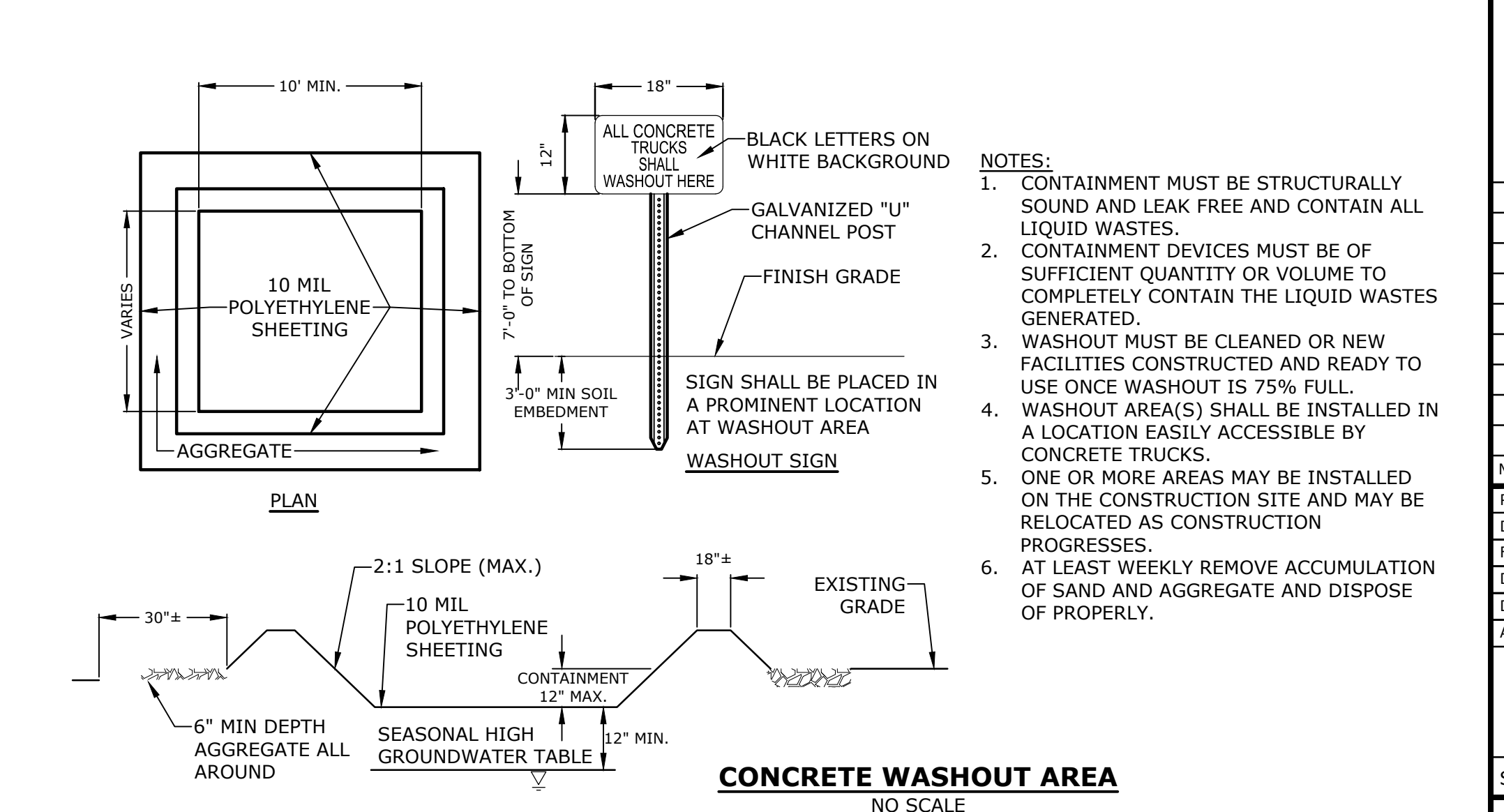
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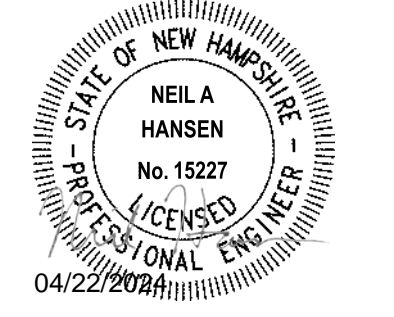
ACCESSIBLE PARKING STALL
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EROSION CONTROL BLANKET
NO SCALE



CONCRETE WASHOUT AREA
NO SCALE



PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

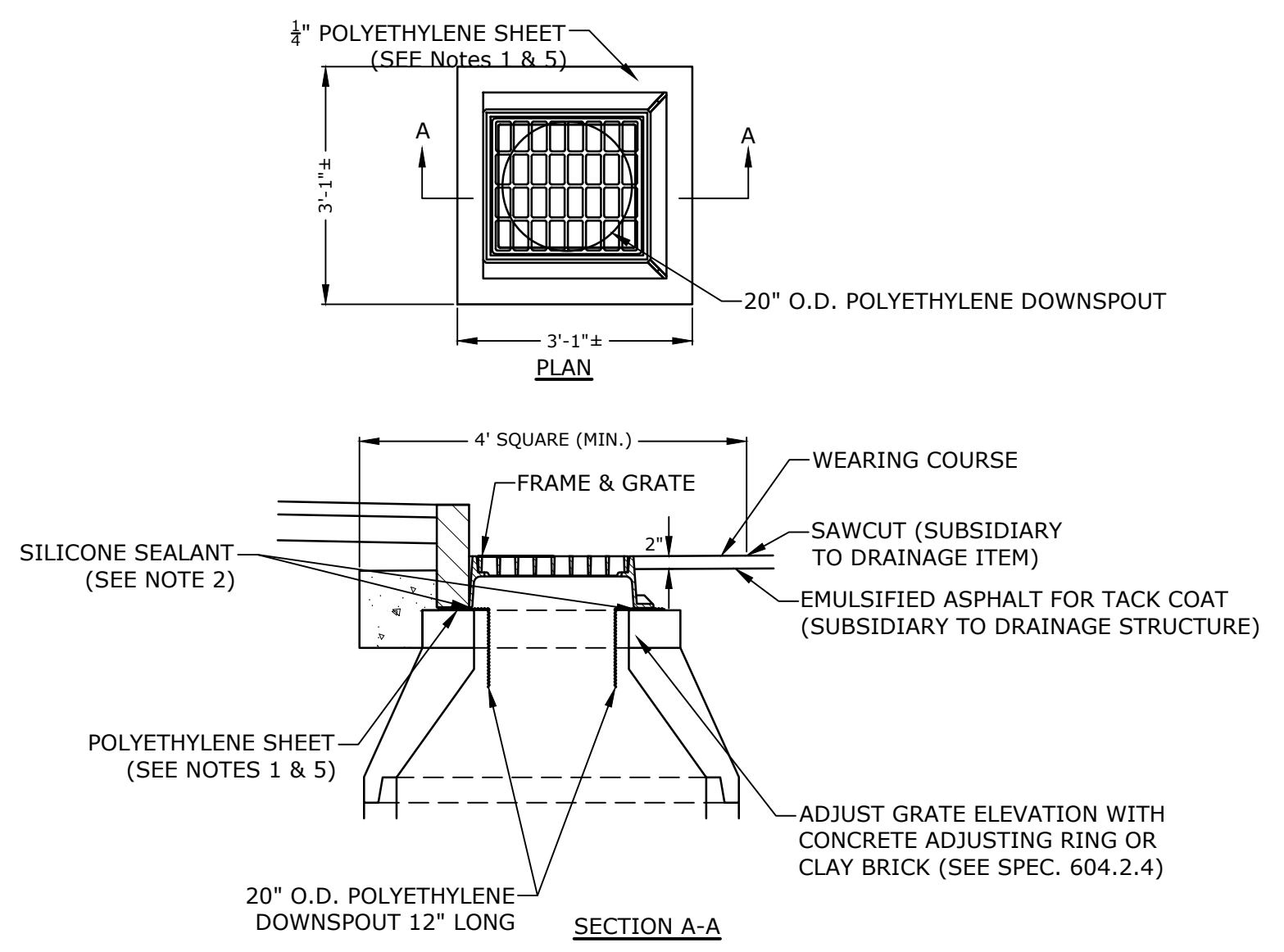
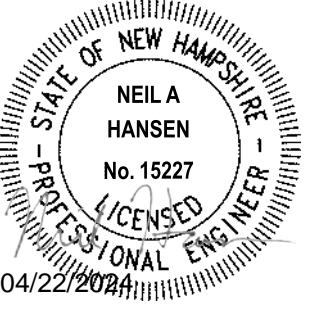
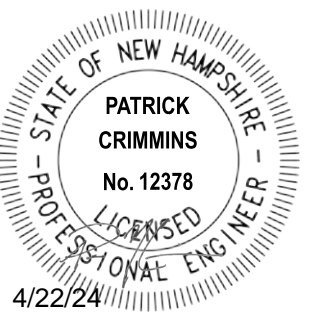
100 DURGIN LANE PORTSMOUTH, NEW HAMPSHIRE

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DRAWN BY:	BKC/NHW	
DESIGNED/CHECKED BY:	NAH	
APPROVED BY:	PMC	

DETAILS SHEET

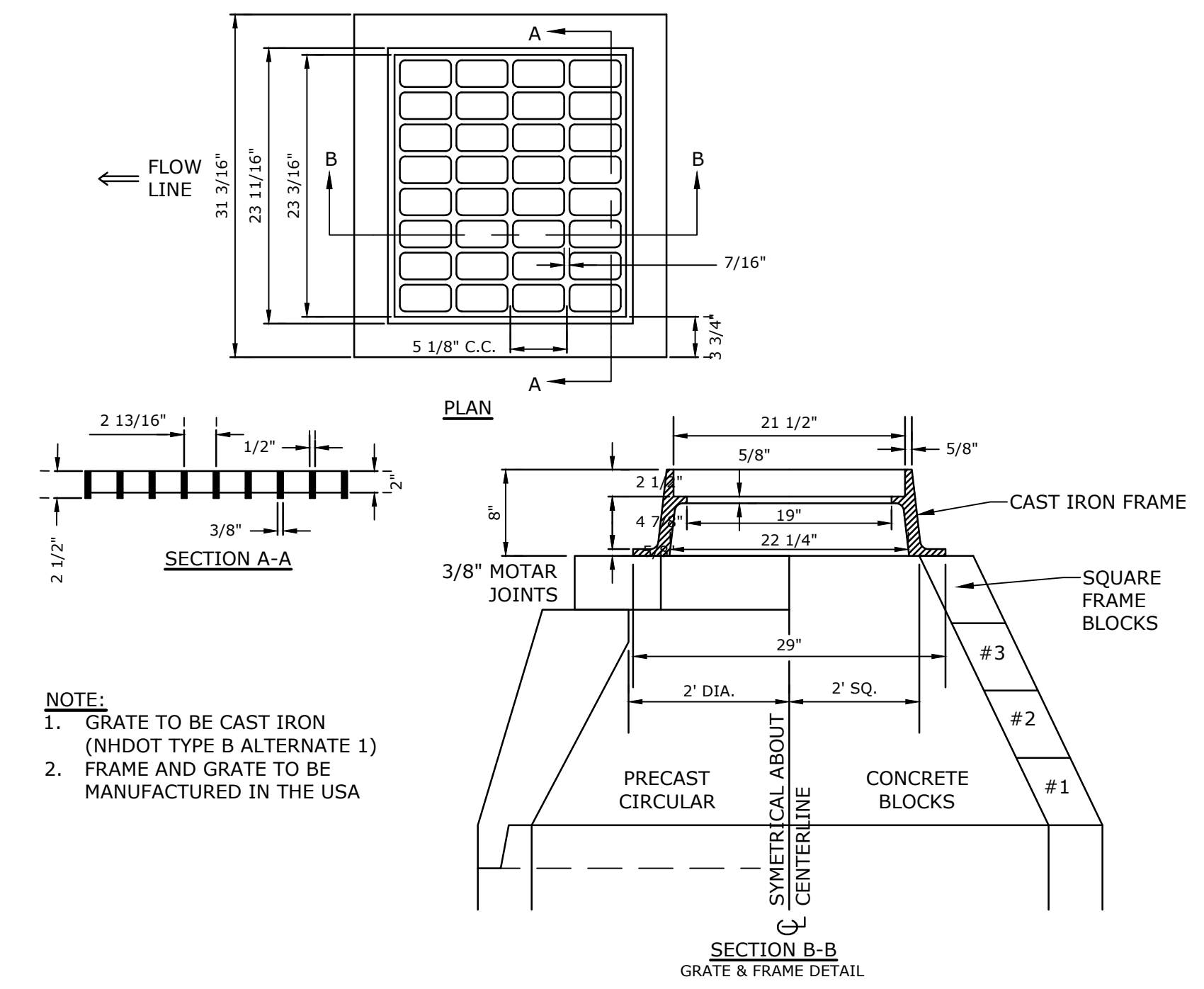
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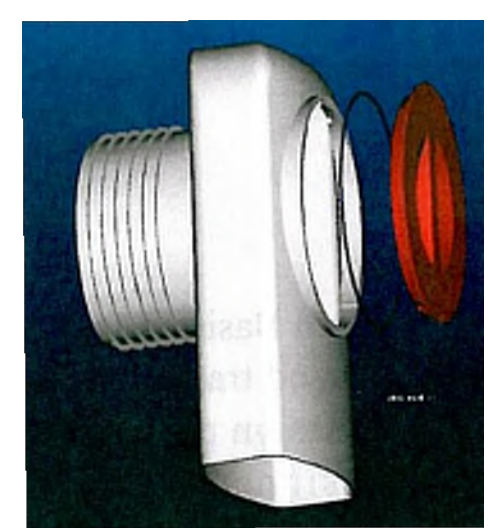
- NOTES:**
- POLYETHYLENE LINER (ITEM 604.0007) SHALL BE FABRICATED AT THE SHOP. DOWNSPOUT SHALL BE EXTRUSION FILLET WELDED TO THE POLYETHYLENE SHEET.
 - PLACE A CONTINUOUS BEAD OF AN APPROVED SILICONE SEALANT (SUBSIDIARY TO ITEM 604.0007) BETWEEN FRAME AND POLYETHYLENE SHEET.
 - PLACE CLASS AA CONCRETE TO 2" BELOW THE TOP OF THE GRATE ELEVATION (SUBSIDIARY TO DRAINAGE STRUCTURE).
 - USE ON DRAINAGE STRUCTURES 4' MIN. DIAMETER ONLY.
 - TRIM POLYETHYLENE SHEET A MAXIMUM OF 4" OUTSIDE THE FLANGE ON THE FRAME FOR THE CATCH BASIN BEFORE PLACING CONCRETE (EXCEPT AS SHOWN WHEN USED WITH 3-FLANGE FRAME AND CURB).
 - THE CENTER OF THE GRATE & FRAME MAY BE SHIFTED A MAXIMUM OF 6" FROM THE CENTER OF THE DOWNSPOUT IN ANY DIRECTION.
 - PLACED ONLY IN DRAINAGE STRUCTURES IN PAVEMENT.
 - SEE NHDOT DR-04, "DI-DB, UNDERDRAIN FLUSHING BASIN AND POLYETHYLENE LINER DETAILS", FOR ADDITIONAL INFORMATION.
 - CATCHBASINS WITHIN CITY RIGHT OF WAY SHALL HAVE A POLYETHYLENE LINER

POLYETHYLENE LINER
NO SCALE



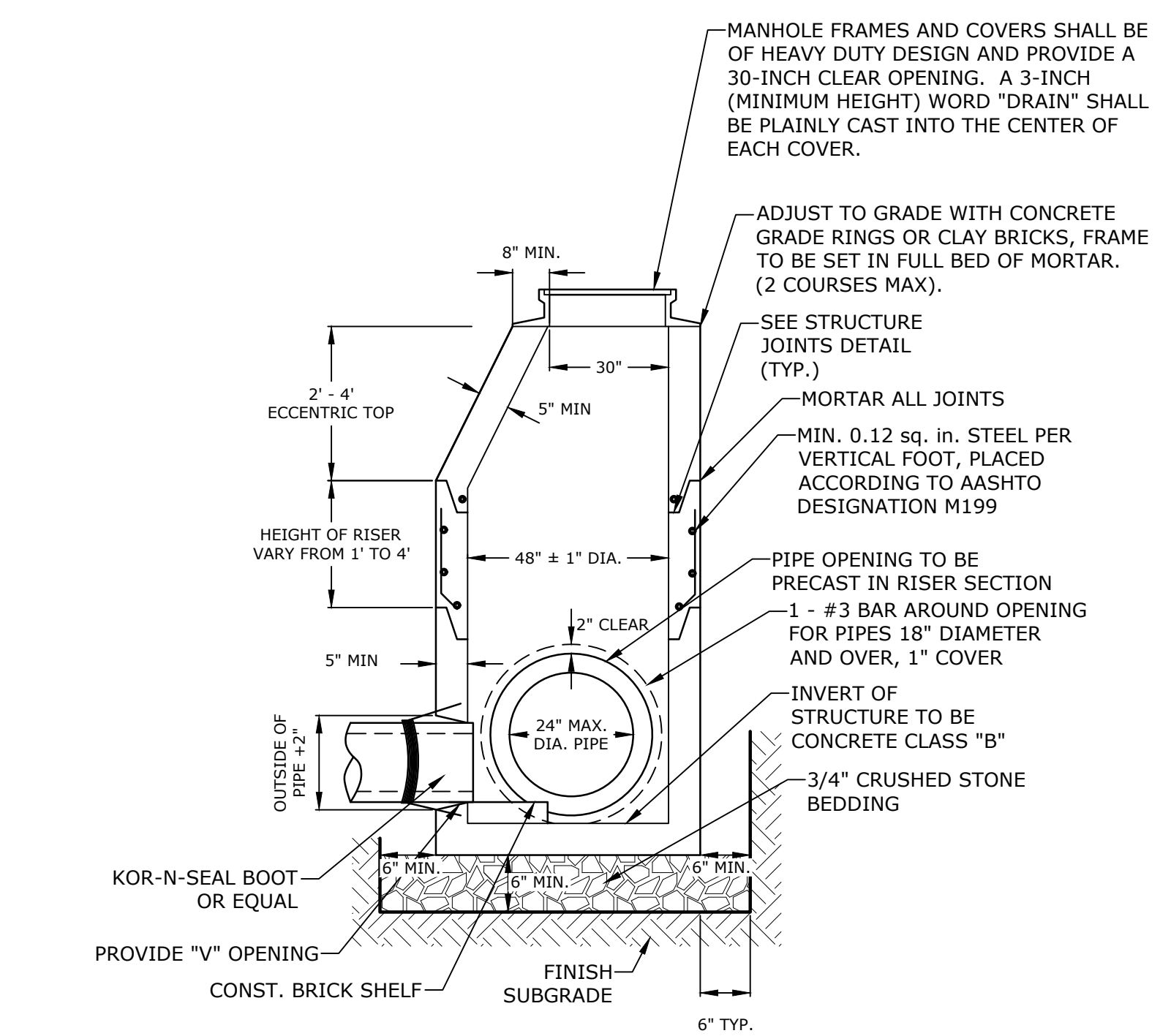
- NOTE:**
- GRATE TO BE CAST IRON (NHDOT TYPE B ALTERNATE 1)
 - FRAME AND GRATE TO BE MANUFACTURED IN THE USA

CATCH BASIN FRAME & GRATE
NO SCALE



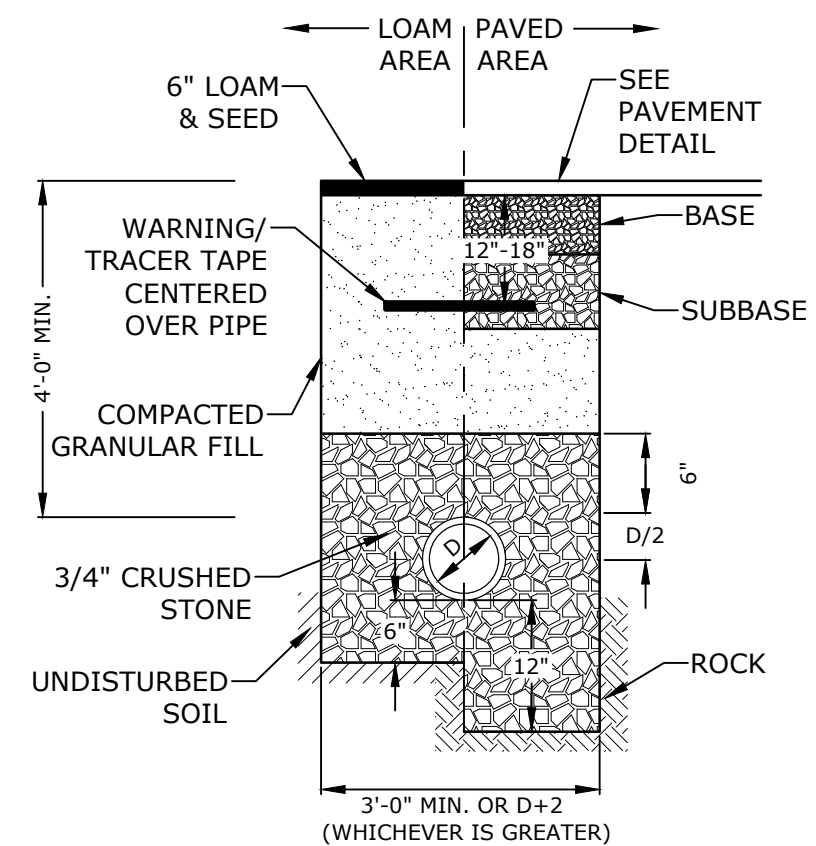
- NOTES:**
- ALL CATCH BASIN OUTLETS TO HAVE "ELIMINATOR" OIL AND FLOATING DEBRIS TRAP MANUFACTURED BY KLEANSTREAM (NO EQUAL)
 - INSTALL DEBRIS TRAP TIGHT TO INSIDE OF STRUCTURE.
 - 1/4" HOLE SHALL BE DRILLED IN TOP OF DEBRIS TRAP

"ELIMINATOR" OIL FLOATING DEBRIS TRAP



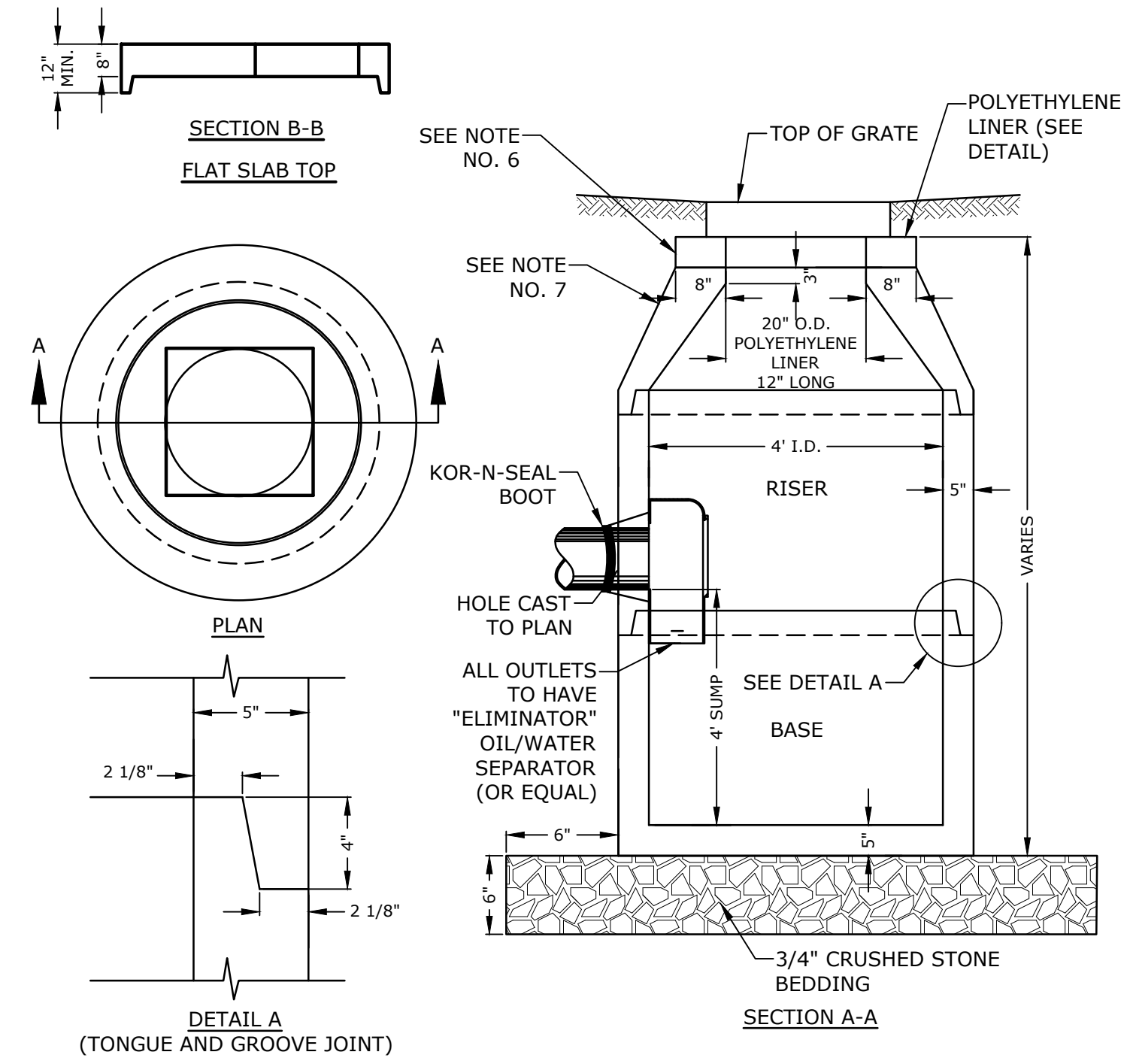
- NOTES:**
- ALL SECTIONS SHALL BE 4,000 PSI CONCRETE.
 - CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
 - THE TONGUE AND GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQUARE INCHES PER LINEAR FOOT.
 - THE STRUCTURES SHALL BE DESIGNED FOR H2O LOADING.
 - CONSTRUCT CRUSHED STONE BEDDING AND BACKFILL UNDER (6" MINIMUM THICKNESS)
 - THE TONGUE AND GROOVE JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
 - PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
 - OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND INSIDE WALL OF STRUCTURE.
 - PRECAST SECTIONS SHALL HAVE A TONGUE AND GROOVE JOINT 4" HIGH AT AN 11° ANGLE CENTERED IN THE WIDTH OF THE WALL AND SHALL BE ASSEMBLED USING AN APPROVED FLEXIBLE SEALANT IN JOINTS.
 - ALL STRUCTURES WITH MULTIPLE PIPES SHALL HAVE A MINIMUM OF 12" OF INSIDE SURFACE BETWEEN HOLES, NO MORE THAN 75% OF A HORIZONTAL CROSS SECTION SHALL BE HOLES, AND THERE SHALL BE NO HOLES CLOSER THAN 3" TO JOINTS.

4' DIAMETER DRAIN MANHOLE
NO SCALE



- NOTES:**
- CRUSHED STONE BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 6" ABOVE TOP OF PIPE.
 - ALL UTILITIES SHALL BE INSTALLED PER THE INDIVIDUAL UTILITY COMPANY STANDARDS. COORDINATE ALL INSTALLATIONS WITH INDIVIDUAL UTILITY COMPANIES AND THE CITY OF PORTSMOUTH.

STORM DRAIN TRENCH
NO SCALE



- NOTES:**
- ALL SECTIONS SHALL BE CONCRETE CLASS AA(4000 psi).
 - CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ. IN. PER LINEAR FT. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
 - THE TONGUE AND GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.
 - RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
 - THE STRUCTURES SHALL BE DESIGNED FOR H2O LOADING.
 - FITTING FRAME TO GRADE MAY BE DONE WITH PREFABRICATED ADJUSTMENT RINGS OR CLAY BRICKS (2 COURSES MAX.).
 - CONE SECTIONS MAY BE EITHER CONCENTRIC OR ECCENTRIC, OR FLAT SLAB TOPS MAY BE USED WHERE PIPE WOULD OTHERWISE ENTER INTO THE CONE SECTION OF THE STRUCTURE AND WHERE PERMITTED.
 - PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
 - OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND INSIDE WALL OF STRUCTURE.
 - PRECAST SECTIONS SHALL HAVE A TONGUE AND GROOVE JOINT 4" HIGH AT AN 11° ANGLE CENTERED IN THE WIDTH OF THE WALL AND SHALL BE ASSEMBLED USING AN APPROVED FLEXIBLE SEALANT IN JOINTS.
 - THE TONGUE AND GROOVE JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
 - "ELIMINATOR" OIL/WATER SEPARATOR SHALL BE INSTALLED TIGHT TO INSIDE OF CATCHBASIN.

4' DIAMETER CATCHBASIN
NO SCALE

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE PORTSMOUTH, NEW HAMPSHIRE

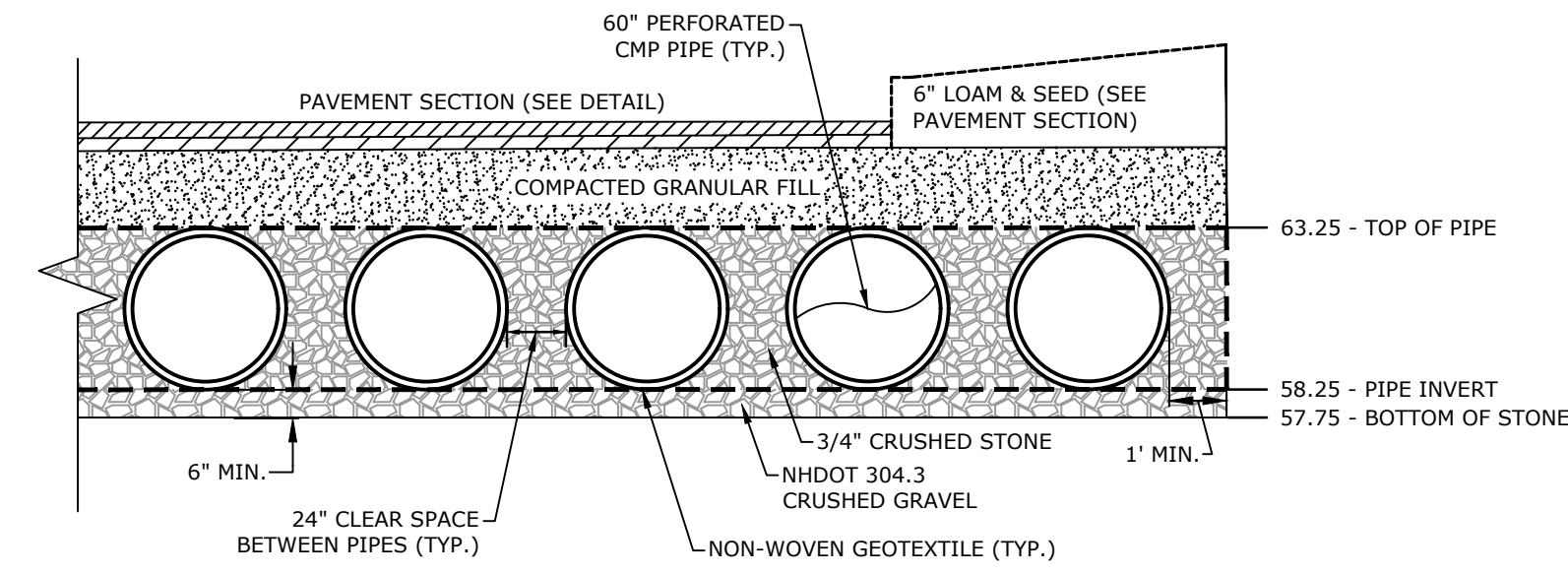
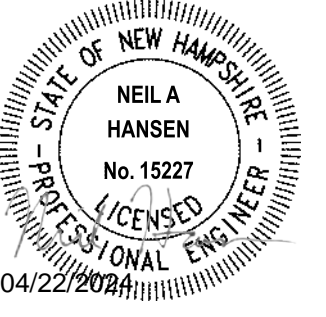
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APPROVED BY:	PMC	

DETAILS SHEET

SCALE: AS SHOWN

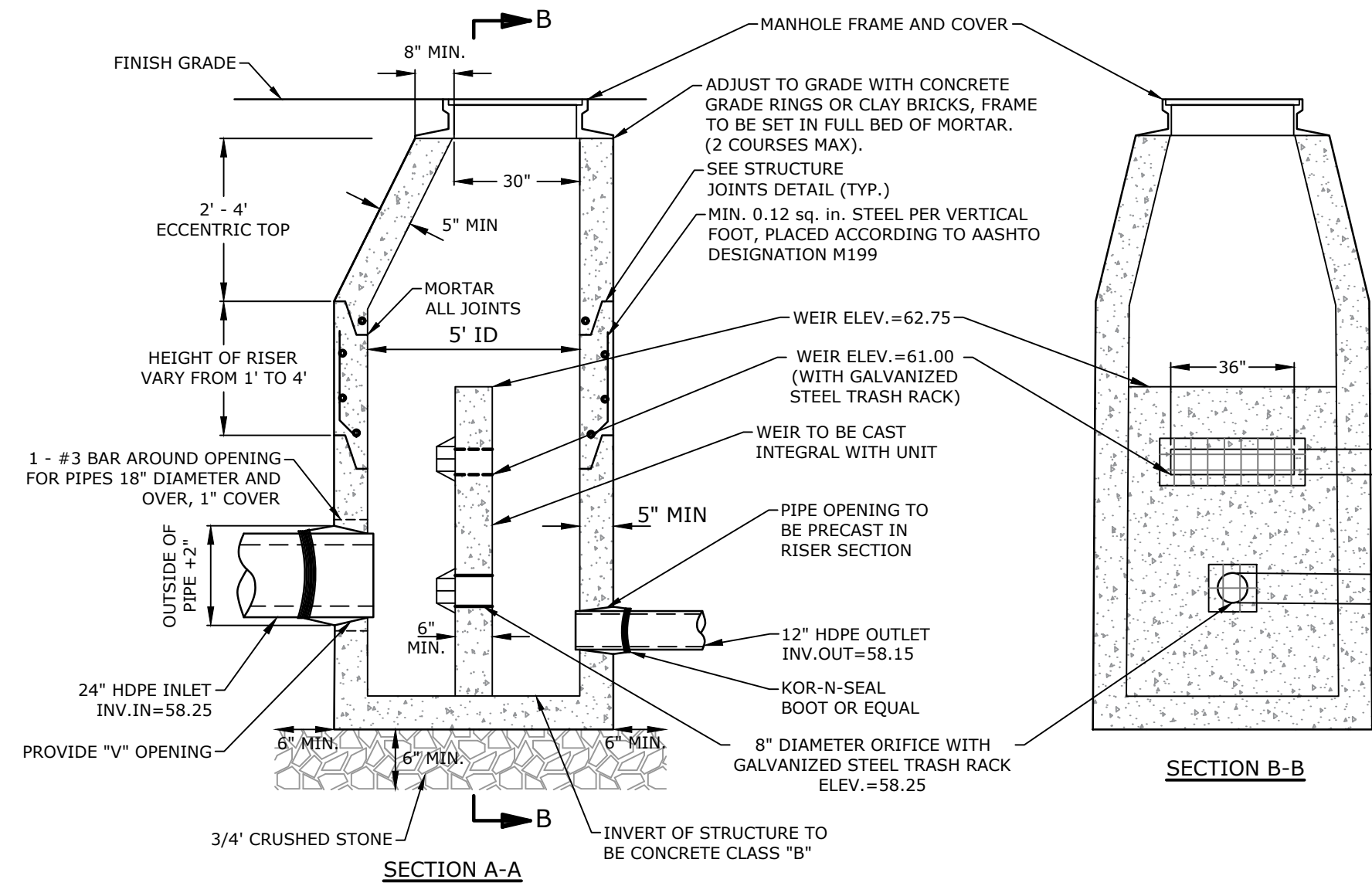
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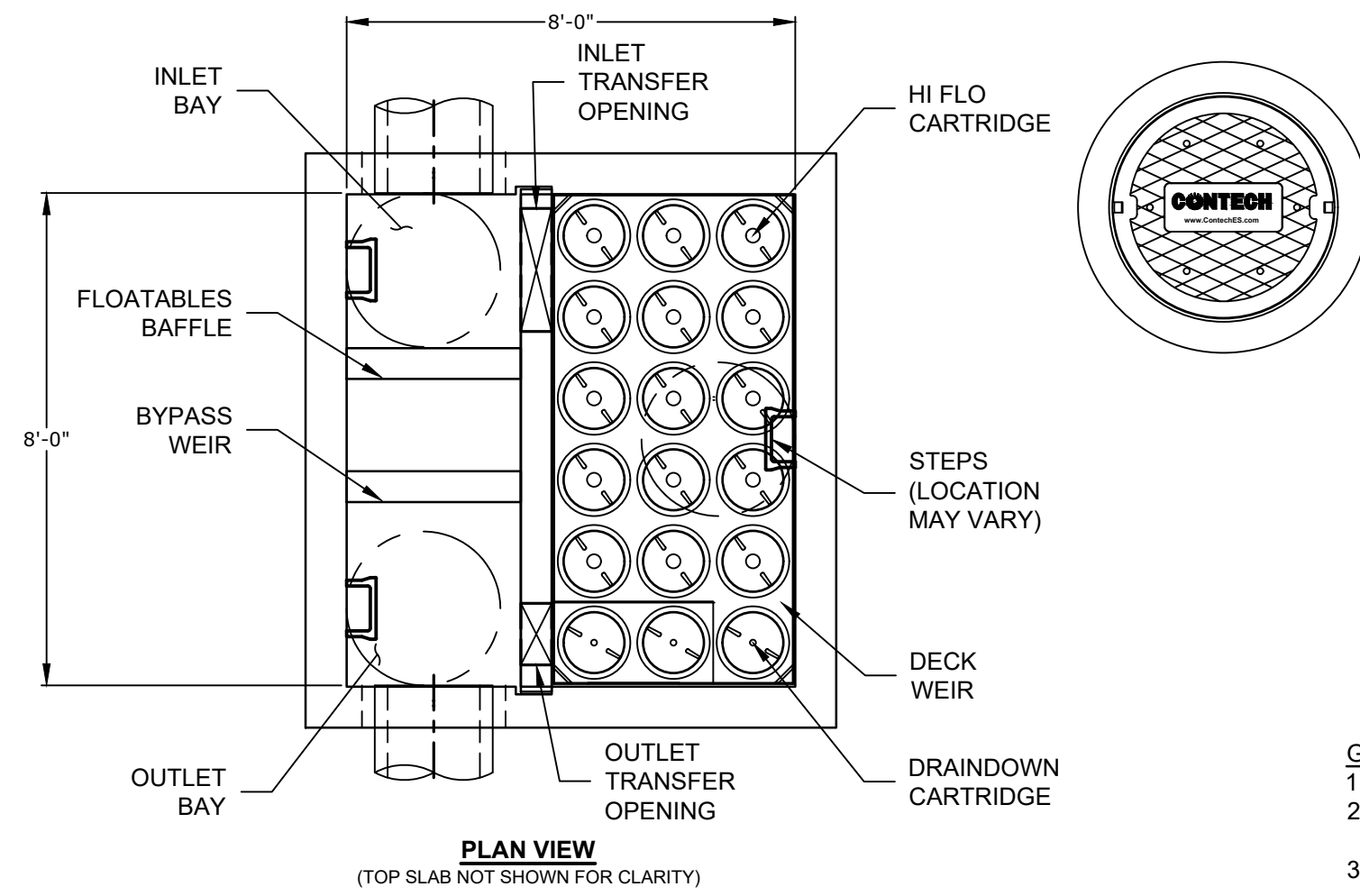
- NOTE:
1. THE UNDERGROUND DETENTION BASIN (UDB) SYSTEM SHALL BE ALUMINIZED 16 GAGE STEEL PIPE DESIGNED FOR H-20 LOADING. CONTRACTOR TO SUBMIT PIPE SPECIFICATIONS AND FINAL MANUFACTURERS DESIGN FOR REVIEW AND APPROVAL.
 2. THE CONTRACTOR SHALL SUBMIT PLANS STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NEW HAMPSHIRE.
 3. THE DESIGN ENGINEER SHALL PROVIDE SUFFICIENT INSPECTION TO CERTIFY THAT THE SYSTEM HAS BEEN INSTALLED PER THE PROPOSED DESIGN PLAN.
 4. THE DESIGN SHALL REQUIRE INSPECTION PORTS/COVERS SUCH THAT SYSTEM CAN BE CLEANED BY VACUUM TRUCK WITH A MINIMUM OF ONE IN EACH CORNER.
 5. OVERALL SYSTEM FOOTPRINT = 132' X 56'
 6. APPROXIMATE LENGTH OF 60" PERFORATED CMP = 960 LF
 7. APPROXIMATE LENGTH OF 60" PERFORATED CMP HEADER = 108 LF

UNDERGROUND DETENTION BASIN (UDB-1)
NO SCALE



- NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE.
 2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
 3. THE TONGUE AND THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQUARE INCHES PER LINEAR FOOT.
 4. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
 5. CONSTRUCT CRUSHED STONE BEDDING AND BACKFILL UNDER (6" MINIMUM THICKNESS)
 6. THE TONGUE AND GROOVE JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
 7. PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
 8. OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND INSIDE WALL OF STRUCTURE.
 9. PRECAST SECTIONS SHALL HAVE A TONGUE AND GROOVE JOINT 4" HIGH AT AN 11° ANGLE CENTERED IN THE WIDTH OF THE WALL AND SHALL BE ASSEMBLED USING AN APPROVED FLEXIBLE SEALANT IN JOINTS.
 10. ALL STRUCTURES WITH MULTIPLE PIPES SHALL HAVE A MINIMUM OF 12" OF INSIDE SURFACE BETWEEN HOLES, NO MORE THAN 75% OF A HORIZONTAL CROSS SECTION SHALL BE HOLES, AND THERE SHALL BE NO HOLES CLOSER THAN 3" TO JOINTS.
 11. SEE DRAINAGE MANHOLE DETAIL FOR MORE INFORMATION (CORE HOLE SIZE, MINIMUM FLOOR AND WALL THICKNESS, ETC.)
 12. OPENINGS BETWEEN TRASH RACK BARS SHALL BE SMALLER THAN THE SIZE OF THE ORIFICE IT COVERS.

UNDERGROUND DETENTION BASIN OUTLET STRUCTURE (POS1)
NO SCALE



JELLYFISH JFPD0806 - DESIGN NOTES

JELLYFISH TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE LENGTH AND THE NUMBER OF CARTRIDGES. THE STANDARD PEAK DIVERSION STYLE WITH PRECAST TOP SLAB IS SHOWN. ALTERNATE OFFLINE VAULT AND/OR SHALLOW ORIENTATIONS ARE AVAILABLE. PEAK CONVEYANCE CAPACITY TO BE DETERMINED BY ENGINEER OF RECORD.

CARTRIDGE SELECTION	54" 40"	27"	15"
CARTRIDGE LENGTH	54" 40"	27"	15"
OUTLET INVERT TO STRUCTURE INVERT (A)	6'-6" 5'-4"	4'-3"	3'-3"
FLOW RATE HI-FLO / DRAINDOWN (CFS) (PER CART)	0.178 / 0.069 / 0.067	0.089 / 0.045	0.049 / 0.025
MAX. TREATMENT (CFS)	1.961.47	0.98	0.54
DECK TO INSIDE TOP (MIN) (B)	5.004.00	4.00	4.00

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	JFF-1
MODEL SIZE	JFPD0808
WATER QUALITY FLOW RATE (cfs)	2.73
PEAK FLOW RATE (cfs)	2.94
RETURN PERIOD OF PEAK FLOW (yrs)	25
# OF CARTRIDGES REQUIRED (HF / DD)	15/3
CARTRIDGE SIZE	54"

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	JFF-2
MODEL SIZE	JFPD0808
WATER QUALITY FLOW RATE (cfs)	2.87
PEAK FLOW RATE (cfs)	2.94
RETURN PERIOD OF PEAK FLOW (yrs)	25
# OF CARTRIDGES REQUIRED (HF / DD)	15/3
CARTRIDGE SIZE	54"

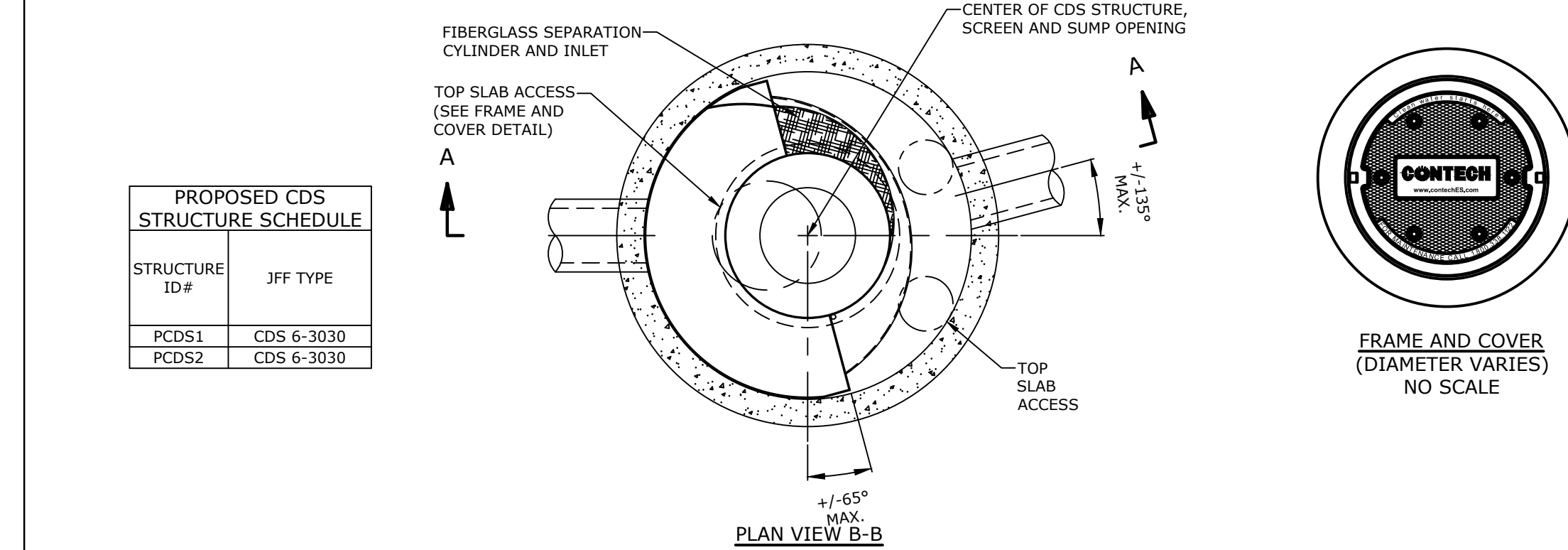
- GENERAL NOTES:
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
 2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS REPRESENTATIVE. www.ContechES.com
 3. JELLYFISH WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
 4. STRUCTURE SHALL MEET AASHTO HS-20 OR PER APPROVING JURISDICTION REQUIREMENTS, WHICHEVER IS MORE STRINGENT, ASSUMING EARTH COVER OF 0' - 3', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 LOAD RATING AND BE CAST WITH THE CONTECH LOGO.
 5. STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.
 6. OUTLET PIPE INVERT IS EQUAL TO THE CARTRIDGE DECK ELEVATION.
 7. THE OUTLET PIPE DIAMETER FOR NEW INSTALLATIONS IS TO BE ONE PIPE SIZE LARGER THAN THE INLET PIPE AT EQUAL OR GREATER SLOPE.
 8. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

- INSTALLATION NOTES:
- A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
 - B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES PROVIDED)
 - C. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT)
 - D. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.
 - E. CARTRIDGE INSTALLATION, BY CONTECH, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE JELLYFISH UNIT IS CLEAN AND FREE OF DEBRIS. CONTACT CONTECH TO COORDINATE CARTRIDGE INSTALLATION WITH SITE STABILIZATION AT (866) 740-3318.

- NOTE:
1. A QUALIFIED ENGINEER SHALL PROVIDE SUFFICIENT INSPECTION TO CERTIFY THAT THE SYSTEM HAS BEEN INSTALLED IN ACCORDANCE WITH THE APPROVED DESIGN PLANS PER THE REQUIREMENTS OF THE ALTERATION OF TERRAIN PERMIT. CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO THE CONSTRUCTION OF THE UNDERGROUND FILTRATION UNITS.

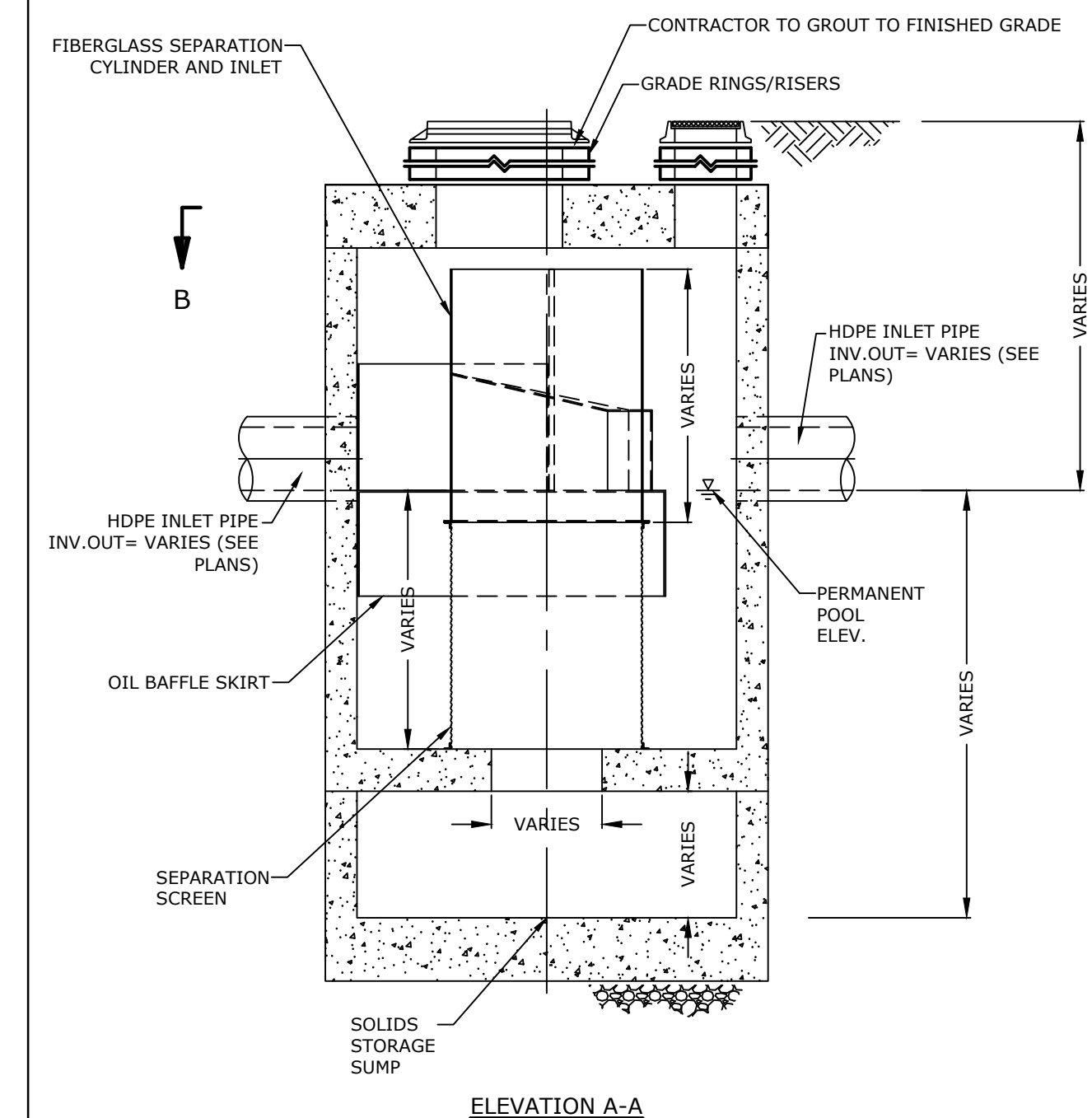


CONTECH JELLYFISH STORMWATER FILTER (JFPD0808)
NO SCALE



PROPOSED CDS STRUCTURE SCHEDULE

STRUCTURE ID#	JFF TYPE
PCDS1	CDS 6-3030
PCDS2	CDS 6-3030



- GENERAL NOTES:
1. CONTECH TO PROVIDE FINAL DIMENSIONS BASED ON APPROVED FLOWS AND ALL MATERIALS UNLESS NOTED OTHERWISE.
 2. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
 3. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
 4. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

- INSTALLATION NOTES:
- A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
 - B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
 - C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
 - D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN ON GRADING PLAN.
 - E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH CDS UNIT
NO SCALE

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

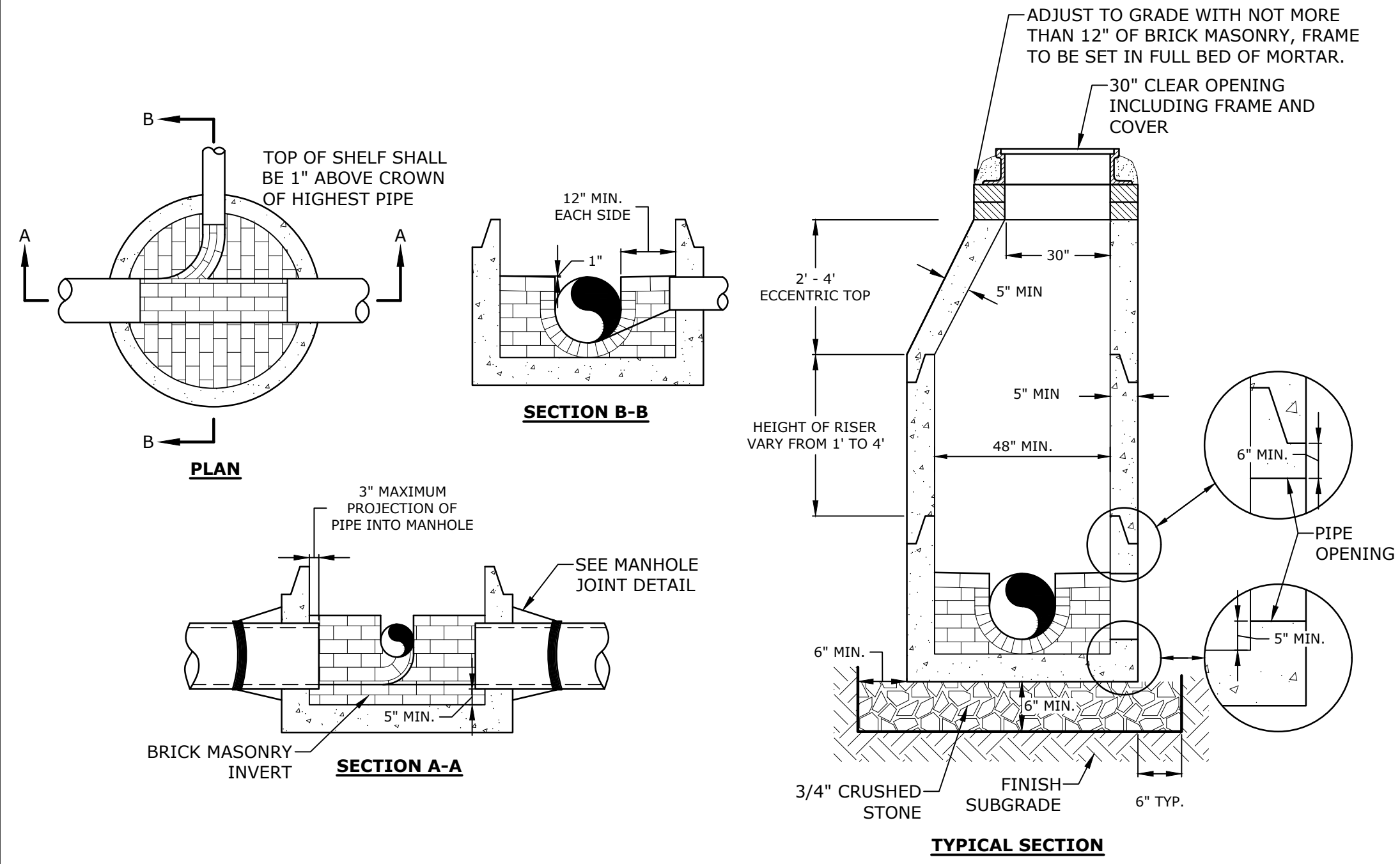
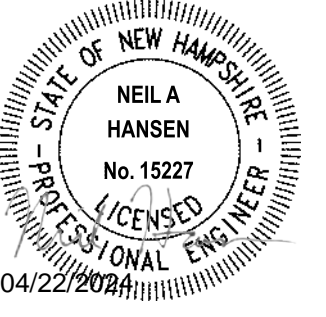
100 DURGIN LANE PORTSMOUTH, NEW HAMPSHIRE

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MARK	DATE	DESCRIPTION
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DATE:	4/22/2024	
FILE:	E5071-001-C-DTLS.dwg	
DRAWN BY:	BKC/NHW	
DESIGNED/CHECKED BY:	NAH	
APPROVED BY:	PMC	

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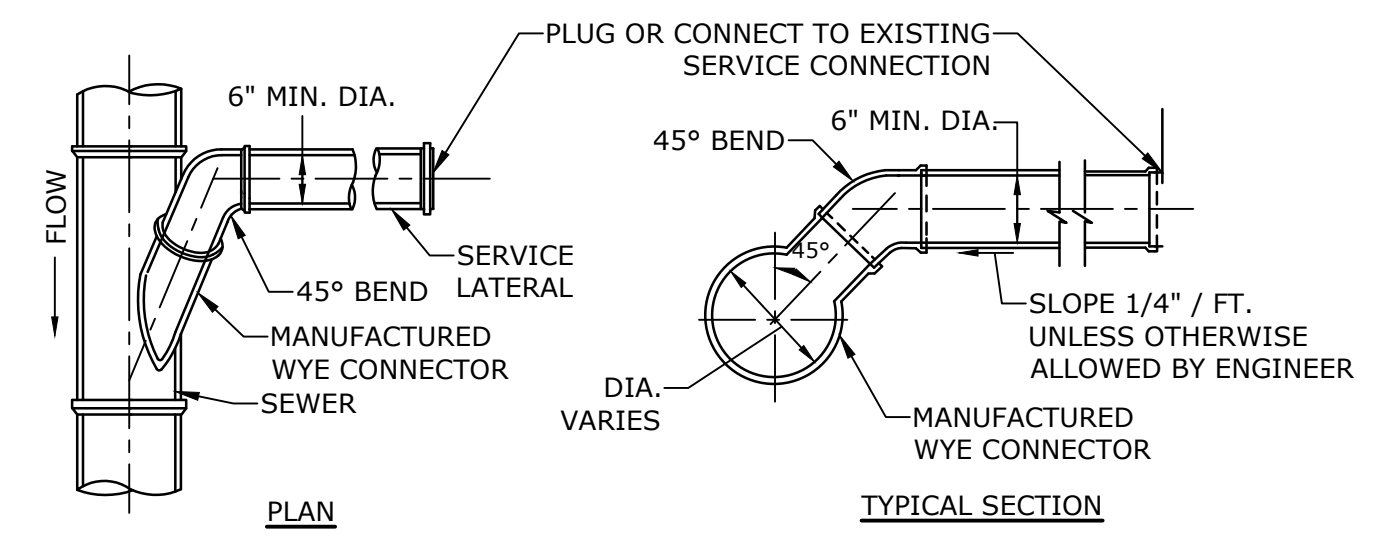
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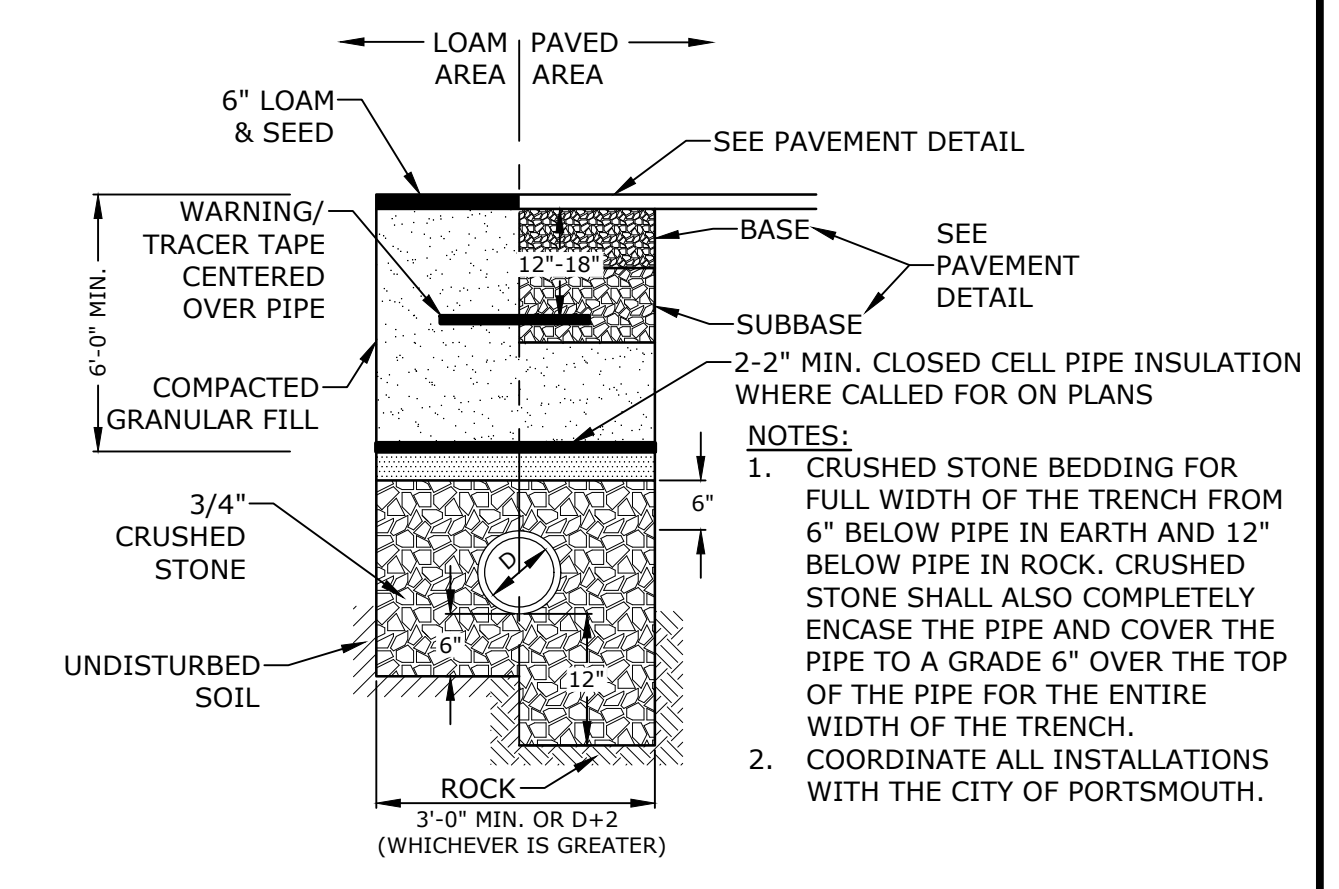


- NOTES:**
1. INVERT AND SHELF TO BE PLACED AFTER EACH LEAKAGE TEST.
 2. CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT.
 3. INVERT BRICKS SHALL BE LAID ON EDGE.
 4. TWO (2) COATS OF BITUMINOUS WATERPROOF COATING SHALL BE APPLIED TO ENTIRE EXTERIOR OF MANHOLE.
 5. **FRAMES AND COVERS:** MANHOLE FRAMES AND COVERS WITHIN CITY RIGHT OF WAY SHALL BE CITY STANDARD HINGE COVERS MANUFACTURED BY E.J. FRAMES AND COVERS WILL BE PURCHASED FROM THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS. ALL OTHER MANHOLE FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30-INCH CLEAR OPENING. A 3-INCH (MINIMUM HEIGHT) WORD "SEWER" SHALL BE PLAINLY CAST INTO THE CENTER OF EACH COVER.
 6. HORIZONTAL JOINTS SHALL BE SEALED FOR WATER TIGHTNESS USING A DOUBLE ROW OF ELASTOMERIC OR MASTIC-LIKE SEALANT.
 7. BARREL AND CONE SECTIONS SHALL BE PRECAST REINFORCED CONCRETE DESIGNED FOR H20 LOADING, AND CONFORMING TO ASTM C478-06.

SEWER MANHOLE
NO SCALE

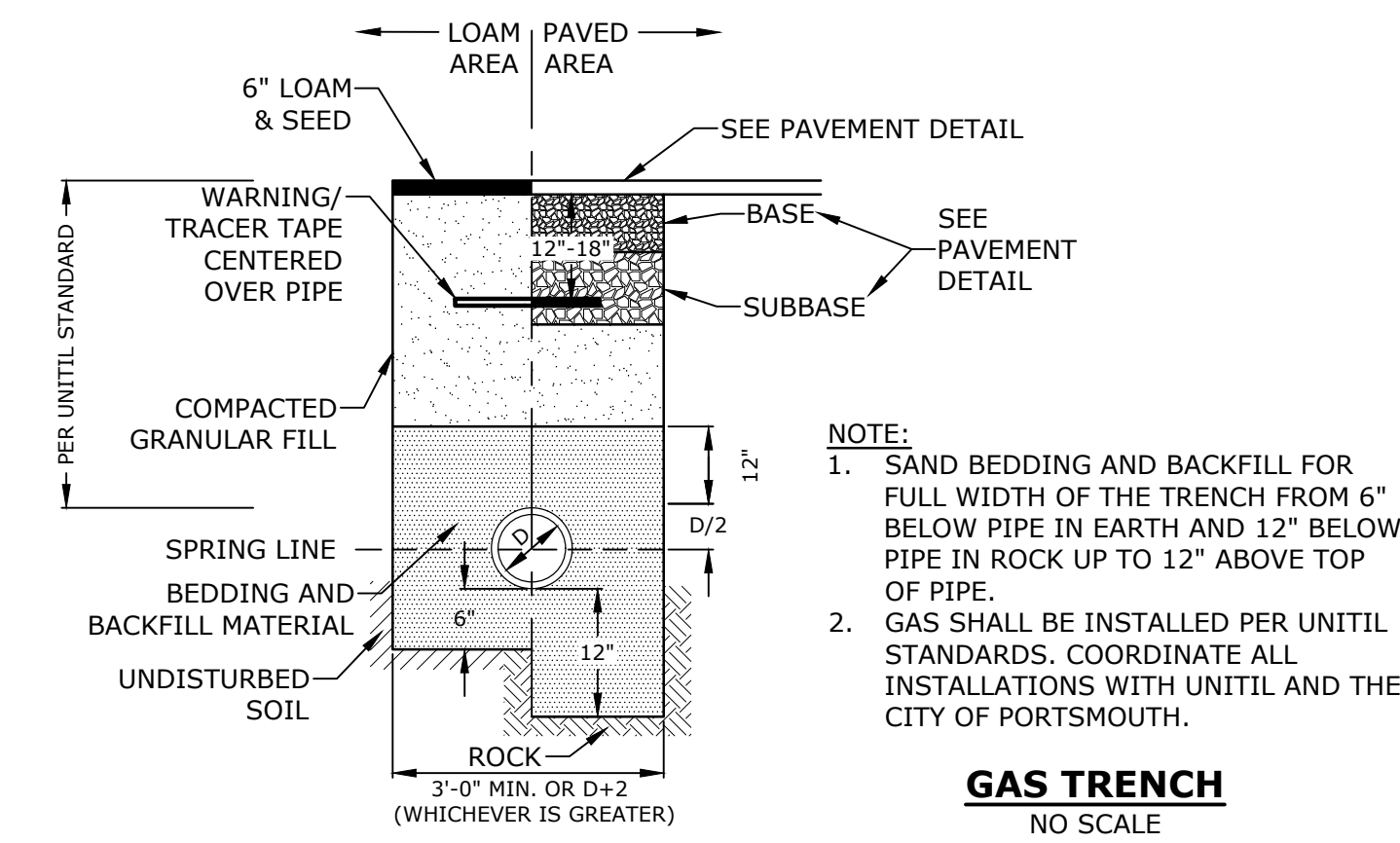


STANDARD SERVICE LATERAL CONNECTION
NO SCALE



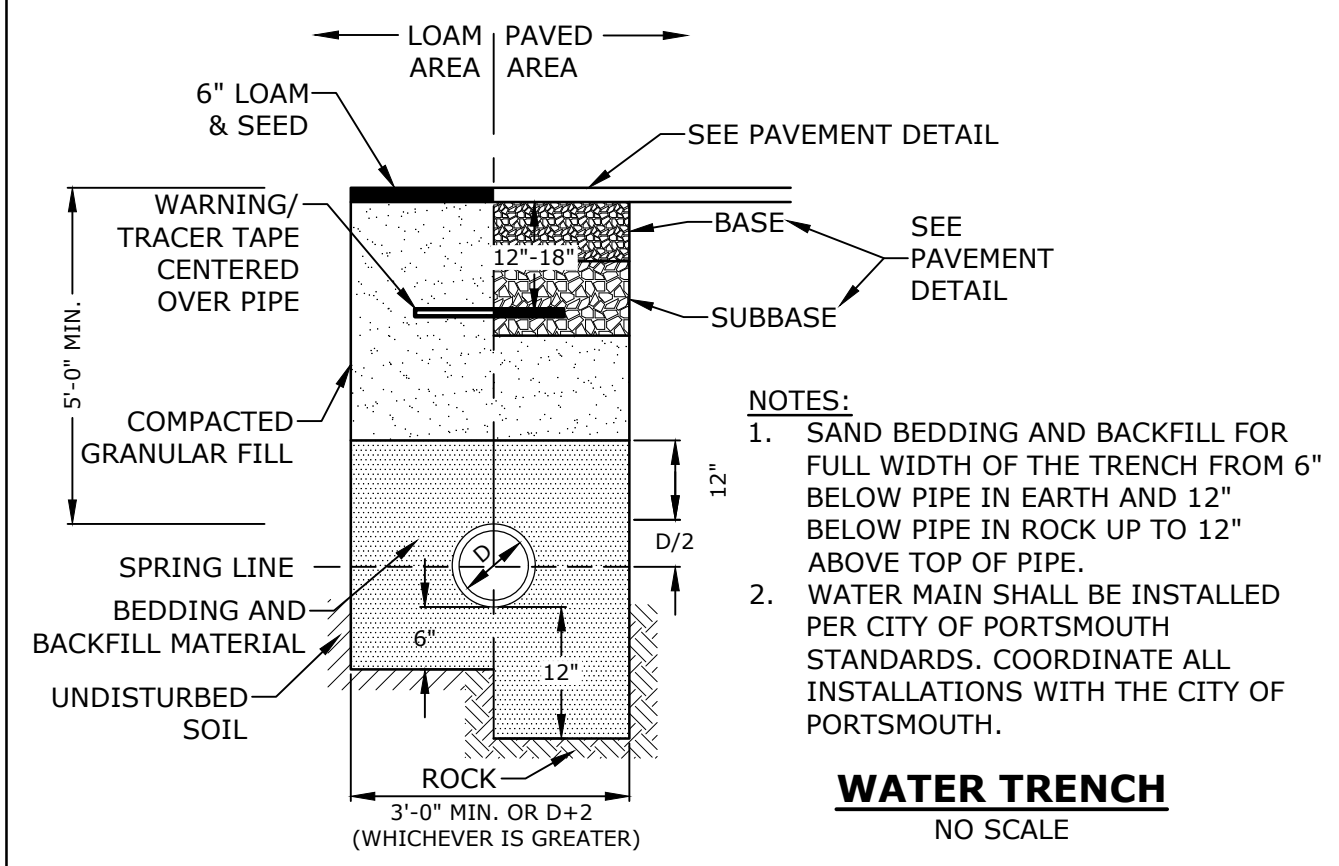
SEWER SERVICE TRENCH
NO SCALE

- NOTES:**
1. CRUSHED STONE BEDDING FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK. CRUSHED STONE SHALL ALSO COMPLETELY ENCASE THE PIPE AND COVER THE PIPE TO A GRADE 6" OVER THE TOP OF THE PIPE FOR THE ENTIRE WIDTH OF THE TRENCH.
 2. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.



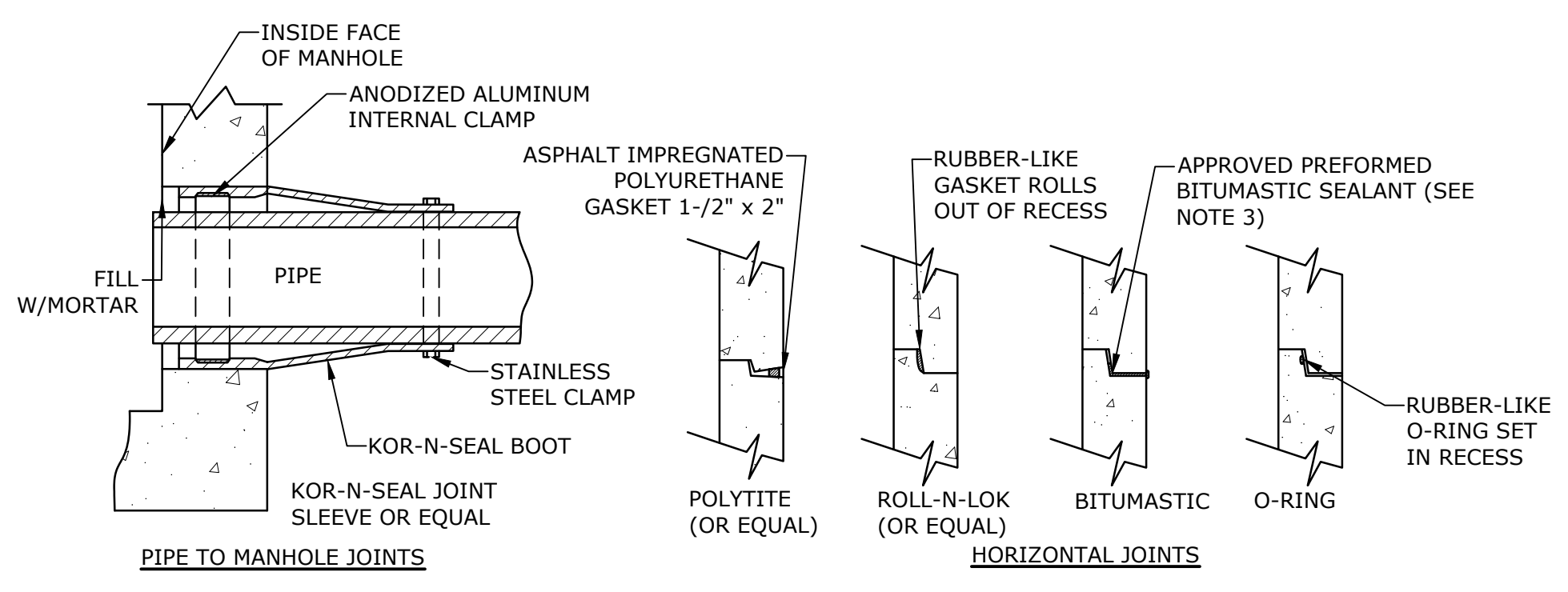
- NOTE:**
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
 2. GAS SHALL BE INSTALLED PER UNITIL STANDARDS. COORDINATE ALL INSTALLATIONS WITH UNITIL AND THE CITY OF PORTSMOUTH.

GAS TRENCH
NO SCALE



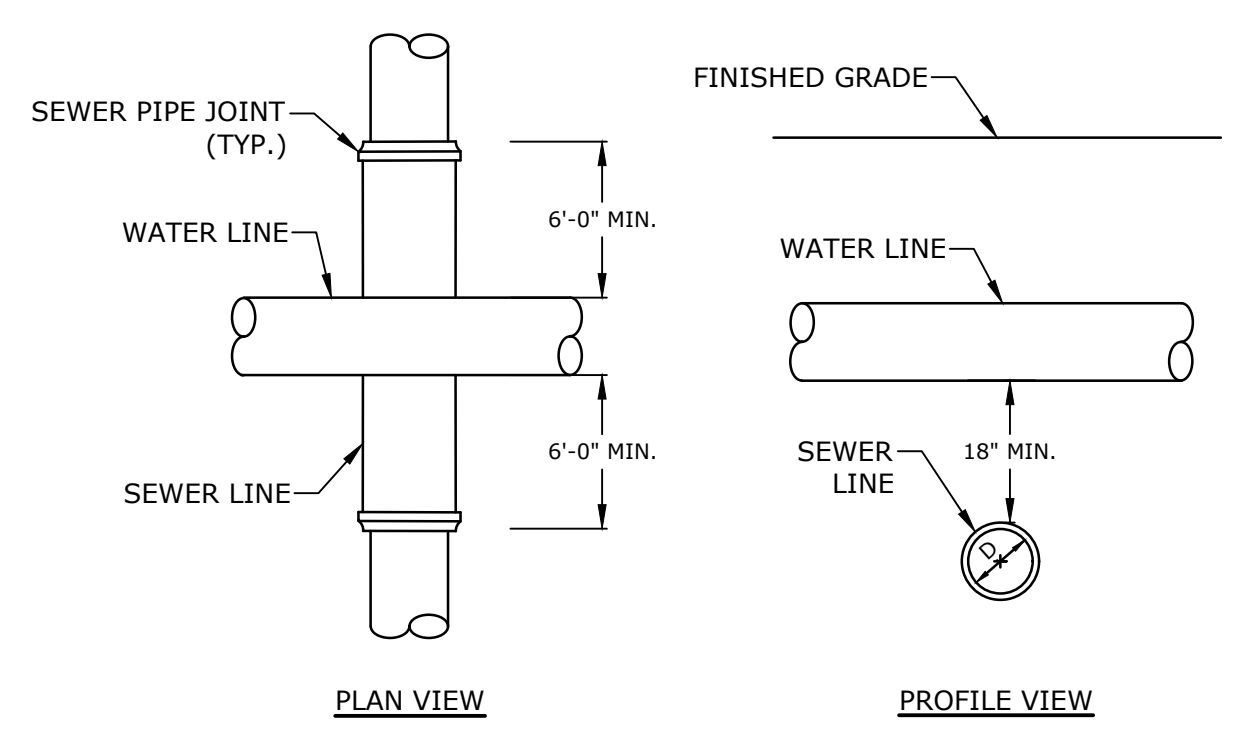
- NOTES:**
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
 2. WATER MAIN SHALL BE INSTALLED PER CITY OF PORTSMOUTH STANDARDS. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.

WATER TRENCH
NO SCALE



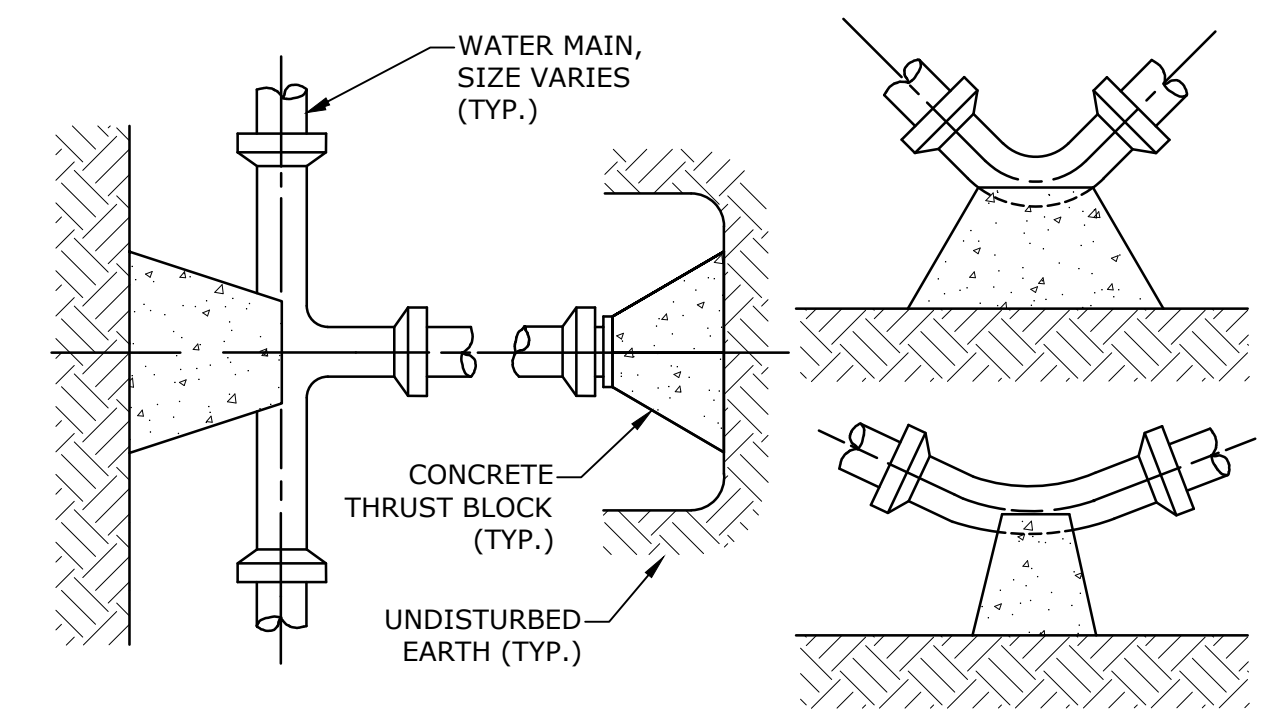
- NOTES:**
1. HORIZONTAL JOINTS BETWEEN THE SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE PER CITY OF PORTSMOUTH DPW STANDARD AND SHALL BE SEALED FOR WATERTIGHTNESS USING A DOUBLE ROW ELASTOMERIC OR MASTIC-LIKE GASKET.
 2. PIPE TO MANHOLE JOINTS SHALL BE PER CITY OF PORTSMOUTH STANDARD.
 3. FOR BITUMASTIC TYPE JOINTS THE AMOUNT OF SEALANT SHALL BE SUFFICIENT TO FILL AT LEAST 75% OF THE JOINT CAVITY.
 4. ALL GASKETS, SEALANTS, MORTAR, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' WRITTEN INSTRUCTIONS.

MANHOLE JOINTS
NO SCALE



- NOTES:**
1. A 10 FOOT MINIMUM EDGE TO EDGE HORIZONTAL SEPARATION SHALL BE PROVIDED FROM ANY EXISTING OR PROPOSED WATER LINE.
 2. AN 18" MINIMUM EDGE TO EDGE VERTICAL SEPARATION SHALL BE PROVIDED, WITH WATER ABOVE SEWER, AT ALL CROSSINGS.
 3. SEWER PIPE JOINTS SHALL BE LOCATED AT LEAST 6 FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED WATER MAIN.
 4. WHERE AN 18" VERTICAL SEPARATION CANNOT BE PROVIDED, SEWER PIPE SHALL BE CONSTRUCTED USING A SDR 26 PVC PIPE MEETING THE REQUIREMENTS OF SEWER FORCE MAIN STANDARDS. THE SDR26 PIPE SHALL BE USED FOR THE ENTIRE RUN BETWEEN MANHOLES ON EITHER SIDE OF CROSSING.
 5. CROSSINGS SHALL CONFORM TO THE CITY OF PORTSMOUTH STANDARDS AND SPECIFICATIONS.
 6. ALL FUTURE SEWER CONNECTIONS SHALL MEET THE ABOVE REQUIREMENTS.

WATER & SEWER CROSSING
NO SCALE



REACTION TYPE	PIPE SIZE				
	4"	6"	8"	10"	12"
A 90°	0.89	2.19	3.82	11.14	17.24
B 180°	0.65	1.55	2.78	8.38	12.00
C 45°	0.48	1.19	2.12	6.02	9.32
D 22-1/2°	0.25	0.60	1.06	3.08	4.74
E 11-1/4°	0.13	0.30	0.54	1.54	2.38

- NOTES:**
1. POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL, WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL. NO JOINTS SHALL BE COVERED WITH CONCRETE.
 2. ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
 3. PLACE BOARD IN FRONT OF ALL PLUGS BEFORE POURING THRUST BLOCKS.
 4. WHERE M.J. PIPE IS USED, M.J. PLUG WITH RETAINER GLAND MAY BE SUBSTITUTED FOR END BLOCKINGS.
 5. INSTALLATION AND STANDARD DIMENSIONAL REQUIREMENTS SHALL BE WITH CITY OF PORTSMOUTH WATER DEPARTMENT STANDARDS.

THRUST BLOCKING DETAIL
NO SCALE

PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	4/22/2024	TAC SUBMISSION
DATE:	4/22/2024	
FILE:	E5071-001-C-DTLS.dwg	
DRAWN BY:	BKC/NHW	
DESIGNED/CHECKED BY:	NAH	
APPROVED BY:	PMC	

DETAILS SHEET

SCALE: AS SHOWN

C-808

Last Saved: 4/19/2024 11:13:13 AM By: Dccurcio
 Plotted On: Apr 19, 2024 1:13:13 PM
 Tighe & Bond \\tgbond\com\dwg\proj\100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-C-DTLS.dwg

LAYOUT AND MATERIALS NOTES

1. REVIEW CONTRACT DOCUMENTS AND FIELD CONDITIONS BEFORE COMMENCING WORK. REPORT ERRORS, OMISSIONS, OR INCONSISTENCIES PROMPTLY TO THE LANDSCAPE ARCHITECT.
2. CONTACT UTILITY COMPANIES AS REQUIRED BY STATE AND LOCAL REGULATIONS BEFORE DIGGING. LOCATE AND MARK EXISTING UTILITIES.
3. THE CONTRACTOR SHALL OBTAIN ALL PERMITS WHICH ARE NECESSARY TO PERFORM THE PROPOSED WORK.
4. WRITTEN DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALED DIMENSIONS.
5. DIMENSIONS REFERRED TO AS "EQUAL" INDICATE SPACING WHICH IS EQUIDISTANT MEASURED TO THE CENTERLINES.
6. MEASUREMENTS ARE TO THE FINISHED FACE OF BUILDINGS, WALLS, OR OTHER FIXED SITE IMPROVEMENTS. DIMENSIONS TO CENTERLINES ARE IDENTIFIED.
7. INSTALL INTERSECTING ELEMENTS AT 90-DEGREE ANGLES, UNLESS OTHERWISE NOTED.
8. PROVIDE EXPANSION JOINTS WHERE FLATWORK MEETS VERTICAL STRUCTURES, SUCH AS WALLS, CURBS, STEPS, AND OTHER HARDSCAPE.
9. CONTROL JOINTS SHOULD BE SPACED NO GREATER THAN TEN (10) LINEAR FEET MAXIMUM, UNLESS OTHERWISE SPECIFIED.
10. CONTROL JOINT RECOMMENDATIONS TO MINIMIZE CRACKING SHALL BE SUBMITTED TO THE LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL.
11. ALL TOP OF WALLS AND FENCES ARE TO BE HELD LEVEL, UNLESS OTHERWISE SPECIFIED.
12. SAMPLES OF SPECIFIED MATERIALS SHALL BE SUBMITTED TO THE LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL PRIOR TO ORDERING.
13. THE CONTRACTOR SHALL PROVIDE A FULL-SCALE MOCKUP AND RECEIVE APPROVAL FROM THE LANDSCAPE ARCHITECT BEFORE BEGINNING CONSTRUCTION OF PAVEMENT.
14. ALL SITE FURNITURE LOCATIONS ARE TO BE STAKED BY CONTRACTOR AND APPROVED BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.

PLANTING NOTES

1. CONTACT UTILITY COMPANIES AS REQUIRED BY STATE AND LOCAL REGULATIONS BEFORE DIGGING. LOCATE AND MARK EXISTING UTILITIES.
2. REFER TO CIVIL ENGINEER'S GRADING PLANS FOR FINAL GRADING AND UTILITY LOCATIONS.
3. THE CONTRACTOR SHALL OBTAIN ALL PERMITS WHICH ARE NECESSARY TO PERFORM THE PROPOSED WORK.
4. LANDSCAPE ARCHITECT TO REVIEW PLANT MATERIALS AT SOURCE OR BY PHOTOGRAPHS PRIOR TO DIGGING OR SHIPPING OF PLANT MATERIAL.
5. CONTRACTOR IS TO VERIFY ALL QUANTITIES. IF QUANTITIES ON PLANT LIST DIFFER FROM GRAPHIC INDICATIONS, GRAPHICS SHALL PREVAIL.
6. EXACT LOCATIONS OF TREES AND B&B SHRUBS ARE TO BE STAKED BY THE CONTRACTOR FOR LANDSCAPE ARCHITECT REVIEW AND APPROVAL PRIOR TO INSTALLATION. THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO ADJUST PLANTS TO EXACT LOCATION IN THE FIELD.
7. PLANT MATERIAL NOT MEETING THE STANDARDS CONTAINED WITHIN CONTRACT DOCUMENTS SHALL BE REPLACED AT NO COST TO THE OWNER.
8. PROVIDE MATCHING SIZES AND FORMS FOR EACH PLANT OF THE SAME SPECIES DESIGNATED ON THE DRAWINGS UNLESS OTHERWISE INDICATED.
9. ALL PLANT MATERIAL IS TO BE INSTALLED PLUMB/PER THE SPECIFICATIONS CONTAINED WITHIN THE CONTRACT DOCUMENTS.
10. PRUNE EXISTING AND/OR NEWLY PLANTED TREES ONLY AS DIRECTED BY THE LANDSCAPE ARCHITECT.
11. PLANT MATERIAL SHALL HAVE ALL WIRE, TWINE, BASKETS, BURLAP, AND ALL OTHER NON-BIODEGRADABLE CONTAINMENT MATERIAL REMOVED FROM THE TRUNK AND/OR ROOT BALL OF THE PLANT PRIOR TO PLANTING. ROOT BALLS SHALL BE FREE OF WEEDS.
12. FINISH GRADE OF PLANTING BEDS SHALL BE ONE (1) INCH BELOW ADJACENT PAVER OR HEADER, UNLESS OTHERWISE SPECIFIED.
13. MULCH OR PLANTING BED DRESSING SHALL BE PLACED IN ALL PLANTING AREAS AS SPECIFIED. MULCH OR PLANTING BED DRESSING SHALL NOT BE PLACED WITHIN SIX (6) INCHES OF TREE TRUNKS. MULCHING SHOULD BE REPEATED ANNUALLY DURING THE AUTUMN TO A 3" DEPTH, SOIL PEP MULCH SHALL BE USED UNLESS OTHERWISE SPECIFIED..
14. ALL PLANT MATERIAL SHOULD RECEIVE AN ORGANIC FERTILIZER IN LIMITED APPLICATION FOLLOWING INSTALLATION. TYPE AND APPLICATION RATE AND METHOD OF APPLICATION TO BE SPECIFIED BY THE CONTRACTOR & APPROVED BY THE LANDSCAPE ARCHITECT.
15. STOCKPILED PLANT MATERIAL TO BE PLACED IN THE SHADE AND PROPERLY HAND-WATERED UNTIL PLANTED.
16. PRESERVE & PROTECT ALL EXISTING VEGETATION INDICATED TO REMAIN AT ALL TIMES.
17. TO THE GREATEST EXTENT POSSIBLE, TOPSOIL THAT IS REMOVED DURING CONSTRUCTION SHALL BE STOCKPILED FOR LATER USE IN AREAS REQUIRING REVEGETATION/PLANTING.
18. ALL MATERIALS USED SHALL CONFORM TO THE GUIDELINES ESTABLISHED BY THE CURRENT AMERICAN STANDARDS FOR NURSERY STOCK, PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
19. ALL DISTURBED AREAS ARE TO BE REVEGETATED

SEEDING NOTES

1. REVEGETATED AREAS ARE TO BE HYRO-SEEDED, FOLLOWED BY THE APPLICATION OF STRAW MULCH.
2. APPLY STRAW MULCH AT A MINIMUM RATE OF 1.5 TONS PER ACRE OF AIR DRY MATERIAL. SPREAD STRAW MULCH UNIFORMLY OVER THE AREA WITH MECHANICAL MULCH SPREADER/CRIMPER. DO NOT MULCH WHEN WIND VELOCITY EXCEEDS 10 MPH.
3. IMMEDIATELY UPON COMPLETION OF THE MULCHING AND BINDING OPERATION, THE SEEDED AREAS SHALL BE IRRIGATED, KEEPING THE TOP 2 INCHES OF SOIL EVENLY MOIST UNTIL SEED HAS UNIFORMLY GERMINATED AND GROWN TO A HEIGHT OF 2 INCHES.
4. WATERING APPLICATION SHALL BE DONE IN A MANNER WHICH WILL PROVIDE UNIFORM COVERAGE BUT WHICH WILL NOT CAUSE EROSION, MOVEMENT, OR DAMAGE TO THE FINISHED SURFACE.

GRADING AND DRAINAGE NOTES

1. MATERIALS/WASTE CREATED BY REMOVAL PROCEDURES SHALL BE LEGALLY DISPOSED OF AWAY FROM THE JOB SITE.
2. NOTIFY LOCAL UNDERGROUND SERVICE COMPANIES FOR UTILITY FINDS 48 HOURS PRIOR TO ANY EXCAVATION.
3. THE CONTRACTOR IS TO REVIEW ARCHITECTURAL DRAWINGS FOR THE VERIFICATION OF CONNECTIONS TO DRAINS OVER STRUCTURE.
4. THE CONTRACTOR IS TO REVIEW ARCHITECTURAL DRAWINGS FOR THE VERIFICATION OF WATERPROOFING OF SLAB PENETRATIONS.
5. THE CONTRACTOR IS TO REVIEW CIVIL ENGINEER'S DRAWINGS FOR THE VERIFICATION OF CONNECTIONS TO DRAINS.
6. GRADING AND EXCAVATION WORK SHALL BE COMPLETED DURING DRY AND NON-FREEZING CONDITIONS.
7. POSITIVE DRAINAGE SHALL BE PROVIDED AWAY FROM ALL STRUCTURES.
8. SOIL COMPACTION SHALL BE 95% PROCTOR DENSITY MINIMUM BENEATH PAVEMENTS, STEPS, WALLS AND LIGHT FOUNDATIONS, UNLESS OTHERWISE SPECIFIED.

ABBREVIATIONS TABLE

APPROX	APPROXIMATE	MH	MANHOLE
ARCH	ARCHITECT	MIN	MINIMUM
AVG	AVERAGE	MISC	MISCELLANEOUS
B+B	BALED AND BURLAPPED	N	NORTH
BF	BOTTOM OF FOOTING	NIC	NOT IN CONTRACT
BLDG	BUILDING	NO	NUMBER
BM	BENCHMARK	NOM	NOMINAL
BOC	BACK OF CURB	NTS	NOT TO SCALE
BR	BOTTOM OF RAMP	OC	ON CENTER
BS	BOTTOM OF STEP	OD	OUTSIDE DIAMETER
BW	BOTTOM OF WAL	OPP	OPPOSITE
CAL	CALIPER	PAR	PARALLEL
CAP	CAPACITY	PC	POINT OF CURVATURE
CF	CUBIC FEET	PE	POLYURETHANE
CHAM	CHAMFER	PERF	PERFORATED
CIP	CAST IN PLACE	PED	PEDESTRIAN
CJ	CONTROL JOINT	PI	POINT OF INTERSECTION
CL	CENTER LINE	PL	PROPERTY LINE
CLR	CLEARANCE	PT	POINT, POINT OF TANGENCY
CM	CENTIMETER	PVC	POLYVINYL CHLORIDE
CO	CLEAN OUT	PVMT	PAVEMENT
COMP	COMPACTED	PVR	PAVER
CONC	CONCRETE	QTY	QUANTITY
CONST	CONSTRUCTION	R	RADIUS
CONT	CONTINUOUS	REF	REFERENCE
CONTR	CONTRACTOR	REINF	REINFORCE(D)
CU	CUBIC	REQ'D	REQUIRED
CY	CUBIC YARD	REV	REVISION, REVISED
DEMO	DEMOLISH, DEMOLITION	ROW	RIGHT OF WAY
DIA	DIAMETER	RT	RIGHT
DIM	DIMENSION	S	SOUTH
DTL	DETAIL	SS	SANITARY SEWER
DWG	DRAWING	SCH	SCHEDULE
E	EAST	SD	STORM DRAIN
EA	EACH	SEC	SECTION
EJ	EXPANSION JOINT	SF	SQUARE FOOT (FEET)
EL	ELEVATION	SHT	SHEET
ELEC	ELECTRICAL	SIM	SIMILAR
ENG	ENGINEER	SNT	SEALANT
EQ	EQUAL	SPECS	SPECIFICATIONS
EQUIP	EQUIPMENT	SQ	SQUARE
EST	ESTIMATE	ST	STORM SEWER
E.W.	EACH WAY	SY	SQUARE YARD
EXIST	EXISTING	STA	STATION
EXP	EXPANSION, EXPOSED	STD	STANDARD
FFE	FINISHED FLOOR ELEVATION	STL	STEEL
FG	FINISHED GRADE	STRL	STRUCTURAL
FIN	FINISH	SYM	SYMMETRICAL
FL	FLOW LINE	T&B	TOP AND BOTTOM
FOW	FACE OF WAL	TBC	TOP OF BACK CURB
FT	FOOT (FEET)	TC	TOP OF CURB
FTG	FOOTING	TF	TOP OF FOOTING
GA	GAUGE	TRANS	ELECTRIC TRANSFORMER
GAL	GALVANIZED	TOC	TOP OF CONCRETE
GEN	GENERAL	TOPO	TOPOGRAPHY
HORIZ	HORIZONTAL	TSL	TOP OF SLAB
HP	HIGH POINT	TR	TOP OF RAMP
HT	HEIGHT	TS	TOP OF STEP
ID	INSIDE DIAMETER	TW	TOP OF WAL
INV	INVERT ELEVATION	TYP	TYPICAL
IN	INCH(ES)	VAR	VARIABLE
INCL	INCLUDE(D)	VERT	VERTICAL
IRR	IRRIGATION	VEH	VEHICLE
JT	JOINT	VOL	VOLUME
LIN	LINEAR	W/	WITH
LF	LINEAR FEET	W/O	WITHOUT
LP	LOW POINT	WT	WEIGHT
LT	LIGHT	WWF	WELDED WIRE FABRIC
MATL	MATERIAL	YD	YARD
MAX	MAXIMUM	@	AT
MEMB	MEMBRANE		
MD	MAIN DISCONNECT SWITCH		



SEAL

PROJECT TITLE

100 Durgin Ln

PREPARED FOR

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE PORTSMOUTH, NH

REVISIONS

DATE

ISSUE DATE

April 19, 2024

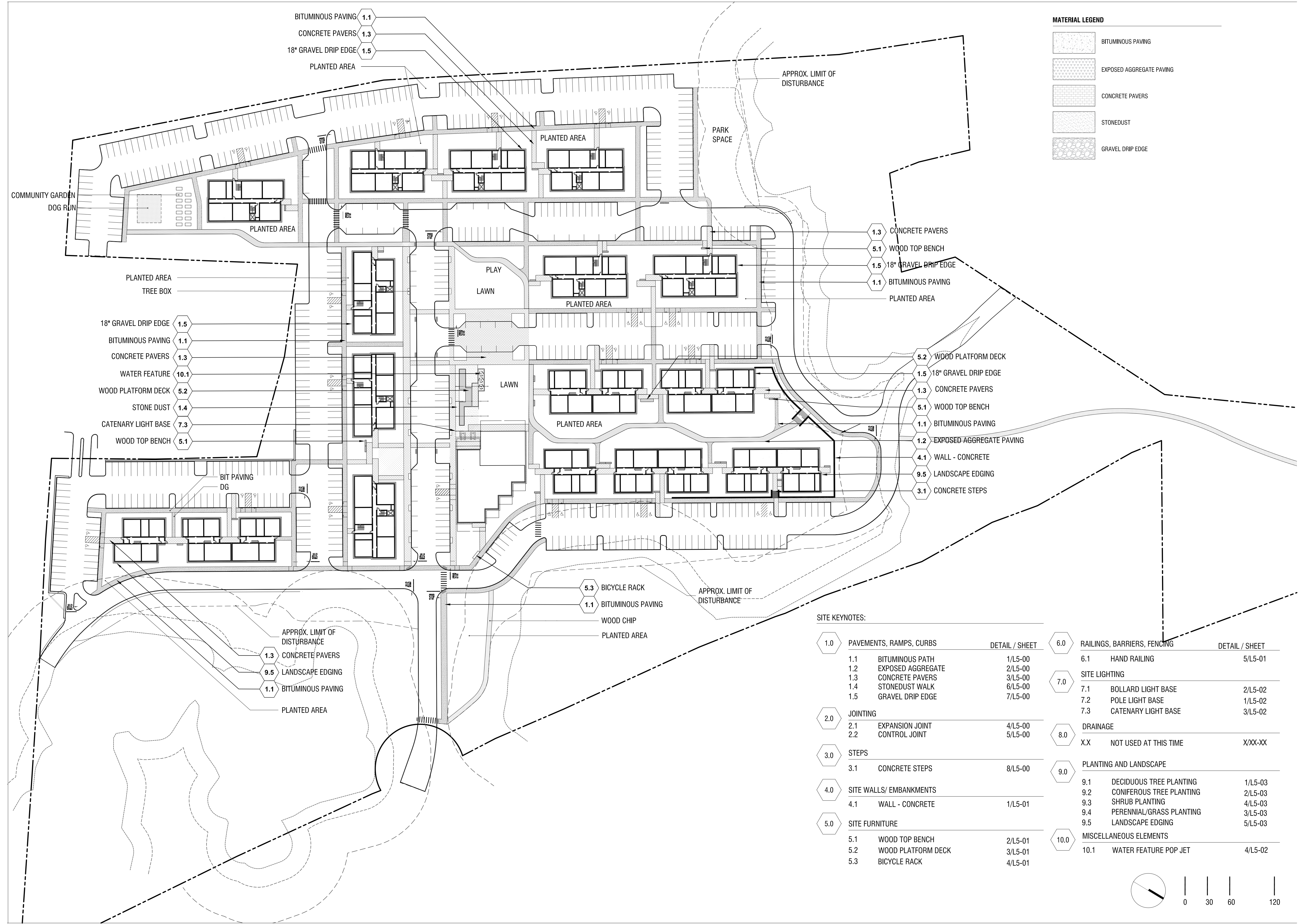
SHEET TITLE

NOTES

SHEET INFORMATION

NOTICE OF CONSTRUCTION
L-0-01

REVISIONS	DATE

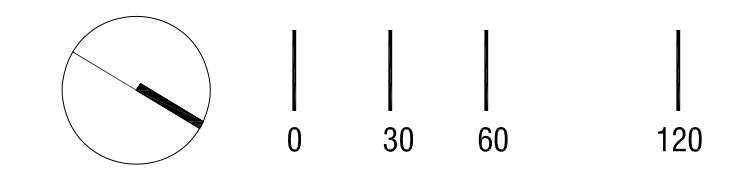


MATERIAL LEGEND

[Pattern]	BITUMINOUS PAVING
[Pattern]	EXPOSED AGGREGATE PAVING
[Pattern]	CONCRETE PAVERS
[Pattern]	STONEDUST
[Pattern]	GRAVEL DRIP EDGE

SITE KEYNOTES:

1.0	PAVEMENTS, RAMPS, CURBS	DETAIL / SHEET	6.0	RAILINGS, BARRIERS, FENCING	DETAIL / SHEET
1.1	BITUMINOUS PATH	1/L5-00	6.1	HAND RAILING	5/L5-01
1.2	EXPOSED AGGREGATE	2/L5-00	7.0	SITE LIGHTING	
1.3	CONCRETE PAVERS	3/L5-00	7.1	BOLLARD LIGHT BASE	2/L5-02
1.4	STONEDUST WALK	6/L5-00	7.2	POLE LIGHT BASE	1/L5-02
1.5	GRAVEL DRIP EDGE	7/L5-00	7.3	CATENARY LIGHT BASE	3/L5-02
2.0	JOINTING		8.0	DRAINAGE	
2.1	EXPANSION JOINT	4/L5-00	X.X	NOT USED AT THIS TIME	X/XX-XX
2.2	CONTROL JOINT	5/L5-00	9.0	PLANTING AND LANDSCAPE	
3.0	STEPS		9.1	DECIDUOUS TREE PLANTING	1/L5-03
3.1	CONCRETE STEPS	8/L5-00	9.2	CONIFEROUS TREE PLANTING	2/L5-03
4.0	SITE WALLS/ EMBANKMENTS		9.3	SHRUB PLANTING	4/L5-03
4.1	WALL - CONCRETE	1/L5-01	9.4	PERENNIAL/GRASS PLANTING	3/L5-03
5.0	SITE FURNITURE		9.5	LANDSCAPE EDGING	5/L5-03
5.1	WOOD TOP BENCH	2/L5-01	10.0	MISCELLANEOUS ELEMENTS	
5.2	WOOD PLATFORM DECK	3/L5-01	10.1	WATER FEATURE POP JET	4/L5-02
5.3	BICYCLE RACK	4/L5-01			



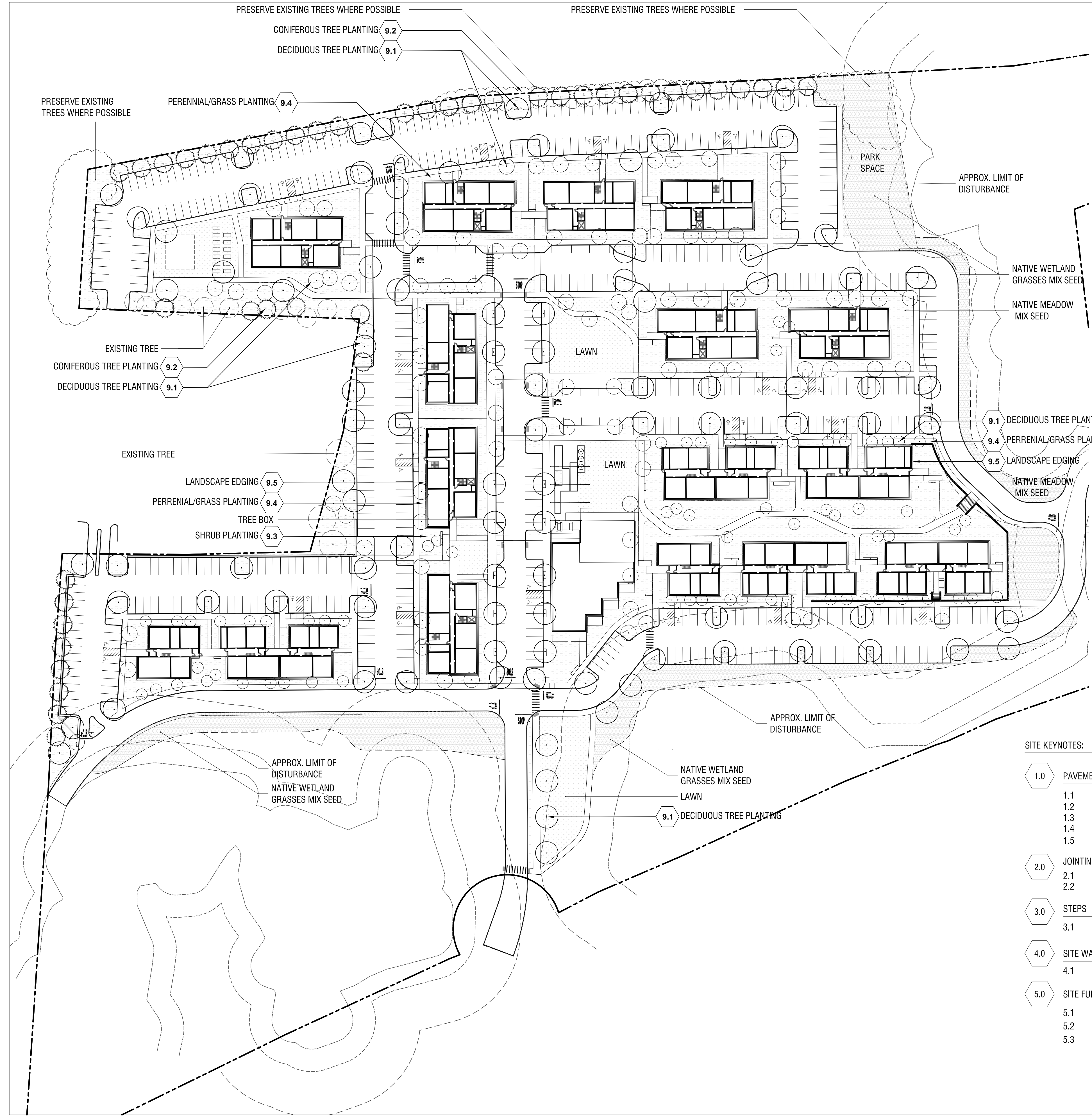
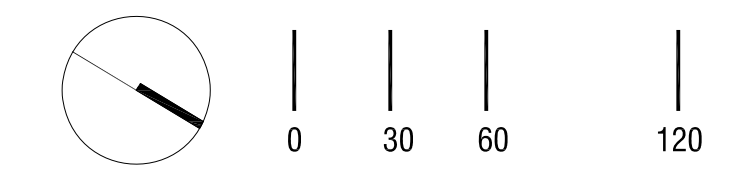
NO.	DESCRIPTION	DATE

POTENTIAL PLANT SCHEDULE

SYMB.	BOTANICAL NAME	COMMON NAME	QTY.	SIZE	SPACING
TREES					
QP	QUERCUS PALUSTRIS	PIN OAK	X	3" CAL. MIN.	PER PLAN
AR	ACER RUBRUM 'BOWHALL'	BOWHALL MAPLE	X	3" CAL. MIN.	PER PLAN
QR	QUERCUS ROBUR X BICOLOR 'LONG'	REGAL PRINCE OAK	X	3" CAL. MIN.	PER PLAN
AS	ACER SACCHARUM	SUGAR MAPLE	X	3" CAL. MIN.	PER PLAN
BP	BETULA PAPPYRIFERA	PAPER BIRCH (SINGLE-STEM)	X	3" CAL. MIN.	PER PLAN
AC	AMELANCHIER CANADENSIS	SERVICEBERRY (MULTI-STEM)	X	8" HT. B&B	PER PLAN
TREES - EVERGREEN					
AB	ABIES BALSAMEA 'COOKS'	'BALSAM FIR 'COOKS'	X	#2	PER PLAN
TC	TSUGA CANADENSIS	EASTERN HEMLOCK	X	#2	PER PLAN
AB	THUJA OCCIDENTALIS	ARBORVITAE	X	7-8'	PER PLAN
SHRUBS					
MP	MYRICA PENNSYLVANICA	BAYBERRY	X	#5	PER PLAN
RA	RHUS AROMATICA	LOW-GRO SUMAC	X	#2	PER PLAN
IG	ILEX GLABRA	INKBERRY	X	#2	PER PLAN
PERENNIALS AND ORNAMENTAL GRASSES					
AU	ARCTOSTAPHYLOS UVA-URSI	BEARBERRY	X	#1	12" O.C.
CP	COMPTONIA PEREGRINA	SWEET FERN	X	#1	12" O.C.
EP	EUTROCHUM PURPUREUM	SWEET JOE PYE WEED	X	#1	12" O.C.
SS	SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM	X	#1	24" O.C.
LUS	LUZULA SYLVATICA	GREATER WOOD RUSH	X	#1	18" O.C.
BG	BOUTELOUA GRACILIS	BLUE GRAMA	X	#1	18" O.C.
SH	SPOROBOLUS HETEROLEPIS	PRAIRIE DROPS EED	X	#1	12" O.C.
EPE	ERAGROSTIS PECTINACEA	PURPLE LOVE GRASS	X	#1	12" O.C.
P	PANICUM	SWITCHGRASS	X	#1	12" O.C.
DM	DRYOPTERIS MARGINALIS	MARGINAL WOOD FERN	X	#1	12" O.C.
LAWN & SEEDING					
LOAM & SEED	XX SF	TURF GRASS MIX PER PLAN, SEE SEED SUPPLIER SPEC. FOR APPLICATION RATE			
NATIVE WETLAND GRASSES MIX SEED	XX SF	NATIVE GRASS MIX PER PLAN, SEE SEED SUPPLIER SPEC. FOR APPLICATION RATE			
NATIVE MEADOW MIX SEED	XX SF	MEADOW MIX PER PLAN, SEE SEED SUPPLIER SPEC. FOR APPLICATION RATE			

SITE KEYNOTES:

1.0	PAVEMENTS, RAMPS, CURBS	DETAIL / SHEET	6.0	RAILINGS, BARRIERS, FENCING	DETAIL / SHEET
1.1	BITUMINOUS PATH	1/L5-00	6.1	HAND RAILING	5/L5-01
1.2	EXPOSED AGGREGATE	2/L5-00	7.0	SITE LIGHTING	
1.3	CONCRETE PAVERS	3/L5-00	7.1	BOLLARD LIGHT BASE	2/L5-02
1.4	STONEDUST WALK	6/L5-00	7.2	POLE LIGHT BASE	1/L5-02
1.5	GRAVEL DRIP EDGE	7/L5-00	7.3	CATENARY LIGHT BASE	3/L5-02
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4.0	SITE WALLS/ EMBANKMENTS		9.3	SHRUB PLANTING	4/L5-03
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5.2	WOOD PLATFORM DECK	3/L5-01	10.1	WATER FEATURE POP JET	4/L5-02
5.3	BICYCLE RACK	4/L5-01			



PRESERVE EXISTING TREES WHERE POSSIBLE

PRESERVE EXISTING TREES WHERE POSSIBLE

PRESERVE EXISTING TREES WHERE POSSIBLE

CONIFEROUS TREE PLANTING 9.2

DECIDUOUS TREE PLANTING 9.1

PERENNIAL/GRASS PLANTING 9.4

PARK SPACE

APPROX. LIMIT OF DISTURBANCE

NATIVE WETLAND GRASSES MIX SEED

NATIVE MEADOW MIX SEED

EXISTING TREE

CONIFEROUS TREE PLANTING 9.2

DECIDUOUS TREE PLANTING 9.1

EXISTING TREE

LANDSCAPE EDGING 9.5

PERENNIAL/GRASS PLANTING 9.4

TREE BOX

SHRUB PLANTING 9.3

9.1 DECIDUOUS TREE PLANTING

9.4 PERENNIAL/GRASS PLANTING

9.5 LANDSCAPE EDGING

NATIVE MEADOW MIX SEED

APPROX. LIMIT OF DISTURBANCE

NATIVE WETLAND GRASSES MIX SEED

LAWN

9.1 DECIDUOUS TREE PLANTING

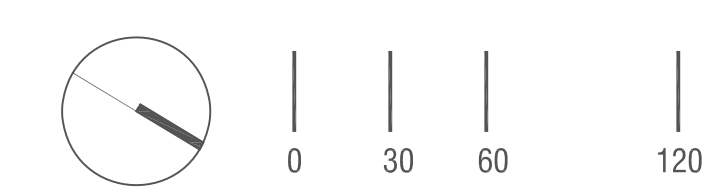
APPROX. LIMIT OF DISTURBANCE

NATIVE WETLAND GRASSES MIX SEED



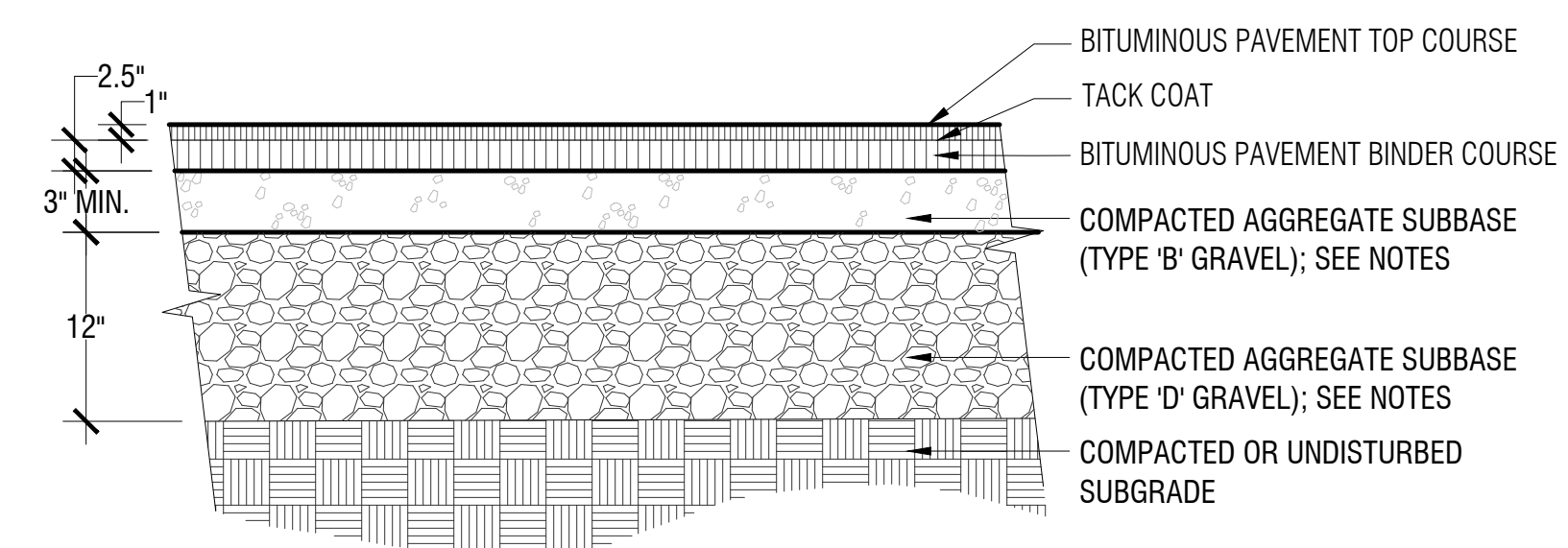
Luminaire Schedule Symbol	Qty	Label	Arrangement	Description	Tag	LMF	Luminaire Lumens	Luminaire Watts	Total Watts
B	25	B3	Single	BMO: FAL10-A SERIES-BLED-A508 DIST-80 CRI-3000K-CXX		0.900	1622	15.7	461.5
B	9	G2	Single	COOPER: GAIN-SALC-35-D-BL3-CXX	MOUNTED ON 20" VALMONT POLE: DS330-4002200-D1-FF-COOPER CXX-FBC-AB	0.900	6467	59	456
B	21	G4-HSS	Single	COOPER: GAIN-SALC-35-D-TRIP-CXX-HSS	MOUNTED ON 20" VALMONT POLE: DS330-4002200-D1-FF-COOPER CXX-FBC-AB	0.900	10202	125	2625
B	1	G4A	Single	COOPER: GAIN-SALC-35-D-TRIP-CXX	MOUNTED ON 20" VALMONT POLE: DS330-4002200-D1-FF-COOPER CXX-FBC-AB	0.900	6357	63	63
B	8	G4B	Single	COOPER: GAIN-SALC-35-D-TRIP-CXX	MOUNTED ON 20" VALMONT POLE: DS330-4002200-D1-FF-COOPER CXX-FBC-AB	0.900	13398	82	654
B	3	G4W	Single	COOPER: GAIN-SALC-35-D-TW6-CXX	MOUNTED ON 20" VALMONT POLE: DS330-4002200-D1-FF-COOPER CXX-FBC-AB	0.900	12885	108	324
B	2	G4W-2	2 @ 90 degrees	COOPER: GAIN-SALC-35-D-TW6-CXX	MOUNTED ON 20" VALMONT POLE: DS330-4002200-D5-FF-COOPER CXX-FBC-AB	0.900	18381	63	252
B	2	G5A	Single	COOPER: GAIN-SALC-35-D-SM2-CXX	MOUNTED ON 20" VALMONT POLE: DS330-4002200-D1-FF-COOPER CXX-FBC-AB	0.900	8784	63	126
B	3	G5B	Single	COOPER: GAIN-SALC-35-D-SM2-CXX	MOUNTED ON 20" VALMONT POLE: DS330-4002200-D1-FF-COOPER CXX-FBC-AB	0.900	11930	82	246
B	11	B3	Single	WLS: TRC-C-18-5-100-TRV-SSB-CXX-16	MOUNTED ON 18" POLE, INCLUDES WTR FIXTURE	0.900	4410	36	396
B	109	T1	Single	TIVOLI: 1812-B-18-5-30-P-12 // POWER AND LEAD WIRES // MOUNTING POLE	(13) 41" BUNS AND (1) 34" BUN, GLASSES SPACED 18 IN // CONTRACTOR TO CONFIRM LENGTH // MOUNTED 10' AFF	0.900	5	0.2	21.8
B	39	W1	Single	WAC: WS-W220208-3P-CXX	WALL MTD 6" AFF	0.900	282	5.77914	225.346

Calculation Summary	Units	Avg	Max	Min	Foot/Cd	Foot/Min
ENTIRE AREA	FC	0.33	35.5	0.0	N/A	N/A
EAST CENTRAL PARKING	FC	1.33	4.3	0.4	3.33	10.75
MAIN STREE	FC	1.17	5.1	0.0	3.50	17.00
NORTH PARKING	FC	1.33	4.4	0.5	2.66	8.80
NORTHEAST PARKING	FC	1.20	3.6	0.4	3.00	9.00
SOUTHEAST PARKING	FC	1.38	3.7	0.4	3.45	9.25
SOUTHWEST PARKING	FC	1.26	4.3	0.4	3.15	10.50
WEST CENTRAL PARKING	FC	1.43	3.1	0.5	2.86	8.25

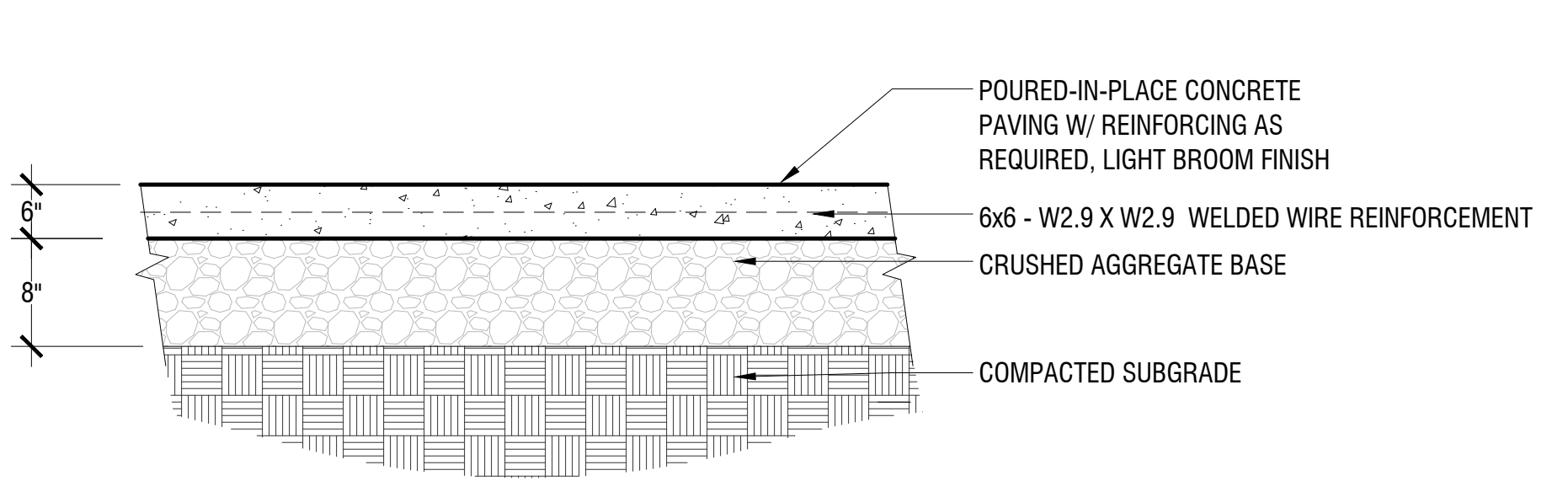


REVISIONS	DATE

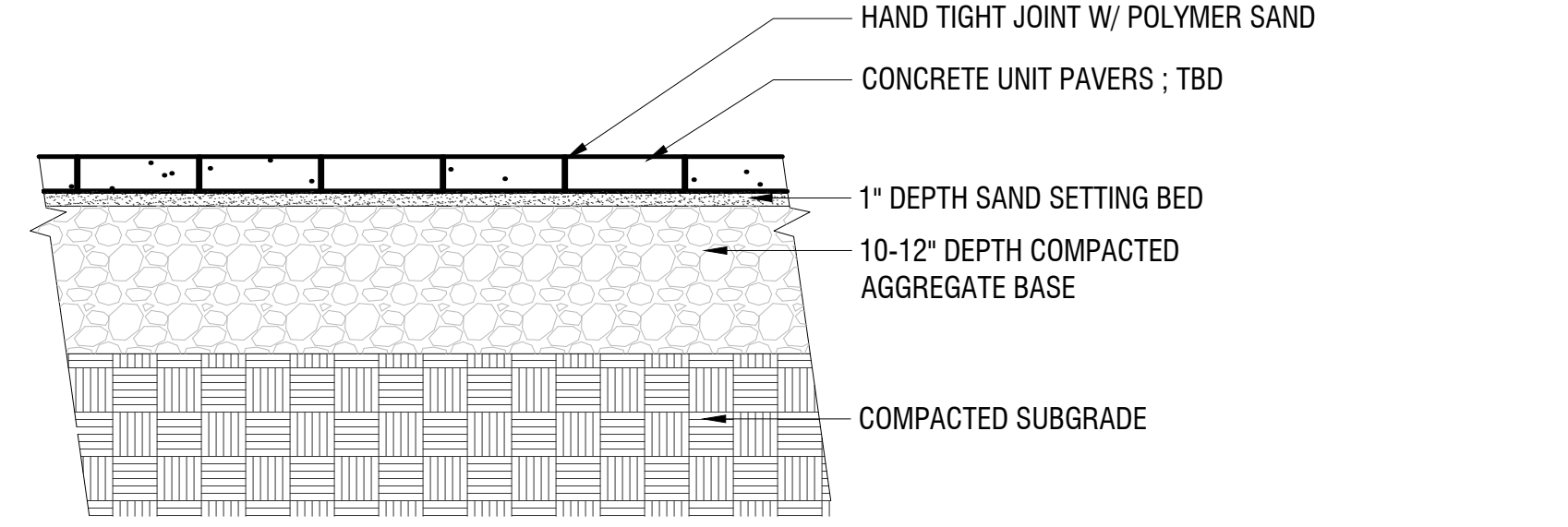
April 19, 2024



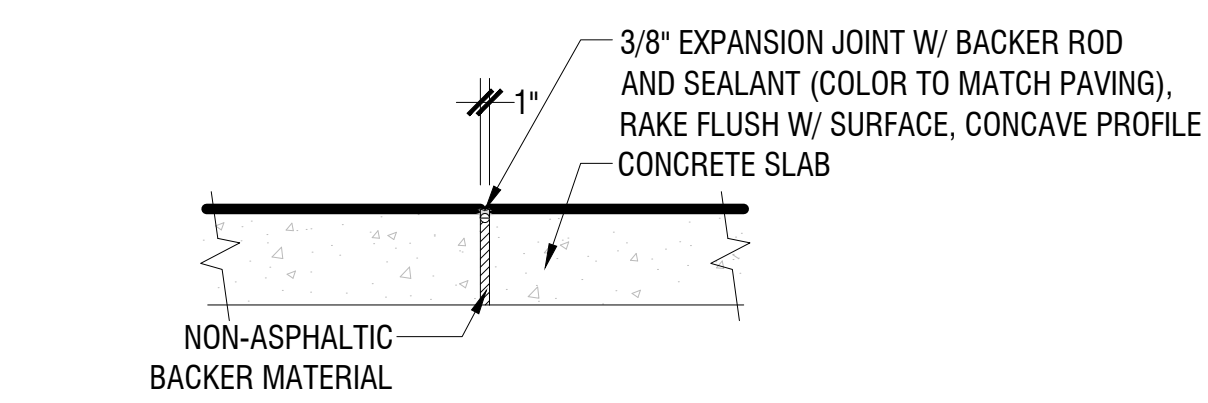
1 Bituminous Paving
1":1'-0"
1.1



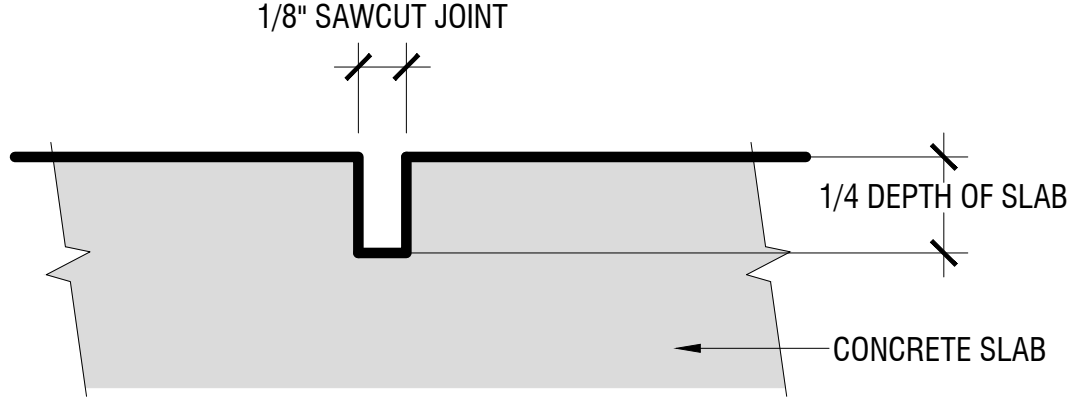
2 Exposed Aggregate
1":1'-0"
1.2



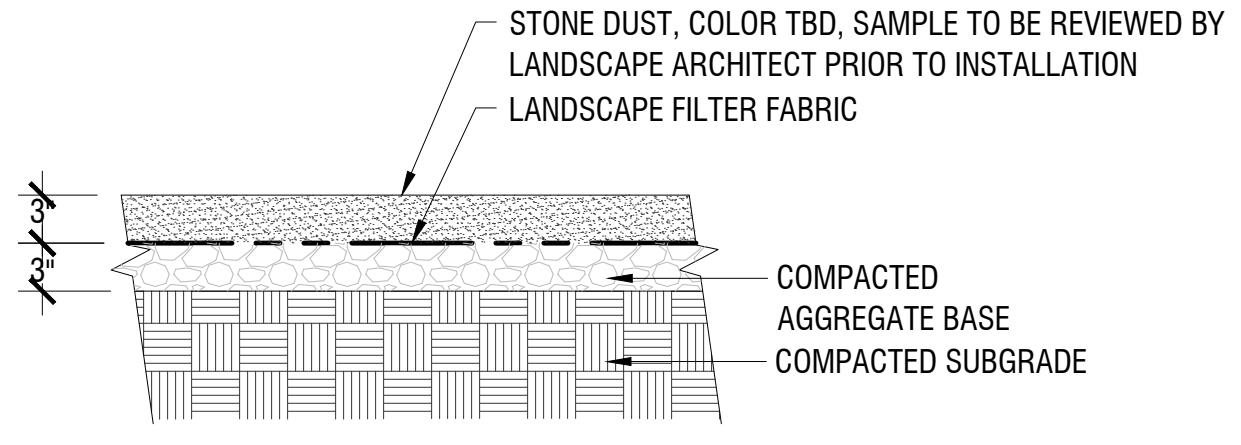
3 Concrete Unit Paving
1":1'-0"
1.3



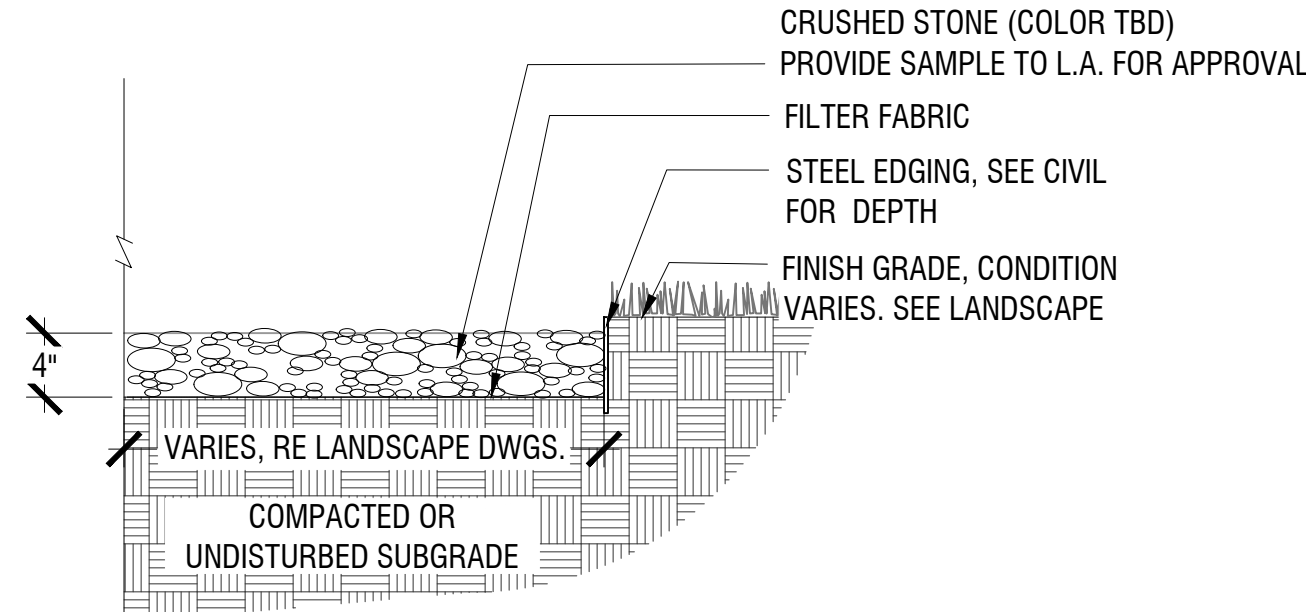
4 Expansion Joint
NTS
2.1



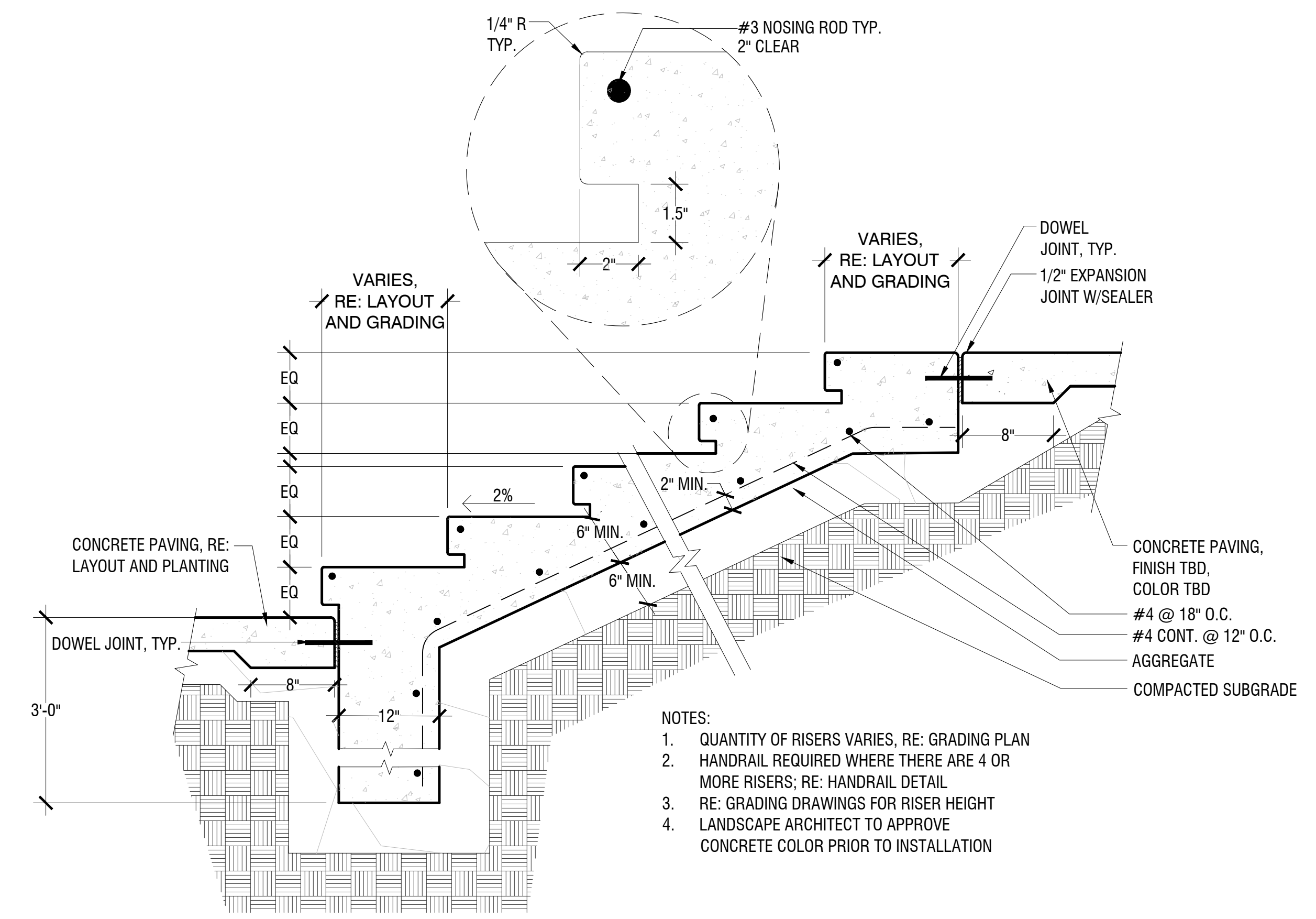
5 Control Joint
NTS
2.2



6 Stone Dust
1":1'-0"
1.4



7 Gravel Drip Edge
1/4":1'-0"
1.5

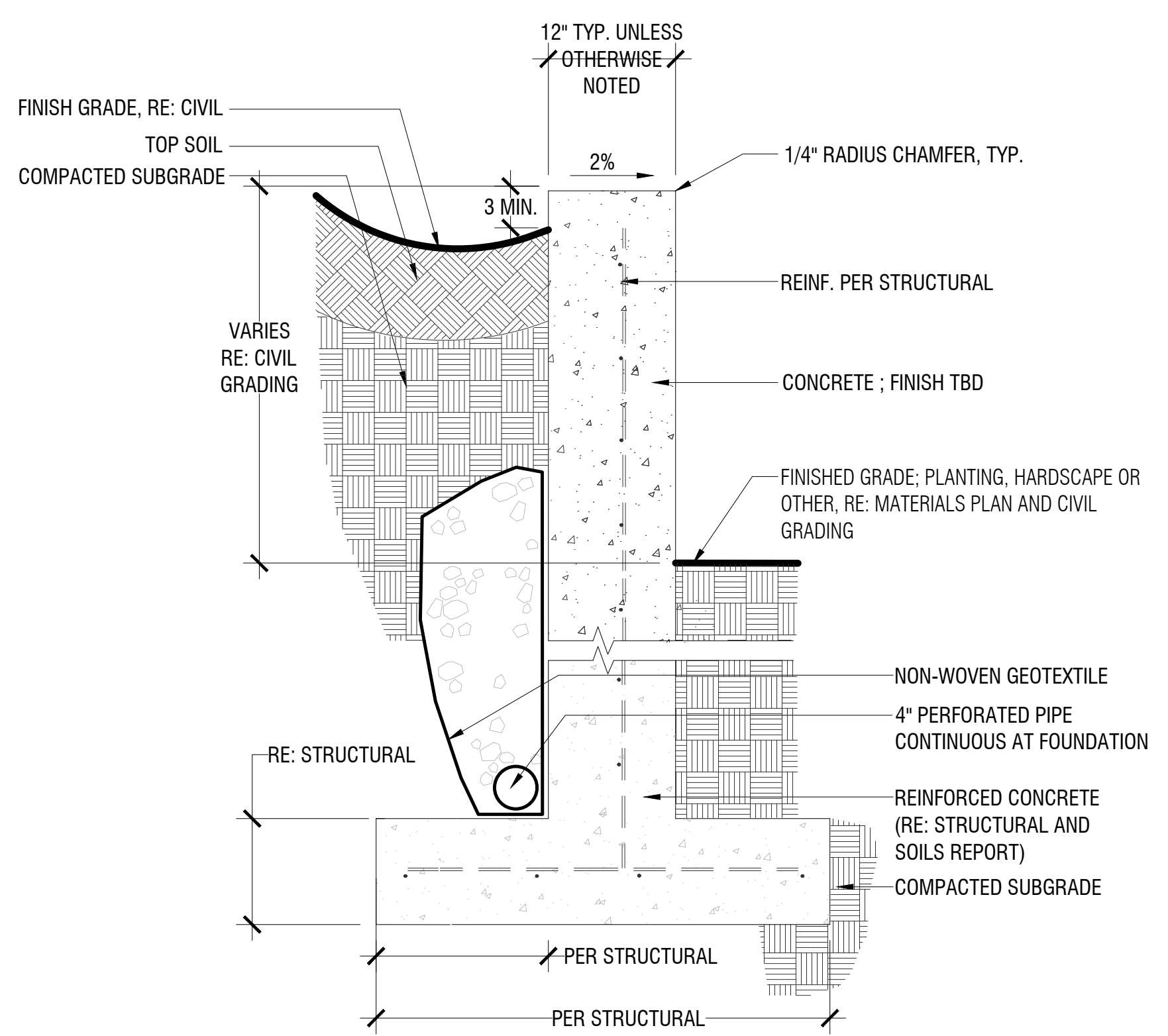


8 Concrete Steps
1":1'-0"
3.1

SITE KEYNOTES:

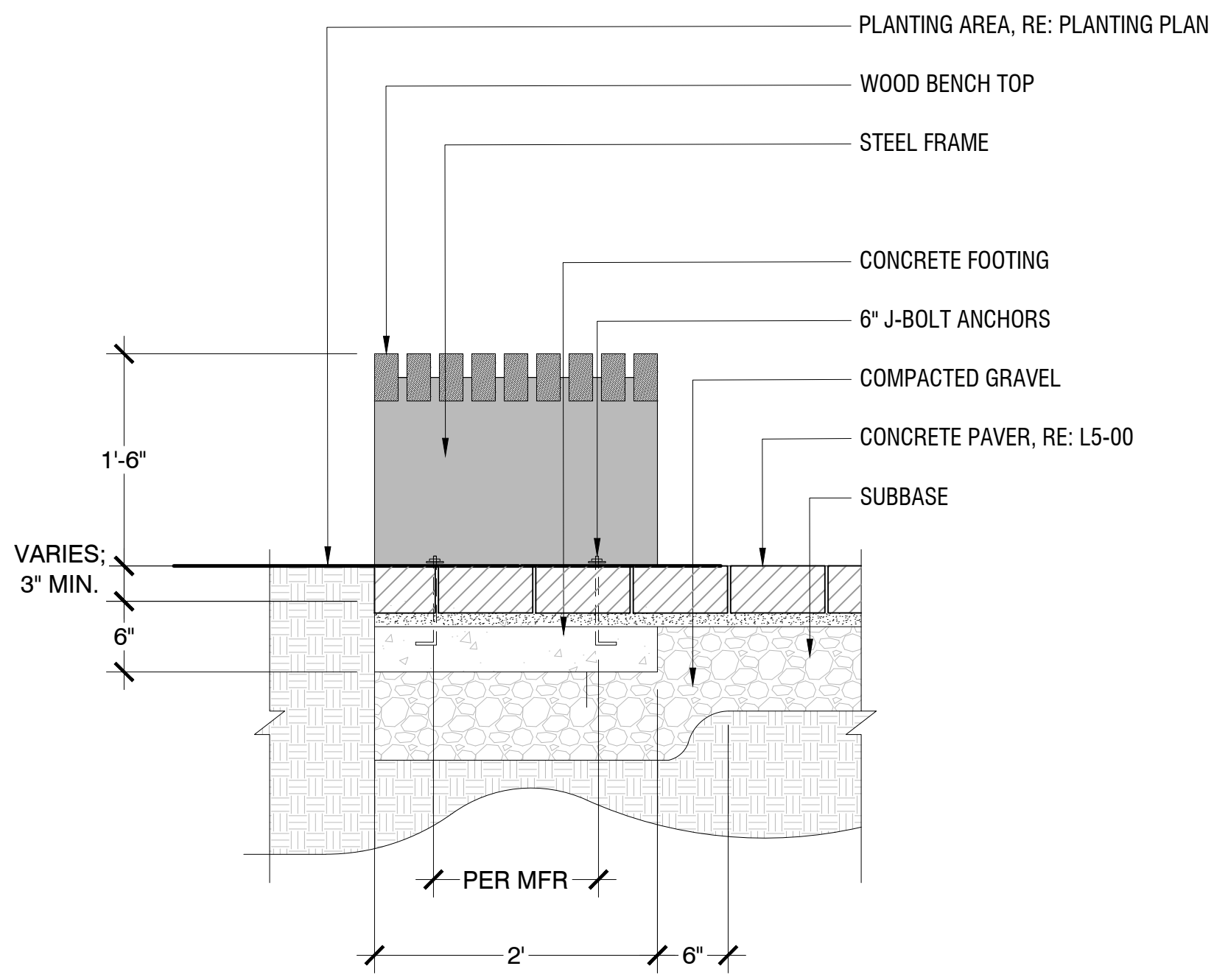
1.0 PAVEMENTS, RAMPS, CURBS	DETAIL / SHEET	6.0 RAILINGS, BARRIERS, FENCING	DETAIL / SHEET
1.1 BITUMINOUS PATH	1/L5-00	6.1 HAND RAILING	5/L5-01
1.2 EXPOSED AGGREGATE	2/L5-00	7.0 SITE LIGHTING	
1.3 CONCRETE PAVERS	3/L5-00	7.1 BOLLARD LIGHT BASE	2/L5-02
1.4 STONEDUST WALK	6/L5-00	7.2 POLE LIGHT BASE	1/L5-02
1.5 GRAVEL DRIP EDGE	7/L5-00	7.3 CATENARY LIGHT BASE	3/L5-02
2.0 JOINTING		8.0 DRAINAGE	
2.1 EXPANSION JOINT	4/L5-00	X.X NOT USED AT THIS TIME	X/XX-XX
2.2 CONTROL JOINT	5/L5-00	9.0 PLANTING AND LANDSCAPE	
3.0 STEPS		9.1 DECIDUOUS TREE PLANTING	1/L5-03
4.0 SITE WALLS/ EMBANKMENTS		9.2 CONIFEROUS TREE PLANTING	2/L5-03
4.1 WALL - CONCRETE	1/L5-01	9.3 SHRUB PLANTING	4/L5-03
5.0 SITE FURNITURE		9.4 PERENNIAL/GRASS PLANTING	3/L5-03
5.1 WOOD TOP BENCH	2/L5-01	9.5 LANDSCAPE EDGING	5/L5-03
5.2 WOOD PLATFORM DECK	3/L5-01	10.0 MISCELLANEOUS ELEMENTS	
5.3 BICYCLE RACK	4/L5-01	10.1 WATER FEATURE POP JET	4/L5-02

REVISIONS	DATE



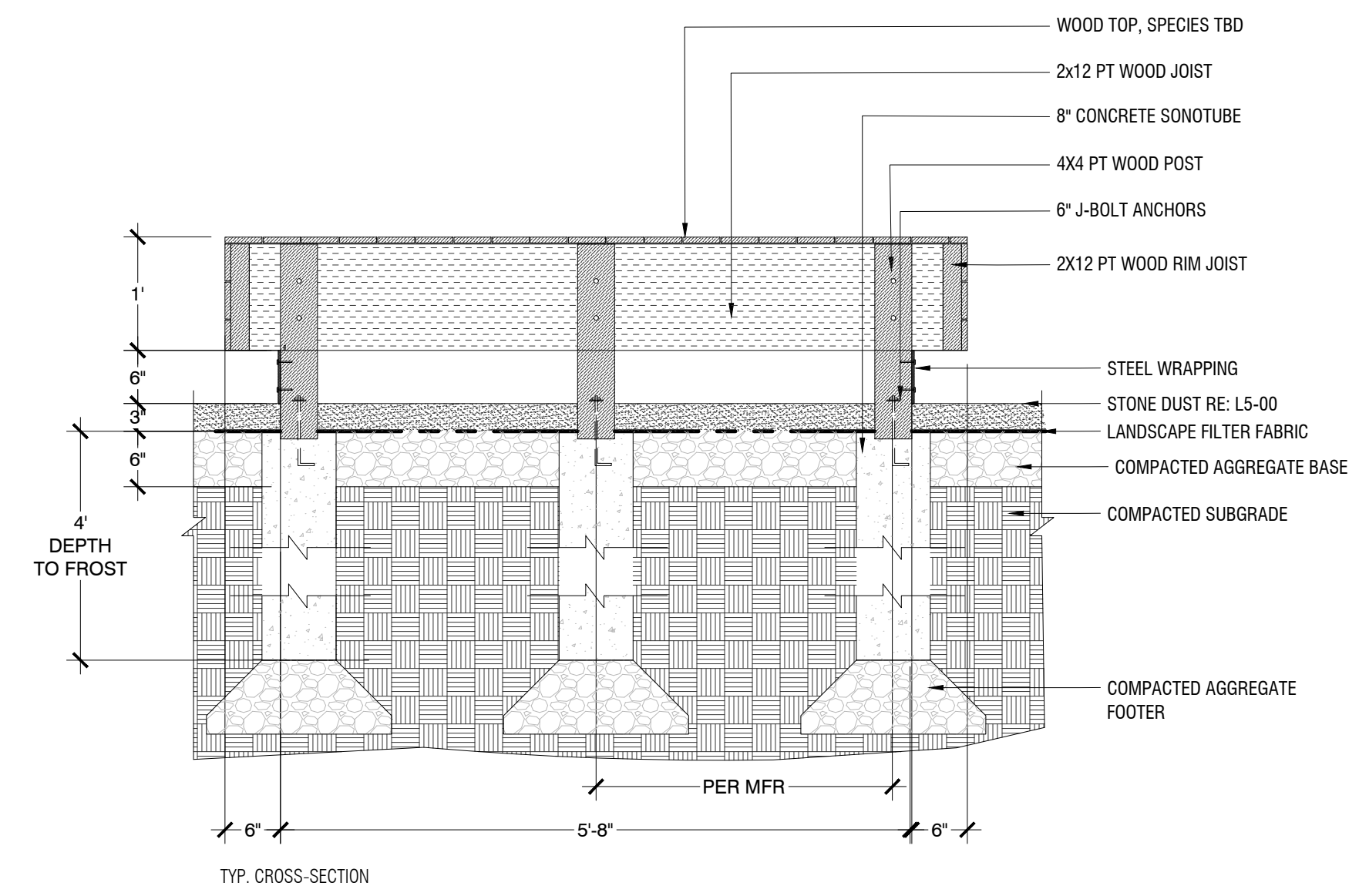
1 Wall - Concrete
1":1'-0"

4.1



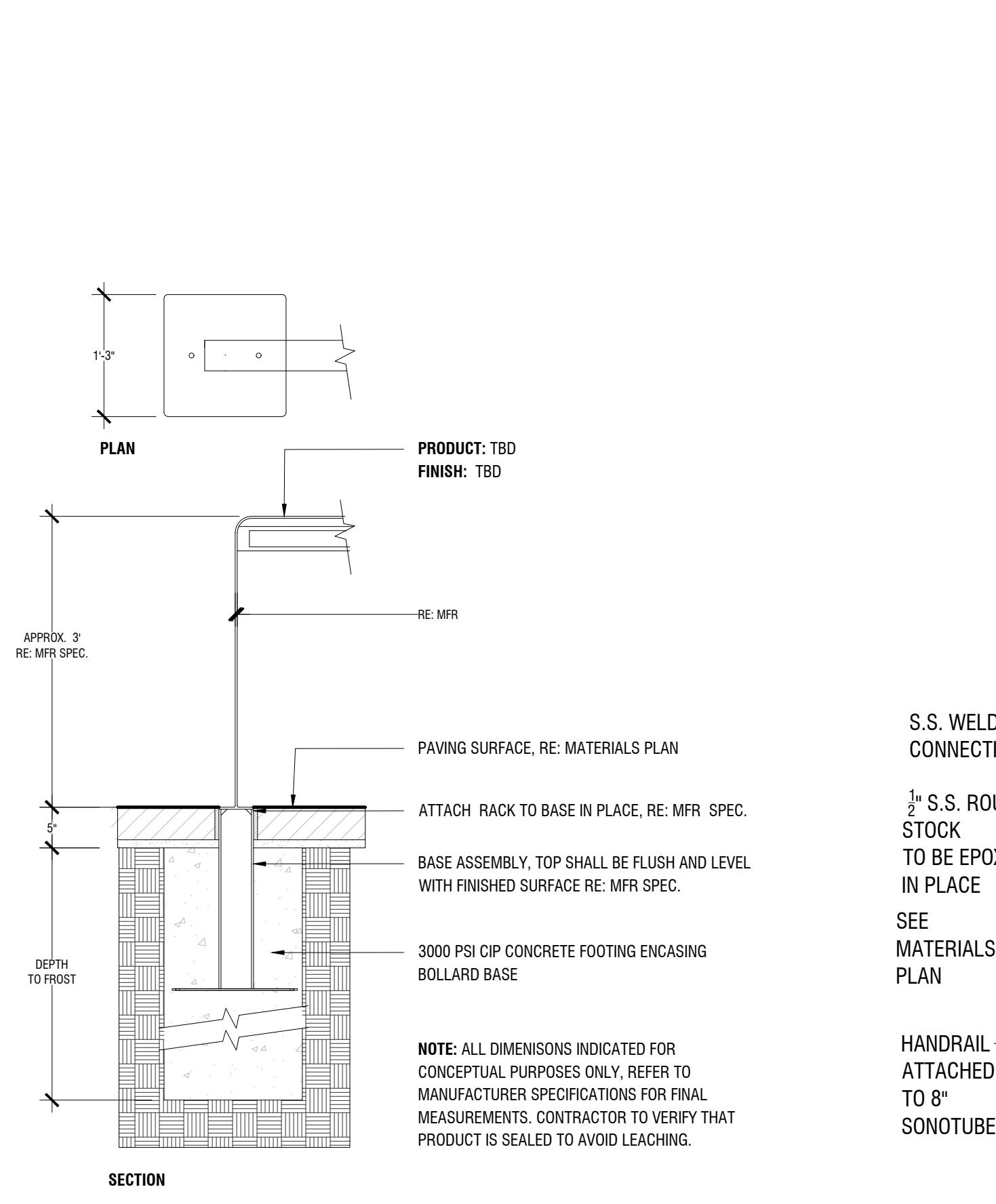
2 Wood Top Bench
1":1'-0"

5.1



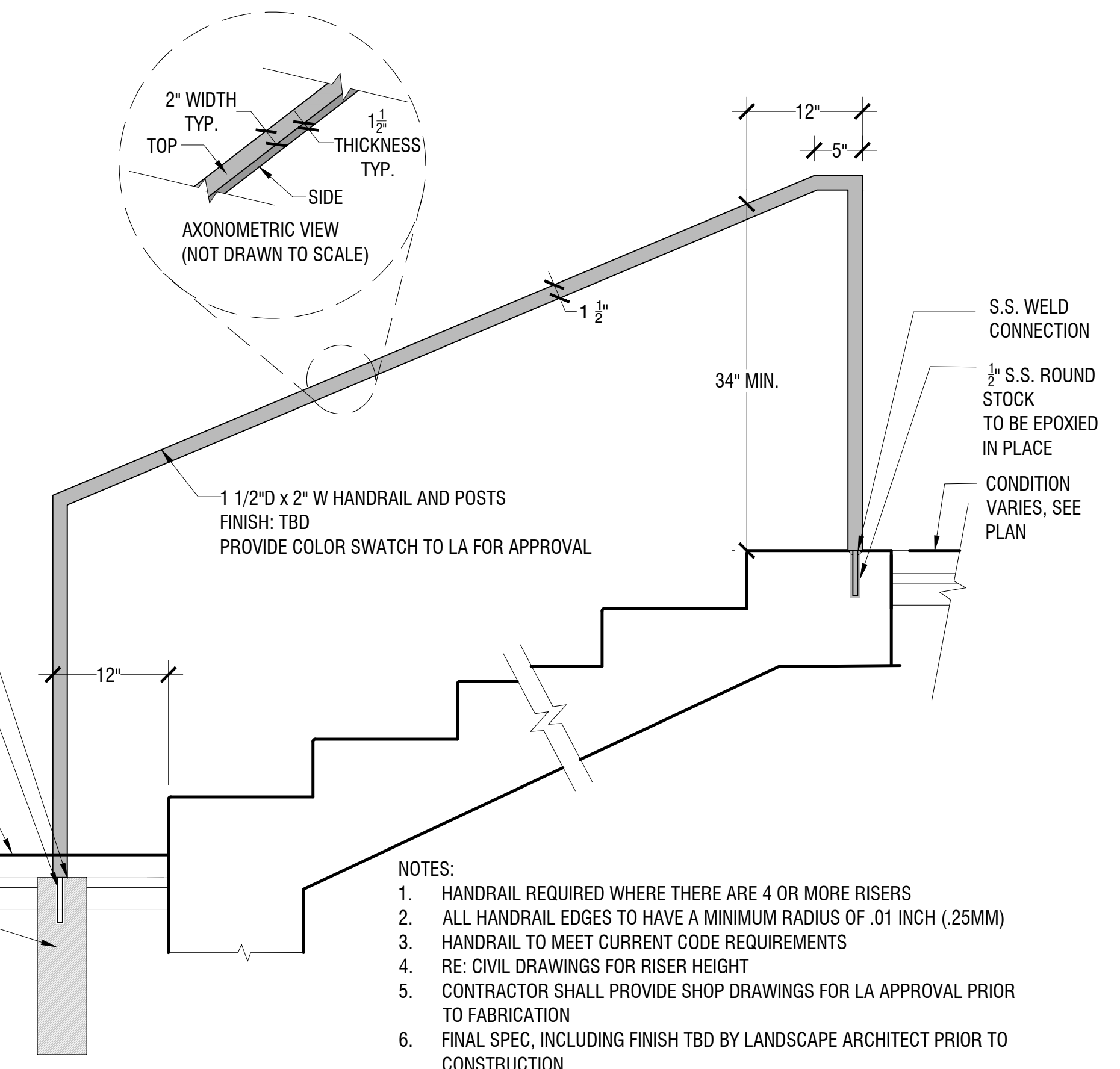
3 Wood Platform Deck
3/4":1'-0"

5.2



4 Bicycle Rack
3/4":1'-0"

5.3



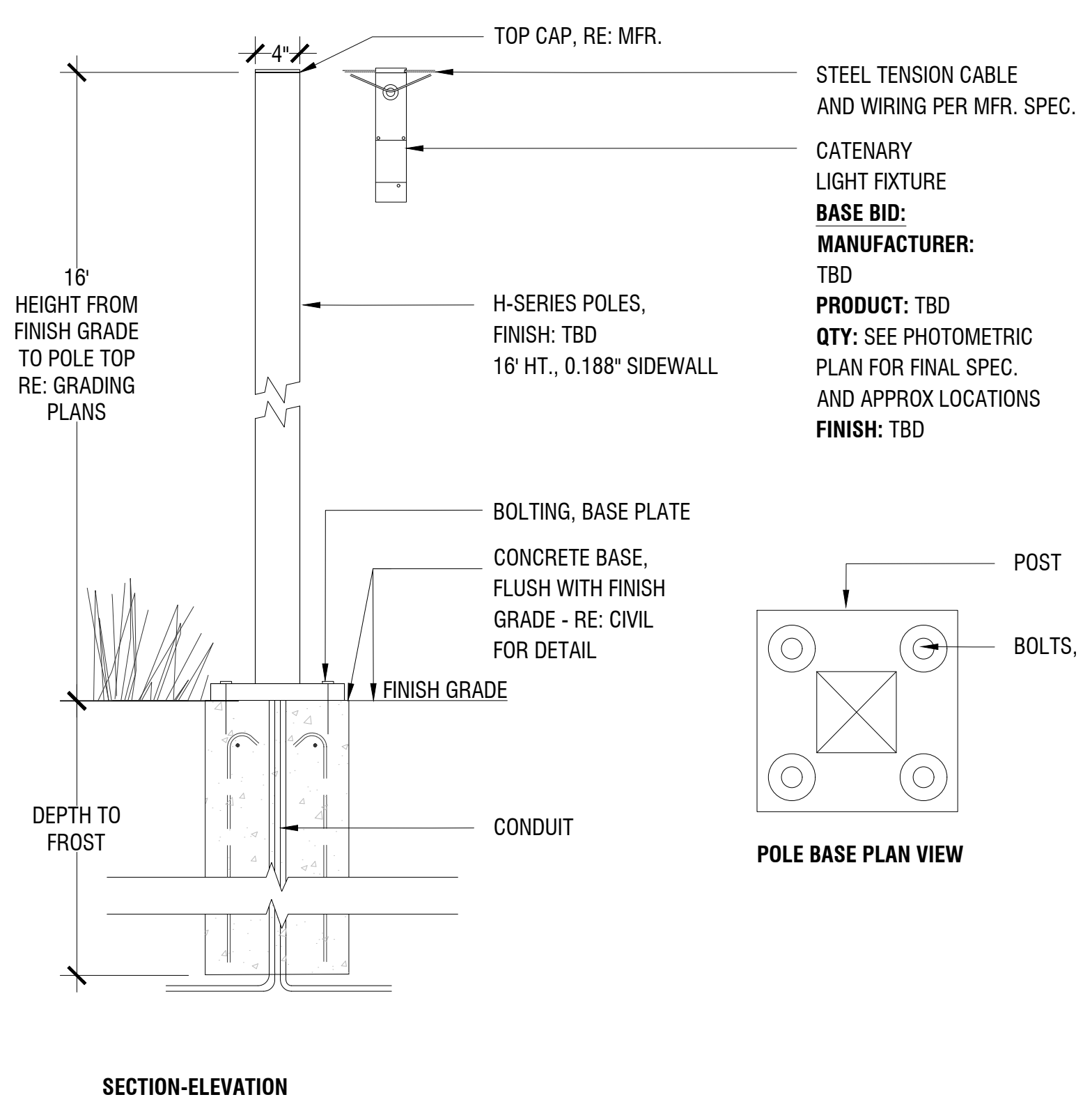
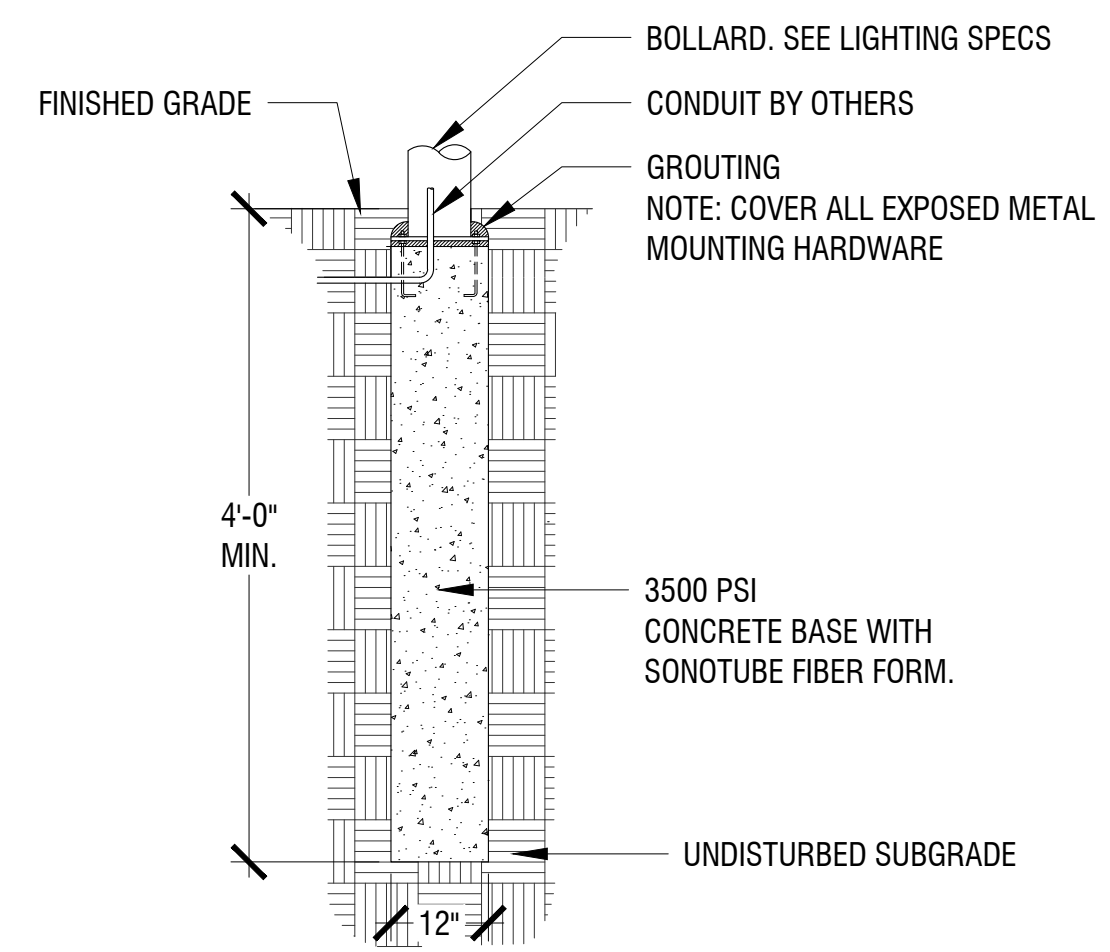
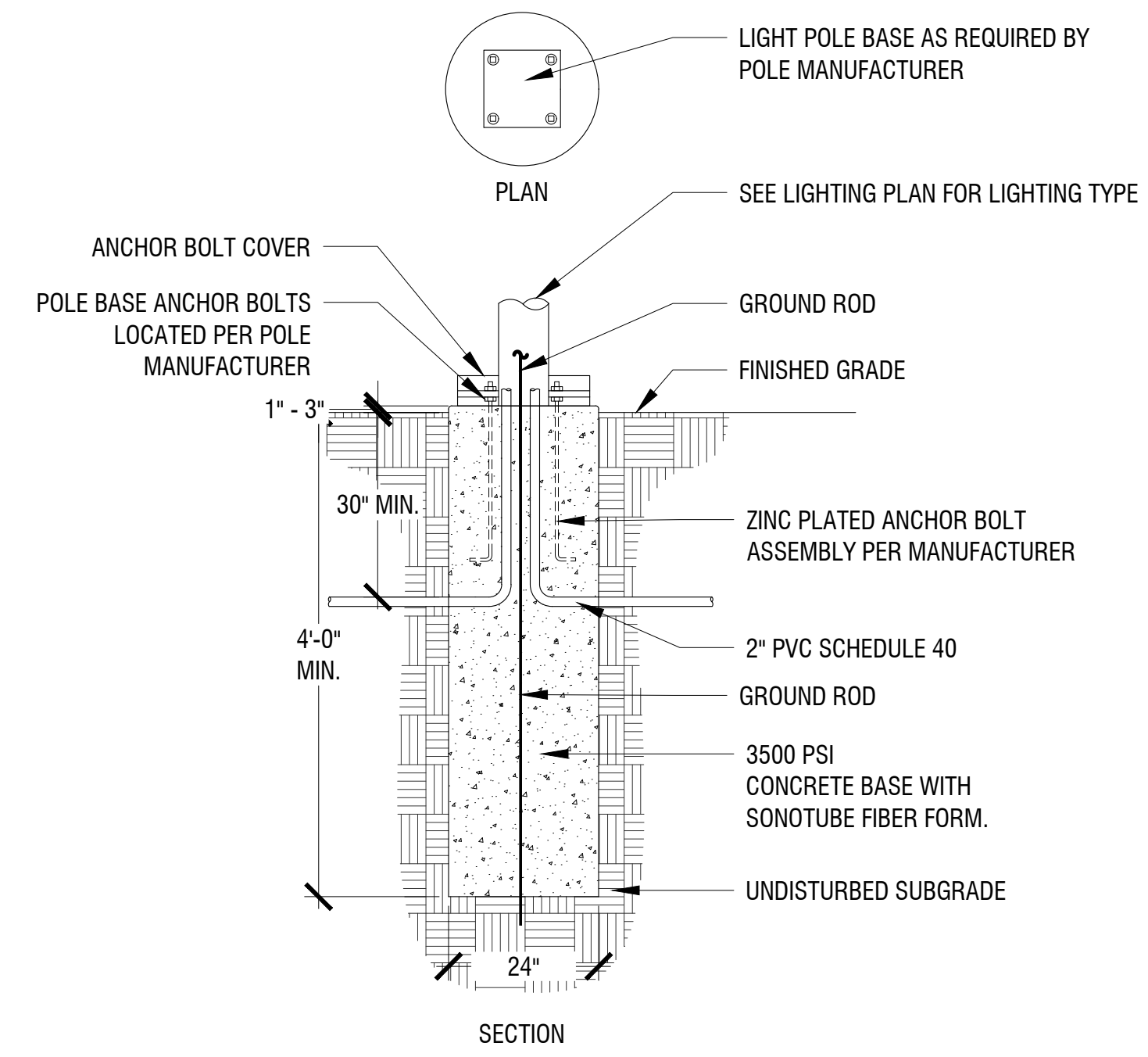
5 Hand Railing
1/2":1'-0"

6.1

SITE KEYNOTES:

KEYNOTE	DETAIL / SHEET	KEYNOTE	DETAIL / SHEET
1.0 PAVEMENTS, RAMPS, CURBS		6.0 RAILINGS, BARRIERS, FENCING	
1.1 BITUMINOUS PATH	1/L5-00	6.1 HAND RAILING	5/L5-01
1.2 EXPOSED AGGREGATE	2/L5-00	7.0 SITE LIGHTING	
1.3 CONCRETE PAVERS	3/L5-00	7.1 BOLLARD LIGHT BASE	2/L5-02
1.4 STONEDUST WALK	6/L5-00	7.2 POLE LIGHT BASE	1/L5-02
1.5 GRAVEL DRIP EDGE	7/L5-00	7.3 CATENARY LIGHT BASE	3/L5-02
2.0 JOINTING		8.0 DRAINAGE	
2.1 EXPANSION JOINT	4/L5-00	XX NOT USED AT THIS TIME	X/XX-XX
2.2 CONTROL JOINT	5/L5-00	9.0 PLANTING AND LANDSCAPE	
3.0 STEPS		9.1 DECIDUOUS TREE PLANTING	1/L5-03
3.1 CONCRETE STEPS	8/L5-00	9.2 CONIFEROUS TREE PLANTING	2/L5-03
4.0 SITE WALLS/ EMBANKMENTS		9.3 SHRUB PLANTING	4/L5-03
4.1 WALL - CONCRETE	1/L5-01	9.4 PERENNIAL/GRASS PLANTING	3/L5-03
5.0 SITE FURNITURE		9.5 LANDSCAPE EDGING	5/L5-03
5.1 WOOD TOP BENCH	2/L5-01	10.0 MISCELLANEOUS ELEMENTS	
5.2 WOOD PLATFORM DECK	3/L5-01	10.1 WATER FEATURE POP JET	4/L5-02
5.3 BICYCLE RACK	4/L5-01		

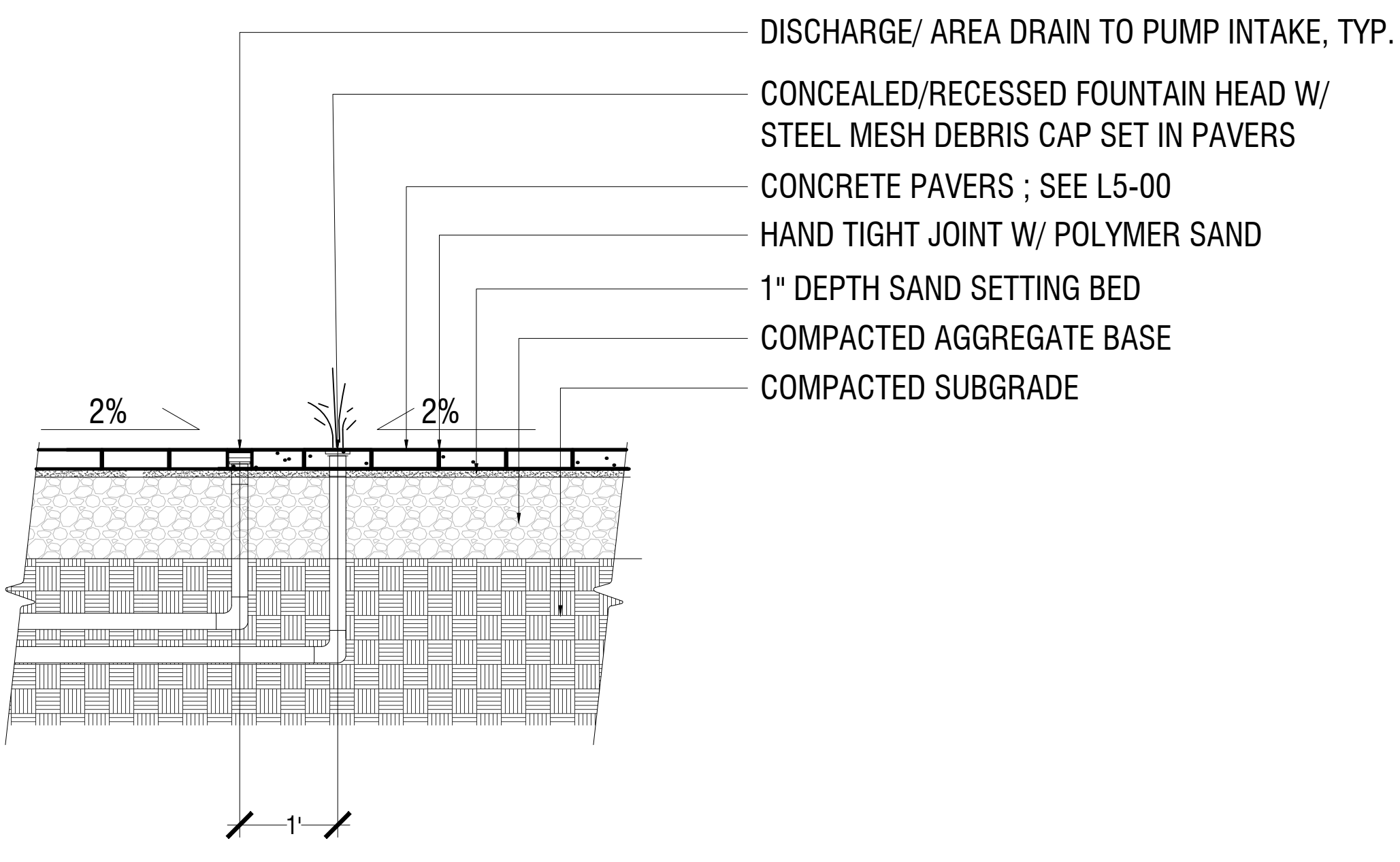
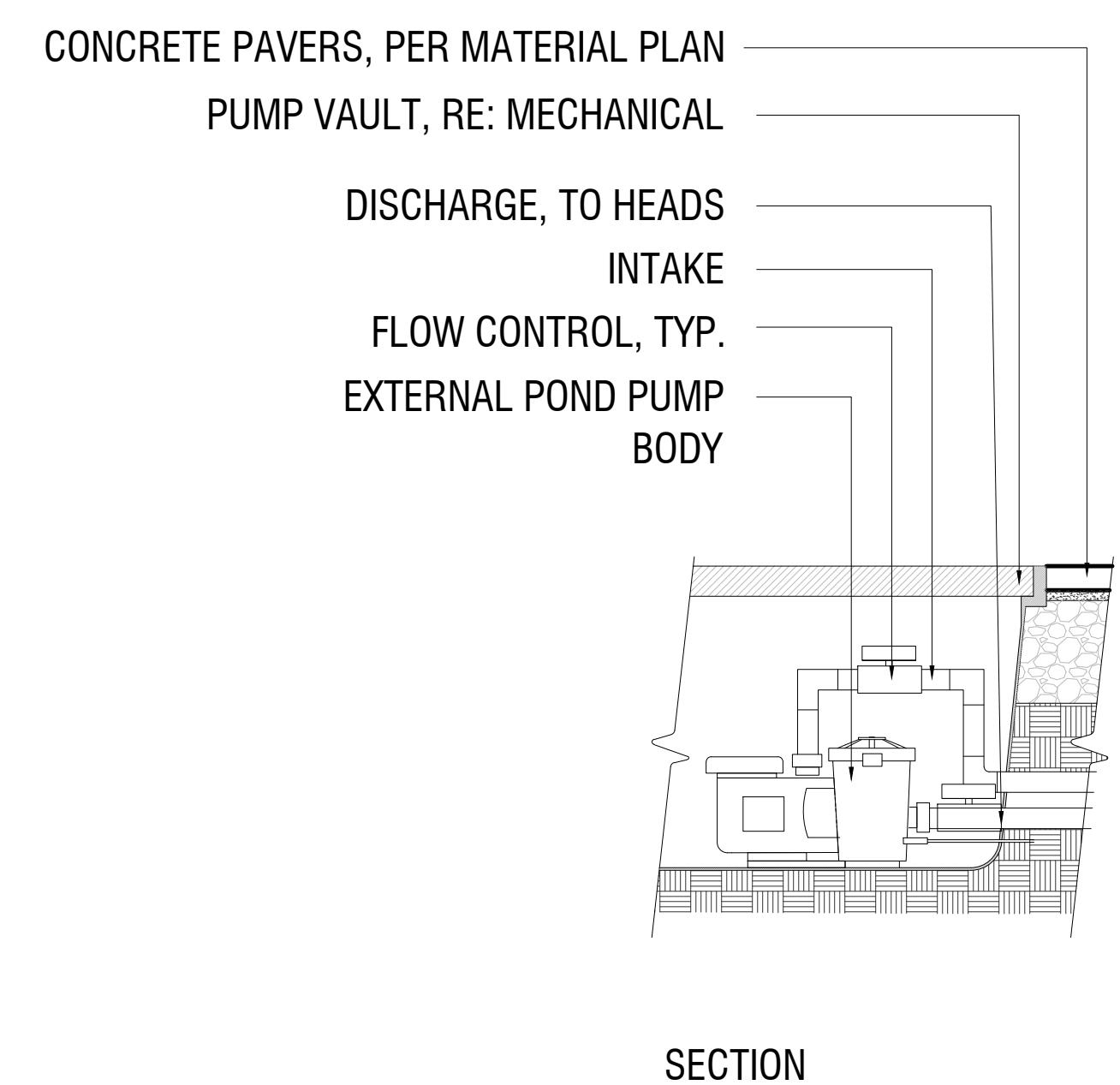
- NOTES:
- HANDRAIL REQUIRED WHERE THERE ARE 4 OR MORE RISERS
 - ALL HANDRAIL EDGES TO HAVE A MINIMUM RADIUS OF .01 INCH (.25MM)
 - HANDRAIL TO MEET CURRENT CODE REQUIREMENTS
 - RE: CIVIL DRAWINGS FOR RISER HEIGHT
 - CONTRACTOR SHALL PROVIDE SHOP DRAWINGS FOR LA APPROVAL PRIOR TO FABRICATION
 - FINAL SPEC, INCLUDING FINISH TBD BY LANDSCAPE ARCHITECT PRIOR TO CONSTRUCTION



1 Pole Light Base
1/2":1'-0"

2 Bollard Light Base
1/2":1'-0"

3 Catenary Light Base
1":1'-0"



NOTE:
1. LOCATIONS AND QUANTITIES PER LAYOUT PLAN ; SEE L 1-00
2. MECHANICAL VAULT LOCATION TBD
3. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS OF SPECIFICATION AND ASSEMBLY FOR LANDSCAPE ARCHITECT REVIEW

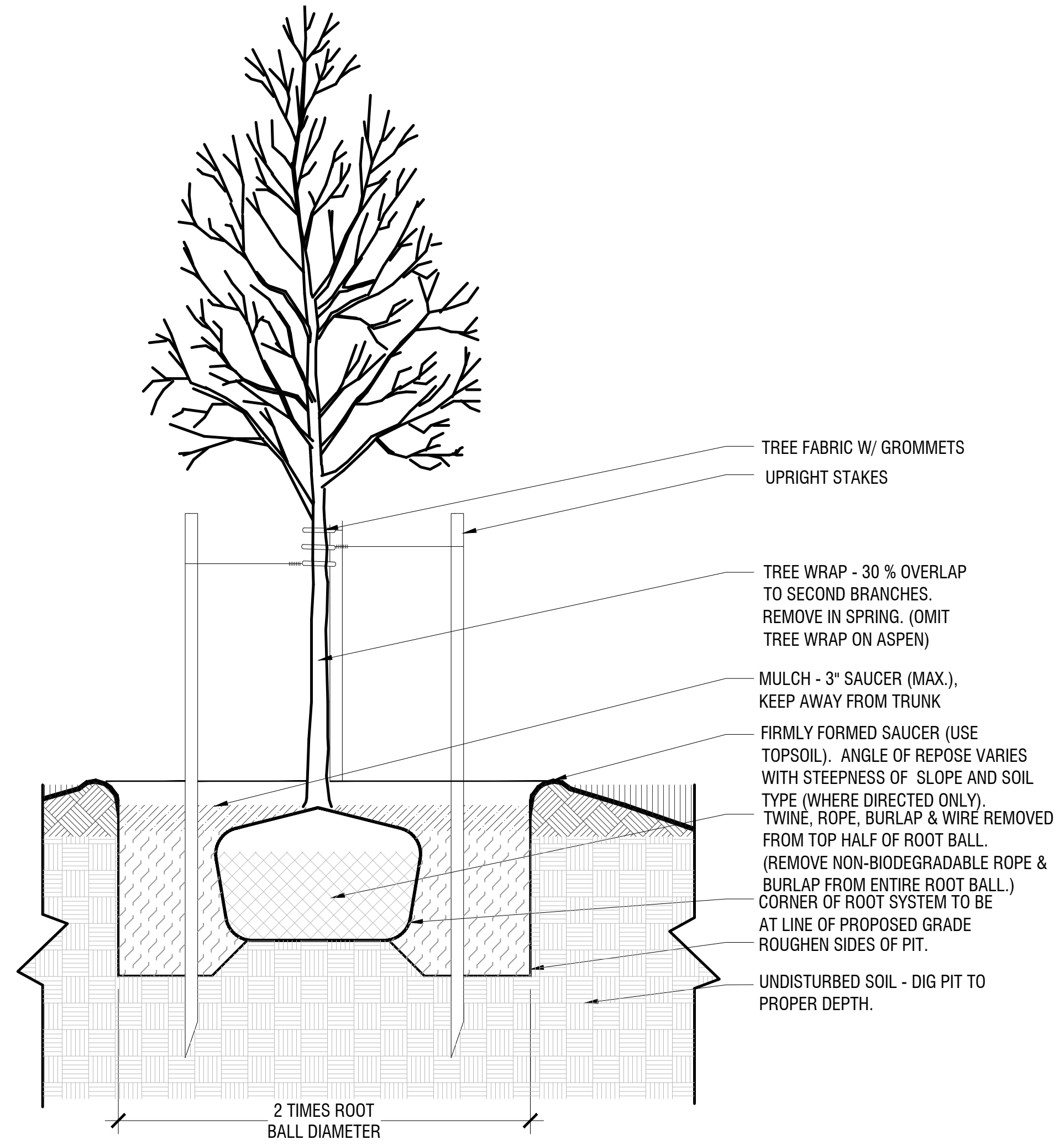
4 Water Feature Pop Jets
1":1'-0"

SITE KEYNOTES:

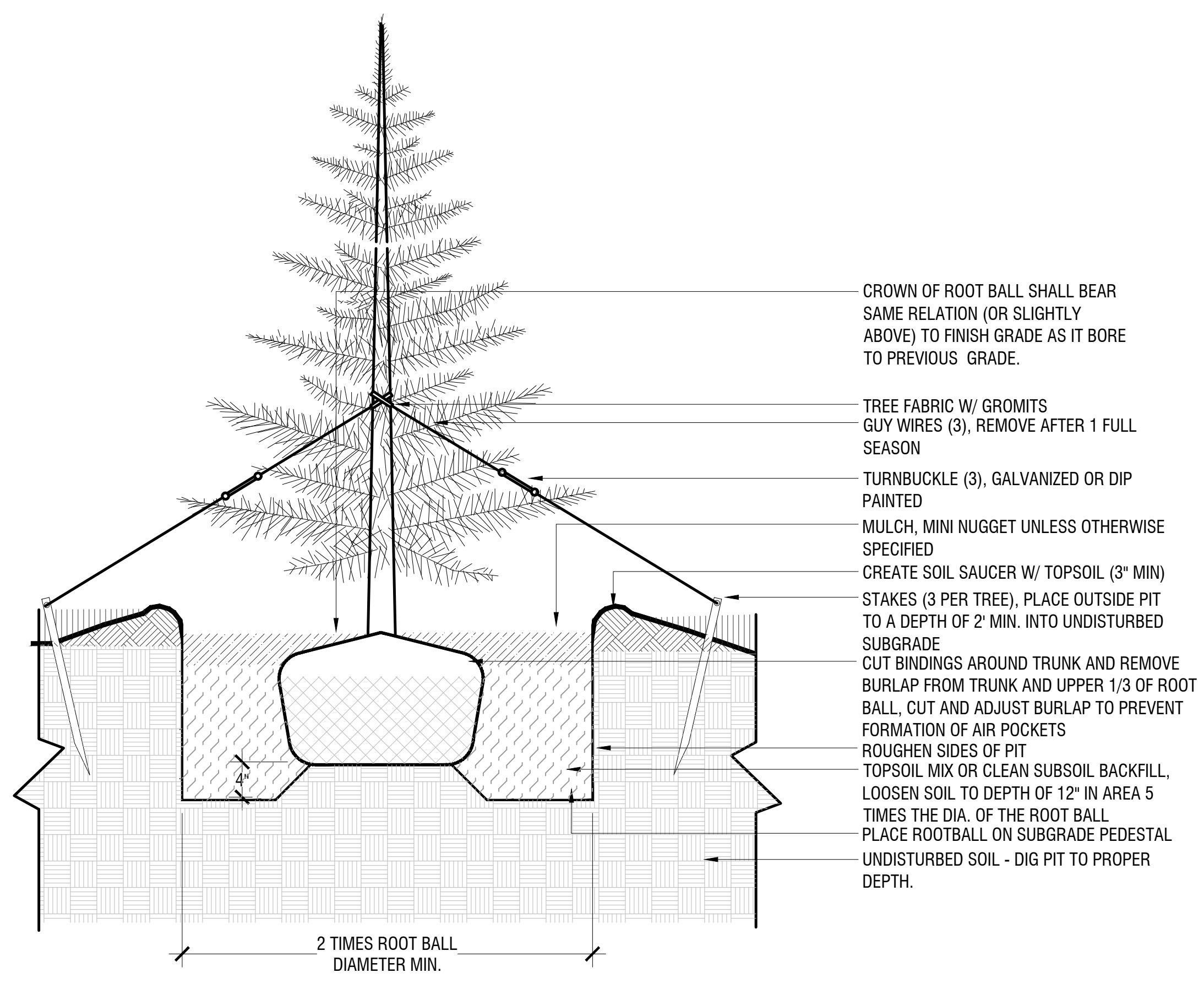
1.0	PAVEMENTS, RAMPS, CURBS	DETAIL / SHEET	6.0	RAILINGS, BARRIERS, FENCING	DETAIL / SHEET
1.1	BITUMINOUS PATH	1/L5-00	6.1	HAND RAILING	5/L5-01
1.2	EXPOSED AGGREGATE	2/L5-00	7.0 SITE LIGHTING		
1.3	CONCRETE PAVERS	3/L5-00	7.1	BOLLARD LIGHT BASE	2/L5-02
1.4	STONEDUST WALK	6/L5-00	7.2	POLE LIGHT BASE	1/L5-02
1.5	GRAVEL DRIP EDGE	7/L5-00	7.3	CATENARY LIGHT BASE	3/L5-02
2.0 JOINTING			8.0 DRAINAGE		
2.1	EXPANSION JOINT	4/L5-00	XX	NOT USED AT THIS TIME	X/XX-XX
2.2	CONTROL JOINT	5/L5-00	9.0 PLANTING AND LANDSCAPE		
3.0 STEPS			9.1	DECIDUOUS TREE PLANTING	1/L5-03
3.1	CONCRETE STEPS	8/L5-00	9.2	CONIFEROUS TREE PLANTING	2/L5-03
4.0 SITE WALLS/ EMBANKMENTS			9.3	SHRUB PLANTING	4/L5-03
4.1	WALL - CONCRETE	1/L5-01	9.4	PERENNIAL/GRASS PLANTING	3/L5-03
5.0 SITE FURNITURE			9.5	LANDSCAPE EDGING	5/L5-03
5.1	WOOD TOP BENCH	2/L5-01	10.0 MISCELLANEOUS ELEMENTS		
5.2	WOOD PLATFORM DECK	3/L5-01	10.1	WATER FEATURE POP JET	4/L5-02
5.3	BICYCLE RACK	4/L5-01			

10.1

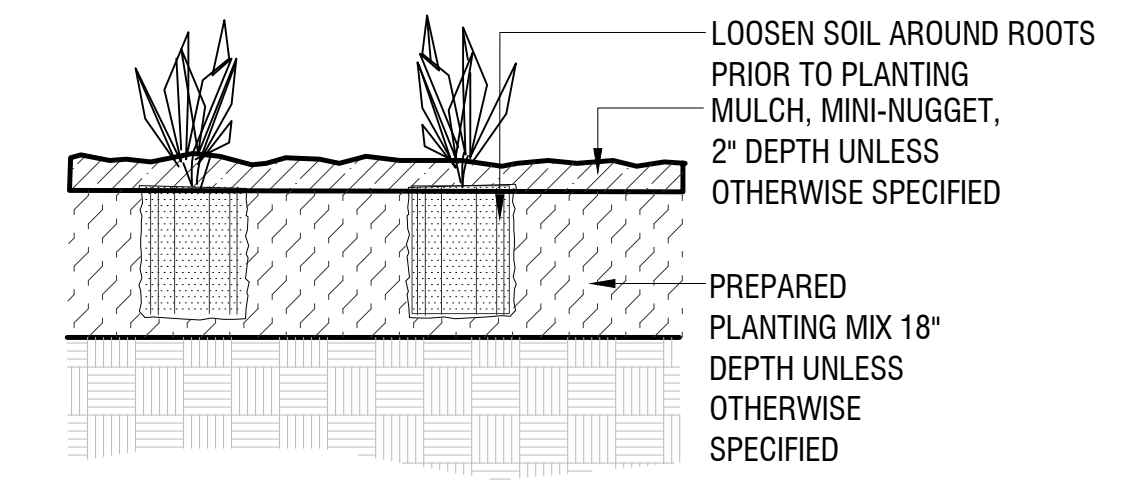
REVISIONS	DATE



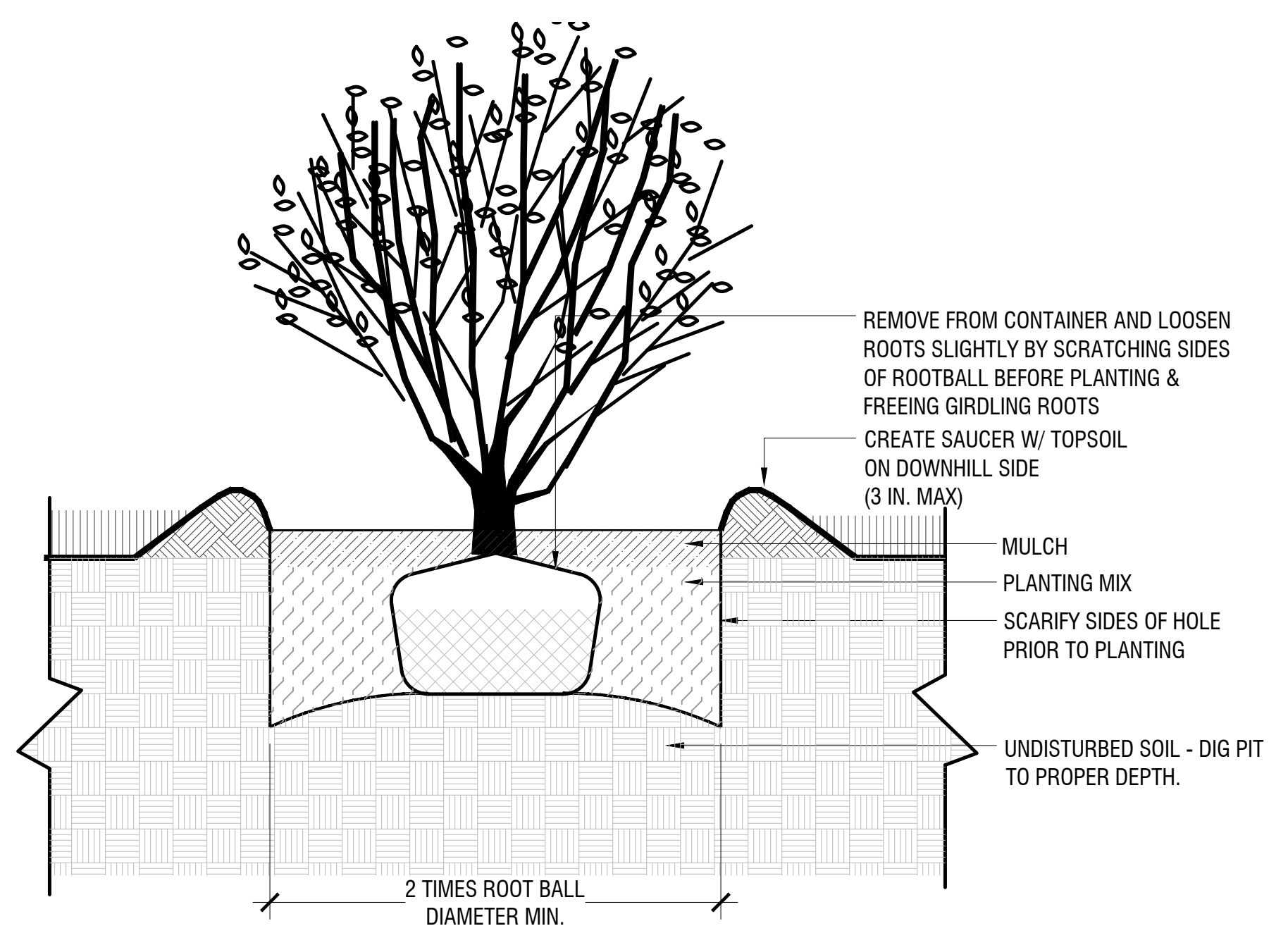
1 Deciduous Tree Planting
1":1'-0" 9.1



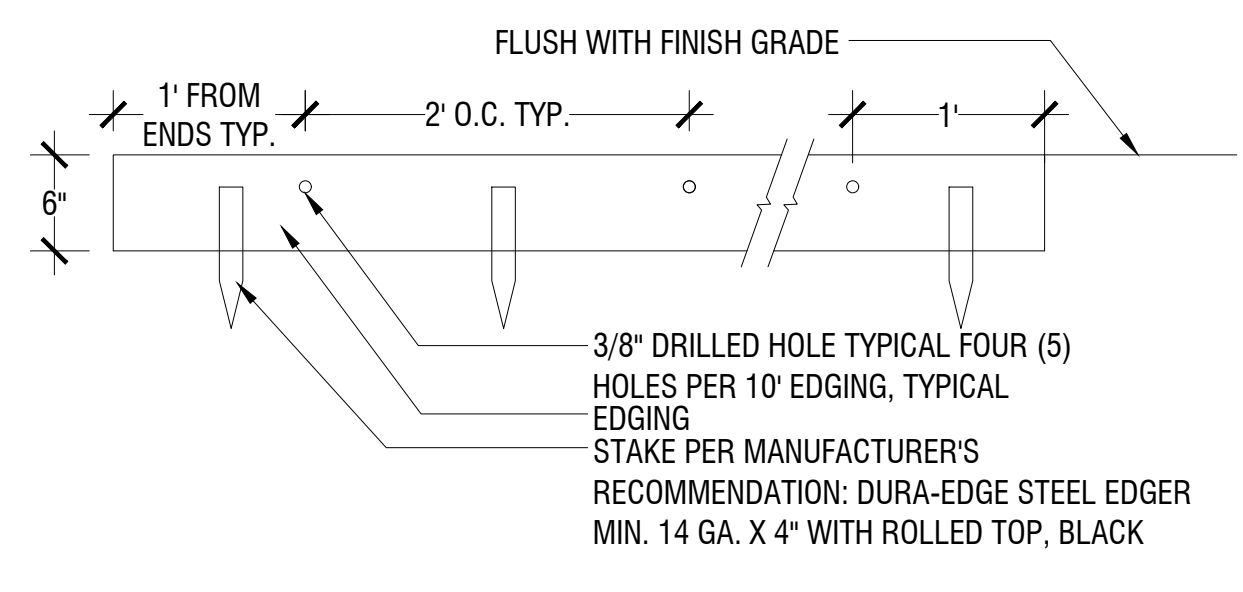
2 Conifer Tree Planting
1":1'-0" 9.2



3 Perennial / Ornamental Grass Planting
1":1'-0" 9.4



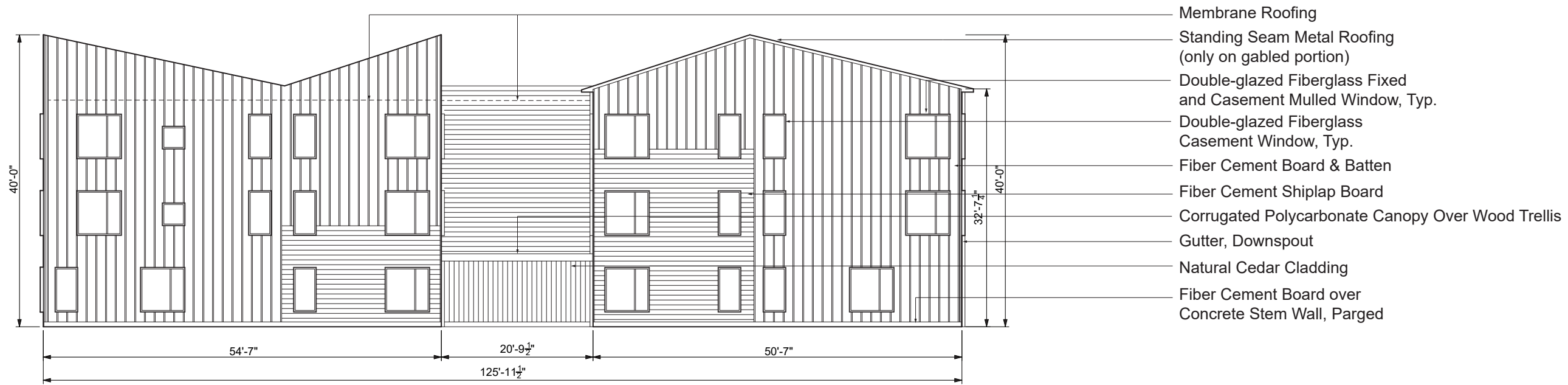
4 Shrub Planting
1":1'-0" 9.3



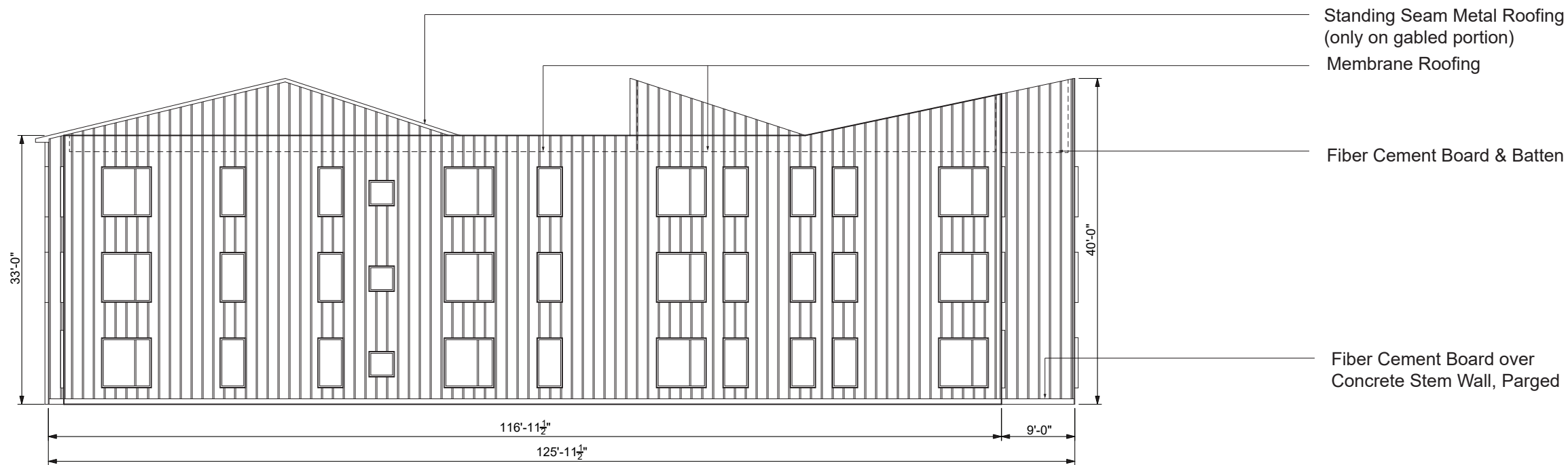
5 Steel Edging
1":1'-0" 9.5

SITE KEYNOTES:

1.0	PAVEMENTS, RAMPS, CURBS	DETAIL / SHEET	6.0	RAILINGS, BARRIERS, FENCING	DETAIL / SHEET
1.1	BITUMINOUS PATH	1/L5-00	6.1	HAND RAILING	5/L5-01
1.2	EXPOSED AGGREGATE	2/L5-00	7.0 SITE LIGHTING		
1.3	CONCRETE PAVERS	3/L5-00	7.1	BOLLARD LIGHT BASE	2/L5-02
1.4	STONEDUST WALK	6/L5-00	7.2	POLE LIGHT BASE	1/L5-02
1.5	GRAVEL DRIP EDGE	7/L5-00	7.3	CATENARY LIGHT BASE	3/L5-02
2.0 JOINTING			8.0 DRAINAGE		
2.1	EXPANSION JOINT	4/L5-00	X.X	NOT USED AT THIS TIME	X/XX-XX
2.2	CONTROL JOINT	5/L5-00	9.0 PLANTING AND LANDSCAPE		
3.0 STEPS			9.1	DECIDUOUS TREE PLANTING	1/L5-03
3.1	CONCRETE STEPS	8/L5-00	9.2	CONIFEROUS TREE PLANTING	2/L5-03
4.0 SITE WALLS/ EMBANKMENTS			9.3	SHRUB PLANTING	4/L5-03
4.1	WALL - CONCRETE	1/L5-01	9.4	PERENNIAL/GRASS PLANTING	3/L5-03
5.0 SITE FURNITURE			9.5	LANDSCAPE EDGING	5/L5-03
5.1	WOOD TOP BENCH	2/L5-01	10.0 MISCELLANEOUS ELEMENTS		
5.2	WOOD PLATFORM DECK	3/L5-01	10.1	WATER FEATURE POP JET	4/L5-02
5.3	BICYCLE RACK	4/L5-01			



FRONT SIDE

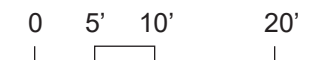


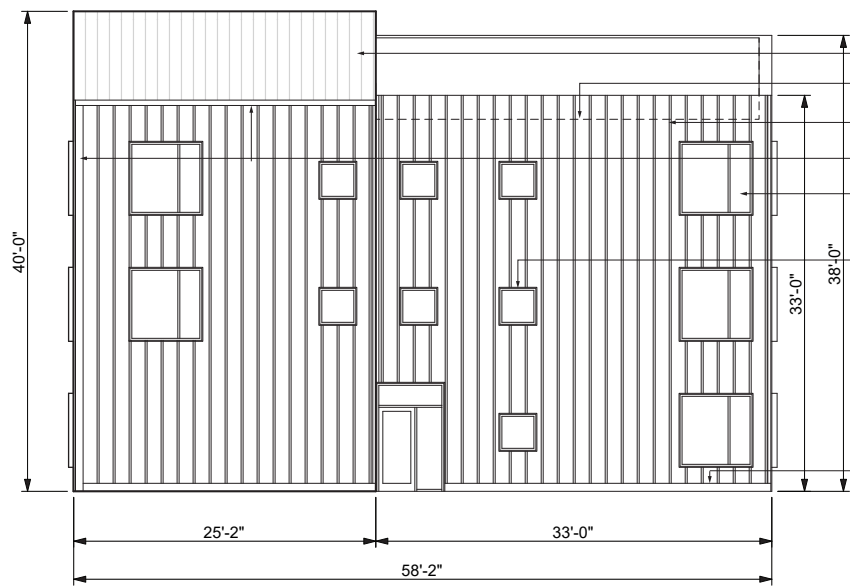
BACK SIDE

- Membrane Roofing
- Standing Seam Metal Roofing (only on gabled portion)
- Double-glazed Fiberglass Fixed and Casement Muller Window, Typ.
- Double-glazed Fiberglass Casement Window, Typ.
- Fiber Cement Board & Batten
- Fiber Cement Shiplap Board
- Corrugated Polycarbonate Canopy Over Wood Trellis
- Gutter, Downspout
- Natural Cedar Cladding
- Fiber Cement Board over Concrete Stem Wall, Parged

- Standing Seam Metal Roofing (only on gabled portion)
- Membrane Roofing
- Fiber Cement Board & Batten
- Fiber Cement Board over Concrete Stem Wall, Parged

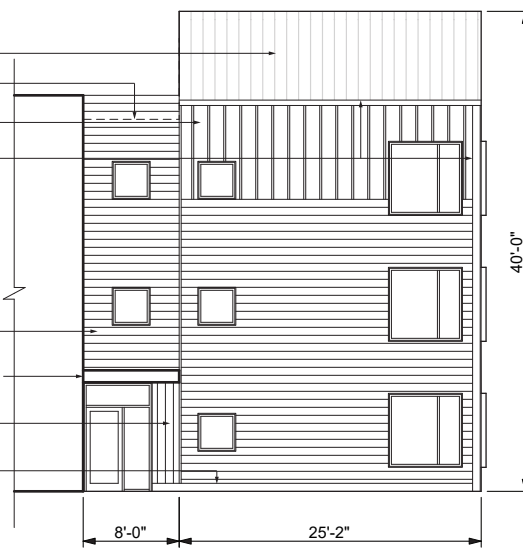
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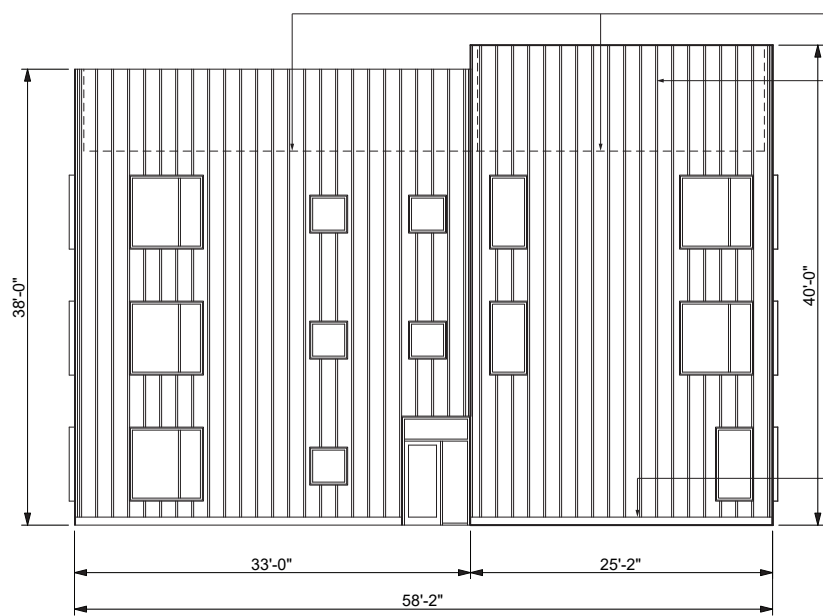


RIGHT SIDE

- Standing Seam Metal Roofing
- Membrane Roofing
- Fiber Cement Board & Batten
- Gutter, Downspout
- Double-glazed Fiberglass Fixed and Casement Muller Window, Typ.
- Double-glazed Fiberglass Casement Window, Typ.
- Fiber Cement Shiplap Board
- Corrugated Polycarbonate Canopy Over Wood Trellis
- Natural Cedar Cladding
- Fiber Cement Board over Concrete Stem Wall, Parged

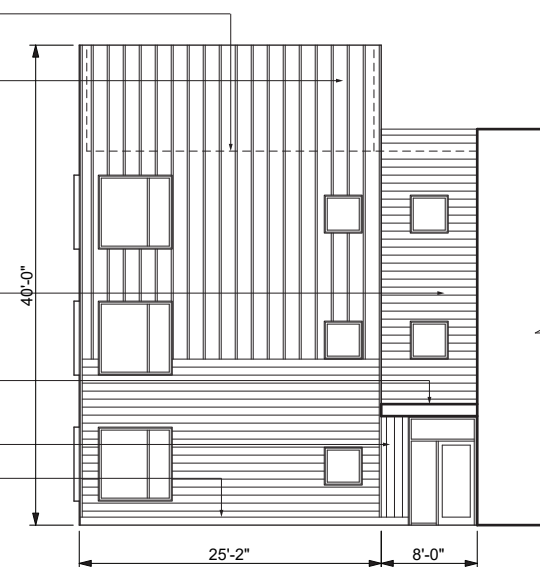


COURTYARD RIGHT SIDE



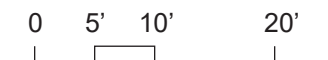
LEFT SIDE

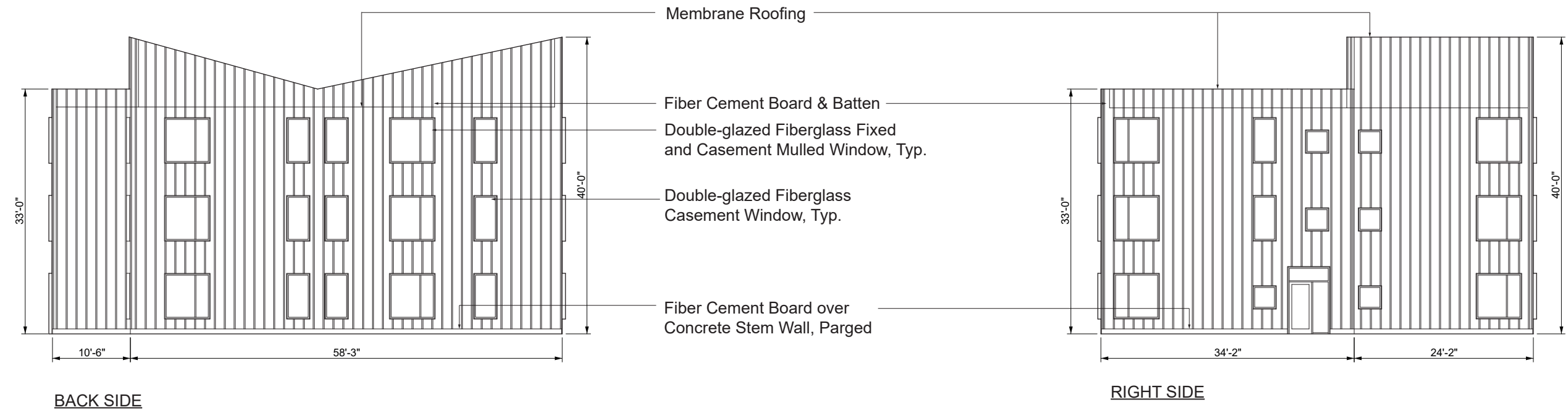
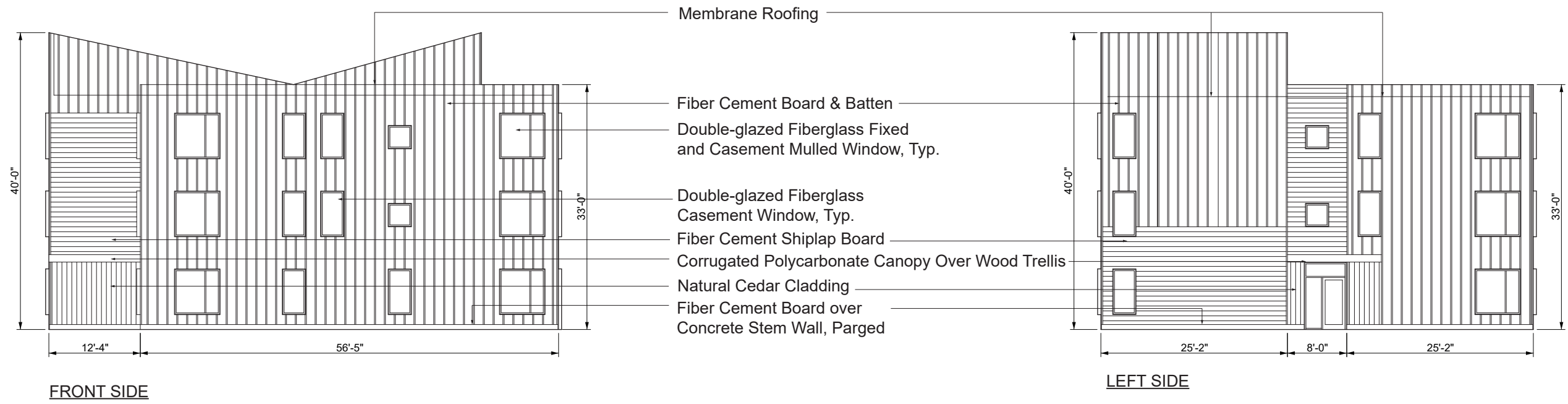
- Membrane Roofing
- Fiber Cement Board & Batten
- Fiber Cement Shiplap Board
- Corrugated Polycarbonate Canopy Over Wood Trellis
- Natural Cedar Cladding
- Fiber Cement Board over Concrete Stem Wall, Parged



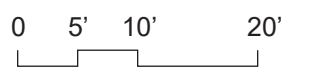
COURTYARD LEFT SIDE

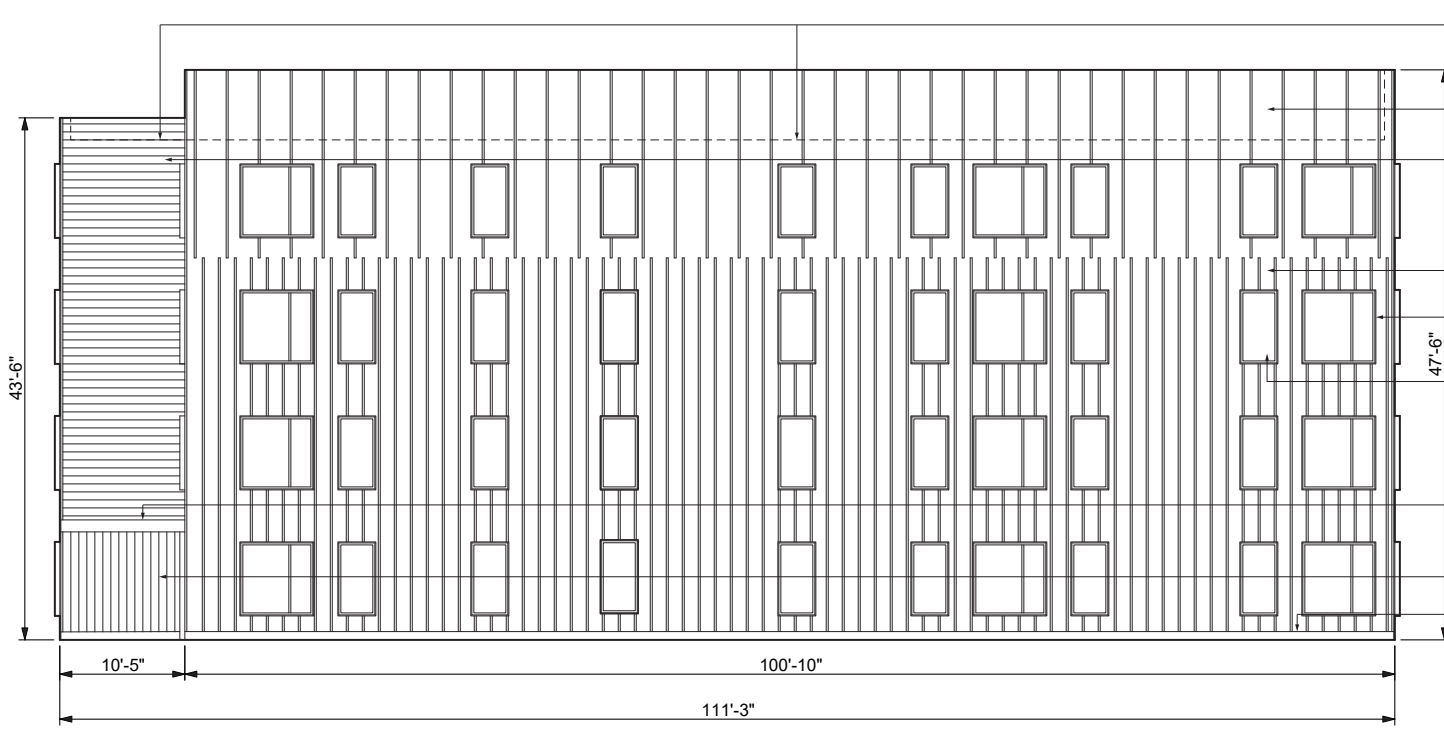
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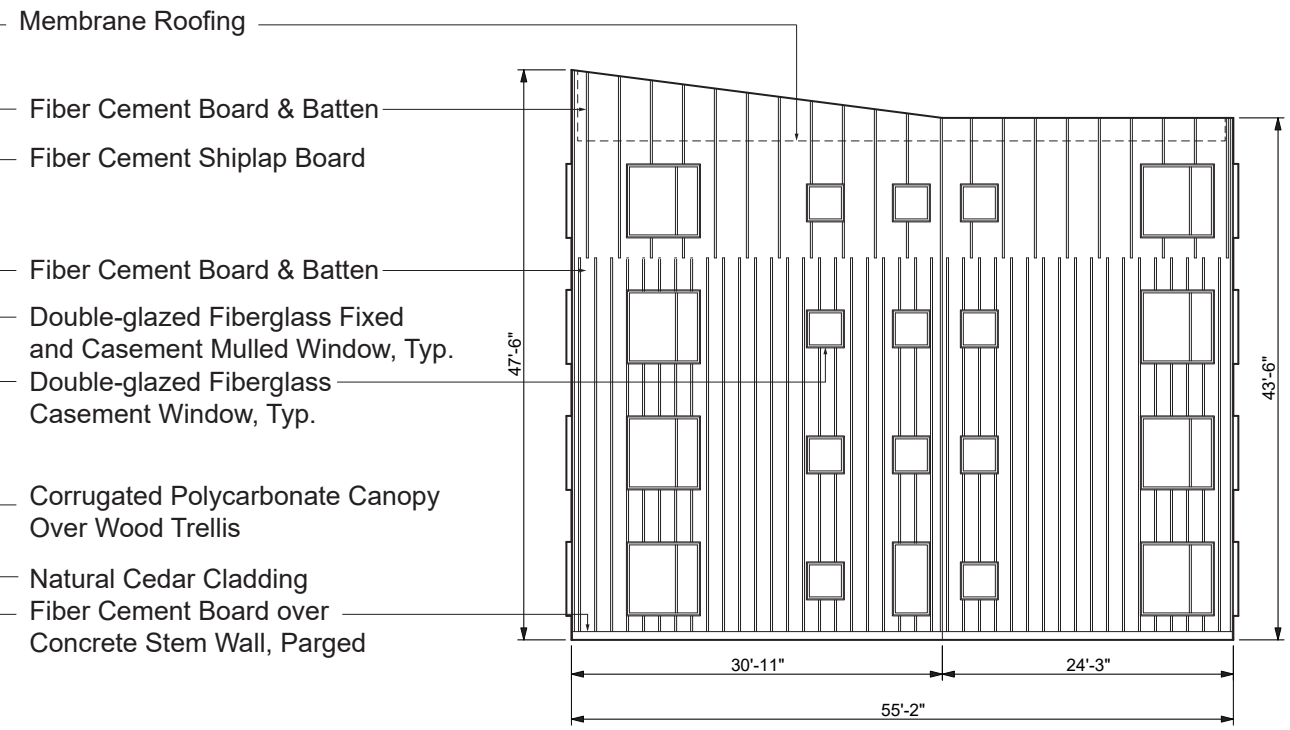


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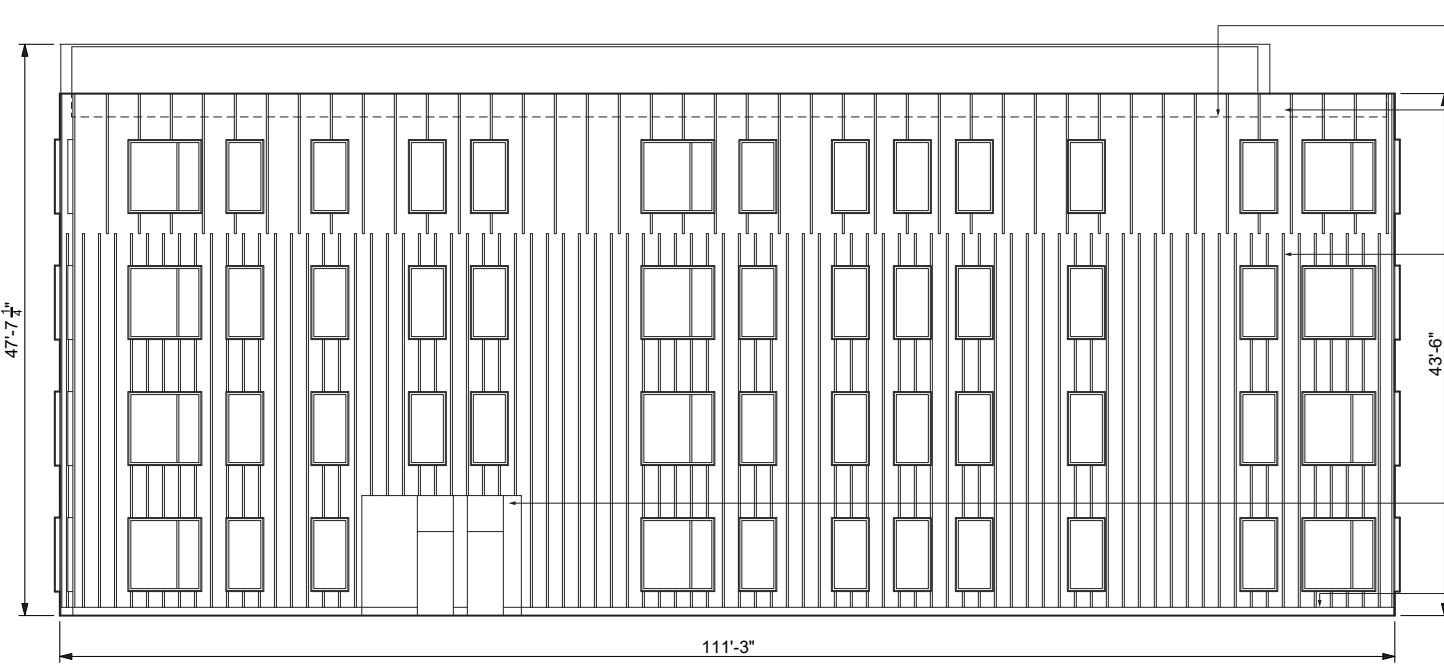




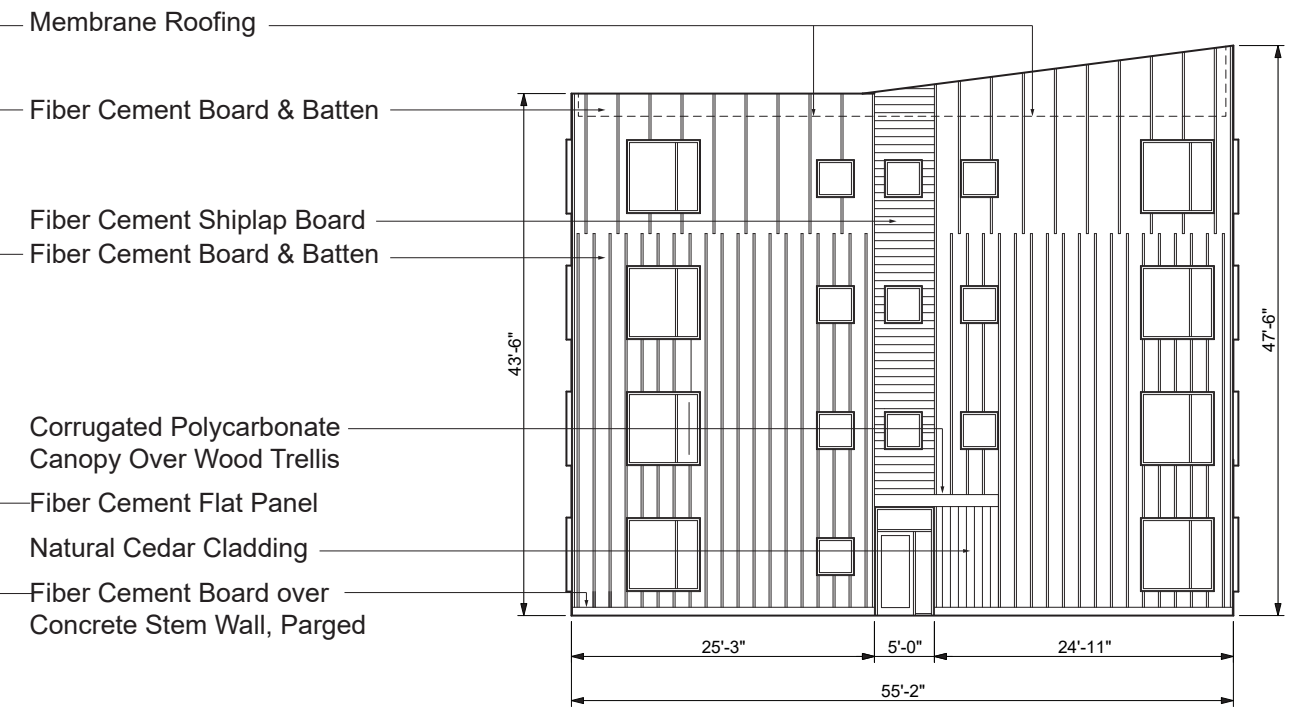
FRONT SIDE



RIGHT SIDE



BACK SIDE

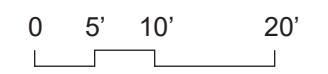


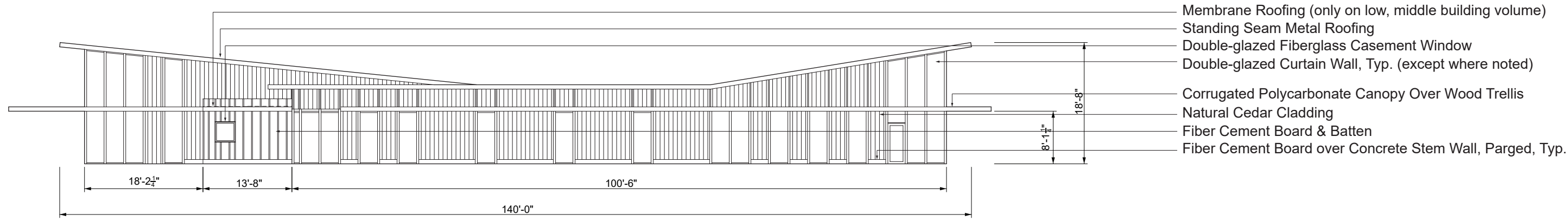
LEFT SIDE

- Membrane Roofing
- Fiber Cement Board & Batten
- Fiber Cement Shiplap Board
- Fiber Cement Board & Batten
- Double-glazed Fiberglass Fixed and Casement Muller Window, Typ.
- Double-glazed Fiberglass Casement Window, Typ.
- Corrugated Polycarbonate Canopy Over Wood Trellis
- Natural Cedar Cladding
- Fiber Cement Board over Concrete Stem Wall, Parged

- Membrane Roofing
- Fiber Cement Board & Batten
- Fiber Cement Shiplap Board
- Fiber Cement Board & Batten
- Corrugated Polycarbonate Canopy Over Wood Trellis
- Fiber Cement Flat Panel
- Natural Cedar Cladding
- Fiber Cement Board over Concrete Stem Wall, Parged

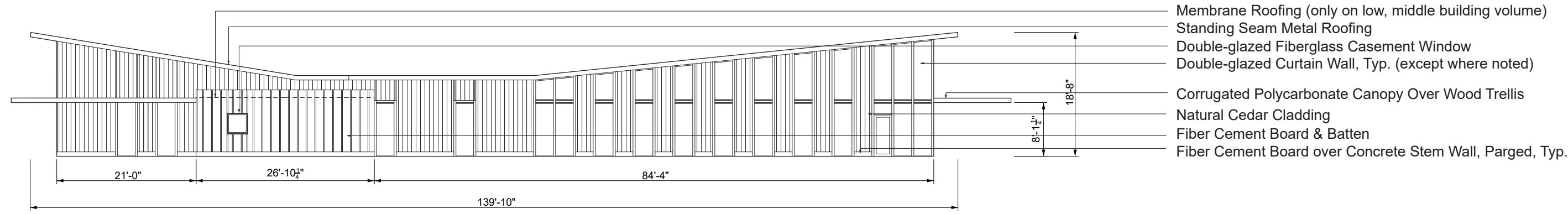
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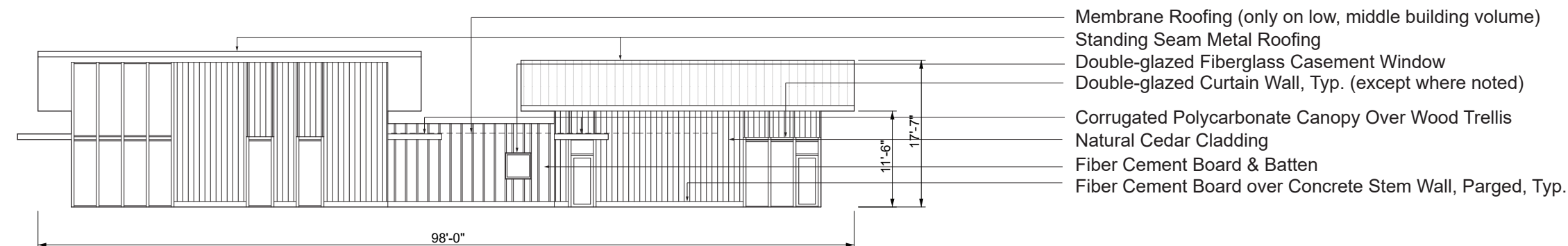
- Membrane Roofing (only on low, middle building volume)
- Standing Seam Metal Roofing
- Double-glazed Fiberglass Casement Window
- Double-glazed Curtain Wall, Typ. (except where noted)
- Corrugated Polycarbonate Canopy Over Wood Trellis
- Natural Cedar Cladding
- Fiber Cement Board & Batten
- Fiber Cement Board over Concrete Stem Wall, Parged, Typ.

SOUTH FACADE



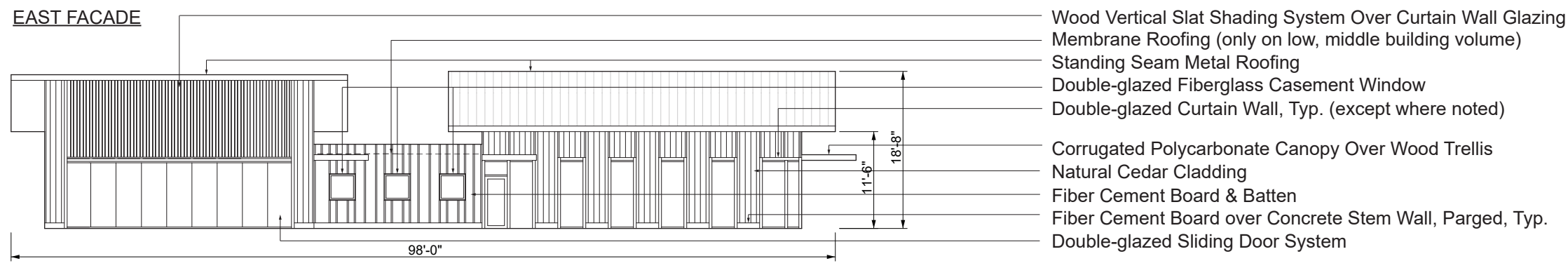
- Membrane Roofing (only on low, middle building volume)
- Standing Seam Metal Roofing
- Double-glazed Fiberglass Casement Window
- Double-glazed Curtain Wall, Typ. (except where noted)
- Corrugated Polycarbonate Canopy Over Wood Trellis
- Natural Cedar Cladding
- Fiber Cement Board & Batten
- Fiber Cement Board over Concrete Stem Wall, Parged, Typ.

NORTH FACADE



- Membrane Roofing (only on low, middle building volume)
- Standing Seam Metal Roofing
- Double-glazed Fiberglass Casement Window
- Double-glazed Curtain Wall, Typ. (except where noted)
- Corrugated Polycarbonate Canopy Over Wood Trellis
- Natural Cedar Cladding
- Fiber Cement Board & Batten
- Fiber Cement Board over Concrete Stem Wall, Parged, Typ.

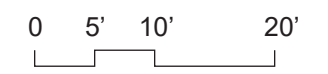
EAST FACADE

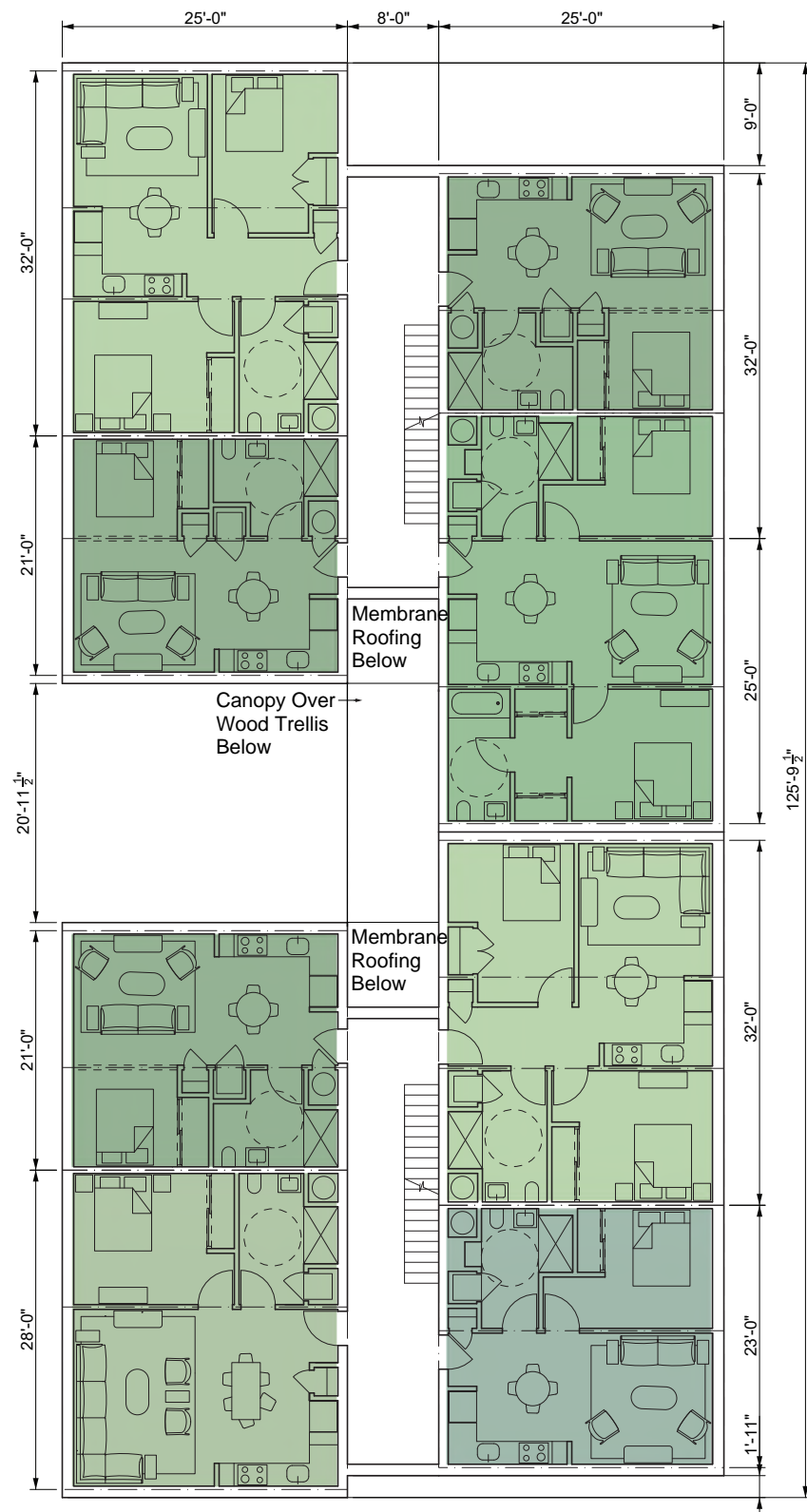


- Wood Vertical Slat Shading System Over Curtain Wall Glazing
- Membrane Roofing (only on low, middle building volume)
- Standing Seam Metal Roofing
- Double-glazed Fiberglass Casement Window
- Double-glazed Curtain Wall, Typ. (except where noted)
- Corrugated Polycarbonate Canopy Over Wood Trellis
- Natural Cedar Cladding
- Fiber Cement Board & Batten
- Fiber Cement Board over Concrete Stem Wall, Parged, Typ.
- Double-glazed Sliding Door System

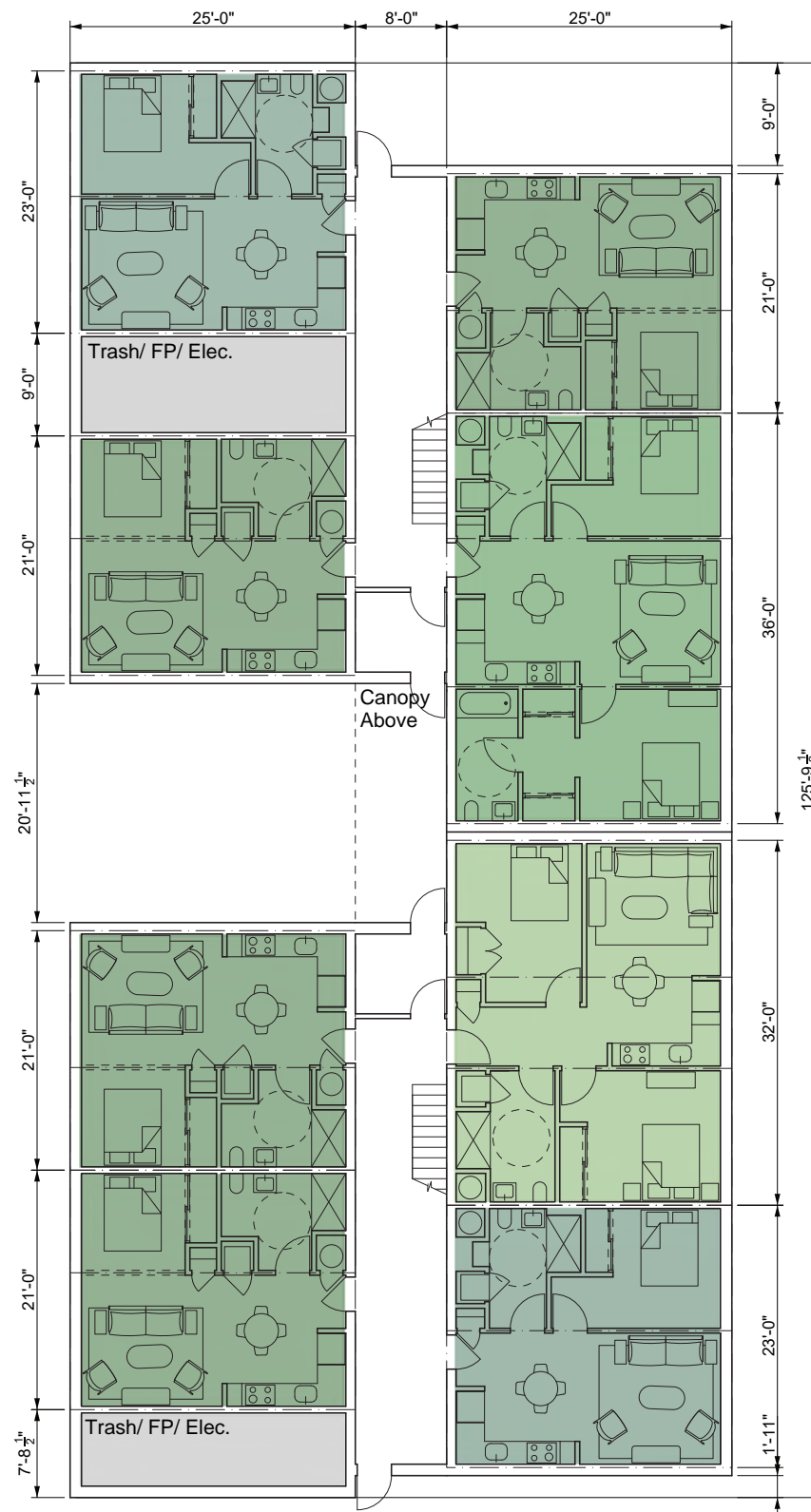
WEST FACADE

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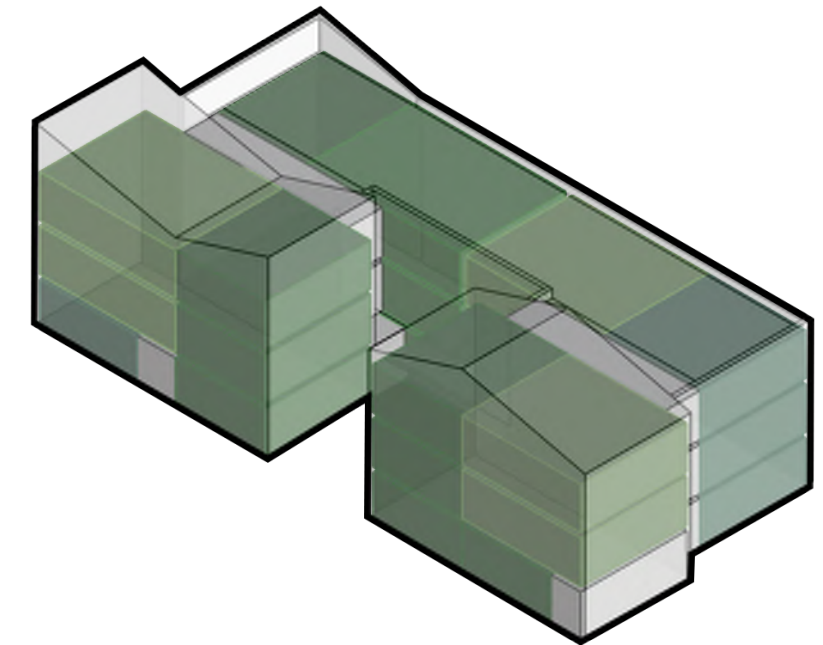




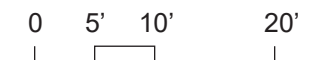
TYPICAL FLOOR
6,126 GSF

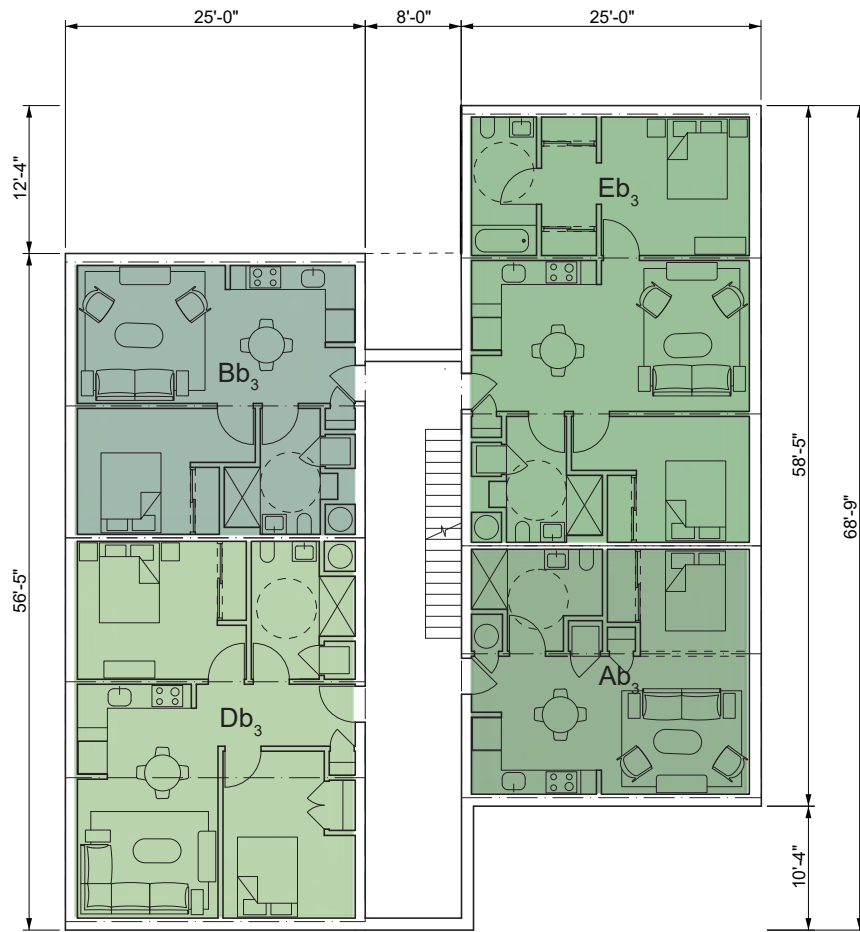


GROUND FLOOR
6,244 GSF

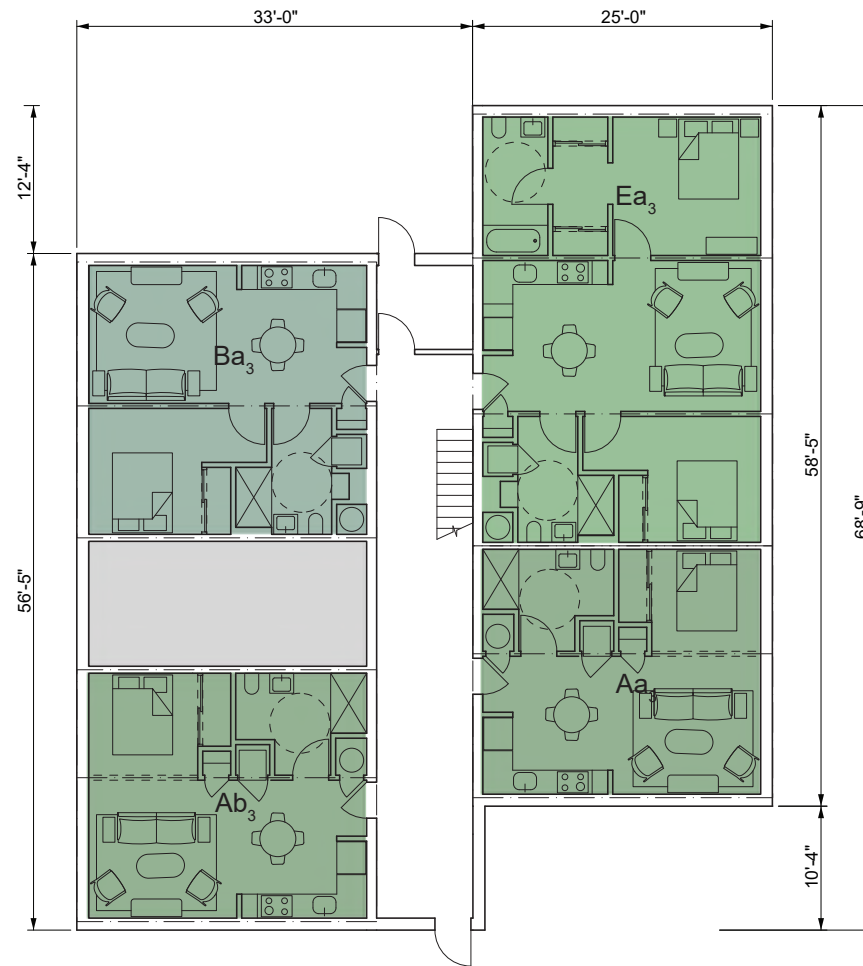


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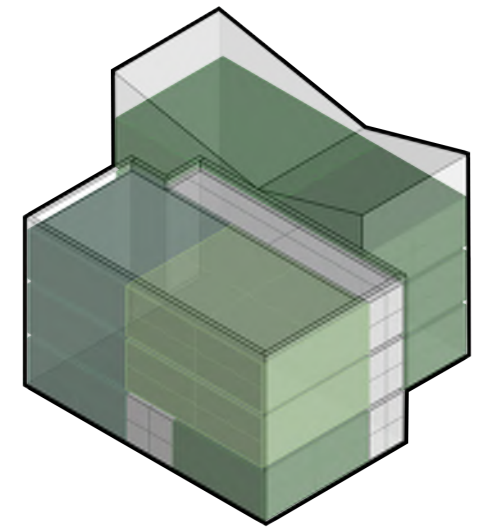




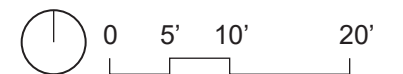
TYPICAL FLOOR
3,278 GSF



GROUND FLOOR
3,334 GSF



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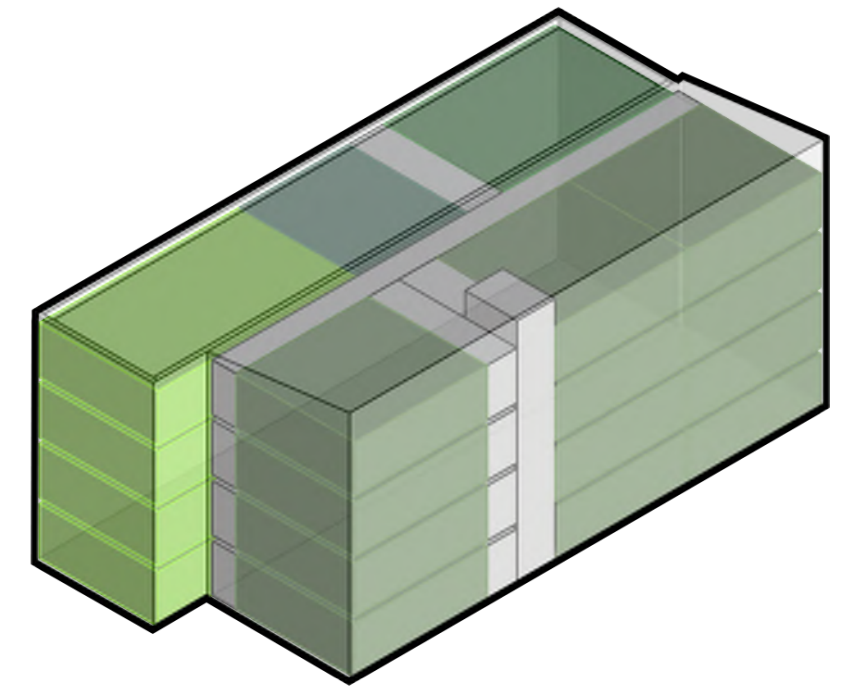
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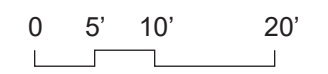
TYPICAL FLOOR
5,705 GSF

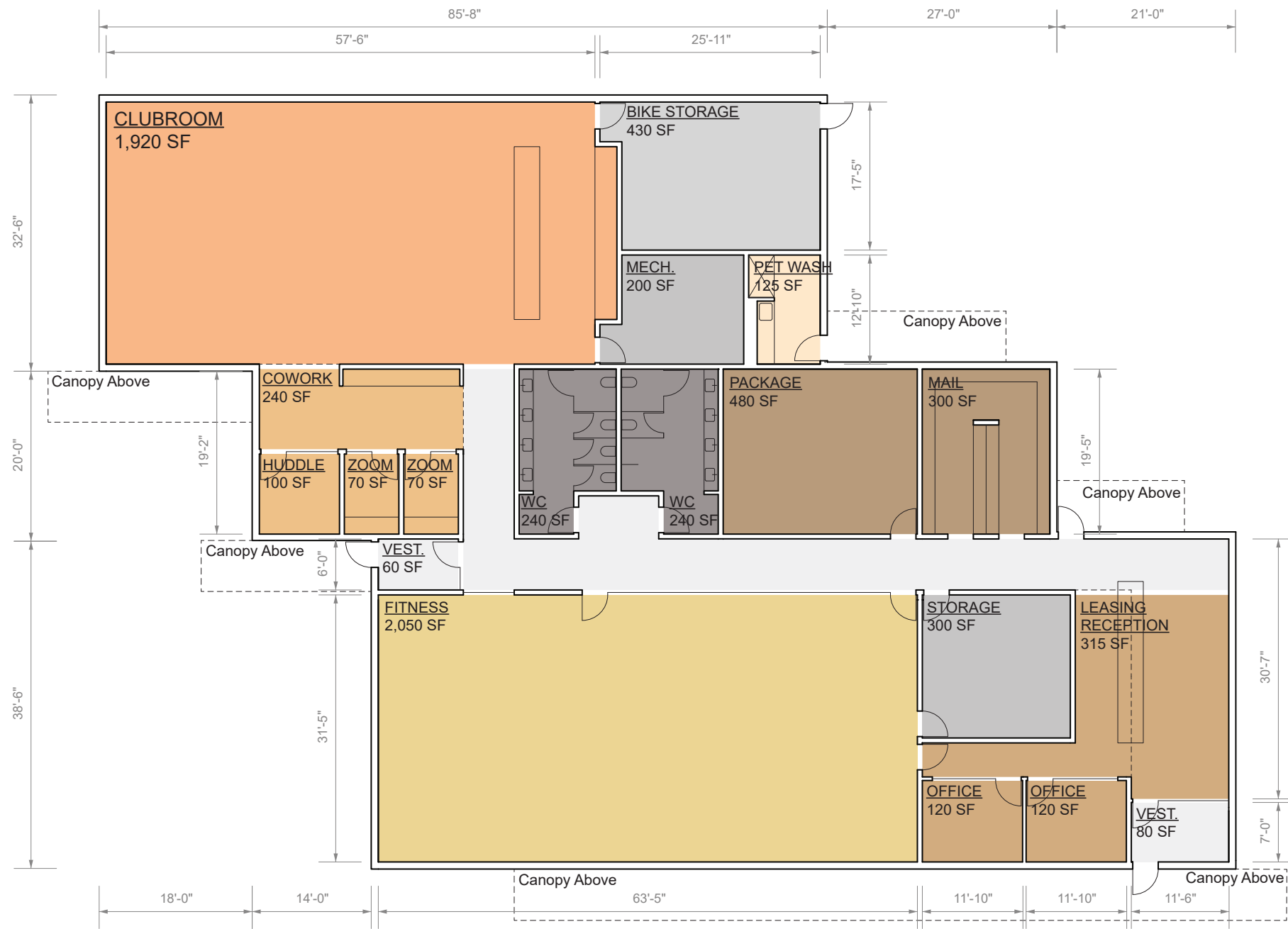


GROUND FLOOR
5,729 GSF

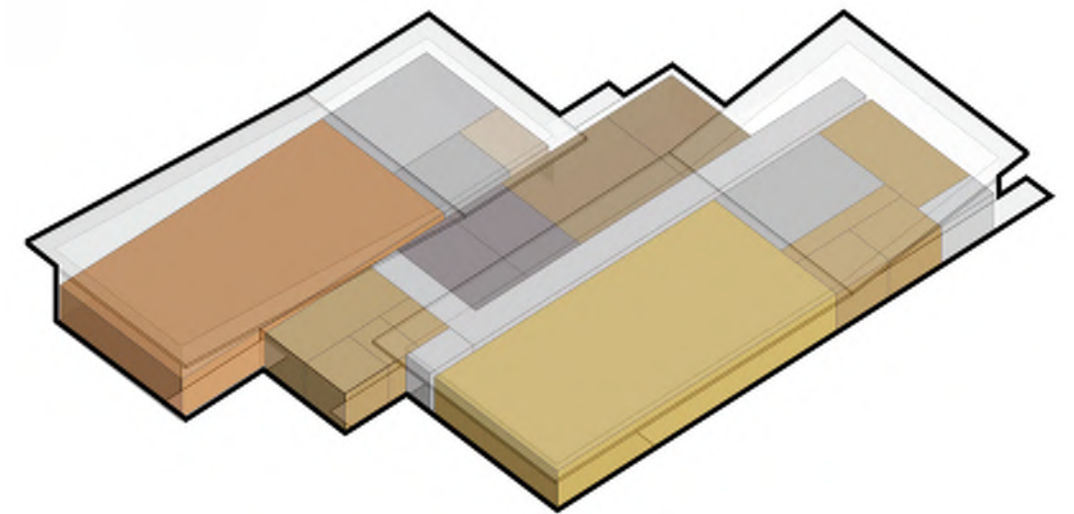


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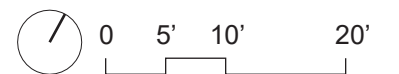




GROUND FLOOR PLAN
8,350 GSF



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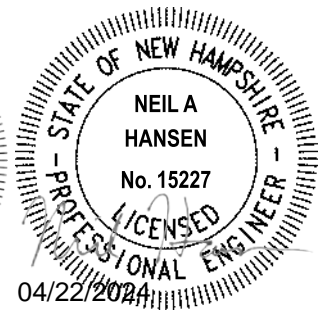
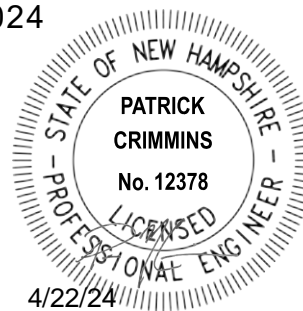


Proposed Multi-Family Development
100 Durgin Lane
Portsmouth, NH

Drainage Analysis

100 Durgin Lane Owner, LLC

April 22, 2024



Tighe & Bond

Section 1 Project Description

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Appendices

A Web Soil Survey Report
B Extreme Precipitation Tables
C Coastal Precipitation Increase

Section 1

Project Description

The proposed project is located at 100 Durgin Lane and includes lots identified as Map 239 Lots 13-2, 16 & 18 on the City of Portsmouth Tax Maps. The site was previously home to Christmas Tree Shops and Bed, Bath and Beyond locations which are no longer in operation. The properties are a combined 26.1 acres of land and are bound to the west by Route 16, to the north by the Motel 6 property and Gosling Road, to the south by the Hampton Inn and Home Depot properties, and to the east by an Eversource easement, Pep Boys and Durgin Plaza.

The proposed project consists of the demolition of the existing Christmas Tree Shops and Bed, Bath and Beyond building and the construction of approximately 360 rental housing units in a mix of 3-story and 4-story buildings. The proposed project will include a community building and associated site improvements such as parking, pedestrian access, community spaces, utilities, stormwater management, lighting, and landscaping. The proposed project also includes a reduction in overall impervious surface on the development lot.

1.1 On-Site Soil Description

The soils on site are primarily drainage Class B soils with wetland areas of drainage Class C/D. The ground cover within the area of study consists mostly of paved surfaces, building, and landscaped islands. There are two (2) wetland systems that drain into two (2) separate unnamed brooks that eventually join together before flowing into the Piscataqua River. The site slopes generally from the center of the parcel to either the eastern or western wetlands.

1.2 Pre- and Post-Development Comparison

The pre-development and post-development watershed areas have been analyzed at five (5) distinct points of analysis (PA-1 through PA-5). While the points of analysis have remained unchanged, the contributing sub-catchment areas varied between pre-development and post-development conditions. These adjustments were made to reflect the differences in drainage patterns between the existing and proposed conditions. The overall area analyzed as part of this drainage analysis was held constant.

PA-1 is located to the northwest end of the site. Under the existing condition, contributing watershed areas to this point of analysis consist of runoff from the existing retail store building, as well as a combination of impervious loading areas behind the building and grassed and wooded areas to the north. Runoff discharges from an existing 24" drainage outlet to an unnamed wetland after flowing through a water quality unit (pre-treatment only, by today's standard). Under the proposed condition, the contributing watershed(s) are proposed to convey runoff to an underground detention basin for detention prior to release out of the same existing outlet. Flows are proposed to be pre-treated by either offline catch-basins or a Contech CDS unit, and treated by a Contech Jellyfish Filter prior discharge.

PA-2 is located to the northeast end of the site. Under the existing condition, contributing watershed areas to this point of analysis consist of primarily impervious paved parking and access areas. There are both treated and untreated impervious areas that flow to this point of analysis. Existing treatment practices include a rain garden, as well as a separate water quality unit (pre-treatment only, by today's standard) for a portion of the contributing watersheds. The roadway extension off Durgin Lane and adjacent parking to the east are not treated. Under the proposed condition, the contributing watershed(s) are proposed to be treated by various rain gardens and bioretention areas. Pretreatment is included by a combination of offline catch basins, Rain Guardian Turrets, and a sediment forebay.

PA-3 is located along the eastern edge of the site. Under the existing condition, contributing watersheds to this point of analysis are characterized by primarily impervious areas, with a mix of both wooded and landscaped/lawn areas. A small rain garden treats a small portion of this watershed, and water quality unit pre-treats a portion of the remaining area prior to discharge through a 36" outlet to an unnamed wetland. Under the proposed condition, the contributing watershed(s) are proposed to be treated by a treatment train, including a Contech CDS unit and a Contech Jellyfish Filter unit prior to discharge through the same 36" outlet.

PA-4 is located at the southwestern corner of the site. Under the existing condition, the contributing watershed pitches runoff from primarily impervious parking areas off site without conveyance or treatment. Under the proposed condition, the watershed area associated with this point of analysis is instead captured on-site and conveyed to PA-3 for proper treatment.

PA-5 is located at the southern end of the site, a smaller point of analysis to assess flows exiting the property down the access road connecting to the neighboring abutter. In both the existing and proposed conditions, runoff to this point of analysis flow from a high point in the roadway down to a couple of off-site catch basins. Under the proposed condition, the contributing watershed area is reduced as to not increase runoff to the abutting property post-development.

The peak discharge rates at these points of analysis were determined by analyzing Type III, 24-hour storm events. The rainfall data for these storm events were obtained from the data published by the Northeast Regional Climate Center at Cornell University, which can be found in Appendix B.

Furthermore, the site is located within a Coastal and Great Bay Community, therefore an added factor of safety of 15% was included as required by Env-Wq 1503.08(I).

1.3 Calculation Methods

The design storms analyzed in this study are the 2-year, 10-year, 25-year and 50-year 24-hour duration storm events. The stormwater modeling system, HydroCAD 10.0 was utilized to predict the peak runoff rates from these storm events. The peak discharge rates were determined by analyzing Type III 24-hour storm events. The rainfall data for these storm events were obtained from the data published by the Northeast Regional Climate Center at Cornell University, with an additional 15% added factor of safety as required by Env-Wq 1503.08(I).

The time of concentration was computed using the TR-55 Method, which provides a means of determining the time for an entire watershed to contribute runoff to a specific location via sheet flows, shallow concentrated flow, and channel flow. Runoff curve numbers were calculated by estimating the coverage areas and then summing the curve number for the coverage area as a percent of the entire watershed.

References:

1. HydroCAD Stormwater Modeling System, by HydroCAD Software Solutions LLC, Chocorua, New Hampshire.
2. New Hampshire Stormwater Management Manual, Volume 2, Post-Construction Best Management Practices Selection and Design, December 2008.
3. "Extreme Precipitation in New York & New England." Extreme Precipitation in New York & New England by Northeast Regional Climate Center (NRCC), 26 June 2012.

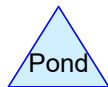
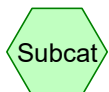
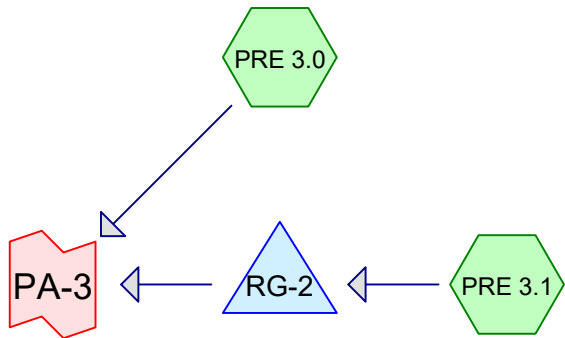
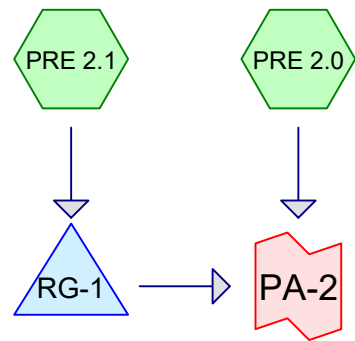
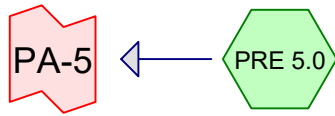
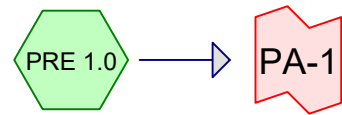
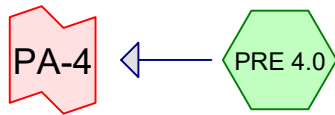
Section 2

Pre-Development Conditions

To analyze the pre-development condition, the site has been modeled utilizing the five (5) distinct points of analysis described in Section 1. These points of analysis and watersheds are depicted on the plan entitled "Pre-Development Watershed Plan", Sheet C-801.

2.1 Pre-Development Calculations

2.2 Pre-Development Watershed Plan



Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
148,803	61	>75% Grass cover, Good, HSG B (PRE 1.0, PRE 2.0, PRE 2.1, PRE 3.0, PRE 3.1, PRE 4.0)
1,271	74	>75% Grass cover, Good, HSG C (PRE 2.1)
18,071	80	>75% Grass cover, Good, HSG D (PRE 1.0, PRE 2.0, PRE 3.0, PRE 4.0)
353,404	98	Paved parking, HSG B (PRE 1.0, PRE 2.0, PRE 2.1, PRE 3.0, PRE 3.1, PRE 4.0, PRE 5.0)
10,273	98	Paved parking, HSG C (PRE 2.0)
5,406	98	Paved parking, HSG D (PRE 3.0, PRE 4.0, PRE 5.0)
79,133	98	Unconnected roofs, HSG B (PRE 1.0)
98,651	55	Woods, Good, HSG B (PRE 1.0, PRE 2.0, PRE 3.0)
513	70	Woods, Good, HSG C (PRE 1.0)
715,525	84	TOTAL AREA

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
679,991	HSG B	PRE 1.0, PRE 2.0, PRE 2.1, PRE 3.0, PRE 3.1, PRE 4.0, PRE 5.0
12,057	HSG C	PRE 1.0, PRE 2.0, PRE 2.1
23,477	HSG D	PRE 1.0, PRE 2.0, PRE 3.0, PRE 4.0, PRE 5.0
0	Other	
715,525		TOTAL AREA

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

Subcatchment PRE 1.0: Runoff Area=207,580 sf 57.69% Impervious Runoff Depth>1.93"
Flow Length=999' Tc=6.8 min CN=82 Runoff=10.36 cfs 33,388 cf

Subcatchment PRE 2.0: Runoff Area=140,155 sf 70.79% Impervious Runoff Depth>2.43"
Flow Length=500' Tc=5.0 min CN=88 Runoff=9.15 cfs 28,403 cf

Subcatchment PRE 2.1: Runoff Area=58,944 sf 77.01% Impervious Runoff Depth>2.62"
Flow Length=360' Slope=0.0150 '/' Tc=5.0 min CN=90 Runoff=4.10 cfs 12,846 cf

Subcatchment PRE 3.0: Runoff Area=267,550 sf 57.12% Impervious Runoff Depth>1.85"
Flow Length=435' Tc=11.0 min CN=81 Runoff=11.20 cfs 41,284 cf

Subcatchment PRE 3.1: Runoff Area=16,036 sf 66.20% Impervious Runoff Depth>2.17"
Flow Length=155' Slope=0.0150 '/' Tc=5.0 min CN=85 Runoff=0.94 cfs 2,903 cf

Subcatchment PRE 4.0: Runoff Area=16,868 sf 71.28% Impervious Runoff Depth>2.52"
Flow Length=115' Tc=5.0 min CN=89 Runoff=1.14 cfs 3,546 cf

Subcatchment PRE 5.0: Runoff Area=8,392 sf 100.00% Impervious Runoff Depth>3.44"
Flow Length=145' Slope=0.0170 '/' Tc=5.0 min CN=98 Runoff=0.69 cfs 2,409 cf

Pond RG-1: Peak Elev=60.37' Storage=2,804 cf Inflow=4.10 cfs 12,846 cf
Outflow=1.49 cfs 12,737 cf

Pond RG-2: Peak Elev=62.29' Storage=449 cf Inflow=0.94 cfs 2,903 cf
Outflow=0.59 cfs 2,862 cf

Link PA-1: Inflow=10.36 cfs 33,388 cf
Primary=10.36 cfs 33,388 cf

Link PA-2: Inflow=10.46 cfs 41,140 cf
Primary=10.46 cfs 41,140 cf

Link PA-3: Inflow=11.80 cfs 44,145 cf
Primary=11.80 cfs 44,145 cf

Link PA-4: Inflow=1.14 cfs 3,546 cf
Primary=1.14 cfs 3,546 cf

Link PA-5: Inflow=0.69 cfs 2,409 cf
Primary=0.69 cfs 2,409 cf

Total Runoff Area = 715,525 sf Runoff Volume = 124,780 cf Average Runoff Depth = 2.09"
37.36% Pervious = 267,309 sf 62.64% Impervious = 448,216 sf

Summary for Subcatchment PRE 1.0:

[47] Hint: Peak is 703% of capacity of segment #3

Runoff = 19.19 cfs @ 12.10 hrs, Volume= 62,260 cf, Depth> 3.60"
 Routed to Link PA-1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Yr Rainfall=5.58"

Area (sf)	CN	Description
57,422	61	>75% Grass cover, Good, HSG B
40,628	98	Paved parking, HSG B
27,467	55	Woods, Good, HSG B
79,133	98	Unconnected roofs, HSG B
0	74	>75% Grass cover, Good, HSG C
0	98	Paved parking, HSG C
*	98	Roofs, HGC C
513	70	Woods, Good, HSG C
2,417	80	>75% Grass cover, Good, HSG D
0	98	Paved parking, HSG D
0	77	Woods, Good, HSG D
207,580	82	Weighted Average
87,819		42.31% Pervious Area
119,761		57.69% Impervious Area
79,133		66.08% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	100	0.0050	0.85		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.68"
1.5	220	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.3	679	0.0050	3.47	2.73	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Corrugated PP, smooth interior
6.8	999	Total			

Summary for Subcatchment PRE 2.0:

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

[47] Hint: Peak is 617% of capacity of segment #3

Runoff = 15.55 cfs @ 12.07 hrs, Volume= 49,288 cf, Depth> 4.22"
 Routed to Link PA-2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Yr Rainfall=5.58"

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Type III 24-hr 10-Yr Rainfall=5.58"

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Area (sf)	CN	Description
25,651	61	>75% Grass cover, Good, HSG B
88,940	98	Paved parking, HSG B
7,775	55	Woods, Good, HSG B
0	74	>75% Grass cover, Good, HSG C
10,273	98	Paved parking, HSG C
*	0	98 Roofs, HGC C
0	70	Woods, Good, HSG C
7,516	80	>75% Grass cover, Good, HSG D
0	98	Paved parking, HSG D
0	77	Woods, Good, HSG D
140,155	88	Weighted Average
40,942		29.21% Pervious Area
99,213		70.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.48		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.68"
1.2	200	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.0	200	0.0050	3.21	2.52	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
3.3	500	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment PRE 2.1:

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

Runoff = 6.78 cfs @ 12.07 hrs, Volume= 21,785 cf, Depth> 4.44"
Routed to Pond RG-1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.58"

Area (sf)	CN	Description
12,279	61	>75% Grass cover, Good, HSG B
45,394	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
1,271	74	>75% Grass cover, Good, HSG C
0	98	Paved parking, HSG C
*	0	98 Roofs, HGC C
0	70	Woods, Good, HSG C
0	80	>75% Grass cover, Good, HSG D
0	98	Paved parking, HSG D
0	77	Woods, Good, HSG D
58,944	90	Weighted Average
13,550		22.99% Pervious Area
45,394		77.01% Impervious Area

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Type III 24-hr 10-Yr Rainfall=5.58"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.31		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.68"
1.7	260	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.0	360	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment PRE 3.0:

[47] Hint: Peak is 839% of capacity of segment #3

Runoff = 21.14 cfs @ 12.15 hrs, Volume= 77,964 cf, Depth> 3.50"
Routed to Link PA-3 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.58"

Area (sf)	CN	Description
44,666	61	>75% Grass cover, Good, HSG B
150,206	98	Paved parking, HSG B
63,409	55	Woods, Good, HSG B
0	74	>75% Grass cover, Good, HSG C
0	98	Paved parking, HSG C
*	0	Roofs, HGC C
0	70	Woods, Good, HSG C
6,658	80	>75% Grass cover, Good, HSG D
2,611	98	Paved parking, HSG D
0	77	Woods, Good, HSG D
267,550	81	Weighted Average
114,733		42.88% Pervious Area
152,817		57.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	25	0.1000	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.68"
5.2	315	0.0400	1.00		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	55	0.0050	3.21	2.52	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.9	40	0.0050	0.35		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.0	435	Total			

Summary for Subcatchment PRE 3.1:

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

Runoff = 1.67 cfs @ 12.07 hrs, Volume= 5,219 cf, Depth> 3.91"
 Routed to Pond RG-2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Yr Rainfall=5.58"

Area (sf)	CN	Description
5,420	61	>75% Grass cover, Good, HSG B
10,616	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
0	74	>75% Grass cover, Good, HSG C
0	98	Paved parking, HSG C
*	98	Roofs, HGC C
0	70	Woods, Good, HSG C
0	80	>75% Grass cover, Good, HSG D
0	98	Paved parking, HSG D
0	77	Woods, Good, HSG D
16,036	85	Weighted Average
5,420		33.80% Pervious Area
10,616		66.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0150	1.31		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.68"
0.4	55	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.7	155	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment PRE 4.0:

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

Runoff = 1.91 cfs @ 12.07 hrs, Volume= 6,082 cf, Depth> 4.33"
 Routed to Link PA-4 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Yr Rainfall=5.58"

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Type III 24-hr 10-Yr Rainfall=5.58"

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Area (sf)	CN	Description
3,365	61	>75% Grass cover, Good, HSG B
11,270	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
0	74	>75% Grass cover, Good, HSG C
0	98	Paved parking, HSG C
*	98	Roofs, HGC C
0	70	Woods, Good, HSG C
1,480	80	>75% Grass cover, Good, HSG D
753	98	Paved parking, HSG D
0	77	Woods, Good, HSG D
16,868	89	Weighted Average
4,845		28.72% Pervious Area
12,023		71.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0270	1.66		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.68"
0.1	15	0.3300	4.02		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.1	115	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment PRE 5.0:

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

Runoff = 1.06 cfs @ 12.07 hrs, Volume= 3,734 cf, Depth> 5.34"
Routed to Link PA-5 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.58"

Area (sf)	CN	Description
0	61	>75% Grass cover, Good, HSG B
6,350	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
0	74	>75% Grass cover, Good, HSG C
0	98	Paved parking, HSG C
*	98	Roofs, HGC C
0	70	Woods, Good, HSG C
0	80	>75% Grass cover, Good, HSG D
2,042	98	Paved parking, HSG D
0	77	Woods, Good, HSG D
8,392	98	Weighted Average
8,392		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0170	1.38		Sheet Flow, SHEET Smooth surfaces n= 0.011 P2= 3.68"
0.3	45	0.0170	2.65		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.5	145	Total, Increased to minimum Tc = 5.0 min			

Summary for Pond RG-1:

[92] Warning: Device #3 is above defined storage

[93] Warning: Storage range exceeded by 0.24'

[58] Hint: Peaked 0.81' above defined flood level

Inflow Area = 58,944 sf, 77.01% Impervious, Inflow Depth > 4.44" for 10-Yr event
 Inflow = 6.78 cfs @ 12.07 hrs, Volume= 21,785 cf
 Outflow = 4.08 cfs @ 12.25 hrs, Volume= 21,647 cf, Atten= 40%, Lag= 10.4 min
 Primary = 4.08 cfs @ 12.25 hrs, Volume= 21,647 cf
 Routed to Link PA-2 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 61.24' @ 12.23 hrs Surf.Area= 4,110 sf Storage= 5,022 cf
 Flood Elev= 60.43' Surf.Area= 3,078 sf Storage= 2,973 cf

Plug-Flow detention time= 28.3 min calculated for 21,647 cf (99% of inflow)
 Center-of-Mass det. time= 24.3 min (810.1 - 785.8)

Volume	Invert	Avail.Storage	Storage Description	
#1	57.65'	5,022 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
57.65	2,300	0.0	0	0
58.50	2,300	40.0	782	782
60.00	2,300	30.0	1,035	1,817
61.00	4,110	100.0	3,205	5,022

Device	Routing	Invert	Outlet Devices
#1	Primary	54.00'	24.0" Round Culvert L= 19.0' Ke= 0.500 Inlet / Outlet Invert= 54.00' / 52.19' S= 0.0953 ' / Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Device 1	57.65'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	61.15'	4.5" x 2.5" Horiz. Orifice/Grate X 4.00 columns X 8 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.89 cfs @ 12.25 hrs HW=61.22' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 3.89 cfs of 37.72 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.72 cfs @ 8.77 fps)
- 3=Orifice/Grate (Weir Controls 2.16 cfs @ 0.85 fps)

Summary for Pond RG-2:

Inflow Area = 16,036 sf, 66.20% Impervious, Inflow Depth > 3.91" for 10-Yr event
 Inflow = 1.67 cfs @ 12.07 hrs, Volume= 5,219 cf
 Outflow = 0.96 cfs @ 12.19 hrs, Volume= 5,166 cf, Atten= 43%, Lag= 7.2 min
 Primary = 0.96 cfs @ 12.19 hrs, Volume= 5,166 cf
 Routed to Link PA-3 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 62.92' @ 12.19 hrs Surf.Area= 1,745 sf Storage= 815 cf
 Flood Elev= 64.25' Surf.Area= 2,000 sf Storage= 1,847 cf

Plug-Flow detention time= 21.2 min calculated for 5,155 cf (99% of inflow)
 Center-of-Mass det. time= 15.0 min (817.1 - 802.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	61.65'	1,847 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
61.65	1,745	0.0	0	0
62.50	1,745	40.0	593	593
64.00	1,745	30.0	785	1,379
64.25	2,000	100.0	468	1,847

Device	Routing	Invert	Outlet Devices
#1	Primary	61.60'	12.0" Round Culvert L= 130.0' Ke= 0.500 Inlet / Outlet Invert= 61.60' / 61.00' S= 0.0046 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	61.65'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Primary	63.95'	4.5" x 2.5" Horiz. Orifice/Grate X 4.00 columns X 8 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.96 cfs @ 12.19 hrs HW=62.92' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 0.96 cfs of 2.80 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.96 cfs @ 4.86 fps)
- 3=Orifice/Grate (Controls 0.00 cfs)

Summary for Link PA-1:

Inflow Area = 207,580 sf, 57.69% Impervious, Inflow Depth > 3.60" for 10-Yr event
 Inflow = 19.19 cfs @ 12.10 hrs, Volume= 62,260 cf
 Primary = 19.19 cfs @ 12.10 hrs, Volume= 62,260 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PA-2:

Inflow Area = 199,099 sf, 72.63% Impervious, Inflow Depth > 4.28" for 10-Yr event
Inflow = 17.09 cfs @ 12.07 hrs, Volume= 70,934 cf
Primary = 17.09 cfs @ 12.07 hrs, Volume= 70,934 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PA-3:

Inflow Area = 283,586 sf, 57.63% Impervious, Inflow Depth > 3.52" for 10-Yr event
Inflow = 22.09 cfs @ 12.15 hrs, Volume= 83,131 cf
Primary = 22.09 cfs @ 12.15 hrs, Volume= 83,131 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PA-4:

Inflow Area = 16,868 sf, 71.28% Impervious, Inflow Depth > 4.33" for 10-Yr event
Inflow = 1.91 cfs @ 12.07 hrs, Volume= 6,082 cf
Primary = 1.91 cfs @ 12.07 hrs, Volume= 6,082 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PA-5:

Inflow Area = 8,392 sf, 100.00% Impervious, Inflow Depth > 5.34" for 10-Yr event
Inflow = 1.06 cfs @ 12.07 hrs, Volume= 3,734 cf
Primary = 1.06 cfs @ 12.07 hrs, Volume= 3,734 cf, Atten= 0%, Lag= 0.0 min

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

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

Subcatchment PRE 1.0: Runoff Area=207,580 sf 57.69% Impervious Runoff Depth>4.98"
Flow Length=999' Tc=6.8 min CN=82 Runoff=26.26 cfs 86,098 cf

Subcatchment PRE 2.0: Runoff Area=140,155 sf 70.79% Impervious Runoff Depth>5.66"
Flow Length=500' Tc=5.0 min CN=88 Runoff=20.53 cfs 66,088 cf

Subcatchment PRE 2.1: Runoff Area=58,944 sf 77.01% Impervious Runoff Depth>5.89"
Flow Length=360' Slope=0.0150 '/' Tc=5.0 min CN=90 Runoff=8.87 cfs 28,925 cf

Subcatchment PRE 3.0: Runoff Area=267,550 sf 57.12% Impervious Runoff Depth>4.86"
Flow Length=435' Tc=11.0 min CN=81 Runoff=29.14 cfs 108,402 cf

Subcatchment PRE 3.1: Runoff Area=16,036 sf 66.20% Impervious Runoff Depth>5.32"
Flow Length=155' Slope=0.0150 '/' Tc=5.0 min CN=85 Runoff=2.24 cfs 7,105 cf

Subcatchment PRE 4.0: Runoff Area=16,868 sf 71.28% Impervious Runoff Depth>5.77"
Flow Length=115' Tc=5.0 min CN=89 Runoff=2.51 cfs 8,115 cf

Subcatchment PRE 5.0: Runoff Area=8,392 sf 100.00% Impervious Runoff Depth>6.83"
Flow Length=145' Slope=0.0170 '/' Tc=5.0 min CN=98 Runoff=1.35 cfs 4,775 cf

Pond RG-1: Peak Elev=61.43' Storage=5,022 cf Inflow=8.87 cfs 28,925 cf
Outflow=8.04 cfs 28,768 cf

Pond RG-2: Peak Elev=63.54' Storage=1,140 cf Inflow=2.24 cfs 7,105 cf
Outflow=1.21 cfs 7,044 cf

Link PA-1: Inflow=26.26 cfs 86,098 cf
Primary=26.26 cfs 86,098 cf

Link PA-2: Inflow=26.94 cfs 94,856 cf
Primary=26.94 cfs 94,856 cf

Link PA-3: Inflow=30.34 cfs 115,446 cf
Primary=30.34 cfs 115,446 cf

Link PA-4: Inflow=2.51 cfs 8,115 cf
Primary=2.51 cfs 8,115 cf

Link PA-5: Inflow=1.35 cfs 4,775 cf
Primary=1.35 cfs 4,775 cf

Total Runoff Area = 715,525 sf Runoff Volume = 309,508 cf Average Runoff Depth = 5.19"
37.36% Pervious = 267,309 sf 62.64% Impervious = 448,216 sf

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

Subcatchment PRE 1.0: Runoff Area=207,580 sf 57.69% Impervious Runoff Depth>6.29"
Flow Length=999' Tc=6.8 min CN=82 Runoff=32.86 cfs 108,841 cf

Subcatchment PRE 2.0: Runoff Area=140,155 sf 70.79% Impervious Runoff Depth>7.01"
Flow Length=500' Tc=5.0 min CN=88 Runoff=25.15 cfs 81,928 cf

Subcatchment PRE 2.1: Runoff Area=58,944 sf 77.01% Impervious Runoff Depth>7.25"
Flow Length=360' Slope=0.0150 '/' Tc=5.0 min CN=90 Runoff=10.79 cfs 35,636 cf

Subcatchment PRE 3.0: Runoff Area=267,550 sf 57.12% Impervious Runoff Depth>6.17"
Flow Length=435' Tc=11.0 min CN=81 Runoff=36.64 cfs 137,509 cf

Subcatchment PRE 3.1: Runoff Area=16,036 sf 66.20% Impervious Runoff Depth>6.65"
Flow Length=155' Slope=0.0150 '/' Tc=5.0 min CN=85 Runoff=2.78 cfs 8,892 cf

Subcatchment PRE 4.0: Runoff Area=16,868 sf 71.28% Impervious Runoff Depth>7.13"
Flow Length=115' Tc=5.0 min CN=89 Runoff=3.06 cfs 10,029 cf

Subcatchment PRE 5.0: Runoff Area=8,392 sf 100.00% Impervious Runoff Depth>8.22"
Flow Length=145' Slope=0.0170 '/' Tc=5.0 min CN=98 Runoff=1.61 cfs 5,746 cf

Pond RG-1: Peak Elev=62.00' Storage=5,022 cf Inflow=10.79 cfs 35,636 cf
Outflow=13.07 cfs 35,463 cf

Pond RG-2: Peak Elev=64.00' Storage=1,382 cf Inflow=2.78 cfs 8,892 cf
Outflow=1.95 cfs 8,826 cf

Link PA-1: Inflow=32.86 cfs 108,841 cf
Primary=32.86 cfs 108,841 cf

Link PA-2: Inflow=37.55 cfs 117,390 cf
Primary=37.55 cfs 117,390 cf

Link PA-3: Inflow=38.59 cfs 146,335 cf
Primary=38.59 cfs 146,335 cf

Link PA-4: Inflow=3.06 cfs 10,029 cf
Primary=3.06 cfs 10,029 cf

Link PA-5: Inflow=1.61 cfs 5,746 cf
Primary=1.61 cfs 5,746 cf

Total Runoff Area = 715,525 sf Runoff Volume = 388,581 cf Average Runoff Depth = 6.52"
37.36% Pervious = 267,309 sf 62.64% Impervious = 448,216 sf

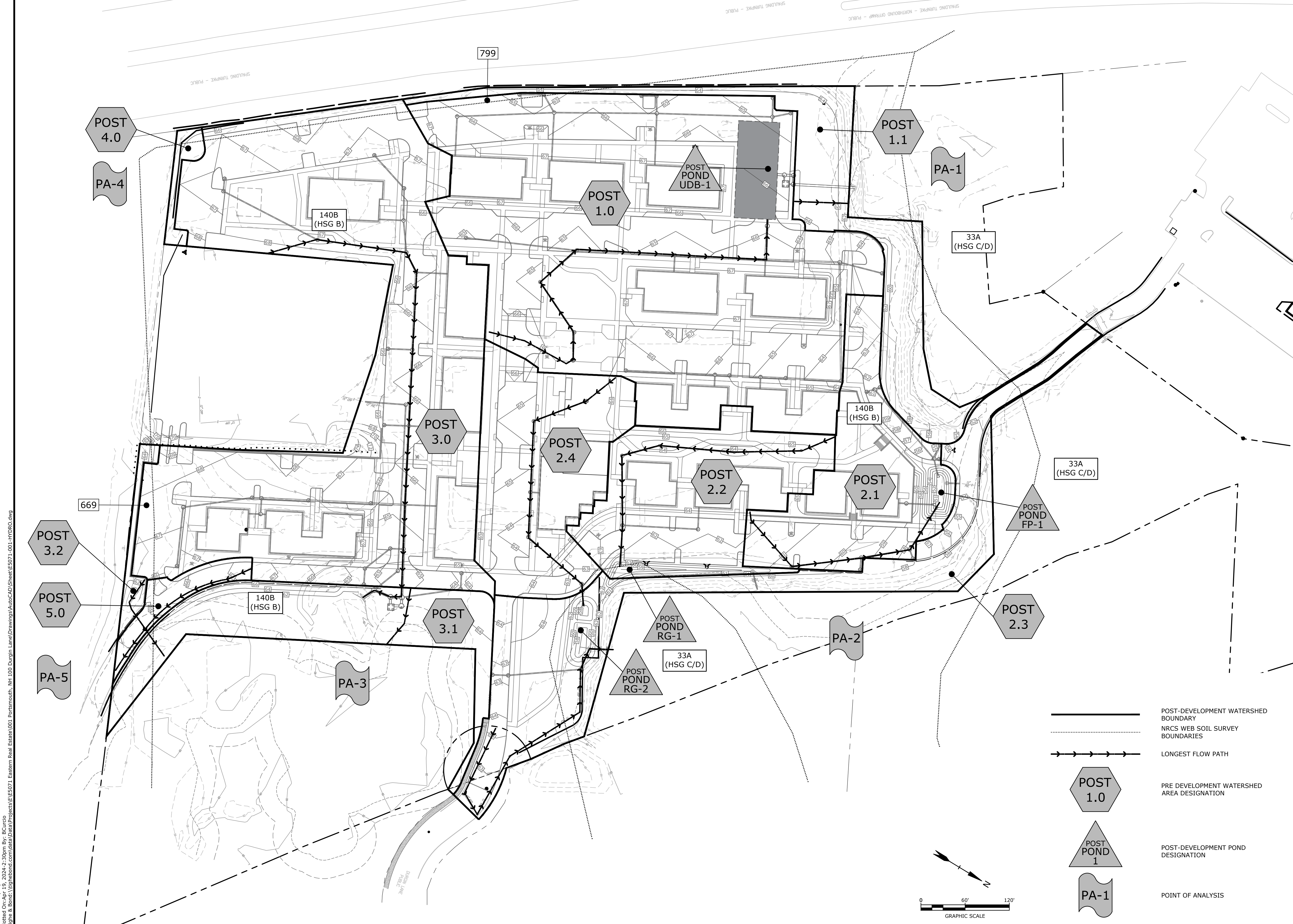
Section 3

Post-Development Conditions

To analyze the post-development condition, the site has been modeled utilizing the same five (5) distinct points of analysis as the Pre-Development condition with revised watershed areas to reflect the post-construction conditions. The points of analysis and their sub-catchment areas are depicted on the plan entitled "Post-Development Watershed Plan," Sheet C-802.

3.1 Post-Development Calculations

3.2 Post-Development Watershed Plan



**PROPOSED
MULTI-FAMILY
DEVELOPMENT**

100 DURGIN
LANE OWNER,
LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

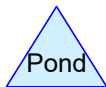
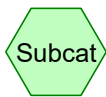
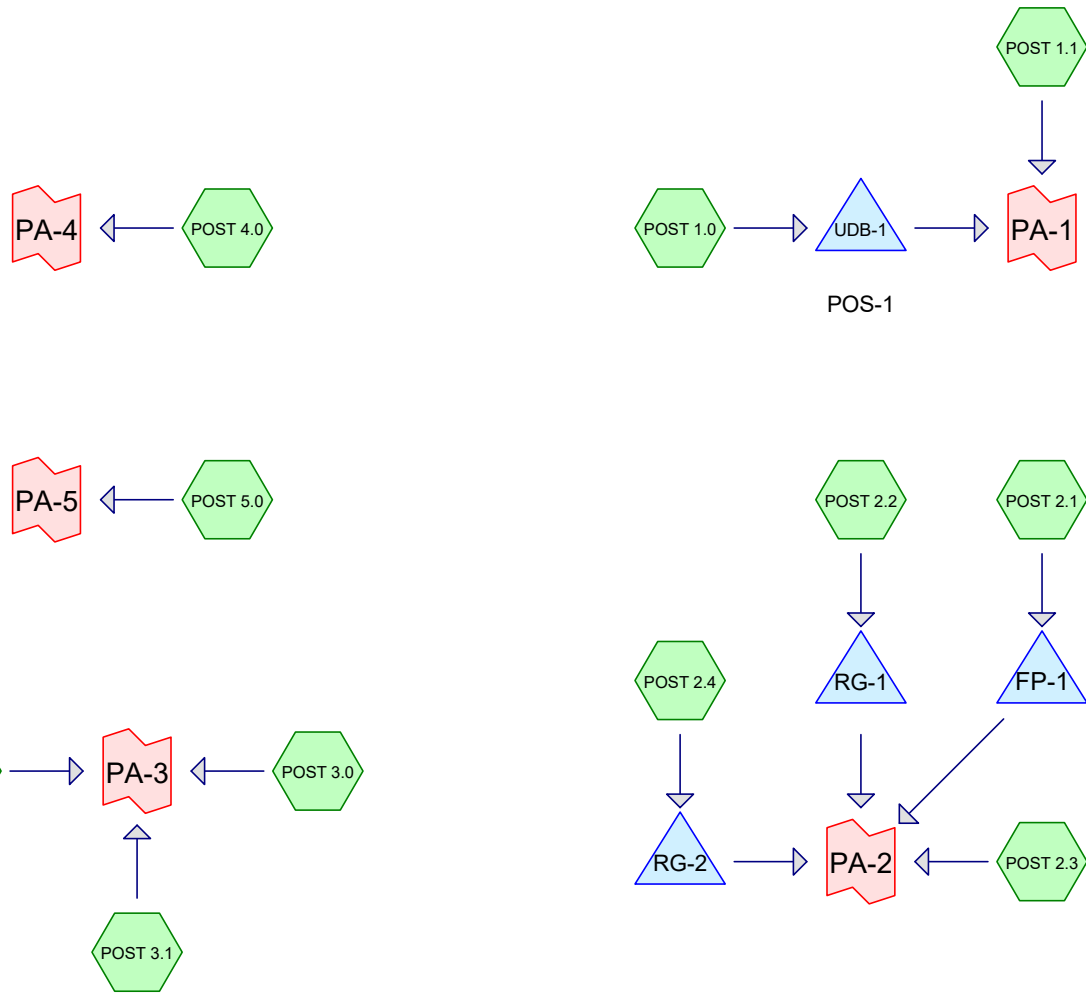
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PROJECT NO:	E5071-001	
DATE:	4/22/2024	
FILE:	E5071-001-HYDRO.dwg	
DRAWN BY:	BKC/NHW	
DESIGNED/CHECKED BY:	NAH	
APPROVED BY:	PMC	

**PRE-DEVELOPMENT
WATERSHED PLAN**

SCALE: AS SHOWN

C-802

Last Saved: 4/18/2024 2:30pm By: ECurcio
 Plotted On: Apr 19, 2024 2:30pm
 Tighe & Bond \Vigilante.com\Data\Projects\E5071-Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane Drawings\AutoCAD\Sheet\E5071-001-HYDRO.dwg



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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
249,330	61	>75% Grass cover, Good, HSG B (POST 1.0, POST 1.1, POST 2.1, POST 2.2, POST 2.3, POST 2.4, POST 3.0, POST 3.1, POST 3.2, POST 4.0, POST 5.0)
8,625	74	>75% Grass cover, Good, HSG C (POST 2.2, POST 2.3)
14,874	80	>75% Grass cover, Good, HSG D (POST 1.0, POST 1.1, POST 2.3, POST 3.0, POST 3.1, POST 3.2, POST 4.0)
299,992	98	Paved parking, HSG B (POST 1.0, POST 2.1, POST 2.2, POST 2.3, POST 2.4, POST 3.0, POST 5.0)
2,917	98	Paved parking, HSG C (POST 2.3)
8,603	98	Paved parking, HSG D (POST 1.0, POST 3.0, POST 5.0)
92,723	98	Roofs, HSG B (POST 1.0, POST 2.1, POST 2.2, POST 2.4, POST 3.0)
37,946	55	Woods, Good, HSG B (POST 1.1, POST 2.3, POST 3.1)
515	70	Woods, Good, HSG C (POST 1.1)
715,525	82	TOTAL AREA

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
679,991	HSG B	POST 1.0, POST 1.1, POST 2.1, POST 2.2, POST 2.3, POST 2.4, POST 3.0, POST 3.1, POST 3.2, POST 4.0, POST 5.0
12,057	HSG C	POST 1.1, POST 2.2, POST 2.3
23,477	HSG D	POST 1.0, POST 1.1, POST 2.3, POST 3.0, POST 3.1, POST 3.2, POST 4.0, POST 5.0
0	Other	
715,525		TOTAL AREA

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Type III 24-hr 2-Yr Rainfall=3.68"

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

Subcatchment POST 1.0:	Runoff Area=208,896 sf 71.87% Impervious Runoff Depth>2.43" Flow Length=950' Tc=5.6 min CN=88 Runoff=13.39 cfs 42,330 cf
Subcatchment POST 1.1:	Runoff Area=40,669 sf 0.00% Impervious Runoff Depth>0.61" Flow Length=75' Slope=0.0400 '/' Tc=5.5 min CN=60 Runoff=0.49 cfs 2,068 cf
Subcatchment POST 2.1:	Runoff Area=48,315 sf 65.70% Impervious Runoff Depth>2.17" Flow Length=340' Tc=5.0 min CN=85 Runoff=2.82 cfs 8,747 cf
Subcatchment POST 2.2:	Runoff Area=52,733 sf 53.30% Impervious Runoff Depth>1.85" Flow Length=450' Tc=8.0 min CN=81 Runoff=2.42 cfs 8,142 cf
Subcatchment POST 2.3:	Runoff Area=68,786 sf 32.19% Impervious Runoff Depth>1.36" Flow Length=415' Tc=5.0 min CN=74 Runoff=2.46 cfs 7,822 cf
Subcatchment POST 2.4:	Runoff Area=53,602 sf 68.17% Impervious Runoff Depth>2.26" Flow Length=400' Tc=7.7 min CN=86 Runoff=3.03 cfs 10,076 cf
Subcatchment POST 3.0:	Runoff Area=186,544 sf 68.86% Impervious Runoff Depth>2.34" Flow Length=700' Tc=8.8 min CN=87 Runoff=10.50 cfs 36,402 cf
Subcatchment POST 3.1:	Runoff Area=41,365 sf 0.00% Impervious Runoff Depth>0.65" Flow Length=80' Tc=5.4 min CN=61 Runoff=0.56 cfs 2,257 cf
Subcatchment POST 3.2:	Runoff Area=3,972 sf 0.00% Impervious Runoff Depth>1.71" Flow Length=135' Tc=5.0 min CN=79 Runoff=0.18 cfs 565 cf
Subcatchment POST 4.0:	Runoff Area=3,305 sf 0.00% Impervious Runoff Depth>0.85" Tc=5.0 min CN=65 Runoff=0.07 cfs 233 cf
Subcatchment POST 5.0:	Runoff Area=7,338 sf 96.78% Impervious Runoff Depth>3.33" Flow Length=230' Slope=0.0200 '/' Tc=5.0 min CN=97 Runoff=0.60 cfs 2,037 cf
Pond FP-1:	Peak Elev=52.80' Storage=1,765 cf Inflow=2.82 cfs 8,747 cf Outflow=1.56 cfs 8,338 cf
Pond RG-1:	Peak Elev=59.24' Storage=661 cf Inflow=2.42 cfs 8,142 cf Outflow=1.71 cfs 8,142 cf
Pond RG-2:	Peak Elev=58.79' Storage=968 cf Inflow=3.03 cfs 10,076 cf Outflow=1.86 cfs 10,057 cf
Pond UDB-1: POS-1	Peak Elev=61.05' Storage=15,503 cf Inflow=13.39 cfs 42,330 cf Outflow=2.73 cfs 41,500 cf
Link PA-1:	Inflow=2.91 cfs 43,568 cf Primary=2.91 cfs 43,568 cf

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Type III 24-hr 2-Yr Rainfall=3.68"

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Link PA-2:

Inflow=7.03 cfs 34,359 cf
Primary=7.03 cfs 34,359 cf

Link PA-3:

Inflow=11.21 cfs 39,224 cf
Primary=11.21 cfs 39,224 cf

Link PA-4:

Inflow=0.07 cfs 233 cf
Primary=0.07 cfs 233 cf

Link PA-5:

Inflow=0.60 cfs 2,037 cf
Primary=0.60 cfs 2,037 cf

Total Runoff Area = 715,525 sf Runoff Volume = 120,679 cf Average Runoff Depth = 2.02"
43.51% Pervious = 311,290 sf 56.49% Impervious = 404,235 sf

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Type III 24-hr 10-Yr Rainfall=5.58"

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Summary for Subcatchment POST 1.0:

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

[47] Hint: Peak is 902% of capacity of segment #3

Runoff = 22.71 cfs @ 12.08 hrs, Volume= 73,454 cf, Depth> 4.22"
Routed to Pond UDB-1 : POS-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.58"

Area (sf)	CN	Description
58,333	61	>75% Grass cover, Good, HSG B
108,639	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
40,358	98	Roofs, HSG B
0	74	>75% Grass cover, Good, HSG C
0	98	Paved parking, HSG C
*	0	Roofs, HGC C
0	70	Woods, Good, HSG C
422	80	>75% Grass cover, Good, HSG D
1,144	98	Paved parking, HSG D
0	77	Woods, Good, HSG D
208,896	88	Weighted Average
58,755		28.13% Pervious Area
150,141		71.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.48		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.68"
0.3	50	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
4.2	800	0.0050	3.21	2.52	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
5.6	950	Total			

Summary for Subcatchment POST 1.1:

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

Runoff = 1.68 cfs @ 12.10 hrs, Volume= 5,594 cf, Depth> 1.65"
Routed to Link PA-1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.58"

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Type III 24-hr 10-Yr Rainfall=5.58"

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Area (sf)	CN	Description
21,449	61	>75% Grass cover, Good, HSG B
0	98	Paved parking, HSG B
16,442	55	Woods, Good, HSG B
0	98	Unconnected roofs, HSG B
0	74	>75% Grass cover, Good, HSG C
0	98	Paved parking, HSG C
*	0	Roofs, HGC C
515	70	Woods, Good, HSG C
2,263	80	>75% Grass cover, Good, HSG D
0	98	Paved parking, HSG D
0	77	Woods, Good, HSG D
40,669	60	Weighted Average
40,669		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	75	0.0400	0.23		Sheet Flow, Grass: Short n= 0.150 P2= 3.68"

Summary for Subcatchment POST 2.1:

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

[47] Hint: Peak is 200% of capacity of segment #2

Runoff = 5.03 cfs @ 12.07 hrs, Volume= 15,724 cf, Depth> 3.91"
Routed to Pond FP-1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.58"

Area (sf)	CN	Description
16,570	61	>75% Grass cover, Good, HSG B
25,509	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
6,236	98	Roofs, HSG B
0	74	>75% Grass cover, Good, HSG C
0	98	Paved parking, HSG C
*	0	Roofs, HGC C
0	70	Woods, Good, HSG C
0	80	>75% Grass cover, Good, HSG D
0	98	Paved parking, HSG D
0	77	Woods, Good, HSG D
48,315	85	Weighted Average
16,570		34.30% Pervious Area
31,745		65.70% Impervious Area

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Type III 24-hr 10-Yr Rainfall=5.58"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.48		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.68"
1.2	240	0.0050	3.21	2.52	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
2.3	340	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment POST 2.2:

[47] Hint: Peak is 181% of capacity of segment #2

Runoff = 4.57 cfs @ 12.11 hrs, Volume= 15,375 cf, Depth> 3.50"
Routed to Pond RG-1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.58"

Area (sf)	CN	Description
23,452	61	>75% Grass cover, Good, HSG B
18,539	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
9,570	98	Roofs, HSG B
1,172	74	>75% Grass cover, Good, HSG C
0	98	Paved parking, HSG C
*	0	Roofs, HGC C
0	70	Woods, Good, HSG C
0	80	>75% Grass cover, Good, HSG D
0	98	Paved parking, HSG D
0	77	Woods, Good, HSG D
52,733	81	Weighted Average
24,624		46.70% Pervious Area
28,109		53.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.0150	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 3.68"
2.1	400	0.0050	3.21	2.52	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
8.0	450	Total			

Summary for Subcatchment POST 2.3:

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

[47] Hint: Peak is 208% of capacity of segment #2

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Type III 24-hr 10-Yr Rainfall=5.58"

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Runoff = 5.25 cfs @ 12.08 hrs, Volume= 16,239 cf, Depth> 2.83"
Routed to Link PA-2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.58"

Area (sf)	CN	Description
30,833	61	>75% Grass cover, Good, HSG B
19,227	98	Paved parking, HSG B
7,775	55	Woods, Good, HSG B
0	98	Unconnected roofs, HSG B
7,453	74	>75% Grass cover, Good, HSG C
2,917	98	Paved parking, HSG C
*	0	Roofs, HGC C
0	70	Woods, Good, HSG C
581	80	>75% Grass cover, Good, HSG D
0	98	Paved parking, HSG D
0	77	Woods, Good, HSG D
68,786	74	Weighted Average
46,642		67.81% Pervious Area
22,144		32.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	95	0.0200	1.46		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.68"
1.7	320	0.0050	3.21	2.52	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
2.8	415	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment POST 2.4:

[47] Hint: Peak is 210% of capacity of segment #2

Runoff = 5.29 cfs @ 12.11 hrs, Volume= 17,900 cf, Depth> 4.01"
Routed to Pond RG-2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.58"

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Type III 24-hr 10-Yr Rainfall=5.58"

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Area (sf)	CN	Description
17,063	61	>75% Grass cover, Good, HSG B
26,872	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
9,667	98	Roofs, HSG B
0	74	>75% Grass cover, Good, HSG C
0	98	Paved parking, HSG C
*	98	Roofs, HGC C
0	70	Woods, Good, HSG C
0	80	>75% Grass cover, Good, HSG D
0	98	Paved parking, HSG D
0	77	Woods, Good, HSG D
53,602	86	Weighted Average
17,063		31.83% Pervious Area
36,539		68.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.0150	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 3.68"
1.8	350	0.0050	3.21	2.52	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
7.7	400	Total			

Summary for Subcatchment POST 3.0:

[47] Hint: Peak is 415% of capacity of segment #2

Runoff = 18.09 cfs @ 12.12 hrs, Volume= 63,913 cf, Depth> 4.11"
Routed to Link PA-3 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.58"

Area (sf)	CN	Description
54,857	61	>75% Grass cover, Good, HSG B
96,571	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
26,892	98	Roofs, HSG B
0	74	>75% Grass cover, Good, HSG C
0	98	Paved parking, HSG C
*	98	Roofs, HGC C
0	70	Woods, Good, HSG C
3,232	80	>75% Grass cover, Good, HSG D
4,992	98	Paved parking, HSG D
0	77	Woods, Good, HSG D
186,544	87	Weighted Average
58,089		31.14% Pervious Area
128,455		68.86% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	50	0.0100	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 3.68"
1.9	650	0.0150	5.56	4.36	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
8.8	700	Total			

Summary for Subcatchment POST 3.1:

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

Runoff = 1.81 cfs @ 12.09 hrs, Volume= 5,957 cf, Depth> 1.73"
Routed to Link PA-3 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.58"

Area (sf)	CN	Description
23,632	61	>75% Grass cover, Good, HSG B
0	98	Paved parking, HSG B
13,729	55	Woods, Good, HSG B
0	98	Roofs, HSG B
0	74	>75% Grass cover, Good, HSG C
0	98	Paved parking, HSG C
*	0	Roofs, HGC C
0	70	Woods, Good, HSG C
4,004	80	>75% Grass cover, Good, HSG D
0	98	Paved parking, HSG D
0	77	Woods, Good, HSG D
41,365	61	Weighted Average
41,365		100.00% Pervious 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= 3.68"
0.2	30	0.1300	2.52		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
5.4	80	Total			

Summary for Subcatchment POST 3.2:

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

Runoff = 0.35 cfs @ 12.08 hrs, Volume= 1,094 cf, Depth> 3.30"
Routed to Link PA-3 :

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Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Yr Rainfall=5.58"

Area (sf)	CN	Description
262	61	>75% Grass cover, Good, HSG B
0	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
0	98	Roofs, HSG B
0	74	>75% Grass cover, Good, HSG C
0	98	Paved parking, HSG C
*	98	Roofs, HSG C
0	70	Woods, Good, HSG C
3,710	80	>75% Grass cover, Good, HSG D
0	98	Paved parking, HSG D
0	77	Woods, Good, HSG D
3,972	79	Weighted Average
3,972		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	40	0.3000	3.83		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	55	0.0050	3.21	2.52	Pipe Channel, 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.9	40	0.0050	0.35		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.4	135	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment POST 4.0:

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

Runoff = 0.18 cfs @ 12.08 hrs, Volume= 564 cf, Depth> 2.05"
 Routed to Link PA-4 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Yr Rainfall=5.58"

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Type III 24-hr 10-Yr Rainfall=5.58"

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Area (sf)	CN	Description
2,643	61	>75% Grass cover, Good, HSG B
0	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
0	98	Unconnected roofs, HSG B
0	74	>75% Grass cover, Good, HSG C
0	98	Paved parking, HSG C
*	98	Roofs, HGC C
0	70	Woods, Good, HSG C
662	80	>75% Grass cover, Good, HSG D
0	98	Paved parking, HSG D
0	77	Woods, Good, HSG D
3,305	65	Weighted Average
3,305		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0					Direct Entry,
1.0	0				Total, Increased to minimum Tc = 5.0 min

Summary for Subcatchment POST 5.0:

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

Runoff = 0.92 cfs @ 12.07 hrs, Volume= 3,194 cf, Depth> 5.22"
 Routed to Link PA-5 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Yr Rainfall=5.58"

Area (sf)	CN	Description
236	61	>75% Grass cover, Good, HSG B
4,635	98	Paved parking, HSG B
0	55	Woods, Good, HSG B
0	98	Unconnected roofs, HSG B
0	74	>75% Grass cover, Good, HSG C
0	98	Paved parking, HSG C
*	98	Roofs, HGC C
0	70	Woods, Good, HSG C
0	80	>75% Grass cover, Good, HSG D
2,467	98	Paved parking, HSG D
0	77	Woods, Good, HSG D
7,338	97	Weighted Average
236		3.22% Pervious Area
7,102		96.78% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0200	1.28		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.68"
1.0	180	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.6	230	Total, Increased to minimum Tc = 5.0 min			

Summary for Pond FP-1:

Inflow Area = 48,315 sf, 65.70% Impervious, Inflow Depth > 3.91" for 10-Yr event
 Inflow = 5.03 cfs @ 12.07 hrs, Volume= 15,724 cf
 Outflow = 4.13 cfs @ 12.13 hrs, Volume= 15,304 cf, Atten= 18%, Lag= 3.6 min
 Primary = 4.13 cfs @ 12.13 hrs, Volume= 15,304 cf

Routed to Link PA-2 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 53.29' @ 12.13 hrs Surf.Area= 1,332 sf Storage= 2,363 cf
 Flood Elev= 54.00' Surf.Area= 1,665 sf Storage= 3,424 cf

Plug-Flow detention time= 33.5 min calculated for 15,304 cf (97% of inflow)
 Center-of-Mass det. time= 17.9 min (819.9 - 802.0)

Volume	Invert	Avail.Storage	Storage Description
#1	48.40'	3,424 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
48.40	440	0.0	0	0
49.50	440	40.0	194	194
51.00	440	30.0	198	392
52.00	785	100.0	613	1,004
53.00	1,195	100.0	990	1,994
54.00	1,665	100.0	1,430	3,424

Device	Routing	Invert	Outlet Devices
#1	Primary	48.40'	15.0" Round Culvert L= 12.0' Ke= 0.500 Inlet / Outlet Invert= 48.40' / 47.60' S= 0.0667 ' S= 0.0667 ' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	48.40'	100.000 in/hr Exfiltration over Surface area above 48.40' Excluded Surface area = 440 sf
#3	Device 1	53.00'	1.0" x 1.0" Horiz. Orifice/Grate X 114 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.06 cfs @ 12.13 hrs HW=53.28' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 4.06 cfs of 12.19 cfs potential flow)
- 2=Exfiltration (Exfiltration Controls 2.05 cfs)
- 3=Orifice/Grate (Orifice Controls 2.01 cfs @ 2.54 fps)

Summary for Pond RG-1:

Inflow Area = 52,733 sf, 53.30% Impervious, Inflow Depth > 3.50" for 10-Yr event
 Inflow = 4.57 cfs @ 12.11 hrs, Volume= 15,375 cf
 Outflow = 2.27 cfs @ 12.31 hrs, Volume= 15,375 cf, Atten= 50%, Lag= 12.0 min
 Primary = 2.27 cfs @ 12.31 hrs, Volume= 15,375 cf
 Routed to Link PA-2 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 60.30' @ 12.31 hrs Surf.Area= 1,996 sf Storage= 2,091 cf
 Flood Elev= 61.00' Surf.Area= 3,026 sf Storage= 3,836 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 6.1 min (821.7 - 815.6)

Volume	Invert	Avail.Storage	Storage Description	
#1	56.40'	3,836 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
56.40	560	0.0	0	0
57.50	560	40.0	246	246
59.00	560	30.0	252	498
60.00	1,545	100.0	1,053	1,551
61.00	3,026	100.0	2,286	3,836

Device	Routing	Invert	Outlet Devices
#1	Primary	54.00'	24.0" Round Culvert L= 25.0' Ke= 0.500 Inlet / Outlet Invert= 54.00' / 52.19' S= 0.0724 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Device 1	56.40'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	56.40'	10.000 in/hr Exfiltration over Surface area
#4	Device 1	60.50'	1.0" x 1.0" Horiz. Orifice/Grate X 114 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.27 cfs @ 12.31 hrs HW=60.30' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 2.27 cfs of 34.83 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.81 cfs @ 9.20 fps)
- 3=Exfiltration (Exfiltration Controls 0.46 cfs)
- 4=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond RG-2:

Inflow Area = 53,602 sf, 68.17% Impervious, Inflow Depth > 4.01" for 10-Yr event
 Inflow = 5.29 cfs @ 12.11 hrs, Volume= 17,900 cf
 Outflow = 2.41 cfs @ 12.32 hrs, Volume= 17,876 cf, Atten= 55%, Lag= 12.9 min
 Primary = 2.41 cfs @ 12.32 hrs, Volume= 17,876 cf
 Routed to Link PA-2 :

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

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Peak Elev= 60.33' @ 12.32 hrs Surf.Area= 1,564 sf Storage= 2,668 cf
 Flood Elev= 62.00' Surf.Area= 3,184 sf Storage= 6,636 cf

Plug-Flow detention time= 8.1 min calculated for 17,839 cf (100% of inflow)
 Center-of-Mass det. time= 7.3 min (808.6 - 801.2)

Volume	Invert	Avail.Storage	Storage Description	
#1	55.40'	6,636 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.40	509	0.0	0	0
56.50	509	40.0	224	224
58.00	509	30.0	229	453
60.00	1,245	100.0	1,754	2,207
62.00	3,184	100.0	4,429	6,636

Device	Routing	Invert	Outlet Devices
#1	Primary	55.40'	18.0" Round Culvert L= 24.0' Ke= 0.500 Inlet / Outlet Invert= 55.40' / 55.25' S= 0.0062 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	55.40'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	55.40'	10.000 in/hr Exfiltration over Surface area
#4	Device 1	61.00'	1.0" x 1.0" Horiz. Orifice/Grate X 114 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.40 cfs @ 12.32 hrs HW=60.32' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 2.40 cfs of 17.38 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 2.04 cfs @ 10.41 fps)
- 3=Exfiltration (Exfiltration Controls 0.36 cfs)
- 4=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond UDB-1: POS-1

Inflow Area = 208,896 sf, 71.87% Impervious, Inflow Depth > 4.22" for 10-Yr event
 Inflow = 22.71 cfs @ 12.08 hrs, Volume= 73,454 cf
 Outflow = 12.06 cfs @ 12.22 hrs, Volume= 72,369 cf, Atten= 47%, Lag= 8.4 min
 Primary = 12.06 cfs @ 12.22 hrs, Volume= 72,369 cf
 Routed to Link PA-1 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 61.95' @ 12.22 hrs Surf.Area= 7,392 sf Storage= 20,950 cf
 Flood Elev= 63.25' Surf.Area= 7,392 sf Storage= 27,366 cf

Plug-Flow detention time= 62.1 min calculated for 72,218 cf (98% of inflow)
 Center-of-Mass det. time= 53.1 min (846.3 - 793.2)

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Type III 24-hr 10-Yr Rainfall=5.58"

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Volume	Invert	Avail.Storage	Storage Description
#1A	58.25'	6,396 cf	56.00'W x 132.00'L x 5.00'H Field A 36,960 cf Overall - 20,970 cf Embedded = 15,990 cf x 40.0% Voids
#2A	58.25'	20,970 cf	CMP Round 60 x 48 Inside #1 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L 48 Chambers in 8 Rows 54.00' Header x 19.63 sf x 2 = 2,120.6 cf Inside
		27,366 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	58.25'	24.0" Round Culvert L= 5.0' Ke= 0.500 Inlet / Outlet Invert= 58.25' / 58.15' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	58.25'	8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	61.00'	36.0" W x 12.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	62.75'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=11.84 cfs @ 12.22 hrs HW=61.94' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 11.84 cfs of 24.80 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 3.08 cfs @ 8.82 fps)
- 3=Orifice/Grate (Orifice Controls 8.76 cfs @ 3.11 fps)
- 4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link PA-1:

Inflow Area = 249,565 sf, 60.16% Impervious, Inflow Depth > 3.75" for 10-Yr event
 Inflow = 13.06 cfs @ 12.22 hrs, Volume= 77,963 cf
 Primary = 13.06 cfs @ 12.22 hrs, Volume= 77,963 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PA-2:

Inflow Area = 223,436 sf, 53.05% Impervious, Inflow Depth > 3.48" for 10-Yr event
 Inflow = 13.19 cfs @ 12.11 hrs, Volume= 64,794 cf
 Primary = 13.19 cfs @ 12.11 hrs, Volume= 64,794 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PA-3:

Inflow Area = 231,881 sf, 55.40% Impervious, Inflow Depth > 3.67" for 10-Yr event
 Inflow = 20.15 cfs @ 12.12 hrs, Volume= 70,964 cf
 Primary = 20.15 cfs @ 12.12 hrs, Volume= 70,964 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PA-4:

Inflow Area = 3,305 sf, 0.00% Impervious, Inflow Depth > 2.05" for 10-Yr event
Inflow = 0.18 cfs @ 12.08 hrs, Volume= 564 cf
Primary = 0.18 cfs @ 12.08 hrs, Volume= 564 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link PA-5:

Inflow Area = 7,338 sf, 96.78% Impervious, Inflow Depth > 5.22" for 10-Yr event
Inflow = 0.92 cfs @ 12.07 hrs, Volume= 3,194 cf
Primary = 0.92 cfs @ 12.07 hrs, Volume= 3,194 cf, Atten= 0%, Lag= 0.0 min

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

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Type III 24-hr 25-Yr Rainfall=7.07"

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

Subcatchment POST 1.0:	Runoff Area=208,896 sf 71.87% Impervious Runoff Depth>5.66" Flow Length=950' Tc=5.6 min CN=88 Runoff=29.98 cfs 98,492 cf
Subcatchment POST 1.1:	Runoff Area=40,669 sf 0.00% Impervious Runoff Depth>2.65" Flow Length=75' Slope=0.0400 '/' Tc=5.5 min CN=60 Runoff=2.81 cfs 8,983 cf
Subcatchment POST 2.1:	Runoff Area=48,315 sf 65.70% Impervious Runoff Depth>5.32" Flow Length=340' Tc=5.0 min CN=85 Runoff=6.76 cfs 21,406 cf
Subcatchment POST 2.2:	Runoff Area=52,733 sf 53.30% Impervious Runoff Depth>4.86" Flow Length=450' Tc=8.0 min CN=81 Runoff=6.29 cfs 21,377 cf
Subcatchment POST 2.3:	Runoff Area=68,786 sf 32.19% Impervious Runoff Depth>4.10" Flow Length=415' Tc=5.0 min CN=74 Runoff=7.60 cfs 23,504 cf
Subcatchment POST 2.4:	Runoff Area=53,602 sf 68.17% Impervious Runoff Depth>5.43" Flow Length=400' Tc=7.7 min CN=86 Runoff=7.07 cfs 24,244 cf
Subcatchment POST 3.0:	Runoff Area=186,544 sf 68.86% Impervious Runoff Depth>5.54" Flow Length=700' Tc=8.8 min CN=87 Runoff=24.04 cfs 86,129 cf
Subcatchment POST 3.1:	Runoff Area=41,365 sf 0.00% Impervious Runoff Depth>2.75" Flow Length=80' Tc=5.4 min CN=61 Runoff=2.98 cfs 9,479 cf
Subcatchment POST 3.2:	Runoff Area=3,972 sf 0.00% Impervious Runoff Depth>4.65" Flow Length=135' Tc=5.0 min CN=79 Runoff=0.50 cfs 1,538 cf
Subcatchment POST 4.0:	Runoff Area=3,305 sf 0.00% Impervious Runoff Depth>3.15" Tc=5.0 min CN=65 Runoff=0.28 cfs 869 cf
Subcatchment POST 5.0:	Runoff Area=7,338 sf 96.78% Impervious Runoff Depth>6.71" Flow Length=230' Slope=0.0200 '/' Tc=5.0 min CN=97 Runoff=1.17 cfs 4,102 cf
Pond FP-1:	Peak Elev=53.61' Storage=2,815 cf Inflow=6.76 cfs 21,406 cf Outflow=5.40 cfs 20,976 cf
Pond RG-1:	Peak Elev=60.67' Storage=2,923 cf Inflow=6.29 cfs 21,377 cf Outflow=4.06 cfs 21,377 cf
Pond RG-2:	Peak Elev=61.05' Storage=4,049 cf Inflow=7.07 cfs 24,244 cf Outflow=3.58 cfs 24,217 cf
Pond UDB-1: POS-1	Peak Elev=62.65' Storage=24,714 cf Inflow=29.98 cfs 98,492 cf Outflow=18.72 cfs 97,228 cf
Link PA-1:	Inflow=20.81 cfs 106,211 cf Primary=20.81 cfs 106,211 cf

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Link PA-2:

Inflow=17.21 cfs 90,075 cf
Primary=17.21 cfs 90,075 cf

Link PA-3:

Inflow=27.33 cfs 97,146 cf
Primary=27.33 cfs 97,146 cf

Link PA-4:

Inflow=0.28 cfs 869 cf
Primary=0.28 cfs 869 cf

Link PA-5:

Inflow=1.17 cfs 4,102 cf
Primary=1.17 cfs 4,102 cf

Total Runoff Area = 715,525 sf Runoff Volume = 300,124 cf Average Runoff Depth = 5.03"
43.51% Pervious = 311,290 sf 56.49% Impervious = 404,235 sf

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Type III 24-hr 50-Yr Rainfall=8.46"

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

Subcatchment POST 1.0:	Runoff Area=208,896 sf 71.87% Impervious Runoff Depth>7.01" Flow Length=950' Tc=5.6 min CN=88 Runoff=36.71 cfs 122,099 cf
Subcatchment POST 1.1:	Runoff Area=40,669 sf 0.00% Impervious Runoff Depth>3.68" Flow Length=75' Slope=0.0400 '/' Tc=5.5 min CN=60 Runoff=3.96 cfs 12,468 cf
Subcatchment POST 2.1:	Runoff Area=48,315 sf 65.70% Impervious Runoff Depth>6.65" Flow Length=340' Tc=5.0 min CN=85 Runoff=8.37 cfs 26,791 cf
Subcatchment POST 2.2:	Runoff Area=52,733 sf 53.30% Impervious Runoff Depth>6.17" Flow Length=450' Tc=8.0 min CN=81 Runoff=7.91 cfs 27,117 cf
Subcatchment POST 2.3:	Runoff Area=68,786 sf 32.19% Impervious Runoff Depth>5.34" Flow Length=415' Tc=5.0 min CN=74 Runoff=9.84 cfs 30,585 cf
Subcatchment POST 2.4:	Runoff Area=53,602 sf 68.17% Impervious Runoff Depth>6.77" Flow Length=400' Tc=7.7 min CN=86 Runoff=8.71 cfs 30,246 cf
Subcatchment POST 3.0:	Runoff Area=186,544 sf 68.86% Impervious Runoff Depth>6.89" Flow Length=700' Tc=8.8 min CN=87 Runoff=29.55 cfs 107,112 cf
Subcatchment POST 3.1:	Runoff Area=41,365 sf 0.00% Impervious Runoff Depth>3.80" Flow Length=80' Tc=5.4 min CN=61 Runoff=4.17 cfs 13,084 cf
Subcatchment POST 3.2:	Runoff Area=3,972 sf 0.00% Impervious Runoff Depth>5.93" Flow Length=135' Tc=5.0 min CN=79 Runoff=0.63 cfs 1,964 cf
Subcatchment POST 4.0:	Runoff Area=3,305 sf 0.00% Impervious Runoff Depth>4.27" Tc=5.0 min CN=65 Runoff=0.38 cfs 1,175 cf
Subcatchment POST 5.0:	Runoff Area=7,338 sf 96.78% Impervious Runoff Depth>8.10" Flow Length=230' Slope=0.0200 '/' Tc=5.0 min CN=97 Runoff=1.40 cfs 4,951 cf
Pond FP-1:	Peak Elev=53.92' Storage=3,296 cf Inflow=8.37 cfs 26,791 cf Outflow=6.41 cfs 26,354 cf
Pond RG-1:	Peak Elev=60.94' Storage=3,646 cf Inflow=7.91 cfs 27,117 cf Outflow=5.15 cfs 27,116 cf
Pond RG-2:	Peak Elev=61.35' Storage=4,773 cf Inflow=8.71 cfs 30,246 cf Outflow=5.11 cfs 30,217 cf
Pond UDB-1: POS-1	Peak Elev=63.26' Storage=27,366 cf Inflow=36.71 cfs 122,099 cf Outflow=28.61 cfs 120,678 cf
Link PA-1:	Inflow=31.65 cfs 133,146 cf Primary=31.65 cfs 133,146 cf

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Link PA-2:

Inflow=22.42 cfs 114,272 cf
Primary=22.42 cfs 114,272 cf

Link PA-3:

Inflow=34.08 cfs 122,160 cf
Primary=34.08 cfs 122,160 cf

Link PA-4:

Inflow=0.38 cfs 1,175 cf
Primary=0.38 cfs 1,175 cf

Link PA-5:

Inflow=1.40 cfs 4,951 cf
Primary=1.40 cfs 4,951 cf

Total Runoff Area = 715,525 sf Runoff Volume = 377,592 cf Average Runoff Depth = 6.33"
43.51% Pervious = 311,290 sf 56.49% Impervious = 404,235 sf

Section 4

Peak Rate Comparison

The following table summarizes and compares the pre- and post-development peak runoff rates from the 2-year, 10-year, 25-year and 50-year storm events at the point of analysis.

Table 4.1
Comparison of Pre- and Post-Development Flows (CFS)

	2-Year Storm	10-Year Storm	25-Year Storm	50-Year Storm
Pre-Development Watershed				
PA-1	10.36	19.19	26.26	32.86
PA-2	10.46	17.09	26.94	37.55
PA-3	11.80	22.09	30.34	38.59
PA-4	1.14	1.91	2.51	3.06
PA-5	0.69	1.06	1.35	1.61
Post-Development Watershed				
PA-1	2.91	13.06	20.81	31.65
PA-2	7.03	13.19	17.21	22.42
PA-3	11.21	20.15	27.33	34.08
PA-4	0.07	0.18	0.28	0.38
PA-5	0.60	0.92	1.17	1.40

Section 5

Mitigation Description

The stormwater management system has been designed to provide stormwater treatment as required by the City of Portsmouth Site Review Regulations and NHDES AoT Regulations (Env-Wq 1500).

5.1 Pre-Treatment Methods for Protecting Water Quality

Pre-treatment for the stormwater filtration systems consists of off-line deep sump catch basins, sediment forebays, Rain Guardian turrets, and Contech CDS units.

5.2 Treatment Methods for Protecting Water Quality.

The runoff from proposed impervious areas will be treated by Contech Jellyfish stormwater filtration systems as well as a Rain Garden bioretention systems. These Jellyfish and Rain Garden systems are sized to treat the Water Quality Flow of their respective sub catchment areas. The BMP worksheets for the treatment practices have been included in Section 6 of this report.

The proposed stormwater management system is required to remove 80% of the annual Total Suspended Solids (TSS) loads and 50% of the annual Total Nitrogen (TN) loads per the City of Portsmouth's Site Plan regulations, Section 7.6.2.1.a.i. As shown in Table 5.1 the pollutant removal efficiencies for the proposed treatment systems exceed the City of Portsmouth's removal requirements.

BMP	Total Suspended Solids	Total Nitrogen	Total Phosphorus
Jellyfish Filter w/Pretreatment ¹	91%	53%	61%
Rain Garden w/Pretreatment ²	97%	65%	65%

Section 6

BMP Worksheets



FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: _____

RG-1

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

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
1.21	ac	A = Area draining to the practice	
0.64	ac	A _I = Impervious area draining to the practice	
0.53	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.53	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.64	ac-in	WQV = 1" x Rv x A	
2,310	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
578	cf	25% x WQV (check calc for sediment forebay volume)	
1,733	cf	75% x WQV (check calc for surface sand filter volume)	
Rain Guardian Turret		Method of Pretreatment? (not required for clean or roof runoff)	
N/A	cf	V _{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
Calculate time to drain if system IS NOT underdrained:			
	sf	A _{SA} = Surface area of the practice	
	iph	K _{sat} _{DESIGN} = Design infiltration rate ¹	
	Yes/No	If K _{sat} (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
-	hours	T _{DRAIN} = Drain time = V / (A _{SA} * I _{DESIGN})	≤ 72-hrs
Calculate time to drain if system IS underdrained:			
60.45	ft	E _{WQV} = Elevation of WQV (attach stage-storage table)	
2.35	cfs	Q _{WQV} = Discharge at the E _{WQV} (attach stage-discharge table)	
0.55	hours	T _{DRAIN} = Drain time = 2WQV/Q _{WQV}	≤ 72-hrs
57.50	feet	E _{FC} = Elevation of the bottom of the filter course material ²	
56.40	feet	E _{UD} = Invert elevation of the underdrain (UD), if applicable	
-	feet	E _{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
-	feet	E _{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.10	feet	D _{FC to UD} = Depth to UD from the bottom of the filter course	≥ 1'
#VALUE!	feet	D _{FC to ROCK} = Depth to bedrock from the bottom of the filter course	≥ 1'
#VALUE!	feet	D _{FC to SHWT} = Depth to SHWT from the bottom of the filter course	≥ 1'
60.94	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
61.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	← yes
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	< 10 ac
	cf	V = Volume of storage ³ (attach a stage-storage table)	≥ 75%WQV
	inches	D _{FC} = Filter course thickness	18", or 24" if within GPA
Sheet		Note what sheet in the plan set contains the filter course specification.	
Yes/No		Access grate provided?	← yes

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	← yes
2,509	cf	V = Volume of storage ³ (attach a stage-storage table)	≥ WQV
18.0	inches	D _{FC} = Filter course thickness	18", or 24" if within GPA
Sheet		Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	> 3:1
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A _{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	≤ 5:1
	inches	D _{FC} = Filter course thickness	12", or 18" if within GPA
			mod. 304.1 (see spec)
Sheet		Note what sheet in the plan set contains the filter course spec.	

1. Rate of the limiting layer (either the filter course or the underlying soil). K_{sat_design} includes factor of safety. See Env-Wq 1504.14 for guidance on determining the infiltration rate.
2. See lines 34, 40 and 48 for required depths of filter media.
3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet structure, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes: _____

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Stage-Discharge for Pond RG-1:

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
56.40	0.00	59.00	1.58
56.45	0.14	59.05	1.61
56.50	0.16	59.10	1.63
56.55	0.19	59.15	1.66
56.60	0.24	59.20	1.68
56.65	0.30	59.25	1.71
56.70	0.36	59.30	1.74
56.75	0.43	59.35	1.76
56.80	0.49	59.40	1.79
56.85	0.55	59.45	1.81
56.90	0.60	59.50	1.84
56.95	0.65	59.55	1.87
57.00	0.69	59.60	1.89
57.05	0.73	59.65	1.92
57.10	0.76	59.70	1.94
57.15	0.80	59.75	1.97
57.20	0.83	59.80	1.99
57.25	0.86	59.85	2.01
57.30	0.89	59.90	2.04
57.35	0.92	59.95	2.06
57.40	0.95	60.00	2.09
57.45	0.98	60.05	2.12
57.50	1.00	60.10	2.15
57.55	1.03	60.15	2.18
57.60	1.05	60.20	2.21
57.65	1.08	60.25	2.24
57.70	1.10	60.30	2.27
57.75	1.12	60.35	2.30
57.80	1.14	60.40	2.33
57.85	1.17	60.45	2.35
57.90	1.19	60.50	2.38
57.95	1.21	60.55	3.27
58.00	1.23	60.60	3.65
58.05	1.25	60.65	3.95
58.10	1.27	60.70	4.20
58.15	1.29	60.75	4.44
58.20	1.31	60.80	4.65
58.25	1.33	60.85	4.84
58.30	1.34	60.90	5.03
58.35	1.36	60.95	5.20
58.40	1.38	61.00	5.37
58.45	1.40		
58.50	1.42		
58.55	1.43		
58.60	1.45		
58.65	1.47		
58.70	1.48		
58.75	1.50		
58.80	1.52		
58.85	1.53		
58.90	1.55		
58.95	1.56		

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Stage-Area-Storage for Pond RG-1:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
56.40	560	0	59.00	560	498
56.45	560	11	59.05	609	528
56.50	560	22	59.10	659	559
56.55	560	34	59.15	708	593
56.60	560	45	59.20	757	630
56.65	560	56	59.25	806	669
56.70	560	67	59.30	855	711
56.75	560	78	59.35	905	755
56.80	560	90	59.40	954	801
56.85	560	101	59.45	1,003	850
56.90	560	112	59.50	1,053	902
56.95	560	123	59.55	1,102	955
57.00	560	134	59.60	1,151	1,012
57.05	560	146	59.65	1,200	1,070
57.10	560	157	59.70	1,249	1,132
57.15	560	168	59.75	1,299	1,195
57.20	560	179	59.80	1,348	1,262
57.25	560	190	59.85	1,397	1,330
57.30	560	202	59.90	1,446	1,401
57.35	560	213	59.95	1,496	1,475
57.40	560	224	60.00	1,545	1,551
57.45	560	235	60.05	1,619	1,630
57.50	560	246	60.10	1,693	1,713
57.55	560	255	60.15	1,767	1,799
57.60	560	263	60.20	1,841	1,890
57.65	560	272	60.25	1,915	1,983
57.70	560	280	60.30	1,989	2,081
57.75	560	288	60.35	2,063	2,182
57.80	560	297	60.40	2,137	2,287
57.85	560	305	60.45	2,211	2,396
57.90	560	314	60.50	2,286	2,509
57.95	560	322	60.55	2,360	2,625
58.00	560	330	60.60	2,434	2,744
58.05	560	339	60.65	2,508	2,868
58.10	560	347	60.70	2,582	2,995
58.15	560	356	60.75	2,656	3,126
58.20	560	364	60.80	2,730	3,261
58.25	560	372	60.85	2,804	3,399
58.30	560	381	60.90	2,878	3,541
58.35	560	389	60.95	2,952	3,687
58.40	560	398	61.00	3,026	3,836
58.45	560	406			
58.50	560	414			
58.55	560	423			
58.60	560	431			
58.65	560	440			
58.70	560	448			
58.75	560	456			
58.80	560	465			
58.85	560	473			
58.90	560	482			
58.95	560	490			



FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: _____

RG-2

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

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
1.23	ac	A = Area draining to the practice	
0.84	ac	A _I = Impervious area draining to the practice	
0.68	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.66	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.82	ac-in	WQV = 1" x Rv x A	
2,968	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
742	cf	25% x WQV (check calc for sediment forebay volume)	
2,226	cf	75% x WQV (check calc for surface sand filter volume)	
Sediment Forebay		Method of Pretreatment? (not required for clean or roof runoff)	
750	cf	V _{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
Calculate time to drain if system IS NOT underdrained:			
	sf	A _{SA} = Surface area of the practice	
	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?	
	Yes/No	(Use the calculations below)	
-	hours	T _{DRAIN} = Drain time = V / (A _{SA} * I _{DESIGN})	≤ 72-hrs
Calculate time to drain if system IS underdrained:			
60.50	ft	E _{WQV} = Elevation of WQV (attach stage-storage table)	
2.50	cfs	Q _{WQV} = Discharge at the E _{WQV} (attach stage-discharge table)	
0.66	hours	T _{DRAIN} = Drain time = 2WQV/Q _{WQV}	≤ 72-hrs
56.50	feet	E _{FC} = Elevation of the bottom of the filter course material ²	
55.40	feet	E _{UD} = Invert elevation of the underdrain (UD), if applicable	
-	feet	E _{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
-	feet	E _{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.10	feet	D _{FC to UD} = Depth to UD from the bottom of the filter course	≥ 1'
#VALUE!	feet	D _{FC to ROCK} = Depth to bedrock from the bottom of the filter course	≥ 1'
#VALUE!	feet	D _{FC to SHWT} = Depth to SHWT from the bottom of the filter course	≥ 1'
61.35	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
62.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	← yes
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	< 10 ac
	cf	V = Volume of storage ³ (attach a stage-storage table)	≥ 75%WQV
	inches	D _{FC} = Filter course thickness	18", or 24" if within GPA
Sheet		Note what sheet in the plan set contains the filter course specification.	
Yes/No		Access grate provided?	← yes

If a bioretention area is proposed:

YES	ac	Drainage Area no larger than 5 ac?	← yes
3,937	cf	$V = \text{Volume of storage}^3$ (attach a stage-storage table)	≥ WQV
18.0	inches	$D_{FC} = \text{Filter course thickness}$	18", or 24" if within GPA
Sheet		Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	> 3:1
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	

If porous pavement is proposed:

	acres	Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
		$A_{SA} = \text{Surface area of the pervious pavement}$	
	:1	Ratio of the contributing area to the pervious surface area	≤ 5:1
	inches	$D_{FC} = \text{Filter course thickness}$	12", or 18" if within GPA
Sheet		Note what sheet in the plan set contains the filter course spec.	mod. 304.1 (see spec)

1. Rate of the limiting layer (either the filter course or the underlying soil). $K_{sat, design}$ includes factor of safety. See Env-Wq 1504.14 for guidance on determining the infiltration rate.
2. See lines 34, 40 and 48 for required depths of filter media.
3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet structure, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes: _____

E-5071-001_POST

Prepared by Tighe & Bond Consulting

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Type III 24-hr 50-Yr Rainfall=8.46"

Printed 4/19/2024

Stage-Discharge for Pond RG-2:

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
55.40	0.00	58.00	1.57	60.60	2.53
55.45	0.01	58.05	1.59	60.65	2.55
55.50	0.04	58.10	1.61	60.70	2.57
55.55	0.09	58.15	1.63	60.75	2.59
55.60	0.17	58.20	1.64	60.80	2.61
55.65	0.26	58.25	1.66	60.85	2.63
55.70	0.35	58.30	1.68	60.90	2.66
55.75	0.41	58.35	1.70	60.95	2.68
55.80	0.48	58.40	1.72	61.00	2.70
55.85	0.54	58.45	1.74	61.05	3.57
55.90	0.59	58.50	1.76	61.10	3.95
55.95	0.64	58.55	1.77	61.15	4.24
56.00	0.68	58.60	1.79	61.20	4.49
56.05	0.72	58.65	1.81	61.25	4.71
56.10	0.75	58.70	1.83	61.30	4.92
56.15	0.79	58.75	1.85	61.35	5.10
56.20	0.82	58.80	1.86	61.40	5.28
56.25	0.85	58.85	1.88	61.45	5.45
56.30	0.88	58.90	1.90	61.50	5.61
56.35	0.91	58.95	1.92	61.55	5.76
56.40	0.94	59.00	1.93	61.60	5.91
56.45	0.96	59.05	1.95	61.65	6.05
56.50	0.99	59.10	1.97	61.70	6.18
56.55	1.01	59.15	1.98	61.75	6.32
56.60	1.04	59.20	2.00	61.80	6.45
56.65	1.06	59.25	2.02	61.85	6.57
56.70	1.09	59.30	2.03	61.90	6.69
56.75	1.11	59.35	2.05	61.95	6.81
56.80	1.13	59.40	2.07	62.00	6.93
56.85	1.15	59.45	2.08		
56.90	1.17	59.50	2.10		
56.95	1.20	59.55	2.12		
57.00	1.22	59.60	2.13		
57.05	1.24	59.65	2.15		
57.10	1.26	59.70	2.17		
57.15	1.28	59.75	2.18		
57.20	1.29	59.80	2.20		
57.25	1.31	59.85	2.21		
57.30	1.33	59.90	2.23		
57.35	1.35	59.95	2.24		
57.40	1.37	60.00	2.26		
57.45	1.39	60.05	2.28		
57.50	1.40	60.10	2.30		
57.55	1.42	60.15	2.33		
57.60	1.44	60.20	2.35		
57.65	1.45	60.25	2.37		
57.70	1.47	60.30	2.39		
57.75	1.49	60.35	2.42		
57.80	1.50	60.40	2.44		
57.85	1.52	60.45	2.46		
57.90	1.54	60.50	2.48		
57.95	1.55	60.55	2.50		

E-5071-001_POST

Prepared by Tighe & Bond Consulting

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Type III 24-hr 50-Yr Rainfall=8.46"

Printed 4/19/2024

Stage-Area-Storage for Pond RG-2:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
55.40	509	0	60.60	1,827	3,129
55.50	509	20	60.70	1,924	3,316
55.60	509	41	60.80	2,021	3,513
55.70	509	61	60.90	2,118	3,720
55.80	509	81	61.00	2,215	3,937
55.90	509	102	61.10	2,311	4,163
56.00	509	122	61.20	2,408	4,399
56.10	509	143	61.30	2,505	4,645
56.20	509	163	61.40	2,602	4,900
56.30	509	183	61.50	2,699	5,165
56.40	509	204	61.60	2,796	5,440
56.50	509	224	61.70	2,893	5,724
56.60	509	239	61.80	2,990	6,019
56.70	509	254	61.90	3,087	6,322
56.80	509	270	62.00	3,184	6,636
56.90	509	285			
57.00	509	300			
57.10	509	316			
57.20	509	331			
57.30	509	346			
57.40	509	361			
57.50	509	377			
57.60	509	392			
57.70	509	407			
57.80	509	422			
57.90	509	438			
58.00	509	453			
58.10	546	506			
58.20	583	562			
58.30	619	622			
58.40	656	686			
58.50	693	754			
58.60	730	825			
58.70	767	899			
58.80	803	978			
58.90	840	1,060			
59.00	877	1,146			
59.10	914	1,236			
59.20	951	1,329			
59.30	987	1,426			
59.40	1,024	1,526			
59.50	1,061	1,631			
59.60	1,098	1,738			
59.70	1,135	1,850			
59.80	1,171	1,965			
59.90	1,208	2,084			
60.00	1,245	2,207			
60.10	1,342	2,336			
60.20	1,439	2,475			
60.30	1,536	2,624			
60.40	1,633	2,783			
60.50	1,730	2,951			



FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: _____

FP-1 (FocalPoint BioFiltration)

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

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
1.10	ac	A = Area draining to the practice	
0.73	ac	A_i = Impervious area draining to the practice	
0.66	decimal	l = Percent impervious area draining to the practice, in decimal form	
0.65	unitless	R_v = Runoff coefficient = $0.05 + (0.9 \times l)$	
0.71	ac-in	WQV = 1" x R_v x A	
2,585	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
646	cf	25% x WQV (check calc for sediment forebay volume)	
1,938	cf	75% x WQV (check calc for surface sand filter volume)	
Offline CBs		Method of Pretreatment? (not required for clean or roof runoff)	
N/A	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
Calculate time to drain if system IS NOT underdrained:			
	sf	A_{SA} = Surface area of the practice	
	iph	$K_{sat_{DESIGN}}$ = Design infiltration rate ¹	
	Yes/No	If K_{sat} (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = $V / (A_{SA} * I_{DESIGN})$	≤ 72-hrs
Calculate time to drain if system IS underdrained:			
N/A	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
N/A	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = $2WQV/Q_{WQV}$	≤ 72-hrs
49.50	feet	E_{FC} = Elevation of the bottom of the filter course material ²	
48.40	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
-	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
-	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.10	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	≥ 1'
49.50	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	≥ 1'
49.50	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	≥ 1'
53.90	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
54.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	← yes
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	< 10 ac
	cf	V = Volume of storage ³ (attach a stage-storage table)	≥ 75%WQV
	inches	D_{FC} = Filter course thickness	18", or 24" if within GPA
Sheet		Note what sheet in the plan set contains the filter course specification.	
Yes/No		Access grate provided?	← yes

If a bioretention area is proposed:

YES	ac	Drainage Area no larger than 5 ac?	← yes
N/A	cf	$V =$ Volume of storage ³ (attach a stage-storage table)	≥ WQV
18.0	inches	D_{FC} = Filter course thickness	18", or 24" if within GPA
Sheet		Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	> 3:1
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	

If porous pavement is proposed:

	acres	Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
		A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	≤ 5:1
	inches	D_{FC} = Filter course thickness	12", or 18" if within GPA
Sheet		Note what sheet in the plan set contains the filter course spec.	mod. 304.1 (see spec)

1. Rate of the limiting layer (either the filter course or the underlying soil). K_{sat_design} includes factor of safety. See Env-Wq 1504.14 for guidance on determining the infiltration rate.
2. See lines 34, 40 and 48 for required depths of filter media.
3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet structure, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes: System meets minimum sizing requirements set by FocalPoint for the associated drainage area.



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** (i.e. for a technology which is not a stormwater wetland, infiltration practice, etc.)

Water Quality Volume (WQV)

4.79	ac	A = Area draining to the practice
3.45	ac	A _i = Impervious area draining to the practice
0.72	decimal	I = Percent impervious area draining to the practice, in decimal form
0.70	unitless	R _v = Runoff coefficient = 0.05 + (0.9 x I)
3.34	ac-in	WQV = 1" x R _v x A
12,141	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".
0.70	inches	Q = Water quality depth. Q = WQV/A
97	unitless	CN = Unit peak discharge curve number. CN = 1000 / (10 + 5P + 10Q - 10 * [Q ² + 1.25 * Q * P] ^{0.5})
0.3	inches	S = Potential maximum retention. S = (1000/CN) - 10
0.064	inches	I _a = Initial abstraction. I _a = 0.2S
5.0	minutes	T _c = Time of Concentration
640.0	cfs/mi ² /in	q _u is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III.
3.345	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: POST 1.0 WATERSHED

Proprietary Pretreatment device located upstream of underground detention.

Pretreatment Device - Contech CDS Model 3030-6 (designed to treat maximum 3.0 cfs) with internal bypass

Proprietary treatment device located downstream of underground detention.

Per previous project approvals with the AoT Bureau, for treatment systems located downstream from detention facilities, the surrogate for the WQF is the discharge from a detention facility during the 2-year storm event.

Treatment Device - Contech Jellyfish Filter Model JFPD080815-3 (designed to treat maximum 2.94 cfs)

Outlet Control structure configuration set to bypass flows beyond WQF.



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** (i.e. for a technology which is not a stormwater wetland, infiltration practice, etc.)

Water Quality Volume (WQV)

4.28 ac	A = Area draining to the practice
2.95 ac	A_i = Impervious area draining to the practice
0.69 decimal	I = Percent impervious area draining to the practice, in decimal form
0.67 unitless	R_v = Runoff coefficient = $0.05 + (0.9 \times I)$
2.87 ac-in	$WQV = 1'' \times R_v \times A$
10,414 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, $P = 1''$.
0.67 inches	Q = Water quality depth. $Q = WQV/A$
97 unitless	CN = Unit peak discharge curve number. $CN = 1000 / (10 + 5P + 10Q - 10 * [Q^2 + 1.25 * Q * P]^{0.5})$
0.4 inches	S = Potential maximum retention. $S = (1000/CN) - 10$
0.072 inches	I_a = Initial abstraction. $I_a = 0.2S$
8.8 minutes	T_c = Time of Concentration
640.0 cfs/mi ² /in	q_u is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III.
2.869 cfs	$WQF = q_u \times WQV$. Conversion: to convert "cfs/mi ² /in * ac-in" to "cfs" multiply by $1 \text{mi}^2/640 \text{ac}$.

Designer's Notes: POST 3.0 WATERSHED
PJFF-2 AND PCDS-2

Pretreatment Device - Contech CDS Model 3030-6 (designed to treat maximum 3.0 cfs)

Treatment Device - Contech Jellyfish Filter Model JFPD080815-3 (designed to treat maximum 2.94 cfs)



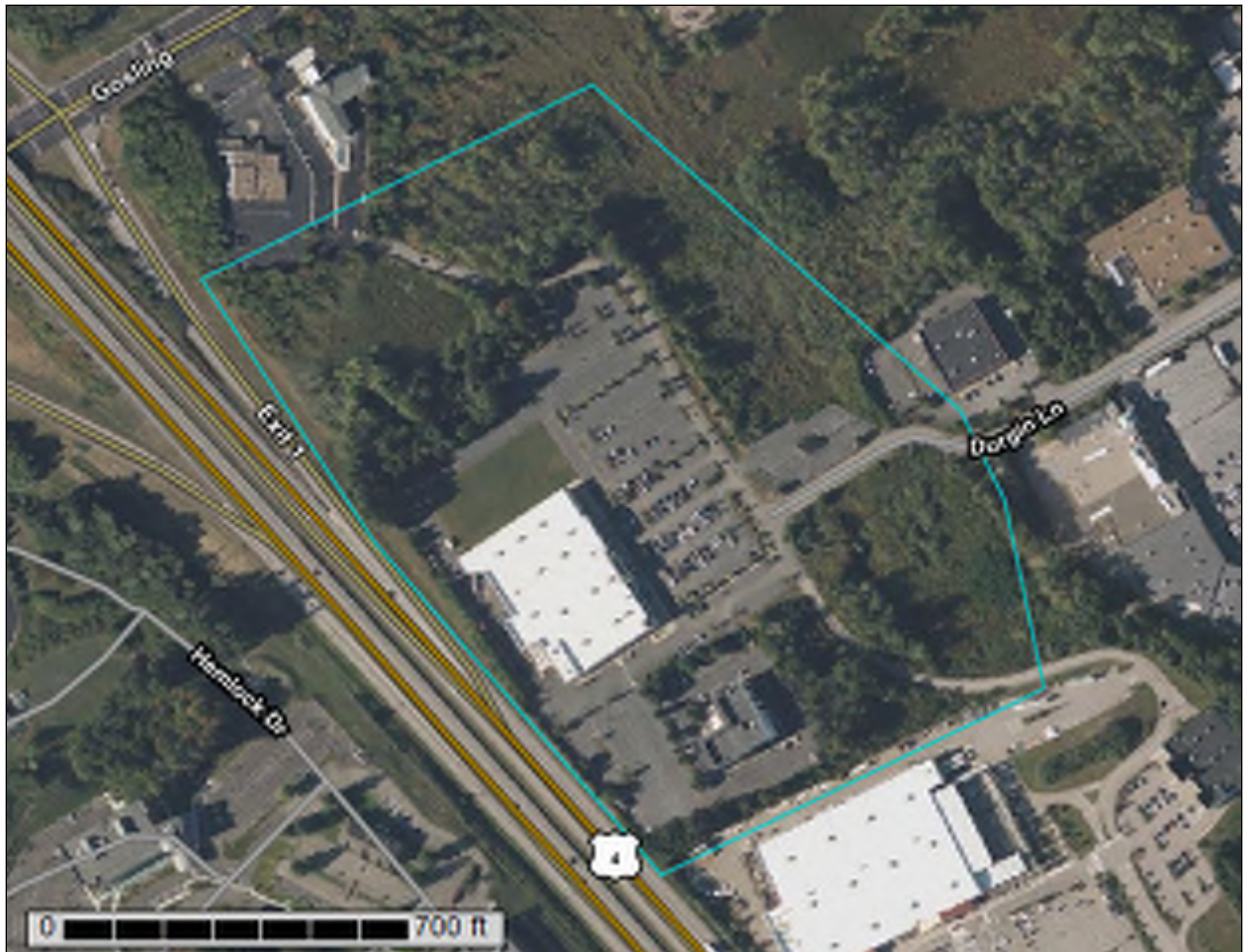
United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

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

Custom Soil Resource Report for Rockingham County, New Hampshire



Preface

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

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

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

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

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

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

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How Soil Surveys Are Made

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

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

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

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

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

Custom Soil Resource Report

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

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

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

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

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

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

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

Custom Soil Resource Report

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

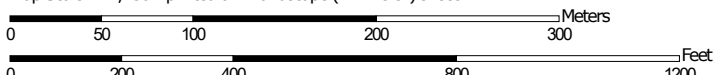
Soil Map

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

Custom Soil Resource Report Soil Map

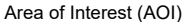





































Map Scale: 1:4,130 if printed on A landscape (11" x 8.5") sheet.



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

MAP LEGEND

- Area of Interest (AOI)**
 -  Area of Interest (AOI)
- Soils**
 -  Soil Map Unit Polygons
 -  Soil Map Unit Lines
 -  Soil Map Unit Points
- Special Point Features**
 -  Blowout
 -  Borrow Pit
 -  Clay Spot
 -  Closed Depression
 -  Gravel Pit
 -  Gravelly Spot
 -  Landfill
 -  Lava Flow
 -  Marsh or swamp
 -  Mine or Quarry
 -  Miscellaneous Water
 -  Perennial Water
 -  Rock Outcrop
 -  Saline Spot
 -  Sandy Spot
 -  Severely Eroded Spot
 -  Sinkhole
 -  Slide or Slip
 -  Sodic Spot
- Water Features**
 -  Streams and Canals
- Transportation**
 -  Rails
 -  Interstate Highways
 -  US Routes
 -  Major Roads
 -  Local Roads
- Background**
 -  Aerial Photography
- Other Features**
 -  Spoil Area
 -  Stony Spot
 -  Very Stony Spot
 -  Wet Spot
 -  Other
 -  Special Line Features

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 26, Aug 22, 2023

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
33A	Scitico silt loam, 0 to 5 percent slopes	8.9	25.6%
134	Maybid silt loam	0.4	1.1%
140B	Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky	23.0	66.0%
699	Urban land	1.6	4.5%
799	Urban land-Canton complex, 3 to 15 percent slopes	1.0	2.9%
Totals for Area of Interest		34.9	100.0%

Map Unit Descriptions

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

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

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

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

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

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

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

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

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

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

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

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

Rockingham County, New Hampshire

33A—Scitico silt loam, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 9cn6
Elevation: 0 to 180 feet
Mean annual precipitation: 47 to 49 inches
Mean annual air temperature: 48 degrees F
Frost-free period: 155 to 165 days
Farmland classification: Farmland of local importance

Map Unit Composition

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

Description of Scitico

Setting

Landform: Marine terraces

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 12 inches: silty clay loam
H3 - 12 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: F144AY019NH - Wet Lake Plain
Hydric soil rating: Yes

Minor Components

Maybid

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

Squamscott

Percent of map unit: 5 percent
Landform: Marine terraces

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Hydric soil rating: Yes

Boxford

Percent of map unit: 5 percent

Hydric soil rating: No

134—Maybid silt loam

Map Unit Setting

National map unit symbol: 9cmg

Elevation: 0 to 180 feet

Mean annual precipitation: 47 to 50 inches

Mean annual air temperature: 48 degrees F

Frost-free period: 155 to 165 days

Farmland classification: Not prime farmland

Map Unit Composition

Maybid and similar soils: 75 percent

Minor components: 25 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Maybid

Setting

Landform: Marine terraces

Parent material: Silty and clayey marine deposits

Typical profile

H1 - 0 to 9 inches: silt loam

H2 - 9 to 26 inches: silty clay loam

H3 - 26 to 63 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Very poorly drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Depth to water table: About 0 to 6 inches

Frequency of flooding: None

Frequency of ponding: Frequent

Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6w

Hydrologic Soil Group: C/D

Ecological site: F144AY020MA - Very Wet Coastal Lake Plain

Hydric soil rating: Yes

Minor Components

Ossipee

Percent of map unit: 10 percent
Landform: Swamps
Hydric soil rating: Yes

Scitico

Percent of map unit: 10 percent
Landform: Marine terraces
Hydric soil rating: Yes

Not named wet

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

140B—Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky

Map Unit Setting

National map unit symbol: 2w82m
Elevation: 380 to 1,070 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Chatfield, very stony, and similar soils: 35 percent
Canton, very stony, and similar soils: 25 percent
Hollis, very stony, and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chatfield, Very Stony

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

O_i - 0 to 1 inches: slightly decomposed plant material
A - 1 to 2 inches: fine sandy loam
B_w - 2 to 30 inches: gravelly fine sandy loam
2R - 30 to 40 inches: bedrock

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Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 20 to 41 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Canton, Very Stony

Setting

Landform: Ridges, hills, moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist

Typical profile

O_i - 0 to 2 inches: slightly decomposed plant material
A - 2 to 5 inches: fine sandy loam
Bw₁ - 5 to 16 inches: fine sandy loam
Bw₂ - 16 to 22 inches: gravelly fine sandy loam
2C - 22 to 67 inches: gravelly loamy sand

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 19 to 39 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

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Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Hollis, Very Stony

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

O_i - 0 to 2 inches: slightly decomposed plant material
A - 2 to 7 inches: gravelly fine sandy loam
B_w - 7 to 16 inches: gravelly fine sandy loam
2R - 16 to 26 inches: bedrock

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 8 to 23 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (K_{sat}): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Minor Components

Freetown

Percent of map unit: 5 percent
Landform: Swamps, kettles, bogs, depressions, marshes
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Newfields, very stony

Percent of map unit: 5 percent
Landform: Moraines, hills, ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope

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Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Walpole, very stony

Percent of map unit: 3 percent
Landform: Outwash terraces, depressions, outwash plains, depressions, deltas
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Rock outcrop

Percent of map unit: 2 percent
Landform: Hills, ridges
Hydric soil rating: Unranked

699—Urban land

Map Unit Composition

Urban land: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Minor Components

Not named

Percent of map unit: 15 percent
Hydric soil rating: No

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

Map Unit Setting

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

Map Unit Composition

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

Description of Canton

Setting

Parent material: Till

Typical profile

H1 - 0 to 5 inches: gravelly fine sandy loam

H2 - 5 to 21 inches: gravelly fine sandy loam

H3 - 21 to 60 inches: loamy sand

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: A

Ecological site: F144AY034CT - Well Drained Till Uplands

Hydric soil rating: No

Minor Components

Udorthents

Percent of map unit: 5 percent

Hydric soil rating: No

Boxford and eldridge

Percent of map unit: 4 percent

Hydric soil rating: No

Squamscott and scitico

Percent of map unit: 4 percent

Landform: Marine terraces

Hydric soil rating: Yes

Scituate and newfields

Percent of map unit: 4 percent

Hydric soil rating: No

Chatfield

Percent of map unit: 4 percent

Hydric soil rating: No

Walpole

Percent of map unit: 4 percent

Landform: Depressions

Hydric soil rating: Yes

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Extreme Precipitation Tables

Northeast Regional Climate Center

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

Metadata for Point	
Smoothing	Yes
State	New Hampshire
Location	Rockingham County, New Hampshire, United States
Latitude	43.088 degrees North
Longitude	70.798 degrees West
Elevation	10 feet
Date/Time	Tue Mar 05 2024 16:41:17 GMT-0500 (Eastern Standard Time)

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day
1yr	0.26	0.40	0.50	0.65	0.81	1.04	1yr	0.70	0.98	1.21	1.56	2.02	2.65	2.91	1yr	2.35	2.80
2yr	0.32	0.50	0.62	0.81	1.02	1.30	2yr	0.88	1.18	1.51	1.93	2.48	3.20	3.55	2yr	2.83	3.42
5yr	0.37	0.58	0.73	0.97	1.24	1.60	5yr	1.07	1.46	1.88	2.42	3.13	4.05	4.56	5yr	3.59	4.38
10yr	0.41	0.64	0.81	1.11	1.44	1.88	10yr	1.24	1.72	2.22	2.88	3.73	4.85	5.50	10yr	4.29	5.29
25yr	0.47	0.75	0.96	1.32	1.76	2.32	25yr	1.52	2.13	2.75	3.61	4.71	6.15	7.07	25yr	5.44	6.80
50yr	0.53	0.85	1.09	1.52	2.05	2.73	50yr	1.77	2.51	3.26	4.29	5.63	7.36	8.54	50yr	6.52	8.22
100yr	0.59	0.95	1.23	1.75	2.39	3.22	100yr	2.06	2.95	3.86	5.11	6.73	8.82	10.33	100yr	7.80	9.94
200yr	0.66	1.08	1.40	2.01	2.78	3.78	200yr	2.40	3.48	4.56	6.07	8.03	10.57	12.50	200yr	9.35	12.02
500yr	0.78	1.29	1.68	2.44	3.42	4.69	500yr	2.95	4.33	5.68	7.62	10.14	13.43	16.08	500yr	11.88	15.46

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day
1yr	0.23	0.36	0.44	0.59	0.73	0.89	1yr	0.63	0.87	0.92	1.32	1.66	2.22	2.49	1yr	1.97	2.40
2yr	0.31	0.49	0.60	0.81	1.00	1.19	2yr	0.86	1.16	1.37	1.82	2.34	3.05	3.44	2yr	2.70	3.31
5yr	0.35	0.54	0.67	0.92	1.17	1.40	5yr	1.01	1.37	1.61	2.13	2.74	3.78	4.18	5yr	3.34	4.02
10yr	0.38	0.59	0.73	1.02	1.32	1.60	10yr	1.14	1.56	1.81	2.40	3.07	4.36	4.85	10yr	3.86	4.67
25yr	0.44	0.67	0.83	1.18	1.56	1.90	25yr	1.34	1.86	2.10	2.78	3.56	4.68	5.89	25yr	4.14	5.66
50yr	0.48	0.73	0.91	1.31	1.76	2.17	50yr	1.52	2.12	2.35	3.10	3.97	5.29	6.80	50yr	4.68	6.54
100yr	0.53	0.81	1.01	1.46	2.01	2.47	100yr	1.73	2.42	2.63	3.45	4.40	5.94	7.86	100yr	5.25	7.56
200yr	0.59	0.89	1.13	1.63	2.27	2.82	200yr	1.96	2.75	2.93	3.84	4.86	6.65	9.08	200yr	5.88	8.73
500yr	0.68	1.02	1.31	1.90	2.71	3.37	500yr	2.34	3.29	3.40	4.40	5.56	7.72	10.98	500yr	6.83	10.55

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day
1yr	0.28	0.44	0.54	0.72	0.89	1.08	1yr	0.76	1.06	1.25	1.75	2.21	2.99	3.14	1yr	2.64	3.02
2yr	0.33	0.52	0.64	0.86	1.06	1.26	2yr	0.92	1.24	1.48	1.96	2.51	3.42	3.68	2yr	3.02	3.54
5yr	0.40	0.61	0.76	1.04	1.33	1.61	5yr	1.15	1.58	1.88	2.53	3.24	4.32	4.93	5yr	3.82	4.74
10yr	0.46	0.71	0.88	1.24	1.60	1.96	10yr	1.38	1.92	2.27	3.10	3.93	5.32	6.16	10yr	4.71	5.92
25yr	0.57	0.87	1.08	1.54	2.02	2.55	25yr	1.75	2.49	2.94	4.05	5.11	7.75	8.27	25yr	6.86	7.95
50yr	0.66	1.01	1.26	1.80	2.43	3.09	50yr	2.10	3.02	3.57	4.97	6.25	9.70	10.36	50yr	8.58	9.96
100yr	0.78	1.17	1.47	2.13	2.91	3.76	100yr	2.52	3.67	4.34	6.11	7.66	12.13	12.98	100yr	10.74	12.48
200yr	0.91	1.37	1.73	2.50	3.49	4.58	200yr	3.01	4.48	5.29	7.51	9.38	15.21	16.28	200yr	13.46	15.65
500yr	1.12	1.67	2.15	3.12	4.44	5.93	500yr	3.83	5.80	6.86	9.91	12.30	20.54	21.96	500yr	18.18	21.11

Coastal and Great Bay Region Precipitation Increase		
	24-hr Storm Event (in.)	24-hr Storm Event + 15% (in.)
1 Year	2.65	3.05
2 Year	3.20	3.68
10 Year	4.85	5.58
25 Year	6.15	7.07
50 Year	7.36	8.46
100 Year	8.82	10.14





Proposed Multi-Family Development
100 Durgin Lane
Portsmouth, NH

Long-Term Operation & Maintenance Plan

100 Durgin Lane Owner, LLC

April 22, 2024

Tighe&Bond

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Section 1

Long-Term Operation & Maintenance Plan

It is the intent of this Operation and Maintenance Plan to identify the areas of this site that need special attention and consideration, as well as implementing a plan to assure routine maintenance. By identifying the areas of concern as well as implementing a frequent and routine maintenance schedule the site will maintain a high-quality stormwater runoff.

1.1 Contact/Responsible Party

100 Durgin Lane Owner, LLC
1 Marina Park Drive, Suite 1500
Boston, MA 02210

(Note: The contact information for the Contact/Responsible Party shall be kept current. If ownership changes, the Operation and Maintenance Plan must be transferred to the new party.)

1.2 Maintenance Items

Maintenance of the following items shall be recorded:

- Litter/Debris Removal
- Landscaping
- Catchbasin Cleaning
- Pavement Sweeping
- Underground Detention System
- Rain Garden
- Contech Jellyfish Filtration System
- Contech CDS Units
- Rip Rap Outlets

The following maintenance items and schedule represent the minimum action required. Periodic site inspections shall be conducted, and all measures must be maintained in effective operating condition. The following items shall be observed during site inspection and maintenance:

- Inspect vegetated areas, particularly slopes and embankments for areas of erosion. Replant and restore as necessary
- Inspect catch basins for sediment buildup
- Inspect site for trash and debris

1.3 Overall Site Operation & Maintenance Schedule

Maintenance Item	Frequency of Maintenance
Litter/Debris Removal	Weekly
Pavement Sweeping - Sweep impervious areas to remove sand and litter.	Annually
Landscaping - Landscaped islands to be maintained and mulched.	Maintained as required and mulched each Spring
Catch Basin (CB) Cleaning - CB to be cleaned of solids and oils.	Annually
Rain Gardens - Trash and debris to be removed. - Any required maintenance shall be addressed.	Two (2) times annually After any rainfall event exceeding 2.5" in a 24-hr period
Contech Jelly Fish Units	In accordance with Manufacturer's Recommendations
Contech CDS Units®	In accordance with Manufacturer's Recommendations
Underground Detention Basin - Visual observation of sediment levels within system	Annually

1.3.1 Disposal Requirements

Disposal of debris, trash, sediment and other waste material should be done at suitable disposal/recycling sites and in compliance with all applicable local, state and federal waste regulations.

1.4 Underground Detention System Maintenance Requirements

Underground Detention System Inspection/Maintenance Requirements		
Inspection/ Maintenance	Frequency	Action
Monitor inlet and outlet structures for sediment accumulation	Two (2) times annually	<ul style="list-style-type: none"> - Trash, debris and sediment to be removed - Any required maintenance shall be addressed
Deep Sump Catchbasins	Two (2) times annually	<ul style="list-style-type: none"> - Removal of sediment as warranted by inspection - No less than once annually
Monitor detention system for sediment accumulation	Two (2) times annually	<ul style="list-style-type: none"> - Trash, debris and sediment to be removed - Any required maintenance shall be addressed

1.5 Rain Garden Maintenance Requirements

Rain Garden Inspection/Maintenance Requirements		
Inspection/ Maintenance	Frequency	Action
Monitor to ensure that Rain Gardens function effectively after storms	Two (2) times annually and after any rainfall event exceeding 2.5" in a 24-hr period	<ul style="list-style-type: none"> - Trash and debris to be removed - Any required maintenance shall be addressed
Inspect Vegetation	Annually	<ul style="list-style-type: none"> - Inspect the condition of all Rain Garden vegetation - Prune back overgrowth - Replace dead vegetation - Remove any invasive species
Inspect Drawdown Time - The system shall drawdown within 48-hours following a rainfall event.	Annually	<ul style="list-style-type: none"> - Assess the condition of the facility to determine measures required to restore the filtration function, including but not limited to removal of accumulated sediments or reconstruction of the filter.

1.6 Contech Jellyfish Filter System Maintenance Requirements

Contech Jellyfish Filter System Inspection/Maintenance Requirements		
Inspection/ Maintenance	Frequency	Action
Inspect vault for sediment build up, static water, plugged media and bypass condition	One (1) time annually and after any rainfall event exceeding 2.5" in a 24-hr period	Maintenance required for any of the following: - >4" of sediment on the vault floor - >1/4" of sediment on top of the cartridge - .4" of static water above the cartridge bottom more than 24 hours after a rain event - If pore space between media is absent. - If vault is in bypass condition during an average rainfall event.
Replace Cartridges	As required by inspection, 1-5 years.	- Remove filter cartridges per manufacturer methods. - Vacuum sediment from vault. - Install new cartridges per manufacturer methods

1.7 Contech CDS Unit Maintenance Requirements

Contech Cascade Separator® Inspection/Maintenance Requirements		
Inspection/ Maintenance	Frequency	Action
Visual Inspection	Twice per year at a minimum (spring and fall)	-Visually inspect for blockages or obstruction in the inlet chamber, flumes or outlet channel - Sediment removal once 50% of maximum storage has been reached

1.8 Rip Rap Maintenance Requirements

Rip Rap Inspection/Maintenance Requirements		
Inspection/ Maintenance	Frequency	Action
Visual Inspection	Annually	- Visually inspect for damage and deterioration - Repair damages immediately

1.9 Snow & Ice Management for Standard Asphalt and Walkways

Snow storage areas shall be located such that no direct untreated discharges are possible to receiving waters from the storage site (snow storage areas have been shown on the Site Plan). Salt storage areas shall be covered or located such that no direct untreated discharges are possible to receiving waters from the storage site. Salt and sand shall be used to the minimum extent practical (refer to the attached for de-icing application rate guideline from the New Hampshire Stormwater Management Manual, Volume 2,).

Deicing Application Rate Guidelines

24' of pavement (typical two-lane road)

These rates are not fixed values, but rather the middle of a range to be selected and adjusted by an agency according to its local conditions and experience.

Pavement Temp. (°F) and Trend (↑↓)	Weather Condition	Maintenance Actions	Pounds per two-lane mile			
			Salt Prewetted / Pretreated with Salt Brine	Salt Prewetted / Pretreated with Other Blends	Dry Salt*	Winter Sand (abrasives)
> 30° ↑	Snow	Plow, treat intersections only	80	70	100*	Not recommended
	Freezing Rain	Apply Chemical	80 - 160	70 - 140	100 - 200*	Not recommended
30° ↓	Snow	Plow and apply chemical	80 - 160	70 - 140	100 - 200*	Not recommended
	Freezing Rain	Apply Chemical	150 - 200	130 - 180	180 - 240*	Not recommended
25° - 30° ↑	Snow	Plow and apply chemical	120 - 160	100 - 140	150 - 200*	Not recommended
	Freezing Rain	Apply Chemical	150 - 200	130 - 180	180 - 240*	Not recommended
25° - 30° ↓	Snow	Plow and apply chemical	120 - 160	100 - 140	150 - 200*	Not recommended
	Freezing Rain	Apply Chemical	160 - 240	140 - 210	200 - 300*	400
20° - 25° ↑	Snow or Freezing Rain	Plow and apply chemical	160 - 240	140 - 210	200 - 300*	400
20° - 25° ↓	Snow	Plow and apply chemical	200 - 280	175 - 250	250 - 350*	Not recommended
	Freezing Rain	Apply Chemical	240 - 320	210 - 280	300 - 400*	400
15° - 20° ↑	Snow	Plow and apply chemical	200 - 280	175 - 250	250 - 350*	Not recommended
	Freezing Rain	Apply Chemical	240 - 320	210 - 280	300 - 400*	400
15° - 20° ↓	Snow or Freezing Rain	Plow and apply chemical	240 - 320	210 - 280	300 - 400*	500 for freezing rain
0° - 15° ↑↓	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	300 - 400	Not recommended	500 - 750 spot treatment as needed
< 0°	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	400 - 600**	Not recommended	500 - 750 spot treatment as needed

* Dry salt is not recommended. It is likely to blow off the road before it melts ice.

** A blend of 6 - 8 gal/ton MgCl₂ or CaCl₂ added to NaCl can melt ice as low as -10°.

Anti-icing Route Data Form				
Truck Station:				
Date:				
Air Temperature	Pavement Temperature	Relative Humidity	Dew Point	Sky
Reason for applying:				
Route:				
Chemical:				
Application Time:				
Application Amount:				
Observation (first day):				
Observation (after event):				
Observation (before next application):				
Name:				

Section 2

Chloride Management Plan

Winter Operational Guidelines

The following Chloride Management Plan is for the 100 Durgin Lane - Multifamily Development in Portsmouth, New Hampshire. The Plan includes operational guidelines including: winter operator certification requirements, weather monitoring, equipment calibration requirements, mechanical removal, and salt usage evaluation and monitoring. Due to the evolving nature of chloride management efforts, the Chlorides Management Plan will be reviewed annually, in advance of the winter season, to reflect the current management standards.

2.1 Background Information

The 100 Durgin Lane - Multifamily Development located within the Upper Hodgson Brook Watershed in Newington and Portsmouth, New Hampshire. The Upper Hodgson Brook is identified as a chloride-impaired waterbody.

2.2 Operational Guidelines – Chloride Management

All 100 Durgin Lane Owner LLC private contractors engaged at the 100 Durgin Lane premises for the purposes of winter operational snow removal and surface maintenance, are responsible for assisting in meeting compliance for the following protocols. 100 Durgin Lane Owner LLC private contractors are expected to minimize the effects of the use of de-icing, anti-icing and pretreatment materials by adhering to the strict guidelines outlined below.

The 100 Durgin Lane Owner LLC winter operational de-icing, anti-icing and pretreatment materials will adhere to the following protocols:

2.2.1 Winter Operator Certification Requirements

All private contractors engaged at the 100 Durgin Lane premises for the purpose of winter operational snow removal and surface maintenance must be current UNHT2 Green SnowPro Certified operators or equivalent and will use only pre-approved methods for spreading abrasives on private roadways and parking lots. All private contractors engaged at the 100 Durgin Lane premises for the purpose of winter operational snow removal and surface maintenance shall provide to 100 Durgin Lane Owner LLC management two copies of the annual UNHT2 Green SnowPro certificate or equivalent for each operator utilized on the 100 Durgin Lane premises. The annual UNHT2 Green SnowPro certificate or equivalent for each operator will be available on file in the 100 Durgin Lane Facilities Management office and be present in the vehicle/carrier at all times.

2.2.2 Improved Weather Monitoring

100 Durgin Lane Owner LLC will coordinate weather information for use by winter maintenance contractors. This information in conjunction with site specific air/ground surface temperature monitoring will ensure that private contractors engaged at the 100 Durgin Lane premises for the purpose of winter operational snow removal and surface maintenance will make more informed decisions as to when and to what extent de-icing, anti-icing and pretreatment materials are applied to private roadways, sidewalks, and parking lots.

2.2.3 Equipment Calibration Requirements

All equipment utilized on the 100 Durgin Lane premises for the purpose of winter operational snow removal and surface maintenance will conform to the following calibration requirements.

2.2.3.1 Annual Calibration Requirements

All private contractors engaged at the 100 Durgin Lane premises for the purpose of winter operational snow removal and surface maintenance shall provide two copies of the annual calibration report for each piece of equipment utilized on the 100 Durgin Lane premises. Each calibration report shall include the vehicle/carrier VIN number and the serial numbers for each component including, but not limited to, spreader control units, salt aggregate spreader equipment, brining/pre-wetting equipment, ground speed orientation unit, and air/ground surface temperature monitor. Annual calibration reports will be available on file in the 100 Durgin Lane Facilities Management office and be present in the vehicle/carrier at all times.

Prior to each use, each vehicle/carrier operator will perform a systems check to verify that unit settings remain within the guidelines established by the 100 Durgin Lane Owner LLC Management Team in order to accurately dispense material. All private contractors engaged at the 100 Durgin Lane premises for the purpose of winter operational snow removal and surface maintenance will be subject to spot inspections by members of the 100 Durgin Lane Owner LLC Management Team to ensure that each vehicle/carrier is operating in a manner consistent with the guidelines set herein or State and Municipal regulations. All units will be recalibrated, and the updated calibration reports will be provided each time repairs or maintenance procedures affect the hydraulic system of the vehicle/carrier.

2.2.4 Increased Mechanical Removal Capabilities

All private contractors engaged at the 100 Durgin Lane premises will endeavor to use mechanical removal means on a more frequent basis for roadways, parking lots and sidewalks. Dedicating more manpower and equipment to increase snow removal frequencies prevents the buildup of snow and the corresponding need for de-icing, anti-icing and pretreatment materials. Shortened maintenance

routes, with shorter service intervals, will be used to stay ahead of snowfall. Minimized snow and ice packing will reduce the need for abrasives, salt aggregates, and/or brining solution to restore surfaces back to bare surface states after winter precipitation events.

After storm events the 100 Durgin Lane Owner LLC management team will be responsible for having the streets swept to recapture un-melted de-icing materials, when practical.

2.3 Salt Usage Evaluation and Monitoring

All private contractors engaged at the 100 Durgin Lane premises for the purpose of winter operational snow removal and surface maintenance shall provide two copies of a storm report, which includes detailed information regarding treatment areas and the use of de-icing, anti-icing and pretreatment materials applied for the removal of snow and surface maintenance on the 100 Durgin Lane premises. 100 Durgin Lane Owner LLC will maintain copies of Summary Documents, including copies of the Storm Reports, operator certifications, equipment used for roadway and sidewalk winter maintenance, calibration reports and amount of de-icing materials used.

2.4 Summary

The above-described methodologies are incorporated into the 100 Durgin Lane Operational Manual and are to be used to qualify and retain all private contractors engaged at the 100 Durgin Lane premises for the purpose of winter operational snow removal and surface maintenance. This section of the Manual, is intended to be an adaptive management document that is modified as required based on experience gained from past practices and technological advancements that reflect chloride BMP standards. All 100 Durgin Lane Owner LLC employees directly involved with winter operational activities are required to review this document and the current standard Best Management Practices published by the UNH Technology Transfer (T2) program annually. All 100 Durgin Lane Owner LLC employees directly involved with winter operational activities, and all private contractors engaged at the 100 Durgin Lane premises for the purposes of winter operational snow removal and surface maintenance, must be current UNHT2 Green SnowPro Certified operators or equivalent and undergo the necessary requirements to maintain this certification annually.

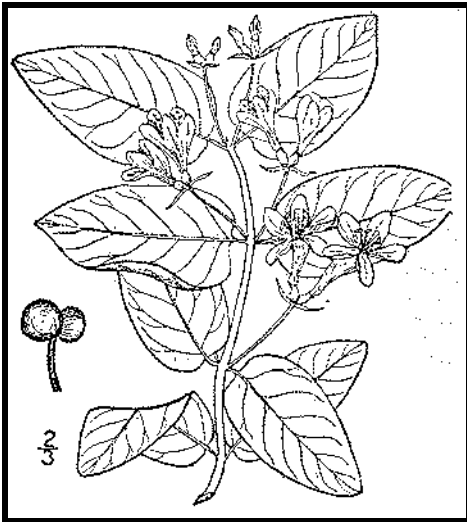
Section 3

Invasive Species

With respect to a particular ecosystem, any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem is classified as an invasive species. Refer to the following fact sheet prepared by the University of New Hampshire Cooperative Extension entitled Methods for Disposing Non-Native Invasive Plants for recommended methods to dispose of invasive plant species.



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



Tatarian honeysuckle

Lonicera tatarica

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

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

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

Knowing how a particular plant reproduces indicates its method of spread and helps determine

the appropriate disposal method. Most are spread by seed and are dispersed by wind, water, animals, or people. Some reproduce by vegetative means from pieces of stems or roots forming new plants. Others spread through both seed and vegetative means.

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

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

New Hampshire Regulations

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

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

How and When to Dispose of Invasives?

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

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

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

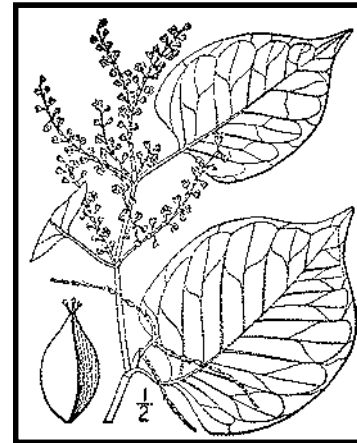
Tarping and Drying: Pile material on a sheet of plastic and cover with a tarp, fastening the tarp to the ground and monitoring it for escapes. Let the material dry for several weeks, or until it is clearly nonviable.

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

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

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

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






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

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

Suggested Disposal Methods for Non-Native Invasive Plants

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

Woody Plants	Method of Reproducing	Methods of Disposal
Norway maple <i>(Acer platanoides)</i> European barberry <i>(Berberis vulgaris)</i> Japanese barberry <i>(Berberis thunbergii)</i> autumn olive <i>(Elaeagnus umbellata)</i> burning bush <i>(Euonymus alatus)</i> Morrow's honeysuckle <i>(Lonicera morrowii)</i> Tatarian honeysuckle <i>(Lonicera tatarica)</i> showy bush honeysuckle <i>(Lonicera x bella)</i> common buckthorn <i>(Rhamnus cathartica)</i> glossy buckthorn <i>(Frangula alnus)</i>		<p>Prior to fruit/seed ripening</p> <p>Seedlings and small plants</p> <ul style="list-style-type: none"> ▪ Pull or cut and leave on site with roots exposed. No special care needed. <p>Larger plants</p> <ul style="list-style-type: none"> ▪ Use as firewood. ▪ Make a brush pile. ▪ Chip. ▪ Burn.
		<p>After fruit/seed is ripe</p> <p>Don't remove from site.</p> <ul style="list-style-type: none"> ▪ Burn. ▪ Make a covered brush pile. ▪ Chip once all fruit has dropped from branches. ▪ Leave resulting chips on site and monitor.
oriental bittersweet <i>(Celastrus orbiculatus)</i> multiflora rose <i>(Rosa multiflora)</i>		<p>Prior to fruit/seed ripening</p> <p>Seedlings and small plants</p> <ul style="list-style-type: none"> ▪ Pull or cut and leave on site with roots exposed. No special care needed. <p>Larger plants</p> <ul style="list-style-type: none"> ▪ Make a brush pile. ▪ Burn.
		<p>After fruit/seed is ripe</p> <p>Don't remove from site.</p> <ul style="list-style-type: none"> ▪ Burn. ▪ Make a covered brush pile. ▪ Chip – only after material has fully dried (1 year) and all fruit has dropped from branches. Leave resulting chips on site and monitor.

Non-Woody Plants	Method of Reproducing	Methods of Disposal
<p>garlic mustard (<i>Alliaria petiolata</i>)</p> <p>spotted knapweed (<i>Centaurea maculosa</i>)</p> <ul style="list-style-type: none"> ▪ Sap of related knapweed can cause skin irritation and tumors. Wear gloves when handling. <p>black swallow-wort (<i>Cynanchum nigrum</i>)</p> <ul style="list-style-type: none"> ▪ May cause skin rash. Wear gloves and long sleeves when handling. <p>pale swallow-wort (<i>Cynanchum rossicum</i>)</p> <p>giant hogweed (<i>Heracleum mantegazzianum</i>)</p> <ul style="list-style-type: none"> ▪ Can cause major skin rash. Wear gloves and long sleeves when handling. <p>dame's rocket (<i>Hesperis matronalis</i>)</p> <p>perennial pepperweed (<i>Lepidium latifolium</i>)</p> <p>purple loosestrife (<i>Lythrum salicaria</i>)</p> <p>Japanese stilt grass (<i>Microstegium vimineum</i>)</p> <p>mile-a-minute weed (<i>Polygonum perfoliatum</i>)</p>	<p>Fruits and Seeds</p> 	<p>Prior to flowering</p> <p>Depends on scale of infestation</p> <p>Small infestation</p> <ul style="list-style-type: none"> ▪ Pull or cut plant and leave on site with roots exposed. <p>Large infestation</p> <ul style="list-style-type: none"> ▪ Pull or cut plant and pile. (You can pile onto or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material. <hr/> <p>During and following flowering</p> <p>Do nothing until the following year or remove flowering heads and bag and let rot.</p> <p>Small infestation</p> <ul style="list-style-type: none"> ▪ Pull or cut plant and leave on site with roots exposed. <p>Large infestation</p> <ul style="list-style-type: none"> ▪ Pull or cut plant and pile remaining material. (You can pile onto plastic or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material.
<p>common reed (<i>Phragmites australis</i>)</p> <p>Japanese knotweed (<i>Polygonum cuspidatum</i>)</p> <p>Bohemian knotweed (<i>Polygonum x bohemicum</i>)</p>	<p>Fruits, Seeds, Plant Fragments</p> <p>Primary means of spread in these species is by plant parts. Although all care should be given to preventing the dispersal of seed during control activities, the presence of seed doesn't materially influence disposal activities.</p>	<p>Small infestation</p> <ul style="list-style-type: none"> ▪ Bag all plant material and let rot. ▪ Never pile and use resulting material as compost. ▪ Burn. <p>Large infestation</p> <ul style="list-style-type: none"> ▪ Remove material to unsuitable habitat (dry, hot and sunny or dry and shaded location) and scatter or pile. ▪ Monitor and remove any sprouting material. ▪ Pile, let dry, and burn.

January 2010

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Managing Invasive Plants

Methods of Control

by Christopher Mattrick

They're out there. The problem of invasive plants is as close as your own backyard.

Maybe a favorite dogwood tree is struggling in the clutches of an Oriental bittersweet vine. Clawlike canes of multiflora rose are scratching at the side of your house. That handsome burning bush you planted few years ago has become a whole clump in practically no time ... but what happened to the azalea that used to grow right next to it?

If you think controlling or managing invasive plants on your property is a daunting task, you're not alone. Though this topic is getting lots of attention from federal, state, and local government agencies, as well as the media, the basic question for most homeowners is simply, "How do I get rid of the invasive plants in my own landscape?" Fortunately, the best place to begin to tackle this complex issue is in our own backyards and on local conservation lands. We hope the information provided here will help you take back your yard. We won't kid you—there's some work involved, but the payoff in beauty, wildlife habitat, and peace of mind makes it all worthwhile.

PLAN OF ATTACK

Three broad categories cover most invasive plant control: mechanical, chemical, and biological. Mechanical control means physically removing plants from the environment



Spraying chemicals to control invasive plants.

through cutting or pulling. Chemical control uses herbicides to kill plants and inhibit regrowth. Techniques and chemicals used will vary depending on the species. Biological controls use plant diseases or insect predators, typically from the targeted species' home range. Several techniques may be effective in controlling a single species, but there is usually one preferred method—the one that is most resource efficient with minimal impact on non-target species and the environment.

MECHANICAL CONTROL METHODS

Mechanical treatments are usually the first ones to look at when evaluating an invasive plant removal project. These procedures do not require special licensing or introduce chemicals into the environment. They do require permits in some situations, such as wetland zones. [See sidebar on page 23.] Mechanical removal is highly labor intensive and creates a significant amount of site disturbance, which can lead to rapid reinvasion if not handled properly.

Pulling and digging

Many herbaceous plants and some woody species (up to about one inch in diameter), if present in limited quantities, can be pulled out or dug up. It's important to remove as much of the root system as possible; even a small portion can restart the infestation. Pull plants by hand or use a digging fork, as shovels can shear off portions of the root system, allowing for regrowth. To remove larger woody stems (up to about three inches in diameter), use a Weed Wrench™, Root Jack, or Root Talon. These tools, available from several manufacturers, are designed to remove the aboveground portion of the plant as well as the entire root system. It's easiest to undertake this type of control in the spring or early summer when soils are moist and plants come out more easily.



Using tools to remove woody stems.



Volunteers hand pulling invasive plants.

Suffocation

Try suffocating small seedlings and herbaceous plants. Place double or triple layers of thick UV-stabilized plastic sheeting, either clear or black (personally I like clear), over the infestation and secure the plastic with stakes or weights. Make sure the plastic extends at least five feet past the edge of infestation on all sides. Leave the plastic in place for at least two years. This technique will kill everything beneath the plastic—invasive and non-invasive plants alike. Once the plastic is removed, sow a cover crop such as annual rye to prevent new invasions.

Cutting or mowing

This technique is best suited for locations you can visit and treat often. To be effective, you will need to mow or cut infested areas three or four times a year for up to five years. The goal is to interrupt the plant's ability to photosynthesize by removing as much leafy material as possible. Cut the plants at ground level and remove all resulting debris from the site. With this treatment, the infestation may actually appear to get worse at first, so you will need to be as persistent as the invasive plants themselves. Each time you cut the plants back, the root system gets slightly larger, but must also rely on its energy reserves to push up new growth. Eventually, you will exhaust these reserves and the plants will die. This may take many years, so you have to remain committed to this process once you start; otherwise the treatment can backfire, making the problem worse.

CHEMICAL CONTROL METHODS

Herbicides are among the most effective and resource-efficient tools to treat invasive species. Most of the commonly known invasive plants can be treated using only two herbicides—glyphosate (the active ingredient in Roundup™ and Rodeo™) and triclopyr (the active ingredient in Brush-B-Gone™ and Garlon™). Glyphosate is non-selective, meaning it kills everything it contacts. Triclopyr is selective and does not injure monocots (grasses, orchids, lilies, etc.). Please read labels and follow directions precisely for both environmental and personal safety. These are relatively benign herbicides, but improperly used they can still cause both short- and long-term health and environmental problems. Special aquatic formulations are required when working in wetland zones. You are required to have a state-issued pesticide applicator license when applying these chemicals on land you do not own. To learn more about the pesticide regulations in your state, visit or call your state's pesticide control division, usually part of the state's Department of Agriculture. In wetland areas, additional permits are usually required by the Wetlands Protection Act. [See sidebar on page 23.]

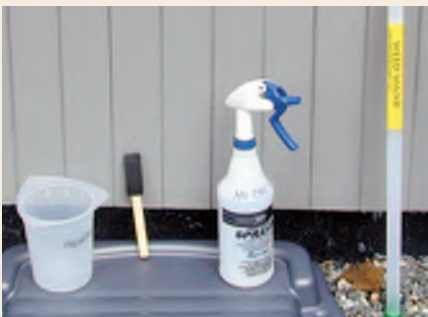
Foliar applications

When problems are on a small scale, this type of treatment is usually applied with a backpack sprayer or even a small handheld spray bottle. It is an excellent way to treat large monocultures of herbaceous plants, or to spot-treat individual plants that are difficult to remove mechanically, such as goutweed, swallowwort, or purple loosestrife. It is also an effective treatment for some woody species, such as Japanese barberry, multiflora rose, Japanese honeysuckle, and Oriental bittersweet that grow in dense masses or large numbers over many acres. The herbicide mixture should contain no more than five percent of the active ingredient, but it is important to follow the instructions on the product label. This treatment is most effective when the plants are actively growing, ideally when they are flowering or beginning to form fruit. It has been shown that plants are often more susceptible to this type of treatment if the existing stems are cut off and the regrowth is treated. This is especially true for Japanese knotweed. The target plants should be thoroughly wetted with the herbicide on a day when there is no rain in the forecast for the next 24 to 48 hours.

Cut stem treatments

There are several different types of cut stem treatments, but here we will review only the one most commonly used. All treatments of this type require a higher concentration of the active ingredient than is used in foliar applications. A 25 to 35 percent solution of the active ingredient should be used for cut stem treatments, but read and follow all label instructions. In most cases, the appropriate herbicide is glyphosate, except for Oriental bittersweet, on which triclopyr should be used. This treatment can be used on all woody stems, as well as phragmites and Japanese knotweed.

For woody stems, treatments are most effective when applied in the late summer and autumn—between late August and November. Stems should be cut close to the ground, but not so close that you will lose track of them. Apply herbicide directly to the cut surface as soon as possible after cutting. Delaying the application will reduce the effectiveness of the treatment. The herbicide can be applied with a sponge, paintbrush, or spray bottle.



Cut stem treatment tools.

For phragmites and Japanese knotweed, treatment is the same, but the timing and equipment are different. Plants should be treated anytime from mid-July through September, but the hottest, most humid days of the summer are best

for this method. Cut the stems halfway between two leaf nodes at a comfortable height. Inject (or squirt) herbicide into the exposed hollow stem. All stems in an infestation should be treated. A wash bottle is the most effective application tool, but you can also use an eyedropper, spray bottle, or one of the recently developed high-tech injection systems.

It is helpful to mix a dye in with the herbicide solution. The dye will stain the treated surface and mark the areas that have been treated, preventing unnecessary reapplication. You can buy a specially formulated herbicide dye, or use food coloring or laundry dye.

There is not enough space in this article to describe all the possible ways to control invasive plants. You can find other treatments, along with more details on the above-described methods, and species-specific recommendations on The Nature Conservancy Web site (tncweeds.ucdavis.edu). An upcoming posting on the Invasive Plant Atlas of New England (www.ipane.org) and the New England Wild Flower Society (www.newfs.org) Web sites will also provide further details.



Hollow stem injection tools.

Biological controls—still on the horizon

Biological controls are moving into the forefront of control methodology, but currently the only widely available and applied biocontrol relates to purple loosestrife. More information on purple loosestrife and other biological control projects can be found at www.invasiveplants.net.

DISPOSAL OF INVASIVE PLANTS

Proper disposal of removed invasive plant material is critical to the control process. Leftover plant material can cause new infestations or reinfest the existing project area. There are many appropriate ways to dispose of invasive plant debris. I've listed them here in order of preference.

- 1. Burn it**—Make a brush pile and burn the material following local safety regulations and restrictions, or haul it to your town's landfill and place it in their burn pile.
- 2. Pile it**—Make a pile of the woody debris. This technique will provide shelter for wildlife as well.
- 3. Compost it**—Place all your herbaceous invasive plant debris in a pile and process as compost. Watch the pile closely for resprouts and remove as necessary. Do not use the resulting compost in your garden. The pile is for invasive plants only.



Injecting herbicide into the hollow stem of phragmites.

4. Dry it/cook it—Place woody debris out on your driveway or any asphalt surface and let it dry out for a month. Place herbaceous material in a doubled-up black trash bag and let it cook in the sun for one month. At the end of the month, the material should be non-viable and you can dump it or dispose of it with the trash. The method assumes there is no viable seed mixed in with the removed material.

Care should be taken in the disposal of all invasive plants, but several species need extra attention. These are the ones that have the ability to sprout vigorously from plant fragments and should ideally be burned or dried prior to disposal: Oriental bittersweet, multiflora rose, Japanese honeysuckle, phragmites, and Japanese knotweed.

Christopher Mattrick is the former Senior Conservation Programs Manager for New England Wild Flower Society, where he managed conservation volunteer and invasive and rare plant management programs. Today, Chris and his family work and play in the White Mountains of New Hampshire, where he is the Forest Botanist and Invasive Species Coordinator for the White Mountain National Forest.



Controlling Invasive Plants in Wetlands

Special concerns; special precautions

Control of invasive plants in or around wetlands or bodies of water requires a unique set of considerations. Removal projects in wetland zones can be legal and effective if handled appropriately. In many cases, herbicides may be the least disruptive tools with which to remove invasive plants. You will need a state-issued pesticide license to apply herbicide on someone else's property, but all projects in wetland or aquatic systems fall under the jurisdiction of the Wetlands Protection Act and therefore require a permit. *Yes, even hand-pulling that colony of glossy buckthorn plants from your own swampland requires a permit.* Getting a permit for legal removal is fairly painless if you plan your project carefully.

1. Investigate and understand the required permits and learn how to obtain them. The entity charged with the enforcement of the Wetlands Protection Act varies from state to state. For more information in your state, contact:

ME: Department of Environmental Protection
www.state.me.us/dep/blwq/docstand/nrpapage.htm

NH: Department of Environmental Services
www.des.state.nh.us/wetlands/

VT: Department of Environmental Conservation
www.anr.state.vt.us/dec/waterq/permits/htm/pm_cud.htm

MA: Consult your local town conservation commission

RI: Department of Environmental Management
www.dem.ri.gov/programs/benviron/water/permits/fresh/index.htm

CT: Consult your local town Inland Wetland and Conservation Commission

2. Consult an individual or organization with experience in this area. Firsthand experience in conducting projects in wetland zones and navigating the permitting process is priceless. Most states have wetland scientist societies whose members are experienced in working in wetlands and navigating the regulations affecting them. A simple Web search will reveal the contact point for these societies. Additionally, most environmental consulting firms and some nonprofit organizations have skills in this area.

3. Develop a well-written and thorough project plan. You are more likely to be successful in obtaining a permit for your project if you submit a project plan along with your permit application. The plan should include the reasons for the project, your objectives in completing the project, how you plan to reach those objectives, and how you will monitor the outcome.

4. Ensure that the herbicides you plan to use are approved for aquatic use. Experts consider most herbicides harmful to water quality or aquatic organisms, but rate some formulations as safe for aquatic use. Do the research and select an approved herbicide, and then closely follow the instructions on the label.

5. If you are unsure—research, study, and most of all, ask for help. Follow the rules. The damage caused to aquatic systems by the use of an inappropriate herbicide or the misapplication of an appropriate herbicide not only damages the environment, but also may reduce public support for safe, well-planned projects.

Section 4

Annual Updates and Log Requirements

The Owner and/or Contact/Responsible Party shall review this Operation and Maintenance Plan once per year for its effectiveness and adjust the plan and deed as necessary.

A log of all preventative and corrective measures for the stormwater system shall be kept on-site and be made available upon request by any public entity with administrative, health environmental or safety authority over the site including NHDES.

Copies of the Stormwater Maintenance report shall be submitted to the City of Portsmouth on an annual basis.

Stormwater Management Report						
Multifamily Development		100 Durgin Lane				
BMP Description	Date of Inspection	Inspector	BMP Installed and Operating Properly?	Cleaning / Corrective Action Needed	Date of Cleaning / Repair	Performed By
Deep Sump CB's			<input type="checkbox"/> Yes <input type="checkbox"/> No			
Underground Detention Basin			<input type="checkbox"/> Yes <input type="checkbox"/> No			
Jellyfish Filter 1			<input type="checkbox"/> Yes <input type="checkbox"/> No			
Jellyfish Filter 2			<input type="checkbox"/> Yes <input type="checkbox"/> No			
CDS Unit 1			<input type="checkbox"/> Yes <input type="checkbox"/> No			
CDS Unit 2			<input type="checkbox"/> Yes <input type="checkbox"/> No			
Rain Garden 1			<input type="checkbox"/> Yes <input type="checkbox"/> No			
Rain Garden 2			<input type="checkbox"/> Yes <input type="checkbox"/> No			
Rain Garden 3			<input type="checkbox"/> Yes <input type="checkbox"/> No			

**Jellyfish[®] Filter
Owner's Manual**



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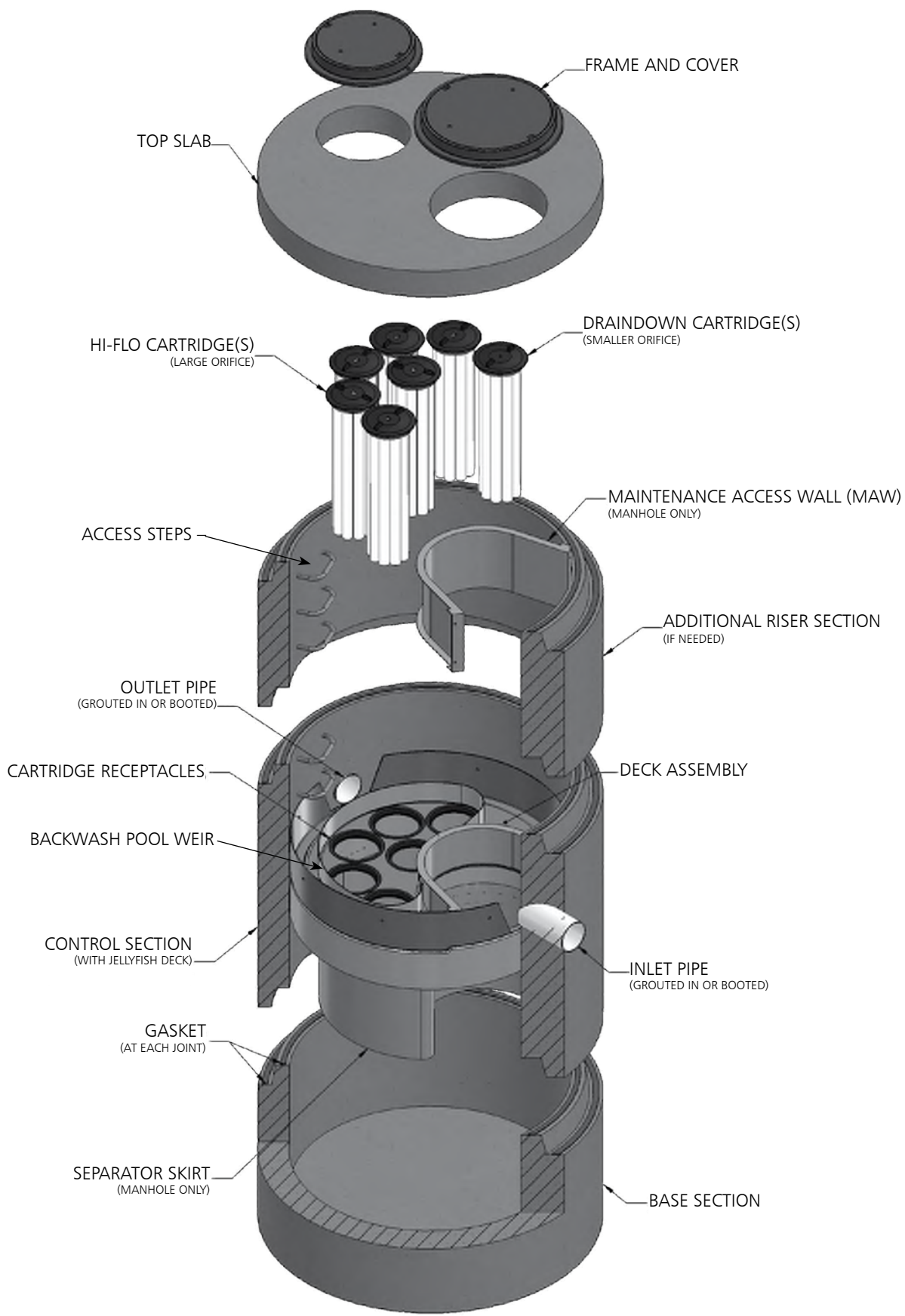
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THANK YOU FOR PURCHASING THE JELLYFISH® FILTER!

Contech Engineered Solutions would like to thank you for selecting the Jellyfish Filter to meet your project’s stormwater treatment needs. With proper inspection and maintenance, the Jellyfish Filter is designed to deliver ongoing, high levels of stormwater pollutant removal.

If you have any questions, please feel free to call us or e-mail us:

Contech Engineered Solutions
9025 Centre Pointe Drive, Suite 400 | West Chester, OH 45069
513-645-7000 | 800-338-1122
www.ContechES.com
info@conteches.com



WARNINGS / CAUTION

1. FALL PROTECTION may be required.
2. WATCH YOUR STEP if standing on the Jellyfish Filter Deck at any time; Great care and safety must be taken while walking or maneuvering on the Jellyfish Filter Deck. Attentive care must be taken while standing on the Jellyfish Filter Deck at all times to prevent stepping onto a lid, into or through a cartridge hole or slipping on the deck.
3. The Jellyfish Filter Deck can be SLIPPERY WHEN WET.
4. If the Top Slab, Covers or Hatches have not yet been installed, or are removed for any reason, great care must be taken to NOT DROP ANYTHING ONTO THE JELLYFISH FILTER DECK. The Jellyfish Filter Deck and Cartridge Receptacle Rings can be damaged under high impact loads. This type of activity voids all warranties. All damaged items to be replaced at owner's expense.
5. Maximum deck load 2 persons, total weight 450 lbs.

Safety Notice

Jobsite safety is a topic and practice addressed comprehensively by others. The inclusions here are intended to be reminders to whole areas of Safety Practice that are the responsibility of the Owner(s), Manager(s) and Contractor(s). OSHA and Canadian OSH, and Federal, State/Provincial, and Local Jurisdiction Safety Standards apply on any given site or project. The knowledge and applicability of those responsibilities is the Contractor's responsibility and outside the scope of Contech Engineered Solutions.

Confined Space Entry

Secure all equipment and perform all training to meet applicable local and OSHA regulations regarding confined space entry. It is the Contractor's or entry personnel's responsibility to proceed safely at all times.

Personal Safety Equipment

Contractor is responsible to provide and wear appropriate personal protection equipment as needed including, but not limited to safety boots, hard hat, reflective vest, protective eyewear, gloves and fall protection equipment as necessary. Make sure all equipment is staffed with trained and/or certified personnel, and all equipment is checked for proper operation and safety features prior to use.

- Fall protection equipment
- Eye protection
- Safety boots
- Ear protection
- Gloves
- Ventilation and respiratory protection
- Hard hat
- Maintenance and protection of traffic plan

Chapter 1

1.0 – Owner Specific Jellyfish Filter Product Information

Below you will find a reference page that can be filled out according to your Jellyfish Filter specification to help you easily inspect, maintain and order parts for your system.

Owner Name:	
Phone Number:	
Site Address:	
Site GPS Coordinates/unit location:	
Unit Location Description:	
Jellyfish Filter Model No.:	
Contech Project & Sequence Number	
No. of Hi-Flo Cartridges	
No. of Cartridges:	
Length of Draindown Cartridges:	
No. of Blank Cartridge Lids:	
Bypass Configuration (Online/Offline):	

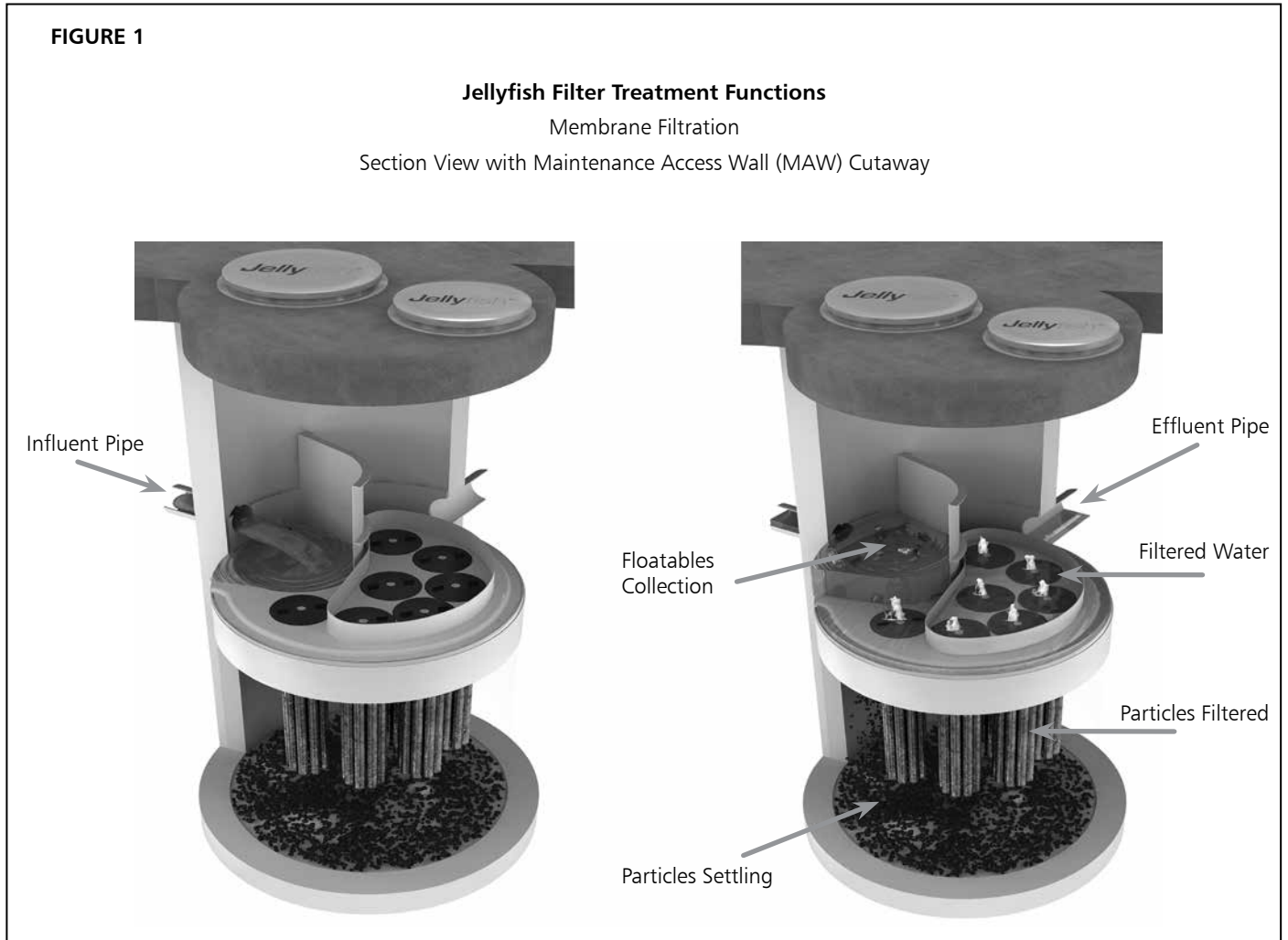
Notes:

Chapter 2

2.0 – Jellyfish Filter System Operations and Functions

The Jellyfish Filter is an engineered stormwater quality treatment technology that removes a high level and wide variety of stormwater pollutants. Each Jellyfish Filter cartridge consists of eleven membrane - encased filter elements (“filtration tentacles”) attached to a cartridge head plate. The filtration tentacles provide a large filtration surface area, resulting in high flow and high pollutant removal capacity.

The Jellyfish Filter functions are depicted in Figure 1 below.



Jellyfish Filter cartridges are backwashed after each peak storm event, which removes accumulated sediment from the membranes. This backwash process extends the service life of the cartridges and increases the time between maintenance events.

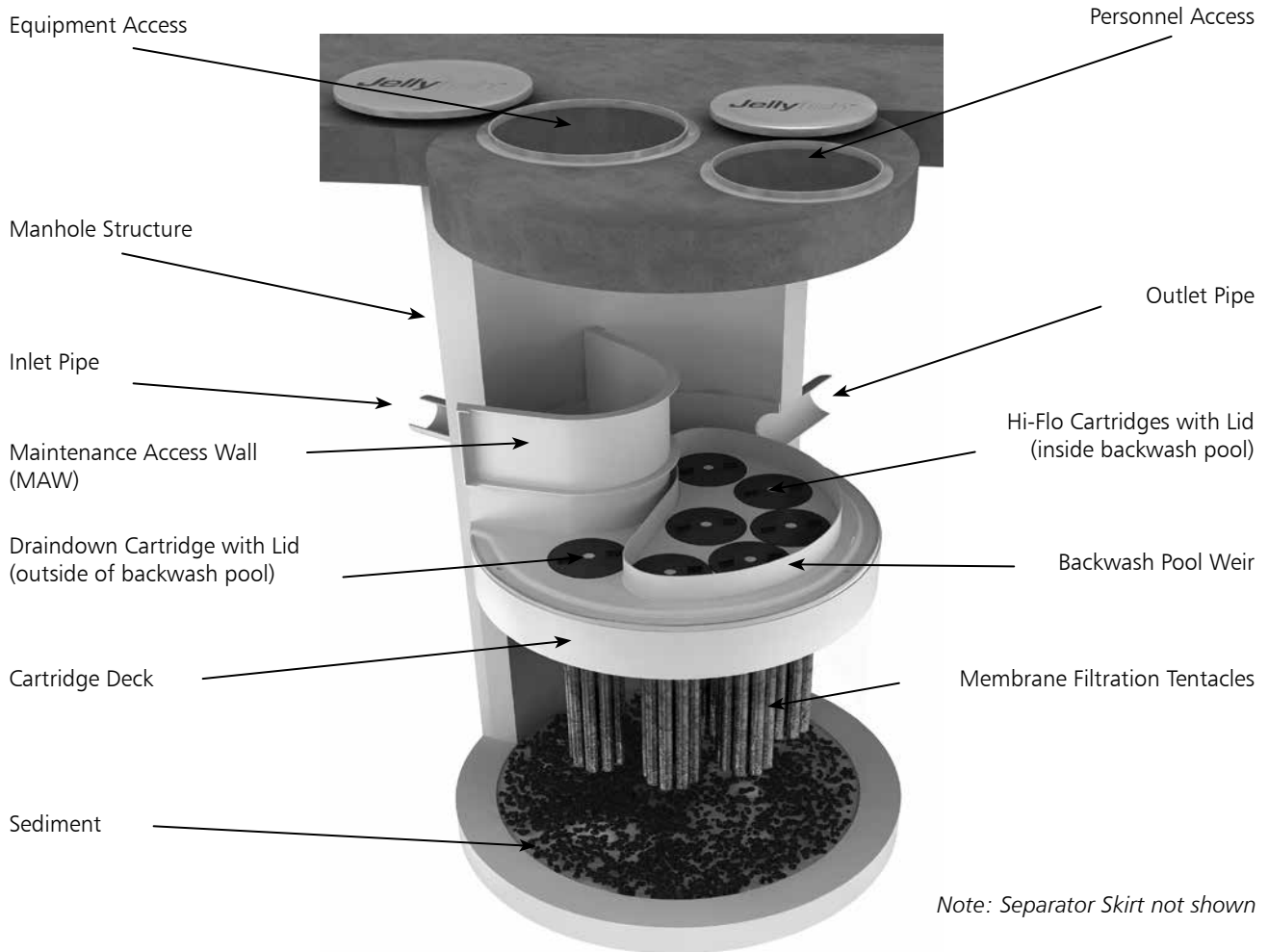
For additional details on the operation and pollutant capabilities of the Jellyfish Filter please refer to additional details on our website at www.ContechES.com.

2.1 – Components and Cartridges

The Jellyfish Filter and components are depicted in Figure 2 below.

FIGURE 2

Jellyfish Filter Components



Tentacles are available in various lengths as depicted in Table 1 below.

Table 1 – Cartridge Lengths / Weights and Cartridge Lid Orifice Diameters

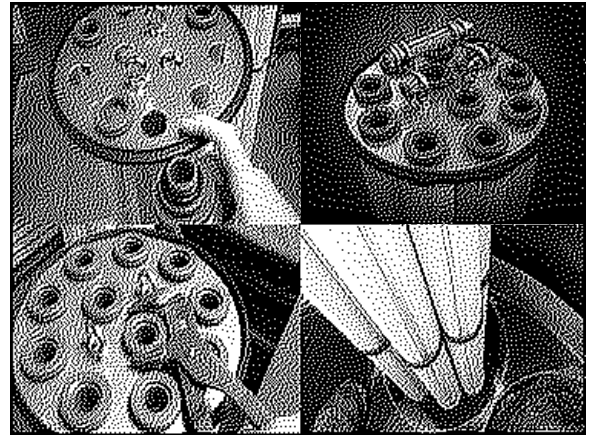
Cartridge Lengths	Dry Weight	Hi-Flo Orifice Diameter	Draindown Orifice Diameter
15 inches (381 mm)	10 lbs (4.5 kg)	35 mm	20 mm
27 inches (686 mm)	14.5 lbs (6.6 kg)	45 mm	25 mm
40 inches (1,016 mm)	19.5 lbs (8.9 kg)	55 mm	30 mm
54 inches (1,372 mm)	25 lbs (11.4 kg)	70 mm	35 mm

2.2 – Jellyfish Membrane Filtration Cartridge Assembly

The Jellyfish Filter utilizes multiple membrane filtration cartridges. Each cartridge consists of removable cylindrical filtration “tentacles” attached to a cartridge head plate. Each filtration tentacle has a threaded pipe nipple and o-ring. To attach, insert the top pipe nipples with the o-ring through the head plate holes and secure with locking nuts. Hex nuts to be hand tightened and checked with a wrench as shown below.

2.3 – Jellyfish Membrane Filtration Cartridge Installation

- Cartridge installation will be performed by trained individuals and coordinated with the installing site Contractor. Flow diversion devices are required to be in place until the site is stabilized (final paving and landscaping in place). Failure to address this step completely will reduce the time between required maintenance.
- Descend to the cartridge deck (see Safety Notice and page 3).
- Refer to Contech's submittal drawings to determine proper quantity and placement of Hi-Flo, Draindown and Blank cartridges with appropriate lids. Lower the Jellyfish membrane filtration cartridges into the cartridge receptacles within the cartridge deck. It is possible that not all cartridge receptacles will be filled with a filter cartridge. In that case, a blank headplate and blank cartridge lid (no orifice) would be installed.



Cartridge Assembly

Do not force the tentacles down into the cartridge receptacle, as this may damage the membranes. Apply downward pressure on the cartridge head plate to seat the lubricated rim gasket (thick circular gasket surrounding the circumference of the head plate) into the cartridge receptacle. (See Figure 3 for details on approved lubricants for use with rim gasket.)

- Examine the cartridge lids to differentiate lids with a small orifice, a large orifice, and no orifice.
 - Lids with a small orifice are to be inserted into the Draindown cartridge receptacles, outside of the backwash pool weir.
 - Lids with a large orifice are to be inserted into the Hi-Flo cartridge receptacles within the backwash pool weir.
 - Lids with no orifice (blank cartridge lids) and a blank headplate are to be inserted into unoccupied cartridge receptacles.
- To install a cartridge lid, align both cartridge lid male threads with the cartridge receptacle female threads before rotating approximately 1/3 of a full rotation until firmly seated. Use of an approved rim gasket lubricant may facilitate installation.

3.0 Inspection and Maintenance Overview

The primary purpose of the Jellyfish® Filter is to capture and remove pollutants from stormwater runoff. As with any filtration system, these pollutants must be removed to maintain the filter's maximum treatment performance. Regular inspection and maintenance are required to insure proper functioning of the system. Maintenance frequencies and requirements are site specific and vary depending on pollutant loading. Additional maintenance activities may be required in the event of non-storm event runoff, such as base-flow or seasonal flow, an upstream chemical spill or due to excessive sediment loading from site erosion or extreme runoff events. It is a good practice to inspect the system after major storm events.

Inspection activities are typically conducted from surface observations and include:

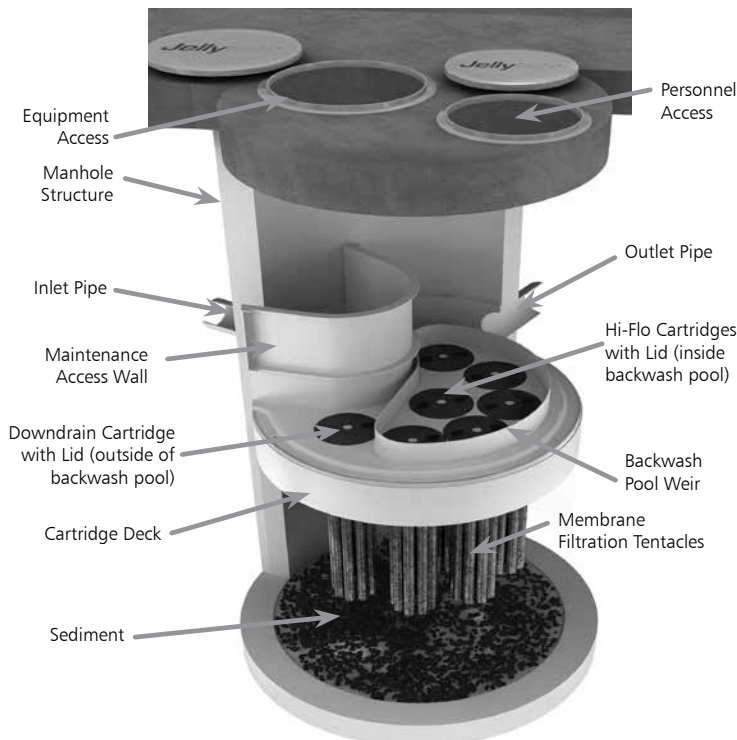
- Observe if standing water is present
- Observe if there is any physical damage to the deck or cartridge lids
- Observe the amount of debris in the Maintenance Access Wall (MAW) or inlet bay for vault systems

Maintenance activities include:

- Removal of oil, floatable trash and debris
- Removal of collected sediments
- Rinsing and re-installing the filter cartridges
- Replace filter cartridge tentacles, as needed

4.0 Inspection Timing

Inspection of the Jellyfish Filter is key in determining the maintenance requirements for, and to develop a history of, the site's pollutant loading characteristics. In general, inspections should be performed at the times indicated below; *or per the approved project stormwater quality documents (if applicable), whichever is more frequent.*



Note: Separator Skirt not shown

1. A minimum of quarterly inspections during the first year of operation to assess the sediment and floatable pollutant accumulation, and to ensure proper functioning of the system.
2. Inspection frequency in subsequent years is based on the inspection and maintenance plan developed in the first year of operation. Minimum frequency should be once per year.
3. Inspection is recommended after each major storm event.
4. Inspection is required immediately after an upstream oil, fuel or other chemical spill.

5.0 Inspection Procedure

The following procedure is recommended when performing inspections:

1. Provide traffic control measures as necessary.
2. Inspect the MAW or inlet bay for floatable pollutants such as trash, debris, and oil sheen.
3. Measure oil and sediment depth in several locations, by lowering a sediment probe until contact is made with the floor of the structure. Record sediment depth, and presences of any oil layers.
4. Inspect cartridge lids. Missing or damaged cartridge lids to be replaced.
5. Inspect the MAW (where appropriate), cartridge deck and receptacles, and backwash pool weir, for damaged or broken components.

5.1 Dry weather inspections

- Inspect the cartridge deck for standing water, and/or sediment on the deck.
- No standing water under normal operating conditions.
- Standing water inside the backwash pool, but not outside the backwash pool indicates, that the filter cartridges need to be rinsed.



Inspection Utilizing Sediment Probe

- Standing water outside the backwash pool is not anticipated and may indicate a backwater condition caused by high water elevation in the receiving water body, or possibly a blockage in downstream infrastructure.
- Any appreciable sediment ($\geq 1/16''$) accumulated on the deck surface should be removed.

5.2 Wet weather inspections

- Observe the rate and movement of water in the unit. Note the depth of water above deck elevation within the MAW or inlet bay.
- Less than 6 inches, flow should be exiting the cartridge lids of each of the draindown cartridges (i.e. cartridges located outside the backwash pool).
- Greater than 6 inches, flow should be exiting the cartridge lids of each of the draindown cartridges and each of the hi-flo cartridges (i.e. cartridges located inside the backwash pool), and water should be overflowing the backwash pool weir.
- 18 inches or greater and relatively little flow is exiting the cartridge lids and outlet pipe, this condition indicates that the filter cartridges need to be rinsed.

6.0 Maintenance Requirements

Required maintenance for the Jellyfish Filter is based upon results of the most recent inspection, historical maintenance records, or the site specific water quality management plan; whichever is more frequent. In general, maintenance requires some combination of the following:

1. Sediment removal for depths reaching 12 inches or greater, or within 3 years of the most recent sediment cleaning, whichever occurs sooner.
2. Floatable trash, debris, and oil removal.
3. Deck cleaned and free from sediment.
4. Filter cartridges rinsed and re-installed as required by the most recent inspection results, or within 12 months of the most recent filter rinsing, whichever occurs sooner.
5. Replace tentacles if rinsing does not restore adequate hydraulic capacity, remove accumulated sediment, or if damaged or missing. It is recommended that tentacles should remain in service no longer than 5 years before replacement.
6. Damaged or missing cartridge deck components must be repaired or replaced as indicated by results of the most recent inspection.
7. The unit must be cleaned out and filter cartridges inspected immediately after an upstream oil, fuel, or chemical spill. Filter cartridge tentacles should be replaced if damaged or compromised by the spill.

7.0 Maintenance Procedure

The following procedures are recommended when maintaining the Jellyfish Filter:

1. Provide traffic control measures as necessary.
2. Open all covers and hatches. Use ventilation equipment as required, according to confined space entry procedures. *Caution: Dropping objects onto the cartridge deck may cause damage.*
3. Perform Inspection Procedure prior to maintenance activity.

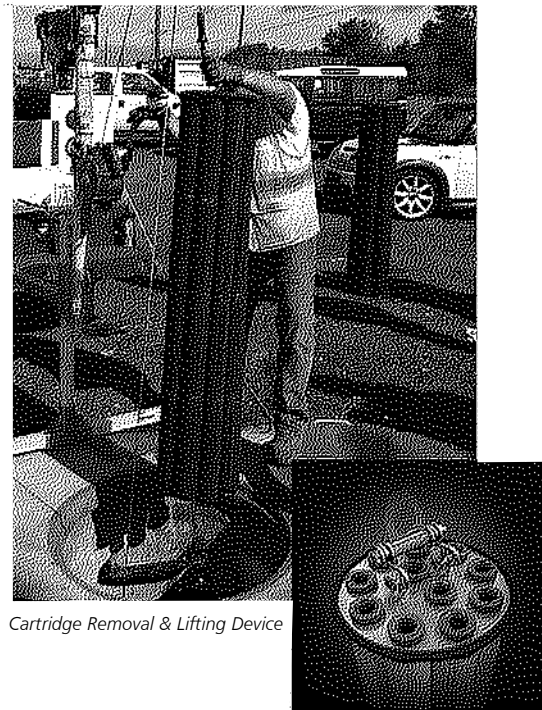
4. To access the cartridge deck for filter cartridge service, descend into the structure and step directly onto the deck. *Caution: Do not step onto the maintenance access wall (MAW) or backwash pool weir, as damage may result. Note that the cartridge deck may be slippery.*
5. Maximum weight of maintenance crew and equipment on the cartridge deck not to exceed 450 lbs.

7.1 Filter Cartridge Removal

1. Remove a cartridge lid.
2. Remove cartridges from the deck using the lifting loops in the cartridge head plate. Rope or a lifting device (available from Contech) should be used. *Caution: Should a snag occur, do not force the cartridge upward as damage to the tentacles may result. Wet cartridges typically weigh between 100 and 125 lbs.*
3. Replace and secure the cartridge lid on the exposed empty receptacle as a safety precaution. Contech does not recommend exposing more than one empty cartridge receptacle at a time.

7.2 Filter Cartridge Rinsing

1. Remove all 11 tentacles from the cartridge head plate. Take care not to lose or damage the O-ring seal as well as the plastic threaded nut and connector.
2. Position tentacles in a container (or over the MAW), with the



Cartridge Removal & Lifting Device

3. threaded connector (open end) facing down, so rinse water is flushed through the membrane and captured in the container.
3. Using the Jellyfish rinse tool (available from Contech) or a low-pressure garden hose sprayer, direct water spray onto the tentacle membrane, sweeping from top to bottom along the length of the tentacle. Rinse until all sediment is removed from the membrane. *Caution: Do not use a high pressure sprayer or focused stream of water on the membrane. Excessive water pressure may damage the membrane.*
4. Collected rinse water is typically removed by vacuum hose.

5. Reassemble cartridges as detailed later in this document. Reuse O-rings and nuts, ensuring proper placement on each tentacle.

7.3 Sediment and Floatables Extraction

1. Perform vacuum cleaning of the Jellyfish Filter only after filter cartridges have been removed from the system. Access the lower chamber for vacuum cleaning only through the maintenance access wall (MAW) opening. Be careful not to damage the flexible plastic separator skirt that is attached to the underside of the deck on manhole systems. Do not lower the vacuum wand through a cartridge receptacle, as damage to the receptacle will result.
2. Vacuum floatable trash, debris, and oil, from the MAW opening or inlet bay. Alternatively, floatable solids may be removed by a net or skimmer.
3. Pressure wash cartridge deck and receptacles to remove all



Rinsing Cartridge with Contech Rinse Tool

sediment and debris. Sediment should be rinsed into the sump area. Take care not to flush rinse water into the outlet pipe.

4. Remove water from the sump area. Vacuum or pump equipment should only be introduced through the MAW or inlet bay.
5. Remove the sediment from the bottom of the unit through the MAW or inlet bay opening.
6. For larger diameter Jellyfish Filter manholes (≥ 8 -ft) and some



Vacuuming Sump Through MAW

vaults complete sediment removal may be facilitated by removing a cartridge lid from an empty receptacle and inserting a jetting wand (not a vacuum wand) through the receptacle. Use the sprayer to rinse loosened sediment toward the vacuum hose in the MAW opening, being careful not to damage the receptacle.

7.4 Filter Cartridge Reinstallation and Replacement

1. Cartridges should be installed after the deck has been cleaned. It is important that the receptacle surfaces be free from grit and debris.
2. Remove cartridge lid from deck and carefully lower the filter cartridge into the receptacle until head plate gasket is seated squarely in receptacle. *Caution: Do not force the cartridge downward; damage may occur.*
3. Replace the cartridge lid and check to see that both male threads are properly seated before rotating approximately 1/3 of a full rotation until firmly seated. Use of an approved rim gasket lubricant may facilitate installation. See next page for additional details.
4. If rinsing is ineffective in removing sediment from the tentacles, or if tentacles are damaged, provisions must be made to replace the spent or damaged tentacles with new tentacles. Contact Contech to order replacement tentacles.

7.5 Chemical Spills

Caution: If a chemical spill has been captured, do not attempt maintenance. Immediately contact the local hazard response agency and contact Contech.

7.6 Material Disposal

The accumulated sediment found in stormwater treatment and conveyance systems must be handled and disposed of in accordance with regulatory protocols. It is possible for sediments to contain measurable concentrations of heavy metals and organic chemicals (such as pesticides and petroleum products). Areas with the greatest potential for high pollutant loading include industrial areas and heavily traveled roads. Sediments and water must be disposed of in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. This typically requires coordination with a local landfill for solid waste disposal. For liquid waste disposal a number of options are available including a municipal vacuum truck decant facility, local waste water treatment plant or on-site treatment and discharge.

Jellyfish Filter Components & Filter Cartridge Assembly and Installation

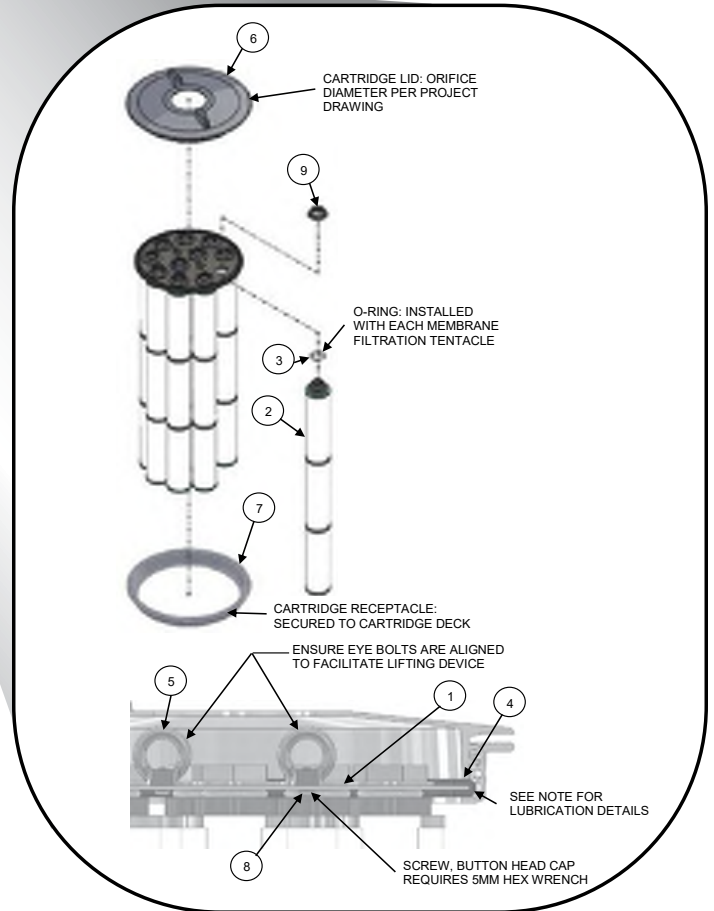
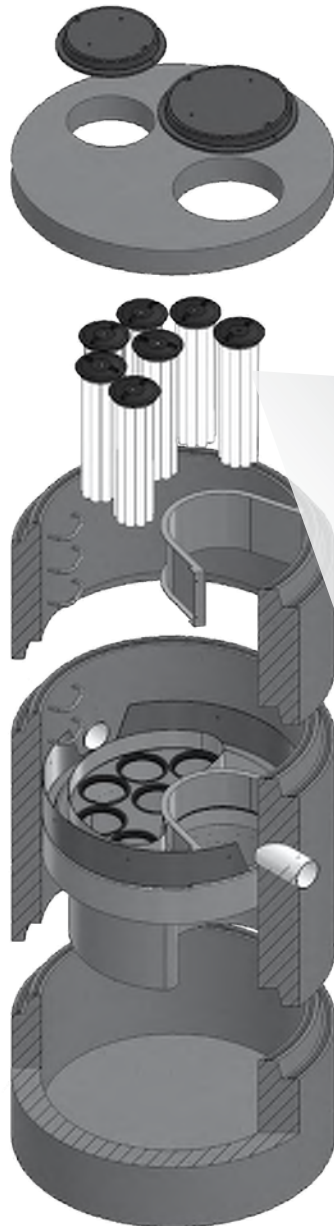


TABLE 1: BOM

ITEM NO.	DESCRIPTION
1	JF HEAD PLATE
2	JF TENTACLE
3	JF O-RING
4	JF HEAD PLATE GASKET
5	JF CARTRIDGE EYELET
6	JF 14IN COVER
7	JF RECEPTACLE
8	BUTTON HEAD CAP SCREW M6X14MM SS
9	JF CARTRIDGE NUT

TABLE 2: APPROVED GASKET LUBRICANTS

PART NO.	MFR	DESCRIPTION
78713	LA-CO	LUBRI-JOINT
40501	HERCULES	DUCK BUTTER
30600	OATEY	PIPE LUBRICANT
PSLUBXL1Q	PROSELECT	PIPE JOINT LUBRICANT

NOTES:

Head Plate Gasket Installation:

Install Head Plate Gasket (Item 4) onto the Head Plate (Item 1) and liberally apply a lubricant from Table 2: Approved Gasket Lubricants onto the gasket where it contacts the Receptacle (Item 7) and Cartridge Lid (Item 6). Follow Lubricant manufacturer's instructions.

Lid Assembly:

Rotate Cartridge Lid counter-clockwise until both male threads drop down and properly seat. Then rotate Cartridge Lid clock-wise approximately one-third of a full rotation until Cartridge Lid is firmly secured, creating a watertight seal.

Jellyfish Filter Inspection and Maintenance Log

Owner: _____ Jellyfish Model No.: _____

Location: _____ GPS Coordinates: _____

Land Use: Commercial: _____ Industrial: _____ Service Station: _____

 Road/Highway: _____ Airport: _____ Residential: _____ Parking Lot: _____

Date/Time:					
Inspector:					
Maintenance Contractor:					
Visible Oil Present: (Y/N)					
Oil Quantity Removed					
Floatable Debris Present: (Y/N)					
Floatable Debris removed: (Y/N)					
Water Depth in Backwash Pool					
Cartridges externally rinsed/re-commissioned: (Y/N)					
New tentacles put on Cartridges: (Y/N)					
Sediment Depth Measured: (Y/N)					
Sediment Depth (inches or mm):					
Sediment Removed: (Y/N)					
Cartridge Lids intact: (Y/N)					
Observed Damage:					
Comments:					

CDS[®] Inspection and Maintenance Guide



Maintenance

The CDS system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit. For example, unstable soils or heavy winter sanding will cause the grit chamber to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (e.g. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment washdown areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

The visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet and separation screen. The inspection should also quantify the accumulation of hydrocarbons, trash, and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument. If absorbent material is used for enhanced removal of hydrocarbons, the level of discoloration of the sorbent material should also be identified during inspection. It is useful and often required as part of an operating permit to keep a record of each inspection. A simple form for doing so is provided.

Access to the CDS unit is typically achieved through two manhole access covers. One opening allows for inspection and cleanout of the separation chamber (cylinder and screen) and isolated sump. The other allows for inspection and cleanout of sediment captured and retained outside the screen. For deep units, a single manhole access point would allow both sump cleanout and access outside the screen.

The CDS system should be cleaned when the level of sediment has reached 75% of capacity in the isolated sump or when an appreciable level of hydrocarbons and trash has accumulated. If absorbent material is used, it should be replaced when significant discoloration has occurred. Performance will not be impacted until 100% of the sump capacity is exceeded however it is recommended that the system be cleaned prior to that for easier removal of sediment. The level of sediment is easily determined by measuring from finished grade down to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Particles at the top of the pile typically offer less resistance to the end of the rod than consolidated particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the as-built drawing for the unit to determine whether the height of the sediment pile off the bottom of the sump floor exceeds 75% of the total height of isolated sump.

Cleaning

Cleaning of a CDS system should be done during dry weather conditions when no flow is entering the system. The use of a vacuum truck is generally the most effective and convenient method of removing pollutants from the system. Simply remove the manhole covers and insert the vacuum hose into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The area outside the screen should also be cleaned out if pollutant build-up exists in this area.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill should be cleaned out immediately. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use absorbent pads since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash and debris can be netted out to separate it from the other pollutants. The screen should be power washed to ensure it is free of trash and debris.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure that proper safety precautions have been followed. Confined space entry procedures need to be followed if physical access is required. Disposal of all material removed from the CDS system should be done in accordance with local regulations. In many jurisdictions, disposal of the sediments may be handled in the same manner as the disposal of sediments removed from catch basins or deep sump manholes.



CDS Model	Diameter		Distance from Water Surface to Top of Sediment Pile		Sediment Storage Capacity	
	ft	m	ft	m	y ³	m ³
CDS1515	3	0.9	3.0	0.9	0.5	0.4
CDS2015	4	1.2	3.0	0.9	0.9	0.7
CDS2015	5	1.3	3.0	0.9	1.3	1.0
CDS2020	5	1.3	3.5	1.1	1.3	1.0
CDS2025	5	1.3	4.0	1.2	1.3	1.0
CDS3020	6	1.8	4.0	1.2	2.1	1.6
CDS3025	6	1.8	4.0	1.2	2.1	1.6
CDS3030	6	1.8	4.6	1.4	2.1	1.6
CDS3035	6	1.8	5.0	1.5	2.1	1.6
CDS4030	8	2.4	4.6	1.4	5.6	4.3
CDS4040	8	2.4	5.7	1.7	5.6	4.3
CDS4045	8	2.4	6.2	1.9	5.6	4.3
CDS5640	10	3.0	6.3	1.9	8.7	6.7
CDS5653	10	3.0	7.7	2.3	8.7	6.7
CDS5668	10	3.0	9.3	2.8	8.7	6.7
CDS5678	10	3.0	10.3	3.1	8.7	6.7

Table 1: CDS Maintenance Indicators and Sediment Storage Capacities



Support

- Drawings and specifications are available at www.contechstormwater.com.
- Site-specific design support is available from our engineers.

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WETLAND DELINEATION REPORT

100 Durgin Lane
Portsmouth, NH
May 8, 2024



As requested, I am pleased to provide the following report documenting the wetland delineation performed by Gove Environmental Services, Inc. in connection with the above referenced property. This is an update to my February 28th report which includes a functional assessment of the identified wetland areas. The work was conducted on three lots, referenced on the City of Portsmouth assessors' maps as lots 239-13-2, 239-16, and 239-18 which together total approximately 26.15 acres (the Site). The resource areas discussed in this report are depicted on the enclosed sketch.

WETLAND DELINEATION

The delineation work was performed on November 11, 2023 by Brendan Quigley utilizing the following standards:

1. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region*, (Version 2.0) January 2012, U.S. Army Corps of Engineers.
2. *Field Indicators of Hydric Soils in the United States, A Guide for Identifying and Delineating Hydric Soils*, Version 8.2. United States Department of Agriculture (2018).
3. *New England Hydric Soils Technical Committee. 2019 Version 4, Field Indicators for Identifying Hydric Soils in New England*. New England Interstate Water Pollution Control Commission, Lowell, MA.
4. *U.S. Army Corps of Engineers National Wetland Plant List, version 3.5*. (2020)

The central part of the Site is a developed commercial property consisting of a large retail building, associated parking areas, and a connector road running between Gosling Road and Arthur Brady Drive. The developed portions of the Site are generally well defined from the surrounding vegetated areas which are a mix of forest, dense early successional shrub growth, and emergent wetland. Wetlands were identified in three main areas east and north of the developed portion of the Site. These were demarcated with seven (7) series of consecutively numbered pink "WETLAND DELINEATION" flagging as shown on the attached sketch. The following table provides a description of each wetland area.

Table 1—Wetland Descriptions

Wetland ID	Cowardin Class ¹	Description/Notes
A and C	PSS1B	These two wetlands occupy the area under the power lines in the southeast corner of the Site. They are scrub shrub wetlands with a saturated hydrology, dominated by silky dogwood, willow, and glossy buckthorn. The wetlands are isolated from one another and surrounded by development or roadway. At the time of the delineation timber mats and stabilized access had been installed in and adjacent to the wetlands for power line maintenance activities.
B	PSS1Kh	This small wetland occupies a portion of a constructed stormwater basin. It is otherwise similar to Wetlands A and C.
#1-62	PSS1E/PFO1E PEM1/5E	This wetland lies on the west side of the connector road north of the existing development. Much of the wetland lies off-site and is predominantly a cattail/phragmites marsh. The edges of this emergent wetland that lie on the Site are a mix of scrub shrub and forested wetland dominated by speckled alder, common and glossy buckthorn, and red maple. Hydrology of the wetland is seasonally flooded /saturated. The wetland also contains a shallow pond and an old weir structure that appear to be components of legacy drainage system, now nearly indistinguishable from the larger wetland. The wetland drains into Wetland E via a culvert under the connector road.
D & E	PSS1E/PFO1E PEM1/5E	These two series of flags define two on-site portions of a larger wetland situated under the power lines and extending off-site to the north and east. Like the wetland defined by flags #1-62, to which this area is connected, this is predominantly a cattail and Phragmites marsh with a limited forested and scrub shrub edge.
F	PEM1/5B	This small wetland is essentially the same as D&E but appears to have been purposely separated from the main wetland by construction of a dyke and weir like the one contained in the #1-62 wetland. Though its intended function is not clear this is also likely part of a legacy drainage system.

¹ *Classification of Wetlands and Deepwater Habitats of the United States*. USFW Manual FWS/OBS-79/31 (1979)

OTHER REGULATED WETLAND RESOURCES

The NHDES' web-based Wetlands Permit and Planning Tool (WPPT) was used to identify the presence of other regulated wetland resources such as protected shoreland, prime wetland, and other Priority Resource Areas as defined by NH Administrative Rule Env-Wt 103.66. The planning tool indicates that no such areas are present on the property. A copy of the WPPT map is attached.

The field work for the delineation was conducted in late fall so no formal vernal pool survey was conducted. The large cattail and phragmites marsh wetland (D, E, F, 1-62) that constitutes most of the wetlands on the site is not typically suitable vernal pool habitat. The smaller scrub-shrub wetland (A, B, & C) do not appear to have the topography to maintain a pool. Furthermore, all the wetland on the site exist in a highly developed area with very minimal supporting upland habitat necessary to support vernal pool species. It is therefore very unlikely that any of the wetlands identified on the Site contain vernal pools. This should be verified during the vernal pool breeding season.

PORTSMOUTH WETLAND PROTECTION ORDINANCE

Section 10.1010 of the Portsmouth Zoning Ordinance regulates wetland resource areas including vegetated wetlands, vernal pools, tidal areas, streams, other surface water, and specific buffers to these resources. The Site only contains inland freshwater wetlands which are regulated under the Ordinance if they are 10,000 square feet in size or greater². Wetlands B and F are 4,594 square feet and 2,442 square feet respectively, so these two small wetlands are not regulated under the Ordinance. Note, however, that these areas are still jurisdictional wetlands subject to state and federal regulation. All other wetlands identified on the Site, and a 100-foot buffer from these areas, are regulated under the Ordinance.

WETLAND FUNCTION & VALUE ASSESSMENT

A wetland function and value assessment was conducted using the US Army Corps Highway Methodology guidelines. Functions are self-sustaining properties of wetlands, which exist in the absence of human involvement. Values refers to the benefits gained by society from a given wetland or ecosystem and their inherent functions. Functions and values identified as "primary" have been determined to be significant features of the wetland being evaluated. An important distinction is that the primary functions and values of a particular wetland does not necessarily indicate the wetland supports them at a significant *level* in comparison to other wetlands in the region or even near the site.

² Section 10.1013.10

The Highway Methodology considers 13 functions and values:

1. **Groundwater recharge/discharge:** This function considers the potential for a wetland to serve as a groundwater recharge and/or discharge area. Recharge should relate to the potential for the wetland to contribute water to an aquifer. Discharge should relate to the potential for the wetland to serve as an area where ground water can be discharged to the surface.
2. **Floodflow Alteration:** This function considers the effectiveness of the wetland in reducing flood damage by attenuation of floodwaters for prolonged periods following precipitation events.
3. **Fish and Shellfish Habitat:** This function considers the effectiveness of seasonal or permanent water bodies associated with the wetland in question for fish and shellfish habitat.
4. **Sediment/Toxicant/Pathogen Retention:** This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants or pathogens.
5. **Nutrient Removal/Retention/Transformation:** This function relates to the effectiveness of the wetland to prevent adverse effects of excess nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers or estuaries.
6. **Production Export:** This function relates to the effectiveness of the wetland to produce food or usable products for human, or other living organisms.
7. **Sediment/Shoreline Stabilization:** This function relates to the effectiveness of a wetland to stabilize stream banks and shorelines against erosion.
8. **Wildlife Habitat:** This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and the wetland edge. Both resident and or migrating species must be considered.
9. **Recreation:** This value considers the effectiveness of the wetland and associated watercourses to provide recreational opportunities such as canoeing, boating, fishing, hunting and other active or passive recreational activities. Consumptive opportunities consume or diminish the plants, animals or other resources that are intrinsic to the wetland, whereas non-consumptive opportunities do not.
10. **Educational/Scientific Value:** This value considers the effectiveness of the wetland as a site for an “outdoor classroom” or as a location for scientific study or research.
11. **Uniqueness/Heritage:** This value relates to the effectiveness of the wetland or its associated water bodies to produce certain special values. Special values may include such things as archeological sites, unusual aesthetic quality, historical events, or unique plants, animals, or geological features.
12. **Visual Quality/Aesthetics:** This value relates to the visual and aesthetic qualities of the wetland.
13. **Threatened or Endangered Species Habitat:** This value relates to the effectiveness of the wetland or associated water bodies to support threatened or endangered species.

The collection of individually flagged wetlands on the Site were evaluated in two groups based on their proximity to one another, type, and connectivity. The A and C series wetlands located in the southeast corner of the site were evaluated as one since they lie directly adjacent to one another and share the same characteristics. The D and E series were grouped together with the wetland numbered 1-65 since these three areas are part of a larger wetland extending off-site to the east and separated only by an access driveway. Wetlands B and F are stormwater management features which are too small to be regulated under the Portsmouth Wetlands Protection Ordinance and were not evaluated.

Due to the character of the wetlands and the densely developed setting, several of the functions and values listed above are clearly not supported or are supported to a very limited extent. The lack of permanent or any significant surface water is the most obvious limiting factor. Functions such as fish habitat and shoreline stabilization, which require close association with surface water are not supported in these wetlands. Wetland supported recreation is also strongly linked with surface water for activities such as boating and fishing. Recreational value of this type is not supported but other more passive forms of recreation may be supported to a limited degree depending on how broadly recreation is defined. Aesthetic value is even more subjective, as is value for scientific or educational pursuits. These are traditionally associated with more diverse, unique, and accessible wetlands than those present in this area. In the context of the densely developed area, however, these wetlands provide notable value by providing readily viewable green space amongst developed areas. They may also offer unique educational or scientific opportunities for the study of wetlands in a developed landscape. These values have therefore been considered secondary values supported by all the wetlands on the Site.

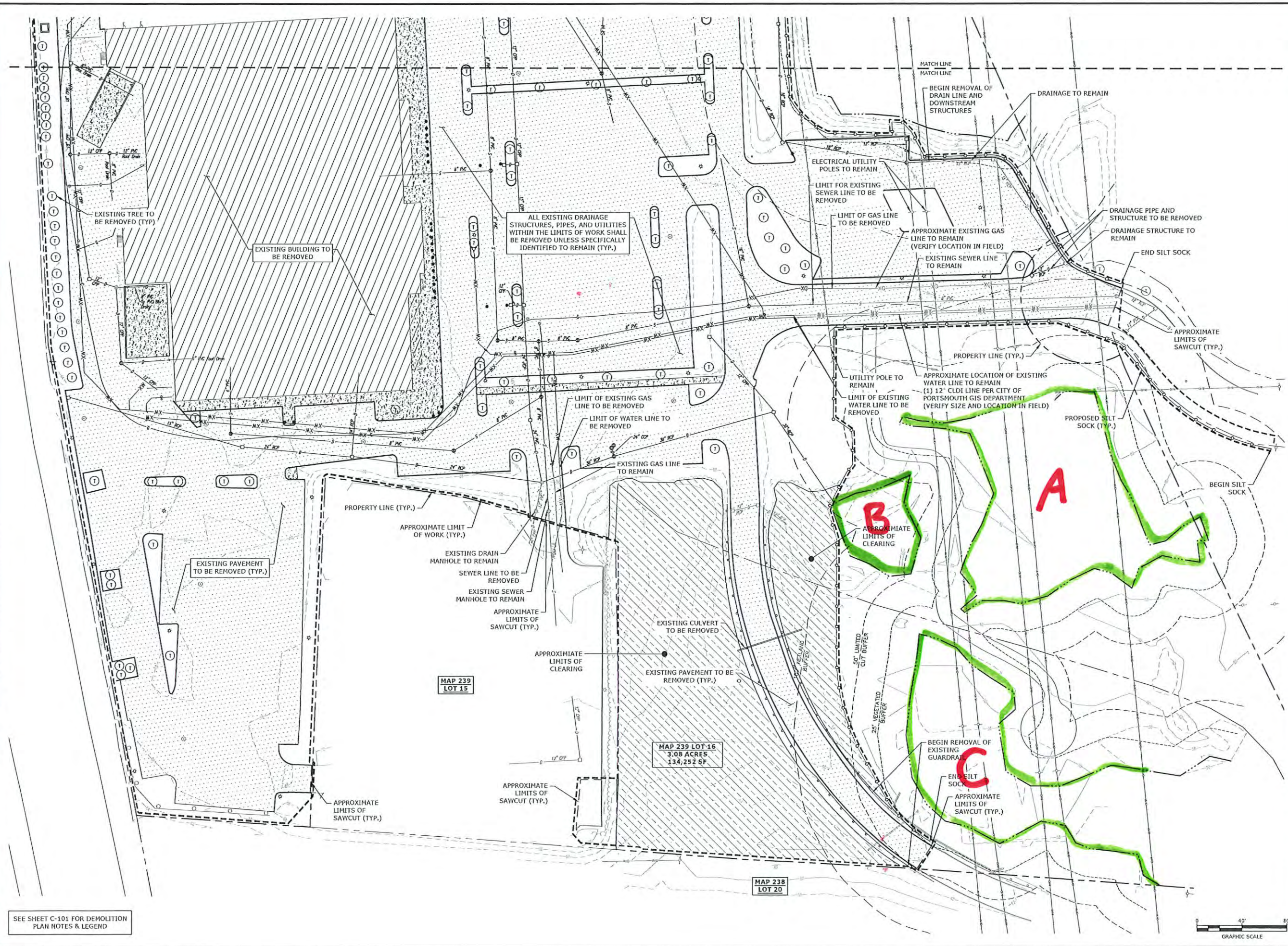
The densely developed setting also highlights the importance of certain wetland functions and strongly influences the *Principal Functions* of the wetlands. The most important function of the larger interconnected wetland system (#1-62/D/E) is protection of water quality. This area receives significant runoff from the surrounding developed areas and drains through dense emergent wetlands and restricted outlets. This arrangement provides both sediment trapping, retention, and nutrient transformation function. This is also likely to provide an important flood attenuation function, not as a floodplain, but by intercepting and storing runoff. The smaller wetland areas (A/C) supports these functions to a much lesser degree or not at all due to their limited connectivity.

The long-term effects of performing these water quality functions and overall fragmentation of the wetland in this area does degrade their ecological integrity and suitability for functions as wildlife habitat. However, considering the limited habitat in this developed landscape and the fact that some of the wetlands are quite large, they function as important habitat islands. These areas are likely to be used by numerous avian species and small mammals with limited habitat requirements. The wetter areas in the larger wetlands (#1-62/D/E) may also provide habitat for amphibian and reptile species but this is limited by general lack of permanent water.

The table below summarizes all the identified principle and secondary functions of the two groups of wetlands evaluated. The Highway Methodology data forms are attached.

Table 2—Wetland Function & Value Summary

Wetland ID	Principle Functions/Values	Secondary Functions/Values	Justification/Discussion
A & C	Export/Production Wildlife Habitat	Sediment Retention Nutrient Removal Educational/Scientific Aesthetic	<p>Principle Function is that of a habitat island in the context of a developed landscape. Production for wildlife food sources is enhanced by the dense cover of berry producing shrubs and nectar producing herbaceous vegetation.</p> <p>Water quality has been considered secondary due to lack of connectivity and lack of emergent wetland. Limited Educational/Scientific and Aesthetic value supported in the context of densely developed area.</p>
	Wildlife Habitat Sediment Retention Nutrient Removal Floodflow Alteration	Groundwater Educational/Scientific Aesthetic	<p>Principal water quality function is based on significant urban runoff and diffuse and constricted flow through dense mostly emergent vegetation. Floodflow attenuation by way of storage is derived in a similar way. Principal Wildlife habitat functions is as a habitat island in context of developed landscape.</p> <p>Production for wildlife food sources is considered secondary due to significant areas of invasive or uniform vegetation (Phragmites and Cattail). Limited groundwater interaction in wettest areas but not located in aquafer area. Limited Educational/Scientific and Aesthetic value supported in the context of densely developed area.</p>



ALL EXISTING DRAINAGE STRUCTURES, PIPES, AND UTILITIES WITHIN THE LIMITS OF WORK SHALL BE REMOVED UNLESS SPECIFICALLY IDENTIFIED TO REMAIN (TYP.)

EXISTING TREE TO BE REMOVED (TYP.)

EXISTING BUILDING TO BE REMOVED

EXISTING PAVEMENT TO BE REMOVED (TYP.)

APPROXIMATE LIMIT OF WORK (TYP.)

MAP 239 LOT 15

MAP 239 LOT 16
3.08 ACRES
134,252 SF

MAP 238 LOT 20

SEE SHEET C-101 FOR DEMOLITION PLAN NOTES & LEGEND



PROPOSED MULTI-FAMILY DEVELOPMENT

100 DURGIN LANE OWNER, LLC

100 DURGIN LANE PORTSMOUTH, NEW HAMPSHIRE

MARK	DATE	DESCRIPTION
A	4/22/2024	TAC SUBMISSION
PROJECT NO: E5071-001		
DATE: 4/22/2024		
FILE: E5071-001-C-DSGN.dwg		
DRAWN BY: BKC/NHW		
DESIGNED/CHECKED BY: NAH		
APPROVED BY: FMC		

DEMOLITION PLAN

SCALE: AS SHOWN

Plot Date: 4/19/2024
Printed On: Apr 19, 2024 11:02am By: BJC/ldc
Tighe & Bond: \\Tighebond.com\data\data\projects\E5071\E5071-001-C-DSGN.dwg



**PROPOSED
MULTI-FAMILY
DEVELOPMENT**

100 DURGIN
LANE OWNER,
LLC

100 DURGIN LANE
PORTSMOUTH,
NEW HAMPSHIRE

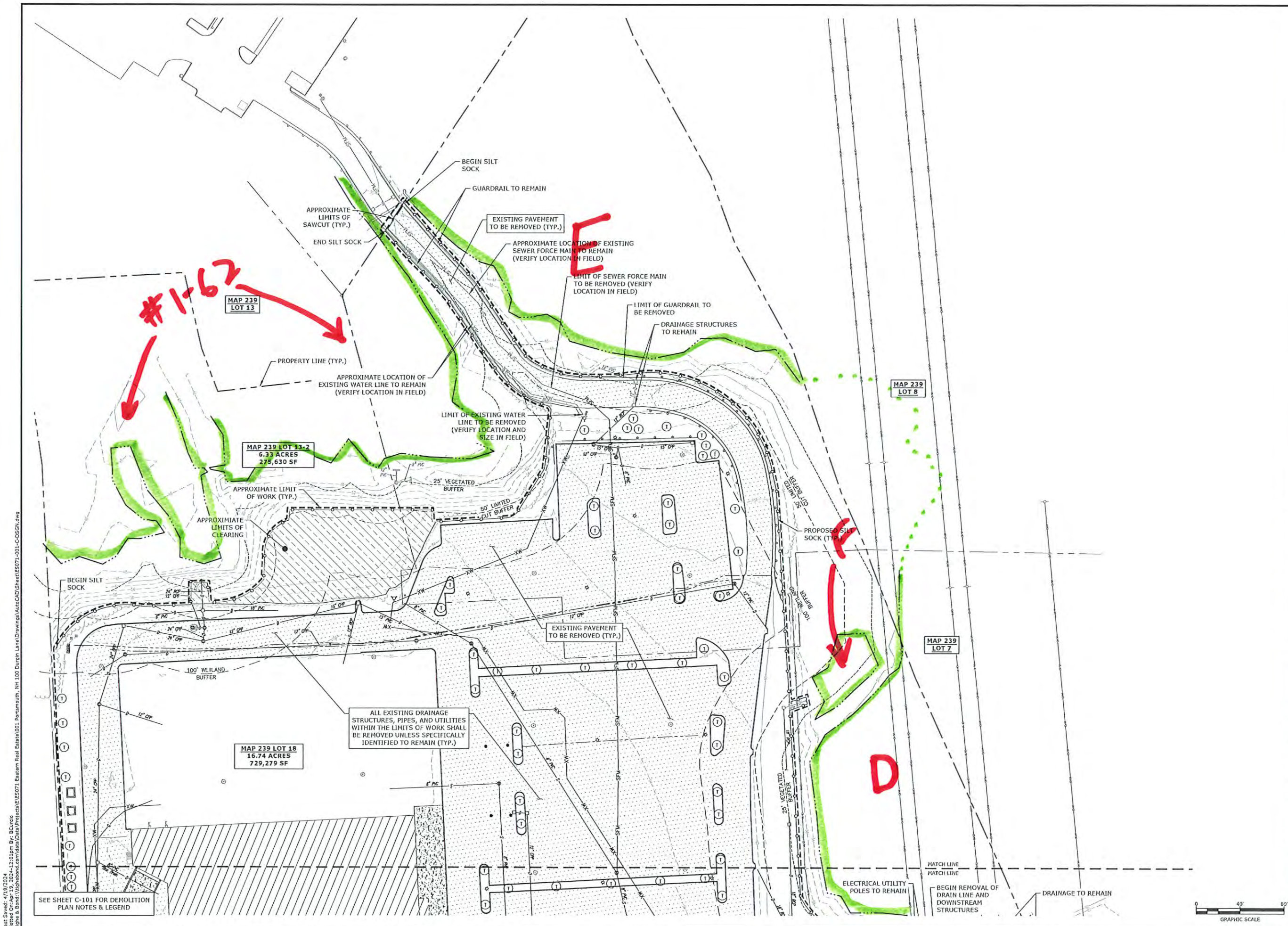
MARK	DATE	DESCRIPTION
A	4/22/2024	TAC SUBMISSION

PROJECT NO: E5071-001
 DATE: 4/22/2024
 FILE: E5071-001-C-DSGN.dwg
 DRAWN BY: BKC/NHW
 DESIGNED/CHECKED BY: NAH
 APPROVED BY: FMC

DEMOLITION PLAN

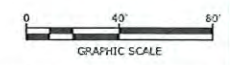
SCALE: AS SHOWN

C-201

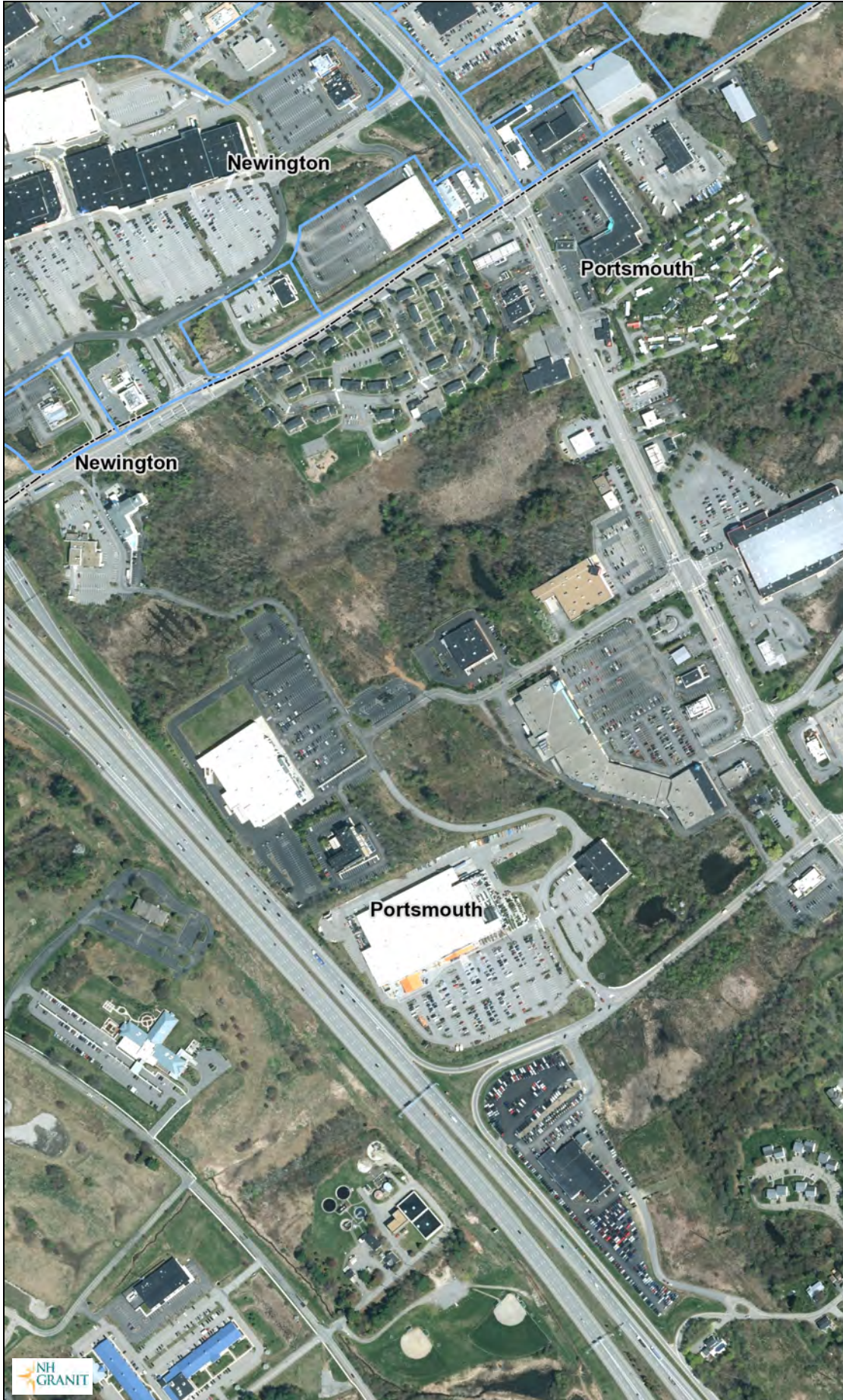


Last Saved: 4/19/2024
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SEE SHEET C-101 FOR DEMOLITION
PLAN NOTES & LEGEND



Durgin Lane WPPT



Legend

-  Additional Lines
-  City/Town
-  Prime Wetlands
-  Prime Wetlands with 100
-  Peatland
-  Flood Plain Wetlands Adj:
-  Marsh-Scrub / Shrub Wet
- Dunes**
 -  backdune
 -  foredune
 -  interdune
 -  other

Map Scale

1: 6,494

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Map Generated: 2/29/2024



Notes

Wetland Function-Value Evaluation Form

Total area of wetland ~1.1 ac Human made? No Is wetland part of a wildlife corridor? NO or a "habitat island"? YES

Adjacent land use Commercial Development, Elec. Transmission Distance to nearest roadway or other development >100 ft

Dominant wetland systems present PSS1B Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? Yes If not, where does the wetland lie in the drainage basin? _____

How many tributaries contribute to the wetland? isolated Wildlife & vegetation diversity/abundance (see wetland report)

Wetland I.D. A & C













Latitude see report Longitude _____

Prepared by: BJQ Date 5/2/24

Wetland Impact:
Type Buffer Area see plans

Evaluation based on:
Office Yes Field Yes

Corps manual wetland delineation completed? Y^x N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
 Groundwater Recharge/Discharge	N			wetland is characteristic of perched GW
 Floodflow Alteration	N			isolated
 Fish and Shellfish Habitat	N	N/A		No permanent surface water
 Sediment/Toxicant Retention	Y	1,2,5		potential sources but limited connectivity, minimal function
 Nutrient Removal	Y	3,4,8,9		potential sources but limited connectivity, minimal function
 Production Export	Y	1,7,12	X	wildlife food sources in dense berry bearing shrubs and nectar prod. species
 Sediment/Shoreline Stabilization	N			not associated with surface water
 Wildlife Habitat	Y	8,19,21	X	limited habitat island for songbirds and small mammal
 Recreation	N			Common wetland, subject to transmission line maintenance; low diversity
 Educational/Scientific Value	Y			limited potential for study of fragmentation and development
 Uniqueness/Heritage	N			Common wetland, subject to transmission line maintenance; low diversity
 Visual Quality/Aesthetics	Y			minimal, open space in context of developed landscape
ES Endangered Species Habitat	N			None identified
Other		N/A		N/A

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland ~20 ac Human made? No Is wetland part of a wildlife corridor? NO or a "habitat island"? YES













Adjacent land use Commercial Development, Elec. Transmission Distance to nearest roadway or other development >100 ft

Dominant wetland systems present PEM1/5E/PSS1E Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? NO If not, where does the wetland lie in the drainage basin? LOW

How many tributaries contribute to the wetland? UNK Wildlife & vegetation diversity/abundance (see wetland report)

Wetland I.D. #1-62/E/D
 Latitude see report Longitude _____
 Prepared by: BJQ Date 5/2/24
 Wetland Impact:
 Type none Area see plans
 Evaluation based on:
 Office Yes Field Yes
 Corps manual wetland delineation completed? Y^x N

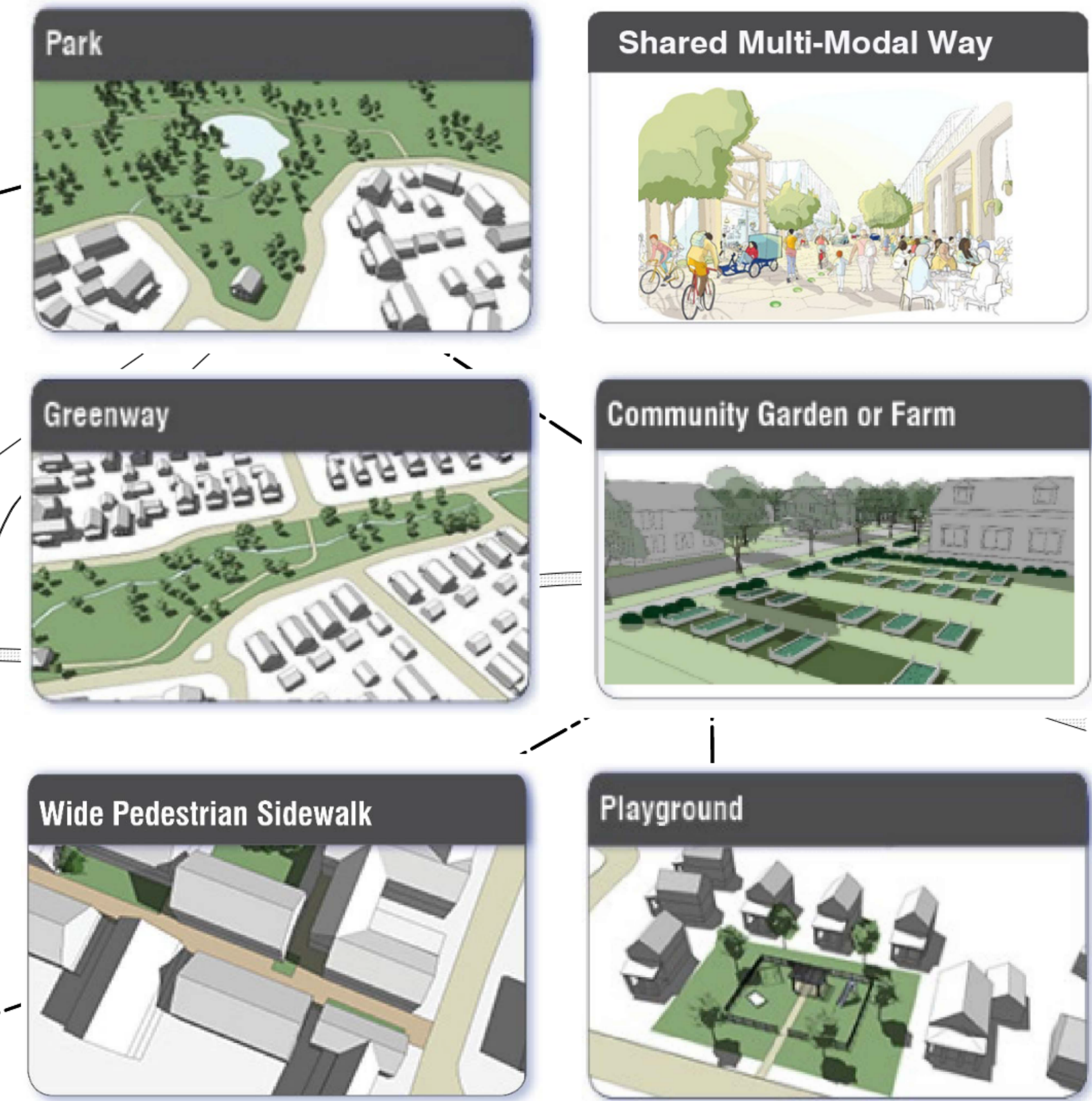
Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
 Groundwater Recharge/Discharge	Y			some potential in very poorly drained areas
 Floodflow Alteration	Y	4,5,6,7,15	X	significant urban runoff, constricted outlet, large area of storage relative to its watershed
 Fish and Shellfish Habitat	N	N/A		No permanent surface water
 Sediment/Toxicant Retention	Y	1,2,3,4,5,10,12,14,16	X	Significant sources, diffuse flow though dense vegetation
 Nutrient Removal	Y	1,3,5,6,7,8,9,11,13,14,15	X	Significant sources, diffuse flow, long retention time, dense emergent vegetation
 Production Export	Y	1,2,7,12,14		high production but limited export, berry and nectar wildlife food sources, low diversity
 Sediment/Shoreline Stabilization	N			not associated with surface water
 Wildlife Habitat	Y	8,19,21	X	part of a larger habitat island for songbirds and small sp. tolerant of proximate devel.
 Recreation	N			disturbed wetland, densely developed area
 Educational/Scientific Value	Y			limited potential for study of fragmentation and development
 Uniqueness/Heritage	N			disturbed wetland, densely developed area
 Visual Quality/Aesthetics	Y			minimal, open space in context of developed landscape
ES Endangered Species Habitat	N			None identified
Other		N/A		N/A

Notes:




* Refer to backup list of numbered considerations.

REVISIONS	DATE

POTENTIAL COMMUNITY SPACE



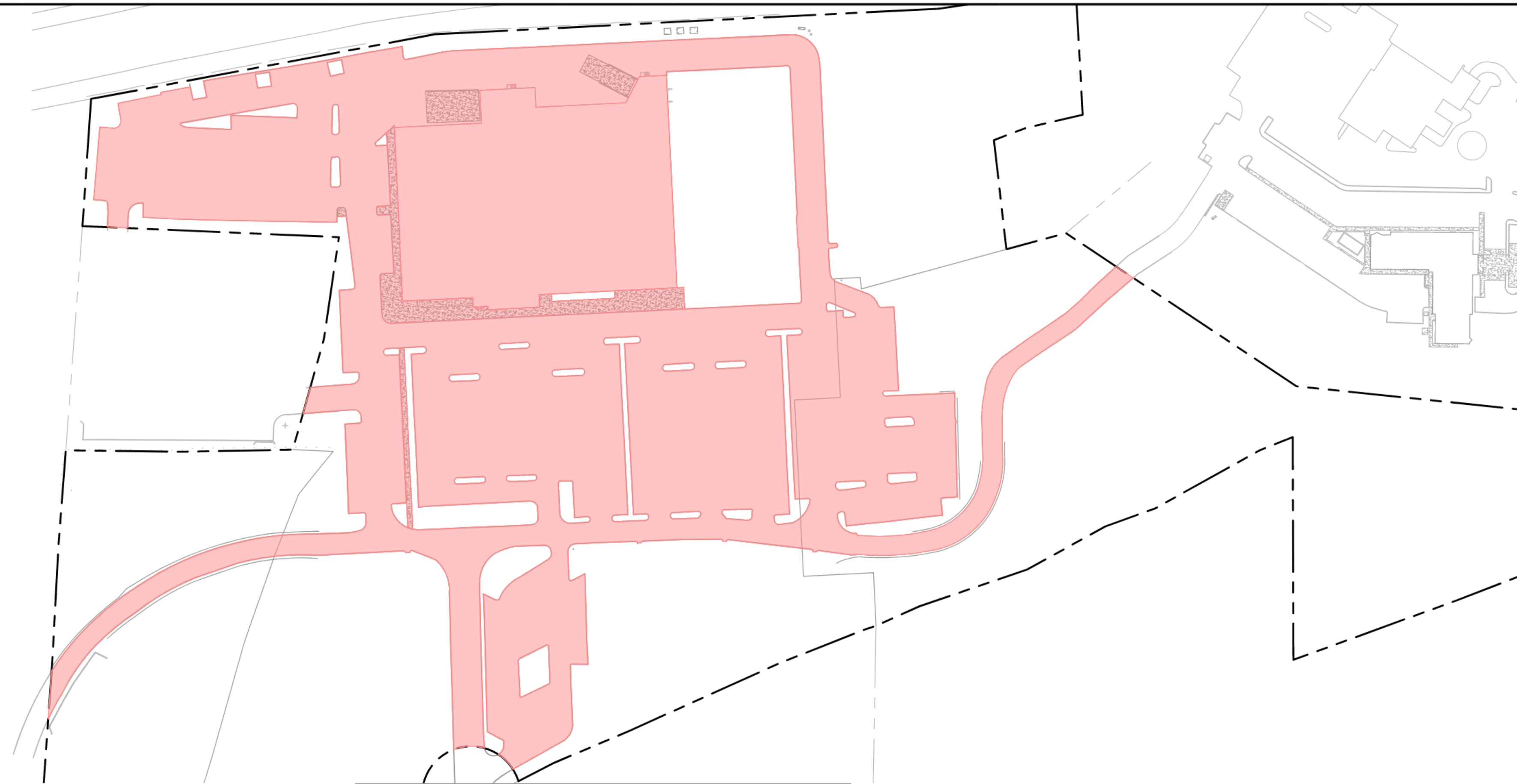
PROPOSED COMMUNITY SPACE:

	POTENTIAL RESIDENTIAL SOCIAL SPACES	REQUIRED	PROVIDED
			
	POTENTIAL COMMUNITY SPACE	113,915 SF (10%) (2.62 ACRES)	131,942 SF (11.6%) (3.03 ACRES)
	TOTAL DEVELOPMENT LOT	1,139,156 SF (26.15 ACRES)	
TOTAL COMMUNITY SPACE AREA		113,915 SF (2.62 ACRES)	131,942 SF (11.6%) (3.03 ACRES)

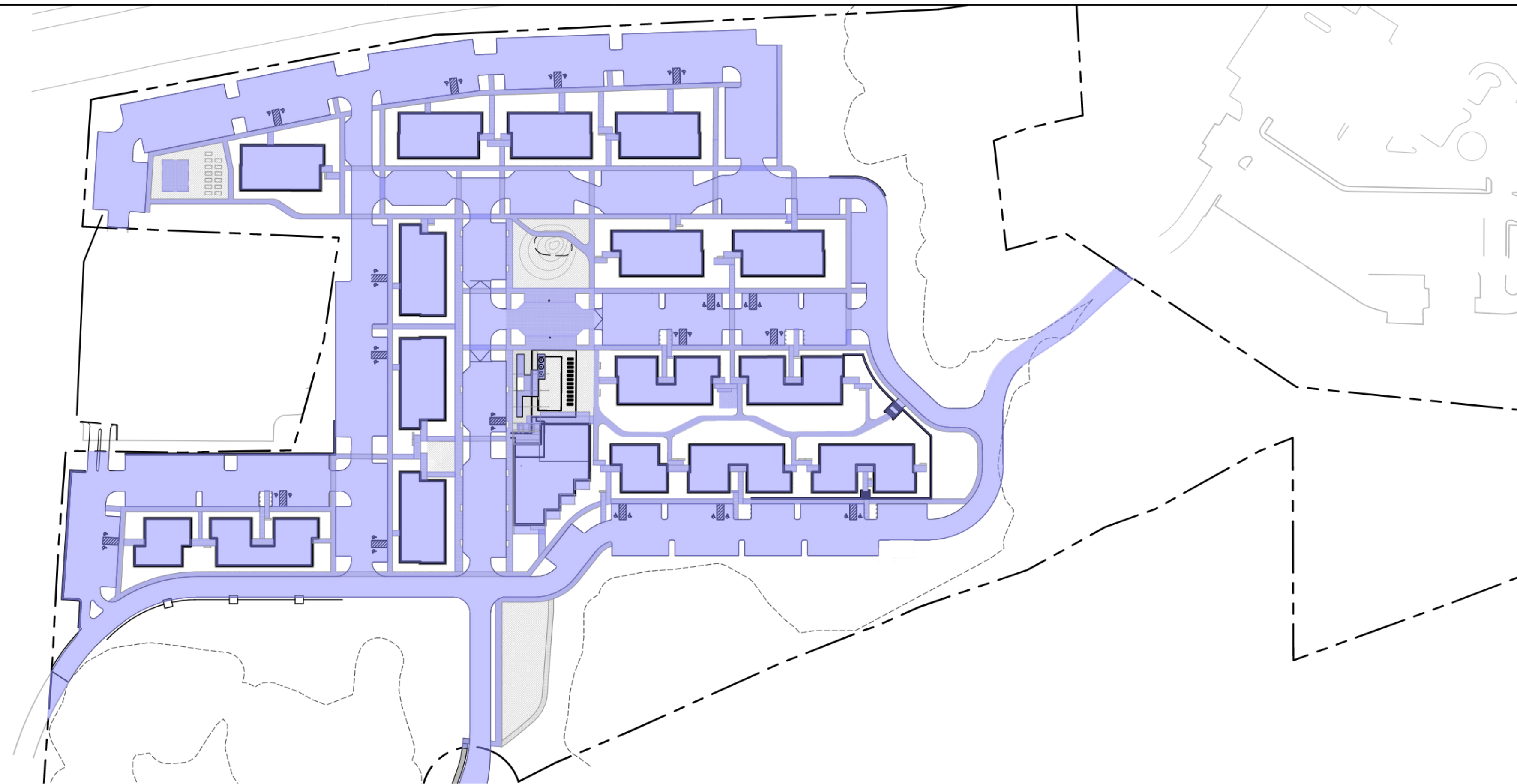


PROPOSED MULTI-FAMILY DEVELOPMENT
 DURGIN LANE
 PORTSMOUTH, NEW HAMPSHIRE

IMPERVIOUS SURFACE
 REDUCTION EXHIBIT

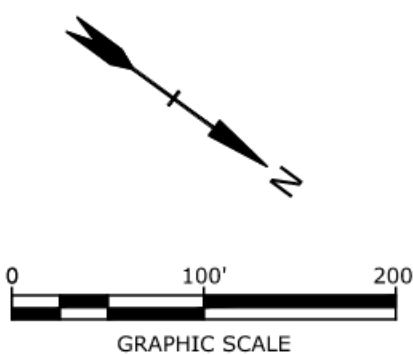


EXISTING IMPERVIOUS SURFACES
 SCALE 1" = 100'



PROPOSED IMPERVIOUS SURFACES
 SCALE 1" = 100'

Impervious Surface Within Site	
Existing Conditions	434,787 sf
Proposed Development	425,295 sf
Net Impervious Cover	- 9,492 sf



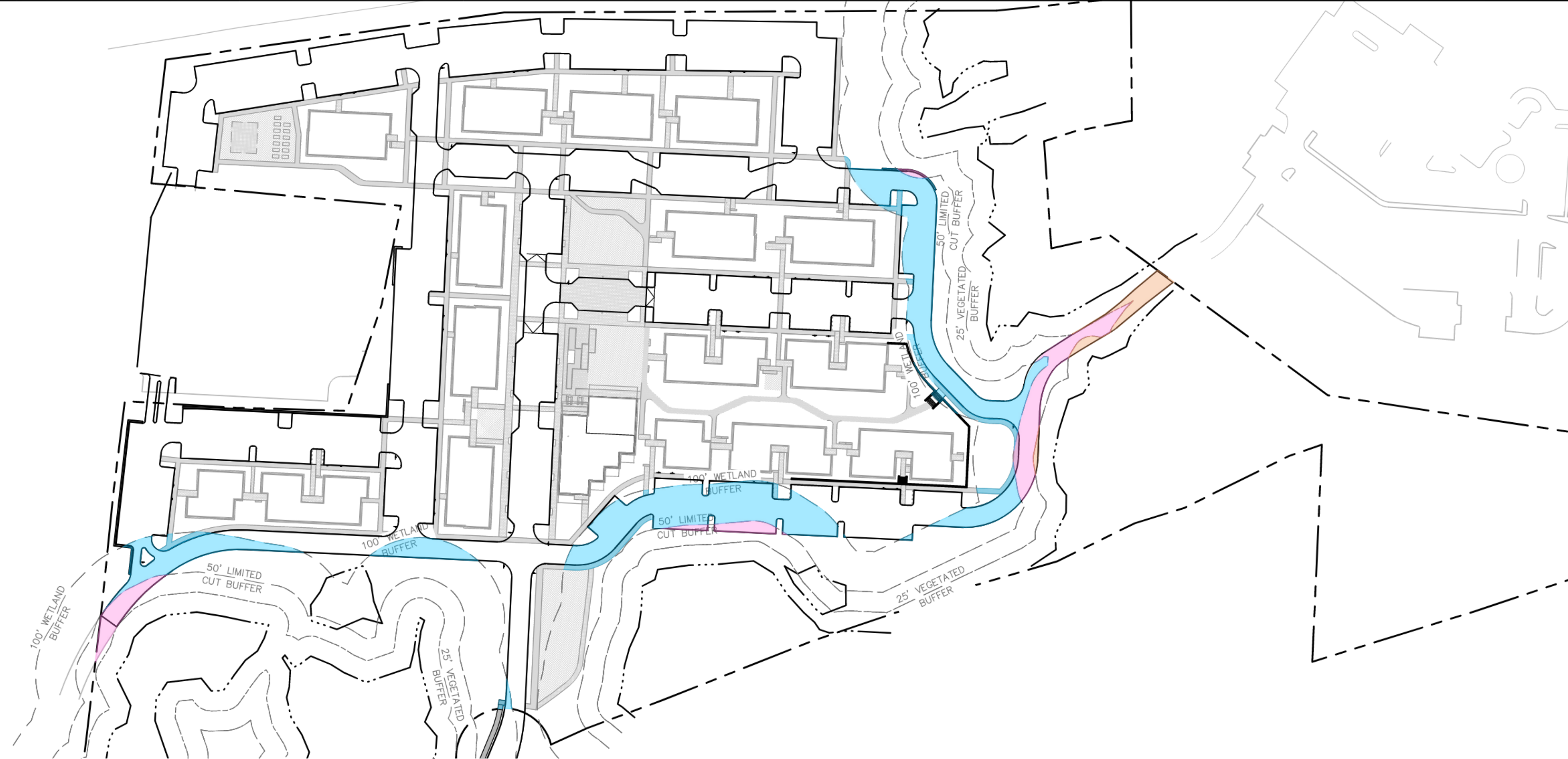
Tighe & Bond

PROPOSED MULTI-FAMILY DEVELOPMENT
DURGIN LANE
PORTSMOUTH, NEW HAMPSHIRE

WETLAND BUFFER IMPERVIOUS
SURFACE EXHIBIT

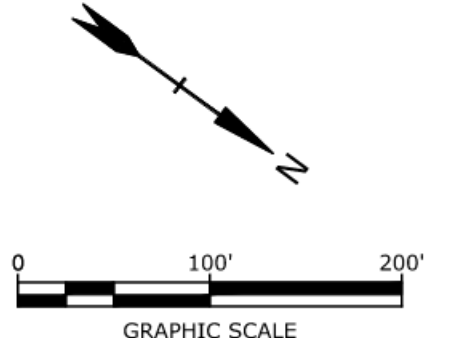


EXISTING WETLAND BUFFER IMPERVIOUS SURFACE
SCALE 1" = 100'



PROPOSED WETLAND BUFFER IMPERVIOUS SURFACE
SCALE 1" = 100'

Impervious Surface Within Buffer Area		
Local Wetland Buffer Setback	Impervious Surface	
	Existing Condition	Proposed Development
0 - 25 FT	3,114 SF	2,467 SF
25 - 50 FT	12,156 SF	9,010 SF
50 - 100 FT	45,975 SF	41,506 SF
Total Impervious Surface	61,245 SF	52,983 SF
Net Impervious Surface	-8,262 SF	



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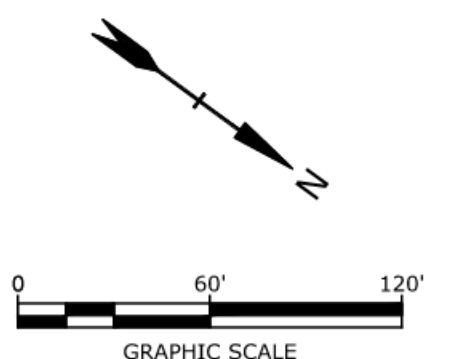
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PROPOSED MULTI-FAMILY DEVELOPMENT
 DURGIN LANE
 PORTSMOUTH, NEW HAMPSHIRE

WETLAND BUFFER IMPERVIOUS
 COMPARISON EXHIBIT



Wetland Buffer Impervious Surface Comparison	
Impervious Surface Removed	28,930 SF
Impervious Surface Added	20,668 SF
Net Impervious Surface	-8,262 SF



Tighe & Bond

APRIL 22, 2024
 E5071-001-FIGS.dwg


Last Save Date: April 19, 2024, 10:55 AM By: MAHANSEN
 Plot Date: Friday, April 19, 2024 Plotted By: Neil A. Hansen
 T&B File Location: J:\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Sheet\E5071-001-FIGS.dwg Layout Tab: BUFFER_COMP

AUTHORIZATION
100 Durgin Lane, Portsmouth
Map 239, Lots 13, 16 & 18

The undersigned owner and applicant of the above referenced property hereby authorize representatives of Bosen & Associates, PLLC, and Tighe & Bond Civil Engineering to represent their interests before the Portsmouth land use boards and to submit any and all applications and materials related thereto on their behalf solely in connection with the multifamily development thereof.


Oak Street Investment Grade Net Lease
Fund Series 2021-2, LLC

Date: April 23, 2024

By: 
Name: Ryan Phelan
Title: Managing Director - Delegatee

100 Durgin Lane Owner, LLC

Date: 4/24/24

By: 
Name: ANDREW HAMER
Title: AUTHORIZED SIGNER